



**QUEENSLAND URBAN UTILITIES
LOWOOD SEWAGE TREATMENT PLANT
Auxiliary Chemical Dosing System**

**Operation and
Maintenance Manual**
(Including Electrical Drawings)



AQUATEC MAXCON



Aquatec Maxcon Reference Number: 8848

1. Operation & Maintenance Manual

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1 INTRODUCTION

The (existing) Lowood Sewage Treatment Plant (STP) has a rated design capacity of 1200 EP with an Average Dry Weather Flow (ADWF) of 270 m³ /day. The treated effluent is either discharged to the Brisbane River or further treated via a pressure filter to provide recycling water for the local community.

While the STP has generally performed within its release limits, the plant has failed on a number of occasions to meet effluent discharge requirements (especially SS and BOD5) set by the Development Approval ENDC00464406 under the Environmental Protection Act 1994 Section 621 (4).

To improve effluent quality – and meet discharge quality requirements – the (previous) pressure filter has been replaced to treat all effluent; prior to discharge into the Brisbane River.

Aquatec Maxcon has been engaged by Queensland Urban Utilities (QUU) to supply (and install) a semi-permanent chemical dosing solution for the Lowood STP with the objective of ensuring plant effluent meets DEHP discharge requirements.

The information contained in this manual has been extracted from the specific vendor documentation, functional descriptions and/or arrangement and assembly drawings – with the basic structure of the manual being divided into five (5) areas for each system and a particular section for job plans.

The five (5) areas include the following:

- Process Overview – A basic, not too technical description of the process involved – where possible, a capture of the SCADA screen has been included to assist in the identification of equipment.
- Equipment Listing – Where the major components of the process involved are listed, including the product name, model number, quantity and supplier information – where possible, the maintenance spares and/or lubrication information are supplied.
- Maintenance Schedule – The major maintenance tasks are listed for the major components of the process involved with the supplier/manufacturer recommendations for maintenance intervals – where possible a list of spares are supplied.
- Drawings – A guideline provided to highlight the process isolation required when taking the major components of the process involved off-line for maintenance purposes.
- Job Plans – While these documents do not form part of the maintenance manual – they are located at the end of the section – for clarity. (These “Job Plans” are current at date of issue of this document) Always refer to the electronic version/s prior to accessing critical decisions and/or performing maintenance.

2 0500 CHEMICAL DOSING

2.1 PROCESS OVERVIEW

2.1.1 GRUNDFOS MODEL DDA 12-10 (DOSING) PUMPS

Two (2) Grundfos Pumps model DDA 12-10 (chemical) dosing pumps dose chemical to the following two (2) areas within the STP including;

- Upstream of the inlet works system and
- The outlet of the (existing) trickling filter.

To ensure accurate dosing; the two (2) (independent) Grundfos Pumps model DDA 12-10 (chemical) dosing pumps shall operate within the following range;

- 1.73 – 8.65 litres per hour

An additional Grundfos Pumps model DDA 12-10 (chemical) dosing pump is supplied as spare.

The two (2) Grundfos Pumps model DDA 12-10 (chemical) dosing pumps are installed on a plasticised polyvinyl chloride (PVC) panel assembly – located within the drying bed area.

The (following) controls are available on both Grundfos Pumps model DDA 12-10 (chemical) dosing pumps and include;

- Manual,
- Pulse,
- Analogue,
- Batch,
- Cycle Timer,
- 7-day Timer,
- GeniBus and
- Remote On/Off.

One (1) Grundfos Pumps (500 millilitre) calibration cylinder – installed below the plasticised polyvinyl chloride (PVC) panel assembly – shall confirm (positive) output flow of the two (2) Grundfos Pumps model DDA 12-10 (chemical) dosing pumps.

The chemical dosing pipework design provides for effective control of any/all (individual) equipment via a series of George Fischer type 546 (PVC) ball valves.

Any/all (chemical) is transferred – to the (respective) dosing points – via Ø12 millimetre (clear) polyethylene tubing.

Immediately downstream of the plasticised polyvinyl chloride (PVC) panel assembly; the (PVC) tubing is inserted into (black) Ø25 millimetre polyethylene tubing to provide a (secondary) containment measure and aid in the capture of any/all (pipe-related) Megapac 23 spillage/s.

The (double-skinned) pipework is installed in four-hundred (400) millimetre deep trenches.

2.1.2 CHEMICAL STORAGE CONTAINMENT AND SAFETY CONSIDERATIONS

To ensure a sufficient quantity is available on-site at all times, the (Aluminium Chlorohydrate) Megapac 23 is stored within two (2) 1000 litre intermediate bulk containers (IBCs).

[Both IBCs can be utilised as (semi-permanent) storage]

The two (2) 1000 litre intermediate bulk containers (IBCs) are installed on a (double) IBC polyethylene spill containment unit – located within the drying bed area.

To minimise manual – and/or (potentially) hazardous chemical handling – the two (2) 1000 litre intermediate bulk containers (IBCs) remain (permanently) secured to the chemical dosing system.

Any/all items are chemical-resistant.

By utilising the existing drying bed as a storage area for the Megapac 23, an additional secondary containment facility is ensured in the event of a spill.

Any/all (Aluminium Chlorohydrate) Megapac 23 can be pumped from the sump.

To reduce the personnel risk of exposure to the Megapac 23; one (1) safety shower and eyewash assembly – utilising the (existing) potable water pipework – is located adjacent to the chemical storage area.

Appropriate (safety) signage and (additional) information are installed on site.

2.2 EQUIPMENT LISTING

2.2.1 CHEMICAL DOSING SYSTEM

- Two (2) Grundfos Pumps model DDA 12-10 (chemical) dosing pumps,
- One (1) DN15 (Grey) unplasticised polyvinyl chloride (uPVC) inlet pipework assembly – from the (1000) litre intermediate bulk container (IBC) to the plasticised polyvinyl chloride (PVC) panel assembly – Complete with associated valves and supports,
- One (1) Ø12 millimetre (clear) polyethylene outlet pipework assembly – from the plasticised polyvinyl chloride (PVC) panel assembly to the (respective) dosing points – Complete with associated valves and supports,
- Two (2) 1000 litre intermediate bulk containers (IBCs),

2.3 EQUIPMENT INFORMATION

2.3.1 GRUNDFOS MODEL DDA 12-10 (DOSING) PUMP



Make/Description: Grundfos Pumps (Chemical) Dosing Pump

Model: DDA 12-10

Supplier: Grundfos Pumps (Australia) Pty Ltd
30 Blanck Street
ORMEAU QLD 4208

Phone: (07) 5540 6700

Fax: (07) 5540 6710

<http://au.grundfos.com/>

2.3.2 GRUNDFOS MODEL DDA 12-10 (DOSING) PUMP – MAINTENANCE SCHEDULE

Description	Daily	Weekly	Monthly	3 Monthly	6 Monthly	Yearly	2 Yearly	3 Yearly	5 Yearly	Lubricant/Comments
GRUNDFOS PUMPS MODEL DDA 12-10 PUMP										
Verify correct operation of the dosing pump			x							
Check for any "abnormal" noises and vibrations		x								Rectify immediately
Check for any leakage from the "intermediate" flange		x								Rectify immediately
Check the tightness of any/all piping connections			x							Secure where necessary
Check the integrity of any/all electrical connections			x							Rectify immediately
Inspect (and thoroughly clean) the opto-sensor			x							Clean where necessary
Inspect (and thoroughly clean) any/all suction valves				x						Clean where necessary
Inspect (and thoroughly clean) any/all discharge valves				x						Clean where necessary
Inspect, thoroughly clean and/or replace diaphragm				x						Replace where necessary

2.3.3 GRUNDFOS MODEL 525 (PRESSURE-LOADING) VALVE



Make/Description: Grundfos (Pressure-Loading) Valve

Model: 525

Supplier: Grundfos Pumps (Australia) Pty Ltd
30 Blanck Street
ORMEAU QLD 4208

Phone: (07) 5540 6700

Fax: (07) 5540 6710

<http://au.grundfos.com/>

2.3.4 GRUNDFOS MODEL 525 (PRESSURE-LOADING) VALVE – MAINTENANCE SCHEDULE

	Daily	Weekly	Monthly	3 Monthly	6 Monthly	Yearly	2 Yearly	3 Yearly	5 Yearly
Description									
GRUNDFOS MODEL 525 PRESSURE VALVE									
Thoroughly clean the pressure-loading valve			x						
Replace the pressure-loading valve diaphragm			x						
Replace the pressure-loading valve o-rings			x						

2.3.5 GRUNDFOS MODEL SEV.80.80 (SUBMERSIBLE) PUMP



Make/Description: Grundfos (Submersible) Pump

Model: SEV.80.80

Supplier: Grundfos Pumps (Australia) Pty Ltd
30 Blanck Street
ORMEAU QLD 4208

Phone: (07) 5540 6700

Fax: (07) 5540 6710

<http://au.grundfos.com/>

2.3.6 GRUNDFOS MODEL SEV.80.80 (SUBMERSIBLE) PUMP – MAINTENANCE SCHEDULE

	Daily	Weekly	Monthly	3 Monthly	6 Monthly	Yearly	2 Yearly	3 Yearly	5 Yearly	
Description										Lubricant/Comments
GRUNDFOS MODEL SEV.80.80 PUMP										
Verify correct operation of the submersible pump				x						
Check the submersible pump oil level			x							Shell Ondina 917 Oil
Inspect the submersible pump oil for colour consistency		x								
Inspect the submersible pump for oil leakage		x								Replace the shaft seal
Inspect the submersible pump for oil contamination		x								Replace the shaft seal
Ensure the pump electrical cable is not pinched		x								Rectify immediately
Ensure the pump electrical cable is not bent sharply		x								Rectify immediately
Check for any "abnormal" noises and vibrations		x								Rectify immediately
Replace the submersible pump oil every 3.000 hours				x						Shell Ondina 917 Oil
Replace the submersible pump shaft seal				x						
Conduct inspection of submersible pump internal parts				x						Replace where required
Conduct inspection of submersible pump ball bearings				x						Replace where required

2.3.7 GEORGE FISCHER FIGURE 546 (SOLVENT-WELD) BALL VALVE

Description	Supplier Information
 Figure 546 Ball Valve	George Fischer Pty Ltd Unit 7/30 Raubers Road BANYO QLD 4014 Phone: (1300) 130 149 Fax: (1300) 884 122 http://www.georgfischer.com/

2.4 MAINTENANCE PROCEDURES

2.4.1 GENERAL

Danger: **Moving Parts**
Potential Slip Hazard

2.4.2 PRIOR TO START-UP

Prior to the commencement of any operations; the following items need to be checked:

- Ensure any/all connections, within the DN15 (Grey) unplasticised polyvinyl chloride (uPVC) inlet pipework assembly – from the (fixed) 1000 litre intermediate bulk container (IBC) to the plasticised polyvinyl chloride (PVC) panel assembly – are secure,
- Ensure any/all connections, within the Ø12 millimetre (clear) polyethylene outlet pipework assembly to the (respective) dosing points – are secure,
- Ensure any/all pipe supports are secure,
- Ensure power supply is available to the two (2) Grundfos Pumps model DDA 12-10 (chemical) dosing pumps,
- Ensure any/all isolation valves are configured correctly.

2.4.3 PRE AND POST-START CHECK

2.4.3.1 PRE-START CHECKS

- Ensure power supply is available.
- Ensure no alarms are "active".
- Ensure the two (2) Grundfos Pumps model DDA 12-10 (chemical) dosing pumps are adequately lubricated.

2.4.3.2 POST-START CHECKS

- Thoroughly inspect all pipework assemblies for leakage – rectify immediately.
- Visually (and audibly) check the two (2) Grundfos Pumps model DDA 12-10 (chemical) dosing pumps for any abnormal sound and/or vibration – rectify immediately.
- Ensure the two (2) Grundfos Pumps model DDA 12-10 (chemical) dosing pumps is operating normally.

2.4.4 SAFETY ASPECTS

2.4.4.1 GENERAL

Always wear protective clothing when operating and/or undertaking any maintenance on the two (2) Grundfos Pumps model DDA 12-10 (chemical) dosing pumps and/or associated components.

Always ensure power is isolated to the two (2) Grundfos Pumps model DDA 12-10 (chemical) dosing pumps when undertaking any maintenance on the equipment.

Always ensure suction/discharge pipework are correctly isolated to the two (2) Grundfos Pumps model DDA 12-10 (chemical) dosing pumps when undertaking any maintenance equipment.

2.4.4.2 GRUNDFOS PUMPS MODEL DDA 12-10 (CHEMICAL) DOSING PUMPS

The two (2) Grundfos Pumps model DDA 12-10 (chemical) dosing pumps requires established safety guidelines for both operation and maintenance.

These procedures do not address all safety concerns associated with operating the pressure filter and do not replace a properly designed and implemented facility safety program.

It is the responsibility of the user to establish appropriate safety and health practices and ensure their implementation.

Any/all operations and maintenance staff should be familiar with any/all hazards associated with the equipment.

2.4.4.3 EQUIPMENT WARRANTY

The equipment warranty can be voided due to inappropriate operation including – but not limited to – the following;

- Not conducting routine maintenance on any/all (supplied) equipment.

2.4.4.4 SAFETY PRECAUTIONS

The following safety pre-cautions should be observed during plant operation;

- "Do not" operate any/all rotating equipment without the protective guards in place.
- "Do not" attempt to dismantle any pipework and/or fittings prior to relieving the system pressure to any/all pipework.

Warning: Any/All electrical work must be carried out by a qualified electrician.

2.4.4.5 SAFETY PROCEDURES

Established facility safety procedures should be followed during maintenance;

- Any/all local isolators and/or motors should be properly locked and/or tagged out according to plant safety procedures. A facility policy should be in place and followed to prevent unauthorised maintenance.

Warning: Eye protection should be worn at all times when operating, or adjusting any equipment, whilst the system is operational, or stationary, due to the nature of fluids contained within the pipe work and fittings.

2.5 DRAWING LISTING

2.5.1 MECHANICAL DRAWINGS

NOTE

**REFER TO THE QUEENSLAND URBAN UTILITIES TAG OUT/LOCK OUT GUIDE
FOR CORRECT TAG OUT/LOCK OUT PROCEDURES**

- 486/5/5-0274-001 – Dosing System – Site Layout
- 486/5/5-0274-010 – Dosing System – General Arrangement
- 486/5/5-0274-011 – Dosing System – Pressure Filter Views And Details (Sheet I of II)
- 486/5/5-0274-012 – Dosing System – Pressure Filter Views And Details (Sheet II of II)
- 486/5/5-0274-013 – Dosing System – Chlorine Detention Tank Pump Arrangement
- 486/5/5-0274-014 – Dosing System – Pressure Filter Platform Arrangement
- 486/5/5-0274-015 – Dosing System – Pressure Filter/Backwash Reject Drain Assembly
- 486/5/5-0274-016 – Dosing System – Process and Instrumentation Diagram
- 486/5/5-0274-017 – Dosing System – Megapac Dosing General Arrangement

2.5.2 ELECTRICAL DRAWINGS

NOTE

**REFER TO THE QUEENSLAND URBAN UTILITIES TAG OUT/LOCK OUT GUIDE
FOR CORRECT TAG OUT/LOCK OUT PROCEDURES**

- 486/5/5-0274-040 – Dosing System – Single Line Diagram
- 486/5/5-0274-041 – Dosing System – Single Line Diagram
- 486/5/5-0274-042 – Dosing System – Mains Power Incoming/Distribution Schematic
- 486/5/5-0274-043 – Dosing System – Pump I Schematic Diagram
- 486/5/5-0274-044 – Dosing System – Pump II Schematic Diagram
- 486/5/5-0274-045 – Dosing System – Primary Tank Scraper Schematic Diagram
- 486/5/5-0274-046 – Dosing System – Secondary Scraper Schematic Diagram
- 486/5/5-0274-047 – Dosing System – Digestor Mixer Schematic Diagram
- 486/5/5-0274-048 – Dosing System – Controls Schematic Diagram

2.6 ISOLATION VALVE LISTING

Sections For Maintenance	Manual Isolation Valves
Grundfos Pumps Model DDA 12-10 (Chemical) Dosing Pump	One (1) DN15 George Fischer type 546 (PVC) manually-actuated ball valve – Installed in the DN15 suction pipework and One (1) DN15 George Fischer type 546 (PVC) manually-actuated ball valve – Installed in the DN15 discharge pipework
Grundfos Pumps Model DDA 12-10 (Chemical) Dosing Pump	One (1) DN15 George Fischer type 546 (PVC) manually-actuated ball valve – Installed in the DN15 suction pipework and One (1) DN15 George Fischer type 546 (PVC) manually-actuated ball valve – Installed in the DN15 discharge pipework

2. Vendor Documentation

Grundfos Model DDA-12-10 Dosing Pump

SMART Digital - DDA

Installation and operating instructions



Declaration of conformity

GB: EC declaration of conformity

We, Grundfos, declare under our sole responsibility that the products DDA, DDC and DDE, to which this declaration relates, are in conformity with these Council directives on the approximation of the laws of the EC member states:

- Machinery Directive (2006/42/EC).
Standards used: EN 809: 1998, EN ISO 12100-1+A1: 2009, EN ISO 12100-2+A1: 2009.
- Low Voltage Directive (2006/95/EC). *
Standard used: EN 61010-1: 2001 (second edition).
- EMC Directive (2004/108/EC).
Standards used: EN 61326-1: 2006, EN 61000-3-2: 2006+A1: 2009+A2: 2009, EN 61000-3-3: 2008.

* Only for products with operating voltage > 50 VAC or > 75 VDC.

This EC declaration of conformity is only valid when published as part of the Grundfos installation and operating instructions.

CZ: ES prohlášení o shodě

My firma Grundfos prohlašujeme na svou plnou odpovědnost, že výrobky DDA, DDC a DDE, na něž se toto prohlášení vztahuje, jsou v souladu s ustanoveními směrnice Rady pro sbílení právních předpisů členských států Evropského společenství v oblastech:

- Směrnice pro strojní zařízení (2006/42/ES).
Použité normy: EN 809: 1998, EN ISO 12100-1+A1: 2009, EN ISO 12100-2+A1: 2009.
- Směrnice pro nízkonapěťové aplikace (2006/95/ES). *
Použitá norma: EN 61010-1: 2001 (druhé vydání).
- Směrnice pro elektromagnetickou kompatibilitu (EMC) (2004/108/ES).
Použité normy: EN 61326-1: 2006, EN 61000-3-2: 2006+A1: 2009+A2: 2009, EN 61000-3-3: 2008.

* Pouze pro výrobky s provozním napětím > 50 VAC nebo > 75 VDC.

Toto ES prohlášení o shodě je platné pouze tehdy, pokud je zveřejněno jako součást instalacních a provozních návodů Grundfos.

DE: EG-Konformitätserklärung

Wir, Grundfos, erklären in alleiniger Verantwortung, dass die Produkte DDA, DDC und DDE, auf die sich diese Erklärung bezieht, mit den folgenden Richtlinien des Rates zur Angleichung der Rechtsvorschriften der EU-Mitgliedsstaaten übereinstimmen:

- Maschinenrichtlinie (2006/42/EG).
Normen, die verwendet wurden: EN 809: 1998, EN ISO 12100-1+A1: 2009, EN ISO 12100-2+A1: 2009, EN ISO 12100-3-2+A1: 2009.
- Niederspannungsrichtlinie (2006/95/EG). *
Norm, die verwendet wurde: EN 61010-1: 2001 (zweite Ausgabe).
- EMV-Richtlinie (2004/108/EG).
Normen, die verwendet wurden: EN 61326-1: 2006, EN 61000-3-2: 2006+A1: 2009+A2: 2009, EN 61000-3-3: 2008.

* Nur für Produkte mit Betriebsspannungen > 50 VAC oder > 75 VDC.

Diese EG-Konformitätserklärung gilt nur, wenn sie in Verbindung mit der Grundfos Montage- und Betriebsanleitung veröffentlicht wird.

BG: EC декларация за съответствие

Ние, фирма Grundfos, заявяваме с пътна отговорност, че продуктите DDA, DDC и DDE, за които се отнася настоящата декларация, отговарят на следните указания на Съвета за уеднаквяване на правните разпоредби на държавите членки на ЕС:

- Директива за машините (2006/42/EC).
Приложени стандарти: EN 809: 1998, EN ISO 12100-1+A1: 2009, EN ISO 12100-2+A1: 2009.
- Директива за нисковолтови системи (2006/95/EC). *
Приложен стандарт: EN 61010-1: 2001 (второ издание).
- Директива за електромагнитна съвместимост (2004/108/EC).
Приложени стандарти: EN 61326-1: 2006, EN 61000-3-2: 2006+A1: 2009+A2: 2009, EN 61000-3-3: 2008.

* Само за продукти, работещи при напрежение > 50 VAC или > 75 VDC.

Тази ЕС декларация за съответствие е валидна само когато е публикувана като част от инструкциите за монтаж и експлоатация на Grundfos.

DK: EF-overensstemmelseserklæring

Vi, Grundfos, erklærer under ansvar at produkterne DDA, DDC og DDE som denne erklæring omhandler, er i overensstemmelse med disse af Rådets direktiver om indbyrdes tilnærme til EF-medlemsstaternes lovgivning:

- Maskindirektivet (2006/42/EF).
Anvendte standarder: EN 809: 1998, EN ISO 12100-1+A1: 2009, EN ISO 12100-2+A1: 2009.
- Lavspændingsdirektivet (2006/95/EF). *
Anvendt standard: EN 61010-1: 2001 (anden udgave).
- EMC-direktivet (2004/108/EF).
Anvendte standarder: EN 61326-1: 2006, EN 61000-3-2: 2006+A1: 2009+A2: 2009, EN 61000-3-3: 2008.

* Gælder kun for produkter med driftsspænding > 50 VAC eller > 75 VDC.

Denne EF-overensstemmelseserklæring er kun gyldig når den publiceres som en del af Grundfos-monterings- og driftsinstruktionen.

EE: EL vastavusdeklaratsioon

Meie, Grundfos, deklareerime enda ainuvastutusel, et töötad DDA, DDC ja DDE, mille kohta käesolev juhend käib, on vastavuses EÜ Nõukogu direktiividega EMÜ liikmesriikide seaduse ühitamise kohta, mis käislevad:

- Masinate ohutus (2006/42/EC).
Kasutatud standardid: EN 809: 1998, EN ISO 12100-1+A1: 2009, EN ISO 12100-2+A1: 2009.
- Madalpinge direktiivi (2006/95/EC). *
Kasutatud standard: EN 61010-1: 2001 (teine väljaanne).
- Elektromagnetiline ühilduvus (EMC direktiiv) (2004/108/EC).
Kasutatud standardid: EN 61326-1: 2006, EN 61000-3-2: 2006+A1: 2009+A2: 2009, EN 61000-3-3: 2008.

* Ainult toodete jaoks mille tööpinge on suurem kui > 50 VAC või suurem kui > 75 VDC.

Käesolev EL-i vastavusdeklaratsioon kehtib ainult siis, kui see avaldatakse Grundfosi paigaldus- ja kasutusjuhendi osana.

GR: Δήλωση συμμόρφωσης EC

Εμεις, η Grundfos, δηλώνουμε με αποκλειστικά δική μας ευθύνη ότι τα προϊόντα DDA, DDC και DDE στα οποία αναφέρεται η παρούσα δήλωση, συμμορφώνονται με τις εξής Οδηγίες του Συμβούλου περί προσέγγισης των νομοθεσιών των κρατών μελών της ΕΕ:

- Οδηγία για μηχανήματα (2006/42/ΕC).
Πρότυπα που χρησιμοποιήθηκαν: EN 809: 1998, EN ISO 12100-1+A1: 2009, EN ISO 12100-2+A1: 2009.
- Οδηγία χαρημάτων τάσης (2006/95/ΕC). *
Πρότυπο που χρησιμοποιήθηκε: EN 61010-1: 2001 (δεύτερη έκδοση).
- Οδηγία Ηλεκτρομαγνητικής Συμβατότητας (EMC) (2004/108/ΕC).
Πρότυπα που χρησιμοποιήθηκαν: EN 61326-1: 2006, EN 61000-3-2: 2006+A1: 2009+A2: 2009, EN 61000-3-3: 2008.

* Μόνο για προϊόντα με τάση λειτουργίας > 50 VAC ή > 75 VDC.

Αυτή η δήλωση συμμόρφωσης EC ισχύει μόνον όταν συνοδεύει τις οδηγίες εγκατάστασης και λειτουργίας της Grundfos.

FR: Déclaration de conformité CE

Nous, Grundfos, déclarons sous notre seule responsabilité, que les produits DDA, DDC et DDE, auxquels se réfère cette déclaration, sont conformes aux Directives du Conseil concernant le rapprochement des législations des Etats membres CE relatives aux normes énoncées ci-dessous :

- Directive Machines (2006/42/CE).
Normes utilisées : EN 809: 1998, EN ISO 12100-1+A1: 2009, EN ISO 12100-2+A1: 2009.
- Directive Basse Tension (2006/95/CE). *
Norme utilisée : EN 61010-1: 2001 (deuxième édition).
- Directive Compatibilité Electromagnétique CEM (2004/108/CE).
Normes utilisées : EN 61326-1: 2006, EN 61000-3-2: 2006+A1: 2009+A2: 2009, EN 61000-3-3: 2008.

* Convient uniquement aux produits avec tension de service > 50 VAC ou > 75 VDC.

Cette déclaration de conformité CE est uniquement valide lors de sa publication dans la notice d'installation et de fonctionnement Grundfos.

IT: Dichiarazione di conformità CE

Grundfos dichiara sotto la sua esclusiva responsabilità che i prodotti DDA, DDC e DDE, ai quali si riferisce questa dichiarazione, sono conformi alle seguenti direttive del Consiglio riguardanti il riavvicinamento delle legislazioni degli Stati membri CE:

- Direttiva Macchine (2006/42/CE).
Norme applicate: EN 809: 1998, EN ISO 12100-1+A1: 2009, EN ISO 12100-2+A1: 2009.
- Direttiva Bassa Tensione (2006/95/CE). *
Norma applicata: EN 61010-1: 2001 (seconda edizione).
- Direttiva EMC (2004/108/CE).
Norme applicate: EN 61326-1: 2006, EN 61000-3-2: 2006+A1: 2009+A2: 2009, EN 61000-3-3: 2008.

* Solo per prodotti con tensione di alimentazione > 50 VAC o > 75 VDC.

Questa dichiarazione di conformità CE è valida solo quando pubblicata come parte delle istruzioni di installazione e funzionamento Grundfos.

LT: EB atitikties deklaracija

Mes, Grundfos, vyska atsakomybe pareiškiame, kad gaminiai DDA, DDC ir DDE, kuriems skirta ši deklaracija, atitinka šias Tarybos Direktyvas dėl Europos Ekonominių Bendrijos šalių narių įstatymų suderinimo:

- Mažinė direktiva (2006/42/EB).
Taikomi standartai: EN 809: 1998, EN ISO 12100-1+A1: 2009, EN ISO 12100-2+A1: 2009.
- Žemų įtampų direktiva (2006/95/EB). *
Taikomos standartas: EN 61010-1: 2001 (antrasis leidimas).
- EMS direktiva (2004/108/EB).
Taikomi standartai: EN 61326-1: 2006, EN 61000-3-2: 2006+A1: 2009+A2: 2009, EN 61000-3-3: 2008.

* Tik produktams, kurių darbinė įtampa yra > 50 V kintama arba > 75 V nuolatinė.

Ši EB atitikties deklaracija galioja tik tuo atveju, kai yra pateikta kaip "Grundfos" įrengimo ir naudojimo instrukcijos dalis.

ES: Declaración CE de conformidad

Nosotros, Grundfos, declaramos bajo nuestra entera responsabilidad que los productos DDA, DDC y DDE, a los cuales se refiere esta declaración, están conformes con las Directivas del Consejo en la aproximación de las leyes de los Estados Miembros del EM:

- Directiva de Maquinaria (2006/42/CE).
Normas aplicadas: EN 809: 1998, EN ISO 12100-1+A1: 2009, EN ISO 12100-2+A1: 2009.
- Directiva de Baja Tensión (2006/95/CE). *
Norma aplicada: EN 61010-1: 2001 (segunda edición).
- Directiva EMC (2004/108/CE).
Normas aplicadas: EN 61326-1: 2006, EN 61000-3-2: 2006+A1: 2009+A2: 2009, EN 61000-3-3: 2008.

* Sólo para productos con tensión de funcionamiento > 50 VAC o > 75 VDC.

Esta declaración CE de conformidad sólo es válida cuando se publique como parte de las instrucciones de instalación y funcionamiento de Grundfos.

HR: EZ izjava o uskladenosti

Mi, Grundfos, izjavljujemo pod vlastitim odgovornošću da je proizvod DDA, DDC i DDE, na koji se ova izjava odnosi, u skladu s direktivama ovog Vijeća o uskladjivanju zakona država članica EU:

- Direktiva za strojeve (2006/42/EZ).
Korištene norme: EN 809: 1998, EN ISO 12100-1+A1: 2009, EN ISO 12100-2+A1: 2009.
- Direktiva za niski napon (2006/95/EZ). *
Korištena norma: EN 61010-1: 2001 (drugo izdanje).
- Direktiva za elektromagnetsku kompatibilnost (2004/108/EZ).
Korištene norme: EN 61326-1: 2006, EN 61000-3-2: 2006+A1: 2009+A2: 2009, EN 61000-3-3: 2008.

* Samo za proizvode s radnim naponom > 50 VAC ili > 75 VDC.

Ova EZ izjava o sukladnosti važeća je jedino kada je izdana kao dio Grundfos montažnih i pogonskih uputa.

LV: EK paziņojums par atbilstību prasībām

Sabiedrība GRUNDFOS ar pilnu atbildību darīzāmū, ka produkti DDA, DDC un DDE, uz kuriem attiecas šīs paziņojumi, atbilst šādām Padomes direktīvām par tuvināšanos EK daļbvalstu likumdošanas normām:

- Mažinibūves direktiva (2006/42/EK).
Piemēroti standarti: EN 809: 1998, EN ISO 12100-1+A1: 2009, EN ISO 12100-2+A1: 2009.
- Zema sprieguma direktiva (2006/95/EK). *
Piemērotās standarts: EN 61010-1: 2001 (otrs versija).
- Elektromagnētiskās saderības direktīva (2004/108/EK).
Piemēroti standarti: EN 61326-1: 2006, EN 61000-3-2: 2006+A1: 2009+A2: 2009, EN 61000-3-3: 2008.

* Tikai produktiem, kuru darba spriegums ir > 50 V maiņstrāvas vai > 75 V līdzstrāvas.

Šī EK atbilstības deklarācija ir derīga vienīgi tad, ja ir publicēta kā daļa no GRUNDFOS uzstādīšanas un ekspluatācijas instrukcijām.

HU: EK megfelelőségi nyilatkozat

Mi, a Grundfos, egyedül felelősséggel kijelentjük, hogy a DDA, DDC és DDC termékek, amelyekre jelen nyilatkozat vonatkozik, megfelelnek az Európai Unió tagállamainak jogi irányelvétől összehangoltanacs aláírásainak:

- Gépek (2006/42/EK).
Alkalmaszt szabványok: EN 809: 1998, EN ISO 12100-1+A1: 2009, EN ISO 12100-2+A1: 2009.
- Kisfeszültségű Direktíva (2006/95/EK). *
Alkalmaszt szabvány: EN 61010-1: 2001 (második kiadás).
- EMC Direktíva (2004/108/EK).
Alkalmaszt szabványok: EN 61326-1: 2006, EN 61000-3-2: 2006+A1: 2009+A2: 2009, EN 61000-3-3: 2008.

* Csak a > 50 VAC vagy > 75 VDC feszültségnél magasabb üzemelő feszültséggel berendezések.

Ez az EK megfelelőségi nyilatkozat kizárolag akkor érvényes, ha Grundfos telepítési és üzemeltetési utasítás részeként kerül kiadásra.

NL: EC overeenkomstigheidsverklaring

Wij, Grundfos, verklaren geheel onder eigen verantwoordelijkheid dat de producten DDA, DDC en DDE waarop deze verklaring betrekking heeft, in overeenstemming zijn met de Richtlijnen van de Raad in zake de onderlinge aanpassing van de wetgeving van de EG Lidstaten betreffende:

- Machine Richtlijn (2006/42/EC).
Gebruikte normen: EN 809: 1998, EN ISO 12100-1+A1: 2009, EN ISO 12100-2+A1: 2009.
- Laagspannings Richtlijn (2006/95/EC). *
Gebruikte norm: EN 61010-1: 2001 (tweede editie).
- EMC Richtlijn (2004/108/EC).
Gebruikte normen: EN 61326-1: 2006, EN 61000-3-2: 2006+A1: 2009+A2: 2009, EN 61000-3-3: 2008.

* Alleen voor producten met bedrijfsspanning > 50 VAC of > 75 VDC.

Dese EC overeenkomstigheidsverklaring is alleen geldig wanneer deze gepubliceerd is als onderdeel van de Grundfos installatie- en bedieningsinstructies.

PL: Deklaracja zgodności WE

My, Grundfos, oświadczamy z pełną odpowiedzialnością, że nasze wyroby DDA, DDC oraz DDE, których deklaracja niniejsza dotyczy, są zgodne z następującymi wytycznymi Rady d/o jednolicienia przepisów prawnych krajów członkowskich WE:

- Dyrektywa Maszynowa (2006/42/WE).
Zastosowane normy: EN 809: 1998, EN ISO 12100-1+A1: 2009, EN ISO 12100-2+A1: 2009.
- Dyrektywa Niskonapięciowa (LVD) (2006/95/WE). *
Zastosowana norma: EN 61010-1: 2001 (drugie wydanie).
- Dyrektywa EMC (2004/108/WE).
Zastosowane normy: EN 61326-1: 2006, EN 61000-3-2: 2006+A1: 2009+A2: 2009, EN 61000-3-3: 2008.

* Dotyczy produktów o napięciu zasilania > 50 VAC lub > 75 VDC.

Deklaracja zgodności WE jest ważna tylko i wyłącznie wtedy kiedy jest opublikowana przez firmę Grundfos i umieszczona w instrukcji montażu i eksploatacji.

RU: Декларация о соответствии ЕС

Мы, компания Grundfos, со всей ответственностью заявляем, что изделия DDA, DDC и DDE, к которым относится настоящая декларация, соответствуют следующим Директивам Совета Европейского союза об унификации законодательных предписаний стран-членов ЕС:

- Механические устройства (2006/42/EC).
Применившиеся стандарты: EN 809: 1998, EN ISO 12100-1+A1: 2009, EN ISO 12100-2+A1: 2009.
- Низковольтное оборудование (2006/95/EC). *
Применившийся стандарт: EN 61010-1: 2001 (второе издание).
- Электромагнитная совместимость (2004/108/EC).
Применившиеся стандарты: EN 61326-1: 2006, EN 61000-3-2: 2006+A1: 2009+A2: 2009, EN 61000-3-3: 2008.

* Только для изделий с рабочим напряжением > 50 В AC или > 75 В DC.

Данная декларация о соответствии ЕС имеет силу только в случае публикации в составе инструкции по монтажу и эксплуатации на продукцию производства компании Grundfos.

SK: Prehlásenie o konformite EÚ

My firma Grundfos prehlasujeme na svoju plnú zodpovednosť, že výrobky DDA, DDC a DDE, na ktoré sa toto prehlásenie vzťahuje, sú v súlade s ustanoveniami smernice Rady pre zblíženie právnych predpisov členských štátov Európskeho spoločenstva v oblastiach:

- Smernica pre strojové zariadenia (2006/42/EC).
Použité normy: EN 809: 1998, EN ISO 12100-1+A1: 2009, EN ISO 12100-2+A1: 2009.
- Smernica pre nízkonapäťové aplikácie (2006/95/EC). *
Použitá norma: EN 61010-1: 2001 (druhé vydanie).
- Smernica pre elektromagnetickú kompatibilitu (2004/108/EC).
Použité normy: EN 61326-1: 2006, EN 61000-3-2: 2006+A1: 2009+A2: 2009, EN 61000-3-3: 2008.

* Len pre produkty s prevádzkovým napäťom > 50 VAC or > 75 VDC.

Toto prehlásenie o konformite ES je platné iba vtedy, ak je zverejnené ako súčasť montážnych a prevádzkových pokynov Grundfos.

UA: Свідчення про відповідність вимогам ЄС

Компанія Grundfos заявляє про свою виключну відповідальність за те, що продукти DDA, DDC та DDE, на які поширяється дана декларація, відповідають таким рекомендаціям Ради з уніфікації правових норм країн - членів ЄС:

- Механічні прилади (2006/42/EC).
Стандарти, що застосовувалися: EN 809: 1998, EN ISO 12100-1+A1: 2009, EN ISO 12100-2+A1: 2009.
- Низька напруга (2006/95/ЄС). *
Стандарт, що застосовувався: EN 61010-1: 2001 (друге видання).
- Електромагнітна сумісність (2004/108/ЄС).
Стандарти, що застосовувалися: EN 61326-1: 2006, EN 61000-3-2: 2006+A1: 2009+A2: 2009, EN 61000-3-3: 2008.

* Тільки для продуктів з робочою напругою > 50 VAC або > 75 VDC.

Ця декларація відповідності ЄС дійсна тільки в тому випадку, якщо публікується як частина інструкцій Grundfos з монтажу та експлуатації.

PT: Declaração de conformidade CE

A Grundfos declara sob sua única responsabilidade que os produtos DDA, DDC e DDE, aos quais diz respeito esta declaração, estão em conformidade com as seguintes Directivas do Conselho sobre a aproximação das legislações dos Estados Membros da CE:

- Directiva Máquinas (2006/42/CE).
Normas utilizadas: EN 809: 1998, EN ISO 12100-1+A1: 2009, EN ISO 12100-2+A1: 2009.
- Directiva Baixa Tensão (2006/95/CE). *
Norma utilizada: EN 61010-1: 2001 (segunda edição).
- Directiva EMC (compatibilidade electromagnética) (2004/108/CE).
Normas utilizadas: EN 61326-1: 2006, EN 61000-3-2: 2006+A1: 2009+A2: 2009, EN 61000-3-3: 2008.

* Apenas para produtos com tensão de funcionamento > 50 VCA ou > 75 VCC.

Esta declaração de conformidade CE é apenas válida quando publicada como parte das instruções de instalação e funcionamento Grundfos.

RO: Declarație de conformitate CE

Noi, Grundfos, declarăm pe propria răspundere că produsele DDA, DDC și DDE, la care se referă această declarație, sunt în conformitate cu aceste Directive de Consiliu asupra armonizării legilor Statelor Membre CE:

- Directiva Utilaje (2006/42/CE).
Standarde utilizate: EN 809: 1998, EN ISO 12100-1+A1: 2009, EN ISO 12100-2+A1: 2009.
- Directiva Tensiune Joasă (2006/95/CE). *
Standard utilizat EN 61010-1: 2001 (a doua editie).
- Directiva EMC (2004/108/CE).
Standarde utilizate: EN 61326-1: 2006, EN 61000-3-2: 2006+A1: 2009+A2: 2009, EN 61000-3-3: 2008.

* Numai pentru produse cu tensiunea de funcționare > 50 VAC ori > 75 VDC.

Această declarație de conformitate CE este valabilă numai când este publicată ca parte a instrucțiunilor Grundfos de instalare și funcționare.

SI: ES izjava o skladnosti

V Grundfosu s polno odgovornostjo izjavljamo, da so naši izdelki DDA, DDC in DDE, na katere se ta izjava nanaša, v skladu z naslednjimi direktivami Svetega pribljevanju zakonodaje za izenačevanje pravnih predpisov držav članic ES:

- Direktiva o strojih (2006/42/ES).
Uporabljeni normi: EN 809: 1998, EN ISO 12100-1+A1: 2009, EN ISO 12100-2+A1: 2009.
- Direktiva o nizki napetosti (2006/95/ES). *
Uporabljeni norma: EN 61010-1: 2001 (druga izdaja).
- Direktiva o elektromagnetski združljivosti (EMC) (2004/108/ES).
Uporabljeni normi: EN 61326-1: 2006, EN 61000-3-2: 2006+A1: 2009+A2: 2009, EN 61000-3-3: 2008.

* Samo za izdelke z delovno napetostjo, večjo od 50 V AC ali manjšo od 75 V DC.

ES izjava o skladnosti velja samo kadar je izdana kot del Grundfos instalacije in navodil delovanja.

RS: EC deklaracija o konformitetu

Mi, Grundfos, izjavljujemo pod vlastitom odgovornošću da je proizvod DDA, DDC i DDE, na koji se ova izjava odnosi, u skladu sa direktivama Svetra za usklađivanje zakona država članica EU:

- Direktiva za mašine (2006/42/EC).
 - Korišćeni standardi: EN 809: 1998, EN ISO 12100-1+A1: 2009, EN ISO 12100-2+A1: 2009.
- Direktiva niskog napona (2006/95/EC). *
 - Korišćeni standard: EN 61010-1: 2001 (drugo izdanje).
- EMC direktiva (2004/108/EC).
 - Korišćeni standardi: EN 61326-1: 2006, EN 61000-3-2: 2006+A1: 2009+A2: 2009, EN 61000-3-3: 2008.

* Samo za proizvode sa radnim naponom > 50 VAC ili > 75 VDC.

Ova EC deklaracija o konformitetu važeća je jedino kada je izdata kao deo Grundfos uputstava za instalaciju i rad.

SE: EG-försäkran om överensstämmelse

Vi, Grundfos, försäkrar under ansvar att produkterna DDA, DDC och DDE, som omfattas av denna försäkran, är i överensstämmelse med rättsdirektiv om inbördes närmande till EU-medlemsstaternas lagstiftning, avseende:

- Maskindirektivet (2006/42/EG).
 - Tillämpade standarder: EN 809: 1998, EN ISO 12100-1+A1: 2009, EN ISO 12100-2+A1: 2009.
- Lågspänningsdirektivet (2006/95/EG). *
 - Tillämpad standard: EN 61010-1: 2001 (andra upplagan).
- EMC-direktivet (2004/108/EG).
 - Tillämpade standarder: EN 61326-1: 2006, EN 61000-3-2: 2006+A1: 2009+A2: 2009, EN 61000-3-3: 2008.

* Endast för produkter med driftspänning > 50 VAC eller > 75 VDC.

Denna EG-försäkran om överensstämmelse är endast giltig när den publiceras som en del av Grundfos monterings- och driftsinstruktion.

CN: EC 产品合格声明书

我们格兰富在我们的全权责任下声明，产品 DDA, DDC 和 DDE，即该合格证所指之产品，符合欧盟使其成员国法律趋于一致的以下欧共理会指令：

- 机械设备指令 (2006/42/EC)。
所用标准：EN 809: 1998, EN ISO 12100-1+A1: 2009, EN ISO 12100-2+A1: 2009。
- 低电压指令 (2006/95/EC). *
所用标准：EN 61010-1: 2001 (第 2 版)。
- 电磁兼容性指令 (2004/108/EC)。
所用标准：EN 61326-1: 2006, EN 61000-3-2: 2006+A1: 2009+A2: 2009, EN 61000-3-3: 2008。

* 仅适用于工作电压 > 50 VAC 或 > 75 VDC 的产品。

本 EC 合格性声明仅在作为格兰富安装与操作指导手册的一部分时有效。

KO: EC 적합성 선언

Grundfos 에서는 자사의 단독 책임에 따라 이 선언과 관련된 DDA, DDC 및 DDE 제품이 EC 회원국 법률에 기반한 다음 이사회 지침을 준수함을 선언합니다 :

- 기계류 지침 (2006/42/EC).
사용된 표준 : EN 809: 1998, EN ISO 12100-1+A1: 2009, EN ISO 12100-2+A1: 2009.
- 저전압 지침 (2006/95/EC). *
사용된 표준 : EN 61010-1: 2001 (제 2 출간).
- EMC 지침 (2004/108/EC).
사용된 표준 : EN 61326-1: 2006, EN 61000-3-2: 2006+A1: 2009+A2: 2009, EN 61000-3-3: 2008.

* 작동 전압 50 VAC 미만 또는 75 VDC 미만인 제품에만 해당.

본 EC 인증은 그린포스에서 인쇄 배포한 설치 가이드 및 작업 매뉴얼에 포함되어 발행되었을 경우에만 유효합니다.

FI: EY-vaatimustenmukaisuusvakuutus

Me, Grundfos, vakuutamme omalla vastuullamme, että tuotteet DDA, DDC ja DDE, joita tämä vakuutus koskee, ovat EY:n jäsenvaltioiden lainsäädännön yhdenmukaistamiseen tähystävien Euroopan neuvoston direktiivien vaatimusten mukaisia seuraavasti:

- Konetraketti (2006/42/EC).
 - Sovellettavat standardit: EN 809: 1998, EN ISO 12100-1+A1: 2009, EN ISO 12100-2+A1: 2009.
- Pienjännitedirektiivi (2006/95/EY). *
 - Sovellettu standardi: EN 61010-1: 2001 (uudistettu versio).
- EMC-direktiivi (2004/108/EC).
 - Sovellettavat standardit: EN 61326-1: 2006, EN 61000-3-2: 2006+A1: 2009+A2: 2009, EN 61000-3-3: 2008.

* Vai laitteille, joiden käyttötähtävä on > 50 VAC tai > 75 VDC.

Tämä EY-vaatimustenmukaisuusvakuutus on voimassa vain, kun se julkaistaan osana Grundfosin asennus- ja käyttöohjeita.

TR: EC uygunluk bildirgesi

Grundfos olarak bu beyannameye konu olan DDA, DDC ve DDE ürünlerinin, AB Üyesi Ülkelerin kanunlarını birbirine yaklaşırma üzerine Konsey Direktifleriyle uyumlu olduğunu yalnızca bizim sorumluluğumuz altında olduğunu beyan ederiz:

- Makine Yönetmeliği (2006/42/EC).
 - Kullanılan standartlar: EN 809: 1998, EN ISO 12100-1+A1: 2009, EN ISO 12100-2+A1: 2009.
- Düşük Voltaj Yönetmeliği (2006/95/EC). *
 - Kullanılan standart: EN 61010-1: 2001 (ikinci baskı).
- EMC Direktifi (2004/108/EC).
 - Kullanılan standartlar: EN 61326-1: 2006, EN 61000-3-2: 2006+A1: 2009+A2: 2009, EN 61000-3-3: 2008.

* Çalışma voltajı yalnızca > 50 VAC veya > 75 VDC değerlerinde olan ürünler için.

İşbu EC uygunluk bildirgesi, yalnızca Grundfos kurulum ve çalışma talimatlarının bir parçası olarak basıldığı takdirde geçerlilik kazanmaktadır.

JP: EC 適合宣言書

Grundfos は、その責任の下に、DDA、DDC 製品および DDE 製品が EC 加盟諸国の法規に関する、以下の評議会指令に適合していることを宣言します：

- 機械指令 (2006/42/EC)。
適用規格 : EN 809: 1998, EN ISO 12100-1+A1: 2009, EN ISO 12100-2+A1: 2009。
- 低電圧指令 (2006/95/EC). *
適用規格 : EN 61010-1: 2001 (第 2 版)。
- EMC 指令 (2004/108/EC)。
適用規格 : EN 61326-1: 2006, EN 61000-3-2: 2006+A1: 2009+A2: 2009, EN 61000-3-3: 2008。

* 動作電圧 > 50 VAC または > 75 VDC。

この EC 適合宣言書は、グレンンドフォス取扱説明書の一部に掲載される場合のみ有効です。

Pfinztal, 1 June 2011

Ulrich Stemick

Technical Director

Grundfos Water Treatment GmbH
Reetzstr. 85, D-76327 Pfinztal, Germany

Person authorised to compile technical file and
empowered to sign the EC declaration of conformity.

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Warning

Prior to installation, read these installation and operating instructions. Installation and operation must comply with local regulations and accepted codes of good practice.



1. Safety instructions

These installation and operating instructions contain general instructions that must be observed during installation, operation and maintenance of the pump. It must therefore be read by the installation engineer and the relevant qualified operator prior to installation and start-up, and must be available at the installation location at all times.

1.1 Symbols used in this document



Warning

If these safety instructions are not observed, it may result in personal injury.

Caution

If these safety instructions are not observed, it may result in malfunction or damage to the equipment.

Note

Notes or instructions that make the job easier and ensure safe operation.

1.2 Qualification and training of personnel

The personnel responsible for the installation, operation and service must be appropriately qualified for these tasks. Areas of responsibility, levels of authority and the supervision of the personnel must be precisely defined by the operator. If necessary, the personnel must be trained appropriately.

Risks of not observing the safety instructions

Non-observance of the safety instructions may have dangerous consequences for the personnel, the environment and the pump and may result in the loss of any claims for damages.

It may lead to the following hazards:

- Personal injury from exposure to electrical, mechanical and chemical influences.
- Damage to the environment and personal injury from leakage of harmful substances.

1.3 Safety instructions for the operator/user

The safety instructions described in these instructions, existing national regulations on health protection, environmental protection and for accident prevention and any internal working, operating and safety regulations of the operator must be observed. Information attached to the pump must be observed.

Leakages of dangerous substances must be disposed of in a way that is not harmful to the personnel or the environment.

Damage caused by electrical energy must be prevented, see the regulations of the local electricity supply company.

Before any work to the pump, the pump must be in the "Stop" operating state or be disconnected from the mains. The system must be pressureless!

Caution

The mains plug is the separator separating the pump from the mains.

Only original accessories and original spare parts should be used. Using other parts can result in exemption from liability for any resulting consequences.

1.4 Safety of the system in the event of a failure in the dosing pump

The dosing pump was designed according to the latest technologies and is carefully manufactured and tested.

If it fails regardless of this, the safety of the overall system must be ensured. Use the relevant monitoring and control functions for this.

Make sure that any chemicals that are released from the pump or any damaged lines do not cause damage to system parts and buildings.

Caution

The installation of leak monitoring solutions and drip trays is recommended.

1.5 Dosing chemicals

Warning

Before switching the supply voltage back on, the dosing lines must be connected in such a way that any chemicals in the dosing head cannot spray out and put people at risk.



The dosing medium is pressurised and can be harmful to health and the environment.

Warning

When working with chemicals, the accident prevention regulations applicable at the installation site should be applied (e.g. wearing protective clothing).



Observe the chemical manufacturer's safety data sheets and safety instructions when handling chemicals!

Warning

If the diaphragm leaks or is broken, dosing liquid will escape from the drain opening on the dosing head (see fig. 3).



Take suitable precautions to prevent harm to health and damage to property from escaping dosing liquid!

Check daily whether liquid is escaping from the discharge opening!

Changing the diaphragm, see section 7. Service.

Caution

A deaeration hose, which is routed into a container, e.g. a drip tray, must be connected to the deaeration valve.

Caution

The dosing medium must be in liquid aggregate state!

Caution

Observe the freezing and boiling points of the dosing medium!

The resistance of the parts that come into contact with the dosing medium, such as the dosing head, valve ball, gaskets and lines, depends on the medium, media temperature and operating pressure.

Caution

Ensure that parts in contact with the dosing media are resistant to the dosing medium under operating conditions, see data booklet!

Should you have any questions regarding the material resistance and suitability of the pump for specific dosing media, please contact Grundfos.

2. General information

The DDA dosing pump is a self-priming diaphragm pump. It consists of a housing with stepper motor and electronics, a dosing head with diaphragm and valves and the control cube.

Excellent dosing features of the pump:

- Optimal intake even with degassing media, as the pump always works at full suction stroke volume.
- Continuous dosing, as the medium is sucked up with a short suction stroke, regardless of the current dosing flow, and dosed with the longest possible dosing stroke.



2.1 Applications

The pump is suitable for liquid, non-abrasive, non-flammable and non-combustible media strictly in accordance with the instructions in these installation and operating instructions.

Areas of application

- Drinking water treatment
- Wastewater treatment
- Swimming pool water treatment
- Boiler water treatment
- CIP (Clean-In-Place)
- Cooling water treatment
- Process water treatment
- Wash plants
- Chemical industry
- Ultrafiltration processes and reverse osmosis
- Irrigation
- Paper and pulp industry
- Food and beverage industries

2.2 Improper operating methods

The operational safety of the pump is only guaranteed if it is used in accordance with section 2.1 Applications.

Warning

Other applications or the operation of pumps in ambient and operating conditions, which are not approved, are considered improper and are not permitted. Grundfos cannot be held liable for any damage resulting from incorrect use.



Warning

The pump is NOT approved for operation in potentially explosive areas!



Warning

A sunscreen is required for outdoor installation!



Frequent disengagement from the mains voltage, e.g. via a relay, can result in damage to the pump electronics and in the breakdown of the pump. The dosing accuracy is also reduced as a result of internal start procedures.

Caution

Do not control the pump via the mains voltage for dosing purposes!

Only use the "External stop" function to start and stop the pump!

2.3 Symbols on the pump

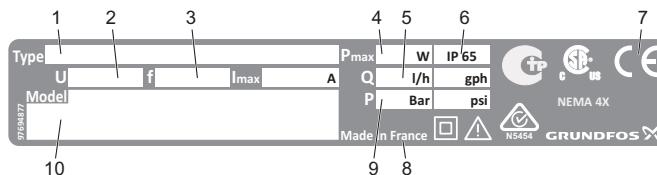
Symbol	Description
	Indication of universally dangerous spot.
	In case of emergency and prior to all maintenance work and repairs, take the mains plug out of the mains supply!
	The device complies with electrical safety class II.
	Connection for deaeration hose at dosing head. If the deaeration hose is not correctly connected, danger will arise due to possible leakage of dosing liquid!

2.4 Warranty

A guarantee claim in accordance with our general terms of sale and delivery is only valid if the following requirements are fulfilled:

- The pump is used in accordance with the information within this manual.
- The pump is not dismantled or incorrectly handled.
- The maintenance is carried out by authorised and qualified personnel.
- Original spare parts are used for repairs during maintenance.

2.5 Nameplate



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Fig. 1 Nameplate

Pos.	Description	Pos.	Description
1	Type designation	6	Enclosure class
2	Voltage	7	Mark of approval, CE mark, etc.
3	Frequency	8	Country of origin
4	Power consumption	9	Max. operating pressure
5	Max. dosing flow	10	Model

2.6 Type key

The type key is used to identify the precise pump and is not used for configuration purposes.

Code	Example	DDA	7.5-	16	AR-	PP/	V	C-	F-	3	1	U2U2	F	G
	Pump type													
	Max. flow [l/h]													
	Max. pressure [bar]													
AR	Control variant													
AR	Standard													
FC	AR with FlowControl													
FCM	FC with integrated flow measurement													
PP	Dosing head material													
PP	Polypropylene													
PVC	PVC (polyvinyl chloride, only up to 10 bar)													
PV	PVDF (polyvinylidene fluoride)													
SS	Stainless steel DIN 1.4401													
E	Gasket material													
E	EPDM													
V	FKM													
T	PTFE													
C	Valve ball material													
C	Ceramic													
SS	Stainless steel DIN 1.4401													
F	Control cube position													
F	Front-mounted (can be changed to the right or left)													
3	Voltage													
3	1 x 100-240 V, 50/60 Hz													
1	Valve type													
1	Standard													
2	Spring-loaded (HV version)													
U2U2	Suction/discharge side connection													
U2U2	Hose, 4/6 mm, 6/9 mm, 6/12 mm, 9/12 mm													
U7U7	Hose 0.17" x 1/4"; 1/4" x 3/8"; 3/8" x 1/2"													
AA	Threaded Rp 1/4", female (stainless steel)													
VV	Threaded 1/4" NPT, female (stainless steel)													
XX	No connection													
I001	Installation set *													
I001	Hose, 4/6 mm (up to 7.5 l/h, 13 bar)													
I002	Hose, 9/12 mm (up to 60 l/h, 9 bar)													
I003	Hose, 0.17" x 1/4" (up to 7.5 l/h, 13 bar)													
I004	Hose, 3/8" x 1/2" (up to 60 l/h, 10 bar)													
F	Mains plug													
F	EU													
B	USA, Canada													
G	UK													
I	Australia, New Zealand, Taiwan													
E	Switzerland													
J	Japan													
L	Argentina													
G	Design													
G	Grundfos													

* including: 2 pump connections, foot valve, injection unit, 6 m PE discharge hose, 2 m PVC suction hose, 2 m PVC deaeration hose (4/6 mm)

2.7 Product overview

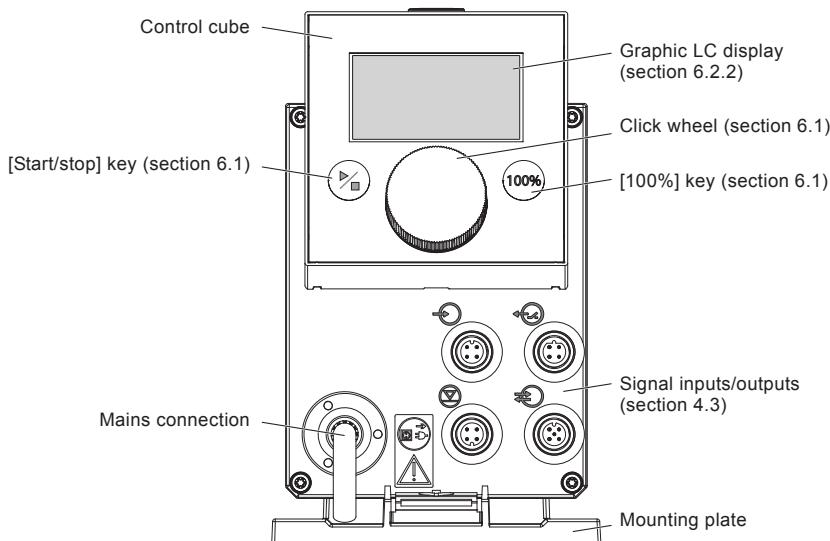
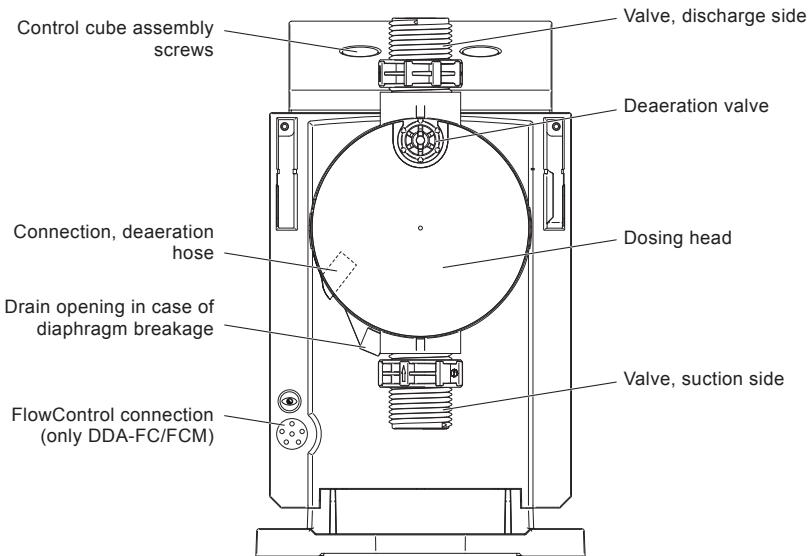


Fig. 2 Front view of the pump

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Fig. 3 Rear view of the pump

3. Technical data / Dimensions



3.1 Technical data

Data		7.5-16	12-10	17-7	30-4	
Turndown ratio (setting range)	[1:X]	3000	1000	1000	1000	
Max. dosing capacity	[l/h]	7.5	12.0	17.0	30.0	
	[gph]	2.0	3.1	4.5	8.0	
Max. dosing capacity with SlowMode 50 %	[l/h]	3.75	6.00	8.50	15.00	
	[gph]	1.00	1.55	2.25	4.00	
Max. dosing capacity with SlowMode 25 %	[l/h]	1.88	3.00	4.25	7.50	
	[gph]	0.50	0.78	1.13	2.00	
Min. dosing capacity	[l/h]	0.0025	0.0120	0.0170	0.0300	
	[gph]	0.0007	0.0031	0.0045	0.0080	
Max. operating pressure	[bar]	16	10	7	4	
	[psi]	230	150	100	60	
Max. stroke frequency ¹⁾	[strokes/min]	190	155	205	180	
Stroke volume	[ml]	0.74	1.45	1.55	3.10	
Accuracy of repeatability	[%]	± 1				
Max. suction lift during operation ²⁾	[m]	6				
Max. suction lift when priming with wet valves ²⁾	[m]	2	3	3	2	
Mechanical data	Min. pressure difference between suction and discharge side	[bar]	1 (FC and FCM: 2)			
	Max. inlet pressure, suction side	[bar]	2			
	Max. viscosity in SlowMode 25 % with spring-loaded valves ³⁾	[mPas] (= cP)	2500	2500	2000	1500
	Max. viscosity in SlowMode 50 % with spring-loaded valves ³⁾	[mPas] (= cP)	1800	1300	1300	600
	Max. viscosity without SlowMode with spring-loaded valves ³⁾	[mPas] (= cP)	600	500	500	200
	Max. viscosity without spring-loaded valves ³⁾	[mPas] (= cP)	50	300	300	150
	Min. internal hose/pipe diameter suction/discharge side ^{2), 4)}	[mm]	4	6	6	9
	Min. internal hose/pipe diameter suction/discharge side (high viscosity) ⁴⁾	[mm]	9			
	Min./Max. liquid temperature	[°C]	-10/45			
	Min./Max. ambient temperature	[°C]	0/45			
	Min./Max. storage temperature	[°C]	-20/70			
	Max. relative humidity (non-condensing)	[%]	96			
	Max. altitude above sea level	[m]	2000			

Data		7.5-16	12-10	17-7	30-4
Electrical data	Voltage	[V]	100-240 V, - 10 %/+ 10 %, 50/60 Hz		
	Length of mains cable	[m]	1.5		
	Max. inrush current for 2 ms (100 V)	[A]	8		
	Max. inrush current for 2 ms (230 V)	[A]	25		
	Max. power consumption P ₁	[W]	24 ⁵⁾		
	Enclosure class		IP65, Nema 4X		
	Electrical safety class		II		
Signal input	Pollution degree		2		
	Max. load for level input		12 V, 5 mA		
	Max. load for pulse input		12 V, 5 mA		
	Max. load for External stop input		12 V, 5 mA		
Signal output	Min. pulse length	[ms]	5		
	Max. pulse frequency	[Hz]	100		
	Impedance at 0/4-20 mA analog input	[Ω]	15		
	Max. resistance in level/pulse circuit	[Ω]	1000		
Weight/size	Max. ohmic load on relay output	[A]	0.5		
	Max. voltage on relay/analog output	[V]	30 VDC/30 VAC		
	Impedance at 0/4-20 mA analog output	[Ω]	500		
Sound pressure	Weight (PVC, PP, PVDF)	[kg]	2.4	2.4	2.6
	Weight (stainless steel)	[kg]	3.2	3.2	4.0
	Diaphragm diameter	[mm]	44	50	74
Approvals	Max. sound pressure level	[dB(A)]	60		

1) The maximum stroke frequency varies depending on calibration

2) Data is based on measurements with water

3) Maximum suction lift: 1 m, dosing capacity reduced (approx. 30 %)

4) Length of suction line: 1.5 m, length of discharge line: 10 m (at max. viscosity)

5) With E-Box

3.2 Dimensions

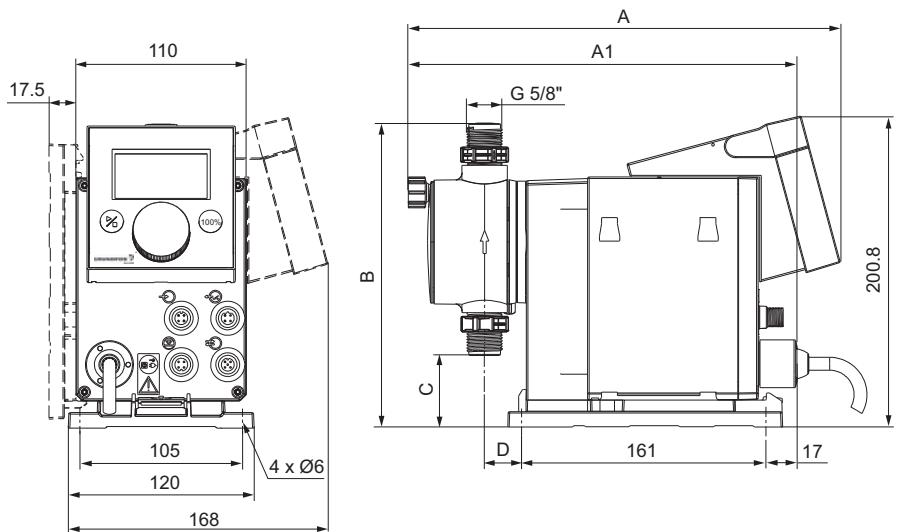


Fig. 4 Dimensional sketch

Pump type	A [mm]	A1 [mm]	B [mm]	C [mm]	D [mm]
DDA 7.5-16	280	251	196	46.5	24
DDA 12-10/17-7	280	251	200.5	39.5	24
DDA 30-4	295	267	204.5	35.5	38.5

4. Assembly and installation



For use in Australia:

Installation of this product must comply with AS/NZS3500!

Note

Certificate of suitability number:
CS9431

C-tick number: N20683

4.1 Pump assembly

Warning

Install the pump in such a way that the plug can easily be reached by the operator during operation! This will enable the operator to separate the pump from the mains quickly in case of emergency!

The pump is delivered with a mounting plate. The mounting plate can be mounted vertically e.g. on a wall or horizontally e.g. on a tank. It takes just a few quick steps to firmly secure the pump to the mounting plate by means of a slot mechanism.

The pump can easily be released from the mounting plate for maintenance.

4.1.1 Requirements

- The mounting surface must be stable and must not vibrate.
- Dosing must flow upwards vertically.

4.1.2 Align and install mounting plate

- **Vertical installation:** Mounting plate slot mechanism must be above.
- **Horizontal installation:** Mounting plate slot mechanism must be opposite the dosing head.
- The mounting plate can be used as a drill template, please see fig. 4 for drill hole distances.



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Fig. 5 Locate mounting plate



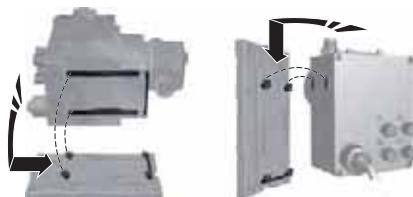
Warning

Make sure that you do not damage any cables and lines during installation!

1. Indicate drill holes.
2. Drill holes.
3. Secure mounting plate using four screws, diameter 5 mm, to the wall, on the bracket or the tank.

4.1.3 Engage pump in mounting plate

1. Attach the pump to the mounting plate support clamps and slide under slight pressure until it engages.



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Fig. 6 Engaging the pump

4.1.4 Adjusting control cube position

The control cube is fitted to the front of the pump on delivery. It can be turned by 90 ° so that the user can select to operate the pump from the right or left side.

The enclosure class (IP65/Nema 4X) and shock protection are only guaranteed if the control cube is installed correctly!

Caution

Pump must be disconnected from the power supply!

1. Carefully remove both protective caps on the control cube using a thin screwdriver.
2. Loosen screws.
3. Carefully lift off control cube only so far from the pump housing that no tensile stress is produced on the flat band cable.
4. Turn control cube by 90 ° and re-attach.
– Make sure the O-ring is secure.
5. Tighten screws slightly and attach protective caps.



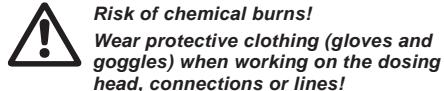
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Fig. 7 Adjusting control cube

4.2 Hydraulic connection

Warning

Risk of chemical burns!



The dosing head may contain water from the factory check!

Caution

When dosing media which should not come into contact with water, another medium must be dosed beforehand!

Caution

Faultless function can only be guaranteed in conjunction with lines supplied by Grundfos!

Caution

The lines used must comply with the pressure limits as per section 3.1 Technical data!

Important information on installation

- Observe suction lift and line diameter, see section 3.1 Technical data.
- Shorten hoses at right angles.
- Ensure that there are no loops or kinks in the hoses.
- Keep suction line as short as possible.
- Route suction line up towards the suction valve.
- Installing a filter in the suction line protects the entire installation against dirt and reduces the risk of leakage.
- Only control variant FC/FCM: For discharge quantities < 1 l/h we recommend the use of an additional spring-loaded valve (approx. 3 bar) on the discharge side for the safe generation of the necessary differential pressure.

Hose connection procedure

1. Push union nut and tensioning ring across hose.
2. Push cone part fully into hose, see fig. 8.
3. Attach cone part with hose to corresponding pump valve.
4. Tighten union nut manually.
– Do not use tools!
5. Tighten up union nuts after 2-5 operating hours if using PTFE gaskets!
6. Attach deaeration hose to the corresponding connection (see fig. 3) and run into a container or a collecting tray.

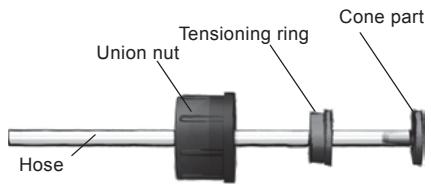


Fig. 8 Hydraulic connection

Pressure differential between suction and discharge side must be at least 1 bar/14.5 psi!

Note

Tighten up the dosing head screws once before commissioning and after 2-5 operating hours at 3 Nm.

Installation example

The pump offers various installation options. In the picture below, the pump is installed in conjunction with a suction line, level switch and multifunction valve on a Grundfos tank.

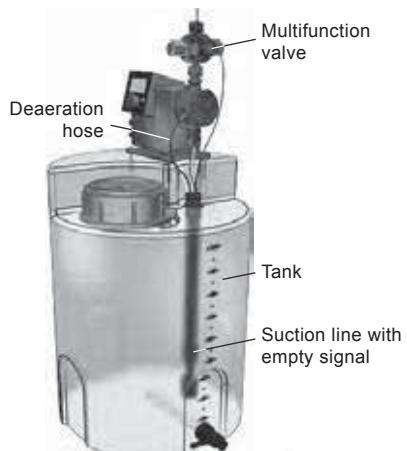


Fig. 9 Installation example

4.3 Electrical connection


Warning

The enclosure class (IP65/Nema 4X) is only guaranteed if plugs or protective caps are correctly installed!


Warning

The pump can start automatically when the mains voltage is switched on!

Do not manipulate mains plug or cable!

Note

The mains plug is the separator separating the pump from the mains.

The rated voltage of the pump, see section 2.5 Nameplate, must conform to local conditions.

Signal connections


Warning

Electric circuits of external devices connected to the pump inputs must be separated from dangerous voltage by means of double or reinforced insulation!

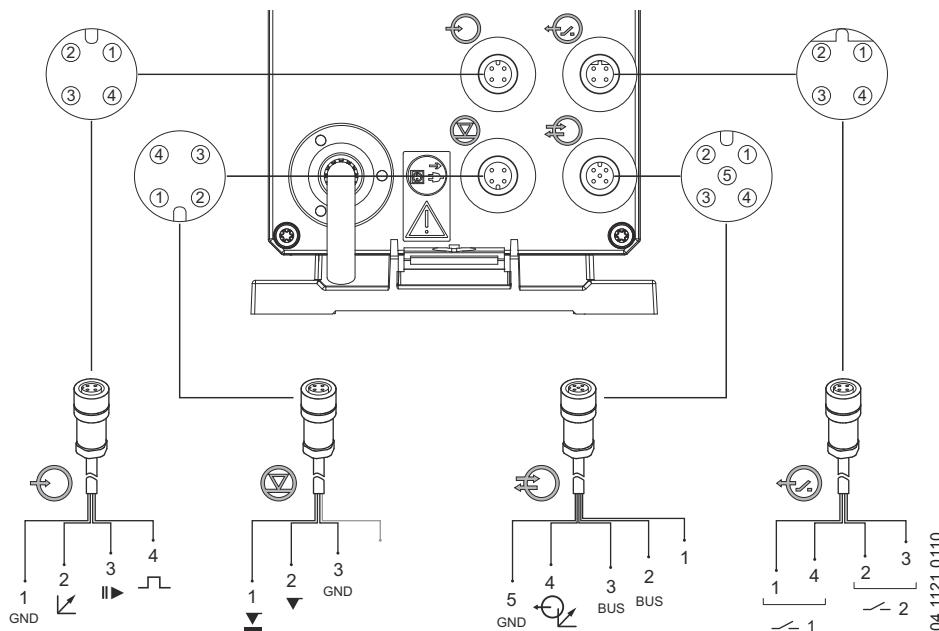


Fig. 10 Wiring diagram of the electrical connections

Analog, External stop and pulse input

Function	Pins				Plug type
	1/brown	2/white	3/blue	4/black	
Analog	GND/(-) mA	(+) mA			mA signal
External stop	GND		X		Pulse
Pulse	GND			X	Pulse

Level signals: Empty signal and Low-level signal

Function	Pins				Plug type
	1	2	3	4	
Low-level signal	X		GND		Pulse
Empty signal		X	GND		Pulse

GENIbus, Analog output

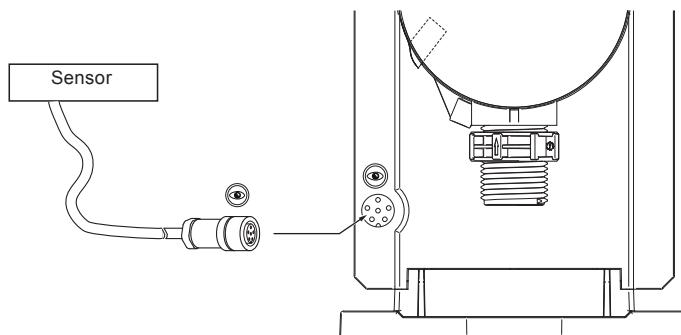
Caution *Danger of damage to the product due to short circuit! Pin 1 supplies 30 VDC.
Never short-circuit pin 1 with any of the other pins!*

Function	Pins					Plug type
	1/brown	2/white	3/blue	4/black	5/yellow/green	
GENIbus	+30 V	GENI bus TXD	GENI bus RXD		GND	Bus
Analog output				(+) mA	GND/(-) mA	mA signal

Relay outputs

Function	Pins				Plug type
	1/brown	2/white	3/blue	4/black	
Relay 1	X			X	Pulse
Relay 2		X	X		Pulse

FlowControl signal connection



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Fig. 11 FlowControl signal connection

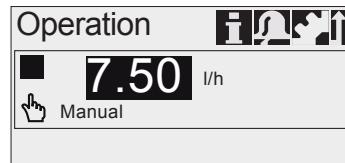


5. Start-up

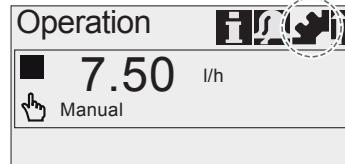
5.1 Setting the menu language

For description of control elements, see section 6.

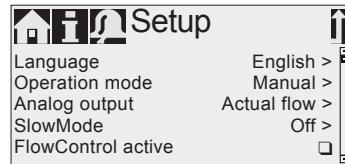
- Turn click wheel to highlight the cog symbol.



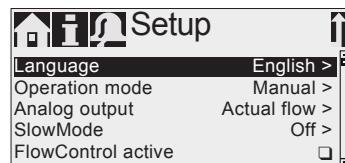
- Press the click wheel to open the "Setup" menu.



- Turn the click wheel to highlight the "Language" menu.



- Press the click wheel to open the "Language" menu.



- Turn the click wheel to highlight the desired language.



- Press the click wheel to select the highlighted language.



- Press the click wheel again to confirm the "Confirm settings?" prompt and apply the setting.



Fig. 12 Set menu language

5.2 Degaerating the pump



Warning

The deaeration hose must be connected correctly and inserted into a suitable tank!

1. Open deaeration valve by approximately half a turn.
2. Press and hold down the [100%] key (deaeration key) until liquid flows continuously without any bubbles from the deaeration hose.
3. Close deaeration valve.

Press the [100%] key and simultaneously turn the click wheel clockwise to increase the duration of the process to up to 300 seconds. After setting the seconds, do not press the key any longer.

Note

5.3 Calibrating the pump

The pump is calibrated in the factory for media with a viscosity similar to water at maximum pump backpressure (see section 3.1 *Technical data*).

If the pump is operated with a backpressure that deviates or if dosing a medium whose viscosity deviates, the pump must be calibrated.

For pumps with FCM control variant, it is not necessary to calibrate the pump if there is deviating or fluctuating backpressure as long as the "AutoFlowAdapt" function has been enabled (see section 6.10 *AutoFlowAdapt*).

Requirements

- The hydraulics and electrics of the pump are connected (see section 4. *Assembly and installation*).
- The pump is integrated into the dosing process under operating conditions.
- The dosing head and suction hose are filled with dosing medium.
- The pump has been degassed.

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Calibration process - example for DDA 7.5-16

- Fill a measuring beaker with dosing medium.
Recommended filling volumes V_1 :

- DDA 7.5-16: 0.3 l
- DDA 12-10: 0.5 l
- DDA 17-7: 1.0 l
- DDA 30-4: 1.5 l

$V_1 = 300 \text{ ml}$ — 

- Read off and note down the fill volume V_1 (e.g. 300 ml).

- Place the suction hose in the measuring beaker.



- Start the calibration process in the "Setup > Calibration" menu.



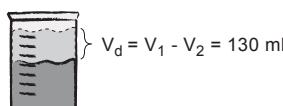
- The pump executes 200 dosing strokes and displays the factory calibration value (e.g. 125 ml).



- Remove the suction hose from the measuring beaker and check the remaining volume V_2 (e.g. 170 ml).

$V_2 = 170 \text{ ml}$ — 

- From V_1 and V_2 , calculate the actual dosed volume $V_d = V_1 - V_2$ (e.g. 300 ml - 170 ml = 130 ml).



- Set and apply V_d in the calibration menu.

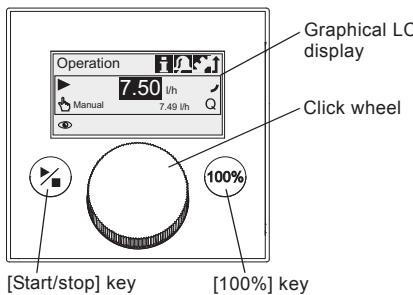
- The pump is calibrated.



6. Operation

6.1 Control elements

The pump control panel includes a display and the following control elements.



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Fig. 13 Control panel

Keys

Key	Function
[Start/stop] key	Starting and stopping the pump.
[100%] key	The pump doses at maximum flow regardless of the operation mode.

Click wheel

The click wheel is used to navigate through the menus, select settings and confirm them.

Turning the click wheel clockwise moves the cursor clockwise in increments in the display. Turning the click wheel counter-clockwise moves the cursor counter-clockwise.

6.2 Display and symbols

6.2.1 Navigation

In the "Info", "Alarm" and "Setup" main menus, the options and submenus are displayed in the rows below. Use the "Back" symbol to return to the higher menu level. The scroll bar at the right edge of the display indicates that there are further menu items which are not shown.

The active symbol (current cursor position) flashes. Press the click wheel to confirm your selection and open the next menu level. The active main menu is displayed as text, the other main menus are displayed as symbols. The position of the cursor is highlighted in black in the sub-menus.

When you position the cursor on a value and press the click wheel, a value is selected. Turning the click wheel clockwise increases the value, turning the click wheel counter-clockwise reduces the value. When you now press the click wheel, the cursor will be released again.

6.2.2 Operating states

The operating state of the pump is indicated by a symbol and display colour.

Display	Fault	Operating state		
White	-	Stop	Standby	
Green	-			Running
Yellow	Warning	Stop	Standby	Running
Red	Alarm	Stop	Standby	

6.2.3 Sleep mode (energy-saving mode)

If in the "Operation" main menu the pump is not operated for 30 seconds, the header disappears. After two minutes, the display brightness is reduced. If in any other menu the pump is not operated for two minutes, the display switches back to the "Operation" main menu and the display brightness is reduced. This state will be cancelled when the pump is operated or a fault occurs.

6.2.4 Overview of display symbols

The following display symbols may appear in the menus.

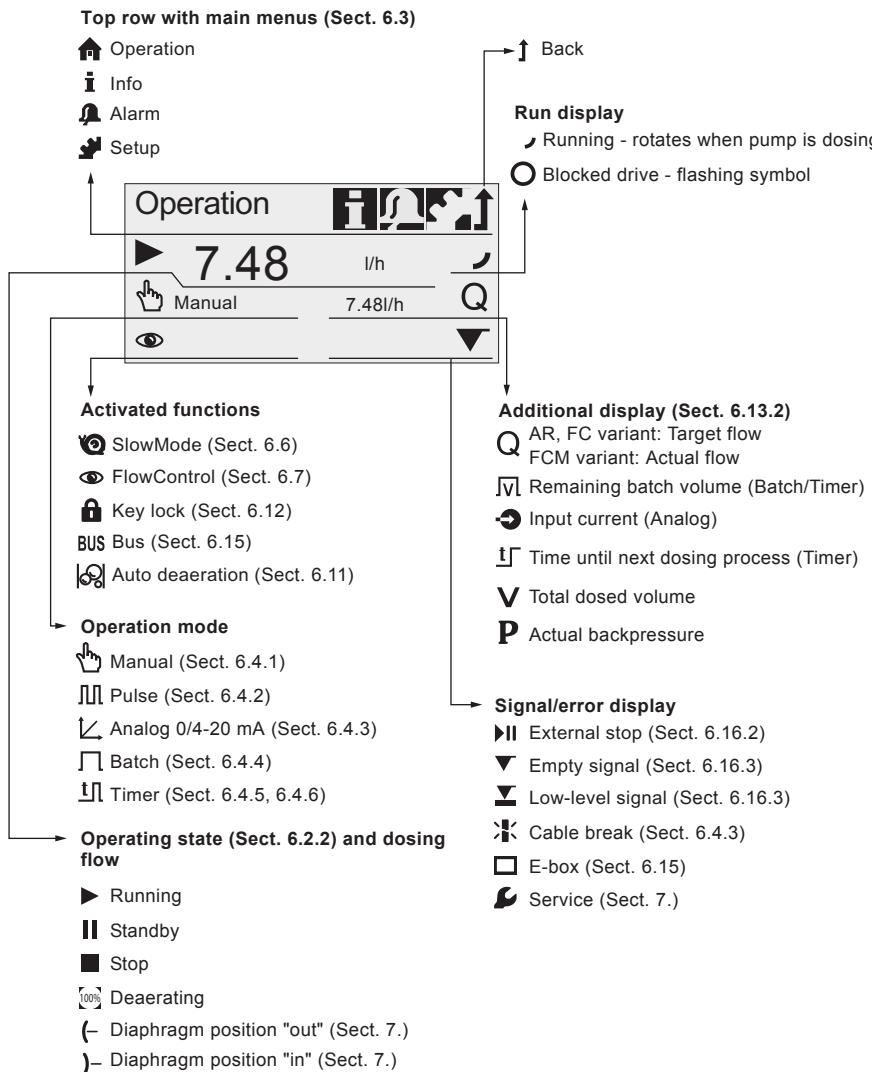


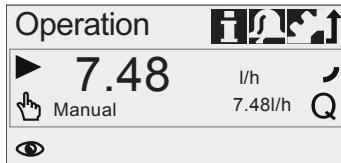
Fig. 14 Overview of display symbols

6.3 Main menus

The main menus are displayed as symbols at the top of the display. The currently active main menu is displayed as text.

6.3.1 Operation

Status information such as the dosing flow, selected operation mode and operating state is displayed in the "Operation" main menu.



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6.3.2 Info

You can find the date, time and information about the active dosing process, various counters, product data and the service system status in the "Info" main menu. The information can be accessed during operation.

The service system can also be reset from here.



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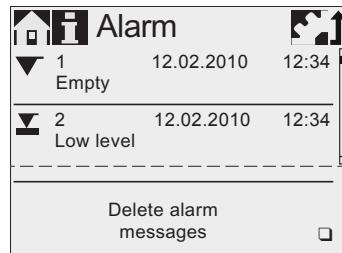
Counters

The "Info > Counters" menu contains the following counters:

Counters	Resettable
Volume	
Total dosed volume [l] or US gallons	Yes
Operating hours	
Accumulated operating hours (pump switched on) [h]	No
Motor runtime	
Accumulated motor runtime [h]	No
Strokes	
Accumulated number of dosing strokes	No
Power on/off	
Accumulated frequency of switching mains voltage on	No

6.3.3 Alarm

You can view errors in the "Alarm" main menu.



Delete alarm messages

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Up to 10 warnings and alarms, together with their date, time and cause, are listed in chronological order. If the list is full, the oldest entry will be overwritten, see section 8. *Faults*.

6.3.4 Setup

The "Setup" main menu contains menus for pump configuration. These menus are described in the following sections.

Note Check all pump settings after any change in the "Setup" menu.

Setup	
Language	English >
Operation mode	Pulse >
Pulse memory*	<input type="checkbox"/>
Analog scaling	>
Batch volume*	1.06 l <
Dosing time[mm:ss]*	7:50 <
Dosing timer cycle*	>
Dosing timer week*	>
Analog output	Actual flow >
SlowMode	Off >
FlowControl active*	<input type="checkbox"/>
FlowControl*	>
Pressure monitoring*	>
AutoFlowAdapt*	<input type="checkbox"/>
Auto deeration	<input type="checkbox"/>
Calibration	>
Key lock	Off >
Display	>
Time+date	>
Bus	>
Inputs/Outputs	>
Basic settings	>

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* These submenus are only displayed for specific default settings and control variants. The contents of the "Setup" menu also vary depending on the operation mode.

6.4 Operation modes

Six different operation modes can be set in the "Setup > Operation mode" menu.

- Manual, see section 6.4.1
- Pulse, see section 6.4.2
- Analog 0-20mA, see section 6.4.3
Analog 4-20mA, see section 6.4.3
- Batch (pulse-based), see section 6.4.4
- Dosing timer cycle, see section 6.4.5
- Dosing timer week, see section 6.4.6

6.4.1 Manual

In this operation mode, the pump constantly doses the dosing flow set with the click wheel. The dosing flow is set in l/h or ml/h in the "Operation" menu. The pump automatically switches between the units. Alternatively, the display can be reset to US units (gph). See section 6.13 Display Setup.

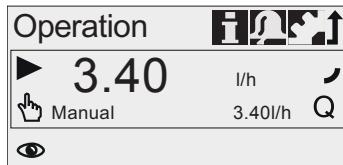


Fig. 15 Manual mode

The setting range depends on the pump type:

Type	Setting range *	
	[l/h]	[gph]
DDA 7.5-16	0.0025 - 7.5	0.0007 - 2.0
DDA 12-10	0.012 - 12	0.0031 - 3.1
DDA 17-7	0.017 - 17	0.0045 - 4.5
DDA 30-4	0.03 - 30	0.0080 - 8.0

* When the "SlowMode" function is active, the maximum dosing flow is reduced, see section 3.1 Technical data.

6.4.2 Pulse

In this operation mode, the pump doses the set dosing volume for each incoming (potential-free) pulse, e.g. from a water meter. The pump automatically calculates the optimum stroke frequency for dosing the set volume per pulse.

The calculation is based on:

- the frequency of external pulses
- the set dosing volume/pulse.

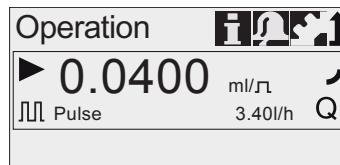


Fig. 16 Pulse mode

The dosing volume per pulse is set in ml/pulse in the "Operation" menu using the click wheel. The setting range for the dosing volume depends on the pump type:

Type	Setting range [ml/pulse]
DDA 7.5-16	0.0015 - 14.9
DDA 12-10	0.0029 - 29.0
DDA 17-7	0.0031 - 31.0
DDA 30-4	0.0062 - 62.0

The frequency of incoming pulses is multiplied by the set dosing volume. If the pump receives more pulses than it can process at the maximum dosing flow, it runs at the maximum stroke frequency in continuous operation. Excess pulses will be ignored if the memory function is not enabled.

Memory function

When the "Setup > Pulse memory" function is enabled, up to 65,000 unprocessed pulses can be saved for subsequent processing.



Warning

Subsequent processing of saved pulses can cause local increase in concentration!

The contents of the memory will be deleted by:

- Switching off the power supply
- Changing the operation mode
- Interruption (e.g. alarm, External stop).

6.4.3 Analog 0/4-20 mA

In this operation mode, the pump doses according to the external analog signal. The dosing volume is proportional to the signal input value in mA.

Operation mode	Input value [mA]	Dosing flow [%]
4-20 mA	≤ 4.1	0
	≥ 19.8	100
0-20 mA	≤ 0.1	0
	≥ 19.8	100

If the input value in operation mode 4-20 mA falls below 2 mA, an alarm is displayed and the pump stops. A cable break or signal transmitter error has occurred. The "Cable break" symbol is displayed in the "Signal and error display" area of the display.

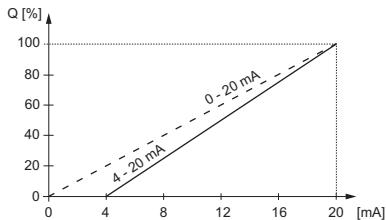


Fig. 17 Analog scaling

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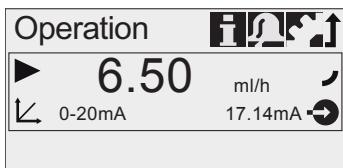


Fig. 18 Analog operation mode

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Set analog scaling

Analog scaling refers to the assignment of the current input value to the dosing flow.

Changes of analog scaling affect also the analog output signal. See section 6.5 Analog output.

Analog scaling passes through the two reference points (I_1/Q_1) and (I_2/Q_2) , which are set in the "Setup > Analog scaling" menu. The dosing flow is controlled according to this setting.

