



Client:

BRISBANE WATER

Document Title: Tufnell Road SP68 Pump Station Upgrade



Issue:

Book 1 of 1

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Author:

Brett Lawrence

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SP68 TUFNELL ROAD PUMP STATION REFURBISHMENT

COMMISSIONING REPORT

26/8/2004

Brett Lawrence

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Issue 1 / Rev 0

CONTENTS

II	VIRODUCTION	*
P_{i}	ROJECT SCOPE SUMMARY	1
P.	LANNING & COMMISSIONING	1
3.1	Project Deliverables	1
3.2	Scope of Commissioning	. 1
3.3	Commissioning Team	. 1
3.4	Review of Pre-commissioning Tests	.2
3.5	Commissioning Activities	.2
\boldsymbol{c}	OMMISSIONING RESULTS	2
4.1	Pumps	.2
4.2	Switchboard	.3
4.3	SCADA	
4.4	O & M Manuals	.3
F	INDINGS & DISCUSSIONS	4
5.1	Pumps	.4
5.2	Switchboard	.4
5.3	SCADA	.4
5.4	O & M Manuals	.4
L	DEFECTS	4
R	RECOMMENDATIONS	4
	P. 3.1 3.2 3.3 3.4 3.5 C 4.1 4.2 4.3 4.4 F 5.1 5.2 5.3 5.4 L	PROJECT SCOPE SUMMARY PLANNING & COMMISSIONING 3.1 Project Deliverables 3.2 Scope of Commissioning 3.3 Commissioning Team 3.4 Review of Pre-commissioning Tests 3.5 Commissioning Activities COMMISSIONING RESULTS 4.1 Pumps 4.2 Switchboard 4.3 SCADA 4.4 O & M Manuals FINDINGS & DISCUSSIONS 5.1 Pumps 5.2 Switchboard

Page 6 of 441

COMMISSIONING REPORT

1 INTRODUCTION

Tufnell Road Pump Station (SP68) is located in Banyo. The existing pumps have an existing duty of 22 l/s and standby duty of 22 l/s. It has been determined that the ultimate population of the SP68 catchment is 1985 EP and the required duty of SP68 at Peak Wet Weather Flow (PWWF) is 28 l/s.

2 PROJECT SCOPE SUMMARY

The scope of works for this project involves:

- Arrange for the supply of two (2) new pumps for Tufnell Road Pump Station SP68.
- Tag new pumps and switchboard with BW identification
- (tags supplied by BW)
- Configure switchboard for new pumping units
- Upgrade electrical Consumers main to suit the increased load induced by the upgrade, if required.
- Replace the two existing 7.5 kW pumps (one at a time to avoid the need for flow diversion) and replace switchboard.
- Configure telemetry and screens at Cullen Ave
- Commission upgraded pump station

3 PLANNING & COMMISSIONING

3.1 Project Deliverables

A fully commissioned and operational facility.
Complete set of As Built drawings and O&M Manuals.
All defects to be rectified.
All necessary and agreed training.

3.2 Scope of Commissioning

The commissioning tests will confirm the project deliverables will achieve the performance as specified in the Project Delivery Document.

3.3 Commissioning Team

Brett Lawrence – BW Project Branch Mark Cowper - BW Networks Branch Peter Rennex - BW Projects Branch Matthew Duncan - BW Networks Branch Alan Ruff – BW Networks Branch Geoff Timms - BW Networks Branch Ross Sehmish - BW Networks Branch George Kaluza - BW Networks Branch

Q-Pulse Id TMS972

3.4 Review of Pre-commissioning Tests

Precommissioning tests results for the control systems and pump flows are attached in Appendix A.

3.5 Commissioning Activities

Commissioning activities will include confirmation of the pump flows and confirmation of the control systems and alarms.

4 COMMISSIONING RESULTS

4.1 Pumps

The Grundfos S1-174-H4A 17kW pumps were checked and the flows were measured.

There were no sewage leaks on the pumps (Fig 1) or pipework and the refluxes and delivery valves were replaced.



Fig 1

4.2 Switchboard

The new switchboard has been installed and the single phase and three phase outlet were repositioned to the distribution board because of the location of the soft starters see Fig 2.



Fig 2

4.3 SCADA

The Alarms were checked and operated correctly

4.4 O & M Manuals

The O & M Manuals are being compiled and will be distributed as soon as the As Constructed drawings are completed.

Page 9 of 441

5 FINDINGS & DISCUSSIONS

5.1 Pumps

The bends did not have the correct lifting or chain attachment positions.

5.2 Switchboard

The soft starters did not leave enough room in the front of the switchboard for the power outlets. The cable entry gland was not installed as the chamber is gas tight.

5.3 SCADA

No problems were found.

5.4 O & M Manuals

There were no issues with the O&M Manuals.

6 DEFECTS

There are no outstanding defects for the installation although there was some slight damage to the switchboard on the installation see Fig 3.



7 RECOMMENDATIONS

The standard pump bends are to be modified to suit the different sized pumps.

Appendix A – Commissioning Checklist

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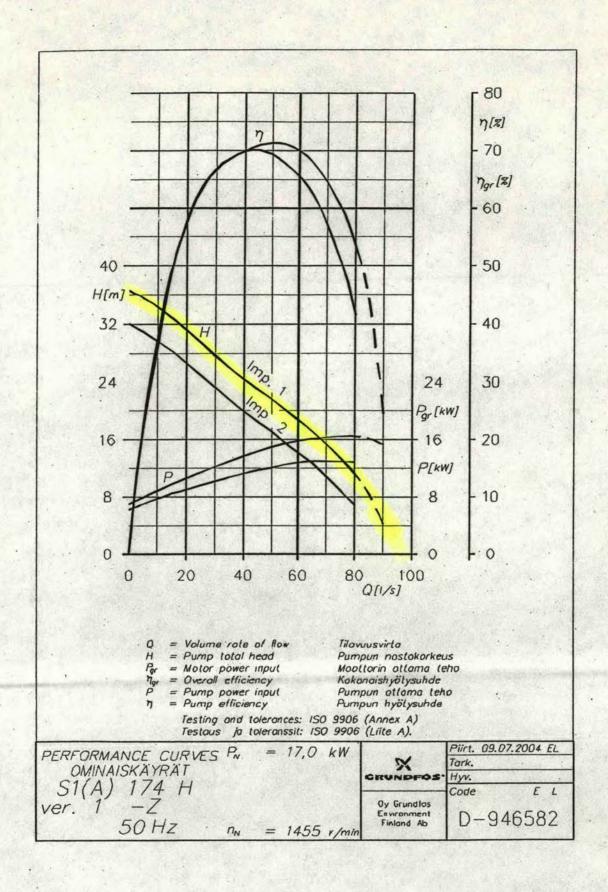
	Pump 1	Pump 2
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Commissioning Report 26 August 2004

Appendix B - Pump Curve and Flow Tests

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Issue 1 / Rev 0



Commissioning Report 26 August 2004

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Issue 1 / Rev 0



1. Start-up & Commissioning
Proedures Page 18 of 441

START-UP & COMMISSIONING PROCEDURES

1.0 GENERAL

Suitably qualified personnel must install the Switchboard assembly. The following check procedures as a minimum, are recommended after installation and prior to initial power-up.

A thorough visual inspection should be made to every aspect of the Switchboard on arrival. This includes checking the Switchboard for any obvious external damages, loose wire connections, loose cabling, loose equipment (relays, contactors, meters etc.), panels damage in transit etc.

All problems must be rectified immediately as they could cause incorrect operation or permanent damage to the equipment.

1.1 INITIAL POWER-UP CHECKLIST

Only authorised and appropriately trained personnel should carry out the inspection and testing tasks specified, included below but not limited to.

- 1. Check all cable connections are firmly fastened and secured.
- 2. Check cable entries are adequately sealed and glanded.
- 3. Check all clearances.
- 4. Check main incoming cables are correctly terminated.
- 5. Check main earth connection for continuity.
- 6. Check switchboard is free from any impurities (dust, filings etc.).
- 7. Check all doors and covers are secure and functioning properly.
- 8. Perform an insulation resistance test on the Switchboard ensuring the results complied with the relevant requirements.

If all inspection and checks have been made, you are now ready to power-up the Switchboard.

1.2 POWER-UP PROCEDURE

Suitably qualified personnel should perform these procedures. These are suggested procedures only, and if specific procedures are available or issued, they MUST prevail.

WARNING

Fatalities have been caused by incorrect connection of Mains services. Correct polarity must be ensured as the wrong connection will energise the earthing system of the installation and create a hazardous situation.

Do not connect or re-connect supply to an installation unless correct polarity has been proven by recognised tests.

- 1. Ensure the main incoming isolator or circuit breaker is isolated.
- 2. Ensure starter modules are isolated.
- 3. Energised mains cabling.
- 4. Turn main circuit breaker on.
- 5. Ensure that all phase voltages are present and correct.
- 6. Individual starter modules can now be energised.



Maintenance & Assembly

PREVENTATIVE MAINTENANCE INSTRUCTIONS

2.0 GENERAL

The Switchboard requires proper care to ensure normal operation at all times. Periodic inspections must be made to determine the exact condition of the Switchboard equipment.

A regular program of systematic maintenance must be established for proper operation of all Switchboard systems. A periodic maintenance schedule must be followed and an inspection log maintained for ready reference. At a minimum, the log must record:

- 1. inspection interval
- 2. inspection procedure performed
- 3. maintenance performed, if any, as a result of inspection
- 4. name of inspector performing task

2.1 PREVENTATIVE MAINTENANCE

Perform preventative maintenance as instructed in Table 1 below

TABLE 1
Preventative Maintenance Schedule

SCHEDULE REQUIREMENT	PARAGRAPH	Reference:
Monthly	Visual inspection	2.2
Six Monthly	Paintwork Maintenance	2.3
Yearly	Mains connections	2.4
Yearly	Switchboard assembly	2.5

2.2 VISUAL INSPECTION

In conjunction with the annual maintenance test, frequent visual inspection should be carried out. To verify the perfect functioning of the signalling system is to guarantee the immediate indication of any abnormal occurrence in the equipment or its components.

- 1. Check that all labelling and schedules are complete, up to date and in their correct places
- 2. Inspect paintwork for signs of corrosion and for any blemishes, which might be susceptible to corrosion in the near future. If inspection indicates areas of rust or corrosion are present, immediately clean and repaint the area. (See section 2.3)
- 3. Check that the load balance on final subcircuits and incomer corresponds to the specifications

2.3 PAINTWORK CARE AND MAINTENANCE

As a general rule, cleaning of externally located powder coating surfaces must take place every six months. Where salts/pollutants are more prevalent such as seaside or industrial areas, a cleaning program should be carried out more frequently. ie. every three months.

THREE STEPS TO CLEANING POWDER COATED SURFACES

- 1. Remove loose deposits with a wet sponge (avoid scratching the surface by dry dusting).
- 2. Using a soft cloth and mild detergent in warm water, clean the powder coating to remove any dust, salt or other deposits.
- 3. Always rinse after cleaning with fresh water to remove any remaining detergent.

Warning: -

In some cases strong solvents recommended for thinning various types of paints and also for cleaning up mastic's/sealants are harmful to the extended life of the powder coated surface. These solvents should not be used for cleaning purposes. If paint splashes and sealants/mastic's need to be removed than the following solvents can be used safely. Methylated Sprits, Turpentine, White Spirits, Ethyl Alcohol, Isopropanol.

2.4 MAINS CONNECTIONS

WARNING

When inspecting or cleaning any of the equipment mentioned below, all due care must be taken to de-energise the circuits associated with the location being serviced.

All mains connections must be thoroughly inspected on an annual basis.

- 1. Inspect the tightness of all bolted connections making sure they are firmly secure so that they cannot work themselves loose;
- 2. Ensure all connections and fixings remain free from dust and dirt build ups and that there is no sign of corrosion;
- 3. Check that all cable supports and their corresponding fixings are in good working order and are firmly secure;

REPAIRS

Immediately replace all damaged or missing parts found during inspection by personnel who are qualified to carry out the repairs.

CLEANING OF EQUIPMENT

All equipment should be cleaned either with a dry soft brush, a feather duster or an equivalent device depending upon the circumstances. If possible, clean with a jet of dry clean air taking care to avoid any damage to components.

2.5 SWITCHBOARD ASSEMBLY

WARNING

When inspecting or cleaning any of the equipment mentioned below, all due care must be taken to de-energise the circuits associated with the location being serviced.

In order for the safe and continued working order of all parts and components within the Switchboard a full maintenance inspection should be carried out annually.

- 1. First, remove all access panels of the Switchboard being careful of any earth wires attached (if applicable).
- 2. Brush or wipe clean, all accumulated dust out of the enclosure.
- 3. Check that all bolted connections are tight and free from corrosion
- 4. Inspect all incoming and outgoing terminations are firmly secure.
- 5. Make sure all C.F.S. units, isolators, contactors, relays, etc. and controls are fully operational.
- 6. Ensure that all instruments are functioning correctly and that their connections and fixings are securely held.
- 7. Ensure that all hinges locks, keys, handles, etc. are secure and functioning properly.
- 8. Check gaskets are intact and providing a suitable seal.
- 9. Make sure that the main earth connections have not come loose and remain secure. Test the Switchboard for continuity.
- 10. Carry out a test to ensure full automatic operation of control circuits.
- 11. Follow manufactures maintenance and inspection procedures on essential equipment. Eg. VFD's, ACB's etc.

REPAIRS

Immediately replace all damaged or missing parts found during inspection by personnel who are qualified to carry out the repairs. If you find that a component, such as a relay, is not working properly due to the fact that there is dirt on any of its contacts or moving parts, an immediate replacement of that part is highly recommended. Also double-check all other components in the general vicinity, as it is highly probable that if one component is affected with dirt others will be also. Since replacements of components are simple, refer to equipment schedule and equipment specification.

SWITCHBOARD ASSEMBLY CONT:

CLEANING OF EQUIPMENT

All equipment enclosed inside the motor control centre should be cleaned with either a dry soft brush, a feather duster or an equivalent device depending upon the circumstances. If possible, clean with a jet of dry clean air taking care to avoid any damage to components.

In the case of grommets, connectors, contactors, etc., cleaning of the contact area can be done in its place using a lint-free cloth moistened with a solvent such as **CRC LECTRA-CLEAN** or an approved electrical cleaning solvent. Removal of corrosion should be with a cleaning solvent and dry thoroughly with a lint-free cloth.

NOTE: -

Take particular care when using industrial solvents, as some of these can be both injurious and flammable. Before using any solvent, establish whether it has been approved for use in the electrical industry and for the particular task.

Warning: - Be sure to follow all safety data sheet instructions on solvent.

If volatile solvents are used for cleaning switchboards, all traces of solvent must be completely evaporated and blown away before the switchboard is re-energised.

SAFETY DIRECTIONS FOR CRC LECTRA-CLEAN

Vapour is harmful to health on prolonged exposure, avoid breathing vapour, use with adequate ventilation. Avoid contact with skin. Intentional misuse by deliberately concentrating and inhaling the contents can be harmful or fatal. Possible risk of irreversible effects. Use only as directed.

First Aid.

If poisoning occurs contact a doctor or poisons information centre.

If swallowed do not induce vomiting – give a glass of water.



ABN 73 052 204 118

Manufacturers of Engineered Switchboards for Mining, Industrial and Commercial Projects

FINAL CHECKING PROCEDURE FOR ALL SWITCHBOARDS

SWITCHBOARD TITLE: Tufnell Road Sewage Pump Station

JOB NUMBER: M0473

	1	Check switchboard has been built as per the approved drawing.
\checkmark	1.	(KA Rating, IP Rating, Form of Segregation)
√	2.	Check all control functions.
✓	3.	Check all connections.
√	4.	Check all clearances.
	5.	Check hinges, locks, keys, handles etc, to ensure that they are secure and
	٥.	function properly
√	6.	Check operations of all CFS units, circuit breakers, isolators, contactors, etc.
✓	7.	Check main earth connections and continuity.
✓	8.	Check that all the neutrals are accessible.
√	9.	Check that all labeling and schedules are in place.
✓	10.	Check general condition of switchboard (paintwork, etc)
✓	11.	Check switchboard has been cleaned out.
✓	12.	Megger switchboard

CIRCUIT	RESULT-1000V MEGGER
R-E	≥200M Ω
W-E	≥200M Ω
В-Е	≥200M Ω
R-W	≥200M Ω
R-B	≥200M Ω
W-B	≥200M Ω
NEUT-E	≥200M Ω

COMMI	ENTS:	
Tested (Okay	
CHECK	ED BY:	
Stephen	McLachlan	
DATE:	11/05/04	

Telephone: (07) 3274 3922 * Facsimile: (07) 3274 3929
Email: POWERELECTRICSWBD@BIGPOND.COM
PO Box 6176, Fairfield Gardens, BRISBANE, QUEENSLAND 4103, Australia
70 Flanders Street, SALISBURY, QUEENSLAND 4107

Pump Station Upgrade Price List

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2002/2003

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Specialists in Industrial Switchgear



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Page 28 of 441

068 Turnell Poad Yaronga SPS Pump Station Upgrade OM Manual



Melbourne Premises

NHP was formed in 1968 for the purpose of manufacturing, importing and merchandising a wide range of specialised electrical switchgear, motor control and other technical electrical products for Australian industry; including mining and general industries, electrical contractors and government departments. NHP is a wholly Australian owned company and exclusively represents a considerable number of overseas companies. These companies manufacture complementary equipment to the NHP programme, which includes products locally manufactured in Melbourne.

The head office and Melbourne sales organisation is situated at Richmond, with branch offices in Sydney, Brisbane, Adelaide, Perth, Newcastle, Townsville, Rockhampton, Toowoomba, Cairns, Darwin and Hobart. The company also has a number of regional representatives to service country areas. NHP products are stocked and distributed through more than 500 centres, Australia wide.

The company also has an office in Auckland, New Zealand primarily involved in the supply of Terasaki circuit breakers and panelboards. The product range is steadily growing with product brands such as Eldon. Schmersal Austrol and Elektra already added.

Due to this extensive national sales and service network, the company is able to continue a policy of supplying an extensive range of technical electrical equipment, supported by substantial stocks and competent service on a national basis.

NHP has also built a substantial 5,200 square metre national distribution warehouse, the first stage of a potential three stage development, which ultimately will result in a 15,000 square metre warehouse. The facility is located in the middle of the freight corridor between Melbourne airport and the city's docks area to help ensure effective stock delivery and despatch.

NHP has been consistently committed to providing an outstanding level of customer service and the staff have been trained over many years to provide a customer friendly environment and be seen to be 'easy to deal with'.

It is the continuing policy of the company to improve both the range and quality of products and services available for the Australian markst. Experienced engineering and management personnel continually visit world centres to ensure that the organisation keeps pace with technological advances, research and development and modern marketing techniques.

Proudly Australian
Effective October 2002

NHP is a 100 per cent Australian owned company

068 Tufnell Road Yeronga SPS Pump Station Upgrade CPA MARGA

TERASAKI - ENGINEERING SPECIALISTS SINCE 1923

The Terasaki Electric Company, Japan, was founded in 1923 in the industrial city of Osaka. In its early beginnings it started with the manufacture of air circuit breakers. Terasaki later expanded its operations in the late 40's when they entered the marine industry manufacturing a complete line of moulded case circuit breakers.

Terasaki is world famous for its installations of marine switchoear, including air and moulded case circuit breakers in over 80% of the world's ocean going marine vessels.

Terasaki has developed systems beyond basic switchgear requirements for guidance and monitoring of ships on the high seas.

Terasaki is very proud of its achievements in this area, proving that quality and reliability of Terasaki products is recognised where service conditions are sometimes arduous and severe.

In the 70's Terasaki expanded their production facilities to enable them to enter the industrial market as well as continuing to expand within the well established marine business. Terasaki now have a total of 7 factories throughout Japan, mainly in the Osaka area, as well as affiliated companies in Great Britain, Malaysia, Spain, Italy, Finland, Sweden, Brazil and China,

NHP were appointed the sole Australian agent for Terasaki products in 1979. From that time until now, NHP has established Terasaki products as a standard in the Australian market.

Terasaki were the pioneers and the first circuit breaker company to introduce current limiting circuit breakers to the world in 1963 utilising the contact repulsion principle. which was first introduced in the TL range of moulded circuit breakers.



MINIATURE CIRCUIT BREAKERS & ACCESSORIES

Safe-T MCBs, RCDs, SRCBs and ELRs, Din-T MCBs, Din-T6, Din-T10, Din-T10H, Din-T15, Din-Safe RCDs and safety switches, Din-T MCB electrical accessories and surge diverters, Sprecher + Schuh and Din-T contactors,

PANELBOARDS, LOADCENTRES & ACCESSORIES

Insulated loadcentres, general purpose, multi-purpose panelboards, premier panelboards, busbar chassis and accessories.

TEMBREAK MCCBs

TemBreak MCCBs thermal magnetic type, electronic type and motor protection type up to 2500 amps. ELB, RCD and TemCurve selectivity software, TemWay XA, XB, XC, MHC and UHC chassis assemblies, TemPlug.

4

6

TEMBREAK MINING BREAKERS

1100 V mining breakers, thermal magnetic electronic type from 15-1250 amps.

AUTOMATIC TRANSFER SWITCHES

Automatic, basic, manual transfer switches, options and accessories. Aichi transfer switches

TEMPOWER 2 AIR CIRCUIT BREAKERS

 $200\mbox{-}6300$ amps, multifunction over current protection relays, options and accessories.

RESIDUAL CURRENT RELAYS

TZS and DSR type residual current relays and toroids, DIN rail and panel mount.

TIME SWITCHES AND RAIL DIN INSTRUMENTS

Grasslin time switches Talento range, IME, RAIL DIN mounted instruments, analogue, digital and energy meters.

TECHNICAL REFERENCE DATA

MCB, MCCB general technical information, motor starting tables, DC applications, discrimination cascading, type "1" and type "2" co-ordination data.

Q-Pulse Id TMS972 Active 10/12/2014 Page 31 of 441

New Products included in this Terasaki CPB Price List



Terasaki Din-T

Miniature circuit breaker Motor operator.

▲ Refer Section 1



Surge Diverters

Din rail mounted surge diverters - Single and 3 phase

▲ Refer Section 1



Din-T DC

DC series MCB 250/440 V DC

▲ Refer Section 1





Din T Main Switch

New type mounts horizontally onto chassis tee offs.

▲ Refer Section 1

Terasaki Concept family panelboards

- Concept
- Concept Premier ▲ Refer Section 2

Terasaki TemBreak Plus MCCBs

Increased Selectivity and fault break ratings

▲ Refer Section 3



Aichi MAC-DT

Manual or solenoid operated transfer switches Terasaki Air circuit

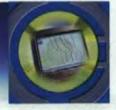
▲ Refer Section 5



TemPower 2 ACBs

A complete new line of Breakers

▲ Refer Section 6



Terasaki TemCurve 4.0 Circuit Breaker & fuse

software for selectivity applications, Suits Windows 95

to NT. A Refer Section 9

SECTION 1

Miniature circuit breakers & accessories

Sal	e-T	M	CE	S
Ou			UL	,,,

Safe-T MCBs 6kA	1-1 to 1-2
Safe-T MCBs - dimensions	1-3
Safe-T MCB - options, hardware and accessories	1 - 4
Safe-T - residual current circuit breakers SRCB	1-5
Safe-T residual current circuit breakers	1 - 6
Safe-T - earth leakage relay ELR	1-7
Control of the contro	

Control of the Contro	
Din-T MCBs	
Din-T general features	1 - 8 to 1 - 9
Din-T6 6kA "C" curve 1, 2 & 3 pole	1 - 10
Din-T6 6kA "D" curve 1, 2 & 3 pole	1-11
Din-10 10kA "C" curve 1, 2, 3 & 4 pole	1 - 12 to 1 - 13
Din-T10 10kA "D" curve 1, 2, 3 & 4 pole	1 - 14
Din-T10H 10kA "C" & "D" curve	1 - 15
Din-T15 15kA "C" curve 1, 2, 3 & 4 pole	1 - 16 to 1 - 17
Din-TDC 6kA "C" curve 1 & 2 pole	1 - 18
Din-T main switch 63-100 amp	1 - 19

Din-Safe - Residual current devices

Din-Safe single pole width	
residual current circuit breakers DSRCBH	1 - 20
Din-Safe - MCBs type DSMCB	1 - 21
Din-Safe - safety switches	1 - 22 to 1 - 23
Din-Safe-M, clip on modules	1 - 24 to 1 - 26

Din-T MCB electrical accessories	
Din-T shunt trip & undervoltage trips	1 - 27
Din-T motor operator	1 - 28
Din-T auxiliary and alarm switches	1 - 29
Accessories and terminals	1 - 30 to 1 - 33

DIM rail mounting accessories	
Din-T modular changeover switches	1 - 34
Din-T pilot light and pushbuttons	1 - 34
Din-T impulse switches	1 - 35
Din-T hour run counters	1 - 35
Titan surge diverters DRI / 4	1 - 36
Sprecher + Schuh CA 4 contactors	1 - 37

Din-T contactors & technical data 1 - 38 to 1 - 39 Dimensions, Din-T series 6, 10 & 15kA 1 - 40

Page

SECTION 2

Panelboards, loadcentres & accessories

Loadcentres and pole covers

Safe-T & Din-T pole covers	2-1
Pilux "Dion" insulated loadcentres	2-2
ILC insulated loadcentres	2-3
Din-Modula 150	2-4
Din-Modula weatherproof	2-5
NLC metal loadcentre - Din-T	2-6
TLC metal loadcentre & accessories - Safe-T	2-7

Panelboards general purpose, premium and	weatherproof
Introduction	2 - 8 to 2 - 10
Quick reference table	2 - 11
CONCEPT General purpose panelboards	2 - 12 to 2 - 14
CONCEPT PLUS multi purpose panelboards	2 -15 to 2 - 21
CONCEPT PREMIER premium weather proof	2 - 22 to 2 - 24
CONCEPT chassis systems	2 - 25 to 2 - 27
and the same and t	

SECTION 3

TemBreak MCCBs

TemBreak - quick selection guide	3 - 1
Enhanced switchgear TemBreak Plus	3-2
ELB residual current devices	3 - 4 to 3 - 5
XM30PB - motor protection circuit breakers 85kA	3 - 6 to 3 - 7
TemBreak 125 A series and accessories	3 - 9 to 3 - 17
XE225 economical series - thermal magnetic type 18kA	3 - 18 to 3 - 19
XH160 Plus PowerBreaker Ics series - thermal magnetic type	18kA 3 - 20
TemBreak 250 A series and accessories	3 - 21 to 3 - 26
TemBreak 400 A series and accessories	3 - 27 to 3 - 36
TemBreak 630 A series	3 - 37 to 3 - 43
TemBreak 800 A series and accessories	3 - 44 to 3 - 52
XS1250 Plus selectivity series - electronic type 65kA	3 - 53
XS1600 Plus selectivity series - electronic type 85kA	3 - 54
1250 to 1600AF accessories	3 - 55 to 3 - 57
XS2000 standard series, electronic for discrimination 100kA	3 - 58
XS2500 standard series, electronic for discrimination 100kA	3 - 59
2000 to 2500AF accessories	3 - 60 to 3 - 61

068 Tufnell Road Yeronga SPS Pump Station Upgrade OM Manual

	Page
TL Plus LimitorBreaker Ics	3 - 62 to 3 - 67
TL30 high fault series - thermal magnetic type 120kA	3 - 68
TL100 current limiting circuit breakers	3 - 69 to 3 - 70
TL225 current limiting circuit breakers	3 - 71 to 3 - 72
TL100F/EM accessories	3 - 74
TL100C accessories	3 - 75
TL225B accessories	3 - 76
TL225F accessories	3 - 77
DC thermal magnetic types 630 A - 2500 A	3 - 80
TemWay XA, XB & XC chassis assemblies	3 - 81 to 3 - 82
Standard MHC chassis assemblies	3 - 83 to 3 - 84
Hi-Tem UHC chassis assemblies	3 - 85 to 3 - 86
NHP TemPlug	3 - 87
TemBreak combination of internally mounted accessories	3 - 88

SECTION 4

TemBreak mining breakers

TL-100 - thermal magnetic type	4-1 to 4-2
XV400 - electronic type	4 - 3 to 4 - 6
XV630 and XV800 - electronic type 18kA	4 - 7 to 4 - 10
XV1250 - electronic type 20kA	4 - 11 to 4 - 14

SECTION 5

Automatic transfer switches

Standard basic transfer switches	5 - 1
BTS and MTS options and accessories	5-2
TemLogic panel	5-3
Aichi MAC-DT transfer switches	5 - 4 to 5 - 7

SECTION 6

TemPower 2 air circuit breakers

TemPower 2, 200 - 6300 A	6 - 1 to 6 - 4
TemPower 2 accessories	6 - 4 to 6 - 6
TemPower 2 overcurrent relays	6-7 to 6-9
TemPower 2 remote operating panel	6 - 10
TemPower 2 technical data	6 - 11 to 6 - 16

068 Tufnell Road Yeronga SPS Pump Station Upgrade OM Manual

Page

SECTION 7

Residual current relays

TZS

- residual current relavs 7 - 1 to 7 - 2 - remote torroids 7 - 3
- Din-Safe-R (DSR) - DIN rail mount residual current relays 7-4 to 7-5
- panel mount residual current relays 7 - 6 to 7 - 8 Wiring diagram/dimensions Din-Safe-R 7 - 7 to 7 - 8 Remote torroids 7 - 9

SECTION 8

Time switches and DIN rail instruments

Grasslin time switches

Talento range, analogue & digital 8-1

IME DIN rail Instruments

- IME DIN rail family 8-2 Analogue meters (AC) 8-3 Analogue meters (DC) 8-4 Energy meters 8-5
 - NEMO modular multifunction meter 8-5 RAIL DIN digital meters 8-6 to 8-7

Page

9 - 30

9-31

9 - 32

SECTION 9

Technical reference

TemBreak mining applications 1100 V

IP rating protection chart

Application notes

Din-T MCB specifications	9-1	
Din-T voltage drop and watts loss	9 - 2	
Din-T time current curves Din-T6 and Din-T10		
"C" and "D" curves	9 - 3 to 9 - 5	
Din-T time current curves Din-T10 & Din-T15	9-6	
Temp. comp. curves Din-T6, 10, 10H & 15	9-7	
TemBreak DC circuit breaker selection table	9-8	
MCB & fuse current limiters co-ordination chart	9 - 9	
Discrimination (selectivity) and		
cascade table at 415V	9 - 10 to 9 - 15	
Type '1' short circuit co-ordination	9 - 16	
Type '2' short circuit co-ordination	9 - 17 to 9 - 19	
S+S ACS/Terasaki type '2' co-ordination	9 - 20	
Motor circuit application table for DOL starting	9 - 22 to 9 - 23	
General motor circuit application table for		
reduced voltage starting	9 - 24 to 9 - 25	
Motor circuit application table for		
DOL FIRE PUMP starting	9 - 26 to 9 - 27	
Footnotes for application tables		
on pages 9 - 22 to 9 - 27	9 - 28	
Motor starting tables for		
DOL starting at 1000V AC 50Hz	9 - 29	

Electrical formula - for obtaining
kW, kVA, HP and Amperes 9 - 32
TemPower 2 ACB and OCR Catalogue Numbers
with applicable Item Numbers 9 - 33

Alpha/numeric Cat. No. index Index 1 to 14

The prices shown in this price list are recommended Australian dollar prices and are exclusive of GST only and there is no obligation to comply with the recommendation. These prices are not valid in New Zealand. Equipment offered for sale in this catalogue is subject to our Standard Conditions of Sale applicable at the date the order is placed. Copies are available on request.

Our policy is one of continuous improvement and we reserve the right to alter any product at any time without notice. All detail is subject to change without notice and should be confirmed at time of purchase. No responsibility can be accepted for any errors, omissions or losses arising from the application of any information in this catalogue.



High quality moulded case circuit breakers, air circuit breakers, loadcentres and distribution boards

Explanation of terms and headings used within Price List CPB

The price list catalogue is segregated into sections. A full list of contents of each section is situated at the front of the price list catalogue.

Each page has a bold section number for prompt page location.

Each page is identified by both its section number and its page number eg. 1 - 2 signifies this is section 1 page 2.

All catalogue numbers are bold and shaded.

All prices are per each unless otherwise shown. Sales tax, where applicable, is not included in the price.

Prices for equipment fitted with coils, apply to standard voltages only. Non standard voltages shown are available on request at additional cost.

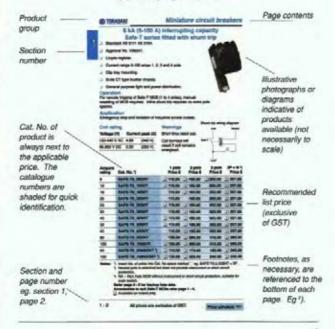
Items prefixed i are generally available on indent only.

A quick alpha/numeric reference by catalogue number or brief description is located at the rear of the catalogue.

Current NHP standard conditions of sale COS-14 apply to this price list catalogue.

The prices in this price list catalogue are recommended prices only and there is no obligation to comply with the recommendation.

Typical page layout



068 Tufpell Road Yeronga SPS Pump Station Upgrade OM Manual industrial switchgear refer to NHP price list catalogues

> Part A and Part B or NHP E-CAT electronic price list catalogue



Please contact your nearest NHP branch for details

6 kA (6-100 A) interrupting capacity Safe-T series

- Standard AS 3111 AS 2184.
- Approval No. V99347.
- Lloyds register.
- Current range 6-100 amps 1, 2, 3 and 4 pole.
- Clip tray mounting.
- Suits CT type busbar chassis.
- General purpose light and power distribution.

Technical data

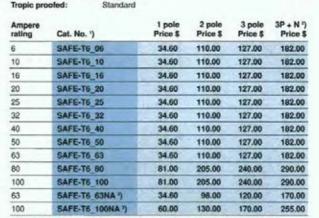
Interrupting capacity:

6 kA at 250 V AC (sym) 1 pole 6 kA at 400 V AC (sym) 2 & 3 pole

5 kA at 125 V DC 2 pole

Thermal setting: Fixed (40°)

Magnetic setting: Fixed Fluorescent switching: UL489



Notes: ') Insert No. of poles into Cat. No.space marked 'eg. SAFE-T6 3 25 = 3P .

 Neutral pole is switched but does not provide overcurrent or short circuit protection.

 NA – Non Auto MCB without overcurrent or short circuit protection, suitable for main switch.

Refer page 9 - 9 for backup fuse data. Accessories to suit Safe-T MCBs refer page 1 - 4.

@Puse 18 TMS972 Active 10717/2014 Page 41 of 441-1

6 kA (6-100 A) interrupting capacity Safe-T series fitted with shunt trip

- Standard AS 3111 AS 2184.
- Approval No. V99347.
- Lloyds register.
- Current range 6-100 amps 1, 2, 3 and 4 pole.
- Clip tray mounting.
- Suits CT type busbar chassis.
- General purpose light and power distribution.

Operation

For remote tripping of Safe-T MCB (1 to 4 poles), manual resetting of MCB required. Inline shunt trip requires no extra pole spaces.

Application

Emergency stop and isolation of industrial socket outlets.

Coil rating Warnings

Voltage (V)	Current	peak (A)
120-440 V AC	4.88	(440 V)
48-250 V DC	2 32	/250 V)

arnings

Short time rated coil.

Coil burnout will

result if coil remains energised.



Line	diagram Neutra
	1
Safe-T \ E	
- N	
	T

Ampere rating	Cat. No. 1)	1 pole Price \$	2 pole Price \$	3 pole Price \$	3P + N ²) Price \$
6	SAFE-T6_06SHT	110.00	185.00	<u>ii</u> 202.00	<u>i</u> 257.00
10	SAFE-T6_10SHT	110.00	185.00	202.00	1 257.00
16	SAFE-T6_16SHT	110.00	185.00	202.00	i 257.00
20	SAFE-T6_20SHT	110.00	185.00	202.00	1 257.00
25	SAFE-T6_25SHT	<u>i</u> 110.00	185.00	202.00	1 257.00
32	SAFE-T6_32SHT	110.00	185.00	202.00	<u>ii</u> 257.00
40	SAFE-T6_40SHT	110.00	185.00	202.00	1 257.00
50	SAFE-T6_50SHT	110.00	185.00	202.00	1 257.00
63	SAFE-T6_63SHT	110.00	185.00	202.00	1 257.00
80	SAFE-T6_80SHT	156.00	1 280.00	315.00	₫ 365.00
100	SAFE-T6_100SHT	156.00	1 280.00	315.00	i 365.00
63	SAFE-T6_63NASHT 2)	110.00	i 173.00	195.00	<u>i</u> 245.00
100	SAFE-T6_100NASHT 3)	135.00	i 205.00	245.00	i 330.00

- Notes: 1) Insert No. of poles into Cat. No.space marked '_' eg. SAFE-T6 3 25SHT = 3P .
 - Neutral pole is switched but does not provide overcurrent or short circuit protection.
 - NA Non Auto MCB without overcurrent or short circuit protection, suitable for main switch.

Refer page 9 - 9 for backup fuse data. Accessories to suit Safe-T MCBs refer page 1 - 4.

Available on indent only.

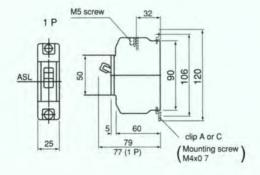
Circuit breakers for distribution and lighting Safe-T series

Fluorescent light switching duty - UL 489

All Safe-T MCBs are by design suitable for fluorescent light switching duty as per the requirements of UL 489 issued by Underwriters Laboratories (USA). Performance standards to regularly switch banks of fluorescent lights ON and OFF require the MCB to withstand the higher inrush current (up to 30 times normal rating). If the MCB cannot withstand this inrush current, contact erosion and excess temperature rise will be experienced. Safe-T MCBs have been designed to withstand this type of duty. (Refer NHP)

Dimensions (mm)

Poles	1	2	3	3P + N	SHT
Н	95	95	95	95	150
W	25	50	75	100	
D	60	60	60	60	
kg	0.16	0.42	0.63	0.84	4



Options, hardware and accessories

Description	Sale-1 series	Cat. No.	Price \$
Handle lock	Red	TAA-5LR	2.00
	Yellow	TAA-5LY	2.00
Handle cap	Green	I TAA-5CG	1.20
	Red	TAA-5CR	1.20
	Yellow	II TAA-5CY	1.20
Padlock attach	1 pole	TKB-50SG-L	12.40
	3 pole	TKC-50SG	12.40
Padlock attach kits	12 pack & resin	SAFE-TLCK 12	93.00
(captive)	24 pack & resin	SAFE-TLCK 24	122.00
Tunnel terminal	35 mm² Safe-T (6-63 A)	7T-1ST	7.60
	70 mm² Safe-T (80-100 A)	7T-2ST	9.00
T-off plastic caps		TH250TOPC	0.35
Pole fillers		SAFE-TPF	1.00
Cliptray (per 12 pole pie	eces)	TDB-50SG-12	12.20
Link bar (1 phase)	6 pole	LB-6	7.80
120 amps	9 pole	LB-9	8.80
	12 pole	LB-12	11.00
	15 pole	LB-15	14.60
	18 pole	LB-18	15.80
	24 pole	LB-24	19.20
Link bar (3 phase)	12 pole	LB3PH12 Nett	91.50
120 amps	18 pole	LB3PH18 Nett	127.00
Wiring harness (3 phas	e)	SAFE-TWH3P	2.70
MCB flush mount kit	1 pole	7PE50SG1	25.40
	2 pole	7PE50SG2	30.80
	3 pole	7PE50SG3	35.00
	4 pole	7PF50SG4	40.00

Note: i Available on indent only.



Link bars

3 phase wiring harness



Tunnel terminals





Flush mount kit



3 phase link bars



Locking attachment

Q-Pulse Id TMS972 Active 10/12/2014

Parge 44hefu44ti

Single pole width residual current circuit breakers (SRCB) Safe-T series

- Standard AS 3111 AS 3190.
- Approval No. N15251.
- Mines Approval MDA Ex. 11576.
 OMD 997458XU.
- Current rating: 10, 16 and 20 amp.
- Voltage 240 V AC 50/60 Hz (not suitable for 415/440 V).
- Short circuit protection 6000 amps.
- □ Earth leakage protection 30 mA and 10 mA.

Operation

Safe-T single pole width residual current circuit breakers offer overload, short circuit and earth leakage protection in a single module width unit.

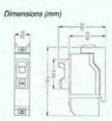
Mounting arrangements are identical for those throughout the Safe-T MCB range utilising the NHP clip tray mounting system in panelboards and loadcentres.

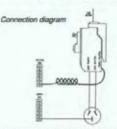
Ampere rating	Poles	Modules	Trip sensitivity (mA)	Cat. No. 1)	Price \$
10	1	1	30	SRCB 1030	195.00
16	1	1	30	SRCB 1630	195.00
20	1	1	30	SRCB 2030	195.00
10	1	1	10	SRCB 1010 U	210.00
16	1	1	10	SRCB 1610 II	210.00
20	1	1	10	SRCB 2010 II	210.00

- Note: ') Neutral not switched.
 - Available on indent only
- 1) 30 mA units only

Accessories

Description		Cat. No.	Price \$
Padlock attachment kit	12 pack and resin	SRCBLCK 12	93.00
(captive)	24 pack and resin	SRCBLCK 24	122.00
Adaptor kit	Cutler hammer (Quicklag)	SRCBWA	15.40





Note: Nuisance tripping may be experienced in VFD and motor starting applications refer NHP.

Residual current circuit breakers Safe-T series

- Standard AS3111 AS3190.
- Approval No. V99347.
- Current rating:
 6-50 1 pole switching.
 6-63 A 1 pole and N switching.
- Clip tray mounting.

The Sale-T residual current circuit breaker provides overload, short circuit and earth leakage protection. They feature separate indication for earth leakage and overload trip. They also utilise the same mounting method as the Sale-T MCBs and fit the CT type chassis and TLC type loadcentres.



Ampere rating	Sensitivity *)	Cat. No. ')	1 pole ') Price \$	1P + N")") Price \$
6	30 mA	SAFE-TRC86_0630	198.00	215.00
10	30 mA	SAFE-TRCB6_1030	198.00	215.00
16	30 mA	SAFE-TRCB6_1630	198.00	215.00
20	30 mA	SAFE-TRC86_2030	198.00	215.00
25	30 mA	SAFE-TRCB6_2530	198.00	215.00
32	30 mA	SAFE-TRCB6_3230	198.00	215.00
40	30 mA	SAFE-TRCB6_4030	198.00	215.00
50	30 mA	SAFE-TRC86_5030	198.00	215.00
63	30 mA	SAFE-TRCB6_6330	N/A	215.00

Notes: ') Insert the No. of poles into space marked '__

7) 250 V, switched neutral (not suitable for 415/440 V).

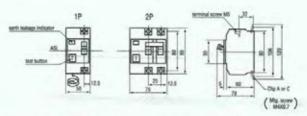
1) 1P+N = 3 modules wide.

1) 1 pole × 2 modules wide.

1) 100 mA sensitivity available on special indent order.

Weight

Poles	1 pole	1P + N
kg	0.34	0.50



Note: Nuisance tripping may be experienced in VFD and motor starting applications refer NHP.

ELR earth leakage relay for 'Safe-T' MCBs

- Standard AS3190.
- Approval No. N15380.
- Mines Approval MDA Ex. 11577.
 QMD 997459XU.
- Earth leakage protection 30mA.
- NHP clip tray mounting (CT chassis).

Application

The ELR is identical in width to the single pole Safe-T MCB.
The ELR is clip tray mountable along side the Safe-T MCB when fitted to the CT chassis as found in the CST/TPP series panelboards.

When the ELR is combined with a Safe-T MCB fitted with a shunt trip, the resulting combination offers overload, short circuit and earth leakage protection and can be retrofitted into an existing installation or installed in a new installation. Suitable for commercial and industrial applications.

Test function

A test button is provided on the unit to functionally test the detection and tripping circuits. It is recommended a functional test be performed monthly.

Poles	Sensitivity mA ')	Voltage	Cat. No.	Price \$
1	10	240	ELR24010	395.00
1	30	240	ELR24030	395.00
1	100	240	ELR240100	350.00
1	300	240	ELR240300	395.00
1	30	440	ELR44030	350.00

Technical data

Operation: Instantaneous

Frequency: 40-60 Hz
Output ratings: I peak 8 A,

I average 0.5 A

☐ Toroid window: 4 x 35 mm²

(aperture diam.

35 mm)

☐ Dimensions: H = 152 mm W = 25 mm

D = 60 mm 0.16 kg

TERRADAY SAPE-T
CIRCUIT BREAKER
WITH SHURT TRIP
BARTT
LEARTH
LEARAGE
RELAY

DO NOT
PAGE
TORONO
NEUTRAL BAR
TORONO

LINE

Note: 1) Mines dept approval for 30 mA only.

Nuisance tripping may be experienced in VFD and motor starting applications refer NHP.

General features Din-T series

Advantages of the Din-T series miniature circuit breakers

- □ Short circuit breaking capacity of 6, 10 and 15 kA at 415 V AC.
- Increased rating up to 50 kA when backed up with a 200 A HRC fuse. (Refer page 9 - 8).
- Rated current range from 0.5 A up to 125 A.
- Silver graphite contacts.
- Input connection by lifting cage terminal with capacity of up to 35 mm² giving fast and practical connection.
- Output terminals offer finger and hand protection with a capacity of up to 25 mm².
- A new design of snap fixing with two stop locations, for normal DIN rail mounting.
- Approval number N13374 and N13753.
- Complies with IEC 898 and IEC 947-2 as applicable.

Brief description

The Din-T series of miniature circuit breakers have inverse time delayed thermal and instantaneous magnetic trips, and are suitable for mounting in distribution boards or in switchgear panels and consumer units.

Operation

Protection against overheating of electrical conductors, excess currents due to overload, short circuit or earth fault.

Application

In switching, control, distribution and measurement systems for domestic, commercial and industrial installations.

Tripping characteristics

Thermal release

In case of overload, the release is initiated by a bimetal strip. Standards IEC 998 and IEC 947 define the range of release for specific overload values. Reference ambient temperatures are 30 °C and 40 °C for the respective standards.

Magnetic release

In case of short circuit, an electromagnet with plunger ensures instantaneous tripping. IEC 898 describes the characteristics for the following curve types:

Type	Test current	Application
С	5-10 x ln	Protection general distribution loads - lighting - socket outlets - motors etc
D	10-20 x In	Protection of circuits having high inrush transient currents - high inertia motor starting - transformers - welders

<mark>068 Tufnell Road Yeronga SPS Pump Station Upgrade OM Manual</mark>

General features Din-T series

Handle

Sealable and padiockable with quick-make and quick-break type mechanism. The handle is sealable in ON and OFF position. Due to the free tripping mechanism, the MCB contacts open through overload or short circuit even when the handle is sealed in the ON position on all types.

Input terminal ('OFF' side)

Box terminal with lifting screw for copper and aluminium conductors: max. capacity 1 x 35 mm² or 2 x 16 mm².

When unscrewing the screw, the head lifts; however, on pushing the screw head, the box terminal opens. This system enables the MCBs to be linked with a cable and fork or pin type bus comb. The MCB is delivered with a half open box terminal and a lifted screw head. A protection cap is fixed onto the input terminal in order to obtain IP 20 protection against finger contact. (Standard for 10 and 15 kA only).

Output terminal ('ON' side)

Box type terminal with captive terminal screw for copper and aluminium conductors: max. 1 x 25 mm² or 2 x 10 mm².

The box terminals are always delivered in the open position. Output terminal screw has IP 20 protection against direct finger contact by standard design.

Arc chamber

Contains are extinction plates, (de-ionising type) designed to break up and dissipate the arc which is generated during interruption of all types of faults.

Electromagnet

Operating the plunger which opens the contacts instantaneously.

Arc magnetic blowout system

Short circuit currents do not flow through the bimetal but are directed by the blowout magnet in such a way that the arc is transferred to a special arc runner, therefore taking the bimetal out of the circuit which ensures the thermal trip characteristics remain unchanged after an MCB has been exposed to a fault current.

The combination of the electromagnet (with a plunger rapidly opening the contacts), the blowout magnet and the arc chamber, results in an extremely high short circuit breaking capacity, and very low let through energy.

Snap-on clip for DIN rail mounting

This special flexible system gives ease of mounting and positioning of the MCB on DIN rail.

Catalogue number structure for Din-T MCBs (6, 10, 10H & 15)

DIN-T		XX		X		XX		X
Constant		ort circuit pacity (A)	T	Polarity	C	urrent (A)	T	Curve
NHP DIN	6	6000	1	1 pole	05	0.5	В	3In - 5In
format	10	10000	2	2 pole	02	2	C	5ln - 10ln
	10H	10000	3	3 pole	04	4	D	10ln - 20ln
	15	15000	4	3P + N	10	10		
	-				16	16	1	
					20	20		
					Etc			

6 kA (2-63 A) interrupting capacity 'C' curve Din-T6 series

- Standard AS 3111, IEC 898.
- Approval No. N13374.
- Current range 2-63 amps 1, 2 and 3 pole.
- Sealable and lockable handle.
- DIN rail mounting.
- Suits CD type chassis.
- General purpose light and power distribution.



Curve type: C (5 - 10 In) Single pole

Amps	Cat. No.	Price \$	Amps	Cat. No.	Price \$
2	Din-T6102C	26.60	20	Din-T6120C	26.60
4	Din-T6104C	26.60	25	Din-T6125C	26.60
6	Din-T6106C	26.60	32	Din-T6132C	26.60
10	Din-T6110C	26.60	40	Din-T6140C	26.60
16	Din-T6116C	26.60	50	Din-T6150C	26.60
		Table 1	63	Din-T6163C	26.60

Double pole

2	Din-T6202C	88.50	20	Din-T6220C	88.50
4	Din-T6204C	88.50	25	Din-T6225C	88.50
6	Din-T6206C	88.50	32	Din-T6232C	88,50
10	Din-T6210C	88.50	40	Din-T6240C	88.50
16	Din-T6216C	88.50	50	Din-T6250C	88.50
		100	63	Din-T6263C	88.50

Triple pole

2	Din-T6302C	114.00	20	Din-T6320C	114.00
4	Din-T6304C	114.00	25	Din-T6325C	114.00
6	Din-T6306C	114.00	32	Din-T6332C	114.00
10	Din-T6310C	114.00	40	Din-T6340C	114.00
16	Din-T6316C	114.00	50	Din-T6350C	114.00
		10235	63	Din-T6363C	114.00

Notes: The line side is the 'QFF' (bottom) side of the MCB.

- Suitable for the following side attached accessories:-
- AUX/ALM switches refer page 1 29.
- Shunt trip refer page 1 27.
- Din-Safe-M module refer page 1 24.
- Din-T terminals and accessories refer page 1 31.

6 kA (2-63 A) interrupting capacity 'D' curve Din-T6 series

- Standard AS 3111, IEC 898.
- Approval No. N13374.
- Current range 2-63 amps 1, 2 and 3 pole.
- Sealable and lockable handle.
- DIN rail mounting.
- Suits CD type chassis.
- Motor starting and transformer applications.

Curve type: D (10 – 20 In) Single pole



Double pole

	The same of the sa				
2	Din-T6202D	91.50	20	Din-T6220D	91.50
4	Din-T6204D	91.50	25	Din-T6225D	91.50
6	Din-T6206D	91.50	32	Din-T6232D	91.50
10	Din-T6210D	91.50	40	Din-T6240D	91.50
16	Din-T6216D	91.50	50	Din-T6250D	91.50
		2011	63	Din-T6263D	91.50

Triple pole

2	Din-T6302D	126.00	20	Din-T6320D	126.00
4	Din-T6304D	126.00	25	Din-T6325D	126.00
6	Din-T6306D	126.00	32	Din-T6332D	126.00
10	Din-T6310D	126.00	40	Din-T6340D	126.00
16	Din-T6316D	126.00	50	Din-T6350D	126.00
	100	0	63	Din-T6363D	126.00

Notes: The line side is the 'OFF' (bottom) side of the MCB.

Suitable for the following side attached accessories:-

- AUX/ALM switches - refer page 1 - 29.

- Shunt trip - refer page 1 - 27.

- Shufft trip - refer page 1 - 27.

Din-Safe-M module – refer page 1 - 24.

Din-T terminal and accessories - refer page 1 - 31.

10 kA (0.5-63 A) interrupting capacity 'C' curve Din-T10 series

- Standard AS 3111, IEC 898.
- Approval No. N13753.
- Current range 0.5-63 amps 1, 2, 3 and 4 pole.
- Sealable and lockable handle.
- DIN rail mounting.
- Suits CD type chassis.
- General purpose light and power distribution.



Curve type: C (5 - 10 In) Single pole

Double pole

Amps	Cat. No.	Price \$	Amps	Cat. No.	Price \$
0.5	Din-T10105C	39.80	0.5	Din-T10205C	126.00
1	Din-T10101C	39.80	1	Din-T10201C	126.00
2	Din-T10102C	39.80	2	Din-T10202C	126.00
3	Din-T10103C	39.80	3	i Din-T10203C	126.00
4	Din-T10104C	39.80	4	Din-T10204C	126.00
6	Din-T10106C	39.80	6	Din-T10206C	126.00
10	Din-T10110C	39.80	10	Din-T10210C	126.00
16	Din-T10116C	39.80	16	Din-T10216C	126.00
20	Din-T10120C	39.80	20	Din-T10220C	126.00
25	Din-T10125C	39.80	25	Din-T10225C	126.00
32	Din-T10132C	39.80	32	Din-T10232C	126.00
40	Din-T10140C	39.80	40	Din-T10240C	126.00
50	Din-T10150C	39.80	50	Din-T10250C	126.00
63	Din-T10163C	39.80	63	Din-T10263C	126.00

Notes: The line side is the 'OFF' (bottom) side of the MCB. IP 20 finger protector cover standard line side terminal. Suitable for the following side attached accessories:-

- AUX/ALM switches refer page 1 29. - Shunt trip - refer page 1 - 27.
- Din-Safe-M module refer page 1 24.

Din-T terminals and accessories - refer page 1 - 31.

i Available on indent only.

10 kA (0.5-63 A) interrupting capacity 'C' curve Din-T10 series

- Standard AS 3111, IEC 898.
- Approval No. N13753.
- Current range 0.5-63 amps 1, 2, 3 and 4 pole.
- Sealable and lockable handle.
- DIN rail mounting.
- Suits CD type chassis.
- General purpose light and power distribution.



Curve type: C (5 - 10 In)

Triple pole

г	οu	II I	901	e 1
				- 4

Amps	Cat. No.	Price \$	Amps	Cat. No.	Price \$
0.5	☑ Din-T10305C	146.00		The state of the s	No. of
1	□ Din-T10301C	146.00			
2	Din-T10302C	146.00	4		-
3	☑ Din-T10303C	146.00		Real Park	
4	Din-T10304C	146.00			1
6	Din-T10306C	146.00	6	Din-T10406C	162.00
10	Din-T10310C	146.00	10	Din-T10410C	162.00
16	Din-T10316C	146.00	16	Din-T10416C	162.00
20	Din-T10320C	146.00	20	Din-T10420C	162.00
25	Din-T10325C	146.00	25	Din-T10425C	162.00
32	Din-T10332C	146.00	32	Din-T10432C	162.00
40	Din-T10340C	146.00	40	Din-T10440C	162.00
50	Din-T10350C	146.00	50	Din-T10450C	162.00
63	Din-T10363C	146.00	63	Din-T10463C	162.00

Notes: The line side is the 'OFF' (bottom) side of the MCB. IP 20 finger protector cover standard line side terminal.

1) All poles include overcurrent and short circuit protection

Suitable for the following side attached accessories:-

AUX/ALM switches – refer page 1 - 29.

Shunt trip – refer page 1 - 27.

Din-Safe-M module – refer page 1 - 24.

Din-T terminals and accessories - refer page 1 - 31.

Available on indent only.

1

10 kA (0.5-32 A) interrupting capacity 'D' curve

- Standard AS 3111, IEC 898.
- Approval No. N13753.
- Current range 0.5-63 amps 1, 2 3 and 4 pole.
- Sealable and lockable handle.
- DIN rail mounting.
- Suits CD type chassis.
- Motor starting and transformer applications.

Curve type: D (10 - 20 In) Single pole

Double pole

Amps	Cat. No.	Price \$	Amps	Cat. No.	Price \$		
0.5	i Din-T10105D	43.80	0.5	i Din-T10205D	134.00		
1	Din-T10101D	43.80	1	☑ Din-T10201D	134.00		
2	Din-T10102D	43.80	2	i Din-T10202D	134.00		
3	i Din-T10103D	43.80	3	i Din-T10203D	134.00		
4	Din-T10104D	43.80	4	i Din-T10204D	134.00		
6	Din-T10106D	43.80	6	i Din-T10206D	134.00		
10	Din-T10110D	43.80	10	Din-T10210D	134.00		
16	Din-T10116D	43.80	16	Din-T10216D	134.00		
20	Din-T10120D	43.80	20	Din-T10220D	134.00		
25	Din-T10125D	43.80	25	Din-T10225D	134.00		
32	Din-T10132D	43.80	32	Din-T10232D	134.00		

Triple pole

Four pole 1)

0.5	i Din-T10305D	154.00	-		
1	i Din-T10301D	154.00	-		1000
2	i Din-T10302D	154.00	-		
3	i Din-T10303D	154.00	-		
4	i Din-T10304D	154.00	-		THE REAL PROPERTY.
6	☑ Din-T10306D	154.00	6	i Din-T10406D	168.00
10	Din-T10310D	154.00	10	i Din-T10410D	168.00
16	Din-T10316D	154.00	16	■ Din-T10416D	168.00
20	Din-T10320D	154.00	20	i Din-T10420D	168.00
25	Din-T10325D	154.00	25	i Din-T10425D	168.00
32	Din-T10332D	154.00	32	i Din-T10432D	168.00

Notes: The line side is the 'OFF' (bottom) side of the MCB.

- IP 20 finger protector cover standard line side terminal.
- All pole include overcurrent and short circuit protection.
- Suitable for the following side attached accessories:-
- AUX/ALM switches refer page 1 29.
- Shunt trip refer page 1 27.
- Din-Safe-M module refer page 1 24.
- Din-T terminals and accessories refer page 1 31.
- Available on indent only.

Yeronga SPS Pump Station Upgrade OM Manual

10 kA (80-125 A) interrupting capacity Din-T10H series

- Standard AS 2184, IEC 947-2.
- Current range 80-125 amps 1, 2, 3 and 4 pole.
- Module width = 27 mm.
- DIN rail mounting.
- Suits CD hybrid type chassis.
- Industrial applications.



Din-T10H4125C

620.00

Curve type: C (5 - 10 In) Single pole

Single p	ole		Double	pole	
Amps	Cat. No.	Price \$	Amps	Cat. No.	Price \$
80	Din-T10H180C	115.00	80	i Din-T10H280C	292.00
100	Din-T10H1100C	115.00	100	i Din-T10H2100C	292.00
125	Din-T10H1125C	159.00	125	☑ Din-T10H2125C	330.00
Triple po	ole		Four po	ole 1)	
80	Din-T10H380C	295.00	80	i Din-T10H480C	580.00
100	Din-T10H3100C	295.00	100	■ Din-T10H4100C	580.00

125

Double pole

Curve type: D (10 - 20 In)

Single pole Double pole

Din-T10H3125C 465.00

Amps	Cat. No.	Price \$	Amps	Cat. No.	Price \$	
80	i Din-T10H180D	162.00	80	i Din-T10H280D	308.00	
100	Ⅲ Din-T10H1100D	162.00	100	■ Din-T10H2100D	308.00	
125	☑ Din-T10H1125D	182.00	125	■ Din-T10H2125D	350.00	

Triple pole

125

Triple pole			Four pole ')		
80	Din-T10H380D	430.00	80	i Din-T10H480D	590.00
100	Din-T10H3100D	430.00	100	■ Din-T10H4100D	590.00
125	Din-T10H3125D	515.00	125	Ⅲ Din-T10H4125D	670.00

Notes: The LINE side is the 'OFF' (bottom) side of the MCB.

Din-T10H MCB's do not fit CD chassis with standard 18 mm pole pitch.

For special chassis configurations refer NHP.

1) All poles protected.

Suitable for side attached accessories:-

- AUX/ALM switches, refer page 1-29.

- Shunt trip refer page 1-27.

Accessories refer page 1 - 31.

Dimensions refer page 1 - 40.

i Available on indent only.

15 kA (6-63 A) interrupting capacity 'C' curve Din-T15 series

- Standard AS 2184, IEC 947-2.
- Current range 6-63 amps 1, 2, 3 and 4 pole.
- Sealable and lockable handle.
- DIN rail mounting.
- Suits CD type chassis.
- Industrial applications.



Curve type: C (5 - 10 In) Single pole

Amps	lcu (kA)	Cat. No.	Price \$
6	25	Din-T15106C	93.50
10	25	Din-T15110C	93.50
16	25	Din-T15116C	93.50
20	20	Din-T15120C	93.50
25	15	Din-T15125C	93.50
32	15 ')	Din-T15132C	93.50
40	10 ')	Din-T15140C	93.50
50	10 2)	Din-T15150C	93.50
63	10 ²)	Din-T15163C	93.50

Double p	oole		
6	25	i Din-T15206C	171.00
10	25	i Din-T15210℃	171.00
16	25	<u> </u>	171.00
20	25	Ū Din-T15220C	171.00
25	25	i Din-T15225℃	171.00
32	25	☑ Din-T15232C	171.00
40	12.5 ')	i Din-T15240C	171.00
50	12.5 ²)	☑ Din-T15250C	171.00
63	12.5 ²)	il Din-T15263C	171.00

Notes: The line side is the 'OFF' (bottom) side of the MCB.

IP 20 finger protector cover standard on LINE side terminal.

1) Icu = 22 kA when each pole connected with cable:

1.25 m of 10 mm2 or 1.9 m of 16 mm2 2) Icu = 22 kA when each pole connected with cable:

4.0 m of 10 mm2 or 6.2 m of 16 mm2

Suitable for the following side attached accessories:-

- AUX/ALM switches refer page 1 29.
- Shunt trip refer page 1 27.
- Din-Safe-M module refer page 1 24. Din-T terminals accessories - refer page 1 - 31.
- i Available on indent only.

15 kA (6-63 A) interrupting capacity 'C' curve Din-T15 series

- Standard AS 2184, IEC 947-2.
- Current range 6-63 amps 1, 2, 3 and 4 pole.
- Sealable and lockable handle.
- DIN rail mounting.
- Suits CD type chassis.
- Industrial applications.



Curve type: C (5 – 10 In) Triple pole

Amps	Icu (kA)	Cat. No.	Price \$
6	25	Din-T15306C	275.00
10	25	Din-T15310C	275.00
16	25	Din-T15316C	275.00
20	25	Din-T15320C	275.00
25	25	Din-T15325C	275.00
32	25	Din-T15332C	275.00
40	12.5 ')	Din-T15340C	275.00
50	12.5 ²)	Din-T15350C	275.00
63	12.5 ²)	Din-T15363C	275.00

Four pole 3)

6	25	i Din-T15406C	295.00
10	25	i Din-T15410C	295.00
16	25	☑ Din-T15416C	295.00
20	25	i Din-T15420C	295.00
25	25	i Din-T15425C	295.00
32	25	i Din-T15432C	295.00
40	12.5 1)	i Din-T15440C	295.00
50	12.5 ²)	i Din-T15450C	295.00
63	12.5 ²)	i Din-T15463C	295.00

Notes: The line side is the 'OFF' (bottom) side of the MCB.

IP 20 finger protector cover standard on LINE side terminal.

i) Icu = 22 kA when each pole connected with cable: 1.25 m of 10 mm² or 1.9 m of 16 mm²

2) Icu = 22 kA when each pole connected with cable:

4.0 m of 10 mm² or 6.2 m of 16 mm²

3) All poles include overcurrent and short circuit protection Suitable for the following side attached accessories:-

AUX/ALM switches – refer page 1 - 29.

Shunt trip – refer page 1 - 27.

- Din-Safe-M module - refer page 1 - 24.

Din-T terminals accessories - refer page 1 - 31.

i Available on indent only.

6 kA (0.5-63 A) interrupting capacity 'C' curve Din-T DC series

- ☐ Standard IEC 898
- Current range 0.5-63 amps, 1 and 2 pole.
- DC voltage, 250 V 1 pole, 440 V 2 pole
- Sealable and lockable handle
- DIN rail mounting
- Padlockable in OFF position
- Suits CD type chassis
- Industrial applications



Operation

Din-T DC MCBs are equipped with a permanent magnet which aids arc extinguishing under fault conditions, making this range of MCBs suitable for DC voltages up to 250 V DC (1 pole) and 440 V DC (2 pole in series).

Double pole

Curve type: C (5 — 10 ln) Single pole

Amps	Cat. No.	Price \$	Amps	Cat. No.	Price \$
0.5	■ Din-TDC105C	75.50	0.5	Din-TDC205C	162.00
1	∐Din-TDC101C	75.50	1	Din-TDC201C	162.00
2	Din-TDC102C	75.50	2	Din-TDC202C	162.00
4	■ Din-TDC104C	75.50	4	Din-TDC204C	162.00
6	Din-TDC106C	75.50	6	Din-TDC206C	162.00
10	Din-TDC110C	75.50	10	Din-TDC210C	162.00
16	Din-TDC116C	75.50	16	Din-TDC216C	162.00
20	Din-TDC120C	75.50	20	Din-TDC220C	162.00
25	Din-TDC125C	75.50	25	Din-TDC225C	162.00
32	Din-TDC132C	75.50	32	Din-TDC232C	162.00
40	Din-TDC140C	75.50	40	Din-TDC240C	162.00
50	Din-TDC150C	75.50	50	Din-TDC250C	162.00
63	Din-TDC163C	75.50	63	Din-TDC263C	162.00

Notes: The line side is the 'OFF' (bottom) side of the MCB. Suitable for the following side attached accessories:-

- AUX/ALM switches refer page 1 29.
 Shunt trip refer page 1 27.
- Din-Safe-M module refer page 1 24.

Din-T terminals and accessories - refer page 1 - 31.

Available on indent only.

Main switch DIN mount Din-T main switch 63-100 amps

- ☐ IEC 947-3.
- Double break contacts.
- Padlockable handle.
- Handle sealable ON and OFF position.
- □ Terminal protection IP 20.
- DIN rail mount.

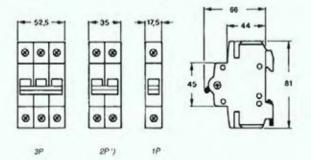
Din-T main switches have the same profile as Din-T MCBs and are suitable for use as a main switch (isolator) in loadcentres and distribution boards.



Poles	Amps	Cat. No.	Price \$
1	63 A	DINTMS631	23.40
1	80 A	DINTMS801	28.80
1	100 A	DINTMS1001	34.00
3	63 A	DINTMS633	72.50
3	100 A	DINTMS1003	88.50

NEW Main switch range - side mounts direct to CD DIN chassis

Dimensions (mm)



Notes: 1) 2 pole Din-T main switches available on indent refer NHP.

Din-Safe single pole width residual current circuit breaker

- Standards IEC 1009, IEC 898.
- Approval No. N17482.
- Voltage 240 V AC.
- Short circuit protection 10,000 amps.
- Sensitivity 30 mA and 10 mA.
- One module wide (18 mm).
- Over current, short circuit and earth protection.
- DIN rail mount.
- Suits CD chassis.

Application

The Din-Sale single pole width residual current circuit breaker (DSRCBH) will fit the standard chassis incorporated in NHP DIN-T panelboards. The revolutionary design makes it possible to provide an MCB complete with earth leakage protection in an 18mm wide module, allowing a greater number of devices to be fitted into an enclosure. The DSRCBH is suitable for residential, commercial and light industrial applications and can be included in new installations or retrofitted into existing NHP Din-T panelboards.

Ampere rating	Modules (18mm)	Volt	Short	Trip sensitivity	Cat. No. ')	Price \$
6	1	240	10 kA	30 mA	DSRCBH0630A	225.00
10	1	240	10 kA	30 mA	DSRCBH1030A	225.00
16	1	240	10 kA	30 mA	DSRCBH1630A	225.00
20	1	240	10 kA	30 mA	DSRCBH2030A	225.00
25	1	240	10 kA	30 mA	DSRCBH2530A	225.00
32	1	240	10 kA	30 mA	DSRCBH3230A	225.00
40	1	240	10 kA	30 mA	DSRCBH4030A	225.00
6	1	240	10 kA	10 mA	DSRCBH0610A	245.00
10	1	240	10 kA	10 mA	DSRCBH1010A	245.00
16	1	240	10 kA	10 mA	DSRCBH1610A	245.00
20	1	240	10 kA	10 mA	DSRCBH2010A	245.00
25	1	240	10 kA	10 mA	DSRCBH2510A	245.00
32	1	240	10 kA	10 mA	DSRCBH3210A	245.00
40	1	240	10 kA	10 mA	DSRCBH4010A	245.00

Note: 1) Neutral not switched

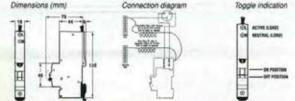
Available on indent only

Nuisance tripping may be experienced in VFD and motor starting applications refer NHP.

Accessories

Description

Removable lock dog. DTLD Refer page 1-31



1-20 All prices are exclusive of GST. Q-Pulse Id TMS972 Active 10/12/2014 Page:60:of:441T3

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Din-Safe MCB

- Standards IEC 898, AS 3190.
- Approval No. N11649.
- Mines approval MDA 11360.
- Voltage rating 240 V 50 Hz.
- Interrupting capacity 10 kA.

Din-Safe-MCB is a combined MCB/RCD providing thermal overload, short circuit and earth leakage protection in the one integral unit.



Curve type: C (5-10 In)

Poles	Ampere rating	Volt.	Phase ')	Trip sens.	Cat. No. 3)	Price \$
2	10	240	1+N	30 mA	DSMCB1030	152.00
2	16	240	1+N	10 mA	□ DSMCB1610	171.00
2	16	240	1+N	30 mA	DSMCB1630	152.00
2	20	240	1+N	10 mA	■ DSMCB2010	171.00
2	20	240	1+N	30 mA	DSMCB2030	152.00
2	25	240	1+N	30 mA	DSMCB2530	152.00
2	32	240	1+N	30 mA	DSMCB3230	152.00
2	40	240	1+N	30 mA	DSMCB4030	152.00

Din-Safe MCB Pig-tail

- Interrupting capacity 6 kA.
- Accepts Din-T clip-on accessories.

With a revised terminal configuration and neutral pigtail, units will fit the standard 3 phase Din-T chassis refer page 2 - 19



Curve type: C (5 - 10 In)

Poles	Ampere rating	Volt.	Phase ")	Trip sens.	Cat. No.	Price \$
2	6	240	1+N	30 mA	■ DSMCB6PT0630	170.00
2	10	240	1+N	30 mA	DSMCB6PT1030	170.00
2	16	240	1+N	30 mA	DSMCB6PT1630	170.00
2	20	240	1+N	30 mA	DSMCB6PT2030	170.00
2	25	240	1+N	30 mA	DSMCB6PT2530	170.00
2.	32	240	1+N	30 mA	DSMCB6PT3230	170.00
2	40	240	1+N	30 mA	DSMCB6PT4030	170.00

Notes: The LINE side is the 'OFF' (bottom) side of the MCB/RCD

- ") Neutral switched.
- ') Fits CD chassis (special configuration) refer NHP.
- ") Neutral not switched.
- Available on indent only.

Nuisance tripping may be experienced in VFD and motor starting applications refer NHP.

Din-Safe safety switches

- ☐ Standard AS 3190.
- ☐ Approval to N11649.
- Mines approval MDA 11360.
- Current ratings 40, 63, 80 and 100 amp.
- 2 and 4 pole configurations.
- ☐ Use on single phase 240 V or multiple phase 415 V.
- Accepts DIn-T aux/alm switches.
- Handle sealable and padlockable.
- DIN rail mount.

Din-Safe safety switches are electrical safety devices that provides core balance protection against earth leakage faults.

A correctly installed safety switch isolates supply when dangerous earth leakage currents are detected, providing protection from electrocution and also protects equipment and property from serious damage and fire.

2 pole

e poie					
Ampere rating	Volt.	Phase	Trip ') sens.	Cat. No.	Price \$
40	240	1+N	30 mA	Din-Safe2-40-30	140.00
40	240	1+N	100 mA	☐ Din-Safe2-40-100	180.00
40	240	1+N	300 mA	☐ Din-Safe2-40-300	190.00
63	240	1+N	30 mA	Din-Safe2-63-30	176.00
63	240	1+N	100 mA	Din-Safe2-63-100	205.00
80	240	1+N	30 mA	Din-Safe2-80-30	198.00
80	240	1+N	100 mA	Din-Safe2-80-100	230.00

4 pole

Ampere rating	Volt.	Phase	Trip ') ') sens.	Cat. No.	Price \$
40	415	3+N	30 mA	Din-Safe4-40-30	188.00
40	415	3+N	100 mA	■ Din-Safe4-40-100	200.00
40	415	3+N	300 mA	☑ Din-Safe4-40-300	215.00
63	415	3+N	30 mA	Din-Safe4-63-30	205.00
63	415	3+N	100 mA	☐ Din-Safe4-63-100	225.00
63	415	3+N	300 mA	☐ Din-Safe4-63-300	248.00
80	415	3+N	30 mA	☐ Din-Safe4-80-30	230.00
80	415	3+N	100 mA	Din-Safe4-80-100	275.00
80	415	3+N	300 mA	Din-Safe4-80-300	305.00
80	415	3+N	500 mA	☑ Din-Safe4-80-500	320.00
100	415	3+N	30 mA	Din-Safe4-100-30	315.00

Notes: 1) Mines department approval for 30 mA units only.

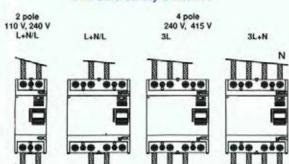
500 mA units for industrial use, to special indent order only.

Refer NHP for additional units not listed.

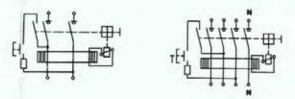
ii Available on indent only.

Nuisance tripping may be experienced in VFD and motor starting applications refer NHP. .

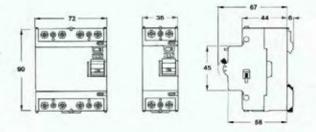
Din-Safe safety switches



Connection diagrams



Dimensions (mm)



Din-Safe-M modules to be combined with Din-T MCBs

- Standard AS 3190.
- Approval to N11974.
- Mines Approval MDA 11158.
- Current ratings 32 and 63 amps.
- Sensitivity I
 Δn 30, 100 and 300 mA.
- Suits Din-T6 10 and 15 MCBs.
- When combined with Din-T MCBs protects against:
 - thermal overload
 - short circuit faults
 - earth leakage faults



0.5 x IAn no tripping t ≤ 300 mS 1 x lan 5 x lan 1 ≤ 40 mS



Din-Safe-M modules to suit Din-T6, 10 and 15

Sensitivity mA ')	MCB rating ")	Poles ')	Width Mods. ')	Cat. No.	Price \$
30 mA	32 A	1P+N	2	DSM-32-30-1PN	260.00
	32 A	3P+N	2	DSM-32-30-3PN	320.00
100 mA	32 A	1P+N	2	DSM-32-100-1PN	275.00
	32 A	3P+N	2	DSM-32-100-3PN	345.00

Din-Safe-M modules to suit Din-T10 and 15

30 mA	63 A	1P+N	2	DSM-63-30-1PN	330.00
	63 A	3P+N	3	DSM-63-30-3PN	350.00
	63 A	3P	3	DSM-53-30-3P	360.00
100 mA	63 A	1P+N	2	■ DSM-63-100-1PN	345.00
	63 A	3P+N	3	DSM-63-100-3PN	375.00
	63 A	3P	3	DSM-63-100-3P	385.00
300 mA	32 A	1P+N	2	DSM-32-300-1PN	305.00
	63 A	1P+N	2	DSM-63-300-1PN	375.00
	32 A	3P+N	2	DSM-32-300-3PN	360.00
	63 A	3P+N	3	DSM-63-300-3PN	395.00

- Notes: 1) Mines approval for 30 mA units only.
 - *) 1P+N and 3P+N type the supply neutral is connected by a 'pigtail' cable.
 - Dimensions of Din-Safe-M unit only; add MCB dimensions for total installed width.
 - ") "MCB rating" refers to the max. MCB size the module can be fitted to.
 - Available on indent only

Note: Nuisance tripping may be experienced in VFD and motor starting applications refer NHP.



Din-Safe-M modules to be combined with Din-T MCBs

 Din-Safe-M modules are an earth leakage module only. To complete the functional unit a Din-T6, Din-T10 or Din-T15 MCB must be added as shown.

Din-Safe-M space requirements

Туре	Without MCB fitted neutral not switched	MCB fitted neutral not switched	MCB fitted neutral switched
1P + N 32/63 A	2 modules (36 mm)	3 modules (54 mm)	4 modules (72 mm)
3P + N 32 A	2 modules (36 mm)	5 modules (90 mm)	6 modules (108 mm)
3P + N 63 A	3 modules (54 mm)	6 modules (108 mm)	7 modules (126 mm)
3P 63 A	3 modules (54 mm)	6 modules (108 mm)	N/A

Operation

The combined Din-T MCB/Din-Safe-M earth leakage module has two operating toggles which indicates the reason for the trip action taking place.

- When an overload or short circuit occurs the Din-T MCB will operate. In this case the Din-Safe-M toggle will remain in the ON position.
- If an earth leakage fault occurs both toggles will move to the OFF position. In order to reset the MCB the Din-Safe-M unit must be reset first.
- In both instances if the cause of the trip operation has not been rectified, a trip operation will occur as soon as the MCB is turned to the ON position. The trip free mechanism of the MCB ensures that a successful trip operation takes place even when the toggle is held in the ON position.

Assembly

- Place the MCB and Din-Sale-M unit on a flat surface. Be sure that both the MCB and the Din-Safe-M toggles are in the ON position.
- Slide the two units towards each other inserting the connecting bars or links into the MCB tunnel terminal, ensuring no undue pressure is applied to the metal. tripping pin of the Din-Safe-M unit.
- Push down the connecting clips, locking the unit together.
- ☐ Check that the MCB trips when the toggle on the Din-Safe-M is moved to the OFF position.
- ☐ Tighten the busbar connections between the MCB and the Din-Safe-M and fit the insulating cover supplied.
- If the pigtail and N connections are reversed, the breaker will trip as soon as load is energised. Reset Din-Sale-M module before switching MCB 'ON'.
- In the case of a three phase 3 wire system (no neutral) use 3 phase models. 3P+N models will operate satisfactorily but test button will only function if neutral pigtail is connected.

Din-Safe-M modules to be combined with Din-T MCBs

Testing

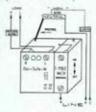
The MCB/Din-Safe-M combination must be connected with the line conductors to the LINE side (OFF/Bottom) side of the MCB and the load conductors connected to the Din-Safe-M terminals. The MCB/Din-Safe-M combination must be tested with the supply connected before connecting the load. First switch the Din-Safe-M unit 'ON' then the MCB, when the test button is pressed, both handles should trip. It is recommended that the test button is operated periodically to test the detection and tripping functions of the combined unit.

Remote tripping

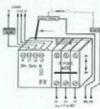
Din-Safe-M module has a facility for remote tripping. Terminals marked C1 and C2, when connected through a switch, pushbutton or auxiliary contact allows tripping of the combined unit. This contact must be voltage free.

 Both 1P+N and 3P+N models have a neutral pigtail connection. 3P modules have no neutral connection at all.

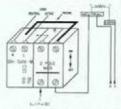
Din-Safe-M 1P+N with 1 pole MCB (neutral not switched)



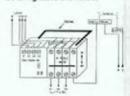
Din-Safe-M-3P+N with 3 pole MCB (neutral not switched)

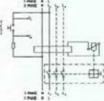


Din-Safe-M 1P+N with 2 pole MCB switching active and neutral



Din-Safe-M 3P+N with 4 pole MCB switching active and neutral





Din-T shunt trip and undervoltage trip

- Clip-on modules for Din-T MCB.
- Modular width of 18 mm.
- Shell is thermosetting, self extinguishing and tropicalised material.

Din-T shunt trip

The shunt trip makes it possible to remotely switch off the MCB by energising the terminals of the trip unit.

Applications

- Emergency stop.
- Isolation of industrial socket outlets.

Rated voltage	Ampere rating	Operating time	Cat. No.	Price \$
110 to 415 V AC	110 V 0.3 A	10 ms	DIN-T SHT 110-415V AC ')	97.00
110 to 125 V DC	240 V 0.6 A	3 ms		
	415 V 1 A	2 ms		
24-60 V AC	24 V - 1 A	10 ms	DIN-T SHT 24-60V AC ')	97.00
24-48 V DC	48 V - 2 A	4 ms		

Dimensions (mm)

Note:

 Couples to either side of Din-T6, 10 & 15 and left side of Din-T10H.



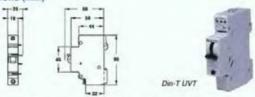


Din-T undervoltage trip

The Din-T undervoltage trip device, trips the MCB when the operating threshold is lower than 0.6Un. An adjustable time delay of up to 0.3 seconds eliminates nuisance tripping.

Rated voltage	Ampere rating	Cat. No.	Price \$
230 to 240V AC	Din-T 10 & 15	DTUVT240	108.00

Dimensions (mm)



Notes: ') Couples to either side of Din-T6, 10 & 15 and left side of Din-T10H. UVT not available for Din-T10H and Din-T6 2-40A.



- Field fittable.
- Manual and electrical reset.
- Impulse to switch on < 20 ms.
- Inbuilt auxiliary/alarm contacts.
- Padlockable in OFF position.Silent operation.



Operation

The Din-T M41 motor operator allows remote opening or closing of attached MCBs and RCDs. Control of the Din-T M41 can be achieved by means of pushbutton, switch, relay or building management system etc. Suitable for coupling to right side of the following Din-T devices:

- 1, 2 & 3 pole Din-T 6, 10 and 15 MCBs
- 2 & 4 pole Din-Safe Safety Switches
- 2 pole Din-Safe-MCBs (combined MCB/RCD)

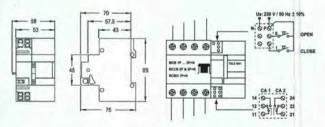
Application

Centralised control and protection of circuits in commercial and industrial installations:

- general purpose light and power distribution
- control of heating cooling and ventilation equipment
- pumping stations and telecommunications

Rated voltage	Aux. Contacts ')	Cat. No.	Price \$
240 V AC	H + H/S	DIN-T M41	465.00

Dimensions (mm)



Notes: ') H/S contact is field changeable from AUX to ALM. Din-safe-in clip-on RCDs can be fitted to left side of MCB with Din-TM41 installed. Available to separate order, programmable re-connection relay to perform automatic sequenced re-closure of circuit breaker coupled to motor operator (refer NHP).

Electrical accessories for MCBs

Combination of auxiliary and alarm switches to fit Din-T 6, 10, 10H and 15

Din-T auxiliary and alarm switches are field fittable and are supplied loose. Types H/S and H+H/S are convertible from auxiliary to alarm by using a small screwdriver. After connection to MCB this feature is non-accessible.

= Auxiliary switch - indicates MCB status ON or OFF.

S

C

= Alarm switch - indicated tripped position.

H/S

= Changeable between auxiliary and alarm switch.

ront indication vith (H) and/or			Auxiliary switch (H)1c	Alarm switch (S) 1c	Auxiliary switch (SH) 1c	Auxiliary switch (SH) each 1c
H : Auxiliary switch, 1c		240V~	Din-T HU	Din-T SU	Din-T H/SU	Din-T H+H/SU to suit Din-T6,10,15
switch, 1c	E	нн				Din-TIOH H+H/S to suit Din-T10H only
switch, 2d			\$52.50	\$56.00 (with test Facility)	\$60.50	\$68.00
H : Auxiliary switch, 1c Alarm H switch, 1c	-		н	ST	SH	SH
onnecting diagram rinted	9	2	아이(H)	0 85 85 86 86 (S)) TO (H)	(S)
	arm switch	MCB	- H-61	- S T T T	- Hi i	O H O S SS
	Position of auxiliary and alarm switch	MCB	-	s s		1 S S S S S S S S S S S S S S S S S S S
	Position of	MCB		الْقِيْرُةِ الْمُ		1 S 3 3 3 3 3 3 3 3 3 3 3 3 3 3 3 3 3 3
	Pole	width	1/2 9 mm	1/2 9 mm	1/2 9 mm	1/2 9 mm

Accessories





Conversion screw for Din-T H/S and Din-T H+H/S



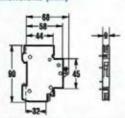
Four variations in half module width (9 mm). Snap-on side of Din-T6, 10, 10H and 15.

Maximum contact ratings

maximum comact	racings	
Volts	AC 11	DC 11
240 V AC	5 amp	
415 V AC	3 amp	
24 V DC		4 amp
48 V DC		2 amp
60 V DC		1 amp
110 V DC		0.7 amp
220 V DC	,	0.5 amp

Maximum wire size 2.5 mm² Electrical life greater than 10,000 operations.

Auxiliary contacts for MCBs Dimensions (mm)



Fitting to Din-T MCB

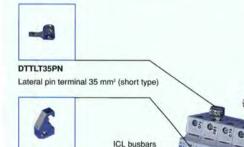






- a) Line up with MCB and accessory in 'ON' position.
- b) Press down spectacle clips with screwdriver.
- c) Test before final installation.





DTLD

Din-T lock dog





DTTLT35SP Lateral spade terminal 25 mm² (short type)



DTTLT35LSP

Lateral spade terminal 35 mm² (extra long type)



DTTAX25SP

Axial spade terminal 25 mm² (insulated)



terminal 35 mm² (long type)

DTCF35

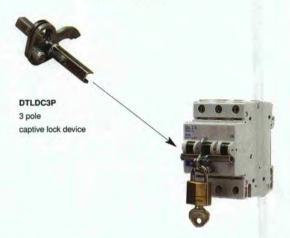
35 mm² main terminals



DTTAX25PN

Axial pin terminal 25 mm²

Accessories Din-T series



Description	Cat. No.	Price \$
Lock dog captive — 1 pole	DTLDC1P	19.40
Lock dog captive — 2 pole	DTLDC2P	23.40
Lock dog captive — 3 pole	DTLDC3P	23.40
Lock dog captive — 4 pole	DTLDC4P	23.40

Price schedule 'T4'

Refer page 1 - 31

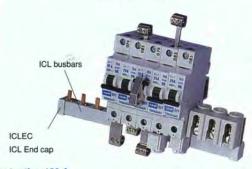
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Lateral pin terminal 35 mm² (short type)	DTTLT35PN	6.40
Lateral pin terminal 35 mm² (long type)	DTTLT35LPN	6.40
Lateral spade terminal 35 mm² (short type)	DTTLT35SP	6.20
Lateral spade terminal 35 mm² (long type)	DTTLT35LSP	7.60
Axial spade terminal 25 mm² (insulated)	DTTAX25SP	5.80
Axial pin terminal 25 mm² (insulated)	DTTAX25PN	5.80
Main terminals 35 mm²	DTCF35	10.60
Din-T lock dog non-captive	DTLD	14.20

Refer page 1 - 33

Pole Filler Din-T (1 strip of 4 poles, 8 x 9 mm segments)	DTPF	2.40
Tee-off cap ICL busbar (strip of 5)	ICLTOC	2.40

Price schedule 'T3'

Accessories ICL bus comb - insulated **Din-T series**



Current rating 120 A

Current rating	120 A				
Cat. No. 1) BUSBAR	1 phase Price \$	3 phase Price \$	3 ph + N Price \$	3 ph + aux Price \$	1 ph + N Price \$
	1')	3 ')	4')	3A ')	2 ')
ICL 08	6.00				
ICL 12	8.60	27.60			Maria .
ICL 15	10.60	36.00	7		
ICL 18	13.00	42.00			- 7
ICL 21	14.80	51.50		Town the	12 100
ICL 56	h children		148.00	114.00 ²)	74.50
ICL 57	42.00	134.00			
END CAP					
ICLEC23	Min Les	2.20		2.20	2.20
IOI FOA			0.00	The state of the s	

1) Add to Cat. No. Example ICL151 for 15 pole single phase and Notes: ICL564 for 56 pole 3P+N.

2) 16 x 3 MCB connections and 16 x 9 mm space (AUX's).



Pole fillers

Price schedule 'T3' Note:



ICLTOC T-off cap (strip of 5)

Din-T modular changeover switches

General features

Din-Modular switches have the same profile as Din-T MCB. These switches have double break contacts and comply to IEC 947.3 with regard to isolating duty. The switch housing self extinguishing material has very high mechanical strength and allows operation in a 50 °C ambient with a 95 % relative humidity.