Example 1 (DDA 7.5-16)

Analog scaling with positive gradient:

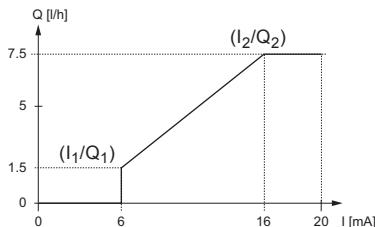


Fig. 19 Analog scaling with pos. gradient

In example 1, the reference points $I_1 = 6$ mA, $Q_1 = 1.5$ l/h and $I_2 = 16$ mA, $Q_2 = 7.5$ l/h have been set.

From 0 to 6 mA analog scaling is described by a line that passes through $Q = 0$ l/h, between 6 mA and 16 mA it rises proportionally from 1.5 l/h to 7.5 l/h and from 16 mA onwards it passes through $Q = 7.5$ l/h.

Example 2 (DDA 7.5-16)

Analog scaling with negative gradient (Operation mode 0-20 mA):

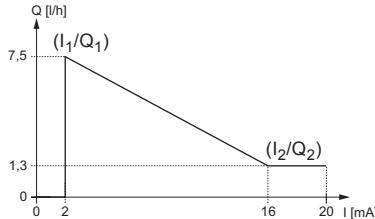


Fig. 20 Analog scaling with neg. gradient

In example 2, the reference points $I_1 = 2$ mA, $Q_1 = 7.5$ l/h and $I_2 = 16$ mA, $Q_2 = 1.3$ l/h have been set.

From 0 to 2 mA analog scaling is described by a line that passes through $Q = 0$ l/h, between 2 mA and 16 mA it drops proportionally from 7.5 l/h to 1.3 l/h and from 16 mA onwards it passes through $Q_2 = 1.3$ l/h.

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Set analog scaling in the "Operation" menu

Analog scaling can also be modified after a security prompt directly in the "Operation" menu. This is how the dosing flow is directly modified for the current flow input value.

Please observe that changes also have a direct effect on point I_2/Q_2 (see fig. 21)!

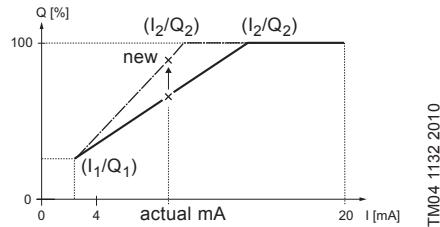


Fig. 21 Set analog scaling ("Operation" menu)

6.4.4 Batch (pulse-based)

In this operation mode, the pump doses the set batch volume in the set dosing time (t_1). A batch is dosed with each incoming pulse.

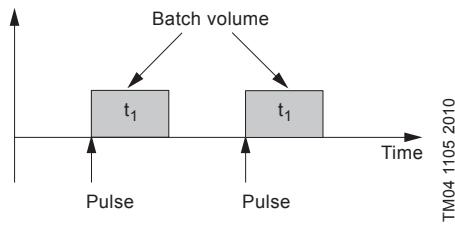


Fig. 22 Batch (pulse-based)

The setting range depends on the pump type:

Type	Setting range per batch		
	from [ml]	to [l]	Resolution * [ml]
DDA 7.5-16	0.74	999	0.0925
DDA 12-10	1.45	999	0.1813
DDA 17-7	1.55	999	0.1938
DDA 30-4	3.10	999	0.3875

* Thanks to the digital motor control, dosing quantities with a resolution of up to 1/8 of the dosing stroke volume can be dosed.

The batch volume (e.g. 75 ml) is set in the "Setup > Batch volume" menu. The minimum dosing time required for this (e.g. 36 seconds) is displayed and can be increased.

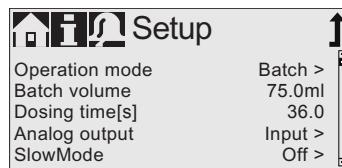


Fig. 23 Batch mode

Signals received during a batch process or an interruption (e.g. alarm, External stop) will be ignored. If the pump is restarted following an interruption, the next batch volume is dosed on the next incoming pulse.

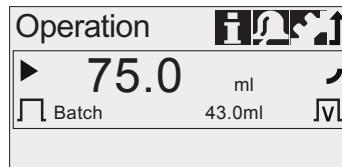


Fig. 24 Batch mode

In the "Operation" menu, the total batch volume (e.g. 75 ml) and the remaining batch volume still to be dosed (e.g. 43 ml) are shown in the display.

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6.4.5 Dosing timer cycle

In this operation mode, the pump doses the set batch volume in regular cycles. Dosing starts when the pump is started after a singular start delay. The setting range for the batch volume corresponds to the values in section 6.4.4 Batch (pulse-based).



Warning

When time or date is changed in "Time+date" menu, timer dosing and timer relay output functions (Relay 2) are stopped!

Timer dosing and timer relay output functions must be restarted manually!

Changing time or date can cause increase or decrease in concentration!

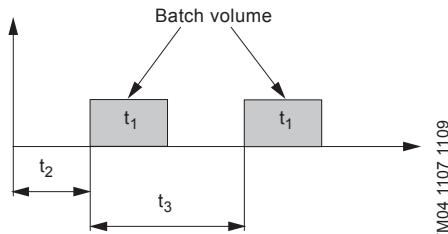


Fig. 25 Dosing timer cycle diagram

t_1	Dosing time
t_2	Start delay
t_3	Cycle time

In the event of an interruption (e.g. interruption of the mains voltage, External stop), the dosing will be stopped while the time continues running. After suspending the interruption, the pump will continue to dose according to the actual timeline position.

The following settings are required in the "Setup > Dosing timer cycle" menu:

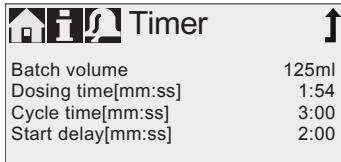
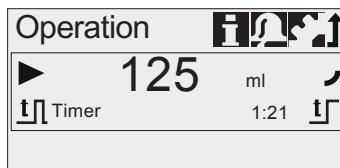


Fig. 26 Dosing timer cycle

The batch volume to be dosed (e.g. 125 ml) is set in the "Setup > Dosing timer cycle" menu. The dosing time required for this (e.g. 1:54) is displayed and can be changed.



The total batch volume (e.g. 125 ml) and the remaining batch volume still to be dosed are displayed in the "Operation" menu. During breaks in dosing, the time until the next dosing process (e.g. 1:21) is displayed.



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Fig. 27 Dosing timer cycle

6.4.6 Dosing timer week

In this operation mode, up to 16 dosing procedures are defined for a week. These dosing procedures may take place regularly on one or several week days. The setting range for the batch volume corresponds to the values in section 6.4.4 Batch (pulse-based).

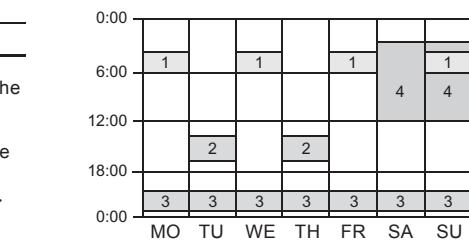


Warning

When time or date is changed in "Time+date" menu, timer dosing and timer relay output functions (Relay 2) are stopped!

Timer dosing and timer relay output functions must be restarted manually!

Changing time or date can cause increase or decrease in concentration!



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Fig. 28 Example for Dosing timer week function

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Note *If several procedures overlap, the process with the higher dosing flow has priority!*

In the event of an interruption (e.g. disconnection of the mains voltage, External stop), the dosing is stopped while the time continues running. After suspending the interruption, the pump continues to dose according to the actual timeline position.

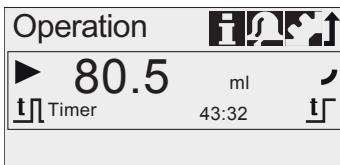
The following settings are required in the "Setup > Dosing timer week" menu for each dosing procedure:



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Fig. 29 Setting the timer

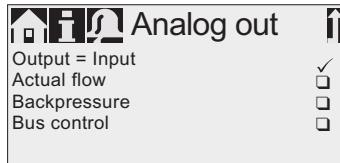
The batch volume (e.g. 80.5 ml) is set in the "Setup > Dosing timer week" menu. The dosing time required for this (e.g. 39.0) is displayed and can be changed. In the "Operation" menu, the total batch volume (e.g. 80.5 ml) and the remaining batch volume to be dosed is displayed. During breaks in dosing, the time (e.g. 43:32) until the next dosing is displayed.



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Fig. 30 Weekly timer dosing (break in dosing)

6.5 Analog output



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Fig. 31 Configure analog output

The analog output of the pump is parametrised in the "Setup > Analog output" menu. The following settings are possible:

Setting	Description of output signal	Variant		
		FCM	FC	AR
Output = Input	The analog input signal is mapped 1:1 to the analog output (e.g. to control several pumps using one signal)	X	X	X
Actual flow **	Current actual flow • 0/4 mA = 0 % • 20 mA = 100 % see section 6.9 Flow measurement	X	X*	X*
Backpressure	Backpressure, measured in the dosing head • 0/4 mA = 0 bar • 20 mA = Max. operating pressure see section 6.8 Pressure monitoring	X	X	
Bus control	Enabled by command in Bus control, see section 6.15 Bus communication	X	X	X

* Output signal is based on motor speed and pump status (target flow).

** Signal has same analog scaling as the current analog input signal. See 6.4.3 Analog 0/4-20 mA.

Wiring diagram see section 4.3 Electrical connection.

In all operation modes, the analog output has a range of 4-20 mA.

Note **Exception: Operation mode 0-20 mA. Here, the analog output range is 0-20 mA.**

6.6 SlowMode



When the "SlowMode" function is enabled, the pump slows down the suction stroke. The function is enabled in the "Setup > SlowMode" menu and is used to prevent cavitation in the following cases:

- for dosing media with a high viscosity
- for degassing dosing media
- for long suction lines
- for large suction lift.

In the "Setup > SlowMode" menu, the speed of the suction stroke can be reduced to 50 % or 25 %.

Enabling the 'SlowMode' function reduces the maximum dosing flow of the pump to the set percentage value!

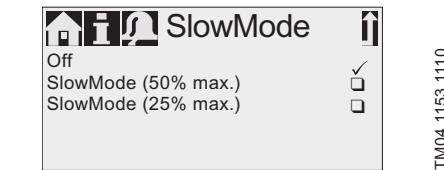


Fig. 32 SlowMode menu

6.7 FlowControl

Applies to DDA-FC/FCM control variant.

This function is used to monitor the dosing process. Although the pump is running, various influences e.g. air bubbles, can cause a reduced flow or even stop the dosing process. In order to guarantee optimum process safety, the enabled "FlowControl" function directly detects and indicates the following errors and deviations:

- Overpressure
- Damaged discharge line
- Air in the dosing chamber
- Cavitation
- Suction valve leakage > 70 %
- Discharge valve leakage > 70 %.

The occurrence of a fault is indicated by the 'eye' symbol flashing. The faults are displayed in the "Alarm" menu (see section 8. *Faults*).



FlowControl works with a maintenance-free sensor in the dosing head. During the dosing process, the sensor measures the current pressure and continuously sends the measured value to the microprocessor in the pump. An internal indicator diagram is created from the current measured values and the current diaphragm position (stroke length). Causes for deviations can be identified immediately by aligning the current indicator diagram with a calculated optimum indicator diagram. Air bubbles in the dosing head reduce e.g. the discharge phase and consequently the stroke volume (see fig. 33).

Requirements for a correct indicator diagram are:

- FlowControl function is active
- pressure difference between suction and discharge side is > 2 bar
- No interruption/pause in discharge stroke
- Pressure sensor and cable are functioning properly
- No leakage > 50 % in suction or discharge valve

If one of these requirements is not met, the indicator diagram cannot be evaluated.

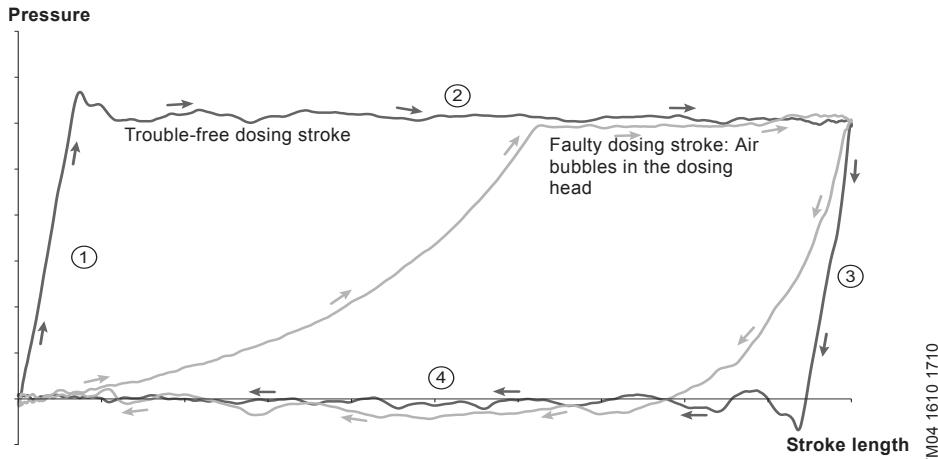


Fig. 33 Indicator diagram

1	Compression phase
2	Discharge phase
3	Expansion phase
4	Suction phase

Setting FlowControl

The "FlowControl" function is set using the two parameters "Sensitivity" and "Delay" in the "Setup > FlowControl" menu.

Sensitivity

In "Sensitivity" the deviation in stroke volume, which will result in an error message, is set in percent.

Sensitivity	Deviation
low	approx. 70 %
medium	approx. 50 %
high	approx. 30 %

Delay

The "Delay" parameter is used to define the time period until an error message is generated: "short", "medium" or "long". The delay depends on the set dosing flow and therefore cannot be measured in strokes or time.

Air bubbles

The "FlowControl" function identifies air bubbles > 60 % of the stroke volume. After switching to "Air bubble" warning status, the pump adapts the stroke frequency to approximately 30-40 % of max. stroke frequency, and starts a special motor drive strategy. The adaptation of the stroke frequency allows the air bubbles to rise from suction to discharge valve. Due to the special motor drive strategy the air bubbles are displaced from the dosing head into the discharge line.

If the air bubbles have not been eliminated after a maximum of 60 strokes, the pump returns to the normal motor drive strategy.

6.8 Pressure monitoring

Applies to DDA-FC/FCM control variant.

A pressure sensor monitors the pressure in the dosing head. If the pressure during the discharge phase falls below 2 bar, a warning is generated (pump continues running). If in the "Setup > Pressure monitoring" menu the function "Min. pressure alarm" is activated, an alarm is generated and the pump is stopped.

If the pressure exceeds the "Max. pressure" set in the "Setup > Pressure monitoring" menu, the pump is shut down, enters the standby state and indicates an alarm.

Caution *The pump restarts automatically once the backpressure falls below the set "Max. pressure"!*

6.8.1 Pressure setting ranges

Type	Fixed min. pressure [bar]	Adjustable max. pressure [bar]
DDA 7.5-16	< 2	3-17
DDA 12-10	< 2	3-11
DDA 17-7	< 2	3-8
DDA 30-4	< 2	3-5

Warning

Caution *Install a pressure-relief valve in the pressure line to provide protection against impermissibly high pressure!*

Caution *The pressure measured in the dosing head is slightly higher than the actual system pressure.*

Caution *Therefore the "Max. pressure" should be set at least 0.5 bar higher than the system pressure.*

6.8.2 Calibration of pressure sensor

The pressure sensor is calibrated in the factory. As a rule, it does not need to be re-calibrated. If specific circumstances (e.g. pressure sensor exchange, extreme air pressure values at the location of the pump) necessitate a calibration, the sensor can be calibrated as follows:

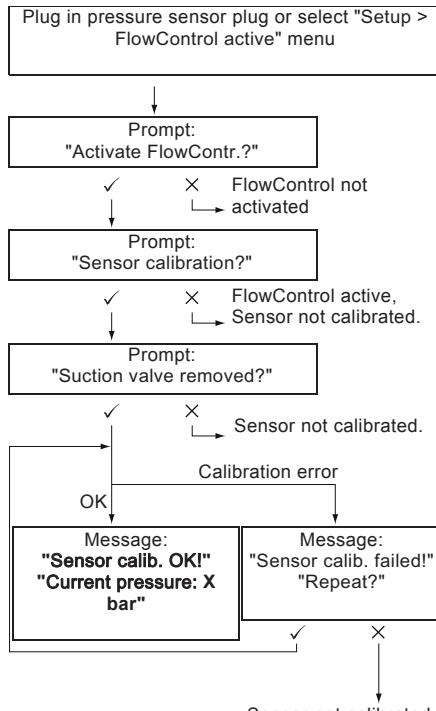
1. Set pump to "Stop" operating state.
2. Make system pressureless and flush.
3. Dismantle suction line and suction valve.

Warning

Calibrating when the suction valve is installed produces incorrect calibration and can cause personal injuries and damage to property!

Only carry out a calibration if this is technically required!

4. Proceed as described below to calibrate:



6.9 Flow measurement

Applies to DDA-FCM control variant.

The pump accurately measures the actual flow and displays it. Via the 0/4-20 mA analog output, the actual flow signal can easily be integrated into an external process control without additional measuring equipment (see section 6.5 *Analog output*).

The flow measurement is based on the indicator diagram as described in section 6.7 *FlowControl*. The accumulated length of the discharge phase multiplied by the stroke frequency produces the displayed actual flow. Faults e.g. air bubbles or backpressure that is too low result in a smaller or larger actual flow. When the "AutoFlowAdapt" function is activated (see section

6.10 *AutoFlowAdapt*), the pump compensates for these influences by correction of the stroke frequency.

Strokes which cannot be analysed (partial strokes, pressure differential which is too low) are provisionally calculated based on the setpoint value and displayed.

Note

6.10 AutoFlowAdapt

Applies to DDA-FCM control variant.

The "AutoFlowAdapt" function is activated in the "Setup" menu. It detects changes in various parameters and responds accordingly in order to keep the set target flow constant.

Dosing accuracy is increased when "AutoFlowAdapt" is activated.

Note

This function processes information from the pressure sensor in the dosing head. Errors detected by the sensor are processed by the software. The pump responds immediately regardless of the operation mode by adjusting the stroke frequency or where necessary compensating for the deviations with a corresponding indicator diagram.

If the target flow cannot be achieved by the adjustments, a warning is issued.

"AutoFlowAdapt" operates on the basis of the following functions:

- FlowControl: malfunctions are identified (see section 6.7 *FlowControl*).
- Pressure monitoring: pressure fluctuations are identified (see section 6.8 *Pressure monitoring*).
- Flow measurement: deviations from the target flow are identified (see section 6.9 *Flow measurement*).



Example of "AutoFlowAdapt"

Pressure fluctuations

The dosing volume decreases as backpressure increases and conversely the dosing volume increases as the backpressure decreases.

The "AutoFlowAdapt" function identifies pressure fluctuations and responds by adjusting the stroke frequency. The actual flow is thus maintained at a constant level.

6.11 Auto deaeration



Dosing degassing media can result in air pockets in the dosing head during breaks in dosing. This can result in no medium being dosed when restarting the pump. The "Setup > Auto deaeration" function performs pump deaeration automatically at regular intervals.

Software-controlled diaphragm movements encourage any bubbles to rise and gather at the discharge valve so that they can be removed on the next dosing stroke.

The function works:

- when the pump is not in the "Stop" operating state
- during breaks in dosing (e.g. External stop, no incoming pulses, etc.).

The diaphragm movements can displace small volumes into the discharge line. When dosing strongly degassing media, this is however virtually impossible.

6.12 Key lock



The key lock is set in the "Setup > Key lock" menu by entering a four-digit code. It protects the pump by preventing changes to settings. Two levels of key lock can be selected:

Level	Description
Settings	All settings can only be changed by entering the lock code. The [Start/stop] key and the [100%] key are not locked.
Settings + keys	The [Start/stop] key and the [100%] key and all settings are locked.

It is still possible to navigate in the "Alarm" and "Info" main menu and reset alarms.

6.12.1 Temporary deactivation

If the "Key lock" function is activated but settings need to be modified, the keys can be unlocked temporarily by entering the deactivation code. If the code is not entered within 10 seconds, the display automatically switches to the "Operation" main menu. The key lock remains active.

6.12.2 Deactivation

The key lock can be deactivated in the "Setup > Key lock" menu via the "Off" menu point. The key lock is deactivated after the general code "2583" or a pre-defined custom code has been entered.

6.13 Display Setup

Use the following settings in the "Setup > Display" menu to adjust the display properties:

- Units (metric/US)
- Display contrast
- Additional display.

6.13.1 Units

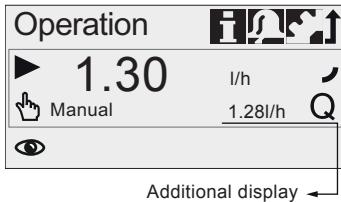
Metric units (litres/millilitres/bar) or US units (US gallons/PSI) can be selected. According to the operation mode and menu, the following units of measurement are displayed:

Operation mode / function	Metric units	US units
Manual control	ml/h or l/h	gph
Pulse control	ml/ Δt	ml/ Δt
0/4-20 mA Analog control	ml/h or l/h	gph
Batch (pulse- or timer-controlled)	ml or l	gal
Calibration	ml	ml
Volume counter	l	gal
Pressure monitoring	bar	psi

6.13.2 Additional display

The additional display provides additional information about the current pump status. The value is shown in the display with the corresponding symbol.

In "Manual" mode the "Actual flow" information can be displayed with $Q = 1.28 \text{ l/h}$ (see fig. 34).



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Fig. 34 Display with additional display

The additional display can be set as follows:

Setting	Description
Default display	Depending on the operation mode:
	Q Actual flow (Manual/Pulse) ^{1), 2)}
	Q Target flow (Pulse)
	\odot Input current (analog)
	\square Remaining batch volume (Batch, Timer)
	\square Period until next dosing (Timer)
Dosed volume	V Dosed vol. since last reset (see <i>Counters</i> on page 24)
Actual flow	Q Current actual flow ¹⁾
Backpressure	P Current backpressure in the dosing head ³⁾

¹⁾ only DDA-FCM control variant

²⁾ only if indicator diagram can be evaluated (see *6.7 FlowControl*)

³⁾ only DDA-FCM/FC control variant

6.14 Time+date

The time and date can be set in the "Setup > Time+date" menu.

Warning

When time or date is changed in "Time+date" menu, timer dosing and timer relay output functions (Relay 2) are stopped!



Timer dosing and timer relay output functions must be restarted manually!

Changing time or date can cause increase or decrease in concentration!

The conversion between summer and winter time does not take place automatically!

Caution

6.15 Bus communication

The bus communication enables remote monitoring and setting of the pump via a fieldbus system.

6.15.1 GENibus communication

The pump is supplied with an integrated module for GENibus communication. The pump identifies the bus control after connecting to the corresponding signal input. The "Activate communication?" prompt is displayed. After confirmation, the corresponding symbol appears in the "Activated functions" area in the "Operation" menu.

In the "Setup > Bus" menu the GENibus address can be set from 32 to 231 and bus control can be deactivated.



Fig. 35 Bus menu

6.15.2 Profibus® communication

The pump can be integrated into a Profibus DP network using the additional E-box 150 (retrofitting possible for software version V2.0 and higher).

Warning

Prior to installation and start-up, read the documentation delivered with the E-Box 150!

The functional profile for Profibus communication and the GSD-file can be found on the product CD delivered with the E-box 150.

Activate communication

- Set the pump to operating state "Stop" with the [Start/stop] key.
- Switch off the power supply of the pump.
- Install and connect the E-Box 150 as described in the separate installation and operating instructions of the E-Box 150.
- Switch on the power supply of the pump.

The "Activate communication?" prompt is displayed.

After confirmation, the "Bus" symbol appears in the "Activated functions" area of the "Operation" menu, no matter if the prompt was accepted or refused.

BUS

If the prompt has been accepted, the bus control function is activated. If the prompt has been refused, bus control function can be activated in "Setup > Bus" menu.



Fig. 36 Submenu for Profibus

Setting the bus address

- Enter "Setup > Bus" menu and set desired bus address from 0 to 126.
- The pump needs to be restarted to initialise the new bus address. Switch off the power supply of the pump and wait for approximately 20 seconds.
- Switch on the power supply of the pump.

The pump is initialised with the new bus address.

Characteristics of bus communication

To start and stop the pump via Profibus, it needs to be in operating state "Running". When the pump is remotely stopped from Profibus, the "External stop" symbol is displayed and the pump switches to operating state "Standby".

While bus control function is activated, the "Setup" menu only shows the "Bus" and "Key lock" submenus. The other main menus, the "External stop" function and the keys are still available.

All operation modes (see section 6.4 Operation modes) can still be used when bus control is activated. This allows to use the bus control only for monitoring and setting the pump. In this case the "ProfibusWatchDog" (see functional profile on E-Box product CD) should be deactivated in Profibus control, because otherwise faults in communication can stop the pump.

To change any settings manually, the bus control function must be deactivated temporarily.

The analog output can not be used while the pump is bus-controlled as both functions use the same electrical connection. See section 4.3 Electrical connection.

Deactivate communication

Warning

After deactivating the bus control function, the pump can start automatically!

Before deactivating the bus control function, set the pump to operating state "Stop"!

Bus control function can be deactivated in the "Setup > Bus" menu. After deactivation all submenus in "Setup" menu are available.

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The "Bus" symbol in the display disappears at next restart of the pump, after the E-Box plug was disconnected.

Caution *After disconnecting any plug, always refit protective cap!*

Communication faults

Faults are only detected, if the "ProfibusWatchDog" (see functional profile on E-Box product CD) is activated.

Warning

After a communication fault is repaired, the pump can start automatically, depending on current bus control and pump settings!

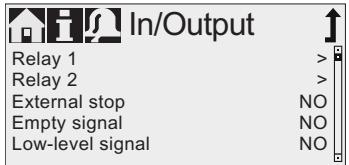


Before repairing any fault, set the pump to operating state "Stop"!

In case of bus communication faults (e.g. communication cable break), the pump stops dosing and switches to operating state "Standby" approximately 10 seconds after the fault was detected. An alarm is triggered, detailing the cause of the fault. See section 8. *Faults*.

6.16 Inputs/Outputs

In the "Setup > Inputs/Outputs" menu, you can configure the two outputs "Relay 1+Relay 2" and the signal inputs "External stop", "Empty signal" and "Low-level signal".



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Fig. 37 Inputs/Outputs menu

Warning

When time or date is changed in "Time+date" menu, timer dosing and timer relay output functions (Relay 2) are stopped!



Timer dosing and timer relay output functions must be restarted manually!

Changing time or date can cause increase or decrease in concentration!

6.16.1 Relay outputs

The pump can switch two external signals using installed relays. The relays are switched by potential-free pulses. The connection diagram of the relays is shown in section 4.3 *Electrical connection*. Both relays can be allocated with the following signals:

Relay 1 signal	Relay 2 signal	Description
Alarm *	Alarm	Display red, pump stopped (e.g. empty signal, etc.)
Warning *	Warning	Display yellow, pump is running (e.g. low-level signal, etc.)
Stroke signal	Stroke signal	Each full stroke
Pump dosing	Pump dosing *	Pump running and dosing
Pulse input **	Pulse input **	Each incoming pulse from pulse input
Bus control	Bus control	Activated by a command in the bus communication
	Timer Cycle	See following sections
	Timer Week	See following sections

Contact type

NO *	NO *	Normally open contact
NC	NC	Normally closed contact

* Factory setting

** The correct transmission of incoming pulses can only be guaranteed up to a pulse frequency of 5 Hz.

Timer Cycle (Relay 2)

For the "Relay 2 > Timer Cycle" function, set the following parameters:

- On (t_1)
- Start delay (t_2)
- Cycle time (t_3)

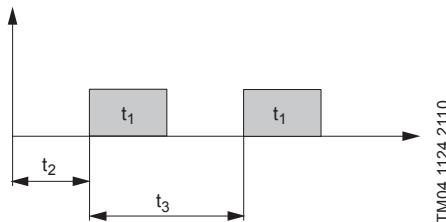


Fig. 38 Diagram

Timer Week (Relay 2)

This function saves up to 16 relay on-times for a week. The following settings can be made for each relay switching operation in the "Relay 2 > Timer Week" menu:

- Procedure (No.)
- On time (duration)
- Start time
- Weekdays.

6.16.2 External stop

The pump can be stopped via an external pulse, e.g. from a control room. When activating the external stop pulse, the pump switches from the operating state "Running" into the operating state "Standby". The corresponding symbol appears in the "Signal/error display" area of the display.

Caution

Frequent disengagement from the mains voltage, e.g. via a relay, can result in damage to the pump electronics and in the breakdown of the pump. The dosing accuracy is also reduced as a result of internal start procedures.

Do not control the pump via the mains voltage for dosing purposes!

Only use the "External stop" function to start and stop the pump!

The contact type is factory-set to normally open contact (NO). In the "Setup > Inputs/Outputs > External stop" menu, the setting can be changed to normally closed contact (NC).

6.16.3 Empty and Low level signals

In order to monitor the filling level in the tank, a dual-level sensor can be connected to the pump. The pump responds to the signals as follows:

Sensor signal	Pump status
Low level	<ul style="list-style-type: none"> • Display is yellow • Flashes • Pump continues running
Empty	<ul style="list-style-type: none"> • Display is red • Flashes • Pump stops

Caution *When the tank is filled up again, the pump restarts automatically!*

Both signal inputs are allocated to the normally open contact (NO) in the factory. They can be re-allocated in the "Setup > Inputs/Outputs" menu to normally closed contact (NC).

6.17 Basic settings

All settings can be reset to the settings default upon delivery in the "Setup > Basic settings" menu.

Selecting "Save customer settings" saves the current configuration to the memory. This can then be activated using "Load customer settings".

The memory always contains the previously saved configuration. Older memory data is overwritten.

**7. Service**

In order to ensure a long service life and dosing accuracy, wearing parts such as diaphragms and valves must be regularly checked for signs of wear. Where necessary, replace worn parts with original spare parts made from suitable materials.

Should you have any questions, please contact your service partner.

Warning

If the diaphragm leaks or is broken, dosing liquid will escape from the drain opening on the dosing head (see fig. 3).



Take suitable precautions to prevent harm to health and damage to property caused by escaping dosing liquid!

Check daily whether liquid is escaping from the drain opening!

7.1 Cleaning

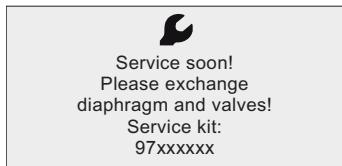
If necessary, clean all pump surfaces with a dry and clean cloth.

7.2 Service system

According to the motor runtime or after a defined period of operation, service requirements will appear. Service requirements appear regardless of the current operating state of the pump and do not affect the dosing process.

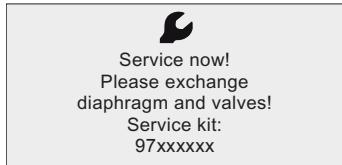
Service requirement	Motor runtime [h] *	Time interval [months] *
Service soon!	7500	23
Service now!	8000	24

* Since the last service system reset



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Fig. 39 Service soon!



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Fig. 40 Service now!

The service requirement signals when the replacement of wearing parts is due and displays the number of the service kit. Press the click wheel to temporarily hide the service prompt.

When the "Service now!" message appears (displayed daily), the pump must be serviced immediately. The symbol appears in the "Operation" menu.

The number of the service kit required is also displayed in the "Info" menu.

For media which result in increased wear, the service interval must be shortened.

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7.3 Perform service

Only spare parts and accessories from Grundfos should be used for maintenance. The usage of non-original spare parts and accessories renders any liability for resulting damages null and void. Information about carrying out maintenance can be found in the service kit catalog on our homepage (www.grundfos.com).

Warning

Risk of chemical burns!

When dosing dangerous media, observe the corresponding precautions in the safety data sheets!



Wear protective clothing (gloves and goggles) when working on the dosing head, connections or lines!

Do not allow any chemicals to leak from the pump. Collect and dispose of all chemicals correctly!

Before any work to the pump, the pump must be in the "Stop" operating state or be disconnected from the mains.

The system must be pressureless!

Caution

7.3.1 Dosing head overview

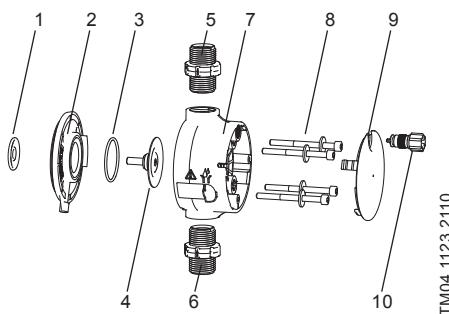


Fig. 41 Changing the diaphragm and valves

1	Safety diaphragm
2	Flange
3	O-ring
4	Diaphragm
5	Valve on discharge side
6	Valve on suction side
7	Dosing head
8	Screws with discs
9	Cover
10	Deaeration valve

7.3.2 Dismantling the diaphragm and valves

1. Make system pressureless.
2. Empty dosing head before maintenance and flush it if necessary.
3. Set pump to "Stop" ■ operating state using the [Start/stop] key.
4. Press the [Start/stop] and [100%] keys at the same time to put the diaphragm into "out" position.
– Symbol (← must be displayed (see fig. 14).
5. Take suitable steps to ensure that the returning liquid is safely collected.
6. Dismantle suction, pressure and deaeration hose.
7. Dismantle valves on suction and discharge side (5, 6).
8. Remove the cover (9).
9. Undo screws (8) on the dosing head (7) and remove with discs.
10. Remove the dosing head (7).
11. Unscrew diaphragm (4) counter-clockwise and remove with flange (2).

7.3.3 Reassembling the diaphragm and valves

1. Attach flange (2) correctly and screw on new diaphragm (4) clockwise.
– Make sure that the O-ring (3) is seated correctly!
2. Press the [Start/stop] and [100%] keys at the same time to put the diaphragm into "in" position.
– Symbol (→ must be displayed (see fig. 14).
3. Attach the dosing head (7).
4. Install screws with discs (8) and cross-tighten.
– Torque: 3 Nm.
5. Attach the cover (9).
6. Install new valves (5, 6).
– Do not interchange valves and pay attention to direction of arrow.
7. Connect suction, pressure and deaeration hose (see section 4.2 *Hydraulic connection*)
8. Press the [Start/stop] key to leave the service mode.
9. Degaerate dosing pump (see section 5.2 *Degaerating the pump*).
10. Please observe the notes on commissioning in section 5. Start-up!

7.4 Resetting the service system

After performing the service, the service system must be reset using the "Info > Reset service system" function.

7.5 Repairs

Warning

The pump housing must only be opened by personnel authorised by Grundfos!



Repairs must only be carried out by authorised and qualified personnel!

Switch off the pump and disconnect it from the voltage supply before carrying out maintenance work and repairs!

After consulting Grundfos, please send the pump, together with the safety declaration completed by a specialist, to Grundfos. The safety declaration can be found at the end of these instructions. It must be copied, completed and attached to the pump.

Caution

If the pump has been used to dose toxic liquids or liquids hazardous to health, the pump must be cleaned prior to dispatch!

If the above requirements are not met, Grundfos may refuse to accept delivery of the pump. The shipping costs will be charged to the sender.

8. Faults

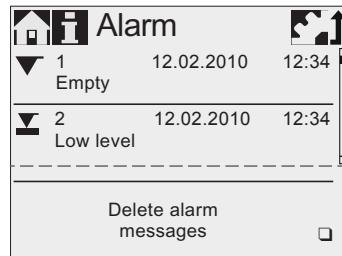
In the event of faults in the dosing pump, a warning or an alarm is triggered. The corresponding fault symbol flashes in the "Operation" menu, see section 8.1 *List of faults*. The cursor jumps to the "Alarm" main menu symbol. Press the click wheel to open the "Alarm" menu and, where necessary, faults to be acknowledged will be acknowledged.

A yellow display indicates a warning and the pump continues running.

A red display indicates an alarm and the pump is stopped.

The last 10 faults are stored in the "Alarm" main menu. When a new fault occurs, the oldest fault is deleted.

The two most recent faults are shown in the display, you can scroll through all the other faults. The time and cause of the fault are displayed.



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The list of faults can be deleted at the end of the list. If there is a service requirement, this appears when the "Alarm" menu is opened. Press the click wheel to temporarily close the service prompt (see section 7.2 *Service system*).

8.1 List of faults

8.1.1 Faults with error message

Display in the "Alarm" menu	Possible cause	Possible remedy
▼ Empty (Alarm)	<ul style="list-style-type: none"> Dosing medium tank empty 	<ul style="list-style-type: none"> Fill tank. Check contact setting (NO/NC).
▼ Low level (Warning)	<ul style="list-style-type: none"> Dosing medium tank almost empty 	
Overpressure (Alarm)	<ul style="list-style-type: none"> Discharge valve blocked Isolating valve in discharge line closed Pressure peaks due to high viscosity Max. pressure set too low (see section 6.8 <i>Pressure monitoring</i>) 	<ul style="list-style-type: none"> Replace valve if necessary (see section 7.3 <i>Perform service</i>). Check flow direction of valves (arrow) and correct if necessary. Open the isolating valve (on the discharge side). Enlarge diameter of discharge line. Change pressure setting (see section 6.8 <i>Pressure monitoring</i>).
Low backpressure (Warning/alarm *)	<ul style="list-style-type: none"> Faulty diaphragm Broken discharge line Pressure differential between suction and discharge side too low Leakage in the pressure loading valve at $Q < 1 \text{ l/h}$ Deareration valve open 	<ul style="list-style-type: none"> Change the diaphragm (see section 7.3 <i>Perform service</i>). Check discharge line and repair if necessary. Install additional spring-loaded valve (approx. 3 bar) on the discharge side. Close the deareration valve.
Air bubble (Warning)	<ul style="list-style-type: none"> Broken/leaky suction line Strongly degassing medium Tank dosing medium empty 	<ul style="list-style-type: none"> Check suction line and repair if necessary. Provide positive inlet pressure (place dosing medium tank above the pump). Enable "SlowMode" (see section 6.6 <i>SlowMode</i>). Fill tank.
👁 Cavitation (Warning)	<ul style="list-style-type: none"> Blocked/constricted/squeezed suction line Blocked/constricted suction valve Suction lift too high Viscosity too high 	<ul style="list-style-type: none"> Enable "SlowMode" (see section 6.6 <i>SlowMode</i>). Reduce suction lift. Increase suction hose diameter. Check suction line and open isolating valve if necessary.
Suct. valve leak (Warning)	<ul style="list-style-type: none"> Leaky/dirty suction valve Deareration valve open 	<ul style="list-style-type: none"> Check valve and tighten it up. Flush system. Replace valve if necessary (see section 7.3 <i>Perform service</i>). Check O-ring position. Install filter in suction line. Close the deareration valve.
Disch. valve leak (Warning)	<ul style="list-style-type: none"> Leaky/dirty discharge valve Leakage in the pressure loading valve Deareration valve open 	<ul style="list-style-type: none"> Check valve and tighten it up. Flush system. Replace valve if necessary (see section 7.3 <i>Perform service</i>). Check O-ring position. Install screen in suction line. Close the deareration valve. Install spring-loaded valve on the discharge side.
Flow deviation (Warning)	<ul style="list-style-type: none"> Considerable deviation between target and actual flow Pump not or incorrectly calibrated 	<ul style="list-style-type: none"> Check installation. Calibrate the pump (see section 5.3 <i>Calibrating the pump</i>).

Display in the "Alarm" menu	Possible cause	Possible remedy
Pressure sensor (Warning)	<ul style="list-style-type: none"> Broken "FlowControl" cable (see fig. 11) Sensor defect Pressure sensor not correctly calibrated. 	<ul style="list-style-type: none"> Check plug connection. Change sensor if necessary. Calibrate pressure sensor correctly (see section 6.8.2 <i>Calibration of pressure sensor</i>).
Motor blocked (Alarm)	<ul style="list-style-type: none"> Backpressure greater than nominal pressure Damage to gears 	<ul style="list-style-type: none"> Reduce backpressure. Arrange for repair of gears, if necessary.
BUS Bus error (Alarm)	<ul style="list-style-type: none"> Fieldbus communication error 	<ul style="list-style-type: none"> Check cables for correct specification and damage; replace if necessary. Check cable routing and shielding; correct if necessary.
E-Box (Alarm)	<ul style="list-style-type: none"> E-Box connection error Faulty E-Box 	<ul style="list-style-type: none"> Check plug connection. Replace E-Box if necessary.
Cable break (Alarm)	<ul style="list-style-type: none"> Defect in analog cable 4-20 mA (input current < 2 mA) 	<ul style="list-style-type: none"> Check cable/plug connections and replace, if necessary. Check signal transmitter.
Service now (Warning)	<ul style="list-style-type: none"> Time interval for service expired 	<ul style="list-style-type: none"> Perform service (see section 7.3 <i>Perform service</i>).

* Depending on setting

8.1.2 General faults

Fault	Possible cause	Possible remedy
Dosing flow too high	Inlet pressure greater than backpressure	Install additional spring-loaded valve (approx. 3 bar) on the discharge side.
		Increase pressure differential.
	Incorrect calibration	Calibrate the pump (see section 5.3 <i>Calibrating the pump</i>).
	Air in dosing head	Deaerate the pump.
	Faulty diaphragm	Change the diaphragm (see section 7.3 <i>Perform service</i>).
	Leakage/fracture in lines	Check and repair lines.
	Valves leaking or blocked	Check and clean valves.
	Valves installed incorrectly	Check that the arrow on the valve housing is pointing in the direction of flow. Check whether all O-rings are installed correctly.
	Blocked suction line	Clean suction line/install filter.
		Reduce suction lift.
No dosing flow or dosing flow too low	Suction lift too high	Install priming aid.
		Enable "SlowMode" (see section 6.6 <i>SlowMode</i>).
	Viscosity too high	Enable "SlowMode" (see section 6.6 <i>SlowMode</i>).
		Use hose with larger diameter.
	Faulty calibration	Calibrate the pump (see section 5.3 <i>Calibrating the pump</i>).
	Deaeration valve open	Close the deaeration valve.

Fault	Possible cause	Possible remedy
Irregular dosing	Valves leaking or blocked	Tighten up valves, replace valves if necessary (see section 7.3 <i>Perform service</i>).
	Backpressure fluctuations	Keep backpressure constant. Activate "AutoFlowAdapt" (only DDA-FCM).
Liquid escaping from the drain opening on the flange	Faulty diaphragm	Change the diaphragm (see section 7.3 <i>Perform service</i>).
Liquid escaping	Dosing head screws not tightened	Tighten up screws (see section 4.2 <i>Hydraulic connection</i>).
	Valves not tightened	Tighten up valves/union nuts (see section 4.2 <i>Hydraulic connection</i>).
Pump not sucking in	Suction lift too high	Reduce suction lift; if necessary, provide positive inlet pressure.
	Backpressure too high	Open the deaeration valve.
	Soiled valves	Flush system, replace valves if necessary (see section 7.3 <i>Perform service</i>).

9. Disposal

This product or parts of it must be disposed of in an environmentally sound way. Use appropriate waste collection services. If this is not possible, contact the nearest Grundfos company or service workshop.



Subject to alterations.

Appendix

Safety declaration

Please copy, fill in and sign this sheet and attach it to the pump returned for service.

Note *Fill in this document using English or German language.*

Product type (nameplate)

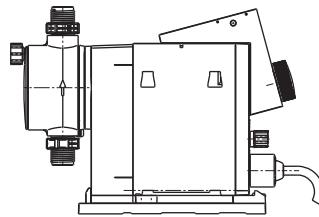
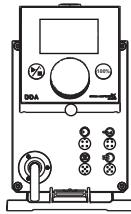
Model number (nameplate)

Dosing medium

Fault description

Please make a circle around the damaged parts.

In the case of an electrical or functional fault, please mark the cabinet.



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Please describe the error/cause of the error in brief.

We hereby declare that the pump has been cleaned and is completely free from chemical, biological and radioactive substances.

Date and signature

Company stamp

Argentina

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Ruta Panamericana km. 37.500 Lote
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ST49 Lowood STP - Auxiliary Chemical Dosing System - OM Manual

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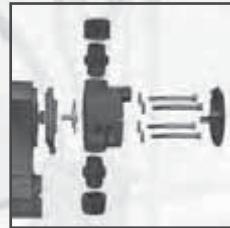
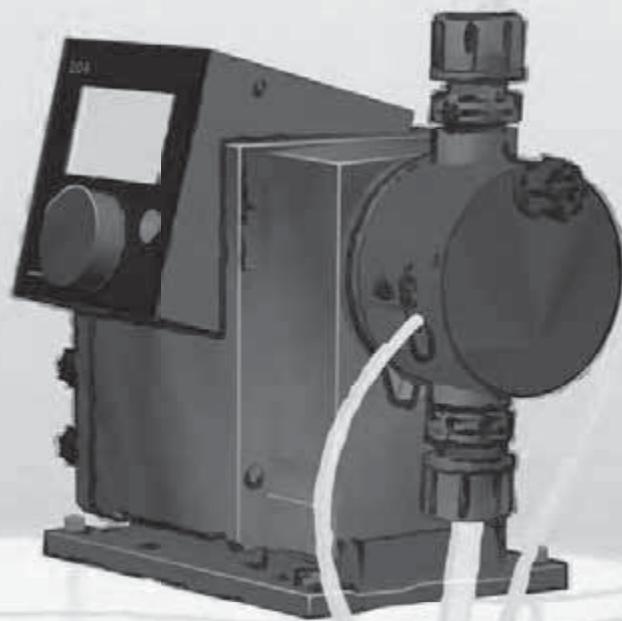
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DDA, DDC



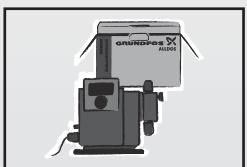
GB	This Quick Guide belongs to the DDA / DDC dosing pump and is only valid together with the respective installation and operating instructions.	SI	Ta Hitri vodnik sodi k dozirni črpalki DDA / DDC in je veljaven samo v povezavi s pripadajočimi navodili za montažo in obratovanje.
DE	Dieser Quick-Guide gehört zu der Dosierpumpe DDA / DDC und ist nur in Verbindung mit der zugehörigen Montage- und Betriebsanleitung gültig.	HR	Ovaj Brzi vodič priložen je crpki za doziranje DDA / DDC i vrijedi samo uz odgovarajuće montažne i pogonske upute.
FR	Ce guide rapide concerne la pompe de dosage DDA / DDC et n'est valable qu'en liaison avec la notice d'installation et d'entretien correspondante.	RS	Ovaj brzi vodič pripada pumpi za doziranje DDA / DDC i važi samo u povezanosti sa to pripadajućim uputstvom za montažu i upotrebu.
IT	La presente guida rapida riguarda la pompa di dosaggio DDA / DDC ed è valida solo se accompagnata dalle relative istruzioni di installazione e funzionamento.	RO	Acest ghid sumar este aferent pompei de dozare DDA / DDC și este valabil numai în combinație cu instrucțiuni de instalare și utilizare.
ES	Esta Guía Rápida pertenece a la bomba dosificadora DDA / DDC y sólo se considera válida en combinación con las instrucciones de instalación y funcionamiento.	BG	Това Кратко ръководство принадлежи към дозиращата помпа DDA / DDC и е валидно само във връзка със съответното Упътване за монтаж и експлоатация.
PT	Este guia rápido faz parte da bomba de dosagem DDA / DDC e só é válido em conjunto com as instruções de instalação e funcionamento correspondentes.	CZ	Tento stručný průvodce je součástí dávkovacího čerpadla DDA / DDC a je platný pouze ve spojení s příslušným montážním a provozním návodom.
GR	Αυτός ο σύντομος οδηγός ανήκει στην δοσομετρική αντλία DDA / DDC και ισχύει μόνο σε συνδυασμό με τις αντίστοιχες Οδηγίες εγκατάστασης και λειτουργίας.	SK	Tento rýchly návod patrí k dávkovaciemu čerpadlu DDA / DDC a je platný iba v spojení s príslušným návodom na montáž a prevádzku.
NL	Deze quick-guide hoort bij de doseerpomp DDA / DDC en is uitsluitend geldig in combinatie met de bijhorende installatie- en bedieningsinstructies.	TR	Bu Hızlı Başvuru Kılavuzu, DDA / DDC dozajlama pompası içindir ve ilgili montaj ve kullanım kılavuzu ile birlikte gelmiştir.
SE	Denna snabbguide hör samman med doseringspump DDA / DDC och gäller bara i kombination med monterings- och driftsinstruktion.	EE	Käesolev kiirjuhend kuulub doseerimispumba DDA / DDC juurde ning on kehtiv üksnes koos jurdekuuluva paigaldus- ja kasutusjuhendiga.
FI	Tämä pikaopas kuuluu annostelupumppuun DDA / DDC ja on voimassa vain vastaan vain asennus- ja käytööhajeiden kanssa.	LT	Šis trumpasis žinytas skirtas dozavimo siurbliui DDA / DDC ir galioja tik kartu su susijusia įrengimo ir naudojimo instrukcija.
DK	Denne quick-guide vedrører doseringspumpen DDA / DDC og er udelukkende gyldig i forbindelse med den tilhørende monterings- og driftsinstruktion.	LV	Šī īsā lietošanas pamācība attiecas uz dozatorūknī DDA / DDC un ir spēkā tikai kopā ar atbilstošo uzstādīšanas un ekspluatācijas instrukciju.
PL	Niniejszy krótki przewodnik należy do pompy dozącej DDA / DDC i obowiązuje jedynie w połączeniu z odpowiednią instrukcją montażu i eksploatacji.	UA	Це експрес-керівництво стосується насоса-дозатора DDA / DDC та є чинним тільки у сполученні з відповідними інструкціями з монтажу та експлуатації.
RU	Данное краткое руководство по эксплуатации относится к дозирующему насосу DDA / DDC и действительно только вместе с инструкцией по монтажу и эксплуатации.	CN	本快速指南是DDA / DDC型剂量泵的附件，仅限于与安装和使用说明书同时使用。
HU	Jelen összefoglaló útmutató a DDA / DDC adagoló-szivattyú tartozékát képezi, és kizárolag a hozzá tartozó szerelési és üzemeltetési utasítással együtt érvényes.	JP	この クイックガイドは 定量ポンプ DDA / DDC に属しており、それぞれ取付・取扱説明書と共に使用される場合に限り、有効です。
		KO	이 퀵가이드는 DDA / DDC 도징펌프의 구성품으로서 설치 및 작동 지침과 함께 사용할 때만 유효하다.



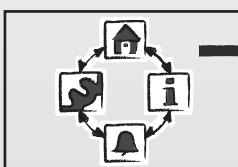
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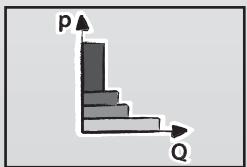
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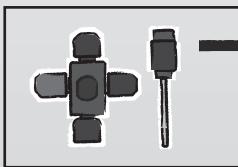
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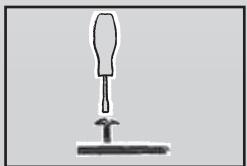
Chap. 6.



7



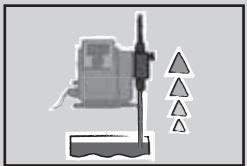
WWW



8 - 15



Chap. 9.



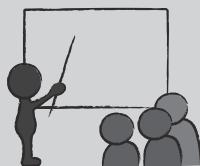
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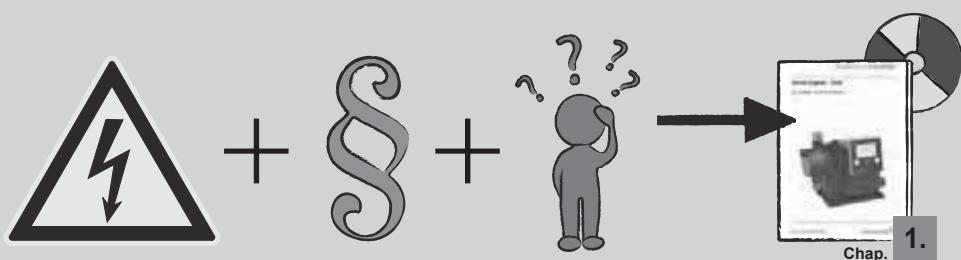
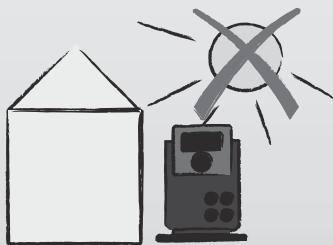


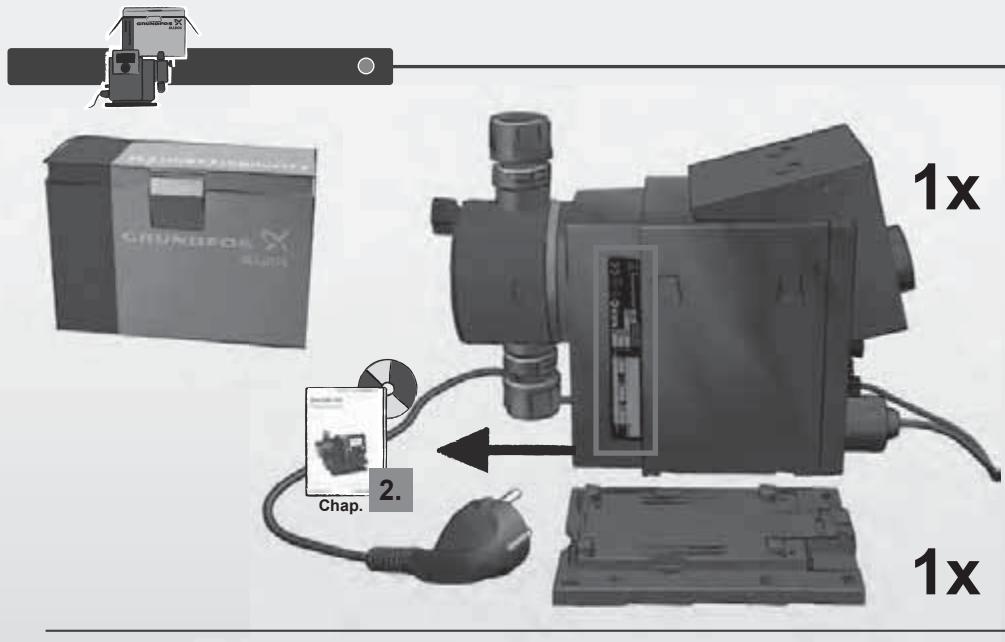
Chap. 8.



OO



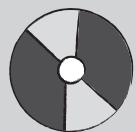


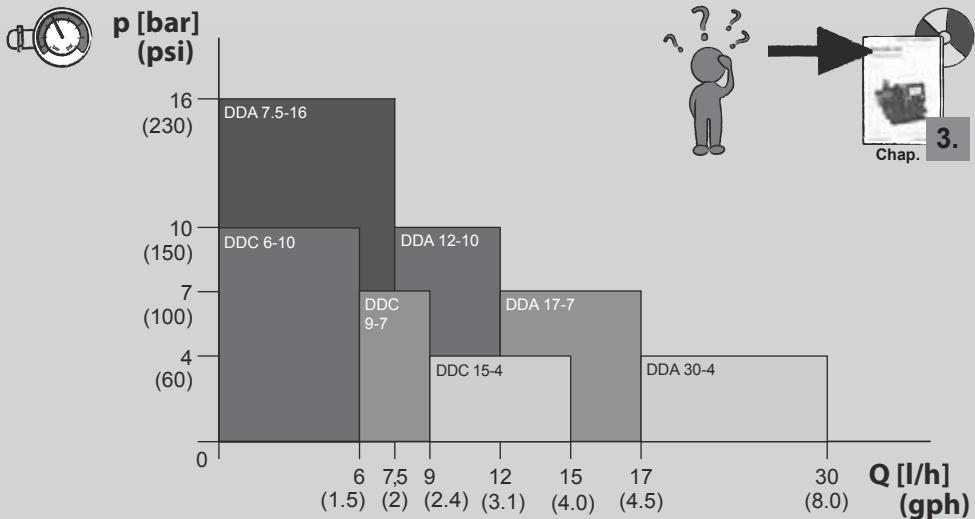
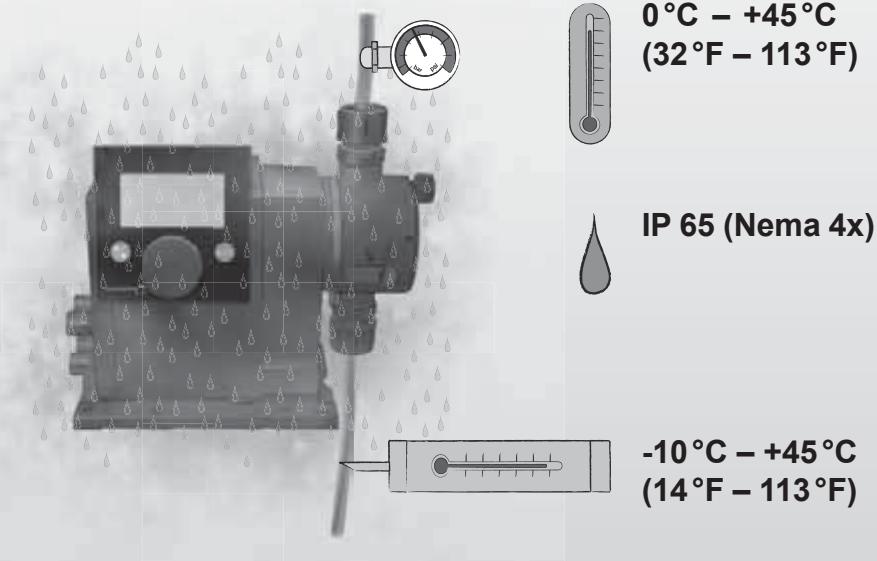


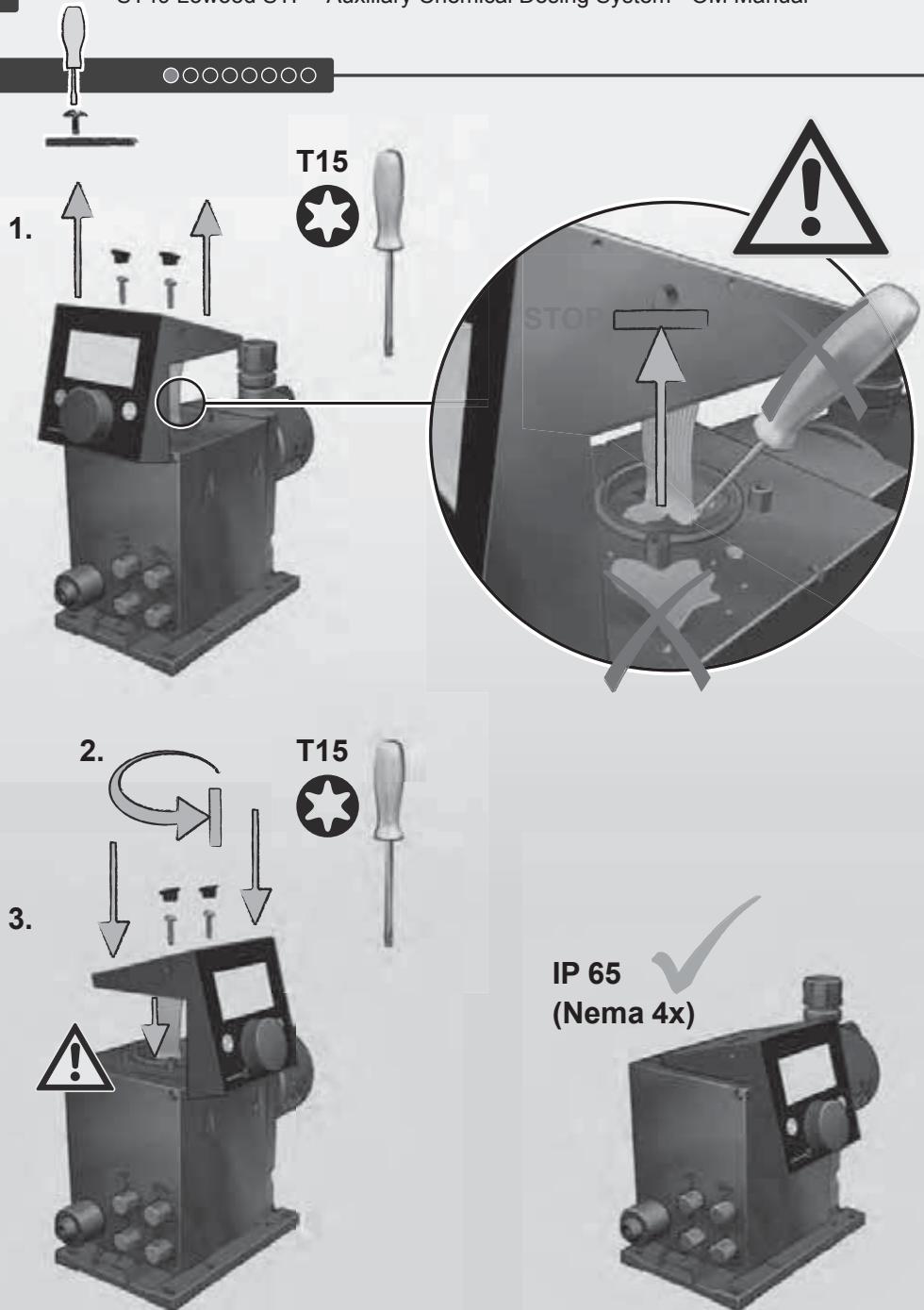
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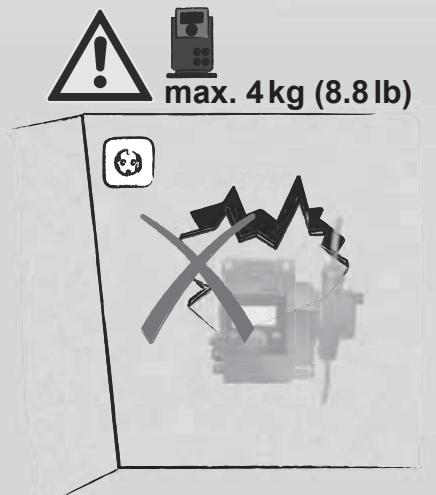
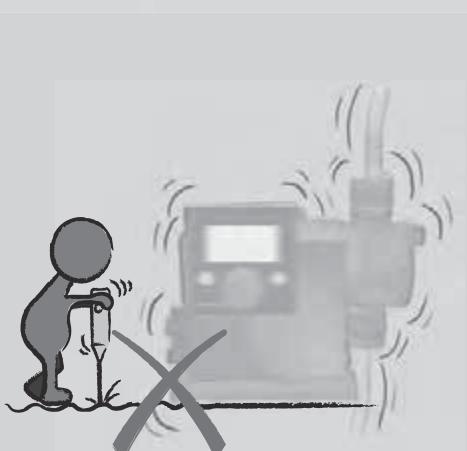
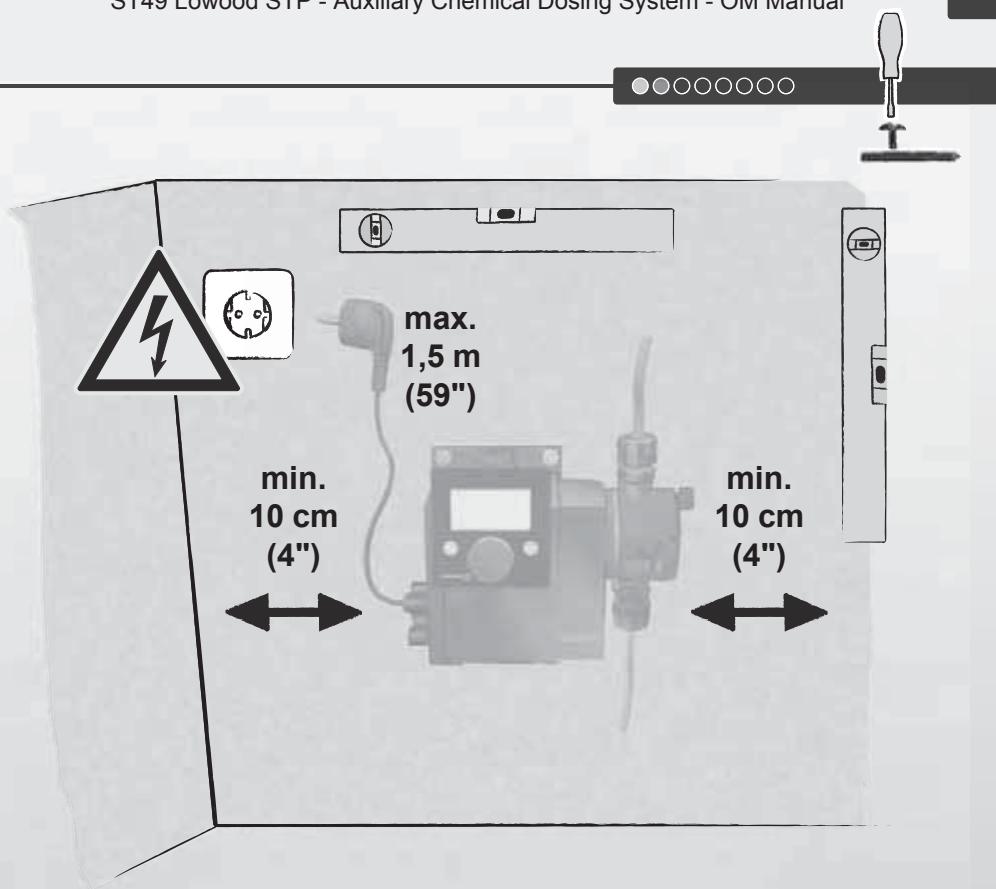


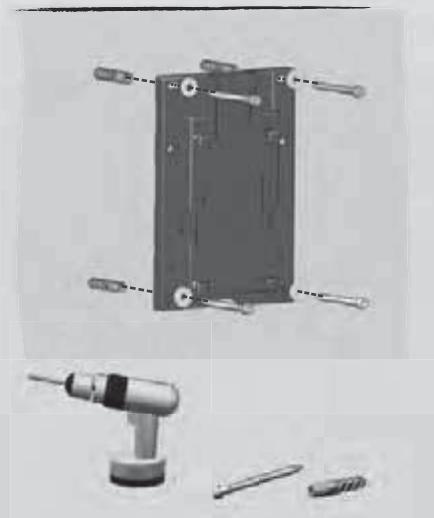
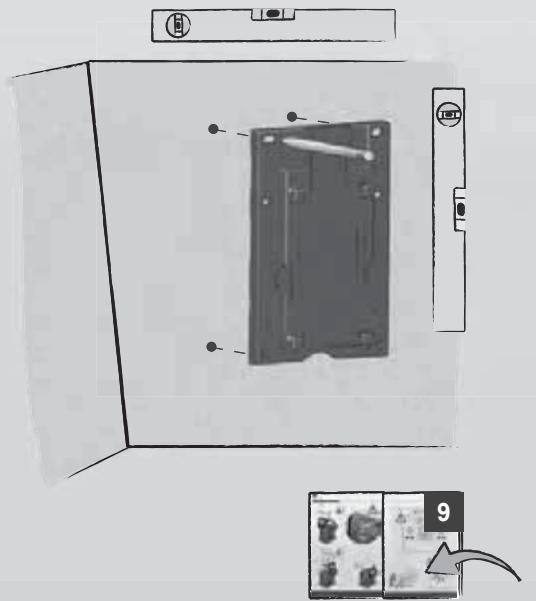
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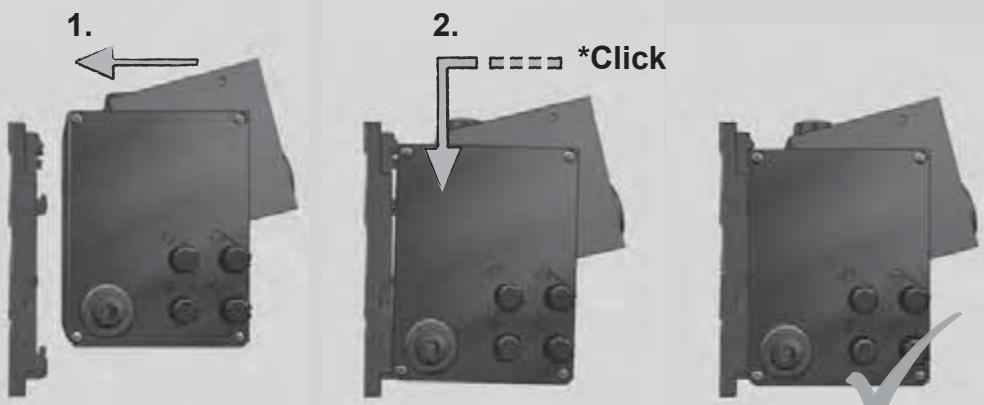
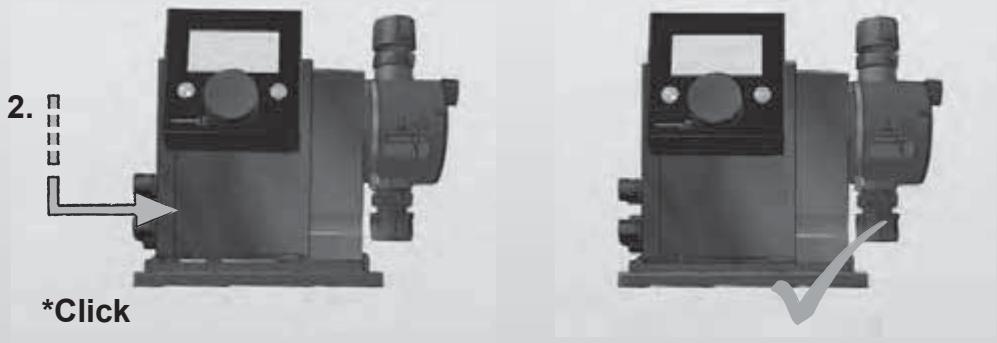
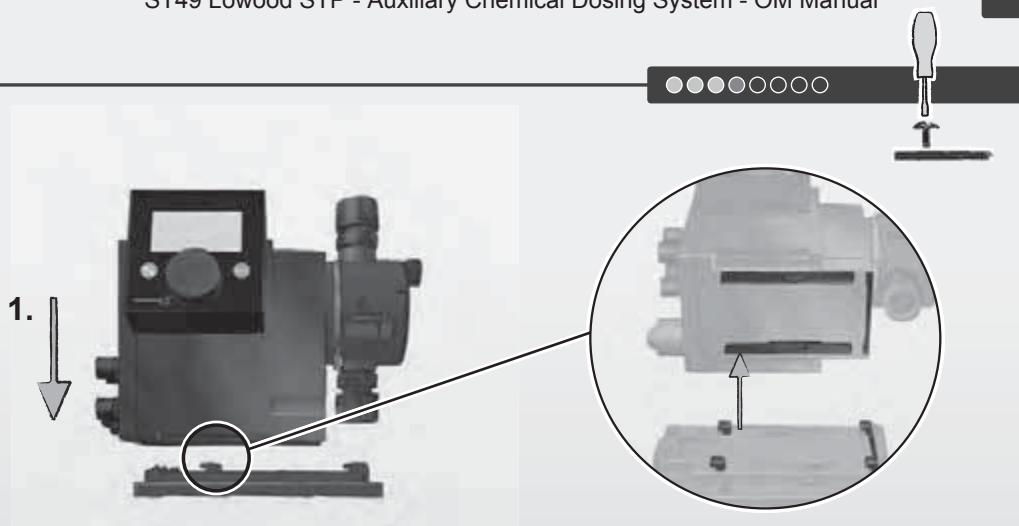






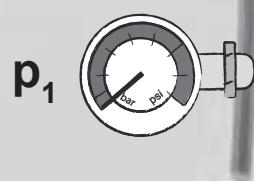
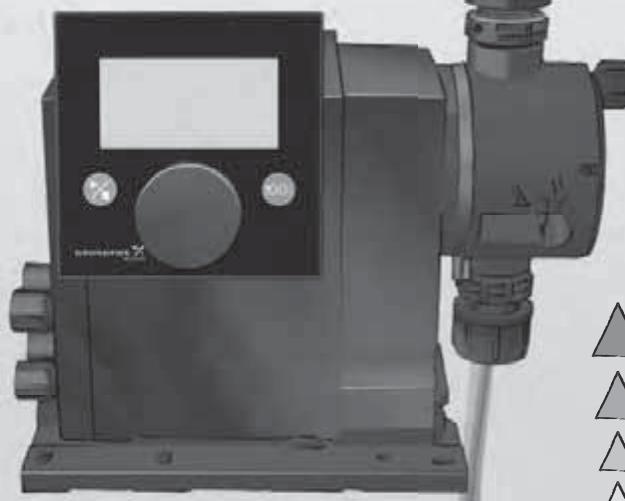
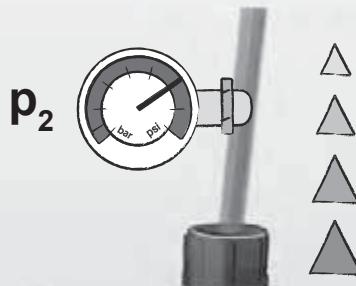


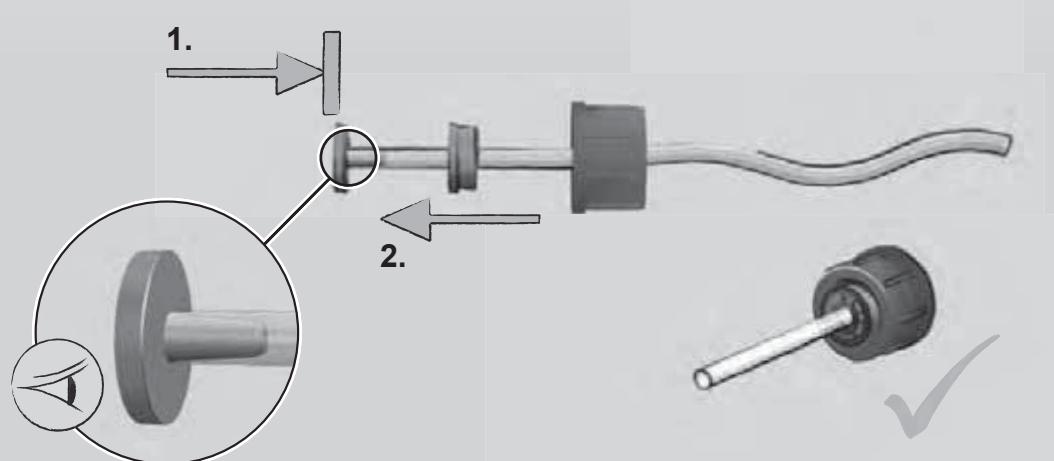
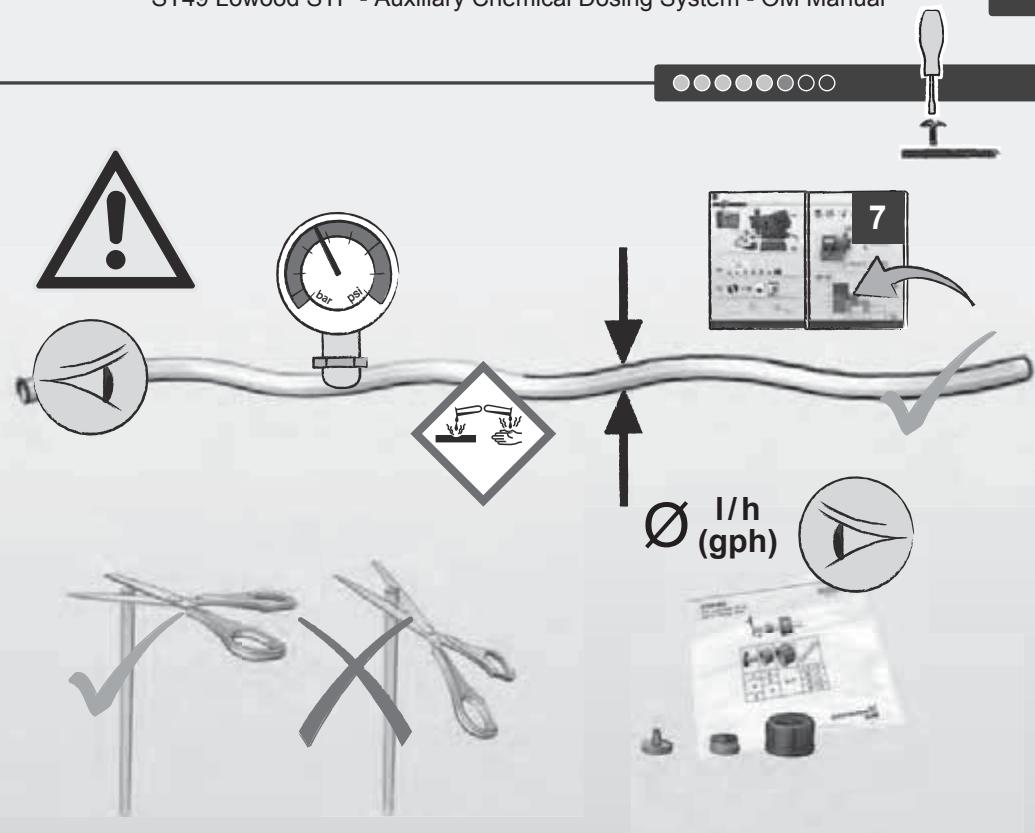
$\varnothing 5 \text{ mm (0.2")}$

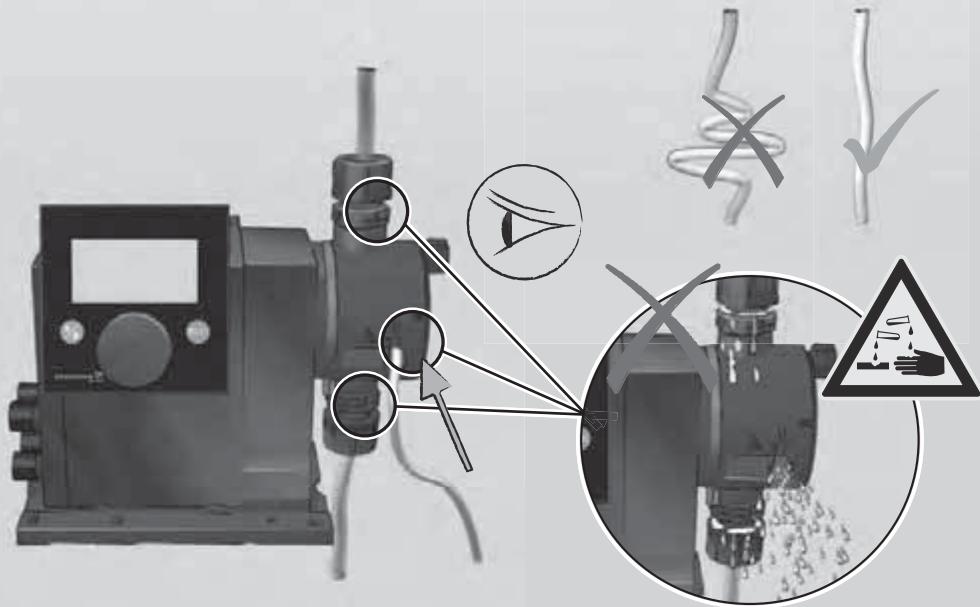
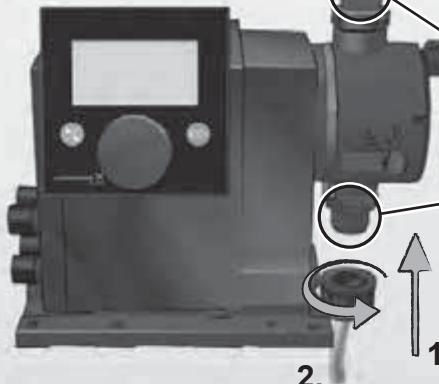


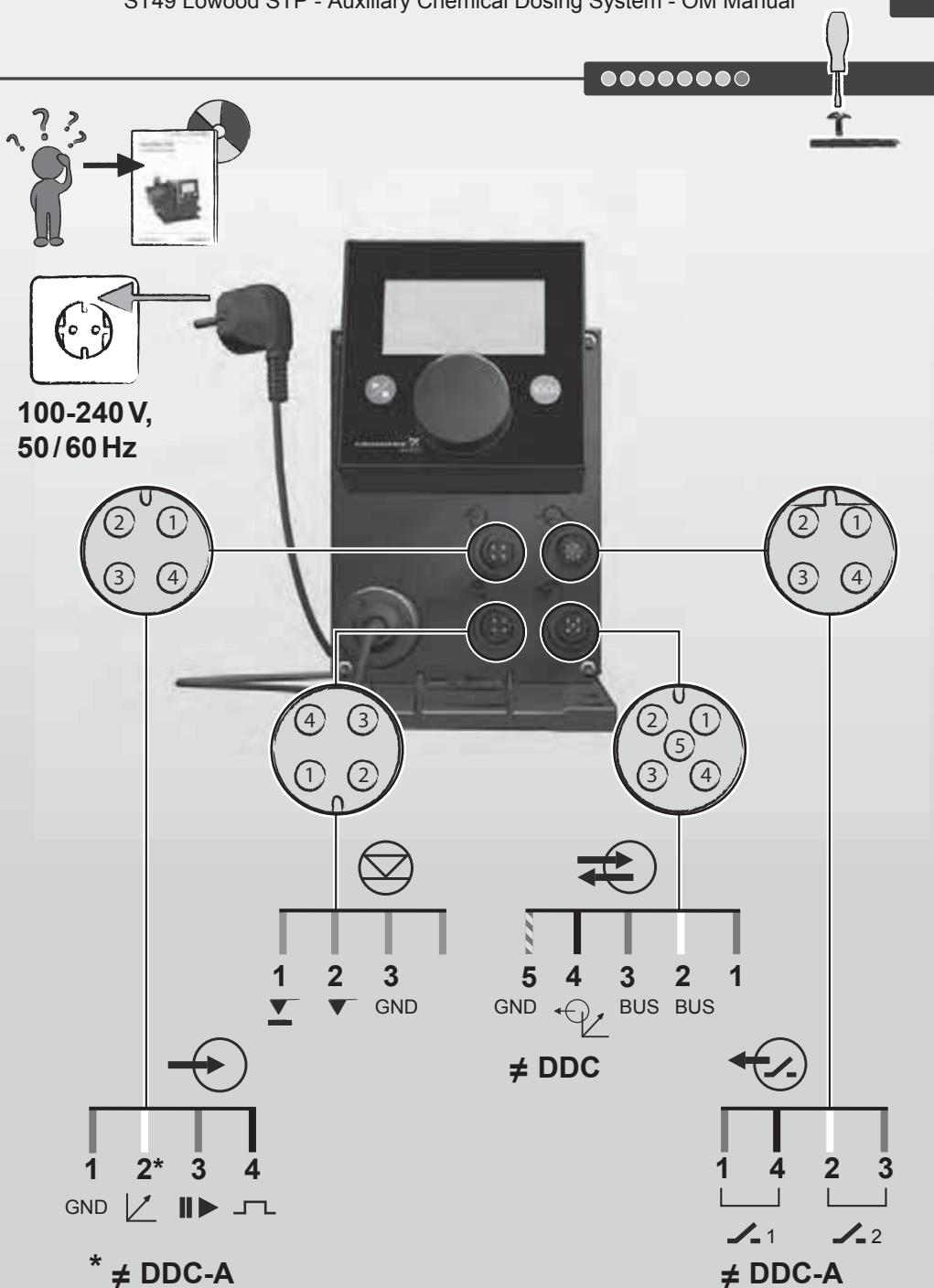


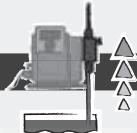
$p_2 - p_1 \geq 1 \text{ bar (15 psi)}$





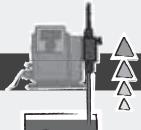


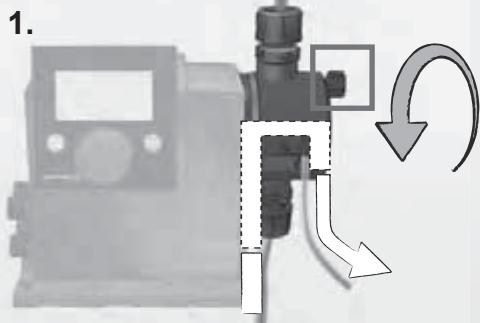
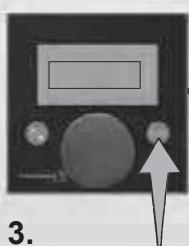
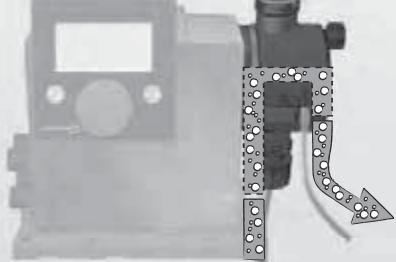
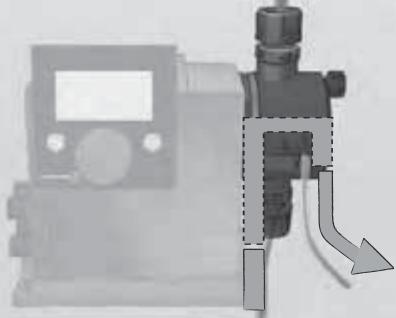
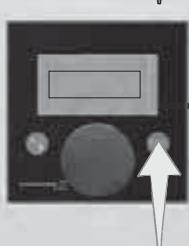
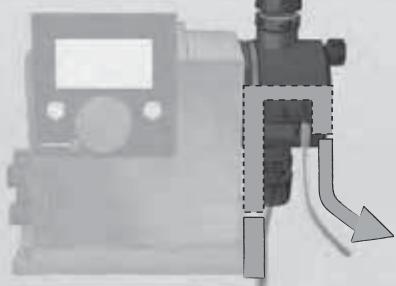
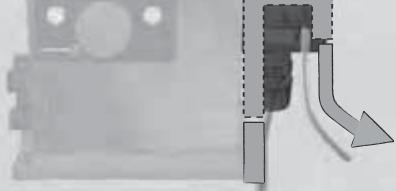
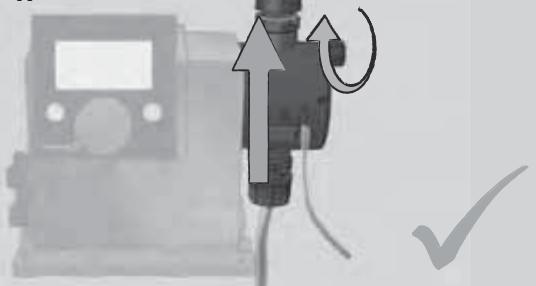


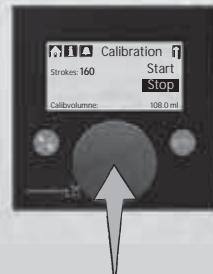
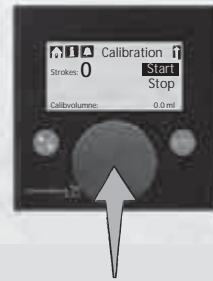


OOOO

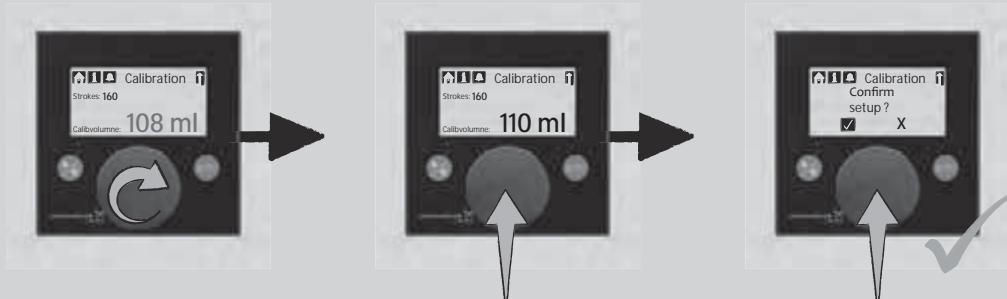




1. 
2.   
3.   
4.  

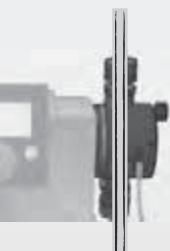


$$V1 - V2 \\ e.g. 300 - 190 \text{ ml} = 110 \text{ ml}$$

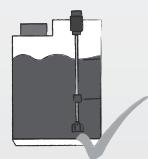




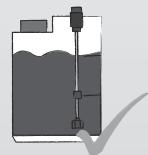
OK



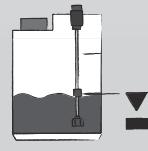
e. g.



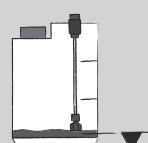
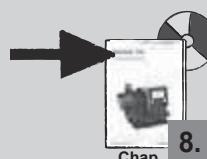
OK



Warning

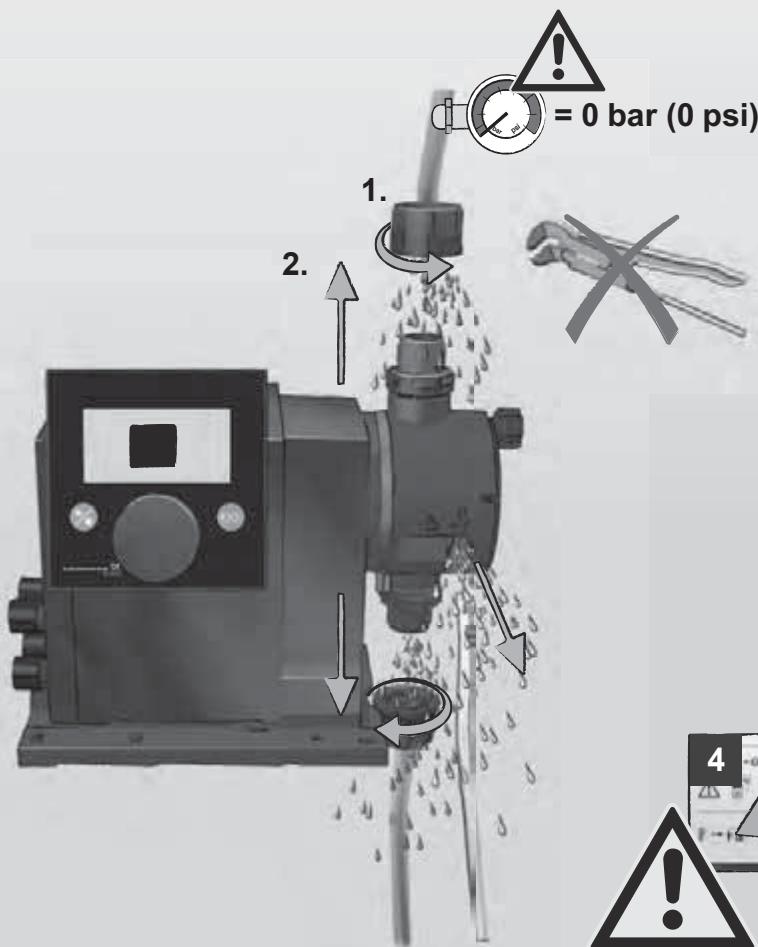


Alarm



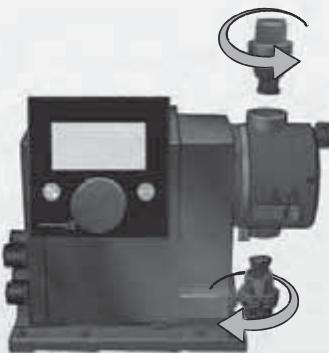


OOOO

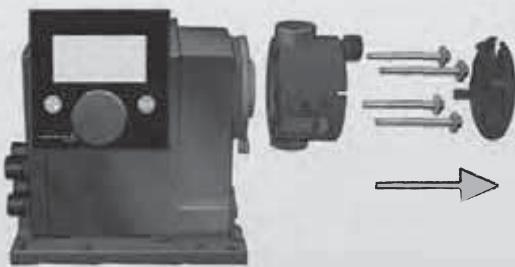




3.



4.



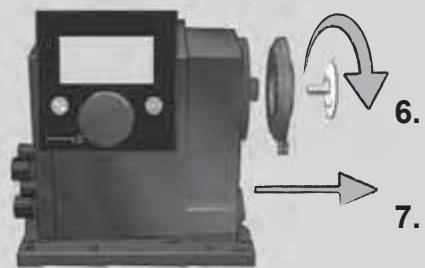
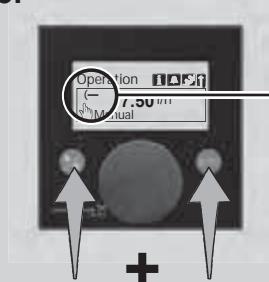
4 mm [M5]

5 mm [M6]



→ DDA 30-4

5.

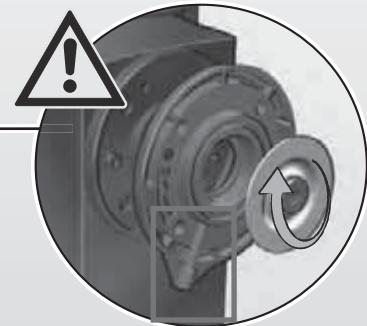
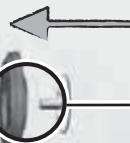


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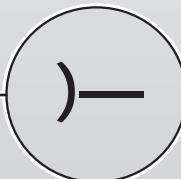
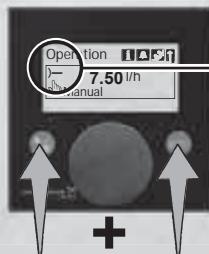
7.



8.



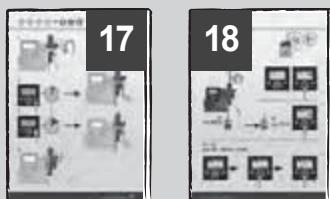
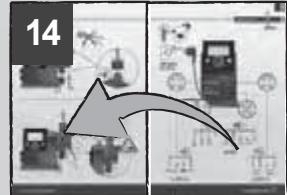
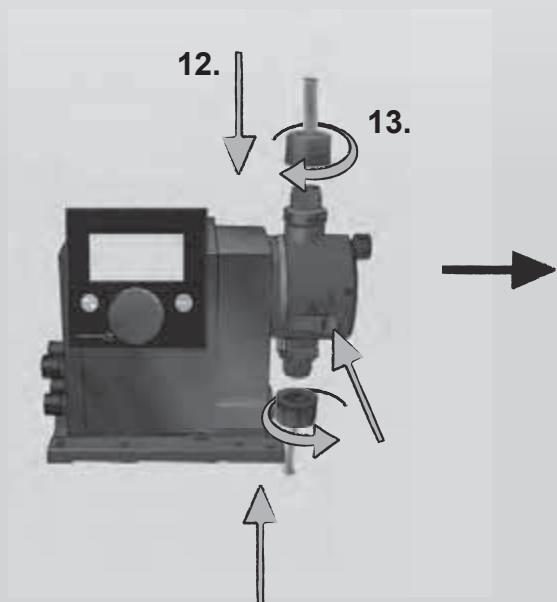
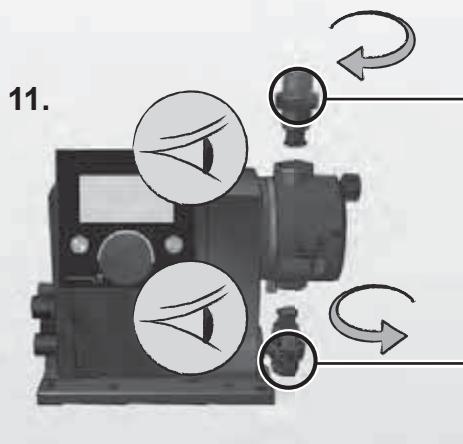
9.



10.



3 Nm (2.21 lb/ft)



Safety declaration

Please copy, fill in and sign this sheet and attach it to the pump returned for service.

Note

Fill in this document using English or German language.

Product type (nameplate)

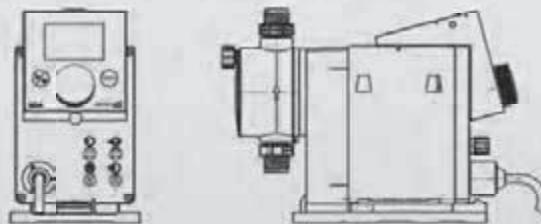
Model number (nameplate)

Dosing medium

Fault description

Please make a circle around the damaged parts.

In the case of an electrical or functional fault, please mark the cabinet.



Please describe the error/cause of the error in brief.

We hereby declare that the pump has been cleaned and is completely free from chemical, biological and radioactive substances.

Date and signature

Company stamp

EC declaration of conformity

GB We, Grundfos, declare under our sole responsibility that the products DDA, DDC and DDE, to which this declaration relates, are in conformity with these Council directives on the approximation of the laws of the EC member states:

DE Wir, Grundfos, erklären in alleiniger Verantwortung, dass die Produkte DDA, DDC und DDE, auf die sich diese Erklärung bezieht, mit den folgenden Richtlinien des Rates zur Angleichung der Rechtsvorschriften der EU-Mitgliedsstaaten übereinstimmen:

FR Nous, Grundfos, déclarons sous notre seule responsabilité, que les produits DDA, DDC et DDE, auxquels se réfère cette déclaration, sont conformes aux Directives du Conseil concernant le rapprochement des législations des Etats membres CE relatives aux normes énoncées ci-dessous :

IT Grundfos dichiara sotto la sua esclusiva responsabilità che i prodotti DDA, DDC e DDE, ai quali si riferisce questa dichiarazione, sono conformi alle seguenti direttive del Consiglio riguardanti il riavvicinamento delle legislazioni degli Stati membri CE:

ES Nosotros, Grundfos, declaramos bajo nuestra entera responsabilidad que los productos DDA, DDC y DDE, a los cuales se refiere esta declaración, están conformes con las Directivas del Consejo en la aproximación de las leyes de los Estados Miembros del EM:

PT A Grundfos declara sob sua única responsabilidade que os produtos DDA, DDC e DDE, aos quais diz respeito esta declaração, estão em conformidade com as seguintes Directivas do Conselho sobre a aproximação das legislações dos Estados Membros da CE:

GR Εμείς, η Grundfos, δηλώνουμε με αποκλειστικά δική μας ευθύνη ότι τα προϊόντα DDA, DDC και DDE στα οποία αναφέρεται η παρούσα δήλωση, συμμορφώνονται με τις εξής Οδηγίες του Συμβουλίου περί προσέγγισης των νομοθεσιών των κρατών μελών της ΕΕ:

NL Wij, Grundfos, verklaren geheel onder eigen verantwoordelijkheid dat de producten DDA, DDC en DDE waarop deze verklaring betrekking heeft, in overeenstemming zijn met de Richtlijnen van de Raad in zake de onderlinge aanpassing van de wetgeving van de EG Lidstaten betreffende:

SE Vi, Grundfos, försäkrar under ansvar att produkterna DDA, DDC och DDE, som omfattas av denna försäkran, är i överensstämmelse med rådets direktiv om inbördes närmade till EU-medlemsstaternas lagstiftning, avseende:

FI Me, Grundfos, vakuutamme omalla vastuullamme, että tuotteet DDA, DDC ja DDE, joita tämä vakuutus koskee, ovat EY:n jäsenvaltioiden lainsäädännön yhdenmukaistamiseen tähänäviin Euroopan neuvoston direktiivien vaatimusten mukaisia seuraavasti:

DK Vi, Grundfos, erklærer under ansvar at produkterne DDA, DDC og DDE som denne erklæring omhandler, er i overensstemmelse med disse af Rådets direktiver om inbyrdes tilnærmetil EF-medlemsstaternes lovgivning:

PL My, Grundfos, oświadczamy z pełną odpowiedzialnością, że nasze wyroby DDA, DDC oraz DDE, których deklaracja niniejsza dotyczy, są zgodne z następującymi wytycznymi Rady ds. ujednolicenia przepisów prawnych krajów członkowskich WE:

RU Мы, компания Grundfos, со всей ответственностью заявляем, что изделия DDA, DDC и DDE, к которым относится настоящая декларация, соответствуют следующим Директивам Совета Европы о унификации законодательных предписаний стран-членов ЕС:

HU Mi, a Grundfos, egyedüli felelősséggel kijelentjük, hogy a DDA, DDC és DDE termékek, amelyekre jelen nyilatkozat vonatkozik, megfelelnek az Európai Unió tagállamainak jogi irányelvétől összhangoló tanács alábbi előírásainak:

SI V Grundfosu s polno odgovornostjo izjavljamo, da so naši izdelki DDA, DDC in DDE, na katere se ta izjava nanaša, v skladu z naslednjimi direktivami Sveta o približevanju zakonodaje za izenačevanje pravnih predpisov držav članic ES:

HR Mi, Grundfos, izjavljujemo pod vlastitom odgovornošću da je proizvod DDA, DDC i DDE, na koji se ova izjava odnosi, u skladu sa direktivama ovog Vijeća o usklajivanju zakona država članica EU:

RS Mi, Grundfos, izjavljujemo pod vlastitom odgovornošću da je proizvod DDA, DDC i DDE, na koji se ova izjava odnosi, u skladu sa direktivama Saveta za usklajivanje zakona država članica EU:

EC declaration of conformity

- RO** Noi, Grundfos, declarăm pe propria răspundere că produsele DDA, DDC și DDE, la care se referă această declarație, sunt în conformitate cu aceste Directive de Consiliu asupra armonizării legilor Statelor Membre CE:
- BG** Ние, фирма Grundfos, заявяваме с пълна отговорност, че продуктите DDA, DDC и DDE, за които се отнася настоящата декларация, отговарят на следните указания на Съвета за уеднаквяване на правните разпоредби на държавите членки на ЕС:
- CZ** My firma Grundfos prohlašujeme na svou plnou odpovědnost, že výrobky DDA, DDC a DDE, na něž se toto prohlášení vztahuje, jsou v souladu s ustanoveními směrnice Rady pro sbližení právních předpisů členských států Evropského společenství v oblastech:
- SK** My firma Grundfos prehlasujeme na svoju plnú zodpovednosť, že výrobky DDA, DDC a DDE, na ktorú sa toto prehlásenie vzťahuje, sú v súlade s ustanovením smernice Rady pre zblíženie právnych predpisov členských štátov Európskeho spoločenstva v oblastiach:
- TR** Grundfos olarak bu beyannameye konu olan DDA, DDC ve DDE ürünlerinin, AB Üyesi Ülkelerin kanunlarını birbirine yaklaşma üzerine Konsey Direktifleriyle uyumlu olduğunu yalnızca bizim sorumluluğumuz altında olduğunu beyan ederiz:
- EE** Meie, Grundfos, deklareerime enda ainuvastutusel, et tooted DDA, DDC ja DDE, mille kohta käesolev juhend käib, on vastavuses EÜ Nõukogu direktiividega EMU liikmesriikide seaduste ühitamise kohta, mis käsitlevad:
- LT** Mes, Grundfos, su visa atsakomybe pareiškiame, kad gaminiai DDA, DDC ir DDE, kuriems skirta ši deklaracija, atitinka šias Tarybos Direktyvas dėl Europos Ekonominių Bendrijos šalių narių įstatymų suderinimo:
- LV** Sabiedrība GRUNDFOS ar pilnu atbildību dara zināmu, ka produkti DDA, DDC un DDE, uz kuriem attiecas šis paziņojums, atbilst šādām Padomes direktīvām par tuvināšanos EK dalībvalstu likumdošanas normām:
- UA** Компанія Grundfos заявляє про свою виключну відповідальність за те, що продукти DDA, DDC та DDE, на які поширяється дана декларація, відповідають таким рекомендаціям Ради з уніфікації правових норм країн - членів ЄС:
- CN** 我们格兰富在我们的全权责任下声明，产品 DDA, DDC 和 DDE，即该合格证所指之产品，符合欧共体使其成员国法律趋于一致的以下欧共理事会指令：
- JP** Grundfos は、その責任の下に、DDA, DDC 製品および DDE 製品が EC 加盟諸国の法規に関する、以下の評議会指令に適合していることを宣言します：
- KO** Grundfos 에서는 자사의 단독 책임에 따라 이 선언과 관련된 DDA, DDC 및 DDE 제품이 EC 회원국 법률에 기반한 다음 이사회 지침을 준수함을 선언합니다:
- Machinery Directive (2006/42/EC).
Standards used: EN 809: 1998,
EN ISO 12100-1+A1: 2009,
EN ISO 12100-2+A1: 2009.
 - Low Voltage Directive (2006/95/EC).*
Standard used: EN 61010-1: 2001 (second edition).
 - EMC Directive (2004/108/EC).
Standards used: EN 61326-1: 2006,
EN 61000-3-2: 2006+A1: 2009+A2: 2009,
EN 61000-3-3: 2008.
- * Only for products with operating voltage > 50 VAC or > 75 VDC.

Pfinztal, 1 June 2011

Ulrich Stemick

Technical Director

Grundfos Water Treatment GmbH
Reetzstr. 85, D-76327 Pfinztal, Germany

Person authorised to compile technical file and empowered to sign the EC declaration of conformity.

This EC declaration of conformity is only valid when published as part of the Grundfos Quick Guide 95725552 0412.

ST49 Lowood STP - Auxiliary Chemical Dosing System - OM Manual

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SMART Digital - DDA and DDC

Safety instructions



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English (GB) Safety instructions

Original safety instructions.

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Warning

Prior to installation, read this document and the electronic version of the installation and operating instructions. Installation and operation must comply with local regulations and accepted codes of good practice.

1. Safety instructions

1.1 Symbols used in this document

Warning

If these safety instructions are not observed, it may result in personal injury.

Caution

If these safety instructions are not observed, it may result in malfunction or damage to the equipment.

Note

Notes or instructions that make the job easier and ensure safe operation.

1.2 Qualification and training of personnel

The personnel responsible for the installation, operation and service must be appropriately qualified for these tasks.

1.3 Safety instructions for the operator/user

Before any work to the pump, the pump must be in the "Stop" operating state or be disconnected from the power supply. The system must be pressureless!

Caution

1.4 Dosing chemicals

Warning

Before switching the supply voltage back on, the dosing lines must be connected in such a way that any chemicals in the dosing head cannot spray out and put people at risk.



The dosing medium is pressurised and can be harmful to health and the environment.



Warning

Observe the chemical manufacturer's safety data sheets and safety instructions when handling chemicals!

Caution

A deaeration hose, which is routed into a container, e.g. a drip tray, must be connected to the deaeration valve.

Caution

Ensure that parts in contact with the dosing media are resistant to the dosing medium under operating conditions, see data booklet!

1.5 Diaphragm breakage

If the diaphragm leaks or is broken, dosing liquid escapes from the drain opening on the dosing head.

Warning

Danger of explosion, if dosing liquid has entered the pump housing!

Operation with damaged diaphragm can lead to dosing liquid entering the pump housing.



In case of diaphragm breakage, immediately separate the pump from the power supply!

Caution

Make sure the pump cannot be put back into operation by accident!

Caution

Dismantle the dosing head without connecting the pump to the power supply and make sure no dosing liquid has entered the pump housing.

1.6 Applications

The pump is suitable for liquid, non-abrasive, non-flammable and non-combustible media strictly in accordance with the instructions in these installation and operating instructions.

The dosing medium must be in liquid aggregate state!

Caution

Observe the freezing and boiling points of the dosing medium!

1.7 Improper operating methods



Warning

The pump is NOT approved for operation in potentially explosive areas!

Frequent disengagement from the mains voltage, e.g. via a relay, can result in damage to the pump electronics and in the breakdown of the pump. The dosing accuracy is also reduced as a result of internal start procedures.

Caution

Do not control the pump via the mains voltage for dosing purposes!

Only use the "External stop" function to start and stop the pump!

2. Assembly and installation

2.1 Pump assembly



Warning

Install the pump in such a way that the plug can easily be reached by the operator during operation! This will enable the operator to separate the pump from the mains quickly in case of emergency!

2.1.1 Adjusting control cube position

Caution

The enclosure class (IP65/Nema 4X) and shock protection are only guaranteed if the control cube is installed correctly!

Caution

Pump must be disconnected from the power supply!

2.2 Hydraulic connection



Warning

Wear protective clothing (gloves and goggles) when working on the dosing head, connections or lines!

The dosing head may contain water from the factory check!

Caution

When dosing media which should not come into contact with water, another medium must be dosed beforehand!

Tighten the dosing head screws with a torque wrench once before commissioning and again after 2-5 operating hours at 4 Nm.

Caution

Pressure differential between suction and discharge side must be at least 1 bar/14.5 psi!

2.3 Electrical connection

Warning

The enclosure class (IP65/Nema 4X) is only guaranteed if plugs or protective caps are correctly installed!

Warning

The pump can start automatically when the mains voltage is switched on!

Do not manipulate mains plug or cable!

Note

The mains plug is the separator separating the pump from the mains.

Signal connections

Warning

Electric circuits of external devices connected to the pump inputs must be separated from dangerous voltage by means of double or reinforced insulation!

3. Operation

Note

Check all pump settings after any change in the "Setup" menu.

3.1 Operation modes

3.1.1 Pulse



Memory function

Warning

Subsequent processing of saved pulses can cause local increase in concentration!

3.1.2 Dosing timer cycle / Dosing timer week

Applies to DDA-AR/FC/FCM control variant.



Warning

When time or date is changed in "Time+date" menu, timer dosing and timer relay output functions (Relay 2) are stopped!

Timer dosing and timer relay output functions must be restarted manually!

Changing time or date can cause increase or decrease in concentration!

3.2 Pressure monitoring

Applies to DDA-FC/FCM control variant.

If the pressure exceeds the "Max. pressure" set in the "Setup > Pressure monitoring" menu, the pump is shut down, enters the standby state and indicates an alarm.

Caution *The pump restarts automatically once the backpressure falls below the set "Max. pressure"!*

3.2.1 Pressure setting ranges

The pressure measured in the dosing head is slightly higher than the actual system pressure.

Caution *Therefore the "Max. pressure" should be set at least 0.5 bar higher than the system pressure.*

3.3 Time+date

Applies to DDA-AR/FC/FCM control variant.

Caution *The conversion between summer and winter time does not take place automatically!*

3.4 Inputs/Outputs

3.4.1 Relay outputs

Timer Cycle (Relay 2) / Timer Week (Relay 2)

Applies to DDA-AR/FC/FCM control variant.

Warning

When time or date is changed in "Time+date" menu, timer dosing and timer relay output functions (Relay 2) are stopped!

Timer dosing and timer relay output functions must be restarted manually!

Changing time or date can cause increase or decrease in concentration!

3.4.2 Empty and Low level signals



Caution *When the tank is filled up again, the pump restarts automatically!*

4. Service

4.1 Perform service

Warning

Danger of explosion, if dosing liquid has entered the pump housing!

If the diaphragm is possibly damaged, don't connect the pump to the power supply!



Dismantle the dosing head without connecting the pump to the power supply and make sure no dosing liquid has entered the pump housing.

Check daily whether liquid is escaping from the drain opening!

Warning

Wear protective clothing (gloves and goggles) when working on the dosing head, connections or lines!



Do not allow any chemicals to leak from the pump. Collect and dispose of all chemicals correctly!

Before any work to the pump, the pump must be in the "Stop" operating state or be disconnected from the power supply. The system must be pressureless!

4.2 Repairs

Warning

Repairs must only be carried out by authorised and qualified personnel!



Switch off the pump and disconnect it from the voltage supply before carrying out maintenance work and repairs!

5. Disposal

This product or parts of it must be disposed of in an environmentally sound way. Use appropriate waste collection services. If this is not possible, contact the nearest Grundfos company or service workshop.

Subject to alterations.

Safety declaration

Please copy, fill in and sign this sheet and attach it to the pump returned for service.

Note *Fill in this document using English or German language.*

Product type (nameplate)

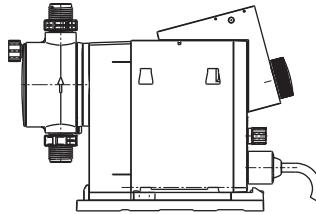
Model number (nameplate)

Dosing medium

Fault description

Please make a circle around the damaged parts.

In the case of an electrical or functional fault, please mark the cabinet.



TMO4 1185 1110

Please describe the error/cause of the error in brief.

- Dosing liquid has possibly entered the pump housing.
 The pump must not be connected to the power supply! Danger of explosion!
-

We hereby declare that the pump has been cleaned and is completely free from chemical, biological and radioactive substances.

Date and signature

Company stamp

Declaration of conformity

GB: EC declaration of conformity

We, Grundfos, declare under our sole responsibility that the products DDA, DDC and DDE, to which this declaration relates, are in conformity with these Council directives on the approximation of the laws of the EC member states:

- Machinery Directive (2006/42/EC).
Standards used: EN 809: 1998, EN ISO 12100-1+A1: 2009, EN ISO 12100-2+A1: 2009.
- Low Voltage Directive (2006/95/EC). *
Standard used: EN 61010-1: 2001 (second edition).
- EMC Directive (2004/108/EC).
Standards used: EN 61326-1: 2006, EN 61000-3-2: 2006+A1: 2009+A2: 2009, EN 61000-3-3: 2008.

* Only for products with operating voltage > 50 VAC or > 75 VDC.

This EC declaration of conformity is only valid when published as part of the Grundfos installation and operating instructions.

CZ: ES prohlášení o shodě

My firma Grundfos prohlašujeme na svou plnou odpovědnost, že výrobky DDA, DDC a DDE, na něž se toto prohlášení vztahuje, jsou v souladu s ustanoveními směrnice Rady pro sbílení právních předpisů členských států Evropského společenství v oblastech:

- Směrnice pro strojní zařízení (2006/42/ES).
Použité normy: EN 809: 1998, EN ISO 12100-1+A1: 2009, EN ISO 12100-2+A1: 2009.
- Směrnice pro nízkonapěťové aplikace (2006/95/ES). *
Použitá norma: EN 61010-1: 2001 (druhé vydání).
- Směrnice pro elektromagnetickou kompatibilitu (EMC) (2004/108/ES).
Použité normy: EN 61326-1: 2006, EN 61000-3-2: 2006+A1: 2009+A2: 2009, EN 61000-3-3: 2008.

* Pouze pro výrobky s provozním napětím > 50 VAC nebo > 75 VDC.

Toto ES prohlášení o shodě je platné pouze tehdy, pokud je zveřejněno jako součást instalacních a provozních návodů Grundfos.

DE: EG-Konformitätserklärung

Wir, Grundfos, erklären in alleiniger Verantwortung, dass die Produkte DDA, DDC und DDE, auf die sich diese Erklärung bezieht, mit den folgenden Richtlinien des Rates zur Angleichung der Rechtsvorschriften der EU-Mitgliedsstaaten übereinstimmen:

- Maschinenrichtlinie (2006/42/EG).
Normen, die verwendet wurden: EN 809: 1998, EN ISO 12100-1+A1: 2009, EN ISO 12100-2+A1: 2009, EN ISO 12100-3-2+A1: 2009.
- Niederspannungsrichtlinie (2006/95/EG). *
Norm, die verwendet wurde: EN 61010-1: 2001 (zweite Ausgabe).
- EMV-Richtlinie (2004/108/EG).
Normen, die verwendet wurden: EN 61326-1: 2006, EN 61000-3-2: 2006+A1: 2009+A2: 2009, EN 61000-3-3: 2008.

* Nur für Produkte mit Betriebsspannungen > 50 VAC oder > 75 VDC.

Diese EG-Konformitätserklärung gilt nur, wenn sie in Verbindung mit der Grundfos Montage- und Betriebsanleitung veröffentlicht wird.

BG: EC декларация за съответствие

Ние, фирма Grundfos, заявяваме с пътна отговорност, че продуктите DDA, DDC и DDE, за които се отнася настоящата декларация, отговарят на следните указания на Съвета за уеднаквяване на правните разпоредби на държавите членки на ЕС:

- Директива за машините (2006/42/EC).
Приложени стандарти: EN 809: 1998, EN ISO 12100-1+A1: 2009, EN ISO 12100-2+A1: 2009.
- Директива за нисковолтови системи (2006/95/EC). *
Приложен стандарт: EN 61010-1: 2001 (второ издание).
- Директива за електромагнитна съвместимост (2004/108/EC).
Приложени стандарти: EN 61326-1: 2006, EN 61000-3-2: 2006+A1: 2009+A2: 2009, EN 61000-3-3: 2008.

* Само за продукти, работещи при напрежение > 50 VAC или > 75 VDC.

Тази ЕС декларация за съответствие е валидна само когато е публикувана като част от инструкциите за монтаж и експлоатация на Grundfos.

DK: EF-overensstemmelseserklæring

Vi, Grundfos, erklaerer under ansvar at produkteene DDA, DDC og DDE som denne erklæring omhandler, er i overensstemmelse med disse af Rådets direktiver om indbyrdes tilnærme til EF-medlemsstaternes lovgivning:

- Maskindirektivet (2006/42/EF).
Anvendte standarder: EN 809: 1998, EN ISO 12100-1+A1: 2009, EN ISO 12100-2+A1: 2009.
- Lavspændingsdirektivet (2006/95/EF). *
Anvendt standard: EN 61010-1: 2001 (anden udgave).
- EMC-direktivet (2004/108/EF).
Anvendte standarder: EN 61326-1: 2006, EN 61000-3-2: 2006+A1: 2009+A2: 2009, EN 61000-3-3: 2008.

* Gælder kun for produkter med driftsspænding > 50 VAC eller > 75 VDC.

Denne EF-overensstemmelseserklæring er kun gyldig når den publiceres som en del af Grundfos-monterings- og driftsinstruktionen.

EE: EL vastavusdeklaratsioon

Meie, Grundfos, deklareerime enda ainuvastutusest, et töötad DDA, DDC ja DDE, mille kohta käesolev juhend käib, on vastavuses EÜ Nõukogu direktiividega EMÜ liikmesriikide seaduste kohta, mis käsitelevad:

- Masinate ohutus (2006/42/EC).
Kasutatud standardid: EN 809: 1998, EN ISO 12100-1+A1: 2009, EN ISO 12100-2+A1: 2009.
- Madalpinge direktiivi (2006/95/EC). *
Kasutatud standard: EN 61010-1: 2001 (teine väljaanne).
- Elektromagnetiline ühilduvus (EMC direktiiv) (2004/108/EC).
Kasutatud standardid: EN 61326-1: 2006, EN 61000-3-2: 2006+A1: 2009+A2: 2009, EN 61000-3-3: 2008.

* Ainult toodete jaoks mille tööpinge on suurem kui > 50 VAC või suurem kui > 75 VDC.

Käesolev EL-i vastavusdeklaratsioon kehtib ainult siis, kui see avaldatakse Grundfosi paigaldus- ja kasutusjuhendi osana.

GR: Δήλωση συμμόρφωσης EC

Εμεις, η Grundfos, δηλώνουμε με αποκλειστικά δική μας ευθύνη ότι τα προϊόντα DDA, DDC και DDE στα οποία αναφέρεται η παρούσα δήλωση, συμμορφώνονται με τις εξις Οδηγίες του Συμβούλου περί προσέγγισης των νομοθεσιών των κρατών μελών της ΕΕ:

- Οδηγία για μηχανήματα (2006/42/EC).
Πρότυπα που χρησιμοποιήθηκαν: EN 809: 1998, EN ISO 12100-1+A1: 2009, EN ISO 12100-2+A1: 2009.
- Οδηγία χαρημάτων τάσης (2006/95/ΕΖ). *
Πρότυπο που χρησιμοποιήθηκε: EN 61010-1: 2001 (δεύτερη έκδοση).
- Οδηγία Ηλεκτρομαγνητικής Συμβατότητας (EMC) (2004/108/ΕC).
Πρότυπα που χρησιμοποιήθηκαν: EN 61326-1: 2006, EN 61000-3-2: 2006+A1: 2009+A2: 2009, EN 61000-3-3: 2008.

* Μόνο για προϊόντα με τάση λειτουργίας > 50 VAC ή > 75 VDC.

Αυτή η δήλωση συμμόρφωσης EC ισχύει μόνον όταν συνοδεύει τις οδηγίες εγκατάστασης και λειτουργίας της Grundfos.

FR: Déclaration de conformité CE

Nous, Grundfos, déclarons sous notre seule responsabilité, que les produits DDA, DDC et DDE, auxquels se réfère cette déclaration, sont conformes aux Directives du Conseil concernant le rapprochement des législations des Etats membres CE relatives aux normes énoncées ci-dessous :

- Directive Machines (2006/42/CE).
Normes utilisées : EN 809: 1998, EN ISO 12100-1+A1: 2009, EN ISO 12100-2+A1: 2009.
- Directive Basse Tension (2006/95/CE). *
Norme utilisée : EN 61010-1: 2001 (deuxième édition).
- Directive Compatibilité Electromagnétique CEM (2004/108/CE).
Normes utilisées : EN 61326-1: 2006, EN 61000-3-2: 2006+A1: 2009+A2: 2009, EN 61000-3-3: 2008.

* Convient uniquement aux produits avec tension de service > 50 VAC ou > 75 VDC.

Cette déclaration de conformité CE est uniquement valide lors de sa publication dans la notice d'installation et de fonctionnement Grundfos.

IT: Dichiarazione di conformità CE

Grundfos dichiara sotto la sua esclusiva responsabilità che i prodotti DDA, DDC e DDE, ai quali si riferisce questa dichiarazione, sono conformi alle seguenti direttive del Consiglio riguardanti il riavvicinamento delle legislazioni degli Stati membri CE:

- Direttiva Macchine (2006/42/CE).
Norme applicate: EN 809: 1998, EN ISO 12100-1+A1: 2009, EN ISO 12100-2+A1: 2009.
- Direttiva Bassa Tensione (2006/95/CE). *
Norma applicata: EN 61010-1: 2001 (seconda edizione).
- Direttiva EMC (2004/108/CE).
Norme applicate: EN 61326-1: 2006, EN 61000-3-2: 2006+A1: 2009+A2: 2009, EN 61000-3-3: 2008.

* Solo per prodotti con tensione di alimentazione > 50 VAC o > 75 VDC.

Questa dichiarazione di conformità CE è valida solo quando pubblicata come parte delle istruzioni di installazione e funzionamento Grundfos.

LT: EB atitikties deklaracija

Mes, Grundfos, vysakomysle pareiškame, kad gaminiai DDA, DDC ir DDE, kuriems skirta ši deklaracija, atitinka šias Tarybos Direktyvas dėl Europos Ekonominių Bendrijos šalių narių įstatymų suderinimo:

- Mažinė direktiva (2006/42/EB).
Taikomi standartai: EN 809: 1998, EN ISO 12100-1+A1: 2009, EN ISO 12100-2+A1: 2009.
- Žemų įtampų direktiva (2006/95/EB). *
Taikomais standartas: EN 61010-1: 2001 (antrasis leidimas).
- EMS direktiva (2004/108/EB).
Taikomi standartai: EN 61326-1: 2006, EN 61000-3-2: 2006+A1: 2009+A2: 2009, EN 61000-3-3: 2008.

* Tik produktams, kurių darbinė įtampa yra > 50 V kintama arba > 75 V nuolatinė.

Ši EB atitikties deklaracija galioja tik tuo atveju, kai yra pateikta kaip "Grundfos" įrengimo ir naudojimo instrukcijos dalis.

ES: Declaración CE de conformidad

Nosotros, Grundfos, declaramos bajo nuestra entera responsabilidad que los productos DDA, DDC y DDE, a los cuales se refiere esta declaración, están conformes con las Directivas del Consejo en la aproximación de las leyes de los Estados Miembros del EM:

- Directiva de Maquinaria (2006/42/CE).
Normas aplicadas: EN 809: 1998, EN ISO 12100-1+A1: 2009, EN ISO 12100-2+A1: 2009.
- Directiva de Baja Tensión (2006/95/CE). *
Norma aplicada: EN 61010-1: 2001 (segunda edición).
- Directiva EMC (2004/108/CE).
Normas aplicadas: EN 61326-1: 2006, EN 61000-3-2: 2006+A1: 2009+A2: 2009, EN 61000-3-3: 2008.

* Sólo para productos con tensión de funcionamiento > 50 VAC o > 75 VDC.

Esta declaración CE de conformidad sólo es válida cuando se publique como parte de las instrucciones de instalación y funcionamiento de Grundfos.

HR: EZ izjava o uskladenosti

Mi, Grundfos, izjavljujemo pod vlastitim odgovornošću da je proizvod DDA, DDC i DDE, na koji se ova izjava odnosi, u skladu s direktivama ovog Vijeća o uskladišnjivanju zakona država članica EU:

- Direktiva za strojeve (2006/42/EZ).
Korištene norme: EN 809: 1998, EN ISO 12100-1+A1: 2009, EN ISO 12100-2+A1: 2009.
- Direktiva za niski napon (2006/95/EZ). *
Korištena norma: EN 61010-1: 2001 (drugo izdanje).
- Direktiva za elektromagnetsku kompatibilnost (2004/108/EZ).
Korištene norme: EN 61326-1: 2006, EN 61000-3-2: 2006+A1: 2009+A2: 2009, EN 61000-3-3: 2008.

* Samo za proizvode s radnim naponom > 50 VAC ili > 75 VDC.

Ova EZ izjava o sukladnosti važeća je jedino kada je izdana kao dio Grundfos montažnih i pogonskih uputa.

LV: EK paziņojums par atbilstību prasībām

Sabiedrība GRUNDFOS ar pilnu atbildību darīzāmū, ka produkti DDA, DDC un DDE, uz kuriem attiecas šīs paziņojumi, atbilst šādām Padomes direktīvām par tuvināšanos EK dalībvalstu likumdošanas normām:

- Mašīnbūves direktīva (2006/42/EK).
Piemēroti standarti: EN 809: 1998, EN ISO 12100-1+A1: 2009, EN ISO 12100-2+A1: 2009.
- Zema sprieguma direktīva (2006/95/EK). *
Piemērotās standarts: EN 61010-1: 2001 (otrs versija).
- Elektromagnētiskās saderības direktīva (2004/108/EK).
Piemēroti standarti: EN 61326-1: 2006, EN 61000-3-2: 2006+A1: 2009+A2: 2009, EN 61000-3-3: 2008.

* Tikai produktiem, kuru darba spriegums ir > 50 V maiņstrāvas vai > 75 V līdzstrāvas.

Šī EK atbilstības deklarācija ir derīga vienīgi tad, ja ir publicēta kā daļa no GRUNDFOS uzstādīšanas un ekspluatācijas instrukcijām.

HU: EK megfelelőségi nyilatkozat

Mi, a Grundfos, egyedül felelősséggel kijelentjük, hogy a DDA, DDC és DDC termékek, amelyekre jelen nyilatkozat vonatkozik, megfelelnek az Európai Unió tagállamainak jogi irányelvétől összehangoltanacs aláírásainak:

- Gépek (2006/42/EK).
Alkalmaszt szabványok: EN 809: 1998, EN ISO 12100-1+A1: 2009, EN ISO 12100-2+A1: 2009.
- Kisfeszültségű Direktíva (2006/95/EK). *
Alkalmaszt szabvány: EN 61010-1: 2001 (második kiadás).
- EMC Direktíva (2004/108/EK).
Alkalmaszt szabványok: EN 61326-1: 2006, EN 61000-3-2: 2006+A1: 2009+A2: 2009, EN 61000-3-3: 2008.

* Csak a > 50 VAC vagy > 75 VDC feszültségnél magasabb üzemel feszültséggel berendezések.

Ez az EK megfelelőségi nyilatkozat kizárolag akkor érvényes, ha Grundfos telepítési és üzemeltetési utasítás részeként kerül kiadásra.

NL: EC overeenkomstigheidsverklaring

Wij, Grundfos, verklaren geheel onder eigen verantwoordelijkheid dat de producten DDA, DDC en DDE waarop deze verklaring betrekking heeft, in overeenstemming zijn met de Richtlijnen van de Raad in zake de onderlinge aanpassing van de wetgeving van de EG Lidstaten betreffende:

- Machine Richtlijn (2006/42/EC).
Gebruikte normen: EN 809: 1998, EN ISO 12100-1+A1: 2009, EN ISO 12100-2+A1: 2009.
- Laagspannings Richtlijn (2006/95/EC). *
Gebruikte norm: EN 61010-1: 2001 (tweede editie).
- EMC Richtlijn (2004/108/EC).
Gebruikte normen: EN 61326-1: 2006, EN 61000-3-2: 2006+A1: 2009+A2: 2009, EN 61000-3-3: 2008.

* Alleen voor producten met bedrijfsspanning > 50 VAC of > 75 VDC.

Dese EC overeenkomstigheidsverklaring is alleen geldig wanneer deze gepubliceerd is als onderdeel van de Grundfos installatie- en bedieningsinstructies.

PL: Deklaracja zgodności WE

My, Grundfos, oświadczamy z pełną odpowiedzialnością, że nasze wyroby DDA, DDC oraz DDE, których deklaracja niniejsza dotyczy, są zgodne z następującymi wytycznymi Rady d/o jednolicienia przepisów prawnych krajów członkowskich WE:

- Dyrektywa Maszynowa (2006/42/WE).
Zastosowane normy: EN 809: 1998, EN ISO 12100-1+A1: 2009, EN ISO 12100-2+A1: 2009.
- Dyrektywa Niskonapięciowa (LVD) (2006/95/WE). *
Zastosowana norma: EN 61010-1: 2001 (drugie wydanie).
- Dyrektywa EMC (2004/108/WE).
Zastosowana normy: EN 61326-1: 2006, EN 61000-3-2: 2006+A1: 2009+A2: 2009, EN 61000-3-3: 2008.

* Dotyczy produktów o napięciu zasilania > 50 VAC lub > 75 VDC.

Deklaracja zgodności WE jest ważna tylko i wyłącznie wtedy kiedy jest opublikowana przez firmę Grundfos i umieszczona w instrukcji montażu i eksploatacji.

RU: Декларация о соответствии ЕС

Мы, компания Grundfos, со всей ответственностью заявляем, что изделия DDA, DDC и DDE, к которым относится настоящая декларация, соответствуют следующим Директивам Совета Европейского союза об унификации законодательных предписаний стран-членов ЕС:

- Механические устройства (2006/42/EC).
Применившиеся стандарты: EN 809: 1998, EN ISO 12100-1+A1: 2009, EN ISO 12100-2+A1: 2009.
- Низковольтное оборудование (2006/95/EC). *
Применившийся стандарт: EN 61010-1: 2001 (второе издание).
- Электромагнитная совместимость (2004/108/EC).
Применившиеся стандарты: EN 61326-1: 2006, EN 61000-3-2: 2006+A1: 2009+A2: 2009, EN 61000-3-3: 2008.

* Только для изделий с рабочим напряжением > 50 В AC или > 75 В DC.

Данная декларация о соответствии ЕС имеет силу только в случае публикации в составе инструкции по монтажу и эксплуатации на продукцию производства компании Grundfos.

SK: Prehlásenie o konformite EÚ

My firma Grundfos prehlasujeme na svoju plnú zodpovednosť, že výrobky DDA, DDC a DDE, na ktoré sa toto prehlásenie vzťahuje, sú v súlade s ustanoveniami smernice Rady pre zblíženie právnych predpisov členských štátov Európskeho spoločenstva v oblastiach:

- Smernica pre strojové zariadenia (2006/42/EC).
Použité normy: EN 809: 1998, EN ISO 12100-1+A1: 2009, EN ISO 12100-2+A1: 2009.
- Smernica pre nízkonapäťové aplikácie (2006/95/EC). *
Použitá norma: EN 61010-1: 2001 (druhé vydanie).
- Smernica pre elektromagnetickú kompatibilitu (2004/108/EC).
Použité normy: EN 61326-1: 2006, EN 61000-3-2: 2006+A1: 2009+A2: 2009, EN 61000-3-3: 2008.

* Len pre produkty s prevádzkovým napäťom > 50 VAC or > 75 VDC.

Toto prehlásenie o konformite ES je platné iba vtedy, ak je zverejnené ako súčasť montážnych a prevádzkových pokynov Grundfos.

UA: Свідчення про відповідність вимогам ЄС

Компанія Grundfos заявляє про свою виключну відповідальність за те, що продукти DDA, DDC та DDE, на які поширяється дана декларація, відповідають таким рекомендаціям Ради з уніфікації правових норм країн - членів ЄС:

- Механічні прилади (2006/42/EC).
Стандарти, що застосовувалися: EN 809: 1998, EN ISO 12100-1+A1: 2009, EN ISO 12100-2+A1: 2009.
- Низька напруга (2006/95/ЄС). *
Низька напруга (2006/95/ЄС). *
- Електромагнітна сумісність (2004/108/ЄС).
Стандарти, що застосовувалися: EN 61326-1: 2006, EN 61000-3-2: 2006+A1: 2009+A2: 2009, EN 61000-3-3: 2008.

* Тільки для продуктів з робочою напругою > 50 VAC або > 75 VDC.

Ця декларація відповідності ЄС дійсна тільки в тому випадку, якщо публікується як частина інструкцій Grundfos з монтажу та експлуатації.

PT: Declaração de conformidade CE

A Grundfos declara sob sua única responsabilidade que os produtos DDA, DDC e DDE, aos quais diz respeito esta declaração, estão em conformidade com as seguintes Directivas do Conselho sobre a aproximação das legislações dos Estados Membros da CE:

- Directiva Máquinas (2006/42/CE).
Normas utilizadas: EN 809: 1998, EN ISO 12100-1+A1: 2009, EN ISO 12100-2+A1: 2009.
- Directiva Baixa Tensão (2006/95/CE). *
Norma utilizada: EN 61010-1: 2001 (segunda edição).
- Directiva EMC (compatibilidade electromagnética) (2004/108/CE).
Normas utilizadas: EN 61326-1: 2006, EN 61000-3-2: 2006+A1: 2009+A2: 2009, EN 61000-3-3: 2008.

* Apenas para produtos com tensão de funcionamento > 50 VCA ou > 75 VCC.

Esta declaração de conformidade CE é apenas válida quando publicada como parte das instruções de instalação e funcionamento Grundfos.

RO: Declarație de conformitate CE

Noi, Grundfos, declarăm pe propria răspundere că produsele DDA, DDC și DDE, la care se referă această declarație, sunt în conformitate cu aceste Directive de Consiliu asupra armonizării legilor Statelor Membre CE:

- Directiva Utilaje (2006/42/CE).
Standarde utilizate: EN 809: 1998, EN ISO 12100-1+A1: 2009, EN ISO 12100-2+A1: 2009.
- Directiva Tensiune Joasă (2006/95/CE). *
Standard utilizat EN 61010-1: 2001 (a doua editie).
- Directiva EMC (2004/108/CE).
Standarde utilizate: EN 61326-1: 2006, EN 61000-3-2: 2006+A1: 2009+A2: 2009, EN 61000-3-3: 2008.

* Numai pentru produse cu tensiunea de funcționare > 50 VAC ori > 75 VDC.

Această declarație de conformitate CE este valabilă numai când este publicată ca parte a instrucțiunilor Grundfos de instalare și funcționare.

SI: ES izjava o skladnosti

V Grundfosu s polno odgovornostjo izjavljamo, da so naši izdelki DDA, DDC in DDE, na katere se ta izjava nanaša, v skladu z naslednjimi direktivami Svetega pribljevanju zakonodaje za izenačevanje pravnih predpisov držav članic ES:

- Direktiva o strojih (2006/42/ES).
Uporabljeni normi: EN 809: 1998, EN ISO 12100-1+A1: 2009, EN ISO 12100-2+A1: 2009.
- Direktiva o nizki napetosti (2006/95/ES). *
Uporabljeni norma: EN 61010-1: 2001 (druga izdaja).
- Direktiva o elektromagnetski združljivosti (EMC) (2004/108/ES).
Uporabljeni normi: EN 61326-1: 2006, EN 61000-3-2: 2006+A1: 2009+A2: 2009, EN 61000-3-3: 2008.

* Samo za izdelke z delovno napetostjo, večjo od 50 V AC ali manjšo od 75 V DC.

ES izjava o skladnosti velja samo kadar je izdana kot del Grundfos instalacije in navodil delovanja.

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Declaration of conformity RU



Насосы объемные серии DDA, DDE, DDC сертифицированы на соответствие требованиям Технического регламента о безопасности машин и оборудования (Постановление правительства РФ от 15.09.2009 №753).

Сертификат соответствия: № С-DK.АЯ56.В.01421, срок действия до 23.03.2016г.

Истра, 1 августа 2013 г.

A handwritten signature in black ink, appearing to read 'B. Kasatkina'.

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2. Vendor Documentation

Grundfos Model 525 Pressure Loading Valve



Pressure Loading Valve 525

Operation Manual

Read this manual completely and keep it!
No warranty in case of damages caused by incorrect operation.

Imprint

**Pressure Loading Valve 525
Operation Manual**

Version 3.0

Publisher

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Subject to change.

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1 General

1.1 Introduction

This operation manual contains all the information required for starting up and handling the described pressure loading valves.

If you require further information or if any problems arise, which are not discussed in detail in this operation manual, contact ALLDOS directly for the information needed.

1.2 Using this Paper

The headings **WARNING**, **CAUTION** and **NOTE** have the following meaning:



Warning

Danger of injuries and accidents!



Caution

Danger of incorrect operation or damage to the product!



Note

There is an exceptional feature.

1.3 Warranty

Warranty in accordance with our general terms of sale and delivery shall only be valid, if:

- the product is used according to the information within this paper,
- the product is not being opened or used improperly,
- maintenance and repair is implemented exclusively by authorized and qualified personnel,
- original spare parts are used for repairs.

The safety instructions specified in this document must be observed at all times!

2 Safety Instructions

The component has left the factory in a safe error-free state. In order to maintain this state and ensure safe operation, the user must observe the instructions and warning notes provided in this technical information.

If safe operation is no longer possible, the component must be shut down and secured against unintentional operation. This is the case:

- If the component is visibly damaged
- If the component no longer seems operational
- Following long periods of storage under unfavourable conditions

2.1 Application of the Product

The pressure loading valve described here is used to maintain the required counterpressure for the pump, if insufficient counterpressure is available in the system or open outflow is specified.



Warning

Other applications are not intended and are not permitted. ALLDOS Eichler GmbH accept no responsibility for damages caused by unintended use.

2.2 Obligations of the Operating Authority

The operating authority of the plant is responsible for

- instructing the operation personnel
- arranging regular maintenance

2.3 Averting Dangers



Warning

When dosing dangerous media, observe the corresponding safety precautions!



Warning

Please observe the chemical resistance of dosing media with regard to materials.



Warning

Wear protective gloves and glasses when executing work at the connections or lines!



Warning

*Only use the prescribed line types!
Repair only by authorized personnel!*

3 General description

3.1 Function

The pressure loading valve keeps the pump's backpressure constant. The valve opens and the liquid is dosed, if the pressure exceeds the opening pressure adjusted at the valve.

3.2 Ambient and Operating Conditions

Admissible storage temperature	20 °C to +50 °C
Admissible ambient temperature	0 °C to +40 °C (at an installation height of up to 1000 m above sea level)
Admissible humidity	rel. humidity: 70% at 40 °C, 90% at 35 °C

3.3 Admissible Media

Admissible Mediatemperaturer	
Material	Pressure range
1.4571	until 10 bar -10 °C to 40 °C
PVC	0 °C to 40 °C
PP	0 °C to 40 °C
PVDF	-10 °C to 40 °C *



Warning

Pressure loading valves must not be used for abrasive or crystallizing media.



Warning

Pressure loading valves are not absolutely tight. When dosing dangerous substances take appropriate protective measures!

Additional information with regard to the medium, medium temperature and operating pressure is available on request.

4 Technical Data

4.1 Pressure Loading Valves DN 4 and DN 8

Order No.	Nominal width	Pressure release	Valve body	Gasket	Hose type	Pipe	Connection	Image
525-0565	4	3	PP	Viton	PE-SL4/6		G 5/8"	1
525-0565.1	4	3	PP	EPDM	PE-SL4/6		G 5/8"	1
525-0566.1	4	3	PVDF	PTFE		RO4/6"	G 5/8"	2
525-0567	4 8	3	PVC	Viton	PE-SL4/6 PVC-SL6/12	RO10/12"	G 5/8"	1
525-0567.1	4 8	3	PVC	EPDM	PE-SL4/6 PVC-SL6/12	RO10/12"	G 5/8"	1
525-0567.2	4 8	3	PVC	PTFE	PE-SL4/6 PVC-SL6/12	RO10/12"	G 5/8"	1
525-0570	4	3	1.4571			RO4/6"	G 1/4"	5
525-0573	4	3	PP	EPDM	PE-SL5/8		G 5/8"	1
525-0600	4	3	1.4571			RO4/6"	G 1/4"	4
525-0608	4	3	PTFE	Viton			GL 18"	-
525-3173	4 8	3	PP	Viton	PE-SL4/6 PE-SL6/9 PE-SL9/12		G 5/8"	1
525-3173.1	4 8	3	PP	EPDM	PE-SL4/6 PE-SL6/9 PE-SL9/12		G 5/8"	1
525-3174	4 8	3	PVC	Viton	PE-SL4/6 PE-SL6/9 PE-SL9/12 PVC-SL6/12	RO10/12"	G 5/8"	1
525-3174.1	4 8	3	PVC	EPDM	PE-SL4/6 PE-SL6/9 PE-SL9/12	RO10/12"	G 5/8"	1
525-0563	8	3	PP	EPDM	PE-SL9/12		G 5/8"	1
525-0568	8	3	PP	Viton		RO12/16"	G 5/8"	3
525-0568.1	8	3	PP	EPDM		RO12/16"	G 5/8"	3
525-0569.1	8	3	PVDF	PTFE		RO12/16"	G 5/8"	3
525-0571	8	3	1.4571			RO1/4"	G 1/4"	6
525-1565.1	8	3	PP	EPDM	PVC-SL6/12		G 5/8"	1
525-3177	8	3	PVDF	PTFE	PE-SL6/9		G 5/8"	1

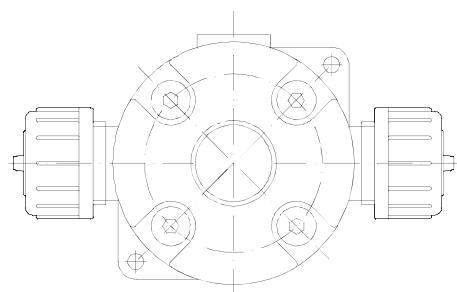
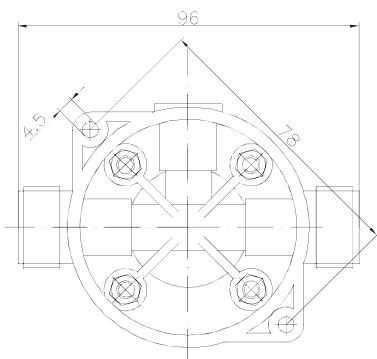


Image 1

Drilling scheme for Images 1-4

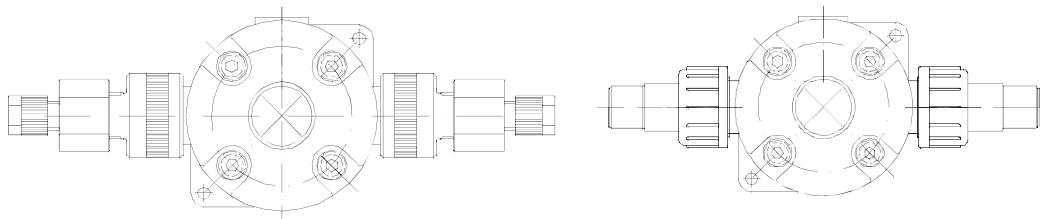


Image 3

Image 2

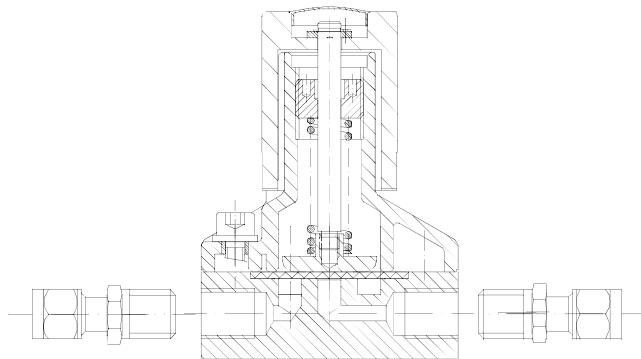


Image 4

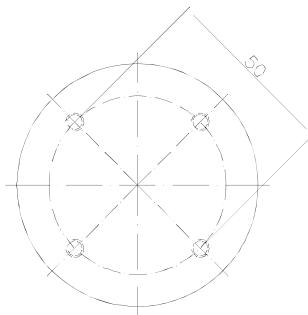
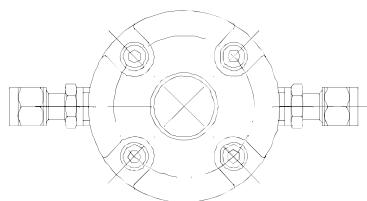


Image 5



Drilling scheme for Images 5 and 6

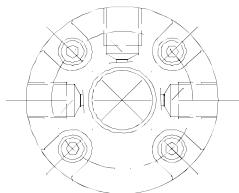
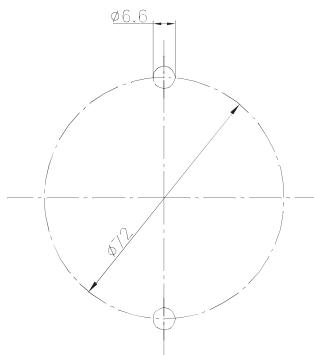


Image 6

4.2 Pressure Loading Valves DN 20

Order No.	Nominal width	Pressure release	Valve body	Gasket	L	Hose type	Pipe	Connection	Image
525-1113	20	3	PVC	Viton	149	PVC-SL13/20	RO20/25	G 11/4"	7
525-1113.01	20	3	PVC	Viton	149	PVC-SL19/27		G 11/4"	8
525-1113.1	20	3	PVC	EPDM	149	PVC-SL13/20	RO20/25	G 11/4"	7
525-1113.11	20	3	PVC	EPDM	149	PVC-SL19/27		G 11/4"	8
525-1113.21	20	3	PVC	PTFE	149	PVC-SL19/27		G 11/4"	8
525-1163	20	3	PP	Viton	152,5		RO20/25	G 11/4"	7
525-1163.01	20	3	PP	Viton	152,5	PVC-SL19/27		G 11/4"	8
525-1163.1	20	3	PP	EPDM	152,5		RO20/25	G 11/4"	7
525-1163.11	20	3	PP	EPDM	152,5	PVC-SL19/27		G 11/4"	8
525-1183.1	20	3	PVDF	PTFE	145,5		RO20/25	G 11/4"	7
525-2133	20	3	1.4571		-			G3/4	10
525-4113	20	3	PVC	Viton	149			3/4" NPT	9



Drilling scheme

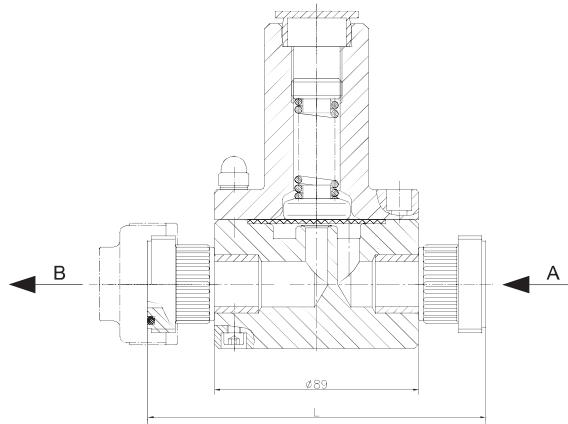


Image 7

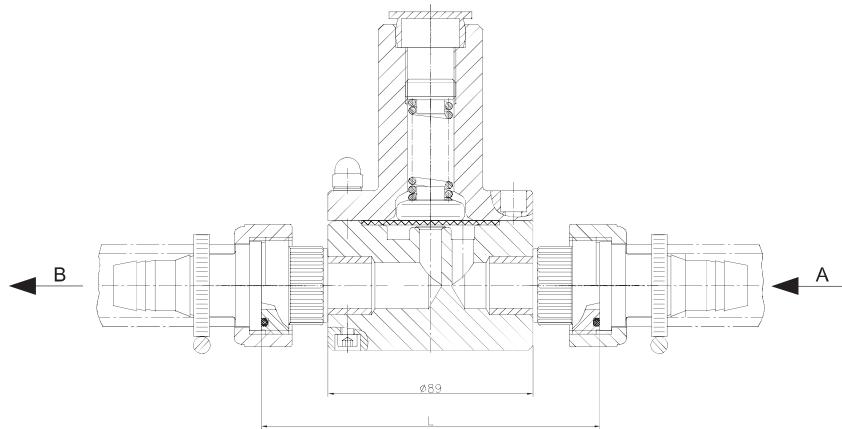


Image 8

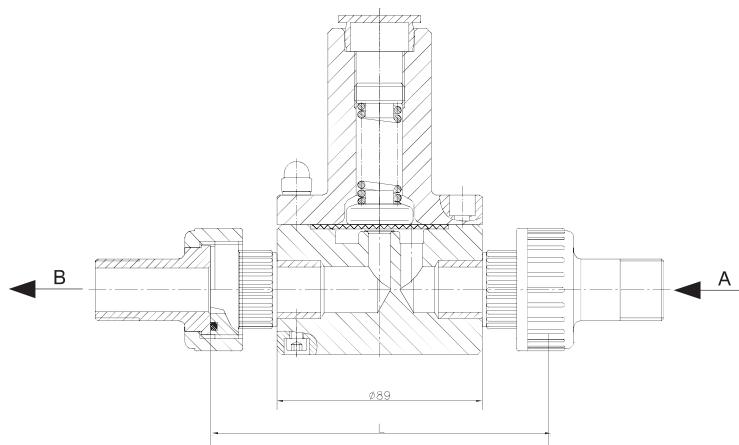


Image 9

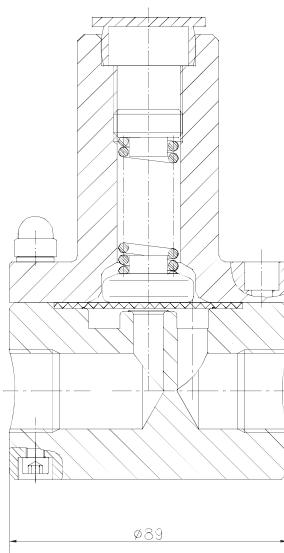
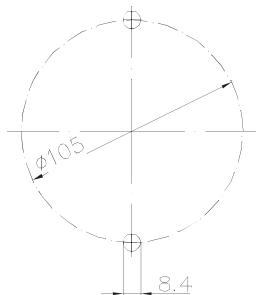


Image 10

4.3 Pressure Loading Valves DN 32

Order No.	Nominal width	Pressure release	Valve body	Gasket	L	Pipe	Connection	Image
525-1173	32	3	PP	Viton	229	RO32/40"	flange DN32	12
525-1173.01	32	3	PP	Viton	205	RO32/40"	G 2"	13
525-1173.1	32	3	PP	EPDM	229		flange DN32	12
525-1173.11	32	3	PP	EPDM	205	RO32/40"	G 2"	13
525-1223	32	3	PVC	Viton	205	RO32/40"	G 2"	11
525-1223.1	32	3	PVC	EPDM	205	RO32/40"	G 2"	11
525-1243	32	3	PVC	Viton	229		flange DN32	12
525-1243.1	32	3	PVC	EPDM	229		flange DN32	12
525-2233	32	3	1.4571		-		G 11/4"	14
525-2243	32	3	1.4571	PVC	?		flange DN32/G 11/4"	15
525-2403	32	3	PVDF	PTFE	229	RO32/40"	flange DN32	12

* With insertion section for pipe 32/40 in PP and also in PVDF



Drilling scheme

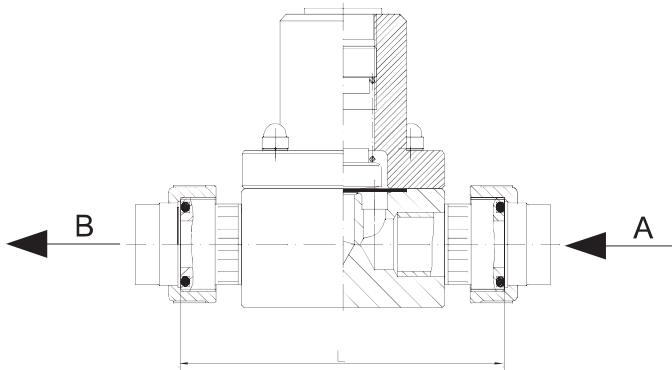


Image 11

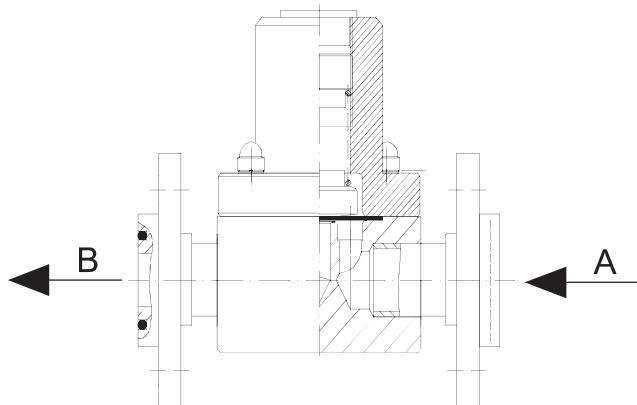


Image 12

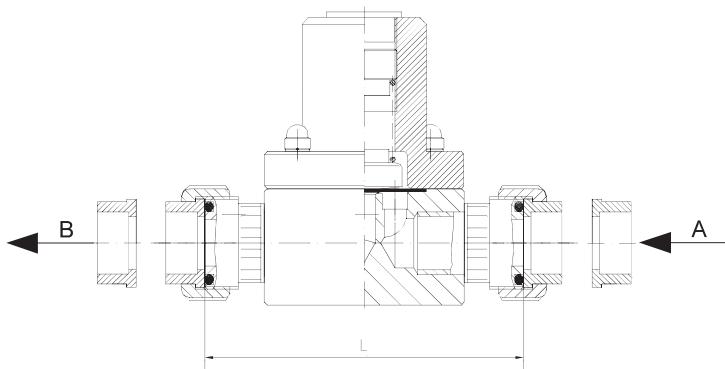


Image 13

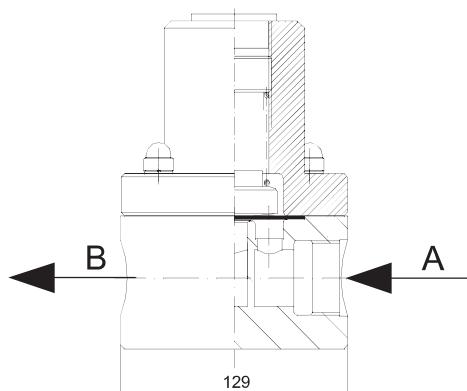


Image 14

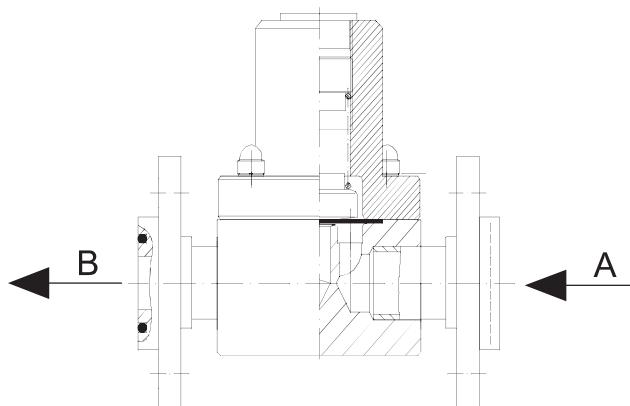
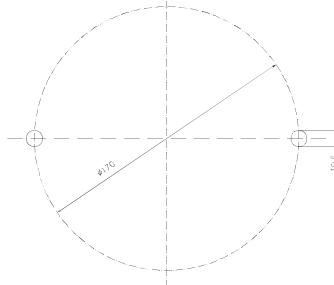


Image 15

4.4 Pressure Loading Valves DN 50 and DN 65

Order No.	Nominal width	Pressure release	Valve body	Gasket	L	Connection	Image
525-2363	50	2,2	PP	Viton	264	flange DN50	17
525-0610	65	1,5	PVC	Viton	266	flange DN65	17
525-0611	65	1,5	PVC	EPDM	266	flange DN65	17
525-0612	65	1,5	PP	Viton	326	flange DN65	17
525-0613	65	1,5	1.4571	PVC-WEICH	-	flange DN65	16



Drilling scheme for Image 16

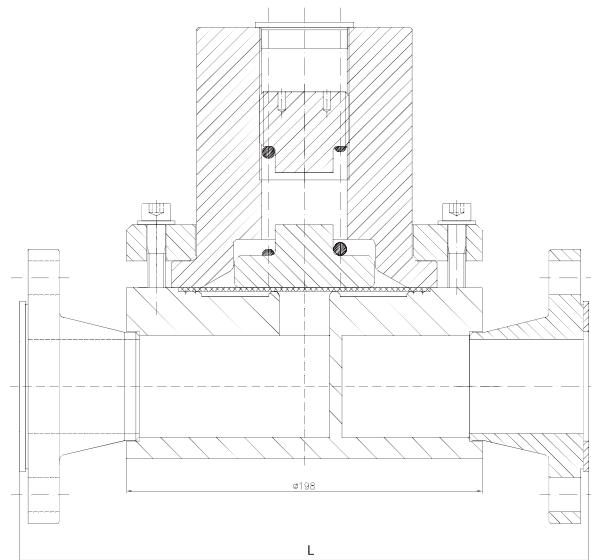


Image 16

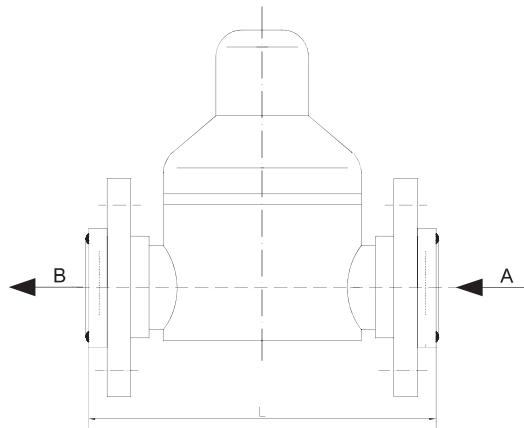


Image 17

5 Installation



Warning

The installation must only be carried out by authorized specialists!



Warning

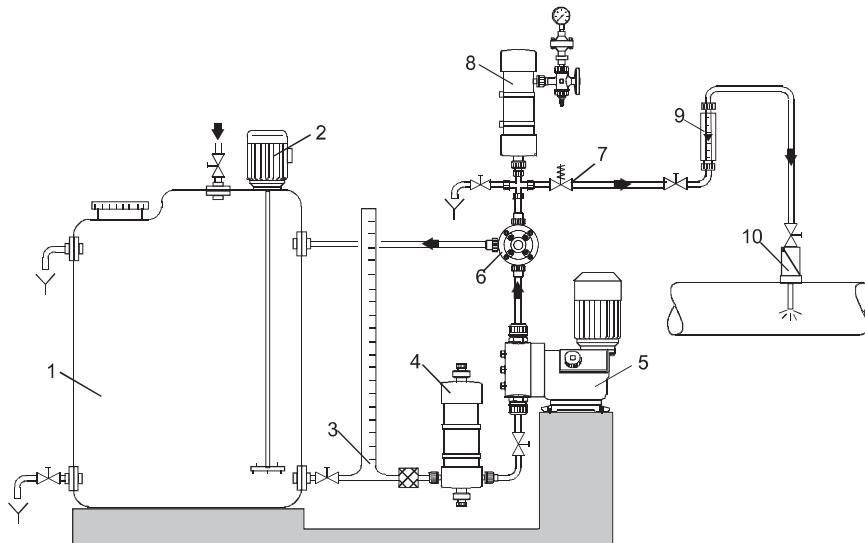
When dosing dangerous media, always refer to the corresponding safety data sheets!



Warning

Wear protective gloves and glasses when executing work at the connections or lines!

5.1 Picture of optimal installation:



- 1 Dosing tank
- 2 Electric agitator
- 3 Extraction device
- 4 Suction pulsation damper
- 5 Dosing pump
- 6 Overflow valve
- 7 Pressure loading valve
- 8 Pulsation damper
- 9 Measuring glass
- 10 Injection unit

5.2 Connections

The pressure loading valves have an input (A) and an output on the pressure side (B). They are installed in the pressure line.

Pressure loading valves DN4 and DN8 can also be mounted directly on the pressure valve for the dosing pump with an optional adapter (D) (for the adapter for pump installation, see section 'spare parts and accessories').



Warning

During installation, observe the flow direction of the dosing line. (Direction arrow on valve housing)



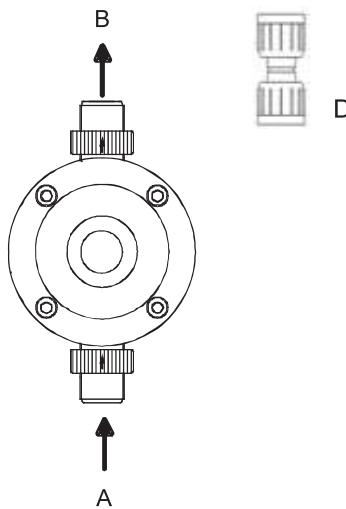
Caution

When using a pressure loading valve in conjunction with a pulsation damper, the pressure loading valve must be installed after the pulsation damper.



Note

*It is recommended that the pressure loading valve is installed directly in front of the addition point in the dosing line.
For direct pump installation, the line connected to the injection unit should be as short as possible.*

**For line installation**

1. Connect the pressure line from the dosing head to the input (A).
2. Connect the outgoing pressure line to the output on the pressure side (B).

For installation directly on the pump

1. Remove connection from the input (A).
2. Screw the adapter (D) for pump installation onto the input (A) and onto the pressure valve for the pump.
3. Connect the outgoing pressure line to the output on the pressure side (B).

**Warning**

Danger of injuries! Never operate the pump if the line is not correctly connected to the pressure loading valve.

4. After 48 operating hours, tighten the screws on the upper part of the valve.
Max. torque:

DN4	2Nm
DN8	
DN20	5Nm

6 Setting of Opening Pressure

6.1 General

The opening pressure can only be set if a manometer is installed in the system between the pump and the pressure loading valve.

**Warning**

Settings on the pressure loading valve must only be carried out by authorized specialists!

The opening pressure of the pressure loading valve is set in the factory to the value specified in the technical data. The opening pressure during operation depends on various factors, e.g. the flow, the stroke frequency of the pump, or the back-pressure. If an exact setting is required, the pressure loading valve must be adapted to the local conditions.

The opening pressure must only be set to values **below** the maximum permissible operating pressure.

**Warning**

Danger of injury! Never set the opening pressure higher than the maximum permissible operating pressure of the dosing system and dosing pump.

**Warning**

When dosing dangerous media, always refer to the corresponding safety data sheets! Wear protective clothing (goggles, gloves) when working on the connections and lines!

**Caution**

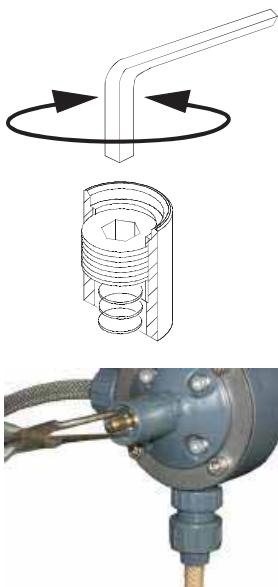
The pressure loading valve does not function as a shut-off valve. Therefore, the adjusting screw must not be tightened too far.

6.2 Setting Instructions for Opening Pressure

Proceed as follows if the factory-set pressure is to be changed:

With the pump running:

1. Remove the cap from the top part of the pressure loading valve.
2. Read the current opening pressure on the manometer.
3. For DN4 and DN8 use a hexagon wrench, for DN20 - DN65 use a pair of needle-nose pliers:
 - in the clockwise direction to increase the pressure
 - in the counterclockwise direction to reduce the pressure until the desired opening pressure is set.
4. Attach the cap again.



7 Possible Faults

Fault	Cause	Elimination
pressure loading valve produces no backpressure	pressure loading valve set incorrectly (too low)	Set pressure loading valve to a higher opening pressure
	Diaphragm faulty	Replace diaphragm
	Contamination	Clean pressure loading valve

8 Maintenance



Warning

*When dosing dangerous media, always refer to the corresponding safety data sheets!
Wear protective clothing (goggles, gloves) when working on the connections and lines!
Maintenance must only be carried out by authorized specialists!*

8.1 Intervals for Cleaning and Maintenance

- at least every 12 months or after 8000 operating hours or
- should faults occur.

Clean the pressure loading valve, and replace the diaphragm and O-rings if necessary.

Spare parts-> see section 'spare parts and accessories'

8.2 Replacing the Diaphragm

1. Shut down the dosing system.
2. Make it impossible for a return flow or overpressure to occur.
3. Loosen the 4 screws on the top part of the pressure loading valve.
4. Remove top part of pressure loading valve.
5. Remove the diaphragm.
6. Insert new diaphragm.
7. Return top part of pressure loading valve and tighten screws diagonally.
Max. torque: :

DN4	2Nm
DN8	
DN20	5Nm

8. Start up the dosing system again.
9. Tighten the screws on the top part of the pressure loading valve again after 48 hours of operation.
Max. torque: :

DN4	2Nm
DN8	
DN20	5Nm

9 Spare Parts and Accessories

9.1 Adapter for installation directly on the pump

Order No.	Nominal width	Material	Connection (pump-valve)
529-057	DN 4	PVC	3/8" an 5/8"
529-058	DN 4	1.4571	3/8" an 1/4"
529-062	DN 4	PP	3/8" an 5/8"
529-064	DN 4	PVDF	3/8" an 5/8"
529-059	DN 8	1.4571	5/8" an 1/4"
529-061	DN 8	PVC	5/8" an 5/8"
529-063	DN 8	PP	5/8" an 5/8"
529-065	DN 8	PVDF	5/8" an 5/8"

* not suitable for pumps with Plus³ System

9.2 Set of counter flanges for Pressure Loading Valves DN 32 and DN 65

Order No.	Nominal width	Material	Description
529-412	DN 32	V4A	Consisting of lapped flange, headed bush, screws, collars and nuts
529-417	DN 32	PVC	
529-420	DN 32	PVDF	
529-443	DN 65	PVC	
529-444	DN 65	PP	
529-421	DN 32	PP	Consisting of welding neck flange, flat gasket, screws, collars and nuts
529-445	DN 65	V4A	Consisting of welding neck flange, screws, collars and nuts

9.3 Spare Parts for Pressure Loading Valves

Spare parts - Order No.

Pressure loading valve	Nominal width	Diaphragm	O-rings	Amount	Pressure springr	Adjusting screw
525-0565	4	10.6243-401	52.105-2	2	10.6247	10.6490-400
525-0565.1	4	10.6243-401	52.105-1	2	10.6247	10.6490-400
525-0566.1	4	10.6243-401	52.344	2	10.6247	10.6490-400
525-0567	4	10.6243-401	52.105-2	2	10.6247	10.6490-400
525-0567.1	4	10.6243-401	52.105-1	2	10.6247	10.6490-400
525-0567.2	4	10.6243-401	52.344	2	10.6247	10.6490-400
525-0570	4	10.6243-401	-	-	10.6251	10.6490-400
525-0573	4	10.6243-401	52.105-1	2	10.6247	10.6490-400
525-0600	4	10.6243-401	-	2	10.6247	10.6490-401
525-0608	4	10.6243-401	52.183	2	10.6247	10.6490-401
525-3173	4	10.6243-401	52.105-2	2	10.6247	10.6490-400
525-3173.1	4	10.6243-401	52.105-1	2	10.6247	10.6490-400
525-3174	4	10.6243-401	52.150-2	2	10.6247	10.6490-400
525-3174.1	4	10.6243-401	52.105-1	2	10.6247	10.6490-400
525-0563	4	10.6243-401	52.105-1	2	10.6247	10.6490-400
525-0568	8	10.6243-401	52.105-2	2	10.6247	10.6490-400
525-0569.1	8	10.6243-401	52.344	2	10.6247	10.6490-400
525-0571	8	10.6243-401	-	-	10.6251	10.6490-400
525-1565.1	8	10.6243-401	52.105-1	2	10.6251	10.6490-400
525-3177	8	10.6243-401	52.344	2	10.6251	10.6490-400
525-0568.1	10	10.6243-401	52.105-1	2	10.2663	10.6490-400
525-1113	20	10.6243-402	52.141	2	10.6251	10.2617-41
525-1113.01	20	10.6243-402	52.141	2	10.6251	10.2617-41
525-1113.1	20	10.6243-402	52.141-1	2	10.6251	10.2617-41
525-1113.11	20	10.6243-402	52.141-1	2	10.6251	10.2617-41
525-1113.21	20	10.6243-402	52.141-2	2	10.6251	10.2617-41
525-1163	20	10.6243-402	52.141	2	10.6251	10.2617-41
525-1163.01	20	10.6243-402	52.141	2	10.6251	10.2617-41
525-1163.1	20	10.6243-402	52.141-1	2	10.6251	10.2617-41
525-1163.11	20	10.6243-402	52.141-1	2	10.6251	10.2617-41
525-1183.1	20	10.6243-402	52.141-2	2	10.6251	10.2617-41
525-2133	20	10.6243-402	-	-	10.6251	10.2617-41
525-4113	20	10.6243-402	52.141	2	10.6251	10.2617-41
525-1173	32	10.6243-403	52.202	2	10.2663	10.2664-41
525-1173.01	32	10.6243-402	52.202	2	10.2663	10.2664-41
525-1173.1	32	10.6243-402	52.261	2	10.2663	10.2664-41

Pressure loading valve	Nominal width	Diaphragm	O-rings	Amount	Pressure springr	Adjusting screw
525-1173.11	32	10.6243-402	52.261	2	10.2663	10.2664-41
525-1223	32	10.6243-402	52.154-2	2	10.2663	10.2664-41
525-1223.1	32	10.6243-402	52.393	2	10.2663	10.2664-41
525-1243	32	10.6243-402	52.202	2	10.2663	10.2664-41
525-1243.1	32	10.6243-402	52.261	2	10.2663	10.2664-41
525-2233	32	10.6243-402	-	1	10.2663	10.2664-41
525-2243	32	10.6243-402	-	1	10.2663	10.2664-41
525-2403	32	10.6243-402	52.422	2	10.2663	10.2664-41
525-0610	65	-	52.260	2	-	-
525-0611	65	-	52.259	2	-	-
525-0612	65	-	52.260	2	-	-
525-0613	65	10.1572-41	54.020-4	1	10.3361	10.3349-402



Pressure Loading Valve 525

Operation Manual

Read this manual completely and keep it!
No warranty in case of damages caused by incorrect operation.

Imprint

**Pressure Loading Valve 525
Operation Manual**

Version 3.0

Publisher

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Subject to change.

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1 General

1.1 Introduction

This operation manual contains all the information required for starting up and handling the described pressure loading valves.

If you require further information or if any problems arise, which are not discussed in detail in this operation manual, contact ALLDOS directly for the information needed.

1.2 Using this Paper

The headings **WARNING**, **CAUTION** and **NOTE** have the following meaning:



Warning

Danger of injuries and accidents!



Caution

Danger of incorrect operation or damage to the product!



Note

There is an exceptional feature.

1.3 Warranty

Warranty in accordance with our general terms of sale and delivery shall only be valid, if:

- the product is used according to the information within this paper,
- the product is not being opened or used improperly,
- maintenance and repair is implemented exclusively by authorized and qualified personnel,
- original spare parts are used for repairs.

The safety instructions specified in this document must be observed at all times!

2 Safety Instructions

The component has left the factory in a safe error-free state. In order to maintain this state and ensure safe operation, the user must observe the instructions and warning notes provided in this technical information.

If safe operation is no longer possible, the component must be shut down and secured against unintentional operation. This is the case:

- If the component is visibly damaged
- If the component no longer seems operational
- Following long periods of storage under unfavourable conditions

2.1 Application of the Product

The pressure loading valve described here is used to maintain the required counterpressure for the pump, if insufficient counterpressure is available in the system or open outflow is specified.



Warning

Other applications are not intended and are not permitted. ALLDOS Eichler GmbH accept no responsibility for damages caused by unintended use.

2.2 Obligations of the Operating Authority

The operating authority of the plant is responsible for

- instructing the operation personnel
- arranging regular maintenance

2.3 Averting Dangers



Warning

When dosing dangerous media, observe the corresponding safety precautions!



Warning

Please observe the chemical resistance of dosing media with regard to materials.



Warning

Wear protective gloves and glasses when executing work at the connections or lines!



Warning

*Only use the prescribed line types!
Repair only by authorized personnel!*

3 General description

3.1 Function

The pressure loading valve keeps the pump's backpressure constant. The valve opens and the liquid is dosed, if the pressure exceeds the opening pressure adjusted at the valve.

3.2 Ambient and Operating Conditions

Admissible storage temperature	20 °C to +50 °C
Admissible ambient temperature	0 °C to +40 °C (at an installation height of up to 1000 m above sea level)
Admissible humidity	rel. humidity: 70% at 40 °C, 90% at 35 °C

3.3 Admissible Media

Admissible Mediatemperaturer	
Material	Pressure range
1.4571	until 10 bar -10 °C to 40 °C
PVC	0 °C to 40 °C
PP	0 °C to 40 °C
PVDF	-10 °C to 40 °C *



Warning

Pressure loading valves must not be used for abrasive or crystallizing media.



Warning

Pressure loading valves are not absolutely tight. When dosing dangerous substances take appropriate protective measures!

Additional information with regard to the medium, medium temperature and operating pressure is available on request.