Modular switches

In	Diagram	Poles	Cat. No.	Price \$
	101 1		Without off-position	100
32 A	-0/	1	Din-T C0321 I-II	30.20
32 A	OII	2	Din-T C0322 I-II	60.50
	101		With off-position	1
32 A	-0 0°	1	Din-T C0321 I-O-II	37.20
32 A	OH	2	Din-T C0322 I-O-II	69.00

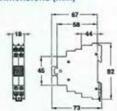
Din-T pilot light and Din-T pushbuttons

Modular style pushbutton with illuminated indication circuit and pilot lights. Lenses in red, green, grange or clear ordered separately. Pushbutton contact rating 16 amp.

Poles	Cat. No.	Price \$
1	DTPL	19.40
	DTLRD	2.80
s green -		2.80
200	DTLOR	2.80
	DTLCL	2.80
	DTLP240	3.40
-	DTLP24	3.40
1 1 N/O	DTPB771 ')	44.00
1 1 N/O + 1	N/C DTPB691	31.00
	1	1 DTPL - DTLRD - DTLGR - DTLOR - DTLCL - DTLP240 - DTLP24 1 1 NO DTPB771')

Note: 1) Illuminated pushbutton 240 volt only, bulb is built in and cannot be changed.

Dimensions (mm)





P068 Tufnell Road Yeronga SPS Pump Station Upgrade OM Manual mpulse switches

Din-T - impulse switch

Impulse switches 16 A

For DIN rail mounting - depth 68 mm.

Din-T impulse switches are used for central control of heating and lighting applications in conjunction with time clocks and PLCs. To change contact status a pulse of 0.05 sec duration is required. Din-T impulse switch coils are continually rated but it is not recommended to be used in a way which will allow continuous energisation.



Impulse switch coil modules - switches 16 A

In	Poles	Mods	Coil voltage	Diagram	Cat. No.	Price \$
16 A	1	1	240 V AC	\$\$	Din-T 511	53.50
16 A	2	1	240 V AC	\$\$-\$-	Din-T 512	72.50
16 A	2	1	240 V AC	\$-\$-\$-	Din-T 711	75.50

Notes: Special voltage models available on indent. Voltages 12, 24, 48 AC, 12, 24 DC.

Din-T hour run counter

Hour run counter DIN rail mounting.

Technical data

- Synchronous motor drive.
- ☐ Supply voltage: 230/240 V 50 Hz
- ☐ Consumption: 1 VA
- ☐ Terminal capacity: 2.5 mm²
- ☐ Time range: 99,999.99 hours
- Protection degree: IP 20
- Ambient operating temperature: From -20 °C up to +55 °C
- Permanent visual display. Non-resettable

Width poles	Cat. No.	Price \$
2	DTHR	88.50



Dimensions (mm)

	- 32	-5-	-	- 60	
	- ₽)	-			
12	-	45			
1	Α.		4_	-	
+	Boo			1	_



Titan DIN mount surge diverters

Surge diverters offer affordable protection against overvoltage spikes, the Titan range incorporates metal oxide varistors individually fused for maximum safety. Modular DIN rail design offers installation flexibility, user-replaceable modules can be replaced without disturbing electrical wiring or interrupting mains supply.





DR4P80K400DC

DR1P20K2309

Surge Diverters

	Rated	Maximum Impulse	Signal	Width No. 18 mm		1
Type	voltage	current	Contact	modules	Cat. No.	Price \$
Single phase ')	230 V AC	20 kA	-	1	DR1P20K230S	85.00
Single phase ')	230 V AC	45 kA	1x00	1	DR1P45K230DC	118.00
Single phase ')	230 V AC	65 kA	1 x C/O	1	DR1P65K230DC	215.00
Multi phase	230/400 V AC	80 kA	1 x G/O	4	DR4P80K400DC	480.00

Accessories Description	Cat. No.	Price \$
Replacement module 5 kA 230 V	DR1P20K230M0D	70.00
Replacement module 10 kA 230 V	DR1P45K230M0D	98.00
Replacement module 20 kA 230 V	DR1P65K230M0D	185.00
Bridging link 3 pole *)	DOVPBL3	3.10)
Bridging link 4 pole ")	DOVPBL4	3.70)

Technical data	DR1P20K230	DR1P45K230	DR1P65K230	DR4P80K400			
Rated Voltage	230 V AC	230 V AC	230 V AC	230/400 V AC			
Operational voltage (Uc)	270 V AC	270 V AC	270 V AC	270/480 V AC			
Nominal Impulse current	5 kA	10 kA	20 kA	20 kA			
Max. Impulse current 8/20µs	20 kA	45 kA	65 kA	80 kA			
Residual Voltage (Up)	960 V	1000 V	1200 V	1200 V			
Respose time		<u><</u> 5ns					
Operating frequency		50/60 Hz					
Terminal size	50 mm²						
Temperature range	-30° to + 75 °C						
Standard	IEC 643-1						

- Notes: 1) Single phase units may be grouped for protection on 3 phase systems additional unit required for neutral if no MEN connection.
 - Price schedule "T4"
 - 1) Links ordered separately to bridge earth terminals on single phase units when used in 3 phase configuration.

Ensure surge divert is connected upstream of RCD's.

P068 Tufnell Road Yeronga SPS Pump Station Upgrade OM Manual

Sprecher + Schuh CA 4 contactors

Features

- Ideally suited for heating, lighting, hot water and storage heating applications.
- DIN rail mounting.
- Contactors can be mechanically interlocked. (AC only).
- Large range of snap on accessories 1).
- Protection cover allows mounting adjacent to Din-T circuit breakers utilising a 2.5 module width.
- Conforms to AS 1202 and IEC 158 with world wide approvals.



Maximum current rating (amps) at 415 volts

Cat. No. 1)	CA 4-5-10 ²)		CA 4-9-10 ²) [CA 4-12-10 ²)]			CA 4-9-M40 ²) ³)		
Price 5)	\$76.00			\$81.0	0 [\$8	8.00]	\$87.00	
Contacts in parallel *)	1	2	3	1	2	3	1	4
Heating loads AC 1								
Amps per phase 40 °C (A)	20	34	50	20	34	50	20	64
Amps per phase 60 °C (A)	16	27	40	16	27	40	16	51
Lighting loads								
Tungsten per phase (A)	4			7	-		7	
Fluorescent 40 °C (A)	18	30	45	18	30	45	18	57
Fluorescent 60 °C (A)	14.5	24	35	14.5	24	35	14.5	45
Motor loads								
Amps 415 volt AC 3	5.3			9.0 [2]		9.0	
kW 60 °C	2.6			4.5 [6	5.1]		4.5	
Width (poles)	2.5			2.5 [2	2.5]		2.5	

Accessories

Description	Cat. No.	Price \$
Bridging link 2 pole	CB4-2	6,40
Bridging link 3 pole	CB4-3	6.90
Bridging link 4 pole	CB4-4	7.20
Protection cover	CA 4-PC	5.40

Notes: 1) For further information refer to Part A catalogue.

- 2) Supplied with 1 N/O auxiliary contact. For 1 N/C auxiliary contact specify 01 instead of 10 when ordering.
 - 3) M40 denotes 4 pole contactor.
- 1) Single pole contactor using CB4 bridging links.
- 5) Price is for standard coil voltage.

Din-T contactors

Features

- 240/415 V ratings.
- ☐ IEC 947-4-1.
- Silent DC coil circuit
- Switch position indicator.
- Integrated surge suppression.
- Increased switching capacity and endurance.
- DIN rail mount.



Application

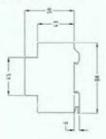
Din-T contactors are electromagnetically operated load-break devices with one stable position, used to realise automatic control of equipment. Applications include switching and controlling of lighting equipment, heating, ventilation, pumps, heat pumps, and other equipment.

Features

The 20 A type has an AC magnetic system, 24, 40 and 63 A types have a DC magnetic drive and therefore are silently operated. An integrated diode recibiler allows AC connection. The integrated varistor protects the coil against lightning and overvotage up to 5 kV. The contactors can be combined with PLCs. Surge suppression is not necessary, the magnetic system is shielded for radio interference.

Modules (18mm)	No. of contacts	Current amps (lth)	Coll volts (AC)	Cat. No.	Price \$
1	2 x N/O	20	24	DC202024	89.50
1	2 x N/O	20	240	DC202240	89.50
2	4 x N/O	24	240	DC244240	109.00
2	4 x N/C	24	240	DC244C240	116.00
3	4 x N/O	40	240	DC404240	171.00
3	4 x N/O	63	240	DC634240	259.00

Dimensions (mm)



Din-T contactors

Technical data Type	Q.	DC20	DC24	DC40	DC63
Rated continuous	current Ith	20 A	24 A	40 A	63 A
AC 1 AC 7a switc	hing of heaters				
Rated operational	current le	20 A	24 A	40 A	63 A
Rated output AC1	') 240 V 1e	4 kW	5.3 kW	8.7 kW	13.3 kW
	415 V 3 ø	-	16.0 kW	26.0 kW	40.0 kW
AC 3/AC 7b switc	hing of motors				
Rated operational	current le	9 A	9 A	22 A	30 A
Rated output AC 3	415 V 3 ø	-	4.0 kW	11.0 kW	15.0 kW
AC 5a switching	of electric dischar	ge lamp co	ntrols) unc	ompensat	ed
Rated operational	current le	8	10	30	44
AC 5b switching	of incandescent la	mps")			
Rated operational	current le	6	7	15	22
Characteristics o	f the magnet syste	em			
Rated operational	voltage Uc 240V	Range of	magnetic co	il: 0.85 up	to 1.1 x Uc
Rated consumption	n of magnetic coil a	t Uc = 240	٧	- 10	
	Pull in	8 VA.	3.7 VA.	4.4 VA.	70 VA.
		5 W	3.7 W	4.4 W	70 W
	Holding	3.2 VA,	3.7 VA,	4.4 VA,	4.2 VA.
		1.2 W	3.7 W	4.4 W	4.2 W
Ohmic loss per cu	rrent path				
at Ith and AC 1		1.0 W	12W	3.0 W	6.0 W
Connections	Main leads	1x10 mr	n²/2x4 mm²	1x25 mm	/2x10 mm
	Coil	1x2.5 mm²/2X2.5 mm²		1x4 mm²/2x2.5 mm²	
Endurance and m	nechanical switchi	ng			
Endurance	Mechanical	1 x 10°	1x 10°	1x 10°	1x 10°
	Electrical at AC 1	150000	150000	150000	150000
	Electrical at AC 3	150000	500000	170000	240000

Permitted nett frequency

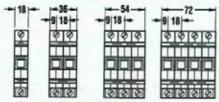
40 up to 450 Hz

⁵⁰ Hz Notes: 1) When parallel switching of 2 current paths the rated current le will be multiplied by 1.6.

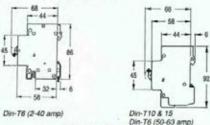
For additional light switching data refer to NHP.

If several contactors are mounted beside each other and the operating time is greater than one hour, fit a 1/2 module distance piece between every 3rd contactor.

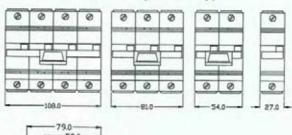
Dimensions Din-T series 6, 10 and 15 kA

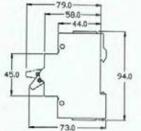


Width remains constant for ranges 6, 10 and 15. Width for Dis-T10H increases refer diagram below.



Din-T6 (2-40 amp) Din-T10H (80-125 amp)





Notes: 27 mm width. Din-T10H (80-125 amp) MCBs only fit onto hybrid CD chassis.

Refer NHP.

All dimensions (mm)

Safe-T and Din-T pole covers

- ☐ Standard AS 3132.
- Degree of protection IP 30.
- Surface mounting.
- ☐ Colour Black.
- Supplied complete with clip tray.





Poles	Cat. No.	Price \$	
1	SAFE-TPC1		
3	SAFE-TPC23	19.80	

Dimensions (mm)

н	W	D	
160	30	64	
160	80	64	

Price schedule 'T1

Din-T pole covers for Din-T series of MCBs

- Standard AS 3132.
- Suits Din-T6, 10, 10H, 15 kA MCBs and associated DIN equipment.
- Made from high resistance material.
- Degree of protection IP 30.
- Surface mounting.
- Colour Grey.

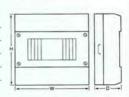




Poles	Cat. No.	Price \$
2	DTPC2	8.80
4	DTPC4	10.90
6	DTPC6	18.40
8	DTPC8	24.60

Dimensions (mm)

D
61
61
72
72



Insulated loadcentres "Dion" – flush mount metal facia

- ☐ Standard AS 3439-3.
- Suits NHP Din-T MCBs and associated DIN equipment.
- Flush mount cavity or solid wall.
- Bevelled metal tacia.
- Degree of protection IP 30 (IP 40 with door).
- Totally insulated.
- Earth and split neutral bars fitted as standard
- Transparent plastic or white metal door.
- 15 mm wiring space behind DIN rail.
- □ 125 mm spacing between DIN rails.
- Removable gland plates top and bottom.



The Pilux "Dion" series is an economical range of IP 30 flush mounted plastic loadcentres suitable for residential and commercial installations. The quality appearance of the beveiled metal facia will appeal to architects wishing to provide something special for their customers at an affordable price. The facia is made from polyester powder coated steel, white in colour and incorporates a removable left or right hinged door. The Dion range is stocked with the choice of transparent plastic or white metal doors. The DIN frame is slotted to allow alignment of the front facia after the enclosure has been mounted.

The Dion series is packed with features to reduce installation costs. Mounting components provided with the enclosure make them suitable for installation in a cavity or solid wall and once secured into the cavity the top or bottom gland plate can be removed to provide access for cables. Cable tie anchor points are provided for securing cables and conduits. The segmented gland plates can be easily shaped around installed cables and snapped into place in addition there is a comprehensive array of cable and conduit entries in the back and sides of the base. Earth and neutral bars are mounted on removable brackets.

Capacity poles	No. of rows	Door	Neutral bar	Earth bar	Cat. No.	Price \$
12	1	Transparent	4/11	11	PILDNC12T')	86.50
24	2	Transparent	14/23	23	PILDNC24T	125.00
36	3	Transparent	24/35	35	PILDNC36T	170.00
12	1	White	4/11	11	PILDNO12W ')	86.50
24	2	White	14/23	23	PILDNC24W	125.00
36	3	White	24/35	35	PILDNC36W	170.00

Dimensions (mm)

Cat. No.	A	В	C	D	E	н	Kg
DNC12	205	313	287	190	90	110	1.9
DNC24	360	313	287	345	90	110	3.0
DNC36	490	313	287	475	90	110	3.9

C E

Note: ') Bus comb supplied as standard.

Q-Pulse Id TMS972 Active 10/12/2014

P068 <u>Tufnell Roa</u>d Yeronga SPS Pump Station Upgrade ON (TERASAKI

Insulated loadcentres ILC series

- Standard AS 3132.
- Suits Din-T6, 10, 10H, 15 MCBs and associated DIN equipment.
- Allows easy access to apparatus.
- Made from high impact resistance material.
- Comprehensive cable entry facilities at top, bottom, sides and rear.
- Modern consumer unit designed, with an attractive styling for new buildings replacing old units or adding extensions.



Standard accessories include single phase comb busbar to suit DIN T6, 10 & 15 MCB ranges with insulation cover, RCD wiring cables, full DIN rail, earth and neutral bar. ILC 10-18 have a split neutral for fitting of Din-Safe safety switches. All models have a clear top hinged door.

Capacity poles	Neutral bar	Earth Bar	Cat. No.	Price \$
4	"	")	(LC 45 ')	40.50
8	")	7)	ILC857	47.50
10	4/9	10	ILC 10SSN	85.00
14	8/9	14	ILC 14SSN	95.00
18	12/9	18	ILC 18SSN	115.00

Optional accessories

Technical data

- Comb type busbars refer page 1 33.
- Max. load 120 amp.
- Main switches refer page 1 19.
- Max. operating voltage 415 V AC.
- Earth and neutral bar kit ')
- Degree of protection
- ILC 4EN \$16.00 ILC BEN \$19.40
- ILC 4-8 IP 54. ILC 10-18 IP 40.
- ☐ Flush mount kit *) ILC 10F \$20.20 nett
- ☐ Material self extinguishing halogen free polystyrene.
- ILC 14F \$21.60 nett ILC 18F \$22.60 nett

Base: Grey Door: Clear

Dimensions (mm)

Cat. No.	н	w	D
ILC 4S	175	90	100
ILC 8S	175	170	120
ILC 105SN	208	218	108
ILC 14SSN	208	292	108
ILC 18SSN	208	370	108

Colour:

Earth and neutral kit ordered separately.

- Bus comb ordered separately.
- When ordering specify standard powder coat colour, refer NHP. Available on indent only.

- ☐ Standard AS 3132.
- Suits Din-T6, 10, 10H & 15 MCBs and associated DIN equipment.
- □ IP.40 protection rating.
- ☐ Totally insulated.
- Maximum 120 amp load.
- 150 mm centre distance between DIN rails with 30 mm behind the mounting frame.
- The range consists of 36, 54 and 72 pole enclosures.
- Neutral and earth bars rated at 100 amps.



These enclosures have generous 150 mm wiring space between and 30 mm behind equipment rails. The removable mounting frame serves to ease cabling and wiring greatly. Din-Modula 150 is designed for indoor use and to accept the Din-T 6, 10, 10H and 15 MCB range, time switches, contactors and main switches.

A range of accessories consisting of lugs and busbar combs facilitates easy mains connection of larger sized cables up to 35mm*. Refer page 1 - 31 & 1 - 33.

Technical data

- ☐ Maximum load:120 amp.
- Max. operating voltage: 415 V AC.
- ☐ Material: Base:
- Impact resistant
 - polystyrene.
 - Door: polycarbonate.
- □ Degree of protection: IP 40.
 □ Colour: Base: Grev.
 - Door: Clear.

Accessories

- Circuit identification labels.
- Earth and neutral bars.
- ☐ Lock (with 2 keys)
- available at extra cost.

 Neutral bar extension kits
- available at extra cost (field fitted).

 Flush mount kit available at extra cost.
- □ Grey door refer NHP.

Ordering details

No. of rows	Capacity (poles)	Neutral bar	Earth bar	Cat. No.	Surface Price \$	Flush kit Price \$
2	36	1 x 18	1 x 18	DM15036	190,00	nett 86.00
3	54	2 x 18	1 x 24	DM15054	285.00	nett 86.00
4	72	2 x 18	1 x 36	DM15072	360.00	nett 86.00

Optional accessories

Optional acce	Dimensio						
Description	Cat. No.	Price \$	Cat. No.	н	W	D	
Neutral19-36	DM150NAA	13.00	DM15036	450	355	142	
Neutral 37-54	DM150NAB	21.80	DM15054	600	355	142	
Neutral 55-72	DM150NAC	21.80	DM15072	750	355	142	
Locking device	DM150LD	20.20				- 4	

Coupling kit DM150JK 13.00

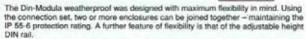
Notes: Neutral and earth bars rated at 100 amps.

Neutral bar extension kits must be ordered separately. When flush mount required order separately by description.

²068 Tufnell Road Yeronga SPS Pump Station Upgrade OM Magual

Insulated loadcentres Din-Modula weatherproof series

- Standard AS 3132.
- Suits Din-T6, 10, 10H, 15 MCBs.
- IP 55-6 protection.
- Maximum 120 amp load.
- Padlocking possible.
- Door changeable left or right side.
- Totally insulated.



Din-Modula weatherproof was designed for use with the Din-T 6, 10, 10H and 15 MCB range in wet area applications, out of direct sunlight. Split neutral and earth bars are provided. A range of accessories including three phase insulated busbar combs and terminal lugs are available for applications up to 120 amp. Refer page 1 - 31 & 1 - 33.

Technical data

- Maximum load:120 amp
- Max. operating voltage: 415 V
- Material: base: impact resistant
- polystyrene.
- door: polycarbonate

IP 55-6

- Degree of protection:

 - Colour: Base: Grey Door: Clear
- Compliance to AS 3132.

Accessories

- Circuit identification labels.
- Split neutral and earth bars
- Weatherproof sealing caps for mounting screws.
- Pole fillers
- Locking bracket, padlock and three keys at extra cost.
- Connection set-for joining enclosures together at extra cost.

No. of rows	No. of modules	Neutral bar	Earth bar	Cat. No.	Price \$
1	12	8/4	8	DMWP12	145.00
2	24	18/6	18	DMWP24	190.00
3	36	24/12	18	DMWP36	245.00

Accessories

Description	Cat. No.	Price \$
Locking device	DMWPLD	17.20
Connection set	DMWPCS	7.60

Dimensions (mm)

Cat. No.	H	W	D
DMWP12	250	285	138
DMWP24	375	285	138
DMWP36	500	285	138

Notes: Neutral and earth bars rated at 100 amps. Neutral bar indicated as eq. 8/4 split.

Metal loadcentres NLC metal loadcentres for Din-T MCBs

- Suits Din-T6, 10, 10H & 15 MCBs and associated DIN equipment.
- Commercial and light industrial applications.
- 1.0 mm zinc annealed steel.
- Polyester powder coated N42 grey.
- Earth neutral bars provided.
- Circuit schedule labels provided.
- DIN rail fitted.
- Australian made.
- IP 30 without door.
- ☐ IP 40 with door.



Capacity poles	Surface mo enclosure Cat. No.	unt Price \$	Flush 1) escutcheon Cat. No.	Price \$	Door ¹) ²) Cat. No.	Price \$
8	NLC8S	86.50	NLC8FE	19.60	LD6/B	35.00
12	NLC12S	108.00	NLC12FE	19.60	LD9/12	35.00
15	NLC15S	115.00	NLC15FE	19.60	LD12/15	41.00
18	NLC18S	130.00	NLC18FE	19.60	LD15/18	41.00
21	NLC21S	149.00	NLC21FE	19.60	LD18/21	47.00

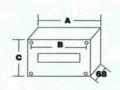
Options and accessories

Price \$

		Price \$	
Insulated busbar 120 amp	Refer page	1 - 33	
Locking kit includes bracket and fasteners (CL001)	DSLK	12.80	
Traffolite labels	Refer NHP		
Special paint colours	Refer NHP		
DIN pole fillers	Refer page	1-32	
Fitting of Din-T MCB single pole	Add each	1.00	
Fitting of Din-T MCBs two and three pole	Add each	1.20	
NSW Public Works Department E1 type lock	Add	302.00	

Dimensions (mm)

Pole cap.	A 3)	В	C 3)
8	268	192	245
12	343	267	245
15	418	342	245
18	493	417	245
21	568	492	245

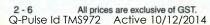


Notes: 1) Doors and flush escutcheons supplied loose.

2) Door has provision for lock. Lock kit ordered separately.

7 Down has jove sold for increased by 50 mm when flush mounted.
With door depth = 98 mm.

ACCORDADA MANA





Metal loadcentres TLC loadcentres for 'Safe-T' MCBs

- Suitable for Safe-T MCBs and Safe-T RCDs.
- Commercial and light industrial applications.



	1.0 mm zinc annealed steel.		A	
	Polyester powder coated N4	2 grey.	-	
	Earth and neutral bars provide	ded.		
0	Circuit schedule labels provi	ded.		
	MCB clip tray fitted.	ATTENDED TOOL		
	IP 30 (IP 40 with door).			- 1
	Australian made.			
	Surface mount enclosure	Flush escutcheon 1)	Door 1)	

Pole	enclosure		escutcheon ')		Door ')	
cap	Cat. No.	Price \$	Cat. No.	Price \$	Cat. No.	Price \$
6	TLC6S	72.00	TLC6FE	19.60	LD6/8	35.00
9	TLC9S	92.00	TLC9FE	19.60	LD9/12	35.00
12	TLC12S	108.00	TLC12FE	19.60	LD12/15	41.00
15	TLC15S	115.00	TLC15FE	19.60	LD15/18	41.00
18	TLC18S	130.00	TLC18FE	19.60	LD18/21	47.00
21	TLC21S	150.00	TLC21FE	19.60	LD21	47.00

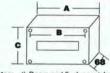
Options and accessories

Price \$

Refer page	1-4
SAFE-TPF	1.00
DSLK	12.80
Refer NHP	
Refer NHP	
Add each	1.00
Add each	1.20
TLCDMA	14.80
Add	302.00
	SAFE-TPF DSLK Refer NHP Refer NHP Add each Add each TLCDMA

Dimensions (mm)

Pole cap.	A 2)	В	C 2)
6	268	192	245
9	343	267	245
12	418	342	245
15	493	417	245
18	568	492	245
21	693	617	245



Notes:

- 1) Doors and flush escutcheons supplied loose.
- Dimensions 'A' and 'C' increased by 50 mm when flush mounted. With door depth = 98 mm.

Introducing NHP's new family

CONCEP1

CONCEPT • PLUS

CONCEPT • PREMIERTHE PREMIUM PANELBOARD

To compliment the successful CONCEPT PLUS panelboard, NHP are proud to release for sale another two all new panelboard ranges; CONCEPT and CONCEPT PREMIER. These new designs replace some previous models and offer an expanded range of features and price structures designed to benefit our customers. The CONCEPT family range of panelboards keeps a common and attractive appearance throughout the range.

The new "CONCEPT" panelboard is designed for those wanting a visually attractive, economical panelboard, but also offering a robust enclosure with an excellent range of standard features. This type of panelboard is a new addition within the NHP product offering, and is designed to be stocked nationally as an "off the shelf" panelboard.

NEW Standard grey or Compact 160 A main switch as standard orange door. (250 A optional) Horizontal DIN rail version Din-T Chassis Optional emergency lighting kits Top and bottom The chassis can be split in accessories DIN rail the field The chassis is rated to Contactor option up to 160 A (250 A option) 43 A AC 3 Removable tee off end caps Splayed busbars at top

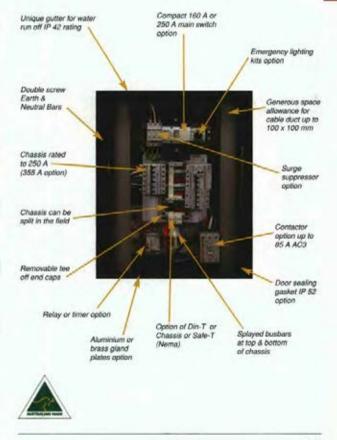
and bottom of the chassis

Rox width 485 mm

CONCEPT•PLUS

The multipurpose panelboard:

For those wanting an "off the shelf" panelboard which offers a large range of features and options. The CONCEPT PLUS is a multipurpose panelboard that offers among its many features: two IP ratings, 6 modular sizes, and add-on accessory boxes that can be added to extend the height or width of the panelboard. CONCEPT PLUS panelboards are available for either DIN or NEMA (SAFE T) MCBs.



CONCEPT • PREMIERThe premium panelboard:

This new panelboard replaces several previous versions: the NPP, TPP and TPX. The CONCEPT PREMIER has all the features of Concept Plus, but also includes important additional features, such as a greater box depth, a genuine IP66 rating, the option of stainless steel enclosures, a floor mounting plinth, plus others. Because of the additional depth of the CONCEPT PREMIER the number and size of accessory items such as isolators and contactors is greatly increased. Add to that, the modular design that allows standard boxes and accessory boxes to be connected together lengthways or side by side. This modularity enables custom designs to be quickly built, but also allowing cost savings because of the modular yet flexible design. CONCEPT PREMIER panelboards are available for SAFE T, DIN T, 125A and 250A MCCBs or combinations thereof, CONCEPT PREMIER offers a premium in flexibility and features.



Increased width, increased depth, widest flexibility of options



THE PANELBOARD INNOVATORS

The CONCEPT Panelboard Family - QUICK REFERENCE TABLE

Features and options	Concept	Concept PLUS	Concept PREMIER	
CIRCUIT BREAKER TYPES	DIN-T	DIN-T / SAFE T	DIN-T / SAFE T/ 125 & 250A MCCBs	
ENCLOSURE DETAILS & ACCESSOR	VISPACING		123 & 230A MOCOS	
Width	485mm	585mm	640mm	
Depth	151mm	180mm	240mm	
IP Rating	1P42	IP42 (IP52 option)	1P66	
Material	1mm	1.6mm	1.6mm	
No of sizes available	4	8	8	
Colours available	Grey & Orange	Grey & Orange	Grey & Orange	
Spare din-rail rail mounting space	12 Poles	18 Poles	18 Poles	
Largest contactor under PB escutcheon	CA7-43	CA7-85	CA6-170	
Largest contactor in accessory module	UM743	CA6-170	CA6-420	
MAIN SWITCHES, BUSBARS, EARTH	& NEUTRAL BARS	ONO-170	ON0 420	
STD Main switch Rating	160A (250A optional)	160 or 250A standard	160 or 250A standard	
Maximum main switch sizes available	250A	400A	800A	
Busbar amp ratings for MCBs	160A (250A optional)	250A & 355A	250A & 355A	
Busbar amp ratings for MCCBs	-	-	400, 630, 800, 1000A	
Main busbar short time kA rat. 415Vac	20kA for 0.2 sec's	20kA for 0.2 sec's	20-50kA refer chassis	
Earth & Neutral bars	1 screw	2 screw	2 screw	
Earth & Neutral bar size	13.0 x 9.5mm	19.0 x 9.5mm	19.0 x 9.5mm	
Lock type on door	Flush	Flush	Metal "T" lock	
Chassis type	CD DIN chassis	CD or CT	CD-CT-XA-XB-XC	
COMMON FEATURES				
Horizontal Din-rail	1	1	1	
Dished Escutcheon	1	1	1	
Knockouts for MCBs & accessories	/	1	/	
Dogr reversible RHS to LHS	/	,	1	
Door hinged independent of escutcheon		1	1	
White Escutcheon	/	1	1	
OPTIONAL ACCESSORIES & FEATUR		-		
Emergency lighting kits – option	/	1	1	
Can duct be Fitted – option	1	1	1	
Split Chassis – option	1	1	1	
Split neutral link – option	1	1	1	
Special colours – option	1	1	1	
Rain Hood	1	- 4	1	
Custom "modular" assemblies - option	2	1	1	
Accessory / Header boxes – option		1	1	
Brass or aluminum gland plates – option	-	1	1	
Removable gland plates – standard	-	1	1	
Can fit MCCB's - option	_	1	1	
Fault current limiter DIN fuses - option	-	1	1	
Flush surround kits – option	-	1	1	
Hinged escutcheon	-	optional	Standard	
IP 52 door seal – option	-	✓ ✓	Ottandard	
Floor mounting plinth – option		,	1	
Wall mounting brackets – option		,	1	
"3 point locking" door - on Lge encl. ')			1	
Stainless Steel enclosure – option		-	1	

Note: For a more complete listing of accessory details refer accessory pages relating to individual panelboards.

') on Lge encl. = on Large enclosures

CONCEPT - The economical panelboard for **DIN-T MCBs**

- ☐ Standard AS 3439
- Commercial and industrial applications
- Type tested busbar system
- Compact 160 A switch standard. 250 A option
- Door fitted independent of escutcheon
 - Left or right hand door hinging
 - Lockable door
 - Australian made



The Concept range of panel boards is an economical panel board designed for the commercial and light industrial sectors. It will accept DIN-T circuit breakers and associated accessory devices.

Features

- Two tone colour scheme, make a colour change by simply changing the door colour.
- The door is field changeable from right to left hinged and is totally independent of the escutcheon.
- Gloss white escutcheon has been dished to allow a wide range of accessories to fit under the door.
- Knockouts provided in the escutcheon for up to 12 modules of extra standard DIN rail equipment.
- Compact main switch with a 160 A rating. A 250 A switch is available on request.
- Earth and neutral bars, circuit identification and schedule cards supplied.

Technical Data

Material type 1 mm Steel

Finish Polyester powder coated

Colour (AS2700-1995) Base - charcoal Grey

Door - N42 Grey or X15 Orange

Escutcheon - bright white

Protection degree IP 30 without door

IP 42 with door

Busbar ratings 160 A (250A optional)

20 kA for 0.2 seconds

Main Switch 160 A 3 pole 415 V AC top mount

250 A 3 pole 415 V AC top mount (optional)



CONCEPT - The economical panelboard for DIN-T MCBs







(WZ)

CONCEPT - Surface mount panelboard with grey door

Suits Din-T N	ICBs (DIN) refer	160 A	250 A		
Poles	Box size	Height (mm)	Cat. No. ')	M/S Price \$	M/S Price \$
24	1	700	CON 24 M160 G	705.00	855.00
36	2	800	CON 36 M160 G	800.00	900.00
48	3	900	CON 48 M160 G	890.00	960.00
60	4	1000	CON 60 M160 G	990.00	1050.00

Width = 485 mm Depth = 151 mm includes door. (Door = 20 mm)

CONCEPT - Surface mount panelboard with orange door

Suits Din-1 MCDS (DIN) refer section one			DIII. I MCD2 (DIM) LEIST ZECTION ONE		
Poles	Box size	Height (mm)	Cat. No. ')	M/S Price \$	M/S Price \$
24	1	700	CON 24 M160 O	705.00	855.00
36	2	800	CON 36 M160 O	800.00	900.00
48	3	900	CON 48 M160 O	890.00	i 960.00
60	4	1000	CON 60 M160 O	990.00	i 1050.00

Width = 485 mm Depth = 151 mm includes door. (Door = 20 mm)

Note:

- 1) Concept panelboards are stocked as standard with a 160A main switch. If a 250 A main switch is required, replace the "160" contained in any of the above part numbers with "250". For example: CON 24 M250 G. Concept panelboards requiring 250 A main switches require factory fitting at NHP, along with larger earth and neutral bars.
- i Available on indent only.



CONCEPT - The economical panelboard for **DIN-T MCBs**

Accessories

Description		Cat. No.	Price \$
Split chassis kit		STKCD	70.00
(supplied loose)			
Emergency lighting	kit (supplied loose)		
	Rotary control switch	CPELK1 ')	255.00
	Key operated control switch	CPELK21)	295.00
Pole filters (DIN T)		DTPF	2.40
Rain Hood	Suits all Sizes	CONWC	80.00

Note:

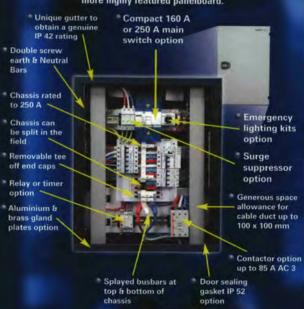
Emergency lighting kits can be field fitted to Concept panelboard utilizing horizontal DIN knockouts at top of board. Kits include control switch, timer, 24 A 4P N/C contactor, labels and wiring diagram to complete control circuit which complies to AS 2293.1.

Factory fitted options

Description		Cat. No.	Price \$
Load shedding/emergency power contactor kWh metering		REFER NHP	P.O.A
		IME ENERGY METERS	Refer 8 - 5
Special colours (door	rs)		
	Std powder coat (per	REFER NHP	140.00
	Interpon chart)		
	Non standard powder coat	REFER NHP	POA
	Wetspray	REFER NHP	POA
Non standard powder coat		REFER NHP	POA

CONCEPT-PLUS Cading Panelboard The INNOVATIVE Panelboard

Concept Plus is an innovative panelboard for commercial and industrial applications. Since its introduction the Concept Plus panelboard has won wide market acceptance, even so, NHP is continuing to implement product improvements to make this an even more highly featured panelboard.











Escutcheon features

- Dished escutcheon with knock out system for accessory devices
- Optional hinged escutcheon
 - Accessory enclosure
 - 400 mm & 600 mm bolt on accessory boxes are available

MCBs

- DIN or SAFE T MCB versions available

Colours

- Grey or Orange doors available

CONCEPT - PLUS - Multi-purpose panelboards for Din-T or Safe-T MCBs

- C Standard AS 3439
- Commercial and industrial applications
- D IP 42
- @ 6 modular sizes up to 96 poles
- Accessory module
- Type tested busbar chassis system
- New compact 250 A main switch
- Generous wiring room
- Removable gland plates
- Door fitted independent of escutcheon
- Left or right hand door hinging



Application

The Concept Plus range of panelboards provides a unique enclosure system for the NHP range of Din-T and Safe-T MCBs and associated accessory devices. The generous wiring room and vast array of features result in a flexible enclosure system to meet the most demanding requirements of light and power distribution systems in commercial and industrial applications.

Use the ordering information on the following page to select a standard product from stock or contact your nearest NHP office to customize a Concept Plus enclosure to your specific needs.

Features

- Two tone colour scheme, make a colour change simply by changing the door colour. The door is field changeable from right to left hinged and is totally independent of the
- escutcheon. Gloss white escutcheon has been dished to allow a wide range of accessories to fit
- under the door. Left or right hand door hinging option.
- Knockouts provided in the escutcheon for up to 18 modules of standard DIN rail. equipment.
- Generous internal dimensions ensure ample room for wiring, ducting and contactors.
- Removable gland plates aid on site installation of cables and trunking systems.
- New compact main switch with a fully enclosed rating of 160 A and 250 A.
- Earth and neutral bars, circuit identification and schedule cards supplied standard.

Technical data

Protection degree:

Material type: 1.6 mm steel, polyester powder coated

Colour (AS 2700-1995): Base - charcoal

Door - N42 grey or X15 orange (other colours refer NHP)

Escutcheon - bright white

IP 30 - without door

IP 42 - with door

IP 52 - with dustproof seal fitted to door (option)

250 amp; (355 amp option, refer NHP) **Busbar ratings:**

Short time rating: 20 kA for 0.2 seconds

Main switch (options): Safe-T 100 A Non-auto (chassis mount Concept Plus Safe-T)

Din-T M/S 100 A (Chassis mount Concept Plus Din-T)

160 A 3 pole 415 V AC (top mount)

250 A 3 pole 415 V AC (top mount)

Neutral and earth bars; 2 x 8 mm studs; tunnel terminals with 2 screws 10 kA 1 sec



CONCEPT - PLUS - Multi-purpose panelboards for Din-T MCBs







CONCEPT-PUS Din-T - Surface mount with grey door

MCBs (D)	N) reter section	0.008	No	160 A	250 A
Box size	Height (mm)	Cat. No. ')	M/S Price \$	M/S *) Price \$	M/S ²) Price S
1	700	CDT 18-XXXX-G	630.00	760.00 7	810.00 7
1	700	CDT 24-XXXX-G	690.00	830.00	1030.00 *)
2	900	COT 36-XXXX-G	740.00	940.00	1090.00 ")
2	900	CDT 48-XXXX-G	890.00	1080.00	1180.00
3	1100	CDT 60-XXXX-G	990.00	1190.00	1320.00
4	1300	CDT 72-XXXX-G	1140.00	100	1430.00
4	1300	CDT 84-XXXX-G	1320.00	1122	1590.00
5	1500	CDT 96-XXXX-G	1530.00		1830.00
	Box size 1 1 2 2 3 4 4	Box Height (mm) 1 700 1 700 2 900 2 900 3 1100 4 1300 4 1300	Box Height Cat. No. ') 1 700 GDT 18-XXXX-G 1 700 GDT 24-XXXX-G 2 900 GDT 36-XXXX-G 2 900 GDT 48-XXXX-G 3 1100 GDT 60-XXXX-G 4 1300 GDT 72-XXXX-G 4 1300 GDT 84-XXXX-G 4 1300 GDT 84-XXXX-G 4 1300 GDT 84-XXXX-G 7 7 7 7 7 7 7 7 7	Box Height (mm) Cat. No. ') Price \$ 1 700 GDT 18-XXXX-G 630.00 1 700 CDT 24-XXXX-G 890.00 2 900 CDT 36-XXXX-G 740.00 2 900 CDT 48-XXXX-G 990.00 3 1100 CDT 60-XXXX-G 990.00 4 1300 CDT 72-XXXX-G 1140.00 4 1300 CDT 84-XXXX-G 1320.00	Box Height size (mm) Cat. No. ') Price \$ Price \$

Width = 585 mm, Depth = 180 mm includes door. (Door = 20 mm)

Suits Din-		N) refer section	000	No	160 A	250 A
Poles	Box	Height (mm)	Cat. No. ')	M/S Price \$	M/S *) Price \$	M/S *
18	1	700	CDT 18-XXXX-O	630.00	760.00 ")	810.00 ")
24	1	700	CDT 24-XXXX-O	690.00	830.00	1030.00 *)
36	2	900	CDT 36-XXXX-O	740.00	940.00	1090.00")
48	2	900	CDT 48-XXXX-O	890.00	1080.00 ")	1180.00
60	3	1100	CDT 60-XXXX-O	990.00	1190.00 ")	1320.00
72	4	1300	CDT 72-XXXX-O	1140.00		1430.00
84	4	1300	CDT 84-XXXX-O	1320.00	-	1590.00
96	5	1500	CDT 96-XXXX-O	1530.00	-	1830.00 7)

Width = 585mm, Depth = 180mm includes door. (Door = 20mm)

Notes: ') Panelboards without main switch delete "XXXX" eg. CDT24G. Main switch "XXXX" - insert M160 =160 Aor M250 = 250 A

> eg. CDT24M250G. Main switch supplied loose ie CDT24M250G = CDT24G + CDT250MS









CONCEPT-PUS Safe-T - Surface mount with grey door

Suits Safe	-T-MCBs (N	EMA) refer se	ction one	No	160 A	250 A
Poles	Box size	Height (mm)	Cat. No. ')	M/S Price \$	M/S ') Price \$	M/S ') Price \$
18	1	700	CST 18-XXXX-G	630.00	760.00°)	810.00 ")
24	1	700	CST 24-XXXX-G	690.00	830.00	1030.00")
36	2	900	CST 36-XXXX-G	740.00	940.00	1090.00")
48	3	1100	CST 48-XXXX-G	890.00	1080.00	1180.00
60	4	1300	CST 60-XXXX-G	990.00	1190.00	1320.00
72	5	1500	CST 72-XXXX-G	1140.00	70	1430.00
84	6	1700	CST 84-XXXX-G	1320.00	119991	1590.00
96	6	1700	CST 96-XXXX-G	1530.00		1830.00

Width = 585 mm Depth = 180 mm includes door. (Door = 20 mm)

CONCEPT-PLUS Safe-T - Surface mount with orange door

Suits Safe	-T MC8= (N	(EMA) refer sec	ction one	No	160 A	250 A
Poles	Box	Height (mm)	Cat. No. ')	M/S Price \$	M/S ') Price \$	M/S ') Price \$
18	1	700	CST 18-XXXX-O	630.00	760.00 ")	810.00 ")
24	1	700	CST 24-XXXX-O	690.00	830.00	1030.00 ")
36	2	900	CST 36-XXXX-O	740.00	940.00	1090.00 ")
48	3	1100	CST 48-XXXX-O	890.00	1080.00 ")	1180.00
60	4	1300	CST 60-XXXX-O	990.00	1190.00 ")	1320.00
72	5	1500	CST 72-XXXXX-O	1140.00		1430.00
84	6	1700	CST 84-XXXX-O	1320.00		1590.00
96	6	1700	CST 96-XXXX-O	1530.00		1830.00 1)

Width = 585 mm Depth = 180 mm includes door. (Door = 20 mm)

Notes: 1) Panelboards without main switch delete "XXXX" eg. CST24G.

 Main switch "XXXX" – Insert M160 = 160 Aor M250 = 250 A eg. CST24M250G.

 Main switch supplied loose ie CST24M250G = CST24G + CST250MS.



P068 Tufnell Road Yeronga SPS Pump Station Upgrade OM Manua

CONCEPT-PUS - Multi-purpose panelboards for Din-T or Safe-T MCBs

Accessories Description				Cat. No.	Price S
Top mount	160 A	3 pole	CDT	CDT160MS	195.00
main switch			CST	CST160MS	195.00
kits (supplied	250 A	3 pole	CDT	CDT250MS	285.00
loose)		1	CST	CST250MS	285.00
Chassis mount	100 A	3 pole	CDT	DINTMS1003	Page 1-19
main switch	100 A	3 pole	CST	SAFE-T63100NA	Page 1-1
Bolt on accesso	ry modul	e (supplied	i loose)		
Grey lockable door	- with esc	utcheon	400 mm	CPACCGE 1)	330.00
			600 mm	CPACCGE6 ')	410.00
	- without	escutcheon	400 mm	CPACCG	285.00
			600 mm	CPACCG5	350.00
Orange lockable doo	or - with esc	utcheon	400 mm	CPACCOE')	330.00
			600 mm	CPACCOE6")	410.00
	- without	escutcheon	400 mm	CPACCO	285.00
			600 mm	CPACCO6	350.00
Flush surround	kit (suppi	lled loose)	Size 1	CPBFK-1	157.00
			Size 2	CPBFK-2	157.00
			Size 3	CPBFK-3	157.00
			Size 4	CPBFK-4	157.00
			Size 5	CPBFK-5	157.00
			Size 6	CPBFK-6	157.00
Dustproof door	seal (IP 5	2) Fits all b	ox sizes	CPDRUBBER	115.00
Floor mount plin	nth		-	CPPLINTH	205.00
Gland plate opti		p (cutout for c	able entry)	CPECS	60.00
		late (suits ope		CPGPS	29.80
		late (suits op	200000000000000000000000000000000000000	CPGPB	116.00
A	luminium at	and plate (sub	s open end capi	CPGPA	36.80
Split chassis kit			CDT	STKCD	Page 2-26
(supplied loose)		CT250 A	CST	STK250ND/TH	Page 2-27
		CT355 A	CST	STK300TH	Page 2-27
Emergency ligh	ting kit (s	upplied lo	ose)		-
	otary contro		1000	CPELK1*)	255.00
	ey operated	CPELK2 7	295.00		
Pole fillers	, ,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,	Din-T	CDT	DTPF	Page 1-32
		Safe-T	CST	SAFE-TPF	Page 1-4

Notes: 1) Escutcheon supplied loose, i.e. CPACCGE - CPACCG + CPESOOD.

⁷⁾ Emergency lighting kits can be field fitted to Concept Plus panelboard utilising horizontal DIN knockous at top of board. Kits include control switch, siner, 24 A 4P NIC contactor, labels and wiring diagram to complete control circuit complying to AS 2293.1.

P068 Tufnell Road Yeronga SPS Pump Station Upgraste OM Manual

CONCEPT-PUS - Multi-purpose panelboards for Din-T or Safe-T MCBs

Factory	fitted	opt	ions
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Description	Cat. No.	Price \$
Optional main switches	1	1
- 250 A MCCB non auto	XE250NN	POA
- 250 A MCCB	XS250NJ	POA
- 315 S+S loadbreak	LE 7-315-1753	POA
- 400 A MCCB non auto	XS400NN	POA
Feeder MCCB	The second	
- 125 A 3 pole	DIN-T10H3125C	POA
- 160 A 3 pole	X5250 NJ160	POA
Fault current limiters	The same of the	1 6 6
- 160 A DIN size 00	Refer NHP	POA
- 200 A DIN size 1	Refer NHP	POA
355 A busbar (specify by description)	Refer NHP	POA
Split chassis kit (fitted)	Refer NHP	100.00
Load shedding / emergency power contactor	Refer NHP	POA
kWh metering	IME energy meters	Page 8-5
Cable duct (fitted) - CDT max. 100 x 100 mm	Refer NHP	POA
- CST max. 60 x 100 mm	Refer NHP	POA
Special colours (doors)		
- Std powder coat (per Interpon chart)	Refer NHP	140.00
- Non standard powder coat	Refer NHP	POA
- Wetspray	Refer NHP	POA
Hinged escutcheon	Refer NHP	62.00
Left hand hinged door (specify by description)	Refer NHP	POA
NSW PWD 'Ei' type lock	Refer NHP	302.00



Common items to suit the CONCEPT family of panelboards To suit Din-T or Safe-T MCBs

Panelboard hardware



Poles	Cat. No.	Price \$	Cat. No.	Price \$
18	TGPEN181S	27.60	TGPEN182S	30.50
24	TGPEN241S	34.00	TGPEN242S	37.50
30	TGPEN301S	41.00	TGPEN302S	44.50
36	TGPEN3615	45.50	TGPEN3625	51.50
42	TGPEN4215	46.50	TGPEN4225	57.00
48	TGPEN4815	52.50	TGPEN482S	59.50
60	TGPEN6015	70.00	TGPEN602S	79.00
72	-	THE PERSON NAMED IN	TGPEN7225	87.50
78	TGPEN7815	92.00	TGPEN7828	100.00
84	TGPEN8418	95.00	TGPEN842S	106.00
96	TGPEN961S	110.00	TGPEN962S	127.00

Description		Cat. No.	Price \$
Neutral bar extension - 300	A ')	NEB33S	51.50
Neutral bar isolator (pair)		TGPINS	5.00
A4 Schedule card		CPSCHEDULECARD	1.40
Schedule card holder (plastic)		CPSCHEDULEHOLD	7.20
Touch-up paint charcoal	spray can 150 g	392.00001	16.20
Touch-up paint grey	spray can 150 g	392.35554	16.20
Touch-up paint orange	spray can 150 g	392.35555	16.20
Touch-up paint white	spray can 150 g	392,35553	16.20
Touch-up paint bright white	spray can 150 g	392.00002 1)	16.20

Note: 1) "Bright white" to suit Concept Plus Escutcheon.

[&]quot;) Neutral bar extention not suitable for "concept" panelboards fitted with a 160 A main switch.



NEB33S Neutral bar extension



TGPINS Neutral bar insulators



CP schedule card

IP 66

(E) TERASAKI

CONCEPT PREMIER - The premium panelboard suits DIN-T and SAFE-T MCBs

- Standard AS 3439
- 1.6 mm fully welded construction
- IP 66 rated enclosure
- Commercial and industrial applications
- Modular sizes up to 96 poles
- Suits DIN-T6, 10, 15 kA and SAFE-T MCBs and accessories
 - Type tested busbar/chassis system
 - Removable gland plates (with gaskets)
- Hinged escutcheon
- Lockable door with 3 point locking on longer sizes
- Australian made

		emier to N) refer section	SUIT DIN-T MC	BS No	160 A	250 A
Poles	Box size	Height (mm)	Cat. No. ')	M/S Price \$	M/S *) Price \$	M/S ') Price S
18	1	800	CPD 18-XXXX-Y	1125.00	1285.00 ")	1395.00 ")
24	1	800	CPD 24-XXXX-Y	1180.00	1340.00")	1430.00 ")
36	2	1000	CPD 36-XXXX-Y	1330.00	1460,00 ")	1540.00 ")
48	2	1000	CPD 48-XXXX-Y	1490.00	1660.00")	1790.00 1)
60	3	1200	CPD 60-XXXX-Y	1550.00	1730.00 ")	1890.00 ")
72	4	1400	CPD 72-XXXX-Y	1910.00	-	2250.00 ")
84	4	1400	CPD 84-XXXX-Y	2210.00		2490.00 ")
96		1600	COD OF VVVV V	2420.00		2720 00 31

Concent Premier to quit SAFE T MCRe

Suits SAFE	-T MCBs (7	NEMA) refer se	iction one	No	160A	250A
Poles	Box size	Height (mm)	Cat. No. ')	M/S Price \$	M/S ') Price \$	M/S ') Price \$
18	1	800	CPS 16-XXXX-Y	1125.00	1285.00")	1395.00 %
24	1	800	CPS 24-XXXX-Y	1180.00	1340.00 ")	1430.00.")
36	2	1000	CPS 36-XXXX-Y	1330.00	1460.00 ")	1540.00 7)
48	3	1200	CPS 48-XXXX-Y	1490.00	1660.00 7	1790.00 ')
60	4	1400	CPS 60-XXXX-Y	1550.00	1730.00 ")	1890.00*)
72	5	1600	CPS 72-XXXX-Y	1910.00		2250.00 ")
84	6	1800	CPS 84-XXXX-Y	2210.00		2490.00")
96	6	1800	CPS 96-XXXX-Y	2430.00	1500	2720.00 ")

Width = 640 mm Depth = 240 mm includes door. (Door = 20 mm)

- Notes: ") Panelboards without main switch delete "XXXX" eg. CPS 24 G.
 - ") Main switch "XXXX" insert M160 = 160 A or M250 = 250 A. eq. CPS 24 M250 G.
 - ") Main switches are supplied loose. i.e. CPS 24 M250 G = CPS 24G + CDT250MS.
 - Door colour "Y" onsert O = Orange or G = Grey to select colour.
 - CPD and CPS panelboards are stocked less main switch.
 - Refer pages ... for larger main switches and other options and accessories.
- Stock: types less main switch are stocked. refer NHP for delivery confirmation. regarding types with main switches.

Q-Pulse Id TMS972 Active 10/12/2014 Page 102 of 441

068 Jufnell Road Yernag SPS Pump Station Hograde OM Manual

CONCEPT PREMIER panelboards and accessories

Other main switches available for CPD & CPT panelboards

Chanala	mounting	Cantra	-	manuation
Chassis	mounting	Centre	top	mounting

Current rating	Type of main switch		s mounting Cent CM price \$	tre top mounting add TM price \$
100 A	DINTMS1003	OF THE	POA	POA
100 A	SAFE-T Non-auto	100	POA	POA
250 A	XS250NN	Ministra	N/A	POA
315 A	LE7-315-1753		N/A	POA
400 A	XS400NN	1000	N/A	POA
400 A	OETL 400	The later	N/A	POA
630 A	XS630NN	Wall of	N/A	POA
800 A	XS800NN	The same	N/A	POA
Party State			Factory Assen	
Options and ac	cessories	_	Cat. No.	Price \$
Accessory module -	-bolt on Height 600 mm G	rey/Orange	CPPACCG	305.00
Escutcheon to suit a	accessory module		CPPESØØØ	58.00
Weatherproof rainho	ood		CPPWC_	145.00
Wall mounting brack	ets		CPPWB	37.50
Floor mounting plint	h CPP PLINTH			
Flush mounting kit s	upplied loose. Order as CF	PFK and	CPPFK_	157.00
add modular base s	ize 1-6.		The William	- 10
Special external col	ours		7	POA
White interior				POA
Split chassis kit	C	T250A		Refer page 2 - 27
(suppled loose)	C.	T355A		Refer page 2 - 27
	C	D250/355A		Refer page 2 - 26
KWH meter			11000	Refer page 8 - 5
Larger main isolator	(see above). Increased he	ight by 300		POA
mm minimum. There	is an additional cost for th	e enclosure.		
Addition of NSW De	partment of Public Works a	nd Services	1	302.00
(DPWS) lock "E1 typ	pe" lock			
Addition of PVC wiri	ing duct			POA
Traffolite labeling av	ailable			POA
Pole fillers	C	PS		Refer page 1 - 4
	C	PD	SAFE TPF	Refer page 1 - 32
Tee-off plastic caps	C	PS	DTPF	Refer page 2 - 27
	C	PD	TH250TOPC	Refer page 2 - 26
355 A busbar			CD250TOPC	POA
Special contents an	d layout available			POA
Fitting of MCBs sing	le pole			Each, 0.90
Fitting of MCBs dou	ble and triple pole			Each, 1.20

Note: For any other special requirement refer to NHP.

CONCEPT PREMIER - The premium panelboard Suits 125 A and XS250A MCCBs up to 50 kA

- Standard AS 3439
- IP 66 rated enclosure with bottom gland plate

THESE PANELROARDS ARE ASSEMBLED TO DRIDER

- Modular sizes ranging 18 to 72 poles
- Suits XS/XH125 and XS250 MCCBs and internal MCCB accessories
- Lockable door with 3 point locking on larger box sizes
- Chrome T-bar handle lock, door and escutcheon hinges
- Enclosures available with Orange or Grey doors
- Appearance in common with the Concept family of panelboards

CPX panelboard application & enclosure details

The CPX panelboard is part of the Concept Premier panelboard range and is designed for commercial and industrial applications. The main feature of the CPX panelboard is that it will accept chassis mounted Moulded Case Circuit Breakers (MCCBs) up to 250 A. Fabricated from 1.6mm mild steel with a fully welded construction, and fitted with gasketed bottom gland plates the increased depth caters for larger contactors (CA 6-170) and other special equipment. An attachable accessory enclosure is also available which allows greater depth and even larger equipment to be fitted, for example, a CA 6-420 contactor. The Standard enclosure sizes below are with either a 250 A or 400 A main isolator fitted. Box dimensions that include isolators up to 800 A are available upon request. Doors and escutcheons are independently hinged as standard.

Cap. poles	Mod. box size	Height	Width	Depth
18-24	2	1000	640	240
36	3	1200	640	240
48	4	1400	640	240
60	5	1600	640	240
72	6	1800	640	240

Busbar ratings XA, XB, XC Chassis

CPX panelboards can accommodate a range of type tested chassis busbar systems suitable for TemBreak MCCBs such as the XA, XB, XC and other hybrid versions of these TemBreak MCCB chassis. Ranging from 18-72 poles, 400 A main busbars are standard, 600 A, 800 A and 1000 A rated main busbar chassis are available on special order, refer NHP. Note: An XC Chassis with 400 A incomer tee-offs cannot be used.

- 400 A bar, 31.5 kA for 1 second
- 800 A bar, 35 kA for 0.5 second
- ☐ 630 A bar, 31.5 kA for 1 second
- 1000 A bar, 50 kA for 1 second

Other options and accessories	Cat. No.	Price \$
630 A, 800 A or 1000 A busber (refer to NHP for board dimensions)	300	POA
Flush mounting kit supplied loose. Order as CPPFK "add modular base size 1-6"	CPPFK,	157.00
Special colours or white interiors		POA
Addition of PVC wiring duct		POA
Addition of N.S.W. DPWS "E1 type" lock		\$302.00
Accessory modules: CPPACCG (grey), CPPACCO (orange)	Sec. U	\$305.00
Weatherproof rain hood (without escutcheon)	OPPWC.	\$145.00
Wall mounting brackets	CPPWB,	\$37.50

top & bottom

1068 Tufnell Road Yeronga SPS Pump Station Upgrade OM Manual (E) TERASAKI

Concept Plus and Concept Premier busbar chassis assemblies for Din-T MCBs Busbar flare

- ☐ Standards AS 3439
- Current rating 250 A and 355 A.
- Withstand rating 250 A / 20 kA for 0.2 sec.
- ☐ Withstand rating 355 A / 25 kA for 0.3 sec. (20 kA for 1.0 sec).
- Splayed busbar to suit 160 A & 250 A switch.
- Top and bottom feed.
- Tee-offs stripped and 50 % capped.
- Top power feed stripped and capped.
- Full 35 mm DIN rail, improved MCB mounting security.
- Improved insulation coating.



The Concept range of busbar chassis assemblies, have been specifically designed for incorporation into the Concept Plus and Concept Premier range of multipurpose panelboards. Providing a secure mounting platform and connection system for the NHP Din-T range of MCBs. The busbars are fully dipped and type tested and are mounted on a box section steel pan, powder coated white.

Concept Din-T - 250 & 355 A suits Din-T MCBs

(18mm pole pitch)

Pole capacity	Cut-out 'C' length (mm)	Pan height mm ²)	Cat. No. 1)	250A Price \$	355A Price \$
12	110	152	CD12/18-3U	122.00	j 193.00
18	164	206	CD 18/18 - 3U	138.00	<u>i</u> 215.00
24	218	260	CD 24/18 - 3U	160.00	1 250.00
30	272	314	CD30/18-3U	177.00	i 270.00
36	326	368	CD 36/18 - 3U	210.00	297.00
42	380	422	CD42/18-3U	225.00	320.00
48	434	476	CD48/18-3U	260.00	365.00
54	488	530	CD 54/18 - 3U	275.00	₫ 390.00
60	542	584	CD 60/18 - 3U	300.00	415.00
72	650	692	CD 72/18 - 3U	395.00	470.00
78	704	746	CD 78/18 - 3U	450.00	515.00
84	758	800	CD84/18-3U	465.00	560.00
96	866	908	CD96/18-3U	505.00	635.00

Notes: 1) Ordering details; busbar "_ " - insert "2" = 250 A or "3" = 355 A.

Add 32.5 mm for flared busbar at top and bottom of chassis.

4 pole and other special configurations available to special order refer NHP. 'OFF' (line) side of MCB connects to chassis tee-off.

Use insulated tool provided to disengage DIN clip when removing MCB from chassis.

Din clip can be removed and discarded when mounting MCB on CD chassis.

i Available on indent only.



Concept busbar chassis assemblies for Din-T MCBs

Concept Din-T 250 A suits Din-T and Din-T10H MCBs

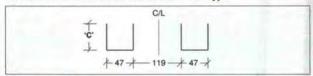
(27/18 mm pole pitch)

pore pitery						
Pole capacity 18 mm	Cutout length 'C' mm	Height mm	Cat. No. ') 2)	Price \$		
12	191	228	CDH-2-6/12-27/18-3U	185.00		
24	299	380	CDH-2-6/24-27/18-3U	220.00		
36	407	488	CDH-2-6/36-27/18-3U	260.00		
30	434	471	CDH-2-12/30-27/18-3U	300.00		
42	542	579	CDH-2-12/42-27/18-3U	345.00		
60	704	741	CDH-2-12/60-27/18-3U	475.00		
	Pole capacity 18 mm 12 24 36 30 42	Pole capacity 18 mm C'C' mm 12 191 24 299 36 407 30 434 42 542	Pole capacity 18 mm Cutout Inght 10 mm Height mm 12 191 228 24 299 380 36 407 488 30 434 471 42 542 579	Pole capacity 18 mm Cutout length 'C' mm Height mm Cat. No. ') ²) 12 191 228 CDH-2-6/12-27/18-3U 24 299 380 CDH-2-6/24-27/18-3U 36 407 488 CDH-2-6/36-27/18-3U 30 434 471 CDH-2-12/30-27/18-3U 42 542 579 CDH-2-12/42-27/18-3U		

Accessories CD chassis

Description	Cat. No.	Price \$
Split tariff kit 250/355 A (supplied loose)	STKCD	70.00
Split tariff kit (supplied & fitted)	Refer NHP Ne	100.00
Plastic tee-off cap 250/355 A	CD250TOPC	0.35

Escutcheon critical cut-out dimensions - CD type



Catalogue number structure

XX	X	XX	XX	X
Туре	Current rating	No. of ways	Module width (mm)	No. of phases
CD Din-T	2 250 A	12	18 Din-T	2 1P+N (rd,blk)
CDH Din-T10H	3 355 A	18	27 Din-T10H	3 3P (rd,w, bl)
CT Safe-T	Etc.	24	27/18 Hybrid	4 3P+N (rd,w,
		36 etc.	Din-T10H/Din-T	bl, blk)
		27 mm/18 mm	25 Safe-T	31 - 5
		6/24		
		12/60		



Notes: 1) Combinations other than those listed above available to special order refer NHP.
2) 355 A available to special order.

Din clip can be removed when mounting MCB on CD chassis. 'OFF' (line) side of MCB connects to chassis tee-off.

Use insulated tool provided to disengage DIN clip when removing MCB from chassis.

Concept Plus and Concept Premier busbar chassis assemblies for Safe-T MCBs

- Standards AS 3439.
- Current rating 250 A and 355 A.
- Withstand rating 250 A / 20 kA for 0.2 sec.
- Withstand rating 355 A / 20 kA for 1 sec.
- Splayed busbar to suit 160 A & 250 A switch.
- Top and bottom feed.
- Tee-offs stripped and 50 % capped.
- Top power feed stripped and capped.
- Improved insulation coating.



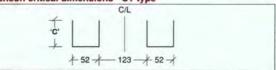
Pole capacity	Cut-out 'C' length (mm)	Pan height mm ²) ³)	Cat. No. 1)	250A Price \$	355A Price \$
12	147	221	CT - 12/25 - 3	122.00	199.00
18	222	296	CT18/25-3	135.00	i 230.00
24	297	371	CT - 24/25 - 3	152.00	270.00
30	372	446	CT - 30/25 - 3	163.00	i 295.00
36	447	521	CT36/25-3	199.00	i 330.00
42	522	596	CT42/25-3	215.00	365.00
48	597	671	CT - 48/25 - 3	235.00	i 420.00
60	747	821	CT60/25-3	285.00	485.00
72	897	971	CT72/25-3	395.00	560.00
84	1047	1121	CT84/25-3	450.00	625.00
96	1197	1271	CT - 96/25 - 3	550.00	710.00

Accessories CT chassis Description	Cat. No.	Price \$
Split tariff kit 250 A (supplied loose)	STK250ND/TH	70.00
Split tariff kit 355 A	STK300TH	70.00
Split tariff kit (supplied and fitted)	Refer NHP	100.00
Plastic tee-off cap 250/355 A	TH250TOPC	0.35

Notes: ') Ordering details; busbar " " - insert "2" = 250 A or "3" = 355 A.

- 2) Add 25 mm for flared busbar at top of chassis.
 - 3) Add 22 mm for straight busbar at bottom of chassis.
 - 4 pole and other special configuration available to special order refer NHP
 - i Available on indent only.

Escutcheon critical dimensions - CT type







VARIABLE SPEED DRIVES 0.4 kW to 132 kW

Full featured performance with functional versatility



For all applications including high torque loads such as hoisting and conveying systems select the Sensorless Vector SJ100 and SJ300 Series



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ELECTRICAL ENGINEERING PRODUCTS PTY LTD

P068 frightsakid Yeronga SPS Pump Station Upgrade Mc MBsual

TemBreak and TemBreak Plus - quick selection guide

kA	OCR Type	Base current adj.	TemBreak Cat. No.	Page No.
85	Hydraulic/magnetic	Fixed	хмэорв	3 - 6
18	Thermal magnetic	Fixed	XS125CS	3 - 9
30	Thermal magnetic	Fixed	XS125NS	3 - 10
18	Thermal magnetic	63-100 %	XS125CJ	3 - 11
30	Thermal magnetic	63-100 %	XS125NJ	3 - 12
50	Thermal magnetic	63-100 %	XH125NJ	3 - 13
50	Thermal magnetic	63-100 %	XH125PJ	3 - 14
18	Thermal magnetic	Fixed	XE225NC	3 - 18
50	Thermal magnetic		XH160PJ	3 - 20
35	•	63-100 %	XS250NJ	3 - 21
50	-	63-100 %	XH250NJ	3 - 22
65		63-100 %	-	3 - 26
35		63-100 %	XS400CJ	3 - 27
50	_	63-100 %	XS400NJ	3 - 28
65	_	63-100 %	XH400PJ	3 - 29
		50-100 %		3 - 30
65		50-100 %	XH400NE	3 · 31
65	Electronic	50-100 %	XH400SE	3 - 32
				3 - 33
45		63-100 %	XS630CJ	3 - 37
	•			3 - 38
85	•			3 - 39
				3 - 40
				3 - 41
				3 - 42
				3 - 43
				3 - 44
				3 - 45
-	_	-		3 - 46
				3 - 47
				3 - 48
				3 - 49
				3 - 53
				3 54
				J - 54 3 - 58
		••		3 - 58
				3 - 52
				3 - 63
	_			
				3 - 64 3 - 65
				3 - 66
				3 - 67 3 - 68
	•			3 - 68
-	_			
	_			3 - 70
				3 - 71
120	DC types	63-100%	XS-ND	3 - 72 3 - 80
	85 18 30 18 30 50 50 18 50 35 50 65 65 65 65 65 65 65	85 Hydraulic/magnetic 18 Thermal magnetic 30 Thermal magnetic 30 Thermal magnetic 50 Thermal magnetic 65 Thermal magnetic 65 Electronic 66 Electronic 67 Thermal magnetic 68 Electronic 69 Thermal magnetic	85 Hydraulic/magnetic Fixed 18 Thermal magnetic Fixed 30 Thermal magnetic Fixed 18 Thermal magnetic Fixed 30 Thermal magnetic 63-100 % 50 Thermal magnetic 63-100 % 51 Thermal magnetic 63-100 % 65 Thermal magnetic 63-100 % 65 Thermal magnetic 63-100 % 65 Electronic 50-100 %	kA OCR Type current adj. Cat. No. 85 Hydraulic/magnetic Fixed XM30PB 18 Thermal magnetic Fixed XS125CS 30 Thermal magnetic 63-100 % XS125NS 18 Thermal magnetic 63-100 % XS125NJ 30 Thermal magnetic 63-100 % XH125NJ 50 Thermal magnetic 63-100 % XH125NJ 50 Thermal magnetic 63-100 % XH125NJ 50 Thermal magnetic 63-100 % XH25NNJ 50 Thermal magnetic 63-100 % XH25ONJ 51 Thermal magnetic 63-100 % XH25ONJ 65 Thermal magnetic 63-100 % XH25ONJ 65 Thermal magnetic 63-100 % XH25ONJ 65 Thermal magnetic 63-100 % XH40ONJ 65 Thermal magnetic 63-100 % XH40ONJ 65 Electronic 50-100 % XH40ONE 65 Electronic 50-10

Enhanced Switchgear TemBreak Plus MCCBs Ics = Icu = 50 kA & 85 kA, and Selectivity Series SE

The new Terasaki TemBreak Plus series of MCCBs are designed to provide superior performance in two main areas:

Selectivity: The need for a continuous and reliable power supply places increased emphasis on selectivity requirements in today's electrical distribution system. The Selectivity series utilises microprocessor based protection, giving enhanced selectivity. This ensures selectivity between the upstream and downstream MCCBs. Selection data can be found in sections 3 and 9.

Fault Interrupting Capacities: The majority of distribution systems are designed to an ultimate short circuit rating (Icu). A Icu rated MCCB provides the optimum protection in terms of safe and economical selection. However, certain applications may require protection which is designed to the more onerous short circuit rating (Ics). The Terasaki TemBreak *Plus* range can provide a range of MCCBs with superior Ics ratings up to 85 kA at 440 V AC. Refer section 3.



NEW

Icu = O-CO 2 Full Short Circuits

Ics = O-CO-CO 3 Full Short Circuits

Following the introduction of the New TemBreak *Plus* range of MCCBs, there are now 4 main groupings as follows:

Series name	MCCB types	Application
Standard TemBreak series	XS/XH/XMCS/NS, CJ/NJ, NE, PB	Wide ranging general applications

New TemBreak Plus	MCCB types	Application
PowerBreaker series	XS/XHPJ, and PE	lcs = 50 kA minimum
LimitorBreaker series	TLNJ	Ics = 50 kA - 85 kA
Selectivity series	XS/XHSE	Improved selectivity applications







TemBreak Plus

for high performance applications

More choice for more applications

- Greatly improved selectivity
- New Ics = 100% Icu types
- Increased breaking capacity

PELECTRICAL ENGINEERING PRODUCTS PTY-LT

ELB residual current device

Dept of NSW Minerals and Energy Approval No.: MDA 14247.

The ELB is an add on residual current block (earth factor & leakage detector) designed to be fitted TemBreak MCCBs up to 250 amp.

The unit is controlled by an electronic circuit which initiates tripping of the circuit breaker whenever an earth leakage greater than the set value is detected by a toroidal CT. The ELB has adjustable sensitivity from 0.03 amp up to 3 amps and adjustable time delay from 0 - 700 milliseconds.



The ELB is suitable for 3 pole or 4 pole breakers. A bolted neutral connection is provided for 3 phase 4 wire systems.

Features include:

- Wide adjustable range
- Space saving
- No external power source
- Optional model with pre-trip alarm
- Trip and non-trip options ')
- Local and remote indication
- EMC compatible (CE mark approved)
- No added tripping device required eq. shunt or UVT



XS125 and FLB125

LED or mechanical indication

Green LED fixed light to indicate voltage presence. A yellow magnetic indicator shows when an earth leakage occurs (black shows normally).

Optional model with alarm

Additional features: A normally open contact operates when an earth leakage above the pre-set alarm value is detected by the toroidal CT.

A dip switch is used to select pre-trip alarm values of 50 or 70 % of the set IAn value. Trip/non-trip function in selected dip switches.

LED indication

A red flickering light indicates presence of an earth leakage in the system - Alarm model only.

Note: ') Applies to pre-trip alarm models only.

068 Tufnell Road Yeronga SPS Pum**p Station Upgrade OM: Wan**ual

ELB residual current blocks

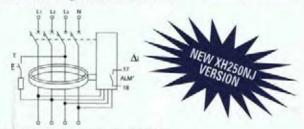
Dept of NSW Minerals and Energy Approval No. MDA 14247

Type Add to MCCB part no. Price adder \$ Applicable breakers 3 or 4 pole 3 phase 3 wire or 3 phase or 4 wire		EL	B125A	EL	B250A	ELB250AH
		1000000		177	70.00	1770.00
				XS	250NJ	XH160PJ XH250NJ
Sensitivity IAn (A) (adjustable via rotary switch)		0.03	0.1	0.3	1	.0 3.0
Time Delay	Non tripping time (ms)	0	60	200	40	700
	Maximum breaking time (ms)	40	195	365	5 6:	20 950
Operational	voltage	200 - 440 Volt				
Frequency				50/	60Hz	
Features:	Mechanical Indications					
	Push Button Test				•	
	Pick up LED	4				
	Pre-trip Alarm Contact ³) (250 Volt - 2 Amps)				•	
	Trip/Non-trip function ')					
Operating Temperature				- 10 -	160°C	
Dimensions (mm) (Including MCCB & ELB):HXWXD		235H x 120W x 86D 245H x 120W x 8 245H X 120W X 1		The State of the S		

- Notes: 1 Earth Leakage Blocks are a Factory Fit Item. The table above can be used to select the ELB required, which is to be ordered with the MCCB. Using the above type code, add this to the MCCB part number.
 - Example: XS125CJ1003 + ELB125A = XS125NJ1003ELB1.
 - 2 Prices: Add the above price adder for each ELB type to the standard 3 or 4 pole MCCB price on the MCCB selection pages. Example: MCCB 5 list price + ELB 5 list price = 5 new list price.
 - ") Set at 50 % or 70 % Ian by a dip switch
 - Set by a Dip switch
 Suitable for 3 or 4 pole MCCBs.

Schematic diagram and test circuit





Note: The alarm contact rating is 2A - 250 V AC

Caution: 3 mm is the max length of wire for connections

TemBreak co-ordination motor protection circuit breakers XM30PB

85 KA

Current rating:

0.7-12 A

Approvals and tests:

Standards AS 3947-2 and IEC 947-2 Certificate of suitability CS 900132V

Interrupting capacity:

Symmetrical rms amps

	Voltage	lcu kA	lcs kA
AC use	400/415	85	85

Trip unit:

fixed hydraulic-magnetic

OCR options: none

Dimensions (mm)

Poles	3	
H	148	
W	78	
D	97	
kg	1.3	

(amps)	Cat. No. 1)	Price \$
0.7	XM30PB0.7 3P	340.00
1.4	XM30PB1.4 3P	340.00
2.0	XM30PB2.0 3P	340.00
2.6	XM30PB2.6 3P	340.00
4	XM30PB4 3P	340.00
5	XM30PB5 3P	340.00
8	XM30PB8 3P	340.00
10	XM30PB10 3P	340.00
12	XM30PB12 3P	340.00

1) New XM30PB type replaces XM30PS.



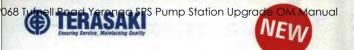
068 Tutnell Road Yeronga SPS Pump Station Upgrade OMManual

Accessories to suit XM30PB

Description		Cat. No.	Price \$
Internal a	ccessories		
Shunt trip	110 V AC SHT (100 - 115 V)	2H1931BAA	87.00
	240 V AC SHT (200 - 480 V)	2H1931BBA	87.00
	24 V DC SHT	2H1931BCA	87.00
	48 V DC SHT	2H1931BDA	87.00
	110 V DC SHT (100 - 115 V)	2H1931BEA	87.00
	24 V AC SHT	2H1932BAA	87.00
	48 V AC SHT	2H193DBBA	87.00
	12 V DC SHT	2H1932BDA	87.00
	125 V DC SHT	2H1932BGA	87.00
	200 V DC SHT (200 - 230 V)	2H1932BHA	87.00
Auxiliary	AUX SW right/left hand 1C	UXXB0001C	60.50
switches	AUX SW right/left hand 2C	UXXB0003C	85.00
Alarm	Alarm SW right/left hand	UXLB000GC	56.00
switches			
Alarm &	Alarm/AUX SW right/left hand 1C	UXLB0008C	79.00
auxiliary		A CONTRACTOR OF THE PARTY OF TH	
switches			
External a	accessories		
Solderless	3P solderless terminals (6)	TXBD0009A	23.60
terminals		20000000	
Rear	3P rear connect studs (6)	UXRC0005A	81.00
connect			
studs		THE RESERVE	
Handle	Variable depth handle, door interlocking	XFHA18	95.00
operators	IP 55 direct mount rotary handle ')	TFJ21PB	155.00
	Flush plate included		
Handle	Handle lock	UXKH0009A	38.00
locks	Lock plate	UXKE0030A	1.10
	Key interlock (L&F type) incl TFJ mechanism		POA
TemPlug	3P Templug	UPX330PB 1	173.00

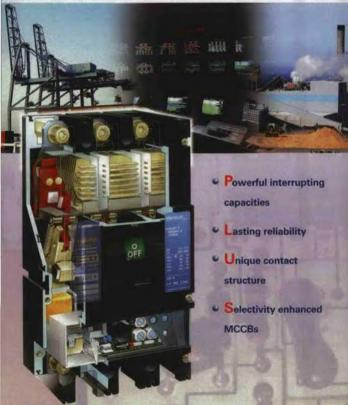
Note: ') Flush plate included.

Discount code T3 applies for this item.



TemBreak Plus SE

For High Demand Selectivity Applications



NHIP ELECTRICAL ENGINEERING PRODUCTS PTY LTD

068 Turnell Road Yeronga SPS Pump Station Upgrade Opportunit

TemBreak standard series current limiting thermal magnetic type XS125CS

18 kA

Current rating:

16-125 A

Approvals and tests:

Standards - AS 3947-2 and IEC 947-2

Interrupting capacity:

Symmetrical rms amps

	Voltage	lcu kA	lcs kA
AC use	230/250	14	7
AC use	400/415 ')	18	9



Dimensions (mm)

Poles	1
Н	155
W	30
D	86
kg	0.5

Amp rating NRC	Cat. No. 1 pole	Price \$
16	XS125CS 16 1	112.00
20	XS125CS 20 1	112.00
25	XS125CS 25 1	112.00
32	XS125CS 32 1	112.00
40	XS125CS 40 1	112.00
50	XS125CS 50 1	112.00
63	XS125CS 63 1	112.00
80	XS125CS 80 1	193.00
100	XS125CS 100 1	193.00
125	XS125CS 125 1	240.00

Notes: 1) 415 V Icu rating to AS 2184 only.
NRC: Nominal rated current.

TemBreak standard series current limiting thermal magnetic type **XS125NS**

30 KA

16-125 A

Current rating: Approvals and tests:

Standards - AS 3947-2 and IEC 947-2

Interrupting capacity

Symmetrical rms amps

70	Voltage	lcu kA	lcs kA
AC use	230/250	30	15
AC use	400/415 1)	30	15
_			

Trip unit:

1 pole - fixed thermal magnetic

Dimensions (mm)

Poles	1	
Н	155	
W	30	
D	86	
kg	0.5	

Amp rating NRC	Cat. No. 1 pole	Price \$
16	XS125NS 16 1	140.00
20	XS125NS 20 1	140.00
25	XS125NS 25 1	140.00
32	XS125NS 32 1	140.00
40	XS125NS 40 1	140.00
50	XS125NS 50 1	140.00
63	XS125NS 63 1	140.00
80	XS125NS 80 1	255.00
100	XS125NS 100 1	255.00
125	XS125NS 125 1	285.00

Note:

1) 415 V Icu rating to AS 2184 only.

NRC: Nominal rated current.



P068 Tufnell Road Yeronga SPS Pump Station Upgrade OM Manual

TemBreak standard series current limiting thermal magnetic type XS125CJ

18 KA

Current rating:

12.5-125 A

Approvals and tests:

Standards - AS 3947-2 and IEC 947-2

Interrupting capacity:

Symmetrical rms amps

	Voltage	lcu kA	lcs kA
AC use	400/415 ')	18	9
DC use	250	10	-
DC use	125	5	



Trip unit:

Adjustable thermal fixed magnetic

OCR options: Special ca

Special calibrated or disabled thermal trip

Dimensions (mm)

	2	3	4
	155	155	155
	90	90	120
	86	86	86
pole	i		I
	1.3	1.3	1.58
	1.3	1.3	

Amp rating NCR		R') n max	Cat. No.	2 pole Price \$	3 pole Price \$	4 pole Price \$
20	12.5	20	XS125CJ 20	232.00	275.00	365.00
32	20	32	XS125CJ 32	232.00	275.00	365.00
50	32	50	XS125CJ 50	232.00	275.00	365.00
63	40	63	XS125CJ 63	232.00	275.00	365.00
100	63	100	XS125CJ 100	310.00	375.00	490.00
125	80	125	XS125CJ 125	340.00	410.00	500.00
125	non-a	auto (1.8 kA for 1 Sec)	XS125NN ')	315.00	380.00	495.00

Notes: 1) 415 V Icu rating to AS 2184 only.

1) Load-break isolating switch only - no protection.

Magnetic only available on application.

2 pole models comprise a 3 pole body with centre pole removed.

Mounting chassis refer pages 3-81 to 3-86.

Accessories refer pages 3-15, 16, 17.

NRC: Nominal rated current.

ASR: Adjustable setting range - amperes.

TemBreak standard series current limiting thermal magnetic type XS125NJ

30 kA

12.5-125 A Current rating:

Approvals and tests:

Standards - AS 3947-2 and IEC 947-2

Interrupting capacity:

Symmetrical rms amps

	Voltage	lcu kA	lcs kA
AC use	400/415 2)	30	15
DC use	250	15	

Trip unit: Adjustable thermal fixed magnetic

OCR options: Special calibrated or disabled thermal trip

Dimensions (mm)

Poles	2	3	4
Н	155	155	155
W	90	90	120
D	86	86	86
kg	1.3	1.3	1.58

Amp rating NRC	ASR		Cat. No. ')	2 pole Price \$	3 pole Price \$	4 pole Price \$
20	12.5	20	XS125NJ 20	255.00	325.00	435.00
32	20	32	XS125NJ 32	275.00	325.00	435.00
50	32	50	XS125NJ 50	275.00	325.00	435.00
63	40	63	XS125NJ 63	275.00	325.00	435.00
100	63	100	XS125NJ 100	405.00	485.00	650.00
125	80	125	XS125NJ 125	475.00	580.00	760.00

Notes: 1) Add No. of poles to Cat. No. eg. 2P, 3P or 4P.

2) 415 V Icu rating to AS 2184 only.

For non-auto model refer to page 3 - 11. Magnetic only available on application.

2 pole models comprise a 3 pole body with centre pole removed.

Mounting chassis refer page

Accessories refer pages 3-15, 16, 17,

NRC: Nominal rated current.

ASR: Adjustable setting range - amperes.

068 Tufnell Road Yeronga SPS Pump Station Upgrade OM Manual

TemBreak high fault series current limiting thermal magnetic type XH125NJ

50 kA

Current rating:

12.5-125 A

Approvals and tests:

Standards AS 3947-2 and IEC 947-2

Interrupting capacity:

Symmetrical rms amps

	Voltage	lcu kA	lcs kA
AC use	400/415	50	25
DC use	250	40	+



Trip unit:

Adjustable thermal fixed magnetic

OCR options:

Special calibrated or disabled thermal trip

Dimensions (mm)

Poles	3 P	4 P
Н	155	155
W	90	120
D	86	86
kg	1.3	1.58

Ampere rating NRC	ASR Min.	ASR Max.	Cat. No. ')	3 P Price \$	4 P Price \$
20	12.5	20	XH125NJ 20	420.00	495.00
32	20	32	XH125NJ 32	420.00	495.00
50	32	50	XH125NJ 50	420.00	495.00
63	40	63	XH125NJ 63	420.00	495.00
100	63	100	XH125NJ 100	580.00	710.00
125	80	125	XH125NJ 125	680.00	840.00

Notes: ') Add number of poles to Cat. No. eg. 3P or 4P.

Magnetic only available on application.

Specify for DC rating.

NRC: Nominal rated current. ASR: Adjustable setting range.

TemBreak PLUS PowerBreaker Ics = 50kA thermal magnetic type XH125PJ

50 KA

Current rating: 12.5-125 A

Approvals and tests:

Standards AS 3947-2 and IEC 947-2

Interrupting capacity:

in the second	Voltage	lcu kA	lcs kA
AC use	400/415	50	50
DC use	250 V	40	

Trip unit: Adjustable thermal and fixed magnetic

OCR options: Special calibrated or disabled thermal trip

Dimensions (mm)

Poles	3
Н	155
W	90
D (less toggle)	86
4 pole i	POA
kg	1.3

Ampere rating NRC	ASR Min.	ASR Max.	3 pole Cat. No.	Price \$
20	12.5	20	XH125PJ 20 3	465.00
32	20	32	XH125PJ 32 3	465.00
50	32	50	XH125PJ 50 3	465.00
63	40	63	XH125PJ 63 3	465.00
100	63	100	XH125PJ 100 3	610.00
125	80	125	XH125PJ 125 3	720.00

Notes: Magnetic only available on application.

Specify for DC rating.

NRC: Nominal rated current ASR: Adjustable setting range

i Available on indent only

068 Tufnell Road Yeronga SPS Pump Station Upgrade AM Mayual

Accessories to suit 125AF, TL30F

Description		Cat. No.	Price
nternal acce	essories		
Shunt trip	100-440 V AC / 48-250 V DC 1P SHT	UXVC0001C	199.0
Shunt trips	110 V AC SHT (100-115 V)	2H1935BAC	171.0
2, 3, 4 pole)	240 V AC SHT (200-480 V)	2H1935BBC	171.0
	24 V DC SHT	2H1935BCC	171.0
	48 V DC SHT	2H1935BDC	171.0
	110 V DC SHT (100-115 V)	2H1935BEC	171.0
	24 V AC SHT	2H1936BAC	171.0
	48 V AC SHT	2H1936BBC	171.0
	12 V DC SHT	2H1936BDC	171.0
	200 V DC SHT (200-230 V)	2H1936BHC	171.0
Undervoltage	AC coil ¹)	2H1947BAC	117.0
trips	24 V DC coil ²)	2H1947BBC	117.0
	100-230 V DC coil 2)	2H1947BCC	117.0
	48 V DC coil ²)	2H1948BAC	117.0
	60 V DC coil 2)	2H1948BBC	117.0
	110 V AC instantaneous controller	UXUB0013B	75.5
	240 V AC instantaneous controller	UXUB0014B	75.5
	440 V AC instantaneous controller	UXUB0015B	75.5
	110 V AC time delay controller	UXUB0016B	146.0
	240 V AC time delay controller	UXUB0017B	146.0
	440 V AC time delay controller	UXUB0018B	146.0
	200-230 V DC controller	UXUB0037B	75.5
Auxiliary	AUX SW right hand 1C / 3P	UXXB0019D	88.5
switches	AUX SW right hand 2C / 3P	UXXB0020D	132.0
TOTAL CET	AUX SW right hand 1C / 4P	2H2383DAA	82.0
	AUX SW right hand 2C / 4P	2H2384DAA	123.0
	AUX SW left hand 1C	UXXB0026E	88.5
	AUX SW left hand 2C	UXXB0027E	132.0
Alarm	ALT SW right hand / 3P	UXLB0001E	97.0
switches	ALT SW right hand / 4P	2H2385DAA	97.0
	ALT SW left hand	UXLB0027E	97.0
Alarm &	ALT/AUX SW right hand 1C / 3P	UXLB0003E	128.0
auxiliary	ALT/AUX SW right hand 1C / 4P	2H2387DAA	128.0
switches	ALT/AUX SW left hand 1C	UXLB0028E	128.0
Extra low or high	Special selectivity, generator or marine applications		120.0

068 Tutnell Road Yeronga SPS Pump Station Upgrade O

Accessories to suit 125AF, TL30F

Description		Cat. No.	Price \$
External acc	essories		
Attached busbar	3P attached busbars (6 in kit)	TRED0001	23.20
Solderless	3P solderless terminals (6 in kit) ⁸)	TXED0005A	67.00
terminals	4P solderless terminals (8 in kit) *)	TXED0006A	70.00
Rear connect	3P rear connect studs (6 in kit)	UXRC0011A	132.00
studs	4P rear connect studs (8 in kit)	UXRC0012A	177.00
Motor	110 V AC motor	UXMB0041C	610.00
operators	240 V AC motor	UXMB0057B	610.00
	110 V DC motor	UXMB0061C	650.00
Mechanical	3P rear mech I/lock	UXKB0017B	220.00
interlocks	4P rear mech I/lock	UXKB0018B	320.00
Handle	Variable depth handle, door interlocking	XFHA22	162.00
operators	IP 65 rated variable depth handle, door interlocking	TLKA22	205.00
	IP 55 direct mount rotary handle 3)	TFJ22XU	180.00
Handle locks	Handle lock	UXKB0013A	40.00
	Key interlock (L&F type) incl TFJ mechanism		780.00
	Padlock attachment 4)	XKA2	21.50
	Resin for XKA2	LOCTITE 480 RESIN	26.60
Terminal	3P FC terminal cover	2H1407DAA	18.60
covers - front	4P FC terminal cover	2H1408DAA	22.40
connect	IP 20 protection cover 5)	2A1785DAA	2.40
	Seal plate ⁶)	2H1406DAA	6.20
Terminal	3P RC terminal cover	UXPD0031A	18.60
covers - rear	4P RC terminal cover	UXPD0032A	22.40
Plug-in	Terminal and bolt	UXYD0007A	5.40
breaker parts	Insulation plate	UXYE0005A	5.10
3 pole	AUX conn. block (MCCB side)	UXYC0013A	33.50
	3P tulip blocks (6 in kit)	TXED0010A	77.00
	3P mounting base	XDM2-3	159.00

068 Tafnell Road Yeronga SPS Pump Station Upgrade McMgaual

Accessories to suit 125AF, TL30F

Description		Cat. No.	Price \$
External acc	essories		
Plug-in	Terminal and bolt	UXYD0007A	5.40
breaker parts	Insulation plate	UXYE0005A	5.10
4 pole	AUX Conn. block (MCCB side)	UXYC0013A	33.50
	4P tulip blocks (8 in kit)	TXED0011A	77.00
	4P mounting base	XDM2-4	200.00
TemPlug	3P TemPlug °)	UPX3125	162.00
Interpole barrier	Set of 2 interpole barriers 7)	UXQH0002A	5.80
OCR sealing kit	OCR sealing kit	XS1250CRSK	26.80
Pole fillers	For use with metal escutcheon covers	XAB2	2.50
Earth leakage block	Add-on earth leakage block not fitted with alarm contacts	ELB125S	1270.00
	Add-on earth leakage block with alarm contacts	ELB125A	1330.00
Adapter kit for TO400 chassis	Order one kit per breaker	TO400XS125	59.00

- Notes: ') An AC UVT controller is required for 100-440 V AC.
 - A DC UVT controller is needed for 200-230 V DC operation. None required for 24-110 V DC.
 - *) Flush plate included.
 - *) Captive type. Resin fixing.
 - 3) 6 pieces required for 3P / 8 pieces required for 4P.
 - 5) Specify aty required (up to 2 pieces).
 - 7) A total 4 individual barriers for 3P, and 6 barriers required for 4P.
 - ") Factory fit only.
 - *) Discount code T3 applies to TemPlugs.