4 Technical Data

4.1 Pressure Loading Valves DN 4 and DN 8

Order No.	Nominal width	Pressure release	Valve body	Gasket	Hose type	Pipe	Connection	Image
525-0565	4	3	PP	Viton	PE-SL4/6		G 5/8"	1
525-0565.1	4	3	PP	EPDM	PE-SL4/6		G 5/8"	1
525-0566.1	4	3	PVDF	PTFE		RO4/6"	G 5/8"	2
525-0567	4 8	3	PVC	Viton	PE-SL4/6 PVC-SL6/12	RO10/12"	G 5/8"	1
525-0567.1	4 8	3	PVC	EPDM	PE-SL4/6 PVC-SL6/12	RO10/12"	G 5/8"	1
525-0567.2	4 8	3	PVC	PTFE	PE-SL4/6 PVC-SL6/12	RO10/12"	G 5/8"	1
525-0570	4	3	1.4571			RO4/6"	G 1/4"	5
525-0573	4	3	PP	EPDM	PE-SL5/8		G 5/8"	1
525-0600	4	3	1.4571			RO4/6"	G 1/4"	4
525-0608	4	3	PTFE	Viton			GL 18"	-
525-3173	4 8	3	PP	Viton	PE-SL4/6 PE-SL6/9 PE-SL9/12		G 5/8"	1
525-3173.1	4 8	3	PP	EPDM	PE-SL4/6 PE-SL6/9 PE-SL9/12		G 5/8"	1
525-3174	4 8	3	PVC	Viton	PE-SL4/6 PE-SL6/9 PE-SL9/12 PVC-SL6/12	RO10/12"	G 5/8"	1
525-3174.1	4 8	3	PVC	EPDM	PE-SL4/6 PE-SL6/9 PE-SL9/12	RO10/12"	G 5/8"	1
525-0563	8	3	PP	EPDM	PE-SL9/12		G 5/8"	1
525-0568	8	3	PP	Viton		RO12/16"	G 5/8"	3
525-0568.1	8	3	PP	EPDM		RO12/16"	G 5/8"	3
525-0569.1	8	3	PVDF	PTFE		RO12/16"	G 5/8"	3
525-0571	8	3	1.4571			RO1/4"	G 1/4"	6
525-1565.1	8	3	PP	EPDM	PVC-SL6/12		G 5/8"	1
525-3177	8	3	PVDF	PTFE	PE-SL6/9		G 5/8"	1

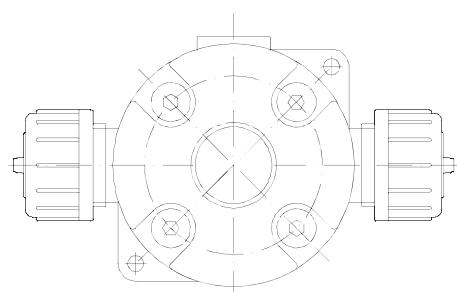
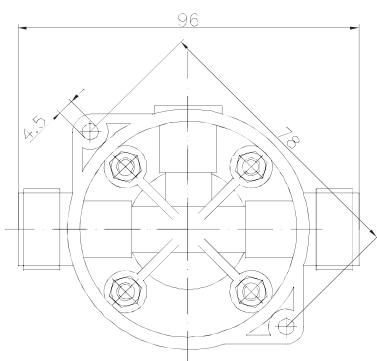


Image 1

Drilling scheme for Images 1-4

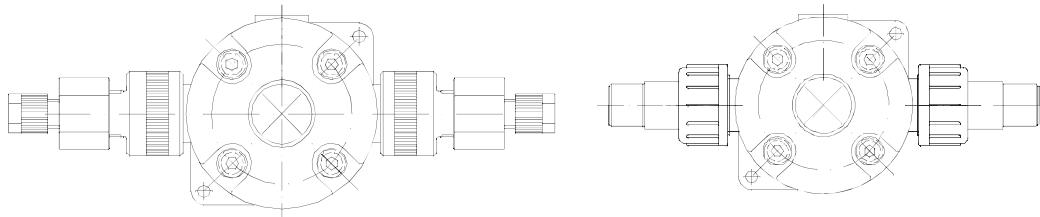


Image 3

Image 2

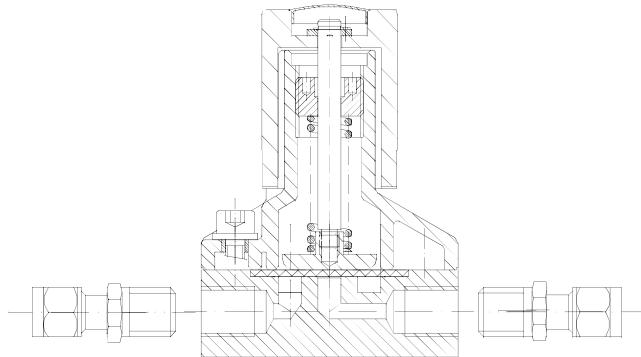


Image 4

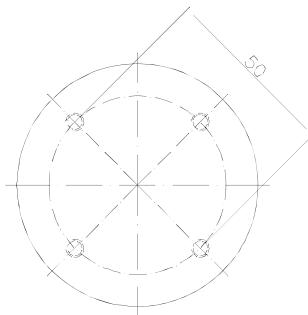
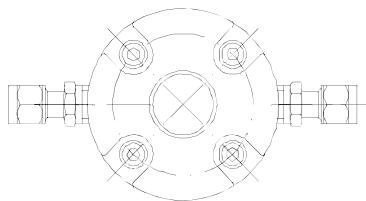


Image 5



Drilling scheme for Images 5 and 6

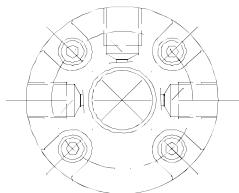
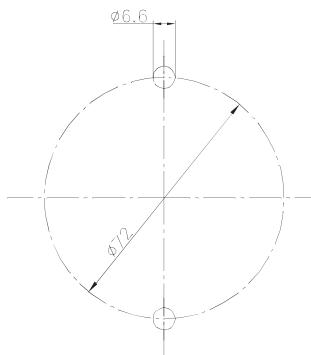


Image 6

4.2 Pressure Loading Valves DN 20

Order No.	Nominal width	Pressure release	Valve body	Gasket	L	Hose type	Pipe	Connection	Image
525-1113	20	3	PVC	Viton	149	PVC-SL13/20	RO20/25	G 11/4"	7
525-1113.01	20	3	PVC	Viton	149	PVC-SL19/27		G 11/4"	8
525-1113.1	20	3	PVC	EPDM	149	PVC-SL13/20	RO20/25	G 11/4"	7
525-1113.11	20	3	PVC	EPDM	149	PVC-SL19/27		G 11/4"	8
525-1113.21	20	3	PVC	PTFE	149	PVC-SL19/27		G 11/4"	8
525-1163	20	3	PP	Viton	152,5		RO20/25	G 11/4"	7
525-1163.01	20	3	PP	Viton	152,5	PVC-SL19/27		G 11/4"	8
525-1163.1	20	3	PP	EPDM	152,5		RO20/25	G 11/4"	7
525-1163.11	20	3	PP	EPDM	152,5	PVC-SL19/27		G 11/4"	8
525-1183.1	20	3	PVDF	PTFE	145,5		RO20/25	G 11/4"	7
525-2133	20	3	1.4571		-			G3/4	10
525-4113	20	3	PVC	Viton	149			3/4" NPT	9



Drilling scheme

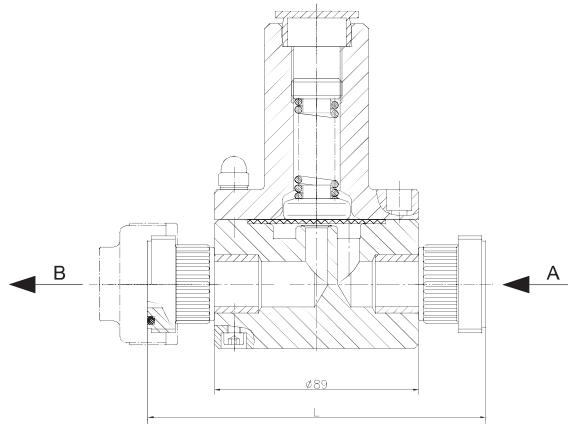


Image 7

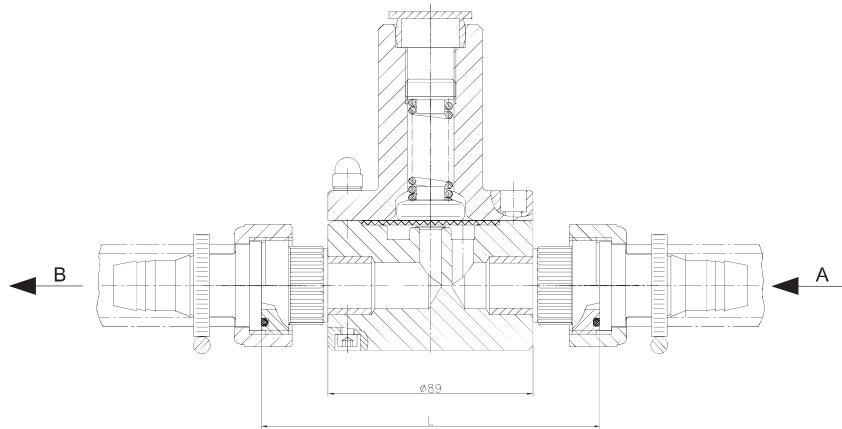


Image 8

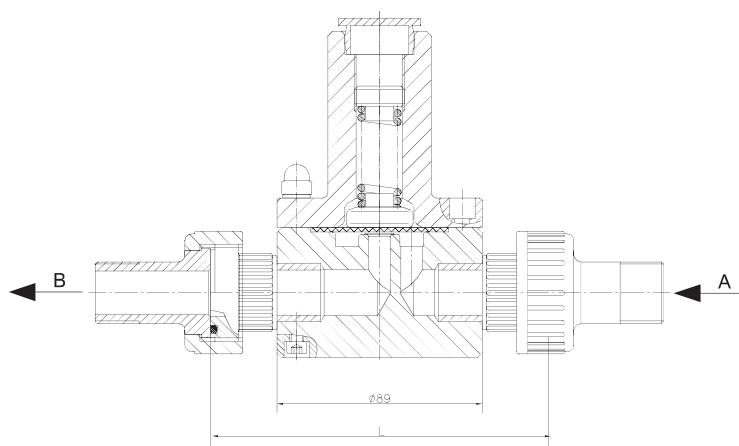


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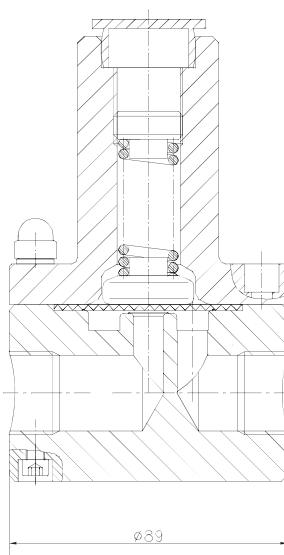
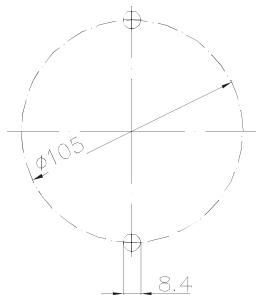


Image 10

4.3 Pressure Loading Valves DN 32

Order No.	Nominal width	Pressure release	Valve body	Gasket	L	Pipe	Connection	Image
525-1173	32	3	PP	Viton	229	RO32/40"	flange DN32	12
525-1173.01	32	3	PP	Viton	205	RO32/40"	G 2"	13
525-1173.1	32	3	PP	EPDM	229		flange DN32	12
525-1173.11	32	3	PP	EPDM	205	RO32/40"	G 2"	13
525-1223	32	3	PVC	Viton	205	RO32/40"	G 2"	11
525-1223.1	32	3	PVC	EPDM	205	RO32/40"	G 2"	11
525-1243	32	3	PVC	Viton	229		flange DN32	12
525-1243.1	32	3	PVC	EPDM	229		flange DN32	12
525-2233	32	3	1.4571		-		G 11/4"	14
525-2243	32	3	1.4571	PVC	?		flange DN32/G 11/4"	15
525-2403	32	3	PVDF	PTFE	229	RO32/40"	flange DN32	12

* With insertion section for pipe 32/40 in PP and also in PVDF



Drilling scheme

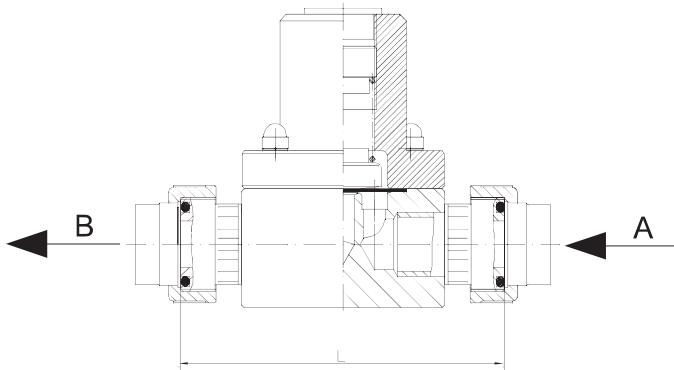


Image 11

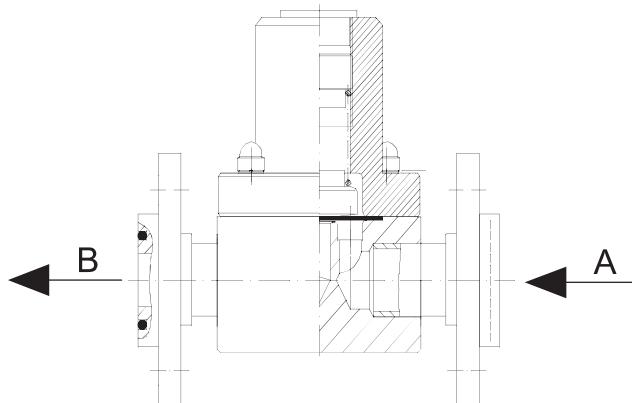


Image 12

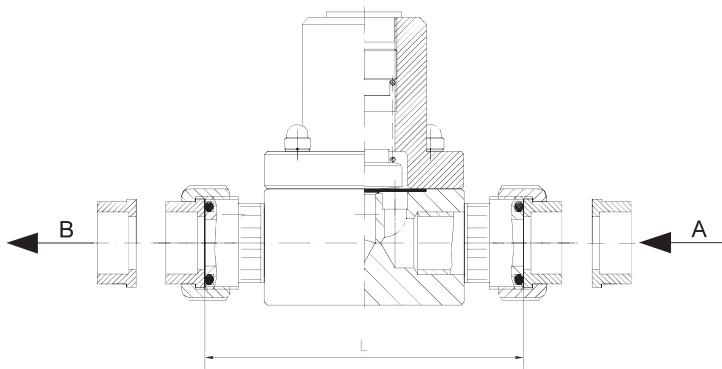


Image 13

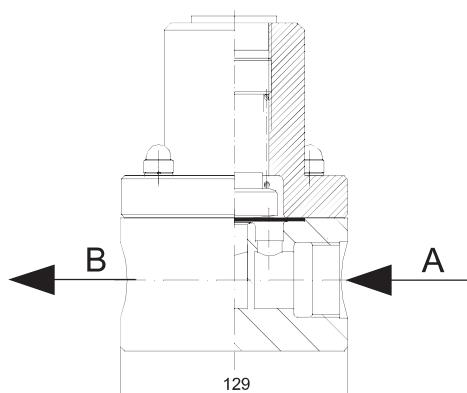


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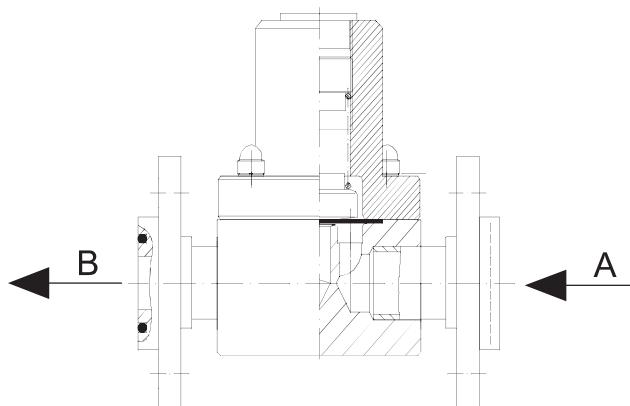
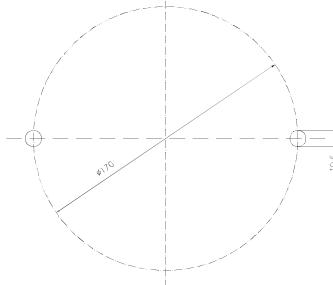


Image 15

4.4 Pressure Loading Valves DN 50 and DN 65

Order No.	Nominal width	Pressure release	Valve body	Gasket	L	Connection	Image
525-2363	50	2,2	PP	Viton	264	flange DN50	17
525-0610	65	1,5	PVC	Viton	266	flange DN65	17
525-0611	65	1,5	PVC	EPDM	266	flange DN65	17
525-0612	65	1,5	PP	Viton	326	flange DN65	17
525-0613	65	1,5	1.4571	PVC-WEICH	-	flange DN65	16



Drilling scheme for Image 16

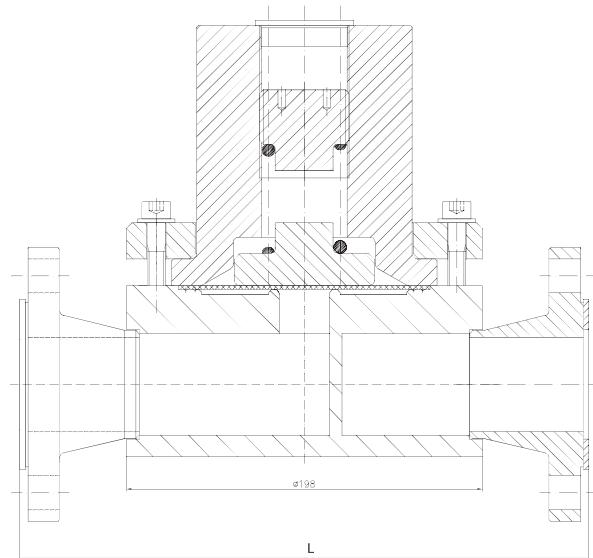


Image 16

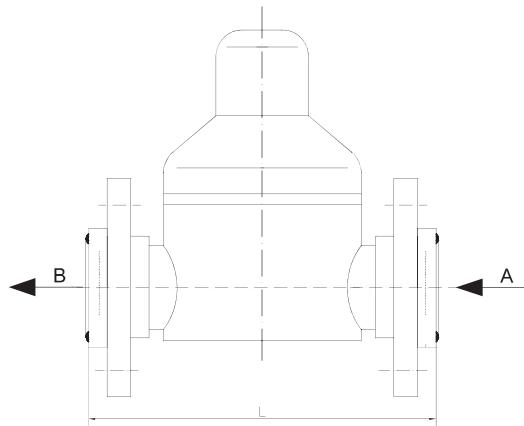


Image 17

5 Installation



Warning

The installation must only be carried out by authorized specialists!



Warning

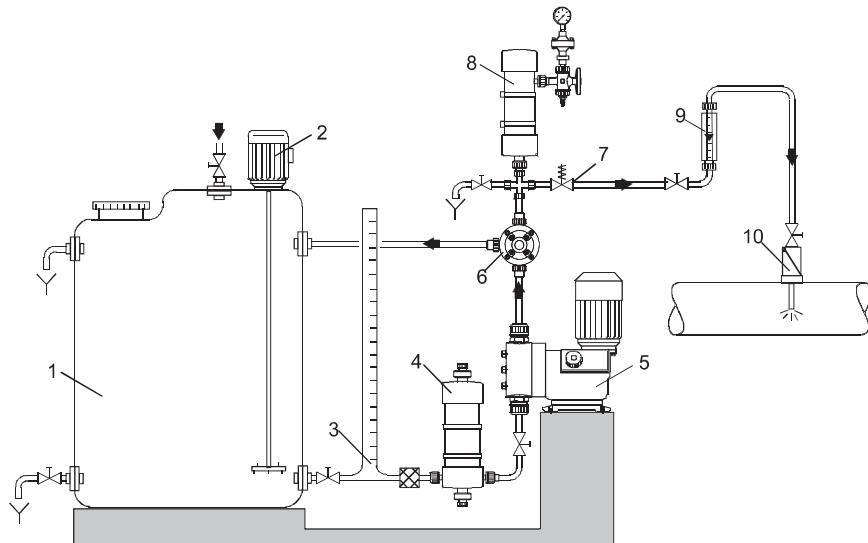
When dosing dangerous media, always refer to the corresponding safety data sheets!



Warning

Wear protective gloves and glasses when executing work at the connections or lines!

5.1 Picture of optimal installation:



- 1 Dosing tank
- 2 Electric agitator
- 3 Extraction device
- 4 Suction pulsation damper
- 5 Dosing pump
- 6 Overflow valve
- 7 Pressure loading valve
- 8 Pulsation damper
- 9 Measuring glass
- 10 Injection unit

5.2 Connections

The pressure loading valves have an input (A) and an output on the pressure side (B). They are installed in the pressure line.

Pressure loading valves DN4 and DN8 can also be mounted directly on the pressure valve for the dosing pump with an optional adapter (D) (for the adapter for pump installation, see section 'spare parts and accessories').



Warning

During installation, observe the flow direction of the dosing line. (Direction arrow on valve housing)



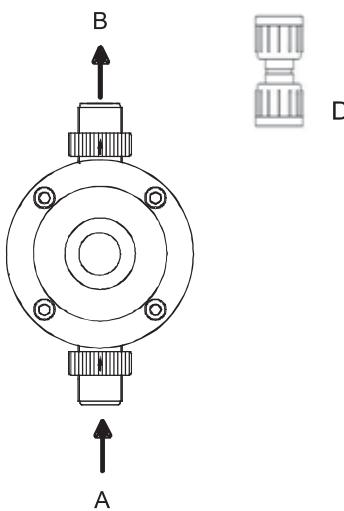
Caution

When using a pressure loading valve in conjunction with a pulsation damper, the pressure loading valve must be installed after the pulsation damper.



Note

*It is recommended that the pressure loading valve is installed directly in front of the addition point in the dosing line.
For direct pump installation, the line connected to the injection unit should be as short as possible.*

**For line installation**

1. Connect the pressure line from the dosing head to the input (A).
2. Connect the outgoing pressure line to the output on the pressure side (B).

For installation directly on the pump

1. Remove connection from the input (A).
2. Screw the adapter (D) for pump installation onto the input (A) and onto the pressure valve for the pump.
3. Connect the outgoing pressure line to the output on the pressure side (B).

**Warning**

Danger of injuries! Never operate the pump if the line is not correctly connected to the pressure loading valve.

4. After 48 operating hours, tighten the screws on the upper part of the valve.
Max. torque:

DN4	2Nm
DN8	
DN20	5Nm

6 Setting of Opening Pressure

6.1 General

The opening pressure can only be set if a manometer is installed in the system between the pump and the pressure loading valve.

**Warning**

Settings on the pressure loading valve must only be carried out by authorized specialists!

The opening pressure of the pressure loading valve is set in the factory to the value specified in the technical data. The opening pressure during operation depends on various factors, e.g. the flow, the stroke frequency of the pump, or the back-pressure. If an exact setting is required, the pressure loading valve must be adapted to the local conditions.

The opening pressure must only be set to values **below** the maximum permissible operating pressure.

**Warning**

Danger of injury! Never set the opening pressure higher than the maximum permissible operating pressure of the dosing system and dosing pump.

**Warning**

When dosing dangerous media, always refer to the corresponding safety data sheets! Wear protective clothing (goggles, gloves) when working on the connections and lines!

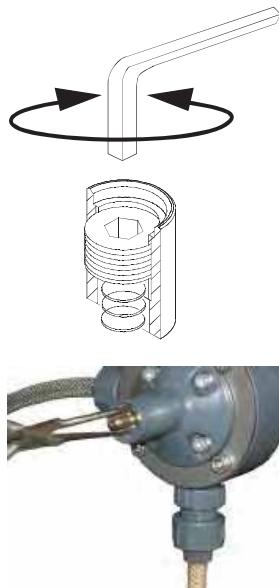
**Caution**

The pressure loading valve does not function as a shut-off valve. Therefore, the adjusting screw must not be tightened too far.

6.2 Setting Instructions for Opening Pressure

Proceed as follows if the factory-set pressure is to be changed:

With the pump running:



1. Remove the cap from the top part of the pressure loading valve.
2. Read the current opening pressure on the manometer.
3. For DN4 and DN8 use a hexagon wrench, for DN20 - DN65 use a pair of needle-nose pliers:
 - in the clockwise direction to increase the pressure
 - in the counterclockwise direction to reduce the pressure until the desired opening pressure is set.
4. Attach the cap again.



7 Possible Faults

Fault	Cause	Elimination
pressure loading valve produces no backpressure	pressure loading valve set incorrectly (too low)	Set pressure loading valve to a higher opening pressure
	Diaphragm faulty	Replace diaphragm
	Contamination	Clean pressure loading valve

8 Maintenance



Warning

*When dosing dangerous media, always refer to the corresponding safety data sheets!
Wear protective clothing (goggles, gloves) when working on the connections and lines!
Maintenance must only be carried out by authorized specialists!*

8.1 Intervals for Cleaning and Maintenance

- at least every 12 months or after 8000 operating hours or
- should faults occur.

Clean the pressure loading valve, and replace the diaphragm and O-rings if necessary.

Spare parts-> see section 'spare parts and accessories'

8.2 Replacing the Diaphragm

1. Shut down the dosing system.
2. Make it impossible for a return flow or overpressure to occur.
3. Loosen the 4 screws on the top part of the pressure loading valve.
4. Remove top part of pressure loading valve.
5. Remove the diaphragm.
6. Insert new diaphragm.
7. Return top part of pressure loading valve and tighten screws diagonally.
Max. torque: :

DN4	2Nm
DN8	
DN20	5Nm

8. Start up the dosing system again.
9. Tighten the screws on the top part of the pressure loading valve again after 48 hours of operation.
Max. torque: :

DN4	2Nm
DN8	
DN20	5Nm

9 Spare Parts and Accessories

9.1 Adapter for installation directly on the pump

Order No.	Nominal width	Material	Connection (pump-valve)
529-057	DN 4	PVC	3/8" an 5/8"
529-058	DN 4	1.4571	3/8" an 1/4"
529-062	DN 4	PP	3/8" an 5/8"
529-064	DN 4	PVDF	3/8" an 5/8"
529-059	DN 8	1.4571	5/8" an 1/4"
529-061	DN 8	PVC	5/8" an 5/8"
529-063	DN 8	PP	5/8" an 5/8"
529-065	DN 8	PVDF	5/8" an 5/8"

* not suitable for pumps with Plus³ System

9.2 Set of counter flanges for Pressure Loading Valves DN 32 and DN 65

Order No.	Nominal width	Material	Description
529-412	DN 32	V4A	Consisting of lapped flange, headed bush, screws, collars and nuts
529-417	DN 32	PVC	
529-420	DN 32	PVDF	
529-443	DN 65	PVC	
529-444	DN 65	PP	
529-421	DN 32	PP	Consisting of welding neck flange, flat gasket, screws, collars and nuts
529-445	DN 65	V4A	Consisting of welding neck flange, screws, collars and nuts

9.3 Spare Parts for Pressure Loading Valves

Spare parts - Order No.

Pressure loading valve	Nominal width	Diaphragm	O-rings	Amount	Pressure springr	Adjusting screw
525-0565	4	10.6243-401	52.105-2	2	10.6247	10.6490-400
525-0565.1	4	10.6243-401	52.105-1	2	10.6247	10.6490-400
525-0566.1	4	10.6243-401	52.344	2	10.6247	10.6490-400
525-0567	4	10.6243-401	52.105-2	2	10.6247	10.6490-400
525-0567.1	4	10.6243-401	52.105-1	2	10.6247	10.6490-400
525-0567.2	4	10.6243-401	52.344	2	10.6247	10.6490-400
525-0570	4	10.6243-401	-	-	10.6251	10.6490-400
525-0573	4	10.6243-401	52.105-1	2	10.6247	10.6490-400
525-0600	4	10.6243-401	-	2	10.6247	10.6490-401
525-0608	4	10.6243-401	52.183	2	10.6247	10.6490-401
525-3173	4	10.6243-401	52.105-2	2	10.6247	10.6490-400
525-3173.1	4	10.6243-401	52.105-1	2	10.6247	10.6490-400
525-3174	4	10.6243-401	52.150-2	2	10.6247	10.6490-400
525-3174.1	4	10.6243-401	52.105-1	2	10.6247	10.6490-400
525-0563	4	10.6243-401	52.105-1	2	10.6247	10.6490-400
525-0568	8	10.6243-401	52.105-2	2	10.6247	10.6490-400
525-0569.1	8	10.6243-401	52.344	2	10.6247	10.6490-400
525-0571	8	10.6243-401	-	-	10.6251	10.6490-400
525-1565.1	8	10.6243-401	52.105-1	2	10.6251	10.6490-400
525-3177	8	10.6243-401	52.344	2	10.6251	10.6490-400
525-0568.1	10	10.6243-401	52.105-1	2	10.2663	10.6490-400
525-1113	20	10.6243-402	52.141	2	10.6251	10.2617-41
525-1113.01	20	10.6243-402	52.141	2	10.6251	10.2617-41
525-1113.1	20	10.6243-402	52.141-1	2	10.6251	10.2617-41
525-1113.11	20	10.6243-402	52.141-1	2	10.6251	10.2617-41
525-1113.21	20	10.6243-402	52.141-2	2	10.6251	10.2617-41
525-1163	20	10.6243-402	52.141	2	10.6251	10.2617-41
525-1163.01	20	10.6243-402	52.141	2	10.6251	10.2617-41
525-1163.1	20	10.6243-402	52.141-1	2	10.6251	10.2617-41
525-1163.11	20	10.6243-402	52.141-1	2	10.6251	10.2617-41
525-1183.1	20	10.6243-402	52.141-2	2	10.6251	10.2617-41
525-2133	20	10.6243-402	-	-	10.6251	10.2617-41
525-4113	20	10.6243-402	52.141	2	10.6251	10.2617-41
525-1173	32	10.6243-403	52.202	2	10.2663	10.2664-41
525-1173.01	32	10.6243-402	52.202	2	10.2663	10.2664-41
525-1173.1	32	10.6243-402	52.261	2	10.2663	10.2664-41

Pressure loading valve	Nominal width	Diaphragm	O-rings	Amount	Pressure springr	Adjusting screw
525-1173.11	32	10.6243-402	52.261	2	10.2663	10.2664-41
525-1223	32	10.6243-402	52.154-2	2	10.2663	10.2664-41
525-1223.1	32	10.6243-402	52.393	2	10.2663	10.2664-41
525-1243	32	10.6243-402	52.202	2	10.2663	10.2664-41
525-1243.1	32	10.6243-402	52.261	2	10.2663	10.2664-41
525-2233	32	10.6243-402	-	1	10.2663	10.2664-41
525-2243	32	10.6243-402	-	1	10.2663	10.2664-41
525-2403	32	10.6243-402	52.422	2	10.2663	10.2664-41
525-0610	65	-	52.260	2	-	-
525-0611	65	-	52.259	2	-	-
525-0612	65	-	52.260	2	-	-
525-0613	65	10.1572-41	54.020-4	1	10.3361	10.3349-402

2. Vendor Documentation

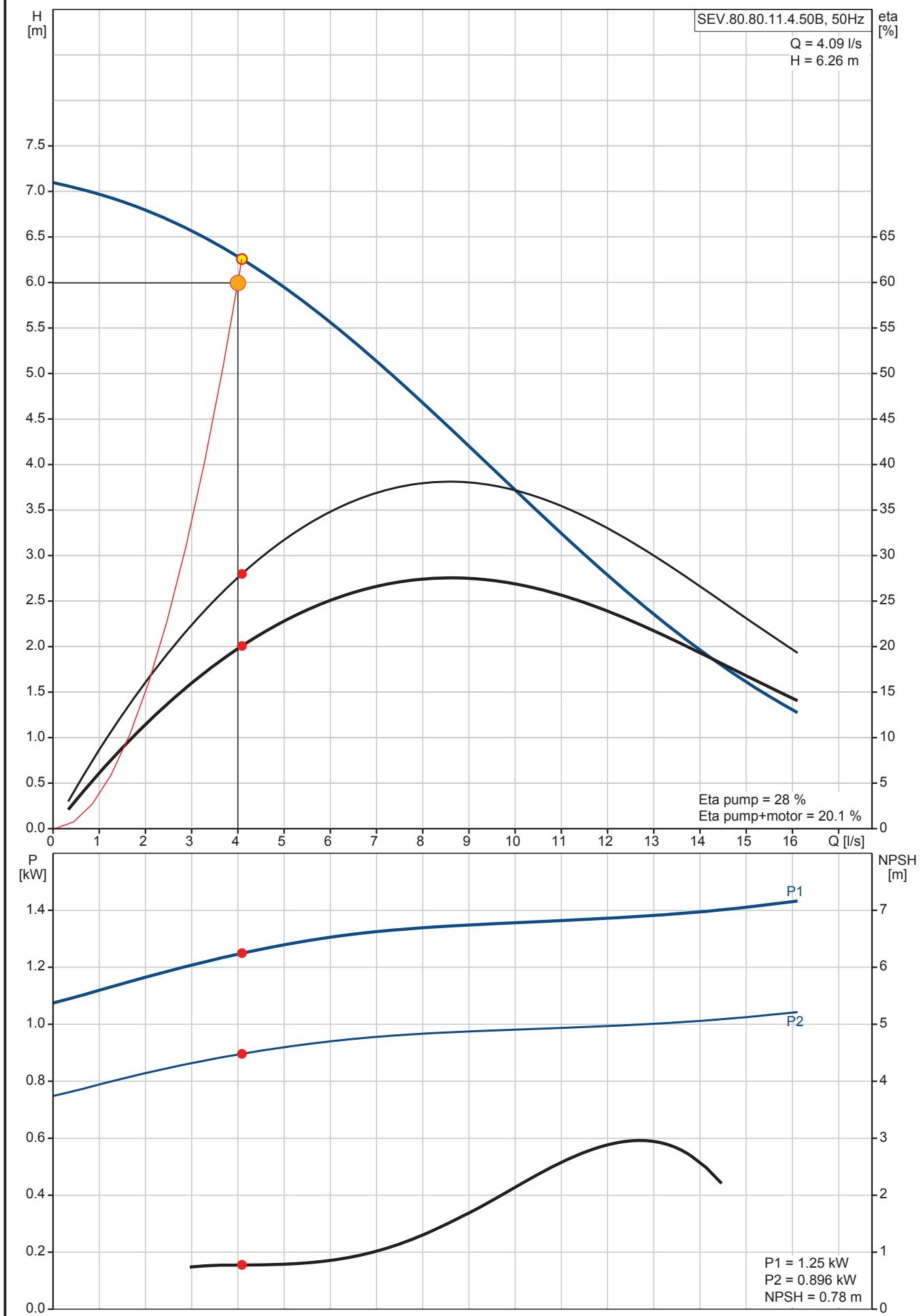
Grundfos Model SEV 80-80 Submersible Pump

Position	Qty.	Description	Single Price
	1	<p>SEV.80.11.4.50B</p>  <p>Note! Product picture may differ from actual product</p> <p>Product No.: 96048486</p> <p>Highly advanced pumps with many unique features. The Grundfos SEV ranges are technologically advanced pumps designed for handling wastewater, process water and unscreened raw sewage in heavy-duty municipal utilities and industrial applications. These heavy-duty pumps are built for years of trouble-free operation in the most demanding applications. The pumps may be installed submerged or dry without motor cooling; in either case they are extremely reliable and very easy to service. The efficient SuperVortex impellers provides free passage of solids up to 80 mm. This greatly reduces the risk of clogging and ensures maximum up-time and reduced operating costs.</p> <p>Advanced technology inside out The Grundfos SEV pumps feature advanced technology inside out. In spite of their good looks, these highly efficient pumps are designed for years of trouble-free operation in the toughest environments. Easy to install and easy to service, the SEV pumps ensure low long-term operating costs.</p> <p>Watertight cable connection Polyurethane-filled stainless steel cable connection, hermetically sealed. Ensures that liquid cannot penetrate through the cable into the motor.</p> <p>Short rotor shaft Compact motor construction with short rotor shaft reduces vibrations. Increases efficiency and lifetime of shaft seal and ball bearings.</p> <p>Liquid-less motor cooling Solid-block stator housing with built-in cooling conduits, which efficiently transfer excess heat to pumped liquid via a solid cast intermediate cooling flange. This allows for continuous operation even in a dry installation.</p> <p>Double mechanical shaft seal Efficient single-unit cartridge shaft seal system ensures longer operating time and less down-time. Easy to replace in the field without use of special tools.</p> <p>Stainless steel motor jacket Extremely robust impact-resistant stainless steel motor-housing jacket, with an easy-to-clean smooth surface.</p> <p>Stainless steel clamp Unique stainless steel clamp assembling system enables quick and easy disassembly of pump from motor unit. No tools required. Provides easy access for service and inspection.</p>	

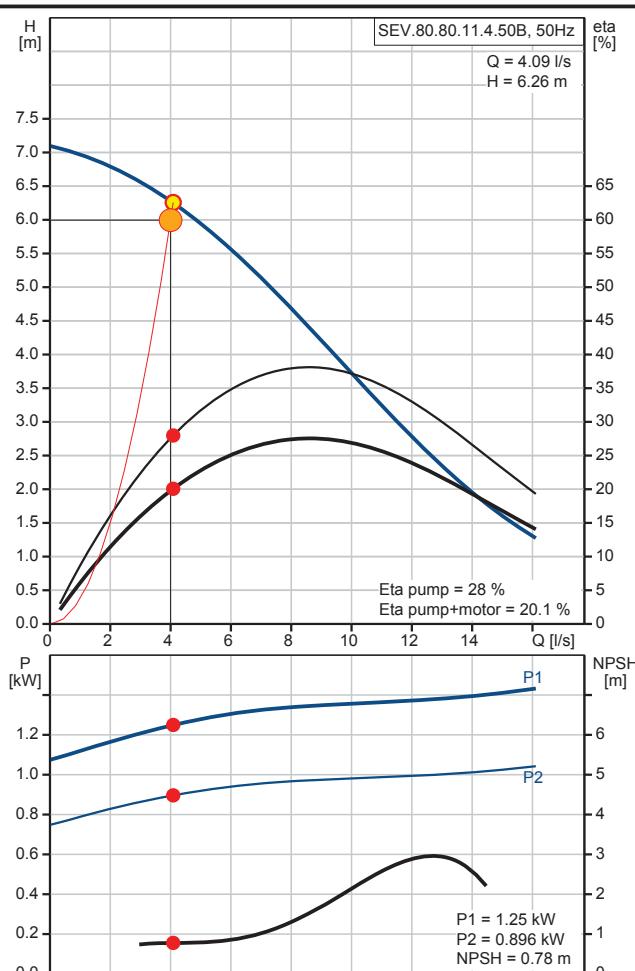
Position	Qty.	Description	Single Price																																																												
		<p>Modular design Each motor size fits several pump sizes with SuperVortex hydraulics.</p> <p>Operating conditions The Grundfos SEV pumps are suitable for continuous submerged operation with a liquid level just above the pump housing, or in a dry installation without separate motor cooling arrangements.</p> <p>Explosion-proof versions For applications involving a risk of explosion, or where otherwise required, explosion-proof versions of the Grundfos SEV pumps are available. The SEV pumps are in a II 2 GD, EEx d IIB 135°C (T4) c 135°C (T4) explosion protection classification according to EN standards 50 014-1997 / 50 018-2000 / 50 281-1-1. The SEV pumps are also available with a Class 1 Zone 2, Ex nA IIB 200°C (T3) classification in accordance with the IEC 60079-15:1987.</p> <p>Approvals The SEV.65, SEV.80 and SEV.100, have been approved according to DIN 12050-1, for use in buildings services by the German Building Technology Institute.</p> <p>Technical:</p> <table> <tbody> <tr> <td>Actual calculated flow:</td> <td>4.08 l/s</td> </tr> <tr> <td>Resulting head of the pump:</td> <td>6.26 m</td> </tr> <tr> <td>Type of impeller:</td> <td>SUPER VORTEX</td> </tr> <tr> <td>Maximum particle size:</td> <td>80 mm</td> </tr> <tr> <td>Primary shaft seal:</td> <td>SIC/SIC</td> </tr> <tr> <td>Secondary shaft seal:</td> <td>CARBON/CERAMICS</td> </tr> <tr> <td>Max. hydraulic efficiency:</td> <td>37 %</td> </tr> <tr> <td>Approvals on nameplate:</td> <td>EN12050-1</td> </tr> <tr> <td>Curve tolerance:</td> <td>ISO 9906:1999 Annex A</td> </tr> </tbody> </table> <p>Materials:</p> <table> <tbody> <tr> <td>Pump housing:</td> <td>EN-GJL-200</td> </tr> <tr> <td>Impeller:</td> <td>EN-GJL-200</td> </tr> </tbody> </table> <p>Installation:</p> <table> <tbody> <tr> <td>Maximum ambient temperature:</td> <td>40 °C</td> </tr> <tr> <td>Maximum operating pressure:</td> <td>6 bar</td> </tr> <tr> <td>Flange standard:</td> <td>DIN</td> </tr> <tr> <td>Pump outlet:</td> <td>DN 80</td> </tr> <tr> <td>Pressure stage:</td> <td>PN 10</td> </tr> <tr> <td>Maximum installation depth:</td> <td>20 m</td> </tr> </tbody> </table> <p>Liquid:</p> <table> <tbody> <tr> <td>Pumped liquid:</td> <td>0</td> </tr> <tr> <td>Liquid temperature range:</td> <td>0 .. 40 °C</td> </tr> <tr> <td>Density:</td> <td>1000 kg/m³</td> </tr> <tr> <td>Kinematic viscosity:</td> <td>1 mm²/s</td> </tr> </tbody> </table> <p>Electrical data:</p> <table> <tbody> <tr> <td>Number of poles:</td> <td>4</td> </tr> <tr> <td>Power input - P1:</td> <td>1.5 kW</td> </tr> <tr> <td>Rated power - P2:</td> <td>1.1 kW</td> </tr> <tr> <td>Mains frequency:</td> <td>50 Hz</td> </tr> <tr> <td>Rated voltage:</td> <td>3 x 400-415 V</td> </tr> <tr> <td>Voltage tolerance:</td> <td>+10/-10 %</td> </tr> <tr> <td>Start. method:</td> <td>direct-on-line</td> </tr> <tr> <td>Max starts per. hour:</td> <td>20</td> </tr> <tr> <td>Rated current:</td> <td>2,7-2,8 A</td> </tr> </tbody> </table>	Actual calculated flow:	4.08 l/s	Resulting head of the pump:	6.26 m	Type of impeller:	SUPER VORTEX	Maximum particle size:	80 mm	Primary shaft seal:	SIC/SIC	Secondary shaft seal:	CARBON/CERAMICS	Max. hydraulic efficiency:	37 %	Approvals on nameplate:	EN12050-1	Curve tolerance:	ISO 9906:1999 Annex A	Pump housing:	EN-GJL-200	Impeller:	EN-GJL-200	Maximum ambient temperature:	40 °C	Maximum operating pressure:	6 bar	Flange standard:	DIN	Pump outlet:	DN 80	Pressure stage:	PN 10	Maximum installation depth:	20 m	Pumped liquid:	0	Liquid temperature range:	0 .. 40 °C	Density:	1000 kg/m³	Kinematic viscosity:	1 mm²/s	Number of poles:	4	Power input - P1:	1.5 kW	Rated power - P2:	1.1 kW	Mains frequency:	50 Hz	Rated voltage:	3 x 400-415 V	Voltage tolerance:	+10/-10 %	Start. method:	direct-on-line	Max starts per. hour:	20	Rated current:	2,7-2,8 A	
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Position	Qty.	Description	Single Price
		<p>Rated current at 3/4 load: 2.3 A</p> <p>Rated current at 1/2 load: 2 A</p> <p>Starting current: 12 A</p> <p>Rated current at no load: 1.8 A</p> <p>Cos phi - power factor: 0,73</p> <p>Cos phi - p.f. at no load: 0,17</p> <p>Cos phi - p.f. at 3/4 load: 0,64</p> <p>Cos phi - p.f. at 1/2 load: 0,52</p> <p>Rated speed: 1440 rpm</p> <p>Locked-rotor torque: 15 Nm</p> <p>Breakdown torque: 21 Nm</p> <p>Moment of inertia: 0.0142 kg m²</p> <p>Motor efficiency at full load: 73,2 %</p> <p>Motor efficiency at 3/4 load: 71,2 %</p> <p>Motor efficiency at 1/2 load: 65,6 %</p> <p>Enclosure class (IEC 34-5): IP68</p> <p>Insulation class (IEC 85): F</p> <p>Explosion proof: no</p> <p>Length of cable: 15 m</p> <p>Cable type: LYNIFLEX</p> <p>Type of cable plug: NO PLUG</p> <p>Controls:</p> <p>Moisture sensor: without moisture sensors</p> <p>Water-in-oil sensor: without water-in-oil sensor</p> <p>Temp. sensor: N</p> <p>Others:</p> <p>Net weight: 96 kg</p>	

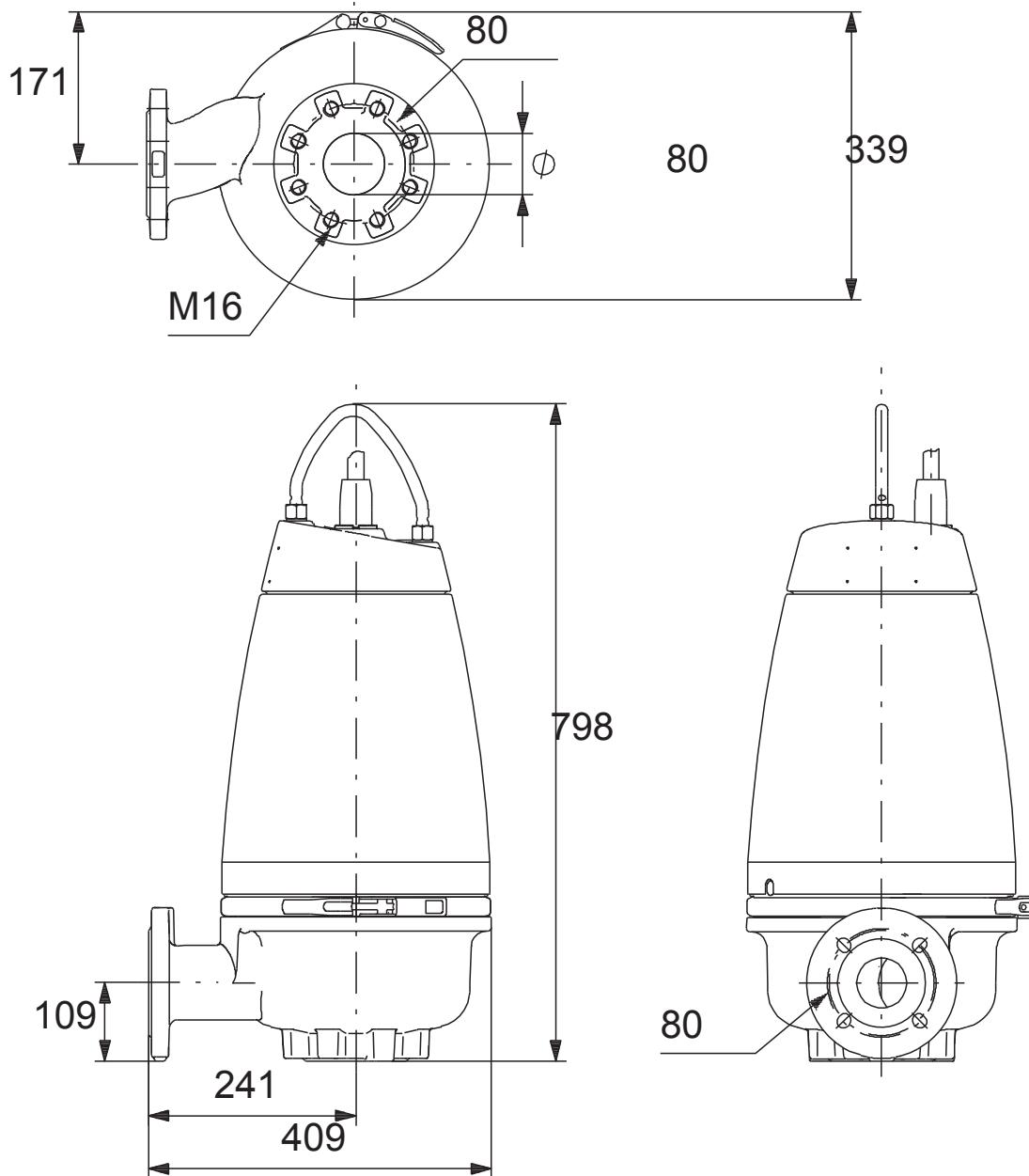
96048486 SEV.80.80.11.4.50B 50 Hz



Description	Value
Product name:	SEV.80.80.11.4.50B
Product No:	96048486
EAN number:	5700396437804
Price:	On request
Technical:	
Actual calculated flow:	4.09 l/s
Max flow:	16.1 l/s
Resulting head of the pump:	6.26 m
Head max:	7.1 m
Type of impeller:	SUPER VORTEX
Maximum particle size:	80 mm
Primary shaft seal:	SIC/SIC
Secondary shaft seal:	CARBON/CERAMICS
Max. hydraulic efficiency:	37 %
Approvals on nameplate:	EN12050-1
Curve tolerance:	ISO 9906:1999 Annex A
Materials:	
Pump housing:	EN-GJL-200
Impeller:	EN-GJL-200
Installation:	
Maximum ambient temperature:	40 °C
Maximum operating pressure:	6 bar
Flange standard:	DIN
Pump outlet:	DN 80
Pressure stage:	PN 10
Maximum installation depth:	20 m
Inst dry/wet:	DRY/SUBMERGED
Installation:	horizontal or vertical
Liquid:	
Pumped liquid:	0
Liquid temperature range:	0 .. 40 °C
Density:	1000 kg/m³
Kinematic viscosity:	1 mm²/s
Electrical data:	
Number of poles:	4
Power input - P1:	1.5 kW
Rated power - P2:	1.1 kW
Mains frequency:	50 Hz
Rated voltage:	3 x 400-415 V
Voltage tolerance:	+10/-10 %
Start. method:	direct-on-line
Max starts per. hour:	20
Rated current:	2,7-2,8 A
Rated current at 3/4 load:	2.3 A
Rated current at 1/2 load:	2 A
Starting current:	12 A
Rated current at no load:	1.8 A
Cos phi - power factor:	0,73
Cos phi - p.f. at no load:	0,17
Cos phi - p.f. at 3/4 load:	0,64
Cos phi - p.f. at 1/2 load:	0,52
Rated speed:	1440 rpm
Locked-rotor torque:	15 Nm
Breakdown torque:	21 Nm
Moment of inertia:	0.0142 kg m²
Motor efficiency at full load:	73,2 %
Motor efficiency at 3/4 load:	71,2 %
Motor efficiency at 1/2 load:	65,6 %
Enclosure class (IEC 34-5):	IP68
Insulation class (IEC 85):	F
Explosion proof:	no
Motor protec:	THERMAL SWITCH
Thermal protec:	internal
Length of cable:	15 m
Cable type:	LYNIFLEX
Type of cable plug:	NO PLUG
Controls:	

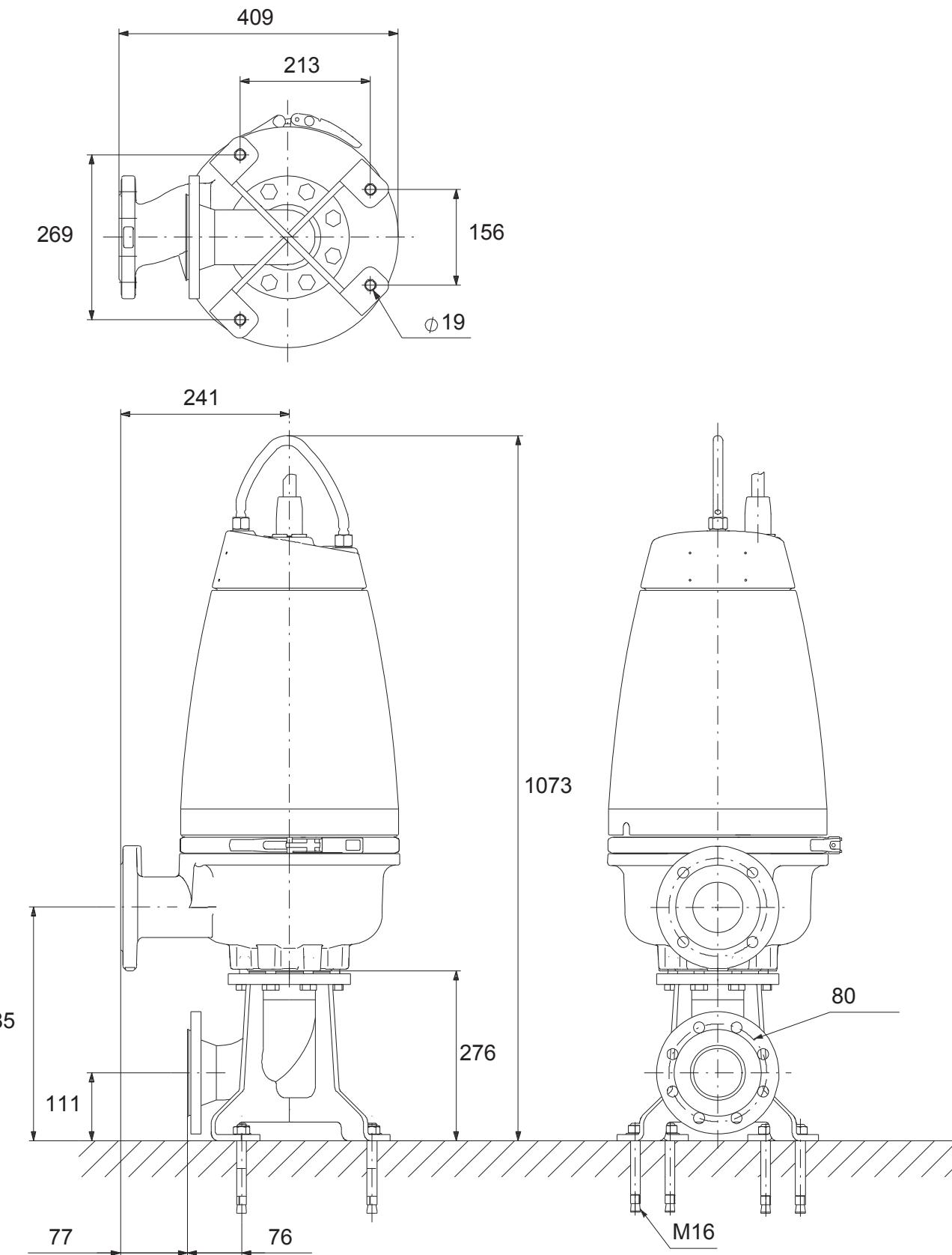


Description	Value
Control box:	not included
Moisture sensor:	without moisture sensors
Water-in-oil sensor:	without water-in-oil sensor
Temp. sensor:	N
Others:	
Net weight:	96 kg
Sales region:	Australia

96048486 SEV.80.80.11.4.50B 50 Hz

Note! All units are in [mm] unless others are stated.
Disclaimer: This simplified dimensional drawing does not show all details.

96048486 SEV.80.80.11.4.50B 50 Hz



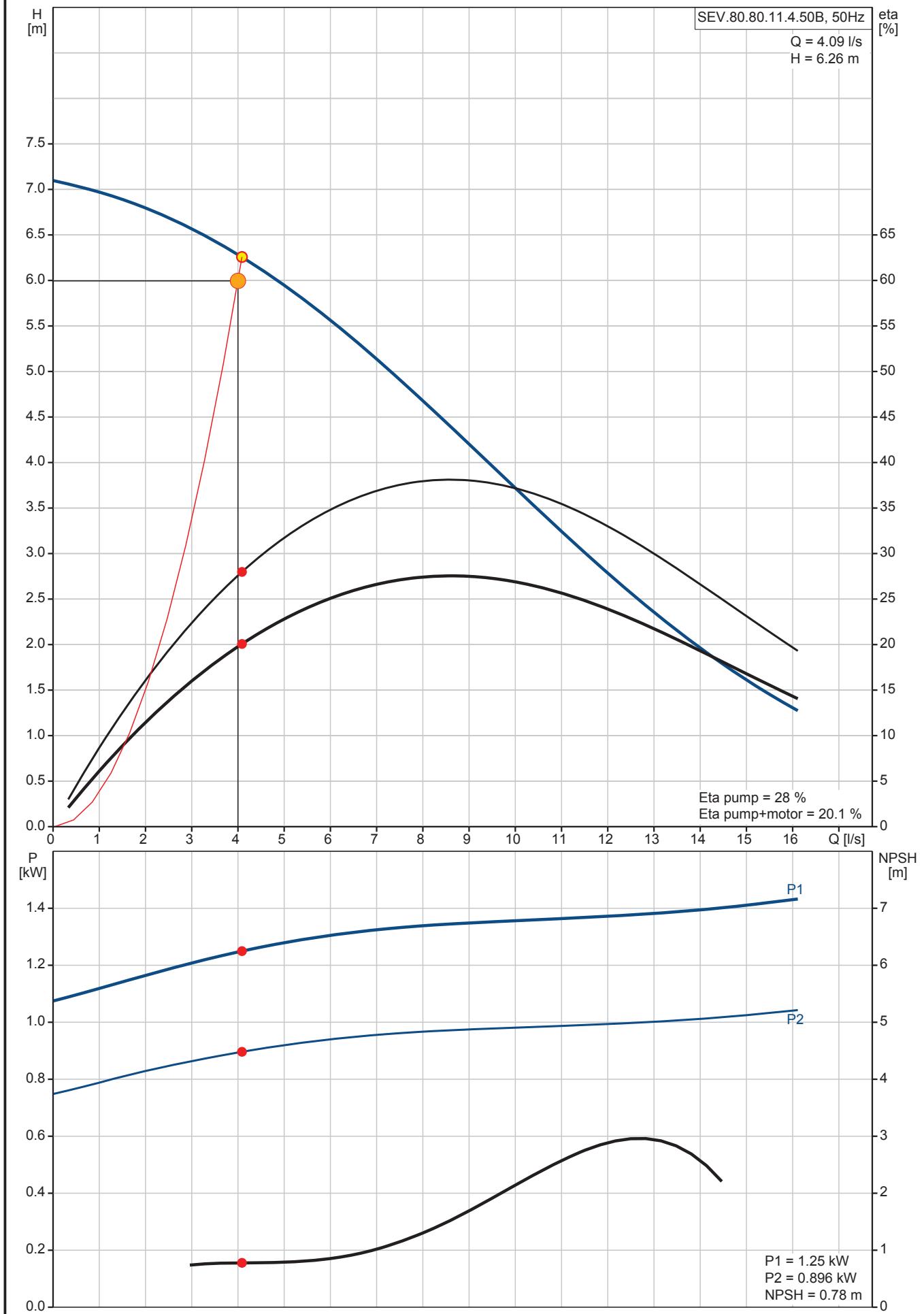
Note! All units are in [mm] unless others are stated.
 Disclaimer: This simplified dimensional drawing does not show all details.

Position	Qty.	Description	Single Price
	1	<p>SEV.80.11.4.50B</p>  <p>Note! Product picture may differ from actual product</p> <p>Product No.: 96048486</p> <p>Highly advanced pumps with many unique features. The Grundfos SEV ranges are technologically advanced pumps designed for handling wastewater, process water and unscreened raw sewage in heavy-duty municipal utilities and industrial applications. These heavy-duty pumps are built for years of trouble-free operation in the most demanding applications. The pumps may be installed submerged or dry without motor cooling; in either case they are extremely reliable and very easy to service. The efficient SuperVortex impellers provides free passage of solids up to 80 mm. This greatly reduces the risk of clogging and ensures maximum up-time and reduced operating costs.</p> <p>Advanced technology inside out The Grundfos SEV pumps feature advanced technology inside out. In spite of their good looks, these highly efficient pumps are designed for years of trouble-free operation in the toughest environments. Easy to install and easy to service, the SEV pumps ensure low long-term operating costs.</p> <p>Watertight cable connection Polyurethane-filled stainless steel cable connection, hermetically sealed. Ensures that liquid cannot penetrate through the cable into the motor.</p> <p>Short rotor shaft Compact motor construction with short rotor shaft reduces vibrations. Increases efficiency and lifetime of shaft seal and ball bearings.</p> <p>Liquid-less motor cooling Solid-block stator housing with built-in cooling conduits, which efficiently transfer excess heat to pumped liquid via a solid cast intermediate cooling flange. This allows for continuous operation even in a dry installation.</p> <p>Double mechanical shaft seal Efficient single-unit cartridge shaft seal system ensures longer operating time and less down-time. Easy to replace in the field without use of special tools.</p> <p>Stainless steel motor jacket Extremely robust impact-resistant stainless steel motor-housing jacket, with an easy-to-clean smooth surface.</p> <p>Stainless steel clamp Unique stainless steel clamp assembling system enables quick and easy disassembly of pump from motor unit. No tools required. Provides easy access for service and inspection.</p>	

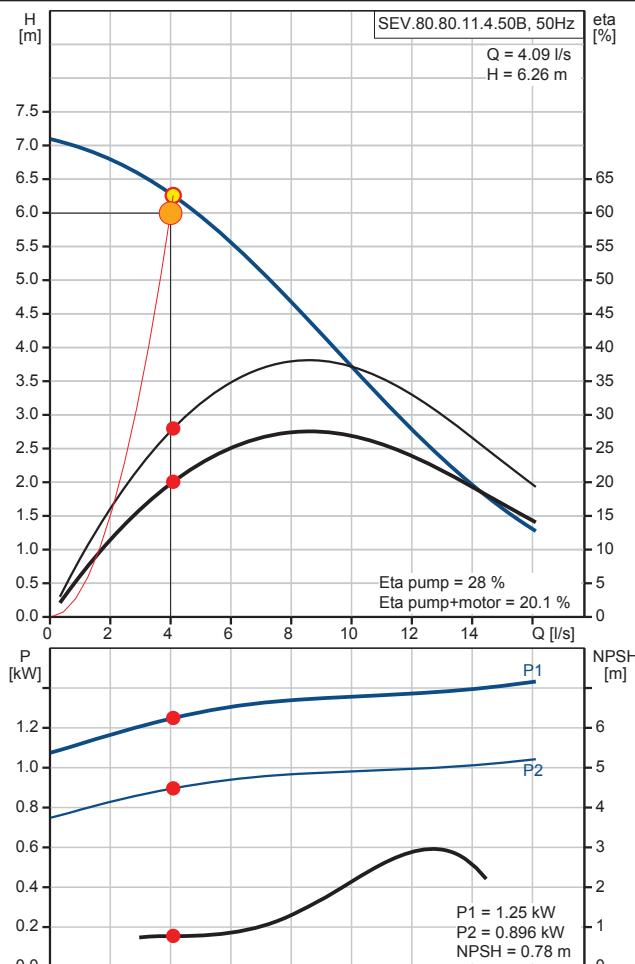
Position	Qty.	Description	Single Price																																																												
		<p>Modular design Each motor size fits several pump sizes with SuperVortex hydraulics.</p> <p>Operating conditions The Grundfos SEV pumps are suitable for continuous submerged operation with a liquid level just above the pump housing, or in a dry installation without separate motor cooling arrangements.</p> <p>Explosion-proof versions For applications involving a risk of explosion, or where otherwise required, explosion-proof versions of the Grundfos SEV pumps are available. The SEV pumps are in a II 2 GD, EEx d IIB 135°C (T4) c 135°C (T4) explosion protection classification according to EN standards 50 014-1997 / 50 018-2000 / 50 281-1-1. The SEV pumps are also available with a Class 1 Zone 2, Ex nA IIB 200°C (T3) classification in accordance with the IEC 60079-15:1987.</p> <p>Approvals The SEV.65, SEV.80 and SEV.100, have been approved according to DIN 12050-1, for use in buildings services by the German Building Technology Institute.</p> <p>Technical:</p> <table> <tbody> <tr> <td>Actual calculated flow:</td> <td>4.08 l/s</td> </tr> <tr> <td>Resulting head of the pump:</td> <td>6.26 m</td> </tr> <tr> <td>Type of impeller:</td> <td>SUPER VORTEX</td> </tr> <tr> <td>Maximum particle size:</td> <td>80 mm</td> </tr> <tr> <td>Primary shaft seal:</td> <td>SIC/SIC</td> </tr> <tr> <td>Secondary shaft seal:</td> <td>CARBON/CERAMICS</td> </tr> <tr> <td>Max. hydraulic efficiency:</td> <td>37 %</td> </tr> <tr> <td>Approvals on nameplate:</td> <td>EN12050-1</td> </tr> <tr> <td>Curve tolerance:</td> <td>ISO 9906:1999 Annex A</td> </tr> </tbody> </table> <p>Materials:</p> <table> <tbody> <tr> <td>Pump housing:</td> <td>EN-GJL-200</td> </tr> <tr> <td>Impeller:</td> <td>EN-GJL-200</td> </tr> </tbody> </table> <p>Installation:</p> <table> <tbody> <tr> <td>Maximum ambient temperature:</td> <td>40 °C</td> </tr> <tr> <td>Maximum operating pressure:</td> <td>6 bar</td> </tr> <tr> <td>Flange standard:</td> <td>DIN</td> </tr> <tr> <td>Pump outlet:</td> <td>DN 80</td> </tr> <tr> <td>Pressure stage:</td> <td>PN 10</td> </tr> <tr> <td>Maximum installation depth:</td> <td>20 m</td> </tr> </tbody> </table> <p>Liquid:</p> <table> <tbody> <tr> <td>Pumped liquid:</td> <td>0</td> </tr> <tr> <td>Liquid temperature range:</td> <td>0 .. 40 °C</td> </tr> <tr> <td>Density:</td> <td>1000 kg/m³</td> </tr> <tr> <td>Kinematic viscosity:</td> <td>1 mm²/s</td> </tr> </tbody> </table> <p>Electrical data:</p> <table> <tbody> <tr> <td>Number of poles:</td> <td>4</td> </tr> <tr> <td>Power input - P1:</td> <td>1.5 kW</td> </tr> <tr> <td>Rated power - P2:</td> <td>1.1 kW</td> </tr> <tr> <td>Mains frequency:</td> <td>50 Hz</td> </tr> <tr> <td>Rated voltage:</td> <td>3 x 400-415 V</td> </tr> <tr> <td>Voltage tolerance:</td> <td>+10/-10 %</td> </tr> <tr> <td>Start. method:</td> <td>direct-on-line</td> </tr> <tr> <td>Max starts per. hour:</td> <td>20</td> </tr> <tr> <td>Rated current:</td> <td>2,7-2,8 A</td> </tr> </tbody> </table>	Actual calculated flow:	4.08 l/s	Resulting head of the pump:	6.26 m	Type of impeller:	SUPER VORTEX	Maximum particle size:	80 mm	Primary shaft seal:	SIC/SIC	Secondary shaft seal:	CARBON/CERAMICS	Max. hydraulic efficiency:	37 %	Approvals on nameplate:	EN12050-1	Curve tolerance:	ISO 9906:1999 Annex A	Pump housing:	EN-GJL-200	Impeller:	EN-GJL-200	Maximum ambient temperature:	40 °C	Maximum operating pressure:	6 bar	Flange standard:	DIN	Pump outlet:	DN 80	Pressure stage:	PN 10	Maximum installation depth:	20 m	Pumped liquid:	0	Liquid temperature range:	0 .. 40 °C	Density:	1000 kg/m³	Kinematic viscosity:	1 mm²/s	Number of poles:	4	Power input - P1:	1.5 kW	Rated power - P2:	1.1 kW	Mains frequency:	50 Hz	Rated voltage:	3 x 400-415 V	Voltage tolerance:	+10/-10 %	Start. method:	direct-on-line	Max starts per. hour:	20	Rated current:	2,7-2,8 A	
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Position	Qty.	Description	Single Price
		<p>Rated current at 3/4 load: 2.3 A</p> <p>Rated current at 1/2 load: 2 A</p> <p>Starting current: 12 A</p> <p>Rated current at no load: 1.8 A</p> <p>Cos phi - power factor: 0,73</p> <p>Cos phi - p.f. at no load: 0,17</p> <p>Cos phi - p.f. at 3/4 load: 0,64</p> <p>Cos phi - p.f. at 1/2 load: 0,52</p> <p>Rated speed: 1440 rpm</p> <p>Locked-rotor torque: 15 Nm</p> <p>Breakdown torque: 21 Nm</p> <p>Moment of inertia: 0.0142 kg m²</p> <p>Motor efficiency at full load: 73,2 %</p> <p>Motor efficiency at 3/4 load: 71,2 %</p> <p>Motor efficiency at 1/2 load: 65,6 %</p> <p>Enclosure class (IEC 34-5): IP68</p> <p>Insulation class (IEC 85): F</p> <p>Explosion proof: no</p> <p>Length of cable: 15 m</p> <p>Cable type: LYNIFLEX</p> <p>Type of cable plug: NO PLUG</p> <p>Controls:</p> <p>Moisture sensor: without moisture sensors</p> <p>Water-in-oil sensor: without water-in-oil sensor</p> <p>Temp. sensor: N</p> <p>Others:</p> <p>Net weight: 96 kg</p>	

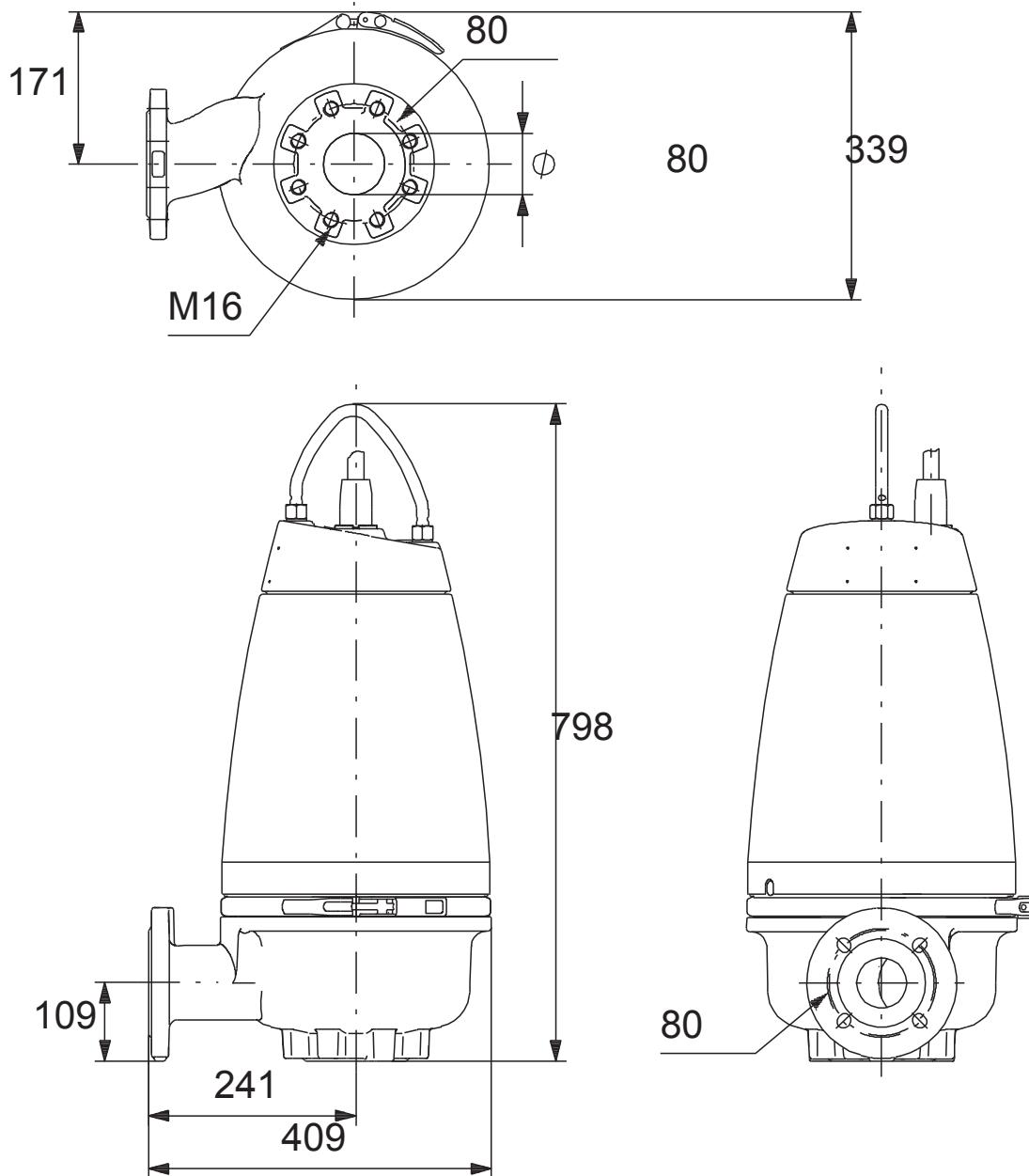
96048486 SEV.80.80.11.4.50B 50 Hz



Description	Value
Product name:	SEV.80.80.11.4.50B
Product No:	96048486
EAN number:	5700396437804
Price:	On request
Technical:	
Actual calculated flow:	4.09 l/s
Max flow:	16.1 l/s
Resulting head of the pump:	6.26 m
Head max:	7.1 m
Type of impeller:	SUPER VORTEX
Maximum particle size:	80 mm
Primary shaft seal:	SIC/SIC
Secondary shaft seal:	CARBON/CERAMICS
Max. hydraulic efficiency:	37 %
Approvals on nameplate:	EN12050-1
Curve tolerance:	ISO 9906:1999 Annex A
Materials:	
Pump housing:	EN-GJL-200
Impeller:	EN-GJL-200
Installation:	
Maximum ambient temperature:	40 °C
Maximum operating pressure:	6 bar
Flange standard:	DIN
Pump outlet:	DN 80
Pressure stage:	PN 10
Maximum installation depth:	20 m
Inst dry/wet:	DRY/SUBMERGED
Installation:	horizontal or vertical
Liquid:	
Pumped liquid:	0
Liquid temperature range:	0 .. 40 °C
Density:	1000 kg/m³
Kinematic viscosity:	1 mm²/s
Electrical data:	
Number of poles:	4
Power input - P1:	1.5 kW
Rated power - P2:	1.1 kW
Mains frequency:	50 Hz
Rated voltage:	3 x 400-415 V
Voltage tolerance:	+10/-10 %
Start. method:	direct-on-line
Max starts per. hour:	20
Rated current:	2,7-2,8 A
Rated current at 3/4 load:	2.3 A
Rated current at 1/2 load:	2 A
Starting current:	12 A
Rated current at no load:	1.8 A
Cos phi - power factor:	0,73
Cos phi - p.f. at no load:	0,17
Cos phi - p.f. at 3/4 load:	0,64
Cos phi - p.f. at 1/2 load:	0,52
Rated speed:	1440 rpm
Locked-rotor torque:	15 Nm
Breakdown torque:	21 Nm
Moment of inertia:	0.0142 kg m²
Motor efficiency at full load:	73,2 %
Motor efficiency at 3/4 load:	71,2 %
Motor efficiency at 1/2 load:	65,6 %
Enclosure class (IEC 34-5):	IP68
Insulation class (IEC 85):	F
Explosion proof:	no
Motor protec:	THERMAL SWITCH
Thermal protec:	internal
Length of cable:	15 m
Cable type:	LYNIFLEX
Type of cable plug:	NO PLUG
Controls:	

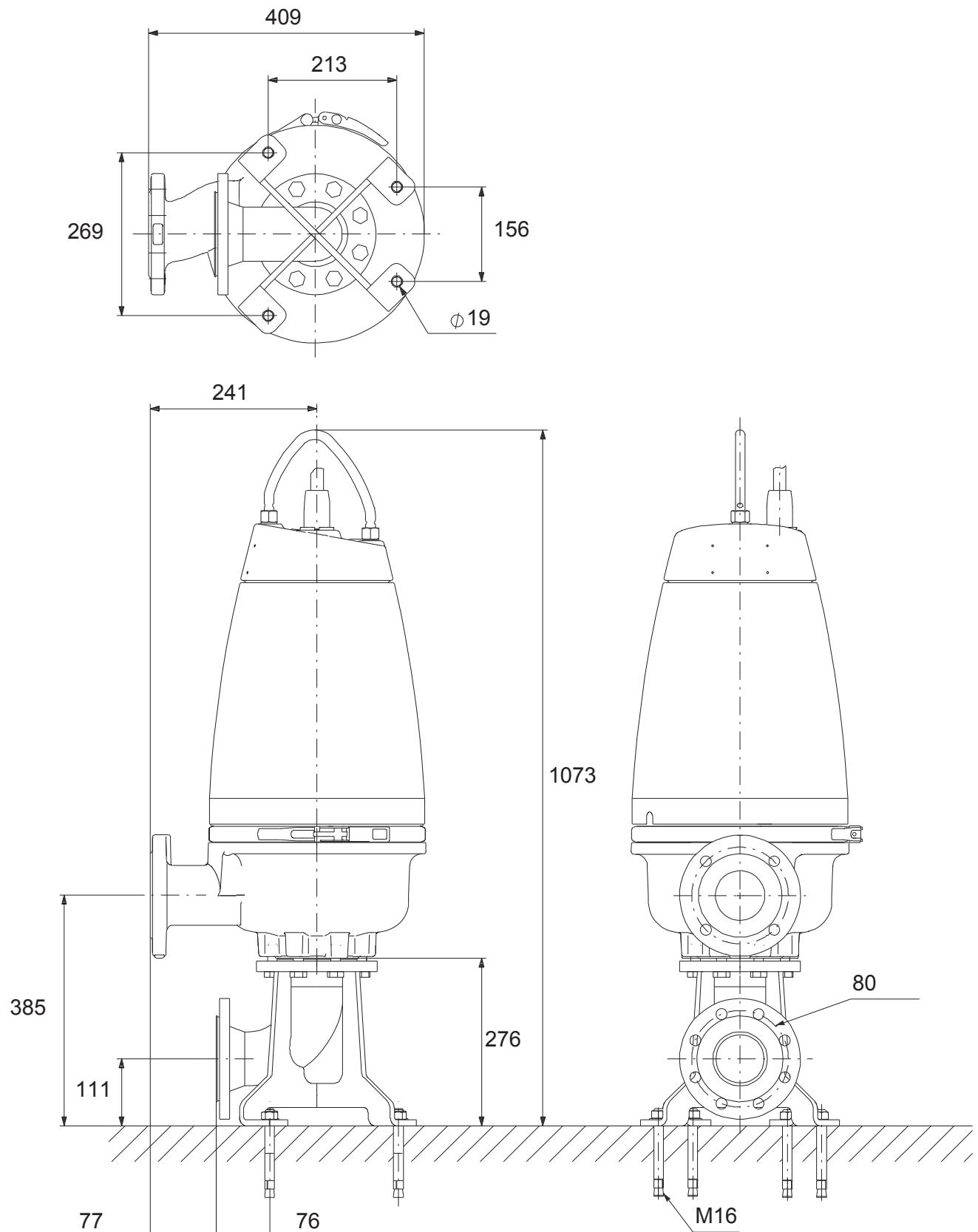


Description	Value
Control box:	not included
Moisture sensor:	without moisture sensors
Water-in-oil sensor:	without water-in-oil sensor
Temp. sensor:	N
Others:	
Net weight:	96 kg
Sales region:	Australia

96048486 SEV.80.80.11.4.50B 50 Hz

Note! All units are in [mm] unless others are stated.
Disclaimer: This simplified dimensional drawing does not show all details.

96048486 SEV.80.80.11.4.50B 50 Hz



Note! All units are in [mm] unless others are stated.
 Disclaimer: This simplified dimensional drawing does not show all details.

SE1 50, 80, 100

SEV 65, 80, 100

Installation and operating instructions

(GB) (D) (F) (I) (E) (P) (GR) (NL) (S) (FIN) (DK)
(PL) (RU) (H) (SI) (HR) (YU) (RO) (BG) (CZ) (SK) (TR)



Declaration of Conformity

We **Grundfos** declare under our sole responsibility that the products **SE1** and **SEV** to which this declaration relates, are in conformity with the Council Directives on the approximation of the laws of the EC Member States relating to

- Machinery (98/37/EC).
Standard used: EN ISO 12100.
- Electromagnetic compatibility (89/336/EEC).
Standards used: EN 61000-6-2 and EN 61000-6-3.
- Electrical equipment designed for use within certain voltage limits (73/23/EEC) [95].
Standards used: EN 60335-1:1994 and EN 60335-2-41: 1996.
- Construction products (89/106/EEC).
Standard used: EN 12050-1/-2.
- ATEX 94/9/EC (ATEX 100) (applies only to products with the ATEX mark on the nameplate).
Standards used: EN 50014, EN 50018, EN 50281-1-1, EN 13463-1 and EN 13463-5.

Déclaration de Conformité

Nous **Grundfos** déclarons sous notre seule responsabilité que les produits **SE1** et **SEV** auxquels se réfère cette déclaration sont conformes aux Directives du Conseil concernant le rapprochement des législations des Etats membres CE relatives à

- Machines (98/37/CE).
Norme utilisée: EN ISO 12100.
- Compatibilité électromagnétique (89/336/CEE).
Normes utilisées: EN 61000-6-2 et EN 61000-6-3.
- Matériel électrique destiné à employer dans certaines limites de tension (73/23/CEE) [95].
Normes utilisées: EN 60335-1:1994 et EN 60335-2-41: 1996.
- Produits de construction (89/106/CEE).
Norme utilisée: EN 12050-1/-2.
- ATEX 94/9/CE (ATEX 100) (s'applique uniquement aux produits avec norme ATEX citée sur la plaque signalétique).
Normes utilisées: EN 50014, EN 50018, EN 50281-1-1, EN 13463-1 et EN 13463-5.

Declaración de Conformidad

Nosotros **Grundfos** declaramos bajo nuestra única responsabilidad que los productos **SE1** y **SEV** a los cuales se refiere esta declaración son conformes con las Directivas del Consejo relativas a la aproximación de las legislaciones de los Estados Miembros de la CE sobre

- Máquinas (98/37/CE).
Norma aplicada: EN ISO 12100.
- Compatibilidad electromagnética (89/336/CEE).
Normas aplicadas: EN 61000-6-2 y EN 61000-6-3.
- Material eléctrico destinado a utilizarse con determinadas límites de tensión (73/23/CEE) [95].
Normas aplicadas: EN 60335-1:1994 y EN 60335-2-41: 1996.
- Productos de construcción (89/106/CEE).
Norma aplicada: EN 12050-1/-2.
- ATEX 94/9/CE (ATEX 100) (se refiere sólo a productos con la marca ATEX en la placa de características).
Normas aplicadas: EN 50014, EN 50018, EN 50281-1-1, EN 13463-1 y EN 13463-5.

Δήλωση Συμμόρφωσης

Εμείς η **Grundfos** δηλώνουμε με αποκλειστικά δίκια μας ευθύνη ότι τα προϊόντα **SE1** και **SEV** συμμορφώνονται με την Οδηγία του Συμβουλίου επί της σύγκλισης των νόμων των Κρατών Μελών της Ευρωπαϊκής Ένωσης σε σχέση με τα

- Μηχανήματα (98/37/EC).
Πρότυπο που χρησιμοποιήθηκε: EN ISO 12100.
- Ηλεκτρομαγνητική συμβάση (89/336/EC).
Πρότυπο που χρησιμοποιήθηκαν: EN 61000-6-2 και EN 61000-6-3.
- Ηλεκτρικές συσκευές σχεδιασμένες για χρήση εντός ορισμένων ορίων ηλεκτρικής τάσης (73/23/EEC) [95].
Πρότυπο που χρησιμοποιήθηκαν: EN 60335-1:1994 και EN 60335-2-41: 1996.
- Προϊόντα κατασκευών (89/106/EC).
Πρότυπο που χρησιμοποιήθηκε: EN 12050-1/-2.
- ATEX 94/9/EC (ATEX 100) (εφαρμόζεται μόνο σε προϊόντα με το σήμα ATEX στην πινακίδα τους).
Πρότυπο που χρησιμοποιήθηκαν: EN 50014, EN 50018, EN 50281-1-1, EN 13463-1 και EN 13463-5.

Försäkran om överensstämmelse

Vi **Grundfos** försäkrar under ansvar, att produkterna **SE1** och **SEV**, som omfattas av denna försäkran, är i överensstämmelse med Rådets direktiv om inbördes närmande till EU-medlemsstaternas lagstiftning, avseende

- Maskinell utrustning (98/37/EC).
Använd standard: EN ISO 12100.
- Elektromagnetisk kompatibilitet (89/336/EC).
Använda standarder: EN 61000-6-2 och EN 61000-6-3.
- Elektriskt material avsedd för användning inom vissa spänningsgränser (73/23/EC) [95].
Använda standarder: EN 60335-1:1994 och EN 60335-2-41: 1996.
- Produkter för bygg och anläggning (89/106/EC).
Använd standard: EN 12050-1/-2.
- ATEX 94/9/EC (ATEX 100) (endast för produkter med ATEX-märkning på typeskylten).
Använda standarder: EN 50014, EN 50018, EN 50281-1-1, EN 13463-1 och EN 13463-5.

Oversættelsen af overensstemmelseserklæringen

Vi **Grundfos** erklærer under ansvar, at produkterne **SE1** og **SEV**, som denne erklæring omhandler, er i overensstemmelse med Rådets direktiver om inbørdes nærmælelse til EF medlemsstaternes lovgivning om

- Maskiner (98/37/EF).
Anvendt standard: EN ISO 12100.
- Elektromagnetisk kompatibilitet (89/336/EØF).
Anvendte standarder: EN 61000-6-2 og EN 61000-6-3.
- Elektrisk materiel bestemt til anvendelse inden for visse spændingsgrænser (73/23/EØF) [95].
Anvendte standarder: EN 60335-1:1994 og EN 60335-2-41: 1996.
- Byggevarer (89/106/EØF).
Anvendt standard: EN 12050-1/-2.
- ATEX 94/9/EF (ATEX 100) (gælder kun for produkter med ATEX-mærkning på typeskillet).
Anvendte standarder: EN 50014, EN 50018, EN 50281-1-1, EN 13463-1 og EN 13463-5.

Konformitätsdeklaration

Wir **Grundfos** erklären in alleiniger Verantwortung, daß die Produkte **SE1** und **SEV**, auf die sich diese Erklärung bezieht, mit den folgenden Richtlinien des Rates zur Angleichung der Rechtsvorschriften der EG-Mitgliedstaaten übereinstimmen:

- Maschinen (98/37/EG).
Norm, die verwendet wurde: EN ISO 12100.
- Elektromagnetische Verträglichkeit (89/336/EWG).
Normen, die verwendet wurden: EN 61000-6-2 und EN 61000-6-3.
- Elektrische Betriebsmittel zur Verwendung innerhalb bestimmter Spannungsgrenzen (73/23/EWG) [95].
Normen, die verwendet wurden: EN 60335-1:1994 und EN 60335-2-41: 1996.
- Bauprodukte (89/106/EWG).
Norm, die verwendet wurde: EN 12050-1/-2.
- ATEX 94/9/EG (ATEX 100) (gilt nur für Produkte mit der ATEX-Kennzeichnung auf dem Leistungsschild).
Normen, die verwendet wurden: EN 50014, EN 50018, EN 50281-1-1, EN 13463-1 und EN 13463-5.

Dichiarazione di Conformità

Noi **Grundfos** dichiariamo sotto la nostra esclusiva responsabilità che i prodotti **SE1** e **SEV** ai quali questa dichiarazione si riferisce sono conformi alle Direttive del Consiglio concernente il ravvicinamento delle legislazioni degli Stati membri CE relative a

- Macchine (98/37/CE).
Norma usata: EN ISO 12100.
- Compatibilità elettromagnetica (89/336/CEE).
Norme usate: EN 61000-6-2 e EN 61000-6-3.
- Materiale elettrico destinato ad essere utilizzato entro certi limiti di tensione (73/23/CEE) [95].
Norme usate: EN 60335-1:1994 e EN 60335-2-41: 1996.
- Prodotti da costruzione (89/106/CEE).
Norma usata: EN 12050-1/-2.
- ATEX 94/9/CE (ATEX 100) (si applica solo ai prodotti che riportano la sigla ATEX sull'etichetta).
Norme usate: EN 50014, EN 50018, EN 50281-1-1, EN 13463-5.

Declaração de Conformidade

Nós **Grundfos** declaramos sob nossa única responsabilidade que os produtos **SE1** e **SEV** aos quais se refere esta declaração estão em conformidade com as Directivas do Conselho das Comunidades Europeias relativas à aproximação das legislações dos Estados Membros respeitantes à

- Máquinas (98/37/CE).
Norma utilizada: EN ISO 12100.
- Compatibilidade electromagnética (89/336/CEE).
Normas utilizadas: EN 61000-6-2 e EN 61000-6-3.
- Material eléctrico destinado a ser utilizado dentro de certos limites de tensão (73/23/CEE) [95].
Normas utilizadas: EN 60335-1:1994 e EN 60335-2-41: 1996.
- Produtos de construção (89/106/CEE).
Norma utilizada: EN 12050-1/-2.
- ATEX 94/9/CE (ATEX 100) (apenas aplicável a produtos com a inscrição ATEX gravada na chapa de características).
Normas utilizadas: EN 50014, EN 50018, EN 50281-1-1, EN 13463-5.

Overeenkomingheidverklaring

Wij **Grundfos** verklaaren geheel onder eigen verantwoordelijkheid dat de produkten **SE1** en **SEV** waarop deze verklaring betrekking heeft in overeenstemming zijn met de Richtlijnen van de Raad inzake de onderlinge aanpassing van de wetgeving van de Lid-Staten betreffende

- Machines (98/37/EG).
Norm: EN ISO 12100.
- Elektromagnetische compatibiliteit (89/336/EEG).
Normen: EN 61000-6-2 en EN 61000-6-3.
- Elektrisch materiaal bestemd voor gebruik binnen bepaalde spanningsgrenzen (73/23/EEG) [95].
Normen: EN 60335-1:1994 en EN 60335-2-41: 1996.
- Bouwproducten (89/106/EEG).
Norm: EN 12050-1/-2.
- ATEX 94/9/EEG (ATEX 100) (alleen van toepassing voor producten met de ATEX markering op de typeplaat).
Normen: EN 50014, EN 50018, EN 50281-1-1, EN 13463-5.

Vastaavuusvakuutus

Me **Grundfos** vakuutamme yksin vastuullisesti, että tuotteet **SE1** ja **SEV**, joita tämä vakuutus koskee, noudattavat direktiivejä jotka käsittelevät EY:n jäsenvaltojen koneellisia laitteita koskevien lakiain yhdenmukaisuutta seur:

- Koneet (98/37/EY).
Käytetyt standardit: EN ISO 12100.
- Elektromagneettinen vastaavuus (89/336/EY).
Käytetyt standardit: EN 61000-6-2 ja EN 61000-6-3.
- Määritetyt jänniterajoitusten puitteissa käytettävä sähköiset laitteet (73/23/EY) [95].
Käytetyt standardit: EN 60335-1:1994 ja EN 60335-2-41: 1996.
- Rakennustuotteet (89/106/EY).
Käytetyt standardit: EN 12050-1/-2.
- ATEX 94/9/EY (ATEX 100) (soveltuu vain tuotteisiin, joissa on ATEX-merkintä arvolikessä).
Käytetyt standardit: EN 50014, EN 50018, EN 50281-1-1 ja EN 13463-5.

Deklaracija zgodnosti

My **Grundfos**, oświadczamy w pełnej odpowiedzialności, że nasze wyroby **SE1** i **SEV**, o których deklaracja niniejsza dotyczy, są zgodne z następującymi wytycznymi Rady ds. ujednolicenia przepisów prawnych krajów EG:

- Maszyny (98/37/EG).
Zastosowana norma: EN ISO 12100.
- Zgodność elektromagnetyczna (89/336/EWG).
Zastosowane normy: EN 61 000-6-2 i EN 61 000-6-3.
- Wyposażenie elektryczne do stosowania w określonym zakresie napięć (73/23/EWG) [95].
Zastosowane normy: EN 60 335-1:1994 i EN 60 335-2-41.
- Budowa wyrobów (89/106/EEC).
Zastosowana norma: EN 12050-1/-2.
- ATEX 94/9/EY (ATEX 100) (dotyczy tylko wyrobów ze znakiem ATEX na tabliczce znamionowej).
Zastosowane normy: EN 50014, EN 50018, EN 50281-1-1, EN 13463-1 i EN 13 463-5.

Заявление о соответствии

Мы, фирма **Grundfos**, со всей ответственностью заявляем, что изделия **SE1** и **SEV**, к которым относится данное заявление, соответствуют следующим предписаниям Совета Европы об унификации законодательных предписаний стран-членов ЕС, касающимся:

- машиностроительного оборудования (98/37/EC), применявшиеся стандарты: EN ISO 12100;
- электромагнитной совместимости (89/336/EЭС), применявшиеся стандарты: EN 61000-6-2 и EN 61000-6-3;
- электрооборудования, спроектированного для эксплуатации в определенном диапазоне значений напряжения (73/23/EС) [95], применявшиеся стандарты: EN 60335-1:1994 и EN 335-2-41;
- Строительные изделия (89/106/EEC). Применявшиеся стандарты: EN 12050-1/-2.
- ATEX 94/9/EC (ATEX 100) (действительно только для изделий с маркировкой ATEX на фирменной табличке с техническими данными), применявшиеся стандарты: EN 50014, EN 50018, EN 50281-1-1, EN 13463-1 и EN 13463-5.

Megfelelőségi nyilatkozat

Grundfos teljes felelősséggel kijelenti, hogy a **SE1** és **SEV** típusú szivattyúk, amelyre ezen nyilatkozat vonatkozik, megfelelnek az Európai Unió tagállamainak jogi irányelvét összhangoló tanács alábbi előírásainak:

- Gépek (98/37/EC). Alkalmazott szabvány: EN ISO 12100.
- Elektromágneses összeférhetőség (89/336/EEC). Alkalmazott szabvány: EN 61000-6-2 és EN 61000-6-3.
- Meghatározott feszültséghatáron belül használt elektromos eszközök (73/23/EEC) [95]. Alkalmazott szabvány: EN 60335-1:1994 és EN 60335-2-41: 1996.
- Összeépített berendezések (89/106/EEC) Alkalmazott szabvány: EN 12050-1/-2.
- ATEX 94/9/EC (ATEX 100) (csak az ATEX jelzéssel ellátott termékekre vonatkozik). Alkalmazott szabvány: EN 50014, EN 50018, EN 50281-1-1, EN 13463-1 és EN 13463-5.

Izjava o skladnosti

Mi, **Grundfos**, pod svojo izključno odgovornostjo izjavljamo, da so izdelki **SE1** in **SEV**, na katere se ta izjava nanaša, skladni z Direktivami sveta o približevanju zakonodaji držav članic EC glede:

- Strojev (98/37/EC). Uporabljeni standard: EN ISO 12100.
- Elektromagnetske kompatibilnosti (89/336/EEC).
- Uporabljena standarda: EN 61000-6-2 in EN 61000-6-3.
- Električne opreme, izdelane za uporabo v okviru določenih meja napetosti (73/23/EEC) [95]. Uporabljena standarda: EN 60335-1:1994 in EN 60335-2-41: 1996.
- Izdelek gradnje (89/106/EEC) Uporabljena norma: EN 12050-1/-2.
- ATEX 94/9/EC (ATEX 100) (velja samo za izdelke z oznako ATEX na tipski ploščici). Uporabljena standarda: EN 50014, EN 50018, EN 50281-1-1, EN 13463-1 in EN 13463-5.

Izjava o konformitetu

Mi, **Grundfos**, izjavljujemo pod potpunom odgovornošču da su proizvodi **SE1** i **SEV**, na koje se odnosi ova izjava, u saglasnosti sa smernicama i uputstvima Savjeta za usaglašavanje pravnih propisa članica Evropske Unije:

- Mašine (98/37/EC). Korišćeni standard: EN ISO 12100.
- Elektromagnetska kompatibilnost (89/336/EEC). Korišćeni standardi: EN 61000-6-2 i EN 61000-6-3.
- Električna oprema razvijena za korišćenje unutar određenih naponskih granica (73/23/EEC) [95]. Korišćeni standardi: EN 60335-1:1994 i EN 60335-2-41: 1996.
- Konstruktivni proizvodi (89/106/EEC) korišćeni standardi: EN 12050-1/-2.
- ATEX 94/9/EC (ATEX 100) (odnosi se samo na proizvode sa natpisom ATEX na natpisnoj pločici). Korišćeni standardi: EN 50014, EN 50018, EN 50281-1-1, EN 13463-1 i EN 13463-5.

Декларация за съответствие

Ние, фирма **Grundfos** заявяваме с пълна отговорност, че продуктите **SE1** и **SEV**, за които се отнася настоящата декларация, отговарят на следните указания на Съвета за уеднаквяване на правните разпоредби на държавите членки на ЕО:

- Машини (98/37/EO). Приложена норма: EN ISO 12100.
- Електромагнетична поносимост (89/336/EИО). Приложени норми: EN 61000-6-2 и EN 61000-6-3.
- Електрически машини и съоръжения за употреба в рамките на определени граници на напрежение на електрически ток (73/23/EИО) [95]. Приложени норми: EN 60335-1:1994 и EN 60335-2-41: 1996.
- Конструктивни продукти (89/106/EИО) Приложена норма: EN 12050-1/-2.
- ATEX 94/9/EO (ATEX 100) (отнася се само за продукти със символа ATEX върху табелата с данни). Приложени норми: EN 50014, EN 50018, EN 50281-1-1, EN 13463-1 и EN 13463-5.

Prehlásenie o zhode

My, firma **Grundfos**, prehlasujeme na svoju plnú zodpovednosť, že výrobky **SE1** a **SEV**, na ktoré sa toto prehlásenie vzťahuje, zodpovedajú ustanoveniam nasledujúcich smerníc Rady EÚ pre harmonizačiu právnych predpisov členských zemí Európskych spoločenstiev:

- Strojné zariadenia (98/37/EC). Použitá norma: EN ISO 12100.
- Elektromagnetická kompatibilita (89/336/EEC). Použité normy: EN 61000-6-2 a EN 61000-6-3.
- Prevádzkovanie elektrotechnických zariadení v rámci určitých napäťových tolerancí (73/23/EEC) [95]. Použitá normy: EN 60335-1:1994 a EN 60335-2-41: 1996.
- Konštrukčné výrobky (89/106/EEC) Použitá norma: EN 12050-1/-2.
- ATEX 94/9/EC (ATEX 100) (týka sa iba výrobkov nesúciach na typovom štítku značku ATEX). Použité normy: EN 50014, EN 50018, EN 50281-1-1, EN 13463-1 a EN 13463-5.

Izjava o usklađenosti

Mi, **Grundfos**, izjavljujemo uz punu odgovornost, da su proizvodi **SE1** i **SEV**, na koje se ova izjava odnosi, sukladni slijedećim smjernicama Savjeta za prilagodbu propisa država-članica EZ:

- strojev (98/37/EZ); korištena norma: EN ISO 12100.
- Elektromagnetska kompatibilnost (89/336/EEZ); korištene norme: EN 61000-6-2 i EN 61000-6-3.
- Električni pogonski uređaji za uporabu unutar određenih granica napona (73/23/EEZ) [95]; korištena norme: EN 60335-1:1994 i EN 60335-2-41: 1996.
- Građevni proizvodi (89/106/EEZ). Korištena norma: EN 12050-1/-2.
- ATEX 94/9/EZ (ATEX 100) (vrijedi samo za proizvode s ATEX-знаком na natpisnoj pločici); korištena norma: EN 50014, EN 50018, EN 50281-1-1, EN 13463-5.

Declarația de conformitate

Grundfos declară pe propria răspundere că produsele **SE1** și **SEV**, la care se referă această declarație sunt în conformitate cu Directivele Consiliului și legile Statelor membre EC, referitoare la:

- Utilaj (98/37/EC). Standard folosit: EN ISO 12100.
- Compatibilitatea electromagnetică (89/336/EEC). Standarde folosite: EN 61000-6-2 și EN 61000-6-3.
- Echipamente electric proiectat pentru a fi folosit în anumite limite de tensiune (73/23/EEC) [95]. Standarde folosite: EN 60335-1:1994 și EN 60335-2-41: 1996.
- Construcția produselor (89/106/EEC). Standard aplicat: EN 12050-1/-2.
- ATEX 94/9/EC (ATEX 100) (se aplică numai la produsele cu marca ATEX pe plăcuță de înmatriculare). Standarde folosite: EN 50014, EN 50018, EN 50281-1-1, EN 13463-5.

Prohlášení o shodě

My, firma **Grundfos**, prohlašujeme na svou plnou odpovědnost, že výrobky **SE1** a **SEV**, na něž se toto prohlášení vzťahuje, odpovídají ustanovením následujúcich smerníc Rady EU pro harmonizaci právnych predpisov členských zemí Európskych spoločenstiev:

- Strojní zariadení (98/37/EC). Použitá norma: EN ISO 12100.
- Elektromagnetická kompatibilita (89/336/EEC). Použité normy: EN 61000-6-2 a EN 61000-6-3.
- Provozování elektrotechnických zařízení v rámci určitých napěťových tolerancí (73/23/EEC) [95]. Použité normy: EN 60335-1:1994 a EN 60335-2-41: 1996.
- Konstrukční výrobky (89/106/EEC). Použitá norma: EN 12050-1/-2.
- ATEX 94/9/EC (ATEX 100) (týká se pouze výrobků nesoucích na typovém štítku značku ATEX). Použité normy: EN 50014, EN 50018, EN 50281-1-1, EN 13463-1 a EN 13463-5.

Uygunluk Bildirgesi

Biz **Grundfos** olarak, bu bildirgede belirtilen **SE1** ve **SEV** ürünlerinin,

- Makina (98/37/EC). Kullanılan standart: EN ISO 12100.
- Elektromanyetik uyumluluk (89/336/EEC). Kullanılan standartlar: EN 61000-6-2 ve EN 61000-6-3.
- Beli voltaj sınırlarında kullanılmak üzere üretilmiş elektrik donanımı (73/23/EEC) [95]. Kullanılan standartlar: EN 60335-1:1994 ve EN 60335-2-41: 1996.
- Yapı ürünlerleri (89/106/EEC). Kullanılan standartlar: EN 12050-1/-2.
- ATEX 94/9/EC (ATEX 100) (sadece bilgi etiketine ATEX işaretli bulunan ürünlerde uygulanmaktadır). Kullanılan standartlar: EN 50014, EN 50018, EN 50281-1-1, EN 13463-1 ve EN 13463-5.
- ile ilgili olarak Avrupa topluluğu'na Üye Devletlerin yasalarında yer alan Belediye Yönetmeliklerine uygun olduğunu, tüm sorumluluğu bize ait olmak üzere beyan ederiz.

Bjerringbro, 15th October 2005

Jan Strandgaard
Technical Director

SE1 50, 80, 100

SEV 65, 80, 100

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Before beginning installation procedures, these installation and operating instructions should be studied carefully. The installation and operation should also be in accordance with local regulations and accepted codes of good practice.

1. Symbols used in this booklet

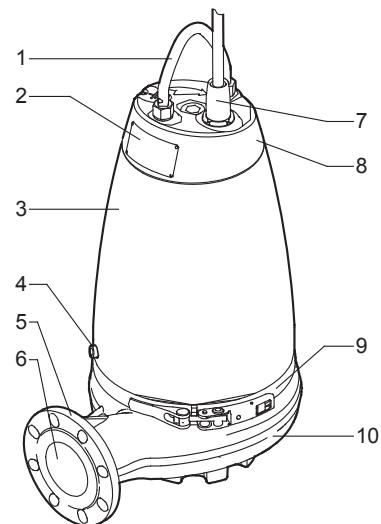
Instructions marked with this symbol require special attention. The non-compliance with these instructions involves the risk of personal injury.



Instructions marked with this symbol apply to explosion-proof pumps.
These instructions **must** be observed for explosion-proof pumps. It is advisable also to follow these instructions for standard pumps.

2. General description

Grundfos SE pumps are designed with channel or free-flow impeller to ensure reliable and optimum operation.
SE pumps are used for the removal of wastewater in small and medium systems.
The pumps can be controlled via the Grundfos LC/D 107, LC/D 108, LC/D 110 pump controllers or the Grundfos CU 100 control box, see installation and operating instructions for the selected unit.



TM02 8112 4603

Fig. 1 SE pump

Pos.	Description
1	Lifting bracket
2	Nameplate
3	Sleeve
4	Oil screw
5	Discharge flange
6	Discharge
7	Cable plug
8	Top cover
9	Clamp
10	Pump housing

3. Applications

SE pumps are designed for pumping

- drainage water
- domestic wastewater
- wastewater with a high content of fibres (free-flow impeller)
- industrial wastewater
- wastewater with gaseous sludge
- municipal wastewater.

The pumps are ideal for the pumping of the above liquids when discharged from e.g.

- public buildings
- blocks of flats
- factories/industry
- garages
- multi-storey car parks
- vehicle washing tunnels
- restaurants.

The pumps are suitable for both permanent and temporary installation.

3.1 Variants

The table shows the suitability of pump passage and impeller type for each individual liquid.

Impeller type: 1 = channel impeller, V = free-flow impeller.

Pumped liquid	Pump passage [mm]			
	50	65	80	100
Drainage water	1	V	1 / V	1 / V
Domestic wastewater without discharge from toilets	1	V	1 / V	1 / V
Domestic wastewater with discharge from toilets			1 / V	1 / V
Wastewater with a high content of fibres	V	1 / V	1 / V	
Industrial wastewater	1 / V	1 / V		
Wastewater with gaseous sludge	1 / V	1 / V		
Municipal wastewater	1 / V	1 / V		

3.2 Potentially explosive environments

Use explosion-proof SE pumps for applications in potentially explosive environments.



The explosion protection classification of the pump is: CE 0344 Ex II 2 GD EEx dc IIB T4/T3 IP68 T 135°C/200°C. (Australia, see 7.2.)

The classification of the installation site **must** in each individual case be approved by the local fire-fighting authorities.

4. Safety



Pump installation in pits must be carried out by specially trained persons.

Work in or near pits must be carried out according to local regulations.

Sumps and pits for submerged wastewater pumps contain wastewater with toxic and/or disease-causing substances. Therefore, all persons involved must wear appropriate personal protective equipment and clothing and all work on and near the pump must be carried out under strict observance of the hygiene regulations in force.

5. Transportation and storage

5.1 Transportation

The pump can be transported in a vertical or horizontal position. Make sure that it cannot roll or fall over.

Always lift the pump by its lifting bracket, **never** by the motor cable or the hose/pipe.

The polyurethane-embedded plug prevents water from penetrating into the motor via the motor cable.

5.2 Storage

For long periods of storage, the pump must be protected from extremes of heat and cold.

If the pump has been in use, the oil should be changed before storage, see section 12.2.1 Oil change.

After a long period of storage, the pump should be inspected before it is put into operation. Make sure that the impeller can rotate freely. Pay special attention to the shaft seal and the cable entry.

6. Nameplate

The nameplate is fitted to the top cover of the pump. The loose nameplate supplied with the pump should be fixed at the installation site or kept in the cover of this booklet.

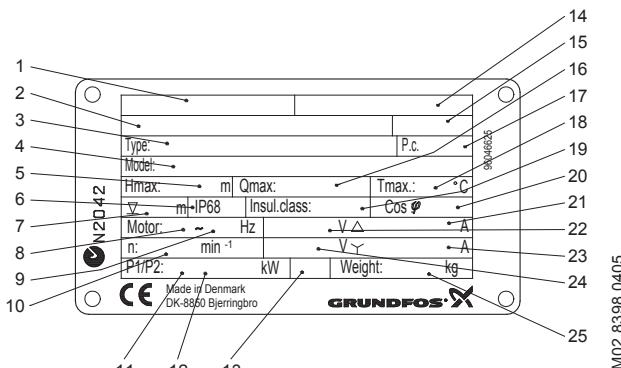


Fig. 2 Nameplate

Pos.	Description
1	Notified body
2	Explosion protection mark, X for special requirements applicable to explosion-proof equipment according to IEC 79-15
3	Type designation
4	Product number and serial number
5	Maximum head [m]
6	Enclosure class
7	Maximum installation depth [m]
8	Number of phases
9	Frequency [Hz]
10	Speed [min^{-1}]
11	Motor input power P1 [kW]
12	Motor output power P2 [kW]
13	Frame size
14	Explosion protection classification and certificate number
15	EN approval
16	Maximum flow [m^3/h]
17	Production code (year/week)
18	Maximum liquid temperature [$^{\circ}\text{C}$]
19	Insulation class
20	Power factor
21	Rated current 1
22	Rated voltage 1
23	Rated current 2
24	Rated voltage 2
25	Weight [kg]

7. Approvals

The standard version of SE pumps has been tested by VDE, and the explosion-proof version approved by KEMA according to the ATEX directive.

7.1 Approval standards

The standard variants are approved by LGA (notified body under the construction products directive) according to EN 12050-1/2.

GB

7.2 Explanation to Ex approval

The explosion protection classification of the pump is:

CE 0344 Ex II 2 GD EEx dc IIB T4 IP68 T 135°C

CE 0344 Ex II 2 GD EEx dc IIB T3 IP68 T 200°C (frequency converter controlled pumps).

Directive/standard	Code	Description
	CE 0344	= CE marking of conformity according to the ATEX directive 94/9/EC, Annex X. 0344 is the number of the notified body which has certified the quality system for ATEX.
ATEX	Ex	= Marking of explosion protection
	II	= Equipment group according to the ATEX directive, Annex II, point 2.2, defining the requirements applicable to the equipment in this group
	2	= Equipment category according to the ATEX directive, Annex II, point 2.2, defining the requirements applicable to the equipment in this category
	G	= Explosive atmospheres caused by gases, vapours or mists
	D	= Explosive atmospheres caused by dust (EN 50281-1-1: 1998)
	EEx	= The equipment conforms to harmonized European standard
	d	= Flame-proof enclosure according to EN 50018: 2000
	c	= Constructional safety
	II	= Suitable for use in explosive atmospheres (not mines)
Harmonized European standard EN 50014	B	= Classification of gases, see EN 50014: 1997, Annex A. Gas group B includes gas group A.
	T4/T3	= Maximum surface temperature is 135°C/200°C
	T 135°C/ 200°C	= Maximum surface temperature on all pump parts according to EN 50028-1-1: 1998
	IP68	= Enclosure class according to IEC 60529
	X	The letter X in the certificate number indicates that the equipment is subject to special conditions for safe use. The conditions are mentioned in the certificate and the installation and operating instructions.

7.2.1 Australia

Ex nA II T3.

Ex variants for Australia are approved as Ex nA II T3 according to IEC 79-15 (corresponding to AS 2380.9).

Standard	Code	Description
	Ex	= Area classification according to AS 2430.1
	nA	= Non-sparking according to AS 2380.9: 1991, section 3 (IEC 79-15: 1987)
IEC 79-15: 1987	II	= Suitable for use in explosive atmospheres (not mines)
	T3	= Maximum surface temperature is 200°C
	X	The letter X in the certificate number indicates that the equipment is subject to special conditions for safe use. The conditions are mentioned in the certificate and the installation and operating instructions.

8. Type key

The pump can be identified by the type key stated on the pump nameplate, see section 6.

Code	Example	SE	1	.80	.80	.40	.A	.Ex	.4	.5	1D
	Pump type:										
SE	Grundfos wastewater pump/sewage pump										
	Version – material:										
[]	Standard										
	Impeller type:										
1	Channel impeller, number of channels										
V	Free-flow impeller (SuperVortex)										
	Pump passage:										
80	Maximum solids size [mm]										
	Pump discharge:										
80	Nominal diameter of pump discharge port [mm]										
	Power:										
40	Motor output power P2/100 [W]										
	Equipment:										
[]	Standard										
A	Sensor										
	Pump version:										
Ex	Explosion-proof pump										
[]	Standard pump										
	Number of poles:										
2	2-pole, 3000 min ⁻¹ , 50 Hz										
4	4-pole, 1500 min ⁻¹ , 50 Hz										
	Number of phases:										
[]	Three-phase motor										
	Frequency:										
5	50 Hz										
	Voltage and starting method:										
0D	380-415 V, DOL, 50 Hz										
1D	380-415 V, Y/D, 50 Hz										
0E	220-240 V, DOL, 50 Hz										
1E	220-240 V Y/D, 50 Hz										
	Generation:										
[]	First generation										
A	Second generation										
B	Third generation, etc.										
	The generation code distinguishes between structurally different pumps which have the same power rating										
	Material in pump:										
[]	Standard										

GB

9. Installation

Before beginning installation procedures, make sure

- that the pump corresponds to order.
- that the pump is suitable for the supply voltage and frequency available at the installation site.
- that accessories and other equipment have not been damaged during transportation.

The loose nameplate supplied with the pump should be fixed at the installation site or kept in the cover of this booklet.

All safety regulations must be observed at the installation site, e.g. the use of blowers for fresh-air supply to the pit.

Prior to installation, check the oil level in the oil chamber, see section 12. *Maintenance*.

The SE pumps are suitable for different installation types, which are described in sections 9.2, 9.3 and 9.4.

All pump housings have a cast PN 10 discharge flange, DN 65, DN 80, DN 100 or DN 150.

Note: The pumps are designed for continuous operation, both for submerged and dry installation.

See section 15. *Technical data and operating conditions*.

9.1 Installation types

Submerged installation

- on auto-coupling or
- free-standing on ring stand.

Dry installation

- vertical on base stand or
- horizontal with brackets, secured to a concrete floor or foundation.

When mounted on a base stand/bracket, the pump must be installed outside the pump sump. A suction line must be connected to the pump.

A dimensional sketch for each individual installation type can be found at the end of this booklet.

9.2 Submerged installation on auto-coupling

Pumps for permanent installation can be mounted on a stationary auto-coupling guide rail system. The auto-coupling system facilitates maintenance and service as the pump can easily be lifted out of the pit.



Before beginning installation procedures, make sure that the atmosphere in the pit is not potentially explosive.

Auto-coupling guide rail system, see fig. 3.

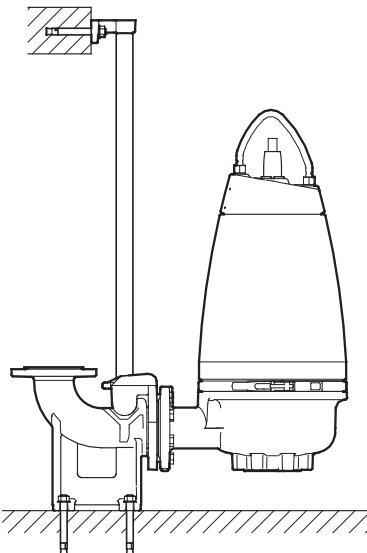
Procedure:

1. Fit the guide rail bracket on the inside of the pit and fasten it provisionally with anchor bolts.
2. Place the auto-coupling base unit on the bottom of the pit. Use a plumb line to establish the correct positioning. Fasten with heavy-duty expansion bolts. Support the auto-coupling base unit so that it is level when being fastened.
3. Connect the discharge line without exposing it to distortion or tension.
4. Insert the guide rails in the auto-coupling base unit and adjust the length of the rails accurately to the guide rail bracket.
5. Unscrew the provisionally fastened guide rail bracket and fit it on top of the guide rails. Fasten the bracket firmly to the pit wall.

Note: The guide rails must not have any axial play as this would cause noise during pump operation.

6. Clean out debris from the pit before lowering the pump into the pit.
7. Fit the guide claw to the discharge port of the pump. Then slide the guide claw down the guide rails and lower the pump into the pit by means of a chain fastened to the lifting bracket. When the pump reaches the auto-coupling base unit, the pump will automatically connect tightly.

8. Hang up the end of the chain on a suitable hook at the top of the pit and in such a way that the chain cannot come into contact with the pump housing.
9. Adjust the length of the motor cable by coiling it up on a relief fitting to ensure that the cable is not damaged during operation. Fasten the relief fitting to a suitable hook at the top of the pit. Make sure that the cable is not sharply bent or pinched.
10. Connect the motor cable.



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Fig. 3 Submerged pump on auto-coupling

9.3 Free-standing submerged installation

Pumps for free-standing submerged installation can stand freely on the bottom of the pit or the like. The pump must be installed on a ring stand, see fig. 4.

The ring stand is available as an accessory.

In order to facilitate service on the pump, fit a flexible union or coupling to the discharge line for easy separation.

If a **hose** is used, make sure that the hose does not buckle and that the inside diameter of the hose matches that of the pump discharge port.

If a **rigid pipe** is used, the union or coupling, non-return valve and isolating valve should be fitted in the order mentioned, when viewed from the pump.

If the pump is installed in muddy conditions or on uneven ground, it is recommended to support the pump on bricks or a similar support.

Procedure:

1. Fit a 90° elbow to the pump discharge port and connect the discharge pipe/hose.
2. Lower the pump into the liquid by means of a chain secured to the lifting bracket of the pump. It is recommended to place the pump on a plane, solid foundation. Make sure that the pump stands securely.
3. Hang up the end of the chain on a suitable hook at the top of the pit and in such a way that the chain cannot come into contact with the pump housing.
4. Adjust the length of the motor cable by coiling it up on a relief fitting to ensure that the cable is not damaged during operation. Fasten the relief fitting to a suitable hook. Make sure that the cable is not sharply bent or pinched.
5. Connect the motor cable.

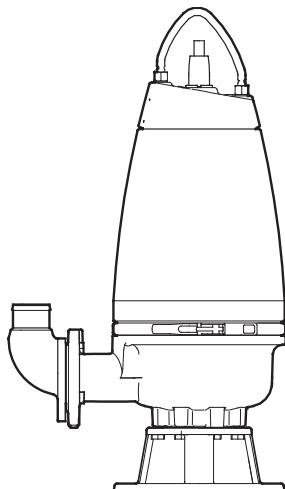


Fig. 4 Free-standing submerged pump on ring stand

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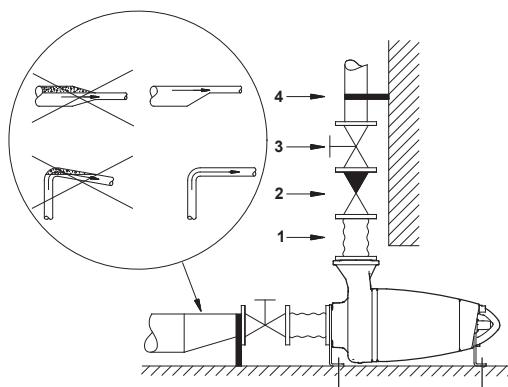
9.4 Dry installation

In dry installations, the pump must be installed permanently outside the pump sump.

The pump motor is totally enclosed and watertight. Consequently, it will not be damaged in case the installation site is flooded.

Precautions:

- When the pump is installed outside the pump sump, it must be ensured that the liquid level in the pump sump does not fall below the critical NPSH (Net Positive Suction Head).
- The suction line must be sized according to the length and the desired pump performance. A possible difference in level between the pump sump and the pump inlet must also be taken into account. The size of the suction line must never be larger than the size of the pump discharge flange.
- The pipework must be supported so that no strain or other mechanical influences are transmitted to the pump. It is recommended to install expansion joints and pipe hangers, see fig. 5.



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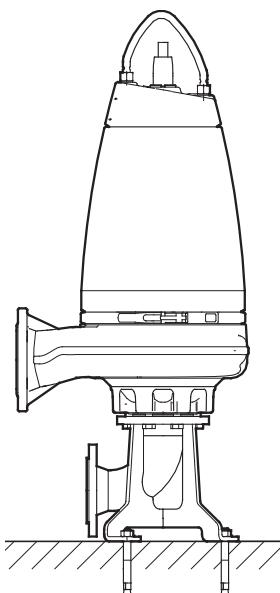
Fig. 5 Horizontal dry installation with brackets

- The pump should be installed on a separate foundation, e.g. concrete foundation. The weight of the foundation should be approx. 1.5 times the weight of the pump. To prevent vibrations from being transmitted to the building and pipework, it is recommended to place the pump on a vibration absorbing material.

Procedure:

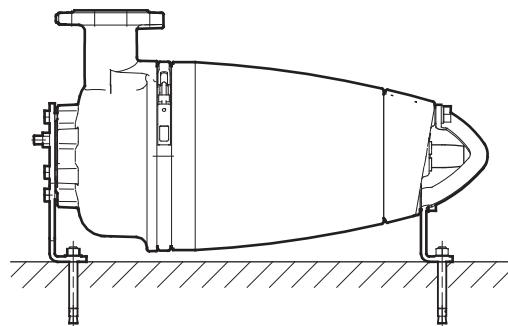
- Fit the base stand or brackets to the pump. See dimensional sketches at the end of this booklet.
- Mark and drill fixing holes in the concrete floor/foundation.
- Secure the pump with expansion bolts.
- Check that the pump stands vertically/horizontally.
- Connect the motor cable.
- It is recommended to fit an isolating valve on the suction side of the pump and a non-return valve as well as an isolating valve on the discharge side.
- Install the suction and discharge lines as well as the valves, if any. Ensure that the pump is not stressed by the pipework.

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Fig. 6 Vertical dry installation on base stand



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Fig. 7 Horizontal dry installation with brackets

Pos.	Description
1	Expansion joint
2	Non-return valve
3	Isolating valve
4	Pipe hanger

- If a reducer is fitted between the suction line and the pump, it must be of the eccentric type. The reducer must be fitted so that the straight edge is pointing upwards to avoid air locks in the suction line. Air in the suction line may cause cavitation, see fig. 5.

10. Electrical connection

The electrical connection must be carried out in accordance with local regulations.

The pump must be connected to a mains switch with a minimum contact gap of 3 mm in all poles.

The motor starter must be set to the current consumption of the pump. The current consumption is stated on the pump nameplate.

The explosion protection classification of the pump is: CE 0344 II 2 GD EEx dc IIB T4/T3 IP68 T 135°C/200°C. (Australia, see 7.2.)

The classification of the installation site must in each individual case be approved by the local fire-fighting authorities.



Grundfos control boxes, pump controllers and Ex barriers **must not** be installed in potentially explosive environments.



Make sure that all protective equipment has been connected correctly.

If the pump has an "X" on the nameplate (pos. 1), it must be ensured that the pump is connected in accordance with the instructions given in this booklet.

On explosion-proof pumps, it must be ensured that an external earth wire is connected to the terminal on the pump top cover. The cross section of the earth wire must be at least 4 mm², e.g. type H07 V2-K (PVT 90°) yellow/green.

Float switches used in potentially explosive environments must be approved for this application. They **must** be connected to the Grundfos LC/D 108 pump controller via the intrinsically safe LC-Ex4 barrier to ensure a safe circuit.

The supply voltage and frequency are marked on the pump nameplate. The voltage tolerance must be within -10%/+6% of the rated voltage. Make sure that the motor is suitable for the electricity supply available at the installation site.

All pumps are supplied with 10 metres of cable and a free cable end.

The pump must be connected to

- a control box with motor starter, e.g. Grundfos CU 100 control box, or
- a Grundfos LC/D 107, LC/D 108 or LC/D 110 pump controller.

See fig. 8 or 9 and the installation and operating instructions for the selected control box or pump controller.

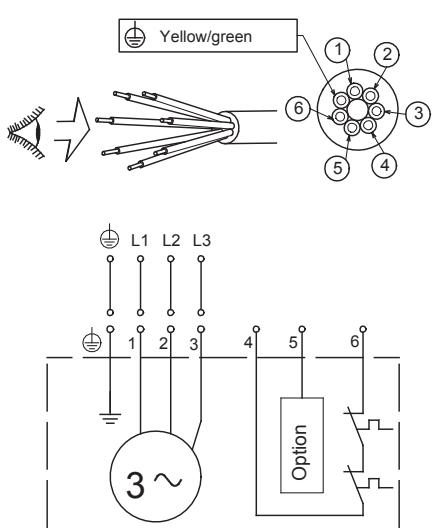


Fig. 8 Wiring diagram – 7-wire cable

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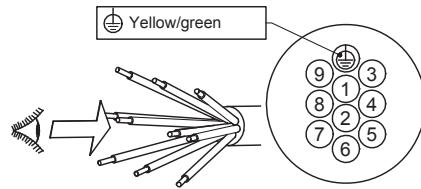


Fig. 9 Wiring diagram – 10-wire cable

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10.1 Pump controllers

The following LC and LCD pump controllers are available:

LC controllers are for one-pump installations and LCD controllers are for two-pump installations.

- LC 107 and LCD 107 with level pickups.
- LC 108 and LCD 108 with float switches.
- LC 110 and LCD 110 with electrodes.

In the following description, "level switches" can be level pickups, float switches or electrodes, depending on the pump controller selected.

The **LC** controller is fitted with two or three level switches: One for start and the other for stop of pump. The third level switch, which is optional, is for high-level alarm.

The **LCD** controller is fitted with three or four level switches: One for common stop and two for start of the pumps. The fourth level switch, which is optional, is for high-level alarm.

When installing the level switches, the following points should be observed:

- To prevent air intake and vibrations, the **stop level switch** must be installed in such a way that the pump is stopped before the liquid level is lowered below the upper edge of the clamp on the pump.
- During one-pump operation, the **start level switch** should be installed in such a way that the pump is started at the required level; however, the pump must always be started before the liquid level reaches the bottom inlet pipe to the pit.
- During two-pump operation, the **start level switch** for pump 2 must start the pump before the liquid level reaches the bottom inlet pipe to the pit, and the start level switch for pump 1 must start this pump correspondingly earlier.
- The **high-level alarm switch**, if installed, should always be installed about 10 cm above the start level switch; however, the alarm must always be given before the liquid level reaches the bottom inlet pipe to the pit.

For further settings, see the installation and operating instructions for the pump controller selected.

The pump must not run dry.

An additional level switch must be installed to ensure that the pump is stopped in case the stop level switch is not operating.

Stop the pump when the liquid level reaches the upper edge of the clamp on the pump.

Float switches used in potentially explosive environments must be approved for this application. They **must** be connected to the Grundfos LC/D 108 pump controller via the intrinsically safe LC-Ex4 barrier to ensure a safe circuit.

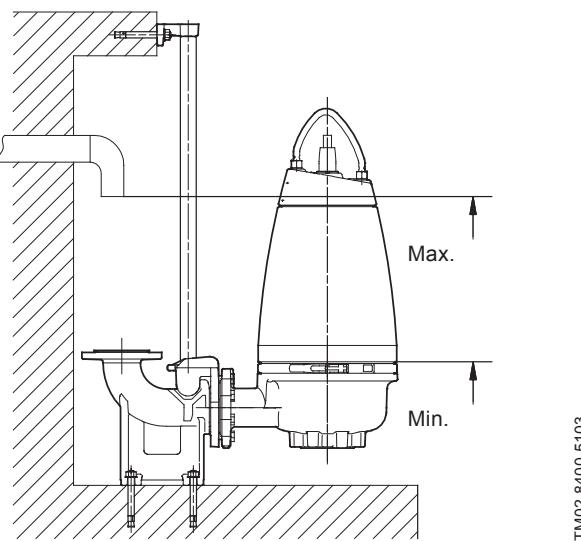


Fig. 10 Start and stop levels

It should be ensured that the effective volume in the pump sump does not get so small that the number of starts per hour exceeds the maximum permissible number.

See section 15. Technical data and operating conditions.

10.2 Thermal switch

All SE pumps have a thermal switch incorporated in the stator windings.

Via the pump controller safety circuit, the thermal switch will stop the pump by breaking the circuit in case of overtemperature (approx. 150°C). The thermal switch will close the circuit after cooling.

The maximum operating current of the thermal switch is 0.5 A at 500 VAC and cos j 0.6. The switch must be able to break a coil in the supply circuit.

In the case of **standard pumps**, the thermal switch can (when closing the circuit after cooling) restart the pump automatically via the controller.



In the case of **explosion-proof pumps**, the thermal switch must not restart the pump automatically. This ensures protection against overtemperature in potentially explosive environments.



The separate motor starter/control box must not be installed in potentially explosive environments.



10.3 WIO sensor

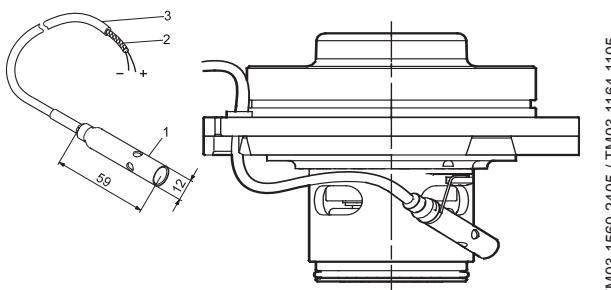


Fig. 11 WIO sensor

The WIO sensor measures the water content in the oil and converts the value into an analog current signal. The two sensor conductors are for power supply as well as for carrying the signal to the measuring device or controller. The sensor measures the water content from 0 to 20%. It also sends a signal if the water content is outside the normal range (warning), or if there is air in the oil chamber (alarm). The sensor is fitted in a stainless steel tube for mechanical protection.

It is important to fit the sensor next to one of the shaft seal openings, see fig. 11. The sensor must be tilted into the motor's direction of rotation to ensure that oil is led into the sensor. Make sure that the sensor is submerged in the oil.

10.3.1 Data

Input voltage:	12 - 24 VDC
Output current:	3.5 - 22 mA
Power consumption:	0.6 W
Ambient temperature:	0 to 70°C

For further information, see instructions 96573975 at www.grundfos.com.

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10.4 Moisture sensor

The moisture sensor is positioned in the bottom of the motor. If there is moisture in the motor, the sensor sends a signal to the IO 111.

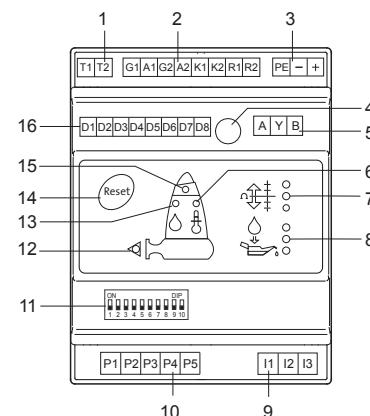
10.5 IO 111

The IO 111 forms interface between a Grundfos wastewater pump with analog and digital sensors and the pump controller. The most important sensor data are indicated on the front panel. One pump can be connected to an IO 111 module.

Together with the sensors, the IO 111 forms a galvanic separation between the motor voltage in the pump and the controller connected.

IO 111 operates with two categories of fault:

1. Alarm. The pump stops. The fault is a primary functionality (e.g. too high motor temperature).
2. Warning. The pump does not stop. The fault is a secondary functionality (e.g. too much water in the oil).



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Fig. 12 IO 111 module

Pos. Description

1	Terminal for alarm relay
2	Terminal for analog and digital inputs and outputs
3	Terminal for supply voltage (24 VAC/24 VDC)
4	Potentiometer for setting the warning limit of stator insulation resistance
5	Terminal for RS485
6	Red indicator light. Alarm in case of too high motor temperature.
7	Indicator lights for stator insulation resistance. Green = ok. Yellow = warning. Red = alarm.
8	Indicator lights for measurement of water in oil
9	Terminal for measurement of stator insulation resistance
10	Terminal for connection of pump sensors
11	DIP switch for configuration
12	Green indicator light. On when the pump is running.
13	Red indicator light. Alarm in case of moisture in the motor.
14	Button for reset of alarm
15	Yellow indicator light. Warning in case of pump fault.
16	Terminal for digital outputs

Pos.	Symbol	Description
6	○ ○ ○	Stator temperature
7	○ ○ ○ ○ ○	Stator insulation resistance
8	○ ○ ○ ○ ○	Water in oil chamber
12	○ ○ ○	Pump running
13	○ ○ ○	Moisture in motor
15	○ ○ ○	Pump fault

10.5.1 Data

Supply voltage:	24 VAC ±10%, 50 & 60 Hz
	24 VDC ±10%
Input current:	Min. 0.5 A; max. 8 A
Power consumption:	Max. 5 W
Ambient temperature:	-25°C to +65°C
Enclosure class:	IP 20

10.6 Frequency converter operation

If the pump is controlled by means of a frequency converter, the thermal protection of the pump must be connected to the stopping circuit of the frequency converter.

In order to prevent deposits, the minimum flow velocity in the pipework must be observed when setting the minimum setpoint.

Pipework	Minimum flow velocity
Horizontal	1.0 [m/s]
Vertical	0.7 [m/s]

11. Start-up



Before starting work on the pump, make sure that the fuses have been removed or the mains switch has been switched off. It must be ensured that the electricity supply cannot be accidentally switched on.

Make sure that all protective equipment has been connected correctly.

The pump must not run dry.



The pump must not be started if a potentially explosive atmosphere is present in the pit.

Procedure:

1. Remove the pump from the system.
2. Check that the impeller can rotate freely. Turn the impeller by hand.
3. Check the condition of the oil in the oil chamber. See also section 12.2.1 *Oil change*.
4. Check whether the monitoring units, if used, are operating satisfactorily.
5. Check the setting of the level pickups, float switches or electrodes.
6. Mount the pump in the system and switch on the electricity supply.
7. Open the isolating valves, if fitted.
8. Check whether the system has been filled with liquid and vented. The pump is usually self-venting, but in certain installations it may be necessary to tilt the pump a little while it runs for a short time to reduce the counter pressure and remove air pockets in the pump.

9. Start the pump.

Note: In case of abnormal noise or vibrations from the pump or other pump or supply failures, stop the pump immediately. Do not attempt to restart the pump before the cause of the fault has been found and the fault corrected.

After one week of operation after replacement of the shaft seal, the condition of the oil in the chamber should be checked. See section 12. *Maintenance* for procedure.

11.1 Direction of rotation

Note: The pump may be started for a very short period without being submerged for checking of the direction of rotation.

Before starting up the pump, the direction of rotation must be checked.

An arrow on the top cover indicates the correct direction of rotation.

The pump should rotate clockwise when viewed from above. When started, the pump will jerk in the opposite direction of the direction of rotation, see fig. 13.

If the direction of rotation is wrong, interchange any two of the incoming supply wires, see fig. 8 or 9.

Checking the direction of rotation:

The direction of rotation should be checked in one of the following ways every time the pump is connected to a new installation.

Procedure 1:

1. Start the pump and measure the quantity of liquid or the discharge pressure.
2. Stop the pump and interchange any two of the incoming supply wires.
3. Restart the pump and measure the quantity of liquid or the discharge pressure.
4. Stop the pump.
5. Compare the results taken under points 1 and 3. The connection which gives the larger quantity of liquid or the higher pressure is the correct direction of rotation.

Procedure 2:

1. Let the pump hang from a lifting device, e.g. the hoist used for lowering the pump into the pit.
2. Start and stop the pump while observing the movement (jerk) of the pump.
3. If connected correctly, the pump will jerk in the opposite direction of the direction of rotation, see fig. 13. If not, interchange any two of the incoming supply wires.

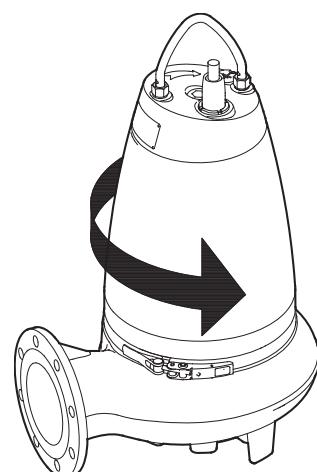


Fig. 13 Jerk direction

12. Maintenance



Before starting work on the pump, make sure that the fuses have been removed or the mains switch has been switched off. It must be ensured that the electricity supply cannot be accidentally switched on. All rotating parts must have stopped moving.



Except for maintenance on the hydraulic part, all other maintenance work **must** be carried out by **Grundfos or an authorized service workshop**.

Before carrying out maintenance, it must be ensured that the pump has been thoroughly flushed with clean water. Rinse the pump parts in water after dismantling.



When slackening the screws of the oil chamber, note that pressure may have built up in the chamber. Do not remove the screws until the pressure has been fully relieved.

12.1 Inspection intervals

Pumps running normal operation should be checked at least once a year or at least after 3000 operating hours. If the pumped liquid is very muddy or sandy, check the pump at shorter intervals.

The following points should be checked:

- **Power consumption**

See pump nameplate.

- **Oil level and oil condition**

When the pump is new or after replacement of the shaft seal, check the oil level after one week of operation.

The oil becomes greyish white like milk if it contains water.

This may be the result of a defective shaft seal. The oil should be changed after 3000 operating hours or once a year.

Use Shell Ondina 917 oil or similar type.

See sections 12.2.1 Oil change and 13. Service.

- **Cable entry**

Make sure that the cable entry is watertight (visual inspection) and that the cable is not sharply bent and/or pinched.

See section 13. Service.

- **Pump parts**

Check the impeller, pump housing, etc. for possible wear.

Replace defective parts.

See section 13. Service.

- **Ball bearings**

Check the shaft for noisy or heavy operation (turn the shaft by hand). Replace defective ball bearings.

In case of defective ball bearings or poor motor function, a general overhaul of the pump is usually required. This work must be carried out by Grundfos or an authorized service workshop.

- **O-rings and similar parts**

During service/replacement, it must be ensured that the grooves for O-rings and seal faces have been cleaned before the new parts are fitted.

Note: Used rubber parts must not be reused.



Explosion-proof pumps must be checked by an authorized Ex workshop once a year.

12.2 Dismantling the pump

12.2.1 Oil change

After 3000 operating hours or once a year, change the oil in the oil chamber as described below.

If the shaft seal has been replaced, the oil must be changed.



When slackening the screws of the oil chamber, note that pressure may have built up in the chamber. Do not remove the screws until the pressure has been fully relieved.

Draining of oil:

1. Place the pump on a plane surface with one oil screw pointing downwards.

2. Place a suitable container (approx. 1 litre) under the oil screw.

Note: Used oil must be disposed of in accordance with local regulations.

3. Remove the lower oil screw.

4. Remove the upper oil screw.

If the oil in the container is greyish white like milk, it contains water. This means that the shaft seal is defective and must be replaced. If the shaft seal is still used, the motor will be damaged within a short time.

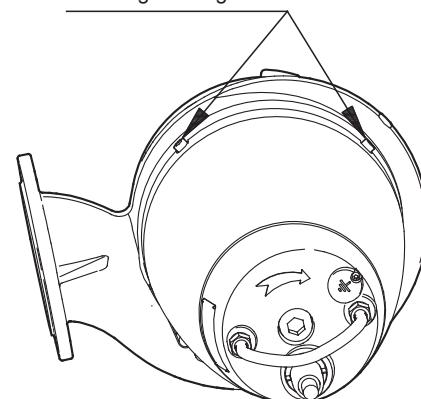
If the quantity of oil is smaller than the quantity stated in section 13.1 Oil quantities, the shaft seal is defective.

5. Clean the faces for the gaskets for oil screws.

Oil filling:

1. Turn the pump so that the oil filling holes are placed opposite to each other, pointing upwards.

Oil filling/venting



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Fig. 14 Oil filling holes

2. Pour oil into the chamber.

For oil quantity, see section 13.1.

3. Fit the oil screws with new gaskets.

12.2.2 Cleaning/removing the pump housing and impeller

For position numbers, see page 377.

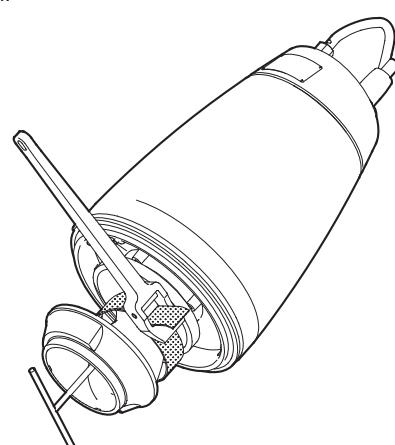
Procedure:

1. Loosen the clamp (pos. 92).

2. Remove the screw (pos. 92a) using fingers.

3. Remove the pump housing (pos. 50) by inserting two screwdrivers between the sleeve and the pump housing.

4. Remove the screw (pos. 188a). Hold the impeller with a strap wrench.



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Fig. 15 Removing the impeller

5. Loosen the impeller (pos. 49) with a light blow on the edge. Pull it off.

6. Remove the key (pos. 9a) and the spring for impeller (pos. 157).

12.2.3 Removing the seal ring and wear ring

Procedure:

1. Turn the pump housing upside-down.
2. Knock the seal ring (pos. 46) out of the pump housing using a punch.

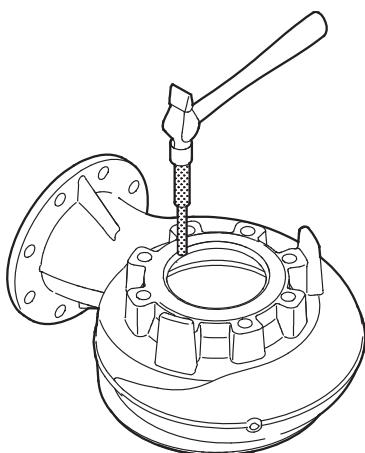


Fig. 16 Removing the seal ring

3. Clean the pump housing where the seal ring was fitted.
4. Remove the wear ring (pos. 49c) with a screwdriver.

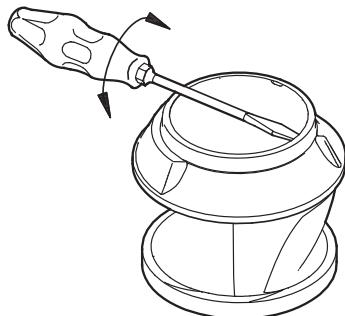


Fig. 17 Removing the wear ring

5. Clean the impeller where the wear ring was fitted.

12.2.4 Checking/removing the shaft seal

Procedure:

1. Remove the screws (pos. 188).
2. Remove the cover for oil chamber (pos. 58) with a puller.
3. Remove the screws (pos. 186).
4. Remove the shaft seal (pos. 105) with the puller.
5. Remove the O-ring (pos. 153b).

Procedure (pump with sensor):

1. Remove the screws (pos. 188).
2. Remove the cover for oil chamber (pos. 58) with a puller.
3. Remove the screws (pos. 186).
4. Remove the sensor (pos. 521) and holder (pos. 522) from the shaft seal.
5. Remove the shaft seal (pos. 105) with the puller.
6. Remove the O-ring (pos. 153b).

12.3 Assembly

12.3.1 Fitting the shaft seal

Procedure:

1. Fit and lubricate the O-ring (pos. 153b) with oil.
2. Slide the shaft seal (pos. 105) gently over the shaft.
3. Fit and tighten the screws (pos. 186).
4. Fit and lubricate the O-ring (pos. 107) in the cover for oil chamber (pos. 58) with oil.
5. Fit the cover for oil chamber.
6. Fit and tighten the screws (pos. 188).

Procedure (pump with sensor):

1. Fit and lubricate the O-ring (pos. 153b) with oil.
2. Slide the shaft seal (pos. 105) gently over the shaft.
3. Fit the holder (pos. 522) and sensor (pos. 521) with one of the screws (pos. 186).
4. Fit the second screw and tighten both screws (pos. 186).
5. Fit and lubricate the O-ring (pos. 107) in the cover for oil chamber (pos. 58) with oil.
6. Check that the sensor is positioned correctly, see 10.3 WIO sensor and fig. 11. This is of special importance in horizontal pumps.
7. Fit the cover for oil chamber.
8. Fit and tighten the screws (pos. 188).

12.3.2 Fitting the seal ring and wear ring

Procedure:

1. Lubricate the seal ring (pos. 46) with soapy water.
2. Place the seal ring in the pump housing.
3. Knock the seal ring home in the pump housing using a punch or a wooden block.

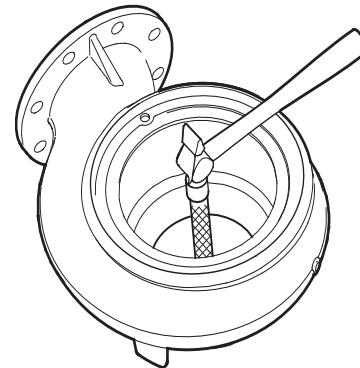


Fig. 18 Fitting the seal ring

4. Place the wear ring (pos. 49c) on the impeller.
5. Knock the wear ring home using a wooden block.

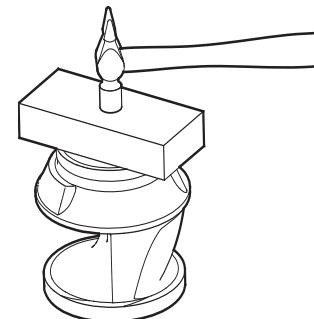


Fig. 19 Fitting the wear ring

12.3.3 Fitting the impeller and pump housing

Procedure:

1. Fit the spring (pos. 157) and the key (pos. 9a). Keep the key in position while the impeller is fitted.
2. Fit the impeller (pos. 49).
3. Fit the washer (pos. 66) and the screw (pos. 188a).
4. Tighten the screw (pos. 188a) to 75 Nm. Hold the impeller with the strap wrench.
5. Mark the position of the pin on the pump housing.
6. Mark the position of the pin hole on the oil chamber.
7. Fit and lubricate the O-ring (pos. 37) with oil.
8. Fit the pump part in the pump housing (pos. 50).
9. Fit the clamp (pos. 92).
10. Tighten the screw (pos. 92a) to 8 Nm.
11. Check that the impeller rotates freely and without drag.

13. Service



Before starting work on the pump, make sure that the fuses have been removed or the mains switch has been switched off. It must be ensured that the electricity supply cannot be accidentally switched on.

All rotating parts must have stopped moving.



Except for service on the hydraulic part, all other service work **must** be carried out by **Grundfos or an authorized service workshop**.

GB

To simplify the overview in section 13.2, the pumps have been divided into four categories: B, C22, C and D.

The four categories can be found by means of the shaft power output and number of poles stated on the pump nameplate, see section 6. *Nameplate*.

Power	Frame size			
	B	C22	C	D
2-pole				
2.2	x			
3.0	x			
4.0		x		
5.5			x	
7.5			x	
9.2				x
11.0			x	
4-pole				
1.0	x			
1.3	x			
1.5	x			
2.2	x			
3.0		x		
4.0		x		
5.5		x		
7.5				x

13.1 Oil quantities

The table shows the quantity of oil in the oil chamber of SE pumps:

Frame size	Oil quantity [l]
B	0.3
C22	0.55
C	0.55
D	0.7

Note: Used oil must be disposed of in accordance with local regulations.

13.2 Service kits

The following service kits are available for all SE pumps and can be ordered as required:

Service kit	Contents	Frame size			
		B	C22	C	D
Shaft seal kit	Shaft seal complete	96102360		96102361	
Impeller kit	Key, washer, screw and spring for impeller	96102365		96102366	
O-ring kit	O-rings	96102367	96102368	96102369	96102370

Service kit	Contents	Pump passage		
		50 mm	80 mm	100 mm
Seal ring and wear ring (channel impeller)	Seal ring and wear ring	96102362	96102363	96102364
Oil	1 litre of oil, type Shell Ondina 917	All types	96046902	
Washers for oil screws	10 washers	All types	96102359	

Note: A possible replacement of the cable must be carried out by **Grundfos or an authorized service workshop.**

For service parts not shown in the above table, consult www.grundfos.com - WebCAPS, Service.

Examples of service parts:

- cables
- pump housings
- impellers
- bearings
- shafts/rotors
- clamps
- stators
- motor complete, both standard and Ex.

13.3 Contaminated pumps

Note: If a pump has been used for a liquid which is injurious to health or toxic, the pump will be classified as contaminated.

If Grundfos is requested to service the pump, Grundfos must be contacted with details about the pumped liquid, etc. *before* the pump is returned for service. Otherwise Grundfos can refuse to accept the pump for service.

Possible costs of returning the pump are paid by the customer.

However, any application for service (no matter to whom it may be made) must include details about the pumped liquid if the pump has been used for liquids which are injurious to health or toxic.

Before a pump is returned, it must be cleaned in the best possible way.

14. Fault finding chart



Before attempting to diagnose any fault, make sure that the fuses have been removed or the mains switch has been switched off. It must be ensured that the electricity supply cannot be accidentally switched on.

All rotating parts must have stopped moving.



All regulations applying to pumps installed in potentially explosive environments must be observed.

It must be ensured that no work is carried out in potentially explosive atmosphere.

GB

Fault	Cause	Remedy
1. Motor does not start. Fuses blow or motor starter trips out immediately. Caution: Do not start again!	a) Supply failure; short-circuit; earth-leakage fault in cable or motor winding. b) Fuses blow due to use of wrong type of fuse. c) Impeller blocked by impurities. d) Level pickup, float switch or electrode out of adjustment or defective.	Have the cable and motor checked and repaired by a qualified electrician. Fit fuses of the correct type. Clean the impeller. Check the level pickups, float switches or electrodes.
2. Pump operates, but motor starter trips out after a short while.	a) Low setting of thermal relay in motor starter. b) Increased current consumption due to large voltage drop. c) Impeller blocked by impurities. Increased current consumption in all three phases. d) Wrong direction of rotation.	Set the relay in accordance with the specifications on the pump nameplate. Measure the voltage between two motor phases. Tolerance: -10%/+6%. Clean the impeller. Check the direction of rotation and possibly interchange any two of the incoming supply wires, see section 11.1 <i>Direction of rotation</i> .
3. Pump operates at below-standard performance and power consumption.	a) Impeller blocked by impurities. b) Wrong direction of rotation.	Clean the impeller. Check the direction of rotation and possibly interchange any two of the incoming supply wires, see section 11.1 <i>Direction of rotation</i> .
4. Pump operates, but gives no liquid.	a) Discharge valve closed or blocked. b) Non-return valve blocked. c) Air in pump.	Check the discharge valve and possibly open and/or clean. Clean the non-return valve. Vent the pump.
5. Pump clogged.	a) The liquid contains large particles. b) A float layer has formed on the surface.	Select a pump with a larger size of passage. Install a mixer in the pump sump.

15. Technical data and operating conditions

Supply voltage

- 3 x 230 V -10%/+6%, 50 Hz.
- 3 x 400 V -10%/+6%, 50 Hz.

Standards

These standards apply to all pumps:

- EN 12050-1: 2001, wastewater with discharge from toilets.
- EN 12050-2: 2000, wastewater without discharge from toilets.

Standards for Ex protection

These standards apply to explosion-proof pumps:

- CE 0344 II 2 GD EEx dc IIB T4 IP68 T 135°C
CE 0344 II 2 GD EEx dc IIB T3 IP68 T 200°C (frequency converter controlled pumps).
According to EN 50014: 1997, EN 50018: 2000 and EN 50281-1-1: 1998.
- Ex nA II T3.
According to IEC 79-15: 1987.

Enclosure class

IP 68. According to IEC 60529.

Insulation class

F (155°C).

pH value

SE pumps in permanent installations can cope with pH values ranging from 4 to 10.

Liquid temperature

0°C to +40°C.

For short periods up to +60°C.



Explosion-proof pumps must never pump liquids with a temperature higher than +40°C.

Ambient temperature



Explosion-proof pumps must be installed in environments with a temperature ranging from -20°C to +40°C.

Density of pumped liquid

Maximum 1100 kg/m³.

In the case of higher values, contact Grundfos.

Installation depth

Maximum 20 metres below liquid level.

Operating mode

Maximum 20 starts per hour.

S1, continuous operation.

Pump curves

Pump curves are available via internet www.grundfos.com.

The curves are to be considered as a guide. They must not be used as guarantee curves.

Test curves for the supplied pump are available on request.

It must be ensured that the pump does not operate outside the recommended operating range during normal operation.

Sound pressure level

The sound pressure level of the pump is lower than the limiting values stated in the EC Council Directive 98/37/EC relating to machinery.

Electrical data

Frame size	Power [kW]	Motor			Cable connection	
		Voltage [V]	Thermal protection	Resistance [Ω]	Cable cross section [mm ²]	Wires/plug pins
2-pole						
B	2.2	3 x 220-240	Thermal switch	1.7	1.5	7/7
B	3	3 x 220-240	Thermal switch	1.1	1.5	7/7
B	2.2	3 x 380-415	Thermal switch	5.2	1.5	7/7
B	3	3 x 380-415	Thermal switch	3.4	1.5	7/7
C	4	3 x 380-415/660-720	Thermal switch	3.7	2.5	10/10
C	4	3 x 380-415/660-720	Thermal sensor	3.7	2.5	10/10
C	4	3 x 220-240/380-415	Thermal switch	1.2	2.5	10/10
C	5.5	3 x 380-415/660-720	Thermal switch	2.3	2.5	10/10
C	5.5	3 x 380-415/660-720	Thermal sensor	2.3	2.5	10/10
C	5.5	3 x 220-240/380-415	Thermal switch	0.7	2.5	10/10
C	7.5	3 x 380-415/660-720	Thermal switch	1.7	2.5	10/10
C	7.5	3 x 380-415/660-720	Thermal sensor	1.7	2.5	10/10
C	7.5	3 x 220-240/380-415	Thermal switch	0.5	2.5	10/10
D	9.2	3 x 380-415/660-720	Thermal switch	1.3	2.5	10/10
D	9.2	3 x 380-415/660-720	Thermal sensor	1.3	2.5	10/10
D	9.2	3 x 220-240/380-415	Thermal switch	0.4	2.5	10/10
D	11	3 x 380-415/660-720	Thermal switch	1.0	2.5	10/10
D	11	3 x 380-415/660-720	Thermal sensor	1.0	2.5	10/10
D	11	3 x 220-240/380-415	Thermal switch	0.3	2.5	10/10
4-pole						
B	1.5	3 x 220-240	Thermal switch	3.0	1.5	7/7
B	2.2	3 x 220-240	Thermal switch	1.8	1.5	7/7
B	1.5	3 x 380-415	Thermal switch	9.1	1.5	7/7
B	2.2	3 x 380-415	Thermal switch	5.4	1.5	7/7
C	3	3 x 220-240	Thermal switch	1.2	1.5	7/10
C	3	3 x 380-415	Thermal switch	3.5	1.5	7/10
C	3	3 x 380-415	Thermal switch	3.6	1.5	7/10
C	3	3 x 660-720	Thermal switch	10.5	1.5	7/10
C	4	3 x 380-415/660-720	Thermal switch	3.8	2.5	10/10
C	4	3 x 380-415/660-720	Thermal sensor	3.8	2.5	10/10
C	4	3 x 220-240/380-415	Thermal switch	1.3	2.5	10/10
C	5.5	3 x 380-415/660-720	Thermal switch	2.8	2.5	10/10
C	5.5	3 x 380-415/660-720	Thermal sensor	2.8	2.5	10/10
C	5.5	3 x 220-240/380-415	Thermal switch	1.0	2.5	10/10
D	7.5	3 x 380-415/660-720	Thermal switch	1.6	2.5	10/10
D	7.5	3 x 380-415/660-720	Thermal sensor	1.6	2.5	10/10
D	7.5	3 x 220-240/380-415	Thermal switch	0.6	2.5	10/10

The supply cable resistance depends on the cable diameter

Resistance per running metre of cable, 1.5 mm² = 0.012 Ω

Resistance per running metre of cable, 2.5 mm² = 0.007 Ω

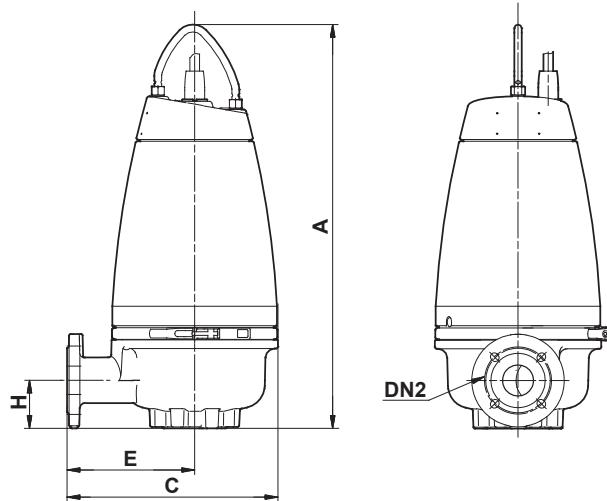
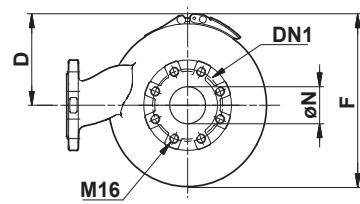
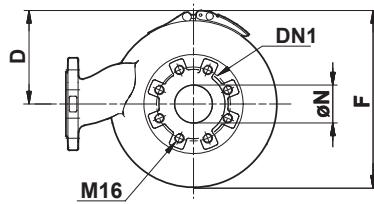
16. Disposal

Disposal of this product or parts of it must be carried out according to the following guidelines:

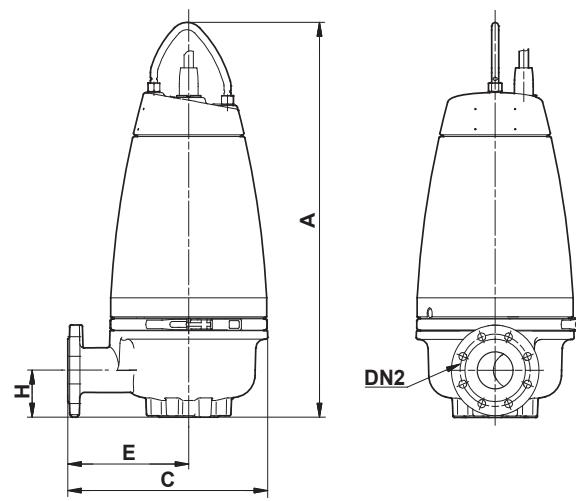
1. Use the local public or private waste collection service.
2. In case such waste collection service does not exist or cannot handle the materials used in the product, please deliver the product or any hazardous materials from it to your nearest Grundfos company or service workshop.

Subject to alterations.

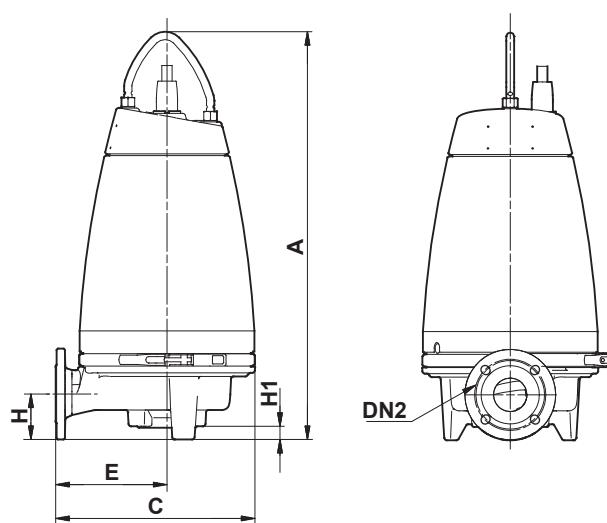
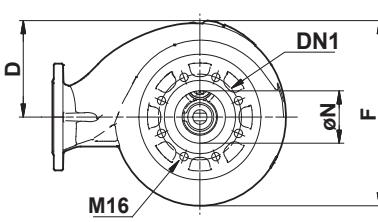
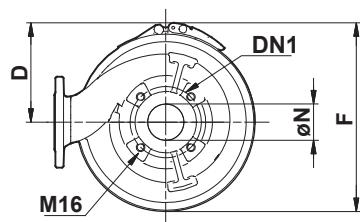
Pump without accessories



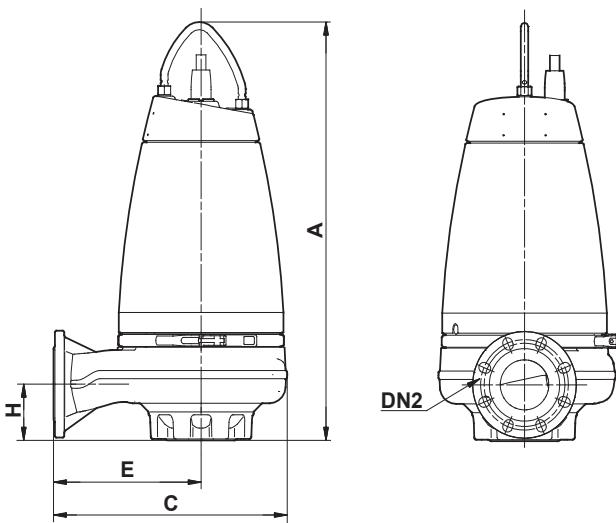
TM02 8271 4803



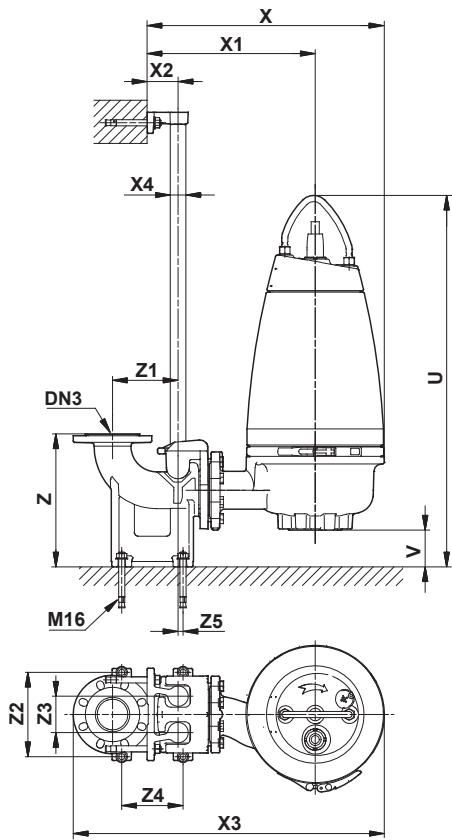
TM02 8257 4803



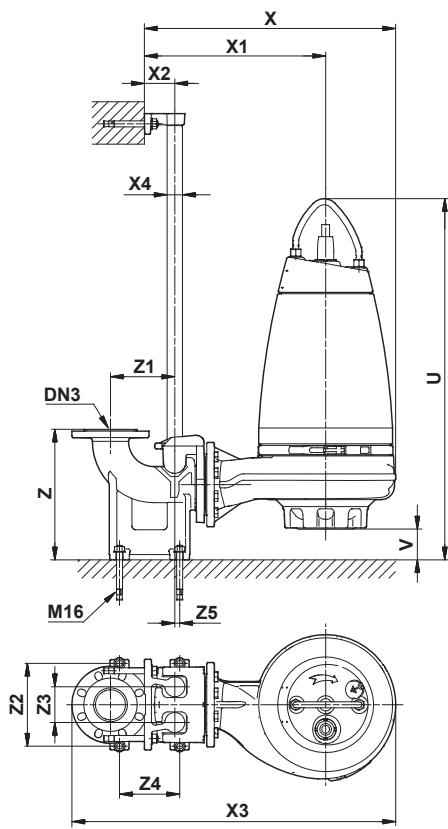
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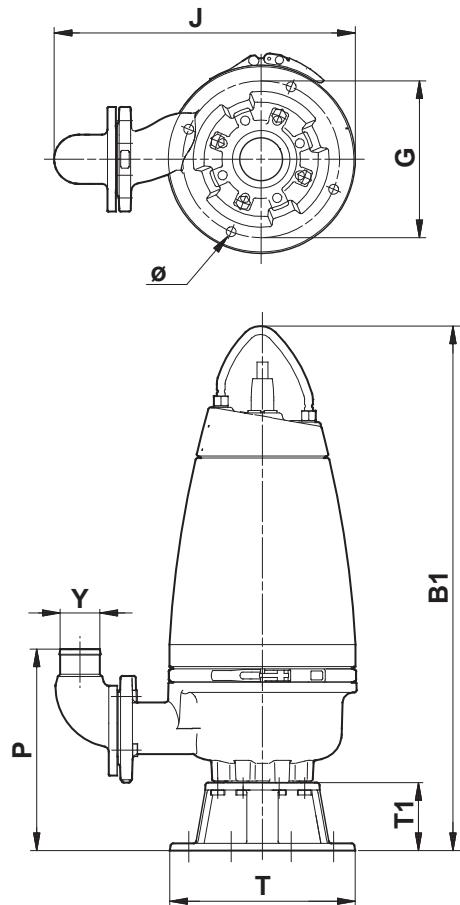
TM02 8256 4803

Submerged pump on auto-coupling

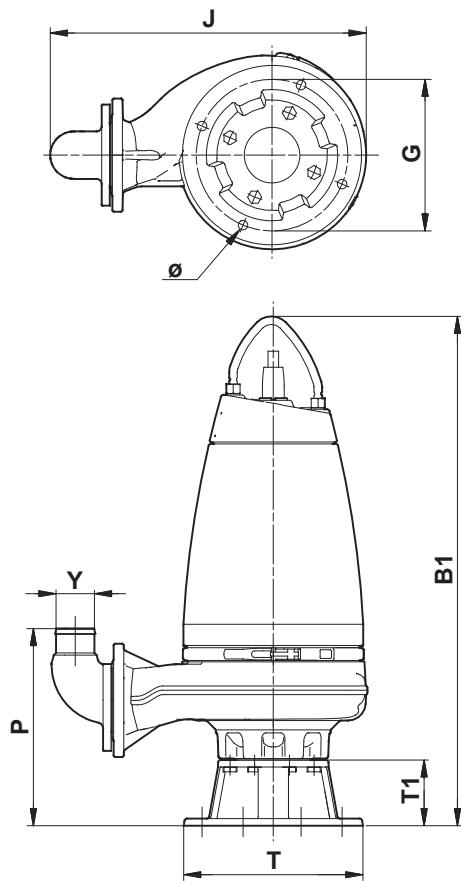
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TM02 8275 4803

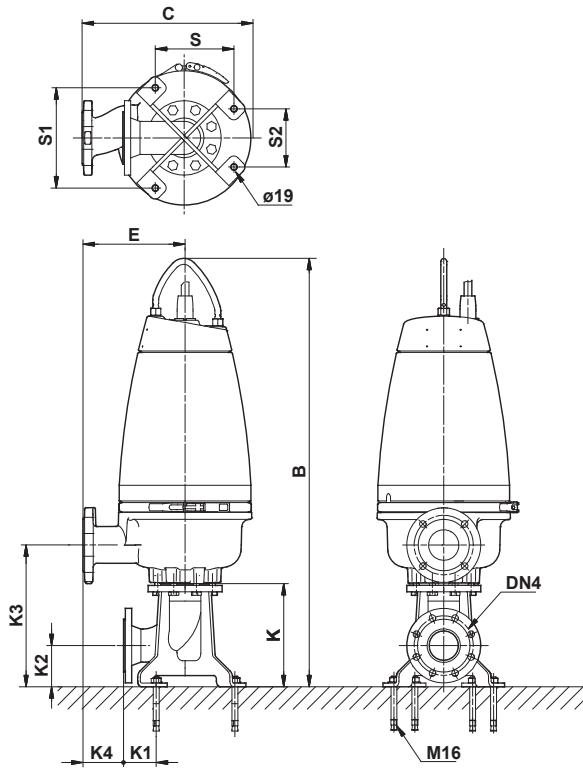
Free-standing submerged pump on ring stand

TM02 8276 4803

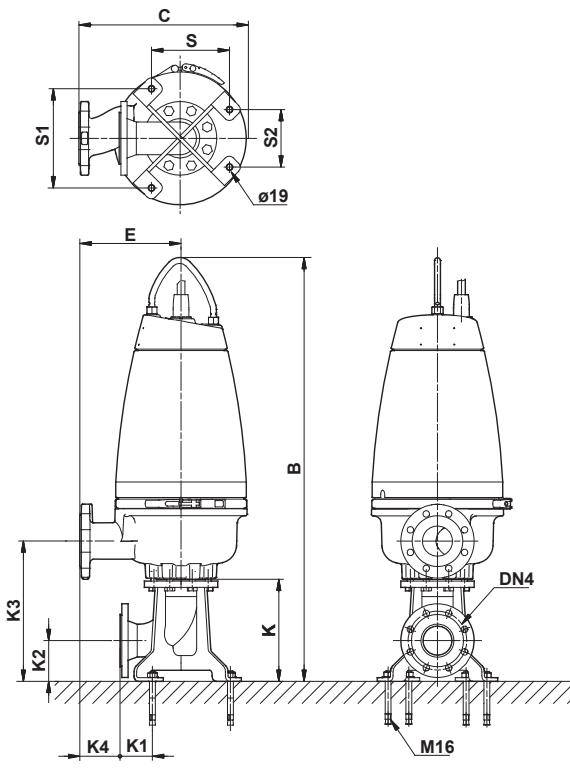


TM02 8272 4803

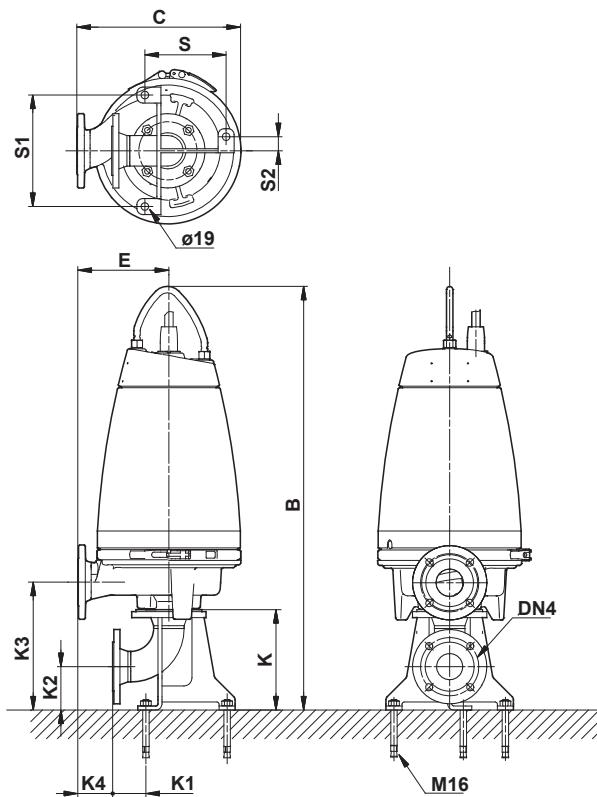
Vertical dry installation on base stand



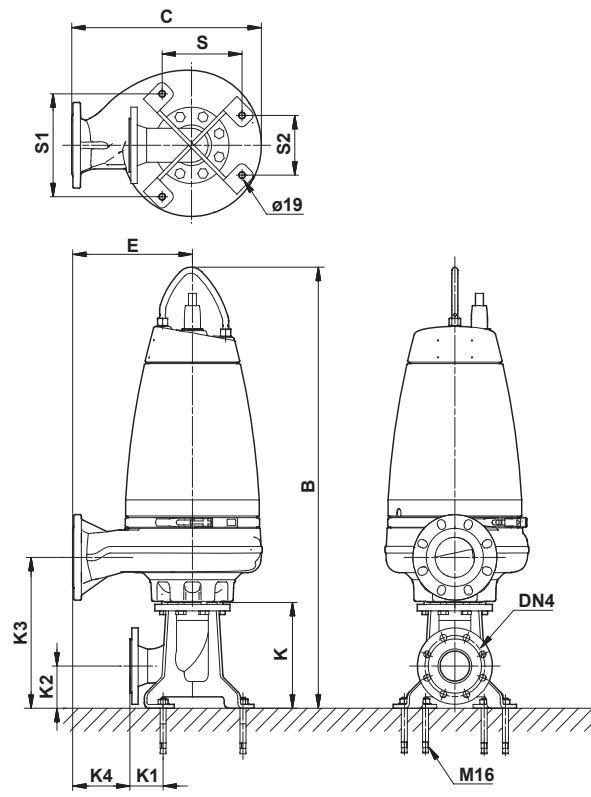
TM02 83336 4803



TM02 8277 4803

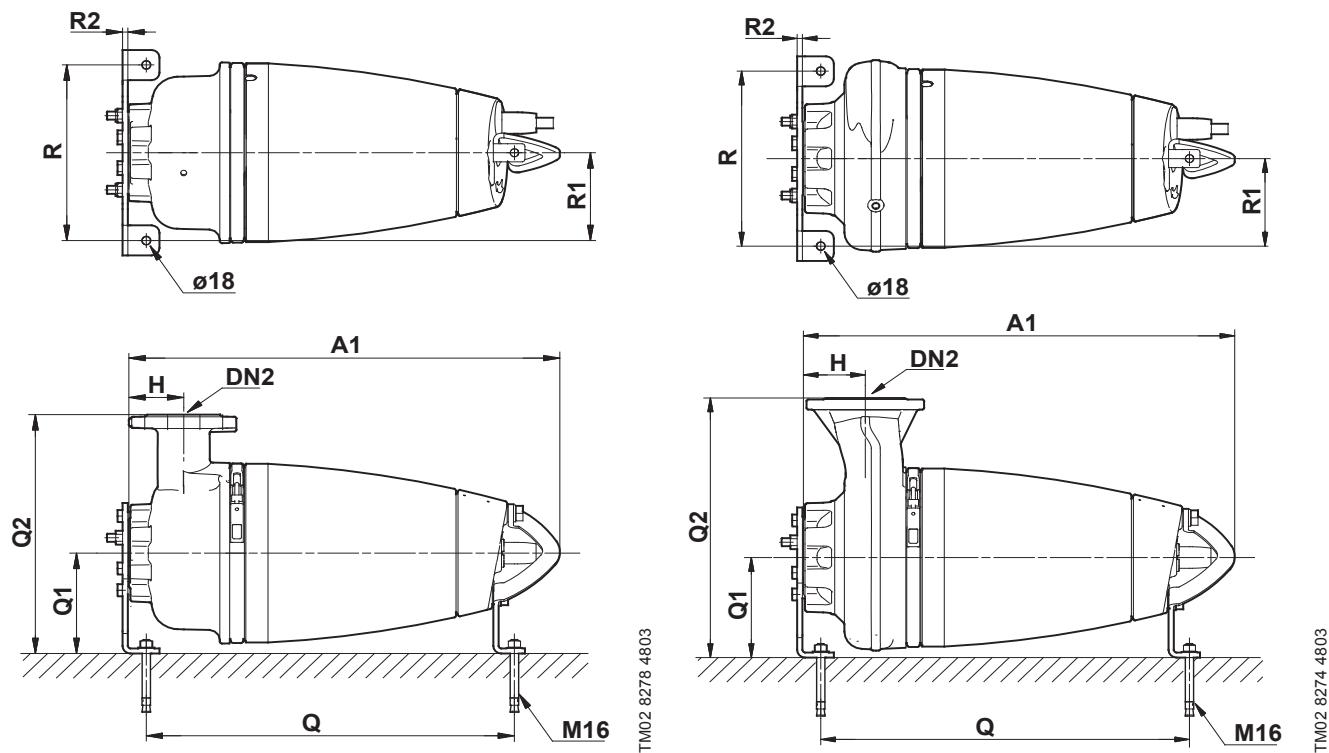


TM02 8563 0404



TM02 8273 4803

Horizontal dry installation with brackets



Pump type	A	A1	B	B1	C	D	DN1	DN2	DN3	DN4	E	F	G	H	H1	J
SE1.50.65.22.2.	753	682	975	857	366	171	65	65	65	65	216	321	270	93	26	491
SE1.50.65.30.2.	753	682	975	857	366	171	65	65	65	65	216	321	270	93	26	491
SE1.50.65.40.2.	831	749	1055	937	407	200	65	65	65	65	227	379	270	93	24	519
SE1.50.80.22.2.	760	682	975	857	366	171	65	80	80	65	216	321	270	100	33	496
SE1.50.80.30.2.	760	682	975	857	366	171	65	80	80	65	216	321	270	100	33	496
SE1.50.80.40.2.	838	749	1055	937	407	200	65	80	80	65	227	379	270	100	31	525

Pump type	K	K1	K2	K3	K4	øN	P	Q	Q1	Q2	R	R1	R2	S	S1	S2	T	T1
SE1.50.65.22.2.	248	62	108	315	76	50	339	579	200	416	350	175	10	202	278	35	325	130
SE1.50.65.30.2.	248	62	108	315	76	50	339	579	200	416	350	175	10	202	278	35	325	130
SE1.50.65.40.2.	248	62	108	317	87	50	341	659	200	427	350	175	10	202	278	35	325	130
SE1.50.80.22.2.	248	62	108	315	76	50	339	579	200	416	350	175	10	202	278	35	325	130
SE1.50.80.30.2.	248	62	108	315	76	50	339	579	200	416	350	175	10	202	278	35	325	130
SE1.50.80.40.2.	248	62	108	317	87	50	341	659	200	427	350	175	10	202	278	35	325	130

Pump type	U	V	X	X1	X2	X3	X4	Y	Z	Z1	Z2	Z3	Z4	Z5	ø	Net weight*
SE1.50.65.22.2.	826	99	513	363	81	700	1½"	65	266	175	210	95	140	1	ø18	86
SE1.50.65.30.2.	826	99	513	363	81	700	1½"	65	266	175	210	95	140	1	ø18	90
SE1.50.65.40.2.	904	97	554	375	81	741	1½"	65	266	175	210	95	140	1	ø18	122
SE1.50.80.22.2.	860	133	526	376	81	719	1½"	80	345	171	220	95	160	13	ø18	87
SE1.50.80.30.2.	860	133	526	376	81	719	1½"	80	345	171	220	95	160	13	ø18	91
SE1.50.80.40.2.	938	131.5	567	387	81	760	1½"	80	345	171	220	95	160	13	ø18	123

* Pump with 10 metres of cable

Pump type	A	A1	B	B1	C	D	DN1	DN2	DN3	DN4	E	F	G	H	H1	J
SE1.80.80.15.4.	776	723	1109	898	435	171	100	80	80	100	272	347	300	100	8	567
SE1.80.80.22.4.	776	723	1109	898	435	171	100	80	80	100	272	347	300	100	8	567
SE1.80.80.30.4.	878	820	1218	1008	505	200	100	80	80	100	319	397	300	118	0	623
SE1.80.80.40.4.	878	820	1218	1008	505	200	100	80	80	100	319	397	300	118	0	623
SE1.80.80.55.4.	878	820	1218	1008	505	200	100	80	80	100	319	397	300	118	0	623
SE1.80.80.75.4.	924	876	1265	1054	530	217	100	80	80	100	328	423	300	118	0	648
SE1.80.100.15.4.	788	723	1109	898	435	171	100	100	100	100	272	347	300	112	20	591
SE1.80.100.22.4.	788	723	1109	898	435	171	100	100	100	100	272	347	300	112	20	591
SE1.80.100.30.4.	878	820	1218	1008	505	200	100	100	100	100	319	397	300	118	0	647
SE1.80.100.40.4.	878	820	1218	1008	505	200	100	100	100	100	319	397	300	118	0	647
SE1.80.100.55.4.	878	820	1218	1008	505	200	100	100	100	100	319	397	300	118	0	647
SE1.80.100.75.4.	924	876	1265	1054	530	217	100	100	100	100	328	423	300	118	0	672

Pump type	K	K1	K2	K3	K4	øN	P	Q	Q1	Q2	R	R1	R2	S	S1	S2	T	T1
SE1.80.80.15.4.	341	106	136	433	67	80	364	620	200	472	350	175	10	255	311	198	355	130
SE1.80.80.22.4.	341	106	136	433	67	80	364	620	200	472	350	175	10	255	311	198	355	130
SE1.80.80.30.4.	341	106	136	458	115	80	390	699	200	519	350	175	10	255	311	198	355	130
SE1.80.80.40.4.	341	106	136	458	115	80	390	699	200	519	350	175	10	255	311	198	355	130
SE1.80.80.55.4.	341	106	136	458	115	80	390	699	200	519	350	175	10	255	311	198	355	130
SE1.80.80.75.4.	341	106	136	459	124	80	390	741	200	528	350	175	10	255	311	198	355	130
SE1.80.100.15.4.	341	106	136	433	67	80	369	620	200	472	350	175	10	255	311	198	355	130
SE1.80.100.22.4.	341	106	136	433	67	80	369	620	200	472	350	175	10	255	311	198	355	130
SE1.80.100.30.4.	341	106	136	459	115	80	395	699	200	519	350	175	10	255	311	198	355	130
SE1.80.100.40.4.	341	106	136	459	115	80	395	699	200	519	350	175	10	255	311	198	355	130
SE1.80.100.55.4.	341	106	136	459	115	80	395	699	200	519	350	175	10	255	311	198	355	130
SE1.80.100.75.4.	341	106	136	459	124	80	395	741	200	528	350	175	10	255	311	198	355	130

Pump type	U	V	X	X1	X2	X3	X4	Y	Z	Z1	Z2	Z3	Z4	Z5	ø	Net weight*
SE1.80.80.15.4.	876	108	595	432	81	788	1½"	80	345	171	220	95	160	13	ø19	98
SE1.80.80.22.4.	876	108	595	432	81	788	1½"	80	345	171	220	95	160	13	ø19	100
SE1.80.80.30.4.	960	82	666	480	81	858	1½"	80	345	171	220	95	160	13	ø19	143
SE1.80.80.40.4.	960	82	666	480	81	858	1½"	80	345	171	220	95	160	13	ø19	152
SE1.80.80.55.4.	960	82	666	480	81	858	1½"	80	345	171	220	95	160	13	ø19	157
SE1.80.80.75.4.	1006	82	690	489	81	883	1½"	80	345	171	220	95	160	13	ø19	205
SE1.80.100.15.4.	916	148	652	489	110	878	2"	100	413	220	260	110	270	0	ø19	99
SE1.80.100.22.4.	916	148	652	489	110	878	2"	100	413	220	260	110	270	0	ø19	101
SE1.80.100.30.4.	1000	122	722	536	110	948	2"	100	413	220	260	110	270	0	ø19	143
SE1.80.100.40.4.	1000	122	722	536	110	948	2"	100	413	220	260	110	270	0	ø19	153
SE1.80.100.55.4.	1000	122	722	536	110	948	2"	100	413	220	260	110	270	0	ø19	158
SE1.80.100.75.4.	1046	122	747	545	110	972	2"	100	413	220	260	110	270	0	ø19	204

* Pump with 10 metres of cable

Pump type	A	A1	B	B1	C	D	DN1	DN2	DN3	DN4	E	F	G	H	H1	J
SE1.100.100.40.4.	885	827	1327	1071	541	200	150	100	100	150	320	438	400	115	0	711
SE1.100.100.55.4.	885	827	1327	1071	541	200	150	100	100	150	320	438	400	115	0	711
SE1.100.100.75.4.	932	884	1375	1118	541	217	150	100	100	150	312	462	400	115	0	706
SE1.100.150.40.4.	900	811	1311	1054	541	200	150	150	150	150	320	440	400	143	32	807
SE1.100.150.55.4.	900	811	1311	1054	541	200	150	150	150	150	320	440	400	143	32	807
SE1.100.150.75.4.	948	868	1359	1102	541	217	150	150	150	150	306	472	400	143	32	803

Pump type	K	K1	K2	K3	K4	øN	P	Q	Q1	Q2	R	R1	R2	S	S1	S2	T	T1
SE1.100.100.40.4.	443	135	159	558	37	100	445	706	300	620	500	250	12	339	396	283	450	186
SE1.100.100.55.4.	443	135	159	558	37	100	445	706	300	620	500	250	12	339	396	283	450	186
SE1.100.100.75.4.	443	135	159	558	29	100	445	749	300	612	500	250	12	339	396	283	450	186
SE1.100.150.40.4.	443	135	159	553	37	100	555	690	300	620	500	250	12	339	396	283	450	186
SE1.100.150.55.4.	443	135	159	553	37	100	555	690	300	620	500	250	12	339	396	283	450	186
SE1.100.150.75.4.	443	135	159	553	23	100	555	733	300	606	500	250	12	339	396	283	450	186

Pump type	U	V	X	X1	X2	X3	X4	Y	Z	Z1	Z2	Z3	Z4	Z5	ø	Net weight*
SE1.100.100.40.4.	1009	125	758	537	110	983	2"	100	413	220	260	110	270	0	ø22	157
SE1.100.100.55.4.	1009	125	758	537	110	983	2"	100	413	220	260	110	270	0	ø22	161
SE1.100.100.75.4.	1057	125	758	529	110	983	2"	100	413	220	260	110	270	0	ø22	204
SE1.100.150.40.4.	1033	164	780	559	110	1093	2"	150	450	280	300	110	340	0	ø22	161
SE1.100.150.55.4.	1033	164	780	559	110	1093	2"	150	450	280	300	110	340	0	ø22	166
SE1.100.150.75.4.	1081	164	780	545	110	1093	2"	150	450	280	300	110	340	0	ø22	210

* Pump with 10 metres of cable

Pump type	A	A1	B	B1	C	D	DN1	DN2	DN3	DN4	E	F	G	H	H1	J
SEV.65.65.22.2.	771	725	1046	899	396	171	80	65	65	80	246	321	280	102	0	524
SEV.65.65.30.2	771	725	1046	899	396	171	80	65	65	80	246	321	280	102	0	524
SEV.65.65.40.2.	848	790	1123	976	456	200	80	65	65	80	276	380	280	106	0	568
SEV.65.80.22.2.	771	726	1047	899	397	171	80	80	80	80	247	321	280	103	0	530
SEV.65.80.30.2.	771	726	1047	899	397	171	80	80	80	80	247	321	280	103	0	530
SEV.65.80.40.2	848	791	1124	976	455	200	80	80	80	80	276	379	280	106	0	573