TemBreak economical series thermal magnetic type XE225NC

18 kA

Current rating:

150-225 A

Approvals and tests:

Standards AS 3947-2 and IEC 947-2

Interrupting capacity:

Symmetrical rms amps

	Voltage	lcu kA	lcs kA
AC use	400/415 1)	18	9
DC use	250	15	



Trip unit:

Fixed thermal magnetic

OCR options:

Special calibrated or disabled thermal trip

Dimensions (mm)

Poles	3	
Н	160	
W	105	
D	68	
kg	1.85	

Current ratings (amps)	Cat. No.	Price \$
125	XE225NC 125 3	605.00
150	XE225NC 150 3	605.00
175	XE225NC 175 3	920.00
200	XE225NC 200 3	920.00
225	XE225NC 225 3	950.00
250 (non-auto) 1) (3 kA for 1 sec)	XE250NNC 2)	590.00

Note:

1) 415 V Icu rating to AS 2184 only.

2) Load-break isolating switch only - no protection.

068 Tufnell Road Yeronga SPS Pump Station Upgrade AMAGRUAL

Accessories to suit 225AF

Description		Cat. No.	Price \$
Internal acc	cessories		
Shunt trips	110 V AC SHT (100 - 115 V)	2H0153CAB	178.00
(2, 3, 4 pole)	240 V AC SHT (200 - 480 V)	2H0153CBB	178.00
	24 V DC SHT	2H0153CCB	178.00
	48 V DC SHT	2H0153CDB	178.00
	110 V DC SHT (100 - 115 V)	2H0153CEB	178.00
Auxiliary	AUX SW right hand 1C	2H0156CAB	104.00
switches	AUX SW right hand 2C	2H0156CBB	122.00
	AUX SW left hand 1C	2H1613CAA	104.00
	AUX SW left hand 2C	2H1613CBA	122.00
Alarm switches	ALT SW right hand	2H0157CAB	104.00
Alarm & auxiliary switches	ALT/AUX SW right hand 1C	2H0167CBB	122.00

External accessories

Attached busbar	3P attached busbars (6)	7B3BA1B	64.00
Solderless terminals	3P solderless terminals (6)	2A1818CAA	102.00
Rear connect studs	3P rear connect studs (6)	2H10B1CAA	255.00
Mechanical interlocks	3P rear mech. Wook	2H0158CAA	215.00
Handle	Variable depth handle, door interlocking	TFH23CB	195.00
operators	IP 55 direct mount rotary handle ')	TFJ23CU	185.00
Handle locks	Lock plate	UXKE0030A	1.10
	Handle lock	KGH7123A	37.00
	Key interlock (L&F Type) incl TFJ mechanism		POA
Terminal Cover		The state of	100
- front connect	3P FC terminal cover	2H1050CAA	49.00
- rear connect	3P RC terminal cover	2H1079CAA	49.00
Interpole barrier	Interpole barrier *)	TOOSCA	4.60

Notes: ') Flush plate included.

^{7) 4} barriers required per breaker.

TemBreak PLUS PowerBreaker Ics = 50 kA thermal magnetic type XH160PJ

50 KA

Current rating:

100-160 A

Approvals and tests:

Standards AS 3947-2 and IEC 947-2

Interrupting capacity:

Marie I	Voltage	lcu kA	les kA
AC use	400/415	50	50
AC use DC use	250 V	40	

Trip unit:

Adjustable thermal fixed magnetic

OCR options:

Special calibrated or disabled thermal trip

Dimensions (mm)

Poles	3
н	165
W	105
D (less toggle)	103
4 pole i	POA
kg	2.1

Ampere rating NRC	ASR Min.	ASR Max.	Cat. No.	Price \$
160	100	160	XH160PJ 160 3	1090.00

Notes: Magnetic only available on application.

NRC: Nominal rated current ASR: Adjustable setting range Available on indent only

Q-Pulse Id TMS972 Active 10/12/2014

Page 128 of 441 T2

068 Turnell Road Yeronga SPS Pump Station Upgrade @wcwgyal

TemBreak standard series current limiting thermal magnetic type XS250NJ

35 kA

Current rating:

100-250 A

Approvals and tests:

Standards AS 3947-2 and IEC 947-2

Interrupting capacity:

Symmetrical rms amps

	Voltage	lcu kA	lcs kA	
AC use	400/415 1)	35	18	
DC use	250	40	*	



Adjustable thermal fixed magnetic

OCR options: Special calibrated or disabled thermal trip

Dimensions (mm)

Poles	3 P	4 P
Н	165	165
W	105	140
D	86	86
kg	1.85	2.4

Ampere rating		ASR		3 P	4 P
NRC	Min	Max	Cat. No.	Price \$	Price \$
160	100	160	XS250NJ 160 3)	810.00	1180.00
250	160	250	XS250NJ 250 *)	970.00	1290.00
250	non-au	to (4 kA for 1 sec)	XS250NN 2) 3)	650.00	850.00

Notes: ') 415 V Icu rating to AS 2184 only.

2) Load-break isolating switch only - no protection.

^a) Add number of poles to Cat. No. eg. 3 P or 4 P.

NRC: Nominal rated current ASR: Adjustable setting range

-

TemBreak high fault series current limiting thermal magnetic type XH250NJ

50 KA

Current rating:

100-250 A

Approvals and tests:

Standards AS 3947-2 and IEC 947-2

Interrupting capacity:

Symmetrical rms amps

	Voltage	lcu kA	lcs kA
AC use	400/415	50	25
DC use	250	40	-



Trip unit:

Adjustable thermal fixed magnetic

OCR options: S

Special calibrated or disabled thermal trip

Dimensions (mm)

3 P	4 P
165	165
105	140
103	103
2.1	2.6
	165 105 103

Ampere rating	A	SR		3 P	4 P
NRC	Min	Max	Cat. No. 1)	Price \$	Price \$
160	100	160	XH250NJ 160	1030.00	1450.00
250	160	250	XH250NJ 250	1190.00	1590.00

Notes: 1) Add number of poles to Cat. No. eg. 3 P or 4 P.

NRC: Nominal rated current ASR: Adjustable setting range

P068 Tufnell Road Yeronga SPS Pump Station Upgrade OM Monual

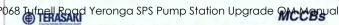
Accessories to suit 160AF / 250AF

Description		Cat. No.	Price S
Internal acc	essories		
Shunt trips	110 V AC (100 - 115 V)	2H1937BAA	174.00
	240 V AC (200 - 480 V)	2H1937BBA	174.00
	24 V DC	2H1937BCA	174.00
	48 V DC	2H1937BDA	174.00
	110 V DC (100 - 115 V)	2H1937BEA	174.00
	24 V AC	2H1938BAA	174.00
	48 V AC	2H1938BBA	174.00
	12 V DC	2H1938BDA	174.00
	200 V DC (200-230 V)	2H1938BHA	174.00
Under voltage	AC coil 1)	2H1949BAB	139.00
trips	24 V DC coil 2)	2H1949BBB	139.00
	100-230 V DC coil 2)	2H1949BCB	139.00
	48 V DC coil 2)	2H1950BAB	139.00
	60 V DC coil 2)	2H1950BBB	139.00
	110 V AC instantaneous controller	UXUB0013B	75.50
	240 V AC instantaneous controller	UXUB0014B	75.50
	440 V AC instantaneous controller	UXUB0015B	75.50
	110 V AC time delay controller	UXUB0016B	146.00
	240 V AC time delay controller	UXUB0017B	146.00
	440 V AC time delay controller	UXUB0018B	146.00
	200-230 V DC controller	UXUB0037B	75.50
Auxiliary	AUX SW right hand 1C	2H1951BAA	108.00
switches	AUX SW right hand 2C	2H1952BAA	127.00
	AUX SW left hand 2C	UXXB0028B	127.00
Alarm switches	ALT SW right hand	2H1953BAA	116.00
Alarm & Auxiliary switches	ALT / AUX SW right hand 1C 5)	2H1954BAA	132.00
Extra low or high magnetic trip	Special selectivity, generator or marine applications		120.00

Note: Refer page 3 - 25 for footnotes.

Description		Cat. No.	Price \$
External ac	cessories		
Attached	3P attached busbars (6)	TXJD0050B	60.00
busbars	4P attached busbars (8)	TXJD0051B	77.00
Screw tunnel	3P solderless term (6) / XS *)	2H2008DAB	114.00
lug	4P solderless term (8) / XS *)	2H2008DBB	151.00
17	3P solderless term (6) / XH ")	2H2734DAA	114.00
	4P solderless term (8) / XH ")	2H2734DBA	151.00
Crimp lugs	Compression term (80mm²)	80-3BA	16.20
NO.	Compression term (100mm²)	100-3BA	19.40
Rear	3P rear connect studs (6)	2H2266DAA	250.00
connection studs	4P rear connect studs (8)	2H2266DBA	335.00
Motor	110 V AC motor *)	UXMB0046D	960.00
operators	220 V AC motor *)	UXMB0047D	960.00
	240 V AC motor *)	UXMB0058B	1030.00
	110 V DC motor ²)	UXMB0062C	1030.00
Mechanical	3P rear mech int. / XS	UXKB0019B	270.00
Interlocks	4P rear mech nt. / XS	UXK80020B	405.00
	3P rear mech int./ XH	UXKB0021B	270.00
	4P rear mech int./ XH	UXKB0022B	405.00
Handle	Variable depth handle, door interlocking ")	XFHA238 ')	196,00
operators	IP 65 rated variable depth handle, door interlocking *)	TLKA23')	215.00
	IP 55 direct mount rotary handle mechanism *)	TFJ23SU	210.00
Handle lock	Handle lock	UXKB0014A	40.00
	Key interlock (L&F Type) incl TFJ mechanism		780.00
	Padlock attachment *)	XKA2	21.50
	Resin for XKA2	LOCTITE 480 RESIN	26.60

Refer page 3 - 25 for footnotes



Accessories to suit 160AF / 250AF

Pessories 3P FC terminal cover / XS 4P FC terminal cover / XS 3P FC terminal cover / XH 4P FC terminal cover / XS 4P FC terminal cover / XS 4P FC terminal cover / XH 4P FC te		2H2135DAA 2H1410DAA 2H2136DAA 2H1412DAA 2A1786DAA UXPD0027B UXPD0028B UXPD0033B UXPD0034B 2H1406DAA UXYC0010A	52.50 70.00 52.50 70.00 2.40 52.50 70.00 52.80 70.20
4P FC terminal cover / XS 3P FC terminal cover / XH 4P FC terminal cover / XH IP 20 protective cover *) 3P RC terminal cover / XS 4P RC terminal cover / XS 3P RC terminal cover / XH 4P RC terminal cover / XH Seal plate *) AUX conn. block (MCCB side) AUX conn. block (panel side)		2H1410DAA 2H2136DAA 2H1412DAA 2A1786DAA UXPD0027B UXPD0028B UXPD0033B UXPD0034B 2H1406DAA	70.00 52.50 70.00 2.40 52.50 70.00 52.80 70.20
3P FC terminal cover / XH 4P FC terminal cover / XH IP 20 protective cover *) 3P RC terminal cover / XS 4P RC terminal cover / XS 3P RC terminal cover / XH 4P RC terminal cover / XH 4P RC terminal cover / XH Seal plate *) AUX conn. block (MCCB side) AUX conn. block (panel side)		2H2136DAA 2H1412DAA 2A1786DAA UXPD0027B UXPD0028B UXPD0033B UXPD0034B 2H1406DAA	52.50 70.00 2.40 52.50 70.00 52.80 70.20 6.20
4P FC terminal cover / XH IP 20 protective cover *) 3P RC terminal cover / XS 4P RC terminal cover / XS 3P RC terminal cover / XH 4P RC terminal cover / XH Seal plate *) AUX conn. block (MCCB side) AUX conn. block (panel side)		2H1412DAA 2A1786DAA UXPD0027B UXPD0028B UXPD0033B UXPD0034B 2H1406DAA	70.00 2.40 52.50 70.00 52.80 70.20 6.20
IP 20 protective cover *) 3P RC terminal cover / XS 4P RC terminal cover / XS 3P RC terminal cover / XH 4P RC terminal cover / XH Seal plate *) AUX conn. block (MCCB side) AUX conn. block (panel side)		2A1786DAA UXPD0027B UXPD0028B UXPD0033B UXPD0034B 2H1406DAA	2.40 52.50 70.00 52.80 70.20 6.20
3P RC terminal cover / XS 4P RC terminal cover / XS 3P RC terminal cover / XH 4P RC terminal cover / XH Seal plate 7) AUX conn. block (MCCB side) AUX conn. block (panel side)		UXPD0027B UXPD0028B UXPD0033B UXPD0034B 2H1406DAA	52.50 70.00 52.80 70.20 6.20
4P RC terminal cover / XS 3P RC terminal cover / XH 4P RC terminal cover / XH Seal plate 7) AUX conn. block (MCCB side) AUX conn. block (panel side)		UXPD0028B UXPD0033B UXPD0034B 2H1406DAA	70.00 52,80 70.20 6.20
3P RC terminal cover / XH 4P RC terminal cover / XH Seal plate 7) AUX conn. block (MCCB side) AUX conn. block (panel side)		UXPD0033B UXPD0034B 2H1406DAA	52.80 70.20 6.20
4P RC terminal cover / XH Seal plate ⁷) AUX conn. block (MCCB side) AUX conn. block (panel side)		UXPD0034B 2H1406DAA	70.20
Seal plate 7) AUX conn. block (MCCB side) AUX conn. block (panel side)		2H1406DAA	6.20
AUX conn. block (MCCB side) AUX conn. block (panel side)		BOAL SCHOOL ST	
AUX conn. block (panel side)		HYVCODIOA	
AUX conn. block (panel side)		UATEUUTUA	33.50
3P tulio block / YS	- 1	UXYB0004A	33.50
טו נעווף טוטער / אט		TXJD0054A	108.00
3P tulip block / XH		TXJD0058A	108.0
3P mounting base		XDM3-3	205.0
AUX conn. block (MCCB side)		UXYC0010A	33.5
AUX conn. block (panel side)		UXYB0004A	33.5
4P tulip block / XS		TXJD0055A	128.0
4P tulip block / XH		TXJD0059A	128.0
4P mounting base		XDM3-4	235.0
3P TemPlug / XH only 10)		UPX3250 (9)	173.0
Interpole barrier / XS *)		UXQH0002A	5.8
Interpole barrier / XH ⁶)		UXQH0003A	5.8
For use with metal escutcheon covers		XAB3	2.5
Add-on earth leakage block not fitted		ELB250S	1490.0
with alarm contacts (XS250 only)			
Add-on earth leakage block with alarm	n	ELB250A	1770.0
contacts (suits XS250 only)			
OCR sealing kit		XS250OCRSK	25.4
ired for 100-440 V AC. C UVT controller is needed 00-230 V DC operation. Prequired for 24-110 V DC. UXFD0016A when required 1,4250NJ or XH160JP. Add 1,016A when required for 1,016A when required 1,016A when required 1,016A when required for 1,016A when required 1,016A when required for 1,016A when required for	6 pieces Specif pieces 4 pieces Factor	es required for 3P required for 4P. ry quantity required s). es required for 3P required for 4P). y fit only.	/ 8 d (up to
	3P tulip block / XS 3P tulip block / XH 3P mounting base AUX conn. block (MCCB side) AUX conn. block (panel side) 4P tulip block / XS 4P tulip block / XS 4P tulip block / XH 4P mounting base 3P TemPlug / XH only (*) Interpole barrier / XS (*) Interpole barrier / XH (*) For use with metal escutcheon covers Add-on earth leakage block not fitted with alarm contacts (XS250 only) Add-on earth leakage block with alarm contacts (suits XS250 only) OCR sealing kit C UVT controller is (*) IVT controller is (*) Ive dir 100-440 V AC. (*) Ive controller is needed 00-230 V DC operation. (*) Ive controller is needed 100-230 V DC operation. (*) Ive controller is needed 100-230 V DC operation. (*) Ive controller is needed 100-230 V DC Add (*) 10016A when required (*)	3P tulip block / XS 3P tulip block / XH 3P mounting base AUX conn. block (MCCB side) AUX conn. block (panel side) 4P tulip block / XS 4P tulip block / XS 4P tulip block / XH 4P mounting base 3P TemPlug / XH only 16) Interpole barrier / XS 1) Interpole barrier / XS 1) Interpole barrier / XH 1) For use with metal escutcheon covers Add-on earth leakage block not fitted with alarm contacts (XS250 only) Add-on earth leakage block with alarm contacts (suits XS250 only) OCR sealing kit C UVT controller is 20 Captive ried for 100-440 V AC. 30 6 pieces (2 UVT controller is needed 00-230 V DC operation. 30 Specific pieces (2 UVT controller is needed 00-230 V DC operation. 30 Specific pieces (2 UVT controller is needed 00-230 V DC operation. 30 Specific pieces (2 UVT controller is needed 00-230 V DC operation. 30 Specific pieces (2 UVT controller is needed 00-230 V DC operation. 30 Specific pieces (2 UVT controller is needed 00-230 V DC operation. 30 Specific pieces (2 UXF controller is needed 00-230 V DC operation. 30 Specific pieces (2 UXF controller is needed 00-230 V DC operation. 30 Specific pieces (2 UXF controller is needed 00-230 V DC operation. 30 Specific pieces (2 UXF controller is needed 00-230 V DC operation. 30 Specific pieces (2 UXF controller is needed 00-230 V DC operation. 30 Specific pieces (2 UXF controller is needed 00-230 V DC operation. 30 Specific pieces (2 UXF controller is needed 00-230 V DC operation. 30 Specific pieces (2 UXF controller is needed 00-230 V DC operation. 30 Specific pieces (2 UXF controller is needed 00-230 V DC operation. 30 Specific pieces (2 UXF controller is needed 00-230 V DC operation. 30 Specific pieces 00-230 V DC operation. 30 Specific piec	3P tulip block / XS 3P tulip block / XH 3P mounting base AUX conn. block (MCCB side) AUX conn. block (panel side) AUX conn. block (panel side) AP tulip block / XS 4P tulip block / XS 4P tulip block / XH TXJD0055A TXJD0055A TXJD0055A TXJD0055A TXJD0059A AP mounting base AP tulip block / XH AP ploossa

XH160JP or XH250NJ. ") Flush plate included.

TemBreak PLUS PowerBreaker Ics = 50 kA thermal magnetic type XH250PJ

65 kA

Current rating:

160-250 A

Approvals and tests:

Standards AS 3947-2 and IEC 947-2

Interrupting capacity:

Mi-1	Voltage	lcu kA	lcs kA
AC use	400/415	65	50
DC use	250 V	40	+

Trip unit:

Adjustable thermal and adjustable magnetic trip unit

OCR options:

Special calibrated or disabled thermal trip

Dimensions (mm)

Poles	3
Н	260
W	140
D (less toggle)	103
4 pole i	POA
kg	4.8

Ampere rating NRC	ASR Min.	ASR Max.	Cat. No.	Price \$
160	100	160	XH250PJ 160 3	1240.00
250	160	250	XH250PJ 250 3	1240.00

Notes: Magnetic only available on application. NRC: Nominal rated current

ASR: Adjustable setting range

Available on indent only

3 - 26 All prices are exclusive of GST. Q-Pulse Id TMS972 Active 10/12/2014



2068 Tufnell Road Yeronga SPS Pump Station Upgrade Om Manual

TemBreak standard series current limiting thermal magnetic type XS400CJ

35 kA

Current rating:

160-400 A

Approvals and tests:

Standards AS 3947-2 and IEC 947-2

Interrupting capacity:

Symmetrical rms amps

	Voltage	lcu kA	Ics kA	
AC use	400/415 1)	35		
DC use	250	40		



Trip unit:

Adjustable thermal fixed magnetic

OCR options: Special calibrated or disabled thermal trip

Dimensions (mm)

Poles	3 P	4P
H	260	260
W	140	185
D	103	103
kg	4.7	6.2

Ampere rating	A	SR		3 P	4 P
NRC	Min	Max	Cat. No. 1)	Price \$	Price \$
250	160	250	XS400CJ 250	1250.00	1740.00
400	250	400	XS400CJ 400	1350.00	1790.00
400	non-au	to (5 kA for 0.3 sec)	XS400NN ')	1180.00	1650.00

- Notes: 1) 415 V lou rating to AS 2184 only.
 - Load-break isolating switch only no protection.
 - i) Add number of poles to Cat. No. eg. 3 P or 4 P.

Magnetic only available on application. Specify for DC rating NRC: Nominal rated current

ASR: Adjustable setting range

2068 Tufnell Road Yeronga SPS Pump Station Upgrade Omassual

TemBreak standard series current limiting thermal magnetic type XS400NJ

50 KA

Current rating:

160-400 A

Approvals and tests:

Standards AS 3947-2 and IEC 947-2

Interrupting capacity:

Symmetrical rms amps

Voltage	lcu kA	lcs kA	
400/415	50	25	
250	40		
	400/415	400/415 50	



Trip unit:

Adjustable thermal adjustable magnetic

OCR options:

Special calibrated or disabled thermal trip

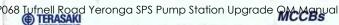
Dimensions (mm)

Poles	3 P	4 P
H	260	260
W	140	185
D	103	103
kg	4.8	6.2

Ampere rating	A	SR		3 P	4 P
NRC	Min	Max	Cat. No. 1)	Price \$	Price \$
250	160	250	XS400NJ 250	1440.00	1950.00
400	250	400	XS400NJ 400	1510.00	1990.00

Notes: 1) Add number of poles to Cat. No. eg. 3 P or 4 P.
Magnetic only available on application.
Specify for DC rating.

NRC: Nominal rated current ASR: Adjustable setting range



TemBreak PLUS PowerBreaker Ics = 50 kA thermal magnetic type

XH400PJ

65 kA

Current rating:

250-400 A

Approvals and tests:

Standards AS 3947-2 and IEC 947-2

Interrupting capacity:

	Voltage	lcu kA	lcs kA
AC use	400/415	65	50
DC use	250 V	40	

Trip unit:

Adjustable thermal adjustable magnetic

OCR options:

Special calibrated thermal trip

Dimensions (mm)

Poles	3 P	4 P
Н	260	260
W	140	185
D (less toggle)	103	103
kg	4.7	6.2

Ampere rating NRC	ASR Min.	ASR Max.	Cat. No. ')	3 P Price \$	
400	250	400	XH400PJ 400	1690.00	2090.00

Notes: 1) Add number of poles to Cat. No. eg. 3 P or 4 P. Magnetic only available on application.

NRC: Nominal rated current

ASR: Adjustable setting range

XS400SE

50 KA

Current rating:

80-400 A

Approvals and tests:

Standards AS 3947-2 and IEC 947-2

Interrupting capacity:

7: THE	Voltage	lcu kA	lcs kA
AC use	400/415	50	25
- NO.			



Electronic trip unit: Adjustable long, short and instantaneous trip.

Trip unit: Fixed LTD adjustment: I₁: 0.8 STD adjustment: I₂: 2 - Instantaneous Adj: I₃: 3 -

I₁: 0.8-1 t: 5 - 30 s I₂: 2 - 10 t: 0.1 - 0.3 s I₃: 3 - 12 NRC

OCR options:

Pre-trip alarm, fault indication and contacts

Dimensions (mm)

Poles	3 P	4 P
Н	260	260
W	140	185
D (less toggle)	103	103
kg	4.8	6.2
kg	4.8	6.

Ampere rating NRC	ASR Min.	ASR Max.	Cat. No. ')	3 P Price \$	4 P Price \$
160	80	160	XS400SE 160	1690.00	2210.00
250	125	250	XS400SE 250	1690.00	2210.00
400	200	400	XS400SE 400	1760.00	2460.00

Notes: 1) Add number of poles to Cat. No. eg. 3 P or 4 P. NRC: Nominal rated current

ASR: Adjustable setting range

1068 Tufnell Road Yeronga SPS Pump Station Upgrade **McCap**yal

TemBreak standard series electronic XH400NE

65 KA

Current rating:

80-400 A

Approvals and tests:

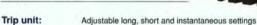
Standards AS 3947-2 and IEC 947-2

Interrupting capacity:

Symmetrical rms amps

	Voltage	lcu kA	lcs kA
AC use	400/415	65	33

I1: 0.8-1



t: 5-30 s

STD adjustment: 12: 2-10 t: 0.1-0.3 s Instantaneous Adj: 13:3-12 NRC

OCR options: Pre-trip alarm, fault indication with relay contact

Dimensions (mm)

LTD adjustment:

Poles	3
Н	260
W	140
D	103
kg	4.8
4 pole	i

Ampere rating	ASR				
NRC	Min	Max	Cat. No.	Price \$	
160	80	160	XH400NE 160 3	1760.00	
250	125	250	XH400NE 250 3	1760.00	
400	250	400	XH400NE 400 3	1820.00	

Notes: NRC: Nominal rated current

ASR: Adjustable setting range Overcurrent trip combinations: (specify combinations reg)

LSI - standard. LS - optional,

LSIP - optional (pre-trip alarm) i Available on indent only.

electronic type XH400SE

65 kA

Current rating: 80-400 A

Approvals and tests:

Standards AS 3947-2 and IEC 947-2

Interrupting capacity:

	Voltage	lcu kA	lcs kA
AC use	400/415	65	33

Trip unit:

Electronic trip unit: Adjustable long, short and instantaneous trip.

Trip unit: Fixed.

LTD adjustment: I₁: 0.8-1 t: 5 - 30 s
STD adjustment: I₂: 2 - 10 t: 0.1 - 0.3 s
Instantaneous Adj: I₃: 3 - 12 NRC

OCR options: Pre-trip alarm, fault indication and contacts

Dimensions (mm)

Poles	3 P	4 P
Н	260	260
W	140	185
D (less toggle)	103	103
kg	4.8	6.2

Ampere rating NRC	ASR Min.	ASR Max.	Cat. No. 1)	3 P Price \$	i 4 P Price \$
160	80	160	XH400SE 160	1900.00	-
250	125	250	XH400SE 250	1900.00	2670.00
400	200	400	XH400SE 400	1970.00	2750.00

Notes: 1) Add number of poles to Cat. No. eg. 3 P or 4 P.

NRC: Nominal rated current ASR: Adjustable setting range

Available on indent only

068 Tufnell Road Yeronga SPS Pump Station Upgrade AMAGRUAL

TemBreak PLUS PowerBreaker Ics = 50 kA electronic type XH400PE

65 kA

Current rating:

125-400 A

Approvals and tests:

Standards AS 3947-2 and IEC 947-2

Interrupting capacity:

	Voltage	lcu kA	lcs kA
AC use	400/415	65	50
DC use	250 V	40	



Trip unit:

Electronic trip unit: Adjustable long, short and instantaneous trip.

Trip unit:

Fixed.

LTD adjustment: STD adjustment: l₁: 0.8-1 t: 5 - 30 s l₂: 2 - 10 t: 0.1 - 0.3 s

Instantaneous Adj: I₃: 3 - 12 NRC

OCR options:

Pre-trip alarm, fault indication and contacts

Dimensions (mm)

Poles	3 P	4P
Н	260	260
W	140	185
D (less toggle)	103	103
kg	4.8	6.2
		_

Ampere rating NRC	ASR Min.	ASR Max.	Cat. No. ')	3 P Price \$	U 4 P Price \$
250	125	250	XH400PE 250	1590.00	3110.00
400	250	400	XH400PE 400	2260.00	3150.00

Notes: 1) Add number of poles to Cat. No. eg. 3 P or 4 P. NRC: Nominal rated current

ASR: Adjustable setting range

Available on indent only

Alarm &

auxiliary switch

Fault

indication &

contacts Extra low or

trip

Description Cat. No. Price \$ Internal accessories 110 V AC/DC (100 - 115 V) 2H1305BAA Shunt trips 255.00 240 V AC (200 - 480 V) 2H1306BAA 255.00 12 V DC 2H1307BAA 255.00 24 V DC 2H1308BAA 255.00 48 V DC 2H1309BAA 255.00 200 V DC (200 - 230 V) 2H1310BAA 255.00 24 V AC 2H1311BAA 255.00 48 V AC 2H1312BAA 255.00 Under voltage AC coil ') 2H1492BAA 210.00 100-230 V DC coil 1) 2H1493BAA trips 210.00 2H1494BAA 24 V DC coil 1) 210.00 48 V DC coil 3) 2H1495BAA 210.00 60 V DC coil 7) 2H1496BAA 210.00 110 V AC instantaneous controller UXUB0013B 75.50 240 V AC instantaneous controller UXUB0014E 75.50 440 V AC instantaneous controller UXUB0015B 75.50 110 V AC time delay controller UXUB0016B 146.00 UXUB0017B 146.00 240 V AC time delay controller 440 V AC time delay controller UXUB0018B 146.00 200-230 V DC controller **UXUB00388** 75.50 Auxiliary AUX SW right hand 1C UXXB0004D 108.00 switches AUX SW right hand 20 UXXB0005D 138.00 AUX SW right hand 3C UXXB0005D 159.00 Alarm switch ALT SW right hand UXLB0009D 113.00

UXLB0013D

UXLB0014D

Pre-trip alarm

and "FI" then

voltage

121.00

142.00

540.00

730.00

120.00

Note: Refer page 3 - 36 for footnotes.

high magnetic applications

ALT/AUX SW right hand 1C

ALT/AUX SW right hand 2C

Side of breaker mounted module.

Special selectivity, generator or marine

Pre-trip alarm For electronic OCR MCCBs only

Electronic MCCBs only

Accessories to suit 400AF

Description		Cat. No.	Price \$
External ac	cessories		
Attached	3P attached busbars (6 in kit)	2H1384DAA	145.00
busbars	4P attached busbars (8 in kit)	2H1385DAA	195.00
Screw tunnel	3P solderless term (6 in kit)	2H2012DAB	285.00
terminals	4P solderless term (8 in kit)	2H2012DBB	355.00
Crimp lugs	Compression term (80 mm²)	804BA	19,40
	Compression term (100 mm²)	1004BA	21.60
	Compression term (150 mm²)	1504BA	26.80
Rear connect	3P RC studs (6 in kit)	UXRC0006C	540.00
studs	4P RC studs (8 in kit)	UXRC0007C	720.00
Motor	110 V AC motor ")	UXMC0001B	1590.00
operators	110 V DC motor ")	UXMC0003B	1590.00
(XMC4)	24 V DC motor ")	UXMC0004B	1590.00
	240 V AC motor '')	UXMC0005B	1590.00
	Motor base support ")	UXMD0001B	31.00
Mechanical	3P mech I/lock 3)	UXKC0001B	370.00
interlocks	3/4P mech I/lock ⁴)	UXKC0002B	370.00
	4P mech I/lock 5)	UXKC0003B	560.00
Cable	Interlock cable (wire)	UXKC0020A	55.00
mechanical interlocks	Cable interlock mechanism *)	UXKC0021B	164.00
Handle	Variable depth handle. Door interlocking	XFHA34	255.00
operators	IP 65 rated variable depth handle. Door interlocking	TLKA34	410.00
	IP 55 direct mount rotary handle mechanism 7)	TFJ34XU	275.00
Handle lock	Handlelock	UXKB0006A	41.00
	Key interlock (L&F type) incl TFJ mechanism		790.00

Refer page 3 - 36 for footnotes.

Accessories to suit 400AF

Description		Cat. No.	Price \$
External ac	cessories		
Terminal	3P front connecting terminal cover	2H1413DAA	126.00
covers	- busbar connect type		
	4P front connecting terminal cover	2H1414DAA	162.00
	- busbar connect type		
	3P front connecting terminal cover	2H1415DAA	126.00
	- cable connect type	Harris I	
	4P front connecting terminal cover	2H1416DAA	162.00
	- cable connect type		
	IP 20 protective cover - busbar connect type ")	2A1787DBA	3.60
	IP 20 protective cover - cable connect type *)	2A1788DAA	3.80
	3P rear connecting terminal cover	UXP000118	126.00
	4P rear connecting terminal cover	UXPD0012A	162.00
Accessory	Accessory lead terminal	UXYD0001A	17.60
lead terminal	Terminal and bolt *)	UXYD0002A	1.20
Plug-in	AUX conn block (MCCB) side	UXYC0005A	35.50
breaker parts	AUX conn block (panel) side	UXYB0004A	33.50
3 pole	Mounting bolts	TXKD0032A	9.20
	3P tulip block (8)	TXKD0033A	133.00
	3P mounting base	XDM4-3	465.00
Plug-in	AUX conn block (MCCB) side	UXYC0005A	35,50
breaker parts	AUX conn block (panel) side	UXYB0004A	33.50
4 pole	Mounting bolts	TXKD0032A	9.20
	4P tulip block (8)	TXKD0034A	164.00
	4P mounting base	XDM4-4	625.00
TemPlugs	3P TemPlug 250A 11)	UPX3425 ")	196.00
	3P TemPlug 400A ⁽¹⁾	UPX3440 **)	225.00
Interpole barrier	Interpole barrier (*)	UXQH0004A	6.70
OCR sealing kit	Tamperproof cover for the OCR adjustment dials	XS400OCRSK	37.00

Notes: ') An AC UVT controller is required for 100-440 V AC.

- A DC UVT controller is needed for 200-230 V DC operation. None required for 24-110 V DC.
- ') For 3P circuit breakers without motors.
- 9 For 4P circuit breakers without motors or 3P circuit breakers with motors.
- ") For 4P circuit breakers with motors.
- *) Order one interlock mechanism for each circuit breaker.
- Flush plate included.
- 5 6 pieces required for 3P / 8 pieces required for 4P.
- ") Specify quantity required (up to 6 pieces).
- Order individually.
- ") Order a motor base support for each motor : UXMD0001B.
- ¹⁹) Discount code T3 applies to TemPlug.

068 Turnell Road Yeronga SPS Pump Station Upgrade Om Manual

TemBreak standard series current limiting thermal magnetic type XS630CJ

45 kA

Current rating:

250-630 A

Approvals and tests:

Standards AS 3947-2 and IEC 947-2

Interrupting capacity:

Symmetrical rms amps

Voltage	lcu kA	ics kA
400/415 ")	45	25
250	40	
	400/415 ')	400/415 ') 45



Trip unit:

Adjustable thermal adjustable magnetic

OCR options: Special calibrated or disabled thermal trip

Dimensions (mm)

3 P	4 P
276	276
210	280
103	103
9.6	12.2
	276 210 103

Ampere rating	A	SR		3 P	4 P
NRC	Min	Max	Cat. No. ')	Price \$	Price \$
400	250	400	X5630CJ 400	1890.00	2510.00
630	400	630	XS630CJ 630	1910.00	2590.00
630	non-au	to (9.6 kA for 0.3 sec)	XS630NN3 ')	1760.00	2450.00

- Notes: ') 415 V lou rating to AS 2184 only.
 - Load-break isolating switch only no protection.
 - ") H excludes attached busbar.
 - Add number of poles to Cat. No. Eq. 3 P or 4 P.

Magnetic only available on application.

Specify for DC rating.

NRC: Nominal rated current

ASR: Adjustable setting range

TemBreak standard series current limiting thermal magnetic type XS630NJ

65 KA

Current rating:

250-630 A

Approvals and tests:

Standards AS 3947-2 and IEC 947-2

Interrupting capacity:

Symmetrical rms amps

	Voltage	lcu kA	lcs kA
AC use	400/415 1)	65	33
DC use	250	40	-



Trip unit:

Adjustable thermal adjustable magnetic

OCR options: Special calibrated or disabled thermal trip

Dimensions (mm)

Poles	3		
H 2)	273		
W	210		
D	103		
4 pole	i		
kg	9.6		

Ampere rating	A	SR		
NRC	Min	Max	Cat. No.	Price \$
400	250	400	XS630NJ 400 3	2140.00
630	400	630	XS630NJ 630 3	2140.00

Notes: 1) 415 V Icu rating to AS 2184 only.

2) H excludes attached busbar. Magnetic only available on application.

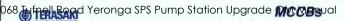
NRC: Nominal rated current

ASR: Adjustable setting range

Specify for DC rating.

i Available on indent only.

3 - 38 All prices are exclusive of GST. Page 1246:0f:0441T2



TemBreak PLUS PowerBreaker Ics = 50 kA thermal magnetic type

XH630PJ

85 KA

Current rating: 250-630 A

Approvals and tests:

Standards AS 3947-2 and IEC 947-2

Interrupting capacity:

	Voltage	lcu kA	lcs kA
AC use	400 V	100	50
	415 V	85	50
DC use	250 V	40	

Trip unit: Adjustable thermal adjustable magnetic

OCR options: Special calibrated or disabled thermal trip

Dimensions (mm)

3
273
210
103
9.6
POA

Ampere rating NRC	ASR Min.	ASR Max.	Cat. No.	Price \$
400	250	400	XH630PJ 400 3	2430.00
630	400	630	XH630PJ 630 3	2890.00

Notes: 1) Height dimension excludes attached busbar Magnetic only available on application.

NRC: Nominal rated current

ASR: Adjustable setting range i Available on indent only

TemBreak PLUS selectivity series electronic type

XS630SE

50 kA

Current rating:

315-630 A

Approvals and tests:

Standards AS 3947-2 and IEC 947-2

Interrupting capacity:

AC use	Voltage	lcu kA	lcs kA
	400/415	50	25



Electronic trip unit: Adjustable long, short and instantaneous trip

Trip unit: LTD adjustment:

1.: 0.8-1 t:5-30 s 12:2-10 t: 0.1 - 0.3 s

STD adjustment: Instantaneous Adj:

NBC la: 3 - 12

Fixed.

OCR options:

Pre-trip alarm, fault indication and contacts. ground fault trip

Dimensions (mm)

	4 P
273	273
210	280
103	103
9.6	12.2
	210 103

Ampere rating	ASR	ASR	Cat. No. 1)	3 P	4 P
NRC	Min.	Max.		Price \$	Price \$
630	315	630	XS630SE 630	2590.00	3240.00

Notes: 1) Height dimension excludes attached busbar

Add number of poles to Cat. No. eg. 3 P or 4 P. NRC: Nominal rated current

ASR: Adjustable setting range

2068 Tufnell Road Yeronga SPS Pump Station Upgrade Program

TemBreak standard series electronic type XH630NE

65 kA

Current rating:

315-630 A

Approvals and tests:

Standards AS 3947-2 and IEC 947-2

Interrupting capacity:

Symmetrical rms amps

	Voltage	lou kA	les kA	
AC use	400/415	65	33	



Trip unit:

Adjustable long, short and instantaneous settings

LTD adjustment:

1,: 0.8-1

t: 5 - 30 s t: 0.1 - 0.3 s NRC

STD adjustment: Instantaneous Adj:

L: 2 - 10 1:3-12

OCR options:

Pre-trip alarm, fault indication and contacts,

ground fault trip

Dimensions (mm)

Poles	3
H')	273
W	210
D	103
kg	9.6
4 pole	1

Ampere rating	A	SR		
NRC	Min	Max	Cat. No.	Price \$
630	315	630	XH630NE 630 3	2640.00

Notes: 7) Height dimension excludes attached busbar.

NRC: Nominal rated current ASR: Adjustable setting range

Overcurrent trip combinations: (specify combinations req)

LSI - standard, LS - optional, LSIP - optional,

LSIG - optional

Available on indent only

TemBreak PLUS selectivity series

electronic type XH630SE

65 KA

Current rating:

315-630 A

Approvals and tests:

Standards AS 3947-2 and IEC 947-2

Interrupting capacity:

100	Voltage	leu kA	les kA	
AC use	400/415	65	33	



Electronic trip unit: Adjustable long, short and instantaneous trip.

Trip unit: LTD adjustment: STD adjustment: Instantaneous Adj: Fixed. I₁: 0.8-1 t: 5 - 30 s I₂: 2 - 10 t: 0.1 - 0.3 s I₃: 3 - 12 NRC

OCR options:

Pre-trip alarm, fault indication and contacts, ground fault trip

Dimensions (mm)

3 P	4 P	
273	273	
210	280	
103	103	
9.6	12.2	
	273 210 103	

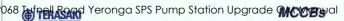
Ampere rating NRC	ASR Min.	ASR Max.	Cat. No. ')	3 P Price \$	4 P Price \$
630	315	630	XH630SE 630	2850.00	3900.00

Notes: ') Height dimension excludes attached busbar.

^a) Add number of poles to Cat. No. eg. 3 P or 4 P.

NRC: Nominal rated current ASR: Adjustable setting range

3



TemBreak PLUS PowerBreaker Ics = 50 kA electronic type

XH630PE

65 kA

Current rating:

315-630 A

Approvals and tests:

Standards AS 3947-2 and IEC 947-2

Interrupting capacity:

	Voltage	lcu kA	lcs kA	
AC use	400/415	65	50	
DC use	250 V	40		



Electronic trip unit: Adjustable long, short and instantaneous trip.

Trip unit:

Fixed.

LTD adjustment: STD adjustment:

t: 5 - 30 s 1.: 0.8-1 12:2-10 t: 0.1 - 0.3 s

Instantaneous Adj: 13:3-12

NRC

OCR options:

Pre-trip alarm, fault indication and contacts.

ground fault trip

Dimensions (mm)

Poles	3 P	4 P
H ')	273	273
W	210	280
D (less toggle)	103	103
kg	9.6	12.2

Ampere rating NRC	ASR Min.	ASR Max.	Cat. No. 2)	3 P Price \$	1 4 P Price \$
630	315	630	XH630PE 630	2980.00	4590.00

Notes: 1) Height dimension excludes attached busbar. 2) Add number of poles to Cat. No. eg. 3 P or 4 P.

NRC: Nominal rated current

ASR: Adjustable setting range i Available on indent only.

65 kA

Current rating:

500-800 A

Approvals and tests:

Standards AS 3947-2 and IEC 947-2

Interrupting capacity: Symmetrical rms amps

	Voltage	lcu kA	lcs kA	
AC use	400/415 ')	65	33	
DC use	250	40		



Trip unit:

Adjustable thermal adjustable magnetic

OCR options:

Special calibrated or disabled thermal trip

Dimensions (mm)

Poles	3 P	4 P
H 2)	273	273
W	210	280
D	103	103
kg	9.7	12.2

Ampere rating		ASR		3 P	4 P
NRC	Min	Max	Cat. No. 4)	Price \$	Price \$
800	500	800	XS800NJ 800	2580.00	3550.00
800	non-	auto (9.6 kA for 0.3 sec)	XS800NN 3)	2390.00	3330.00

Notes: 1) 415 V Icu rating to AS 2184 only.

2) Height dimension excludes attached busbar.

3) Load-break isolating switch only - no protection.

1) Add number of poles to Cat. No. eg. 3 P or 4 P.

NRC: Nominal rated current

ASR: Adjustable setting range Magnetic only available on application.

Specify for DC rating.

ad Yeronga SPS Pump Station Upgrade 🍿 📆 🗝 al

TemBreak PLUS PowerBreaker Ics = 50 kA thermal magnetic type XH800PJ

85 KA

Current rating:

500-800 A

Approvals and tests:

Standards AS 3947-2 and IEC 947-2

Interrupting capacity:

	Voltage	lcu kA	lcs kA
AC use	400 V	100	50
	415 V	85	50
DC use	250 V	40	-

Trip unit:

Adjustable thermal adjustable magnetic

OCR options:

Special calibrated or disabled thermal trip

Dimensions (mm)

Poles	3 P	4 P
H ')	273	273
W	210	280
D (less toggle)	103	103
kg	9.7	12.2
4 pole i	POA	

Ampere rating NRC	ASR Min.	ASR Max.	Cat. No. 2)	3 P Price \$	4 P Price \$
800	500	800	XH800PJ 800	3620.00	4820.00

Notes: ') Height dimension excludes attached busbar 2) Add number of poles to Cat. No. eg. 3 P or 4 P.

Magnetic only available on application. NRC: Nominal rated current

ASR: Adjustable setting range

i Available on indent only

50 KA

Current rating: 400-800 A

Approvals and tests:

Standards AS 3947-2 and IEC 947-2

Interrupting capacity:

March 19	Voltage	lcu kA	lcs kA
AC use	400/415	50	25
-			



Electronic trip unit: Adjustable long, short and instantaneous trip

Trip unit: Fixed.

1.: 0.8-1 LTD adjustment: t: 5 - 30 s STD adjustment: I2: 2 - 10 t: 0.1 - 0.3 s NRC Instantaneous Adi: 12:3-12

OCR options: Pre-trip alarm, fault indication and contacts,

ground fault trip

Dimensions (mm)

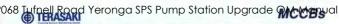
Poles	3 P	4 P	
H ')	273	273	
W	210	280	
D (less toggle)	103	103	
kg	9.7	12.2	

Ampere rating NRC	ASR Min.	ASR Max.	Cat. No. 2)	3 P Price \$	4 P Price \$
800	400	800	XS800SE 800	3040.00	4300.00

1) Height dimension excludes attached busbar Notes:

2) Add number of poles to Cat. No. eq. 3 P or 4 P. NRC: Nominal rated current

ASR: Adjustable setting range



TemBreak standard series electronic XH800NE

65 KA

Current rating:

400-800 A

Approvals and tests:

Standards AS 3947-2 and IEC 947-2

Interrupting capacity:

Symmetrical rms amps

	Voltage	lcu kA	lcs kA
AC use	400/415	65	33



LTD adjustment: I₁: 0.8-1 t: 5 - 30 s STD adjustment: I₂: 2 - 10 t: 0.1 - 0.3 s Instantaneous Adj: I₄: 3 - 12 NRC

motaniano de Prieji igi o na inici

OCR options: Pre-trip alarm, fault indication with relay contact,

ground fault trip

Dimensions (mm)

Poles	3	
H ')	273	
W	210	
D	103	
kg	12.0	
4 pole	i	

Ampere rating	A	SR		
NRC	Min	Max	Cat. No.	Price \$
800	400	800	XH800NE 800	2930.00

Notes: ') Height dimension excludes attached busbar.

NRC: Nominal rated current

ASR: Adjustable setting range

Overcurrent trip combinations: (specify combinations req)

LSI - standard, LS - optional, LSIP - optional, LSIG - optional

i Available on indent only.

TemBreak PLUS selectivity series

electronic type XH800SE

65 KA

Current rating:

400-800 A

Approvals and tests:

Standards AS 3947-2 and IEC 947-2

Interrupting capacity:

	Voltage	lcu kA	lcs kA	
AC use	400/415	65	33	



Electronic trip unit: Adjustable long, short and instantaneous trip

Fixed.

Trip unit: LTD adjustment: STD adjustment: Instantaneous Adj:

I₁: 0.8-1 t: 5 - 30 s I₂: 2 - 10 t: 0.1 - 0.3 s I₃: 3 - 12 NRC

OCR options:

Pre-trip alarm, fault indication and contacts, ground fault trip

Dimensions (mm)

Poles	3 P	4 P
H 1)	273	273
W	210	280
D (less toggle)	103	103
kg	9.7	12.2
4 pole ii		

Ampere rating NRC	ASR Min.	ASR Max.	Cat. No. 2)	3 P Price \$	4 P Price \$
800	400	800	XH800SE 800	3160.00	4420.00

Notes: 1) Height dimension excludes attached busbar.

2) Add number of poles to Cat. No. eg. 3 P or 4 P.

NRC: Nominal rated current ASR: Adjustable setting range

Available on indent only

3-48 Q-Pulse Id TMS972 Active 10/12/2014 Page: 1.56.0f. 4.4.1 T2

NEW

Yeronga SPS Pump Station Upgrade QM Manual

TemBreak PLUS PowerBreaker Ics = 50 kA electronic type

XH800PF

65 kA

Current rating: 400-800 A

Approvals and tests:

Standards AS 3947-2 and IEC 947-2

Interrupting capacity:

	Voltage	lcu kA	lcs kA
AC use	400/415	65	50
DC use	250 V	40	91



Trip unit:

Electronic trip unit: Adjustable long, short and instantaneous trip

t: 5 - 30 s

Fixed. Trip unit:

LTD adjustment: 1,: 0.8-1

STD adjustment: 12:2-10 t: 0.1 - 0.3 s NRC

Instantaneous Adj: 13:3-12

OCR options: Pre-trip alarm, fault indication and contacts. ground fault trip

Dimensions (mm)

Poles	3 P	4 P
H ')	273	273
W	210	280
D (less toggle)	103	103
kg	9.7	12.2
4 pole [i]		

Ampere rating	ASR	ASR		3 P	4 P
NRC	Min.	Max.	Cat. No. 2)	Price \$	Price \$
800	400	800	XH800PE 800	3830.00	5350.00

Notes: 1) Height dimension excludes attached busbar.

2) Add number of poles to Cat. No. eq. 3 P or 4 P.

NRC: Nominal rated current ASR: Adjustable setting range

i Available on indent only

Accessories to suit 630-800AF

Description		Cat. No.	Price \$
Internal acc	essories		
Shunt trips	110 V AC/DC	2H1515BAA	285.00
	240 V AC	2H1516BAA	285.00
	12 V DC	2H1517BAA	285.00
	24 V DC	2H1518BAA	285.00
	48 V DC	2H1519BAA	285.00
	200 V DC	2H1520BAA	285.00
	24 V AC	2H1521BAA	285.00
1	48 V AC	2H1522BAA	285.00
Under voltage	AC coil ')	2H1503BAA	260.00
trips	100-230 V DC coil 2)	2H1504BAA	260.00
	24 V DC coil 2)	2H1505BAA	260.00
	48 V DC coil 2)	2H1506BAA	260.00
	60 V DC coil 2)	2H1507BAA	260.00
	110 V AC instantaneous controller	UXUB0013B	75.50
	240 V AC instantaneous controller	UXUB0014B	75.50
	440 V AC instantaneous controller	UXUB0015B	75.50
	110 V AC time delay controller	UXUB0016B	146.00
	240 V AC time delay controller	UXUB0017B	146.00
	440 V AC time delay controller	UXUB0018B	146.00
	200-230 V DC controller	UXUB0038B	75.50
Auxiliary	AUX SW right hand 1C	UXXB0007D	108.00
switches	AUX SW right hand 2C	UXXB0008D	127.00
	AUX SW right hand 3C	UXXB0009D	149.00
Alarm switch	ALT SW right hand	UXLB0010D	113.00
Alarm & auxiliary	ALT/AUX SW right hand 1C	UXLB0015D	128.00
switches	ALT/AUX SW right hand 2C	UXLB0016D	150.00
Pre-trip alarm	For electronic OCR MCCBs only	Add "LSIP"	560.00
Fault	Side of breaker mounted module. Electronic	and "FI" then	730.00
indication &	MCCBs only	voltage	
contacts			
Earth fault	Earth fault, electronic breakers only (4th CT's	Add "LSIG"	730.00
option with	included)	- 4	
external 4th	630 A 4th CT	UXOY0001A	275.00
CT's	800 A 4th CT	UXOY0002A	275.00
Extra low or high magnetic	Special selectivity, generator or marine applications		120.00
trip	age 3 - 52 for footnotes		

Notes: Refer page 3 - 52 for footnotes

Accessories to suit 630-800AF

Description		Cat. No.	Price \$
External ac	cessories		
Terminal	3P front connecting terminal cover	2H1417DAA	148.00
covers	4P front connecting terminal cover	2H1418DAA	187.00
	IP 20 protective cover *)	2A1787DBA	3.80
	3P rear connecting terminal cover	UXPD0013C	147.00
	4P rear connecting terminal cover	UXPD0014B	187.00
Accessory	Accessory terminal block	UXYD0001A	17.60
lead terminal	Terminal and bolt ')	UXYD0002A	1.20
Plug-in breaker parts	Aux conn block (MCCB) side	UXYC0005A	35.50
	Aux conn block (panel) side	UXYB0004A	33.50
3 pole	Mounting bolts	COVER	18.40
100	Tulip block (6) 630	TXLD0012A	235.00
	Tulip block (6) 800	2A3308DAA	250.00
	Mounting base	XDM6-3	635.00
Plug-in	Aux conn block (MCCB) side	UXYC0005A	35.50
breaker parts	Aux conn block (panel) side	UXYB0004A	33.50
4 pole	Mounting bolts	TXLD0016A	18.40
	Tulip block (8) 630	TXLD0013A	290.00
	Tulip block (8) 800	2A3308DBA	310.00
	Mounting bolts	XDM6-4	710.00
TemPlug	TemPlug 800 A rated ')	UPX3800 ')	440.00
Interpole barrier	Interpole barrier	UXQH0004A	6.70
OCR sealing kit	Tamperproof cover for the OCR adjustment dials	XS630OCRSK	37.00

Notes: 1) An AC UVT controller is required for 100-440 V AC.

A DC UVT controller is needed for 200-230 V DC operation. None required for 24-110 V DC

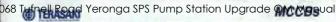
1) Order one Interlock mechanism for each circuit breaker.

Flush plate included.

1) 6 pieces required for 3P / 8 pieces required for 4P.

Specify quantity required (up to 6 pieces).

Discount code T3 applies to TemPlug.



Accessories to suit 630-800AF

Description		Cat. No.	Price S
External ac	cessories		
Screw tunnel	3P solderless terminals for 630AF (6 in kit)	TXLD0005A	265.00
terminals	4P solderless terminals for 630AF (8 in kit)	TXLD0006A	340.00
Rear connect	3P rear connect studs, 630/800AF (6 in kit)	UXRC0008B	1010.00
studs	4P rear connect studs, 630/800AF (8 in kit)	UXRC0009B	1360.00
Motor	110 V AC motor	UXMC0006B	2160.00
operators (XMC6)	110 V DC motor	UXMC0008B	2160.00
	24 V DC motor	UXMC0009B	2160.00
	240 V AC motor	UXMC0010B	2160.00
	Motor base support	UXMD0002B	31.00
Mechanical interlocks	3P mech l/lock rear mounting	UXKC0004A	240.00
	4P mech Vlock rear mounting	UXKC0005A	360.00
	Interlock cable (wire)	UXKC0020A	55.00
	Cable interlock mechanism *)	UXKC00228	210.00
Handle	Variable depth handle. Door interlocking	XFHA46	310.00
operators	IP 65 rated variable depth handle. Door interlocking	TLKA46	475.00
	IP 55 direct mount rotary handle mechanism ¹)	TFJ36XU	355.00
Handle extension	Handle extension	2A2272BAB	62.00
Handle lock	Handle lock	UXKB0002A	41.00
	Key interlock (L&F type) incl TFJ mechanism		790.00

Notes: Refer page 3 - 52 for footnotes.

068 Tutnell Road Yeronga SPS Pump Station Upgrade Qwown al

TemBreak PLUS selectivity series

electronic type XS1600SE

85 KA

Current rating:

800-1600 A

Approvals and tests:

Standards AS 3947-2 and IEC 947-2

Interrupting capacity:

		Voltage	Icu kA	lcs kA
	AC use	400/415	85	64
1				



Electronic trip unit: Adjustable long, short and instantaneous trip.

Trip unit: LTD adjustment: Fixed. I₁: 0.8-1 t: 5 - 30 s I₂: 2 - 10 t: 0.1 - 0.3 s

STD adjustment: Instantaneous Adj:

I₃: 3 - 12 NRC

OCR options:

Pre-trip alarm, fault indication and contacts, ground fault trip

Dimensions (mm)

Poles	3 P	4 P
H ')	370	370
W	210	280
D (less toggle)	140	140
kg	27	35

Ampere rating NRC	ASR Min.	ASR Max.	Cat. No. 3)	3 P Price \$	
1600	800	1600	XS1600SE 1600 FC	10740.00	14600.00
1600	Non auto	(20 kA for 0.3 sec)	XS1600NN *)	9525.00	13295.00

Notes: 1) Height dimension excludes attached busbar.

Load-break isolating switch only. No protection.
 Add number of poles to Cat. No. eg. 3 P or 4 P.

NRC: Nominal rated current ASR: Adjustable setting range

3 - 54

All prices are exclusive of GST.

Q-Pulse Id TMS972 Active 10/12/2014

Page 6 6 6 444 T

068 Tu**inell Road** Yeronga SPS Pump Station Upgrade **Qwodsb**yal

TemBreak PLUS selectivity series

electronic type XS1250SE

65 kA

Current rating:

500-1250 A

Approvals and tests:

Standards AS 3947-2 and IEC 947-2

Interrupting capacity:

	Voltage	lcu kA	lcs kA
AC use	400/415	65	49



Electronic trip unit: Adjustable long, short and instantaneous trip.

Trip unit: LTD adjustment: Fixed. I₁: 0.8-1 t: 5 - 30 s I₂: 2 - 10 t: 0.1 - 0.3 s

STD adjustment: I₂: 2 - 10 t: 0.1 Instantaneous Adj: I₃: 3 - 12 NRC

OCR options: Pre-trip alarm, fault indication and contacts,

ground fault trip

Dimensions (mm)

Poles	3 P	4 P
H ')	370	370
W	210	280
D (less toggle)	120	120
kg	22	28

Ampere rating NRC	ASR Min.	ASR Max.	Cat. No. 3)	3 P Price \$	4 P Price \$
1000	500	1000	XS1250SE 1000 FC	5140.00	6858.00
1250	625	1250	XS1250SE 1250 FC	6380.00	8930.00
1250	Non auto	o (15 kA for 0.3 sec)	XS1250NN 2)	5990.00	8870.00

Notes: ') Height dimension excludes attached busbar

Load-break isolating switch only. No protection.
 Add number of poles to Cat. No. eg. 3 P or 4 P.

NRC: Nominal rated current ASR: Adjustable setting range

Accessories to suit 1250-1600AF

Description		Cat. No.	Price
Internal ac	cessories		
Shunt trips	110 V AC/DC (110-115 V)	2H1197BAA	345.00
	240 V AC (200-480 V)	2H1198BAA	345.00
	12 V DC	2H1199BAA	345.00
	24 V DC	2H1200BAA	345.00
	48 V DC	2H1201BAA	345.00
	200 V DC (200-230 V)	2H1202BAA	345.00
	24 V AC	2H1203BAA	345.00
	48 V AC	2H1204BAA	345.00
Under	AC coil ')	2H1208BAA	280.00
voltage trips	100-230 V DC coil 2)	2H1209BAA	280.00
	24 V DC coil ²)	2H1210BAA	280.00
	48 V DC *)	2H1211BAA	280.00
	60 V DC *)	2H1212BAA	280.00
	110 V AC instantaneous controller	UXUB00138	75.50
	240 V AC instantaneous controller	UXUB00148	75.50
	440 V AC instantaneous controller	UXUB0015B	75.50
	110 V AC time delay controller	UXUB0016B	146.00
	240 V AC time delay controller	UXU80017B	146.00
	440 V AC time delay controller	UXUB0018B	146.00
	200-230 V DC controller	UXU80038B	75.50
Auxiliary	AUX SW right hand 1C / 3P	UXXB0010D	220.00
switches	AUX SW right hand 2C / 3P	UXX80011D	275.00
	AUX SW right hand 3C / 3P	UXX80012D	325.00
	AUX SW right hand 1C / 4P	UXXB0023D	220.00
	AUX SW right hand 2C / 4P	UXXB0024D	275.00
	AUX SW right hand 3C / 4P	UXX80025D	325.00
Alarm	ALT SW right hand / 3P	UXLB0011D	210.00
switches	ALT SW right hand / 4P	UXLB00240	210.00
Alarm &	ALT/AUX right hand 1C / 3P	UXLB0017D	255.00
auxiliary	ALT/AUX right hand 2C / 3P	UXLB0018D	305.00
switches	ALT/AUX right hand 1C / 4P	UXL80025D	255.00
	ALT/AUX right hand 2C / 4P	UXLB0026D	305.00

Notes: Refer page 3 - 57 for footnotes.

Description	Description		Price \$
Internal acc	essories	70 02-0	
Fault indication & contacts	An option for all 1250-1600 A types	Add "FI" then voltage	562.00
Pre-Trip alarm	An option for all 1250-1600 A types	Add "LSIP"	562.00
Earth fault	An option for all 1250-1600 A types	Add "LSIG"	734.00
indication	1000 A 4th CT	UXOY0003A	285.00
	1250 A 4th CT	UXOY0004A	285.00
	1600 A 4th CT	UXOY0005A	285.00
Extra high instantaneous magnetic trip	An option for all 1000-1600 A types		POA

External accessories

Rear connect	3P rear connect studs (6 in kit) 1250 A	2H1959DAB	1160.00
studs	4P rear connect studs (8 in kit) 1250 A	2H1959DBB	1540.00
	3P rear connect studs (6 in kit) 1600 A	2H1960DAA	1530.00
	4P rear connect studs (8 in kit) 1600 A	2H1960DBA	2040.00
Motor	110 V AC motor	2H1191CAB	2590.00
operators	110 V DC motor	2H1193CAB	2590.00
(XMD9)	24 V DC motor	2H1194CAB	2590.00
	240 V AC mater	2H1195CAB	2590.00
Mechanical	3P mech Mock / 1250 A rear connect	UXKC0006D	580.00
interlocks	4P mech l/lock / 1250 A rear connect	UXKC0007D	780.00
	3P mech Mock / 1600 A rear connect	UXKC0028C	580.00
	4P mech Mock / 1600 A rear connect	UXKC0027C	780.00
	Interlock cable (wire)	UXKC0020A	55.00
	Interlock mech 1250 A Cable type 3)	UXKC0023B	305.00
	Interlock mech 1600 A Cable type 2)	UXKC00248	305.00

Notes: Refer page 3 - 57 for footnotes.

068 Tufnell Road Yeronga SPS Pump Station Upgrade OM Manual

Accessories to suit 1250-1600AF

Description		Cat. No.	Price \$
External ac	cessories		
Handle	Variable depth handle, door interlocking	XFHA49	335.00
operators	IP 65 rated variable depth handle. Door interlocking	TLKA49	465.00
	IP 55 direct mount rotary handle mechanism *)	TFJ38XU	395.00
Handle extension	Handle extension	2A2272BAB	82.00
Handle lock	Handle lock	UXKB0003A	49.50
	Key interlock (L&F Type) incl TFJ mechanism		790.00
Terminal	3P FC terminal cover / 1250	2H1419DAA	146.00
covers	4P FC terminal cover / 1600	2H1420DAA	186.00
	IP 20 protective cover 1)	2A1787DBA	3.80
Accessory	Accessory terminal block	UXYD0001A	17.60
lead terminal	Terminal and bolt 1)	UXYD0002A	1.20
Interpole barrier	Interpole barrier ')	UXQH0004A	6.70
OCR sealing kit	Tamperproof cover for the OCR adjustment dials	XS1250OCRSK	26.60

Notes: ') An AC UVT controller is required for 100-440 V AC.

- A DC UVT controller is needed for 200-230 V DC operation. None required for 24-110 V DC.
- 3) Order one interlock mechanism for each breaker.
- 1) Flush plate included.
- 1) 6 pieces required for 3P / 8 pieces required for 4P.
- 1) Specify quantity required (up to 6 pieces).
- 1) Individual barrier (not a set)

TemBreak standard series electronic XS2000NE

100 kA

Current rating: 100

1000-2000 A

Approvals and tests:

Standards AS 3947-2 and IEC 947-2

Interrupting capacity:

Symmetrical rms amps

	Voltage	lcu kA	lcs kA
AC use	400/415 ")	100	75

Trip unit: Adjustable long, short and instantaneous settings

LTD adjustment: I₁: 0.8-1 t: 5 - 30 s
STD adjustment: I₂: 2 - 10 t: 0.1 - 0.3 s
Instantaneous Adj: I₃: 3 - 12 NRC

OCR options: Pre-trip alarm, fault indication with relay contact.

ground fault trip

Dimensions (mm)

Ampere

Poles	3 P	4P
HY	450	450
W	320	429
D	185	185
kg	55.0	67

rating	AS	SR		3 P	4 P
NRC	Min	Max	Cat. No. ')	Price \$	Price \$
2000	1000	2000	XS2000NE 2000 RC	11900.00	16600.00
2000	non-aut	o (35 kA for 0.3 sec)	XS2000NN ")	10270.00	14350.00

Notes: ') 415 V Icu rating to AS 2184 only.

7) Height dimension excludes attached busbar.

1) Load-break isolating switch only - no protection.

4) Add number of poles to Cat. No. eg. 3 P or 4 P.

NRC: Nominal rated current

ASR: Adjustable setting range

Overcurrent trip combinations: (specify combinations req)

LSI - standard.

LS - optional,

LSIP - optional (pre-trip alarm),

LSIG - optional

3 - 58 All prices are exclusive of GST. Q-Pulse Id TMS972 Active 10/12/2014 Pager 166-of 441T3

068 Turnell Road Yeronga SPS Pump Station Upgrade Onton Page

TemBreak standard series electronic XS2500NE

100 kA

Current rating:

1250-2500 A

Approvals and tests:

Standards AS 3947-2 and IEC 947-2

Interrupting capacity:

Symmetrical rms amps

	Voltage	lcu kA	lcs kA
AC use	400/415 ')	100	75

Trip unit:

Adjustable long, short and instantaneous settings

LTD adjustment:

I.: 0.8-1 t: 5 - 30 s t: 0.1 - 0.3 s 12:2-10

STD adjustment: I3: 3 - 12 NRC Instantaneous Adi:

OCR options: Pre-trip alarm, fault indication with relay contact,

ground fault trip

Dimensions /mm

Poles	4 P	
H 2)	450	450
W	320	429
D	185	185
kg	66.0	78

Amper	e				
rating	100000000000000000000000000000000000000	SR		3 P	4 P
NRC	Min	Max	Cat. No. 4)	Price \$	Price \$
2500	1250	2500	XS2500NE 2500 RC	14690.00	19600.00
2500	non-aut	o (35 kA for 0.3 sec)	XS2500NN 3)	12990.00	17350.00

Notes: 1) 415 V Icu rating to AS 2184 only.

2) Height dimension excludes attached busbar

2) Load-break isolating switch only - no protection.

*) Add number of poles to Cat. No. eg. 3 P or 4 P.

NRC: Nominal rated current

ASR: Adjustable setting range

Overcurrent trip combinations: (specify combinations reg)

LSI - standard.

LS - optional,

LSIP - optional (pre-trip alarm),

LSIG - optional

Description		Cat. No.	Price 5
Internal acc	cessories		
Shunt trips	110 V AC/DC (110-115 V)	2H1526BAA	350.00
	240 V AC (200-480 V)	2H1527BAA	350.00
	12 V DC	2H1528BAA	350.00
	24 V DC	2H1529BAA	350.00
i .	48 V DC	2H1530BAA	350.00
	200 V DC (200-230 V)	2H1531BAA	350.00
	415 V AC	2H1541BAA	350.00
	24 V AC	2H1532BAA	350.00
	48 V AC	2H1533BAA	350.00
Under	AC coil ')	2H1509BAA	310.00
voltage trips	100-230 V DC coil *)	2H1510BAA	310.00
	24 V DC coil ²)	2H1511BAA	310.00
	48 V DC coil 3)	2H1512BAA	310.00
	60 V DC coil 3)	2H1513BAA	310.00
	110 V AC instantaneous controller	UXUB00138	75.50
	240 V AC instantaneous controller	UXUB0014B	75,50
	440 V AC instantaneous controller	UXUB0015B	75.50
	110 V AC time delay controller	UXU800168	146.00
	240 V AC time delay controller	UXU800178	146.00
	440 V AC time delay controller	UXUB0016B	146.00
	200-230 V DC controller	UXUB0038B	75.50
Auxiliary	AUX SW right hand 1C	UXXB0013C	220.00
switches	AUX SW right hand 2C	UXXB0014C	255.00
	AUX SW right hand 3C	UXXB0015C	295.00
	AUX SW right hand 4C	UXXB0016C	340.00
	AUX SW right hand 5C	UXXB0017C	375.00
	AUX SW right hand 6C	UXXB0018C	415.00
Alarm switch	ALT SW right hand	UXLB0012C	280.00
Alarm &	ALT/AUX right hand 1C	UXLB0019D	325.00
auxiliary	ATL/AUX right hand 2C	UXLB0020C	370.00
switch	ATL/AUX right hand 3C	UXLB0021C	415.00
	ATL/AUX right hand 4C	UXLB0022C	460.00
	ATL/AUX right hand 5C	UXLB0023C	510.00

Notes: Refer page 3 - 61 for footnotes

3 - 60 All prices are exclusive of GST. Q-Pulse Id TMS972 Active 10/12/2014 Page 168 of 44 ITS

068 Tut<mark>nell Road</mark> Yeronga SPS Pump Station Upgrade **AMMo**gual

Accessories to suit 2000-2500AF

Description		Cat. No.	Price \$
Internal acc	essories		
Earth fault	An option for all 2000-2500 A types	ADD "LSIG"	440.00
	2000 A 4th CT	UXOY0006A	455.00
	2500 A 4th CT	UXOY0007A	560.00
Fault	An option for all 2000-2500 A types	Add "FI" then	730.00
indication		voltage	(Time)
with contacts		W. 5 V 1	
Pre-trip alarm	An option for all 2000-2500 A types	Add "LSIP"	540.00
Extra high	An option for all 2000-2500 A types	1000	P.O.A
instantaneous			
magnetic trip		The second second	

External accessories

3P attached busbars FC (6 in kit) 3)	TXRD0003A	510.00
4P attached busbars FC (8 in kit) 1)	TXRD0004A	690.00
Mounting bolts *)	TXRD0005A	240.00
110 V AC motor	UXMB0006B	2630.00
240 V AC motor	UXMB0008B	2630.00
110 V DC motor	UXM800098	2630.00
3P rear mechanical interlock	UXKC0012A	1380.00
4P rear mechanical interlock	UXKC0013A	2070.00
Interlock wire (cable style interlock)	UXKC0020A	55.00
Interlock mechanism - cable type *)	UXKC0025B	430.00
Panel mount handle mechanism	XFE10	1120.00
Handle extension	UXHB0001B	129.00
Fits to MCCB toggle	UXKB0001A	49.50
Key interlock (L&F type) including XFE mechanism		790.00
Accessory lead block	UXYD0001A	17.60
Terminal bolt (6 in kit)	UXYD0002A	1.20
OCR sealing kit	XS2000OCRSK	37.00
	4P attached busbars FC (8 in kit) *) Mounting bolts *) 110 V AC motor 240 V AC motor 110 V DC motor 3P rear mechanical interlock 4P rear mechanical interlock Interlock wire (cable style interlock) Interlock mechanism - cable type *) Panel mount handle mechanism Handle extension Fits to MCCB toggle Key interlock (L&F type) including XFE mechanism Accessory lead block Terminal bolt (6 in kit)	4P attached busbars FC (8 in kit) *) Mounting bolts *) 110 V AC motor 240 V AC motor UXMB0006B 110 V DC motor UXMB0006B 110 V DC motor UXMB0009B 3P rear mechanical interlock 4P rear mechanical interlock UXKC0012A Interlock wire (cable style interlock) UXKC0020A Interlock mechanism - cable type *) Panel mount handle mechanism Handle extension UXHB0001B Fits to MCCB toggle UXKB0001A Key interlock (L&F type) including XFE mechanism Accessory lead block UXYD0001A Terminal bolt (6 in kit) UXYD0002A

Notes: ') An AC UVT controller is required for 100-440 V AC.

A DC UVT controller is needed for 200-230 V DC operation. None required for 24-110 V DC.

⁷ For XS2000NE.

[&]quot;) Order one interlock mechanism per breaker.

TemBreak PLUS LimitorBreaker lcs = 85 kA thermal magnetic type TL100NJ

85 kA

Current rating:

12.5-100 A

Approvals and tests:

Standards AS 3947-2 and IEC 947-2

Interrupting capacity:

	voitage	lcu kA	lcs kA
use	400/415	85	85
use	250 V	40	
	use	use 400/415	use 400/415 85

Trip unit:

Adjustable thermal fixed magnetic

OCR options:

Special calibrated or disabled thermal trip

Dimensions (mm)

Poles	3 P	4 P
Н	235	235
W	90	120
D (less toggle)	86	86
kg	2.2	2.7

Ampere rating NRC	ASR Min.	ASR Max.	Cat. No. 1)	3 P Price \$	☐ 4 P Price \$
20	12.5	20	TL100NJ 20	690.00	850.00
32	20	32	TL100NJ 32	690.00	850.00
50	32	50	TL100NJ 50	690.00	850.00
63	40	63	TL100NJ 63	690.00	850.00
100	63	100	TL100NJ 100	750.00	890.00

Notes: 1) Add number of poles to Cat. No. eg. 3 P or 4 P.

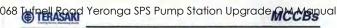
Magnetic only available on application. NRC: Nominal rated current

ASR: Adjustable setting range

Accessories refer page 3 - 15 and 3 - 17

i Available on indent only

3 - 62 All prices are exclusive of GST. Pagenty of 44 T2



TemBreak PLUS LimitorBreaker lcs = 85 kA thermal magnetic type

TL250NJ

85 KA

Current rating:

100-250 A

Approvals and tests:

Standards AS 3947-2 and IEC 947-2

Interrupting capacity:

	Voltage	lcu kA	lcs kA
AC use	400 V	100	100
	415 V	85	85
DC use	250 V	40	6

Trip unit:

Adjustable thermal adjustable magnetic

OCR options: Special calibrated or disabled thermal trip

Dimensions (mm)

Poles	3 P	1 4 P
Н	360	360
W	140	185
D (less toggle)	103	103
kg	7.1	9.1

Ampere rating NRC	ASR Min.	ASR Max.	Cat. No. 1)	3 P Price \$	4 P Price \$
160	100	160	TL250NJ 160	1250.00	1610.00
250	160	250	TL250NJ 250	1380.00	2080.00

Notes: 1) Add number of poles to Cat. No. eg. 3 P or 4 P.

Magnetic only available on application.

NRC: Nominal rated current ASR: Adjustable setting range

Accessories refer page 3 - 34 and 3 - 36

i Available on indent only.

TemBreak PLUS LimitorBreaker Ics = 85 kA electronic type

TL400NE

85 KA

Current rating: 200-400 A

Approvals and tests:

Standards AS 3947-2 and IEC 947-2

Interrupting capacity:

		Voltage	Icu kA	lcs kA
	AC use	400 V	100	100
₹		415 V	85	85
•				



Trip unit:

Electronic trip unit: Adjustable long, short and instantaneous trip

Trip unit: LTD adjustment: STD adjustment: Fixed. I1: 0.8-1

t: 5 - 30 s I2: 2 - 10 t: 0.1 - 0.3 s NRC

Instantaneous Adj: 13:3-12 **OCR options:**

Pre-trip alarm, fault indication and contacts, ground fault trip

Dimensions (mm)

3 P	i 4 P
360	360
140	185
103	103
7.1	9.1
	360 140 103

Ampere rating NRC	ASR Min.	ASR Max.	Cat. No. 1)	3 P Price \$	4 P Price \$
400	200	400	TL400NE 400	2650.00	4110.00

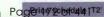
Notes: 1) Add number of poles to Cat. No. eg. 3 P or 4 P.

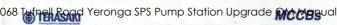
NRC: Nominal rated current ASR: Adjustable setting range

Accessories refer pages 3 - 34 and 3 - 36

i Available on indent only

All prices are exclusive of GST. Q-Pulse Id TMS972 Active 10/12/2014





TemBreak PLUS LimitorBreaker Ics = 70 kA electronic type

TL630NE

125 kA

Current rating:

315-630 A

Approvals and tests:

Standards AS 3947-2 and IEC 947-2

Interrupting capacity:

	Voltage	lcu kA	lcs kA
AC use	400/415	125	70



Electronic trip unit: Adjustable long, short and instantaneous trip

Trip unit:

Fixed. LTD adjustment: STD adjustment:

1,: 0.8-1 12:2-10

t: 0.1 - 0.3 s Instantaneous Adj: 13:3-12 NRC

OCR options:

Pre-trip alarm, fault indication and contacts,

t: 5 - 30 s

ground fault trip

Dimensions (mm)

Poles	3
H ')	370
W	210
D (less toggle)	140
kg	25.8
4 pole i	POA

Ampere rating NRC	ASR Min.	ASR Max.	Cat. No.	Price \$
630	315	630	TL630NE 630 3	3950.00

Notes: ') Height dimension excludes attached busbar.

NRC: Nominal rated current ASR: Adjustable setting range

Accessories refer pages 3 - 50 to 3 - 52

i Available on indent only

TemBreak PLUS LimitorBreaker lcs = 70 kA

electronic type TL800NE

125 kA

Current rating:

400-800 A

Approvals and tests:

Standards AS 3947-2 and IEC 947-2

Interrupting capacity:

	Voltage	lcu kA	lcs kA
AC use	400/415	125	70



Electronic trip unit: Adjustable long, short and instantaneous trip

Trip unit:

LTD adjustment: STD adjustment:

1,: 0.8-1 t: 5 - 30 s 12:2-10 t: 0.1 - 0.3 s NRC

Instantaneous Adj: 13:3-12 **OCR options:**

Pre-trip alarm, fault indication and contacts,

ground fault trip

Fixed.

Dimensions (mm)

Poles	3
H ')	370
W	210
D (less toggle)	140
kg	25.8
4 pole i	POA

Ampere rating NRC	ASR Min.	ASR Max.	Cat. No.	Price \$
800	400	800	TL800NE 800 3	6110.00

Notes: 1) Height dimension excludes attached busbar

NRC: Nominal rated current

ASR: Adjustable setting range Accessories refer pages 3 - 50 to 3 - 52

i Available on indent only

All prices are exclusive of GST. Q-Pulse Id TMS972 Active 10/12/2014

Pager 174 0 449 T2

068 Turnell Road Yeronga SPS Pump Station Upgrade MM Magual

TemBreak PLUS LimitorBreaker lcs = 65 kA electronic type TL1250NE

125 kA

Current rating:

500-1250 A

Approvals and tests:

Standards AS 3947-2 and IEC 947-2

Interrupting capacity:

Voltage Icu kA Ics kA AC use 400/415 125 65

Trip unit:

Electronic trip unit: Adjustable long, short and instantaneous trip

Trip unit: LTD adjustment: Fixed.

STD adjustment: I₂: 2 - 10 Instantaneous Adj: I₃: 3 - 12

l₃: 3 - 12 NRC

OCR options:

Pre-trip alarm, fault indication and contacts, ground fault trip

ground fault trip

Dimensions (mm)

Poles	3
H')	370
W	210
D (less toggle)	140
kg	26
4 pole 1	POA

Ampere rating NRC	ASR Min.	ASR Max.	Cat. No.	Price \$
1000	500	1000	TL1250NE 1000 3 FC	8330.00
1250	625	1250	TL1250NE 1250 3 FC	9100.00

Notes: ') Height dimension excludes attached busbar NRC: Nominal rated current

ASR: Adjustable setting range

Accessories refer pages 3 - 55 to 3 - 57

Available on indent only

TemBreak high fault series current limiting thermal magnetic type TL30F

120 kA

Current rating:

15-30 A

Approvals and tests:

Standards AS 3947-2 and IEC 947-2

Interrupting capacity:

Symmetrical rms amps

	Voltage	lcu kA	lcs kA
AC use	400/440	120	60
DC use	250	40	-



Trip unit:

Fixed thermal magnetic

OCR options: Special calibrated or disabled thermal trip

Dimensions (mm)

3	
155	
90	
86	
i	

Ampere rating	Cat. No.	Price \$
15	TL30F 15 3	640.00
20	TL30F 20 3	640.00
30	TL30F 30 3	640.00

Notes: Magnetic only available on application.

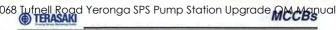
Specify for DC rating.

Refer XS/XH125 section for internal and external accessories for TL30F.

i Available on indent only

All prices are exclusive of GST. Q-Pulse Id TMS972 Active 10/12/2014

Page 176 of 441 'T2'



TemBreak current limiting circuit breakers for very high interrupting capacity TL100F

120 KA

Current rating: 15-100 A

Approvals and tests:

Standards AS 3947-2 and IEC 947-2

Interrupting capacity:

Symmetrical rms amps

	Voltage	lcu kA	lcs kA
AC use	400/440	120	60
DC use	250	40	-



Trip unit:

Fixed thermal magnetic

OCR options:

Special calibrated or disabled thermal trip

Dimensions (mm)

	/
Poles	3
Н	165
W	105
D	125
kg	3.2
4 pole	i

Ampere rating	Cat. No.	Price \$
15	TL100F 15 3	860.00
20	TL100F 20 3	860.00
30	TL100F 30 3	860.00
40	TL100F 40 3	860.00
50	TL100F 50 3	860.00
60	TL100F 60 3	860.00
75	TL100F 75 3	860.00
100	TL100F 100 3	860.00

Notes: For 4 pole breakers POA.

Magnetic only available on application. Specify for DC rating.

i Available on indent only.

TemBreak current limiting circuit breakers very high breaking capacity TI 100C

180 kA

Current rating: 15-100 A

Approvals and tests:

Standards AS 3947-2 and IEC 947-2

Interrupting capacity:

Symmetrical rms amps

	Voltage	lcu kA	les kA
AC use	400/440	180	135
DC use	250	40	-



Trip unit: Fixed thermal magnetic

OCR options: Special calibrated or disabled thermal trip

Dimensions (mm)

Poles	3
Н	230
W	110
D	133
kg	5.0

Ampere rating	Cat. No.	3 pole Price \$
15	TL100C 15 3	830.00
20	TL100C 20 3	830.00
30	TL100C 30 3	830.00
40	TL100C 40 3	830.00
50	TL100C 50 3	830.00
60	TL100C 60 3	830.00
75	TL100C 75 3	870.00
100	TL100C 100 3	870.00

Notes: Magnetic only. Up to 125 A available on application.

Specify for DC rating.

Special models for S.C.R. protection available on application

068 Turnell Road Yeronga SPS Pump Station Upgrade **My Mag**ual

TemBreak current limiting circuit breakers for very high interrupting capacity TL225B

180 kA

Current rating:

125-225 A

Approvals and tests:

Standards AS 3947-2 and IEC 947-2

Interrupting capacity:

Symmetrical rms amps

	Voltage	lcu kA	lcs kA
AC use	400/440	180	135
DC use	250	40	-



Trip unit:

Fixed thermal magnetic

OCR options:

Special calibrated or disabled thermal trip

Dimensions (mm)

Poles	3
Н	260
W	140
D	133
kg	9.3

Ampere rating	Cat. No.	Price \$
125	i TL225B 125 3	3110.00
150	☐ TL225B 150 3	3110.00
175		3110.00
200	<u>i</u> TL225B 200 3	3110.00
225	TL225B 225 3	3110.00

Notes: Magnetic only available on application.

Specify for DC rating.

Special models for S.C.R. protection. Available on application.

i Available on indent only.

TemBreak current limiting circuit breakers for very high interrupting capacity TL225F

120 KA

Current rating: 125-225 A

Approvals and tests:

Standards AS 3947-2 and IEC 947-2

Interrupting capacity:

Symmetrical rms amps

	Voltage	lou kA	les kA
AC use	400/440	120	60
DC use	250	40	



Trip unit:

Fixed thermal magnetic

OCR options:

Special calibrated or disabled thermal trip

Dimensions (mm)

Poles	3
Н	260
W	140
D	133
kg	6.0
4 pole	T)

Ampere rating	Cat. No.	Price \$
125	TL225F 125 3	1590.00
150	TL225F 150 3	1590.00
175	TL225F 175 3	2110.00
200	TL225F 200 3	2110.00
225	TL225F 225 3	2110.00

Notes: Magnetic only. Up to 125 A available on application.

Specify for DC rating.

Available on indent only

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TemBreak MCCBs

Din-LMCBs

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Q-Pulse Id TMS972 Active 10/12/2014 Page 181 of 44173

068 Tufnell Road Yeronga SPS Pump Station Upgrade OM Manual

	Accessories to suit TL10	OF/EM	-04
Description		Cat. No.	Price \$
Internal acc	essories		4.70
Shunt trips	110 V AC sht (100-115 V)	7VF 2M1	164.00
	240 V AC sht (200-480 V)	7VF 2M2-B	164.00
	110 V DC sht (100-110 V)	7VF 2M4	164.00
	48 V DC sht	7VF 2M6	164.00
	24 V DC sht	7VF 2M7	164.00
	24 V AC sht	24V AC SHT	177.00
Undervoltage	440 V AC	7UF 2D5B	210.00
trips	110 V AC	7UF 2D6B	210.00
1000	240 V AC	7UF 2D7B	210.00
	110 V DC	7UF 2FD1	210.00
	24 V DC	7UF 2FD2	210.00
Auxiliary	AUX SW right hand 1C	7XA 2D31B	140.00
switches	AUX SW left hand 1C	7XA 2D41B	140.00
Alarm switches	ALT SW right hand	7AB 2D11B	140.00
Description		Cat. No.	Price \$
External ac	cessories		
Screw tunnel lugs	3P solderless term. (6)	7T 2M1	65.00
Rear connect studs	3P RC studs (6)	7RC 2LE	122.00
Motor	110 V AC motor	7MB 3BA1	1170.00
operators	240 V AC motor	7MB 3BA2	1170.00
Handle	Anti clockwise handle kit	TFH 22D	195.00
operators	IP 65 handle kit	TLK 22D	205.00
	IP 55 handle mech. 1) see page 3 - 51	TFJ 22LU	195.00
Handle locks	Handle lock	7KB 3BA	35.00
	lock plate	UXKE0030A	1.10
Terminal opver	Terminal cover	TL100EMLTC	96.00
Accessory	Accessory lead term. blk	7YD3	32.50
lead terminal			
Plug in 3 pale	Spacer	7AB A01	3.10
	AUX conn block (MCCB side)	788 2M1	37.00
	AUX conn block (panel side)	TY A5/5	37.00
	Mounting bolts	7P 803	9.20
	MODEL STATE OF THE PARTY OF THE	and the second second	THE OWNER OF TAXABLE PARTY.

Tulip block (6)

Plug in base

7P 2M1

TOM 2D

130.00

155.00

^{3.74} Q-Pulse Id TMS972 Active 10/12/2014 Page 182 of 441 12

068 Tufnell Road Yeronga SPS Pump Station Upgrade Qwydgwal

Accessories to suit TL100C

Description		Cat. No.	Price \$	
Internal acc	essories			
Shunt trips	110 V AC	7VF 2H1	164.00	
	240 V AC	7VF 2H2-B	164.00	
	110 V DC	7VF 2H4	164.00	
	48 V DC	7VF 2H6	164.00	
	24 V DC	7VF 2H7	164.00	
Undervoltage	220 V AC	7UF 2H2	205.00	
trips	440 V AC	7UF 2H5	205.00	
Auxiliary	AUX SW right hand 1C	7XA 2H11	140.00	
switches	AUX SW left hand 1C	7XA 2H21	140.00	
Alarm switch	ALT SW right hand	7AB 2H11	145.00	

Description		Cat. No.	Price \$	
External accessories				
Screw tunnel terminals	3P solderless term. (6 in kit)	7T 2H1	53.00	
Rear connect studs	3P RC studs	7RC 2LC	122.00	
Handle kits	Anti clockwise handle kit	TFH 22LC	195.00	
Accessory lead terminal block	Accessory lead block	7YD3	32.50	

Note: For TL30F accessories refer XS/XH125 accessories pages 3-15 to 3-17.