Pump type	K	K1	K2	K3	K4	øN	P	Q	Q1	Q2	R	R1	R2	S	S1	S2	T	T1
SEV.65.65.22.2.	276	76	111	378	82	65	372	623	200	446	350	175	10	213	269	156	330	128
SEV.65.65.30.2	276	76	111	378	82	65	372	623	200	446	350	175	10	213	269	156	330	128
SEV.65.65.40.2.	276	76	111	381	112	65	376	700	200	476	350	175	10	213	269	156	330	128
SEV.65.80.22.2.	276	76	111	379	83	65	373	623	200	447	350	175	10	213	269	156	330	128
SEV.65.80.30.2.	276	76	111	379	83	65	373	623	200	447	350	175	10	213	269	156	330	128
SEV.65.80.40.2	276	76	111	382	112	65	376	700	200	476	350	175	10	213	269	156	330	128

Pump type	U	V	X	X1	X2	X3	X4	Y	Z	Z1	Z2	Z3	Z4	Z5	ø	Net weight*
SEV.65.65.22.2.	834	63	543	394	81	730	1½"	65	266	175	210	95	140	1	ø18	89
SEV.65.65.30.2	834	63	543	394	81	730	1½"	65	266	175	210	95	140	1	ø18	92
SEV.65.65.40.2.	908	60	604	424	81	790	1½"	65	266	175	210	95	140	1	ø18	128
SEV.65.80.22.2.	868	97	557	408	81	750	1½"	80	345	171	220	95	160	13	ø18	90
SEV.65.80.30.2.	868	97	557	408	81	750	1½"	80	345	171	220	95	160	13	ø18	94
SEV.65.80.40.2	942	94	616	437	81	808	1½"	80	345	171	220	95	160	13	ø18	126

* Pump with 10 metres of cable

Pump type	A	A1	B	B1	C	D	DN1	DN2	DN3	DN4	E	F	G	H	H1	J
SEV.80.80.11.4.	798	752	1073	926	409	171	80	80	80	80	241	339	280	109	0	527
SEV.80.80.13.4.	798	752	1073	926	409	171	80	80	80	80	241	339	280	109	0	527
SEV.80.80.15.4.	798	752	1073	926	409	171	80	80	80	80	241	339	280	109	0	527
SEV.80.80.22.4.	798	752	1073	926	409	171	80	80	80	80	241	339	280	109	0	527
SEV.80.80.40.4.	878	821	1154	1006	460	200	80	80	80	80	267	393	280	109	0	578
SEV.80.80.40.2.	874	816	1149	1002	456	200	80	80	80	80	276	380	280	104	0	574
SEV.80.80.60.2.	874	816	1149	1002	456	200	80	80	80	80	276	380	280	104	0	574
SEV.80.80.75.2.	874	816	1149	1002	456	200	80	80	80	80	276	380	280	104	0	574
SEV.80.80.92.2.	922	874	1198	1050	489	217	80	80	80	80	293	413	280	123	0	607
SEV.80.80.110.2	922	874	1198	1050	489	217	80	80	80	80	293	413	280	123	0	607

Pump type	K	K1	K2	K3	K4	øN	P	Q	Q1	Q2	R	R1	R2	S	S1	S2	T	T1
SEV.80.80.11.4.	276	76	111	385	77	80	379	650	200	441	350	175	10	213	269	156	330	128
SEV.80.80.13.4.	276	76	111	385	77	80	379	650	200	441	350	175	10	213	269	156	330	128
SEV.80.80.15.4.	276	76	111	385	77	80	379	650	200	441	350	175	10	213	269	156	330	128
SEV.80.80.22.4.	276	76	111	385	77	80	379	650	200	441	350	175	10	213	269	156	330	128
SEV.80.80.40.4.	276	76	111	385	103	80	379	700	200	467	350	175	10	213	269	156	330	128
SEV.80.80.40.2.	276	76	111	380	112	80	374	726	200	476	350	175	10	213	269	156	330	128
SEV.80.80.60.2.	276	76	111	380	112	80	374	695	200	476	350	175	10	213	269	156	330	128
SEV.80.80.75.2.	276	76	111	380	112	80	374	695	200	476	350	175	10	213	269	156	330	128
SEV.80.80.92.2.	276	76	111	399	129	80	393	739	200	493	350	175	10	213	269	156	330	128
SEV.80.80.110.2	276	76	111	399	129	80	393	739	200	493	350	175	10	213	269	156	330	128

Pump type	U	V	X	X1	X2	X3	X4	Y	Z	Z1	Z2	Z3	Z4	Z5	ø	Net weight*	
SEV.80.80.11.4.	889	91	569	402	81	762	1½"	80	345	171	220	95	160	13	ø18	95	
SEV.80.80.13.4.	889	91	569	402	81	762	1½"	80	345	171	220	95	160	13	ø18	103	
SEV.80.80.15.4.	889	91	569	402	81	762	1½"	80	345	171	220	95	160	13	ø18	103	
SEV.80.80.22.4.	889	91	569	402	81	762	1½"	80	345	171	220	95	160	13	ø18	106	
SEV.80.80.40.4.	969	91	620	428	81	813	1½"	80	345	171	220	95	160	13	ø18	143	
SEV.80.80.40.2.	970	96	617	437	81	809	1½"	80	345	171	220	95	160	13	ø18	131	
SEV.80.80.60.2.	970	96	617	437	81	809	1½"	80	345	171	220	95	160	13	ø18	141	
SEV.80.80.75.2.	970	96	617	437	81	809	1½"	80	345	171	220	95	160	13	ø18	142	
SEV.80.80.92.2.	999	77	650	454	81	842	1½"	80	345	171	220	95	160	13	ø18	190	
SEV.80.80.110.2	999	77	650	454	81	842	1½"	80	345	171	220	95	160	13	ø18	195	

* Pump with 10 metres of cable

Pump type	A	A1	B	B1	C	D	DN1	DN2	DN3	DN4	E	F	G	H	H1	J
SEV.100.100.30.4.	889	832	1230	1019	457	200	100	100	100	100	277	380	300	134	0	599
SEV.100.100.40.4.	889	832	1230	1019	457	200	100	100	100	100	277	380	300	134	0	599
SEV.100.100.55.4.	889	832	1230	1019	457	200	100	100	100	100	277	380	300	134	0	599
SEV.100.100.75.4.	948	900	1288	1078	490	217	100	100	100	100	294	413	300	145	0	632

Pump type	K	K1	K2	K3	K4	øN	P	Q	Q1	Q2	R	R1	R2	S	S1	S2	T	T1
SEV.100.100.30.4.	341	106	136	474	73	100	411	711	200	477	350	175	10	255	311	198	355	130
SEV.100.100.40.4.	341	106	136	474	73	100	411	711	200	477	350	175	10	255	311	198	355	130
SEV.100.100.55.4.	341	106	136	474	73	100	411	711	200	477	350	175	10	255	311	198	355	130
SEV.100.100.75.4.	341	106	136	485	89	100	422	765	200	494	350	175	10	255	311	198	355	130

Pump type	U	V	X	X1	X2	X3	X4	Y	Z	Z1	Z2	Z3	Z4	Z5	ø	Net weight*	
SEV.100.100.30.4.	996	106	674	494	110	900	2"	100	413	220	260	110	270	0	ø19	133	
SEV.100.100.40.4.	996	106	674	494	110	900	2"	100	413	220	260	110	270	0	ø19	141	
SEV.100.100.55.4.	996	106	674	494	110	900	2"	100	413	220	260	110	270	0	ø19	146	
SEV.100.100.75.4.	1043	95	707	511	110	933	2"	100	413	220	260	110	270	0	ø19	190	

* Pump with 10 metres of cable

Pos.	Description (GB)	Beschreibung (D)	Description (F)	Descrizione (I)
6a	Pin	Stift	Goupille	Perno
7a	Rivet	Kerbnagel	Rivet	Rivetto
9a	Key	Keil	Clavette	Chiavetta
37	O-ring	O-Ring	Joint torique	O-ring
37a	O-ring	O-Ring	Joint torique	O-ring
37b	O-ring	O-Ring	Joint torique	O-ring
46	Seal ring	Dichtungsring	Bague d'étanchéité	Anello di tenuta
48	Stator	Stator	Stator	Statore
49	Impeller	Laufrad	Roue	Girante
49c	Wear ring	Verschleißring	Bague d'usure	Anello di usura
50	Pump housing	Pumpengehäuse	Corps de pompe	Corpo pompa
55	Stator housing	Statorgehäuse	Logement de stator	Cassa statore
58	Cover for oil chamber	Deckel für Ölsperrkammer	Couvercle de chambre à huile	Coperchio della camera dell'olio
59	Bearing cover	Lagerdeckel	Couvercle de palier	Copri cuscinetto
60	Bearing retainer	Lagerhalter	Support palier	Flangia di fermo cuscinetto
61	Bearing retainer	Lagerhalter	Support palier	Flangia di fermo cuscinetto
66	Washer	Unterlegscheibe	Rondelle	Rondella
76	Nameplate	Leistungsschild	Plaque signalétique	Targhetta di identificazione
92	Clamp	Spannband	Collier de serrage	Fascetta
92a	Screw	Schraube	Vis	Vite
102	O-ring	O-Ring	Joint torique	O-ring
105	Shaft seal	Wellenabdichtung	Garniture mécanique	Tenuta meccanica
107	O-ring	O-Ring	Joint torique	O-ring
108	O-ring	O-Ring	Joint torique	O-ring
150	Sleeve	Mantel	Chemise	Mantello
151	Top cover	Oberer Deckel	Couvercle supérieur	Coperchio superiore
153	Bearing	Lager	Roulement	Cuscinetto
153b	O-ring	O-Ring	Joint torique	O-ring
154	Bearing	Lager	Roulement	Cuscinetto
155	Adapter flange	Zwischenflansch	Bride d'adaptation	Flangia di connessione al motore
157	Corrugated spring	Gewellte Feder	Ressort ondulé	Molla ondulata
158	Corrugated spring	Gewellte Feder	Ressort ondulé	Molla ondulata
159	O-ring	O-Ring	Joint torique	O-ring
172	Rotor/shaft	Rotor/Welle	Rotor/arbre	Gruppo rotore/albero
173	Screw	Schraube	Vis	Vite
173a	Washer	Unterlegscheibe	Rondelle	Rondella
174	Screw	Schraube	Vis	Vite
174a	Washer	Unterlegscheibe	Rondelle	Rondella
176	Inner plug part	Kabelanschluss, innerer Teil	Partie intérieure de la fiche	Parte interna del connettore
177	Plug protector	Steckerschutz	Protège fiche	Protezione del connettore
181	Outer plug part	Kabelanschluss, äußerer Teil	Partie extérieure de la fiche	Parte esterna del connettore
182	Screw	Schraube	Vis	Vite
183	Screw	Schraube	Vis	Vite
183a	Washer	Unterlegscheibe	Rondelle	Rondella
184	Screw	Schraube	Vis	Vite
184a	Washer	Unterlegscheibe	Rondelle	Rondella
186	Screw	Schraube	Vis	Vite
188	Screw	Schraube	Vis	Vite
188a	Screw	Schraube	Vis	Vite
190	Lifting bracket	Transportbügel	Poignée de levage	Maniglia di sollevamento
190a	O-ring	O-Ring	Joint torique	O-ring
193	Oil screw	Ölschraube	Bouchon d'huile	Tappo dell'olio
193a	Oil	Öl	Huile	Olio
194	Gasket	Dichtung	Joint d'étanchéité	Guarnizione
198	O-ring	O-Ring	Joint torique	O-ring
520	Moisture sensor	Feuchtefühler	Capteur d'humidité	Sensore di umidità
521	WIO sensor	WIO Sensor	Capteur WIO	Sensore WIO
522	Holder for 521	Halter für 521	Douille pour 521	Suporte para 521

Pos.	Descripción (E)	Descrição (P)	Περιγραφή (GR)	Omschrijving (NL)
6a	Pasador	Pino	Πείρος	Paspen
7a	Remache	Rebite	Πριτσίνι	Klinknagel
9a	Chaveta	Chave	Κλειδί	Spie
37	Junta tórica	O-ring	Δακτύλιοι-Ο	O-ring
37a	Junta tórica	O-ring	Δακτύλιοι-Ο	O-ring
37b	Junta tórica	O-ring	Δακτύλιοι-Ο	O-ring
46	Anillo de cierre	Anel de empanque	Δακτύλιο στεγανότητας	Afdichtingsring
48	Estator	Estator	Στάτης	Stator
49	Impulsor	Impulsor	Πτερωτή	Waaier
49c	Anillo de desgaste	Anel de desgaste	Δακτύλιο τριβής	Slijtring
50	Cuerpo de bomba	Voluta da bomba	Περιβλημα αντλίας	Pomphuis
55	Alojamiento de estator	Carcaça do estator	Περίβλημα στάτη	Statorhuis
58	Tapa de la cámara de aceite	Tampa da câmara de óleo	Καπάκι για το θάλαμο λαδιού	Deksel voor de oliekamer
59	Tapa de cojinete	Tampa do rolamento	Κάλυμμα εδράνου	LagerdekSEL
60	Retén de cojinete	Retentor dos rolamentos	Στήριγμα εδράνου	Lagerhuis
61	Retén de cojinete	Retentor dos rolamentos	Στήριγμα εδράνου	Lagerhuis
66	Arandela	Anilha	Ροδέλα	Ring
76	Placa de características	Chapa de características	Πινακίδα	Type plaatje
92	Abrazadera	Grampo	Στεφόνη	Klembeugel
92a	Tornillo	Parafuso	Βίδα	Schroef
102	Junta tórica	O-ring	Δακτύλιοι-Ο	O-ring
105	Cierre	Empanque	Στυπιθλίπτης άξονα	As afdichting
107	Junta tórica	O-ring	Δακτύλιοι-Ο	O-ring
108	Junta tórica	O-ring	Δακτύλιοι-Ο	O-ring
150	Camisa	Camisa	Χιτώνιο	Motorhuis
151	Tapa superior	Cobertura superior	Άνω καπάκι	Motorhuisdeksel
153	Cojinete	Rolamento	Έδρανο	Kogellager
153b	Junta tórica	O-ring	Δακτύλιοι-Ο	O-ring
154	Cojinete	Rolamento	Έδρανο	Kogellager
155	Brida adaptadora	Flange de adaptação	Φλάντζα προσαρμογής	Koppelingsflens
157	Muelle ondulado	Mola	Αυλακωτό ελατήριο	Drukring
158	Muelle ondulado	Mola	Αυλακωτό ελατήριο	Drukring
159	Arandela	O-ring	Δακτύλιοι-Ο	O-ring
172	Rotor/eje	Rotor/veio	Ρότορας/άξονας	Rotor/as
173	Tornillo	Parafuso	Βίδα	Schroef
173a	Arandela	Anilha	Ροδέλα	Ring
174	Tornillo	Parafuso	Βίδα	Schroef
174a	Arandela	Anilha	Ροδέλα	Ring
176	Parte de clavija interior	Parte interna da ficha	Εσωτερικό τμήμα φις	Kabel connector inwendig
177	Protector de clavija	Protecção da ficha	Προστασία φις	Stekker beveiliging
181	Parte de clavija exterior	Parte externa da ficha	Εξωτερικό τμήμα φις	Kabel connector uitwendig
182	Tornillo	Parafuso	Βίδα	Schroef
183	Tornillo	Parafuso	Βίδα	Schroef
183a	Arandela	Anilha	Ροδέλα	Ring
184	Tornillo	Parafuso	Βίδα	Schroef
184a	Arandela	Anilha	Ροδέλα	Ring
186	Tornillo	Parafuso	Βίδα	Schroef
188	Tornillo	Parafuso	Βίδα	Schroef
188a	Tornillo	Parafuso	Βίδα	Schroef
190	Asa	Suporte de elevação	Κρίκος ανάρτησης	Ophangbeugel
190a	Junta tórica	O-ring	Δακτύλιοι-Ο	O-ring
193	Tornillo de aceite	Parafuso do óleo	Βίδα λαδιού	Inbusbout
193a	Aceite	Óleo	Λάδι	Olie
194	Junta	Junta	Τσιμούχα	Pakking ring
198	Junta tórica	O-ring	Δακτύλιοι-Ο	O-ring
520	Sensor de humedad	Sensor de humidade	Αισθητήριο υγρασίας	Vochtsensor
521	Sensor WIO	Sensor WIO	Αισθητήριο WIO	WIO sensor
522	Soporte para 521	Suporte para 521	Στήριγμα για το 521	Klem voor 521

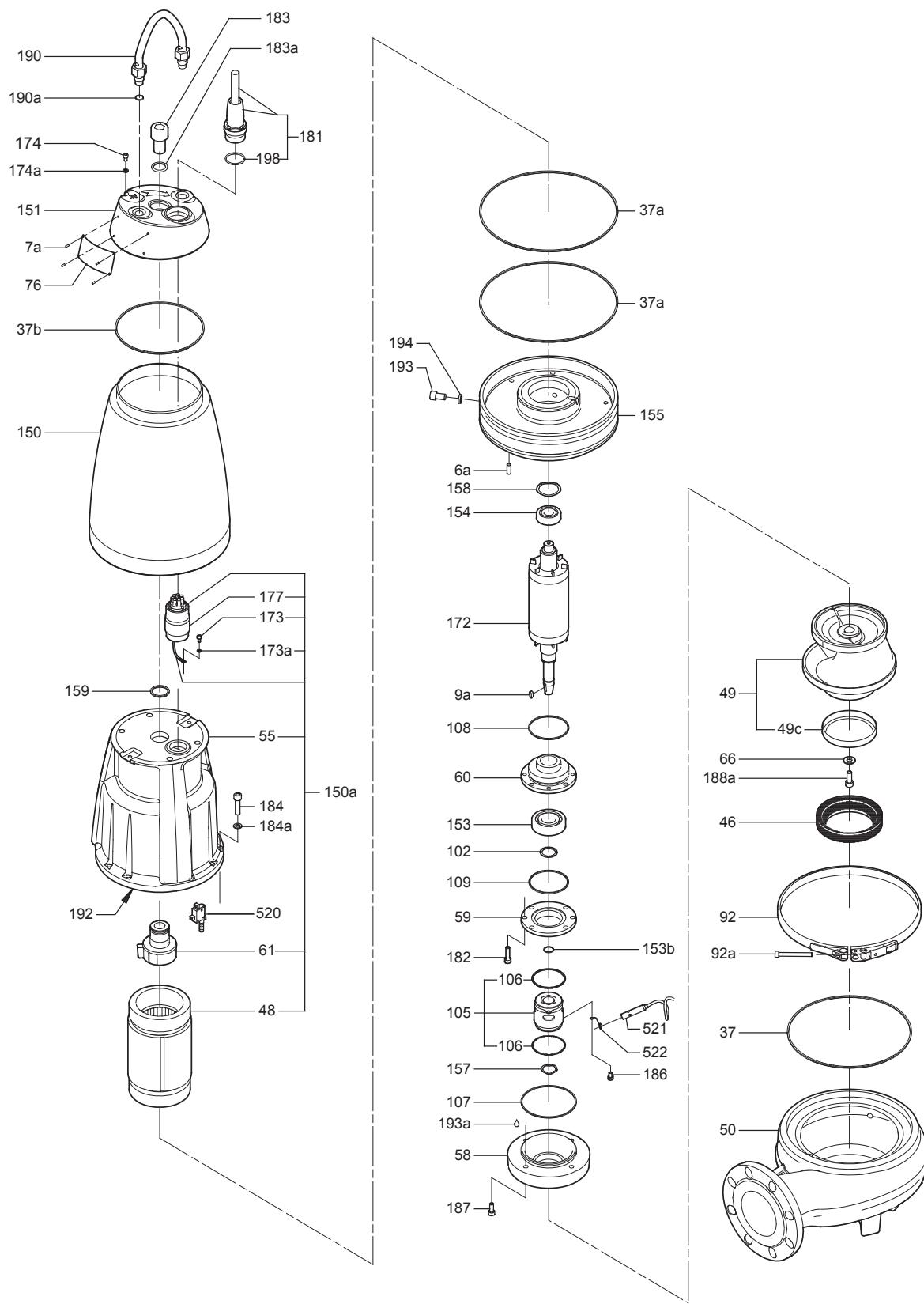
Pos.	Beskrivning (S)	Kuvaus (FIN)	Beskrivelse (DK)
6a	Stift	Tappi	Stift
7a	Nit	Niitti	Nitte
9a	Kil	Kiila	Feder
37	O-ring	O-rengas	O-ring
37a	O-ring	O-rengas	O-ring
37b	O-ring	O-rengas	O-ring
46	Tätningsring	Tiivisterengas	Tætningsring
48	Stator	Staattori	Stator
49	Pumphjul	Juoksupyörä	Løber
49c	Sltring	Kulutusrengas	Slidring
50	Pumphus	Pumppupesä	Pumpehus
55	Statorhus	Staattoripesä	Statorhus
58	Oljekammarens lock	Öljykammion kansi	Dæksel for oliekammer
59	Lagerlock	Laakerikansi	Lejedæksel
60	Lagerhållare	Laakerin lukitsin	Lejeholder
61	Lagerhållare	Laakerin lukitsin	Lejeholder
66	Bricka	Aluslevy	Spændeskive
76	Typskilt	Arvokilpi	Typeskilt
92	Spännsband	Kiinnityspanta	Spændebånd
92a	Skruv	Ruuvi	Skrue
102	O-ring	O-rengas	O-ring
105	Axeltätning	Akselitiviste	Akseltætning
107	O-ring	O-rengas	O-ring
108	O-ring	O-rengas	O-ring
150	Hylsa	Vaippa	Svøb
151	Toppkåpa	Yläkotelo	Topdæksel
153	Lager	Laakeri	Leje
153b	O-ring	O-rengas	O-ring
154	Lager	Laakeri	Leje
155	Adapterfläns	Adapterilaippa	Mellemlange
157	Fjäder	Aaltojousi	Bølggefjeder
158	Fjäder	Aaltojousi	Bølggefjeder
159	O-ring	O-rengas	O-ring
172	Rotor/axel	Roottori/akseli	Rotor/aksel
173	Skruv	Ruuvi	Skrue
173a	Bricka	Aluslevy	Spændeskive
174	Skruv	Ruuvi	Skrue
174a	Bricka	Aluslevy	Spændeskive
176	Kontakt, inre del	Sisäpuolinens tulppaosa	Indvendig stikdel
177	Skydd för kontakt	Tulpan suoja	Stikbeskytter
181	Kontakt, yttre del	Ulkopuolinens tulppaosa	Udvendig stikdel
182	Skruv	Ruuvi	Skrue
183	Skruv	Ruuvi	Skrue
183a	Bricka	Aluslevy	Spændeskive
184	Skruv	Ruuvi	Skrue
184a	Bricka	Aluslevy	Spændeskive
186	Skruv	Ruuvi	Skrue
188	Skruv	Ruuvi	Skrue
188a	Skruv	Ruuvi	Skrue
190	Lyftbygel	Nostosanka	Løftebøjle
190a	O-ring	O-rengas	O-ring
193	Oljeskruv	Öljytulppa	Olieskrue
193a	Olja	Öljjy	Olie
194	Packning	Tiviste	Pakning
198	O-ring	O-rengas	O-ring
520	Fuktsensor	Kosteusanturi	Fugtføler
521	WIO-givare	WIO-anturi	WIO sensor
522	Hållare för 521	Pidike 521:lle	Holder for 521

Pos.	Opis (PL)	Наименование (RU)	Megnevezés (H)	Opis (SI)
6a	Kołek	Штифт	Csap	Zatič
7a	Nit	Заклепка	Szegecs	Zakovica
9a	Klin	Шпонка	Rögzítőék	Zatič
37	Pierścień O-ring	Уплотнительное кольцо	O-gyűrű	O-obroč
37a	Pierścień O-ring	Уплотнительное кольцо	O-gyűrű	O-obroč
37b	Pierścień O-ring	Уплотнительное кольцо	O-gyűrű	O-obroč
46	Pierścień uszczelniający	Уплотнение кольцевое	Tengelytömítés	Tesnilni obroč
48	Stator	Статор	Állórész	Stator
49	Wirnik	Рабочее колесо	Járókerék	Tekalno kolo
49c	Pierscień osadczy	Защитное кольцо	Csapággyűrű	Obrabni obroč
50	Korpus pompy	Корпус насоса	Szivattyúház	Ohišje črpalka
55	Obudowa statora	Корпус статора	Állórészhang	Ohišje statorja
58	Pokrywa komory oleju	Крышка масляной камеры	Olajház	Pokrivalo oljne komore
59	Pokrywa łożyska	Крышка подшипника	Csapággyfedél	Pokrov ležaja
60	Komora łożyska	Опора подшипника	Csapággyház	Držalo
61	Komora łożyska	Опора подшипника	Csapággyház	Držalo
66	Podkładka	Шайба	Alátét	Tesnilni obroč
76	Tabliczka znamionowa	Заводская табличка	Adattábla	Tipska ploščica
92	Zacisk	Хомут	Bilincs	Sponka
92a	Šruba	Винт	Csavar	Vijak
102	Pierścień O-ring	Уплотнительное кольцо	O-gyűrű	O-obroč
105	Uszczelnienie wału	Уплотнение вала	Tengelytömítés	Tesnilni osi
107	Pierścień O-ring	Уплотнительное кольцо	O-gyűrű	O-obroč
108	Pierścień O-ring	Уплотнительное кольцо	O-gyűrű	O-obroč
150	Kadłub pompy	Кожух насоса	Állórészhang	Oklep
151	Pokrywa górska	Верхняя крышка	Ház fedél	Zgornji pokrov
153	Łożysko	Подшипник	Csapág	Ležaj
153b	Pierścień O-ring	Уплотнительное кольцо	O-gyűrű	O-obroč
154	Łożysko	Подшипник	Csapág	Ležaj
155	Dolna pokrwa silnika	Переходник	Csatlakozókarima	Prirobnica adapterja
157	Pierścień sprężysty	Пружинное кольцо	Hullámrugó	Vzmet
158	Pierścień sprężysty	Пружинное кольцо	Hullámrugó	Vzmet
159	Pierścień O-ring	Уплотнительное кольцо	O-gyűrű	O-obroč
172	Rotor/wał	Ротор/вал	Forgórész/tengely	Rotor/os
173	Šruba	Винт	Csavar	Vijak
173a	Podkładka	Шайба	Alátét	Tesnilni obroč
174	Šruba	Винт	Csavar	Vijak
174a	Podkładka	Шайба	Alátét	Tesnilni obroč
176	Łącze kablowe wewnętrzne	Внутренняя часть разъема	Belső kábelbevezetés	Notranji vtični del
177	Obudowa łączki kablowego	Защита разъема	Csatlakozásvédő	Čep
181	Łącze kablowe zewnętrzne	Наружная часть разъема	Külső kábelbevezetés	Zunanji vtični del
182	Šruba	Винт	Csavar	Vijak
183	Šruba	Винт	Csavar	Vijak
183a	Podkładka	Шайба	Alátét	Tesnilni obroč
184	Šruba	Винт	Csavar	Vijak
184a	Podkładka	Шайба	Alátét	Tesnilni obroč
186	Šruba	Винт	Csavar	Vijak
188	Šruba	Винт	Csavar	Vijak
188a	Šruba	Винт	Csavar	Vijak
190	Uchwyt	Подъемная скоба	Emelőfél	Ročaj
190a	Pierścień O-ring	Уплотнительное кольцо	O-gyűrű	O-obroč
193	Šruba komory oleju	Масляная пробка	Olajtöltőnyílás zárócsavarja	Oljni vijak
193a	Olej	Масло	Olaj	Olje
194	Uszczelka	Прокладка	Tömítés	Tesnilni obroč
198	Pierścień O-ring	Уплотнительное кольцо	O-gyűrű	O-obroč
520	Przetwornik wilgotnościowy	Датчик влажности	Nedvesség érzékelő	Senzor vlage
521	WIO przetwornik	Датчик WIO	WIO érzékelő	WIO senzor
522	Uchwyt do 521	Держатель для 521	Tartó az 521-hez	Držalo za 521

Pos.	Opis (HR)	Naziv (YU)	Descriere (RO)	Описание (BG)
6a	nožica	Klin	Pin	Щифт
7a	zarezani čavao	Zakovica	Nit	Нит
9a	opruga	Klin	Pană	Фиксатор
37	O-prsten	O-prsten	Inel O	О-пръстени
37a	O-prsten	O-prsten	Inel O	О-пръстени
37b	O-prsten	O-prsten	Inel O	О-пръстени
46	brtveni prsten	Zaptivač	Inelul de etanșare	Уплътнителен пръстен
48	stator	Stator	Stator	Статор
49	rotor	Propeler	Rotor	Работно колело
49c	žrtveni prsten	Potrošni prsten	Inelul de uzură	Сменяєм пръстен
50	kućište crpke	Kućište pumpe	Carcasă pompă	Помлен корпус
55	kućište statora	Stator kućišta	Carcasă stator	Корпус на статора
58	poklopac komore za ulje	Poklopac za komoru sa uljem	Capacul camerei de ulei	Капак за маслената камера
59	poklopac ležaja	Poklopac ležaja	Carcasă rulment	Лагерен капак
60	pričvrsni dio ležaja	Pridržavač ležaja	Capac fixare rulment	Лагерен фиксатор
61	pričvrsni dio ležaja	Pridržavač ležaja	Capac fixare rulment	Лагерен фиксатор
66	podložna pločica	Prsten podloške	Şaiba	Шайба
76	natpisna pločica	Pločica za obeležavanje	Plăcuță de identificare	Табела
92	zatezna traka	Obujmica spajanja	Colier de prindere	Скоба
92a	vijak	Zavrtanj	Şurub	Винт
102	O-prsten	O-prsten	Inel O	О-пръстени
105	brtva vratila	Zaptivka osovine	Etanșare de arbore	Уплътнение при вала
107	O-prsten	O-prsten	Inel O	О-пръстени
108	O-prsten	O-prsten	Inel O	О-пръстени
150	plašt	Rukavac	Manşon	Кожух
151	gornji poklopac	Gornji poklopac	Capac	Горен капак
153	ležaj	Kuglični ležaj	Rulment	Лагер
153b	O-prsten	O-prsten	Inel O	О-пръстени
154	ležaj	Kuglični ležaj	Rulment	Лагер
155	međuprirubnica	Adapterska prirubnica	Carcasă intermediară	Адапторен фланец
157	valovita opruga	Sigurnosni prste	Arc canelat	Гофрирана пружина
158	valovita opruga	Sigurnosni prste	Arc canelat	Гофрирана пружина
159	O-prsten	O-prsten	Inel O	О-пръстени
172	rotor/vratilo	Rotor/osovina	Rotor/ax	Ротор/вал
173	vijak	Zavrtanj	Şurub	Винт
173a	podložna pločica	Prsten podloške	Şaiba	Шайба
174	vijak	Zavrtanj	Şurub	Винт
174a	podložna pločica	Prsten podloške	Şaiba	Шайба
176	kabel. priklučak, nutarnji dio	Unutrašnji deo konektora	Cablu conector intrare	Вътрешна част на щепсела
177	zaštita utikača	Zaštita utikača	Mufă electrică	Протектор на куплунга
181	kabel. priklučak, vanjski dio	Spoljni deo konektora	Cablu conector ieșire	Външна част на щепсела
182	vijak	Zavrtanj	Şurub	Винт
183	vijak	Zavrtanj	Şurub	Винт
183a	podložna pločica	Prsten podloške	Şaiba	Шайба
184	vijak	Zavrtanj	Şurub	Винт
184a	podložna pločica	Prsten podloške	Şaiba	Шайба
186	vijak	Zavrtanj	Şurub	Винт
188	vijak	Zavrtanj	Şurub	Винт
188a	vijak	Zavrtanj	Şurub	Винт
190	transportni stremen	Ručica	Consolă de ridicare	Ръкохватка
190a	O-prsten	O-prsten	Inel O	О-пръстени
193	vijak za ulje	Zavrtanj za ulje	Bușon de ulei	Винт при камерата за масло
193a	ulje	Ulej	Ulei	Масло
194	brtva	Podloška	Şaiba	Гарнитура
198	O-prsten	O-prsten	Inel O	О-пръстени
520	Senzor vlage	Senzor vlage	Senzor de umezeală	Сензор за влага
521	WIO senzor	WIO senzor	Senzor WIO	WIO сензор (сензор за вода в маслото)
522	Držač za 521	Držač za 521	Detinator pentru 521	Държач за 521

Pos.	Popis (CZ)	Popis (SK)	Tanım (TR)
6a	Kolík	Kolík	Pim
7a	Nýt	Nýt	Percin
9a	Pero	Pero	Anahtar
37	O-kroužek	O-krúžok	O-ring
37a	O-kroužek	O-krúžok	O-ring
37b	O-kroužek	O-krúžok	O-ring
46	Těsnicí kruh	Tesniaci krúžok	Salmastra contası
48	Stator	Stator	Stator
49	Oběžné kolo	Obežné koleso	Çark
49c	Návlek oběžného kola	Tesniace púzdro	Aşınma halkası
50	Těleso čerpadla	Teleso čerpadla	Pompa gövdesi
55	Těleso statoru	Teleso statora	Stator muhafazası
58	Víko olejové komory	Kryt olejovej komory	Yağ hazne kapağı
59	Víko ložiska	Veko ložiska	Rulman kapağı
60	Těleso ložiska	Teleso ložiska	Rulman süzgeci
61	Těleso ložiska	Teleso ložiska	Rulman süzgeci
66	Podložka	Podložka	Pul
76	Typový štítek	Typový štítok	Bilgi etiketi
92	Fixační objímka	Fixačná objímka	Kelepçe
92a	Šroub	Skrutka	Vida
102	O-kroužek	O-krúžok	O-ring
105	Hřídelová upcpávka	Hriadeľová upchávka	Salmastra
107	O-kroužek	O-krúžok	O-ring
108	O-kroužek	O-krúžok	O-ring
150	Plášť	Plášť	Gömlek
151	Horní víko čerpadla	Vrchný kryt	Üst kapak
153	Ložisko	Ložisko	Rulman
153b	O-kroužek	O-krúžok	O-ring
154	Ložisko	Ložisko	Rulman
155	Přechodová příruba	Prechodová príruba	Flanşlı adaptör
157	Tlačná pružina	Tlačná pružina	Oluklu yay
158	Tlačná pružina	Tlačná pružina	Oluklu yay
159	O-kroužek	O-krúžok	O-ring
172	Rotor/hřídel	Rotor/hriadeľ	Rotor/mil
173	Šroub	Skrutka	Vida
173a	Podložka	Podložka	Pul
174	Šroub	Skrutka	Vida
174a	Podložka	Podložka	Pul
176	Vnitřní část kabelové průchodky	Vnútorná časť káblevej priechodky	İç fiş kısmı
177	Těsnění elektrické přípojky	Tesnenie elektrickej prípojky	Soket koruyucusu
181	Vnější část kabelové průchodky	Vonkajšia časť káblevej priechodky	Dış fiş kısmı
182	Šroub	Skrutka	Vida
183	Šroub	Skrutka	Vida
183a	Podložka	Podložka	Pul
184	Šroub	Skrutka	Vida
184a	Podložka	Podložka	Pul
186	Šroub	Skrutka	Vida
188	Šroub	Skrutka	Vida
188a	Šroub	Skrutka	Vida
190	Zvedací rukojeť	Dvihacia rukoväť	Kaldırma kolu
190a	O-kroužek	O-krúžok	O-ring
193	Olejová zátka	Olejová zátka	Yağ vidası
193a	Olej	Olej	Yağ
194	Těsnicí kroužek	Tesniaci krúžok	Conta
198	O-kroužek	O-krúžok	O-ring
520	Vlhkostní snímač	Senzor vlhkosti	Nem sensörü
521	Snímač WIO	WIO senzor	WIO sensörü
522	Držák pro 521	Držiak pre 521	521 için tutucu

Exploded view



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96046675 1205	177
Repl. 96046675 1005	

SE1 50, 80, 100

SEV 65, 80, 100

Installation and operating instructions

(GB) (D) (F) (I) (E) (P) (GR) (NL) (S) (FIN) (DK)
(PL) (RU) (H) (SI) (HR) (YU) (RO) (BG) (CZ) (SK) (TR)



Declaration of Conformity

We **Grundfos** declare under our sole responsibility that the products **SE1** and **SEV** to which this declaration relates, are in conformity with the Council Directives on the approximation of the laws of the EC Member States relating to

- Machinery (98/37/EC).
 - Standard used: EN ISO 12100.
- Electromagnetic compatibility (89/336/EEC).
 - Standards used: EN 61000-6-2 and EN 61000-6-3.
- Electrical equipment designed for use within certain voltage limits (73/23/EEC) [95].
 - Standards used: EN 60335-1:1994 and EN 60335-2-41: 1996.
- Construction products (89/106/EEC).
 - Standard used: EN 12050-1/-2.
- ATEX 94/9/EC (ATEX 100) (applies only to products with the ATEX mark on the nameplate).
 - Standards used: EN 50014, EN 50018, EN 50281-1-1, EN 13463-1 and EN 13463-5.

Déclaration de Conformité

Nous **Grundfos** déclarons sous notre seule responsabilité que les produits **SE1** et **SEV** auxquels se réfère cette déclaration sont conformes aux Directives du Conseil concernant le rapprochement des législations des Etats membres CE relatives à

- Machines (98/37/CE).
 - Norme utilisée: EN ISO 12100.
- Compatibilité électromagnétique (89/336/CEE).
 - Normes utilisées: EN 61000-6-2 et EN 61000-6-3.
- Matériel électrique destiné à employer dans certaines limites de tension (73/23/CEE) [95].
 - Normes utilisées: EN 60335-1:1994 et EN 60335-2-41: 1996.
- Produits de construction (89/106/CEE).
 - Norme utilisée: EN 12050-1/-2.
- ATEX 94/9/CE (ATEX 100) (s'applique uniquement aux produits avec norme ATEX citée sur la plaque signalétique).
 - Normes utilisées: EN 50014, EN 50018, EN 50281-1-1, EN 13463-1 et EN 13463-5.

Declaración de Conformidad

Nosotros **Grundfos** declaramos bajo nuestra única responsabilidad que los productos **SE1** y **SEV** a los cuales se refiere esta declaración son conformes con las Directivas del Consejo relativas a la aproximación de las legislaciones de los Estados Miembros de la CE sobre

- Máquinas (98/37/CE).
 - Norma aplicada: EN ISO 12100.
- Compatibilidad electromagnética (89/336/CEE).
 - Normas aplicadas: EN 61000-6-2 y EN 61000-6-3.
- Material eléctrico destinado a utilizarse con determinadas límites de tensión (73/23/CEE) [95].
 - Normas aplicadas: EN 60335-1:1994 y EN 60335-2-41: 1996.
- Productos de construcción (89/106/CEE).
 - Norma aplicada: EN 12050-1/-2.
- ATEX 94/9/CE (ATEX 100) (se refiere sólo a productos con la marca ATEX en la placa de características).
 - Normas aplicadas: EN 50014, EN 50018, EN 50281-1-1, EN 13463-1 y EN 13463-5.

Δήλωση Συμμόρφωσης

Εμείς η **Grundfos** δηλώνουμε με αποκλειστικά δίκια μας ευθύνη ότι τα προϊόντα **SE1** και **SEV** συμμορφώνονται με την Οδηγία του Συμβουλίου επί της σύγκλισης των νόμων των Κρατών Μελών της Ευρωπαϊκής Ένωσης σε σχέση με τα

- Μηχανήματα (98/37/EC).
 - Πρότυπο που χρησιμοποιήθηκε: EN ISO 12100.
- Ηλεκτρομαγνητική συμβάση (89/336/EC).
 - Πρότυπο που χρησιμοποιήθηκαν: EN 61000-6-2 και EN 61000-6-3.
- Ηλεκτρικές αυσκεύες σχεδιασμένες για χρήση εντός ορισμένων ορίων ηλεκτρικής τάσης (73/23/EEC) [95].
 - Πρότυπο που χρησιμοποιήθηκαν: EN 60335-1:1994 και EN 60335-2-41: 1996.
- Προϊόντα κατασκευών (89/106/EC).
 - Πρότυπο που χρησιμοποιήθηκε: EN 12050-1/-2.
- ATEX 94/9/EC (ATEX 100) (εφαρμόζεται μόνο σε προϊόντα με το σήμα ATEX στην πινακίδα τους).
 - Πρότυπο που χρησιμοποιήθηκαν: EN 50014, EN 50018, EN 50281-1-1, EN 13463-1 και EN 13463-5.

Försäkran om överensstämmelse

Vi **Grundfos** försäkrar under ansvar, att produkterna **SE1** och **SEV**, som omfattas av denna försäkran, är i överensstämmelse med Rådets direktiv om inbördes närmande till EU-medlemsstaternas lagstiftning, avseende

- Maskinell utrustning (98/37/EC).
 - Använd standard: EN ISO 12100.
- Elektromagnetisk kompatibilitet (89/336/EC).
 - Använda standarder: EN 61000-6-2 och EN 61000-6-3.
- Elektriskt material avsedd för användning inom vissa spänningsgränser (73/23/EC) [95].
 - Använda standarder: EN 60335-1:1994 och EN 60335-2-41: 1996.
- Produkter för bygg och anläggning (89/106/EC).
 - Använd standard: EN 12050-1/-2.
- ATEX 94/9/EC (ATEX 100) (endast för produkter med ATEX-märkning på typeskylten).
 - Använda standarder: EN 50014, EN 50018, EN 50281-1-1, EN 13463-1 och EN 13463-5.

Overensstemmelseserklæring

Vi **Grundfos** erklærer under ansvar, at produkterne **SE1** og **SEV**, som denne erklæring omhandler, er i overensstemmelse med Rådets direktiver om inbrydes tilnærmelse til EF medlemsstaternes lovgivning om

- Maskiner (98/37/EF).
 - Anvendt standard: EN ISO 12100.
- Elektromagnetisk kompatibilitet (89/336/EØF).
 - Anvendte standarder: EN 61000-6-2 og EN 61000-6-3.
- Elektrisk materiel bestemt til anvendelse inden for visse spændingsgrænser (73/23/EØF) [95].
 - Anvendte standarder: EN 60335-1:1994 og EN 60335-2-41: 1996.
- Byggevarer (89/106/EØF).
 - Anvendt standard: EN 12050-1/-2.
- ATEX 94/9/EF (ATEX 100) (gælder kun for produkter med ATEX-mærkning på typeskillet).
 - Anvendte standarder: EN 50014, EN 50018, EN 50281-1-1, EN 13463-1 og EN 13463-5.

Konformitätserklärung

Wir **Grundfos** erklären in alleiniger Verantwortung, daß die Produkte **SE1** und **SEV**, auf die sich diese Erklärung bezieht, mit den folgenden Richtlinien des Rates zur Angleichung der Rechtsvorschriften der EG-Mitgliedstaaten übereinstimmen:

- Maschinen (98/37/EG).
 - Norm, die verwendet wurde: EN ISO 12100.
- Elektromagnetische Verträglichkeit (89/336/EWG).
 - Normen, die verwendet wurden: EN 61000-6-2 und EN 61000-6-3.
- Elektrische Betriebsmittel zur Verwendung innerhalb bestimmter Spannungsgrenzen (73/23/EWG) [95].
 - Normen, die verwendet wurden: EN 60335-1:1994 und EN 60335-2-41: 1996.
- Bauproducte (89/106/EWG).
 - Norm, die verwendet wurde: EN 12050-1/-2.
- ATEX 94/9/EG (ATEX 100) (gilt nur für Produkte mit der ATEX-Kennzeichnung auf dem Leistungsschild).
 - Normen, die verwendet wurden: EN 50014, EN 50018, EN 50281-1-1, EN 13463-1 und EN 13463-5.

Dichiarazione di Conformità

Noi **Grundfos** dichiariamo sotto la nostra esclusiva responsabilità che i prodotti **SE1** e **SEV** ai quali questa dichiarazione si riferisce sono conformi alle Direttive del Consiglio concernente il ravvicinamento delle legislazioni degli Stati membri CE relative a

- Macchine (98/37/CE).
 - Norma usata: EN ISO 12100.
- Compatibilità elettromagnetica (89/336/CEE).
 - Norme usate: EN 61000-6-2 e EN 61000-6-3.
- Materiale elettrico destinato ad essere utilizzato entro certi limiti di tensione (73/23/CEE) [95].
 - Norme usate: EN 60335-1:1994 e EN 60335-2-41: 1996.
- Prodotti da costruzione (89/106/CEE).
 - Norma usata: EN 12050-1/-2.
- ATEX 94/9/CE (ATEX 100) (si applica solo ai prodotti che riportano la sigla ATEX sull'etichetta).
 - Norme usate: EN 50014, EN 50018, EN 50281-1-1, EN 13463-1 e EN 13463-5.

Declaração de Conformidade

Nós **Grundfos** declaramos sob nossa única responsabilidade que os produtos **SE1** e **SEV** aos quais se refere esta declaração estão em conformidade com as Directivas do Conselho das Comunidades Europeias relativas à aproximação das legislações dos Estados Membros respeitantes à

- Máquinas (98/37/CE).
 - Norma utilizada: EN ISO 12100.
- Compatibilidade electromagnética (89/336/CEE).
 - Normas utilizadas: EN 61000-6-2 e EN 61000-6-3.
- Material eléctrico destinado a ser utilizado dentro de certos limites de tensão (73/23/CEE) [95].
 - Normas utilizadas: EN 60335-1:1994 e EN 60335-2-41: 1996.
- Produtos de construção (89/106/CEE).
 - Norma utilizada: EN 12050-1/-2.
- ATEX 94/9/CE (ATEX 100) (apenas aplicável a produtos com a inscrição ATEX gravada na chapa de características).
 - Normas utilizadas: EN 50014, EN 50018, EN 50281-1-1, EN 13463-1 e EN 13463-5.

Overeenkomingheidsverklaring

Wij **Grundfos** verklaaren geheel onder eigen verantwoordelijkheid dat de produkten **SE1** en **SEV** waarop deze verklaring betrekking heeft in overeenstemming zijn met de Richtlijnen van de Raad inzake de onderlinge aanpassing van de wetgeving van de Lid-Staten betreffende

- Machines (98/37/EG).
 - Norm: EN ISO 12100.
- Elektromagnetische compatibiliteit (89/336/EEG).
 - Normen: EN 61000-6-2 en EN 61000-6-3.
- Elektrisch materiaal bestemd voor gebruik binnen bepaalde spanningsgrenzen (73/23/EEG) [95].
 - Normen: EN 60335-1:1994 en EN 60335-2-41: 1996.
- Bouwproducten (89/106/EEG).
 - Norm: EN 12050-1/-2.
- ATEX 94/9/EEG (ATEX 100) (alleen van toepassing voor producten met de ATEX markering op de typeplaat).
 - Normen: EN 50014, EN 50018, EN 50281-1-1, EN 13463-1 en EN 13463-5.

Vastaavuusvakuutus

Me **Grundfos** vakuutamme yksin vastuullisesti, että tuotteet **SE1** ja **SEV**, joita tämä vakuutus koskee, noudattavat direktiivejä jotka käsittelevät EY:n jäsenvaltojen koneellisia laitteita koskevien lakiain yhdenmukaisuutta seur.:

- Koneet (98/37/EY).
 - Käytetyt standardit: EN ISO 12100.
- Elektromagneettinen vastaavuus (89/336/EY).
 - Käytetyt standardit: EN 61000-6-2 ja EN 61000-6-3.
- Määritetyt jänniterajoitusten puitteissa käytettävä sähköiset laitteet (73/23/EY) [95].
 - Käytetyt standardit: EN 60335-1:1994 ja EN 60335-2-41: 1996.
- Rakennustuotteet (89/106/EY).
 - Käytetyt standardit: EN 12050-1/-2.
- ATEX 94/9/EY (ATEX 100) (soveltuu vain tuotteisiin, joissa on ATEX-merkintä arvolikkessä).
 - Käytetyt standardit: EN 50014, EN 50018, EN 50281-1-1, EN 13463-1 ja EN 13463-5.

Deklaracija zgodnosti

My **Grundfos**, oświadczamy z pełną odpowiedzialnością, że nasze wyroby **SE1** **SEV**, których deklaracja niniejsza dotyczy, są zgodne z następującymi wytycznymi Rady ds. ujednolicenia przepisów prawnych krajów EG:

- Maszyny (98/37/EG).
 - Zastosowana norma: EN ISO 12100.
- Zgodność elektromagnetyczna (89/336/EWG).
 - Zastosowane normy: EN 61 000-6-2 i EN 61 000-6-3.
- Wypożyczenie elektryczne do stosowania w określonym zakresie napięć (73/23/EWG) [95].
 - Zastosowane normy: EN 60 335-1:1994 i EN 60 335-2-41.
- Budowa wyrobów (89/106/EEC)
 - Zastosowana norma: EN 12050-1/-2.
- ATEX 94/9/EG (ATEX 100) (dotyczy tylko wyrobów ze znakiem ATEX na tabliczce znamionowej).
 - Zastosowane normy: EN 50014, EN 50018, EN 50281-1-1, EN 13463-1 i EN 13 463-5.

Заявление о соответствии

Мы, фирма **Grundfos**, со всей ответственностью заявляем, что изделия **SE1** и **SEV**, к которым относится данное заявление, соответствуют следующим предписаниям Совета Европы об унификации законодательных предписаний стран-членов ЕС, касающимся:

- машиностроительного оборудования (98/37/EC), применявшиеся стандарты: EN ISO 12100;
- электромагнитной совместимости (89/336/EЭС), применявшиеся стандарты: EN 61000-6-2 и EN 61000-6-3;
- электрооборудования, спроектированного для эксплуатации в определенном диапазоне значений напряжения (73/23/EС) [95], применявшиеся стандарты: EN 60335-1:1994 и EN 335-2-41;
- Строительные изделия (89/106/EEC). Применявшиеся стандарты: EN 12050-1/-2.
- ATEX 94/9/EC (ATEX 100) (действительно только для изделий с маркировкой ATEX на фирменной табличке с техническими данными), применявшиеся стандарты: EN 50014, EN 50018, EN 50281-1-1, EN 13463-1 и EN 13463-5.

Megfelelőségi nyilatkozat

Grundfos teljes felelősséggel kijelenti, hogy a **SE1** és **SEV** típusú szivattyúk, amelyre ezen nyilatkozat vonatkozik, megfelelnek az Európai Unió tagállamainak jogi irányelvét összhangoló tanács alábbi előírásainak:

- Gépek (98/37/EC).
 - Alkalmazott szabvány: EN ISO 12100.
 - Elektromágneses összeférhetőség (89/336/EEC).
 - Alkalmazott szabvány: EN 61000-6-2 és EN 61000-6-3.
 - Meghatározott feszültséghatárakon belül használt elektromos eszközök (73/23/EEC) [95].
 - Alkalmazott szabvány: EN 60335-1:1994 és EN 60335-2-41: 1996.
 - Összeépített berendezések (89/106/EEC)
 - Alkalmazott szabványok: EN 12050-1/-2.
 - ATEX 94/9/EC (ATEX 100) (csak az ATEX jelzéssel ellátott termékekre vonatkozik).
 - Alkalmazott szabvány: EN 50014, EN 50018, EN 50281-1-1, EN 13463-1 és EN 13463-5.

Izjava o skladnosti

Mi, **Grundfos**, pod svojo izključno odgovornostjo izjavljamo, da so izdelki **SE1** in **SEV**, na katere se ta izjava nanaša, skladni z Direktivami sveta o približevanju zakonodaji držav članic EC glede:

- Strojev (98/37/EC).
 - Uporabljeni standard: EN ISO 12100.
 - Elektromagnetske kompatibilnosti (89/336/EEC).
 - Uporabljena standarda: EN 61000-6-2 in EN 61000-6-3.
 - Električne opreme, izdelane za uporabo v okviru določenih meja napetosti (73/23/EEC) [95].
 - Uporabljena standarda: EN 60335-1:1994 in EN 60335-2-41: 1996.
 - Izdelek gradnje (89/106/EEC)
 - Uporabljena norma: EN 12050-1/-2.
 - ATEX 94/9/EC (ATEX 100) (velja samo za izdelke z oznako ATEX na tipski ploščici).
 - Uporabljena standarda: EN 50014, EN 50018, EN 50281-1-1, EN 13463-1 in EN 13463-5.

Izjava o konformitetu

Mi, **Grundfos**, izjavljujemo pod potpunom odgovornošču da su proizvodi **SE1** i **SEV**, na koje se odnosi ova izjava, u saglasnosti sa smernicama i uputstvima Savjeta za usaglašavanje pravnih propisa članica Evropske Unije:

- Mašine (98/37/EC).
 - Korišćeni standard: EN ISO 12100.
 - Elektromagnetska kompatibilnost (89/336/EEC).
 - Korišćeni standardi: EN 61000-6-2 i EN 61000-6-3.
 - Električna oprema razvijena za korišćenje unutar određenih naponskih granica (73/23/EEC) [95].
 - Korišćeni standardi: EN 60335-1:1994 i EN 60335-2-41: 1996.
 - Konstruktivni proizvodi (89/106/EEC)
 - Korišćeni standardi: EN 12050-1/-2.
 - ATEX 94/9/EC (ATEX 100) (odnosi se samo na proizvode sa natpisom ATEX na natpisnoj pločici).
 - Korišćeni standardi: EN 50014, EN 50018, EN 50281-1-1, EN 13463-1 i EN 13463-5.

Декларация за съответствие

Ние, фирма **Grundfos** заявяваме с пълна отговорност, че продуктите **SE1** и **SEV**, за които се отнася настоящата декларация, отговарят на следните указания на Съвета за уеднаквяване на правните разпоредби на държавите членки на ЕО:

- Машини (98/37/EO).
 - Приложена норма: EN ISO 12100.
 - Електромагнетична поносимост (89/336/ЕИО).
 - Приложени норми: EN 61000-6-2 и EN 61000-6-3.
 - Електрически машини и съоръжения за употреба в рамките на определени граници на напрежение на електрически ток (73/23/ЕИО) [95].
 - Приложени норми: EN 60335-1:1994 и EN 60335-2-41: 1996.
 - Конструктивни продукти (89/106/ЕИО)
 - Приложена норма: EN 12050-1/-2.
 - ATEX 94/9/ЕО (ATEX 100) (отнася се само за продукти със символа ATEX върху табелата с данни).
 - Приложени норми: EN 50014, EN 50018, EN 50281-1-1, EN 13463-1 и EN 13463-5.

Prehlásenie o zhode

My, firma **Grundfos**, prehlasujeme na svoju plnú zodpovednosť, že výrobky **SE1** a **SEV**, na ktoré sa toto prehlásenie vzťahuje, zodpovedajú ustanoveniam nasledujúcich smerníc Rady EÚ pre harmonizačiu právnych predpisov členských zemí Európskych spoločenstiev:

- Strojné zariadenia (98/37/EC).
 - Použitá norma: EN ISO 12100.
 - Elektromagnetická kompatibilita (89/336/EEC).
 - Použité normy: EN 61000-6-2 a EN 61000-6-3.
 - Elektrické stroje a súčiadienia na použitie v elektrickom toku (73/23/EEC) [95].
 - Použité normy: EN 60335-1:1994 a EN 60335-2-41: 1996.
 - Konštrukčné produkty (89/106/EEC)
 - Použitá norma: EN 12050-1/-2.
 - ATEX 94/9/EC (ATEX 100) (týka sa iba výrobkov nesúciach na typovom štítku značku ATEX).
 - Použité normy: EN 50014, EN 50018, EN 50281-1-1, EN 13463-1 a EN 13463-5.

Izjava o usklađenosti

Mi, **Grundfos**, izjavljujemo uz punu odgovornost, da su proizvodi **SE1** i **SEV**, na koje se ova izjava odnosi, sukladni slijedećim smjernicama Savjeta za prilagodbu propisa država-članica EZ:

- strojev (98/37/EZ):
 - korišćena norma: EN ISO 12100.
 - Elektromagnetska kompatibilnost (89/336/EEZ).
 - korišćene norme: EN 61000-6-2 i EN 61000-6-3.
 - Električni pogonski uređaji za uporabu unutar određenih granica napona (73/23/EEZ) [95];
 - korišćene norme: EN 60335-1:1994 i EN 60335-2-41: 1996.
 - Građevni proizvodi (89/106/EEZ).
 - Korišćena norma: EN 12050-1/-2.
 - ATEX 94/9/EZ (ATEX 100) (vrijedi samo za proizvode s ATEX-znakom na natpisnoj pločici);
 - korišćene norme: EN 50014, EN 50018, EN 50281-1-1, EN 13463-5.

Declarația de conformitate

Grundfos declară pe propria răspundere că produsele **SE1** și **SEV**, la care se referă această declarație sunt în conformitate cu Directivele Consiliului și legile Statelor membre EC, referitoare la:

- Utilaj (98/37/EC).
 - Standard folosit: EN ISO 12100.
 - Compatibilitatea electromagnetică (89/336/EEC).
 - Standarde folosite: EN 61000-6-2 și EN 61000-6-3.
 - Echipamente electric proiectat pentru a fi folosit în anumite limite de tensiune (73/23/EEC) [95].
 - Standarde folosite: EN 60335-1:1994 și EN 60335-2-41: 1996.
 - Construcția produselor (89/106/EEC).
 - Standard aplicat: EN 12050-1/-2.
 - ATEX 94/9/EC (ATEX 100) (se aplică numai la produsele cu marca ATEX pe plăcuță de înmatriculare).
 - Standarde folosite: EN 50014, EN 50018, EN 50281-1-1, EN 13463-1 și EN 13463-5.

Prohlášení o shodě

My, firma **Grundfos**, prohlašujeme na svou plnou odpovědnost, že výrobky **SE1** a **SEV**, na něž se toto prohlášení vzťahuje, odpovídají ustanovením následujúcich smerníc Rady EU pro harmonizaci právnych predpisov členských zemí Evropských spoločenstiev:

- Strojní zariadení (98/37/EC).
 - Použitá norma: EN ISO 12100.
 - Elektromagnetická kompatibilita (89/336/EEC).
 - Použité normy: EN 61000-6-2 a EN 61000-6-3.
 - Provozování elektrotechnických zařízení v rámci určitých napěťových tolerancí (73/23/EEC) [95].
 - Použité normy: EN 60335-1:1994 a EN 60335-2-41: 1996.
 - Konstrukční výrobky (89/106/EEC).
 - Použitá norma: EN 12050-1/-2.
 - ATEX 94/9/EC (ATEX 100) (týká se pouze výrobků nesoucích na typovém štítku značku ATEX).
 - Použité normy: EN 50014, EN 50018, EN 50281-1-1, EN 13463-1 a EN 13463-5.

Uygunluk Bildirgesi

Biz **Grundfos** olarak, bu bildirgede belirtilen **SE1** ve **SEV** ürünlerinin,

- Makina (98/37/EC).
 - Kullanılan standart: EN ISO 12100.
 - Elektromanyetik uyumluluk (89/336/EEC).
 - Kullanılan standartlar: EN 61000-6-2 ve EN 61000-6-3.
 - Belii voltaj sınırlarında kullanılmak üzere üretilmiş elektrik donanımı (73/23/EEC) [95].
 - Kullanılan standartlar: EN 60335-1:1994 ve EN 60335-2-41: 1996.
 - Yapı Ürünləri (89/106/EEC)
 - Kullanılan standartlar: EN 12050-1/-2.
 - ATEX 94/9/EC (ATEX 100) (sadece bilgi etiketine ATEX işaretli bulunan ürünlerde uygulanmaktadır).
 - Kullanılan standartlar: EN 50014, EN 50018, EN 50281-1-1, EN 13463-1 ve EN 13463-5.
 - ile ilgili olarak Avrupa topluluğu'na Üye Devletlerin yasalarında yer alan Belediye Yönetmeliklerine uygun olduğunu, tüm sorumluluğu bize ait olmak üzere beyan ederiz.

Bjerringbro, 15th October 2005

Jan Strandgaard
Technical Director

SE1 50, 80, 100

SEV 65, 80, 100

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Before beginning installation procedures, these installation and operating instructions should be studied carefully. The installation and operation should also be in accordance with local regulations and accepted codes of good practice.

1. Symbols used in this booklet

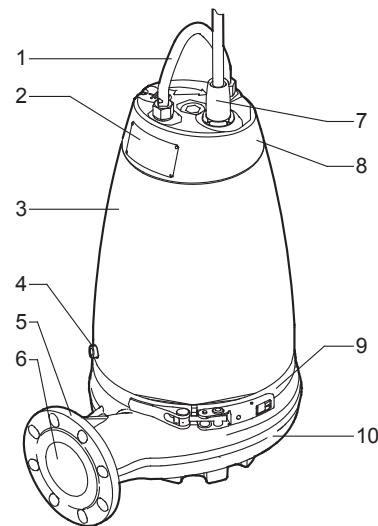
Instructions marked with this symbol require special attention. The non-compliance with these instructions involves the risk of personal injury.



Instructions marked with this symbol apply to explosion-proof pumps.
These instructions **must** be observed for explosion-proof pumps. It is advisable also to follow these instructions for standard pumps.

2. General description

Grundfos SE pumps are designed with channel or free-flow impeller to ensure reliable and optimum operation.
SE pumps are used for the removal of wastewater in small and medium systems.
The pumps can be controlled via the Grundfos LC/D 107, LC/D 108, LC/D 110 pump controllers or the Grundfos CU 100 control box, see installation and operating instructions for the selected unit.



TM02 8112 4603

Fig. 1 SE pump

Pos.	Description
1	Lifting bracket
2	Nameplate
3	Sleeve
4	Oil screw
5	Discharge flange
6	Discharge
7	Cable plug
8	Top cover
9	Clamp
10	Pump housing

3. Applications

SE pumps are designed for pumping

- drainage water
- domestic wastewater
- wastewater with a high content of fibres (free-flow impeller)
- industrial wastewater
- wastewater with gaseous sludge
- municipal wastewater.

The pumps are ideal for the pumping of the above liquids when discharged from e.g.

- public buildings
- blocks of flats
- factories/industry
- garages
- multi-storey car parks
- vehicle washing tunnels
- restaurants.

The pumps are suitable for both permanent and temporary installation.

3.1 Variants

The table shows the suitability of pump passage and impeller type for each individual liquid.

Impeller type: 1 = channel impeller, V = free-flow impeller.

Pumped liquid	Pump passage [mm]			
	50	65	80	100
Drainage water	1	V	1 / V	1 / V
Domestic wastewater without discharge from toilets	1	V	1 / V	1 / V
Domestic wastewater with discharge from toilets			1 / V	1 / V
Wastewater with a high content of fibres	V	1 / V	1 / V	
Industrial wastewater	1 / V	1 / V		
Wastewater with gaseous sludge	1 / V	1 / V		
Municipal wastewater	1 / V	1 / V		

3.2 Potentially explosive environments

Use explosion-proof SE pumps for applications in potentially explosive environments.



The explosion protection classification of the pump is: CE 0344 Ex II 2 GD EEx dc IIB T4/T3 IP68 T 135°C/200°C. (Australia, see 7.2.)

The classification of the installation site **must** in each individual case be approved by the local fire-fighting authorities.

4. Safety



Pump installation in pits must be carried out by specially trained persons.

Work in or near pits must be carried out according to local regulations.

Sumps and pits for submerged wastewater pumps contain wastewater with toxic and/or disease-causing substances. Therefore, all persons involved must wear appropriate personal protective equipment and clothing and all work on and near the pump must be carried out under strict observance of the hygiene regulations in force.

5. Transportation and storage

5.1 Transportation

The pump can be transported in a vertical or horizontal position. Make sure that it cannot roll or fall over.

Always lift the pump by its lifting bracket, **never** by the motor cable or the hose/pipe.

The polyurethane-embedded plug prevents water from penetrating into the motor via the motor cable.

5.2 Storage

For long periods of storage, the pump must be protected from extremes of heat and cold.

If the pump has been in use, the oil should be changed before storage, see section 12.2.1 Oil change.

After a long period of storage, the pump should be inspected before it is put into operation. Make sure that the impeller can rotate freely. Pay special attention to the shaft seal and the cable entry.

6. Nameplate

The nameplate is fitted to the top cover of the pump. The loose nameplate supplied with the pump should be fixed at the installation site or kept in the cover of this booklet.

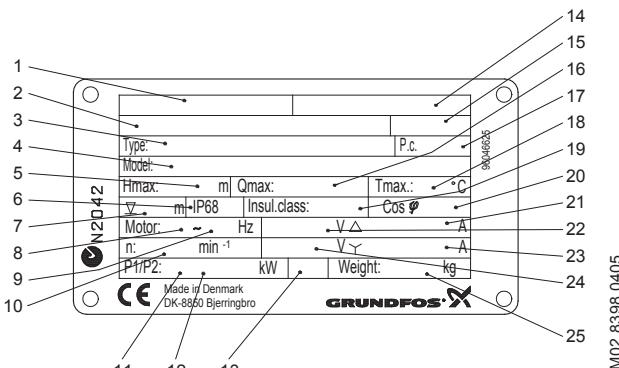


Fig. 2 Nameplate

Pos.	Description
1	Notified body
2	Explosion protection mark, X for special requirements applicable to explosion-proof equipment according to IEC 79-15
3	Type designation
4	Product number and serial number
5	Maximum head [m]
6	Enclosure class
7	Maximum installation depth [m]
8	Number of phases
9	Frequency [Hz]
10	Speed [min^{-1}]
11	Motor input power P1 [kW]
12	Motor output power P2 [kW]
13	Frame size
14	Explosion protection classification and certificate number
15	EN approval
16	Maximum flow [m^3/h]
17	Production code (year/week)
18	Maximum liquid temperature [$^{\circ}\text{C}$]
19	Insulation class
20	Power factor
21	Rated current 1
22	Rated voltage 1
23	Rated current 2
24	Rated voltage 2
25	Weight [kg]

7. Approvals

The standard version of SE pumps has been tested by VDE, and the explosion-proof version approved by KEMA according to the ATEX directive.

7.1 Approval standards

The standard variants are approved by LGA (notified body under the construction products directive) according to EN 12050-1/2.

GB

7.2 Explanation to Ex approval

The explosion protection classification of the pump is:

CE 0344 Ex II 2 GD EEx dc IIB T4 IP68 T 135°C

CE 0344 Ex II 2 GD EEx dc IIB T3 IP68 T 200°C (frequency converter controlled pumps).

Directive/standard	Code	Description
	CE 0344	= CE marking of conformity according to the ATEX directive 94/9/EC, Annex X. 0344 is the number of the notified body which has certified the quality system for ATEX.
ATEX	Ex	= Marking of explosion protection
	II	= Equipment group according to the ATEX directive, Annex II, point 2.2, defining the requirements applicable to the equipment in this group
	2	= Equipment category according to the ATEX directive, Annex II, point 2.2, defining the requirements applicable to the equipment in this category
	G	= Explosive atmospheres caused by gases, vapours or mists
	D	= Explosive atmospheres caused by dust (EN 50281-1-1: 1998)
	EEx	= The equipment conforms to harmonized European standard
	d	= Flame-proof enclosure according to EN 50018: 2000
	c	= Constructional safety
	II	= Suitable for use in explosive atmospheres (not mines)
Harmonized European standard EN 50014	B	= Classification of gases, see EN 50014: 1997, Annex A. Gas group B includes gas group A.
	T4/T3	= Maximum surface temperature is 135°C/200°C
	T 135°C/ 200°C	= Maximum surface temperature on all pump parts according to EN 50028-1-1: 1998
	IP68	= Enclosure class according to IEC 60529
	X	The letter X in the certificate number indicates that the equipment is subject to special conditions for safe use. The conditions are mentioned in the certificate and the installation and operating instructions.

7.2.1 Australia

Ex nA II T3.

Ex variants for Australia are approved as Ex nA II T3 according to IEC 79-15 (corresponding to AS 2380.9).

Standard	Code	Description
	Ex	= Area classification according to AS 2430.1
	nA	= Non-sparking according to AS 2380.9: 1991, section 3 (IEC 79-15: 1987)
IEC 79-15: 1987	II	= Suitable for use in explosive atmospheres (not mines)
	T3	= Maximum surface temperature is 200°C
	X	The letter X in the certificate number indicates that the equipment is subject to special conditions for safe use. The conditions are mentioned in the certificate and the installation and operating instructions.

8. Type key

The pump can be identified by the type key stated on the pump nameplate, see section 6.

Code	Example	SE	1	.80	.80	.40	.A	.Ex	.4	.5	1D
	Pump type:										
SE	Grundfos wastewater pump/sewage pump										
	Version – material:										
[]	Standard										
	Impeller type:										
1	Channel impeller, number of channels										
V	Free-flow impeller (SuperVortex)										
	Pump passage:										
80	Maximum solids size [mm]										
	Pump discharge:										
80	Nominal diameter of pump discharge port [mm]										
	Power:										
40	Motor output power P2/100 [W]										
	Equipment:										
[]	Standard										
A	Sensor										
	Pump version:										
Ex	Explosion-proof pump										
[]	Standard pump										
	Number of poles:										
2	2-pole, 3000 min ⁻¹ , 50 Hz										
4	4-pole, 1500 min ⁻¹ , 50 Hz										
	Number of phases:										
[]	Three-phase motor										
	Frequency:										
5	50 Hz										
	Voltage and starting method:										
0D	380-415 V, DOL, 50 Hz										
1D	380-415 V, Y/D, 50 Hz										
0E	220-240 V, DOL, 50 Hz										
1E	220-240 V Y/D, 50 Hz										
	Generation:										
[]	First generation										
A	Second generation										
B	Third generation, etc.										
	The generation code distinguishes between structurally different pumps which have the same power rating										
	Material in pump:										
[]	Standard										

GB

9. Installation

Before beginning installation procedures, make sure

- that the pump corresponds to order.
- that the pump is suitable for the supply voltage and frequency available at the installation site.
- that accessories and other equipment have not been damaged during transportation.

The loose nameplate supplied with the pump should be fixed at the installation site or kept in the cover of this booklet.

All safety regulations must be observed at the installation site, e.g. the use of blowers for fresh-air supply to the pit.

Prior to installation, check the oil level in the oil chamber, see section 12. *Maintenance*.

The SE pumps are suitable for different installation types, which are described in sections 9.2, 9.3 and 9.4.

All pump housings have a cast PN 10 discharge flange, DN 65, DN 80, DN 100 or DN 150.

Note: The pumps are designed for continuous operation, both for submerged and dry installation.

See section 15. *Technical data and operating conditions*.

9.1 Installation types

Submerged installation

- on auto-coupling or
- free-standing on ring stand.

Dry installation

- vertical on base stand or
- horizontal with brackets, secured to a concrete floor or foundation.

When mounted on a base stand/bracket, the pump must be installed outside the pump sump. A suction line must be connected to the pump.

A dimensional sketch for each individual installation type can be found at the end of this booklet.

9.2 Submerged installation on auto-coupling

Pumps for permanent installation can be mounted on a stationary auto-coupling guide rail system. The auto-coupling system facilitates maintenance and service as the pump can easily be lifted out of the pit.



Before beginning installation procedures, make sure that the atmosphere in the pit is not potentially explosive.

Auto-coupling guide rail system, see fig. 3.

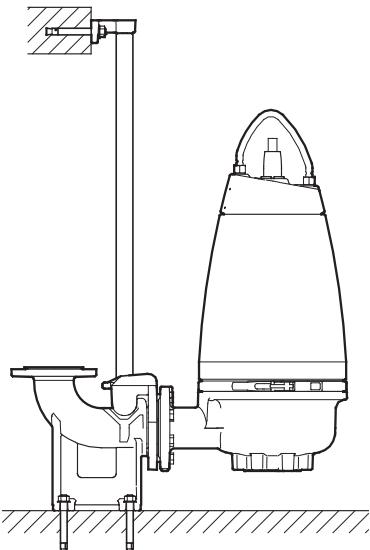
Procedure:

1. Fit the guide rail bracket on the inside of the pit and fasten it provisionally with anchor bolts.
2. Place the auto-coupling base unit on the bottom of the pit. Use a plumb line to establish the correct positioning. Fasten with heavy-duty expansion bolts. Support the auto-coupling base unit so that it is level when being fastened.
3. Connect the discharge line without exposing it to distortion or tension.
4. Insert the guide rails in the auto-coupling base unit and adjust the length of the rails accurately to the guide rail bracket.
5. Unscrew the provisionally fastened guide rail bracket and fit it on top of the guide rails. Fasten the bracket firmly to the pit wall.

Note: The guide rails must not have any axial play as this would cause noise during pump operation.

6. Clean out debris from the pit before lowering the pump into the pit.
7. Fit the guide claw to the discharge port of the pump. Then slide the guide claw down the guide rails and lower the pump into the pit by means of a chain fastened to the lifting bracket. When the pump reaches the auto-coupling base unit, the pump will automatically connect tightly.

8. Hang up the end of the chain on a suitable hook at the top of the pit and in such a way that the chain cannot come into contact with the pump housing.
9. Adjust the length of the motor cable by coiling it up on a relief fitting to ensure that the cable is not damaged during operation. Fasten the relief fitting to a suitable hook at the top of the pit. Make sure that the cable is not sharply bent or pinched.
10. Connect the motor cable.



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Fig. 3 Submerged pump on auto-coupling

9.3 Free-standing submerged installation

Pumps for free-standing submerged installation can stand freely on the bottom of the pit or the like. The pump must be installed on a ring stand, see fig. 4.

The ring stand is available as an accessory.

In order to facilitate service on the pump, fit a flexible union or coupling to the discharge line for easy separation.

If a **hose** is used, make sure that the hose does not buckle and that the inside diameter of the hose matches that of the pump discharge port.

If a **rigid pipe** is used, the union or coupling, non-return valve and isolating valve should be fitted in the order mentioned, when viewed from the pump.

If the pump is installed in muddy conditions or on uneven ground, it is recommended to support the pump on bricks or a similar support.

Procedure:

1. Fit a 90° elbow to the pump discharge port and connect the discharge pipe/hose.
2. Lower the pump into the liquid by means of a chain secured to the lifting bracket of the pump. It is recommended to place the pump on a plane, solid foundation. Make sure that the pump stands securely.
3. Hang up the end of the chain on a suitable hook at the top of the pit and in such a way that the chain cannot come into contact with the pump housing.
4. Adjust the length of the motor cable by coiling it up on a relief fitting to ensure that the cable is not damaged during operation. Fasten the relief fitting to a suitable hook. Make sure that the cable is not sharply bent or pinched.
5. Connect the motor cable.

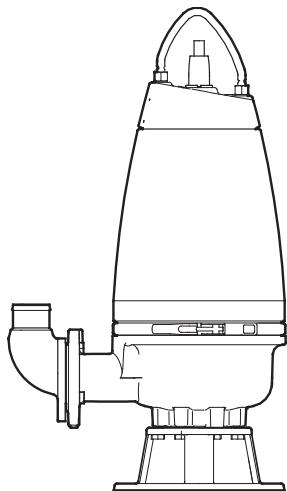


Fig. 4 Free-standing submerged pump on ring stand

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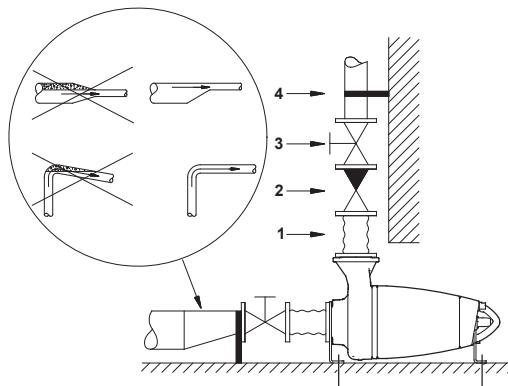
9.4 Dry installation

In dry installations, the pump must be installed permanently outside the pump sump.

The pump motor is totally enclosed and watertight. Consequently, it will not be damaged in case the installation site is flooded.

Precautions:

- When the pump is installed outside the pump sump, it must be ensured that the liquid level in the pump sump does not fall below the critical NPSH (Net Positive Suction Head).
- The suction line must be sized according to the length and the desired pump performance. A possible difference in level between the pump sump and the pump inlet must also be taken into account. The size of the suction line must never be larger than the size of the pump discharge flange.
- The pipework must be supported so that no strain or other mechanical influences are transmitted to the pump. It is recommended to install expansion joints and pipe hangers, see fig. 5.



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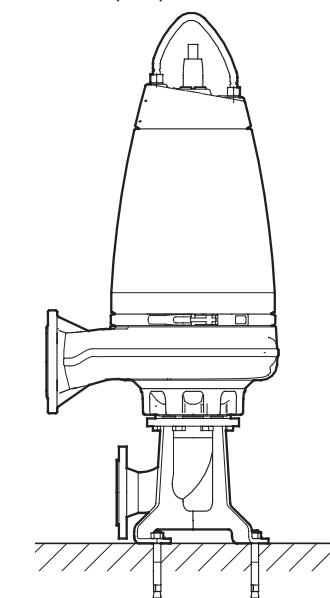
Fig. 5 Horizontal dry installation with brackets

- The pump should be installed on a separate foundation, e.g. concrete foundation. The weight of the foundation should be approx. 1.5 times the weight of the pump. To prevent vibrations from being transmitted to the building and pipework, it is recommended to place the pump on a vibration absorbing material.

Procedure:

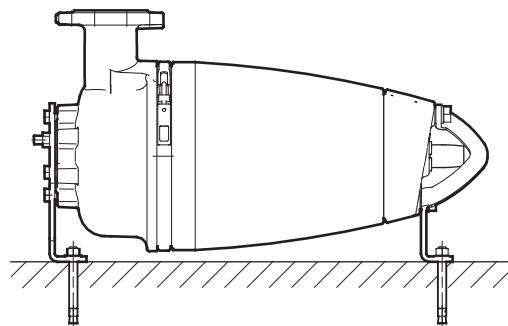
- Fit the base stand or brackets to the pump. See dimensional sketches at the end of this booklet.
- Mark and drill fixing holes in the concrete floor/foundation.
- Secure the pump with expansion bolts.
- Check that the pump stands vertically/horizontally.
- Connect the motor cable.
- It is recommended to fit an isolating valve on the suction side of the pump and a non-return valve as well as an isolating valve on the discharge side.
- Install the suction and discharge lines as well as the valves, if any. Ensure that the pump is not stressed by the pipework.

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Fig. 6 Vertical dry installation on base stand



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Fig. 7 Horizontal dry installation with brackets

- | Pos. | Description |
|------|------------------|
| 1 | Expansion joint |
| 2 | Non-return valve |
| 3 | Isolating valve |
| 4 | Pipe hanger |
- If a reducer is fitted between the suction line and the pump, it must be of the eccentric type. The reducer must be fitted so that the straight edge is pointing upwards to avoid air locks in the suction line. Air in the suction line may cause cavitation, see fig. 5.

10. Electrical connection

The electrical connection must be carried out in accordance with local regulations.

The pump must be connected to a mains switch with a minimum contact gap of 3 mm in all poles.

The motor starter must be set to the current consumption of the pump. The current consumption is stated on the pump nameplate.

The explosion protection classification of the pump is: CE 0344 II 2 GD EEx dc IIB T4/T3 IP68 T 135°C/200°C. (Australia, see 7.2.)

The classification of the installation site must in each individual case be approved by the local fire-fighting authorities.



Grundfos control boxes, pump controllers and Ex barriers **must not** be installed in potentially explosive environments.



Make sure that all protective equipment has been connected correctly.

If the pump has an "X" on the nameplate (pos. 1), it must be ensured that the pump is connected in accordance with the instructions given in this booklet.

On explosion-proof pumps, it must be ensured that an external earth wire is connected to the terminal on the pump top cover. The cross section of the earth wire must be at least 4 mm², e.g. type H07 V2-K (PVT 90°) yellow/green.

Float switches used in potentially explosive environments must be approved for this application. They **must** be connected to the Grundfos LC/D 108 pump controller via the intrinsically safe LC-Ex4 barrier to ensure a safe circuit.

The supply voltage and frequency are marked on the pump nameplate. The voltage tolerance must be within -10%/+6% of the rated voltage. Make sure that the motor is suitable for the electricity supply available at the installation site.

All pumps are supplied with 10 metres of cable and a free cable end.

The pump must be connected to

- a control box with motor starter, e.g. Grundfos CU 100 control box, or
- a Grundfos LC/D 107, LC/D 108 or LC/D 110 pump controller.

See fig. 8 or 9 and the installation and operating instructions for the selected control box or pump controller.

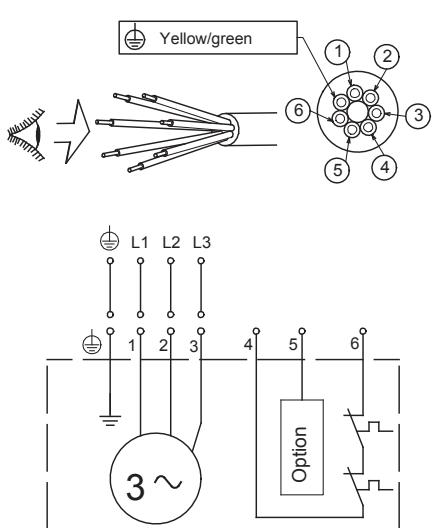


Fig. 8 Wiring diagram – 7-wire cable

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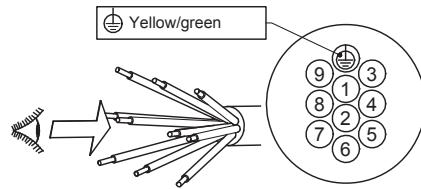


Fig. 9 Wiring diagram – 10-wire cable

TM02 8397 5103

10.1 Pump controllers

The following LC and LCD pump controllers are available:

LC controllers are for one-pump installations and LCD controllers are for two-pump installations.

- LC 107 and LCD 107 with level pickups.
- LC 108 and LCD 108 with float switches.
- LC 110 and LCD 110 with electrodes.

In the following description, "level switches" can be level pickups, float switches or electrodes, depending on the pump controller selected.

The **LC** controller is fitted with two or three level switches: One for start and the other for stop of pump. The third level switch, which is optional, is for high-level alarm.

The **LCD** controller is fitted with three or four level switches: One for common stop and two for start of the pumps. The fourth level switch, which is optional, is for high-level alarm.

When installing the level switches, the following points should be observed:

- To prevent air intake and vibrations, the **stop level switch** must be installed in such a way that the pump is stopped before the liquid level is lowered below the upper edge of the clamp on the pump.
- During one-pump operation, the **start level switch** should be installed in such a way that the pump is started at the required level; however, the pump must always be started before the liquid level reaches the bottom inlet pipe to the pit.
- During two-pump operation, the **start level switch** for pump 2 must start the pump before the liquid level reaches the bottom inlet pipe to the pit, and the start level switch for pump 1 must start this pump correspondingly earlier.
- The **high-level alarm switch**, if installed, should always be installed about 10 cm above the start level switch; however, the alarm must always be given before the liquid level reaches the bottom inlet pipe to the pit.

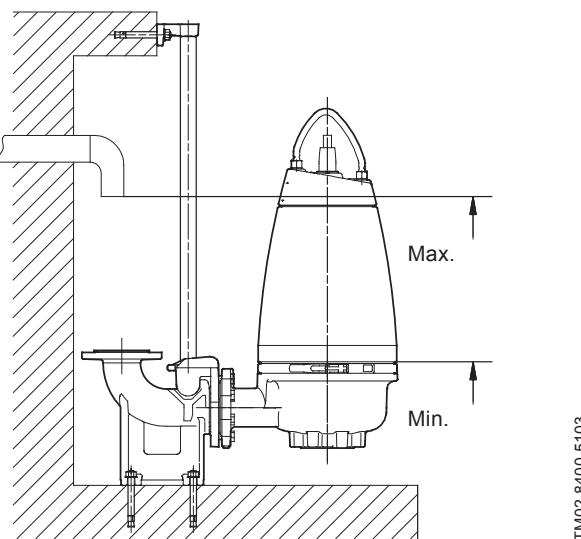
For further settings, see the installation and operating instructions for the pump controller selected.

The pump must not run dry.

An additional level switch must be installed to ensure that the pump is stopped in case the stop level switch is not operating.

Stop the pump when the liquid level reaches the upper edge of the clamp on the pump.

Float switches used in potentially explosive environments must be approved for this application. They **must** be connected to the Grundfos LC/D 108 pump controller via the intrinsically safe LC-Ex4 barrier to ensure a safe circuit.

**Fig. 10 Start and stop levels**

It should be ensured that the effective volume in the pump sump does not get so small that the number of starts per hour exceeds the maximum permissible number.

See section 15. *Technical data and operating conditions*.

10.2 Thermal switch

All SE pumps have a thermal switch incorporated in the stator windings.

Via the pump controller safety circuit, the thermal switch will stop the pump by breaking the circuit in case of overtemperature (approx. 150°C). The thermal switch will close the circuit after cooling.

The maximum operating current of the thermal switch is 0.5 A at 500 VAC and cos j 0.6. The switch must be able to break a coil in the supply circuit.

In the case of **standard pumps**, the thermal switch can (when closing the circuit after cooling) restart the pump automatically via the controller.



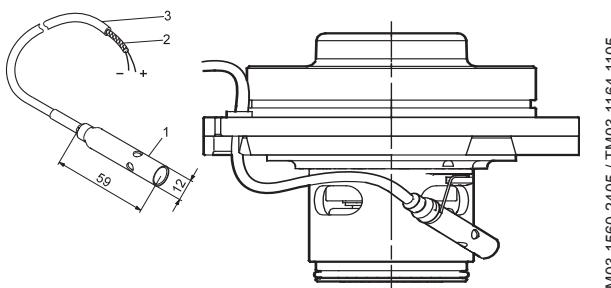
In the case of **explosion-proof pumps**, the thermal switch must not restart the pump automatically. This ensures protection against overtemperature in potentially explosive environments.



The separate motor starter/control box must not be installed in potentially explosive environments.



10.3 WIO sensor

**Fig. 11 WIO sensor**

The WIO sensor measures the water content in the oil and converts the value into an analog current signal. The two sensor conductors are for power supply as well as for carrying the signal to the measuring device or controller. The sensor measures the water content from 0 to 20%. It also sends a signal if the water content is outside the normal range (warning), or if there is air in the oil chamber (alarm). The sensor is fitted in a stainless steel tube for mechanical protection.

It is important to fit the sensor next to one of the shaft seal openings, see fig. 11. The sensor must be tilted into the motor's direction of rotation to ensure that oil is led into the sensor. Make sure that the sensor is submerged in the oil.

10.3.1 Data

Input voltage:	12 - 24 VDC
Output current:	3.5 - 22 mA
Power consumption:	0.6 W
Ambient temperature:	0 to 70°C

For further information, see instructions 96573975 at www.grundfos.com.

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10.4 Moisture sensor

The moisture sensor is positioned in the bottom of the motor. If there is moisture in the motor, the sensor sends a signal to the IO 111.

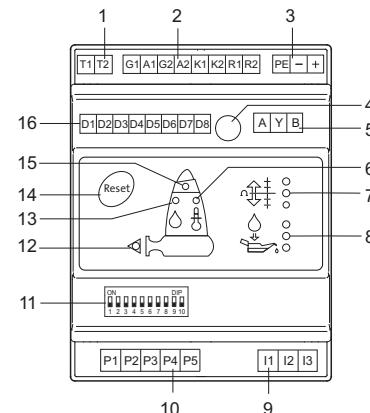
10.5 IO 111

The IO 111 forms interface between a Grundfos wastewater pump with analog and digital sensors and the pump controller. The most important sensor data are indicated on the front panel. One pump can be connected to an IO 111 module.

Together with the sensors, the IO 111 forms a galvanic separation between the motor voltage in the pump and the controller connected.

IO 111 operates with two categories of fault:

1. Alarm. The pump stops. The fault is a primary functionality (e.g. too high motor temperature).
2. Warning. The pump does not stop. The fault is a secondary functionality (e.g. too much water in the oil).

**Fig. 12 IO 111 module**

TM03 0691 0505

Pos. Description

1	Terminal for alarm relay
2	Terminal for analog and digital inputs and outputs
3	Terminal for supply voltage (24 VAC/24 VDC)
4	Potentiometer for setting the warning limit of stator insulation resistance
5	Terminal for RS485
6	Red indicator light. Alarm in case of too high motor temperature.
7	Indicator lights for stator insulation resistance. Green = ok. Yellow = warning. Red = alarm.
8	Indicator lights for measurement of water in oil
9	Terminal for measurement of stator insulation resistance
10	Terminal for connection of pump sensors
11	DIP switch for configuration
12	Green indicator light. On when the pump is running.
13	Red indicator light. Alarm in case of moisture in the motor.
14	Button for reset of alarm
15	Yellow indicator light. Warning in case of pump fault.
16	Terminal for digital outputs

Pos.	Symbol	Description
6		Stator temperature
7		Stator insulation resistance
8		Water in oil chamber
12		Pump running
13		Moisture in motor
15		Pump fault

10.5.1 Data

Supply voltage:	24 VAC ±10%, 50 & 60 Hz
	24 VDC ±10%
Input current:	Min. 0.5 A; max. 8 A
Power consumption:	Max. 5 W
Ambient temperature:	-25°C to +65°C
Enclosure class:	IP 20

10.6 Frequency converter operation

If the pump is controlled by means of a frequency converter, the thermal protection of the pump must be connected to the stopping circuit of the frequency converter.

In order to prevent deposits, the minimum flow velocity in the pipework must be observed when setting the minimum setpoint.

Pipework	Minimum flow velocity
Horizontal	1.0 [m/s]
Vertical	0.7 [m/s]

11. Start-up



Before starting work on the pump, make sure that the fuses have been removed or the mains switch has been switched off. It must be ensured that the electricity supply cannot be accidentally switched on.

Make sure that all protective equipment has been connected correctly.

The pump must not run dry.



The pump must not be started if a potentially explosive atmosphere is present in the pit.