Accessories to suit TL225B

Description		Cat. No.	Price \$
Internal acc	cessories		
Shunt trips	110 V AC sht (110-115 V)	7VF 3H1	198.00
	240 V AC sht (200-480 V)	7VF 3H2-B	198.00
	110 V DC sht (100-110 V)	7VF 3H4	198.00
	200 V DC sht (200-230 V)	7VF 3H5	198.00
	48 V DC	7VF 3H6	198.00
_	24 V AC	7VF 3H7	196.00
46	Support	7VF AOS	16.40
Undervoltage	440 V AC	7UF 48A5	225.00
trips	110 V AC	7UF 4BA6	225.00
1970	240 V AC	7UF 4BA7	225.00
- 1	24 V DC ')	7UF 48D1	225.00
	110 V DC ")	7UF 4802	225.00
	UVT support	7UF 805	15.00
Auxiliary	AUX SW right hand 1C	7XA 3H11	143.00
switches	AUX SW right hand 2C	7XA 3H21	285.00
	AUX SW left hand 1C	7XA 3H31	143.00
	AUX SW left hand 2C	7XA 3H41	285.00
	LH AUX support	7XA A08	15.40
	RH AUX support	7XA 808	15.40
Alarm switch	ALT SW right hand	7AB 3H11	164.00
Alarm and auxiliary switch	ALT/AUX SW right hand 1C	7AB S07	185.00
Description		Cat. No.	Price \$
External ac	cessories		
Attached busbars	3P attached busbars (6)	7B 3B1	53.00
Screw tunnel	3P solderless term. (6)	7T 3B1	101.00
terminal		200	
Handle operator	Variable depth, door interlocking handle	TFH 33LB	225.00
Handle lock	Handle lock	7KB 3BA	35.00
Accessory lead terminal	Accessory lead block		35.00

3 - 76 Q-Pulse Id TMS972 Active 10/12/2014 Page 184 of 144112

068 Turnell Road Yeronga SPS Pump Station Upgrade OM Manual

Accessories to suit TL225F

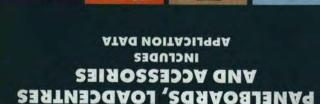
Description		Cat. No.	Price :
Internal acc	cessories		
Shunt trips	110 V AC	7VF 381	198.00
	240 V AC	7VF 3B2-B	198.00
	110 V DC	7VF 3B4	198.00
	200 V DC	7VF 385	198.00
	48 V DC	7VF 386	198.00
	24 V AC	7VF 3B7	198.00
	Support	7VF AO3	16.40
Undervoltage	440 V AC	7UF 4BA5	225.00
trips	110 V AC	7UF 4BA6	225.00
	240 V AC	7UF 4BA7	225.00
	24 V DC	7UF 4BD1	225.00
	48 V DC	7UF 4BD2	225.00
Auxiliary	AUX SW right hand 1C	7XA 10A1	140.00
switches	AUX SW right hand 2C	7XA 10B1	280.00
	AUX SW left hand 1C	7XA 10L1	140.00
	AUX SW left hand 2C	7XA 10M1	280.00
	LH AUX support	7XA A03BB	7.20
	RH AUX support	7XA 8038	5.70
Alarm switch	ALT SW right hand	7A9 3811	158.00
Alarm and auxiliary switch	ALT/AUX SW right hand 1C	7AB 901	171.00
Description		Cat. No.	Price
External ac	cessories		
Attached	3P attached busbars (6)	78 381	53.00
busbars			
Screw tunnel terminal	3P solderless term. (6)	7T 3B1	101,00
Handle	Variable depth, door interlocking handle	TFH 33LE	260.00
operator	IP 55 direct mounting to MCCB handle	TFJ 33LU	275.00
Handle lock	Handle lock	7KB 3BA	35.00

2002/2004

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Catalogue

INCLUDES AND ACCESSORIES PANELBOARDS, LOADCENTRES CIRCUIT BREAKERS,













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DC magnetic types 630 A - 2500 A

- Magnetic trip units in all sizes for DC applications
- 5 ratings to 2500 A
- Size range 630 2500 A
- 2 and 3 pole versions available





Ampere		四周周
rating (A)	Cat. No. ") ")	Price \$
1000		5860.00
1250	X51250ND ')	7370.00
1600	XS1600ND ')	12150.00
2000		13400.00
2500		15020.00

Note: All TemBreak thermal magnetic MCCBs can be used for DC applications

Ampere frame	1000		1250		1600		2000		2500	
Type	A510	X510G0ND		XS1252ND		X3160690	KSZMGAID		X52500MD :	
Number of poles	2	3	2	3	2	1	2	3	2 3	3
Rated current (A).in										
Cultbrated at 45 °C	1000		1250		1500		2000		2500	
DC RATED OPERATIONAL VOLTAGE (Ue) (V DC)	250	0 600	250	600	250 600	250 600	250 600	600		
DC RATED INSULATION VOLTAGE (UI) (V DC)	600		600		600		600		600	
DC RATED BREAKING CAPACITY (NA)						-		100		
IEC 947-2 [los] /EC 947-2 [los] ') 600	٧.	20/10	+0	20/15	-	20/15		2015		29/15
BS EN 60947-2 [lou] / BS EN 60947-2 [lou] ") 500	V -	20/10	410	20/15		20/15		20/15	-	29/15
CEI EN 60947-2 CEI EN 60947-2 9 350	٧.	30/15		30/23		30/23		3073		30/23
250	V 40/12		40/30	*	40/30		40/30	*	40/30	+
DUTLINE DIMENSIONS (mm)	100	9,63	60	-	Sec.		100	-	100	
a d	210		210		210		320		320	
	273	b	370		370		450		450	
B 9 4 6	103		140		140		185		185	
	145	-	191		191	-	245		245	
Weight (kg) ◆ marked standard type	9.2	10.3	23.8	26.0	24.0	27.0	50.0	54.0	55.7	62.5

Notes: ') 3 pole sizes stocked

- 9) Mounting details for DC Applications series are identical to those for the same frame size Standard series (i.e. for XS1000ND refer to XS800NJ, XS1250ND and XS1600ND refer to XS1600NE, XS2000ND and XS2500ND refer to XS2500NE)
- ") Many accessories are common with AC types though please refer to NHP for correct Cat. No.s.
- The time constant (L/R) of the circuit should be less than 2.0 ms at or below rated current, less than 7 ms for short circuit equal and below 10 kA, less than 15 ms for short circuit over 10kA and the connection should be three poles in series.

Available on indent only.

UVTs AVAILABLE NOW

TemWay busbar chassis assemblies TemBreak MCCBs

- Standard AS 3439
- Suits TemBreak MCCBs 125-250 A.
- Top and bottom feed.

30

36

42

527

632

737

Busbars fully insulated.





535.00

650.00

735.00

622.00

XA to suit XS125/XH125 MCCBs

	Dim, C 1)	Pan ')				XA chassis
No. Poles	Height (mm)	Height (mm)	Cat. No. ') ')	400A Price \$	630A Price \$	800A Price \$
6	92	90	XA-XXX-6U	170.00	180.00	190.00
12	182	180	XA-XXX-12U	205.00	260.00	270.00
18	272	270	XA-XXX-18U	275.00	330.00	355.00
24	362	360	XA-XXX-24U	335.00	420.00	440.00
30	452	450	XA-XXX-30U	395.00	500.00	530.00
36	542	540	XA-XXX-36U	485.00	600.00	₫ 640.00
42	632	630	XA-XXX-42U	535.00	675.00	720.00
48	722	720	XA-XXX-48U	765.00	750.00	790.00
60	902	900	XA-XXX-60U	840.00	920.00	965.00
72	1082	1080	XA-XXX-72U	1025.00	1095.00	1155.00
XB to	suit XS250	XH250 M	CCBs			
6	107	105	XB-XXX-6U	-	235.00	255.00
12	212	210	XB-XXX-12U		270.00	306.00
18	317	315	XB-XXX-16U		360.00	412.00
24	422	420	VP. VVV. 2ALL	THE RESERVE	435.00	519.00

XBS 800A Hybrid to suit XS125/XH125 & XS250 MCCBs

XB-XXX-30U

XB-XXX-36U

XB-XXX-42U

525

630

735

No. Poles	Dim. C ²) Height (mm)	Pan ') Height (mm)	No. XS250	No. XS/XH125	Cat. No. ")	Price \$
12	197	195	6	6	XBS900-B6-A6U	390.00
18	287	285	6	12	XBS800-B6-A12U	515.00
24	377	375	6	18	XBS800-B6-A18U	675.00
30	467	465	6	24	XBS800-B6-A24U	B15.00
36	557	555	6	30	XBS800-B6-A30U	950.00
18	302	300	12	6	XBS800-B12-A6U	515.00
24	392	390	12	12	XBS800-B12-A12U	675.00
30	482	480	12	18	XBS800-B12-A18U	815.00
36	572	570	12	24	XBS800-B12-A24U	950.00
42	662	660	12	30	XBS800-B12-A30U	1090.00

Notes: Available on indent only

- ") "XXX" insert busbar current rating ie 400 = 400A
- 1) XA 400A also available in 4 pole configuration to special order
- 1) Dim. C is length of excutcheon cutout
- *) Busbars extend 50 mm beyond length of pan top and bottom
- 1) XBS chassis to suit XH250 MCCBs also available to special order XA, XB, XBS chassis are available in single sided configuration refer NHP.

Active 10/12/2014 Page 189 of 441 81

O-Pulse Id TMS972

TemWay bushar chassis assemblies

TemWay busbar chassis assemblies TemBreak MCCBs



XB chassis

XC 1000A hybrid to suit XS125/XH125 & XS250 MCCBs

No.	Dim. C °)	Pan 7)		
Poles	Height mm	Height mm	Cat. No. *) *)	Price \$
12	10)	10)	XC1000-12U	<u>i</u> 495.00
18	10)	10)	XC1000-18U	680.00
24	10)	10)	XC1000-24U	i 875.00
30	10)	10)	XC1000-30U	1025.00
36	10)	10)	XC1000-36U	1215.00
42	10)	10)	XC1000-42U	i 1445.00
XC with 4	00A tee-off to suit XS	6400MCCB (Max 2)	Add each	304.00

Notes: i Available on indent only using special order form.

6) Dim. C is length of escutcheon cutout.

7) Busbars extend 50 mm beyond length of pan top and bottom.

*) Specify quantity of 125A and 250A MCCBs when ordering.

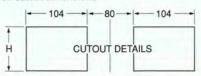
") XC chassis to suit XH250 MCCBs also available to special order.

Dimension dependant on MCCB frame size refer ref. Drawing PD100466. XC chassis are available in single sided configuration refer NHP.

Technical data

Chassis						MCCB	dimension	s (mm)
style	Α	kA		MCCBs		Н	W	D
XA	400	31.5 kA	1 sec	125 A	1 pole	155	30	86
	630	31.5 kA	1 sec	XS, XH	3 pole	155	90	86
	800	35 kA	1 sec	1-3 pole				
XB	630	31.5 kA	1 sec	160-250 A	XS	165	105	96
	800	31.5 kA	1 sec	XS, XH	XH	165	105	103
	800	35 kA	1 sec	refer NHP				
XC	1000	50 kA	1 sec					

Escutcheon cutout dimensions



Standard MHC chassis assemblies

The MHC chassis provides a new concept of compact, economical and space saving design for main and distribution switchboards.

The MHC enables designers to use modern high performance Terasaki moulded case circuit breakers in lieu of more traditional CFS unit stacks.

The MHC has been completely designed, developed and manufactured in Australia by NHP to suit local conditions.

All circuit breakers are REVERSE FED as standard enabling MCCBs to vent unimpeded.

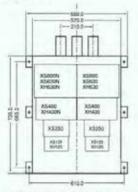
MHC offers compact size, safety, versatility and economy.

Versatility: MHC offers a choice of front or rear connection making it ideal for form 2' or form 3' applications.

Tests: MHC has been short circuit tested and will withstand a short circuit of 50/65kA for one (1) second.

Current carrying capacity: The MHC chassis has been successfully tested at Queensland University of Technology. The MHC main busbar has a full load rating of 1400-1600 A or 2000 A if rear connected.

MHC chassis assemblies Sample cutout





Refer to NHP for new single sided and 65kA MHC chassis types

NOTE

MHC chassis assemblies are manufactured to order.

Dimensions in (mm). To calculate the size of chassis required, match the breakers to be used against the number of unit modules shown above then select next nearest larger assembly from accompanying price list, eg. above space required is 15.5 unit modules, next nearest standard size is MHC 18 unit modules. Layout forms are available to assist with determining dimensions.

Note: Dimensions shown apply to standard type only. For information on special designs, such as form 2 and 3 segregated breakers behind individual doors, centre feed, or dual feed type please enquire at you nearest NHP office or agent.

Use table 2, to calculate price of standard pan assembly (less tee-offs)

Refer NHP for dimensions

Table 1. Tee-offs only ')

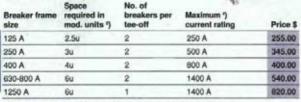


Table 2, MHC pan assembly and busbars (add to table)

Size in modular units	Height (mm) *) units	Width (mm) ') units	Depth (mm) *) units	Cat. No.	1400 1600 amp ") amp ") Price \$ Price \$
12u (10)	650	570	238	MHC/12	690.00 910.00
18u	860	570	238	MHC/18	910.00 1145.00
24u	1070	570	238	MHC/24	1005.00 1320.00
30u	1280	570	238	MHC/30	1155.00 1525.00
36u	1490	570	238	MHC/36	1275.00 1675.00
42u	1700	570	238	MHC42	1460.00 1900.00

Notes: 1) Centre feed - 11) RC 2000A \$860.00

- 7) Only circuit breakers with the same number of modular units can only be mounted opposite each other.
- 1) Add this price to the list price of chassis assembly in table 2. Single pole MCB may only be mounted on the extremities of the chassis.
- 1) Reference and max. current rating of tee off.
- Enclosure rated.
- Height includes 125 mm busbar overhand at the top of chassis
- Chassis width 570 mm (less mounting feet), overall width 650 mm.
- Depth 238 mm with breakers fitted 135 mm less breakers.
- PVC dioped bar not available. Fibreglass screen supplied in lieu.
- ⁽ⁱ⁾ Not suitable for centre feeding.
- ") Relates to current rating of terminal only.

Main bars remain 1600 A nominally but effectively increased due to "centre feed". Busbar is conservatively rated will carry 1250 amp enclosed or 1400 amp open.

Full length fibreglass screen - add \$89.00 (incl. fitting - all sizes).

Please specify when ordering.

Circuit breakers are reverse fed - as standard incl 1250 A.

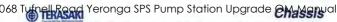
Horizontal mounting please specify when ordering. Special spacers required.

Special modified terminal cover for MCCBs available POA

Layout drawing on an approved form must accompany order.

Options: Dual feed, split tariff segregation barrier 35 mm or 70 mm, single sided chassis.

Q-Pulse Id TMS972 Active 10/12/2014 Page 192 of 4414



TemBreak MCCB accessories UHC chassis - 400 / 415 - 1100 V rated

The Hi-Tem UHC chassis is designed to suit TemBreak MCCBs up to 1100 V. The UHC chassis has two short circuit withstand ratings being 50 kA or 63 kA. The thermal ratings varies according to the type of connection and the ambient temperature (see table below for details). The chassis can be mounted vertically or horizontally.

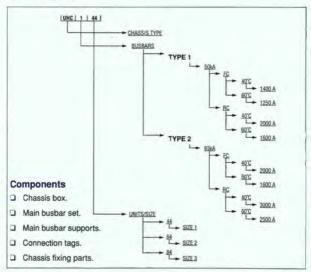
The design lends itself to Form 2 switchboard construction. MCCB's are mounted in a single stack formation with all MCCB toggles aligned. Connection tags are provided as standard which allows connection to the top, bottom or rear of the chassis.



Features

- Modular construction.
- Generous sized modules improved cooling.
- Fast delivery for stock components.
- Incoming terminal connections.
- ☐ Type test 50 kA UHC 1 63 kA UHC 2.
- Choice of busbar ratings.
- Suitable for line voltage up to 1100V.

Selection guide



068 Tufnet Road Yeronga SPS Pump Station Upgrade OMASSINGAL TemBreak MCCB accessories - UHC chassis

Chassis Enclosure size

Туре	Withstand rating 1 kA for 1 sec	Unit	Width (mm)	Overall height (mm)	Price \$
1	50	44	500	930	810.00
1	50	64	500	1330	1260.00
1	50	84	500	1730	1570.00
2	63	44	500	930	1330.00
2	63	64	500	1330	1990.00
2	63	84	500	1730	2570.00

Ordering details:

1. Add TEE OFFs to chassis box price after selecting MCCBs to be included in configuration

2. Add optional accessories below as required in order to build up a list price

3 Pole TEE OFFs

Frame	Frame amp. (A)	Space req. in units	Height (mm)	Price \$
TL100EM	100	6U	120	235.00
XS/XH125	125	6U	120	245.00
XS250NJ	250	6U	120	250.00
XH160/250				250.00
XS/XH400	400	8U	160	305.00
XV400NE				
XS/XH630	630	12U	240	385.00
XV630PE				
XS/XH800	800	12U	240	385.00
XV800PE				
XS1250SE	1250	12U	300	610.00
XV1250NE				A 100 P. S

Optional accessories

Chassis and tag OETL 1600 / 1250 UHC Chassis	3890.00
Connection tag front connect 50 kA	410.00
Connection tag front connect 63 kA	820.00
Connection rear tag connect 50 kA	410.00
Connection rear tag connect 63 kA	820.00
Blanking plate 6 units wide for 125 & 250 A MCCBs	27.00
Blaking plate 8 units wide for 400 AF MCCBs	31.50
Blanking plate 12 units wide for 630 - 1250 A MCCBs	41.50
End cover UHC front connected	58.50
End cover UHC rear connected	58.50

Ruchar rating

-	Open ven	tilated	Enclosed nor	Short circuit	
Model	40 °C Front connect	40 °C Rear connect	60 °C Front connect	60 °C Rear connect	withstand kA for 1 sec.
UHC1 2)	1400	2000	1250	1600	50 kA
UHC2 2)	2000	3000	1600	2500	63 kA
-	2000	0000	1000	2000	00 101

Notes: 1) Specify front or rear connection. 2) Basic chassis assembly less tee-offs kits.

3 - 86 All prices are exclusive of GST. Q-Pulse Id TMS972 Active 10/12/2014 Page 1944114



068 Tufnell Road Yeronga SPS Pump Station Upgrade OM Manual

TemBreak accessories NHP TemPlug - Vertical type ')

- Available for MCCBs from 125-800 amp frame.
- Easily fitted using supplied hardware.
- Moulding constructed from UL approved glass filled polyester.
- Polycarbonate terminal cover supplied as standard.
- Assembly bolts directly to module gear plate.
- Low resistance connection.
- Low watts loss and temperature rise.
- Silver plated contacts with domed face for increased contact pressure.

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-	Ŀ	ä		k					

rating (A)	мссв	Cat. No. ')	Price \$
up to 12 A	XM30PB	UPX330PB	173.00
125	XH125NJ	UPX3125	162.00
250	XH250NJ	UPX3250	173.00
400	XS400	UPX3440	225.00
800	XS630/800	UPX3800	440.00





Vertical TemPlug and MCCR

Cut-out for TemPlug

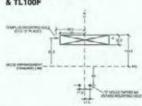
TemPlug (125) cut-out & XM30PB

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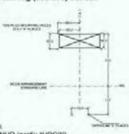
TemPlug (400) cut-out

MATERIAL STATES

TemPlug (250) cut-out & TL100F

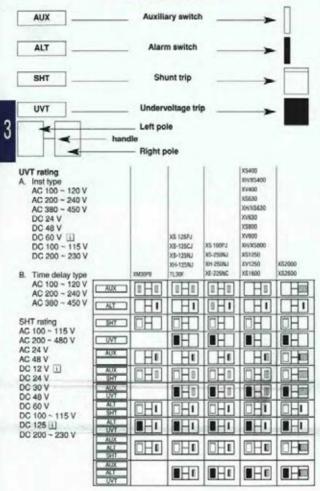


TemPlug (630/800) cut-out



Notes: 1) Horizontal type available on indent only. Horizontal busplugs are available refer to NHP (prefix "HBC3"). Specify left or right mounting. 068 Tufnell Road Yeronga SPS Pump Stat**lan Upgrade Old Manu**al

TemBreak standard combination of internally mounted accessories



^{3 - 88} Q-Pulse Id TMS972 Active 10/12/2014 Page 196 of 441

068 Tufnell Road Yeronga SPS Pump Station Upgrade

TemBreak 1100V mining circuit breakers TL100EM

Current rating: 15-100A

Approvals and tests:

Complies with AS 2184 / AS 3947-2 Complies with IEC 947-2

Interrupting capacity:

10 kA at 1000 V AC (sym) 6.5 kA at 1100 V AC (sym) 1)

Trip unit: Fixed

Thermal setting: Flored 40 °C industrial

45 °C and 50 °C marine Fixed

Magnetic setting:



Dimensions (mm)

Poles	3
Н	165
W	105
D	125
kg	3.2

Ampere rating	Cat. No.	Price \$
15	TL100EM 15 3	1150.00
20	TL100EM 20 3	1150.00
30	TL100EM 30 3	1150.00
40	TL100EM 40 3	1150.00
50	TL100EM 50 3	1150.00
60	TL100EM 60 3	1150.00
75	TL100EM 75 3	1150.00
100	TL100EM 100 3	1150.00

Notes: 1) Ratings based upon IEC 947-2. Magnetic only available on application.

> Note: When TL100EM MCCBs are mounted flush next to one another, a line side terminal cover (TL100EMLTC) MUST be used to provide adequate insulation

The state of the s	Accessor	ies	to	suit	TL1	00	EM
--	----------	-----	----	------	-----	----	----

Description	Accessories to suit	TL100/EM Cat. No.	Price \$
Internal acc	cessories		
Shunt trips	110 V AC sht (100-115 V)	7VF 2M1	164.00
	240 V AC sht (200-480 V)	7VF 2M2-B 7VF 2M4 7VF 2M6	164.00
	110 V DC sht (100-110 V)		164.00
	48 V DC sht		164.00
	24 V DC sht	7VF 2M7	164.00
	24 V AC sht	24V AC SHT	177.00
Undervoltage	440 V AC	7UF 2D58	210.00
trips	110 V AC	7UF 2D6B	210.00
	240 V AC	7UF 2D7B	210.00
	110 V DC	7UF 2FD1	210.00
	24 V DC	7UF 2FD2	210.00
Auxiliary	AUX SW right hand 1C	7XA 2D31B	140.00
switches	AUX SW left hand 1C	7XA 2D41B	140.00
Alarm switches	ALT SW right hand	7AB 2D11B	140.00
Description		Cat. No.	Price \$
External ac	cessories		
Screw tunnel lugs	3 P solderless term. (6)	7T 2M1	65.00
Rear connect studs	3 P RC studs (6)	7RC 2LE	122.00
Motor	110 V AC motor	7MB 3BA1	1170.00
operators	240 V AC motor	7MB 3BA2	1170.00
Handle	Anti clockwise handle kit	TFH 22D	195.00
operators	IP 65 handle kit	TLK 22D	205.00
	IP 55 handle mech ")	TFJ 22LU	195.00
Handle locks	Handle lock	7KB 3BA	35.00
	lock plate	UXKE0030A	1.10
Terminal	Terminal cover (Qty one)	TL100EMLTC	96.00
cover	Fits line or loadside		
Accessory	Accessory lead term, blk	7YD3	32.50

') Flush plate included.

lead terminal

068 Tufnell Road Yeronga SPS Pump Station Upgrade OM Manual

TemBreak 1100 V mining circuit breakers Electronic XV400NE

12.5 kA

Current rating: 80-400 A

Approvals and tests:

Standards AS 3947-2 Complies with IEC 947-2

Interrupting capacity:

12.5 kA at 1100 V AC (IEC 947-2)

Trip unit: Fixed

LTD adj: I₁: 0.8-1 t: 5-30 s STD adj: I₃: 2-10 t: 0.1-0.3 s

INST adj: 12: 3-12

PTA adj: I_g: 0.7-1 t: fixed at 40 s (sep control power req.)



Dimensions (mm)

3
260
140
103
5.0

XV400 MINING BREAKERS MUST USE LINE SIDE TERMINAL COVERS AND WITH TERMINAL BOLT COVERS. (Terminal covers and bolt covers supplied with breaker ') ')

Ampere rating NRC	ASR Min	ASR Max	Cat. No.	Price \$
160	80	160	XV400NE 160 3 7)	2090.00
250	125	250	XV400NE 250 3 1)	2090.00
400	200	400	XV400NE 400 3 °)	2160.00

NRC: Nominal rated current ASR: Adjustable setting range

Overcurrent trip combinations: (specify combinations req)

LSI - standard, LS - optional,

LSIP - optional (pre-trip alarm).

Special current ratings available on indent refer NHP.

Note: ') Applicable for front and rear connected MCCBs.

 For FAULT INDICATION option add "FI" and nominate control voltage.

Installation and incoming connection information can be found on page 9-30.

Accessories to suit 400AF

Description		Cat. No.	Price \$
Internal ac	cessories		
Shunt trips	110 V AC/DC (100 - 115 V)	2H1305BAA	255.00
	240 V AC (200 - 480 V)	2H1306BAA	255.00
	12 V DC	2H1307BAA	255.00
	24 V DC	2H1308BAA	255.00
	48 V DC	2H1309BAA	255.00
	200 V DC (200 - 230 V)	2H1310BAA	255.00
	24 V AC	2H1311BAA	255.00
	48 V AC	2H1312BAA	255.00
Under voltage	AC coil ')	2H1492BAA	210.00
trips	100-230 V DC coil *)	2H1493BAA	210.00
	24 V DC coil *)	2H1494BAA	210.00
	48 V DC coil ')	2H1495BAA	210.00
1	60 V DC coil ')	2H1496BAA	210.00
	110 V AC instantaneous controller	UXUB0013B	75.50
	240 V AC instantaneous controller	UXUB0014B	75.50
	440 V AC instantaneous controller	UXUB0015B	75.50
	110 V AC time delay controller	UXUB0016B	146.00
	240 V AC time delay controller	UXUB0017B	146.00
	440 V AC time delay controller	UXUB0018B	146.00
	200-230 V DC controller	UXUB0038B	75.50
Auxiliary	AUX SW right hand 1C	UXXB0004D	108.00
switches	AUX SW right hand 2C	UXXB0005D	138.00
	AUX SW right hand 3C	UXXB0006D	159.00
Alarm switch	ALT SW right hand	UXLB0009D	113.00
	ALT/AUX SW right hand 1C	UXLB0013D	121.00
Alarm &	ALT/AUX SW right hand 2C	UXLB0014D	142.0
auxiliary		Contract Contract	
switch		The state of the s	
Pre-trip alarm	For electronic OCR MCCBs only	Pre-trip alarm	540.00
Fault	Side of breaker mounted module.	add "FI" then	730.00
indication &	Electronic MCCBs only	voltage	
contacts		2000	

Note: Refer page 4-6 for footnotes.

Q-Pulse Id TMS972 Active 10/12/2014 Page 200 of 441 12

068 Tufnell Road Yeronga SPS Pump Station Upgrade OM Manual

Accessories to suit 400AF

Description		Cat. No.	Price \$
External ac	cessories		
Attached busbars	3 P attached busbars (6 in kit)	2H1384DAA	145.00
Screw tunnel terminals	3 P solderless term (6 in kit)	2H2012DAB	285.00
Crimp lugs	Compression term (80mm²)	804BA	19.40
	Compression term (100mm²)	1004BA	21.60
	Compression term (150mm²)	1504BA	26.80
Rear connect studs	3 P RC studs (6 in kit)	UXRC0006C	540.00
Motor	110 V AC motor 11)	UXMC0001B	1590.00
operators	110 V DC motor 11)	UXMC0003B	1590.00
(XMC4)	24 V DC motor 11)	UXMC0004B	1590.00
	240 V AC motor ")	UXMC0005B	1590.00
	Motor base support 11)	UXMD0001B	31.00
Mechanical	3 P mech I/lock 3)	UXKC0001B	370.00
interlocks	3/4 P mech I/lock 4)	UXKC0002B	370.00
Cable	Interlock cable (wire)	UXKC0020A	55.00
mechanical interlocks	Cable interlock mechanism ⁶)	UXKC0021B	164.00
Handle	Variable depth handle. Door interlocking	XFHA34	255.00
operators	IP 65 rated variable depth handle. Door interlocking	TLKA34	410.00
	IP 55 direct mount rotary handle mechanism 7)	TFJ34XU	275.00
Handle lock	Handlelock	UXKB0006A	41.00
	Key interlock (L&F type) incl TFJ mechanism		790.00

Note: Refer page 4-6 for footnotes.

Accessories to suit 400AF

Description		Cat. No.	Price \$
External ac	cessories		
Terminal covers	3 P front connecting terminal cover - busbar connect type	2H1413DAA	126.00
(Set of 2)	3 P front connecting terminal cover - cable connect type	2H1415DAA	126.00
	IP 20 protective cover - busbar connect type ⁶)	2A1787DBA	3.80
	IP 20 protective cover - cable connect type *)	2A1788DAA	3.80
	3 P rear connecting terminal cover	UXPD0011B	126.00
	4 P rear connecting terminal cover	UXPD0012A	162.00
Accessory	Accessory lead terminal	UXYD0001A	17.60
lead terminal	Terminal and bolt °)	UXYD0002A	1.20
Interpole barrier	Interpole barrier 10)	UXQH0004A	6.70
OCR sealing kit	Tamperproof cover for the OCR adjustment dials	XS400OCRSK	37.00

Notes: 1) An AC UVT controller is required for 100-440 V AC.

2) A DC UVT controller is needed for 200-230 V DC operation. None required for 24-110V DC.

3) For 3 P circuit breakers without motors.

1) For 4 P circuit breakers without motors or 3 P circuit breakers with motors.

5) For 4 P circuit breakers with motors.

Order one interlock mechanism for each circuit breaker.

7) Flush plate included.

) 6 pieces required for 3 P.

9) Specify quantity required (up to 6 pieces).

10) 6 pieces supplied as standard for XV400NE.

11) Order one motor base support per motor.

Yeronga SPS Pump Station Upgrade OM Manual

TemBreak 1100V mining circuit breakers Electronic XV630PE, XV800PE

18 kA

Current rating:

200-800 A

Approvals and tests:

Standards AS 2184, AS 3947-2 Complies with IEC 947-2

Interrupting capacity:

18 kA at 1000 V AC 1) (IEC 947-2) 12.5 kA at 1100 V AC 2)

13: 3-12

Trip unit: LTD adi:

STD adj:

1.: 0.8-1 12: 2-10

INST adj: PTA adi:

Ip: 0.7-1 or GFT adi: Ig: 0.1-0.4 t: 5-30 s t: 0.1-0.3

t: fixed at 40 s (sep control power req.) t: 0.1, 02, 0.3, 0.4 or 0.8 s



Dimensions (mm)

3
273
210
103
11.00

XV630/800 MINING BREAKERS MUST USE EITHER LINE SIDE TERMINAL COVERS OR INTERPOLE BARRIERS (Not supplied with breaker) 5)

Ampere rating NRC	ASR Min	ASR Max	Cat. No.	Price \$
400	200	400	XV630PE 400 3 ')	2330.00
630	315	630	XV630PE 630 3 ')	2910.00
800	400	800	XV800PE 800 3 1)	4360.00

NRC: Nominal rated current ASR: Adjustable setting range

Overcurrent trip combinations: (specify combinations req)

LSI - standard. LS - optional.

LSIP - optional (pre-trip alarm)

Notes: 1) Actual test voltage 1105V. 3) Actual test voltage 1165V.

3) H excludes attached busbar.

1) For FAULT INDICATION option add "FI" and nominate control voltage.

5) Installation and incoming connection information can be found on page 9-30.

Description		Cat. No.	Price \$
Internal acce	essories		
Shunt trips	110 V AC/DC	2H1515BAA	285.00
	240 V AC	2H1516BAA	285.00
	12 V DC	2H1517BAA	285.00
	24 V DC	2H1518BAA	285.00
	48 V DC	2H1519BAA	285.00
	200 V DC	2H1520BAA	285.00
	24 V AC	2H1521BAA	285.00
	48 V AC	2H1522BAA	285.00
Under voltage	AC coil 1)	2H1503BAA	260.00
rips	100-230 V DC coil 2)	2H1504BAA	260.00
	24 V DC coil 2)	2H1505BAA	260.00
	48 V DC coil 2)	2H1506BAA	260.00
	60 V DC coil 2)	2H1507BAA	260.00
	110 V AC instantaneous controller	UXUB0013B	75.50
	240 V AC instantaneous controller	UXUB0014B	75.50
	440 V AC instantaneous controller	UXUB0015B	75.50
	110 V AC time delay controller	UXUB0016B	146.00
	240 V AC time delay controller	UXUB0017B	146.00
	440 V AC time delay controller	UXUB0018B	146.00
	200-230 V DC controller	UXUB0038B	75.50
Auxiliary	AUX SW right hand 1C	UXXB0007D	108.00
switches	AUX SW right hand 2C	UXXB0008D	127.00
	AUX SW right hand 3C	UXXB0009D	149.00
Alarm switch	ALT SW right hand	UXLB0010D	113.00
Alarm & auxiliary	ALT/AUX SW right hand 1C	UXLB0015D	128.00
switches	ALT/AUX SW right hand 2C	UXLB0016D	150.00
Pre-trip alarm	For electronic OCR MCCBs only	Add "LSIP"	562.00
Fault	Side of breaker mounted module. Electronic	add "FI" then	730.00
indication & contacts	MCCBs only	voltage	
Earth fault	Earth fault, electronic breakers only (4th CT's	Add "LSIG"	730.00
option with	included)		

trip Note: Refer page 4-10 for footnotes.

external 4th CT's

Extra low or

high magnetic

630 A 4th CT

800 A 4th CT

applications

All prices are exclusive of GST. Q-Pulse Id TMS972 Active 10/12/2014

Special selectivity, generator or marine

Page 204 6 44 T2

UXOY0001A

UXOY0002A

275.00

275.00

120.00

Accessories to suit 630-800AF

Description		Cat. No.	Price \$
External ac	cessories		
Screw tunnel terminals	3 P solderless terminals for 630AF (6 in kit)	TXLD0005A	265.00
Rear connect studs	3 P rear connect studs, 630/800AF (6 in kit)	UXRC0008B	1010.00
Motor	110 V AC motor ^a)	UXMC0006B	2160.00
operators	110 V DC motor *)	UXMC0008B	2160.00
(XMC6)	24 V DC motor ^s)	UXMC0009B	2160.00
	240 V AC motor *)	UXMC0010B	2160.00
	Motor base support *)	UXMD0002B	31.00
Mechanical	3 P mech I/lock rear mounting	UXKC0004A	240.00
interlocks	Interlock cable (wire)	UXKC0020A	55.00
	Cable interlock mechanism 4)	UXKC0022B	210.00
Handle	Variable depth handle. Door interlocking	XFHA46	310.00
operators	IP 65 rated variable depth handle. Door interlocking	TLKA46	475.00
	IP 55 direct mount rotary handle mechanism 7)	TFJ36XU	355.00
Handle extension	Handle extension	2A2272BAB	82.00
Handle lock	Handle lock	UXKB0002A	41.00
	Key interlock (L&F type) incl TFJ		790.00

Note: Refer page 4-10 for footnotes.

068 Tufnell Road Yeronga SPS Pump Station Uppgrade OM Manual

Accessories to suit 630-800AF

Description		Cat. No.	Price \$		
External accessories					
Terminal	3 P front connecting terminal cover	2H1417DAA	148.00		
covers	IP 20 protective cover ⁶)	2A1788DAA	3.80		
(Set of 2)	3 P rear connecting terminal cover	UXPD0013C	147.00		
Accessory	Accessory terminal block	UXYD0001A	17.60		
lead terminal	Terminal and bolt 7)	UXYD0002A	1.20		
Interpole	Interpole barrier (Qty 1)	UXQH0004A	6.70		
barrier		1			
OCR	Tamperproof cover for the OCR	XS630OCRSK	37.00		
sealing kit	adjustment dials	And the second			

Notes: 1) An AC UVT controller is required for 100-440 V AC.

2) A DC UVT controller is needed for 200-230 V DC operation. None required for 24-110 V DC.

³) Order one interlock mechanism for each circuit breaker. ") Flush plate included.

5) 6 pieces required for 3 P.

9) Specify quantity required (up to 6 pieces).

7) Flush plate included.

*) Order one motor base support per motor.

. . .

068 Tufgell Road Yeronga SPS Pump Station Upgrade OM Manual

TemBreak 1100V mining circuit breakers Electronic XV1250NE

20 KA

Current rating:

200-1250 A

t: 5-30 s t: 0.1-0.3 s

Approvals and tests:

Standards AS 3858, IEC 947-2

Interrupting capacity:

20 kA at 1100 V AC (IEC 947-2)

Trip unit:

Fixed

LTD adi: STD adj: 1.: 0.8-1

12: 2-10 12: 3-12

INST adi: lo: 0.7-1 PTA adi:

Ig: 0.1-0.4

t: fixed at 40 s (sep control power reg.) t: 0.1, 0.2, 0.3, 0.4 or 0.8 s

or GFT adj:

Dimensions (mm)

Poles 3 H 1) 370 w 210 120 D 22.0 kg 4 pole POA XV1250 MINING BREAKERS MUST USE **EITHER LINE SIDE TERMINAL COVERS OR INTERPOLE BARRIERS** (Not supplied with MCCB)

Ampere rating NRC	ASR Min	ASR Max	Cat. No.	Price \$
400	200	400	XV1250NE 400 3 FC	5630.00 ²)
800	400	800	XV1250NE 800 3 FC	5630.00 ²)
1000	500	1000	■ XV1250NE1000 3 FC	5630.00 ²)
1250	630	1250	XV1250NE1250 3 FC	7230.00 ²)

NRC: Nominal rated current

Adjustable setting range Overcurrent trip combinations: (specify combinations reg)

> LSI - standard. LS - optional.

LSIP - pre-trip alarm,

LSIG - trip indicators - optional

Notes: 1) H excludes attached busbar.

2) For FAULT INDICATION option add "FI" and nominate control voltage.

a) Installation and incoming connection information can be found on page 9-30.

i Available on indent item.

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Description		Cat. No.	Price S
Internal ac	cessories		
Shunt trips	110 V AC/DC (110-115V)	2H1197BAA	345.00
	240 V AC (200-480V)	2H1198BAA	345.00
	12 V DC	2H1199BAA	345.00
	24 V DC	2H1200BAA	345.00
	48 V DC	2H1201BAA	345.00
	200 V DC (200-230 V)	2H1202BAA	345.00
	24 V AC	2H1203BAA	345.00
	48 V AC	2H1204BAA	345.00
Under	AC coil 1)	2H1208BAA	280.00
voltage trips	100-230 V DC coil 2)	2H1209BAA	280.00
	24 V DC coil 2)	2H1210BAA	280.00
	48 V DC 2)	2H1211BAA	280.00
	60 V DC 2)	2H1212BAA	280.00
	110 V AC instantaneous controller	UXUB0013B	75.50
	240 V AC instantaneous controller	UXUB0014B	75.50
	440 V AC instantaneous controller	UXUB0015B	75.50
	110 V AC time delay controller	UXUB0016B	146.00
	240 V AC time delay controller	UXUB0017B	146.00
	440 V AC time delay controller	UXUB0018B	146.00
	200-230 V DC controller	UXUB0038B	75.50
Auxiliary	AUX SW right hand 1C / 3 P	UXXB0010D	220.00
switches	AUX SW right hand 2C / 3 P	UXXB0011D	275.00
	AUX SW right hand 3C / 3 P	UXXB0012D	325.00
	AUX SW right hand 1C / 4 P	UXXB0023D	220.00
	AUX SW right hand 2C / 4 P	UXXB0024D	275.00
	AUX SW right hand 3C / 4 P	UXXB0025D	325.00
Alarm	ALT SW right hand / 3 P	UXLB0011D	210.00
switches	ALT SW right hand / 4 P	UXLB0024D	210.00
Alarm &	ALT/AUX right hand 1C / 3 P	UXLB0017D	255.00
auxiliary	ALT/AUX right hand 2C / 3 P	UXLB0018D	305.00
switches	ALT/AUX right hand 1C / 4 P	UXLB0025D	255.00
	ALT/AUX right hand 2C / 4 P	UXLB0026D	305.00

Note: Refer page 4-14 for footnotes



Accessories to suit 1250 A

Description		Cat. No.	Price \$
Internal acc	essories		
Fault indication & contacts	An option for all 1250 A types	Add "FI" then voltage	560.00
Pre-Trip alarm	An option for all 1250-1600 A types	Add "LSIP"	560.00
Earth fault	An option for all 1250-1600 A types	Add "LSIG"	730.00
indication	1000 A 4th CT	AE000YOXU	285.00
	1250 A 4th CT	UXOY0004A	285.00
Extra high instantaneous magnetic trip	An option for all 1000-1600 A types		118.00

External accessories

Rear connect	3 P rear connect studs (6 in kit) 1250 A	2H1959DAB	1160.00
studs			
Motor	110 V AC motor	2H1191CAB	2590.00
operators	110 V DC motor	2H1193CAB	2590.00
(XMD9)	24 V DC motor	2H1194CAB	2590.00
	240 V AC motor	2H1195CAB	2590.00
Mechanical	3 P mech l/lock / 1250 A rear connect	UXKC0006D	580.00
interlocks	3 P mech l/lock / 1600 A rear connect	UXKC0026C	580.00
	Interlock cable (wire)	UXKC0020A	55.00
	Interlock mech 1250 A Cable type *)	UXKC0023B	305.00

Refer page 4-14 for footnotes.

Description		Cat. No.	Price \$
External ac	cessories		
Handle	Variable depth handle. Door interlocking	XFHA49	335.00
operators	IP 65 rated variable depth handle. Door interlocking	TLKA49	465.00
	IP 55 direct mount rotary handle mechanism 4)	TFJ38XU	395.00
Handle extension	Handle extension	2A2272BAB	82.00
Handle lock	Handle lock	UXKB0003A	49.50
	Key interlock (L&F Type) incl TFJ mechanism	•	790.00
Terminal	3 P FC terminal cover / 1250	2H1419DAA	146.00
covers (Set of 2)	IP 20 protective cover 5)	2A1788DAA	3.50
Accessory	Accessory terminal block	UXYD0001A	17.60
lead terminal	Terminal and bolt ^e)	UXYD0002A	1.20
Interpole barriers	Interpole barriers (Qty 1)	UXQH0004A	6.70
OCR sealing kit	Tamperproof cover for the OCR adjustment dials	XS125OCRSK	26.60

Notes: ') An AC UVT controller is required for 100-440 V AC.

- 2) A DC UVT controller is needed for 200-230 V DC operation. None required for 24-110 V DC.
- ³) Order one interlock mechanism for each breaker.
- 4) Flush plate included.
- 5) 6 pieces required for 3 P / 8 pieces required for 4 P.
- Specify quantity required (up to 6 pieces).

4-14

All prices are exclusive of GST.

Q-Pulse Id TMS972 Active 10/12/2014

Page 210 of 441

068 Tutnell Road Yeronga SPS Pump Station Upgrade QM Manual

Basic transfer switches



Details of most common BTS sizes (price on application)



Basic transfer switch (BTS) 3 P/3 P combination shown c/w common loadside busbar option.

Adj. ampere rating	Cat. No. 1) 2)	3)	415 V I/C	MCCB type	Base cur.adj.	н	w	D
80-125	BS1C233		18 kA	XS125CJ	63-100 %	209	305	234
80-125	BS1N233		30 kA	XS125NJ	63-100 %	209	305	234
80-125	BH1N233		50 kA	XH125NJ	63-100 %	209	305	234
160-250	BS2N233		35 kA	XS250NJ	63-100 %	237	336	219
160-250	BH2N233		50 kA	XH250NJ	63-100 %	237	336	219
160-250	BS4C233		35 kA	XS400CJ	63-100 %	342	410	324
250-400	BS4N433		50 kA	XS400NJ	63-100 %	342	410	324
125-250	BS4S233		50 kA	XS400SE	50-100 %	342	410	324
200-400	BH4S433		65 kA	XH400SE	50-100 %	342	410	324
400-630	BS6C633		45 kA	XS630CJ	63-100 %	433	550	341
400-630	BS6N633		65 kA	XS630NJ	63-100 %	433	550	341
315-630	BS6S633		50 kA	XS630SE	50-100 %	433	550	341
315-630	BH6S633		65 kA	XH630SE	50-100 %	433	550	341
500-800	BS8N833		65 kA	XS800NJ	63-100 %	433	550	341
400-800	BS8S833		50 kA	XS800SE	50-100 %	433	550	341
400-800	BH8S833		65 kA	XH800SE	50-100 %	433	550	341
630-1250	BS12S1233		65 kA	XS1250SE	50-100 %	530	553	350
800-1600	BS16S1633		85 kA	XS1600SE	50-100 %	570	443	350
1000-2000	BS20E2033	99	100 kA	XS2000NE	50-100 %	338	774	361
1250-2500	BS25E2533	4)5)	100 kA	XS2500NE	50-100 %	338	774	361

- Notes: 1) 4 pole mixed 3 4 pole of any chosen BTS have unchanged height and depth but have extra width. Refer to NHP for details.
 - 2) Breakers of uneven sizes may be incorporated; please contact NHP
 - 3) SLine transfer switches featuring cable or rod mechanical interlock. Horizontal or vertical forms available refer NHP.
 - 1) Standard configuration is rear connect: all other models are front connect as standard.
 - Enclosed models available on application to NHP.

TemPower BTS up to 6300 A also available.

Manual transfer switches (MTS) are available on application and comprises a mechanical interlock and one auxiliary switch only per MCCB.

All units are POA.

Basic transfer switches (BTS) and manual transfer switches MTS

Option	Description	Price \$
1	Alarm switches	POA
2	Extra AUX contacts ')	POA
3	Common load side busbars	POA
4	Non standard connection	POA
5	Twin handle operation (MTS only)	POA
6	Special enclosures	POA
7	Status indic. lights - FV type (supplied loose)	POA
8	Cable type mechanical interlock	POA
9	Enclosed automatic transfer switches	POA

Note: 1) 1 spare aux. for customer use provided per MCCB = 2 spare per BTS.

Automatic transfer switches choice of logic controller

NHP offers a choice of electro mechanical (relay) logic panels with up to 13 options or a PLC controller. The basic model includes the following standard features: voltage relays, timing relays, time delay normal to emergency and time delay emergency to normal and common power supply relays. A 4 position, mode selector switch is provided loose (manual automatic test off). Up to 13 optional features are available, see table. Special custom designed models using relay logic and designs featuring PLC control logic are available on application.

Transfer switch general definitions

MTS = Manual Transfer Switch: no motors and no logic panel

BTS = Basic Transfer Switch: MCCB's have motors mounted on them, no logic panel

ATS = BTS and logic panel



POA

POA

POA

POA

POA



Panel TemLogic

Optio	n	Code	Price \$
Basic	TemLogic panel	TLP1	1580.00
PLC L	ogic panel	TPLC1	
Optio	onal features 1)		
1	Emergency supply phase sequence relay	EPFR	POA
2	Emergency supply voltage sensing relay	EVSR	POA
3	Emergency supply frequency relay	EFR	POA
4	Engine run in time delay 2)	ERTD	POA
5	Engine start time delay	TDES	POA
6	Inhibit return control Prevents auto return to normal from emergency	IRC	POA
7	Cranking time delay limiter	CLTD	POA
8	Additional mode selector "normal supply"	SSW2	POA
9	Additional contacts for remote indication of mode switch position (includes option 8)	SSW3	POA
5.4	And the second s	100.00	

Special logic panels

10

11

12

13

14

15	Special custom designed logic panels	POA
16	Custom PLC logic panels	POA

Note: 1) When ordering special options please complete order form available from NHP.

2) These options are standard on the PLC logic panel TPLC1.

Alarm lockout relay. Prevents break closure

after overload or short circuit trip

Required for ACB changeover switch 2)

Normal supply phase sequence relay

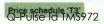
Changeover time delay

Mains stability timer

Custom designed logic panel



Basic logic panel: TLP1



ALR

COTD

NPFR

MSTD

068 Tufnell Road Yeronga SPS Pump Station Upgrade QM Manual

MAC-DT transfer switches

Without 'OFF' position ")

Current rating	No. of poles	No. of Std. auxiliaries	Cat. No. ')	Price \$
100	3	2C	61W - 3FD	1630.00
100	4	2C	61W - 4FD	1860.00
200	3	2C	62W - 3FD	2320.00
200	4	2C	62W - 4FD	2810.00
400	3	2C	64W - 3FD	3740.00
400	4	2C	64W - 4FD	4580.00

Standard voltage: 240 V AC (for availability of 24, 48, 110 V DC and 110 V AC contact NHP). For 2 changeover auxiliary contacts - add suffix -2C additional price 49.00

With 'OFF' position ')

100	3	2C	61WN - 3FD ")	1930.00
100	4	2C	61WN - 4FD 1)	2480.00
200	3	2C	62WN - 3FD 1)	2670.00
200	4	2C	62WN - 4FD ")	3190.00
400	3	2C	64WN - 3FD ')	4070.00
400	4	2C	64WN - 4FD 2)	5050.00
600	3	2C	66WN - 3FD ")	7490.00
600	4	2C	66WN - 4FD ")	9000.00
800	3	2C	68WNA - 3FD ")	8770.00
800	4	2C	68WNA - 4FD ")	10100.00
1000	3	2C	610WN - 3FD 3)	8880.00
1000	4	2C	610WN - 4FD ")	10630.00
1200	3	2C	612WNA - 3FD ')	10100.00
1200	4	2C	612WNA - 4FD ")	11750.00
1600	3	2C	616WN - 3FD *)	10800.00
1600	4	2C	616WN - 4FD ')	12910.00
2000	3	2C	620WN - 3BD ")	18060.00
2000	4	2C	620WN -4BD ")	20640.00
3000	3	2C	630WN - 3BD ")	28410.00
3000	4	2C	630WN - 4BD ")	34560.00
4000	3	20	640WN - 3BD *)	47820.00
5000	3	2C	650WN - 3BD *)	55340.00

Standard voltage: 240 V AC (for availability of 24, 48 110 V DC and 110 V AC contact NHP)

For 2 changeover auxiliary contacts - add suffix -2C additional price 49.00

For more information contact your nearest NHP office

- Notes: ") Prices are for front connected units, rear connected units POA.
 - Prices are for front connected units, rear connected units available from 600A POA.
 - ") Prices are for rear connected units, front connected units are not available.
 - All switches come standard with 1 C/O auxiliary in each position.

All prices are exclusive of GST. Q-Pulse Id TMS972 Active 10/12/2014 Page 214 of 441

068 Tufnell Road Yeronga SPS Pump Station Upgrade OM Manual

MAC-DT transfer switches



Cat. No. 61W-4FD

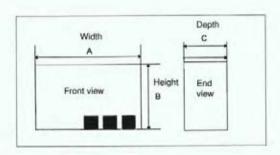


Cat. No. 66WN-4FD

Dimensions (mm)	Width Dim "A"	Width Dim "A"	Height	Depth
Transfer switch	3 pole	4 pole	"B"	"C"
61W/61WN ')	239	269	193	112
62W/62WN 1)	289	329	220	112
64W/64WN 1)	340	400	290	132
66WN ')	465	530	520	220
68WNA ')	465	530	520	220
610WN ')	510	590	600	220
612WNA ')	510	590	600	220
616WN ')	570	670	610	220
620WN ^a)	675	810	580	340
630WN ³)	825	1010	580	370
640WN ³)	1040		610	380
650WN 1)	1190		610	380

Notes: ') Dimensions and weight for front connected units.

Dimensions and weights for rear connected units. All dimensions are in millimetres (mm).



MAC-DT transfer switches



Aichi logic panel - configuration will vary. Indicative picture only.

MAC-DT Automatic transfer switches choice of logic controller

Aichi transfer switches can be supplied with logic panels, which provide a range of features similar to those used in conjunction with Terasaki circuit breakers.

Aichi logic panels

NHP offers a basic electromechanical (relay) logic panel, with up to 11 additional standard options. The basic model includes the following standard features: voltage sensing, time delay from normal to emergency, and time delay from emergency to normal and common power supply relays.

Logic Panels can also be supplied which include, a moulded case circuit breaker for main power short circuit protection, or a logic panel incorporating a programmable logic controller. Contact NHP for additional standard options, or for any other requirements.

Aichi MAC-DT logic panels

Description	Cat. No.	Price \$
Basic logic panel to suit "WN" switches	WNLP1	1580.00
Basic logic panel to suit "W" switches	WLP1	1580.00

5

068 Tufnell Road Yeronga SPS Pump Station Ungrade OM Manual

Aichi MAC-DT logic panels

Standard

	Description	Cat. No.	Price \$
1	Emergency supply phase	EPFR	POA
	sequence relay	1	-
2	Emergency supply voltage sensing relay	EVSR	POA
3	Emergency supply frequency relay	EFR	POA
4	Engine run in time delay	ERTD	POA
5	Engine start time delay	TDES	POA
6	Inhibit return control	IRC	POA
	Prevents auto return to normal	1	
	from emergency		
7	Cranking time delay limiter	CLTD	POA
8	Additional mode selector	refer NHP	POA
	"normal supply" 1)		
9	Additional contacts for remote	refer NHP	POA
	indication of mode switch position	-	
	(includes option 8) 1)		
11	Changeover time delay - required for ACB	COTD	POA
	changeover switch		
12	Normal supply phase sequence relay	NPFR	POA
13	Mains stability timer	MSTD	POA
14	Custom designed logic panel	NAME OF TAXABLE PARTY.	POA

Special logic panels

15	Special custom designed logic
	panels (electro mechanical)
16	PLC logic panels
17	A 3 phase, short circuit
	protection circuit breaker

Cross reference table	Section/page
Accessories	refer NHP
Detailed dimensions	refer NHP

"W" switch logic panel drawing no: 059 AIC1
"WN" switch logic panel drawing no: 059 WNAICHI1

Notes: ") Not available for "W" type Aichi transfer switches. When ordering please complete MCCB/Aichi transfer switch order form available from NHP.

What is an Aichi?

It is not a load break switch or circuit breaker device.

The Aichi Mac DT transfer switch is a solenoid operated
2 or 3 position changeover contactor designed as a
switch for emergency power changeover.

There is simply nothing else quite like it on the Australian market



While being able to switch large currents. Aichi Mac DT switches are extremely compact and shallow allowing for lower cost installations. A low power requirement is another plus because Aichi switches permanently latch either way so zero power is consumed unlike ordinary contactors for example. No coil heat means smaller enclosures!

Aichi can also be converted to a smarter Automatic Transfer Switch via a compact logic panel which senses circuit conditions in order to automatically changeover when needed. Available in 3 or 4 pole models up to 5000 A, making Aichi a real contender.

MINE ELECTRICAL ENGINEERING PR

5 4

The NEW AR Air Circuit Double Breaker

DoubleBreak · DoubleInsulated · DoubleCam · DoubleClosingForce · DoubleArcLength · DoubleLife



Very compact dimensions The smallest depth ACB in the world with an low of 1 second

Very little clearance space equired at the top of the ACB allowing vertical stacking.



control circuit



UNIQUE PATENTED double contact breaking system. 20 World Patents in all.

> Extremely fast clearing time of 30 increase in le as a result of fewer moving parts.





ability. Analogue 4 mA - 20 mA



Up to eight ACBs can be remote operated via the APR operator panel.





ustable LSI settings d thermal memory.

Double insulated front body. One touch flet



Time 2 switch over to

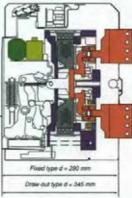
Tem Power

ELECTRICAL ENGINEERING PRODUCTS PTY LTD

The New TemPower Air Circuit Breaker

The TemPower 2 ACB is the result of an intensive market research program over the last 5 years taking into account the requirements of switchboard manufacturers, consultants and end users.

Using the latest 3D design software and Innovative manufacturing techniques, Terasaki have developed one of the smallest and most intelligent ACBs available on the market.



- □ One of the smallest ACBs in the world
 □ Zero arc space required
- ☐ Double contact breaking system☐ Fast clearing time of 30 msec
- Double insulated front body
- ☐ One touch field fit accessories
- Internal switches are solid state
 Minimal temperature rise on terminals
- G winima temperature rise on termina
- Characteristic curve to IEC 947
 5 million unique time current characteristics
- ☐ Percentage contact wear indication
- ☐ Monitoring of contact temperature
- Electronic under voltage protection
 Reverse power protection also available
- □ Digital communications
 □ Analogue communication
 4 mA ~ 20 mA

- Minimises switchboard volume ensuring high packing density
- Reduces damage to installation on occurrence of fault, minimising downtime
- Facilitates simple maintenance, upgrade and retro fitting
- High reliability of switchgear and all control circuits
- Most flexible relay on the market ensures selectivity is always achieved
- Reduces unnecessary maintenance and provides diagnostic information
- Integrated generator protection functions within the one relay
- Flexible communications options ensures end user compatibility

Cover



TemPower

About TEMPOWER 2 AR ACB Ordering:

TemPower 2 ACBs are locally assembled by NHP along with many variations and options available to suit specific end user applications. The listing below represents typical specifications to be considered at the time of ordering:

- ACB type and current rating
- Number of poles
- Main circuit and control circuit voltage and frequency.
- Operating temperatures
- Type of mounting. For example: Fixed ACB (no draw out carriage) Draw out type ACB
- 6. Terminal arrangements. For example rear connect vertical or horizontal main terminals. Front connect terminals are also an option.
- Type of charging, Manual lever (standard) or motor operated. If a motor is chosen then the operating voltage has to be specified.
- The OCR (Over current relay or "release"). The OCR type needs to be chosen depending on the requirements of the installation. NHP / Terasaki have as standard "LSI" OCRs in all ACBs. Basic AGR-11L OCRs are available with or without ground fault.

For feature details covering basic OCRs and more advanced OCRs with features such as communications ability, LCD displays + plus other options. please refer to the tables at the rear of this section. The TemPower 2 ACB range includes 30 different OCR types. This catalogue lists 15 of those types representing the majority of applications.

- Electrical tripping devices: Other options such as Shunt trips, Under voltage releases, or capacitor trips need to be considered.
- 10. Other accessories, some of which are:

ON-OFF cycle counter		IP55 Cover
Auxiliary switch type (4 C is standard)	0	OFF padlock
Key lock devices - standard or L&F etc.	- 0	Door flange
Mechanical interlocks		Trip indicator

Other accessories and options are listed in the table on page 5 of this section.

- 11. Special environment considerations, ACBs are available that are specially configured for Anti-corrosive, very cold or hot / tropical environments.
- 12. Contact your NHP sales office for any other special requirements such as service or repair, retrolitting, spare parts, test reports etc.
- 13. Prices: Contact your NHP sales office for pricing.
- An AR ordering sheet is available covering the above ordering process. Refer NHP

More detailed information can be obtained from the NHP Terasaki "Part C" Note: catalogue or by contacting your nearest NHP sales office.

New

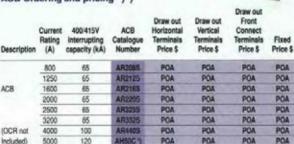
AR ach!

Approvals and tests: IEC947, A.S.T.A. Certified

AR Features:

- ics = 100% icu
- 3 or 4 pole
- ACB Draw out, or fixed Vertical or horizontal or front connections
- LSI Over Current Relays standard
- D Padlock ACB inside carriage - up to 3 locks
- Expanded range of accessories

ACB Ordering and pricing ') ')



POA

POA

POA

POA

120

6300

Description	Standard OCR Cat. No.	Advanced OCR Cat. No.	Advanced/ LCD Display OCR Cat. No.	Price \$
General / Industrial	AGR-11L-AL	Parties and	- Company	POA
8	AGR-11L-GL			POA
transformer protection	AGR-11L-PS			POA
(12t) characteristic. L type	AGR-11L-PG		(Company	POA
	COMMANDE.	AGR-21L-PS	A	POA
	ADVICE NO CO	AGR-21L-PGU	The same of	POA
Selectable characteristic curves	AGR-11R-PS		1	POA
(10.02t, lt, l2t, l3t, l4t) R type	AGR-11R-PG		THE RESERVE	POA
	AGR-11S-AL		THE PARTY NAMED IN	POA
Generator / Marine protection	AGR-115-PS	No. of Concession		POA
S type		AGR-21S-PSU	1	POA
THE RESERVE THE PROPERTY OF THE PERSON NAMED IN COLUMN TWO	00000	AGR-21S-PRU	OR STATE	POA
General / Industrial	7	THE RESERVE	AGR-ZZL-PS ")	POA
& transformer protection			AGR-22L-PG "	POA
(121) characteristic. L type			AGR-22L-PGU "	POA

Notes on ordering

- The above ACEs include as standard: the ACB, Auto spring discharge release, Adjustable LSI = Long time. Short time, Instantaneous trip OCR and associated coils. Safety shutters fitted to carriages for draw out ACBs are standard but can be omitted on request resulting in a price reduction.
 - Details regarding standard OCRs or selection of alternate types can be found on pages 6-7 to 6-13
- OCRs including Earth fault protection are available POA. 4th CT included in price.
- 4 Pole ACBs available. Pricing on application.
- 1) AH50 and AH60 ACBs are available with the advanced TemPower 2 AGR Over Current Relay.
- 4) AGR22 OCRs available late 2002.

All prices are exclusive of GST. Q-Pulse Id TMS972 Active 10/12/2014



TemPower

ACCESSORIES ')	DESCRIPTION	Price \$
Anti corrosion treatment	When an ACB is operated in corrosive environments	POA
Arc barriers (interpole barriers)	A Barrier set providing insulation between ACB rear terminals	PO
Auxiliary contacts	4C, 7C or 10C changeover contacts.	POA
Auxiliary contacts	For micro voltage & current conditions. 3C contacts	POA
Capacitor trip device	Used along with a shunt trip to trip an ACB during a power loss	POA
Cold climate treatment	For cold climate operation and storage.	POA
Cycle counter	A 5 digit readout indicating the ACBs ON-OFF cycles	POA
Door flange	Specify IP20 or IP31 front surround for ACB	POA
Door interlock	Prevents enclosure door being opened unless ACB is isolated	POA
Earthing device	Converts the ACB from normal service to an earthing device	POA
External operations panel	The APR1 displays status & allows remote operation of ACBs	POA
Fixing bolts for ACB	Holds the breaker firmly inside the carriage.	POA
Fungus proofing	Fungus and high humidity / moisture treatment of the ACB	POA
Incorrect insertion device	Prevents ACB and carriage mix ups	POA
IP cover (IP55 cover)	A clear plastic hinged cover mounted at the front of the ACB	POA
L&F/Fortress lock and key	Allows matching of individual locks and keys	POA
Castell lock and key	Allows matching of individual locks and keys	POA
Lifting plates	A set of attachable lifting brackets for ACB bodies only	POA
Lifting truck	Various models are available for lifting an ACB	POA
Manual reset device	For manual resetting a tripped ACB. Refer NHP for details	POA
Mech, Interlock - Horizontal	Horizontal cable interlock preventing simultaneous operation.	POA
Mech. Interlock - Vertical	Vertical side mounting rod interlock	POA
Mech. Interlock - 3 way Hor.	3 way horizontal cable interlock	POA
Mech. Interlock - 3 way Vert.	3 way vertical, available as either a rod or cable type.	POA
Motor operators	A motor is used to remotely open and close an ACB	POA
Neutral CT	An external CT used with 3 pole ACBs with ground fault function	POA
Neutral overcurrent protection	Special OCR. Refer NHP	POA
OCR checker	A hand held device that checks basic OCR settings in the field	POA
Off position padlock	Allows the ACB to be padlocked in the OFF position	POA
Position switch	A contacts set that switches to indicate the ACBs status in a carriage	POA
Shunt trips (continuously rated)	Allows remote tripping of the ACB	POA
Spring charge indicator	Spring charge status allowing ACB closure	POA
Test jumper	A 5m lead that allows the breaker to be tested outside the carriage	POA
Under voltage trips (UVTs)	Depends on OCR type. Refer AR catalogue	POA

Main power circuit terminals

Main terminal configuration is available in either horizontal or vertical form, or a combination of both. Refer to the table below, which indicates which terminal types are standard or optional. Specification of the desired terminal configuration should be made at the time of ordering the ACB or carriage.

ACB type	ACB mounting method	Horizontal terminals	Vertical terminals	Front connect terminals
AR208S	Draw-out	Standard	Optional	Optional
	Fixed	Standard	-	
AR212S	Draw-out	Standard	Optional	Optional
	Fixed	Standard		*
AR216S	Draw-out	Standard	Optional	Optional
	Fixed	Standard		
AR220S	Draw-out	Standard	Optional	Optional
	Fixed	Standard		
AR325S	Draw-out	Optional	Standard	Optional
	Fixed	-	Standard	
AR3325	Draw-out	Optional	Standard	Optional
	Fixed		Standard	
AR440S	Draw-out	70	Standard	
	Fixed		Standard	
AH50C-AH60C	Draw-out		Standard	*

068 Tufnell Road Yeronga SPS Pump Station Upgrade OM Manual TERASAKI TERASAKI

Tem Power

TemPower 2 Accessories

Advanced multifunction Over Current Relays (OCRs)

The TemPower 2 over-current relay provides flexible protection functions within 3 different relay types:

AGR-L General / Industrial & transformer protection

AGR-R Standard Inverse, Very Inverse, & Extremely Inverse curve

AGR-S Generator / Marine protection type

In terms of features other than characteristic curves, AGR OCRs can be split into 3 general categories:

Standard type: AGR-11 (L, R or S curve)
Advanced type: AGR-21 (L, R or S curve)
Advanced LCD display type: AGR-22 (L, R or S curve)

All AGR OCRs have adjustable LSI characteristics. 1)

AGR OCRs contain many overlapping features, meaning an OCR can be chosen for a particular application. OCR features can be found on page 8 & 10.



AGR-11L-AL Basic function OCR

OCR Types and Catalogue Numbers

Description	Standard OCR Cat. No.	Advanced OCR Cat. No.	Advanced/ LCD Display OCR Cat. No.
General / Industrial &	AGR-11L-AL		
transformer protection	AGR-11L-GL		
(12t) characteristic.	AGR-11L-PS		
L type	AGR-11L-PG		
	de care de	AGR-21L-PS	
	La	AGR-21L-PGU	
5 Selectable characteristic	AGR-11R-PS		
curves (10.02t, lt, l2t, l3t, l4t)	AGR-11R-PG		
R type			
Generator / Marine	AGR-11S-AL		
protection S type	AGR-11S-PS		
\$ 100 miles		AGR-21S-PSU	
		AGR-21S-PRU	
General / Industrial & transformer protection			AGR-22L-PS
(I2t) characteristic.			AGR-22L-PG
L type			AGR-22L-PGU

Notes: More specific details on features can be seen on pages 10 – 14 of this catalogue.

Additional models are available. Contact NHP for details or refer to the 2002/2003 Part C Catalogue.

1) LSI = Long time, Short time & Instantaneous settings.

TemPower

TemPower 2 Advanced multifuction over current relays - type AGR

The AGR Over Current Relay

The TemPower 2 protection relay can offer 3 operating modes

- Protection & monitoring
- Setting
- ☐ Testing

Optional protective functions such as reverse power, ground fault together or separately with restricted earth fault, under voltage and phase failure protection are available.

TemPower 2 protection relays can offer users the opportunity to carry out preventative and predictive maintenance on a switchboard. For example, contact temperature monitoring can alert the user to potential overheating problems, perhaps caused by faulty cabling, contact erosion or ventilation failure. Couple this to the contact wear algorithm then definite preventive maintenance data is available.



Standard OCR with adjustment dial Type AGR-11



Enhanced OCR with adjustment dial Type AGR-21



Enhanced OCA with L.C.D. display Type AGR-22

Optional protective functions are listed below:-

- ☐ Ground Fault (Restricted and Unrestricted)
- ☐ Under Voltage & Phase Failure
- Neutral Protection
- Zone Interlocking
- Contact Temperature Monitoring

- Pre Trip Alarm
- а Reverse Power
- Earth Leakage
- Arcing Fault Detection
 - Self diagnosis

With the release of the new TemPower 2 Air Circuit Breaker also comes the latest in Over-Current Relays (OCR) protection. Over the past 20 years Terasaki have incorporated a continuous improvement scheme to ensure that each generation of ACB has associated with it the best over-current protection available. This has continued with the release of the new TemPower 2 Air Circuit Breaker.

068 Tufnell Road Yeronga SPS Pump Station Upgrade QM Manual



TemPower 2 AR ACB OVER CURRENT RELAY TYPE AGR

The TemPower 2 AGR relay is available in numerous models, each with a catalogue of features, available as standard or optional estras. The base model is the AGR-1. Even the most basic model has a large list of protection capabilities, including adjustable Long Time (overload), Short time and Instantaneous (short circuit) protection as standard. Additional protection features such as Ground Fault Trip (GFT), Undervoltage (UVT) and Neutral pole protection are available as optional estras. For a more comprehensive set of features it is required to upgrade to the AGR-2 models.

Two different versions of the AGR-2 are available:

1st is the AGR-21, which is similar in appearance to the AGR-1 and with comparable protection capabilities. However, the AGR-21 has the facility to add on many other features not available in the AGR-1. For example, using the AGR-21 means that at thermocouple can be fitted to the ACB that will give an indication that the main contacts are running too hot. The AGR-1 does not have this feature.

2nd is the AGR-22. This OCR is almost identical to the AGR-21 in terms of the adjustability and protection capabilities. However, the AGR-22 has a in-built LCD display that will give local indication of the electrical data for that ACB via its LCD display. Data that can be displayed includes current, voltage, power, frequency, contact temperature, and % contact wear.

The AGR relays incorporate many NEW features such as Reverse Power Trip (RPT), Contact Temperature Monitoring, and Restricted and/or Unrestricted Ground Fault Trip protection. For more detailed OCR information refer to either the 2002/2003 Part C Catalogue or your nearest NHP sales office.

SENSING TECHNOLOGY

Rogowski colls are used in place of current transformers. Advantages of this are reductions in the depth and overall size of the ACB, and lower overall ACB operating temperatures. By using Rogowski technology, the current sensing accuracy is also increased and therefore the OCRs response to changing conditions.

What is a Regewski cell? A Regewski cell is an 'air-cered' toroidal cell placed around a conductor. An alternating magnetic field produced by the AC current induces a voltage in the cell, which is proportional to the rate of change of current.

To complete the sensing, the voltage is integrated electronically within the AGR protection relay so that the output accurately reproduces the current waveform values. The combination of a coil and the over current relay provides an exceptionally versatile current-measuring method, which can accommodate a wide range of frequencies, current levels and conductor sizes. The output has an accurate phase response and can measure complex current waveforms and transierts.

Linearity

One of the most important properties of a Rogowski coil measuring system is that it is inherently linear. The coil contains no saturable components and the output increases linearly in proportion to current.

Weight savings: AT ACBs and AR ACB compared

For example, an AT type ACB current transformer for a 2000A ACB main CT and 5A auxiliary CT weighs 1.3kg. A 2000A Rogowski coil and power CT weighs 0.22 kg. This is 83% lighter. At 3200A it is 92% lighter, which also translates to roughly equivalent size reduction, not just weight.

COMMUNICATIONS PROTOCOLS

AGR21 and 22 protection relays can communicate using either LonTalk Echelon or Modbus ASCII protocols (Modbus available October 2002). Other protocol capabilities will be added, such Profibus and DeviceNet during 2002/3. 4mA-20mA analogue communications is currently available.

TemPower .

REMOTE OPERATION PANEL: APR-1P

Along with the new AR ACBs comes the APR remote operation panel. The panel provides a lower cost alternative to a PC based system. Incorporating a dual Led display, the information gathered by an AGR21 or ARG22 intelligent protection OCRs can be displayed. ACBs can also be switched off and on.

This APR-1P remote operations panel allows up to 8 ACBs to be remotely monitored. and controlled. For larger systems the operation panel can be connected by daisy chaining several units together. The operations panel allows simple and efficient wiring of ACBs. A single twisted pair is capable of carrying out all the above features. This saves labour, material and can reduce temperature within the cubicle due to fewer CT requirements.

Indication Features

- Voltage (phase to phase)
- ☐ Effective power (kW)
- ☐ Reactive power (kVar)
- □ Power factor
- □ Power consumption (kWh)
- ☐ Current (A)
- Ground fault current (mA)
- □ Frequency (Hz)
- Main contact temperature
- □ Contact wear (%)

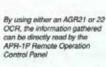
Dimensions, mounting & installation

- □ Panel size: 237 x 202 x 25mm
- ☐ Weight 1.65 kg
- Can be mounted 50m from ACBs
- Can be panel or pedestal mounted
- Peripheral items required when using

an APR consist of a power supply and wiring loom.

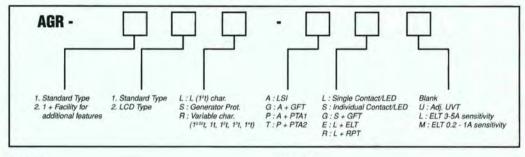
Contact NHP for details.







TemPower 2 AR ACB PRODUCT INFORMATION AND TECHNICAL DATA TABLES TemPower 2 - OCR Guide



Example 1

AGR-11L-PS has the following features:

- 1 Standard Model
- 1 Non=LCD type
- L L (12t) characteristic
- P Long Time, Short Time, Instantaneous protection with single PTA
- S Individual contact/LED indication

Example 2

AGR-22L-PGU has the following features:

- 2 Facility for Contact Temperature Monitoring (fitting is optional)
- 2 LCD Type
- L L (12t) characteristic
- P Long Time, Short Time, Instantaneous protection with single PTA
- G Single Contact and LED indication + Ground Fault Trip
- U Adjustable UVT

TemPower 2 AR ACB PRODUCT INFORMATION AND TECHNICAL DATA TABLES

TemPower 2 - OCR Guide

AR ACB	The state of the s		Pr	otectio	on Functio	n	Pre-Trip	Op	eration Inc				
OCR Specifications		LTD, STD		UVT	Reverse	Alarm	Single	Indivdual	Spring	Trip	Field	1	
		OCR Type	INST	GFT	Adj/Fixed	Power	1 channel	(note 1)	(note 2)	Charge	Indication	Test	No
		AGR-11L-AL	~		F-Opt			~		Opt	Opt		١.
		AGR-11L-GL	~	~	F-Opt			~		Opt	Opt		Th
Dial Adjustment types		AGR-11L-PS	V	3	F - Opt		~		~	Opt	Opt	V	00
	L	AGR-11LPG	~	V	F - Opt		V		~	Opt	Opt	~	a :
		AGR-21L-PS	V		-		~			~	V	~	ou mu
		AGR-21L-PGU	V	~	~		~		~	~		~	inc
	R	AGR-11R-PS	~		F-Opt		~		~	Opt	Opt	~	LE
		AGR-11R-PG	V	V	F-Opt		~		~	Opt	Opt	~	1111
		AGR-11S-AL	V		F-Opt			~		Opt	Opt		2. Th
		AGR-115-PS	~		F-Opt		~		~	Opt	Opt	~	oc
	s	AGR-215-PSU	V		~		~		~	~		~	mu
		AGR-215-PRU	V		~	V	~		~	~		~	ind
LCD		AGR-22L-PS	V				~		~	~	~	~	an
Display	L	AGR-22L-PG	4	~			~		~	~	~	~	CON
types		AGR-22L-PGU		~	~		~		~	~		~	LE

: Standard

6-12

LSI = Long Time, Short Time and INST/MCR Protection

F-0PT = Optional UVT with Fixed settings

Opt : Optional

GFT = Ground Fault Trip

Active 10/12/2014

Page 230 of 441

SP068 Tufnell Road Yeronga SPS Pump Station Upgrade OM Manual

TemPower 2 AR ACB PRODUCT INFORMATION AND TECHNICAL DATA TABLES

TemPower 2 - OCR Guide

Comms

to Operation

Panel

& Output

AR ACB				Optional Prote	ction - Add	abbrevia	ted letter to	OCR type t	o select op	otion	AOR-1
OCR Specifications OCR Type			N-Phase	Restri/Unres	Cont. Temp	Arc	Zone	Data Meas &		Comms	Equivalent
			(N)	Earth Fault (R)	Monit. (0)	Det. (F)	Interlock (Z)	Output (A)	Panel (P)	(L)	
		AGR-11L-AL	Opt								AOR-1BL-AL
		AGR-11L-GL	Opt								AOR-1BL-GL
		AGR-11L-PS	Opt							7	AOR-1BL-AS
Dist.	L	AGR-11L-PG	Opt								AOR-1BL-GS
Dial		AGR-21L-PS	Opt		Opt						New
Adjustment		AGR-21L-PGU	Opt	Opt	Opt	Opt	Opt	Opt	Opt	Opt	New
types	R	AGR-11R-PS	Opt								AOR-1BM-AS
		AGR-11R-PG	Opt								AOR-1BM-GS
		AGR-11S-AL									AOR-1BS-AL
		AGR-11S-PS									AOR-1BS-AS
	s	AGR-21S-PSU			Opt	Opt	Opt	Opt	Opt	Opt	New
	1	AGR-21S-PRU			Opt	Opt	Opt	Opt	Opt	Opt	New
LCD		AGR-22L-PS	Opt		Opt						New
Display	L	AGR-22L-PG	Opt	Opt	Opt	Opt	Opt	Opt	Opt	Opt	New
types		AGR-22L-PGU	Opt	Opt	Opt	Opt	Opt	Opt	Opt	Opt	New
	_		Neutral	Restricted ^a	Temperature	Arc Fault	Zone	Date	Connection	Facility for	

Monitoring of Fault Protection Main Contact ctive 10/12/2014

Interlooking

Unrestricted Earth

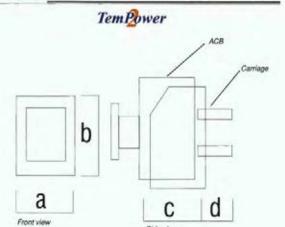
Page 231 of 441

TemPower 2 AR ACB PRODUCT INFORMATION AND TECHNICAL DATA TABLES

Ratings and Specifications

TemPower 2 ACB		AR208	AR212	AR216	AR220	AR325	AR332	AR440	AH50	AH60
Rated current	(In) A	800	1250	1600	2000	2500	3200	4000	5000	6300
Number of poles	1	3 & 4	3 & 4	3 & 4	3 & 4	3 & 4	3 & 4	3 & 4	3 & 4	3 & 4
Coil current ratings (ict)	A	200 400 800	400 800 1250	400 800 1250 1600	400 800 1250 1600 2000	2500	3200	4000	5000	6300
Insulation voltage (UI)	V	1000	1000	1000	1000	1000	1000	1000	1000	1000
Operational voltage	V	690	690	690	690	690	690	690	690	690
Impulse voltage (Uimp)	kV	12	12	12	12	12	12	12	8	8
	690 V	50	50	50	50	65	65	75	85	85
Breaking capacity kA	500 V	65	65	65	65	85	85	100	120	120
(lcs = lcu)	400 V	65	65	65	65	85	85	100	120	120
Rated short time	1 Sec	65	65	65	65	85	85	100	100	120
withstand (Icw)	3 Sec	50	50	50	50	65	65	75	70	70
Total breaking time	Sec	0.03	0.03	0.03	0.03	0.03	0.03	0.03	0.03	0.03
Motor charging time	Sec	10	10	10	10	10	10	10	10	10
Closing time	Sec	0.08	0.08	0.08	0.08	0.08	0.08	0.08	0.04	0.04

Dimensions can be found on page 15.



TemPower 2 draw out type - 3 and 4 pole outline dimensions (mm)

AR208-212		AR216		AR220		AR325		AR332		AR440		AH50C	AH60C	
Draw out Type	3P	4P	3P	4P	3P	4P	зР	4P	3P	4P	зР	4P	3P	3P
A	354	439	354	439	354	439	460	580	460	580	631	801	747	747
В	460		460		460		460		460		460		685	685
С	345		345		345		345		345		375		589	589
D	40		40		40		40		40		53		146	146
kg c/w carriage	73	86	76		79		105	211	105		139		345	355

The AR Advantage...

Benefits for the Switch Board Manufacturer

- Very compact- one of the smallest in world
- Most shallow ACB in world for an lcw 1 sec. ACB. 345 mm draw-out and 290 mm fixed
- Zero arc space required allowing multiple ACBs in one tier
- ☐ Field fittable accessories allows last minute changes
- ☐ Field fittable terminal configurations allows flexible busbar arrangements
- In built trip supervision circuit eliminates need for separate relay



Benefits for Specifiers and Consultants

- High lcs/lcw ratings up to 65, 85 and 100 kA
- Low temperature rise. Minimises power dissipation
- Fully rated Neutral now standard to accommodate the trend towards higher levels of circuit harmonics.
- Very fast Opening time of 30 msec Minimises damages to system after a fault
- Double contact breaking system reduces contact wear and increases reliability
- Flexible protection functions making selectivity applications adjustment much easier

- Adjustable UVT/Phase failure & RPT protection eliminates need for additional relays
- Restricted and Unrestricted earth fault protection eliminates need for additional relays
- Main contacts temperature monitoring ability



Benefits for the End User

- Main contacts can be changed in around 15-minutes per pole. Long term maintenance cost savings.
- Percentage main contacts wear indicator.
 Predictive maintenance information
- Main contacts temperature monitoring provides predictive maintenance information
- Communication to BMS or SCADA system provides centralised control and monitoring
- Full fault diagnostic Information on all trip causes and any malfunction of ACB or OCR



6

TZS series

Features:

- Adjustable time 0.04 or less (inst.).
- ☐ 0.3, 0.5, 1 or 2 secs.
- Sensitivity (adj).
- → 30 mA 1 amp.
- Harmonic resistant.

Relay

Mounting	Voltage specify	Adj. sensitivity	Adj. time range	Cat. No.	Price \$
Surface	120/230 AC	30 mA-1 amp	0.3-2 sec.	TZS AD	420.00
Surface	400/440 AC	30 mA-1 amp	0.3-2 sec.	TZS AD	420.00
Flush (collar only)				TPD OSZ	56.00

Tripping time (sec) fixed	below 0.3	below 0.5	1-2
Non-tripping time (sec)	0.15	0.33	0.7 - 1.25
Dimensions (mm) W/H/D	59/105/75	59/105/76	59/105/77
Weight (kg) (relay only)	0.22		

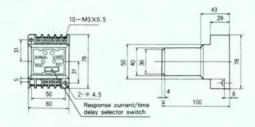
Standard features

Earth leakage detection		current operati	ed type
Internally mounted contact	1c	10	10
Earth leakage indication	LED	LED	LED
Reset function (electrical)	0	0	0
Test button	0	0	0
Remote reset (power source)	1VA		

ZCT only (remote add to relay)

Max. cable 2 wire	Max. cable 4 wire	Internal diam.	Cat. No.	Price \$
8 mm²	5.5 mm²	15 mm	TZS-15	72.50
30 mm²	22 mm ²	24 mm	TZS-24	225.00
100 mm²	80 mm²	40 mm	TZS-40	390.00
325 mm²	250 mm ²	68 mm	TZS-68	625.00
850 mm ²	600 mm²	100 mm	TZS-100	980.00

Dimensions (mm)



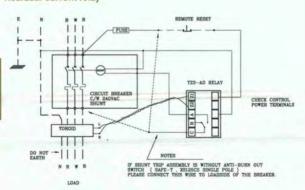
Rating of output contact

	Resistance load cos ø = 1	Inductive load cos ø= 0.4 (L/R=7 ms)	Adj. sensitivity
120/230 V AC	6 A	3.5 A	10m A at 5 V DC
30 V DC	6 A	3 A	10m A at 5 V DC

Notes:

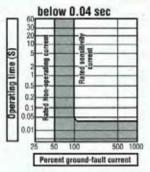
For 415V AC or 440V AC. Please contact NHP for availability. The output contacts remain until the RESET button is operated. Should the control power supply fail the contacts automatically reset.

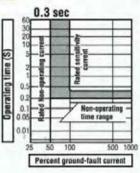
Connection diagram Residual current relay

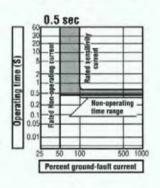


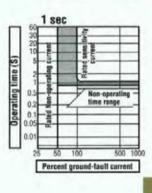
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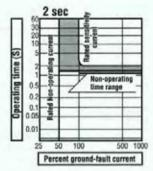
Remote toroids TZS series











DIN rail mount Din-Safe-R series

- Standard IEC 755.
- Core balance earth leakage relay.
- Adjustable IAn up to 9.43 amps.
- Adjustable trip time up to 9.25 sec.
- Field selectable negative/positive security.

Instantaneous display as percentage l\u00e1n.



DSR4DEL



585.00

585.00

635.00

635.00

DSREDEL

Din-Safe-R relays in conjunction with a ring current transformer (torroid) provide earth leakage protection of electrical distribution systems and discrete electrical equipment.

Technical data

Aux. voltage	110/240 or 240/415 50/60 Hz.						
Contact rating							
Trip	5 A-250 V AC cos \u03c4 1.0 3 A-250 V AC cos \u03c4 0.4; 5 A-30 V DC						
60 % (An ')	0.5 A-220 V AC cos φ 0.4; 1 A-24 V DC						
Power fail ')	0.5 A-220 V AC cos φ 0.4; 1 A-24 V DC						
Indication	Supply healthy - green LED						
	Relay tripped - red LED						
	%lan - orange LEDs 15, 30, 45 and 60 %						
Test	Tests relay function and torroid connections.						
IP rating	IP 40 front frame; IP 20 terminals						
Operating temp	-10 °C to +55 °C						

Features	Cat. No.	Price \$
DIN rail mounting	The second	181163

Adjustable time 6 steps addable: 0, 0.25, 0.5, 1, 2.5, 5 seconds Adjustable trip current 6 steps addable: **DSR4DEL 110/240** 0.03, 0.1, 0.3, 1, 3, 5 amps **DSR4DEL 240/415** Trip one changeover and one N/O contact Local reset

DIN rail mounting Adjustable time 6 steps addable:

0, 0.25, 0.5, 1, 2.5, 5 seconds DSR6DEL 110/240 Adjustable trip current 6 steps addable: **DSR6DEL 240/415** 0.03, 0.1, 0.3, 1, 3, 5 amps

Trip two changeover contacts Local reset Mains failure signalling (1 C/O) 60% pre-trip contact (1 C/O)

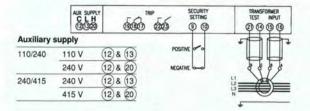
Accessories

Description	Relay type	Cat. No.	Price \$
Flush kit 4 module	DR4DEL	FD4	84.00
Flush kit 6 module	DSR6DEL.	FD6	87.50

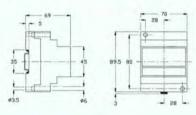
All prices are exclusive of GST Page 238 of 441T3 Q-Pulse Id TMS972 Active 10/12/2014

DIN rail mount Din-Safe-R series

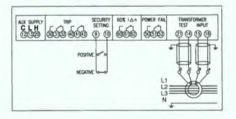
Wiring diagram - DSR4DEL



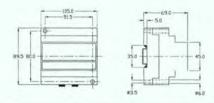
Dimensions (mm)



Wiring diagram - DSR6DEL



Dimensions (mm)



068 Turnell Road Yeronga SPS Pump Station Upgrade OM Manua

Panel mount

Standard IEC 755. Din-Safe-R series

Core balance earth leakage relay.

Adjustable l∆n up to 9.43 amps.

☐ Adjustable trip time up to 9.25 sec.

Field selectable negative/positive security.

☐ Instantaneous display as percentage I∆n.

Technical data

Aux. voltage 110/240 or 240/415 50/60 Hz.
Contact rating

Trip 5 A-250 V AC $\cos \varphi$ 1.0 3 A-250 V AC $\cos \varphi$ 0.4; 5 A-30 V DC 60 % $l\Delta n$ 1) 0.5 A-220 V AC $\cos \varphi$ 0.4; 1 A-24 V DC

Power fail ') 0.5 A-220 V AC cos φ 0.4; 1 A-24 V DC

101101 tall) 0.0 11 220 1 110 000 \$ 0.4, 1 11 24 1 0

Indication Supply healthy - green LED

Relay tripped — red LED
%IΔn — orange LEDs 15, 30, 45 and 60 %

Test Tests relay function and torroid connections.

IP rating IP 40 front frame; IP 20 terminals

Operating temp -10 °C to +55 °C

Note: ') DSR96TDEL and DSR96DTDEL only.

There is a position of the pos

Features Cat. No.

Panel mounting 72 mm

Adjustable time 6 steps:

0, 0.25, 0.5, 1, 2.5, 5 seconds Adjustable trip current 6 steps:

0.03, 0.1, 0.3, 1, 3, 5 amps DSR72DEL 240/415 635.00

Price \$

635.00

Trip two changeover contacts
Local reset

Panel mounting 96 mm

Adjustable time 6 steps: 0, 0.25, 0.5, 1, 2.5, 5 seconds

Adjustable trip current 6 steps: DSR96TDEL 110/240 895.00

0.03, 0.1, 0.3, 1, 3, 5 amps
Alarm preset at 60 % I∆n (1 N/O contact)

DSR96TDEL 240/415

895.00

of trip current

Two changeover contact

Local reset
Mains failure (1 N/O contact)

Panel mounting 96 mm
Adjustable time 6 steps:

0, 0.25, 0.5, 1, 2.5, 5 seconds
Adjustable trip current 6 steps:

DSR96DTDEL 110/240 995,00

0.03, 0.1, 0.3, 1, 3, 5 amps DSR96DTDEL 240/415 995.00

Digital indication of residual current
Trip two changeover contacts

Alarm preset 60 % Idn (1 N/O contact)

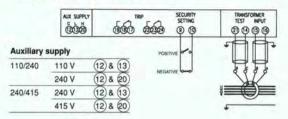
Mains failure (1 N/O contact)

7 - 6 All prices are exclusive of GST.

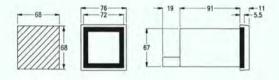
Q-Pulse Id TMS972 Active 10/12/2014 Page 240 3414.473

Panel mount Din-Safe-R series

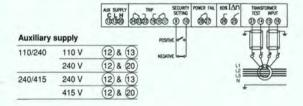
Wiring diagram - DSR72RDEL



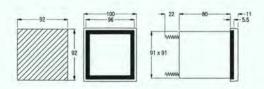
Dimensions (mm)



Wiring diagram - DSR96TDEL/DSR96DTDEL



Dimensions (mm)



Telonga 3F3

Panel mount Din-Safe-R series

- Standard IEC 755.
- Core balance earth leakage relay.
- Rotary selector switches.
- Adjustable sensitivity 30 mA to 30 A.
- Adjustable trip time .04 to 5 seconds.
- Field selectable negative/positive security.
- Reduced depth housing.
- 2 wire toroid connection.
- Continuous permanent test toroid connections.
- Harmonic filter.



Technical data

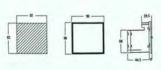
Aux. voltage	110 V AC or 240 V AC 50/60 Hz.					
Contact rating	5 A-250 V AC co	s φ 1.0;	3 A-250 V AC cos φ 0.4;	5 A-30 V DC		
Indication	Supply healthy	- greer	LED			
	Relay tripped	- red L	ED			
Tests	Test button:	Tests in	tegrity of relay internal trip	circuit.		
	Permanent test:	Continu	ously monitors toroid conn	ection and trip		
IP protection	IP 40 front frame; IP 20 terminals					
Operating temp.	-10 °C to +55 °C					

Features	Cat. No.	Price \$
Panel mounting 96 mm		1777
Adjustable time delay 6 steps:		
0.4, 0.25, 0.5, 1, 2.5, 5 seconds.	DSR96 CF DEL 110	595.00
Adjustable trip current 11 steps:		
0.03, 0.06, 0.1, 0.3, 0.5, 1, 2, 3, 10, 15, 30 amps.	DSR96 CF DEL 240	595.00
Trip – 1 changeover contact		
Harmonia filtor		

Wiring diagram

S 201/14 SECURITY WITHIN SAMPLE STATE STA

Dimensions (mm)



7 - 8 All prices are exclusive of GST.
Q-Pulse Id TMS972 Active 10/12/2014

Pade 242hofu44T3

Remote toroids Din-Safe-R series

Only Din-Safe-R type toroids are to be used in conjunction with the NHP range of Din-Safe-R residual current relays. Care should be taken to select a toroid size closest to the diameter of the cables being protected, also ensure the minimum possible distance between the toroid and relay to ensure maximum accuracy.



Closed core toroids

Min. ')	Internal Max. 3 diameter							
Ian (A)	In (A)	(mm)	н	W	D	Cat. No.	Price \$	
0.03	150	35	113	92	56	DSR35DEL	177.00	
0.03	300	80	160	125	56	DSR80DEL	215.00	
0.1	600	110	198	165	56	DSR110DEL	350.00	
0.3	1200	140	234	200	56	DSR140DEL	475.00	
0.3	1800	210	323	290	64	DSR210DEL	570.00	



Open (split) core toroids

Min. ')	Max. 7	Internal diameter		Overall dimensions (mm)			
IAn (A)	In (A)	(mm)	н	W	D	Cat. No.	Price \$
0.5	800	110	205	235	79	DSR110ADEL	595.00
0.5	1200	150	245	275	79	DSR150ADEL	765.00
1.0	2000	310	396	400	30	DSR310ADEL ")	1220.00

Notes: ') Lowest value of IAn to be set on relay with this toroid connected.

- ^a) Values shown are valid only for conductors passing exactly in the middle of the toroid.
- DSR310ADEL 2 wire connection, suitable for use with relay type DSR96CFDEL only.
- Available on indent only.

panelboard Australia's "Leading" Panelboard CONCEPT The INNOVATIVE

continuing to implement product improvements to make this an even panelboard has won wide market acceptance, even so, NHP is industrial applications. Since its introduction the Concept Plus Concept Plus is an innovative panelboard for commercial and

more highly featured panelboard. Compact 160 A or 250 A main switch option Unique gutter to obtain a genuine IP 42 rating earth & Neutral Double screw



suppressor option

Generous space cable duct up to 100 x 100 mm allowance for

Contactor option up to 85 A AC 3

Door sealing gasket IP 52

Splayed busbars at

top & bottom of

option

escutcheon with knock out system Escutcheon feature Dished

Optional hinged escutcheon or accessory devices

400 mm & 600 mm bolt on accessory boxes are available

DIN or SAFE T MCB versions available

Colours - Grey or Orange doors available

(#) TERASAKI



off end caps

be split in the Removable te

field

Chassis can

Chassis rated

Bars

to 250 A

Relay or timer

option

plates option Aluminium &

brass gland







TAL111MINI

TAL111

NEW

PRODUCTS

Talento Range

- Digital & Analogue
- * 24 hr, 7 day & Yearly programming
- 17.5 mm wide & standard DIN housing
 - 1, 2 & 4 channel flexibility
- Economical synchronous operation & Quartz precision with reserve
- Manual Overide
- Pulse switching capability

Specifications

Supply Voltage Contact Rating : 220 - 240 V 50Hz

16A / 240 V AC

Minimum Switching time:

Analogue Daily Analogue Weekly Digital Daily or Weekly 30 min 3 hr 1 min

Analogue 24 hr & 7 day

Programme	Reserve	Min Switch Time	Rating	Contact	Cat. No.	Price \$
24 hr	-	30 min	1 N/O	16 A	TAL111MINI	65.00
24 hr	-	30 min	1 0/0	16 A	TAL111	67.00
24 hr	50 hr	30 min	1 N/O	16 A	TAL211MINI	113.00
24 hr	150 hr	30 min	100	16 A	TAL211	134.00
7 day	-	3 hr	1 0/0	16 A	TAL171	87.00
7 day	150 hr	3 hr	1 0/0	16 A	TAL271	152.00

Digital 24 hr, 7 day & Yearly

Prog.	Reserve	Min Switch Time	No of memory locations	Rating	Contact	Cat. No.	Price \$
24hr/7 days	150 hr	1 min	42	1 0/0	16 A	TAL371MINI	108.00
24hr/7 days	3 yrs	1 min	20	1 0/0	16 A	TAL371	167.00
24hr/7 days	3 yrs	1 min	30	2 C/O	16 A	TAL372	220.00
Yearly	6 yrs	1 sec	400	1 C/O	16 A	TAL891	485.00
Yearly	6 yrs	1 sec	400	2 C/O	16 A	TAL892	575.00
Yearly	6 yrs	1 sec	400	4 C/O	16 A	TAL894	795.00

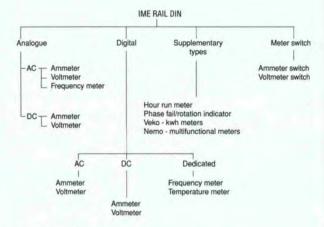
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IME DIN instruments are an exciting concept in instrumentation which gives a choice of analogue, or digital display in a DIN rail mounted housing.

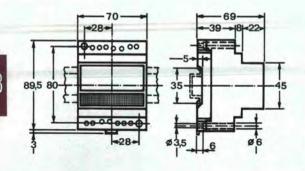
The IME concept of DIN rail mounted equipment occupies four poles of DIN (eg; same space as four DIN Din-T circuit breakers), and offers an economical and convenient system for applications such as metering in starters and distribution centres.

The DIN rail equipment is simple to install and has IP 50 front protection.

IME RAIL DIN family



Overall dimensions (mm)



8-2 Q-Pulse Id TMS972 Active 10/12/2014 Page

Page 246 of 441

210.00

068 Tufnell Road Yeronga SPS Pump Sta**rron Ungrade O'M Man**ual

Analogue meters (AC)

Range		Cat. No.	Price \$
Direct cor	nnect ammeters D4E-A AC - 2 tin	nes overscale	
0-1 A		i D4E-AAC 1A	92.00
0-2.5 A		D4E-AAC 2.5A	92.00
0-5 A		D4E-AAC 5A	92.00
0-10 A		D4E-AAC 10A	92.00
0-15 A		D4E-AAC 15A	92.00
0-20 A		D4E-AAC 20A	92.00
0-25 A		D4E-AAC 25A	92.00
0-30 A		D4E-AAC 30A	92.00
0-40 A		D4E-AAC 40A	92.00
0-50 A		D4E-AAC 50A	92.00
0-60 A		D4E-AAC 60A	92.00
CT operat	ed ammeters D4E-ACT		
5 A	5 times overscale	D4E-ACT 5A 5X ')	86.00
5 A	2 times overscale	D4E-ACT 5A 2X ')	86.00
1 A	5 times overscale	■ D4E-ACT 1A 5X 1)	86.00
1 A	2 times overscale	1 D4E-ACT 1A 2X ')	86.00
Maximum	demand ammeter D4TN		
5 A CT		D4TN 5A	146.00
Direct con	nnect voltmeters D4E-V AC		
0-50 V		1 D4E-VAC 50V	104.00
0-150 V		D4E-VAC 150V	104.00
0-300 V		D4E-VAC 300V	104.00
0-500 V		D4E-VAC 500V	104.00
VT operat	ed voltmeters D4E-VVT		
For use wit	th 110 V VT	i D4E-VVT 110V	114.00
Frequency	y meter D4FI		
	FF.11 0/01/	474	



Range 45-55 Hz 240 V

AC Voltmeter Cat. No. D4E-VAC 300V

Notes: Standard scales - C.T. operated meters comprise of the following scale ranges and their decade multiples - 10/20 A, 12/24 A, 15/30 A, 20/40 A, 25/50 A, 30/60 A, 40/80 A, 50/100 A, 60/120 A, 75/150 A, 80/160 A, up to 4 kA / 8 kA

D4FI

Include range scale to suit chosen transformer ratio.

- eg. A 2 times overscale ammeter operating from a 800/5A CT will have a Cat. No. D4E-ACT 5A 2X 800A.
- i Available on indent only

Analogue meters (DC)

Range	Cat. No.	Price \$
Direct connect ammeters D4M-ADC		
0-1 mA to 0-8 mA	D4M-ADC M1 ')	144.00
0-10 mA to 0-800 mA	D4M-ADC M2 ')	144.00
1, 5, 10, 15, 25, 40 A	D4M-ADC ')	171.00
Shunt connected ammeters D4M-ADC		
0-10 A to 0-1000 A 50 mV	D4M-ADC 5 ')	151.00 7
0-20 A to 0-1000 A 75 mV	D4M-ADC 7 ')	151.00°)
Direct connect DC voltmeters D4M-VD	C	
0-0.5 V to 0-600 V	D4M-VDC V ')	144.00
Direct connect AC (rectified) voltmeter	s D4M-VAC	
0-10 V to 0-600 V	D4M-VAC V ')	144.00

Notes: Standard scales - Moving coil meters comprise the following scale ranges and their decade multiples -

- 0 10, 12, 15, 20, 25, 30, 40, 50, 60, 70, 75, 80, 90.
- Please include range required at the end of the Cat. No. eg. A 0-150 V DC voltmeter in a DIN rail housing will have a Cat. No. D4M-V DC V/150.
- Price does not include a shunt (shunt ordered separately).

Shunts

A wide selection of 50 mV or 75 mV shunts available in stock with current ranges from 10 amps to 12000 amps, refer NHP Part B price list catalogue.

Non standard caption

For meter scale requiring non standard captions, please add the suffix 'S' to the Cat. No. followed by the range required.

eg. A 0-10 mA ammeter in a DIN rail housing, scaled 0-500 RPM will have Cat. No. D4M-ADC M2 S / input 0-10 mA scale 0-500 RPM.

Read Yeronga SPS Pump Sta**imNUagrade(PMMAnny**al 068 Tutnell

Energy meters

Range	Cat. No. 1)	Price \$
Veko KWH meter		
1ø KWH meter 32 A max. direct connect	D4EWMS	405.00
1ø KWH meter 32 A max. direct connect (pulse output)	D4EWMSP	495.00
1ø KWH meter 50/5 A CT connected	D8CMES 50/5A	525.00
1ø KWH meter 100/5 A CT connected	D8CMES 100/5A	525.00
1ø KWH meter 50/5 A CT connected (pulse output)	D8CMESP 50/5A	610.00
1ø KWH meter 100/5 A CT connected (pulse output)	D8CMESP 100/5A	610.00
3ø KWH/MWH meter -/5 A CT class 2	D6CTEP/3SH 3)	625.00
3ø KWH/MWH meter -/5 A CT class 2 (pulse output)	D6CTEP/3SHP *)	640.00
3ø KWH/MWH meter -/5 A CT class 2	D8CTEP/3S	670.00
3ø KWH/MWH meter -/5 A CT (pulse output) class 2	D8CTEP/3SP	775.00
3ø KWH/MWH meter -/5 A CT class 1	D8CTEP/3SD1	735.00
3ø KWH meter/MWH meter -/5 A CT (pulse output) class 1	D8CTEP/3SPD1	815.00







Cat. No. D4EWMS



Cat. No. D6CETP/3SHP

NEMO Modular multifunction power meter

Nemo measures

- O Phase voltages and current
- Frequency and power factor
- O Power, active, reactive and apparent
- O Total and partial energy
- Maximum demand Power (depending on models)
- O Optional output modules digital and analogue models



Notes: ') Auxiliary power supply 240 V AC, DC supply indent only.

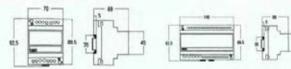
2) Inputs to kWh meter are non isolated.

For further details on model selection and pricing refer Part B price list catalogue.

Range	Connection	Display	Cat. No.	Price \$
Frequency met	er DG3-4FI			
40-80 Hz	Direct	40-80 Hz	DG3-4F180	420.00
200-800 Hz	Direct	200-800 Hz	☐ DG3-4FI 800	420.00
Temperature m	eter DG3-4PT2			
-10 to +100 °C	PT 100 ')	-9.9 to 99.9 °C		1500
	thermistor		■ DG3-4PT2 100	380.00
-20 to + 400 °C	PT 100 ')	-20 to 400 °C		0.00
	thermistor		DG3-4PT2 400	380.00

Range	Connection	Cat. No.	Price \$
Hour run m	eter D4.0 ²)		
5 digital + 2	decimal 110 V	D4.0 - 110	125.00
5 digital + 2	decimal 240 V	D4.0 - 240	125.00

DIN Rail meter dimensions (mm)



Cat. No. D4/DG3-4 meters 4 module

Cat. No. DB Meters 8 module

Phase fall/rotation indicator D4S-E	Cat. No.	Price \$
100-415V	D4S-E	285.00

Notes: Auxiliary supply 240 V/110 V AC

- ') PT 100 thermistor not supplied.
- Also available in panel mount versions.
- Available on indent only

2068 Tufnell Road Yeronga SPS Pump Station Upgrands Pumberns al

Digital meters

Range	Connection	Max. display	Cat. No	Price \$
AC voltmet	er DG3-4VAC			
0-100 V	Direct	99.9 V	DG3-4VAC 100V	305.00
0-600 V	Direct	600 V	DG3-4VAC 600V	305.00
0-1000 V	VT	999 V	DG3-4VAC 1000/100V	305.00
AC ammete	r DG3-4AAC			
0-1 A ¹)	СТ	999 A	I DG3-4ACT 1A	315.00
0-5 A ')	СТ	999 A	DG3-4ACT 5A	315.00
0-10 A	Direct	9.99 A	DG3-4AAC 10A	305.00
0-20 A	Direct	20.0 A	DG3-4AAC 20A	305.00
DC voltmet	er DG3-4VDC			
0-100 V	Direct	99.9 V	DG3-4VDC 100V	305.00
0-600 V	Direct	6 0 0 V	DG3-4VDC 600V	305.00
DĈ ammete	r DG3-4ADC			
0-50 mV ')	Shunt 2)	999 A	DG3-4ADC 50MV	305.00
0-75 mV ¹)	Shunt 2)	999 A	DG3-4ADC 75MV	305.00

Sprecher + Schuh Distribution panel control and metering switches

Туре	Cat. No.	Price \$
12 A ammeter switch for CTs	LA 2-12-8751/Q	113.00
12 A voltmeter switch phase-phase	LA 2-12-8271/QA	92.00
12 A voltmeter switch phase-phase/neutral	LA 2-12-8251/QA	98.00
12 A 1 pole on/off switch	LA 2-12-1751/Q	58.50
12 A 3 pole on/off switch	LA 2-12-1753/Q	86.00
12 A 1 pole c/o switch	LA 2-12-3251/Q	76.00

Notes: 1) The instrument can be used for 10 ranges which may be selected to suit the current transformer or shunt value in use.

Range selections are made by switches located under the front cover of the instrument (refer NHP Part 8 price list catalogue).

Price does not include shunt (shunt ordered separately).

Available on indent only.

Circuit breakers and Loadcentres

Today's miniature circuit breakers and loadcentres need to be versatile, space saving, modular in design, cost effective, safe and reliable.

> The complete range of NHP/Terasaki Din-T miniature circuit breakers (MCBs) and loadcentres, are suitable for domestic, commercial and industrial applications.



Your partner in success

A 100 percent Australian owned company

PELECTRICAL ENGINEERING PRODUCTS PTY LTD

Din-T MCB

Features

Description	Din-T 6 2 to 63 A	Din-T 10 0.5 to 63 A	Din-T 15 6 to 63 A	Din-T 10H 80 to 125 A
No. of poles	1 2 3	1 2 3 4	1 2 3 4	1 2 3 4
Protected poles	1 2 3	1 2 3 4	1 2 3 4	1 2 3 4
Width mm	18 36 54	18 36 54 72	18 36 54 72	27 54 81 108
Depth mm	86	92	92	94
Rated voltage	240/415 V AC	240/415 V AC	240/415 V AC	240/415 V AC
Max. current In	63 A	63 A	63 A	125 A
Calibration temp "C	30	30	40	40
No. of operations				
-220 V In COS=0.9	10000	10000	10000	10000
-415 V In COS=0.9	10000	10000	10000	10000
Insulation resistance	>10M ohm	>10M ohm	>10M ohm	>10M ohm
Dielectric rigidity	>2.5 kV	>4 KV	>4 kV	>4 kV
terminal capacity				
-line mm ²	25	35	35	70
-load mm²	25	25	25	70
Insulation group according to IEC112, NBNG20- 002, VDE0100				
Group B	500 V	500 V	500 V	500 V
Group C	415 V	415 V	415 V	415 V
DC application				
Max. voltage	48 110')	48 110')	48 110')	- 125') - 250
No. operations	4000	4000	4000	4000
at T≤15 ms				
Short circuit kA	66	10 10	10 10	- 10 - 10

Notes: DC magnetic trip current is approximately 40 % higher than 50/60 Hz.

') Series connection 2 pole MCB.

at T≤15 ms

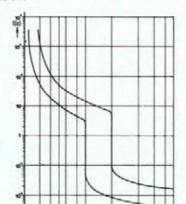
Series connection 4 pole MCB.

Din-T MCB

Voltage drop and watts loss

Description	Din-T 6 2 to 63 A Drop(V) Loss(W)		-	Din-T 10 0.5 to 63 A		Din-T 15 6 to 63 A		Din-T 10H 80-125 A	
In (A)			Drop(V)	Loss(W)	Drop(V)	Loss(W)	Drop(V)	Loss(W)	
0.5	*		3.10	1.55	-	+			
1	*		1.70	1.70	*	*			
2	0.82	1.60	0.90	1.80	15				
4	0.57	2.30	0.50	2.00		-			
6	0.21	1.30	0.318	1.91	0.318	1.91	·		
10	0.13	1.30	0.14	1.40	0.14	1.40			
16	0.11	1.80	0.128	2.05	0.128	2.05			
20	0.14	2.80	0.11	2.20	0.11	2.20			
25	0.10	2.50	0.092	2.31	0.092	2.31			
32	0.09	3.00	0.103	3.28	0.103	3.28			
40	0.08	3.20	0.088	3.50	0.088	3.50			
50	0.09	4.50	0.09	4.50	0.09	4.50			
63	0.088	5.56	0.088	5.56	0.088	5.56	+		
80					-		0.075	6.00	
100					-		0.075	7.50	
125	*		-		49		0.076	9.50	

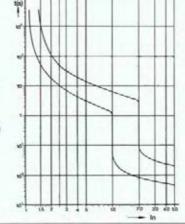
Din-T6: 2 to 6 A Din-T10: 0.5 to 6 A



Type C

(5-10 x In)



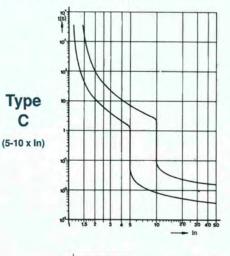


Din-T time current curves Din-T6 and 10

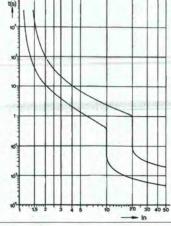
Tripping characteristics according to IEC 898

Din-T6: 10 to 40 A

Din-T10: 10 to 40 A and 50 A (1P)





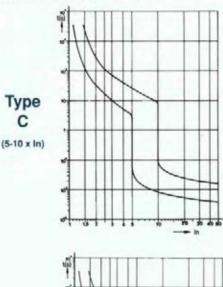


Din-T time current curves Din-T6 and 10

Tripping characteristics according to IEC 898

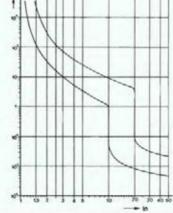
Din-T6: 50 A and 63 A 3P

Din-T10: 50 A (2P, 3P, 3P+N) and 63 A



Type D

(10-20 x ln)



9

Din-T time current curve Din-T10H and Din-T15

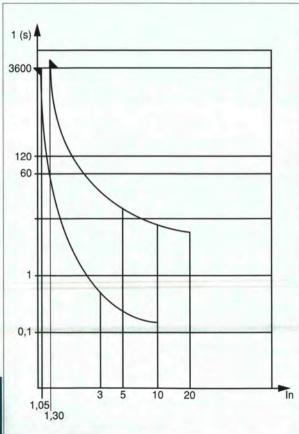
The IEC 947-2 standard

Low voltage switchgear and control gear

Part 2: circuit breakers

This standard applies to circuit breakers, the main contacts of which are intended to be connected to circuits, the rated voltage of which does not exceed 1000 V AC or 1500 V DC.

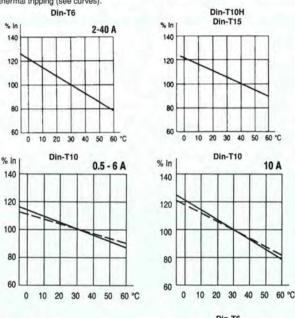
Circuit breakers for use in industrial environments, (for use by instructed people).

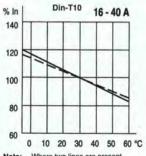


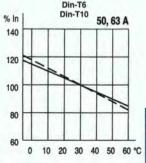
Temperature compensation curves Din-T6, 10, 10H and 15

Influence of ambient temperature

The thermal calibration of the MCBs was carried out at an ambient temperature of 30 $^{\circ}\text{C}$ (IEC 898) or 40 $^{\circ}\text{C}$ (IEC 947-2). Ambient temperatures different from the calibrated temperature influence the bimetal and this results in earlier or later thermal tripping (see curves).







Note: Where two lines are present

1 pole ---- 2, 3 or 4 pole

Q-Pulse Id TMS972 Active 10/12/2014 Page 259 of 44¹⁻⁷

TemBreak DC circuit breaker selection table

MCB type	Breaking capacity kA')	24/48 V	110 V DC	125 V DC	250 V DC	No. of operations at In	Magnetic trip increase
Din-T6	6	1 pole	2 pole			4000	40 %
Din-T10	10	1 pole	2 pole	*		4000	40 %
Din-T10H	10	1 pole	2 pole		4 pole	4000	40 %
Din-T15	10	1 pole	2 pole			4000	40 %
Safe-T	5	-	+	2 pole			40 %

MCCB type	24/48/ 60 V	125 V	250 V	350 V	500 V	125 V
XS125NJ	25	20	15	10	7.5 ")	57
XH125NJ	50	40	40	10	7.5 ")	57
XS250NJ	25	40	40	10	7.5	5
XH250NJ	50	40	40	20	15	10
XS400NJ	50	40	40	20	15	15
XS630NJ	50	40	40	30	20	20
XS800NJ	50	40	40	30	20	20
XS1000ND 7)		40	40	30	20	20
XS1250ND		40	40	30	20	20
XS1600ND		40	40	30	20	20
XS2000ND ")		40	40	30	20	20
XS2500ND *)	.,	40	40	30	20	20

Notes: ') Time constant (L/R) < = 15 ms; excludes 50/63 A where the time constant (L/R) < = 4 ms.

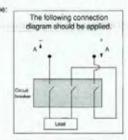
Special version of the standard AC circuit breaker. Standard circuit breakers cannot be used at these ratings. Please specify for use on 500 or 600 V DC on application. Indent only.

Magnetic trip only, without overload protection. Indent only.

Notes for MCCBs only:

For voltage levels up to and including 250 V DC standard 2 pole MCCBs maybe used, with both poles connected in series. For voltage levels greater than 250 V DC 3 pole MCCBs must be used, with all three poles connected in series as shown.

The time constant (L/R) of the circuit should be: less than 2.0 ms at rated current less than 2.5 ms for overload (2.5 x ln) less than 7 ms for short circuit < 10 kA less than 15 ms for short circuit > 10 KA



Miniature circuit breakers and fuse fault current limiters co-ordination chart

For fault current levels up to 63 kA at 415 V

Circuit breaker		Maximum fuse - amps
	Min	

	Rating	Min. fuse	50) kA	63	kA
Туре	amps	amps ')	BS 88	DIN	BS 88	DIN
Safe-T	6-10	50	160 ²)	160	125 ²)	125
	16-25	63	200 ²)	200	160 ²)	160
	32	80	200 ²)	200	160 ²)	160
	40-50	100	200 ²)	200	160 ²)	160
	63-100	160	200 ²)	200	160 ²)	160
SRCB	10	50	160	160	125	125
	16-20	63	200	200	160	160
Din-T6	2-25	20-63	160	160	125	125
	32-63	100	160	160	125	125
Din-T10	0.5-6	20	200	200	160	160
8	10	25	200	200	160	160
Din-T15	16	35	200	200	160	160
	20-32	63	200	200	160	160
	40-63	100	200	200	160	160
DRCBH	10	25	200	200	160	160
(10kA)	16	35	200	200	160	160
	20-32	63	200	200	160	160
Din-T10H	80	160	200	200	160	160
	100	200	200	200	160	160
	125	250	250	250		-
XS125NJ/CJ	16-125	250	400	400	355	355

⁼ changed or new data

Minimum fuse size is based on grading under overload of one MCB with one Notes: 1) set of fuses. Where a single set of fuses protects more than one MCB, the minimum fuse size shall be increased to allow for load biasing effects.

Tables based on the following maximum pre-arcing I2t for both BS 88 and DIN fuses:

125 A - 0.4 x 105, 160 A - 0.62 x 105, 200 A - 1.2 x 105, 250 A - 2.1 x 105. Suitable fuses include NHP, GEC, Siemens and Brovara-Crady.

Fuses with higher current ratings may be used provided Pt values are equal to, or less than the levels above. Semi-conductor fuses have very low I't values and may suit some applications.

Attention is also drawn to AS 3000 clause 7.10.4.4 regarding the use of fault current limiters in installations containing fire and smoke control equipment, evacuation equipment and lifts.

Maximum fuse size based on testing to AS 3439.1 clause 8.2.3.

Selectivity (discrimination) and cascade

Selectivity

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The principle of Selectivity (Discrimination) is based upon an analysis of several circuit breaker characteristics. These include time-current (tripping) curves. Peak-Let-Through Current (Inex) and Energy Let-Through (I2t).

The figures stated give the maximum Selectivity level with the two nominated breakers in series under short-circuit conditions. For an indication on Selectivity under overloads refer to the circuit breaker tripping/characteristic curves, or use the NHP TemCurve Selectivity Analysis Software package.

Selectivity can be enhanced beyond the breaking capacity of the downstream breaker provided it is backed up by an appropriately selected upstream breaker, which should not trip (unlatch) under the stated short circuit current.

Cascade

Cascading is achieved by using an upstream device to assist (back-up) a downstream device in clearing a fault current. This principal is necessary should the downstream device be required to clear a prospective short circuit current greater than the devices breaking capacity.

In most Cascading applications it is generally necessary for the upstream breaker to trip (unlatch), as well as the downstream breaker to give adequate back-up protection. As such, cascade is commonly used in feeding and protecting nonessential loads, such as basic lighting.

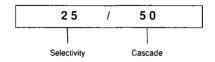
For more information on Selectivity and cascade please refer to the NHP Part C catalogue.

Tables quidelines

The table in the following pages show both the selectivity and cascade levels for two breakers connected in series.

The top (horizontal) axis indicates the upstream breaker, with the left (vertical) axis showing the downstream breaker.

Where the relevant breakers are selected the tables will show information on the following format:



The Selectivity and Cascade figures stated by NHP are fully compliant with the requirements of the applicable standards. The choice of breakers should be made in accordance with the selection tables.

TemCurve

Selectivity Analysis Software





TemCurve, version 4.0 takes all the features presently available in version 3.0 and adds to them

This ensures that TemCurve 4.0 will remain one of the most versatile design tools available on the market today.

Circuit breaker selection and set-up can be a laborious and time-consuming task. NHP has ensured that TemCurve 4.0. for "Windows 95, 98, 2000, NT is now even simpler to operate.

Hence, accurate results can be gained in a matter of minutes.

TemCurve, is an exciting new generation of selectivity software now available from NHP.

Our objective is to provide you with the tools necessary to ensure your time is managed as effectively and efficiently as possible.

TemCurve has been developed wholly by NHP for the Australian market, but will also be used within the Terasaki organisation throughout the world

The database within TemCurve holds the characteristic curves for all Terasaki devices presently available from NHP. In addition to this, the extensive database of non-Terasaki devices allows you to produce accurate grading from the transformer primary side to the point of final distribution.

High quality prints can be output, including the characteristic curves for each chosen device, as well as a complete list of device settings.

For further information please contact your local NHP office or agent.

068 Tufnell Road Yeronga SPS Pump Staffor Upgrade ON Manual

Selectivity and Cascade - TemBreak Plus and Standard TemBreak MCCBs

Upstream MCCB

XS125CJ	18	14 / mm			65	50	65	65	85
-		15/50	15 / 50	18/30	18/30	18/30	18/30	18/18	18/18
XS125NJ	30	25/50	25/50	30/30	30/30	30/30	30/30	30/30	30/30
XH125NJ	50	35/50	35/65	50/50	50/65	50/50	50/65	50/50	50/50
XH125PJ	50	35/50	35/65	50/50	50/65	50/50	50/65	50/50	50/50
TL100NJ	85	35/50	35/65	50/50	50/65	50/50	50/65	50 / 65	50 / 85
XH160PJ	50	25 / 50	25/65	50/50	50/65	50 / 50	50 / 65	50/50	50/50
XE225NC	18	15/30	15/30	18/30	18/30	18/30	18/30	18/18	18/18
XS250NJ	35	15/50	15/65	35/50	35/65	35 / 50	35/65	35/35	35/35
XH250NJ	50	25 / 50	25/65	50 / 50	50 / 65	50 / 50	50 / 65	50 / 50	50/50
XH250PJ	65			10/50	10/65	25 / 50	25 / 65	50/65	50 / 65
TL250NJ	85	2	-/65	10/50	10/65	25/50	25 / 65	50 / 65	50 / 85
XS400CJ	35	+/50	-/50	10/50	10/65	25/50	25 / 65	35 / 42	35/42
XS400NJ	50		-/65	10/50	10/65	25 / 50	25 / 65	50/65	50 / 65
XS400SE	50		-/65	10/50	10/65	25/50	25 / 65	50/65	50 / 65
XH400PJ	65	+:		10/50	10/65	25 / 50	25/65	50 / 65	50 / 65
XH400SE	65		91	10/50	10/65	25 / 50	25/65	50/65	50/65
XH400PE	65			10/50	10/65	25 / 50	25/65	50/65	50 / 65
TL400NE	85		+			25/50	25/65	65/65	85 / 85
X9630CJ	45	-	*	+	-/50	10/50	10/50	30 / 45	30 / 45
XS630NJ	65			*		10/50	10/65	30/65	30 / 85
XS630SE	50		*27		-/65	10/50	10/65	30 / 65	30/85
XH630PJ	85		0		*	10/50	10/65	30/65	30 / 85
XH630SE	65		97			10/50	10/65	30/65	30 / 85
XH630PE	65					10/50	10/65	30/65	30 / 85
XS800NJ	85		*:				4	15/65	20 / 85
XS800SE	50		3				-/65	15/65	20 / 85
XH800PJ	85	+	2		+	,		15/65	20/85
XH800SE	65		*					15/65	20/85
XH800PE	65		*			4		15/65	20/85
XS1250SE	65				-				20/65

Guide

XX YY

Selectivity

Cascade

All figures stated are at 400/415 V AC. All current and time settings on the upstream MCCB are to be set to maximum.

Selectivity and Cascade - TemBreak MCCBs and Din-T/Safe-T MCBs

			U				X34003E			
Downstream MCB	(i.(ma)	XS125C) 18	X5125XJ 30	XXII2SPJ 58	TL198NJ 85	X3250NJ 35	EKZSONI SO	TLESONJ 85	XS400CJ 35	33400HJ 58
Din-T8 (2-25 A)	6	18/18	25 / 25	25 / 25	25/25	25/25	25/25	6.5		+3
Din-T6 (32-63 A)	5	18/18	20/25	20/25	20/25	25/25	8/8			5
Din-T10 (0.5-25 A)	10	18/18	25/30	30/50	30/50	35 / 35	35/50	35/50	35/35	35/50
Din-T10 (32-63 A)	10	18/18	20/25	20 / 25	20/25	25/25	25/25	25/25	25/25	25/25
DRC8H (10-25 A)	10:	18/18	25/30	30 / 50	30/50	35/35	35/50	35/50	35/35	35/50
DRCBH (32 A)	10	18/18	20/25	20/25	20 / 25	25/25	25/25	25/25	25/25	25/25
Din-T10H (80-125 A)	10	4/18	4/25	4/25	4/25	15/15	15/15	10/10	10/10	10/10
Din-T15 (6-16 A)	25	18/25	25/30	30 /50	30/50	35/35	35/50	35/50	35/35	35/50
Din-T15 (20 A)	20-25)	18/20	25/30	30/50	30/50	35/35	35/50	35/50	35/35	35/50
Din-T15 (32 A)	15-25 7	18/18	25/30	30 / 50	30/50	35/35	35/50	35/50	35/35	35/50
Din-T15 (40-63 A)	10-1257	18/18	20/25	20/25	20/25	25/25	2/2	8/3	25/25	25/25
Sate-T (16-63 A)	6	3/10	3/10	3/10	3/10			+		+
SRC8 (16-20 A)	6	3/10	3/10	3/10	3/10			100	-	+)

Note: 1) Dependant on the number of poles. Refer to NHP

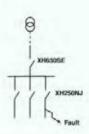
Example

Cascade

The resultant cascade level with the XH630SE (65 kA) and XH250NJ (50 kA) MCCBs in series is 65 kA. This means that the XH630SE will back-up the XH250NJ MCCB to 65 kA, which is beyond its breaking capacity of 50 kA.

Selectivity

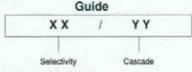
From the tables, the Selectivity level between the same two breakers, XH630SE and XH250NJ connected in series will be 50 kA. This means that for fault levels up to and including 50 kA the XH250NJ will trip before the XH630SE.



Conclusion

For short circuit currents up to and including 50 kA, the XH250NJ will trip before the XH630SE, therefore ensuring Selectivity. For fault levels above 50 kA both breakers may trip, however, the XH630SE will back-up the XH250NJ to 65 kA.

The figures in the Selectivity and Cascade tables show a combination of AS-3-947-2. and AS 2184 breaking capacities where appropriate. Refer Section 3 and 4 for further details.



Note: All figures stated are at 400/415 V AC

068 Tutnell Road Yeronga SPS Pump Sta**tion Upgrade Om Mon**ual

Selectivity and Cascade - Standard TemBreak MCCBs

U	pstr	eam	M	CCB	

			abanen	III IIII O O O			
Downstream MCCB	kA (rms)	XH125NJ 50	X\$250NJ 35	XH250NJ 58	XS400CJ 35	XS400NJ 50	XH400NE 65
XS125CJ	18	-/50	3/30	3/50	4/35	4/50	6/50
XS125NJ	30	-/50	3/30	3/50	4/35	4/50	6/50
XH125NJ	50			4			6/65
XE225NC	18		-/30	-/30	-/30	-/30	6/30
XS250NJ	35					4/50	6/65
XH250NJ	50					4/50	6/65
XS400CJ	35	+		-		-/50	-/50
XS400NJ	50				•		-/65
XH400NE	65			(9)	*	*	100
XS630CJ	45				***		
XS630NJ	65						-
XH630NE	65				•		
X5800NJ	65						

Note: All current and time settings on the upstream MCCB are to be set to maximum.

Downstream	kA (rms)	XS630CJ 45	XS630NJ 65	XS630NE 50	XH630NE 65	XS800NJ 65	XH800NI 65
XS125CJ	18	6/30	6/30	14/30	18/30	10/30	14/30
XS125NJ	30	6/30	6/30	18/30	18 /30	10/30	18/30
XH125NJ	50	+		18/50	18/65	12/65	30/65
XE225NC	18	6/25	6/30	10/30	10/30	8/30	12/30
XS250NJ	35	6/45	6/50	10 / 50	10 / 65	8/50	12/65
XH250NJ	50		70	10/50	10/65	10/65	12/65
XS400CJ	35	6/35	6/50	7.5 / 50	7.5/65	6/50	10/65
XS400NJ	50	-		7.5 / 50	7.5 / 65	6/50	10/65
XH400NE	65		*:	*			10/65
XS630CJ	45						
X5630NJ	65		-	+		12	
XH630NE	65	æ .	+	+0		÷	
XS800NJ	65		-	*			(4)

Note: All current and time settings on the upstream MCCB are to be set to maximum.

Guide

XX / YY
Selectivity Cascade

Note: All figures stated are at 400/415 V AC.

9-14

Q-Pulse Id TMS972 Active 10/12/2014 Page 266 of 441

Selectivity and Cascade

Standard TemBreak MCCBs

Upstream MCCB

Downstream MCCB	kA (rms)	XH888PJ 85	XS2000NE 100	XS2500NE 100
XS125CJ	18	10/30	18 / 18	18/18
XS125NJ	30	10/30	30/30	30 / 30
XH125NJ	50	12/65	50 / 50	50 / 50
XE225NC	18	8/30	18 / 18	18/18
X8250NJ	35	8/65	35/35	35/35
XH250NJ	50	10 / 65	50 / 50	50 / 50
XS400CJ	35	6/65	35 / 42	35 / 42
XS400NJ	50	6 / 65	35/65	50 / 65
XH400NE	65		35 / 65	50/65
X9630CJ	45	-/50	35 / 45	35 / 45
XS630NJ	65	-/85	35 / 85	35 / 85
XH630NE	65	-/85	35 / 85	35 / 85
XS800NJ	65	-/85	35 / 85	35 / 85
market of the same				

All current and time settings on the upstream MCCB are to be set to maximum.

Guide XX Selectivity Cascade

Note: All figures stated are at 400/415 V AC.

Type 1 short circuit co-ordination Motor starter table for DOL starting 50 kA at 400/415 V to AS 3947-4-1

Sprecher +

Motor size kW	Approx. Amps	Terasaki Circuit breaker	Sprecher + Schuh Contactor type	Sprecher + Schuh thermal overload relay type ²)	Setting range amps
0.37	1.1	XM30PB/1.4	CA 7-9	CT 7-24	1-1.6
0.55	1.5	XM30PB/2	CA 7-9	CT 7-24	1-1.6
0.75	1.8	XM30PB/2.6	CA 7-9	CT 7-24	1.6-2.4
1.1	2.6	XM30PB/4	CA 7-9	CT 7-24	2.4-4
1.5	3.4	XM30PB/5	CA 7-9	CT 7-24	2.4-4
2.2	4.8	XM30PB/5	CA 7-9	CT 7-24	4-6
3.0	6.5	XM30PB/8	CA 7-9	CT 7-24	6-10
4.0	8.2	XM30PB/10	CA 7-9	CT 7-24	6-10
5.5	11	XH125NJ/20	CA 7-12	CT 7-24	10-16
7.5	14	XH125NJ/20	CA 7-18	CT 7-24	10-16
10	19	XH125NJ/32	CA 7-23	CT 7-24	16-24
11	21	XH125NJ/32	CA 7-23	CT 7-24	16-24
15	28	XH125NJ/50	CA 7-30	CT 7-45	18-30
18.5	34	XH125NJ/50	CA 7-37	CT 7-45	30-45
22	40	XH125NJ/63	CA 7-43	CT 7-45	30-45
30	55	XH125NJ/100	CA 7-60	CT 7-75	45-60
37	66	XH125NJ/100	CA 7-72	CT 7-75	60-75
45	80	XH125NJ/125 ')	CA 7-85	CT 7-100	70-90
55	100	XH125NJ/125 ')	CA 6-105-EI	CT 6-110	85-110
75	130	XH250NJ/250	CA 6-140-EI	CT 6-150	105-150
90	155	XH250NJ/250 1)	CA 6-170-EI	CT 6-200	140-200
110	200	XH250NJ/250 ')	CA 6-210-EI	CEF 1-41/42	160-400
132	225	XS400SE/400	CA 6-250-EI	CEF 1-41/42	160-400
160	270	XS400SE/400	CA 6-300-EI	CEF 1-41/42	160-400
200	361	XS400SE/400	CA 6-420-EI/	CEF 1-41/42	160-400
			CA 5-450		
250	425	XS630SE/630	CA 6-420-EI/	CEF 1-52	160-630
			CA 5-450		
315	530	XS630SE/630	CA 5-550	CEF 1-52	160-630

Notes: ') Use 'magnetic only' breaker. Refer NHP for details.

⁷⁾ Thermal or electronic overload relays may be used. Some combinations also achieve Type 2 performance. CA7 contactor can be replaced with equivalent CA3 size.

9

Short circuit co-ordination Type '2' co-ordination table for Din-T circuit breakers with rotary isolator DOL starting 50/65 kA @ 400/415 V to AS 3947-4-1

Approx. Amps @ 415 V	Sprecher + Schuh isolator	Terasaki circuit breaker	Sprecher + Schuh current limiter	Sprecher + Schuh contactor	Sprecher + Schuh thermal overload relay	Thermal overload range
1.1	LA-7-80	Din-T 10/4		CA7-9	CT 7-24	1-1.6
1.5	LA-7-80	Din-T 10/4		CA7-9	CT 7-24	1-1.6
1.8	LA-7-80	Din-T 10/4	+	CA7-9	CT 7-24	1.6-2.4
2.6	LA-7-80	Din-T 10/6		CA7-23	CT 7-24	2.4-4
3.4	LA-7-80	Din-T 10/6	+	CA7-23	CT 7-24	2.4-4
4.8	LA-7-80	Din-T 10/10	KTL 3-65	CA7-23	CT 7-24	4-6
6.5	LA-7-80	Din-T 10/16	KTL 3-65	CA7-23	CT 7-24	6-10
8.2	LA-7-80	Din-T 10/16	KTL 3-65	CA7-23	CT 7-24	6-10
11.0	LA-7-80	Din-T 10/20	KTL 3-65	CA7-23	CT 7-24	10-16
14.0	LA-7-80	Din-T 10/32	KTL 3-65	CA7-30	CT 7-45	10-16
21.0	LA-7-80	Din-T 10/40	KTL 3-65	CA7-30	CT 7-45	16-24
28.0	LA-7-100	Din-T 10/63	KTL 3-65	CA7-37	CT 7-45	18-30
34.0	LA-7-100	Din-T 10/63	KTL 3-65	CA7-37	CT 7-45	30-45
	Amps @ 415 V 1.1 1.5 1.8 2.6 3.4 4.8 6.5 8.2 11.0 14.0 21.0 28.0	Amps (#415 V schuh isolator) 1.1 LA-7-80 1.5 LA-7-80 1.8 LA-7-80 2.6 LA-7-80 3.4 LA-7-80 4.8 LA-7-80 6.5 LA-7-80 8.2 LA-7-80 11.0 LA-7-80 14.0 LA-7-80 21.0 LA-7-80 28.0 LA-7-100	Amps @ 415 V + Schuh isolator circuit preaker 1.1 LA-7-80 Din-T 10/4 1.5 LA-7-80 Din-T 10/4 1.8 LA-7-80 Din-T 10/6 3.4 LA-7-80 Din-T 10/6 4.8 LA-7-80 Din-T 10/10 6.5 LA-7-80 Din-T 10/16 8.2 LA-7-80 Din-T 10/16 11.0 LA-7-80 Din-T 10/20 14.0 LA-7-80 Din-T 10/32 21.0 LA-7-80 Din-T 10/40 28.0 LA-7-100 Din-T 10/63	Approx. Amps Amps (9415 V) Sprecher Sclub (1rcuit value our ent limiter) Terasaki clrcuit value our ent limiter + Schub value value our ent limiter 1.1 LA-7-80 Din-T 10/4 - 1.5 LA-7-80 Din-T 10/4 - 1.8 LA-7-80 Din-T 10/4 - 2.6 LA-7-80 Din-T 10/6 - 3.4 LA-7-80 Din-T 10/6 - 4.8 LA-7-80 Din-T 10/10 KTL 3-65 6.5 LA-7-80 Din-T 10/16 KTL 3-65 8.2 LA-7-80 Din-T 10/10 KTL 3-65 11.0 LA-7-80 Din-T 10/20 KTL 3-65 14.0 LA-7-80 Din-T 10/32 KTL 3-65 21.0 LA-7-80 Din-T 10/40 KTL 3-65 28.0 LA-7-100 Din-T 10/63 KTL 3-65	Approx. Amps Amps (2415 V) Sprecher Amps (clrcuit) 1-Erasaki clrcuit + Schuh current	Approx. Amps @ 415 v Sprecher + Schuh circuit breaker Sprecher + Schuh circuit limiter Sprecher + Schuh circuit limiter + Schuh contactor + Schuh thermal verload 1.1 LA-7-80 Din-T 10/4 - CA7-9 CT7-24 1.5 LA-7-80 Din-T 10/4 - CA7-9 CT7-24 1.8 LA-7-80 Din-T 10/6 - CA7-9 CT7-24 2.6 LA-7-80 Din-T 10/6 - CA7-23 CT7-24 4.8 LA-7-80 Din-T 10/6 - CA7-23 CT7-24 4.8 LA-7-80 Din-T 10/16 KTL 3-65 CA7-23 CT7-24 6.5 LA-7-80 Din-T 10/16 KTL 3-65 CA7-23 CT7-24 8.2 LA-7-80 Din-T 10/16 KTL 3-65 CA7-23 CT7-24 11.0 LA-7-80 Din-T 10/16 KTL 3-65 CA7-23 CT7-24 14.0 LA-7-80 Din-T 10/20 KTL 3-65 CA7-30 CT7-45 21.0 LA-7-80 Din-T 10/32 KTL 3-65 <td< td=""></td<>

Note: Isolator provides rotary operation for external control and maybe eliminated if not required.

Type '2' short circuit co-ordination Motor starter table for DOL starting 50 kA 400/415 V to AS 3947-4-1

Motor size kW	Approx. Amps	Terasaki Circuit breaker	Sprecher + Schuh Contactor	Sprecher + Schuh overload relay *)	Setting range amps
0.37	1.1	XM30PB/1.4	CA 7-9	CT 7-24-1.6	1-1.6
0.55	1.5	XM30PB/2	CA 7-9	CT 7-24-1.6	1-1.6
0.75	1.8	XM30PB/2.6	CA 7-9	CT 7-24-2.4	1.6-2.4
1.1	2.6	XM30PB/4	CA 7-16	CT 7-24-4	2.4-4
1.5	3.4	XM30PB/5	CA 7-16	CT 7-24-4	2.4-4
2.2	4.8	XM30PB/8	CA 7-16	CT 7-24-6	4-6
3	6.5	XM30PB/10	CA 7-30	CT 7-24-10	6-10
4	8.2	XM30PB/12	CA 7-30	CT 7-24-10	6-10
5.5	11	XH125NJ/20	CA 7-30	CT 7-24-16	10-16
7.5	14	XH125NJ/20	CA 7-30	CT 7-24-16	10-16
11	21	XH125NJ/32	CA 7-30	CT 7-24-24	16-24
15	28	XH125NJ/50	CA 7-43	CT 7-45-30	18-30
18.5	34	XH125NJ/50	CA 7-43	CT 7-45-45	30-45
22	40	XH125NJ/63	CA 7-43	CT 7-45-45	30-45
30	55	XH125NJ/100	CA 6-85	CT 7-75 ')	45-60
37	66	XH125NJ/100	CA 6-85	CT 7-75 °)	60-75
45	80	XH125NJ/125	CA 6-105-EI	CT 6-90	70-90
55	100	XH125NJ/125 ')	CA 6-105-EI	CT 6-110	85-110
75	130	XH250NJ/250	CA 6-140-EI	CT 6-150	105-150
90	155	XH250NJ/250	CA 6-170-EI	CT 6-200	140-200
110	200	XH250NJ/250 1)	CA 6-210-EI	CEF 1-41/42	160-400
132	225	XS400SE/400	CA 6-210-EI	CEF 1-41/42	160-400
150	250	XS400SE/400	CA 6-250-EI	CEF 1-41/42	160-400
160	270	XS400SE/400	CA 6-300-EI	CEF 1-41/42	160-400
200	361	XS400SE/400	CA 6-420-EI	CEF 1-41/42	160-400
			CA 5-450	CEF 1-22 ")	160-400
250	425	XS630SE/630	CA 5-700	CEF 1-52 ")	160-630
320	538	XS630SE/630	CA 5-700	CEF 1-52")	160-630

Notes:) Use 'magnetic only' breaker or next higher circuit breaker/contactor combination. Refer NHP.

⁷) Use with separate mounting bracket.

⁵) Thermal or electronic overload relays may be used. Combinations based on the thermal overload relay tripping before the circuit breaker at overload currents up to the motor locked rotor current.

9-18 Q-Pulse Id TMS972 Active 10/12/2014 Page 270 of 441

Type '2' short circuit co-ordination with Sprecher + Schuh ACS system **TemBreak**

65 kA

Circuit breakers DOL starting 65 kA @ 400/415 V to AS 3947-4-1

Motor size kW	Approx Amps 415 V	t. Terasaki Circuit breaker Type/current	Contactor	Overload relay ')	Setting range amps
0.37	1.1	XM30PB/1.4	CA 7-9	CEP 7	1.0-2.9
0.55	1.5	XM30PB/2	CA 7-9	CEP 7	1.0-2.9
0.75	1.8	XM30PB/2.6	CA 7-9	CEP 7	1.0-2.9
1.1	2.6	XM30PB/4	CA 7-16	CEP 7	1.6-5
1.5	3.4	XM30PB/5	CA 7-16	CEP 7	1.6-5
2.2	4.8	XM30PB/8	CA 7-16	CEP 7	3.7-12
3	6.5	XM30PB/8	CA 7-30	CEP 7	3.7-12
4	8.2	XM30PB/12	CA 7-30	CEP 7	3.7-12
5.5	11	TL30F/20A	CA 7-30	CEP 7	3.7-12
7.5	14	TL30F/30A	CA 7-30	CEP 7	12-32
11	21	TL30F/30A	CA 7-30	CEP 7	12-32
15	28	TL100NJ/50A	CA 7-43	CEP 7	12-32
18.5	34	TL100NJ/50A	CA 7-43	CEP 7	12-37
22	40	TL100NJ/63A	CA 7-43	CEP 7	14-45
30	55	TL100NJ/100A	CA 7-72	CEP 7	26-85
37	66	TL100NJ/100A	CA 7-72	CEP 7	26-85
45	80	TL100NJ/100A	CA 6-105-EI	CT 6-90	70-90
55	100	XH400SE/250	CA 6-105-EI	CT 6-110	85-110
75	130	XH400SE/250	CA 6-140-EI	CT 6-150	105-150
90	155	XH400SE/250	CA 6-170-EI	CT 6-200	140-200
110	200	XH400SE/250	CA 6-210-EI	CEF 1-41/42	160-400
132	230	XH400SE/400	CA 6-210-EI	CEF 1-41/42	160-400
150	250	XH400SE/400	CA 6-250-EI	CEF 1-41/42	160-400
160	270	XH400SE/400	CA 6-300-EI	CEF 1-41/42	160-400
200	361	XH400SE/400	CA 6-420-EI	CEF 1-41/42	160-400
enth.	1000	-posequent to the th	CA 5-450	CEF 1-22 ')	160-400
250	430	XH630SE/630	CA 5-700	CEF 1-52 ')	160-630
320	538	XH630SE/630	CA 5-700	OEF 1-52 *)	160-630
-	-	Committee of the Commit	THE RESERVE THE PARTY OF THE PA	The state of the s	The second linear second linear second

Notes: ') Thermal or electronic overload relays may be used.

Use with separate mounting bracket.

Combinations based on the overload tripping before the circuit breaker at overload currents up to the motor locked rotor current.

Type '2' short circuit co-ordination with Sprecher + Schuh ACS system TemBreak

85 kA

Circuit breakers DOL starting 85 kA @ 400/415 V to AS 3947-4-1

Motor size kW	Approx. Amps 415 V	Terasaki circuit breaker	Sprecher + Schuh contactor type	Sprecher + Schuh thermal overload type ')	Settings range amps
0.37	1.1	XM30PB/1.4	CA 7-9	CEP 7-M32-2.9-10	1.0-2.9
0.55	1.5	XM30PB/2	CA 7-9	CEP 7-M32-2.9-10	1.0-2.9
0.75	1.8	XM30PB/2.6	CA 7-9	CEP 7-M32-2.9-10	1.0-2.9
1.1	2.6	XM30PB/4	CA 7-16	CEP 7-M32-2.9-10	1.0-2.9
1.5	3.4	XM30PB/5	CA 7-16	CEP 7-M32-5-10	1.6-5
2.2	4.8	XM30PB/8	CA 7-30	CEP 7-M32-12-10	3.7-12
3	6.5	XM30PB/8	CA 7-30	CEP 7-M32-12-10	3.7-12
4	8.2	XM30PB/10	CA 7-30	CEP 7-M32-12-10	3.7-12
5.5	11	TL100NJ/20	CA 7-30	CEP 7-M32-12-10	3.7-12
7.5	14	TL100NJ/20	CA 7-30	CEP 7-M32-32-10	12-32
9	17	TL100NJ/32	CA 7-30	CEP 7-M32-32-10	12-32
10	19	TL100NJ/32	CA 7-30	CEP 7-M32-32-10	12-32
11	21	TL100NJ/32	CA 7-30	CEP 7-M32-32-10	12-32
15	28	TL100NJ/50	CA 7-43	CEP 7-M32-32-10	12-32
18.5	34	TL100NJ/50	CA 7-43	CEP 7-M32-37-10	12-37
22	40	TL100NJ/63	CA 7-43	CEP 7-M32-45-10	14-45
30	55	TL100NJ/100	CA 7-72	CEP 7-M32-85-10	26-85
37	66	TL100NJ/100	CA 7-72	CEP 7-M32-85-10	26-85
45	80	TL250NJ/160	CA 6-105	CEP 7-M32-85-10	26-85
55	100	TL250NJ/160	CA 6-105	CEF 1-11/12	0.5-180
75	135	TL250NJ/250	CA 6-210-EI	CEF 1-11/12	0.5-180
90	160	TL250NJ/250	CA 6-210-EI	CEF 1-11/12	0.5-180
110	200	TL250NJ/250	CA 6-210-EI	CEF 1-41/42/52	160-630
132	230	TL400NE/400	CA 6-210-EI	CEF 1-41/42/52	160-630
160	270	TL400NE/400	CA 6-300-EI	CEF 1-41/42/52	160-630
200	361	TL400NE/400	CA 6-420-EI	CEF 1-41/42/52	160-630

Notes: ") Thermal or electronic overload relay may be used.

Combinations based on the overload tripping before the circuit breaker at overload currents up to the motor locked rotor current.

HHP has solutions to allow you to gain greater value from the power consumed by your business, with products designed to: Reduce down time Minimise energy costs / consumption Increase plant efficiency Lower substation and sub-mains loads Enhance voltage regulation Promote electrical distribution integrity to your 11/3



Power factor correction assemblies, capacitors, reactors, regulators, surge protection, site load surveys, engineering support.

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Motor circuit application table for DOL starting Breaker type and current rating (A)

Motor rating (kW)	Approx. FLC (amps)	Din-T C & D Curve	Safe-T	XS125CJ XS125NJ XH125NJ	XE225NC
0.37	1.1	4	6		
0.55	1.5	4	6	20	
0.75	1.8	6	6	20	
1.1	2.6	10	6	20	
1.5	3.4	10	10	20	
2.2	4.8	16	16	20	
3.0	6.5	20	16	20	
4	8.2	25	20	20	
4.5	9	32	25	20	
5.5	11	32	32	32	
7.5	14	40	40	32	
10	19	50	50	50	
11	21	50	50	50	
15	28	63	63	63	
18.5	34	100 ")	80	100	
22	40	125 ')	100	100	
25	46	125 ')	100	100	
30	55			125	
37	66			125")	125
45	80			125")	125
55	100				175
75	135				225
90	160				
110	200				
132	230				
160	270				
185	320				
200	361				
220	380	i di ini			
250	430	-			
280	480				
300	510	A TOP OF			
375	650				
450	750				

Refer page 9 - 28 for all footnotes

Motor circuit application table for DOL starting

Breaker type and current rating (A)

X\$400\$E XH630\$E
XH400\$F X\$630\$E X\$800\$NJ

XS400SE XH400SE XS250NJ XS400CJ XH250NJ XS400NJ

XS630SE XS630CJ XS630NJ

XS800NJ XH800SE XS800SE

XS1250SE/1000

Refer page 9 - 28 for all footnotes

General motor circuit application table for reduced voltage starting

Breaker type and current rating, star delta, auto transformer resistor or reactance starting

Motor rating (kW)	Approx. FLC (amps)	Din-T C & D Curve	Safe-T	XS125CJ XS125NJ XH125NJ TL100NJ ")	XE225NC
0.37	1.1	4	6		
0.55	1.5	4	6	20	
0.75	1.8	4	6	20	
1.1	2.6	6	6	20	
1.5	3.4	10	6	20	
2,2	4.8	10	10	20	
3.0	6.5	16	16	20	
4	8.2	20	16	20	
4.5	9	20	16	20	
5.5	11	25	20	20	
7.5	14	32	25	20	
10	19	40	40	32	
11	21	50	40	32	
15	28	50	50	50	
18.5	34	63	63	50	
22	40	80 ')	63	63	
25	46	100 ')	80	100	
30	55	125 ')	100	100	
37	66	125")		100	125
45	80			125	125
55	100				150
75	135				175
90	160				225
110	200				
132	230				
160	270				
185	320				
200	361				
220	380				
250	430				
280	480				
300	510				
375	650				
450	750				

Refer page 9 - 28 for all footnotes

Q-Pulse Id TMS972 Active 10/12/2014 Page 276 of 441

General motor circuit application table for reduced voltage starting

Breaker type and current rating, star delta, auto transformer resistor or reactance starting

XS250NJ XH250NJ	XS400SE XH400SE XS400CJ XS400NJ	XH630SE XS630SE XS630CJ XS630NJ	XS800NJ XH800SE XS800SE	XS1250SE/1000
_				
160				
160				
160	250			
160	250			
250	250			
250	250			
250	250	400		
	400	400		
	400	400		
	400	400	800 ²)	
	400 ²)	630	800 ²)	
		630	800	
		630	800	
		630	800	
		630	800	
			800 ²)	
				1000

Refer page 9 - 28 for all footnotes

Motor circuit application table for DOL FIRE PUMP starting duty

Breaker type and current rating (A)

Motor rating (kW)	Approx. FLC (amps)	Din-T C & D Curve	Safe-T	XM30PB	XS125CJ XS125NJ XH125NJ TL100NJ 3)	TL100EM TL100C
0.37	1.1	4	6	3.6		
0.55	1.5	6	6	3.6		
0.75	1.8	6	6	5	20	15
1.1	2.6	10	6	7.4	20	15
1.5	3.4	16	10	10	20	15
2.2	4.8	20	16	12	20	15
3	6.5	25	20		20	20
4	8.2	32	25		32	30
4.5	9	32	32		32	30
5.5	11	40	40		32	30
7.5	14	50	50		50	40
10	19	63	50		50	50
11	21	63	63		63	60
15	28	100 ')	80		100	75
18.5	34	125 ')	100		100	75
22	40				125	75
25	46				125	100
30	55					100
37	66					
45	80					
55	100					
75	130					
90	155					
110	200					
132	225					
160	270					
185	320					
200	361					
220	380					
250	430					
280	480					
300	510					
375	650					
450	750					

Refer page 9 - 28 for all footnotes

^{9 - 26} Q-Pulse Id TMS972 Active 10/12/2014 Page 278 of 441

Motor circuit application table for DOL FIRE PUMP starting duty

XE225NC	XS250NJ XH250NJ	XS400SE XH400SE XS400CJ XS400NJ	XH630SE XS630SE XS630CJ XS630NJ	XS800NJ XH800SE XS800SE	XS1250SE /1000
				_	
	144				
125	160				
150 175	160 250	250			
225	250	250			
	200	400			
		400			
		400	630		
		400	630		
		400	630		
		400 ²)	630		
			630	800	
			630	800	
			630	800	
				800	
				800	

Refer page 9 - 28 for all footnotes

Q-Pulse Id TMS972 Active 10/12/2014 Page 279 of 4477

800²)

9

1000

Footnotes

These motor circuit application tables are to be used as a selection guide for average 3 phase, 4 pole 400/415 V motors for standard applications only. Non standard applications refer NHP.

Notes from pages 9-22 to 9-23 (DOL starting)

-) 80, 100 and 125 amp refers to Din-T10H type.
- Type 'SE' TemBreak MCCB only.
- b) Use magnetic type TemBreak MCCB only. Refer NHP.

The DOL table is based on holding 125 % FLC continuously and 600 % FLC for 10 seconds. For non standard drives consult NHP.

Lower circuit breaker ratings are possible in most applications. Refer to Type '2' co-ordination tables for specific circuit breaker/overload combinations.

Adjustable magnetic trips set to high. Thermal magnetic TemBreak adjustable 63 % - 100 % of NRC (nominal rated current).

Din-T MCBs are calibrated to IEC 898 Curve 'C' & 'D'. Selected sizes of 'D' Curve are available from stock refer NHP.

Notes from page 9-24 to 9-25 (reduced voltage starting)

- 1) 80, 100 and 125 amp refers to Din-T10H type.
- 2) Type 'SE' TemBreak MCCB only.
- 3) TL100NJ up to 100 A only.

If co-ordination to IEC 947-4-1 is required refer to Type '1' and '2' co-ordination tables, contact NHP.

Reduced voltage table is based on holding 120 % FLC continuously and 350 % FLC for 20 seconds.

Din-T MCBs are calibrated to IEC 898 Curve 'C' & 'D'. Selected sizes of 'D' Curve are available from stock refer NHP.

Notes from page 9-26 to 9-27 (DOL starting fire pumps)

- 80, 100 and 125 amp refers to Din-T10H type.
- *) Type 'SE' TemBreak MCCB only.
- 3) TL100NJ up to 100 A only.

DOL table is based on holding 125 % FLC continuously and 600 % FLC for at least 20 seconds.

Din-T MCBs are calibrated to IEC 898 Curve 'C' & 'D'. Selected sizes of 'D' Curve are available from stock refer NHP.

Motor starting table for DOL starting at 1000 V AC 50 Hz

kW	Full load current amperes	МССВ	Voltage 1)
0.37-10	0.4-7.5	TL100EM/15	1000 V
11.0	9.0	TL100EM/20	1000 V
15-18.5	12-14.5	TL100EM/30	1000 V
22-33	17-23	TL100EM/40	1000 V
37-50	28-38	TL100EM/50	1000 V
55-80	40-57	TL100EM/75	1000 V
90-110	65-78	TL100EM/100	1000 V
150	102	XV400NE/160	1000 V
185-220	138-160	XV400NE/250	1000 V
220-500	160-350	XV400NE/400	1000 V

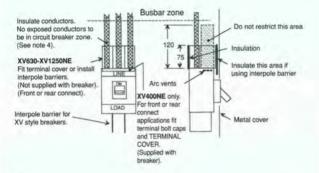
Note: The above table should be used as a guide for standard applications only.
') Rating available at 1100 V AC also.

TemBreak Mining Applications (1100 V) Incoming Connections

The arc chamber in Terasaki TemBreak circuit breakers is located adjacent to the LINE side terminals. The chamber is vented through holes located just above each line terminal. Even at low fault levels the arc gases that are released are very hot and reduce the dielectric strength of the air in the vicinity of the terminals. If care is not taken when installing the TemBreak this gas can cause arcing faults on the incoming bars or cables. Significant voltage transients may also be produced as inductive circuits are switched and contribute to an arcing fault.

These problems affect all circuit breaker installations to varying degrees.

To ensure that problems are not created by installation please observe the following recommendations.



Notes:

- Always observe LINE/LOAD marking. (Do not reverse connect).
- Ensure insulation on incoming conductors is adequate. Do not use low grade heat shrink (some low grade types split at operating temperatures).
- Minimum clearance to earth metal,

Above and below breaker - 120 mm (XV1250NE - 150 mm)

To sides of breaker - 40 mm

- Switchboard construction to be a minimum Form 2 to AS 3439.1 with IP3x protection between busbar and circuit breaker zones.
- Actual construction can vary to the above but in all cases it is the responsibility
 of the switchboard manufacturer to ensure compliance to the relevant standard
 ie. AS 3439.1.

9

	untry	Standard	Com	
Sw	veden	SEN 2121-1960	Similar to DIN 40050, with the except that S is used in place of IP	
Fin	nland	E1 (1974)	Simila	ar to CEE 24/1962 standards
No	rway	NEMKO 22/52		
Sw	vitzerland	SEV 0119, 1955 SEV 1000, 1974		
Fra	ance	NF/UTE C20-010		lementary third code digit for ction against mechanical damage
US	A	NEMA ICS 6-1978	Differ	rs considerably from IEC 144 and 529
Ca	ınada	CSA, C22.2 No. 94, 1976		
Aus	stralia	AS 1939-1976	Aligne is vali	ed with IEC 529/1976; ie. table 1.10 id
IP	rating p	rotection against ingres	ss of o	dust and liquids
IP		of protection against contact ess of foreign bodies	IP	2nd digit Degree of protection against ingress of liquids
0	No protec		0	No protection
1	foreign bo	n against ingress of solid odies with diameters han 50 mm	1	Protection against vertically falling water drops
2	fingers, pr solid forei	n against contact with the protection against ingress of sign bodies with diameter than 12 mm	2	Protection against obliquely falling water, up to an angle of 15 $^{\circ}$
3	wires etc. than 2.5 r foreign bo	n against contact with ., with diameters greater mm, or ingress of solid odies with diameters han 2.5 mm	3	Protection against obliquely sprayed water, up to an angle of 60 ° from the vertical
Protection against contact with wires etc., with diameter greater than 1 mm, or ingress of solid foreign bodies with diameters greater than 1 mm		., with diameter greater m, or ingress of solid odies with diameters		Protection against sprayed low pressure water from any direction
5	with live p	e protection against contact parts, protection against deposits of dust	5	Protection against water-jets from any direction - limited ingress permitted
6		e protection against contact parts, protection against of dust		Protection against strong jets of water eg. ship decks
			7	Protection against temporary immersion in water

Protection against indefinite immersion in water - under

pressure

Application notes

A series of application notes are incorporated in Part C Cat. on Terasaki breakers for applications. Information on the following refer to Part C Cat. or to NHP:

Ref No.	Description
5006	Specification for corrosive proofing of MCCBs
5025	De-rated current of ACBs when enclosed
5093	De-rated current of MCCBs when enclosed
5095, 5069	DC applications of MCCBs
5067	DC applications of ACBs
5065	Reverse connection
5074	Thyristor protection with MCCBs
5063	MCCBs for capacitor switching
5075	MCCBs for use in spot welder circuits
5062	400 Hz application for MCCBs
5078	ELCBs at high frequency
5087	ACBs and MCCBs at high altitude
5088	De-rating of TemBreak electronic MCCBs
5083	Circuit breaker life mechanical and electrical
5086	TemBreak UVT: transient response time

Electrical Formula - For obtaining kW, kVA, HP, and Amperes

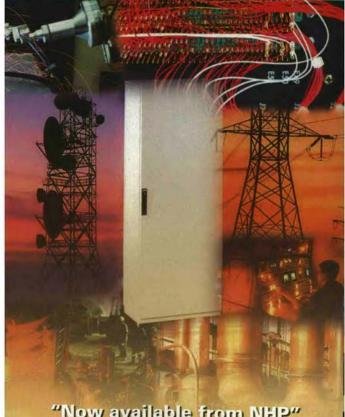
Wanted	Single-phase	Alternating Current Two-phase Four-wire	Three-phase	Direct current
Kilowatts	1xExPF	1xEx2xPF	1xEx1.73xPF	1xE
	1000	1000	1000	1000
kVA	1xE	1xEx2	1xEx1.73	1xE
	1000	1000	1000	1000
Horse	1 x E x % Eff. x PF	1 x E x 2 x % Eff. x PF	1 x E x 1.73 x % Ett. x PF	1 x E x % Eff.
power	746	746	746	746
Amperes from kVA	kVA x 1000	KVA x 1000 2 x E	kVA x 1000 1.73 x E	KVA x 1000

TemPower

ACB and OCR Catalogue Numbers with applicable Item Numbers

Description	Catalogue Number	Item Number
3 pole	AR212S	AR12A3DH1
	AR216S	AR16A3DH1
	AR220S	AR20A3DH1
	AR325S	AR25A3DH1
	AR332S	AR32A3DH1
	AR440S	AR40A3DH1
4 pole	AR2128	AR12A4DH1
	AR216S	AR16A4DH1
	AR2209	AR20A4DH1
	AR325S	AR25A4DH1
	AR3325	AR32A4DH1
	AR440S	AR40A4DH1
AGR - L	AGR-11L-AL	Refer OCR Cat. No
	AGR-11L-GL	Refer OCR Cat. No.
	AGR-11L-PS	Refer OCR Cat. No
	AGR-11L-PG	Refer OCR Cat. No
	AGR-21L-PS	Refer OCR Cat, No
	AGR-21L-PGU	Refer DCR Cat. No
AGR - R	AGR-11R-PS	Refer OCR Cat. No
	AGR-11R-PG	Refer OCR Cat. No
AGR - S	AGR-11S-AL	Refer OCR Cat. No
	AGR-11S-PS	Refer OCR Cat. No
	AGR-21S-PSU	Refer OCR Cat. No
	AGR-21S-PRU	Refer OCR Cat. No
AGR 22 L	AGR-22L-PS	Refer OCR Cat. No
	AGR-22L-PG	Refer OCR Cat. No
	AGR-22L-PGU	Refer OCR Cat. No

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- · Floor standing · Data and 19" racks

068 Tufnell Road	d Yerongo	a SPS Alpha	a Andine H	icocale No	A Manual
Cat. No.	Page	Cat. No.	Page	Cat. No.	Page
100-3BA	3 - 24	2H1197BAA	4 - 12	2H1407DAA	3 - 16

Cat. No. Page	Cat. No.	Page	Cat. No. Page
100-3BA3 - 24	2H1197BAA	_	2H1407DAA3 - 16
1004BA3 - 35	2H1198BAA		2H1408DAA3 - 16
1004BA4 - 5	2H1198BAA	4 - 12	2H1410DAA3 - 25
1504BA3 - 35	2H1199BAA	3 - 55	2H1412DAA3 - 25
1504BA4 - 5	2H1199BAA	4 - 12	2H1413DAA3 - 36
24V AC SHT3 - 74	2H1200BAA		2H1413DAA4 - 6
24V AC SHT4 - 2	2H1200BAA	412	2H1414DAA3 - 36
2A1785DAA3 - 16	2H1201BAA	3 - 55	2H1415DAA3 - 36
2A1786DAA3 - 25	2H1201BAA	4 - 12	2H1415DAA4 - 6
2A1787DBA3 - 36	2H1202BAA	3 - 55	2H1416DAA3 - 36
2A1787DBA3 - 52	2H1202BAA	4 - 12	2H1417DAA3 - 52
2A1787DBA3 - 57	2H1203BAA		2H1417DAA4 - 10
2A1787DBA4 - 6	2H12O3BAA	4 - 12	2H1418DAA3 - 52
2A1788DAA3 - 36	2H12O4BAA		2H1419DAA3 - 57
2A1788DAA4 - 10	2H12O4BAA		2H1419DAA4 - 14
2A1788DAA4 - 14	2H1208BAA	3 - 55	2H1420DAA3 - 57
2A1788DAA4 - 6	2H1208BAA		2H1492BAA3 - 34
2A1818CAA3 - 19	2H1209BAA		2H14928AA4 - 4
2A2272BAB3 - 51	2H1209BAA		2H1493BAA3 · 34
2A2272BAB3 - 57	2H1210BAA		2H1493BAA4 - 4
2A2272BAB4 - 14	2H1210BAA		2H1494BAA 3 - 34
2A2272BAB4 - 9	2H1211BAA		2H1494BAA4 - 4
2A3308DAA3 - 52	2H1211BAA		2H1495BAA 3 - 34
2A3308DBA3 - 52	2H1212BAA		2H1495BAA4 - 4
2H0153CAB3 - 19	2H1212BAA	4 - 12	2H1496BAA3 - 34
2H0153CBB3 - 19	. 2H1305BAA	3 - 34	2H1496BAA4 - 4
2H0153CCB3 - 19	2H1305BAA		2H1503BAA3 - 50
2H0153CDB3 - 19	2H1306BAA		2H1503BAA4 - 8
2H0153CEB3 - 19	2H1306BAA	4 - 4	2H1504BAA3 - 50
2H0156CAB3 - 19	2H1307BAA	3 - 34	2H1504BAA4 - 8
2H0156CBB3 - 19	2H1307BAA	.4 - 4	2H15058AA3 - 50
2H0157CAB3 - 19	2H1308BAA	3 - 34	2H1505BAA4 - 8
2H0157CBB3 - 19	2H1308BAA	.4 - 4	2H1506BAA3 - 50
2H0158CAA3 - 19	2H1309BAA		2H1506BAA4 - 8
2H1079CAA3 - 19	2H1309BAA		2H1507BAA3 - 50
2H1D80CAA3 - 19	2H1310BAA		2H1507BAA4 - 8
2H1081CAA3 - 19	2H1310BAA		2H15Q98AA3 - 6Q
2H1191CAB3 - 56	2H1311BAA		2H15108AA3 - 60
2H1191CAB4 - 13	2H1311BAA		2H1511BAA3 - 60
2H1193CAB3 - 56	2H1312BAA		2H1512BAA3 - 60
2H1193CAB4 - 13	2H1312BAA		2H1513BAA3 - 60
2H1194CAB3 - 56	2H1384DAA		2H1515BAA3 - 50
2H1194CAB4 - 13	2H1384DAA		2H1515BAA4 - 8
2H1195CA83 - 56	2H1385DAA		2H1516BAA3 - 50
2H1195CAB4 - 13	2H1406DAA	-	2H1516BAA4 - 8
2H1197BAA3 - 55	2H1406DAA		2H1517BAA3 - 50
			Index 1 Page 287 of 441
Q-Pulse Id TMS972	Active 10/12/20	UI4 '	age 20/ 01 441

一日日本年代の日本の一日 大田田本田田 い

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68 Tufnell Road Yeronga SPAIP traps to the ride Set of No. Mildex

2H1518BAA	3 - 23 612WNA - 4FD 3 - 23 616WN - 3FD 4FD 3 - 15 61WN - 4FD 3 - 15 620WN - 3BD 3 - 15 620WN - 3BD 3 - 15 620WN - 4BD 3 - 23 62W - 3FD	5 - 4 5 - 4 5 - 4 5 - 4
2H1518BAA	A3 - 23 616WN - 4FD A3 - 7 61W - 3FD A3 - 15 61WN - 3FD A3 - 15 61WN - 4FD A3 - 15 620WN - 3BD A3 - 15 620WN - 4BD A3 - 23 62W - 3FD	5 - 4 5 - 4 5 - 4
2H1519BAA 3 - 50 2H193DBBA 2H1519BAA 4 - 8 2H1947BAC 2H1520BAA 3 - 50 2H1947BBC 2H1520BAA 4 - 8 2H1947BCC 2H1521BAA 3 - 50 2H1948BAC 2H1521BAA 4 - 8 2H1948BBAC 2H1522BAA 3 - 50 2H1949BBB 2H1522BAA 4 - 8 2H1949BBB 2H1522BAA 3 - 60 2H1949BCB 2H1527BAA 3 - 60 2H1950BAB 2H1528BAA 3 - 60 2H1950BBB 2H1529BAA 3 - 60 2H1950BBB 2H1529BAA 3 - 60 2H1951BAA 2H1530BAA 3 - 60 2H1955BBA 2H1531BAA 3 - 60 2H1955BAA 2H1531BAA 3 - 60 2H1955BAA 2H1531BAA 3 - 60 2H1955BAA 2H1531BAA 3 - 60 2H1959DAB 2H1531BAA 3 - 60 2H1959DAB 2H1531BAA 3 - 7 2H200BDB 2H15131BAA 3 - 7 2H200BDB	A	5 - 4 5 - 4 5 - 4
2H1519BAA 4 · 8 2H1947BAC 2H1520BAA 3 · 50 2H1947BBC 2H1521BAA 4 · 8 2H1947BCC 2H1521BAA 4 · 8 2H1948BAC 2H1522BAA 4 · 8 2H1949BBA 2H1522BAA 3 · 50 2H1949BBA 2H1522BAA 3 · 60 2H1949BBA 2H1527BAA 3 · 60 2H1950BBB 2H1527BAA 3 · 60 2H1950BBB 2H1528BAA 3 · 60 2H1950BBB 2H1529BAA 3 · 60 2H1951BAA 2H1531BAA 3 · 60 2H1951BAA 2H1532BAA 3 · 60 2H1955BAB 2H1531BAA 3 · 60 2H1955BAB 2H1531BAA 3 · 60 2H1955DAB 2H1531BAA 3 · 60 2H1955DAB 2H1531BAA 3 · 60 2H1955DAB 2H1531BAA 3 · 7 2H200DBA 2H1931BAA 3 · 7 2H200BDBA 2H1931BAA 3 · 7 2H200BDBA 2H1931BAA 3 · 7 2H2012DBB 2H1931BAA 3 · 7 2H2012DBB 2H1931BAA <t< td=""><td>3 - 15</td><td>5 - 4 5 - 4</td></t<>	3 - 15	5 - 4 5 - 4
2H1520BAA	3 - 15	5 - 4
2H1520BAA	3 - 15 61WN - 4FD 63 - 15 620WN - 3BD 63 - 15 620WN - 4BD 73 - 23 62W - 3FD	5 - 4
2H15218AA 3 - 50 2H1948BAC 2H15218AA 4 - 8 2H1948BBC 2H1522BAA 3 - 50 2H1949BBB 2H1522BAA 3 - 60 2H1950BBB 2H1528BAA 3 - 60 2H1950BBB 2H1528BAA 3 - 60 2H1950BBB 2H1530BAA 3 - 60 2H1952BAA 2H1531BAA 3 - 60 2H1954BAA 2H1531BAA 3 - 60 2H1954BAA 2H1531BAA 3 - 60 2H1959DAB 2H1613BAA 3 - 60 2H1959DAB 2H1613CBA 3 - 7 2H1959DBB 2H1613CBA 3 - 7 2H200BDBA 2H1931BBA 3 - 7 2H200BDBA 2H1931BBA 3 - 7 2H200BDBA 2H1931BCA 3 - 7 2H200BDBA 2H1931BCA 3 - 7 2H2012DBB 2H1932BCA 3 - 7 2H2012DBB 2H1932BCA 3 - 7 2H2135DAA 2H1932BCA 3 - 7 2H2266DBA 2H1932BCA 3 - 15 2H2266DBA 2H1935BCC 3 - 15 2H2385DAA 2H1935BCC 3 - 15 2H2385DAA 2H1935BCC 3 - 15 2H2385DAA 2H1936BBC 3 - 15 2H2385DAA 2H1936BBC 3 - 15 2H2387DAA 2H1936BBC 3 - 15 2H2385DAA 2H1936BBC 3 - 15 2H2387DAA 2H1936BB	3 - 15 61WN - 4FD 63 - 15 620WN - 3BD 63 - 15 620WN - 4BD 73 - 23 62W - 3FD	5 - 4
2H1521BAA	3 - 15 620WN - 3BD 3 - 15 620WN - 4BD 63 - 23 62W - 3FD	
2H1522BAA 3 - 50 2H1949BAB 2H1522BAA 4 - 8 2H1949BAB 2H1526BAA 3 - 60 2H1950BAB 2H1527BAA 3 - 60 2H1950BAB 2H1527BAA 3 - 60 2H1950BAB 2H1527BAA 3 - 60 2H1950BAB 2H1529BAA 3 - 60 2H1952BAA 2H1530BAA 3 - 60 2H1952BAA 2H1530BAA 3 - 60 2H1952BAA 2H1531BAA 3 - 60 2H1959DAB 2H16313BAA 3 - 7 2H1959DAB 2H1613CBA 3 - 19 2H1959DAB 2H1613CBA 3 - 7 2H200BDAB 2H1931BAA 3 - 7 2H200BDAB 2H1931BAA 3 - 7 2H200BDAB 2H1931BAA 3 - 7 2H2012DAB 2H1931BAA 3 - 7 2H2012DAB 2H1931BCA 3 - 7 2H2012DAB 2H1931BCA 3 - 7 2H2012DAB 2H1931BCA 3 - 7 2H2012DAB 2H1932BAA 3 - 7 2H203BDAA 2H1932BAA 3 - 7 2H226GDAA 2H1932BAA 3 - 7 2H226GDAA 2H1935BBC 3 - 15 2H238DAA 2H1936BBC 3 - 15 2H238DAA 2H23	3 - 15 620WN -4BD 63 - 23 62W - 3FD	
2H1522BAA	3 - 23 62W - 3FD	5 - 4
2H1522BAA		
2H1526BAA	1 3 - 23 62W - 4FD	
2H1527BAA		
2H1528BAA		
2H1529BAA		
2H1530BAA		
2H1531BAA		
2H1532BAA		
2H1533BAA		
2H1541BAA		
2H1613BAA 3 - 19		
2H1613CBA 3 - 19		
2H1931BAA 3 - 7 2H1960DBA 2H1931BBA 3 - 7 2H2008DBB 2H1931BCA 3 - 7 2H2008DBB 2H1931BCA 3 - 7 2H2012DAB 2H1931BEA 3 - 7 2H2012DAB 2H1932BAA 3 - 7 2H2012DBA 2H1932BAA 3 - 7 2H2012DBA 2H1932BAA 3 - 7 2H2135DAA 2H1932BAA 3 - 7 2H2135DAA 2H1932BAA 3 - 7 2H2266DBA 2H1932BBA 3 - 7 2H2266DBA 2H1932BBA 3 - 7 2H2266DBA 2H1935BBC 3 - 15 2H2286DBA 2H1935BBC 3 - 15 2H238DAA 2H1935BCC 3 - 15 2H238DAA 2H1935BCC 3 - 15 2H238DAA 2H1935BBC 3 - 15 2H238DAA 2H1936BBC 3 - 15 2H2734DBA 2H1936BBC 3 - 15 392.00001 2H1937BAA 3 - 23 392.35553 2H1937BAA 3 - 23 392.35555 2H1937BAA 3 - 23 392.35555 2H1937BDA 3 - 23 610WN - 3FE	3 3 - 56 650WN - 38D	-
2H1931BBA 3 - 7 2H2008DAB 2H1931BCA 3 - 7 2H2008DBB 2H1931BCA 3 - 7 2H2012DAB 2H1931BEA 3 - 7 2H2012DAB 2H1931BEA 3 - 7 2H2012DBB 2H1932BAA 3 - 7 2H2012DBB 2H1932BAA 3 - 7 2H2135DAA 2H1932BAA 3 - 7 2H2135DAA 2H1932BAA 3 - 7 2H2266DAA 2H1932BAA 3 - 15 2H2266DBA 2H1935BBC 3 - 15 2H2383DAA 2H1935BCC 3 - 15 2H2383DAA 2H1935BCC 3 - 15 2H2384DAA 2H1935BCC 3 - 15 2H2387DAA 2H1935BCC 3 - 15 2H2387DAA 2H1936BBC 3 - 15 2H2387DAA 2H1936BBC 3 - 15 2H2734DBA 2H1936BBC 3 - 15 3P2.00001 2H1937BAA 3 - 23 392.35553 2H1937BAA 3 - 23 392.35555 2H1937BDA 3 - 23 610WN - 3FE	3 - 56 66WN - 3FD	
2H1931BCA 3 - 7 2H2008DBB 2H1931BDA 3 - 7 2H2012DAB 2H1931BEA 3 - 7 2H2012DBB 2H1932BBA 3 - 7 2H2135DAA 2H1932BBA 3 - 7 2H2135DAA 2H1932BBA 3 - 7 2H2266DAA 2H1935BAC 3 - 15 2H2266DBA 2H1935BBC 3 - 15 2H2383DAA 2H1935BC 3 - 15 2H2383DAA 2H1935BC 3 - 15 2H2387DAA 2H1935BC 3 - 15 2H2387DAA 2H1935BBC 3 - 15 2H2387DAA 2H1935BBC 3 - 15 2H2734DBA 2H1936BBC 3 - 15 2H2734DBA 2H1936BBC 3 - 15 392.00001 2H1936BBC 3 - 15 392.00001 2H1937BAA 3 - 23 392.35553 2H1937BBA 3 - 23 392.35555 2H1937BDA 3 - 23 392.35555 2H1937BDA 3 - 23 610WN - 3FE	3 - 56 66WN - 4FD	
2H1931BDA 3 - 7	3 - 24 68WNA - 3FD	5 - 4
2H1931BEA	3 - 24 68WNA - 4FD	5 - 4
2H1932BAA	3 - 35 7AB 2D11B	3 - 74
2H1932BDA 3 - 7 2H2135DAA 2H1932BGA 3 - 7 2H2136DAA 2H1932BHA 3 - 7 2H2266DAA 2H1935BAC 3 - 15 2H2266DBA 2H1935BCC 3 - 15 2H2385DAA 2H1935BCC 3 - 15 2H2385DAA 2H1935BCC 3 - 15 2H2385DAA 2H1935BCC 3 - 15 2H2387DAA 2H1935BCC 3 - 15 2H2387DAA 2H1936BAC 3 - 15 2H2734DBA 2H1936BAC 3 - 15 2H2734DBA 2H1936BBC 3 - 15 392.00001. 2H1937BAA 3 - 23 392.35554. 2H1937BAA 3 - 23 392.35555. 2H1937BDA 3 - 23 610WN - 3FE	4 - 5 7AB 2D11B	4 - 2
2H1932BDA 3 - 7	3 - 35 7AB 2H11	
2H1932BGA	3 - 25 7AB 3B11	
2H1932BHA	3 - 25 7AB 3H11	
2H1935BAC		
2H1935BBC		
2H1935BCC		
2H1935BDC		
2H1935BEC	2 15 20 204	
2H1936BAC	3 - 15 78 381	
2H1936BBC 3 - 15 2H2734DBA 2H1936BDC 3 - 15 392.00001 2H1936BHC 3 - 15 392.00002 2H1937BAA 3 - 23 392.35553 2H1937BBA 3 - 23 392.35554 2H1937BCA 3 - 23 392.35555 2H1937BDA 3 - 23 510WN - 3FE	3 - 15 7B 3B1	
2H1936BDC	3 - 15 7B 3B1	. 74
2H1936BHC	3 - 15 7B 3B1	
2H1937BAA 3 - 23 392.35553 2H1937BBA 3 - 23 392.35554 2H1937BCA 3 - 23 392.35555 2H1937BDA 3 - 23 610WN - 3FE	3 - 15 78 381	3 - 74
2H1937B8A3 - 23 392.35554 2H1937BCA3 - 23 392.35555 2H1937BDA3 - 23 610WN - 3FC	3 - 15	3 - 74 3 - 77
2H1937BCA3 - 23		3 - 74 3 - 77 4 - 2
2H1937BDA3 - 23 610WN - 3FC		3 - 74 3 - 77 4 - 2 3 - 74
		3 - 74 3 - 77 4 - 2 3 - 74 4 - 2
		3 - 74 3 - 77 4 - 2 3 - 74 4 - 2
		3 - 74 3 - 77 4 - 2 3 - 74 4 - 2 3 - 74
		3 - 74 3 - 77 4 - 2 3 - 74 4 - 2 3 - 74
Index 2		3 - 74 3 - 77 4 - 2 3 - 74 4 - 2 3 - 74 4 - 2