Procedure:

1. Remove the pump from the system.
2. Check that the impeller can rotate freely. Turn the impeller by hand.
3. Check the condition of the oil in the oil chamber. See also section 12.2.1 *Oil change*.
4. Check whether the monitoring units, if used, are operating satisfactorily.
5. Check the setting of the level pickups, float switches or electrodes.
6. Mount the pump in the system and switch on the electricity supply.
7. Open the isolating valves, if fitted.
8. Check whether the system has been filled with liquid and vented. The pump is usually self-venting, but in certain installations it may be necessary to tilt the pump a little while it runs for a short time to reduce the counter pressure and remove air pockets in the pump.

9. Start the pump.

Note: In case of abnormal noise or vibrations from the pump or other pump or supply failures, stop the pump immediately. Do not attempt to restart the pump before the cause of the fault has been found and the fault corrected.

After one week of operation after replacement of the shaft seal, the condition of the oil in the chamber should be checked. See section 12. *Maintenance* for procedure.

11.1 Direction of rotation

Note: The pump may be started for a very short period without being submerged for checking of the direction of rotation.

Before starting up the pump, the direction of rotation must be checked.

An arrow on the top cover indicates the correct direction of rotation.

The pump should rotate clockwise when viewed from above. When started, the pump will jerk in the opposite direction of the direction of rotation, see fig. 13.

If the direction of rotation is wrong, interchange any two of the incoming supply wires, see fig. 8 or 9.

Checking the direction of rotation:

The direction of rotation should be checked in one of the following ways every time the pump is connected to a new installation.

Procedure 1:

1. Start the pump and measure the quantity of liquid or the discharge pressure.
2. Stop the pump and interchange any two of the incoming supply wires.
3. Restart the pump and measure the quantity of liquid or the discharge pressure.
4. Stop the pump.
5. Compare the results taken under points 1 and 3. The connection which gives the larger quantity of liquid or the higher pressure is the correct direction of rotation.

Procedure 2:

1. Let the pump hang from a lifting device, e.g. the hoist used for lowering the pump into the pit.
2. Start and stop the pump while observing the movement (jerk) of the pump.
3. If connected correctly, the pump will jerk in the opposite direction of the direction of rotation, see fig. 13. If not, interchange any two of the incoming supply wires.

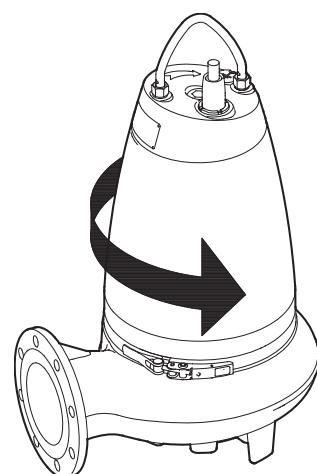


Fig. 13 Jerk direction

12. Maintenance



Before starting work on the pump, make sure that the fuses have been removed or the mains switch has been switched off. It must be ensured that the electricity supply cannot be accidentally switched on. All rotating parts must have stopped moving.



Except for maintenance on the hydraulic part, all other maintenance work **must** be carried out by **Grundfos or an authorized service workshop**.

Before carrying out maintenance, it must be ensured that the pump has been thoroughly flushed with clean water. Rinse the pump parts in water after dismantling.



When slackening the screws of the oil chamber, note that pressure may have built up in the chamber. Do not remove the screws until the pressure has been fully relieved.

12.1 Inspection intervals

Pumps running normal operation should be checked at least once a year or at least after 3000 operating hours. If the pumped liquid is very muddy or sandy, check the pump at shorter intervals.

The following points should be checked:

- **Power consumption**

See pump nameplate.

- **Oil level and oil condition**

When the pump is new or after replacement of the shaft seal, check the oil level after one week of operation.

The oil becomes greyish white like milk if it contains water.

This may be the result of a defective shaft seal. The oil should be changed after 3000 operating hours or once a year.

Use Shell Ondina 917 oil or similar type.

See sections 12.2.1 Oil change and 13. Service.

- **Cable entry**

Make sure that the cable entry is watertight (visual inspection) and that the cable is not sharply bent and/or pinched.

See section 13. Service.

- **Pump parts**

Check the impeller, pump housing, etc. for possible wear.

Replace defective parts.

See section 13. Service.

- **Ball bearings**

Check the shaft for noisy or heavy operation (turn the shaft by hand). Replace defective ball bearings.

In case of defective ball bearings or poor motor function, a general overhaul of the pump is usually required. This work must be carried out by Grundfos or an authorized service workshop.

- **O-rings and similar parts**

During service/replacement, it must be ensured that the grooves for O-rings and seal faces have been cleaned before the new parts are fitted.

Note: Used rubber parts must not be reused.



Explosion-proof pumps must be checked by an authorized Ex workshop once a year.

12.2 Dismantling the pump

12.2.1 Oil change

After 3000 operating hours or once a year, change the oil in the oil chamber as described below.

If the shaft seal has been replaced, the oil must be changed.



When slackening the screws of the oil chamber, note that pressure may have built up in the chamber. Do not remove the screws until the pressure has been fully relieved.

Draining of oil:

1. Place the pump on a plane surface with one oil screw pointing downwards.

2. Place a suitable container (approx. 1 litre) under the oil screw.

Note: Used oil must be disposed of in accordance with local regulations.

3. Remove the lower oil screw.

4. Remove the upper oil screw.

If the oil in the container is greyish white like milk, it contains water. This means that the shaft seal is defective and must be replaced. If the shaft seal is still used, the motor will be damaged within a short time.

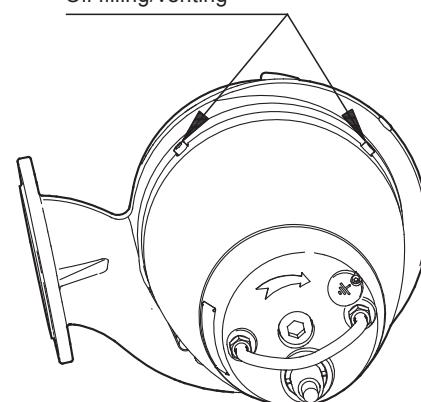
If the quantity of oil is smaller than the quantity stated in section 13.1 Oil quantities, the shaft seal is defective.

5. Clean the faces for the gaskets for oil screws.

Oil filling:

1. Turn the pump so that the oil filling holes are placed opposite to each other, pointing upwards.

Oil filling/venting



TM02 8408 5103

Fig. 14 Oil filling holes

2. Pour oil into the chamber.

For oil quantity, see section 13.1.

3. Fit the oil screws with new gaskets.

12.2.2 Cleaning/removing the pump housing and impeller

For position numbers, see page 377.

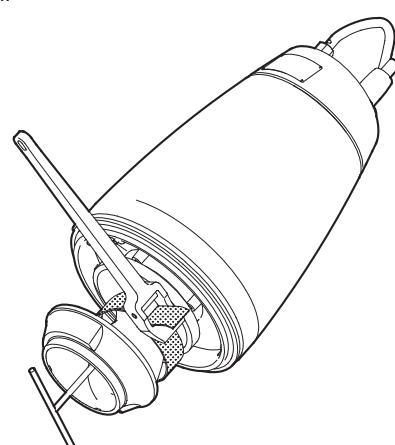
Procedure:

1. Loosen the clamp (pos. 92).

2. Remove the screw (pos. 92a) using fingers.

3. Remove the pump housing (pos. 50) by inserting two screwdrivers between the sleeve and the pump housing.

4. Remove the screw (pos. 188a). Hold the impeller with a strap wrench.



TM02 8407 5103

Fig. 15 Removing the impeller

5. Loosen the impeller (pos. 49) with a light blow on the edge. Pull it off.

6. Remove the key (pos. 9a) and the spring for impeller (pos. 157).

12.2.3 Removing the seal ring and wear ring

Procedure:

1. Turn the pump housing upside-down.
2. Knock the seal ring (pos. 46) out of the pump housing using a punch.

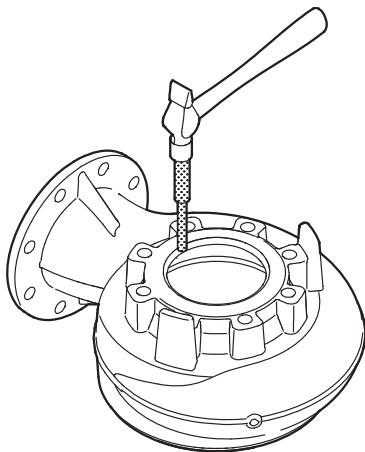


Fig. 16 Removing the seal ring

3. Clean the pump housing where the seal ring was fitted.
4. Remove the wear ring (pos. 49c) with a screwdriver.

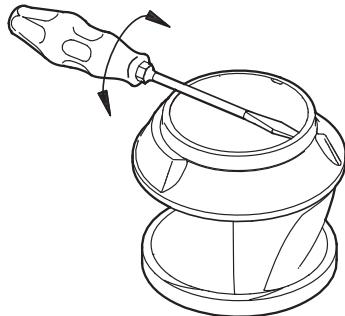


Fig. 17 Removing the wear ring

5. Clean the impeller where the wear ring was fitted.

12.2.4 Checking/removing the shaft seal

Procedure:

1. Remove the screws (pos. 188).
2. Remove the cover for oil chamber (pos. 58) with a puller.
3. Remove the screws (pos. 186).
4. Remove the shaft seal (pos. 105) with the puller.
5. Remove the O-ring (pos. 153b).

Procedure (pump with sensor):

1. Remove the screws (pos. 188).
2. Remove the cover for oil chamber (pos. 58) with a puller.
3. Remove the screws (pos. 186).
4. Remove the sensor (pos. 521) and holder (pos. 522) from the shaft seal.
5. Remove the shaft seal (pos. 105) with the puller.
6. Remove the O-ring (pos. 153b).

12.3 Assembly

12.3.1 Fitting the shaft seal

Procedure:

1. Fit and lubricate the O-ring (pos. 153b) with oil.
2. Slide the shaft seal (pos. 105) gently over the shaft.
3. Fit and tighten the screws (pos. 186).
4. Fit and lubricate the O-ring (pos. 107) in the cover for oil chamber (pos. 58) with oil.
5. Fit the cover for oil chamber.
6. Fit and tighten the screws (pos. 188).

Procedure (pump with sensor):

1. Fit and lubricate the O-ring (pos. 153b) with oil.
2. Slide the shaft seal (pos. 105) gently over the shaft.
3. Fit the holder (pos. 522) and sensor (pos. 521) with one of the screws (pos. 186).
4. Fit the second screw and tighten both screws (pos. 186).
5. Fit and lubricate the O-ring (pos. 107) in the cover for oil chamber (pos. 58) with oil.
6. Check that the sensor is positioned correctly, see 10.3 WIO sensor and fig. 11. This is of special importance in horizontal pumps.
7. Fit the cover for oil chamber.
8. Fit and tighten the screws (pos. 188).

12.3.2 Fitting the seal ring and wear ring

Procedure:

1. Lubricate the seal ring (pos. 46) with soapy water.
2. Place the seal ring in the pump housing.
3. Knock the seal ring home in the pump housing using a punch or a wooden block.

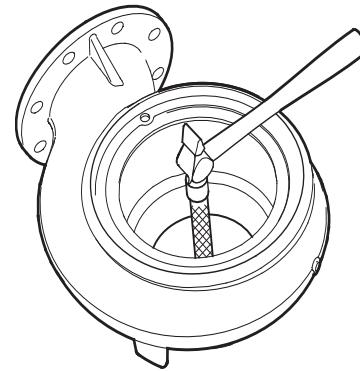


Fig. 18 Fitting the seal ring

4. Place the wear ring (pos. 49c) on the impeller.
5. Knock the wear ring home using a wooden block.

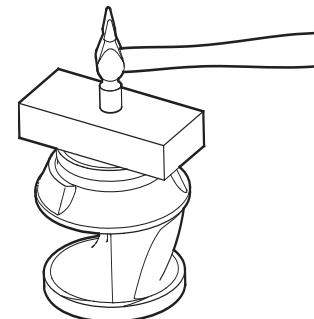


Fig. 19 Fitting the wear ring

12.3.3 Fitting the impeller and pump housing

Procedure:

1. Fit the spring (pos. 157) and the key (pos. 9a). Keep the key in position while the impeller is fitted.
2. Fit the impeller (pos. 49).
3. Fit the washer (pos. 66) and the screw (pos. 188a).
4. Tighten the screw (pos. 188a) to 75 Nm. Hold the impeller with the strap wrench.
5. Mark the position of the pin on the pump housing.
6. Mark the position of the pin hole on the oil chamber.
7. Fit and lubricate the O-ring (pos. 37) with oil.
8. Fit the pump part in the pump housing (pos. 50).
9. Fit the clamp (pos. 92).
10. Tighten the screw (pos. 92a) to 8 Nm.
11. Check that the impeller rotates freely and without drag.

13. Service



Before starting work on the pump, make sure that the fuses have been removed or the mains switch has been switched off. It must be ensured that the electricity supply cannot be accidentally switched on.

All rotating parts must have stopped moving.



Except for service on the hydraulic part, all other service work **must** be carried out by **Grundfos or an authorized service workshop**.

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To simplify the overview in section 13.2, the pumps have been divided into four categories: B, C22, C and D.

The four categories can be found by means of the shaft power output and number of poles stated on the pump nameplate, see section 6. *Nameplate*.

Power	Frame size			
	B	C22	C	D
2-pole				
2.2	x			
3.0	x			
4.0		x		
5.5			x	
7.5			x	
9.2				x
11.0			x	
4-pole				
1.0	x			
1.3	x			
1.5	x			
2.2	x			
3.0		x		
4.0		x		
5.5		x		
7.5				x

13.1 Oil quantities

The table shows the quantity of oil in the oil chamber of SE pumps:

Frame size	Oil quantity [l]
B	0.3
C22	0.55
C	0.55
D	0.7

Note: Used oil must be disposed of in accordance with local regulations.

13.2 Service kits

The following service kits are available for all SE pumps and can be ordered as required:

Service kit	Contents	Frame size			
		B	C22	C	D
Shaft seal kit	Shaft seal complete	96102360		96102361	
Impeller kit	Key, washer, screw and spring for impeller	96102365		96102366	
O-ring kit	O-rings	96102367	96102368	96102369	96102370

Service kit	Contents	Pump passage		
		50 mm	80 mm	100 mm
Seal ring and wear ring (channel impeller)	Seal ring and wear ring	96102362	96102363	96102364
Oil	1 litre of oil, type Shell Ondina 917	All types	96046902	
Washers for oil screws	10 washers	All types	96102359	

Note: A possible replacement of the cable must be carried out by **Grundfos or an authorized service workshop.**

For service parts not shown in the above table, consult www.grundfos.com - WebCAPS, Service.

Examples of service parts:

- cables
- pump housings
- impellers
- bearings
- shafts/rotors
- clamps
- stators
- motor complete, both standard and Ex.

13.3 Contaminated pumps

Note: If a pump has been used for a liquid which is injurious to health or toxic, the pump will be classified as contaminated.

If Grundfos is requested to service the pump, Grundfos must be contacted with details about the pumped liquid, etc. *before* the pump is returned for service. Otherwise Grundfos can refuse to accept the pump for service.

Possible costs of returning the pump are paid by the customer.

However, any application for service (no matter to whom it may be made) must include details about the pumped liquid if the pump has been used for liquids which are injurious to health or toxic.

Before a pump is returned, it must be cleaned in the best possible way.

14. Fault finding chart



Before attempting to diagnose any fault, make sure that the fuses have been removed or the mains switch has been switched off. It must be ensured that the electricity supply cannot be accidentally switched on.

All rotating parts must have stopped moving.



All regulations applying to pumps installed in potentially explosive environments must be observed.

It must be ensured that no work is carried out in potentially explosive atmosphere.

Fault	Cause	Remedy
1. Motor does not start. Fuses blow or motor starter trips out immediately. Caution: Do not start again!	a) Supply failure; short-circuit; earth-leakage fault in cable or motor winding. b) Fuses blow due to use of wrong type of fuse. c) Impeller blocked by impurities. d) Level pickup, float switch or electrode out of adjustment or defective.	Have the cable and motor checked and repaired by a qualified electrician. Fit fuses of the correct type. Clean the impeller. Check the level pickups, float switches or electrodes.
2. Pump operates, but motor starter trips out after a short while.	a) Low setting of thermal relay in motor starter. b) Increased current consumption due to large voltage drop. c) Impeller blocked by impurities. Increased current consumption in all three phases. d) Wrong direction of rotation.	Set the relay in accordance with the specifications on the pump nameplate. Measure the voltage between two motor phases. Tolerance: -10%/+6%. Clean the impeller. Check the direction of rotation and possibly interchange any two of the incoming supply wires, see section 11.1 <i>Direction of rotation</i> .
3. Pump operates at below-standard performance and power consumption.	a) Impeller blocked by impurities. b) Wrong direction of rotation.	Clean the impeller. Check the direction of rotation and possibly interchange any two of the incoming supply wires, see section 11.1 <i>Direction of rotation</i> .
4. Pump operates, but gives no liquid.	a) Discharge valve closed or blocked. b) Non-return valve blocked. c) Air in pump.	Check the discharge valve and possibly open and/or clean. Clean the non-return valve. Vent the pump.
5. Pump clogged.	a) The liquid contains large particles. b) A float layer has formed on the surface.	Select a pump with a larger size of passage. Install a mixer in the pump sump.

15. Technical data and operating conditions

Supply voltage

- 3 x 230 V -10%/+6%, 50 Hz.
- 3 x 400 V -10%/+6%, 50 Hz.

Standards

These standards apply to all pumps:

- EN 12050-1: 2001, wastewater with discharge from toilets.
- EN 12050-2: 2000, wastewater without discharge from toilets.

Standards for Ex protection

These standards apply to explosion-proof pumps:

- CE 0344 II 2 GD EEx dc IIB T4 IP68 T 135°C
CE 0344 II 2 GD EEx dc IIB T3 IP68 T 200°C (frequency converter controlled pumps).
According to EN 50014: 1997, EN 50018: 2000 and EN 50281-1-1: 1998.
- Ex nA II T3.
According to IEC 79-15: 1987.

Enclosure class

IP 68. According to IEC 60529.

Insulation class

F (155°C).

pH value

SE pumps in permanent installations can cope with pH values ranging from 4 to 10.

Liquid temperature

0°C to +40°C.

For short periods up to +60°C.



Explosion-proof pumps must never pump liquids with a temperature higher than +40°C.

Ambient temperature



Explosion-proof pumps must be installed in environments with a temperature ranging from -20°C to +40°C.

Density of pumped liquid

Maximum 1100 kg/m³.

In the case of higher values, contact Grundfos.

Installation depth

Maximum 20 metres below liquid level.

Operating mode

Maximum 20 starts per hour.

S1, continuous operation.

Pump curves

Pump curves are available via internet www.grundfos.com.

The curves are to be considered as a guide. They must not be used as guarantee curves.

Test curves for the supplied pump are available on request.

It must be ensured that the pump does not operate outside the recommended operating range during normal operation.

Sound pressure level

The sound pressure level of the pump is lower than the limiting values stated in the EC Council Directive 98/37/EC relating to machinery.

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Electrical data

Frame size	Power [kW]	Motor			Cable connection	
		Voltage [V]	Thermal protection	Resistance [Ω]	Cable cross section [mm ²]	Wires/plug pins
2-pole						
B	2.2	3 x 220-240	Thermal switch	1.7	1.5	7/7
B	3	3 x 220-240	Thermal switch	1.1	1.5	7/7
B	2.2	3 x 380-415	Thermal switch	5.2	1.5	7/7
B	3	3 x 380-415	Thermal switch	3.4	1.5	7/7
C	4	3 x 380-415/660-720	Thermal switch	3.7	2.5	10/10
C	4	3 x 380-415/660-720	Thermal sensor	3.7	2.5	10/10
C	4	3 x 220-240/380-415	Thermal switch	1.2	2.5	10/10
C	5.5	3 x 380-415/660-720	Thermal switch	2.3	2.5	10/10
C	5.5	3 x 380-415/660-720	Thermal sensor	2.3	2.5	10/10
C	5.5	3 x 220-240/380-415	Thermal switch	0.7	2.5	10/10
C	7.5	3 x 380-415/660-720	Thermal switch	1.7	2.5	10/10
C	7.5	3 x 380-415/660-720	Thermal sensor	1.7	2.5	10/10
C	7.5	3 x 220-240/380-415	Thermal switch	0.5	2.5	10/10
D	9.2	3 x 380-415/660-720	Thermal switch	1.3	2.5	10/10
D	9.2	3 x 380-415/660-720	Thermal sensor	1.3	2.5	10/10
D	9.2	3 x 220-240/380-415	Thermal switch	0.4	2.5	10/10
D	11	3 x 380-415/660-720	Thermal switch	1.0	2.5	10/10
D	11	3 x 380-415/660-720	Thermal sensor	1.0	2.5	10/10
D	11	3 x 220-240/380-415	Thermal switch	0.3	2.5	10/10
4-pole						
B	1.5	3 x 220-240	Thermal switch	3.0	1.5	7/7
B	2.2	3 x 220-240	Thermal switch	1.8	1.5	7/7
B	1.5	3 x 380-415	Thermal switch	9.1	1.5	7/7
B	2.2	3 x 380-415	Thermal switch	5.4	1.5	7/7
C	3	3 x 220-240	Thermal switch	1.2	1.5	7/10
C	3	3 x 380-415	Thermal switch	3.5	1.5	7/10
C	3	3 x 380-415	Thermal switch	3.6	1.5	7/10
C	3	3 x 660-720	Thermal switch	10.5	1.5	7/10
C	4	3 x 380-415/660-720	Thermal switch	3.8	2.5	10/10
C	4	3 x 380-415/660-720	Thermal sensor	3.8	2.5	10/10
C	4	3 x 220-240/380-415	Thermal switch	1.3	2.5	10/10
C	5.5	3 x 380-415/660-720	Thermal switch	2.8	2.5	10/10
C	5.5	3 x 380-415/660-720	Thermal sensor	2.8	2.5	10/10
C	5.5	3 x 220-240/380-415	Thermal switch	1.0	2.5	10/10
D	7.5	3 x 380-415/660-720	Thermal switch	1.6	2.5	10/10
D	7.5	3 x 380-415/660-720	Thermal sensor	1.6	2.5	10/10
D	7.5	3 x 220-240/380-415	Thermal switch	0.6	2.5	10/10

The supply cable resistance depends on the cable diameter

Resistance per running metre of cable, 1.5 mm² = 0.012 Ω

Resistance per running metre of cable, 2.5 mm² = 0.007 Ω

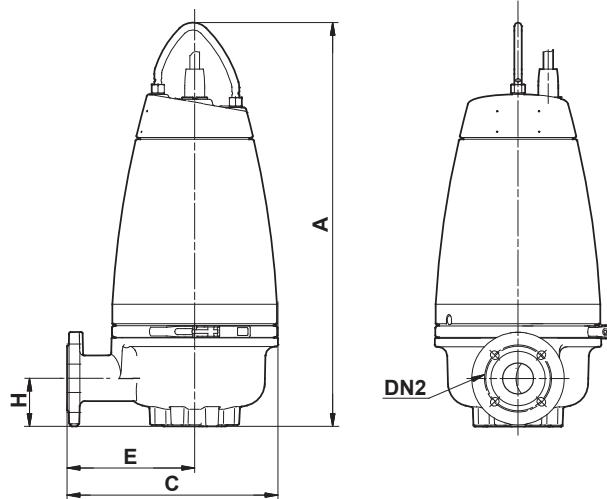
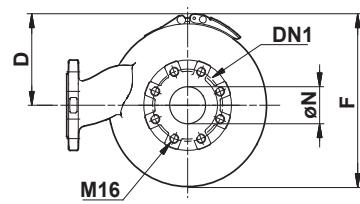
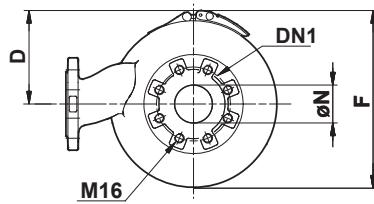
16. Disposal

Disposal of this product or parts of it must be carried out according to the following guidelines:

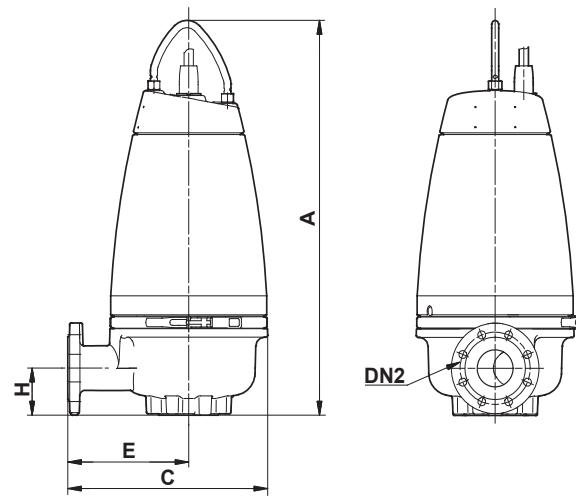
1. Use the local public or private waste collection service.
2. In case such waste collection service does not exist or cannot handle the materials used in the product, please deliver the product or any hazardous materials from it to your nearest Grundfos company or service workshop.

Subject to alterations.

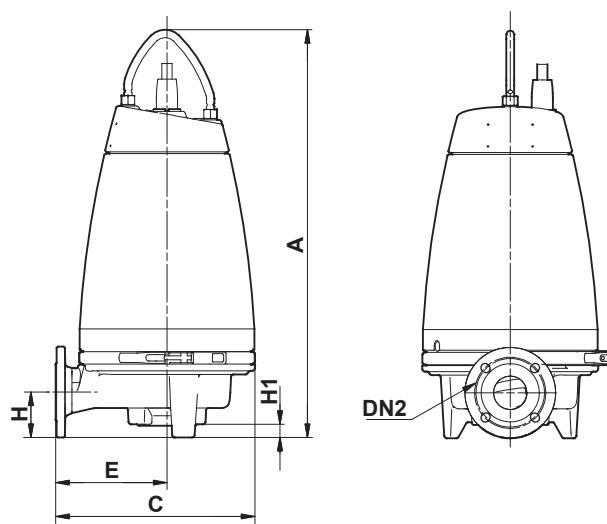
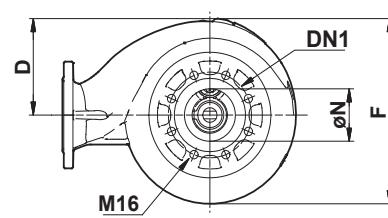
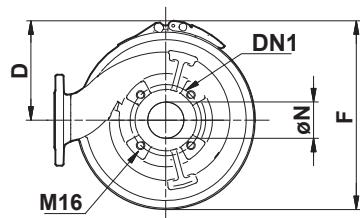
Pump without accessories



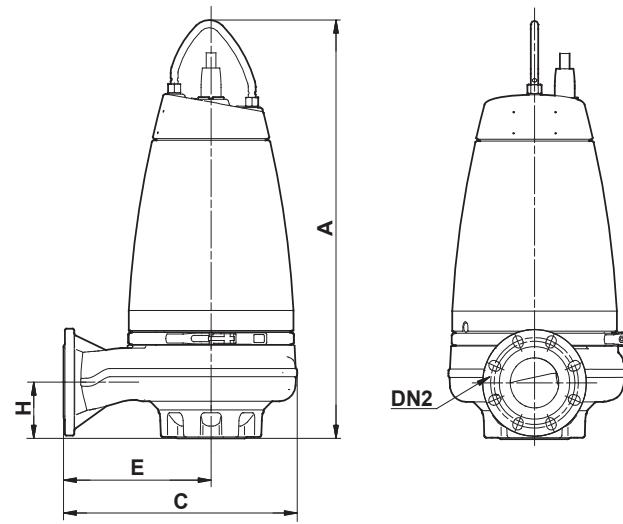
TM02 8271 4803



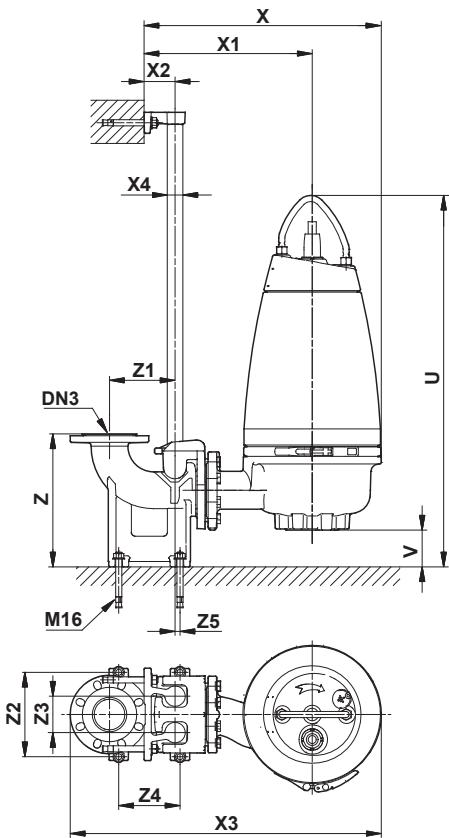
TM02 8257 4803



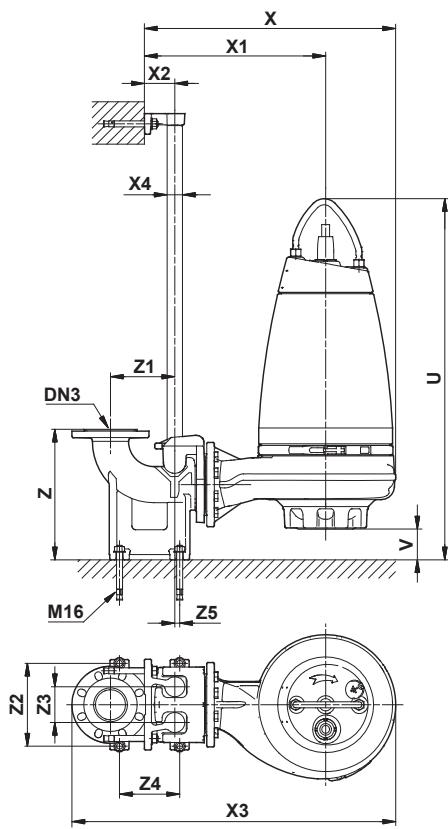
TM02 8260 4803



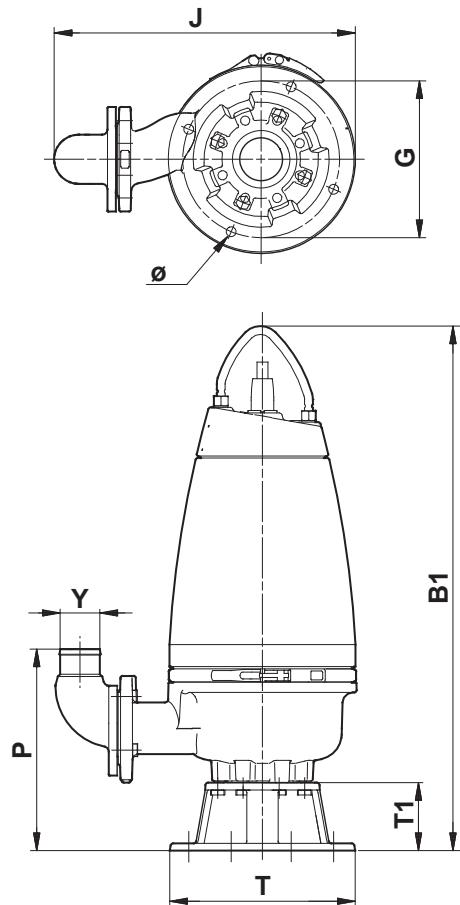
TM02 8256 4803

Submerged pump on auto-coupling

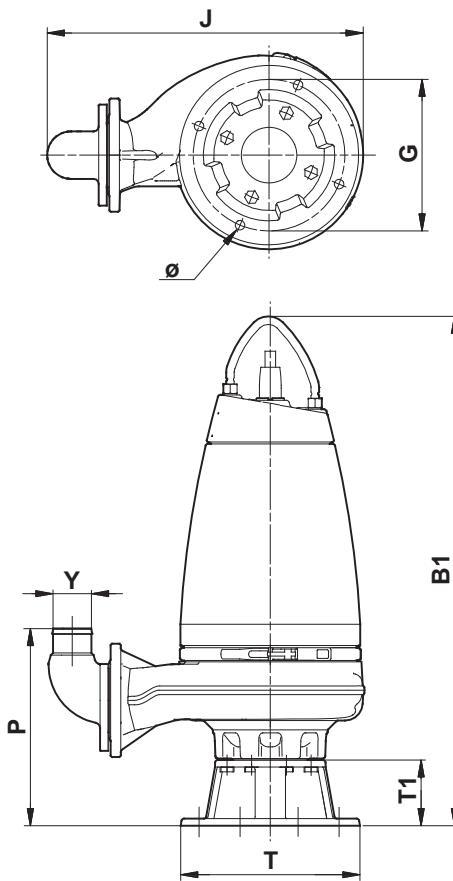
TM02 8279 4803



TM02 8275 4803

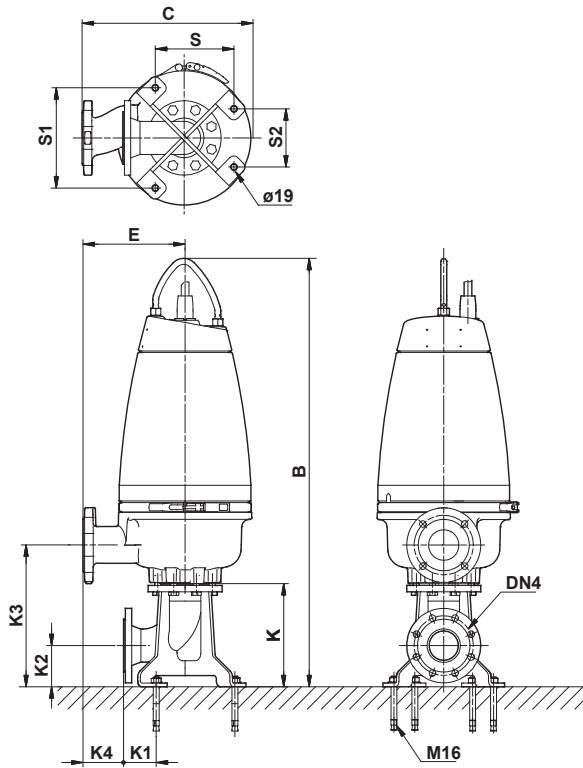
Free-standing submerged pump on ring stand

TM02 8276 4803

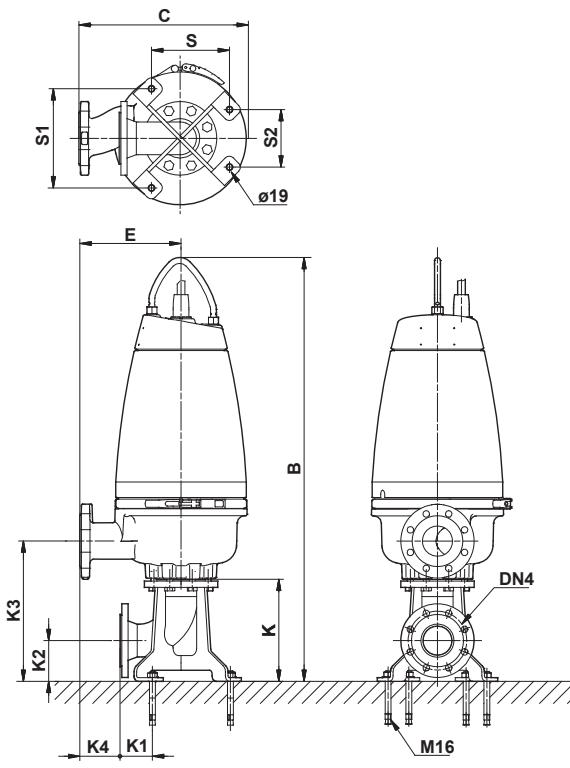


TM02 8272 4803

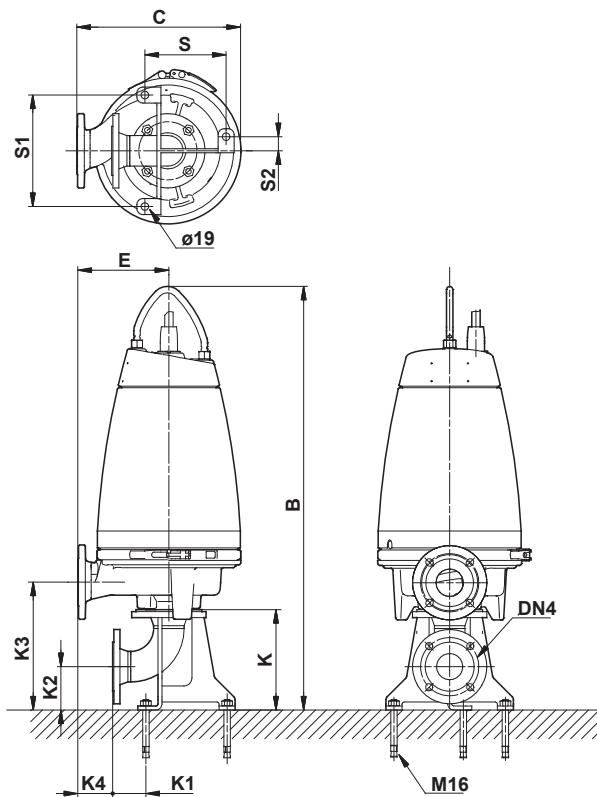
Vertical dry installation on base stand



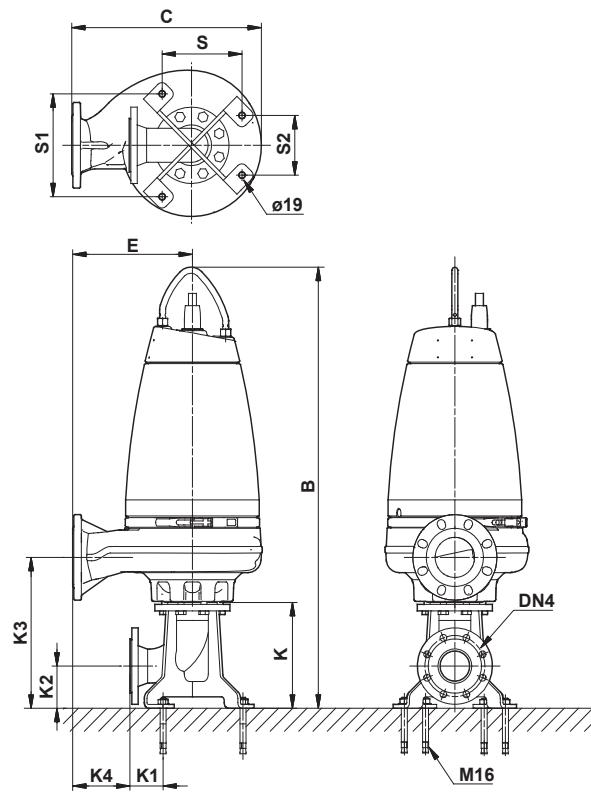
TM02 83336 4803



TM02 8277 4803

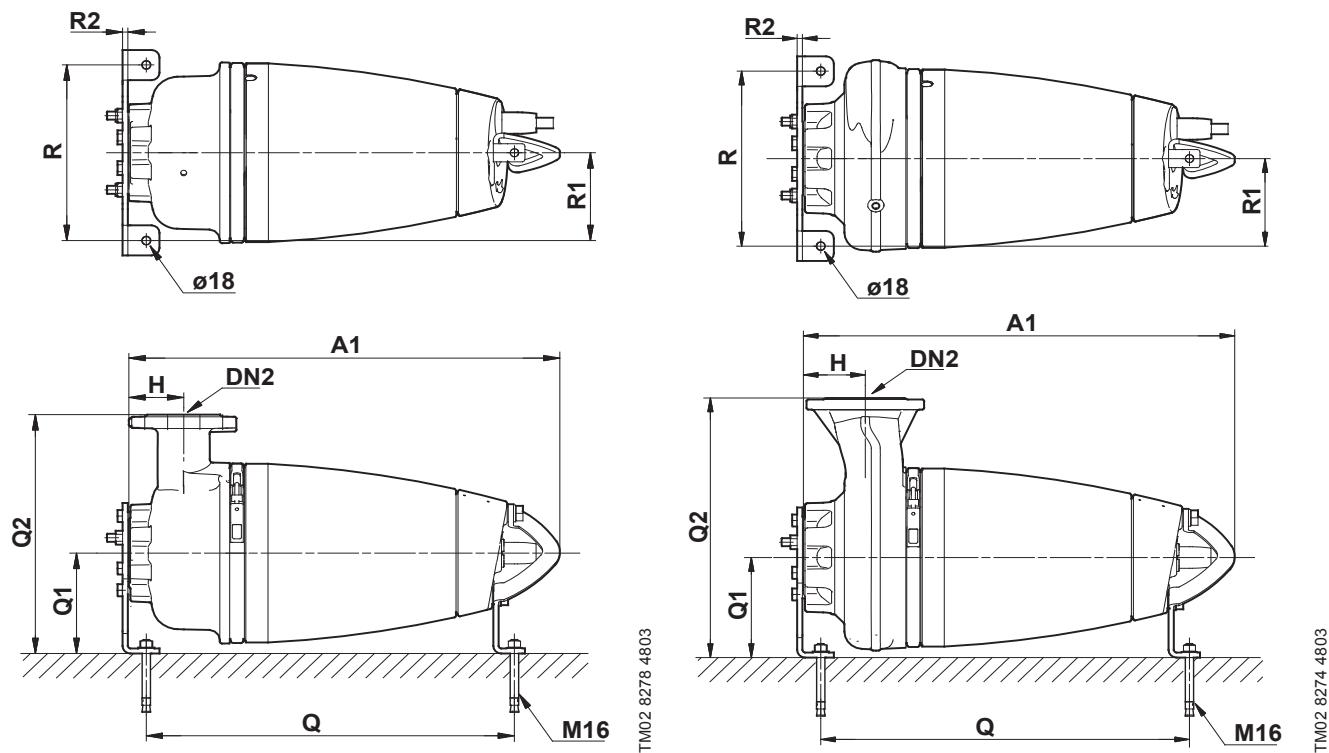


TM02 85643 0404



TM02 8273 4803

Horizontal dry installation with brackets



Pump type	A	A1	B	B1	C	D	DN1	DN2	DN3	DN4	E	F	G	H	H1	J
SE1.50.65.22.2.	753	682	975	857	366	171	65	65	65	65	216	321	270	93	26	491
SE1.50.65.30.2.	753	682	975	857	366	171	65	65	65	65	216	321	270	93	26	491
SE1.50.65.40.2.	831	749	1055	937	407	200	65	65	65	65	227	379	270	93	24	519
SE1.50.80.22.2.	760	682	975	857	366	171	65	80	80	65	216	321	270	100	33	496
SE1.50.80.30.2.	760	682	975	857	366	171	65	80	80	65	216	321	270	100	33	496
SE1.50.80.40.2.	838	749	1055	937	407	200	65	80	80	65	227	379	270	100	31	525

Pump type	K	K1	K2	K3	K4	øN	P	Q	Q1	Q2	R	R1	R2	S	S1	S2	T	T1
SE1.50.65.22.2.	248	62	108	315	76	50	339	579	200	416	350	175	10	202	278	35	325	130
SE1.50.65.30.2.	248	62	108	315	76	50	339	579	200	416	350	175	10	202	278	35	325	130
SE1.50.65.40.2.	248	62	108	317	87	50	341	659	200	427	350	175	10	202	278	35	325	130
SE1.50.80.22.2.	248	62	108	315	76	50	339	579	200	416	350	175	10	202	278	35	325	130
SE1.50.80.30.2.	248	62	108	315	76	50	339	579	200	416	350	175	10	202	278	35	325	130
SE1.50.80.40.2.	248	62	108	317	87	50	341	659	200	427	350	175	10	202	278	35	325	130

Pump type	U	V	X	X1	X2	X3	X4	Y	Z	Z1	Z2	Z3	Z4	Z5	ø	Net weight*
SE1.50.65.22.2.	826	99	513	363	81	700	1½"	65	266	175	210	95	140	1	ø18	86
SE1.50.65.30.2.	826	99	513	363	81	700	1½"	65	266	175	210	95	140	1	ø18	90
SE1.50.65.40.2.	904	97	554	375	81	741	1½"	65	266	175	210	95	140	1	ø18	122
SE1.50.80.22.2.	860	133	526	376	81	719	1½"	80	345	171	220	95	160	13	ø18	87
SE1.50.80.30.2.	860	133	526	376	81	719	1½"	80	345	171	220	95	160	13	ø18	91
SE1.50.80.40.2.	938	131.5	567	387	81	760	1½"	80	345	171	220	95	160	13	ø18	123

* Pump with 10 metres of cable

Pump type	A	A1	B	B1	C	D	DN1	DN2	DN3	DN4	E	F	G	H	H1	J
SE1.80.80.15.4.	776	723	1109	898	435	171	100	80	80	100	272	347	300	100	8	567
SE1.80.80.22.4.	776	723	1109	898	435	171	100	80	80	100	272	347	300	100	8	567
SE1.80.80.30.4.	878	820	1218	1008	505	200	100	80	80	100	319	397	300	118	0	623
SE1.80.80.40.4.	878	820	1218	1008	505	200	100	80	80	100	319	397	300	118	0	623
SE1.80.80.55.4.	878	820	1218	1008	505	200	100	80	80	100	319	397	300	118	0	623
SE1.80.80.75.4.	924	876	1265	1054	530	217	100	80	80	100	328	423	300	118	0	648
SE1.80.100.15.4.	788	723	1109	898	435	171	100	100	100	100	272	347	300	112	20	591
SE1.80.100.22.4.	788	723	1109	898	435	171	100	100	100	100	272	347	300	112	20	591
SE1.80.100.30.4.	878	820	1218	1008	505	200	100	100	100	100	319	397	300	118	0	647
SE1.80.100.40.4.	878	820	1218	1008	505	200	100	100	100	100	319	397	300	118	0	647
SE1.80.100.55.4.	878	820	1218	1008	505	200	100	100	100	100	319	397	300	118	0	647
SE1.80.100.75.4.	924	876	1265	1054	530	217	100	100	100	100	328	423	300	118	0	672

Pump type	K	K1	K2	K3	K4	øN	P	Q	Q1	Q2	R	R1	R2	S	S1	S2	T	T1
SE1.80.80.15.4.	341	106	136	433	67	80	364	620	200	472	350	175	10	255	311	198	355	130
SE1.80.80.22.4.	341	106	136	433	67	80	364	620	200	472	350	175	10	255	311	198	355	130
SE1.80.80.30.4.	341	106	136	458	115	80	390	699	200	519	350	175	10	255	311	198	355	130
SE1.80.80.40.4.	341	106	136	458	115	80	390	699	200	519	350	175	10	255	311	198	355	130
SE1.80.80.55.4.	341	106	136	458	115	80	390	699	200	519	350	175	10	255	311	198	355	130
SE1.80.80.75.4.	341	106	136	459	124	80	390	741	200	528	350	175	10	255	311	198	355	130
SE1.80.100.15.4.	341	106	136	433	67	80	369	620	200	472	350	175	10	255	311	198	355	130
SE1.80.100.22.4.	341	106	136	433	67	80	369	620	200	472	350	175	10	255	311	198	355	130
SE1.80.100.30.4.	341	106	136	459	115	80	395	699	200	519	350	175	10	255	311	198	355	130
SE1.80.100.40.4.	341	106	136	459	115	80	395	699	200	519	350	175	10	255	311	198	355	130
SE1.80.100.55.4.	341	106	136	459	115	80	395	699	200	519	350	175	10	255	311	198	355	130
SE1.80.100.75.4.	341	106	136	459	124	80	395	741	200	528	350	175	10	255	311	198	355	130

Pump type	U	V	X	X1	X2	X3	X4	Y	Z	Z1	Z2	Z3	Z4	Z5	ø	Net weight*
SE1.80.80.15.4.	876	108	595	432	81	788	1½"	80	345	171	220	95	160	13	ø19	98
SE1.80.80.22.4.	876	108	595	432	81	788	1½"	80	345	171	220	95	160	13	ø19	100
SE1.80.80.30.4.	960	82	666	480	81	858	1½"	80	345	171	220	95	160	13	ø19	143
SE1.80.80.40.4.	960	82	666	480	81	858	1½"	80	345	171	220	95	160	13	ø19	152
SE1.80.80.55.4.	960	82	666	480	81	858	1½"	80	345	171	220	95	160	13	ø19	157
SE1.80.80.75.4.	1006	82	690	489	81	883	1½"	80	345	171	220	95	160	13	ø19	205
SE1.80.100.15.4.	916	148	652	489	110	878	2"	100	413	220	260	110	270	0	ø19	99
SE1.80.100.22.4.	916	148	652	489	110	878	2"	100	413	220	260	110	270	0	ø19	101
SE1.80.100.30.4.	1000	122	722	536	110	948	2"	100	413	220	260	110	270	0	ø19	143
SE1.80.100.40.4.	1000	122	722	536	110	948	2"	100	413	220	260	110	270	0	ø19	153
SE1.80.100.55.4.	1000	122	722	536	110	948	2"	100	413	220	260	110	270	0	ø19	158
SE1.80.100.75.4.	1046	122	747	545	110	972	2"	100	413	220	260	110	270	0	ø19	204

* Pump with 10 metres of cable

Pump type	A	A1	B	B1	C	D	DN1	DN2	DN3	DN4	E	F	G	H	H1	J
SE1.100.100.40.4.	885	827	1327	1071	541	200	150	100	100	150	320	438	400	115	0	711
SE1.100.100.55.4.	885	827	1327	1071	541	200	150	100	100	150	320	438	400	115	0	711
SE1.100.100.75.4.	932	884	1375	1118	541	217	150	100	100	150	312	462	400	115	0	706
SE1.100.150.40.4.	900	811	1311	1054	541	200	150	150	150	150	320	440	400	143	32	807
SE1.100.150.55.4.	900	811	1311	1054	541	200	150	150	150	150	320	440	400	143	32	807
SE1.100.150.75.4.	948	868	1359	1102	541	217	150	150	150	150	306	472	400	143	32	803

Pump type	K	K1	K2	K3	K4	øN	P	Q	Q1	Q2	R	R1	R2	S	S1	S2	T	T1
SE1.100.100.40.4.	443	135	159	558	37	100	445	706	300	620	500	250	12	339	396	283	450	186
SE1.100.100.55.4.	443	135	159	558	37	100	445	706	300	620	500	250	12	339	396	283	450	186
SE1.100.100.75.4.	443	135	159	558	29	100	445	749	300	612	500	250	12	339	396	283	450	186
SE1.100.150.40.4.	443	135	159	553	37	100	555	690	300	620	500	250	12	339	396	283	450	186
SE1.100.150.55.4.	443	135	159	553	37	100	555	690	300	620	500	250	12	339	396	283	450	186
SE1.100.150.75.4.	443	135	159	553	23	100	555	733	300	606	500	250	12	339	396	283	450	186

Pump type	U	V	X	X1	X2	X3	X4	Y	Z	Z1	Z2	Z3	Z4	Z5	ø	Net weight*
SE1.100.100.40.4.	1009	125	758	537	110	983	2"	100	413	220	260	110	270	0	ø22	157
SE1.100.100.55.4.	1009	125	758	537	110	983	2"	100	413	220	260	110	270	0	ø22	161
SE1.100.100.75.4.	1057	125	758	529	110	983	2"	100	413	220	260	110	270	0	ø22	204
SE1.100.150.40.4.	1033	164	780	559	110	1093	2"	150	450	280	300	110	340	0	ø22	161
SE1.100.150.55.4.	1033	164	780	559	110	1093	2"	150	450	280	300	110	340	0	ø22	166
SE1.100.150.75.4.	1081	164	780	545	110	1093	2"	150	450	280	300	110	340	0	ø22	210

* Pump with 10 metres of cable

Pump type	A	A1	B	B1	C	D	DN1	DN2	DN3	DN4	E	F	G	H	H1	J
SEV.65.65.22.2.	771	725	1046	899	396	171	80	65	65	80	246	321	280	102	0	524
SEV.65.65.30.2	771	725	1046	899	396	171	80	65	65	80	246	321	280	102	0	524
SEV.65.65.40.2.	848	790	1123	976	456	200	80	65	65	80	276	380	280	106	0	568
SEV.65.80.22.2.	771	726	1047	899	397	171	80	80	80	80	247	321	280	103	0	530
SEV.65.80.30.2.	771	726	1047	899	397	171	80	80	80	80	247	321	280	103	0	530
SEV.65.80.40.2	848	791	1124	976	455	200	80	80	80	80	276	379	280	106	0	573

Pump type	K	K1	K2	K3	K4	øN	P	Q	Q1	Q2	R	R1	R2	S	S1	S2	T	T1
SEV.65.65.22.2.	276	76	111	378	82	65	372	623	200	446	350	175	10	213	269	156	330	128
SEV.65.65.30.2	276	76	111	378	82	65	372	623	200	446	350	175	10	213	269	156	330	128
SEV.65.65.40.2.	276	76	111	381	112	65	376	700	200	476	350	175	10	213	269	156	330	128
SEV.65.80.22.2.	276	76	111	379	83	65	373	623	200	447	350	175	10	213	269	156	330	128
SEV.65.80.30.2.	276	76	111	379	83	65	373	623	200	447	350	175	10	213	269	156	330	128
SEV.65.80.40.2	276	76	111	382	112	65	376	700	200	476	350	175	10	213	269	156	330	128

Pump type	U	V	X	X1	X2	X3	X4	Y	Z	Z1	Z2	Z3	Z4	Z5	ø	Net weight*
SEV.65.65.22.2.	834	63	543	394	81	730	1½"	65	266	175	210	95	140	1	ø18	89
SEV.65.65.30.2	834	63	543	394	81	730	1½"	65	266	175	210	95	140	1	ø18	92
SEV.65.65.40.2.	908	60	604	424	81	790	1½"	65	266	175	210	95	140	1	ø18	128
SEV.65.80.22.2.	868	97	557	408	81	750	1½"	80	345	171	220	95	160	13	ø18	90
SEV.65.80.30.2.	868	97	557	408	81	750	1½"	80	345	171	220	95	160	13	ø18	94
SEV.65.80.40.2	942	94	616	437	81	808	1½"	80	345	171	220	95	160	13	ø18	126

* Pump with 10 metres of cable

Pump type	A	A1	B	B1	C	D	DN1	DN2	DN3	DN4	E	F	G	H	H1	J
SEV.80.80.11.4.	798	752	1073	926	409	171	80	80	80	80	241	339	280	109	0	527
SEV.80.80.13.4.	798	752	1073	926	409	171	80	80	80	80	241	339	280	109	0	527
SEV.80.80.15.4.	798	752	1073	926	409	171	80	80	80	80	241	339	280	109	0	527
SEV.80.80.22.4.	798	752	1073	926	409	171	80	80	80	80	241	339	280	109	0	527
SEV.80.80.40.4.	878	821	1154	1006	460	200	80	80	80	80	267	393	280	109	0	578
SEV.80.80.40.2.	874	816	1149	1002	456	200	80	80	80	80	276	380	280	104	0	574
SEV.80.80.60.2.	874	816	1149	1002	456	200	80	80	80	80	276	380	280	104	0	574
SEV.80.80.75.2.	874	816	1149	1002	456	200	80	80	80	80	276	380	280	104	0	574
SEV.80.80.92.2.	922	874	1198	1050	489	217	80	80	80	80	293	413	280	123	0	607
SEV.80.80.110.2	922	874	1198	1050	489	217	80	80	80	80	293	413	280	123	0	607

Pump type	K	K1	K2	K3	K4	øN	P	Q	Q1	Q2	R	R1	R2	S	S1	S2	T	T1
SEV.80.80.11.4.	276	76	111	385	77	80	379	650	200	441	350	175	10	213	269	156	330	128
SEV.80.80.13.4.	276	76	111	385	77	80	379	650	200	441	350	175	10	213	269	156	330	128
SEV.80.80.15.4.	276	76	111	385	77	80	379	650	200	441	350	175	10	213	269	156	330	128
SEV.80.80.22.4.	276	76	111	385	77	80	379	650	200	441	350	175	10	213	269	156	330	128
SEV.80.80.40.4.	276	76	111	385	103	80	379	700	200	467	350	175	10	213	269	156	330	128
SEV.80.80.40.2.	276	76	111	380	112	80	374	726	200	476	350	175	10	213	269	156	330	128
SEV.80.80.60.2.	276	76	111	380	112	80	374	695	200	476	350	175	10	213	269	156	330	128
SEV.80.80.75.2.	276	76	111	380	112	80	374	695	200	476	350	175	10	213	269	156	330	128
SEV.80.80.92.2.	276	76	111	399	129	80	393	739	200	493	350	175	10	213	269	156	330	128
SEV.80.80.110.2	276	76	111	399	129	80	393	739	200	493	350	175	10	213	269	156	330	128

Pump type	U	V	X	X1	X2	X3	X4	Y	Z	Z1	Z2	Z3	Z4	Z5	ø	Net weight*	
SEV.80.80.11.4.	889	91	569	402	81	762	1½"	80	345	171	220	95	160	13	ø18	95	
SEV.80.80.13.4.	889	91	569	402	81	762	1½"	80	345	171	220	95	160	13	ø18	103	
SEV.80.80.15.4.	889	91	569	402	81	762	1½"	80	345	171	220	95	160	13	ø18	103	
SEV.80.80.22.4.	889	91	569	402	81	762	1½"	80	345	171	220	95	160	13	ø18	106	
SEV.80.80.40.4.	969	91	620	428	81	813	1½"	80	345	171	220	95	160	13	ø18	143	
SEV.80.80.40.2.	970	96	617	437	81	809	1½"	80	345	171	220	95	160	13	ø18	131	
SEV.80.80.60.2.	970	96	617	437	81	809	1½"	80	345	171	220	95	160	13	ø18	141	
SEV.80.80.75.2.	970	96	617	437	81	809	1½"	80	345	171	220	95	160	13	ø18	142	
SEV.80.80.92.2.	999	77	650	454	81	842	1½"	80	345	171	220	95	160	13	ø18	190	
SEV.80.80.110.2	999	77	650	454	81	842	1½"	80	345	171	220	95	160	13	ø18	195	

* Pump with 10 metres of cable

Pump type	A	A1	B	B1	C	D	DN1	DN2	DN3	DN4	E	F	G	H	H1	J
SEV.100.100.30.4.	889	832	1230	1019	457	200	100	100	100	100	277	380	300	134	0	599
SEV.100.100.40.4.	889	832	1230	1019	457	200	100	100	100	100	277	380	300	134	0	599
SEV.100.100.55.4.	889	832	1230	1019	457	200	100	100	100	100	277	380	300	134	0	599
SEV.100.100.75.4.	948	900	1288	1078	490	217	100	100	100	100	294	413	300	145	0	632

Pump type	K	K1	K2	K3	K4	øN	P	Q	Q1	Q2	R	R1	R2	S	S1	S2	T	T1
SEV.100.100.30.4.	341	106	136	474	73	100	411	711	200	477	350	175	10	255	311	198	355	130
SEV.100.100.40.4.	341	106	136	474	73	100	411	711	200	477	350	175	10	255	311	198	355	130
SEV.100.100.55.4.	341	106	136	474	73	100	411	711	200	477	350	175	10	255	311	198	355	130
SEV.100.100.75.4.	341	106	136	485	89	100	422	765	200	494	350	175	10	255	311	198	355	130

Pump type	U	V	X	X1	X2	X3	X4	Y	Z	Z1	Z2	Z3	Z4	Z5	ø	Net weight*	
SEV.100.100.30.4.	996	106	674	494	110	900	2"	100	413	220	260	110	270	0	ø19	133	
SEV.100.100.40.4.	996	106	674	494	110	900	2"	100	413	220	260	110	270	0	ø19	141	
SEV.100.100.55.4.	996	106	674	494	110	900	2"	100	413	220	260	110	270	0	ø19	146	
SEV.100.100.75.4.	1043	95	707	511	110	933	2"	100	413	220	260	110	270	0	ø19	190	

* Pump with 10 metres of cable

Pos.	Description (GB)	Beschreibung (D)	Description (F)	Descrizione (I)
6a	Pin	Stift	Goupille	Perno
7a	Rivet	Kerbnagel	Rivet	Rivetto
9a	Key	Keil	Clavette	Chiavetta
37	O-ring	O-Ring	Joint torique	O-ring
37a	O-ring	O-Ring	Joint torique	O-ring
37b	O-ring	O-Ring	Joint torique	O-ring
46	Seal ring	Dichtungsring	Bague d'étanchéité	Anello di tenuta
48	Stator	Stator	Stator	Statore
49	Impeller	Laufrad	Roue	Girante
49c	Wear ring	Verschleißring	Bague d'usure	Anello di usura
50	Pump housing	Pumpengehäuse	Corps de pompe	Corpo pompa
55	Stator housing	Statorgehäuse	Logement de stator	Cassa statore
58	Cover for oil chamber	Deckel für Ölsperrkammer	Couvercle de chambre à huile	Coperchio della camera dell'olio
59	Bearing cover	Lagerdeckel	Couvercle de palier	Copri cuscinetto
60	Bearing retainer	Lagerhalter	Support palier	Flangia di fermo cuscinetto
61	Bearing retainer	Lagerhalter	Support palier	Flangia di fermo cuscinetto
66	Washer	Unterlegscheibe	Rondelle	Rondella
76	Nameplate	Leistungsschild	Plaque signalétique	Targhetta di identificazione
92	Clamp	Spannband	Collier de serrage	Fascetta
92a	Screw	Schraube	Vis	Vite
102	O-ring	O-Ring	Joint torique	O-ring
105	Shaft seal	Wellenabdichtung	Garniture mécanique	Tenuta meccanica
107	O-ring	O-Ring	Joint torique	O-ring
108	O-ring	O-Ring	Joint torique	O-ring
150	Sleeve	Mantel	Chemise	Mantello
151	Top cover	Oberer Deckel	Couvercle supérieur	Coperchio superiore
153	Bearing	Lager	Roulement	Cuscinetto
153b	O-ring	O-Ring	Joint torique	O-ring
154	Bearing	Lager	Roulement	Cuscinetto
155	Adapter flange	Zwischenflansch	Bride d'adaptation	Flangia di connessione al motore
157	Corrugated spring	Gewellte Feder	Ressort ondulé	Molla ondulata
158	Corrugated spring	Gewellte Feder	Ressort ondulé	Molla ondulata
159	O-ring	O-Ring	Joint torique	O-ring
172	Rotor/shaft	Rotor/Welle	Rotor/arbre	Gruppo rotore/albero
173	Screw	Schraube	Vis	Vite
173a	Washer	Unterlegscheibe	Rondelle	Rondella
174	Screw	Schraube	Vis	Vite
174a	Washer	Unterlegscheibe	Rondelle	Rondella
176	Inner plug part	Kabelanschluss, innerer Teil	Partie intérieure de la fiche	Parte interna del connettore
177	Plug protector	Steckerschutz	Protège fiche	Protezione del connettore
181	Outer plug part	Kabelanschluss, äußerer Teil	Partie extérieure de la fiche	Parte esterna del connettore
182	Screw	Schraube	Vis	Vite
183	Screw	Schraube	Vis	Vite
183a	Washer	Unterlegscheibe	Rondelle	Rondella
184	Screw	Schraube	Vis	Vite
184a	Washer	Unterlegscheibe	Rondelle	Rondella
186	Screw	Schraube	Vis	Vite
188	Screw	Schraube	Vis	Vite
188a	Screw	Schraube	Vis	Vite
190	Lifting bracket	Transportbügel	Poignée de levage	Maniglia di sollevamento
190a	O-ring	O-Ring	Joint torique	O-ring
193	Oil screw	Ölschraube	Bouchon d'huile	Tappo dell'olio
193a	Oil	Öl	Huile	Olio
194	Gasket	Dichtung	Joint d'étanchéité	Guarnizione
198	O-ring	O-Ring	Joint torique	O-ring
520	Moisture sensor	Feuchtefühler	Capteur d'humidité	Sensore di umidità
521	WIO sensor	WIO Sensor	Capteur WIO	Sensore WIO
522	Holder for 521	Halter für 521	Douille pour 521	Suporte para 521

Pos.	Descripción (E)	Descrição (P)	Περιγραφή (GR)	Omschrijving (NL)
6a	Pasador	Pino	Πείρος	Paspen
7a	Remache	Rebite	Πριτσίνι	Klinknagel
9a	Chaveta	Chave	Κλειδί	Spie
37	Junta tórica	O-ring	Δακτύλιοι-Ο	O-ring
37a	Junta tórica	O-ring	Δακτύλιοι-Ο	O-ring
37b	Junta tórica	O-ring	Δακτύλιοι-Ο	O-ring
46	Anillo de cierre	Anel de empanque	Δακτύλιο στεγανότητας	Afdichtingsring
48	Estator	Estator	Στάτης	Stator
49	Impulsor	Impulsor	Πτερωτή	Waaier
49c	Anillo de desgaste	Anel de desgaste	Δακτύλιο τριβής	Slijtring
50	Cuerpo de bomba	Voluta da bomba	Περιβλημα αντλίας	Pomphuis
55	Alojamiento de estator	Carcaça do estator	Περίβλημα στάτη	Statorhuis
58	Tapa de la cámara de aceite	Tampa da câmara de óleo	Καπάκι για το θάλαμο λαδιού	Deksel voor de oliekamer
59	Tapa de cojinete	Tampa do rolamento	Κάλυμμα εδράνου	LagerdekSEL
60	Retén de cojinete	Retentor dos rolamentos	Στήριγμα εδράνου	Lagerhuis
61	Retén de cojinete	Retentor dos rolamentos	Στήριγμα εδράνου	Lagerhuis
66	Arandela	Anilha	Ροδέλα	Ring
76	Placa de características	Chapa de características	Πινακίδα	Type plaatje
92	Abrazadera	Grampo	Στεφόνη	Klembeugel
92a	Tornillo	Parafuso	Βίδα	Schroef
102	Junta tórica	O-ring	Δακτύλιοι-Ο	O-ring
105	Cierre	Empanque	Στυπιθλίπτης άξονα	As afdichting
107	Junta tórica	O-ring	Δακτύλιοι-Ο	O-ring
108	Junta tórica	O-ring	Δακτύλιοι-Ο	O-ring
150	Camisa	Camisa	Χιτώνιο	Motorhuis
151	Tapa superior	Cobertura superior	Άνω καπάκι	Motorhuisdeksel
153	Cojinete	Rolamento	Έδρανο	Kogellager
153b	Junta tórica	O-ring	Δακτύλιοι-Ο	O-ring
154	Cojinete	Rolamento	Έδρανο	Kogellager
155	Brida adaptadora	Flange de adaptação	Φλάντζα προσαρμογής	Koppelingsflens
157	Muelle ondulado	Mola	Αυλακωτό ελατήριο	Drukring
158	Muelle ondulado	Mola	Αυλακωτό ελατήριο	Drukring
159	Arandela	O-ring	Δακτύλιοι-Ο	O-ring
172	Rotor/eje	Rotor/veio	Ρότορας/άξονας	Rotor/as
173	Tornillo	Parafuso	Βίδα	Schroef
173a	Arandela	Anilha	Ροδέλα	Ring
174	Tornillo	Parafuso	Βίδα	Schroef
174a	Arandela	Anilha	Ροδέλα	Ring
176	Parte de clavija interior	Parte interna da ficha	Εσωτερικό τμήμα φις	Kabel connector inwendig
177	Protector de clavija	Protecção da ficha	Προστασία φις	Stekker beveiliging
181	Parte de clavija exterior	Parte externa da ficha	Εξωτερικό τμήμα φις	Kabel connector uitwendig
182	Tornillo	Parafuso	Βίδα	Schroef
183	Tornillo	Parafuso	Βίδα	Schroef
183a	Arandela	Anilha	Ροδέλα	Ring
184	Tornillo	Parafuso	Βίδα	Schroef
184a	Arandela	Anilha	Ροδέλα	Ring
186	Tornillo	Parafuso	Βίδα	Schroef
188	Tornillo	Parafuso	Βίδα	Schroef
188a	Tornillo	Parafuso	Βίδα	Schroef
190	Asa	Suporte de elevação	Κρίκος ανάρτησης	Ophangbeugel
190a	Junta tórica	O-ring	Δακτύλιοι-Ο	O-ring
193	Tornillo de aceite	Parafuso do óleo	Βίδα λαδιού	Inbusbout
193a	Aceite	Óleo	Λάδι	Olie
194	Junta	Junta	Τσιμούχα	Pakking ring
198	Junta tórica	O-ring	Δακτύλιοι-Ο	O-ring
520	Sensor de humedad	Sensor de humidade	Αισθητήριο υγρασίας	Vochtsensor
521	Sensor WIO	Sensor WIO	Αισθητήριο WIO	WIO sensor
522	Soporte para 521	Suporte para 521	Στήριγμα για το 521	Klem voor 521

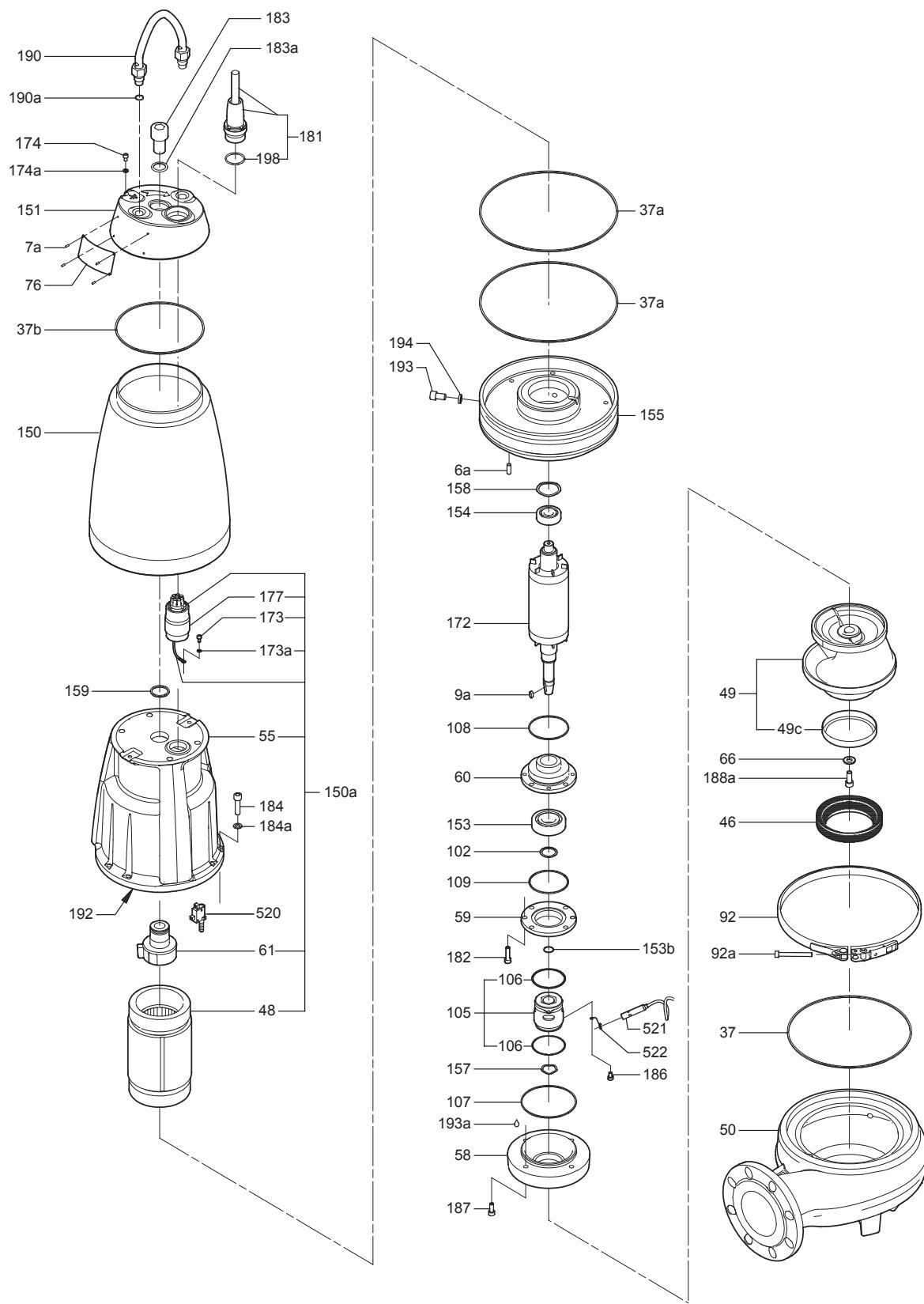
Pos.	Beskrivning (S)	Kuvaus (FIN)	Beskrivelse (DK)
6a	Stift	Tappi	Stift
7a	Nit	Niitti	Nitte
9a	Kil	Kiila	Feder
37	O-ring	O-rengas	O-ring
37a	O-ring	O-rengas	O-ring
37b	O-ring	O-rengas	O-ring
46	Tätningsring	Tiivisterengas	Tætningsring
48	Stator	Staattori	Stator
49	Pumphjul	Juoksupyörä	Løber
49c	Sltring	Kulutusrengas	Slidring
50	Pumphus	Pumppupesä	Pumpehus
55	Statorhus	Staattoripesä	Statorhus
58	Oljekammarens lock	Öljykammion kansi	Dæksel for oliekammer
59	Lagerlock	Laakerikansi	Lejedæksel
60	Lagerhållare	Laakerin lukitsin	Lejeholder
61	Lagerhållare	Laakerin lukitsin	Lejeholder
66	Bricka	Aluslevy	Spændeskive
76	Typskilt	Arvokilpi	Typeskilt
92	Spännsband	Kiinnityspanta	Spændebånd
92a	Skruv	Ruuvi	Skrue
102	O-ring	O-rengas	O-ring
105	Axeltätning	Akselitiviste	Akseltætning
107	O-ring	O-rengas	O-ring
108	O-ring	O-rengas	O-ring
150	Hylsa	Vaippa	Svøb
151	Toppkåpa	Yläkotelo	Topdæksel
153	Lager	Laakeri	Leje
153b	O-ring	O-rengas	O-ring
154	Lager	Laakeri	Leje
155	Adapterfläns	Adapterilaippa	Mellemlange
157	Fjäder	Aaltojousi	Bølggefjeder
158	Fjäder	Aaltojousi	Bølggefjeder
159	O-ring	O-rengas	O-ring
172	Rotor/axel	Roottori/akseli	Rotor/aksel
173	Skruv	Ruuvi	Skrue
173a	Bricka	Aluslevy	Spændeskive
174	Skruv	Ruuvi	Skrue
174a	Bricka	Aluslevy	Spændeskive
176	Kontakt, inre del	Sisäpuolinens tulppaosa	Indvendig stikdel
177	Skydd för kontakt	Tulpan suoja	Stikbeskytter
181	Kontakt, yttre del	Ulkopuolinens tulppaosa	Udvendig stikdel
182	Skruv	Ruuvi	Skrue
183	Skruv	Ruuvi	Skrue
183a	Bricka	Aluslevy	Spændeskive
184	Skruv	Ruuvi	Skrue
184a	Bricka	Aluslevy	Spændeskive
186	Skruv	Ruuvi	Skrue
188	Skruv	Ruuvi	Skrue
188a	Skruv	Ruuvi	Skrue
190	Lyftbygel	Nostosanka	Løftebøjle
190a	O-ring	O-rengas	O-ring
193	Oljeskruv	Öljytulppa	Olieskrue
193a	Olja	Öljy	Olie
194	Packning	Tiviste	Pakning
198	O-ring	O-rengas	O-ring
520	Fuktsensor	Kosteusanturi	Fugtføler
521	WIO-givare	WIO-anturi	WIO sensor
522	Hållare för 521	Pidike 521:lle	Holder for 521

Pos.	Opis (PL)	Наименование (RU)	Megnevezés (H)	Opis (SI)
6a	Kołek	Штифт	Csap	Zatič
7a	Nit	Заклепка	Szegecs	Zakovica
9a	Klin	Шпонка	Rögzítőék	Zatič
37	Pierścień O-ring	Уплотнительное кольцо	O-gyűrű	O-obroč
37a	Pierścień O-ring	Уплотнительное кольцо	O-gyűrű	O-obroč
37b	Pierścień O-ring	Уплотнительное кольцо	O-gyűrű	O-obroč
46	Pierścień uszczelniający	Уплотнение кольцевое	Tengelytömítés	Tesnilni obroč
48	Stator	Статор	Állórész	Stator
49	Wirnik	Рабочее колесо	Járókerék	Tekalno kolo
49c	Pierscień osadczy	Защитное кольцо	Csapággyűrű	Obrabni obroč
50	Korpus pompy	Корпус насоса	Szivattyúház	Ohišje črpalka
55	Obudowa statora	Корпус статора	Állórészhang	Ohišje statorja
58	Pokrywa komory oleju	Крышка масляной камеры	Olajház	Pokrivalo oljne komore
59	Pokrywa łożyska	Крышка подшипника	Csapággyfedél	Pokrov ležaja
60	Komora łożyska	Опора подшипника	Csapággyház	Držalo
61	Komora łożyska	Опора подшипника	Csapággyház	Držalo
66	Podkładka	Шайба	Alátét	Tesnilni obroč
76	Tabliczka znamionowa	Заводская табличка	Adattábla	Tipska ploščica
92	Zacisk	Хомут	Bilincs	Sponka
92a	Šruba	Винт	Csavar	Vijak
102	Pierścień O-ring	Уплотнительное кольцо	O-gyűrű	O-obroč
105	Uszczelnienie wału	Уплотнение вала	Tengelytömítés	Tesnilni osi
107	Pierścień O-ring	Уплотнительное кольцо	O-gyűrű	O-obroč
108	Pierścień O-ring	Уплотнительное кольцо	O-gyűrű	O-obroč
150	Kadłub pompy	Кожух насоса	Állórészhang	Oklep
151	Pokrywa górska	Верхняя крышка	Ház fedél	Zgornji pokrov
153	Łożysko	Подшипник	Csapág	Ležaj
153b	Pierścień O-ring	Уплотнительное кольцо	O-gyűrű	O-obroč
154	Łożysko	Подшипник	Csapág	Ležaj
155	Dolna pokrwa silnika	Переходник	Csatlakozókarima	Prirobnica adapterja
157	Pierścień sprężysty	Пружинное кольцо	Hullámrugó	Vzmet
158	Pierścień sprężysty	Пружинное кольцо	Hullámrugó	Vzmet
159	Pierścień O-ring	Уплотнительное кольцо	O-gyűrű	O-obroč
172	Rotor/wał	Ротор/вал	Forgórész/tengely	Rotor/os
173	Šruba	Винт	Csavar	Vijak
173a	Podkładka	Шайба	Alátét	Tesnilni obroč
174	Šruba	Винт	Csavar	Vijak
174a	Podkładka	Шайба	Alátét	Tesnilni obroč
176	Łącze kablowe wewnętrzne	Внутренняя часть разъема	Belső kábelbevezetés	Notranji vtični del
177	Obudowa łączki kablowego	Защита разъема	Csatlakozásvédő	Čep
181	Łącze kablowe zewnętrzne	Наружная часть разъема	Külső kábelbevezetés	Zunanji vtični del
182	Šruba	Винт	Csavar	Vijak
183	Šruba	Винт	Csavar	Vijak
183a	Podkładka	Шайба	Alátét	Tesnilni obroč
184	Šruba	Винт	Csavar	Vijak
184a	Podkładka	Шайба	Alátét	Tesnilni obroč
186	Šruba	Винт	Csavar	Vijak
188	Šruba	Винт	Csavar	Vijak
188a	Šruba	Винт	Csavar	Vijak
190	Uchwyt	Подъемная скоба	Emelőfél	Ročaj
190a	Pierścień O-ring	Уплотнительное кольцо	O-gyűrű	O-obroč
193	Šruba komory oleju	Масляная пробка	Olajtoltónyílás zárócsavarja	Oljni vijak
193a	Olej	Масло	Olaj	Olje
194	Uszczelka	Прокладка	Tömítés	Tesnilni obroč
198	Pierścień O-ring	Уплотнительное кольцо	O-gyűrű	O-obroč
520	Przetwornik wilgotnościowy	Датчик влажности	Nedvesség érzékelő	Senzor vlage
521	WIO przetwornik	Датчик WIO	WIO érzékelő	WIO senzor
522	Uchwyt do 521	Держатель для 521	Tartó az 521-hez	Držalo za 521

Pos.	Opis (HR)	Naziv (YU)	Descriere (RO)	Описание (BG)
6a	nožica	Klin	Pin	Щифт
7a	zarezani čavao	Zakovica	Nit	Нит
9a	opruga	Klin	Pană	Фиксатор
37	O-prsten	O-prsten	Inel O	О-пръстени
37a	O-prsten	O-prsten	Inel O	О-пръстени
37b	O-prsten	O-prsten	Inel O	О-пръстени
46	brtveni prsten	Zaptivač	Inelul de etanșare	Уплътнителен пръстен
48	stator	Stator	Stator	Статор
49	rotor	Propeler	Rotor	Работно колело
49c	žrtveni prsten	Potrošni prsten	Inelul de uzură	Сменяям пръстен
50	kućište crpke	Kućište pumpe	Carcasă pompă	Помлен корпус
55	kućište statora	Stator kućišta	Carcasă stator	Корпус на статора
58	poklopac komore za ulje	Poklopac za komoru sa uljem	Capacul camerei de ulei	Капак за маслената камера
59	poklopac ležaja	Poklopac ležaja	Carcasă rulment	Лагерен капак
60	pričvrsni dio ležaja	Pridržavač ležaja	Capac fixare rulment	Лагерен фиксатор
61	pričvrsni dio ležaja	Pridržavač ležaja	Capac fixare rulment	Лагерен фиксатор
66	podložna pločica	Prsten podloške	Şaiba	Шайба
76	natpisna pločica	Pločica za obeležavanje	Plăcuță de identificare	Табела
92	zatezna traka	Obujmica spajanja	Colier de prindere	Скоба
92a	vijak	Zavrtanj	Şurub	Винт
102	O-prsten	O-prsten	Inel O	О-пръстени
105	brtva vratila	Zaptivka osovine	Etanșare de arbore	Уплътнение при вала
107	O-prsten	O-prsten	Inel O	О-пръстени
108	O-prsten	O-prsten	Inel O	О-пръстени
150	plašt	Rukavac	Manşon	Кожух
151	gornji poklopac	Gornji poklopac	Capac	Горен капак
153	ležaj	Kuglični ležaj	Rulment	Лагер
153b	O-prsten	O-prsten	Inel O	О-пръстени
154	ležaj	Kuglični ležaj	Rulment	Лагер
155	međuprirubnica	Adapterska prirubnica	Carcasă intermediară	Адапторен фланец
157	valovita opruga	Sigurnosni prste	Arc canelat	Гофрирана пружина
158	valovita opruga	Sigurnosni prste	Arc canelat	Гофрирана пружина
159	O-prsten	O-prsten	Inel O	О-пръстени
172	rotor/vratilo	Rotor/osovina	Rotor/ax	Ротор/вал
173	vijak	Zavrtanj	Şurub	Винт
173a	podložna pločica	Prsten podloške	Şaiba	Шайба
174	vijak	Zavrtanj	Şurub	Винт
174a	podložna pločica	Prsten podloške	Şaiba	Шайба
176	kabel. priključak, nutarnji dio	Unutrašnji deo konektora	Cablu conector intrare	Вътрешна част на щепсела
177	zaštita utikača	Zaštita utikača	Mufă electrică	Протектор на куплунга
181	kabel. priključak, vanjski dio	Spoljni deo konektora	Cablu conector ieșire	Външна част на щепсела
182	vijak	Zavrtanj	Şurub	Винт
183	vijak	Zavrtanj	Şurub	Винт
183a	podložna pločica	Prsten podloške	Şaiba	Шайба
184	vijak	Zavrtanj	Şurub	Винт
184a	podložna pločica	Prsten podloške	Şaiba	Шайба
186	vijak	Zavrtanj	Şurub	Винт
188	vijak	Zavrtanj	Şurub	Винт
188a	vijak	Zavrtanj	Şurub	Винт
190	transportni stremen	Ručica	Consolă de ridicare	Ръкохватка
190a	O-prsten	O-prsten	Inel O	О-пръстени
193	vijak za ulje	Zavrtanj za ulje	Bușon de ulei	Винт при камерата за масло
193a	ulje	Ulej	Ulei	Масло
194	brtva	Podloška	Şaiba	Гарнитура
198	O-prsten	O-prsten	Inel O	О-пръстени
520	Senzor vlage	Senzor vlage	Senzor de umezeală	Сензор за влага
521	WIO senzor	WIO senzor	Senzor WIO	WIO сензор (сензор за вода в маслото)
522	Držač za 521	Držač za 521	Detinator pentru 521	Държач за 521

Pos.	Popis (CZ)	Popis (SK)	Tanım (TR)
6a	Kolík	Kolík	Pim
7a	Nýt	Nýt	Percin
9a	Pero	Pero	Anahtar
37	O-kroužek	O-krúžok	O-ring
37a	O-kroužek	O-krúžok	O-ring
37b	O-kroužek	O-krúžok	O-ring
46	Těsnicí kruh	Tesniaci krúžok	Salmastra contası
48	Stator	Stator	Stator
49	Oběžné kolo	Obežné koleso	Çark
49c	Návlek oběžného kola	Tesniace púzdro	Aşınma halkası
50	Těleso čerpadla	Teleso čerpadla	Pompa gövdesi
55	Těleso statoru	Teleso statora	Stator muhafazası
58	Víko olejové komory	Kryt olejovej komory	Yağ hazne kapağı
59	Víko ložiska	Veko ložiska	Rulman kapağı
60	Těleso ložiska	Teleso ložiska	Rulman süzgeci
61	Těleso ložiska	Teleso ložiska	Rulman süzgeci
66	Podložka	Podložka	Pul
76	Typový štítek	Typový štítok	Bilgi etiketi
92	Fixační objímka	Fixačná objímka	Kelepçe
92a	Šroub	Skrutka	Vida
102	O-kroužek	O-krúžok	O-ring
105	Hřídelová upcpávka	Hriadeľová upchávka	Salmastra
107	O-kroužek	O-krúžok	O-ring
108	O-kroužek	O-krúžok	O-ring
150	Plášť	Plášť	Gömlek
151	Horní víko čerpadla	Vrchný kryt	Üst kapak
153	Ložisko	Ložisko	Rulman
153b	O-kroužek	O-krúžok	O-ring
154	Ložisko	Ložisko	Rulman
155	Přechodová příruba	Prechodová príruba	Flanşlı adaptör
157	Tlačná pružina	Tlačná pružina	Oluklu yay
158	Tlačná pružina	Tlačná pružina	Oluklu yay
159	O-kroužek	O-krúžok	O-ring
172	Rotor/hřídel	Rotor/hriadeľ	Rotor/mil
173	Šroub	Skrutka	Vida
173a	Podložka	Podložka	Pul
174	Šroub	Skrutka	Vida
174a	Podložka	Podložka	Pul
176	Vnitřní část kabelové průchodky	Vnútorná časť káblevej priechodky	İç fiş kısmı
177	Těsnění elektrické přípojky	Tesnenie elektrickej prípojky	Soket koruyucusu
181	Vnější část kabelové průchodky	Vonkajšia časť káblevej priechodky	Dış fiş kısmı
182	Šroub	Skrutka	Vida
183	Šroub	Skrutka	Vida
183a	Podložka	Podložka	Pul
184	Šroub	Skrutka	Vida
184a	Podložka	Podložka	Pul
186	Šroub	Skrutka	Vida
188	Šroub	Skrutka	Vida
188a	Šroub	Skrutka	Vida
190	Zvedací rukojeť	Dvihacia rukoväť	Kaldırma kolu
190a	O-kroužek	O-krúžok	O-ring
193	Olejová zátka	Olejová zátka	Yağ vidası
193a	Olej	Olej	Yağ
194	Těsnicí kroužek	Tesniaci krúžok	Conta
198	O-kroužek	O-krúžok	O-ring
520	Vlhkostní snímač	Senzor vlhkosti	Nem sensörü
521	Snímač WIO	WIO senzor	WIO sensörü
522	Držák pro 521	Držiak pre 521	521 için tutucu

Exploded view



TM03 1522 2305

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Repl. 96046675 1005	

2. Vendor Documentation

George Fischer Model 546 BII Valve

Operating Instructions for the Multifunctional Module for the Ball Valve Type 546

General Information

Several hazard notices are used in this manual to warn you of possible injuries or damages to property. Please read and observe these warnings at all times!



Danger

Imminent acute danger!

Failure to comply could result in death or extremely serious injury



Warning

Possible acute danger!

Failure to comply could result in serious injury.



Caution

Dangerous situation!

Failure to comply could lead to injury or damage to property.

Abbreviations

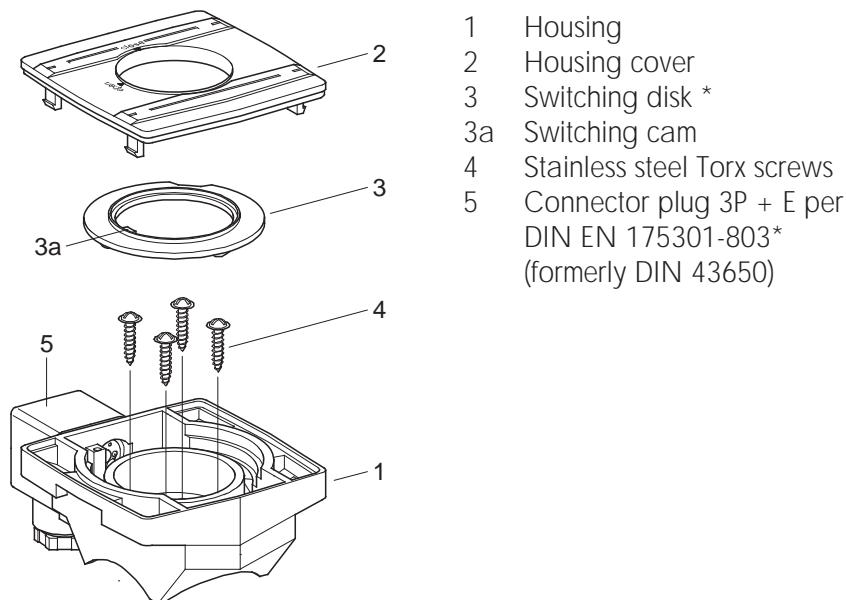
Type 546	Ball Valve Type 546
MF handle	Lockable multifunctional handle
MF module	Multifunctional module
PN	Nominal pressure

Mounting the Multifunctional Module on the Ball Valve

Examine the MF module before mounting to make sure it has not been damaged during transport. We recommend leaving the MF module in its original packaging until just before installation.