Cat. No.	Page	Cat. No.	Page	Cat. No.	Page
7PE50SG1.	1 - 4	7VF 2M7	4 - 2	AGR-11S-PS	6 - 4
7PE50SG2 .	1 - 4	7VF 3B1	3 - 77	AGR-21L-PGU	6 - 4
7PE50SG3.	1 - 4	7VF 3B2-B	3 • 77	AGR-21L-PS	6 - 4
7PE50SG4.	1 - 4	7VF 3B4	3 - 77	AGR-21S-PRU	6 - 4
7RC 2LC	3 - 75	7VF 3B5	3 - 77	AGR-21S-PSU	6 - 4
7RC 2LE	3 - 74	7VF 3B6	3 - 77	AGR-22L-PG	6 - 4
7RC 2LE	4 - 2	7VF 3B7	3 - 77	AGR-22L-PGU	6 - 4
7T 2H1	3 - 75	7VF 3H1	3 - 76	AGR-22L-PS	6 - 4
7T 2M1	3 - 74	7VF 3H2-B	3 - 76	AH50C	6 - 4
7T 2M1	4 - 2	7VF 3H4	3 - 76	AH60C	6 - 4
7T 3B1	3 - 76	7VF 3H5	3 - 76	ALR	5 - 3
7T 3B1	3 - 77	7VF 3H6	3 - 76	AR208S	6 • 4
7T-1ST	1 - 4	7VF 3H7	3 - 76	AR212\$	6 - 4
7T-2ST	1 • 4	7VF A03	3 - 77	AR216S	6 - 4
7UF 2D5B	3 - 74	7VF A05	3 • 76	AR220S	6 - 4
7UF 2D5B	4 - 2	7XA 10A1	3 - 77	AR325S	6 - 4
7UF 2D6B	3 - 74	7XA 10B1	3 • 77	AR332S	6 - 4
7UF 2D6B	4 - 2	7XA 10L1	3 - 77	AR440S	6 - 4
7UF 2D7B	3 - 74	7XA 10M1	3 - 77	BH1N233	5 - 1

7XA 10M1 3 - 77 7UF 2D7B 4 - 2 7XA 2D31B3 - 74 BH2N233 5 - 1 7UF 2FD14 - 2 7XA 2D41B3 - 74 BH6S633 5 - 1 7UF 2FD2 3 - 74 BH8S833 5 - 1 7UF 2FD24 - 2 7XA 2H11.....3 - 75 BS12S12335 - 1 7UF 2H2 3 - 75 7XA 2H21 3 - 75 B\$16\$1633 5 - 1 7UF 2H53 - 75 7XA 3H11.....3 - 76 BS1C2335 - 1 7XA 3H21.....3 - 76 7UF 4BA5.....3 - 76 BS20E20335 - 1 7UF 4BA6......3 - 76 7XA 3H31.....3 - 76 7UF 4BA7......3 - 76 7XA 3H41.....3 - 76 BS25E25335 - 1 7UF 4BD1 3 - 76 7XA A03RB 3 - 77 BS2N233 5 - 1 7UF 4BD23 - 76 7XA A083 - 76 BS4C233 5 - 1 7UF B053 - 76 7XA B03B.....3 - 77 BS4N433 5 - 1 7VF 2H13 - 75 7XA B083 - 76 BS4S233 5 - 1 7VF 2H2-B......3 - 75 7Y033 · 74 BS6C6335 - 1 7VF 2H43 - 75 7YD33 - 75 BS6N633 5 - 1 7VF 2H6 3 - 75 7YD3......4 - 2 BS6S633 5 - 1

80-3BA.....3 - 24

804BA.....3 - 35

7VF 2H7 3 - 75

7VF 2M1 3 - 74

7VF 2M14 - 2

7VF 2M2-B3 - 74

7VF 2M2-B......4 - 2

7VF 2M4 3 - 74

7VF 2M44 - 2

7VF 2M6 3 - 74

7VF 2M64 - 2

7VF 2M7 3 - 74

Q-Pulse Id TMS972

CA 4-12-101 - 37 804BA4 - 5 AGR-11L-AL6 - 4 CA 4-5-101 - 37 CA 4-9-101 - 37 AGR-11L-GL6 - 4 AGR-11L-PG 6 - 4 CA 4-9-M401 - 37 AGR-11L-PS6 - 4 CA 4-PC1 - 37 AGR-11R-PG 6 - 4 CB4-2 1 - 37 AGR-11R-PS......6 - 4 CB4-31 - 37 AGR-11S-AL 6 - 4 CB4-41 - 37 Page 289 of 441 Active 10/12/2014

BS8N833 5 - 1

BS8S8335 - 1

Cat. No. Page	Cat. No. Page	Cat. No. Page
CD 12/18 - 3U2 - 25	CON 60 M160 G2 - 13	CPS 72-XXXX-Y2 - 2
CD 18/18 - 3U2 - 25	CON 60 M160 02 - 13	CPS 84-XXXX-Y2 - 2
CD 24/18 - 3U2 - 25	CONWC2 - 14	CPS 96-XXXX-Y2 - 2
CD 30/18 - 3U2 - 25	COTO5 - 3	CPSCHEDULECARD2 - 2
CD 36/18 - 3U2 - 25	COTD5 - 7	CPSCHEDULEHOLD2 - 2
CO 42/18 - 3U2 - 25	CPACCG2 - 19	CST 18-XXXX-G2 - 1
CD 48/18 - 3U2 - 25	CPACCG62 - 19	CST 18-XXXX-02 - 1
CD 54/18 - 3U2 - 25	CPACCGE2 - 19	CST 24-XXXX-G2 - 1
CD 60/18 - 3U2 - 25	CPACCGE62 - 19	CST 24-XXXX-02 - 1
CD 72/18 - 3U2 - 25	CPACCO2 - 19	CST 36-XXXX-G2 - 1
CD 78/18 - 3U2 - 25	CPACCO62 - 19	CST 36-XXXX-02 - 1
CD 84/18 - 3U2 - 25	CPACCDE2 - 19	CST 48-XXXX-G2 - 1
CO 96/18 - 3U2 - 25	CPACCOE62 - 19	CST 48-XXXX-02 - 1
CD250TOPC2 - 26	CPBFK-12 - 19	CST 60-XXXX-G2 - 1
CDH-2-12/30-27/18-3U2 - 26	CPBFK-22 - 19 CPBFK-32 - 19	CST 60-XXXX-02 - 1 CST 72-XXXX-G2 - 1
COH-2-12/42-27/18-3U2 - 26		
COH-2-12/60-27/18-3U2 - 26	CPBFK-42 - 19	CST 72-XXXX-02 - 1
COH-2-6/12-27/18-3U2 - 26	CPBFK-52 - 19	CST 84-XXXX-G2 - 1
CDH-2-6/24-27/18-3U2 - 26	CPBFK-62 - 19	CST 84-XXXX-02 - 1
CDH-2-6/36-27/18-3U2 - 26	CPD 18-XXXX-Y2 - 22	CST 96-XXXX-G2 - 1
COT 18-XXXX-G2 - 17	CPO 24-XXXX-Y2 - 22	CST 96-XXXX-02 - 1
COT-18-XXXX-02 - 17	CPD 36-XXXX-Y2 - 22	CST160MS2 - 1
CDT 24-XXXX-G2 - 17	CPD 48-XXXX-Y2 - 22	CST250MS2 - 1
CDT 24-XXXX-02 - 17	CPD 60-XXXX-Y2 - 22	CT 12/25 - 32 - 2
CDT 36-XXXX-G2 - 17	CPD 72-XXXX-Y2 - 22	CT 18/25 - 32 - 2
CDT 36-XXXX-02 - 17	CPO 84-XXXX-Y2 - 22	CT 24/25 - 32 - 2
CDT_48-XXXX-G2 - 17	CPO 96-XXXX-Y2 - 22	CT 30/25 - 32 - 2
CDT 48-XXXX-02 · 17	CPORUBBER2 - 19	CT 36/25 - 32 - 2
CDT 60-XXXX-G2 - 17	CPECS2 - 19	CT 42/25 - 32 - 2
COT 60-XXXX-02 - 17	CPELK12 - 14	CT 48/25 - 32 - 2
COT 72-XXXX-G2 - 17	CPELK12 - 19	CT 60/25 - 32 - 2
CDT 72-XXXX-02 - 17	CPELK22 - 14	CT 72/25 - 32 - 2
COT 84-XXXX-G2 - 17	CPELK22 - 19	CT 84/25 - 32 - 2
CDT 84-XXXX-02 - 17	CPGPA2 - 19	CT 96/25 - 32 - 2
CDT 96-XXXX-G2 - 17	CPGPB2 - 19	D4.0 - 1108 -
CDT 96-XXXX-02 - 17	CPGPS2 - 19	D4.0 - 2408 -
CDT16DMS2 - 19	CPPFK2 - 24	D4E-AAC 10A8 -
CDT250MS2 - 19	CPPLINTH2 - 19	D4E-AAC 15A8 -
CLTO5 - 3	CPPWB2 - 23	D4E-AAC 1A8 -
CLTD5 - 7	CPPWB2 - 24	D4E-AAC 2.5A8 -
CON 24 M160 G2 - 13	CPPWC2 - 24	04E-AAC 20A8 -
CON 24 M160 02 - 13	CPS 18-XXXX-Y2 - 22	D4E-AAC 25A8 -
CON 36 M16D G2 - 13	CPS 24-XXXX-Y2 - 22	D4E-AAC 3DA8 -
CON 36 M160 O2 - 13	CPS 36-XXXX-Y2 - 22	D4E-AAC 40A8 -
CDN 48 M160 G2 - 13	CPS 48-XXXX-Y2 - 22	D4E-AAC 50A8 -
CON 48 M160 O2 - 13	CPS 60-XXXX-Y2 - 22	D4E-AAC 5A8 -

Q-Pulse Id TMS972 Active 10/12/2014 Page 290 of 441

068 Tufnell Road Yeronga SPS Pump Station Hograde OM Manual

	^{a SP} Àipha/ritither	ic cat. No. inde
Cat. No. Page	Cat. No. Page	Cat. No. Page
D4E-AAC 60A8 - 3	DG3-4PT2 1008 - 6	DIN-T10106C1 - 12
D4E-ACT 1A 2X8 - 3	DG3-4PT2 4008 - 6	DIN-T10106D1 - 14
D4E-ACT 1A 5X8 - 3	OG3-4VAC 1000/100V8 - 7	DIN-T10110C1 - 12
D4E-ACT 5A 2X8 - 3	DG3-4VAC 100V8 - 7	DIN-T10110D1 - 14
D4E-ACT 5A 5X8 - 3	DG3-4VAC 600V8 - 7	DIN-T10116C1 - 12
D4E-VAC 150V8 - 3	DG3-4VDC 100V8 - 7	DIN-T10116D1 - 14
D4E-VAC 300V8 - 3	DG3-4VDC 600V8 - 7	DIN-T10120C1 - 12
D4E-VAC 500V8 - 3	DIN-SAFE2-40-1001 - 22	DIN-T10120D1 - 14
D4E-VAC 50V8 - 3	DIN-SAFE2-40-301 - 22	DIN-T10125C1 · 12
D4E-VVT 110V8 - 3	DIN-SAFE2-40-3001 - 22	DIN-T10125D1 - 14
	DIN-SAFE2-63-1001 - 22	DIN-T10132C1 - 12
D4EWMS8 - 5	DIN-SAFE2-63-301 - 22	DIN-T10132D1 - 14
D4EWMSP8 - 5		DIN-T10132B1 - 12
D4FI8 - 3	DIN-SAFE2-80-1001 - 22	
D4M-ADC8 - 4	DIN-SAFE2-80-301 - 22	DIN-T10150C1 - 13
D4M-ADC 58 - 4	DIN-SAFE4-100-301 - 22	DIN-T10163C1 - 12
D4M-ADC 78 - 4	DIN-SAFE4-40-1001 - 22	DIN-T10201C1 - 12
D4M-ADC M18 - 4	DIN-SAFE4-40-301 - 22	DIN-T10201D1 - 1
D4M-ADC M28 - 4	DIN-SAFE4-40-3001 - 22	DIN-T10202C1 - 1
D4M-VAC V8 - 4	DIN-SAFE4-63-1001 - 22	DIN-T10202D1 - 1
D4M-VDC V8 - 4	DIN-SAFE4-63-301 - 22	DIN-T10203C1 - 1:
D4S-E8 - 6	DIN-SAFE4-63-3001 - 22	DIN-T10203D1 - 1-
D4TN 5A8 - 3	DIN-SAFE4-80-1001 - 22	DIN-T10204C1 - 1:
D6CTEP/3SH 8 - 5	DIN-SAFE4-80-301 - 22	DIN-T10204D1 - 1
D6CTEP/3SHP8 - 5	DIN-SAFE4-80-3001 - 22	DIN-T10205C1 - 1
D8CMES 100/5A8 - 5	DIN-SAFE4-80-5001 - 22	DIN-T10205D1 · 1
D8CMES 50/5A8 - 5	DIN-T 5111 - 35	DIN-T10206C1 - 1
D8CMESP 100/5A8 - 5	DIN-T 5121 - 35	DIN-T10206D1 - 1
D8CMESP 50/5A8 - 5	DIN-T 7111 - 35	DIN-T10210C1 - 1
D8CTEP/3S8 - 5	DIN-T C0321 I-II1 - 34	DIN-T10210D1 - 1
D8CTEP/3SD18 - 5	DIN-T C0321 I-D-II 1 - 34	DIN-T10216C1 - 1
D8CTEP/3SP8 - 5	DIN-T C0322 I-II1 - 34	DIN-T10216D1 - 1
	DIN-T C0322 I-0-II 1 - 34	DIN-T10220C1 · 1
D8CTEP/3SPD18 - 5		DIN-T10220D1 • 1
DC2020241 - 38	DIN-T LOCK DDG1 - 31	DIN-T10225C1 - 1
DC2022401 - 38	DIN-T M411 - 28	
DC2442401 - 38	OIN-T SHT 110-415V AC .1 - 27	DIN-T10225D1 - 1
DC244C2401 - 38	OIN-T SHT 24-60V AC1 - 27	DIN-T10232C1 - 1
DC4042401 - 38	DIN-T10101C1 - 12	DIN-T10232D1 - 1
DC6342401 - 38	DIN-T10101D1 - 14	DIN-T10240C1 - 1
DG3-4AAC 10A8 - 7	DIN-T10102C1 - 12	DIN-T10250C1 - 1
DG3-4AAC 20A8 - 7	DIN-T10102D1 - 14	DIN-T10263C1 - 1
DG3-4ACT 1A8 - 7	DIN-T10103C1 - 12	DIN-T10301C1 - 1
DG3-4ACT 5A8 - 7	DIN-T10103D1 - 14	DIN-T10301D1 - 1
DG3-4ADC 50MV8 - 7	DIN-T10104C1 - 12	DIN-T10302C1 - 1
DG3-4ADC 75MV8 - 7	DIN-T10104D1 - 14	DIN-T10302D1 - 1
	DIN-T10105C1 - 12	DIN-T10303C1 - 1
DG3-4FI 808 - 6	DIM-11010361 - 12	DIN 1100000
DG3-4FI 808 - 6 DG3-4FI 8008 - 6	DIN-T10105C1 - 12	DIN-T10303D1 - 1

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068 Tufnell Road Yeronga S**วิลัยอิหาสาก**ระกะโอกับ เวลาเป**ล**่อง**ทุกของ**บลโ

Cat. No. Page	Cat. No. Page	Cat. No. Page
DIN-T10304C1 - 13	DIN-T10H3100C1 - 15	DIN-T15440C1 - 17
DIN-T10304D1 - 14	DIN-T10H3100D1 - 15	DIN-T15450C1 - 17
DIN-T10305C1 - 13	DIN-T10H3125C1 - 15	DIN-T15463C1 - 17
DIN-T10305D1 - 14	DIN-T10H3125C2 - 20	DIN-T6102C1 - 10
DIN-T10306C1 - 13	DIN-T10H3125D1 - 15	DIN-T6102D1 - 11
DIN-T10306D1 - 14	DIN-T10H380C1 - 15	DIN-T6104C1 - 10
DIN-T10310C1 - 13	DIN-T10H380D1 - 15	DIN-T6104D1 - 11
DIN-T10310D1 - 14	DIN-T10H4100C1 - 15	DIN-T6106C1 - 10
DIN-T10316C1 - 13	DIN-T10H4100D1 - 15	DIN-T6106D1 - 11
DIN-T10316D1 - 14	DIN-T10H4125C1 - 15	DIN-T6110C1 - 10
DIN-T10320C1 - 13	DIN-T10H4125D1 - 15	DIN-T6110D1 - 11
DIN-T10320D1 - 14	DIN-T10H480C1 - 15	DIN-T6116C1 - 10
DIN-T10325C1 - 13	DIN-T10H480D1 - 15	DIN-T6116D1 - 11
DIN-T10325D1 - 14	DIN-T15106C1 - 16	DIN-T6120C1 • 10
OIN-T10332C1 - 13	DIN-T15110C1 - 16	DIN-T6120D1 - 11
DIN-T10332D1 - 14	DIN-T15116C1 - 16	DIN-T6125C1 • 10
DIN-T10340C1 - 13	DIN-T15120C1 - 16	DIN-T6125D1 - 11
DIN-T10350C1 - 13	DIN-T15125C1 - 16	DIN-T6132C1 - 10
DIN-T10363C1 - 13	DIN-T15132C1 - 16	DIN-T6132D1 - 11
DIN-T10406C1 - 13	DIN-T15140C1 - 16	OIN-T6140C1 - 10
DIN-T10406D1 - 14	DIN-T15150C1 - 16	DIN-T6140D1 - 11
DIN-T10410C1 - 13	DIN-T15163C1 - 16	DIN-T6150C1 - 10
DIN-T10410D1 · 14	DIN-T15206C1 - 16	DIN-T6150D1 - 11
DIN-T10416C1 - 13	DIN-T15210C1 - 16	DIN-T6163C1 - 10
DIN-T10416D1 - 14	DIN-T15216C1 - 16	DIN-T6163D1 - 11
DIN-T10420C1 - 13	DIN-T15220C1 - 16	DIN-T6202C1 - 10
DIN-T10420D1 - 14	DIN-T15225C1 - 16	DIN-T6202D1 - 11
DIN-T10425C1 - 13	DIN-T15232C1 - 16	DIN-T6204C1 - 10
DIN-T10425D1 - 14	DIN-T15240C1 - 16	DIN-T6204D1 - 11
DIN-T10432C1 - 13	DIN-T15250C1 - 16	DIN-T6206C1 - 10
DIN-T10432D1 - 14	DIN-T15263C1 - 16	DIN-T6206D1 - 11
DIN-T10440C1 - 13	DIN-T15306C1 - 17	DIN-T6210C1 - 10
DIN-T10450C1 · 13	DIN-T15310C1 - 17	DIN-T6210D1 - 11
DIN-T10463C1 - 13	DIN-T15316C1 - 17	DIN-T6216C1 - 10
DIN-T10H1100C1 - 15	DIN-T15320C1 - 17	DIN-T6216D1 - 11
DIN-T10H1100D1 - 15	DIN-T15325C1 - 17	DIN-T6220C1 • 10
DIN-T10H1125C1 - 15	DIN-T15332C1 - 17	DIN-T6220D1 - 11
DIN-T10H1125D1 - 15	DIN-T15340C1 - 17	DIN-T6225C1 - 10
DIN-T10H180C1 - 15	DIN-T15350C1 - 17	DIN-T6225D1 - 11
DIN-T10H180D1 - 15	DIN-T15363C1 - 17	DIN-T6232C1 • 10
DIN-T10H2100C1 - 15	DIN-T15406C1 - 17	DIN-T6232D1 - 11
DIN-T10H2100D1 - 15	DIN-T15410C1 - 17	DIN-T6248C1 - 10
DIN-T10H2125C1 · 15	DIN-T15416C1 - 17	DIN-T6240D1 - 10
DIN-T10H2125D1 - 15	DIN-T15410C1 - 17	DIN-T6250C1 - 10
DIN-T10H280C1 - 15	DIN-T15420C1 - 17	DIN-16250D1 - 10
DIN-T10H280D1 - 15	DIN-T15423C1 - 17	DIN-16250D 1 - 11
	UIN*[1040261 * 1/	DIN-102030 1 - 10
Index 6		Develo 000 - £ 441
Q-Pulse Id TMS972	Active 10/12/2014	Page 292 of 441

068 Tufnell Road Yeronga SPS1Pyrap Station: Upgrad NO. M. Manual

	•	
Cat. No. Page	Cat. No. Page	Cat. No. Page
DIN-T6263D1 - 11	DIN-TDC240C1 - 18	DSM-63-30-1PN1 - 24
DIN-T6302C1 - 10	DIN-TDC250C1 - 18	DSM-63-30-3P1 - 24
DIN-T6302D1 - 11	DIN-TDC263C1 - 18	DSM-63-30-3PN1 - 24
DIN-T6304C1 - 10	DINTM\$10011 - 19	DSMCB10301 - 21
DIN-T6304D1 - 11	DINTMS10031 - 19	DSMCB16101 - 21
DIN-T6306C1 - 10	DINTMS6311 - 19	DSMCB16301 - 21
DIN-T6306D1 - 11	DINTMS6331 - 19	DSMCB20101 - 21
DIN-T6310C1 - 10	DINTMSB011 - 19	DSMCB20301 - 21
DIN-T6310D1 - 11	DM150362 - 4	DSMCB25301 - 21
DIN-T6316C1 - 10	DM150542 - 4	DSMCB32301 - 21
DIN-T6316D1 - 11	DM150722 - 4	DSMCB40301 - 21
DIN-T6320C1 - 10	DM150JK2 - 4	DSMCB6PT06301 - 21
DIN-T6320D1 - 11	DM150LD2 - 4	DSMCB6PT10301 - 21
DIN-T6325C1 - 10	DM150NAA2 - 4	DSMCB6PT16301 - 21
DIN-T6325D1 - 11	DM150NAB2 - 4	DSMCB6PT20301 - 21
DIN-T6332C1 - 10	DM150NAC2 - 4	DSMCB6PT25301 - 21
DIN-T6332D1 - 11	DMWP122 - 5	DSMCB6PT32301 - 21
DIN-T6340C1 - 10	DMWP242 - 5 DMWP362 - 5	DSMCB6PT40301 - 2
DIN-T6340D1 - 11		DSR110ADEL7 - 9
DIN-T6350C1 - 10	DMWPCS2 - 5	DSR110DEL7 - 9
DIN-T6350D1 - 11	DMWPLD2 - 5	DSR140DEL7 - 9
DIN-T6363C1 - 10	DNC122 - 2	DSR150ADEL7 - 9
DIN-T6363D1 - 11	DNC242 - 2	DSR210DEL7 - 9
DIN-TDC101C1 - 18	DNC362 - 2	DSR310ADEL7 - 9
DIN-TDC102C1 - 18	DDVPBL31 - 36	DSR35DEL7 - 9
DIN-TDC104C1 - 18	DOVPBL41 - 36	DSR4DEL 110/240 7 -
DIN-TDC105C1 - 18	DR1P20K230M0D1 - 36	DSR4DEL 240/415 7 - 4
DIN-TDC106C1 - 18	DR1P20K230S1 - 36	DSR6DEL 110/240 7 - 4
DIN-TDC110C1 - 18	DR1P45K230DC1 - 36	DSR6DEL 240/415 7 · ·
DIN-TDC116C1 - 18	DR1P45K230M0D1 - 36	DSR72DEL 110/2407 - (
DIN-TDC120C1 - 18	DR1P65K230DC1 - 36	DSR72DEL 240/4157 - (
DIN-TDC125C1 - 18	DR1P65K230M0D1 - 36	DSR80DEL7 · !
DIN-TDC132C1 - 18	DR4P80K400DC1 - 36	DSR96 CF DEL 1107 -
DIN-TDC140C1 - 18	DSLK2 - 6	DSR96 CF DEL 240 7 - 6
DIN-TDC150C1 - 18	DSLK2 · 7	DSR96DTDEL 110/240 7 -
DIN-TDC163C1 - 18	DSM-32-100-1PN1 - 24	DSR96DT0EL 240/415 7 - 1
DIN-TDC201C1 - 18	DSM-32-100-3PN1 - 24	DSR96TDEL 110/2407 - I
DIN-TDC202C1 - 18	DSM-32-300-1PN1 - 24	DSR96T0EL 240/4157 -
DIN-TDC204C1 - 18	DSM-32-300-3PN1 - 24	DSRCBH0630A1 - 2
DIN-TDC205C1 - 18	DSM-32-30-1PN1 - 24	DSRCBH1030A1 - 2
DIN-TDC206C1 - 18	DSM-32-30-3PN1 - 24	DSRCBH1630A1 - 2
DIN-TDC210C1 - 18	DSM-63-100-1PN1 - 24	DSRCBH2030A1 - 20
DIN-TDC216C1 - 18	DSM-63-100-1PN1 - 24	DSRCBH2530A1 - 20
DIN-TDC220C1 - 18	DSM-63-100-3PN1 - 24	DSRCBH3230A1 - 2
DIN-TDC225C1 - 18	DSM-63-300-1PN1 - 24	DSRCBH4030A1 - 2
DIN-TDC232C1 - 18	DSM-63-300-1PN1 - 24	DSRCBH0610A1 - 2

Cat. No. Page	Cat. No. Page	Cat. No. Pag
DSRCBH1010A1 - 20	EL8125A3 - 17	LA 2-12-1753/Q8 -
DSRCBH1610A1 - 20	ELB125A3 - 5	LA 2-12-3251/Q8 -
DSRCBH2010A1 - 20	ELB125S3 - 17	LA 2-12-8251/QA8 -
DSRCBH2510A1 - 20	ELB250A3 - 5	LA 2-12-8271/QA8 -
DSRCBH3210A1 - 20	ELB250A3 - 25	LA 2-12-8751/Q8 -
DSRCBH4010A1 - 20	ELB250AH3 - 5	LB-121 ·
DTCF351 - 31	ELB250S3 - 25	LB-151 ·
DTCF351 - 32	ELR240101 - 7	LB-181 -
DTHR1 - 35	ELR2401001 - 7	LB-241 -
DTLCL1 - 34	ELR240301 - 7	L83PH12 NETT1 -
DTLD1 - 31	ELR2403001 - 7	LB3PH18 NETT1 -
DTLD1 - 32	ELR440301 - 7	LB-61 -
DTLDC1P1 - 32	EPFR5 - 3	LB-91 -
DTLDC2P1 - 32	EPFR5 - 7	LD12/152 -
DTLDC3P1 - 32	ERTD5 - 3	LD12/152 -
DTLDC4P1 - 32	ERTD5 - 7	LD15/182 -
DTLGR1 - 34	EVSR5 - 3	LD15/182 -
DTLOR1 - 34	EVSR5 - 7	LD18/212 -
DTLP241 - 34	FD47 - 4	LD18/212 -
DTLP2401 - 34	FD67 - 4	•
		LD212 -
DTLRD1 - 34	ICL 081 - 33	LD6/82 -
DTPB6911 - 34	ICL 121 - 33	LD6/82 -
DTPB7711 - 34	ICL 151 - 33	L09/122 -
DTPC22 - 1	ICL 181 - 33	LD9/122 -
DTPC42 - 1	ICL 211 - 33	LE 7-315-17532 - 2
DTPC62 - 1	ICL 561 - 33	LOCTITE 480 RESIN3 - 1
DTPC82 - 1	ICL 571 - 33	LOCTITE 480 RESIN3 - 2
DTPF1 - 32	ICLEC231 - 33	MHC/123 - 8
DTPF2 - 14	ICLEC41 - 33	MHC/183 - 8
DTPF2 - 19	ICLTOC1 - 32	MHC/243 - 8
DTPL1 - 34	ILC 10F2 - 3	MHC/303 - 8
DTTAX25PN1 - 31	ILC 10SSN2 · 3	MHC/363 - 8
DTTAX25PN1 - 32	ILC 14F2 - 3	MHC/423 - 8
DTTAX25SP1 - 31	ILC 14SSN2 - 3	MSTD5 -
DTTAX25SP1 - 32	ILC 18F2 - 3	MSTD5 -
DTTLT35LPN1 - 31	ILC 18SSN2 - 3	NEB33S2 - 2
DTTLT35LPN1 - 32	ILC 4EN2 - 3	NLC12FE2 -
DTTLT35LSP1 - 31	ILC 4S2 - 3	NLC12S2 -
DTTLT35LSP1 - 32	ILC 8EN2 - 3	NLC15FE2 -
DTTLT35PN1 - 31	ILC 8S2 - 3	NLC15S2 -
DTTLT35PN1 - 32	IME ENERGY METERS .2 - 14	NLC18FE2 -
DTTLT35SP1 - 31	IME ENERGY METERS .2 - 20	NLC18S2 -
DTTLT35SP1 - 32	IRC5 - 3	NLC21FE2 -
DTUVT2401 - 27	IRC5 - 7	NLC21S2 -
EFR5 - 3	KGH7123A3 - 19	NLC8FE2 -
EFR5 - 7	LA 2-12-1751/Q8 - 7	NLC8S2 -

b

2068 Tufnell Road Yeronga SPS Pump Station Upgrade OM Manual **Alpha**n**umeric Cat. No. Index**

Cat. No. Page	Cat. No. Page	Cat. No. Pag
NPFR5 - 3	SAFE-TRC86_16301 - 6	TDM 2D3 74
NPFR5 - 7	SAFE-TRCB6_20301 - 6	TFH 22D3 - 74
PILDNC12T2 - 2	SAFE-TRCB6_25301 - 6	TFH 22D4 - :
PILDNC12W2 - 2	SAFE-TRCB6_32301 - 6	TFH 22LC3 - 7
PILDNC24T2 - 2	SAFE-TRCB6_40301 - 6	TFH 33LB3 - 70
PILDNC24W2 - 2	SAFE-TRCB6_50301 - 6	TFH 33LE 3 - 7
PILDNC36T2 - 2	SAFE-TRCB6_63301 - 6	TFH23CB3 - 19
PILDNC36W2 - 2	SAFE-TWH3P1 · 4	TFJ 22LU3 • 74
PRE-TRIP ALARM3 - 34	SRCB 10101 - 5	TFJ 22LU4 - :
PRE-TRIP ALARM4 - 4	SRCB 10301 - 5	TFJ 33LU3 - 7
SAFE-T6_061 - 1	SRCB 16101 - 5	TFJ21PB3 -
SAFE-T6_06SHT1 - 2	SRCB 16301 - 5	TFJ22XU3 - 1
SAFE-T6_101 - 1	SRCB 20101 - 5	TFJ23CU3 - 1
SAFE-T6_1001 - 1	SRCB 20301 - 5	TFJ23SU3 - 2
	SRCBLCK 121 - 5	TFJ34XU3 - 3
SAFE-T6_100NA1 - 1	SRCBLCK 241 - 5	TFJ34XU4 - !
SAFE-T6_100NASHT 1 - 2	SRCBWA1 - 5	TFJ36XU3 - 5
SAFE-T6_100SHT1 - 2		TFJ36XU4 -
SAFE-T6_10SHT1 - 2	SSW25 - 3	TFJ38XU3 - 5
SAFE-T6_161 - 1	SSW35 - 3 STK250ND/TH2 - 19	TFJ38XU4 - 1
SAFE-T6_16SHT1 - 2		TGPEN181S2 - 2
SAFE-T6_201 - 1	STK250ND/TH2 - 27	
SAFE-T6_20SHT1 - 2	STK300TH2 - 19	TGPEN182S2 - 2
SAFE-T6_251 - 1	STK300TH2 - 27	TGPEN241S2 - 2
SAFE-T6_25SHT1 - 2	STKCD2 · 14	TGPEN242S2 - 2
SAFE-T6_321 - 1	STKCD2 - 19	TGPEN301S2 - 2
SAFE-T6_32SHT1 - 2	STKCD2 · 26	TGPEN302S2 - 2
SAFE-T6_401 - 1	TAA-5CG1 - 4	TGPEN361S2 - 2
SAFE-T6_40SHT1 - 2	TAA-5CR1 · 4	TGPEN362S2 - 2
SAFE-T6_501 - 1	TAA-5CY1 - 4	TGPEN421S2 - 2
SAFE-T6_50SHT1 - 2	TAA-5LR1 · 4	TGPEN422S2 · 2
SAFE-T6_631 - 1	TAA-5LY1 - 4	TGPEN481S2 - 2
SAFE-T6_63NA1 - 1	TAL1118 - 1	TGPEN482S2 - 2
SAFE-T6_63NASHT1 - 2	TAL111MINI8 - 1	TGPEN601S2 - 2
SAFE-T6_63SHT1 - 2	TAL2118 - 1	TGPEN602S2 - 2
SAFE-T6_801 - 1	TAL211MINI8 · 1	TGPEN722S2 - 2
SAFE-T6_80SHT1 - 2	TAL1718 - 1	TGPEN781S2 - 2
SAFE-T63100NA2 - 19	TAL2718 · 1	TGPEN782S2 - 2
SAFE-TLCK 121 • 4	TAL3718 · 1	TGPEN841S2 - 2
SAFE-TLCK 241 - 4	TAL371MINI8 - 1	TGPEN842S2 - 2
SAFE-TPC12 - 1	TAL3728 - 1	TGPEN961S2 - 2
SAFE-TPC232 - 1	TAL8918 - 1	TGPEN962S2 - 2
SAFE-TPF1 - 4	TAL8928 - 1	TGPINS2 - 2
SAFE-TPF2 - 19	TAL8948 - 1	TH250TOPC1 -
SAFE-TPF2 - 7	TDB-50SG-121 - 4	TH250TDPC2 - 2
SAFE-TRCB6_06301 - 6	TDES5 - 3	TKB-50SG-L1 -
SAFE-TRCB6_10301 - 6	TDES5 - 7	TKC-50SG1 -
		Index
Q-Pulse Id TMS972	Active 10/12/2014	Index Page 295 of 441
Q 1 0130 10 11V13//2	, 10/12/2014	-

C-A No	Page	Cat. No.	0	Cat. No.	Page
Cat. No.	Page		Page		-
TL100C 100 3.	3 - 70	TL30F 20 3	3 - 68	TXKD0032A	3 - 31
TL100C 15 3	3 - 70	TL30F 30 3:	3 - 68	TXKD0033A	3 -
TL100C 20 3	3 - 70	TL400NE 400	3 - 64	TXKD0034A	3 - 3
TI 1000 30 3	3 - 70	TI 630NE 630	3.65	TYL DOODSA	3.5

TL100C 20 33 - 70	TL400NE 4003 - 64	TXKD0034A3 - 36
TL100C 30 33 - 70	TL630NE 6303 - 65	TXLD0005A3 - 51
TL100C 40 33 - 70	TL800NE 8003 - 66	TXLD0005A4 - 9
TL100C 50 33 - 70	TLC12FE2 - 7	TXLD0006A3 - 51
TL100C 60 33 · 70	TLC12S2 - 7	TXLD0012A3 - 52
TL100C 75 33 - 70	TLC15FE2 - 7	TXLD0013A3 - 52
TL100EM 100 34 - 1	TLC15S2 - 7	TXLD0016A3 - 52
TL100EM 15 34 - 1	TLC18FE2 - 7	TXRD0003A3 - 61
TL100EM 20 34 - 1	TLC18S2 - 7	TXRD0004A3 - 61
TL100EM 30 34 - 1	TLC21FE2 - 7	TXRD0005A3 - 61
TL100EM 40 34 - 1	TLC21S2 - 7	TY A5/53 - 74
TL100EM 50 34 - 1	TLC6FE2 - 7	TZS AD7 - 1
TL100EM 60 34 - 1	TLC6S2 - 7	TZS-1007 - 1
TL100EM 75 34 - 1	TLC9FE2 - 7	TZS-157 · 1
TL100EMLTC3 - 74	TLC9S2 · 7	TZS-247 - 1
TL100EMLTC4 - 2	TLCDMA2 - 7	TZS-407 - 1
TL100F 100 33 - 69	TLK 22D3 - 74	TZS-687 - 1
TL100F 15 33 - 69	TLK 22D4 - 2	UPX31253 - 17
TL100F 20 33 - 69	TLKA223 - 16	UPX31253 · 87
TL100F 30 33 - 69	TLKA233 - 24	UPX3250 10)3 - 25
TL100F 40 33 - 69	TLKA343 - 35	UPX32503 - 87
TL100F 50 33 - 69	TLKA344 - 5	UPX330PB3 - 7
TL100F 60 33 - 69	TLKA463 - 51	UPX3425 13 - 36
TL100F 75 33 - 69	TLKA464 - 9	UPX3440 13 - 36
TL100NJ 1003 - 62	TLKA493 - 57	UPX34403 - 87
TL100NJ 203 - 62	TLKA494 - 14	UPX38003 - 52
TL100NJ 323 - 62	TLP15 - 3	UPX38003 - 87
TL100NJ 503 - 62	T0400X\$1253 - 17	UXHB0001B3 - 61
TL100NJ 633 - 62	TPD OSZ7 · 1	UXKB0001A3 - 61
TL1250NE 1000 3 FC3 - 67	TPLC15 - 3	UXKB0002A3 - 51
TL1250NE 1250 3 FC3 - 67	TQQ3CA3 - 19	UXKB0002A4 - 9
TL2258 125 33 - 71	TRED00013 - 16	UXKB0003A3 - 57
TL225B 150 33 - 71	TXBD0009A3 - 7	UXKB0003A4 - 14
TL225B 175 33 - 71	TXED0005A3 - 16	UXKB0006A3 - 35
TL225B 200 33 - 71	TXED0006A3 - 16	UXKB0006A4 - 5
TL225B 225 33 - 71	TXED0010A3 - 16	UXKB0013A3 - 16
TL225F 125 33 - 72	TXED0011A3 - 17	UXKB0014A3 - 24
TL225F 150 33 - 72	TXJD0050B3 - 24	UXKB0017B3 - 16
TL225F 175 33 - 72	TXJD0051B3 - 24	UXKB0018B3 - 16
TL225F 200 33 - 72	TXJD0054A3 - 25	UXKB0019B3 - 24
TL225F 225 33 - 72	TXJD0055A3 - 25	UXKB0020B3 - 24
TL250NJ 1603 - 63	TXJD0058A3 - 25	UXKB0021B3 - 24
TL250NJ 2503 - 63	TXJD0059A3 - 25	UXKB0022B3 - 24
TL30F 15 33 - 68	TXKD0032A3 - 36	UXKC0001B3 - 35
Index 10		
•	A = 10/10/0014	Page 296 of 441
Q-Pulse Id TMS972	Active 10/12/2014	. 490 270 01 141

; ! !

68 Tufnell Road Yeronga SPS Pump/Station Upgrade OM	Maexal
---	--------

Cat. No. Pag		
UXKC0001B4 -	5 UXLB0013D3 - 34	
UXKC0002B3 - 3		
UXKC0002B4 -	5 UXLB0014D3 - 34	1 UXMC0009B4 - 9
UXKC0003B3 - 3		
UXKC0004A3 - 5		UXMC0010B4 - 9
UXKC0004A4 -	9 UXLB0015D4 - 1	
UXKC0005A3 - 5		
UXKC0006D3 - 5	6 UXLB0016D4 - 1	
UXKC0006D4 - 1	3 UXLB0017D3 - 58	5 UXMD0002B4 - 9
UXKC0007D3 - 5	6 UXLB0017D4 - 12	
UXKC0012A3 - 6	1 UXLB0018D3 - 5	
UXKC0013A3 - 6	1 UXLB0018D4 - 12	
UXKC0020A3 - 3	5 UXLB0019D3 - 60	
UXKC0020A3 - 5		
UXKC0020A3 - 5	6 UXLB0021C3 - 60	
UXKC0020A3 - 6		
UXKC0020A4 - 1:		
UXKC0020A4 -		
UXKC0020A4 -		
UXK00021B3 - 3		
UXK00021B4 -		
UXK00022A3 - 5		
UXK00022A4 - !	9 UXLB0026D4 - 1/2	
UXK00023B3 - 50		
UXIC0023B4 - 13		UXPD0013C4 - 10
UX(00024B3 - 50		UXPD0014B3 - 52
UXIC0025B3 - 6		
UXIC0026 C3 - 50		
UXIC0026 C4 - 13		
U)(C0027C3 - 56		UXPD0032A3 - 16
UNE003DA3 - 19		
UNE003DA3 - 7		UXPD0034B3 - 25
UNE003 DA 3 - 74		UXQH0002A3 - 17
UNE003 DA4 - 2		UXQH0002A3 - 25
UH000 913 - 7		UXQH0003A3 - 25
ULB000 TE3 - 15	UXMC0001B3-35	UXQH0004A3 - 36
ULB00 13E3 - 15	UXMC0001B4-5	UXQH000443 - 52
ILB00 16C 3 - 7	UXMC0003B3-35	UXQH000443 - 57
ILB00 863 - 7		
ILB00 1913 - 34		
LB00 DSL4 - 4		
LB00 1 M 3 - 50		UXRC0005A3 - 7
LB00 1 L4 - 8		
LB00 113 - 55	UXMC0006B1-51	
ILBOO 114 - 12	UXMC0006B4-9	UXRC00 17C3 - 35
ILBOO 123 - 60		
	OVINOROGO	UANGUU DID

Cat. No.	Page	Cat. No.	Page	Cat. No.	Page
UXRC0008B	4 - 9	UXUB0017B	3 - 60	UXXB0017C	3 - 60
UXRC0009B	3 - 51	UXUB0017B	4 - 12	381008XU	3 - 60
UXRC0011A	3 - 16	UXUB0017B	4 – 4	UXXB0019D	3 - 15
UXRC0012A	3 - 16	UXUB0017B	4 - 8	UXXB0020D	3 - 15
UXUB0013B	3 - 15	UXUB0018B	3 - 15	UXX80023D	3 - 55
UXUB0013B	3 - 23	UXUB001BB	3 - 23	UXXB0023D	4 - 12
UXUB0013B	3 - 34	UXUB0018B	3 - 50	UXXB0024 D	3 - 55
UXUB0013B	3 - 50	UXUB0018B	3 - 55	UXXB0024 D	4 - 12
UXUB0013B	3 - 55	UXUB0018B	3 - 60	UXXB0025D	3 - 55
UXUB0013B	3 - 60	UXUB0018B	4 - 12	UXXB0025D	4 - 12
UXUB0013B	4 - 12	UXUB0018B	4 - 4	UXXB0026E	3 - 15
UXUB0013B	4 - 4	· UXUB0018B	4 - 8	UXXB0027E	3 - 15
UXUB0013B	4 - 8	UXUB0037B	3 - 15	UXXB0028B	3 - 23
UXUB0014B	3 - 15	UXUB0037B	3 - 23	UXY80004A	3 - 25
UXUB0014B	3 - 23	UXUB0038B	3 - 34	UXYBOOO4A	3 - 36
UXUB0014B	3 - 34	UXUB0038B	3 - 50	UXYB0004A	3 • 52
UXUB0014B	3 - 50	UXUB0038B	3 - 55	UXYCOOG5A	3 - 36

UXUB0038B3 - 60

UXUB0038B4 - 12

UXUB0038B4 - 4

UXUB0038B4 - 8

UXVC0001C3 - 15

UXXB0001C......3 - 7

UXXB0003C.....3 - 7

UXXB0004D3 - 34

UXXB0004D4 - 4

UXXB00050 3 - 34

UXUB0014B3 - 55

UXUB0014B 3 - 60

UXUB0014B4 - 12

UXUB0014B4 - 4

UXUB0014B4 - 8

UXUB0015B 3 - 15

UXUB0015B3 - 23

UXUB0015B3 - 34

UXUB0015B3 - 50

UXU8001583 - 55

UXUB0016B 3 - 50

UXXB0005D4 - 4 UXYD0001A4 - 6 UXUB0015B3 - 60 UXYD0002A 3 · 36 UXUB0015B4 - 12 UXXB0006D3 - 34 UXUB0015B4 - 4 UXXB0006D4 - 4 UXYD0002A.....3 - 52 UXYD0002A.....3 - 57 UXUB001584 - 8 UXXB0007D3 - 50 UXUB0016B 3 - 15 UXXB00070 4 - 8 UXYD0002A 3 - 61 UXUB0016B3 - 23 UXYD0002A4 - 10 UXXB0008D3 - 50 UXUB001683 - 34 UXXB0008D4 - 8 UXYD0002A 4 - 14 UXYD0002A 4 - 6

UXXB0009D3 - 50

UXYD0007A.....3 - 16 UXUB0016B3 - 55 UXXB0009D4 - 8 UXYD0007A..... 3 - 17 UXUB0016B 3 - 60 UXX8001003 - 55 UXYE0005A 3 - 16 UXUB0016B4 - 12 UXXB0010D4 - 12 UXUB0016B4 - 4 UXXB001103 - 55 UXYE0005A 3 - 17 UYDY0006A..... 3 - 61 UXUB0016B4 - 8 UXXB0011D4 - 12 UYOY0007A.....3 - 61 UXUB0017B3 - 34 UXXB0012D3 - 55 VPPBFK...... _ 2 - 23 UXXB0012D4 - 12 UXUB0018B3 - 34 WLP1 _ ... 5 - 6 UXUB0017B3 - 15 UXXB0013C3 - 60 WNLP1 _ .5 - 6 UXUB0017B3 - 23 UXXB0014C3 - 60 XAB2 3 - 17 UXUB0017B3 - 50 UXXB0015C3 - 60 XAB3 3 - 25 UXUB0017B3 - 55 UXXB0016C3 - 60

Index 12 Page 298 of 441 Q-Pulse Id TMS972 Active 10/12/2014

UXYCO005A3 - 52

UXYC0010A3 - 25

UXYC0013A3 - 16

UXYC0013A3 · 17

UXYD0001A3 - 36

UXYD0001A3 - 52 UXYD0001A3 - 57

UXYD0001A......3 - 61 UXYD0001A 4 - 10

UXYD0001A 4 - 14

o. Page	Cat. No. Page	Cat. No. Page
(X-6U3 - 81	XE250NN2 - 20	XH800SE 8003 - 48
(X-12U3 - 81	XE250NNC3 - 18	XKA23 - 16
X-18U3 - 81	XFE103 - 61	XKA23 - 24
X-24U3 - 81	XFHA1B3-7	XM30PB0.73P3-6
X-30U3 - 81	XFHA223-16	XM30PB1.43P3 - 6
X-36U3 - 81	XFHA23S3 - 24	XM30PB10 3P3 - 6
X-42U3 - 81	XFHA343 - 35	XM30PB12 3P3 - 6
(X-48U3 - 81	XFHA344-5	XM30PB2.0 3P3 - 6
(X-60U3 - 81	XFHA463-51	XM30PB2.6 3P3 - 6
(X-72U3 - 81	XFHA464-9	XM30PB4 3P3 - 6
X-6U3 - 81	XFHA493 - 57	XM30PB5 3P3 - 6
(X-12U3 - 81	XFHA494 - 14	XM30PB8 3P3 - 6
(X-18U3 - 81	XH125NJ 1003 - 13	XS1000ND3 - 80
(X-24U3 - 81	XH125NJ 1253 - 13	XS1250CRSK3 - 17
(X-30U3 - 81	XH125NJ 203 - 13	XS1250ND3 - 80
(X-36U3 - 81	XH125NJ 323 - 13	XS1250ND3 - 50
(X-42U3 - 81	XH125NJ 503 - 13	XS12500CRSK3 - 57
00-B6-A6U3 - 81	XH125NJ 633 - 13	XS1250SE 1000 FC3 - 53
	XH125PJ 100 33 - 14	XS1250SE 1250 FC3 - 53
00-B6-A12U3 - 81 00-B6-A18U3 - 81	XH125PJ 125 33 - 14	XS125CJ 1003 - 11
00-B6-A24U3 - 81	XH125PJ 20 33 - 14	XS125CJ 1253 - 11
	XH125PJ 32 33 - 14	XS125CJ 203 - 11
00-B6-A30U3 - 81		
00-B12-A6U3 - 81	XH125PJ 50 33 - 14	XS125CJ 323 - 11
00-B12-A12U3 - 81	XH125PJ 63 33 - 14	X\$125CJ 503 - 11
00-B12-A18U3 - 81	XH160PJ 160 33 - 20	XS125CJ 633 - 11
10-B12-A24U3 - 81	XH250NJ 1603 - 22	XS125CS 100 13 - 9
00-B12-A30U3 - 81	XH250NJ 2503 - 22	X\$125C\$ 125 13 - 9
00-12U3 - 82	XH250PJ 1603 - 26	X\$125C\$ 16 13 - 9
00-18U3 - 82	XH250PJ 2503 - 26	XS125CS 20 13 - 9
00-24U3 - 82	XH400NE 1603 - 31	XS125CS 25 13 - 9
10-30U3 - 82	XH400NE 250 3 - 31	XS125CS 32 13 - 9
00-36U3 - 82	XH400NE 4003 - 31	XS125CS 40 13 - 9
00-42U3 - 82	XH400PE 2503 - 33	XS125CS 50 13 - 9
-33-16	XH400PE 4003 - 33	XS125CS 63 13 - 9
-43-17	XH400PJ 4003 - 29	XS125CS 80 13 - 9
3-33 - 25	XH400SE 1603 - 32	XS125NJ 1003 - 12
3-43 - 25	XH400SE 2503 - 32	XS125NJ 1253 - 12
1-33 - 36	XH400SE 4003 - 32	XS125NJ 203 - 12
1-43-36	XH630NE 630 3 - 41	XS125NJ 323 - 12
5-33-52	XH630PE 6303 - 43	XS125NJ 503 - 12
5-43-52	XH630PJ 4003 - 39	XS125NJ 633 - 12
NC 125 3 3 - 18	XH630PJ 6303 - 39	XS125NN3 - 11
5NC 150 33 - 18	XH630SE 6303 - 42	XS125NS 100 13 - 10
NC 17533-18	XH800NE 8003 - 47	XS125NS 125 13 - 10
5NC 200 3 3 - 18	XH800PE 8003 - 49	XS125NS 16 13 - 10
5NC 225 3 3 - 18	XH800PJ 8003 - 45	XS125NS 20 13 - 10

88 Tufnell Road Yeronga SPS **Pulph a nimerio Cen. No. Meride**Cat. No. Page Cat. No. Page

XS125NS 25 1 3 - 10 XS250NJ 250 3 - 21 XS630NN3 3 - 37

XS125NS 32 1 3 - 10 XS250NJ 2 - 20 XS6300CRSK 3 - 52

XS250NN3 - 21

XS2500CRSK 3 - 25

XS400CJ 2503 - 27

XS400CJ 4003 - 27

XS400NJ 2503 - 28

XS400NJ 4003 - 28

XS6300CRSK 4 - 10

XS630SE 6303 - 40

XS800NJ 8003 - 44

XV1250NE 400 3 FC ... 4 - 11

XS125NS 40 13 - 10

XS125NS 50 13 - 10

XS125NS 63 13 - 10

XS125NS 80 13 - 10

XS1250CRSK4 - 14

XS1600ND3 - 80

XS1600NN3 - 54 XS400NN3 - 27 XV1250NE 800 3 FC ... 4 - 11 XS1600SF 1600 FC 3 - 54 XS400NN 2 - 20 XV1250NE1000 3 FC ... 4 - 11 XS4000CRSK3 - 36 XS2000ND3 - 80 XV1250NE1250 3 FC ... 4 - 11 XS2000NF 2000 RC ... 3 - 58 XS4000CRSK......4 - 6 XV400NE 160 34 - 3 XS2000NN3 - 58 XS400SE 1603 - 30 XV400NE 250 34 - 3 XS20000CRSK ...3 - 61 XS400SE 2503 - 30 XV400NE 400 34 - 3 XS250 NJ1602 - 20 XS400SE 4003 - 30 XV630PE 400 34 - 7 XS2500NO......3 - 80 XS630CJ 4003 - 37 XV630PE 630 34 - 7 XS2500NE 2500 RC....3 - 59 XS630CJ 6303 - 37 XV800PE 800 34 - 7 XS2500NN3 - 59 XS630NJ 4003 - 38 XS630NJ 630 3 - 38 XS250NJ 160 3 - 21

Index 14 Q-Pulse Id TMS972 Active 10/12/2014Page 300 of 441

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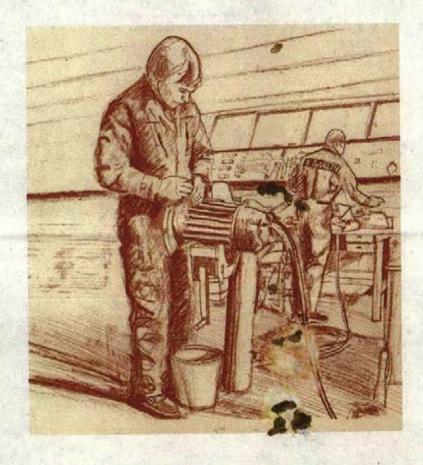
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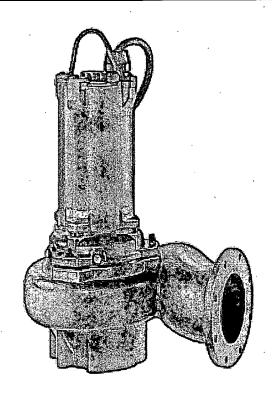


SARLIN PUMPS 3A Repair Marial





Operator's Manual



This manual contains instructions for installation, use and maintenance of Sarlin submersible pumps of frame sizes 50 and 54 comprising the following pumps:

		50 Hz				
	Frame size 50	Frame size 54				
SV 072 BH	S1 054 L	S1 074 H	S1 134 M	S2 134 E		
SV 092 BH	S1 054 M	S1 074 S	S1 134 H	S2 134 L		
SV 122 BH	S1 054 H	S1 124 AE	S1 174 L	S2 174 E		
SS/SR 038 S1 074 E		S1 124 BM	S1 174 M	S2 174 L		
SS/SR 066	S1 074 CM	S1 124 AH	S1 174 H	S1 212 H		
SR 210		·		S1 212 S		
	<u> </u>	60 Hz				
	Frame size 50		Fra	ame size 54		
SV 092 BH	S1 094 AM	S1 134 AL	S1 164 L	S1 204 L		
SV 122 BH	S1 094 AH	S1 134 AM	S1 164 M	S1 204 M		
S1 094 AL	S1 114 AH	S1 134 AH	S1 164 H	S1 204 H		

The manual also contains specific instructions for the pumps in this range executed in explosion-proof construction. The pumps are further specified in the applicable Sarlin pump preselection sheet and in the individual pump data and curve sheets. These documents are available on request from Oy E. Sarlin Ab at the address below or from your nearest Sarlin dealer.

Operator's Manual

Oy Grundfos Environment Finland Ab PL 1036 00101 Helsinki

Page 306 of 441

Table of Contents

Page ii



Table of Contents

1.	Defini	itions	1
	1.1.	About this manual	1
	1.2.	Measurement Units	1
	1.3.	CE Marking	1
	1.4.	Notes, Attentions and Warnings	1
	-		
2.	Pump	Information	
	. 2.1.	Type Designation Code	
	2.2.	Rating Plate Information	3
	2.3.	Pump Noise Emission	3
•	Cafak		_
3.		y	
	3.1.	Regulations and Standards	
	3.2.	Duties of Owner and Operator	
	3.3.	Duties of the Personnel	
	3.4.	Qualifications	
	3.5.	Dangers	
	3.6.	Transportation	
	3.7.	Installation and Connection	3
•	3.8.	Commissioning	
	3.9	Operation and Control	4
	3.10.	Servicing	4
	3,11.	Disposal and Environment Protection	6
4.	Dume	Handling	4
4.	•	-	
	4.1.	Pump Weight and Dimensions	
	4.2.	Pump Lifting and Site Transportation	
	4.3.	Pump Accessories	
	4.4.	Pump Storage	2
5.	Pump	Installation	1
	5.1		
-	5.1.	Installation of Foundations for Versions 1 and 2	
	5.3.	Pump Installation Version 1 and 2	
	5.4.	Pump Installation Version 3 and 6	
	5. 4 . 5.5.	Pump Installation Version 4 and 5	
	5.6.	·	
	_	Pump Installation Version 7	
	5.7.	Pump Floatrical Connection	
	5.8.	Pump Electrical Connection	12
6.	Pump	Use and Operation	1
		Pump Usage	

Oy Grundfos Environment Finland Ab

Operator's Manual



Table of Contents

Page iii

	6.2.	Pump Function	
	6.3.	Pump Description	ĺ
	6.4.	Pump Direction of Rotation	3
	6.5.	Pump Starting	3
	6.6.	Pump Commissioning	
	6.7.	Pump Operation	ŧ
7.	Pum	o Maintenance	ļ
	7.1.	Oil Check and Change	í
	7.2.	Inspection and Adjustment of Suction Clearance	2
	7.3.	Pump Cleaning and Visual Inspection	
8.	Impe	ller Replacement	ļ
	8.1.	Impeller Removal	
	8.2.	Impeller Mounting	
	8.3.	Impeller Screw Tightening Torques	
	8.4.	Component Fastener Tightening Torque	
9.	Expl	osion-proof Pumps	1
	9.1.	General	
	9.2.	Certification and Classification	
	9.3.	Certification Plate	
	9.4.	Motor Construction and Performance	
	9.5.	Motor Protection Device Circuit	
	9.6.	Motor Operating Requirements	
	9.7.	Overhaul and Repair Requirements	
10	Trou	bleshooting	1
11.	Decl	aration of Conformity	1

Page 309 of 441

1. Definitions

Page 1 (1)



1. Definitions

1.1. About this manual

This instruction manual has been prepared by the Technical Department of the Pump Division of Oy E. Sarlin Ab. It provides instructions on the installation, commission, function, operation and maintenance of Sarlin submersible pumps.

The manual is directed at pump and municipal engineering professionals. These professionals are expected to have working knowledge of pumps and pumping in general as well as of pump operation and maintenance.

The illustrations in this manual may not exactly depict all pumps covered but are provided as general reference on dimensions and as an illustration of a particular operation being described.

1.2. Measurement Units

The SI system of measurement units, as implemented for pumping use by the ISO standard 2548, is used in this manual wherever reference is made to dimensions or other quantities. The unit used in drawings for the length dimension is millimetre (mm).

1.3. CE Marking

The Sarlin submersible pumps bear the CE marking according to the Declaration of Conformity forming the Section 11. The CE marking is presented on the pump rating plate affixed to the pump top cover.



1.4. Notes, Attentions and Warnings

Notes, attentions and warnings are provided throughout this manual to provide important information to the reader.

NOTE

A note is used to convey special information or to highlight an operating procedure or practice that requires specific information, knowledge, tools or equipment in order to achieve the desired result.

ATTENSION

An attention is used to convey special information or to highlight an operating procedure or practice where non-compliance could lead to damage of the unit or other equipment.



A warning or safety instruction provides instructions on an operating procedure or practice where nonobservance may lead to serious personal injury or cause danger to the life of operation personnel or others.



A warning of the presence of dangerous voltage is provided with this symbol. Disregard of the warning may lead to electrical shock with consequent risk of serious personal injury or death of the operational personnel.

Oy Grundfos Environment Finland Ab

Operator's Manual

SP068 Tufnell Road Yeronga SPS Pump Station Upgrade OM Manual

Page 311 of 441



2. Pump Information

Page 1 (3)

2. Pump Information

2.1. Type Designation Code

Each Sarlin pump is identified by the type designation code provided in full on the order acknowledgement and other documentation accompanying the pump upon delivery. The code comprises 15 items in the following fashion:

S	1	Χ.	100	4		Н	1	Α		5	11	Ρ.	Z	R
1	2	3	4	5.	6	7	8	9	10	11	12	13	-14	15

The shaded code items are provided on the rating plate of the pump.

Code Item	De	escription		;		
1. Pump type	S	Sarlin S-type				
2. Impeller	V 1 2 3 4 N A S	Vortex Single channel Double-channel Three-channel Four-channel Multi-channel Axial Semi-axial				
3. Motor specification	[] X	Standard Explosion-proof				
4. Motor power	Mo	otor power in kW			£	
5. Motor pole number	2 4 6 8 10 12	12-pole 500	z)	60 Hz rpm 3600 1800 1200 900 720 600 514		
6. Generation marker		1st generation 2nd generation 3rd generation, e e generation indica ferent pumps that h	ator c			
7. Impeller classification	[] F E L M H S	No classification Ultra low head Extra low head Low head Medium head High head Super high head				

SP068 Tufnell Road Yeronga SPS Pump Station Upgrade OM Manual

Q-Pulse Id TMS972 Active 10/12/2014 Page 313 of 441

2. Pump Information

Page 2 (3)



8. Installation version	 Submerged with baseplate and guide rails. Submerged with baseplate and guide rails. May operate continuously with motor exposed. Vertical dry with stand. Submerged portable. Submerged portable. May operate continuously with motor exposed. Horizontal dry with stand. Submerged in column
9. Interchangeability	Interchangeability letter (A, B, C) indicates interchange- ability limitation of parts between otherwise identical pumps Pumps with no or the same letter have full interchangeability of all parts and use the same spare parts catalogue.
10. Supply phase number	[] 3-phase 1 1-phase
11. Supply frequency	5 50 Hz 6 60 Hz
12. Voltage and starting	50 Hz 60 Hz 01 400 V, DOL 01 460 V DOL 11 400 V, Y/D 11 460 V Y/D 02 230 V, DOL 03 500 V DOL 12 230 V, Y/D 13 500 V Y/D 03 415 V, DOL 05 380 V DOL 13 415 V, Y/D 15 380 V Y/D 04 500 V, DOL 07 220 V DOL 14 500 V, Y/D 17 220 V Y/D 06 690 V, DOL
13. Special features	 P Indicates that protection circuitry is included in motors on models where this feature is optional. U Flanges drilled to ANSI specifications. Protection circuitry provided.
14. Non-standard items	 D Trimmed impeller C Cable length Z Combination of D and C or other. Refer to order acknowledgement for details
15. Construction material	 Standard materials All stainless steel Wet parts, including volute, impeller, oil housing and guide shoe (version 1 & 2) stainless steel Impeller stainless steel

SP068 Tufnell Road Yeronga SPS Pump Station Upgrade OM Manual

Page 315 of 441

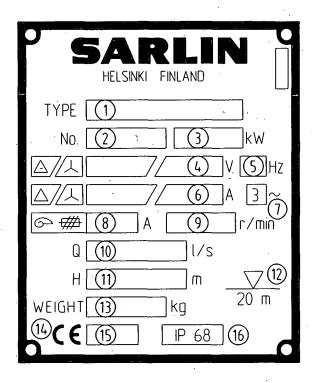


2. Pump Information

Page 3 (3)

2.2. Rating Plate Information

All pumps can be identified by the rating plate (located on the top cover of the motor). If the rating plate is missing or damaged the pump can be identified by the serial number stamped in the casting located under the rating plate.



- 1. Type designation
- 2. Serial number
- 3. Nominal motor power
- Mains voltage for delta (D) and star (U) connection. If the value for star connection is given in brackets, the pump can be connected in delta only
- 5. Frequency, 50 or 60 Hz
- Nominal drawn current for delta and star connection
- 7. Mains phase number
- 8. Fuse rating in delta connection
- 9. Nominal motor speed
- 10. Volume rate of flow range
- 11. Maximum submergence
- 12. Head range
- 13. Gross weight
- 14. CE Marking
- 15. Year of manufacture
- 16. Encapsulation class IEC

Pumps rated for use in an explosive environment (EX-pumps) are fitted with additional nameplates (located on the side of the motor stator housing). Please refer to the Section 10 for information on the rating plates.

2.3. Pump Noise Emission

Without taking account of installation effects the noise level emitted from the pump proper is less than 70 dB(A) when it is measured according to the following procedures:

- The noise level is measured for various load conditions with readings taken at different pump duty points on the entire operating range.
- Submersible pump noise is measured at a point 1.6 m above the wet well rim with the pump submerged to minimum depth according to installation version requirement.
- Dry-installed pump noise is measured at a distance of 1 m from the pump and at 1.6 m above floor level at four points in different direction quadrants. Highest measured value is used for assessment.

Operator's Manual

Oy Grundfos Environment Finland Ab

SP068 Tufnell Road Yeronga SPS Pump Station Upgrade OM Manual

Page 317 of 441

3. Safety

Page 1 (6)



3. Safety

These general safety instructions must be read and understood before any work on or operation of the pumps. All sections of this manual dealing with specific aspects of pump handling and operation contain safety information on each matter at hand where required.

3.1. Regulations and Standards

All work involving the installation and use of machinery is regulated by various local occupational safety ordinances, rules and regulations issued by governmental authorities or other pertinent bodies. It is required that these rules are acquired and followed at all phases and times of installing, using and maintenance of the Sarlin submersible pumps.

3.2. Duties of Owner and Operator

The owner and operator of a pump installation is responsible for the safe conduct of all work and actions on the pumps by employees and subcontractors. The owner must make certain that at least the following procedures are carried out whenever dealing with these submersible pumps:

- Pertinent safety actions must be undertaken whenever required by apparent risk or danger situation
- Pumps and equipment must be inspected for safety and function before any activity is commenced
- All concerned personnel and third parties must be informed both on any known danger or risk
 prevailing at the installation or operation site and the procedures of safe work during special
 circumstances
- All work should be carried out by qualified personnel only using the pertinent personal safety equipment, such as safety glasses or goggles, hearing protection, hard hats and protective clothing, as required by the work in progress
- All work in confined or potentially dangerous areas, such as pumping wells, should be done
 under close supervision only. All work sites should have one person appointed responsible for
 safety procedures.
- Any effluent or waste harmful to the environment must be disposed of in a suitable manner during all phases of work

3.3. Duties of the Personnel

All persons involved in the installation, operation or maintenance work of submersible pumps and equipment must familiarise themselves with these safety instructions before beginning to work. All persons must follow these procedures during the work on the installation, operation and maintenance of submersible pumps:

- Always follow occupational safety and hygienic instructions for work in wastewater installations. All work phases must be conducted safely with special consideration of personal hygiene.
- Wear at all times the required personal safety equipment, such as safety glasses or goggles, hearing protection, hard hats, breathing masks and protective clothing as required by the work in progress
- Acquire information on the following important items before commencing the work:
 - Potential danger from pump and equipment including the danger of exposure to oil and chemical substances

Oy Grundfos Environment Finland Ab

Operator's Manual

Page 319 of 441



3. Safety

Page 2 (6)

- Environmental dangers at the work site, such risk of explosion, noxious gases, steam, lack of oxygen and chemicals
- The function of the safety features on pumps and other equipment
- Operational controls and the location and operation of emergency stop buttons
- · Make sure that the required controls, especially the stop button, are within reach at all times
- · Make sure that all emergency exits are available and kept free of obstructions
- · Learn the use of the fire extinguishing equipment on the site
- Make sure that starting the equipment can be done safely for people and equipment
- Do not start any equipment if there is any risk of danger from malfunctioning or lack of safety equipment
- Never start a pump if people are present in the pump well or in the wet well.
- Start a pump only after any operational problem has been fixed or service job properly completed and all damaged parts exchanged
- Conduct all visual inspections according to schedule
- Report all pump or operational problems or findings to your supervisor or the service department
- Stop all pumps immediately in case of malfunction. Especially if any people or equipment is in danger
- Work only on pumps that have been stopped and safely isolated from the electrical supply to prevent accidental starting. Remove fuses or have an authorised electrician disconnect the pump.
- At all times keep all safety instructions available and visible as well as pump identification and rating plates readable
- · Do not make unauthorised modifications or changes to the pumps or to other equipment
- Dispose of all effluents, such as used oil, properly. Clean up all spills and report all accidental effluent emissions in the environment
- Keep the pumping station or installation site clean and in order at all times

3.4. Qualifications

Qualification for installation, operation or maintenance of submersible pumps and their equipment is defined as a combination of formal and on-the-job training on the subject. Special qualifications are acquired i.e. by:

- Formal training in mechanical engineering combined with work experience and company training on pumps and pumping
- Formal training in electrical engineering with official authorisation for low and high voltage installation work

Qualification for work on submersible pumps and accessories requires further the following from all persons qualifying:

- Knowledge of these instructions and the pumps in question
- Education or experience in the implementation of official safety procedures at mechanical installation, operation and maintenance work
- Knowledge of first aid

Operator's Manual

Oy Grundfos Environment Finland Ab

Page 321 of 441

3. Safety

Page 3 (6)



3.5. Dangers



Disregard of the warnings in these instruction may lead to equipment damage and/or personal injury or death of the operating personnel.

3.6. Transportation

Lifting devices must be used for the handling of all pumps and other equipment weighing more than 50 kg. Items weighing between 35 kg and 50 kg may be lifted only without lifting device but not carried or positioned for installation by a person.

Suitable pallets or other cargo securing devices must be used if fork lifting devices are used.

The equipment must be properly secured to floor or wall surfaces if hoists are used for pump lifting and lowering into wells. The hoist rating must not exceed under any circumstances.

All hooks, chains and slings used with a hoist must have a suitable rating and must only be used according to instructions. The submersible pump may only be lifted from its lifting handle unless expressly advised otherwise in these instructions.



Submersible pumps must never be lifted by the electric supply cable, the delivery pipework or the hose. The risk of the damage to equipment or electric shock with consequent risk of serious personal injury or death may follow.



Do not walk under hoisted pumps or attempt to work on pumps supported by hoist only. The risk of serious injury may follow to operating or servicing personnel.

Pumps must be handled with suitable care during all phases of transportation. Do not bump pumps or leave unsupported on uneven or slanting surfaces. Protect pumps from falling objects at construction sites.

ATTENSION

Do not remove pump cable free end protection sleeve until necessary for electrical connection work. Never subject cable free end, protected or unprotected, to moisture or water. Non-compliance may lead to moisture seepage into cable with consequent risk of damage to motor.

3.7. Installation and Connection

Make sure before commencing installation work that the site is cleared from construction debris and that the site is suitably prepared for work. Install protective barriers around openings to wet wells and elsewhere where required. Restrict access to the site to necessary installation crew only.

Observe all safety rules at installation site, such as the usage of blowers for the supply of fresh air to well sites.

Fasten pump lifting chains and power cables so as to prevent them from being sucked into pump suction during pump testing.

Use only approved pipework assembling practices when connecting pumps with flanged joints.

Oy Grundfos Environment Finland Ab

Operator's Manual



3. Safety

Page 4 (6)

All electrical connection work, either for testing purposes during work or final, may be done by suitably qualified and certified electrician only.



Electrical switchgear and supply lines may be live at all times. Touching and working with electrical equipment may lead to electrical shock with consequent risk of serious injury or death of personnel.



Do not insert hands or tools in pump inlet or outlet openings after the pump has been connected to the electrical supply without prior isolation of pump by removal of fuses. The pump may start with consequent serious injury to personnel.

3.8. Commissioning

Check the pump after completion of installation work for possible safety shortcomings according to these instructions.

Check that all safety installations on site are completed according to site and installation plans of all associated equipment. Do not attempt commissioning the pump if the installation of the specified safety equipment on the site, such as wet well access covers and barriers, switchgear enclosures, fire extinguishers, etc., is incomplete.

All installed equipment must be protected against damage from contact with equipment used on site, i.e. vehicles and hoisting equipment.

3.9. Operation and Control

Make sure that no persons work on the pumps or in areas where danger may arise from running the pumps whenever manually starting pumps or switching them to the automatic control.

Check the pump operation for abnormal noise or vibrations while the pump is running. Compare the actual output and the metered data with the data on the rating plate or supplied in the pump specifications.

ATTENSION

Stop the pumps immediately if you note abnormal noise or vibrations from the pumps or any other problems with the pump operation or the electric supply. Do not attempt to restart the pumps before the reason for the problems has been established and the problems solved.

The operation of the pumps should always be governed by established routines with scheduled controls of pump monitoring equipment and accessories (valves, etc.). Make sure that the pump and equipment settings are not tampered or otherwise adjusted without authorisation.

3.10. Servicing

Servicing may be undertaken only after the pumps have been effectively isolated from the electric supply. Pumps may be disconnected only by a certified electrician. The responsible operator must always be notified before any work on the pumps may begin.

Operator's Manual

Oy Grundfos Environment Finland Ab

Page 325 of 441

3. Safety

Page 5 (6)



Wet wells may only be accessed using appropriate personal protective equipment and clothing. All wet well work must be directly supervised by one person who stays outside for safety reasons.



Submersible pump wet wells contain sewage with toxic substances and/ or pathogens. Entering wet wells or withdrawing of pumps must therefore always be carried out carefully observing hygienic precautions. All persons involved must wear appropriate personal protective equipment and strictly follow personal hygienic procedures.

All pumps and other equipment withdrawn from the wet well must be thoroughly cleaned before work can begin. The use of pressure or steam cleaning and disinfectants is strongly recommended. No flammable or toxic industrial solvents nor strong detergents may be used. Grease and oil may be removed using approved solvents only.

Make sure all washing effluents are disposed of properly according to local instructions and regulations.

After the cleaning the pumps must be inspected for visible damage. The lifting handle and chain must be inspected for breakage or wear before any attempts to lift the pump.

Do not use undue force when working on the pumps, especially when loosening bolted connections and other fasteners. Tighten loose connections to the specified torque whenever observed using the correct tools and procedures.

Check the working atmosphere for explosive substances before beginning to weld or to use electric tools. Make sure that the object is safely isolated from the power mains.

Collect all waste and especially used lubrication oil in containers and dispose all properly. Oil spills must immediately be wiped or collected using suitable absorbent material and disposed of. Never dispose oil to the sewers or to the environment.

Report all damages on the electric equipment and supply cables to an authorised electrician for appropriate repair actions. Replace burned fuses with new ones of the correct rating only. Use only slow-blow fuses for motors.

Reinstall protective equipment immediately after completion of work.

Repairing

ATTENSION

Do not make unauthorised modifications to the pumps or accessories. Never make modifications that affect the safety of the equipment.

Troubleshooting and repairs on the pumps may be made only to the extent described in this manual. Should more extensive repair or modifications of the pumps be needed, it has to be referred to an authorised SARLIN service agent or company only. Unauthorised repair or modifications of the pumps will void the product guarantee.

ATTENSION

Worn or damaged parts lower the operational safety and must be replaced whenever noted.

Only original SARLIN-spare parts must be used. The usage of unauthorised spare parts voids the guarantee and may lower the product safety.

Replace all worn fasteners when assembling. Always use torque wrenches or spanners when tightening fasteners to specified torque. Replace all locking washers with new original spare parts.

Oy Grundfos Environment Finland Ab



3. Safety

Page 6 (6)

3.11. Disposal and Environment Protection

The pump owners are responsible for the correct disposal of waste and other by-products from the operation of the pumps. The following substances will have to be dealt with:

- Sewage or other pumped liquids that may travel with the pumps to service sites or other outside locations
- Lubricants
- Cleaning agents and solvents
- Other debris and trash, such as replaced pump parts and accessories

Scrapped pumps must be cleaned and emptied of all lubricants before disposal. Old pumps should be dismantled and the parts should be used for recycling as appropriate. Non-recyclable parts not containing contaminants only may be disposed of in municipal landfills or brought to garbage collecting stations.

Never-dispose-of waste oil and grease in the environment or the sewerage system. Follow local rules for their safe disposal at all times.

Operator's Manual

4. Pump Handling

Page 1 (2)



4. Pump Handling

4.1. Pump Weight and Dimensions

The pump gross weight is stated on the pump rating plate located on the top cover of the pump motor. Complete pump weight and dimension information is given on the individual pump data sheets. Installation dimensions of pump baseplates and stands are found in section 5. For weights of separate parts please refer to the transportation and delivery documents or project specifications.

4.2. Pump Lifting and Site Transportation

The-pumps-in-this-manual may be lifted and positioned using an appropriate lifting aid or hoist only. All lifting equipment must be rated for the intended load and checked for damages before any attempts are made to lift pumps. Use only adequate chains, shackles, hooks and bands as required. Make sure that enough room is available for safe handling of the pumps along the transport route and at the end location. Items weighing less than 35 kg may be lifted and positioned for installation by hand. Figure 4.1 shows correct pump lifting method.

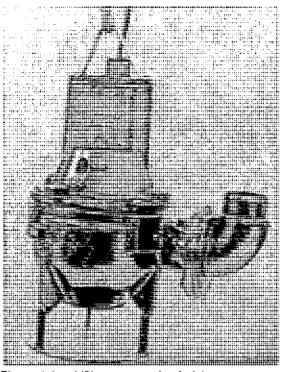


Figure 4.1 Lifting pump using hoist

ATTENSION

Do not attempt to lift pump at any other point than the lifting handle unless expressly advised otherwise in these instructions. Tipping over of the pump may lead to damage to pump or other equipment.



Do not lift the pump from the electric cable under any circumstances. An electric short and risk of shock to the personnel may follow if the pump is connected to the mains. The cable and cable inlet may be damaged, leading to loss of watertightness and consequent severe damage to the motor.

New pumps should not be unpacked from their transport crates until brought to the installation site. Secure other pumps to pallets or otherwise if transported by fork lifting equipment. Handle pumps with care whenever handling or lifting.

The pumps covered by this manual are delivered from the factory completely assembled and no further assembly is required (except with the frame sizes 74 and 78 which are delivered in two parts).

4.3. Pump Accessories

The pump delivery may contain various accessories as required by the installation. Depending on pump installation version and scope of delivery these may include the pump baseplate, guide rails and upper guide rail holders, lifting chains with the suspension equipment, access covers and the control equipment. It is essential that these items are checked against delivery documents and stored safely until needed for installation.

Oy Grundfos Environment Finland Ab

Page 330 of 441



4. Pump Handling

Page 2 (2)

4.4. Pump Storage

The pumps are prepared and packed at the factory for overland transportation by covered carriage. Upon delivery the pumps should be stored in a dry and covered area if storage for a prolonged period is foreseen.

ATTENSION

Do not remove the original watertight closure of the pump cable free end during storage. Make sure that the cable is coiled and secured to the pump and protected from exposure to water. Otherwise the water may seep into the cable and reach the motor with a consequent risk of causing severe damage to the motor windings.

ATTENSION

If new pumps are being stored for a period longer than 2 months the pump impeller should be turned by hand at least every two months to prevent the lower mechanical seal faces from possibly bonding from drying. Failure to do so may lead to seal damage when the pumps are started. If the impeller cannot be turned by hand the pump must be referred to an authorised shop for service before being commissioned.

Operator's Manual

Page 1 (16)



5. Pump Installation

ATTENSION

Always read and observe the safety instructions in section 3.7 before beginning to install pumps.

5.1. Installation Versions

The pumps are configured for different installations, either submerged or dry according to the following schedule of installation versions:

Version 1

Submerged with baseplate and guide rails. Permanent installation in wet well where the pump can be easily withdrawn from and lowered into the wet well along guide rails. A guide shoe bolted to the pressure flange connects automatically to a matching baseplate mounted on the wet well floor where the pump is kept in place by its own weight. The pump motor cooling is by submergence in the liquid requiring that the lowest continuous liquid level in the wet well is set at half motor level. Please refer to figure 5.1.

Version 2

Similar to version 1 but with motor cooling independent of submergence in the pumped liquid by means of a cooling jacket encasing the motor stator housing. The lowest continuous liquid level in the wet well may be set lower. Please refer to figure 5.1.

Version 3

Vertical dry installation with stand. Permanent installation in dry well with pump con-nected to suction line and rising main by bolted flange connections. Pump motor cooling, is by means of a cooling jacket encasing the motor stator housing. Please refer to figure 5.2.

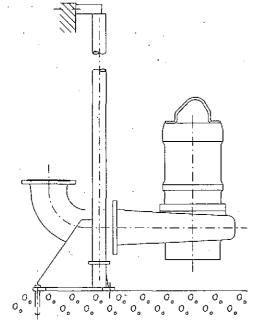


Figure 5.1 Pump versions 1 and 2.
Continuous liquid level can be set lower for version 2.

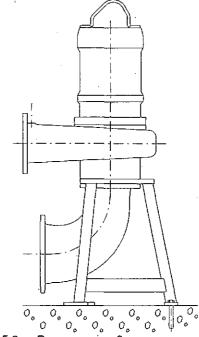


Figure 5.2 Pump version 3.

SP068 Tufnell Road Yeronga SPS Pump Station Upgrade OM Manual

Page 334 of 441



Page 2 (16)

Version 4

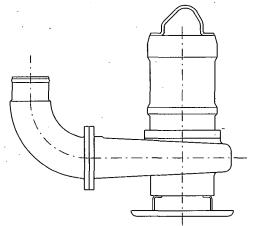
Submerged with stand for portable use in wet wells or for temporary use. The pump is equipped with a hose coupling for connection to delivery hose. The pump motor cooling is by submergence in the liquid requiring the pump is submerged to at least half motor level when operating. Please refer to Figure 5.3 for details.

Version 5

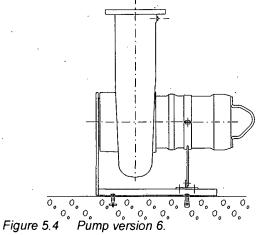
Similar to version 4 but with motor cooling independent of submergence in the pumped liquid by means of a cooling jacket encasing the motor stator housing. Pump must be submerged sufficiently for the required suction head only. Please refer to Figure 5.3 for details.

Version 6

Horizontal dry installation with stand. Permanent installation in dry well with pump connected to suction line and rising main by bolted flange connections. Pump motor cooling is by means of a cooling jacket encasing the motor stator housing. Please refer to Figure 5.4 for details.



Pump versions 4 and 5. Figure 5.3 Continuous liquid level can be set lower for version 5.



Version 7

Vertical column installation. Permanent submersible installation in steel tube or concrete shaft. The circular pump casing fits onto a seat ring installed at the shaft or tube bottom opening and the pump stays in place by its own weight and from the reaction forces from the pumping action. The pump casing is special for the version and is open with trailing vanes. The version finds applications in low head installations for large pumped volumes. Please refer to figure 5.? below.

SP068 Tufnell Road Yeronga SPS Pump Station Upgrade OM Manual

Q-Pulse Id TMS972 Active 10/12/2014 Page 336 of 441

Page 3 (16)



5.2. Installation of Foundations for Versions 1 and 2

Make sure before commencing installation work the construction work is finished according to specifications. It is especially important that the surface under the baseplates is level and even.

Begin the work by fastening the upper guide rail holder (figure 5.5, use Sarlin part according to table 5.1 or equivalent third party fitting) in its final position relative to the wet well access opening. Use appropriate fasteners only. Lower the baseplate(s), selected according to table 5.1 as required, onto the wet well floor and place them approximately in their final position. Please refer to figures 5.6, 5.7, 5.8 and 5.9 below for reference on dimensions.

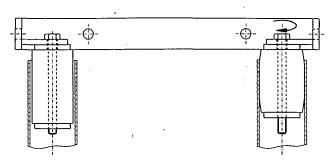


Figure 5.5 Upper guide rail holder with expanding dowels.

NOTE

Using a plumb line suspended from the upper guide rail holder the baseplates can be positioned exactly. The baseplate integral lower guide rail ears are used for correct line-up reference.

Mark the foundation bolts on the wet well floor and remove the baseplate. Install the baseplate bolts or sleeves using appropriate expansion elements or by grouting. Use M 20 or M 24 installation sleeves (Sarlin part No. FMTZ 20070 or FMTZ 24130) as required, or equivalent foundation bolts. Fix the baseplate to the floor and tighten the bolts or nuts to the torque specified in the fastener specifications.

Install the pressure pipework in the wet well according to project plumbing specifications. Use ISO PN 10 flanged joints for the baseplate delivery bend connection.

Table 5.1 Selection of upper guide rail holders and baseplates

Pump size	Upper guide rail holder	Baseplate			
DN 80	71-32462 D	UK 35692			
DN 80/100	71-32462 D	UK 35693			
DN 100	71-32462 C	UV 35586			
DN 150	71-32462 E	UK 35402			
DN 150/200	71-32462 E	UK 35552			
DN 200	71-32462 F	UK 35524			

NOTE

Make sure that the pipework is installed without the use of undue force. The use of pipe joints with loose flanges is recommended for ease of installation and to avoid pipe tension at flanges and bolts.

Mark the correct length of the guide rails considering that the upper guide rail holder rubber dowels will go into the guide rail. Cut the guide rails to length and install them by removing the upper guide rail holder dowels and slide the rails into the lower guide rail ears on the baseplate. Reinstall the guide rail holder dowels and tighten the nuts so as to expand the rubber elements. The guide rails are now installed and the pumps can be lowered into the wet well.

Oy Grundfos Environment Finland Ab

Page 338 of 441

GRUNDFOS*

5. Pump Installation

Page 4 (16)

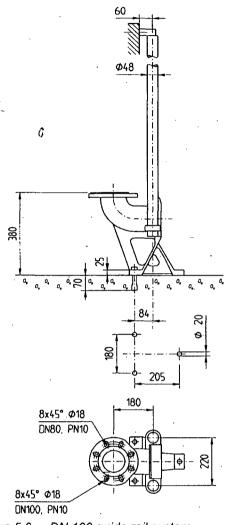


Figure 5.6 DN 100 guide rail system installation dimensions

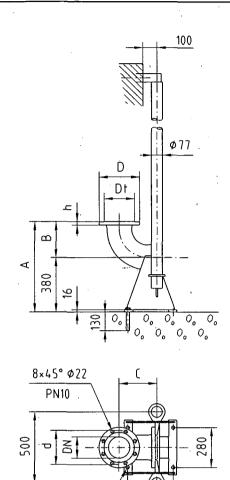


Figure 5.7 DN 150 and DN 150/200 guide rail system installation dimensions. The variable dimensions are given in table

320

4x Ø24

Table 5.2 DN 150 and DN 150/200 baseplate dimensions

Baseplate	DN	D	Dt	d	h	Α	В	С
UK 35402	150	285	212	240	24	630	250	265
UK 35552	200	340	268	295	26 .	680	300	315

Table 5.3 DN 80 and DN 80/100 baseplate dimensions

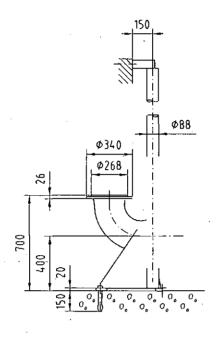
Baseplate	DN	D	Dt	d	d ₁	h	Α	В	С
UK 35692	80	200	138	160	18	22	440	180	203
UK 35693	100 .	220	158	180	18	22	460	200	223

Operator's Manual

SP068 Tufnell Road Yeronga SPS Pump Station Upgrade OM Manual.

Page 5 (16)





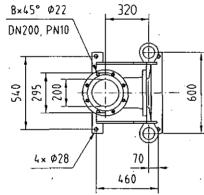
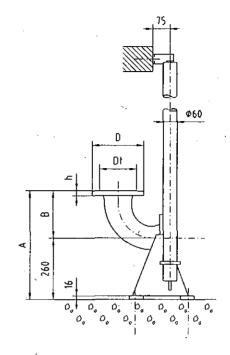


Figure 5.8 DN 200 guide rail system installation dimensions



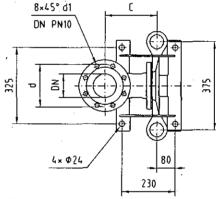


Figure 5.9 DN 80 and DN 80/100 guide rail system installation dimensions. The variable dimensions are given in table 5.3

5.3. Pump Installation Version 1 and 2

Prepare the pump for lowering into the wet well by fastening the lifting chain to the pump handle and by uncoiling the electric cable. Make sure your lifting device is in working order.

ATTENSION

Use only the original lifting chain and shackle or if third-party components are used make sure that these are rated for the pump weight. Inferior components may break and cause the pump to fall with risk of severe damage to the pump and the accessories.



Page 6 (16)

Lift the pump and position the guide shoe between the guide rails at the access opening. Please refer to figure 5.10 for reference. Lower the pump slowly along the guide rails onto the baseplate. Make sure that the pump cable can move freely and does not seize or fall into the well. Attach the upper end of the lifting chain to a suitable hook or eye bolt at or near the upper guide rail holder. Remove chain slack by cutting off the surplus length if necessary.

Route the pump cable through a suitable conduit to the control panel and secure with clamps where necessary. Do not unnecessarily remove the protective sleeve on the pump free end. The pump cable should not be cut to length, but laid in loops so that the end easily reaches the terminal blocks. Connection to the control panel terminals may be completed by authorised electrician only. Please refer to section 5.8 for information on pump wiring.

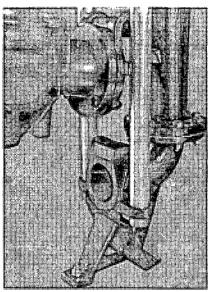


Figure 5.10 Pump being lowered onto submersible baseplate.

5.4. Pump Installation Version 3 and 6

Before commencing installation work make sure that the construction work is finished according to specifications. It is especially important that the surface under the pump stands is level and even.

Begin work by marking the location of the pump and stand in relation to the suction pipe and rising main to the extent these are installed or according to the site drawings. Use a mock-up arrangement to secure a good fit of the components if required. Please refer to Figure 5.11 and Figure 5.12 for reference.

NOTE

For ease of installation, it is advisable to separate pump and stand, especially in cramped locations. The pump should be supported when the fastening screws are loosened to prevent tipping over. The use of a water level is recommended for adjustment.

Table 5.4 DN 150 and DN 200 pump stand dimensions

Stand	DN	Α	В	С	D
DN 150	150	300	600	150	240
DN 200	200	325	700	200	295

Mark the foundation bolts on the dry well floor using the stand as a template. Remove the stand. Install the stand bolts or ground sleeves using expansion elements or by grouting. Use M 24 installation sleeves (Sarlin part No. FMTZ 24130) as required or equivalent foundation bolts. Fix the stand to the floor and tighten the bolts or nuts to the torque specified for the bolts used. Shims may be used to ensure stand is level and to adjust the height to fit the pipework.

Operator's Manual

Page 344 of 441

Page 7 (16)



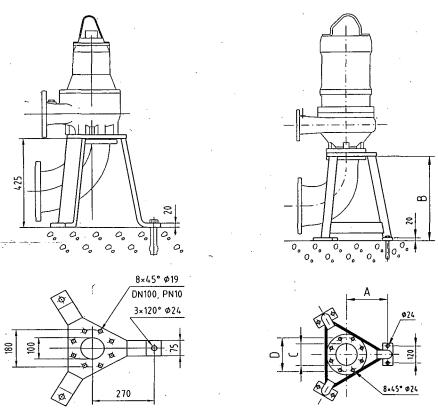


Figure 5.11 Vertical dry installation stand dimensions. The variable dimensions are given in table 5.4.

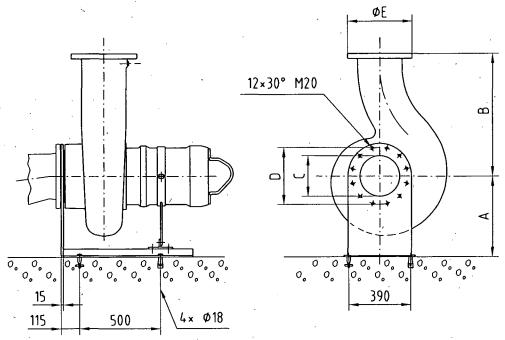


Figure 5.12 Horizontal dry installation stand dimensions. The variable dimensions are given in table 5.5.



Page 8 (16)

Table 5.5 Variable installation dimensions for pump version 6

Pump suction inlet size	DN (C)	Α	В	D	DN (E)	M
Frame size 50, DN 100	100 -	300	285	180	100	M16
Frame size 50, DN 150	150	300	310	240	100	M20
Frame size 50, DN 200	200	350	460	295	200	M20
Frame size 54, DN 150	150	375	355	240	100	M20
Frame size 54, DN 150	150	375	360	240	125	M20
Frame size 54, DN 200	200	375	500	295	200	M20
Frame size 54, DN 250	250	500	750	350	250	M20

For vertical pumps (version 3) install the bend between the suction pipework and the stand. Use reducing bends wherever required by the pipework dimensions. For horizontal pumps (Version 6) install a connection pipe or reducer for the same purpose. Please refer to figures 5.13 and 5.14 for reference.

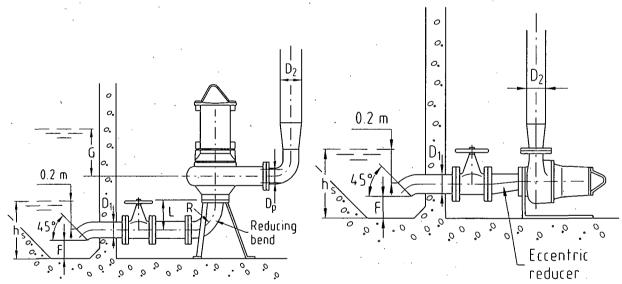


Figure 5.13 Recommended pipework dimensions for vertical dry-installed pumps. $F = 0.5 \times D_1$, $v_{max} = 2.0 \text{ m/s}, G = D_p$, $L \ge D_1 + 100 \text{ mm}, R \approx L$.

Figure 5.14 Recommended pipework dimensions for horizontal dry-installed pumps. $F = 0.5 \times D_1$, $v_{max} = 2.5$ m/s.

ATTENSION

If a reducer is used between the suction pipework and the pump in horizontal installations it must be of the eccentric type and installed so that the straight edge is upwards. This way the accumulation of air in the suction pipeline and possible pump blockage is prevented.

Reinstall the pump onto the stand, using the original fastening bolts. Install the pressure pipework including valves and bends according to the project plumbing specifications. Connect the pump to the

Operator's Manual

Page 9 (16)



rising main using ISO PN 10 flanged joints for the pump delivery connection. Use gaskets at all joints to ensure tightness.

NOTE

Make sure that the pipework is installed without the use of undue force. No loads from the pipework weight must be carried by the pump. The use of pipe joints with loose flanges is recommended for ease of installation and to avoid tension at flanges and bolts. The use of elastic elements or bellows in the pipework is not recommended and these elements should never be used as a means to align the pipework.

Uncoil the electric cable and route it to the control panel. Use cable trays and cable clamps where necessary. Do not unnecessarily remove the protective sleeve on the pump cable free end. The pump cable should not be cut to length, but laid in loops so that the end easily reaches the terminal blocks. Connection to the control panel terminals may be completed by authorised electrician only. Please refer to section 5.8 for information on pump wiring.

5.5. Pump Installation Version 4 and 5

Prepare the pump installation location by levelling the floor or ground under the pump to prevent the pump from tipping over when placed.

Ready the pumps for installation by connecting the delivery hose to the hose connector on the pump. Use stainless clamps of suitable size only. Uncoil the electric cable and route it to the control panel. Attach a suitable lifting chain or wire to the pump handle and lower the pump into the well or pit using a suitable lifting device. Make sure that the pump is standing upright on its integral stand.

Protect the cable and fasten it using clamps or cable ties as appropriate to prevent it from falling into the pumping pit or well and to keep it out of way during pump usage.

NOTE

If the pump is shifted frequently and used at different locations it is good practice to install a cable connector at the free end of the power cable to simplify electrical connection. Please refer to section 5.8 for detailed information.

Oy Grundfos Environment Finland Ab

SP068 Tufnell Road Yeronga SPS Pump Station Upgrade OM Manual

Page 350 of 441



Page 10 (16)

5.6. Pump Installation Version 7

Make sure before commencing installation work the construction work is finished according to specifications. The seat ring, supplied with the pump, is either welded in place in the riser pipe lower opening or grouted into the concrete shaft at the bottom opening. The seat rings should be specified for either installation method when ordering pumps. Please refer to figure 5.15.

Prepare the pump for lowering into the wet well by fastening the lifting chain to the pump handle and by uncoiling the electric cable. If preferred, the site hoist can be hooked directly to the pump lifting bail and used for lifting and lowering the pumps into the wet well.

With the seat ring in place the assembled pump is inserted in the pump shaft and lowered in place. Make sure that the sealing O-ring (item 031) is located in the groove on the outside of the pump casing. The O-ring seals between pump casing and seat ring preventing back flow and loss off pumping efficiency. Three dowel pins in the seat ring guide the pump to correct position and prevents the pump from turning in the seat when running.

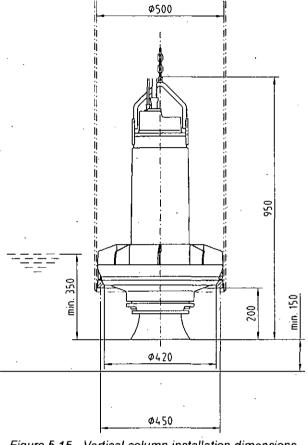


Figure 5.15 Vertical column installation dimensions

ATTENSION

Use only the original lifting chain and shackle or if third-party components are used make sure that these are rated for the pump weight. Inferior components may break and cause the pump to fall with risk of severe damage to the pump and the accessories.

Make sure that the pump cables can move freely and do not seize or fall into the shaft. Attach the upper end of the lifting chain to a suitable hook or eye bolt at or near the shaft upper entry cover. Remove chain slack by cutting off the surplus length if necessary.

Route the pump cables through a suitable conduit to the control panel. Remove slack from the cable in the column and clamp at the conduit only. The cable conduit through the shaft wall may be watertight if called for by the installation. Secure cable with clamps along route to the panel where necessary. Do not unnecessarily remove the protective sleeves on the free end of the pump cables. The pump cables should not be cut to length but instead laid in loops so that the ends eas-ily reach the terminal blocks. Connection to the control panel terminals may be completed by authorised electrician only. Please refer to section 5.8 for information on pump wiring.

Operator's Manual

Page 352 of 441

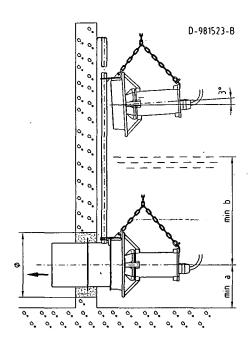
Page 11 (16)



5.7. Pump Installation Type SR

The circulation pumps of type SR are installed submerged on a wall thimble with guide rails. They are intended for permanent installation in basins, and the pump can easily be hoisted from and lowered down into the basin along guide rails. A guide shoe bolted to the propeller nozzle guides the pump down onto a matching flange on a pipe cast into the wall. The guide shoe en-gages automatically with the pipe flange and the pump is kept in place by its own weight. Pump motor cooling is by submergence in the liquid, requiring that the lowest liquid level does not fall below the motor centre line. Please refer to Figure . Minimum dimensions: $a \approx 400 \text{ mm}$, b = 1000 mm.

The guide rails are installed according to the instructions given in section 5.1. The thimble is fit-ted with a girdle flange and is grouted in place in the hole in the wall separating the basin sec-tions. The thimble must be horizontal and the mating flange in a vertical position and level with the upper guide rail holder.



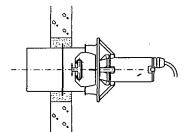


Figure 5.16 Circulation pump type SR. Installation on wallpipe and with guide rails.

NOTE

Using a plumb line suspended from the upper guide rail holder, the thimble flange can be positioned exactly. The integral lower guide rail hollows on the flange are used for correct line-up reference.

Attach the lifting chain at both lifting lugs using the shackles provided and uncoil the electric cable. Make sure your lifting device is in working order.

ATTENSION

Use only the original lifting chain and shackle or, if third-party components are used, make sure these are rated for the pump weight. Inferior components may break and cause the pump to fall with risk of severe damage to the pump and the wall thimble or other components.

Lift the pump and position the guide shoe between the guide rails. Please refer to Figure for reference. Lower the pump slowly along the guide rails onto the mating flange. Make sure that the pump cable can move freely and does not seize or fall into the basin. Attach the upper end of the lifting chain to a

Oy Grundfos Environment Finland Ab



Page 12 (16)

suitable hook or eye bolt at or near the upper guide rail holder. Remove chain slack by hanging in loops and cut off surplus length if necessary.

Route the pump cable through a suitable conduit to the control panel and secure with clamps where necessary. Do not unnecessarily remove the protective sleeve on the pump cable free end. The pump cable should not be cut to length, but laid in loops so that the end easily reaches the terminal blocks. Connection to the control panel terminals may be completed by authorised electrician only. Please refer to section 5.8 for information on pump wiring.

5.8. Pump Electrical Connection

Electrical supply and control of the pumps is provided by the control panel. Control panel specifications vary greatly with the intended pump duty and installation. Panels may include circuitry for pump duty alternation, level control, alarm detection and transfer, and other functions. However, the pump start and stop circuitry must always be executed according to the scheme presented in figures 5.17 and 5.18 below for DOL and Y/D start respectively.

ATTENSION

The control panel starter must include overload protection relays adjustable according to the pump nominal current and provisions for the pump moisture and overheat protection devices whenever these are fitted. Usage of non-complying control panels increases the risk of motor damage and voids the pump warranty.



Make sure that the control panel is isolated from the electrical supply before beginning to work. Turn off the mains switch or remove the main fuses. Non-compliance to do so may lead to electrical shock with consequent serious personal injury or death of the personnel.

Insert the cable through the control panel cable gland and remove the protective sleeve. Note the markings on the leads and connect according to the cable identification and connection chart in figures 5.19 and 5.20. If the markings are missing or if the cable has been cut the leads can be identified with the help of the identification chart as follows:

- · Strip back the cable sheath and identify the yellow/green ground wire
- Identify your cable according to the schedule of the connection charts
- Keeping the cable in the position of the chart the leads can be identified
- · Mark the leads and proceed with the connection procedure

Tighten the cable clamp of the control panel (if fitted) and finish the cable routing to the panel using clamps where required.

Operator's Manual

Page 13 (16)



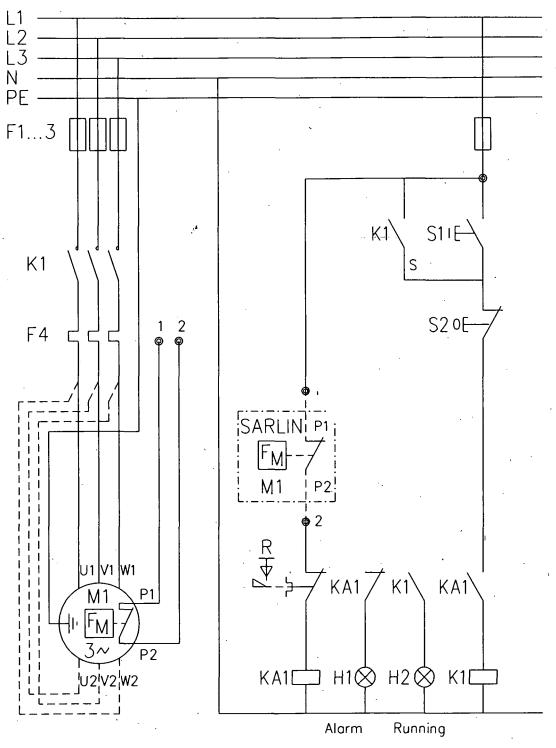


Figure 5.17 Pump wiring diagram for DOL start. F_{M} = internal motor protection device (moisture switch and winding thermal protectors)

Oy Grundfos Environment Finland Ab



Page 14 (16)

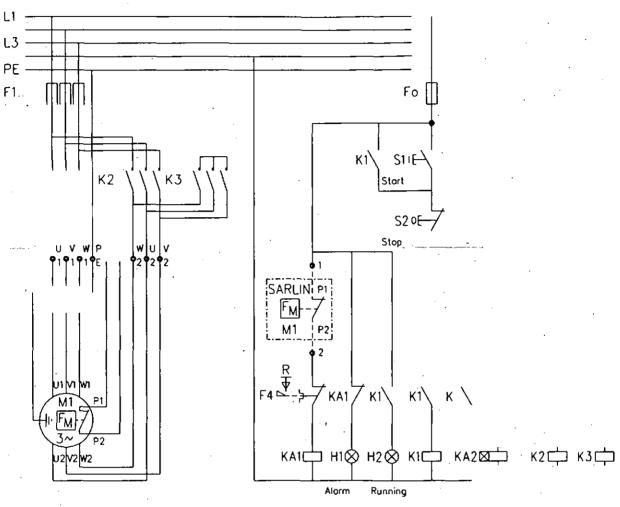


Figure 5.18 Pump wiring diagram for Y/D start. F_{M} = internal motor protection device (moisture switch and winding thermal protectors)

Page 15 (16)



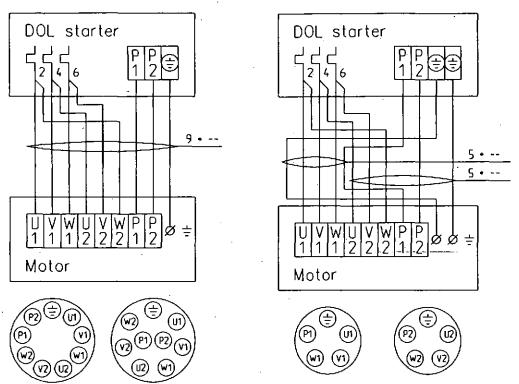


Figure 5.19 Pump cable connection diagrams for DOL and cable identification schedules

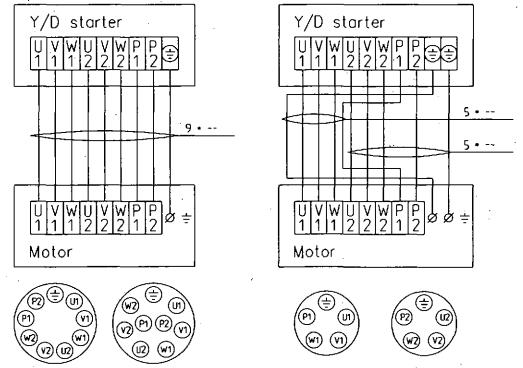


Figure 5.20 Pump cable connection diagrams for Y/D start and cable identification schedules

Page 357 of 441



Page 16 (16)

NOTE

A cable connector on the cable simplifies pump removal and reconnection. The use of a SARLIN pump cable connector, part No. PKL-9-25, is recommended for its suitability for the pump cables and complete watertightness. Figure 5.21 shows the use of the cable connector in a submersible pump installation.

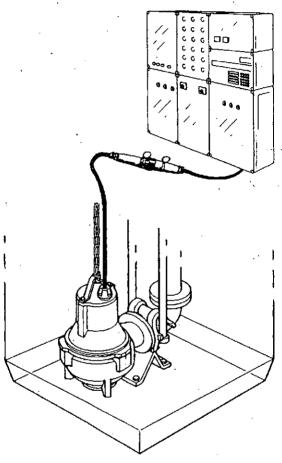


Figure 5.21 A pump cable connector simplifies pump installation and removal.

6. Pump Use and Operation

Page 1 (4)



6. Pump Use and Operation

ATTENSION

Always read and observe the safety instructions in sections 3.8 and 3.9 before beginning to operate pumps.

6.1. Pump Usage

The Sarlin submersible pumps are designed for pumping of unscreened wastewater in municipal and industrial installations and for low to medium density sludge pumping in sewage treatment plants. The pumps are also suitable for various raw water pumping duties where the conditions call for submersible pumps to be installed. The pumps have the capacity to handle unscreened sewage containing solids of 80 mm or 100 mm in spherical size depending on model. The impeller design allows stringy matter and long fibres to pass through the pump. Different pump material specifications are available for use in corrosive liquids.

Pump usage is restricted by the following ambient conditions used as design criteria limits:

- Maximum ambient and pumped liquid temperature is 40 °C
- Storage temperature range is -30 °C...+60 °C
- Maximum allowable voltage fluctuation is ± 5 % of nominal voltage (U_N)

ATTENSION

Usage of the pumps in installations where conditions exceed those allowed in the pump specifications may lead to pump malfunction and damage.

6.2. Pump Function

The Sarlin submersible pumps are short-coupled centrifugal pumps with the pump connected to a proprietary electric motor. The pumps are installed submerged in the pumped liquid or alternatively dryinstalled. Submerged pump motors are cooled by submergence in the pumped liquid or inde-pendently of submergence by encasing the motor stator housing with a cooling jacket. In these a part of the pumped liquid is diverted through channels from the pump casing and circulated in the jacket. Dryinstalled motors are always cooled by means of a cooling jacket.

The pump impellers are of vortex or channel type with one or two vanes, and they are available in a number of standard diameters making up a range of pumps within each frame size.

ATTENSION

Only complete pumps of specified installation versions are delivered from the factory. Unauthorised pump conversion may lead to pump or motor damage from overheating, corrosion or leakage, and voids all factory guarantees.

6.3. Pump Description

The pump unit consists of pump (hydraulic) parts and motor. Sections showing vortex and single-channel pumps are presented in figure 6.1 and figure 6.2 below.

Vortex pumps feature a recessed impeller working in a slightly volute shaped pump casing. The pump casing is fixed to the submersible motor with three fastening screws and can easily be removed for impeller inspection and removal. The open pump casing offers a large unobstructed passage for solids and fibrous matter. The impeller features between two and four vanes with winglets for symmetry and good pumping efficiency.

Channel-impeller pumps feature an impeller with one or two vanes and a patented axial suction clearance between the impeller and the pump casing. The pump casing is fixed to the motor with six

Oy Grundfos Environment Finland Ab



6. Pump Use and Operation

Page 2 (4)

fasteners and three set screws for impeller clearance adjustment. The long vane in single-channel impellers offers a single passage through the impeller for solids and fibrous matter. The asymmetric impeller includes counterweight masses for balance and offers excellent pumping efficiency. Double-channel impellers have wider passages than the one-channeled impellers for solids and fibrous matter. These impellers are symmetric and inherently balanced.

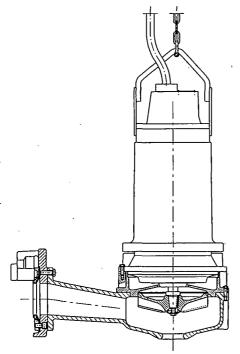


Figure 6.1 Section of vortex pump showing spacious casing.

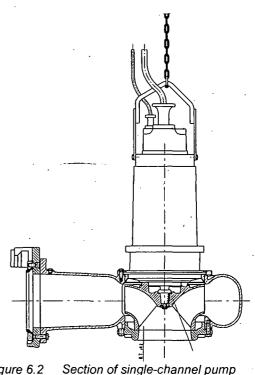


Figure 6.2 Section of single-channel pump showing impeller clearance at suction opening.

The pump motor includes independent double shaft seal with an oil chamber at the motor lower end. The oil serves as a lubricant and a coolant for the shaft seals. The oil chamber is accessible through inspection and fill holes. The state of the lubrication oil serves as an indicator of seal wear and is inspected according to the service schedule. Please refer to section 7 for information on seal oil inspection and replacement procedure.

The pump motor is totally enclosed (IEC IP 68) and may be opened for service only by workshops authorised by Sarlin in order to ensure that the watertight integrity remains intact. The motor may be fitted with internal moisture and winding temperature switches wired in series to a common circuit. The moisture switch is non-reversing and breaks the circuit in case of moisture entering the motor. The thermal switches, one in each phase of the windings, open when the temperature reaches a predetermined, set limit value of 150 °C, breaking the circuit. Upon cooling these switches reset and close the circuit.

The pump control panel must include circuitry for the protection devices, and set to break the pump motor current in the event of the protection circuit opening. The control panel specifications may call for either manual or automatic restarting of the motor after the protection circuit has closed. This, of course, is possible only if the circuit was broken by the thermal switches. The principle of the protective circuit is shown in figure 5.17 and figure 5.18 in section 5.

Operator's Manual

6. Pump Use and Operation

Page 3 (4)



Pump motors for dry installation (version 3 and version 6) are generally identical to those for submerged installation. The motor casing and oil housing flanges are designed for efficient heat transport and dissipation into the pumped media. This cooling system may require that these pumps are rated lower than the largest submersible pumps and, for some models, may have stator casings made of aluminium in lieu of cast iron for enhanced heat conductivity. Therefore, they cannot always serve as motors for a submersible pump of the same type.

6.4. Pump Direction of Rotation

Whenever a pump has been connected to the mains during commissioning the direction of rotation must be ascertained. The pump impeller direction of rotation is clockwise when observed from the driving end. An arrow cast in the pump casing shows the direction. All new pumps have a large sticker clearly showing the direction of rotation.

The direction of rotation of a squirrel-cage electric motor is dependent of the order the three phases were connected at the control panel. Despite the phase markings on the leads the phases may be confused at the panel and the pump may run in the wrong direction when started. The direction of rotation can be controlled with the following procedure:

 With the submersible pump suspended from a lifting device either freely or in the wet well and guided by the guide rails the pump is started briefly from the control panel. By observing the direction the pump spins or "kicks" at the starting moment the direction of rotation can be determined.

NOTE

The pump kicks in the opposite direction of the direction of rotation. With the right direction of rotation being clockwise when observed from the driving end the pump should kick counterclockwise when started. If this is not the case the pump should be reconnected at the control panel with two of the phase leads changing place.

ATTENSION

The pump may be run briefly only when suspended. Make sure that the pump cable does not become twisted or strained during the operation. Failure to observe caution may lead to cable damage. Prolonged dry running of pumps may damage the primary shaft seal and cause motor overheating.

Pumps of version 3 and 6 installed dry shall be controlled for direction of rotation according to the procedure above before final installation.

6.5. Pump Starting

The pumps are started from the control panel manually or automatically. Control panel specifications vary according to installation requirements and local regulations but most control panels have at least the following components:

- · Mains switch and fuses
- · Motor starter contactors with overload relays
- · Selector switch or buttons for pump manual and automatic starting and stopping
- Circuitry for pump motor protective devices
- · Level control system
- Pump on/off indicator lamps

and control functions:

Oy Grundfos Environment Finland Ab

Operator's Manual



6. Pump Use and Operation

Page 4 (4)

- · Mains on/off
- Pump off
- · Pump manual start
- Pump automatic start
- · Overload relay reset

The pump is started from the control panel manually or automatically as controlled by the level control equipment.



Pump controls must always be switched off or to manual control whenever handling or servicing pumps or when personnel is entering the wet well. Pumps in automatic control mode may start unexpectedly from level control or resetting protective devices leading to pump damage or serious injury to the service personnel.

The pumps can be started manually or switched to automatic operation as required for commis-sioning after the opening of all valves in the suction and pressure sections of the pumping station pipework and final visual inspection.

6.6. Pump Commissioning

Pump commissioning to production follows the conclusion of the project work. Begin the procedure with a safety check of the pump installation checking all site work is completed according to specifications and cleared of debris. The function of the level control system is dry-checked against specifications to the extent possible.

Use manual operation to get all the pumps started and check their function and performance using the instrumentation installed. If necessary, portable instruments such as ammeters and voltmeters are used. The pumps are checked for unusual noise and vibrations and possible causes are es-tablished and reported or corrected.

Actual pumping station duty point should be established as accurately as possible in order to confirm that the pump operating conditions are the intended. If the installation includes a flow meter or a manometer the duty point can easily be established or picked off the pump curve. If these are not available actual pump performance can be approximated using the volumetric method. In this method the pump is timed when pumping a known quantity such as the wet well volume between start and stop level. The method is simple and offers an acceptable approximation of the volume rate of flow.

Commissioning is completed with the pumps switched to automatic operation and a final inspection of the pipework for leaks and vibrations. After it the project is ready for handing over to the owner and the pumping station is subject to regular operation and maintenance routines.

6.7. Pump Operation

Pump operation should be governed by established maintenace and check routines. Please refer to Section 7 for recommendations on pump check and maintenace schedules.

ATTENSION

Pump starting frequency may not be greater than 20 starts per hour. If started more frequently the motor windings may be damaged from overheating.

7. Pump Maintenance

Page 1 (4)



7. Pump Maintenance

Regular pump maintenance is a prerequisite for dependable long-term pump operation. With a few simple operator-performed maintenance actions the pump performance can be assured.

ATTENSION

Always read and observe the safety instructions in sections 3.10 and before beginning to work on pumps.

The operator-performed maintenance steps should be performed every 2000 hours of operation and include the following actions:

- Oil check and change if required
- · . Axial clearance inspection and possible adjustment
- Pump and component cleaning and visual inspection

7.1. Oil Check and Change

The volume of oil contained in the chamber between the double mechanical shaft seals is essential for the function of the pump providing lubrication for and cooling of the shaft seals.

Another intended purpose of the oil is to absorb by emulsification the minute amounts of water leaking across the lower seal into the oil chamber. By following the condition of the oil the lower seal can be monitored and scheduled for replacement before failure and damage to the pump motor will occur.

Lay the pump flat on a work bench and locate the oil plugs. Position the pump so that one of the plugs is pointing upwards. Clean the area around the oil plugs.

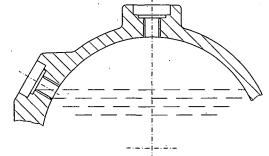


Figure 7.1 Correct oil level

Use a 24mm socket wrench to open the upper plug slowly and let possible excess pressure escape before the plug is removed. Place a clean oil trough under the pump to collect all drained oil. Open the plug pointing to the side and observe the fluid level. The escaped fluid indicates leakage over the lower mechanical seal which may be normal. Please refer to figure 7.1.

Turn the pump using a hoist and let all the fluid drain into the collecting trough. Pour a sample amount of the oil into a glass container and observe the condition of the oil using figure 7.3 for reference.

Clear oil can be reused always discard and dispose of emulsified oil. Low oil level may indicate upper seal failure and the pump should be referred to an authorised repair shop for further checks and possible repair.



Figure 7.2 Oil draining

Oy Grundfos Environment Finland Ab

Operator's Manual

GRUNDFOS XX

7. Pump Maintenance

Page 2 (4)

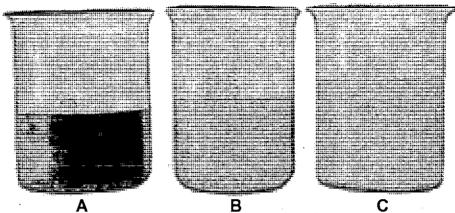


Figure 7.3 Condition of lubrication oil. Sample A: Oil in good condition. Sample B: Oil moderately emulsified. Change oil. Sample C: Excess water in oil. Change oil and check primary seal condition.

When the pump is flat on the bench the oil chamber is refilled from the top plug hole until the oil reaches the correct level. Use regular SAE 10 W 30 motor oil. Replace the O-rings, close the plugs and tighten carefully.

ATTENSION

Never lubricate the O-rings with grease. Greased O-rings may leak and allow the oil to escape from the oil chamber with consequent damage to the shaft seals.

7.2. Inspection and Adjustment of Suction Clearance

Adjustment of the impeller suction clearance is relevant for pumps with single-channel impellers only.

The correct setting value for the axial clearance is $0.7 \text{ mm} \pm 0.2 \text{ mm}$. The suction clearance should be reset if it is worn to 1.2 mm or more. The method for resetting the clearance is different for withdrawable submersible pumps (pumps version 1, 2, 4 or 5) and dry-installed pumps (pumps version 3 or 6). Both methods are described here.

For pumps with semi-axial impellers (pumps type SS), available in version 1 only, the adjustment procedure is different and described separately.

Lay the pump flat on a workbench. Locate the six screws fastening the pump casing to the motor and the three set screws. Please refer to figure 7.5. Check the clearance between impeller and casing all around the perimeter of the suction opening using a feeler gage. Turn the impeller by hand and check at several points. Please refer to figure 7.6.

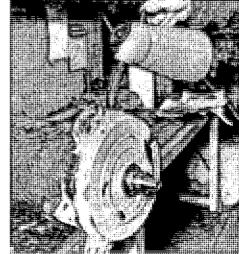


Figure 7.4 Oil filling

Page 366 of 441

7. Pump Maintenance

Page 3 (4)



If the clearance needs adjustment proceed as follows. Loosen all fasteners and set screws between the pump casing and the motor. Use a mallet to tap the casing and close the clearance. Open the clearance to specified by turning the three set screws. Check that the clearance is uniform around the perimeter of the suction opening. Tighten the fastening screws and check that the clearance is stable.

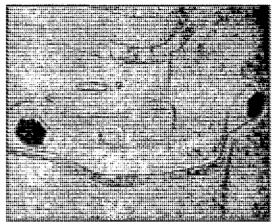


Figure 7.5 Pump casing fasteners and impeller clearance set screw.

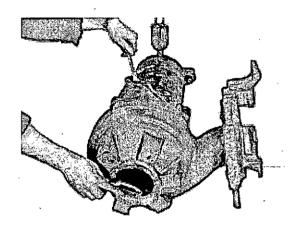


Figure 7.6 Setting impeller clearance using the set screws and feeler gages.

For dry-installed pumps the suction clearance can be inspected with the pump installed on the pump stand and connected to the pipework. Loosen all fasteners and set screws between pump casing and motor. Use a mallet to tap around the casing to break any bonding between casing and motor. Close the impeller clearance by tightening three of the fastening screws. Do not use unnecessary force. Measure and make a note of the distance X between pump casing and motor flange with feeler gages at three points next to the set screws. Please refer to Figure 7.7.

Loosen the fasteners and back up the motor $0.7 \text{ mm} \pm 0.2 \text{ mm}$ using the three set screws and the distance X as reference. Tighten all fasteners and check that the distance X at the three reference points are stable at their new set of values.

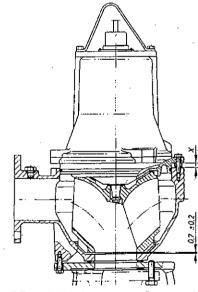


Figure 7.7 Axial clearance reference dimension X.

7.3. Pump Cleaning and Visual Inspection

A simple maintenance measure is to clean the pumps at regular intervals. The pumps may be cleaned in situ at the pumping station when withdrawn from the wet well. The pump is hosed down externally using a high pressure jet cleaner (maximum pressure 100 bar). Caked dirt on the motor must be removed to ensure good heat conductivity. A mild detergent, approved for disposal into the sewerage system may be used. The pumps may be scrubbed, using a soft brush, if necessary.

Oy Grundfos Environment Finland Ab

Operator's Manual



7. Pump Maintenance

Page 4 (4)

Visual inspection of the pump should include search for cracks or other external damages. The lifting handle and lifting chain should be expected for wear and corrosion. The pump cable should be inspected for cracks or lacerations in the sheath, kinks or for other damage. Visible parts of the cable inlet must be inspected for cracks and that they are firmly screwed down onto the top cover or junction box.

Operator's Manual

8. Impeller Replacement

Page 1 (3)



8. Impeller Replacement

ATTENSION

A damaged or badly worn impeller must always be replaced without delay when observed. A damaged impeller is out of balance and will cause damage or premature failure of the pump bearings. Always read and observe the safety instructions in the sections 3.10 and before beginning to work on pumps.

NOTE

Make sure before beginning to work on dry-installed pumps that all closing valves in both the suction pipework and rising main are closed and that the pump is drained.

8.1. Impeller Removal

Loosen and remove all fastening screws between pump casing and motor. Use a mallet to tap around the casing to break any bonding between casing and motor. Use a hoist to lift the pump motor out of the pump casing and place on a work bench. Clean the work area around the impeller and the impeller screw.

Loosen and remove the impeller screw. Be sure to locate and remove all washers. Please refer to the impeller specifications table below for list of components.

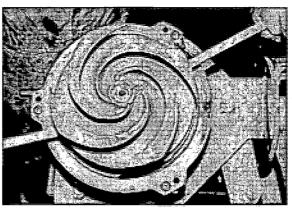


Figure 8.1 Removing vortex impeller using levers

The impeller can be removed using leverage applied behind the impeller by inserting suitable tools, such as tire irons, into clearance between impeller and motor flange. Apply the leverage evenly on both sides of the impeller. Please refer to figure 8.1. With the leverage applied apply a blow to the impeller using a soft mallet. The impeller breaks loose from the tapered shaft and can easily be removed. Remove and store the impeller key.

ATTENSION

Do not apply one-side leverage when removing impeller. One-sided force on the impeller may distort the tapered fit on the shaft end or bend the shaft.

For pumps with large impellers the use of an impeller puller is recommended. Use a two-clawed puller with claws long enough to reach behind the impeller upper shroud. On pumps with impeller screws screw a hex or Allen head bolt of the same dimension into the shaft end for thread protection before applying the puller. Please refer to the impeller specifications table below for list of screw dimensions. Apply the puller and tighten up until the impeller breaks loose from the tapered shaft end. Remove the protective bolt from the shaft end and remove the impeller. Remove and store impeller keys or drive pins. Please refer to figure 8.2.

Clean the shaft end and the area behind the impeller with the impeller removed from the shaft. Check the shaft end for damages or taper distortion from impeller looseness. Do not attempt to install new impeller on damaged or distorted shaft. Instead send the pump to authorised workshop for repair.



8. Impeller Replacement

Page 2 (3)

ATTENSION

Sling heavy impellers to a hoist while removing. Dropping the impeller may cause damage to the impeller or work area floor.

NOTE -

For pumps with semi-axial impellers (SS pumps) the order of component removal is reversed and the impeller is removed before the pump casing. For impeller replacement the casing does not have to be removed at all.

After the impeller is removed from the shaft clean the shaft end and the area behind the impeller. Check the shaft end for damages or taper distortion from impeller looseness. Do not attempt to install new impeller on damaged or distorted shaft but send pump to authorised workshop for re-pair instead.

8.2. Impeller Mounting

Lubricate the threads (internal or external) of the shaft end using oil. The specified tightening torque for the impeller requires the threads to be lubricated to attain sufficient screw tension. Install the impeller key or drive pin. Install the new impeller onto the shaft end. Make sure that the key stays in place in keyway in shaft and impeller. Make sure that the pin recess slides home onto the drive pin where a drive pin is employed to.

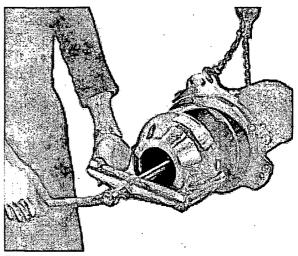


Figure 8.2 Removing single-channel impeller using puller

Install the impeller screw or nut using new locking washers where required. Tighten to prescribed fastening torque using torque wrench. Please refer to impeller screw torque table for the correct torque for your pump model. Turn the impeller by hand to make sure it rotates freely and straight. Please refer to figure 8.3.

Reinstall the pump casing in reverse order of the above. Adjust the single-channel pump's impeller suction clearance according to the instructions in section 7.2.

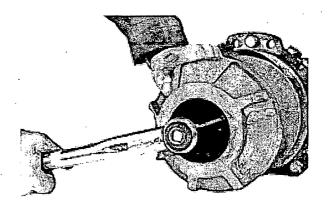


Figure 8.3 Installing impeller using torque wrench

Operator's Manual

8. Impeller Replacement

Page 3 (3)



8.3. Impeller Screw Tightening Torques

The table below contains information on the impeller fastening components for each pump covered by this manual as well as the fastening torque to be applied in each case.

Pump frame size	Screw dimension, part number	Torque, Nm	Note		
50	M10, D-32437	90	Special screw		
54	M12, D-32438	120	Special screw		

8.4. Component Fastener Tightening Torque

The different fasteners opened in the course of the service measures described above should be tightened to specified torque upon reassembly. The torques are as follows:

Screw Dimension	Torque, Nm
M 8	20
M 10	40
M 12	70
M 16	170
M 20	330

Page 372 of 441



Page 1 (6)

9. Explosion-proof Pumps

9.1. General

This section provides specific information for owners and operators of Sarlin submersible pumps built and certified for use in explosive environments. The range of explosion-proof pumps include the following pump types:

50 Hz							
	Frame size 50		Fran	ne size 54			
SVX 072 BH	SVX 092 BH	SVX 122 BH	S1X 134 AL	S1X 134 AM			
S1X 054 L	S1X 054 M	S1X 054 H	S1X 134 AH	S2X 134 AL			
S1X 074 E	S1X 074 CM	S1X 074 H	S2X 134 AE	S1X 174 AL			
S1X 074 S	S1X 124 AE	S1X 124 BM	S1X 174 AM	S1X 174 AH			
S1X 124 AH			S2X 174 AL	S2X 174 AE			
	•	60 Hz					
	Frame size 50	· _	Frame size 54				
SVX 092 BH	SVX 122 BH	S1X 094 BM	S1X 164 AL	S1X 164 AM			
S1X 094 AH	S1X 114 AH	S1X 134 BM	S1X 164 AH	S1X 204 AL			
S1X 134 AH			S1X 204 AM	S1X 204 AH			

The contents of these instructions are provided as information for the pump owners and operators only and as a requirement of the certifying body. Actual repair measures on the pump motor should be referred to an authorised workshop only.

The instructions concerning the pump part of an explosion protected (ex-proof) submersible pump do not differ from the instructions for standard pumps. Consequently this instruction deals only with the structural differences, operation restrictions and special instructions of the pump motor.

ATTENSION

These instructions must be read as a general safety measure in their entirety and understood before any work on or operation of explosion-proof pumps. These instructions do not supersede the safety instructions in section 3 but constitute an complement to these and a stand-alone instruction on explosion-proof pumps. The BASEEFA Regulations governing Flameproof Submersible Motors should also be read in conjunction with these instructions.

9.2. Certification and Classification

The Sarlin explosion-proof pump motors are certified by the British Approval Services for Electrical Equipment in Flammable Atmospheres (BASEEFA) in compliance with the harmonised European Standards EN 50014 and EN 50018. The motor is certified for use in potentially explosive atmospheres

Operator's Manual

Page 374 of 441

Page 2 (6)



requiring electrical apparatus of class dII B T3 or dII B T4. A certification marking compliance is affixed to the motor and is located on the side of the stator casing.

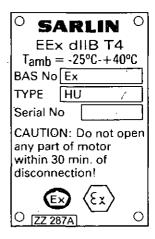


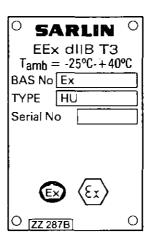


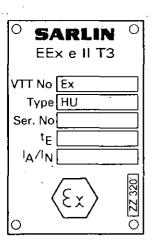


9.3. Certification Plate

The certification plates for class dll B T3 and dll B T4.







The information on the plates reads as follows:

EEx	Apparatus explosion protected according to Euronorm
d	Apparatus withstands explosion pressure
II .	Intended for other potentially explosive locations than mines
В	Intended for use in connection with gases of subcategory B
Т3	Maximum surface temperature of the apparatus is 200 °C
T 4	Maximum surface temperature of the apparatus is 135 °C
T _{amb.}	Allowable ambient temperature range is -25 °C +40 °C
BAS No.	Approval certificate No. EEx

Oy Grundfos Environment Finland Ab

Operator's Manual

Type HU

Motor type number HU... (Sarlin type code HU...)



Page 3 (6)

Serial No

Manufacturing serial No

NOTE

When using the motor in locations requiring Temperature Class T4 the motor may not be opened until 30 minutes after de-energising. When the motors are operated at variable frequency, the Temperature Classification is of Class T3.

9.4. Motor Construction and Performance

The explosion-proof enclosure comprises the following specially-designed items:

- · Motor access cover or plug
- · Cable inlet
- · Stator housing
- · Lower bearing bracket
- · Lower bearing bracket cover
- · Joint between motor body and oil housing

NOTE

This enclosure may be opened by authorised personnel only.

An external ground contact is located on the top cover to ensure the connection to earth. Electrical installation must include external connection from this contact to true ground. Grounding wires must satisfy all valid electrical safety requirements. Ground wire cross section must be at least 6 mm² and less than 70 mm².

For motor characteristics please refer to section 2.2.

9.5. Motor Protection Device Circuit

The motor is provided with two separate moisture switches and the stator is provided with three thermal switches connected in series, one for each phase. In single-phase motors two thermal switches are used, one in the main and one in the auxiliary phase. Thermal switch operating temperature is not higher than 150 °C. The protection devices are connected in series in a separate circuit motor cable leads 1 and 2.

ATTENSION

The control panel starter must include circuitry for automatic disconnection of the mains supply in the event of the pump protective circuit opening.

9.6. Motor Operating Requirements

Motor modifications or other measures that include drilling, welding, fastening etc., possibly affecting or weakening the structure must not be carried out to any parts of the explosion-proof enclosure.

Operator's Manual

Page 4 (6)



The motor must not be opened when energised. The work on the motor, including opening and dismantling, must only be carried out by qualified personnel at a workshop authorised by the manufacturer. Plate on motor serves as reminder, refer to Figure 9.1.

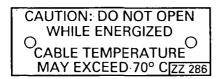


Figure 9.1 Warning plate

Overhauled and repaired motors are marked with a repair plate showing the following items:

- The repair symbol R
- Name or registered trade mark of the repairing workshop
- · Workshop reference number relating to the repair
- · Date of overhaul or repair

In the event of subsequent repairs the earlier plate should be replaced by a new updated one and earlier markings be recorded.

The repairing workshop is liable to keep records of performed overhauls and repairs and further records of all previous repairs, overhauls and possible modifications. Copies of the repairing workshop's detailed records should be filed by owner or operator together with the original type certificate of the explosion-proof motor in question.

9.7. Overhaul and Repair Requirements

Fasteners

Only screws complying with manufacturers specifications as to type, strength and dimensions, are allowed for fastening and securing of motor parts and components. The external fastener strength class is A2-80 or A4-80 and the internal fastener strength class is 8.8.

Wiring

Only cables approved by the manufacturer and complying with the requirements of the cable inlet as to diameter, number of leads, conductor area and sheath material, are allowed for the motor.

The compression seals (grommets) of the cable entry must be marked EExd and their aperture should correspond to the cable diameter. The corresponding cable dimension marking is stamped on the inlet or the entry device.

The cable entry device is secured to the motor cover by tightening the screws evenly in turn until the device bears against the motor cover.

Access Opening

The access openings are primarily intended for motor tightness tests in connection with overhaul. The openings may be used for inspection, should the presence of leakage water in the motor be suspected.

The prescribed time delay before opening the motor applies also to the access openings (screws).

ATTENSION

The access opening cover screw must always be locked with an originalissue Allen head locking screw M4 x 8.

Oy Grundfos Environment Finland Ab

Operator's Manual

SP068 Tufnell Road Yeronga SPS Pump Station Upgrade OM Manual

Page 378 of 441



Page 5 (6)

Lower bearing bracket cover

In motors having a separate bearing bracket cover the flanged joint between them constitutes an explosion proof joint where the joint gap must not exceed 0.15 mm. If the cover has been opened the joint must always be checked in connection with the assembly. The joint is controlled with a 0.15 mm feeler gage which must not fit into the gap from anyone of three radial directions.

Condition of Parts

When assembling, especially the components of the explosion-proof enclosure, must be carefully checked for:

- · Faultlessness of machined surfaces
- · Condition of threaded holes
- Approval markings

Spare parts

Damaged parts should always be replaced by new and approved parts. Parts must not be refurbished by machining, re-tapping, welding, etc.

The components and spare parts of the explosion-proof enclosure must have the following approval markings:

Part	Item No.	Marking
Motor cover	230	Ex 1 PH or Ex 2 PH
Cable entry	236/404	Ex 1 PH or Ex 2 PH
Stator housing	302	Ex 1 PH or Ex 2 PH
Bearing bracket	213	Ex 1 PH or Ex 2 PH
Bracket cover	206	Ex 1 PH or Ex 2 PH
Oil housing (up to 5,2 kW)	257	Ex 1 or Ex 2
Rotor	201	Ex 1 or Ex 2

NOTE

Make sure before assembly that the parts carry the adequate markings.

Stator Rewinding

If a motor stator has to be rewound the directions of the manufacturer must be observed. Thermal switches and winding insulation must completely correspond to original.

ATTENSION

The thermal switches must be embedded in the windings before varnishing and curing.

Testing After Stator Rewinding

After partial or complete repair the stator should be subjected, preferably with the apparatus assembled, to the following tests:

A. The resistance of each winding should be measured at room temperature and verified. In case of three phase windings the resistance of each phase or between line terminals should be balanced. Maximum allowable phase resistance difference is 2 %.

Operator's Manual

SP068 Tufnell Road Yeronga SPS Pump Station Upgrade OM Manual

Page 380 of 441

Page 6 (6)



- B. Insulation resistance should be tested measuring the resistance between:
 - · windings ground
 - · windings windings
 - windings auxiliaries (i.e. thermal switches)
 - · auxiliaries ground

A minimum test voltage of 500 V DC is recommended.

Minimum acceptable insulation resistance is a function of rated voltage, temperature, type of apparatus and whether the rewind is partial or complete. However for example, the insulation resistance should not be less than 100 M Ω at 20 °C on a completely rewound apparatus intended for use at up to 660 V.

- C. A high voltage test in accordance with a relevant standard (i.e. IEC 34-1) should be conducted between:
 - · windings earth
 - · windings windings
 - · windings auxiliaries attached to the windings

Test voltage is 2 x U_N + 1000 V, minimum 2000 V.

Testing After Repair

Before a repaired motor is put back into service, it should be put through the following tests:

- Motor tightness test, using the access opening
- Internal motor protection circuit function control
- · Test run at normal full speed for abnormal vibrations or noise
- Testing of the earth connection between the earth lead at the control panel and the pump body

Overhauled and repaired motor should be marked with a visible plate. The marking should be permanent using corrosion-resistant plate material.



10. Troubleshooting

Page 1 (2)

10. Troubleshooting

ATTENSION

Always read and observe the safety instructions in section 3.10 and 3.11 before beginning to troubleshoot pumps.

Trouble	Possible cause	Check and remedy				
Pump fails to start or stops without visible reason.	No power to motor.	Check power supply and fuses. Operate manual start and check contactor operation.				
Pump fails to start or	Loss of one phase of power supply.	Check power supply and fuses.				
stops. Control panel indicates tripped	Pump momentary overloaded.	if condition not self-corrective, check for cause.				
overcurrent relay or protection devices.	Impeller jammed.	Check impeller and clear as necessary.				
	Overcurrent relay incorrectly set.	Check and reset as necessary according to nominal current.				
	Thermal switches tripped. Pump inadequately cooled.	Allow motor to cool. Ensure adequate cooling by immersion for pumps version 1 and 4.				
	Moisture switch in motor tripped.	Refer to authorised repair shop.				
	Motor cable damaged.	Check for visual damages. Refer to authorised repair shop.				
,	Fluctuating voltage.	Check voltage. Allowable deviation i +/- 5%.				
not deliver rated	Pump runs backwards. Check direction of rotation and as necessary.					
volume flow.	Impeller loose or worn. Check impeller and replace necessary.					
,	Pump or pipework clogged.	Check and clear as necessary.				
	Pump head too high.	Check by pressure gauging and redesign rising main or install other pump.				
	Valves closed or clogged. Check valve not operating.	Check valve position, clean as necessary Relocate or replace check valve.				
	Air accumulated in pump casing or suction pipeline.	Remove air. Raise wet well stop level or redesign suction pipeline.				
	Pumped liquid too dense.	Dilute or redesign process.				
	Pump not properly connected to submersible baseplate.	Pump down wet well level, lift pump and relocate onto baseplate.				
	Leaking pipework.	Check pipework for leaks and fix as necessary.				
	Pump wet well flushing system inadvertently activated.	Check for function and repair as necessary.				

Operator's Manual

10. Troubleshooting

Page 2 (2)



Trouble	Possible cause	Check and remedy
Pump starts but shuts off.	Clogged pump causes overload to trip.	Check and clear pump as necessary.
	Motor overheated, tripping thermal switches.	Allow pump to cool; check for cause as above.
	Insufficient liquid in wet well.	Allow wet well to fill.
	Level control failure.	Clean or reset level control equipment or replace as necessary.
Pump vibrating or	Pump partially clogged.	Check and clear pump as necessary.
emitting excessive noise.	Pump runs backwards.	Check direction of rotation and rectify as necessary.
	Pump operates outside designed operation range.	Check pump head. Redesign rising main or select other pump.
	Pump mechanical failure.	Check pump for damages. Repair or submit to authorised repair shop as necessary.
	Pump not correctly engaged to submersible baseplate.	Pump down wet well level, lift pump and relocate onto baseplate.
	Pump cavitates.	Check pump for partial suction blockage and clear as necessary. Check duty point and adjust as necessary.
	Pump stand, baseplate or guide rails not securely installed.	Check installation and tighten bolts where necessary.
Oil watery or emulsified.	Lower seal leakage.	Refer to authorised workshop.
Low oil level.	Upper seal leakage.	Refer to authorised workshop



11. Declaration of Conformity

Page 1 (1)

11. Declaration of Conformity

Oy E. Sarlin Ab Division Pumps Kaivokselantie 3-5 01610 Vantaa Finland

We herewith declare that the

Sarlin Submersible Pumps, Series S, to which this declaration relates, are in conformity with the provisions in the EU Council Directive 89/392/EEC as amended by 91/368/EEC, 93/44/EEC and 73/23/EEC as amended by 93/68/EEC, and EU Council Directive 89/336/EEC and the following standards stipulated by said directives:

EN 292-1:1991	Safety of M	Machinery. Basic	concepts, general	principles fo	r design. B	Basic
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terminology, methodology.

EN-292-2/5:1991 Safety of Machinery. Basic concepts, general principles for design. Technical

principles and specifications.

prEN 809:1992 Pumps and Pump Units for Liquids - Safety Requirements

EN 60335-2-41 Safety of household and similar electrical appliances. Particular requirements

for electrical pumps.

EN 50082-1 Electromagnetic compatibility. Generic immunity standard. Generic standard

class: Residential, commercial and light industry.

EN 55014 Limits and methods of measurement of radio interference characteristics of

household electrical appliances, portable tools and similar electrical apparatus.

Vantaa, Finland

20.02.1996

Anne Tallgren

Quality Manager

Oluce /Ol



Test Sheet
Active 10/12/2014





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Page 387 of 441

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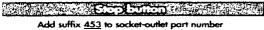




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For other tappings, please consult us





WALL MOUNTING SOCKET



Example for a wall mounting socker DSI 30A/400V 3PNE





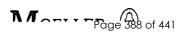
SOCKET-OUTLET 31 14 017

POLYESTER POLYAMIDE

suffix 264 = 4 aux

NEOPRENE

META.



isconnect Lever K...-HESI



The particular feature of the fuse terminal ocks, UK 5-HESI and UK 6,3-HESI is the nged disconnect lever with limit stop for fine ses.

These terminal blocks are available with id without light indicator. The latter signals nen the fuse insert has blown. The light dicator in the disconnect lever contains ht emitting diodes connected in antiparallel r the voltage range 15-30 V and a glow mp for the voltage range 110-250 V. Everal disconnect levers can be coupled by eans of the connection pin

S-UK 10,3-HESI in order to switch a threenase circuit on or off, for example.

The UK 10,3-HESI is a fuse terminal block th disconnect lever for 10.3 x 38 mm fuses, nich are used mainly in the USA. With one ving of the lever, the fuse can be changed off load and without any risk. When selecting and using cartridge fuse rminal blocks and inserts,

C 127 6/DIN EN 60 127 6 and DIN VDE 0611 part 6 should be observed. Cartridge fuse inserts are supplied by:

Wickmann-Werke GmbH Postfach 2520 D-58415 Witten

Phone: ++ / 23 02 / 66 20 Fax: ++ / 23 02 / 66 22 19

ELU

Postfach 101054 D-44010 Dortmund

Phone: ++ / 23 1 / 55 70 30 0 Fax: ++ / 23 1 / 55 70 30 9

SIBA

Postfach 1940 D-44509 Lünen

Phone: ++ / 23 06 / 70 01-0 Fax: ++ / 23 06 / 70 01-10

Schurter GmbH Postfach 1253 D-79343 Endingen

Phone: ++ / 76 42 / 68 2-0 Fax: ++ / 76 42 / 88 20 Higher ambient temperatures

are an additional strain on fuse inserts. In applications of this kind, the shift of the rated current should be taken into consideration accordingly.

Description	Voltage (V AC/DC)	Current [mA]
Fuse terminal block, for mounting for cartridge fuse inserts 5×20 , 5 for 5×20 mm cartridge fuse insert	x 25, 5 x 30 mm	
Fuse terminal block, for mounting for cartridge fuse inserts 6.3 x 32 r for 10.3 x 38 mm cartridge fuse ins	nm (1/4" x 11/4")	
Fuse terminal block2), as above,		
however with light indicator for:	15 - 30	3.5 - 8.1
_	110 - 250	0.5 - 1.0
(1) Fixed bridge, for cross connect	tions in	
the terminal center, screw heads w collar, 10-position, divisible, with 10	ith insulating	
(2) Insertion bridge, fully insul., fully insulated,	2-pos.	0000000000
divisible, insulated spine,	10-pos.	frantreser
(3) Insertion bridge, divisible,	n	
insulated spine 56-pos., 1-phase	dim	n n n n
insulated spine 56-pos., 3-phase	11	
(4) Connection pin, for interconne fuse terminal blocks, plastic, orang		
(5) Zack marker sheet, flat, 50-se-	ction for	
(0) 1100cg 110c, 00-30	-uo., io.	

labeling the marker groove
(6) Zack strlp, 10-section, white

(7) Screwdrivers

Dimensions
Width / length
Height (NS 35:7.5 / NS 35:15 / NS 32)
Technical data in accordance with IEC / DIN VDE
Fuse type / dimensions
Max. power dissipation
at 23°C based on E DIN VDE 0611-6: 2001-04
Max. cross section with insertion bridge (solid/stranded)

[mm²]

Max. cross section with insertion bridge (solid/stranded) Rated surge voltage / contamination class [kV]/-Surge voltage category / insulation material group -/-Connection capacity (mm²ì Stranded with ferrule without / with plastic sleeve Multi-conductor connection (2 cond. with same cross section) Solid / Stranded [mm²] Stranded with ferrule without plastic sleeve (mm²) Stranded with TWIN ferrule with plastic sleeve [mm²] Stripping length [mm]

Internal cylindrical gauge (IEC 60 947-1) Thread / torque Insulation material

Inflammability class acc. to UL 94

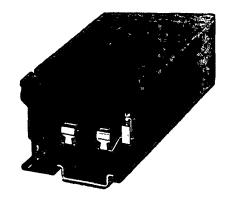
Approvel data (UL and CSA/CUL)

Nom. voltage / nom. current / conduc. sizes UL: [V] / [A] / AWG

CSA/CUL: [V] / [A] / AWG

-/(Nm)

Note: Further fuse terminal blocks for other voltage ranges are available



UK 5-HESI

for cartridge fuse inserts 5 x 20, 5 x 25, 5 x 30 mm with and without light indicator

Terminal width 8.2					
(IEC) [mm²]	rigid solid	flexible stranded	AWG	(A]	(S)
DIN VDE 0611 as disconnect t. b. with fuse	0.2-4 0.2-4	0.2-4 0.2-4	24-12 24-12	6.3 ³}	800 ¹)

<i>9</i> 1	O	KEUA	₿	©	(BV/LR/PRS/RS
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Туре	Order No.	Pcs Pkt
UK 5-HESI	30 04 10 0	50
UK 5-HESILED 24 UK 5-HESILA 250	30 04 12 6 30 04 14 2	50 50
EBS 2-8 L. : 32 A		
EBS 2-8 I _{max} : 32 A EBS 3-8 32 A EBS 10-8 32 A	31 18 14 8	100 50 10
ZB 8 (for order data, see page 337)		
SZS 0,6 x 3,5	12 05 05 3	10

G / 5 x 20, 5 x 25, 5 x 30
')
4/4
6/3
11171
0.25 - 4 / 0.25 - 4
0.2 - 1.5 / 0.2 - 1.5
0.25 - 1.5
0.5 - 2.5
8
A 4
M 3 / 0.5 - 0.8
PA
V2
Limited States of the Control of the

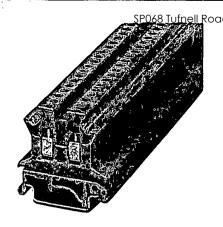
8.2 / 72 5

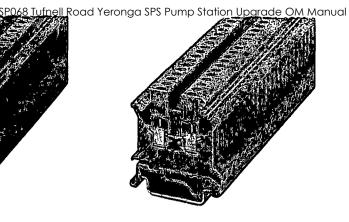
56.5 / 64 / 61.5

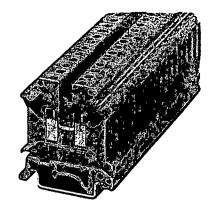
600 / 6.3 / 28 - 10

1) See table page 83 (The current is determined by the fuse used, the voltage by the light indicator).

600 / 6.3 / 26 - 10







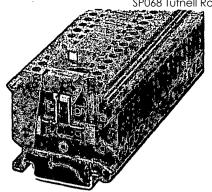
11	K	3	N
u	\mathbf{r}	J	14

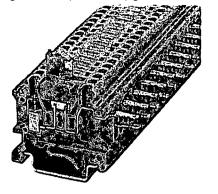
UK 2,5	N		UK 3	N			UK 5 N		
Terminal width 5.2	ded AWG (A 2.5 24-14 2- 2.5 24-14 28/	() [V] 4 800	Terminal width 5.2 (IEC) rigid flex [mm²] solid strar IEC 60 947-7-1 0.2-4 0.2- EN 50 019' 0.2-4 0.2- 'EC Prototype certificate no.: KEMA	ded AWG [A 2.5 24-12 3 2.5 24-12 28/	A] [V] 2 800	Terminal width 6.2 (IEC) [mm²] IEC 60 947-7-1 EN 50 019* • EC Prototype certif	rigid flexible solid stranded 0.2-6 0.2-4 0.2-6 0.2-4 ficate no.: KEMA 98A	4 AWG [/ 24-10 4 24-10 38	
. P.I.	/LR/NV/PRS	7	B KEMA (E. K.) E KEMA (C. R.)	//LR/NV/PRS/RS/	NK	oo 1833	CA B 😌 @ BV/LF Nus FTZU/KDB	VNV/PRS/RS	/NK
Туре	Order No.	Pcs. Pkt.	Туре	Order No.	Pcs. Pkt.	Туре		Order No.	Pcs. Pkt.
UK 2.5 N³) UK 2.5 N BU³)	30 03 34 7 30 03 35 0	50 50	UK 3 N³) UK 3 N BU³)	30 01 50 1 30 01 51 4	50 50	UK 5 N³) UK 5 N BU³)		30 04 36 2 30 04 38 8	50 50
0-UK 2.5 0-UK 2.5 BU	30 01 02 2 30 01 10 3	50 50	D-UK 4/10 D-UK 4/10 BU	30 03 02 0 30 03 10 1	50 50	D-UK 4/10 D-UK 4/10 BU		30 03 02 0 30 03 10 1	50 50
FBRI 10-5 N I _{max.} :24	A 27 70 64 2	10	FBRI 10-5 N I _{max.} :30	A 27 70 64 2	10	FBI 10-6	I _{max.} :41 A	02 03 25 0	10
EBL 2-5 I _{max} : 24 EBL 3-5 24 EBL 10-5 24		100 100 10		23 03 14 5 23 03 15 8 23 03 13 2	10 10 10	EB 2-6 EB 3-6 EB 10-6 ISSBI 10-6	I _{max.} : 32 A 32 A 32 A I _{max.} : 30 A	02 01 15 5 02 01 14 2 02 01 13 9 03 01 50 5	100 100 10 10
						IS-K 4		13 02 33 8	100
USBR 2-7 I _{max.} : 18	A 23 03 23 9	1				USBR 2-7	I _{max.} : 34 A	23 03 23 9	1
TS-KK 3	27 70 21 5	50	тѕ-к	13 02 21 5	50	тѕ-к		13 02 21 5	50
ATP-UK	30 03 22 4	50	ATP-UK	30 03 22 4	50	ATP-UK		30 03 22 4	50
PSB 3/10/4	06 01 29 2	100	PSB 3/10/4	06 01 29 2	100	PSB 3/10/4		06 01 29 2	100
PSBJ 3/13/4	02 01 30 4	100	PSBJ 3/13/4	02 01 30 4	100	PSBJ 3/13/4		02 01 30 4	100
ZB 5 for order data, see page 335)			ZB 5 (for order data, see page 335)			ZB 6 (for order data,	see page 335)		
SZS 0.6 x 3.5	12 05 05 3	10	SZS 0,6 x 3,5	12 05 05 3	10	SZS 0,6 x 3,5		12 05 05 3	10
5.2 / 42.5 / 1 42 / 49.5 / 4			5.2 / 42.5 / 47 / 54.5 / 5				6.2 / 42.5 / 1.8 47 / 54.5 / 52		
24 / 2.5			32 / 4				41/6		
2.5 / 2.5 8 / 3			4/2.5 8/3				4/4 8/3		
W/1			III / I				11171		
0.25 - 2.5 / 0.25	5 - 1		0.25 - 2.5 / 0.25	5 - 1.5			0.25 - 4 / 0.25 - 2.	5	
0.2 - 1 / 0.25	· 1		0.2 - 1.5 / 0.2	- 1.5			0.2 - 1.5 / 0.2 - 1.5	5	
0.25 - 1			0.25 - 1.5				0.25 - 1.5		
0.5 · 1.5			0.5 - 1 8				0.5 - 2.5 8		
, A3			A 3				A 4		
мз			M3				м 3		
0.6 - 0.8			0.6 - 0.8				0.6 - 0.8		
PA			· PA				PA		
V2			V2				VO		
} `			•						

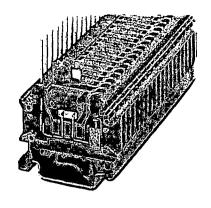
600 / 30 / 30 · 10 600 / 40 / 28 · 10

300 / 20 / 30 - 12 300 / 20 / 28 - 12

600 / 20 / 28 - 12 600 / 20 / 28 - 12







UK 5-MTK-P/P

with female test connector screws

	M.	TK	(-L	0	E	
vith	scre	w/s	older	con	nectio	าก

MTK-TP
with screw, WW or TP connection

Terminal width 6.2					
(IEC) (mm²)	rigid solid	flexible stranded	AWG	 [A]	ſΟ
Connection data	0.2-4	0.2-4	24-12	16	500

(IEC) [mm²]	rigid solid	flexible stranded	AWG	 [A]	[V]
Connection data	0.2-4	0.2-2.5	24-12	12	400
Solder connection	0.2-1.5	0.2-1.5	24-16	12	400
Stip-on connection 2	2.8 x 0.8 m	n		2)	2)

(IEC)	rigid	flexible	AWG		υ
[mm²]	solid	stranded		[A]	(V
connection data VW conn. [mm] 1 x P conn. [mm] 1.6 x P conn. [mm] 2.4 x	0.8	0.2-2.5	24-12 26-20 28-22 24-20	10 10 10	25 25 12

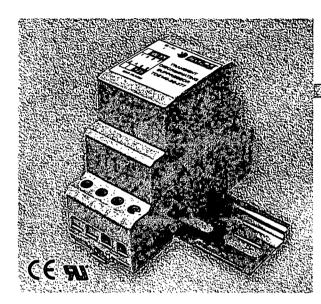
.911 vs ⑨ PRS			<i>9</i> .0					
Туре	Order No.	Pcs. Pkt.	Туре	Order No.	Pcs. Pkt.	Туре	Order No.	Pcs Pki
UK 5-MTK-P/P	30 04 03 2	50						
			MTK-LOER 1) (see illustration) MTK-LOEL 1)	31 05 01 2 31 07 01 0	50 50			
			MTK-LOE/LOE	31 09 01 8	50			
						MTK-WW (1 x 1) 1	31 10 11 7	5
						MTK-TP (2,4 x 0,8) 1L MTK-TP (2,4 x 0,8) 1Q	31 10 41 8 31 10 51 5	5(5(
Closed housing, without cover			D-MTK D-MTK BU	31 01 02 9 31 01 09 0	50 50	D-MTK D-MTK BU	31 01 02 9 31 01 09 0	5: 5:
EB 2-6 1 _{max} : 12 A EB 3-6 12 A	02 01 14 2	100 1 0 0				EBL 2-5 I _{max.} : 11 A EBL 3-5 11 A	23 03 15 8	1: 1:
EB 10-6 12 A	02 01 13 9	10				EBL 10-5 11 A	23 03 13 2	1(
ATP-UK 5-MTK 2 mm thick	30 04 21 0	50	ATS-MTK	31 01 22 3	50	ATS-MTK	31 01 22 3	5
SZG 0,6 x 3,5	12 05 12 1	10	SZS 0,6 x 3,5	12 05 05 3	10	SZS 0,6 x 3,5	12 05 05 3	1
ZB 6 (for order data, see page 335)			ZB 5 (for order data, see page 335)			ZB 5 (for order data, see page 335)		

	MTK-LOE // MTK-LOE/LOE	
6.2 / 51 / -	5.2 / 57.5 / 1 // 5.2 / 69 / 1	5.2 / 46 / 1
58.5 / 66 / 63.5	51.5 / 59 / 56	67 / 74.5 / 72
16 / 4	12 / 4	10 / 4
4/4	~	4/4
6/3	6/3	4/3
III / 1	III / I	11171
0.25 - 4 / 0.25 - 2.5	0.25 - 2.5 / 0.25 - 2.5	0.25 - 2.5 / 0.25 - 2.5
0.2 - 1.5 / 0.2 - 1.5	0.2 - 1.5 / 0.2 - 1.5	0.2 - 1.5 / 0.2 - 1.5
0.25 - 1.5	0.25 - 1	0.25 - 1
0.5 - 2.5	0.5 - 1.5	0.5 - 1.5
8	7	7
A 4	A 3	А3
M 3	M 3	M 3
0.5 - 0.6	0.5 - 0.6	0.5 - 0.6
PA	**PA **	PA .
Vo	V0	. V0
© 36 m/37		
600 / 15 / 22 - 12	300 / 10 / 28 - 12	-
600 / 15 / 18 - 10	_	-

Phoenix Contact

AC Power Devices

TD DINLINE Surge Diverter



TD™ DINLINE

Transient Discriminating TM (TDTM) Technology represents a quantum leap in transient suppression technology for mains powered equipment. It offers a new level of safety and reliability, yet retains optimum protection levels critical for sensitive electronic equipment.

FEATURES

- TD™ Technology for superior service life
- · Low let-through voltage
- UL1449 Edition 2 Recognised
- Extra fast transient withstand
- High over-voltage withstand
- Meets international EMC/RFI specifications
- Multipulse capability

ORDERING INFORMATION

Item Number	Description
TDS 140-2S-120	DINLINE SPD, TDS, 1Ph, 40kA, 120V
TDS 140-2S-277	DINLINE SPD, TDS, 1Ph, 40kA, 277V
TDS 180-4S-120	DINLINE SPD, TDS, 1Ph, 80kA, 120V
TDS 180-4S-277	DINLINE SPD, TDS, 1Ph, 80kA, 277V
TDS 1160-8S-120	DINLINE SPD: TDS, 1Ph: 160kA, 120V
TDS 1160-8S-277	DINLINE SPD, TDS, 1Ph, 160kA, 277V
TDS 50-120	DINLINE SPD. TDS, 1Ph, 3M, 20+20+10kA, 120V
TDS 50-240	DINLINE SPD, TDS, 1Ph, 3M, 20+20+10kA, 240V

SPECIFICATIONS

	TD81xx-x8-120	TD81xx-x8-277	
Operation			
Nominal Line Voltage:	100-120 Vrms	220-277 Vrms	
Frequency:	50 / 60 Hz	50 / 60 Hz	
Leakage Current:	< 4 mA		
MCOV (Ph-N, Ph-E, N-E):	240 Vrms	480 Vrms	
Max Surge Rating:		•	
8/20µs	40kA 80kA 160kA	40kA 80kA 160kA	
10/350µs	8kA 16kA 32kA	8kA 16kA 32kA	
Energy Rating:	1920J 3840J 7680J	1920J 3840J 7680J	
Aggregate Surge Material:			
8/20µs	80kA 160kA 320kA	80kA 160kA 320kA	
Let-through Voltages:			
@ 3kA 8/20µs	< 480V	< 750V	
Let-through Voltages:			
@ 20kA 8/20µs	< 760V	<980V	
Surge Rated to Meet:	ANSI/IEEE C62.41-1991 Cat A, B and C		
÷	Zone 0/1, Class B/C		

Operation TDS50-xxx Three		Mode Range	
	TD850-120	TD850-240	

	10000-120	10000-240
Nominal Line Voltage:	100-120 Vrms	220-277 Vrms
Frequency:	50 / 60 Hz/DC	50 / 60 Hz
Leakage Current:	< 0.2 mA	
MCOV (Ph-N, Ph-E, N-E):	170 Vrms	340 Vrms
Max Surge Rating:		
8/20µs	50kA (20+20+10kA)	50kA (20+20+10kA)
	(L-N, L-G, N-G)	(L-N, L-G, N-G)
Energy Rating:	1390J	1390J
Aggregate Surge Material:		
8/20µs	58kA	
UL1449 SVR Rating:		
@ 500A	330V	700V
Let-through Voltages:		
@ 3kA 8/20µs	< 500V	< 800V

© 3κA 8/20μs < 500V < 800V Surge Rated to Meet: ANSI/IEEE C62.41-1991 Cat A, B Zone 2, Class C

Alarms and Indicators

Status Indication: Staged LED, opto coupler
Voltage free contact 2A @ 250VAC
Available with Alarm relay module

Physicals

Temperature and Humidity: -35°C to +55°C, 0-90%

Terminals: 1.0mm² to 6.0mm²

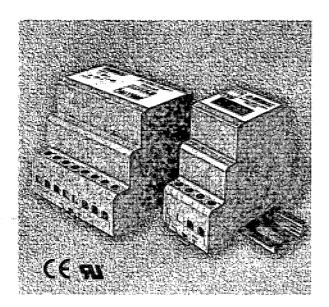
2M (36mm), 4M (72mm), 8M(144mm)

Weight: 200g.(2M), 350g (4M), 700g (8M)

Listing: UL Recognized Component AS3260, IEC950, C Tick
Warranty: 5 years

AC Power Devices

DINLINE Accessories



FEATURES

TDS Alarm Relay accessory

- For use with external alarm & monitoring systems
- Potential free change-over contacts
- Electronic indicators ideal for poorly illuminated locations
- UL 1449 Edition 2 Recognised

TDS Surge Counter accessory

- No power supply or batteries required to maintain counter
- Multiple diverters can be monitored by a single TDS-SC
- · Accidental erasure prevented by non-resettable counter

Alarm Relay & Surge Counter

ERICO's TDS-AR Alarm Relay is an accessory to the TDF and TDS series of surge protection devices. These provide internal monitoring and visual indication of their protection status. The TDS-AR connects to a opto-output and provides a fully isolated potential free changeover alarm contact.

In addition, where the supply voltage is stable the DINLINE Alarm Relay (DAR-275) can be installed. Not only does it provide the same level of internal monitoring and visual indication as the TDS-AR, it has the added benefit of being more cost effective.

The TDS Surge Counter (TDS-SC) is a companion product to the surge diverters and can be used for site monitoring, building information management and predictive maintenance. The TDS-Surge Counter allows accurate and reliable recording of the number of impulses diverted by monitoring the surge current flow. It is powered by the surge energy - no additional power supply or batteries are required. A current transformer provides isolation from the measured circuit and allows monitoring of multiple diverters/filters.

ORDERING INFORMATION

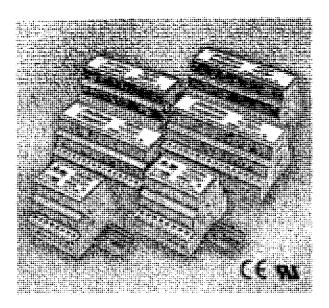
Item Number		er Description
	TDS-AR	DINLINE ALARM RELAY,TDS, 90-275V
	TDS-SC	DINLINE SURGE COUNTER, TDS WITH CT
	DAR-275V	DINLINE ALARM RELAY,90V TO 275V
	DSC-150V	DINLINE SURGE COUNTER,150V
	DSC-275V	DINLINE SURGE COUNTER, 275V

SPECIFICATIONS

Nominal line voltage Vrms: 90-275 90-275	
Contact types: Change over, Change over	,
2A 30VDC, 2A 30VDC,	
250VAC 250VAC	
Physicals:	
Enclosure style: DIN 43880 DIN 43880	
Dimensions (W x D x H): 36 x 88 x 70mm 36 x 88 x 70	mm
Warranty: 5 years 5 years	
Listing: UL Recognized -	
Operation TDS-SC DSC	
Maximum count: 9999 9999	
Sensitivity: 300A 8/20µs 300A 8/20µs	3
Physicals	
Enclosure style: DIN 43880 DIN 43880	
Dimensions (W x D x H): 36 x 88 x 70mm 36 x 88 x 70	mm
Warranty: 5 years 5 years	
Listing: UL Recognized -	

AC Power Devices

Transient Discriminating ** Filter



FEATURES

- Transient DiscriminatingTM Technology ensures safe operation during abnormal over-voltage events
- Remote protection status monitoring and LED indication
- Compact design fits into most switch and distribution boards
- Models available for all power distribution system types
- High surge rating 50kA ensures long service life
- · Optional Alarm Relay and Surge Counter can be retrofitted
- · Easy installation simply clips onto 35mm DIN rail
- UL1449 Edition 2, UL1283 recognised CSA 22.2, C-Tick
- Surge rated to meet ANSI / IEEE C62.41 Cat A, Cat B, Cat C, AS / NZS 1768-1991 Cat A, B, C

TDF

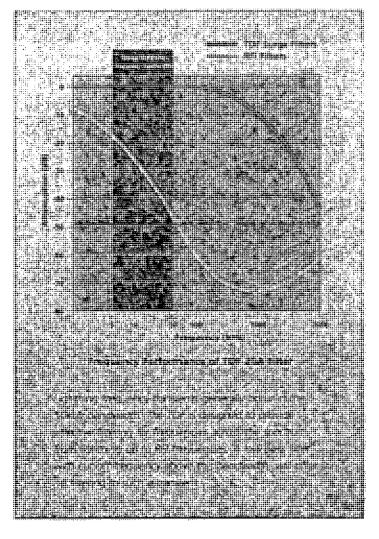
The new Transient Discriminating TM Filter family of two port (or series) SPDs offers high performance and reliable protection from power transients with the convenience of easy installation on 35mm DIN rail mountings. The TDF series has been specifically designed and strongly recommended for protection of critical electronic equipment with the advantage of a robust performance against poor voltage regulation.

The space efficient TDF provides some 65dB attenuation to transients, which not only improves the products residual voltage performance, but assists greatly in reducing the steep rates of voltage and current rise, providing superior protection for sensitive electronic equipment.

Units are available for 3A, 10A and 20A loads and in a range of voltages including 110-120V AC/DC and 240V AC.

ORDERING INFORMATION

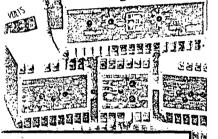
Item Number	Description
TDF-3A-240V	TDF,1 PHASE,3A,240V
TDF-10A-240V	TDF,1 PHASE,10A,240V
TDF-20A-240V	TDF,1 PHASE,20A,240V
TDF-3A-120V	TDF,1 PHASE,3A,120V
TDF-10A-120V	TOF,1 PHASE,10A,120V
TDF-20A-120V	TDF,1 PHASE,20A,120V



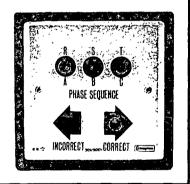
Crompton INSTRUMENTS INTERNATIONAL SEQUENTS

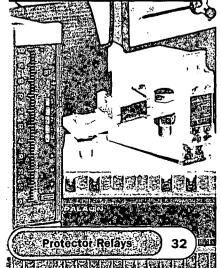
Application:

- Motor protection
- Motors Single Phasing
- Gensets correct engine rotation
- All portable equipment
- All rotating machines



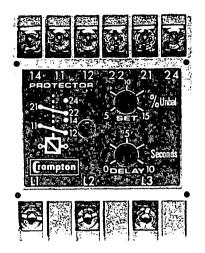
We also manufacture front of panel mounting phase sequence indicators





Protector Trip Relays

250 Series DIN Rail and Wall Mounted - Phase Balance



The Crompton Protector Phase Balance module provides continuous surveillance of a 3 phase, 3 or 4 wire system and protects against:

- Phase Loss, Reversal or Sequence
- Phase Unbalance
- System Under Voltage

Introduction

This Crompton Protector is designed to comprehensively monitor the three phase supply. It monitors the correct phase rotation or sequence of three phase supply systems. Rotating machines are particularly vulnerable to incorrect phase sequence. Three phase motors can rotate in the wrong direction, potentially leading to physical damage or the risk of injury to personnel, yet voltage and current readings may appear normal. If one phase is lost because of a blown fuse, electric motors can continue to operate (single phasing) which can result in severe electrical or mechanical damage.

This relay has the added advantage that it will detect the phantom or regenerated phase that can be caused by a single phase failure on some equipment or when running motors at low load levels.

An unbalanced supply voltage can lead to temperature rises in motors. An unbalance voltage as little as 10% can increase operating temperature to 150% of normal.

For permanent installations, this relay should be used to monitor the incoming supply, protecting all equipment against incorrect connection at initial installation or after maintenance work. Rotating machines that cannot tolerate reverse rotation or pose significant risk to personnel under this condition should be individually protected with this relay. The possibility of incorrect supply connection is much more likely in portable equipment or marine applications.

Product Function

The protector continuously monitors the three phase supply. With the correct phase sequence applied and all three voltages are balanced within the required limits, the front panel LED will illuminate and the output relay will be energized. An incorrect sequence, missing phase, out of balance or under voltage condition will de-energize the relay, and the LED will be extinguished.

The setpoint control allows adjustment of the voltage matching between 5% and 15%.

The time delay function operates only for the voltage unbalance condition. The delay can be used to prevent nuisance tripping due to short term unbalance situations. Incorrect phase rotation, a missing phase or an under voltage condition trip the relay immediately.

Protection against:

- Incorrect phase sequence
- Loss of one phase
- Under voltage

- Unbalanced voltage
- A phantom or regenerated phase voltage

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2001

Page 395 of 441

Protector Trip Relays

250 Series DIN Rail and Wall Mounted - Phase Balance

Specification

Approvals:

U.L. recognised

CSA approved up to 480V.

System:

3 phase, 3 or 4 wire Frequency: 50 or 60Hz

Nominal Voltage:

100, 110, 120, 208, 277,

220, 230, 240, 380,400.

415, 440 & 480V

Burden:

3VA approx.

Voltage Withstand:

1.2 x continuously

1.5 x for 10 x 10 seconds

Set Points: Unbalance:

Adjustable 5% to 15%

Time Delay:

Up to 10 seconds adjustable

Under Voltage (Type 252-PSG only):

Internally preset at 15% of nominal voltage (other values between 10% and 30% available on request) (not operative if voltage falls below 70% of the nominal voltage or set point on type

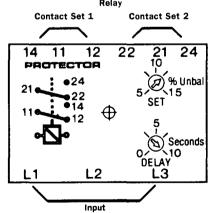
252-PSG)

Product Code Examples

Relay	Input	Protection	ANSI No.	Catalogue No.
3 Phase 3 or 4 Wire	120V L-L 60Hz	Phase loss & unbalance	47	252-PSFU-PQBX-C6
	480V L-L 60Hz	Phase loss & unbalance	47	252-PSFU-SEBX-C6
	120V L-L 60Hz	Phase loss, unbalance, under voltage	47/27	252-PSGU-PQBX-C6-T1-IA
	480V L-L 60Hz	Phase loss, unbalance, under voltage	47/27	252-PSGU-SEBX-C6-T1-IA

Connection Diagrams

252-PSF 252-PSG



Note: No neutral connection is required

150 ac aguis Protector Relays

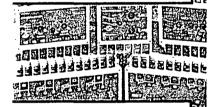
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-eatures

- **№** For high frequency or linear full scale A.C. measurements
- **∑** These instruments measure average values of sinusoidal waveforms and are scaled in r.m.s. values
- The high quality silicon bridge rectifier gives a linear scale down to near zero, where some compression occurs



Features

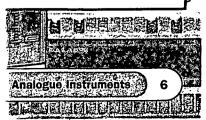
The two instruments in one case can be used to measure a wide range of **Currents or Voltages**

3enefits

Dual instruments save both panel space and assembly time

Application

№ For Independent measurement of 2 parameters in one case or the comparison of the two inputs. For example, when an A.C. generator is to be connected in parallel with mains supply where voltage, phase and frequency must coincide



240 Series DIN Panel Meters

Moving Coil Rectified A.C. Ammeters and **Voltmeters**



Model				
Bezel Size mm	48	72	96	144
Scale length mm	42	6 5	94	145
Product Code				
Ammeters	242-89B	243-01B	244-01B	246-10B
Voltmeters	242-89W	243-01W	244-01W	246-10W

Accuracy: Ratings: Ammeters:

Model 242 from 250uA to 20mA Model 243 from 250µA to 1A

Models 244/246 from 250µA to 20A

Voltmeters: Frequency:

15V to 600V a.c. direct connected Models available for use with V.T.s 50/60Hz, (Single Frequencies

25Hz to 3kHz on request)



Model				
Bezel Size mm	48	72	96	144
Scale length mm	72	112	150	230
Product Code		_	<u> </u>	
Ammeters	242-05B	243-05B	244-05B	246-05B
Voltmeters	242-05W	243-05W	244-05W	246-05W

Accuracy: Ratings:

1.5 % ES

Ammeters: 250µA to 1A A.C.

Up to 30A on models244/246-05B

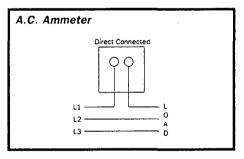
Voltmeters:

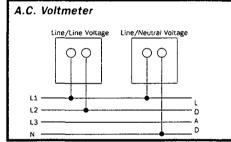
15V to 600V Direct connected

Models available for use with V.Ts

50/60Hz. (Single frequencies

Frequency: 25Hz to 3kHz on request)





Dual A.C. Ammeters and Voltmeters



Accuracy: Ratings:

1.5% ES

Ammeter:

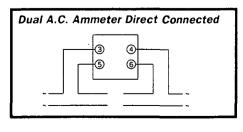
250µA to 10A A.C.

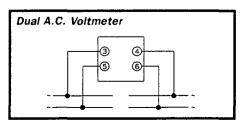


	Voltmeter:
F	requency:

Model	
Bezel Size mm	96
Scale length mm	65
Product Code	
Ammeters	244-80F
Voltmeters	244-80L

15 to 600V direct connected 50/60Hz (single frequencies 25Hz to 3kHz on request)





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RH SERIES POWER RELAYS

Midget Power Type Relays Large Capacity 10A — 1, 2, 3, and 4 Poles

The RH series is a miniature power relay with large capacity. The RH series features 10A contact capacity as large as RR series and the same size as IDEC's miniature relays. Compact in size, the RH series is ideal for installation in small equipment.

• 🕦 . @ and 💯 represent UL recognized, CSA certified and TÜV approved models, respectively.

 Each coil voltage indication is colorcoded for identification.

24V AC: Brown,

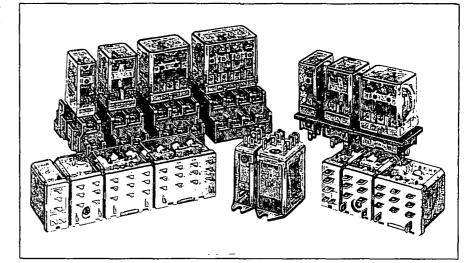
100V AC, 100-110V AC: Blue 120V AC, 110-120V AC: Pink,

200V AC, 200-220V AC: Red 220V AC: White,

240V AC, 220-240V AC: Purple 12V DC: Black, 24V DC: Brown

100-110V DC: Blue





TYPES

Terminal	Contact Configuration	SPDT	DPDT	3PDT	4PDT
Style Blade	Type Basic Type	% <u>10v</u> RH1B-U	% <u>10¥</u> RH2B-U	% <u>Tov</u> RH3B-U	N IUY RH4B-U
Terminal	With Indicator	RH1B-L	RL IUY RH2BU-L	% <u>roy</u> RH3B-UL	NA TUV RH4B-UL
0	With Check Button		(i) IOV RH2B-UC	RH3B-UC	® IQV RH4B-UC
	Top Bracket Mounting Type	90 10V RH1B-UT	® TOV RH2B-UT	® ™ RH3B-UT	90 TUY RH4B-UT
	With Diode (DC coil only)	RH1B-D	RH2B-D	RH3B-D	RH4B-D
	With Indicator and Diode (DC coil only)		RH2B-LD	RH3B-LD	RH4B-LD
	With Resistor and Capacitor (100V AC and over coil)	RH1B-R	RH2B-R		
	With Indicator and RC (100V AC and over coil)	RH1B-LR	RH2B-LR		
PC Board Terminal	Basic Type	% RH1V2-U	91 RH2V2-U	91 RH3V2-U	% RH4V2∙U
(2mm-wide)	With Indicator	RH1V2-L	RH2V2-UL	RH3V2-UL	9\\ @ RH4V2-UL
T	With Check Button		® RH2V2-UC	RH3V2-UC	RH4V2-UC
•	Top Bracket Mounting Type				
	With Diode (DC coil only)	RH1V2-D	RH2V2-D	RH3V2-D	RH4V2-D
	With Indicator and Diode (DC coil only)	<u></u>	RH2V2-LD	RH3V2-LD	RH4V2-LD
	With Resistor and Capacitor (100V AC and over coil)	RH1V2-R	RH2V2-R		
	With Indicator and RC (100V AC and over coil)	RH1V2-LR	RH2V2-LR		

ORDERING INFORMATION

When ordering, specify the type No. and rated coil voltage.

[Example]

RH2B-U AC100-110

Rated Coil Voltage Type No.

RH SERIES POWER RELAYS



COIL RATINGS

	√ × (Ha	ted Voit	age (V)	(5 H)	\$ 50kg	7 (F	Rated Cu	rrent (m	(A) ±159	ad 20*	C				stance (Ω)		Op	eration Characteris	tics in 35-12 to
	SPDT	DPOT	Conner	4PDT	c care	50	Hz .		. 47	. 60	Hz :	14 .	~	±10%	at 20°C		Max. Continuous	nst rated values at : "Min. Pickup	
Ĺ	SPUI		3901	4701	SPDT	DPDT	3PDT:		SPDT	OPOŢ	3PDT	4POT	SPDT.	OPDT	3PDT	4PDT	Applied Voltage	Voltage	Dropout Voltage
	6	6	6	6	170	240	330	387	150	200	280	330	18.8	9.4	6	5.4			
ł	12	12	12	12	86	121	165	196	75	100	140	165	76.8	39.3	25.3	21.2			
ŀ	24	24	24	24	42	60.5	81	98	37	50	70	83	300	153	103	84.5			
1	50	50	50	50	20.5	28.9	39.5	47	18	24	34	40	1,280	680	460	340			
12	100	100-110	100	100	10.5	10.3-11.8	20	23.5	9	9.1-10.0	17	20	5,220	3,360	1,940	1,560		!	
(50/60Hz)	110	 	110	110	9.5		18.1	21.6	8.4		15.5	18.2	6,950		2,200	1,800	110%	80% maximum	30% minimum
	115	110-120	115	115	8.9	9.4-10.8	17,1	20.8	7.8	8.0-9.2	14.8	17.5	7,210	4,290	2,620	1,910	110%	00 /6 IIIaxiinuiii	30 As intellinuin
å	120		120	120	8.6	.	16.4	19.5	7.5	_	14.2	16.5	8,100		2,770	2,220			
		200-220	200	200		5.1-5.9	9.8	11.8		4.3-5.0	8.5	10		13,690	8,140	5,360			
			220	220	-		8.8	10.7		_	7.7	9.1			10.800	7,360			
		220-240	230	230	_	4.7-5.4	8.5	10.3	-	4,0-4.6	7.4	8.7		18,820	11,500	8.520			
			240	240			8.2	9.8	_		7.1	8.3			12,100	9,120			
	SPDT	DPDT	3PDT	4PDT	SP	DΤ	DP	DT	3P	DT	4P	DT	SPDT	DPDT	3PDT	4PDT	, i		
	6	6	6	6	12	28	15	0	24)	25	0	47	40	25	24			
	12	12	12	12	- 6	54	7.	5	12)	12	5	188	160	100	96			
10	24	24	24	24		32	31	5.9	6	0	6	2	750	650	400	388	110%	80% maximum	10% minimum
8	48	48	48	48		18	1:	B.5	3)	3	1	2,660	2,600	1,600	1,550			
	=	100-110	100	100			8.2	9.0	1	4.5	1	5		12,250	6,900	6.670			
			110	110	_				1.	2.8	1	5			8,600	7.340			

Note: For other rated voltages, contact IDEC.

CONTACT RATINGS

_	Maximum Contact Capacity															
	i		Allowable Ci	ontact Power		Rated Load (A)										
Туре	Switching Voltage (V)	Continuous Current (A)	Resistive Inductive Load Load		Voltage (V)	Resistive Load	Inductive Load cosp=0.3 L/R=7 msec									
	250.40		1		110 AC	10	7									
SPDT	250 AC 125 DC	10	1540VA AC					300W DC					990VA AC 210W DC	220 AC	7	4.5
	123 00	[30000	21011 00	30 DC	10	7									
OPDT					110 AC	10	7.5									
3PDT	250 AC 125 DC	10	1650VA AC 300W DC	1100VA AC 225W DC	220 AC	7.5	5									
4PDT	. 125 00 !		30011 DC	22317 00	30 DC	10	7.5									

UL Ratings

		5			111				1001
		Resistive	!	į G	eneral U	se	Horse	Power F	lating
Voltage	RH1 RH2	RH3	RH4	RH1 RH2	RH3	RH4	RH1 RH2	RH3	RH4
240V AC	10A	7.5A	7.5A	7A	6.5A	5A	1/3HP	1/3HP	_
120V AC	_	10A	10A	_	7.5A	7.5A	1/6HP	1/6HP	
30V OC	10A	10A	i —	7A	I —	i —	!	!	_
28V DC			10A	. —		1 —	;		

CSA Ratings

Voltage	Resistive					Horse Power Rating			
Tottage	RH1	RH2	RH3	RH4	RH1	RH2	RH3	RH4	RH1, RH2, RH3
240V AC	10A	10A		7.5A	7A	7A	7A	5A	1/3HP
120V AC	10A	10A	10A	10A	7.5A	7.5A		7.5A	1/6HP
30V DC	10A	10A	10A	10A	7A	7.5A	i —	i —	<u> </u>

SPECIFICATIONS

Contact			Silver cadmium oxide			
Contact	Resis	tance	50mΩ maximum (initial value)			
Minimum Applicable Load		licable Load	24V DC/30mA, 5V DC/100mA (reference value)			
Operate	Operate Time		SPDT/DPDT: 20 msec maximum (at the rated voltage) 3PDT/4PDT: 25 msec maximum (at the rated voltage)			
Release	Time	(Note 1) -	SPDT/OPDT: 20 msec maximum (at the rated voltage) 3PDT/4PDT: 25 msec maximum (at the rated voltage)			
SPDT		SPDT	AC: 1.1 VA (50Hz), 1 VA (60Hz) DC: 0.8W			
Power Consum	stion	DPDT	AC: 1.4 VA (50Hz), 1.2 VA (60Hz) DC: 0.9W			
(Approx.)		3PDT	AC: 2 VA (50Hz), 3.7 VA (60Hz) DC: 1.5W			
		4PDT	AC: 2.5 VA (50Hz), 2 VA (60Hz) DC: 1,5W			
Insulation	n Res	istance	100MΩ minimum (500V DC megger)			
Dielectric Strength OPDT 3POT 4POT		SPOT	Between five and dead pans: 2,000V AC, 1 minute (Note 2) Between contact and coil: 2,000V AC, 1 minute Between contacts of the same pole: 1,000V AC, 1 minute			
		3PDT	Between live and dead parts: 2,000V AC, 1 minute Between contact and coil: 2,000V AC, 1 minute Between contacts of different poles: 2,000V AC, 1 minute Between contacts of the same pole: 1,000V AC, 1 minute			
Maximun		Electrical	1,800 operations/hour			
Frequence Respons		Mechanical	18,000 operations/hour			
Tempera	ture f	Rise	Coil: 85 deg maximum, Contact: 65 deg maximum			
Vibration	- 1	Operating extremes	Frequency: 10 to 55Hz, Amplitude: 1.0mm p-p			
Resistan		Damage limits	Frequency: 10 to 55Hz, Amplitude: 1.0mm p-p			
Shock	L	Operating extremes	SPDT/DPDT: 200 m/sec ² (Approx. 20G) 3PDT/4PDT: 100 m/sec ² (Approx. 10G)			
Resistan	ce	Damage limits	1,000 m/sec² (Approx. 100G)			
Life Electrical		trical	DPDT: 500,000 operations minimum (110V AC, 10A) SPDT/3PDT/4PDT: 200,000 operations minimum (110V AC, 10A)			
	Mec	hanical	50,000,000 operations minimum			
Operation	Operating Temperature		SPDT: -25 to +50°C DPDT/3PDT/4PDT: -25 to ÷40°C (Note 3)			
Weight (/ (Basic ty			SPDT: 24g, DPDT: 37g, 3PDT: 50g, 4PDT: 74g			
Note 1: Relay with diode: 4			40 msec			

Note 1: Retay with diode: 40 msec
Note 2: Relay with indicator or diode: 1,000V AC, 1 minute
Note 3: For use under different temperature conditions, refer to Continuous Load Current
vs Operating Temperature Curve. The operating temperature of RH series power
relays with indicator, diode, resistor and capacitor ranges from -25 to +40°C.

RH SERIES POWER RELAYS

Continuous Load Current vs Operating Temperature Curve (Basic Type, With Check Button, and Top Bracket Mounting Type) (Note: The rated voltage is applied to the coil.) (RH3/RH4) 100 Operating Temperature (°C) Operating Temperature (*C) 80 DC coil 60 AC coil AC coil 3 4 5 6 7 8 9 10 A

Continuous Load Current (A)

DIMENSIONS

All dimensions in mm.

Hold-down Spring

SFA-101

SFA-202

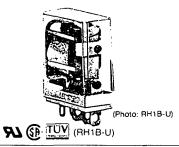
SY4S-02F1

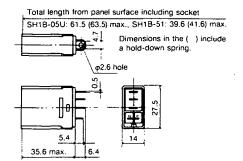
SY4S-51F1

SFA-301

(SY4S-02F1)

RH1B-U/RH1B-L/RH1B-D





Applicable Sockets & Hold-down Springs

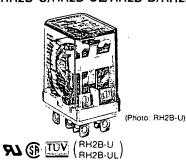
Continuous Load Current (A)

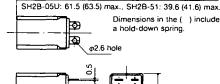
Sock	Hold-down			
Mounting Style	Type No.	Spring		
DIN Rail Mount Socket	SH1B-05U SH1B-05C	SFA-101 SFA-202 SY2S-02F1		
Panel Mount Socket	SH1B-51	SY4S-51F1 SFA-301		
PC Board Mount Socket	SH1B-62	SFA-302		

Applicable Sockets & Hold-down Springs

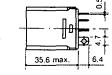
RH2B-U/RH2B-UL/RH2B-D/RH2B-LD

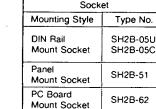
Continuous Load Current (A)





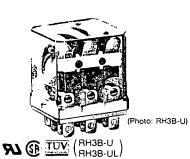
Total length from panel surface including socket

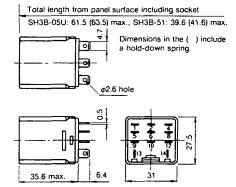




Note 1: (SY4S-02F1) is for the relay with check button. Note 2: SFA-302 and SFA-301 are not applicable to

RH3B-U/RH3B-UL/ RH3B-D/RH3B-LD



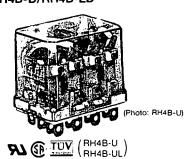


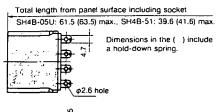
Applicable Sockets & Hold-down Springs

Sock	Hold-down				
Mounting Style	Spring				
DIN Rail Mount Socket	SH3B-05U SH3B-05C	SFA-101 SFA-202 SH3B-05F1			
Panel Mount Socket	SH3B-51	SY4S-51F1 (SH3B-05F1)			
PC Board Mount Socket	SH3B-62	SFA-301 SFA-302			

Note: (SH3B-05F1) is for the relay with check button.

RH4B-U/RH4B-UL/ RH4B-D/RH4B-LD





	0.5		· · · ·
			27.5
	*		~
35.6 max.	6.4	41.0	

Applicable Sockets & Hold-down Springs

- replicable occided a riola actin opiniga				
Sock	Hold-down			
Mounting Style Type No.		Spring		
DIN Rail Mount Socket	SH4B-05U SH4B-05C	SFA-101 SFA-202 SH4B-02F1		
Panel Mount Socket	SH4B-51	SY4S-51F1 (SH4B-02F1)		
PC Board Mount Socket	SH4B-62	SFA-301 SFA-302		

Note 1: (SH4B-02F1) is for the relay with check

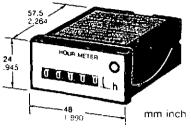
button.
Note 2: SH4B-51 requires two hold-down springs



NAIS

DINHALFSIZE HOUR MEDER

TH63·TH64 Hour Meters





TH63 (without reset function)

TH64 (with reset function)

- Compact size offers more panel space.
- Wide measurement range.
- Simple installation.
- High performance motor with 50/60 Hz selection.
- Rotary indicator.
- Time measurement of leased equipment, management of compact equipment operation, maintenance management of various equipment, etc.

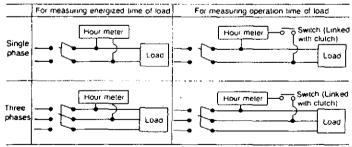
PRODUCT TYPE

	Part No.	Rated operating voltage	Max. power consumption	Counting range
	TH633	12 V AC		
	TH634	24 V AC		0 to 99999.9 hours
	TH635	48 V AC		
T. 180 1	TH631	100 V AC		
TH63 types (without reset)	TH636	110 V AC	Approx.	
(Hilliout reset)	TH637	115 to 120 V AC	1.5 ₩	
	TH632	200 V AC		
	TH638	220 V AC		
	TH639	240 V AC		
	TH643	12 V AC		
	TH644	24 V AC		
	TH645	48 V AC	i	
TUCANA	TH641	100 V AC	•	0 to 9999.9
TH64 types (with reset)	TH646	110 V AC	Approx. 1.5 W	
	TH647	115 to 120 V AC	1.5 ٧	hours
	TH642	200 V AC		
	TH648	220 V AC	ŀ	
	TH649	240 V AC		·

SPECIFICATIONS

Туре		TH63 TH64 (without reset)		
Rated oper	ating	12 V AC, 24 V AC , 48		
voltage		to 120 V AC, 200 V AC	C, 220 V AC, 240 V AC	
Operating range	voltage	85 to 115% of rate	d operating voltage	
Rated frequ	uency	50/60 Hz (selec	table by switch)	
Initial insul	ation	Min. 1	00 M Ω	
resistance	(At 500 V DC)	Between live and	dead metal parts	
initial brea	kdown	2,000 Vrms		
voltage		Between live and dead metal parts		
Shock	Functional	10 G (4 times on 3 axes)		
resistance	Destructive	100 G (5 times on 3 axes)		
Vibration	Functional	10 to 55 Hz: 1 cycle/r	min double amplitude	
resistance	runctional	of 0.5 mm (10 min on 3 axes)		
Max. tempe	rature rise	55 (deg.	
Ambient te	Ambient temperature +10 to ±50°C ±14 to ±122°F		=14 to +122°F	
Storage temperature		-22 to =140 F		
Ambient hu	ımidity	Max. 85% RH		
Counting d	irection	Addition (UP)		

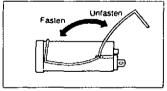
WIRING DIAGRAM



Before operation, check that the Hz selector is set to the power line frequency at the installation site

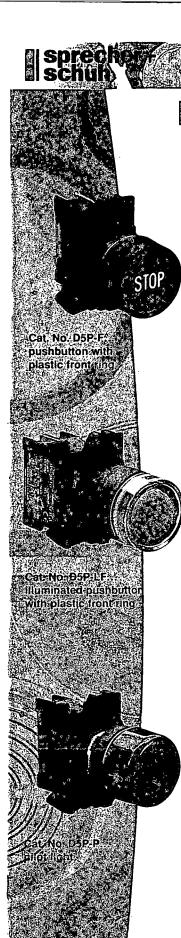
MOUNTING

- Cut a 22.250.3 x 4550.6 mm (.874.) 4.1 772; 73 inch) opening in the panel.
- Swing the mounting spring to the rear of the hour meter and fit the hour meter into the panel opening. (There is no need to detach the mounting spring from the hour meter.) If the panel is 5 to 9 $\,$ mm $\,$ 197 to .354 inch thick, move the mounting spring to the other hole toward the rear of the hour meter
- 3. Swing the mounting spring to the front of the hour meter to secure the hour meter to the panel.
- Wire the supplied quick connectors and connect to the hour meter. Be sure to use the supplied insulating sleeves to cover the connectors.



DIMENSIONS

mm inch No. 187 quicl Reset button (only for TH64 type) Panel mounting Panel cutout dimensions connect terminal Panel (thickness: 1 to 5 mm .039 to .197 inch) Rotary indicator Hz selector lever For penel thickness of 5 to 9 mm .197 to .354 inc (included)



Complete panel mounted standard units

Protection cla

Now with colour coded contact block

•	Protection class in	O
	Individually package	90

D5P-E402W3LX01

Description	Contact	Cat. No.
Pushbuttons		·
Start (green)	N/O	D5P-F301W3LX10
Stop (red)	NC NC	D5P-F402W3LX01
Reset (blue)	N/O	D5P-F607W3LX10
Green (blank)	∄——∰ NO ® ®	D5P-F33LX10
Red (blank)	N/C	D5P-F43LX01
Blue (blank)	, NO	D5P-F63LX10*

N/C

Illuminated pushbuttons

Stop (red extended)

max 130 V, 3 W filament lamp or 230/240 V neon lamp (lamp not included) 1)

Green ———————————————————————————————————	 N/O	D5P-LF33DL0X10
Red →	N/C	D5P-LF43DL0X01

with series diode and resistor element D5-RL7 for operating voltage 240 V AC using 130 volt filament lamp (lamp not included) ³)

G . 55	₩-□-⊗-	N/O	D5P-LF33RL7X10
Red	₩□⊗	N/C *	D5P-LF43RL7X01

Pilot lights

max 130 V, 3 W filament lamp or 230/240 V neon lamp (lamp not included) 1) 2) 3)

Green		D5P-P33DL0
Red	\otimes	D5P-P43DL0
Yellow		D5P-P53DL0
Blue		D5P-P63DL0
Clear	——⊗-	D5P-P73DL0

with series diode and resistor element D5-RL7 for operating voltage 230/240 V AC using 130 volt filament lamp (lamp not included) 1) 2) 3)

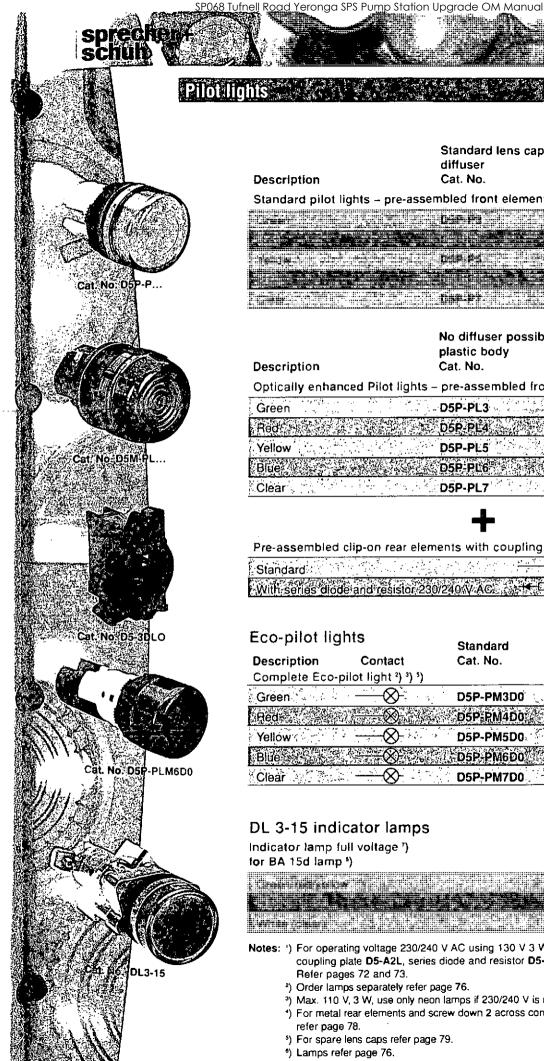
Green	₩-□	D5P-P33RL7
A Red		D5P-P43RL7
Yellow	₩-□-⊗-	D5P-P53RL7
Blue 😘 🚉 😅		D5P-P63RL7,
Clear	★□⊗	D5P-P73RL7

lotes: ') Lamps refer to page 76.

) For spare lens caps refer page 79.

New integrated LED lamp block also available. Refer page 76.

Q-Pulse Id TMS972



Q-Pulse Id TMS972

- Protection class IP 66
- Individually packaged

Standard lens cap & diffuser Cat. No.

Standard lens cap & diffuser/metal body Cat. No.

Description

Description

Standard pilot lights - pre-assembled front elements ')

-Mi
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No diffuser possible plastic body

No diffuser possible

metal body Cat. No.

Optically enhanced Pilot lights - pre-assembled front element 5)

Cat. No.

Green	D5M-PL3
Red ()	D5P-PL4 D5M-PL4
Yellow	D5P-PL5
Blue	D5P-PL6 D5M-PL6
Clear	D5P-PL7



Pre-assembled clip-on rear elements with coupling plate ') 2) 4)

Standard D5-3DL	0 10 10 10 10 10 10 10 10 10 10 10 10 10
With series diode and resistor 230/240 √ AC 3 + □ ⊗ 5 D5-3RL	7-62 (1978)

Eco-pilot lights		Standard	Optically enhanced
Description Complete Eco-	Contact pilot light 2) 3) 5)	Cat. No.	Cat. No.
Green	<u> </u>	D5P-PM3D0	D5P-PLM3D0
Reda .		D5P:RM4D0;	D5P-PLM4D0
Yellów	→	D5P-PM5D0	D5P-PLM5D0
Blue		D5P-PM6D0	D5P:PLM6D0
Clear	$\otimes \overline{\otimes}$	D5P-PM7D0	D5P-PLM7D0

DL 3-15 indicator lamps

Indicator lamp full voltage 7) for BA 15d lamp 5)

Standard lens cap & diffuser/metal body Cat. No.

Optically

	uli alan aranger	

Notes: ') For operating voltage 230/240 V AC using 130 V 3 W filament lamp, order separately, coupling plate D5-A2L, series diode and resistor D5-3R7 and contact block D5-3LX10. Refer pages 72 and 73.

- 2) Order lamps separately refer page 76.
- 3) Max. 110 V, 3 W, use only neon lamps if 230/240 V is required. For lamps refer page 76.
- *) For metal rear elements and screw down 2 across contact blocks for D5M operators refer page 78.
- 5) For spare lens caps refer page 79.
-) Lamps refer page 76.
- 7) For use in metal enclosures.

Page 403 of 441



Complete panel mounted standard units

Incandescent lamps for use with full-voltage lamp block
Ba9S Style for full-voltage lamp blocks D5-3D0 and D5-3D80
Nominate voltage 6, 12, 24, 36, 48, 60V - eg Ba9S-l36 V-1.2 W = 6 V.

Description

Cat. No.

Cat. No.

Cat. No.

一点是在一方面的,只是我们的现在分词,我们是在这个人的现在,我们就是一个人的,我们就是一个人的,我们是这一个人的,我们就是一个人的,我们就是这个人的,我们就是这
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一种 "我们是一种是我们的,我们是我们的人,我们是我们的人,我们的人,我们就是我们的人,我们就是我们的人,我们就会会会会不知道,我们就会会会会会会会会会会会会
一直电影中,我们是有一种,我们是我们的现在分词,我们是我们的我们是我们的人,我们们的人,我们们的人,我们们的人,我们们的人,我们们的人,我们们们就是这个人,我们
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Anger Capatha a security and community

Incandescent lamps for use with resistor diode lamp block Ba9S Style for full-voltage lamp blocks D5-3R7 and D5-3RL7

Description

130 V-2.4 W (long life expectancy) BA9S-I3-130V-2.4W

Neon lamps for use with resistor diode lamp block Ba9S Style for full-voltage lamp blocks D5-3R7 and D5-3RL7

Description

110 V . 127 V clear BA9S-CN3-110V 220 V . 240 V clear BA9S-CN3-240V

Integrated LED lamp blocks - extended life (100,000+ hours)
Available colours Red (R), Green (G), Amber (A), Blue (B), White (W)
Insert corresponding letter at the end of part number eg. D5-3NL3R = RED

Approximate permissible

Voltage	leakage current	Description	Cat. No.
24 V AC/DC	3 mA	Lamp block with operator lat	chD5-3NL3
120 V AC	/ k - ሳይር 3 mA ነ	Lamp block with operatorilat	ch D5-3NL5
240 V AC	3 mA	Lamp block with operator lat	ćh _ 1 D5-3NL7_
24 V AC/DC	3 mA 4 2 2	Lamp block without operator	alchr D53N3 S
. 120 V AC	🏥 - 3 mA 🔞 - 🧎	Lamp block without operator	
240 V ACH-	3 mA	Lamp block withouttoperator	laten - D5-3N7

LED lamps - Extended life (100,000+ hours) for use with full-voltage lamp block (supplied with built-in shunt resistor)

Ba9S Style for full-voltage lamp blocks D5-3D0 and D5-3D80

Description	Red Cat. No.	Green Cat. No.	Yellow Cat. No.	Blue Cat. No.
		" dilabati "		
harrie and a second				
The second series with a second series of the secon				
		-ntmat : ::	. Co. Julius .	
AMERICA IN THE STREET				
	war with the state of the state			

LED multi-chip lamps - Extended life (50,000+ hours) for use with full-voltage lamp block Ba9S Style for full-voltage lamp blocks D5-3D0 and D5- 3D80

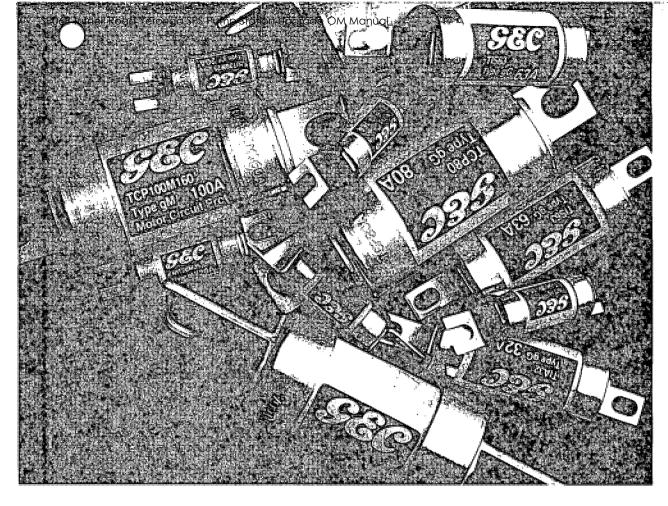
Description Red Cat. No. Green Cat. No. Yellow Cat. No. Blue Cat. No.

Notes: ') 8 Volt LED lamps suitable for use with D5 transformer

2) Nett price only

Active 10/12/2014

GEC ALSTHOM





Page 405 of 441



HRC Cartridge Fuse Links

The best known and respected name in Fusegear. All GEC HRC fuse links have excellent protection characteristics.

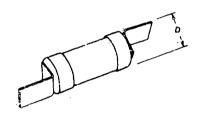
The GEC range of HRC fuse links comply with BS88-2 1988, AS2005-10, 21-2, 2.9 & IEC269-2-1.

Low voltage industrial Type "T" fuse links are ideal for all general applications.

Motor Start Type GEC fuse links offer unique time/current characteristics which combine superior motor starting performance with low values of let-through current and I²t on high fault currents.

Type
NS
Clip-In HRC Fuse Links
Off-Set Tags

80kA 440V AC 40kA 240V DC



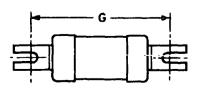
Туре	Rating Amp.	Diameter 'D' (mm)	Part No.
NS2	2	13.9	5AB9500-010
NS4	4	13.9	5AB9500-030
NS6	6	13.9	5AB9500-050
NS10	10	13.9	5AB9500-060
NS16	16	13.9	5AB9500-070
NS20	20	13.9	5AB9500-080
NS25	25	13.9	5AB9500-090
NS32	32	13.9	5AB9500-100
NS20M25	20/25*	13.9	·5AB9501-010
NS20M32	20/32*	13.9	5AB9501-020
NS32M40	32/40*	13.9	5AB9501-040

* Motor Start

Type
NIT
& TIS
Bolt-In HRC Fuse Links

NIT 80kA 550V AC 40kA 250V DC

TIS 80kA 660V AC 40kA 460V DC



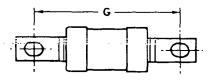
Туре	Rating Amp.	Off-Set G-Centre (mm)	Part No.
NIT2	2	44.5	5AB9510-010
NIT4	4	44.5	5AB9510-030
NIT6	6	44.5	5AB9510-050
NIT10	10	44.5	5AB9510-060
NIT16	16	44.5	5AB9510-070
NIT20	20	44.5	5AB9510-080
NIT20M25	20/25*(1)	44.5	5AB9511-010
NIT20M32	20/32*(1)	44.5	5AB9511-020
-TIS35	35	73.0	5AB9530-120
TIS40	40	73.0	5AB9530-130
TIS50	50	73.0	5AB9530-140
TIS63	63	73.0	5AB9530-150
T!S63M80	.63/80*/1)	73.0	5AB9531-010
TIS63M100	63/100*(1)	73.0	5AB9531-020
* Motor Start		(1) Togg	have bales, not alate

* Motor Start

(1) Tags have holes, not slots

Type
TIA,
TCP
& TFP
Bolt-In HRC Fuse Links

80kA 660V AC 40kA 460V DC (TFP 350V DC)

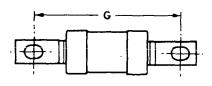


Туре	Rating Amp.	Of∂-Set G-Centre (mm)	Part No.
TIA2	2	73.0	5AB9520-010
TIA4	4	73.0	5AB9520-030
TIA6	6	73.0	5AB9520-050
TIA10	10	73.0	5AB9520-070
TIA16	16	73.0	5AB9520-080
TIA20	20	73.0	5AB9520-090
TIA25	25	73.0	5AB9520-100
TIA32	32	73.0	5AB9520-110
TIA32M35	32/35*	73.0	5AB9521-010
TIA32M40	32/40*	73.0	5AB9521-020
TIA32M50	32/50*	73.0	5AB9521-030
TIA32M63	32/63*	73.0	5AB9521-040
TCP80	80	93.7	5AB9570-060
TCP100	100	93.7	5AB9570-070
TCP100M125	100/125*	93.7	5AB9571-030
TCP100M160	100/160*	93.7	5AB9571-010
TCP100M200	100/200*	93.7	5AB9571-020
TFP125	125	93.7	5AB9583-020
TFP160	160	93.7	5AB9583-030
TFP200	200	93.7	5AB9583-040
TKM250	250	133.4	5AB9593-010
TKM315	315	133.4	5AB9593-020

^{*} Motor Start

Type
TB,
TBC
& TC
Bolt-In HRC Fuse Links

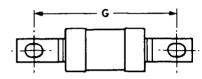
80kA 660V AC 40kA 460V DC



Туре	Rating Amp.	Off-Set G-Centre (mm)	Part No.
TB2	2	96.9	5AB9540-010
TB4	4	96.9	5AB9540-030
TB6	6	96.9	5AB9540-050
TB10	10	96.9	5AB9540-070
TB16	16	96.9	5AB9540-080
TB20	20	96.9	5AB9540-090
TB25	25	96.9	5AB9540-100
TB32	32	96.9	5AB9540-110
TB35	35	96.9	5AB9540-120
TB40	40	96.9	5AB9540-130
TB50	50	96.9	5AB9540-140
TB63	63	96.9	5AB9540-150
TBC2	2	111.0	5AB9550-010
TBC4	4	111.0	5AB9550-030
TBC6	6	111.0	5AB9550-050
TBC10	10	111.0	5AB9550-070
TBC16	16	111.0	5AB9550-080
TBC20	20	111.0	5AB9550-090
TBC25	25	111.0	5AB9550-100
TBC32	32	111.0	5AB9550-110
TBC35	35	111.0	5AB9550-120
TBC40	40	111.0	5AB9550-130
TBC50	50	111.0	5AB9550-140
TBC63	63.	111.0	5AB9550-150
TC80	80	111.0	5AB9560-060
TC100	100	111.0	5AB9560-070

Type
TF,
TKM,
TKF
& TMF
Bolt-In HRC Fuse Links

80kA 660V AC 40kA 460V DC (TF 360V DC)

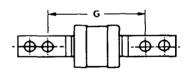


Туре	Rating Amp.	Central G-Centre (mm)	Part No.
TF125	125	111.0	5AB9580-020
TF160	160	111.0	5AB9580-030
TF200	200	111.0	5AB9580-040
TF200M250	200/250*	111.0	5AB9581-010
TF200M315	200/315*	111.0	5AB9581-020
TKF250	250	111.0	5AB9590-010
TKF315	315	111.0	5AB9590-020
TKF315M355	315/355*	111.0	5AB9591-010
TMF355	355	111.0	5AB9603-020
TMF400	400	111.0	5AB9603-030
TMF400M450	400/450*	111.0	5AB9604-010

^{*} Motor Start

Type
TM,
TTM,
TKM
& TLT
Bolt-In HRC Fuse Links

80kA 660V AC 40kA 350-460V DC



Туре	Rating Amp.	Central G-Centre (mm)	Part No.
TM355	355	133.0	5AB9600-020
TM400	400	133.0	5AB9600-030
TM400M450	400/450*	133.0	5AB9601-010
TTM450	450	133.0	5AB9610-010
TTM500	500	133.0	5AB9610-020
TTM560	560	133.0	5AB9610-030
TTM630	630	133.0	5AB9610-040
TLM670	670	133.0	5AB9620-040
TLM710	710	133.0	5AB9620-050
TLM750	750	133.0	5AB9620-060
TLM800	800	133.0	5AB9620-070
TLT670	670	165.0	5AB9622-040
TLT710	710	165.0	5AB9622-050
TLT750	750	165.0	5AB9622-060
TLT800	800	165.0	5AB9622-070

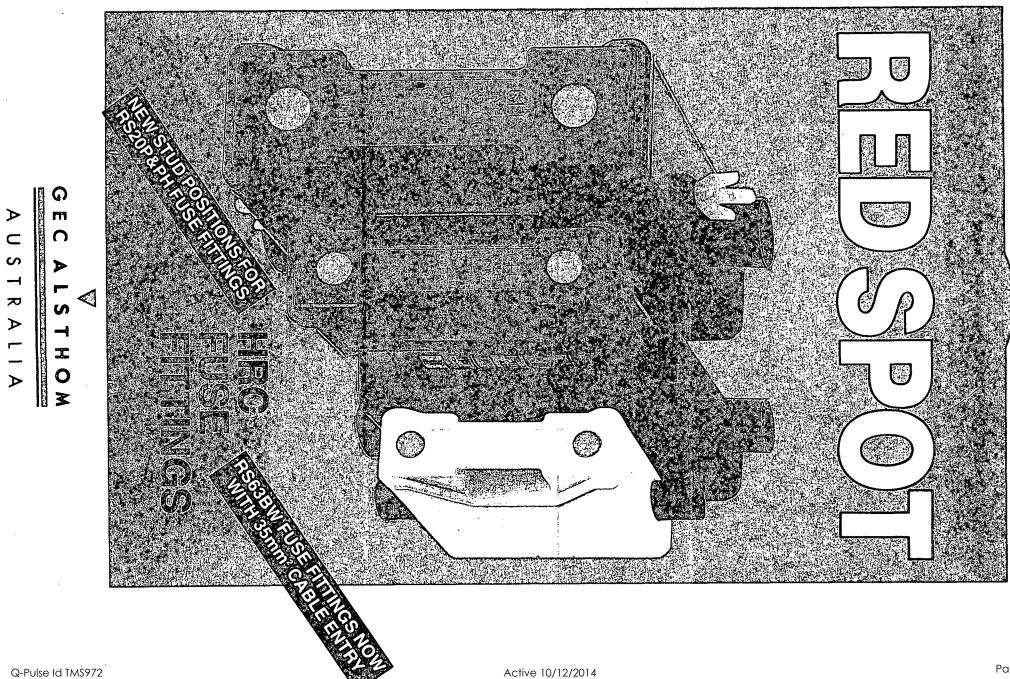
^{*} Motor Start

♥ GEC ALSTHOM

Industrial Products Division, GEC ALSTHOM Australia Limited

25 Princes Road, Regents Park 2143 • PO Box 22 Regents Park NSW 2143 • Telephone (02) 645 0777 • Fax (02) 645 1608
BRISBANE (07) 268 4344 MELBOURNE (03) 544 8344 PERTH (09) 277 4844 ADELAIDE (08) 346 5411 HOBART (002) 34 5133 NEWCASTLE (049) 61 1224

PSP0035



 \subset

Fuse fittings to AS2005.21.2 – 1990 BS88: Part 2: 1988 660 volts A.C./D.C. Approved by leading Authorities and used in equipment approved by Lloyds.

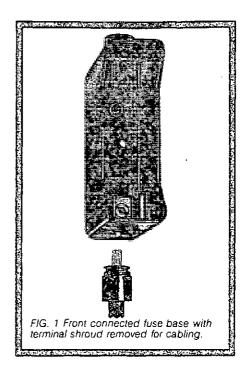
SAFETY FEATURES

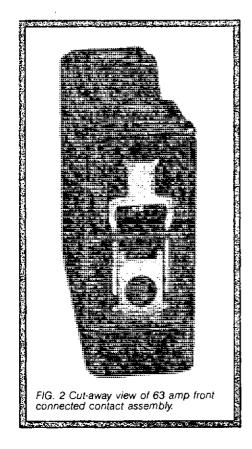
Full Shrouding for personnel safety and complete compliance with the direct contact electric shock.

Insulating sleeves are fitted to front connected fuse bases to provide increased protection at the cable entry point.

Separate base contact insulating shrouds of great strength and flexibility ensure that no 'live' metal is dangerously exposed when the fuse carrier is removed – this enables an outgoing circuit to be cabled with complete safety to personnel and with continuity of supply to other circuits.

Anti-vibration features protect against release of a fuse-carrier due to vibration in service. In the 400 amp size this includes a safety catch which automatically locks on the insertion of the fuse carrier.





RED SPOT SPECIAL FEATURES

20, 32, 63 & 100 amp fuse fittings

Perfect alignment of contacts with single-screw fixing achieved by registration on facets in moulding.

Large contact area and anti-vibration feature incorporated in brass contacts of accurate dimensions.

Tapered shank of fuse link fixing screw ensures easy re-entry.

Safety shroud (cut-away to show base contact) made from moulded red nylon of great strength and flexibility.

Patented non-twist cable clamping screw of large diameter.

Lasting contact pressure ensured by backing stirrups which are located by the shape of the base contact and the moulding.

Carrier and base moulded from flame retardant, non-hygroscopic phenolic.

2

RED SPOT

200 & 400 amp fuse fittings

High quality mouldings, safety shrouds and precision made copper contacts ensure reliable operation.

Additional special features

Through grip handle for maximum control.

Silver plated contacts with generous cross section.

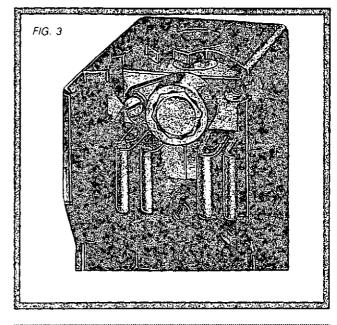
Guides to ensure parallel action on insertion or withdrawal of fuse carrier.

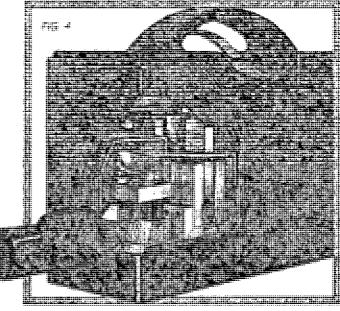
Patented non-twist cable clamping screws of large diameter on the 200 amp and cable clamping plate on the 400 amp fuse holders prevent damage to cables.

Terminal screw locking device, incorporating the principle used in the twelve sided spanner, can be fitted to the hexagon head of the terminal screw, whatever its position when fully tightened, by using one of the two positions provided for locating the captive screw (arrowed in FIG. 3)

FIG. 3 Front connected 200 amp RED SPOT luse base with shroud removed and with moulding partly cut-away to show silver-plated base contact and terminal screw locking device.

FIG. 4 Front connected 400 amp RED SPOT luse litting with moulding partly cut-away to show silver-plated contact, red nylon shroud and cable clamping device.





LIST NUMBERS

for ordering purposes

Standard Colours: Black & White (RS20 - RS100)

Rating		Alte	ernative type of conr	nection	
amp	FAONT	BACK	FRONT/BACK	BACK WIRED	PAD-LOCKABLE INSERTS
20	R\$20H*	R\$20P	RS20PH	R\$20BW	R\$20LOCK
32	RS32H	R\$32P	RS32PH	RS32BW	R\$32LOCK
63	RS63H	RS63P	RS63PH	RS63BW#	RS63LOCK
100	RS100H†	RS100P	RS100PH	RS100BW	RS100LOCK
200	RS200H	R\$200P	RS200PH		
400	RS400H	RS400P	RS400PH	İ	

Illustrations & dimensions shown on pages 5, 6, 7 & 8

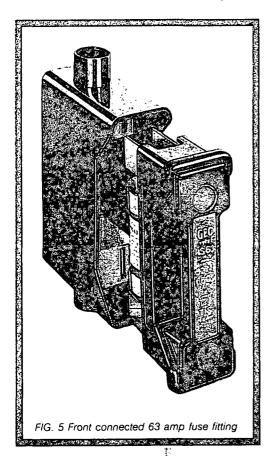
Also available with front & back wire cable terminals

LAPPEROATION.DATA

Fuse fitting	Type 'T' to E	3S.88:Part 2 05.21.2	Extended range of Type 'T' to BS.88:Part 2: & AS2005.21.2 for motor circuit protection. (660 volts a.c.)							
rating	a A320	05.21.2	LIST	No.	Current rating	Rating for				
amp	550/660V	440V AC	550/660V	440V AC	amp	motor starting amp				
20	NIT2-20A		NIT20M25		20	25				
	(550 volts a.c.)		NIT20M32 (415 volts a.c.)		20	32				
32	TIA2-32A	TIA2L-32L	TIA32M35	TIA32M35L	32	35				
			TIA32M40	TIA32M40L	32	40				
			TIA32M50	TIA32M50L	32	50				
			TIA32M63	TIA32M63L	32	63				
63	TIA2-32A	TIA2L-32L	TIS63M80	TIS63M80L	63	80				
	TIS35-63A	TIS35L-63L	TIS63M100	TIS63M100L	63	100				
100	TIA2-32A†	TIA2L-32L†	TCP100M125		100	125				
	TIS35-63A†	TIS35L-63L†	TCP100M160		100	160				
	TCP80 &100A	TCP80L&100L	TCP100M200		100	200				
200	TBC2-63A									
	TC80 & 100A	TC80L & 100L	TF200M250		200	250				
	TF125-200A		TF200M315*		200	315				
400	TBC2-63A# TC80&100#	TC80L &100L#	TM400M450		400	450				
	TF125-200#	10002 01002								
	TKF250&315#									
	TKM250&315A									
	TM355&400A			j						

† Adaptor plate required Type 'A' 5BB9306-010 # Adaptor plate required Type 'B' 5BB9307-010

Note; For full details on Type 'T' fuse links, including D.C. performance, please refer to Publication IEF/401 or PSP0000.



METHOD OF CABLING

Front connected fuse fittings

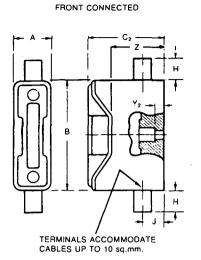
- 1) Remove red nylon insulating shroud to release cable sleeve.
- 2) Remove cable sleeve.
- 3) Fit cable sleeve over cable.
- 4) Fit conductor into fuse base terminal and tighten cable clamping screw to secure. If flexible cables are used, their relatively fine strands may be given increased protection by the use of thin wall copper ferrules over the conductor ends. The following should be taken into account:
 - a) The inside diameter of the thin wall copper ferrule should match that of the bared conductor end as closely as possible.
 - b) The length of the thin wall copper ferrule should match that of the tunnel in the fuse base terminal.
 - c) The wall thickness of the ferrule should be thin enough for the ferrule to be compressed by the tightening of the cable clamping screw. The flexible conductors will then be consolidated within the deformed ferrule.
- 5) Replace red nylon shroud taking care that it holds the cable sleeve in position by locating the shroud in the groove provided in the sleeves.

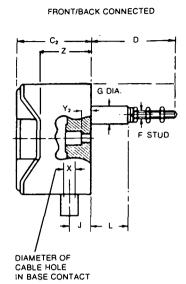
RS100 H-S (COUNCIL SEALABLE)

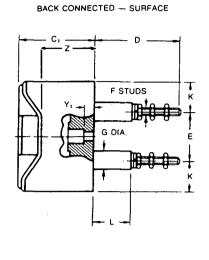
6) Fit nylon screw through the red nylon shroud with the heads of the screws against the shrouds. Fasten the wingnuts on to the fuse fitting base.

DIMENSIONS FREE

20 amp RED SPOT Fuse Fittings

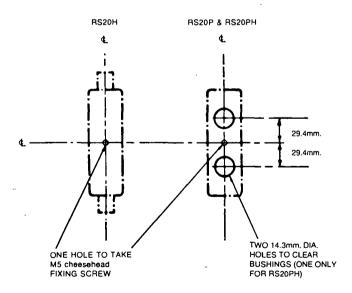






	Α	В	C ₁	C ₂	D	E	F	G	Н	J	К	L	Х	Υ	Y ₂	Z
mm	27.0	79.0	54.0	55.0	63	58.8	М6	13.5	15.0	16	10.10	29	6.0	5.6	6.6	37

PANEL DRILLING DIMENSIONS Viewed From Front Of Panel



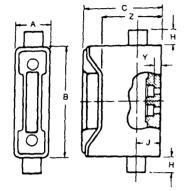
5

4

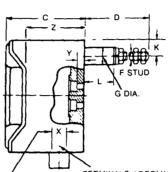


32, 63 & 100 amp RED SPOT Fuse Fittings





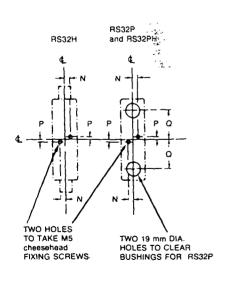
FRONT/BACK CONNECTED

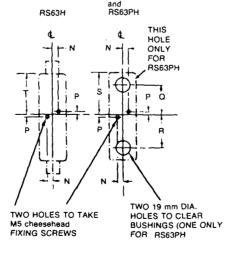


C Z D K F STUD G DIA.	C Z D K K K K K K K K K K K K K K K K K K
TERMINALS ACCOMMODATE	CABLES UP TO:-
Diameter of 16 sq.mm. 32 amp.	
cable hole in 50 sq.mm. 63 amp.	
pase contact 70 sq.mm. 100 amp.	

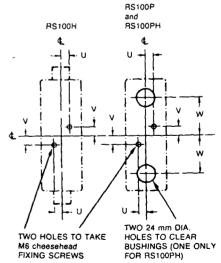
Rating amp		Α	В	С	D	E	F	G	н	J	к	L	x	Y	z
32	mm	32	103	70	81.0	73	M6	17.5	15	22	15	29	6.2	5.6	49
63	mm	· 35·	110	75	84.0	78	M8	17.5	15	24	16	29	9.5	5.6	54
100	mm	51,	140	100	87	94	M10	22	15	28	23	32	12.7	7.2	74

PANEL DRILLING DIMENSIONS Viewed From Front Of Panel





RS63P

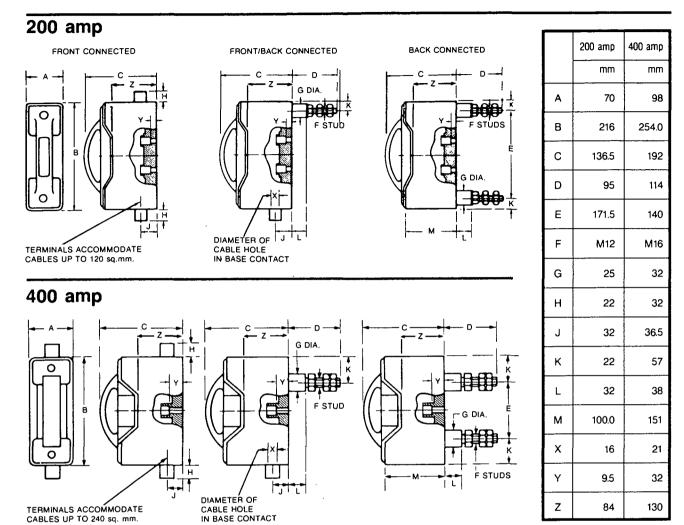


BACK CONNECTED

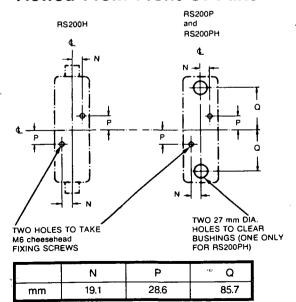
	N	Р	Q	R	S	T	U	٧	w
mm	6.4	3.2	36.5	41.3	52.4	51.6	9.5	,11.1	46.8

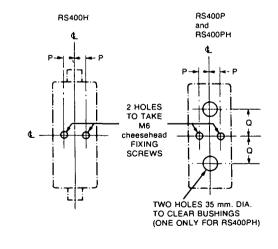


RED SPOT Fuse Fittings



PANEL DRILLING DIMENSIONS Viewed From Front Of Panel

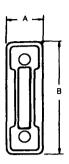


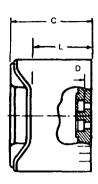


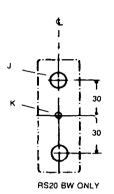
	'	u .
mm	27.0	69.9

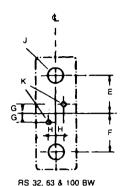
Elme nesson services

RED SPOT H.R.C. Fuse Fittings BACK WIRED PANEL MOUNTED









			_			All dimen	sions in r	nillimetre	S				
TYPE	Rating Amp	Α	В	С	D	E	F	G	Н	J DIA	К	L	Max. Cable Size mm²
RS20BW	20	27	80	54	6	30	30	-	-	8	To suit M5	37	10
RS32BW	32	32	103	70	6	40	40	3,2	6,4	8	M5	49	16
RS63BW	63	35	110	75	6	40	46	3,2	6,4	8	M5	54	35
RS100BW	100	51	140	100	7	50	50	11	9,5	16	M6	74	50

SUGGESTED SPECIFICATION

All fuse fittings are to be rated 660 Volts and accept bolt-in type HRC fuse links. They are required to be fully shrouded, cable ferrules for front entry type should be supplied as standard.

The design shall be such that when removing or replacing a fuse carrier, it shall not be possible to touch the top contact (line) when the bottom contact (load) is inserted into the base and therefore alive.

Fuse fittings are to be from a range having 20A, 32A, 63A, 100A, 200A and 400A rated fittings.

Associated HRC fuse links shall be rated at 80kA 440/550/660VAC and be ASTA 20 certified.

Fuse fittings are to be Red Spot type, or equivalent. HRC fuse link shall be either GEC or English Electric Type T or equivalent.



AUSTRALIA

GEC ALSTHOM Australia Limited, Industrial Products Division A.C.N. 000 215 092

25 Princes Road, Regents Park NSW 2143. • P.O. Box 22 Regents Park NSW 2143. • Telex 20729 • Telephone (02) 645 0777. • Fax (02) 645 1608

SYDNEY (02) 645 0777

BRISBANE (07) 268 4344 MELBOURNE (03) 544 8344 PERTH (09) 277 4844

ADELAIDE (08) 346 5411 HOBART (002) 34 5133 NEWCASTLE (049) 61 1224

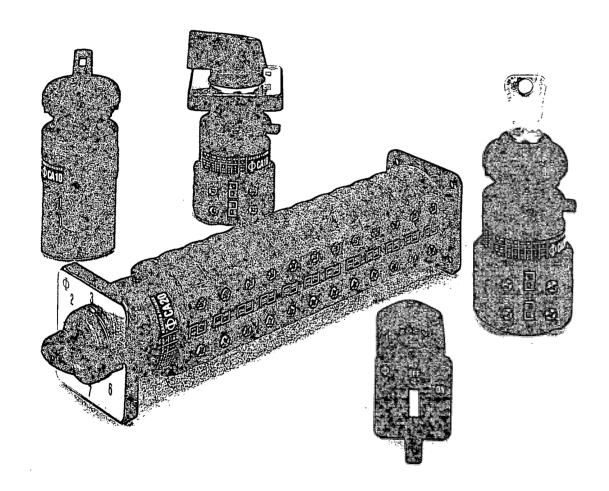
PSP0014A5K0894

KRAUS & NAIMER BLUE LINE SWITCHGEAR

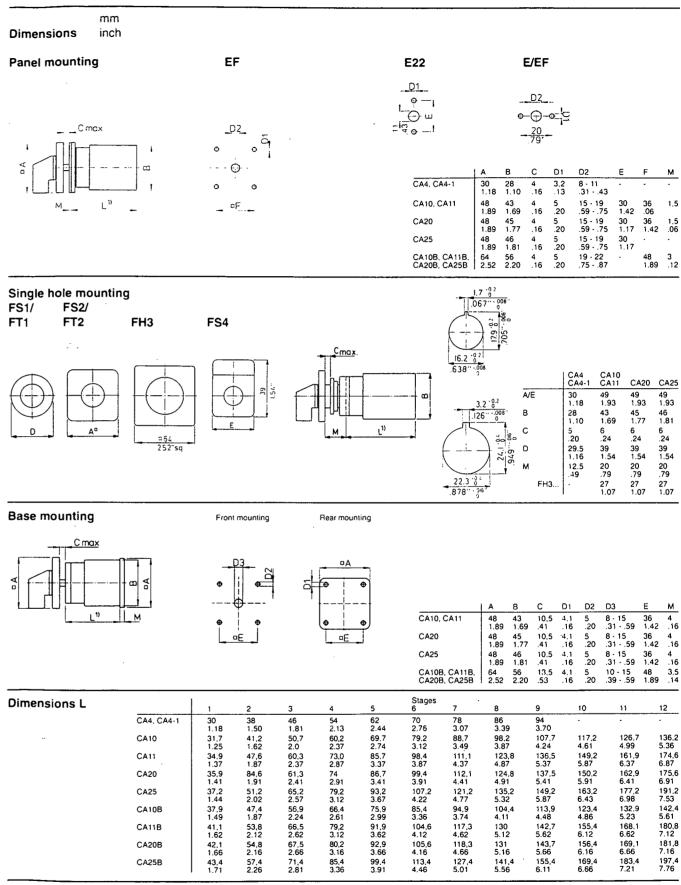


Switch Types CA4, CA4-1, CA10, CA11, CA20, CA25 CA10B, CA11B, CA20B, CA25B





- compact design with the smallest escutcheon plate size of 30 x 30 mm (1.181" x 1.181")
- finger-proof according to VDE 0106 part 100 and VBG 4
- open terminals which are accessible from both sides
- captive plus-minus screws and screwdriver guide
- high switching capacity
- contacts with gold plating (switch types CA4 and CA4-1)



australian solenoid co. pty. ltd.

379 Liverpool Road, ASHFIELD, N.S.W. 2131 P. O. Box 1093, ASHFIELD, N.S.W. 1800 Tel: (02) 9797-7333 Fax: (02) 9797-0092



P0A A126 GB

K 11.99

Page 417 of 441

Construction Data

The terminals of the CA-series cam switches are accessible from both sides. This is an advantage in cases where the switch is prewired for installation or in cases where the terminal wiring cannot be done in the sequence of the stage. The compact design, the excellent switching capabilities under AC-15, AC-3 resp. AC-23A and the obviously unlimited number of switch developments are characteristic for the CA switches and exceed the requirements of IEC 60947-3 and VDE 0660 part 107.

CA switches of this series are supplied with open terminals and protected against accidental finger contact in accordance with VDE 0106 part 100 (VBG 4). Captive plusminus terminal screws and integrated screwdriver guides facilitate wiring.

The CA4 and CA4-1 switches offer maximum space saving benefits. A CA4 or a CA4-1 switch in E mounting 1 stage long and 2 contacts fits into 30 x 30 mm cubicle. The additional length of any further stage is 8 mm. CA4 and CA4-1 contacts are supplied standard with gold plating (CA4 = 1 μ , CA4-1 = 35 μ).

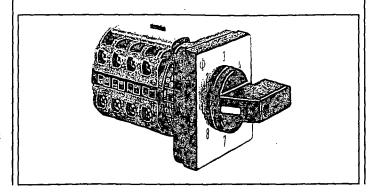
Single hole mounting according to EN 50007 with protection IP 65 is suitable for either 16/22 mm (CA4, CA4-1) or 22 mm (CA10-CA25B) diameter holes and is available with key operator, if required.

Switching angle of CA switches may be 30°, 45°, 60° or 90°. Switch types CA4 and CA4-1 are available with up to 18 contacts. CA10-CA25B switches are available with up to 24 contacts.

A wide range of optional extras and enclosures is available.

Your order should include the following data:

- 1. Switch type (selection according to the following tables)
- Switching program (order a prescribed form for special programs)
- 3. Mounting type
- 4. Escutcheon plate and handle
- 5. Optional extras



Switch	Types				CA4 CA4-1	CA10 CA10B	CA11 CA11B	CA20 CA20B	CA25 CA25B
Rated In:	sulation Voltage U _i	IEC 60947-31), VDE 0660 part SEV ³⁾ UL/Canada CEE/NEMKO		3 ¹⁾ V V V V	440 380 300 400/380	690 660 300 400	690 660 600 400	690 660 600 400	690 690 300
Rated Im	pulse Withstand Voltage U _{in}	np		kV	4	6	6	6	6
Rated Th	nermal Current l _u /l _{th}	IEC 60947-3, IVDE 0660 par SEV ³⁾ UL/Canada		V A	10 10 10/-	20 20 16/12 20 ⁴⁾	20 20 16/12 20 ⁴⁾	25 32 25/25 30	32 32 32/32 30
Rated Op AC-21A	perational Current I, Switching of resistive loads including moderate overloads	IEC 60947-3, E VDE 0660 par		А	10	20	20	25	32
AC-1	Resistive or low inductive loads	SEV ³⁾	380 660	h	10	16 12	16 12	25 20	32 32
AC-15	Switching of control devices, contactors, valves etc.	IEC 60947-3, E VDE 0660 part 107	EN 60947-3 220 V-240 380 V-440	V A	2,5 1,5	5 4	5 4	8 5	12 6
Pilot Duty	1	UL/Canada ³⁾	Hea	vy VAC	300	300	600	600	300
Ampere Rating	Resistive or low inductive loads	UL/Canada ³⁾		A	10	204)	204)	30	30
Resistive	loads/Motor load	CEE NEMKO		A	4/2 6/4 ²⁾	10/6 10/6	10/6	16/10 20/10	-
Max. fuse	rcuit Protection e size ort-time withstand current	(gL-characteris (1s-current)	stic)	A A	10 60	25 140	25 140	35 280	35 480
Rated Ut	ilization Category	IEC 60947-3, 8 VDE 0660 part							
AC-3	Direct-on-line starting, star-delta starting	3 phase 3 pole	220 V-240 380 V-440 500 660 V-690) V kW	1,5 2,2 - -	3 5,5 5,5 5,5	3 5,5 5,5 5,5	4 7,5 7,5 7,5	5,5 11 11 11
AC-23A	Frequent switching of	1 phase 2 pole 3 phase	110 220 V-240 380 V-440 220 V-240	V V V V	0,3 0,55 0,75 1,8	0,6 2,2 3 3,7	0,6 2,2 3 3,7	1,5 3 3,7 5,5	2,2 4 5,5 7,5
7.0 207.	motors or other high inductive loads	3 pole	380 V-440 500 660 V-690) V kW) V) V	3 - -	7,5 7,5 7,5	7,5 7,5 7,5	11 11 11	15 15 15
		1 phase 2 pole	110 220 V-240 380 V-440) V kW	0,37 0,75 1,1	0,75 2,5 3,7	0,75 2,5 3,7	1,5 3 5,5	2,2 4 7,5
Ratings		UL/Canada							
	Standard motor load DOL-Rating (similar AC-3)	3 phase 3 pole	120 240 480 600	V HP	0,75 1 -	1,5 3 -	1,5 3 5 5	3 7,5 10 10	5 10 -
		1 phase 2 pole	120 240 277 480 600	V V HP	0,33 0,75 0,75 -	0,5 1 2	0,5 1 2 2 2	1,5 3 3 5 5	2 5 5
Max. Per	missible Wire Gage single-core or stranded wire			mm² AWG	2x 1,5 14	2x 2,5 12	2x 2,5 12	2x 4 10	2x 6 8
	flexible wire (sleeving in accordance with	DIN 46228)		mm²	2x 1,5 (-)	2x 2,5 (2,5) 14	2x 2,5 (2,5)	2x 4 (2,5) 12	2x 4 : (4) 10

Essential Mounting	<u> </u>	For	
250011111111111111111111111111111111111	Code	type	
			Panel mounting
	E	CA4	two hole p/m
	EF	CA4-1	two hole p/m
			Protection IP 65
		<u> </u>	Single hole mounting combined with 16 and
			22 mm Protection IP 65
TA Comment	FS1	}	w/o escutcheon plate
	FC0	644	with constable an alate
	FS2	CA4 CA4-1	with escutcheon plate 30 x 30 mm
1000			
	FS4		with escutcheon plate
		CA10	Panel mounting
		CA11 CA20	Protection IP 65
	E22	CA25	two hole p/m
		CA10 CA11	
	EF	CA20 CA25	four hole p/m
		CA10B CA11B	·
·		CA20B CA25B	
		0,1200	Single hole mounting
			22 mm Protection IP 65
	FT1		w/o escutcheon plate
			, and the second
Sa San	FT2	CA10 CA11	with escutcheon plate
		CA20 CA25	48 x 48
	1		1
	FH3	}	with escutcheon plate
			64 x 64 mm
		}	
		CA10	Base mounting
		CA11 CA20	Protection IP 40
	VE	CA25 CA10B	four hole p/m
		CA11B CA20B	
		CA25B	

¹⁾ Valid for lines with grounded common neutral termination, overvoltage category III, pollution degree 3. Values for other supply systems on request. 2) Valid for CA4 only. 3) International Standards and Approvals, refer to Catalog 100, page 39. 4) Canada max. 16 A.

sprecher+ schuh The ultimate in technology

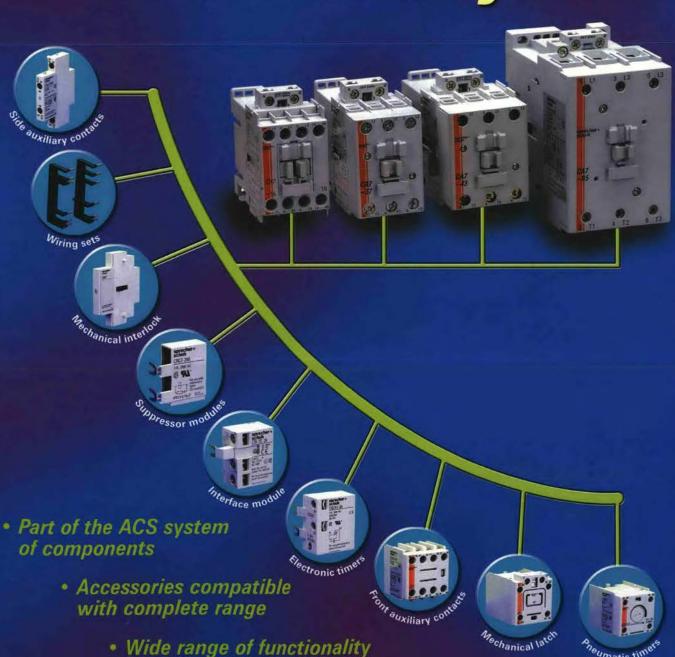




CA 7 Contactors han just a contactor

More than just a contactor...

It's a contactor System.



NHF

ELECTRICAL ENGINEERING PRODUCTS PTY LTD

A.B.N. 84 004 304 812 Page 419 of 441





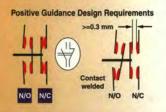


Contactors ... features ahead of its time!





Dual power terminals assure hassle-free wiring in complex control schemes



Reversible coils ... Total flexibility

Contactors usually have fixed coil connections. CA 7 contactors however, offer reversible coils giving the user the option of either top or bottom mounted coil terminals. This is particularly useful in providing more convenient access to coil

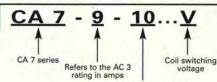
The appropriate coil configuration can be ordered already fitted or simply modified on site.

Dual power terminals

CA 7-30 through to CA 7-85 are designed with two power terminals for each pole. This simplifies power wiring of interconnected contactors in reversing, reduced voltage and two speed applications. Simplified wiring results in less labour/downtime and reduced cost.

An extensive range of accessories common to all frame sizes is available: auxiliary contact blocks, timing elements, mechanical latch, interface module mechanical interlock and suppressor modules. A common mechanical interlock enables two CA 7 contactors of different physical size to be interlocked, making it ideal for applications such as multi-speed starters.

Sample of the Cat. No. when ordering:



This is the auxiliary contact configuration 10 = 1 N/O, 01 = 1 N/C

C	A	7-16
45	mm	wide
		16 A







CA 7-43 54 mm wide 43 A



CA 7-85 72 mm wide 60 A, 72 A, 85 A





AC 3 kW	AC 3 Amps	AC 1 40 °C	AC 1 60 °C	Aux. Co N/O	ontacts N/C	Maximum Aux. Contacts	Cat. No. 1) 2) 3) 4)
4	9	32	32	1	0	9	CA 7-9-10V
				0	1	9	CA 7-9-01V
5.5	12	32	32	1	0	9	CA 7-12-10V
				0	1	9	CA 7-12-01V
7.5	16	32	32	1	0	9	CA 7-16-10V
				0	1	9	CA 7-16-01V
11	23	32	32	1	0	9	CA 7-23-10V
				0	1	9	CA 7-23-01V
15	30	50	45	0	0	8	CA 7-30-00V
18.5	37	50	45	0	0	8	CA 7-37-00V
22	43	85	63	0	0	8	CA 7-43-00V
30	60	100	100	0	0	8	CA 7-60-00V
37	72	100	100	0	0	8	CA 7-72-00V
45	85	100	100	0	0	8	CA 7-85-00V

1) Add control voltage

2) Also available in DC control eg. (CA 7-9C-10...V)

3) Available in 4 pole version eg. (CA 7-9M40...V)

4) 4 pole DC version available on indent only



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FLYER CA7-F Q-Pulse Id TMS972



P20A July 1994

TemBreak

Total Protection, Complete Control



ELECTRICAL ENGINEERING PRODUCTS PTY LTD

Q-Pulse Id TMS972

Active 10/12/2014

A.C.N. 004 304 812.



emBreak Total Protection, Complete Control

TemBreak incorporates a series of microprocessor based MCCBs that represents a major evolution in low-voltage distribution systems. They were engineered to meet the requirements of the fast developing information-oriented society. Each model is designed to serve a key point in the system. Providing refined characteristics, incorporating true r.m.s. detection and ensuring the reliability necessary for the efficient functioning of the system.

TemBreak's features are designed to match the needs of the 90's

- Meets Worldwide Users Requirements
- Electronic Type TemBreak
- Achieves a Higher Degree of Protection Co-ordination
- Adjustable Rated Current
- World Wide Standards
- Operation Unaffected by Harmonics
 Highest Degree of Protection

- Adjustable Long and Short Timedelay Trips
- Expanded Protective Functions
- Improved Breaking Performance
- Spacesaving
- Fast Break Mechanism
- Advanced Breaking Technology

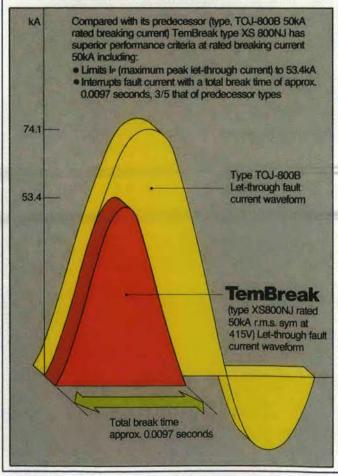
Contents:	Fast Break Mechanism	Page	2
	Advanced Technology	Page	4
	Correspondence TemBreak - Existing Breakers	Page	6
	Precise Protection Co-ordination	Page	8
	OCR Checker	Page	12

Fast Break Mechanism (FBM)

EXCEPTIONAL CURRENT LIMITING QUICK-BREAKING PERFORMANCE

TERASAKI's ingenuity on current breaking is reflected in the new Fast Break Mechanism (FBM) of the TemBreak series. Achieving high-speed, highly-efficient breaking. Its outstanding features include: U-shaped conductors, Dual Repulsive Contacts and Quick-break Arc Chutes (To quickly quench and extinguish ionized arcing gases) The Current Limiting, Quick-Breaking Performance of TemBreak provides exceptional current-limiting characteristics that have not been possible with existing moulded case circuit breakers. The current-limiting characteristics of TemBreak products, up to 800A frame, are outstanding.

REMARKABLE CURRENT — LIMITING FEATURE

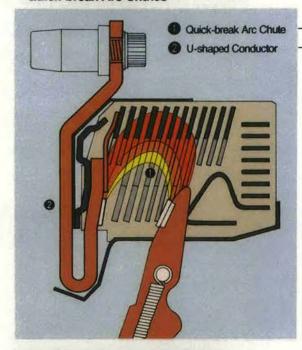


HIGH SPEED, HIGHLY-EFFICIENT BREAKING ACHIEVED!!

U-shaped Conductors

Dual Repulsive Contacts

Quick-break Arc Chutes

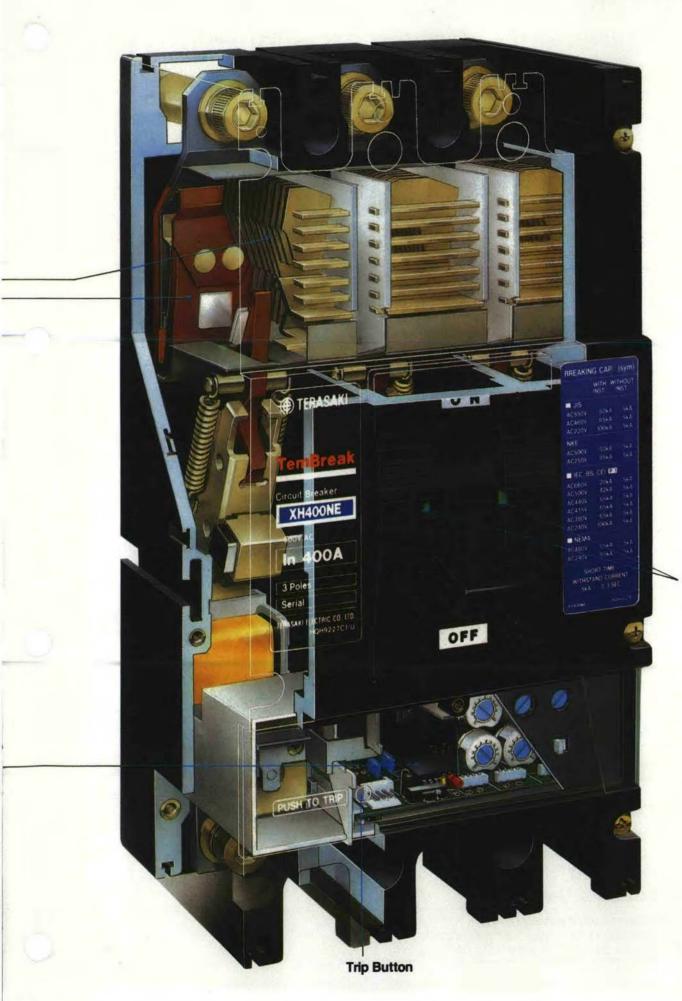




MULTI-PROTECTIVE FUNCTIONS!!
By 8-Bit CPU

Terasaki's 28 years of achievements in the field of electronic technology is "second to none". In particular, its microcomputer application engineering has a "first class record" of supplying computer systems, of high, cost-performance to a variety of industrial plants over the past 10 years.



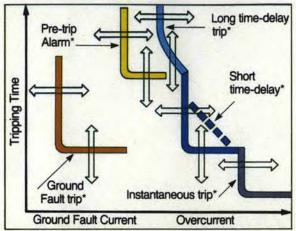


Contact Status Indicator

XH400NE

TemBreak contains advanced technology for precise protection co-ordination, anticipating the requirements of commercial buildings and automated factories.

Multiple Protective Functions Incorporating A Wide Range of Pick-Up Current and Time-delay Settings



*Adjustable

TemBreak Meets All Major Standards

Based Standards

IEC PUB 157-1 Part 1/International Electrotechnical Commission

AS 2184/Australian Standard

BS 4752 Part 1/British Standard

VDE 0660/Verband Deutscher Elektrotechniker

CEI 17.5/Comitato Electrotecnico Italiano

NEMA AB-1/National Electrical Manufacturers Association

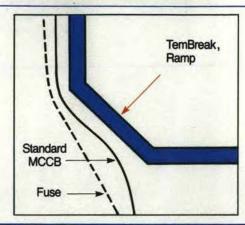
JIS C8 370/Japanese Industrial Standards

TemBreak's Adjustable Rated Current Type (Meets IEC Standards) And Is Available In A Wide Range For Plant Applications

Plug in Mounting Blocks, for Switchboard Use

Note: The degree of protection provided by the mounting blocks for plug-in type TemBreak breakers (for Switchboard use) is IP-20, as defined in IEC Pub, 529.

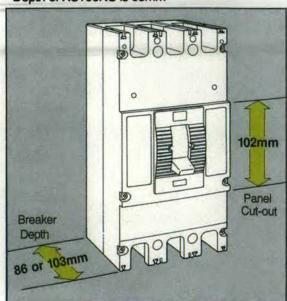
Protective Characteristics
Are Readily Co-ordinated
With Those of ThermalMagnetic MCCBs and
Fuses. (The adjustable short
time-delay trip has a ramp in
its characteristic curve)



Unified Dimensions Simplifies Distribution Board Design

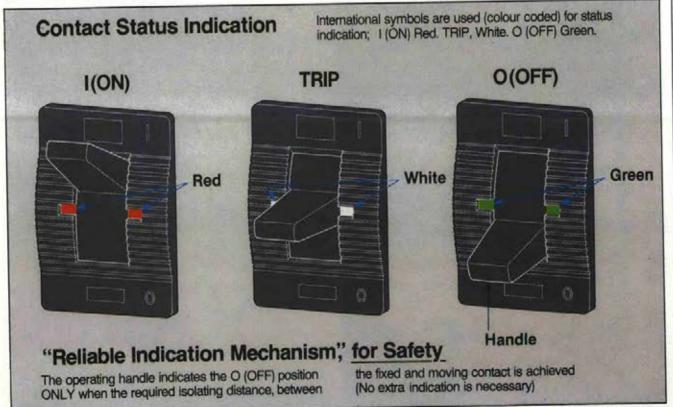
TemBreak includes frame sizes up to 800A which are the most frequently used in distribution boards. Unified dimensions include:

Two depth sizes and one panel cut-out height *Depth of XS100NS is 68mm









TemBreak

A new generation of MCCBs procuring a major evolution in low voltage distribution systems. Each model provides refined characteristics, incorporating true r.m.s. detection and ensuring the reliability necessary for the efficient functioning of a system.

- ☆ UNAFFECTED BY HARMONICS
- ☆ UNIFIED DIMENSIONS
- ☆ 3 and 4 POLE CONSTRUCTIONS



TemBreak series

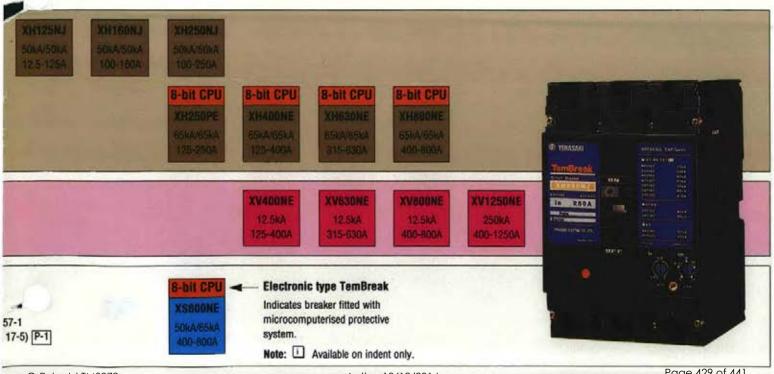
38 types



Page 428 of 441



100/125 160 225/250 400 600/630 800 1250 1600 2000 2500 XE100CS 5kA/5kA]15-100A XE400NS XEGOONS. XE100NS XE225NB 10kA/15kA 25kA/25kA 25kA/25kA 15kA/18kA 250-400A 500-600A 110-100A XE225NS XS400CJ X8630CJ BOKA/35kA 160-400A 250-630A XS160NJ XS250NJ XS400NJ XS630NJ XS800NJ 25kA/35kA 25kA/35kA 50kA/50kA 50kA/65kA 50kA/65kA 100-160A 160-400A 250-630A 500-800A 8-bit CPU 8-bit CPU B-bit CPU 8-bit CPU 8-bit CPU 8-bit CPU 8-bit CPU XS400NE XS630NE XSBOONE XS1250NE XS1600NE 50kA/65kA 35kA/190k/ 35kW100k/ 5kW100kA 125-400A 315-630A 400-800A 530-12504 800-1600A 000-2000 XS250PJ 100-250A



Precise Protection Co-ordination

TemBreak Profile (Electronic type)

Each electronic type TemBreak product is fitted with an electronic protective device using an 8-bit microprocessor, to provide full protective functions necessary for upgrading low-voltage distribution systems and for achieving the highest reliability in operation.

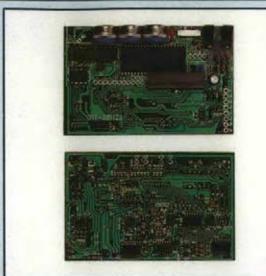
Operation Unaffected By Harmonics

Semiconductor controlled power equipment in a distribution system can be a source of harmonic currents, which can cause malfunctioning in other equipment within the system.

The TemBreak's electronic protective device is designed to detect, true r.m.s. value of the load current. Therefore, remaining unaffected by harmonics.

TemBreak's electronic protective device consists of a number of flat-package ICs, which are compactly mounted,

using high-density double-surface mounting, the most advanced surface mount technology.



Protective Characteristics of TemBreak (Electronic type)

The protective characteristics include:

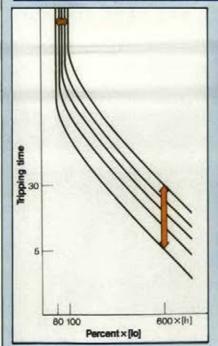
An adjustable long time-delay (For general industrial plants and for generator protection). An adjustable short time-delay trip (for co-ordination with existing solid-state trip and thermal magnetic trip breakers or fuses). An adjustable instantaneous

trip, an adjustable ground fault trip and an adjustable pre-trip alarm.

NOTE: The ground fault trip and pre-trip alarm can not be used simultaneously in a single breaker.

Adjustable long time-delay trip (LTD)

For general industrial applications





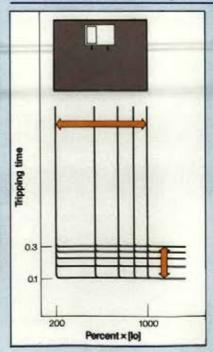
The pick-up current (I,) of from 80, 85, 90, 95 to 100% of the base current



The LTD time delay at 600% of the rated current (I₁) is adjustable from; 5, 10, 15, 20 to 30 secs

Adjustable short time-delay trip (STD)

For co-ordination with existing solid-state trip breakers





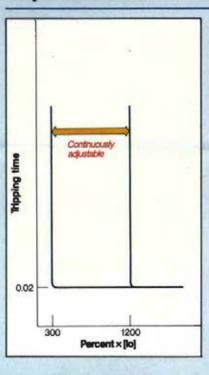
The STD pick-up current (l₂) is adjustable from; 200, 400, 600, 800 to 1000% of the rated current (lo).



The STD has a definite time-delay characteristic. This opening time is adjustable from; 100, 150, 200, 250 to 300 ms

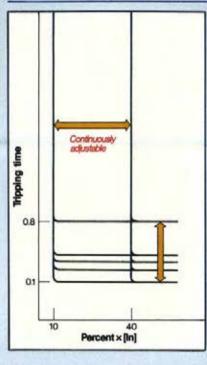


Adjustable instantaneous trip (INST) Adjustable ground fault trip (GFT)





The INST pick-up current [l₃] is continuously adjustable from 300% to 1200% of the rated current [lo]





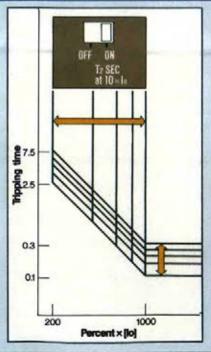
The GFT pick-up current [ls] is continuously adjustable from 10% to 40% of the rated current [In]



The GFT has a definite time-delay characteristic, its opening time is adjustable from; 100, 200, 300, 400 to 800ms

For co-ordination with thermal-magnetic trip breakers or fuses

Adjustable pre-trip alarm (PTA)

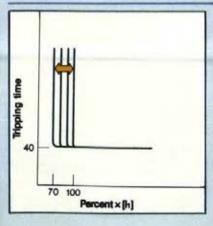




The STD pick-up current (l₂) is adjustable from 200, 400, 600, 800 to 1000% of the rated current [lo]



The STD has a time current characteristic of FT - constant' (ramp characteristic) for optimum co-ordination with conventional thermal-magnetic type moulded case circuit



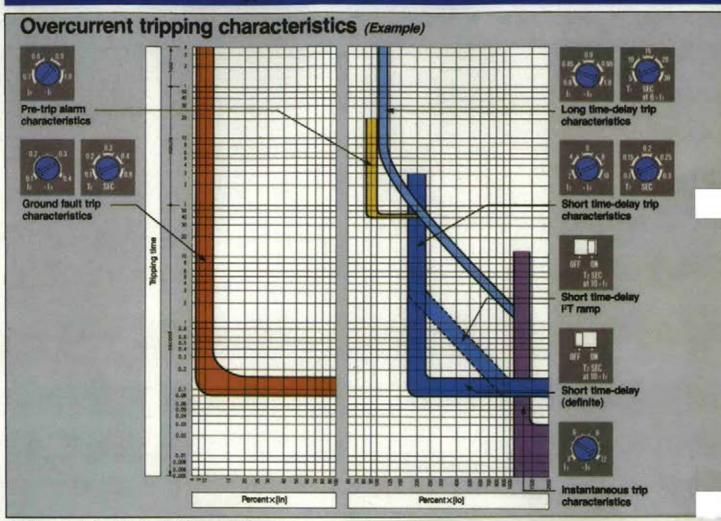


The PTA pick-up current (IP) is adjustable from 70, 80, 90 to 100% of the rated current (I,). The time-delay is 40 seconds fixed. (A separate power source is required)

breakers or fuses. It has a definite time-delay characteristic at current levels above 1000% of the rated current (lo)

Precise Protection Co-ordination

TemBreak, Electronic Type

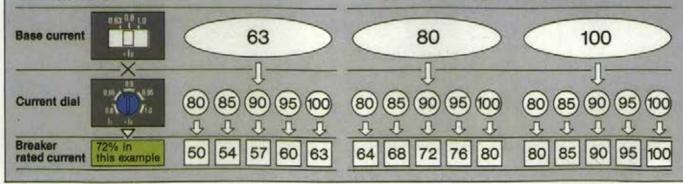


Adjustable Rated Current

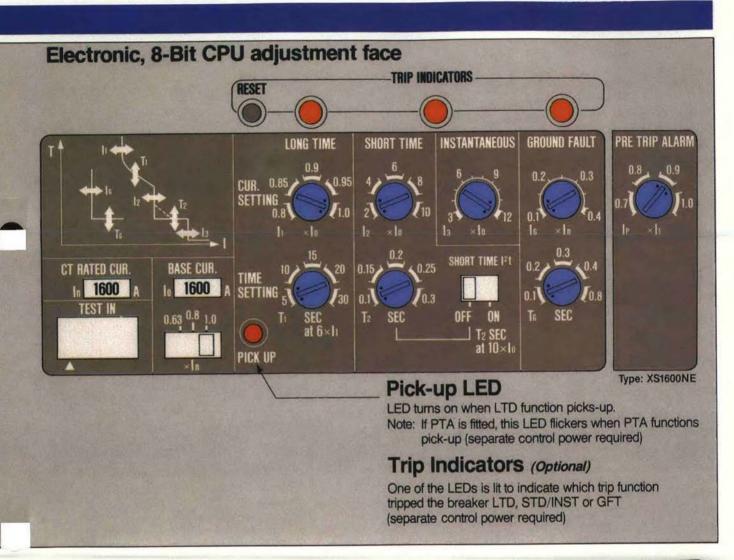
TemBreak (Electronic type)

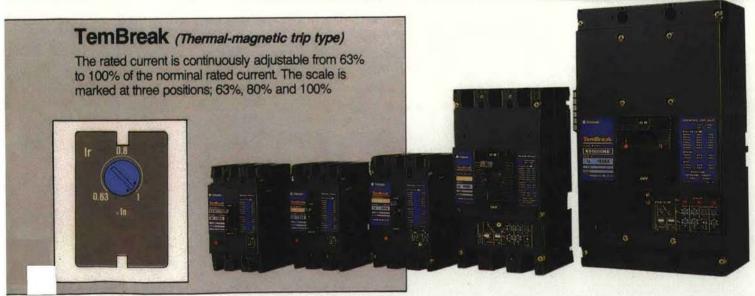
The rated current of the electronic type TemBreak is adjustable in 15 steps from 50% to 100% of the nominal rated current, using the base current [lo] select switch and the rated current [l₁] setting dial.

The rated current of a single breaker is adjustable in 15 steps from 50% to 100%. This is one of the essential features for precise protection co-ordination and for upgrading low-voltage distribution systems.

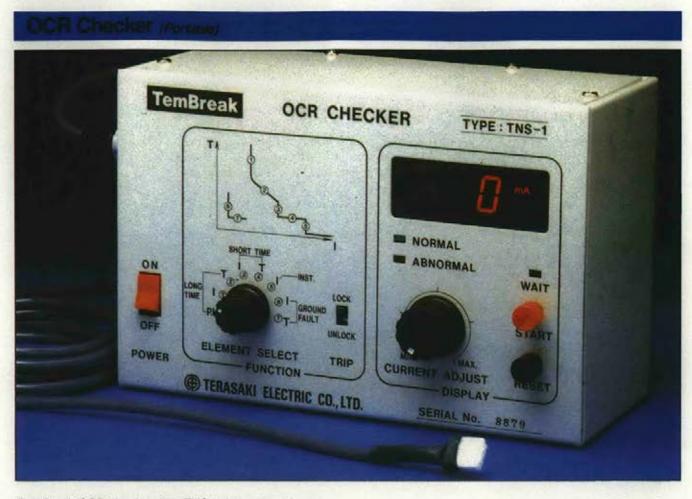








TemBreak

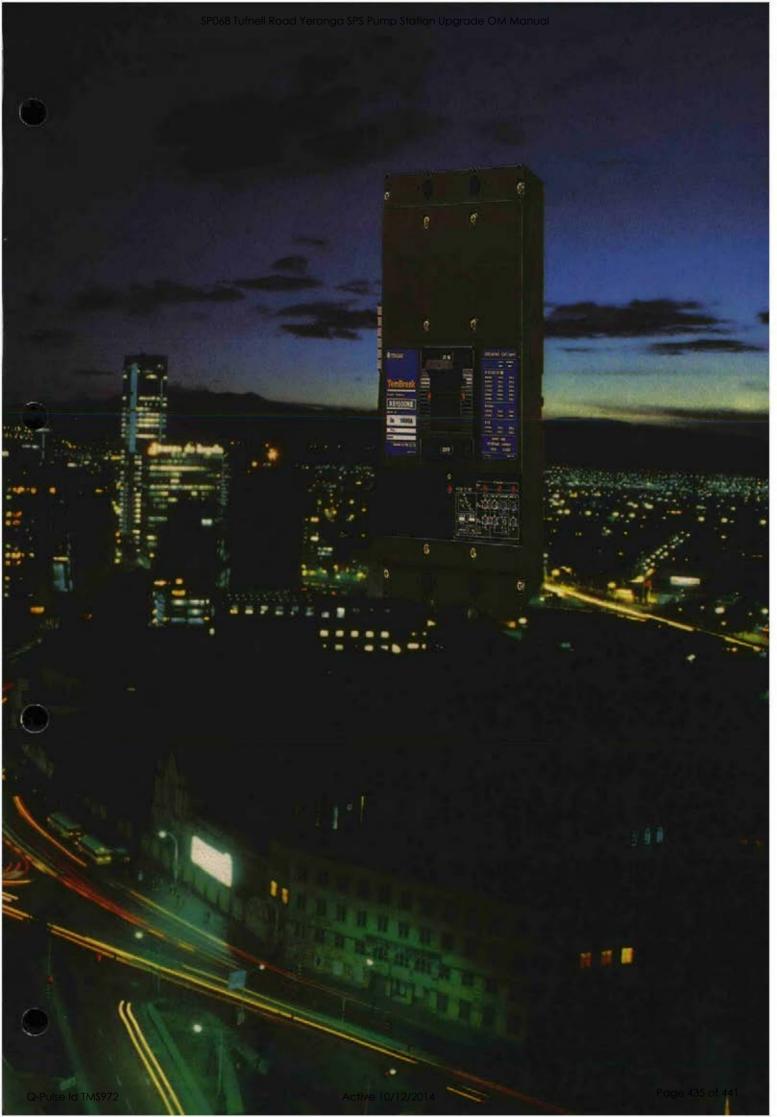


TemBreak OCR checker, type TNS-1, is an easy-to-use instrument for field testing the trip functions of the electronic type TemBreak circuit breakers.

It checks the pick-up current and tripping time values of the functions (LTD, STD, INST and GFT)

The values are indicated digitally on a 3-digit LED display

Power Source 100-110VAC or 220-240VAC, single phase, 50/60Hz 30VA Dimensions: 200mm(W) x 84mm (H) x 130mm (D)



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