The MF module has been equipped with the respective switches and tested ex factory! It is not necessary to dismount the cover when used with hand operated ball valves.

Assembly of the MF module with built-in switch

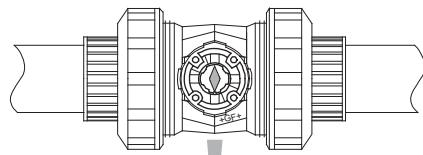


*) for MF module version with pre-assembled microswitches

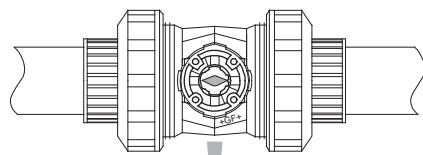
The MF module can be mounted on the Ball Valve Type 546 in the open or closed ball position.

Attention! Stem is asymmetrical

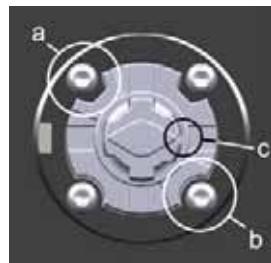
The position of the spigot must be identical to one of the two illustrations.



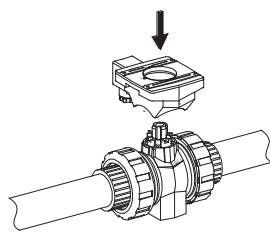
A Stem position for closed ball valve.



B Stem position for open ball valve.

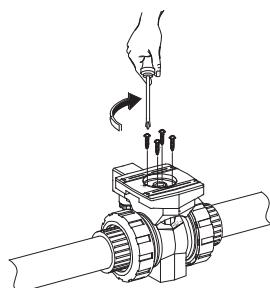


Note the square (a), respectively, round (b) contour, as well as the position of the asymmetrical recess (c) of the stem.

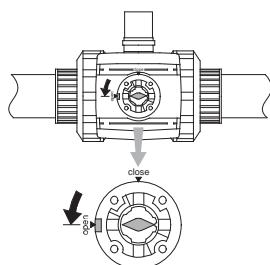


Place the MF module on the ball valve.

Make sure the contour of the multifunctional module agrees with that of the ball valve!

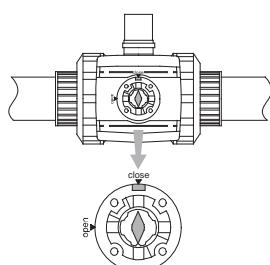


Tighten the four pre-assembled screws.
The MF module is now securely positioned on the ball valve.



Put the switching cam (3a) in the respective position.

For open ball valve

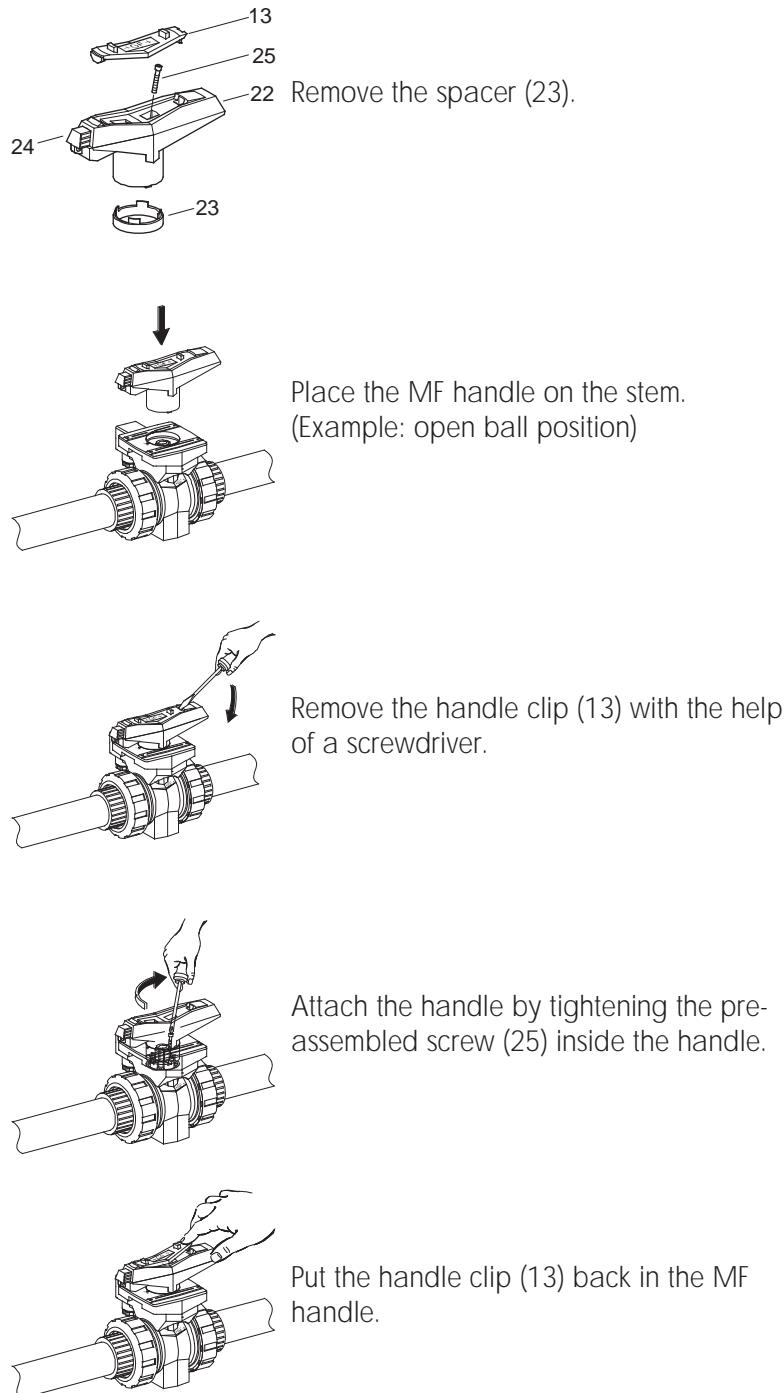


For closed ball valve

The MF module is now ready to receive the MF handle.

Mounting the Multifunctional handle

To mount the MF handle, follow these steps:



General Technical Data for the Multifunctional Module

For general technical data and the circuit diagrams, please see the chapter "Technical Features of the Multifunctional Module".

Operating Instructions for the Multifunctional Module for the Ball Valve Type 546

General Information

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Danger

Imminent acute danger!

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Warning

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Dangerous situation!

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Abbreviations

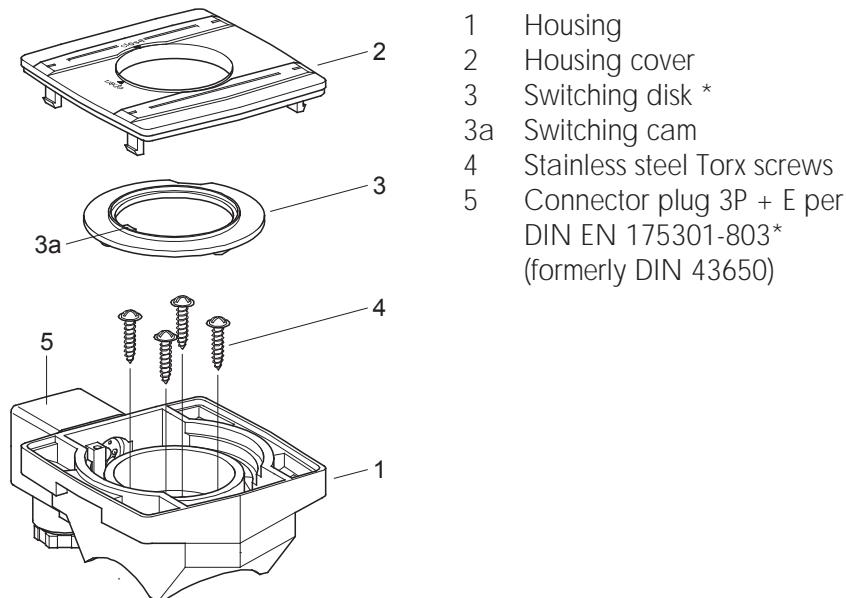
Type 546	Ball Valve Type 546
MF handle	Lockable multifunctional handle
MF module	Multifunctional module
PN	Nominal pressure

Mounting the Multifunctional Module on the Ball Valve

Examine the MF module before mounting to make sure it has not been damaged during transport. We recommend leaving the MF module in its original packaging until just before installation.

The MF module has been equipped with the respective switches and tested ex factory! It is not necessary to dismount the cover when used with hand operated ball valves.

Assembly of the MF module with built-in switch

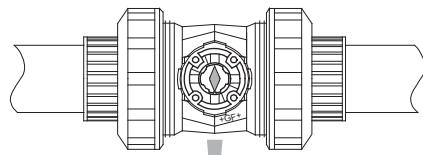


*) for MF module version with pre-assembled microswitches

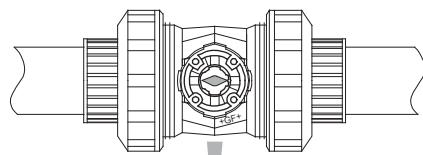
The MF module can be mounted on the Ball Valve Type 546 in the open or closed ball position.

Attention! Stem is asymmetrical

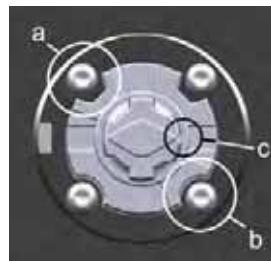
The position of the spigot must be identical to one of the two illustrations.



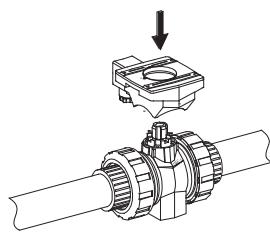
A Stem position for closed ball valve.



B Stem position for open ball valve.

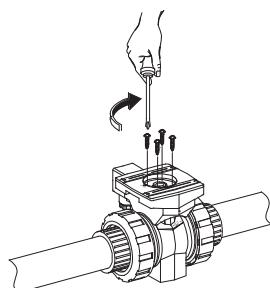


Note the square (a), respectively, round (b) contour, as well as the position of the asymmetrical recess (c) of the stem.

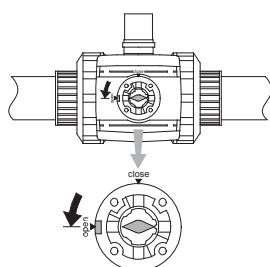


Place the MF module on the ball valve.

Make sure the contour of the multifunctional module agrees with that of the ball valve!

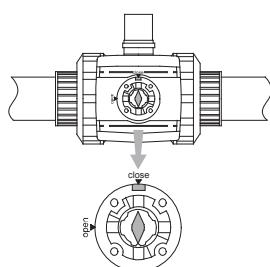


Tighten the four pre-assembled screws.
The MF module is now securely positioned on the ball valve.



Put the switching cam (3a) in the respective position.

For open ball valve

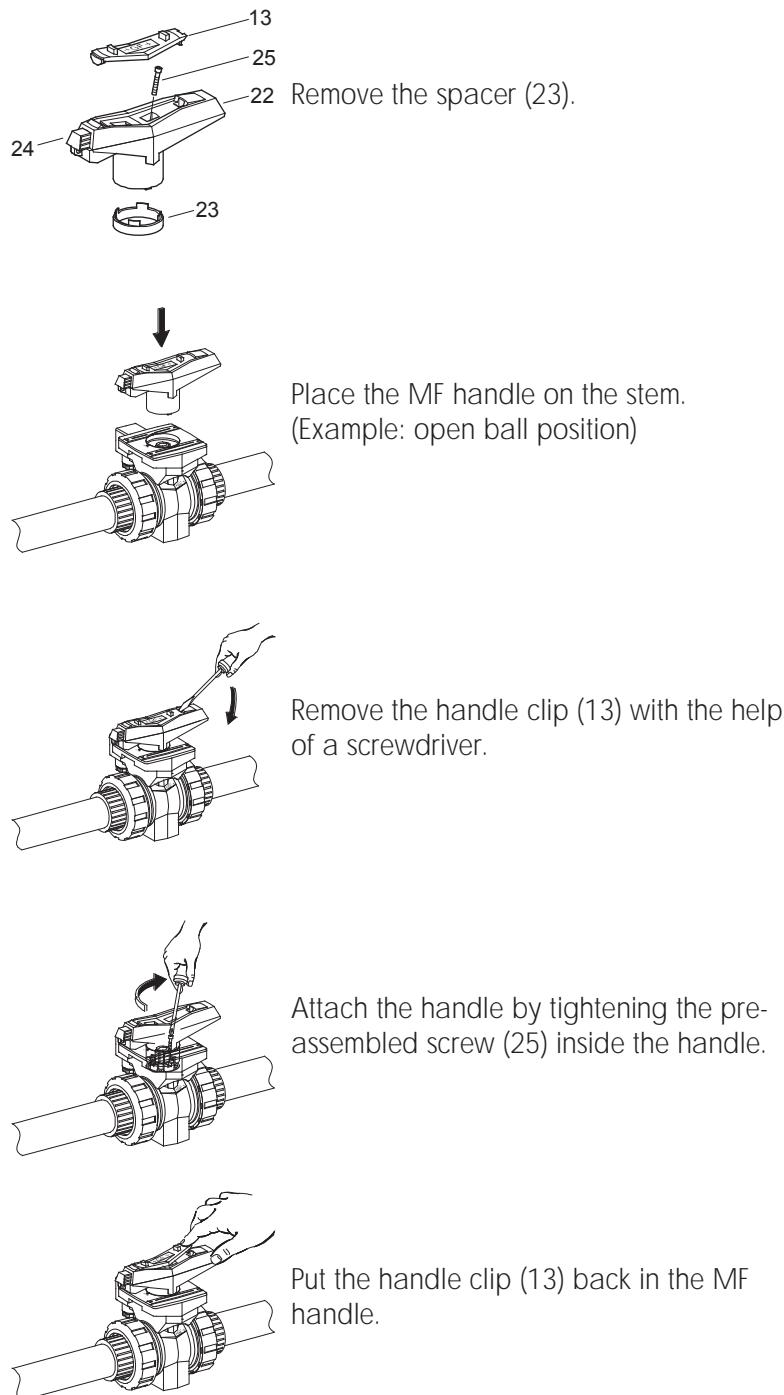


For closed ball valve

The MF module is now ready to receive the MF handle.

Mounting the Multifunctional handle

To mount the MF handle, follow these steps:



General Technical Data for the Multifunctional Module

For general technical data and the circuit diagrams, please see the chapter "Technical Features of the Multifunctional Module".

GEORG FISCHER +GF+

Rohrleitungssysteme / Unternehmenseinheit Industriesysteme

Werkzeugnis nach EN 10204 - 2.2

Artikel	Formmasse	Dimension	Code-Nr.	Druckstufe
Kugelhahn Typ 546	ABS Acrylnitril-Butadien-Styrol	DN10 - 50 mm	169 546 ...	entsprechend Kennzeichnung
Kugelhahn Typ 343	ABS Acrylnitril-Butadien-Styrol	DN10 - 50 mm	169 343 ...	entsprechend Kennzeichnung
Kugelhahn Typ 346	ABS Acrylnitril-Butadien-Styrol	DN10 - 50 mm	169 346 ...	entsprechend Kennzeichnung
Kugelhahn Typ 370	ABS Acrylnitril-Butadien-Styrol	DN65 -100 mm	169 370 ...	entsprechend Kennzeichnung

Wir bescheinigen, dass die oben aufgeführten Bauteile folgende Bedingungen erfüllen:

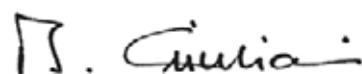
Prüfung	Norm	Bedingungen
Werkstoff		
1 Vicat VST/B/50	DIN EN ISO 306	≥ 90°C (Konditionierung 6 h in Luft bei 80°C)
2 Dichte	DIN EN ISO 15493-1	1.00-1.07 g/cm ³
Bauteil		
3 Masse und zulässige Abweichungen	prEN ISO 16135	Innerhalb zulässiger Toleranzen
4 Lieferzustand	prEN ISO 16135	Frei von Blasen, Lunkern und Inhomogenitäten
Funktions- und Dichtheitsprüfung		
5 Konstruktions-prüfungen	prEN ISO 16135	Materialprüfung, Zeitstandinnendruckfestigkeit, Dichtheit, Dauerprüfung gemäss ISO 9393-2
6 Produktionsprüfungen	prEN ISO 16135	Dichtheit im Durchgang und Sitz gemäss ISO 9393-2

Die für die Herstellung der oben erwähnten Artikel verwendete Formmasse entspricht den Bedingungen nach 1-2. Die angegebenen Prüfergebnisse 3-4 sind laufenden Aufzeichnungen über die betrieblichen Prüfungen aus dem gleichen Werkstoff und der gleichen Herstellungsart wie die Lieferung selbst entnommen.

Georg Fischer Rohrleitungssysteme AG



Helmut Hilger
Leiter F&E



Bruno Giuliani
Leiter PM

GEORG FISCHER +GF+
Piping Systems / Management Unit Industrial Systems

Test report in accordance with EN 10204 - 2.2

Article	Material	Dimension	Code-No.	Nom. pressure
Ball Valve Type 546	ABS Acrylonitrile Butadiene Styrene	DN10 -50 mm	169 546 ...	respective marking
Ball Valve Type 343	ABS Acrylonitrile Butadiene Styrene	DN10 -50 mm	169 343 ...	respective marking
Ball Valve Type 346	ABS Acrylonitrile Butadiene Styrene	DN10 -50 mm	169 346 ...	respective marking
Ball Valve Type 370	ABS Acrylonitrile Butadiene Styrene	DN65 -100 mm	169 370 ...	respective marking

We certify that the above listed articles comply with the following requirements:

Test	Standard	Conditions
Material		
1 Vicat VST/B/50	DIN EN ISO 306	$\geq 90^{\circ}\text{C}$ (Conditioning 6 h in air at 80°C)
2 Density	DIN EN ISO 15493-1	1.00-1.07 g/cm ³
Component		
3 Dimensions and acceptable deviations	prEN ISO 16135	within admissible tolerances
4 Delivery condition	prEN ISO 16135	no voids, blisters, burrs or inhomogenities
Functional testing		
5 Design tests	prEN ISO 16135	Material test, Long term pressure test, Tightness, Durability according to ISO 9393-2
6 Productions tests	prEN ISO 16135	Seat and packing test according to ISO 9393-2

The material used for the fitting manufacture complies with the requirements according to 1-2. The indicated test results 3-4 are taken from the current reports of the works tests for valves from the same material and the same production method as the delivery.

George Fischer Piping Systems Ltd.

Helmut Hilger
Manager R&D

Bruno Giuliani
Manager PM

GEORG FISCHER +GF+

Rohrleitungssysteme / Unternehmenseinheit Industriesysteme

Werkzeugnis nach EN 10204 - 2.2

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Kugelhahn Typ 346	ABS Acrylnitril-Butadien-Styrol	DN10 - 50 mm	169 346 ...	entsprechend Kennzeichnung
Kugelhahn Typ 370	ABS Acrylnitril-Butadien-Styrol	DN65 -100 mm	169 370 ...	entsprechend Kennzeichnung

Wir bescheinigen, dass die oben aufgeführten Bauteile folgende Bedingungen erfüllen:

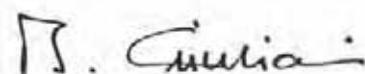
Prüfung	Norm	Bedingungen
Werkstoff		
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2 Dichte	DIN EN ISO 15493-1	1.00-1.07 g/cm ³
Bauteil		
3 Masse und zulässige Abweichungen	prEN ISO 16135	Innerhalb zulässiger Toleranzen
4 Lieferzustand	prEN ISO 16135	Frei von Blasen, Lunkern und Inhomogenitäten
Funktions- und Dichtheitsprüfung		
5 Konstruktions-prüfungen	prEN ISO 16135	Materialprüfung, Zeitstandinnendruckfestigkeit, Dichtheit, Dauerprüfung gemäss ISO 9393-2
6 Produktionsprüfungen	prEN ISO 16135	Dichtheit im Durchgang und Sitz gemäss ISO 9393-2

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Georg Fischer Rohrleitungssysteme AG



Helmut Hilger
Leiter F&E



Bruno Giuliani
Leiter PM

GEORG FISCHER +GF+
Piping Systems / Management Unit Industrial Systems

Test report in accordance with EN 10204 - 2.2

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Ball Valve Type 343	ABS Acrylonitrile Butadiene Styrene	DN10 -50 mm	169 343 ...	respective marking
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George Fischer Piping Systems Ltd.

Helmut Hilger
Manager R&D

Bruno Giuliani
Manager PM

3. Drawings and Drawing Register

REFERENCE DRAWING LIST

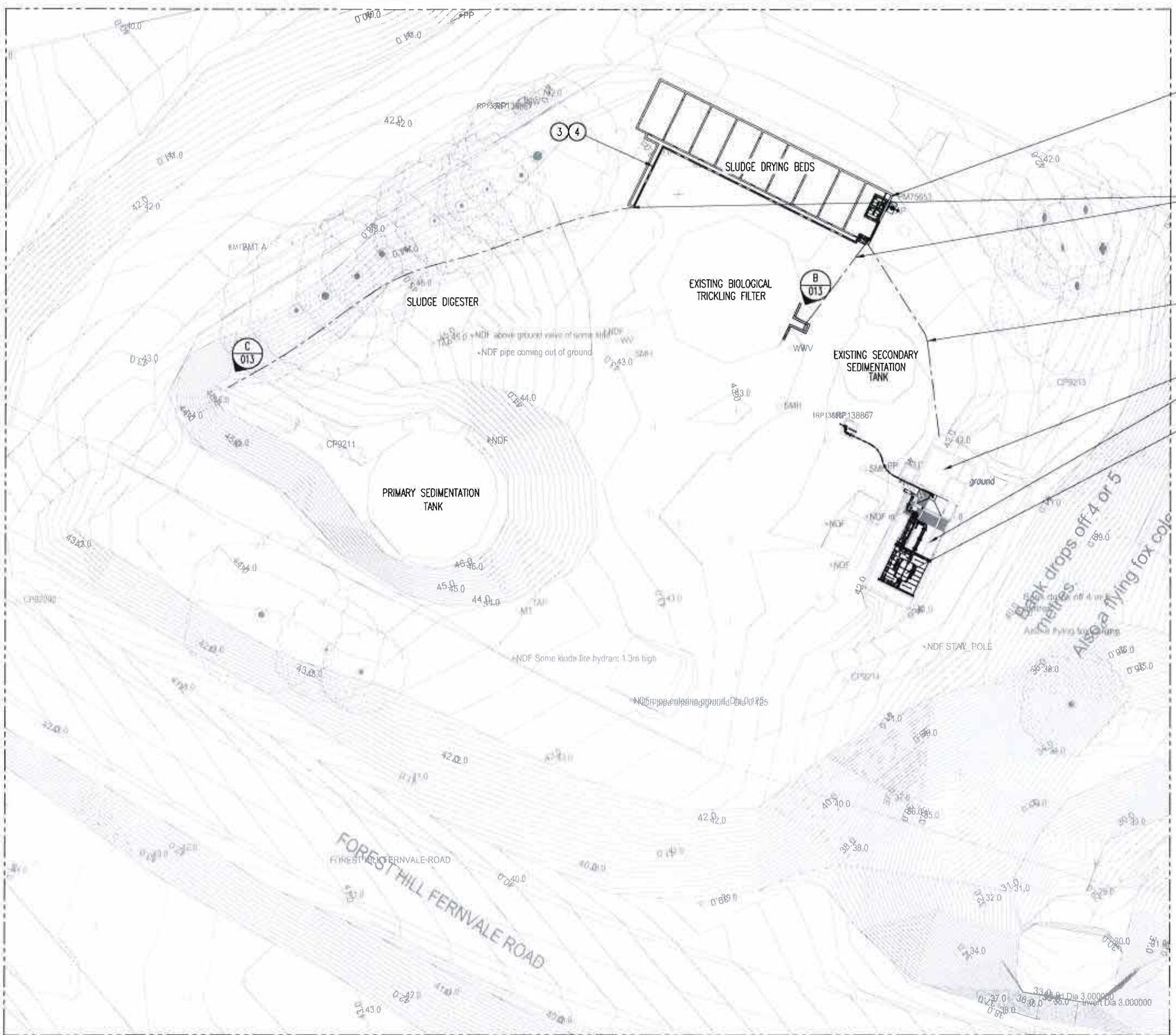
DRAWING No. 8848A-001

DRAWING TITLE MICRO FILTER G.A.

012 MEGAPAC DOSING G.A.

012 DOUBLE CONTAIN ITEM
1 INSIDE ITEM 2.
400mm DEEPELECTRICAL & COMMS CONDUIT
600mm DEEPEXISTING CONTROL/PUMP ROOM
EXISTING CHLORINE DETENTION TANK

001 MICRO FILTER G.A.



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WRITTEN AGREEMENT OF AQUATEC-MAXCON PTY. LTD.

SITE LAYOUT

SCALE 1:200

ITEM	STOCK CODE	QTY	DESCRIPTION	LENGTH	MATERIAL	STANDARD
4	AS665316	56	ANCHOR STUD M 6 x 65mm		316SS	-
3	FM125-27G	28	CLAMP, SADDLE 20 NB D=27		GALV	AS3679.1
2	P25PE8016	1	PIPE 25 O.D. PE 80B, BLACK WITH LILAC STRIPE PN16	85m	POLYETHYLENE	-
1	91338915	1	HOSE 9mm ID x 12mm OD, 10 BAR MAX. BLACK	85m	PE	-
			ITEM STOCK CODE	QTY	DESCRIPTION	LENGTH MATERIAL STANDARD

AS CONSTRUCTED DETAILS

I CERTIFY THAT THE "AS CONSTRUCTED" DETAILS
SHOWN ON THIS PLAN ARE A TRUE AND ACCURATE
RECORD OF THE WORKS.

SIGNED DATE 12-11-14
NAME OF SIGNATORY PAUL KWONG
RPEO No. or Licence: 9872
COMPANY NAME: AQUATEC-MAXCON PTY LTD
START DATE: 31-10-12 FINISH DATE: 12-11-14

AQUATEC-MAXCON PTY. LTD.
WATER TREATMENT TECHNOLOGY AND EQUIPMENT
ACN 002 250 482 P.O. BOX 455 IPONVILLE QLD 4350
Ph. (61) 7 3281 2299 FAX. (61) 7 3281 8259
Email: enquiries@aqmaxcon.com.au

STATUS

WORK AS EXECUTED

DRAWING NUMBER 8848A - 010

NAME SIGNATURE DATE
QUEENSLAND URBAN UTILITIES DELEGATE
(AUTHORISED FOR 12 MONTHS FROM DATE SHOWN)

QUEENSLAND
Urban Utilities

SHEET NO. OF SCALE AS SHOWN
QUEENSLAND URBAN UTILITIES DRAWING NO. AMEND
486/5/5-0274-001 3

1	12-11-14	ADDED ITEMS 3 & 4	B.M.	C.K.	FUNDING	DRAFTED	A.P.D.	27-11-12	23-01-13	ASSET/PROJECT	DRAWING TITLE
2	21-08-14	ADDED NEW C/013, DETAIL 1/013 AND REFERENCE TO DRAWING 012	B.M.	C.K.	AB.	DESIGN W.O. No.	DRAFTING CHECK	AB	23-01-13	DESIGN	R.P.E.Q. No. DATE
		ADDED ITEMS 1 & 2, ADDED ELECTRICAL & COMMS CONDUIT				CONSTRUCTION W.O. No.		CAD FILE		APPROVED BY	SIGNATURE DATE

No.	Date	AMENDMENT	DRAFTER	DESIGNED	REVISION NO.	APPROVED	FUNDED BY Q.U.U. (✓)	EXTERNAL ()	Q.U.U. FILE NO.	DESIGN CHECK	R.P.E.Q. No. DATE	CONSTRUCTION MANAGER	SIGNATURE DATE

REFERENCE DRAWING LIST	
DRAWING No.	DRAWING TITLE
8848A-002	MICROFILTER VIEWS & DETAILS SHEET 1 OF 2
8848A-003	MICROFILTER VIEWS & DETAILS SHEET 2 OF 2
8848A-004	CHLORINE DETENTION TANK SUBMERSIBLE PUMP ARRANGEMENT
8848A-009	MICROFILTER SEDIMENT & BACKWASH REJECT DRAIN ASSEMBLY

EXISTING RETAINING WALL

(3 2 50)

WALKWAY

MICROFILTER

WALKWAY
PLATFORM ARRANGEMENT
005

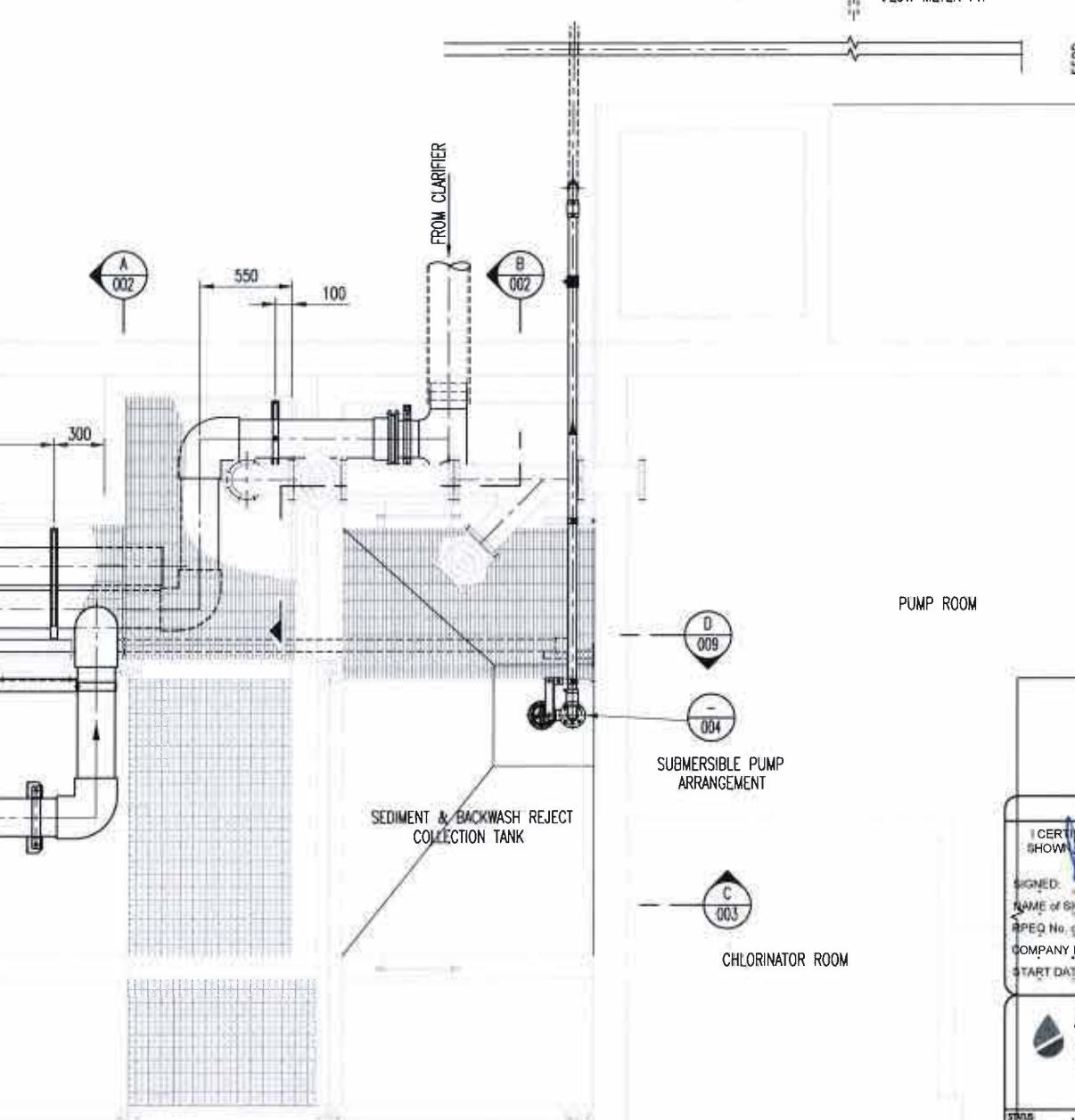
OUTLET

(1 5)

INLET

6

OVERFLOW



MICROFILTER G.A.

SCALE 1:20

200 0 200 400 600 800 1000
SCALE 1:20 AT ORIGINAL SIZE

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NOTE:

- ITEMS 4, 5 & 6 USED AS REQUIRED, ONE ARROW TRIMMED WHEN INSTALLED TO SHOWN FLOW DIRECTION.
- ALL SCREW THREADS COATED WITH NICKEL ANTI-SEIZE.

501	1	UL 1352 CE P.O. NO: 061815, REF DWG: 8848A-701	NUOVE ENERGIE
ITEM	STOCK CODE	DESCRIPTION	LENGTH
ITEM	STOCK CODE	DESCRIPTION	LENGTH

6		3 OVERFLOW, PIPELINE MARKER, TO SUIT 225 O.D. PIPE			AS1345
5		4 FILTERED WATER, PIPELINE MARKER, TO SUIT 225 O.D. PIPE			AS1345
4		4 INLET, PIPELINE MARKER, TO SUIT 225 O.D. PIPE			AS1345
3	S1640316K5	4 SETSCREW, HEX HEAD M 16 x 40mm + 1N + 2W	316SS	DIN 933	
2	WF16P	8 WASHER, INSULATION 19.1 IDx34.9 ODx3.2 THK		PHENOLIC	-
1	200060744	1 PIPE, DN 200, 225 O.D., CLASS 12	10.5m	M-PVC SERIES	-

NAME: SIGNATURE: DATE
QUEENSLAND URBAN UTILITIES DELEGATE
(AUTHORISED FOR 12 MONTHS FROM DATE SHOWN)

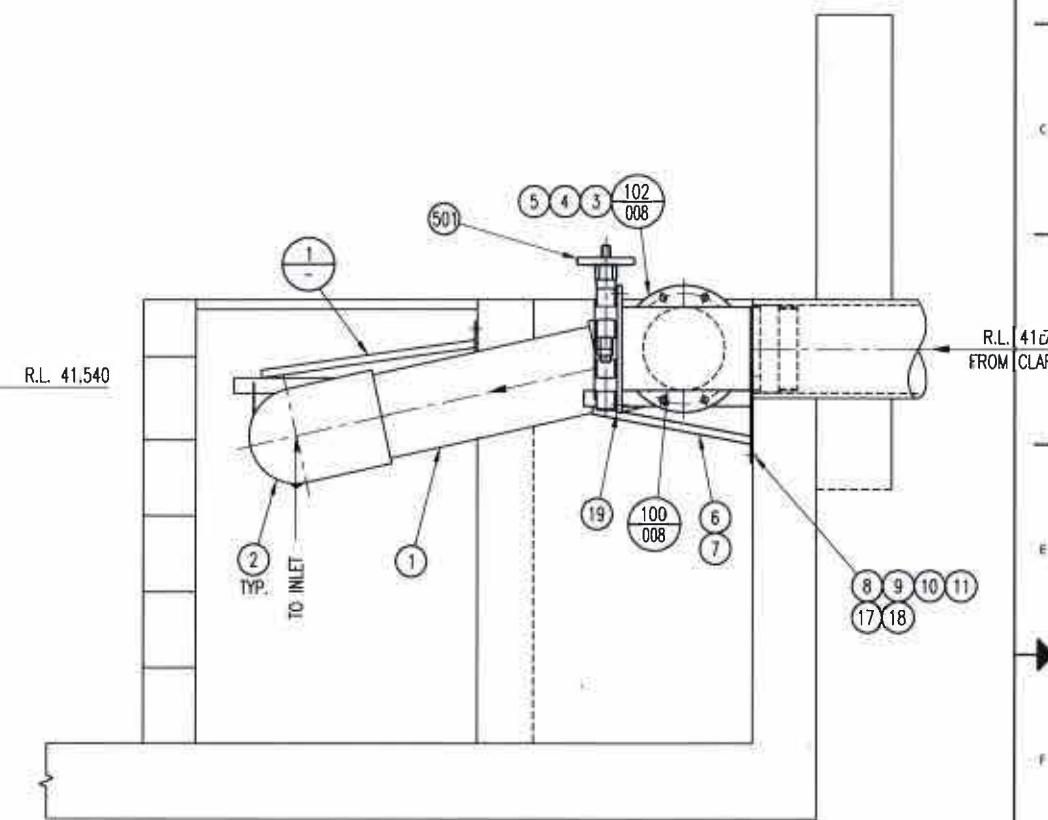
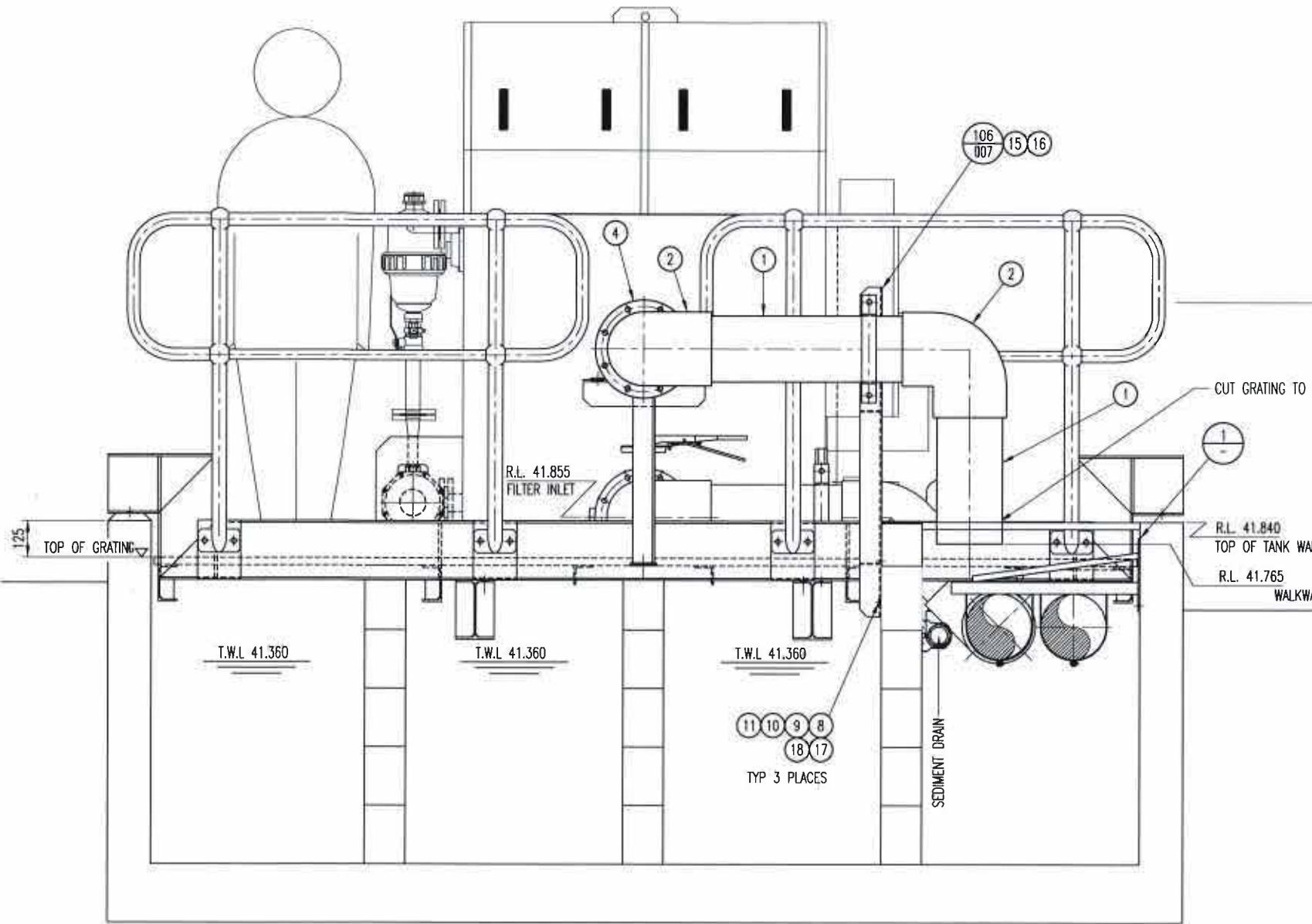
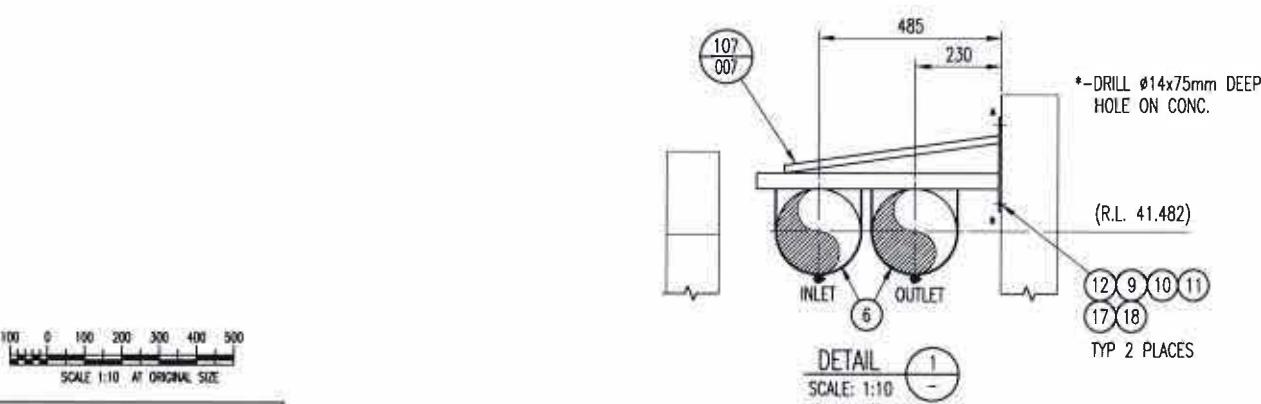
QUEENSLAND
Urban Utilities

SHEET No. OF SCALE AS SHOWN
QUEENSLAND URBAN UTILITIES DRAWING NO. AMEND
486/5/5-0274-010 1

FUNDING		DRAFTED	A.P.D.	27-11-12	B.S.	24-01-13	ASSET/PROJECT		DRAWING TITLE			
1 26-03-13 WORK AS EXECUTED	B.M.		DESIGN W.O. No.		DRAFTING CHECK A.B.	23-01-13	DESIGN	R.P.E.Q. No.	DATE	APPROVED BY	SIGNATURE DATE	
2 23-01-13 FOR CONSTRUCTION	A.P.D.		B.S.	CONSTRUCTION W.O. No.			CAD FILE					
3 26-03-13 AMENDMENT	DRAFTED	DESIGNED	REMOVED	APPROVED	FUNDED BY Q.U.U. (✓)	EXTERNAL ()	Q.U.U. FILE NO.	DESIGN CHECK	R.P.E.Q. No.	DATE	CONSTRUCTION MANAGER	SIGNATURE DATE

REFERENCE DRAWING LIST

DRAWING No.	DRAWING TITLE
8848A-001	MICRO FILTER GA.
8848A-007	MICROFILTER PLATFORM HANDRAIL, GRATING & PIPE SUPPORT DETAILS
8848A-008	SPool & BACKING FLANGE DETAIL

SECTION A
SCALE: 1:10 001SECTION B
SCALE: 1:10 001

NOTE:

1. ITEMS 13 & 14 USED TO CLEAN AND JOIN ALL PVC JOINTS.
2. ALL SCREW THREADS COATED WITH NICKEL ANTI-SEIZE.

501 1 VALVE,KNIFEGATE DN 200 F952, LUGGED

ITEM	STOCK CODE	DESCRIPTION	QTY	LENGTH	MATERIAL	STANDARD
19	S1645316K2	SETScrew,HEX HEAD M 16 x 45mm + 1W	316SS	DIN 933		
18	S112M	SLEEVE,INSULATING M 12 x 1m	NYLAR			
17	WF12P	WASHER,INSULATION 14.3 IDx25.4 ODx3.2 THK	PHENOLIC			
16	B1640GK3	BOLT M 16 x 40mm & NUT + 2W	GALV	AS1111		
15		CLAMP,SADDLE 200 PP D=225	GALV	AS3679.1		
14	799298003	FLUID CEMENT TANTIT CEMENT 1kg (FOR GREY PVC-U)	-	-		
13	799298010	FLUID CLEANER TANTIT CLEAN (FOR PVC-C & PVC-U) 1L	-	-		
12	T12316	ROD,THREADED M 12, MITRE 1 END	100	316SS	DIN 975	
11	ACRY150330	ANCHOR,CHEMICAL 330ml HY-150 2-PART ADHESIVE	-	-		
10	N12316	NUT,PLAIN M 12	316SS	DIN 934		
9	WF12316	WASHER,FLAT M 12	316SS			
8	T12316	ROD,THREADED M 12, MITRE 1 END	135	316SS	DIN 975	
7	FM158-450	BRACKET,CANTILEVER 450mm BRACED	GALV			
6	FM132-225	CUP,CHANNEL 225mm OD TWO PIECE	GALV			
5	B1675316K5	BOLT M 16 x 75mm + 1N + 2W	316SS	DIN 931		
4	G200TD3ER	GASKET,FLANGE DN 200, TABLE D, 3mm THK	EPDM RUBBER			
3	721790120	FLANGE ADAPTOR DN200,d=225mm JOIN FACE SERRATED	PVC-U GREY			
2	721100120	ELBOW,SW 225mm 90DEG	PVC-U GREY			
1	200060744	PIPE DN 200, 225 OD, CLASS 12	3.1m	M-PVC SERIES 2		

AS CONSTRUCTED DETAILS
I CERTIFY THAT THE "AS CONSTRUCTED" DETAILS SHOWN ON THIS PLAN ARE A TRUE AND ACCURATE RECORD OF THE WORKS.
SIGNED: PAUL KWONG DATE: 12-04-13
NAME of SIGNATORY: PAUL KWONG
RPEQ No. or LICENCE: 9972
COMPANY NAME: AQUATEC-MAXCON PTY LTD
START DATE: 31-10-12 FINISH DATE: 12-04-13

AQUATEC-MAXCON PTY. LTD.
WATER TREATMENT TECHNOLOGY AND EQUIPMENT
ABN. 002 300 482 P.O. BOX 400 IPSWICH QLD 4305
PH. (61) 7 3281 2289 FAX. (61) 7 3281 8259
EMAIL: enquiries@aquecmaxcon.com.au

WORK AS EXECUTED
DRAWING NUMBER: 8848A - 002

NAME: SIGNATURE: DATE:
QUEENSLAND URBAN UTILITIES DELEGATE
(AUTHORISED FOR 12 MONTHS FROM DATE SHOWN)

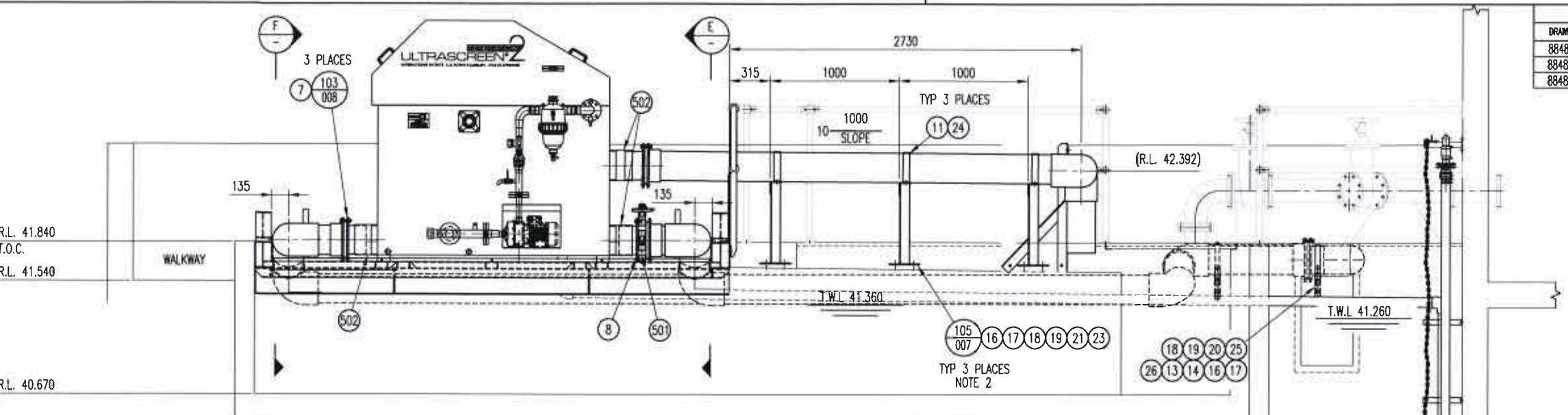
QUEENSLAND
Urban Utilities

ASSET/PROJECT:
QUEENSLAND URBAN UTILITIES
QUU047 - PRESSURE FILTER UPGRADE AT LOWOOD STPS
RFQ Number: C1011-045 QUU047

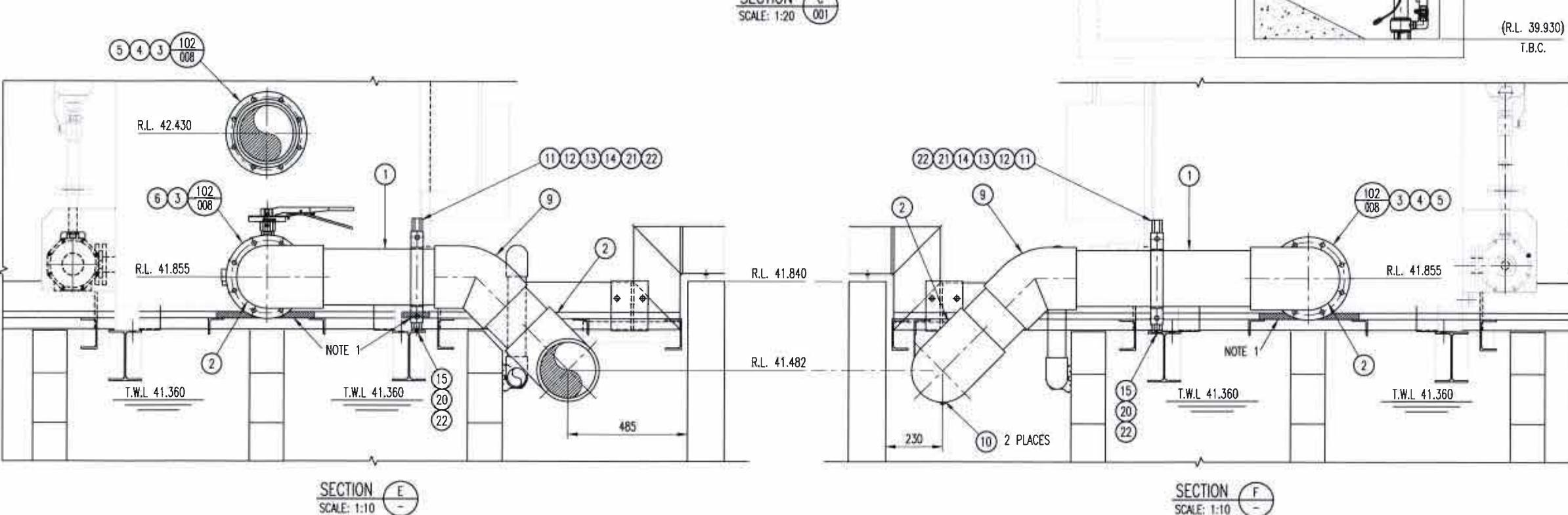
DRAWING TITLE:
MICROFILTER VIEWS & DETAILS
SHEET 1 OF 2

SHEET NO. OF
QUEENSLAND URBAN UTILITIES DRAWING NO. AMEND.
486/5/5-0274-011 1

1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16
1 28-03-13 WORK AS EXECUTED	B.M.			DESIGN W.O. No.		DRAFTED CHECK	A.P.D.	28-11-12	DRAFTING	AB.	23-01-13	DESIGN	R.P.E.Q. No.	DATE	B.S.
2 28-11-12 FOR CONSTRUCTION	A.P.D.			CONSTRUCTION W.O. No.		CAD FILE			APPROVED BY			APPROVED BY	SIGNATURE	DATE	23-01-13
No. DATE	AMENDMENT	DRAFTED	DESIGNED	R.P.E.Q. NO.	APPROVED	FUNDED BY Q.U.U. (✓)	EXTERNAL ()	Q.U.U. FILE NO.	DESIGN CHECK	R.P.E.Q. NO.	DATE	CONSTRUCTION MANAGER	SIGNATURE	DATE	



REFERENCE DRAWING LIST	
DRAWING No.	DRAWING TITLE
8848A-001	MICRO FILTER GA.
8848A-007	MICROFILTER PLATFORM HANDRAIL, GRATING & PIPE SUPPORT DETAILS
8848A-008	SPool & BACKING FLANGE DETAIL



AS CONSTRUCTED DETAILS

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SIGNED: PAUL KWONG DATE: 12-04-13
NAME OF SIGNATORY: PAUL KWONG
RPEQ No. or LICENCE: 9972
COMPANY NAME: AQUATEC-MAXCON PTY. LTD.
START DATE: 31-10-12 FINISH DATE: 12-04-13

AQUATEC-MAXCON PTY. LTD.
WATER TREATMENT TECHNOLOGY AND EQUIPMENT
ACN 002 250 482 P.O. BOX 455 MURWICH QLD 4556
PH. (61) 7 3281 2299 FAX. (61) 7 3281 8259
EMAIL: enquiries@aqutecmaxcon.com.au

WORK AS EXECUTED
DRAWING NUMBER: 8848A - 003

NAME: SIGNATURE: DATE
QUEENSLAND URBAN UTILITIES DELEGATE
(AUTHORISED FOR 12 MONTHS FROM DATE SHOWN)

QUEENSLAND
Urban Utilities

NOTE:
1. GRATING CUT TO SUIT, EDGES BANDED.
2. Ø14x75 DEEP HOLE IN CONC.
3. ITEMS 13 & 14 ON DWG. 8848A-002 USED TO CLEAN AND JOIN ALL UPVC PIPE JOINTS.
4. ALL SCREW THREADS COATED WITH NICKEL ANTI-SEIZE.

502	3	CLAMP,REPAIR TO SUIT 225 OD PIPE, K2-215AB	316SS	PENTAIR	10	SSFM132-225
501	1	VALVE,KNIFEGATE DN 200 F952, LUGGED	STST	-	9	721150120
					8	S1645316K2

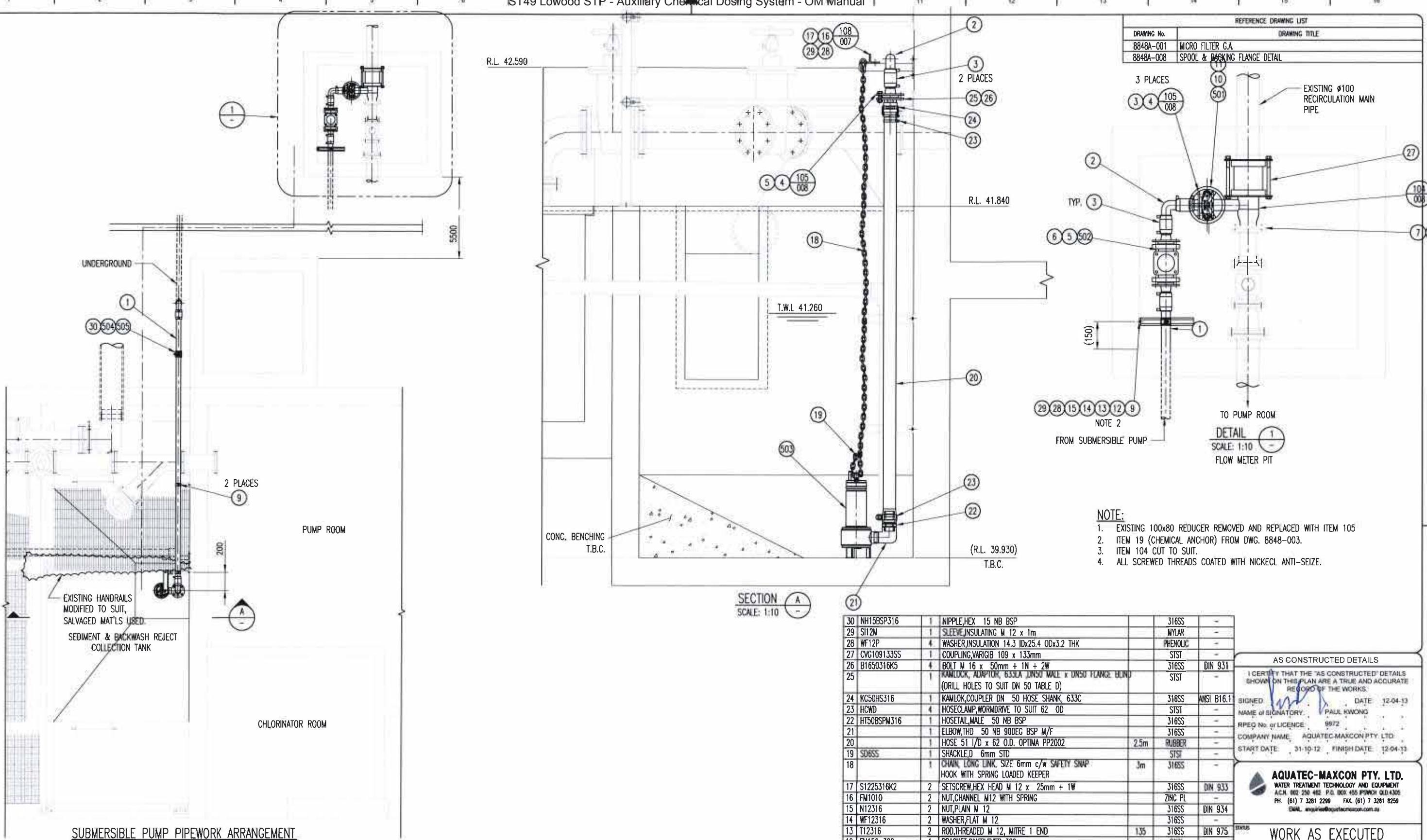
26	FM158-450	1	BRACKET,CANTILEVER 450mm BRACED	GALV	-	19	ACHY150330	1	ANCHOR,CHEMICAL 330mL HY-150 2-PART ADHESIVE	-	-
25	FM125-220G	1	CLAMP SADDLE 200 NB D=220	GALV	AS3679.1	18	N12316	14	NUT,PLAIN M 12	316SS	DIN 934
24	S1240316K5	6	SETScrew,HEX HEAD M 12 x 40mm + 1N + 2W	316SS	DIN 933	17	WF12316	14	WASHER,FLAT M 12	316SS	-
23	S112M	1	SLEEVE,INSULATING M 12 x 1m	MYLAR	-	16	T12316	8	ROD,THREADED M 12, MITRE 1 END	150	316SS DIN 975
22	S116M	1	SLEEVE,INSULATING M 16 x 1m	MYLAR	-	15	S1640316K5	4	SETScrew,HEX HEAD M 16 x 40mm + 1N + 2W	316SS	DIN 933
21	WF12P	16	WASHER,INSULATION 14.3 Øx25.4 00x3.2 THK	PHENOLIC	-	14	S1225316K2	6	SETScrew,HEX HEAD M 12 x 25mm + 1W	316SS	DIN 933
20	WF16P	10	WASHER,INSULATION 19.1 Øx34.9 00x3.2 THK	PHENOLIC	-	13	SSFM1010	6	NUT,CHANNEL M12 WITH SPRING	316SS	-
					12	FM156-450	2	BRACKET,CANTILEVER 450mm	GALV	-	
					11	5	CLAMP,SADDLE 200 PP D=225	GALV	-		
					10	SSFM132-225	2	CLIP,CHANNEL 225mm OD TWO PIECE	SSIE	-	
					9	721150120	2	ELBOW,SW 225mm 45DEG	PVC-U GREY	-	
					8	S1645316K2	8	SETScrew,HEX HEAD M 16 x 45mm + 1W	316SS	DIN 933	
					7	3	W5 S/S GRIP E EPDM LINED PIPE COUPLING, 219mm O.D.	-	-		
					6	B1665316K2	8	BOLT M 16 x 65mm + 1W	316SS	DIN 931	
					5	B1675316K5	16	BOLT M 16 x 75mm + 1N + 2W	316SS	DIN 931	
					4	C200TD3ER	2	GASKET,FLANGE DN 200, TABLE D, 3mm THK	EPDM RUBBER	-	
					3	7211790120	3	FLANGE ADAPTOR DN200,d=225mm JOIN FACE SERRATED	PVC-U GREY	-	
					2	721100120	4	ELBOW,SW 225mm 90DEG	PVC-U GREY	-	
					1	200060744	1	PIPE DN 200, 225 OD, CLASS 12	4m	-	

ASSET/PROJECT		DRAWING TITLE	
QUEENSLAND URBAN UTILITIES		MICROFILTER VIEWS & DETAILS	
QUU047 - PRESSURE FILTER UPGRADE AT LOWOOD STPS		SHEET 2 OF 2	

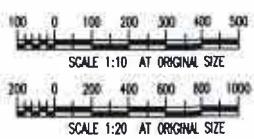
RFQ Number: C1011-045 QUU047

SHEET NO. OF AS SHOWN
QUEENSLAND URBAN UTILITIES DRAWING NO. AMEND
486/5/5-0274-012 3

3	10-03-13	WORK AS EXECUTED	SAF.		FUNDING	DRAFTED	AP.D.	11-12-12	B.S.	24-01-13	DESIGN	R.P.E.Q. No.	DATE	APPROVED BY	SIGNATURE	DATE	
2	04-03-13	ITEM 7 WAS UP.D.	AP.D.		BB	DESIGN W.O. No.		DRAFTING CHECK	AB.	24-01-13	CONSTRUCTION	R.P.E.Q. No.	DATE	CONSTRUCTION MANAGER	SIGNATURE	DATE	
1	04-03-13	ITEM 8 WAS UP.D.	AP.D.		BB	CONSTRUCTION W.O. No.		CAD FILE									
No.	DATE	AMENDMENT	DRAFTED	DESIGNED	REQ'D APPROVED	FUNDED BY Q.U.U. (✓)	EXTERNAL ()	Q.U.U. FILE No.			DESIGN CHECK	R.P.E.Q. No.	DATE				

SUBMERSIBLE PUMP PIPEWORK ARRANGEMENT

SCALE 1:20



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20-02-13 WORK AS EXECUTED	R.A.M.		FUNDING	DRAFTED	A.P.D.	12-12-12	B.S.	24-01-13	ASSET/PROJECT	DRAWING TITLE	Sheet No.	OF	AS SHOWN:
1 24-02-13 ITEM 501, 502 & 503 UPDATED	A.P.D.		BB DESIGN W.O. No.		DRAFTING CHECK	A.B.	24-01-13	DESIGN	R.P.E.Q. No.	QUEENSLAND URBAN UTILITIES	486/5/5-0274-013	2	
2 23-01-13 FOR CONSTRUCTION	A.P.D.		BB CONSTRUCTION W.O. No.		CAD FILE			APPROVED BY	SIGNATURE	CLORINE DETENTION TANK			
3 DATE	AMENDMENT	DRAFTED	DESIGNED	REMOVED APPROVED	FUNDED BY Q.U.U. (✓)	EXTERNAL ()	Q.U.U. FILE No.	DESIGN CHECK	R.P.E.Q. No.	SUBMERSIBLE PUMP ARRANGEMENT			AMEND

- NOTE:**
1. EXISTING 100x80 REDUCER REMOVED AND REPLACED WITH ITEM 105
 2. ITEM 19 (CHEMICAL ANCHOR) FROM DWG. 8848-003.
 3. ITEM 104 CUT TO SUIT.
 4. ALL SCREWED THREADS COATED WITH NICKEL ANTI-SEIZE.

AS CONSTRUCTED DETAILS

I CERTIFY THAT THE "AS CONSTRUCTED" DETAILS SHOWN ON THIS PLAN ARE A TRUE AND ACCURATE RECORD OF THE WORKS.

SIGNED

DATE 12-04-13

NAME OF SIGNATORY PAUL KWONG

RPEQ No. or Licence 9972

COMPANY NAME AQUATEC-MAXCON PTY. LTD.

START DATE 31-10-12 FINISH DATE 12-04-13

AQUATEC-MAXCON PTY. LTD.
WATER TREATMENT TECHNOLOGY AND EQUIPMENT
ACN 002 256 463 P.O. BOX 455 BURNEIGH QLD 4506
PH. (61) 7 3281 2269 FAX (61) 7 3281 8259
EMAIL: enquiries@aquatecmaxcon.com.au

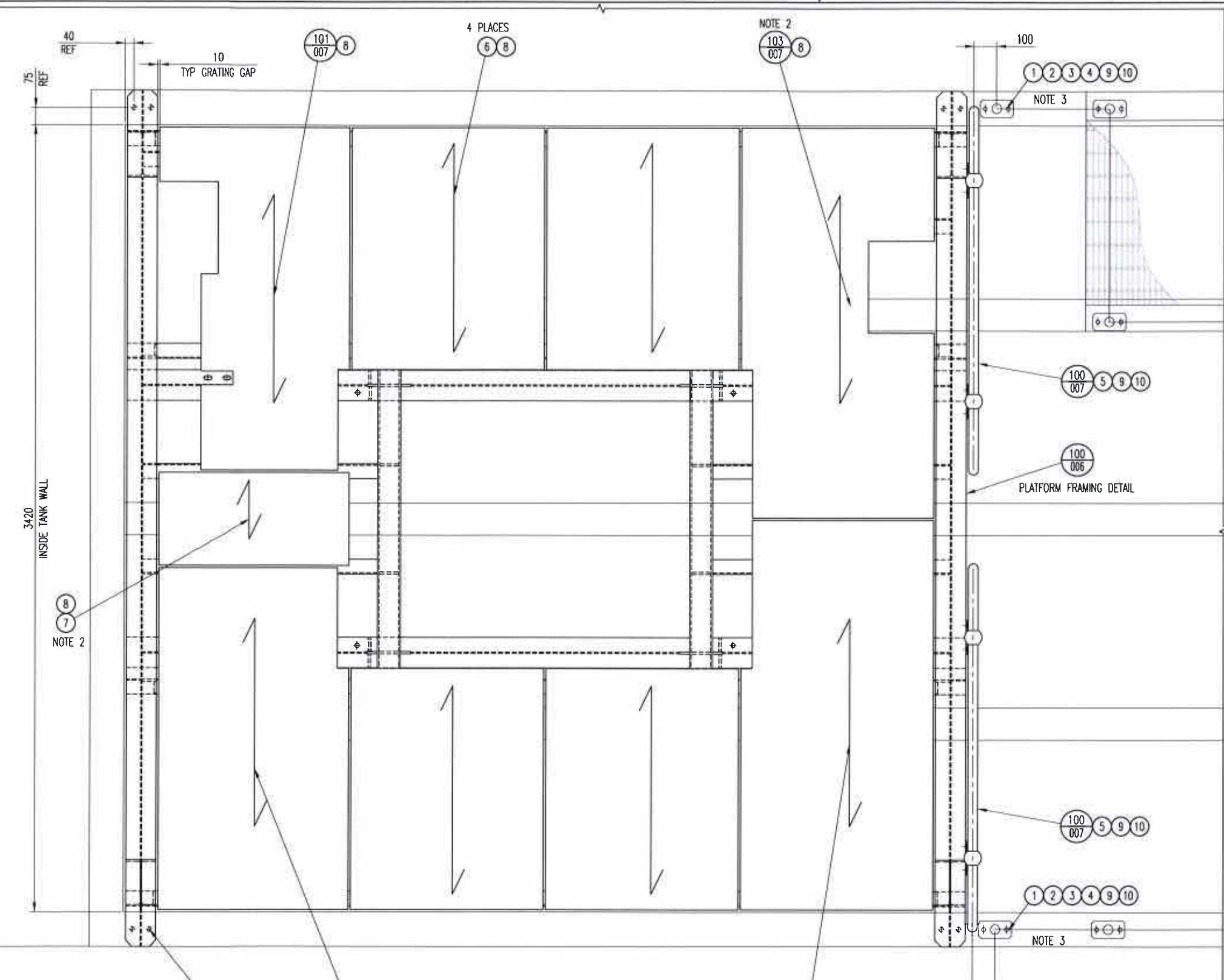
STATUS**WORK AS EXECUTED**

DRAWING NUMBER 8848A - 004

NAME SIGNATURE DATE
QUEENSLAND URBAN UTILITIES DELEGATE
(AUTHORISED FOR 12 MONTHS FROM DATE SHOWN)

QUEENSLAND Urban Utilities

30 NH15BSP316	1 NIPPLE,HEX 15 NB BSP	316SS	-
29 SI12W	1 SLEEVE,INSULATING M 12 x 1m	NYLAR	-
28 WF12P	4 WASHER,INSULATION 14.3 IDx25.4 ODx3.2 THK	PHENOLIC	-
27 CVG109133SS	1 COUPLING,VARIGIB 109 x 133mm	STST	-
26 B1650316K5	4 BOLT M 16 x 50mm + 1N + 2W	316SS DIN 931	-
25	1 KAMLOCK,ADAPTER, 6330 MALE x 6330 FLANGE female (DRILL HOLES TO SUIT DN 50 TABLE D)	STST	-
24 KC50HS316	1 KAMLOCK,COUPLER DN 50 HOSE SHANK, 633C	316SS ANSI B16.11	-
23 HCWD	4 HOSECLAMP,WORM DRIVE TO SUIT 62 OD	STST	-
22 HT50BSPM316	1 HOSETAIL,MALE 50 NB BSP	316SS	-
21	1 ELBOW,THD 50 NB 90DEG BSP M/F	316SS	-
20	1 HOSE 51 1/D x 62 O.D. OPTIMA PP2002	2.5m RUBBER	-
19 SD6SS	1 SHACKLED 6mm STD	STST	-
18	1 CHAIN, LONG LINK, SIZE 6mm c/w SAFETY SNAP HOOK WITH SPRING LOADED KEEPER	3m 316SS	-
17 S1225316K2	2 SETSCREW,HEX HEAD M 12 x 25mm + 1W	316SS DIN 933	-
16 FM1010	2 NUT,CHANNEL M12 WITH SPRING	ZINC PL	-
15 N12316	2 NUT,PLAIN M 12	316SS DIN 934	-
14 WF12316	2 WASHER,FLAT M 12	316SS	-
13 T12316	2 ROD,THREADED M 12, MITRE 1 END	135 316SS DIN 975	-
12 FM156-300	1 BRACKET,CANTILEVER 300mm	GHV	-
11 S1640316K2	4 SETSCREW,HEX HEAD M 16 x 40mm + 1W	316SS DIN 933	-
10 S1630316K2	4 SETSCREW,HEX HEAD M 16 x 30mm + 1W	316SS DIN 933	-
9 FM132-064G	3 CLIP,CHANNEL 64mm OD TWO PIECE	GALV	-
8 B1655316K5	4 BOLT M 16 x 55mm + 1N + 2W	316SS DIN 931	-
7 G80TED3ER	1 GASKET,FLANGE DN 80, TABLE E&D, 3mm THK	EPDM RUBBER	-
6 B16110316K5	4 BOLT M 16 x 110mm + 1N + 2W	316SS DIN 931	-
5 G50TED3ER	3 GASKET,FLANGE DN 50, TABLE E&D, 3mm THK	EPDM RUBBER	-
4 FS50P	3 FLANGE,STUB, ELONGATED 50NB, PN16 BUTT OR FF WELD	POLYETHYLENE	-
3 CEF50P	10 COUPLER,ELEC FUS 50NB, PN16	PLASSON	-
2 E5090P	6 ELBOW,90DEC, ELONGATED 50 O.D. 90 DEG, PN16 BUTT OR FF WELD	POLYETHYLENE	-
1 P50PE8016	1 PIPE 50 O.D. PE 80B, BLACK PN16	20m POLYETHYLENE	-



MICROFILTER PLATFORM ARRANGEMENT

SCALE 1:10

TYP. 2 OFF
4 PLACES
NOTE 1

102 007 8

104 007 8

100

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NOTE:

1. Ø18 x 75mm DEEP HOLE DRILLED IN CONC. WALL.
2. HOLES CUT IN GRATING TO SUIT PIPE/ FLANGE PROTRUSIONS, EDGES BANDED & COLD GALV APPLIED.
3. HANDRAIL/ KNEEER CUT TO SUIT, SALVAGED STANCHION/FITTINGS USED FROM EXISTING.
4. ALL SCREW THREADS COATED WITH NICKEL ANTI-SEIZE.

ITEM	STOCK CODE	QTY	DESCRIPTION	LENGTH	MATERIAL	STANDARD
10	SI16M	1	SLEEVE, INSULATING M 16 x 1m		NYLAR	-
9	WF16P	28	WASHER, INSULATION 19.1 IDx34.9 ODx3.2 THK		PHENOLIC	-
8	C001MG	36	CLIP, FIXING COATING KIT FOR STEEL <50mm (FLANGE PRESENT)		GALV	-
7	GA253MPG	1	GRATING A-PATTERN PLAIN TOPPED 25 x 3mm BARS BANDED, 845mm WIDE x 405mm LG.		GALV	-
6	GA253MPG	4	GRATING A-PATTERN PLAIN TOPPED 25 x 3mm BARS BANDED, 845mm WIDE x 1050mm LG.		GALV	-
5	B1650316K5	8	BOLT M 16 x 50mm + 1N + 2W		316SS	DIN 931
4	ACHY150330	1	ANCHOR, CHEMICAL 330mL HY-150 2-PART ADHESIVE		-	-
3	N16316	20	NUT, PLAIN M 16		316SS	DIN 934
2	WF16316	20	WASHER, FLAT M 16		316SS	-
1	T16316	12	ROD, THREADED M 16, MITRE 1 END	135	316SS	DIN 975

REFERENCE DRAWING LIST	
DRAWING No.	DRAWING TITLE
8848A-001	MICRO FILTER GA.
8848A-006	MICRO FILTER PLATFORM FRAMING DETAIL
8848A-007	MICROFILTER PLATFORM HANDRAIL, GRATING & PIPE SUPPORT DETAILS

AS CONSTRUCTED DETAILS

I CERTIFY THAT THE "AS CONSTRUCTED" DETAILS SHOWN ON THIS PLAN ARE A TRUE AND ACCURATE RECORD OF THE WORKS.

SIGNED *[Signature]* DATE: 12-04-13
NAME of SIGNATORY PAUL KWONG
RPEQ No. or LICENCE 9972
COMPANY NAME: AQUATEC-MAXCON PTY. LTD.
START DATE: 31-10-12 FINISH DATE: 12-04-13

AQUATEC-MAXCON PTY. LTD.
WATER TREATMENT TECHNOLOGY AND EQUIPMENT
ACN: 062 250 482 P.O. BOX 450 POWERS QLD 4355
PH: (61) 7 3281 2289 FAX: (61) 7 3281 8259
EMAIL: info@aquatecmaxcon.com.au

WORK AS EXECUTED

DRWING NUMBER 8848A - 005

NAME SIGNATURE DATE
QUEENSLAND URBAN UTILITIES DELEGATE
(AUTHORISED FOR 12 MONTHS FROM DATE SHOWN)

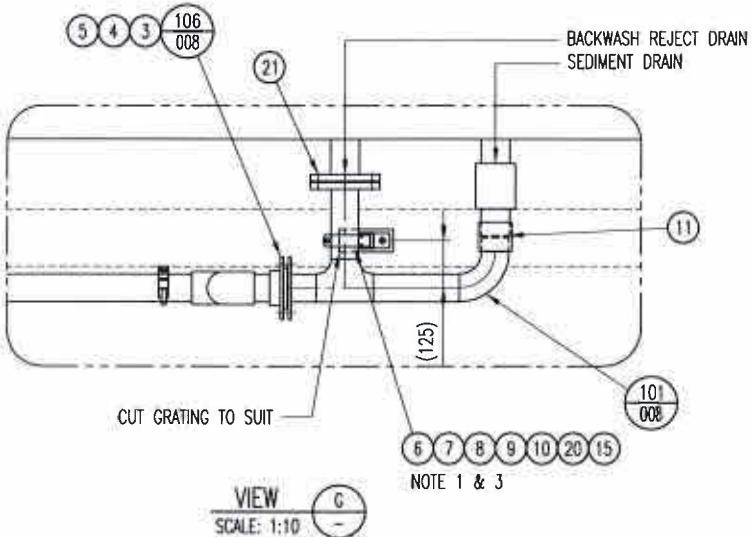
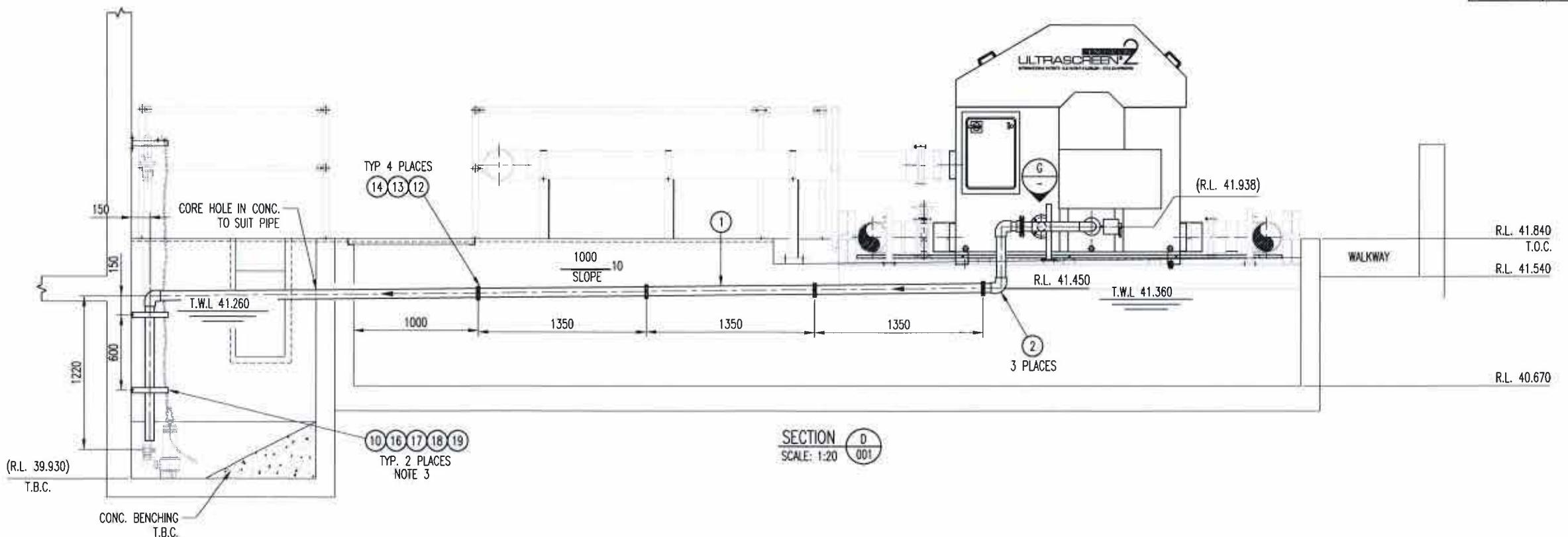
Queensland Urban Utilities

ASSET/PROJECT
QUEENSLAND URBAN UTILITIES
QUU047 - PRESSURE FILTER UPGRADE AT LOWOOD STPS
RFQ Number: C1011-045 QUU047

SHEET No. DF **SCALE AS SHOWN**
QUEENSLAND URBAN UTILITIES DRAWING NO. AMEND
486/5/5-0274-014 1

1	2	3	4	5	6	7	8	9	10	11	12	13	14	15
1 26-05-12 WORK AS EXECUTED														
2 23-01-13 FOR CONSTRUCTION														
No. DATE	AMENDMENT	DRAFTED	DESIGNED	PREP'D	APPROVED	FUNDED BY Q.U.U. ()	EXTERNAL ()	Q.U.U. FILE No.	DESIGN CHECK	R.P.E.Q. No.	DATE	APPROVED BY	SIGNATURE	DATE

REFERENCE DRAWING LIST	
DRAWING No.	DRAWING TITLE
8848A-001	MICRO FILTER GA.
8848A-008	SPool & BACKING FLANGE DETAIL



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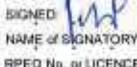
NOTES:

1. Ø14x75 DEEP HOLE, DRILLED IN CONC.
2. ITEMS 13 & 14 FROM DWG. 8848A-002 USED TO CLEAN & JOIN UPVC PIPE JOINTS.
3. USE CHEMICAL ANCHOR ITEM 19 ON DWG. 8848A-003.
4. ALL SCREW THREADS COATED WITH NICKEL ANTI-SEIZE.

21 B1665316K5	4 BOLT M 16 x 65mm + IN + 2W	316SS	DIN 931
20 WF12P	2 WASHER, INSULATION 14.3 Idx25.4 Odx3.2 THK	PHENOLIC	-
19 WF12316	4 WASHER, FLAT M 12	316SS	-
18 T12316	4 ROD, THREADED M 12, MITRE 1 END	135	316SS DIN 975
17 SSFM132-073	2 CUP, CHANNEL 73mm OD TWO PIECE	SISI	-
16 SSFM156-300	2 BRACKET, CANTILEVER 300mm	316SS	-
15 SI12M	1 SLEEVE, INSULATING M 12 x 1m	NYLAR	-
14 SSH825316	4 SCR, HEX SCK CAP M 8 x 25mm	316SS	DIN 912
13 AD830316	4 ANCHOR, DROP-IN M 8 x 30mm	316SS	-
12 167061112	10 CUP, PIPE 2 1/2" KUP-IT HEIGHT FOR 546	POLYPROP	-
11	1 WS S/S CRIP E EPDM LINED CLAMP, 76mm, 0579 9300 076 FLUID HANDLING SOLUTIONS		
10 N12316	6 NUT, PLAIN M 12	316SS	DIN 934
9 WF12316	2 WASHER, FLAT M 12	316SS	-
8 T12316	2 ROD, THREADED M 12	95	316SS DIN 975
7 FM156-450	1 BRACKET, CANTILEVER 450mm	GALV	-
6 FM132-073G	1 CUP, CHANNEL 73mm OD TWO PIECE	GALV	-
5 B1650316K5	4 BOLT M 16 x 50mm + IN + 2W	316SS	DIN 931
4 G65103E	1 GASKET, FLANGE DN 65, TABLE D, 3mm THK	EPDM RUBBER	WSA109
3 721790112	1 FLANGE ADAPTOR 2 1/2" JOIN FACE SERRATED	PVC-U GREY	-
2 721100112	3 ELBOW, SW 2 1/2", 90deg	PVC-U GREY	-
1 8008-025AB	1 PIPE 2 1/2", 73.025 OD x 7.010 WT	7.5m	PVC-U GREY
ITEM STOCK CODE	QTY	DESCRIPTION	LENGTH MATERIAL STANDARD

FUNDING	DRAFTED	AP.D.	14-12-12	DESIGN	R.F.E.Q. No.	DATE	B.S.	APPROVED BY	SIGNATURE	DATE	24-01-13	ASSET/PROJECT	DRAWING TITLE	QUEENSLAND URBAN UTILITIES
1 26-03-13 WORK IS EXECUTED	R.A.M.			DESIGN W.O. No.	DRAFTING CHECK	AB	24-01-13	DESIGN				QUEENSLAND URBAN UTILITIES	MICROFILTER SEDIMENT &	
2 26-03-13 FOR CONSTRUCTION	AP.D.	R.E.		CONSTRUCTION W.O. No.				CAD FILE				RFQ Number: C1011-045 QUU047	BACKWASH REJECT DRAIN ASSEMBLY	
3 DATE	AMENDMENT	DRAFTED	DESIGNED	REFINED	APPROVED	FUNDED BY Q.U.U. (✓)	EXTERNAL ()	Q.U.U. FILE No.	DESIGN CHECK	R.F.E.Q. No.	DATE	CONSTRUCTION MANAGER	SIGNATURE	DATE

AS CONSTRUCTED DETAILS
I CERTIFY THAT THE 'AS CONSTRUCTED' DETAILS
SHOWN ON THIS PLAN ARE A TRUE AND ACCURATE
RECORD OF THE WORKS.

SIGNED  DATE 12-04-13
NAME OF SIGNATORY PAUL KWONG
RPED No. of LICENCE 9972
COMPANY NAME AQUATEC-MAXCON PTY. LTD.
START DATE 31-10-12 FINISH DATE 12-04-13

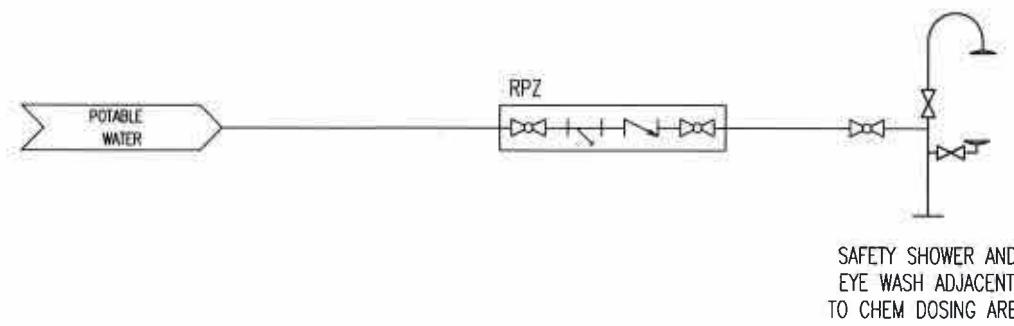
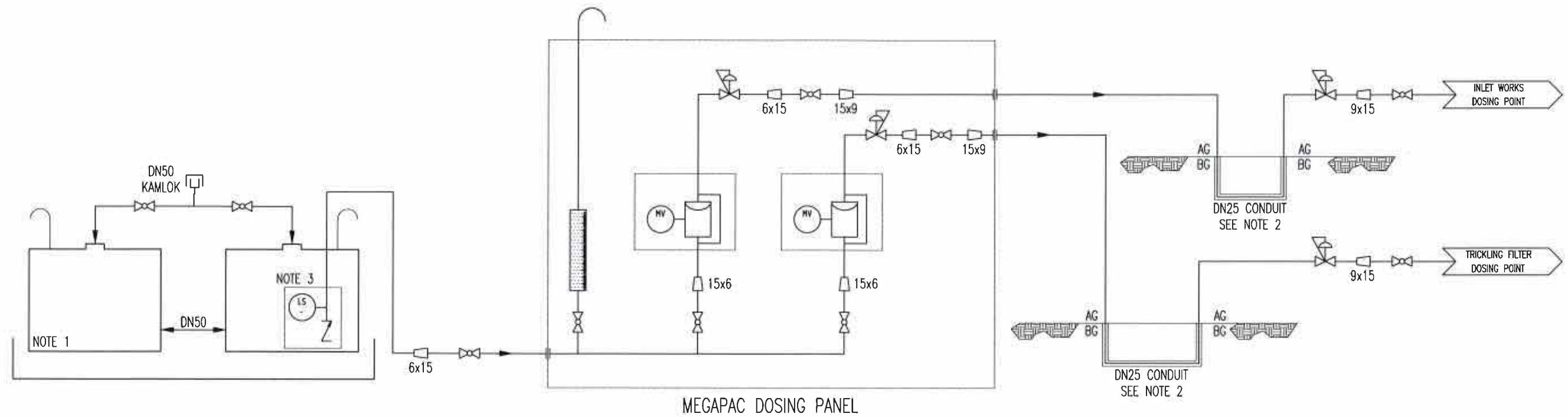
AQUATEC-MAXCON PTY. LTD.
WATER TREATMENT TECHNOLOGY AND EQUIPMENT
ACN 002 250 482 P.O. BOX 455 IPSWICH QLD 4305
PH: (61) 7 3281 2269 FAX: (61) 7 3281 8259
EMAIL: enquiries@aquatecmaxcon.com.au

WORK AS EXECUTED
DRAWING NUMBER 8848A - 009

NAME SIGNATURE DATE
QUEENSLAND URBAN UTILITIES DELEGATE
(AUTHORISED FOR 12 MONTHS FROM DATE SHOWN)



SHEET NO. OF AS SHOWN
QUEENSLAND URBAN UTILITIES DRAWING NO. AMEND.
486/5/5-0274-015 0



NOTES:

1. 2x1000L MEGAPAC IBC'S.
2. USE DN25 PIPE AS SECONDARY CONTAINMENT OF CHEMING DOSING LINES FROM DOSING PANEL TO DOSING POINT.
3. LEVEL SWITCH WITH FOOT VALVE.

AS CONSTRUCTED DETAILS	
I CERTIFY THAT THE "AS CONSTRUCTED" DETAILS SHOWN ON THIS PLAN ARE A TRUE AND ACCURATE RECORD OF THE WORKS.	
SIGNED:	DATE: 12-11-14
NAME of SIGNATORY:	PAUL KWONG
RPEQ No. or LICENCE:	9972
COMPANY NAME:	AQUATEC-MAXCON PTY LTD
START DATE:	14-08-14
FINISH DATE:	12-11-14

AQUATEC-MAXCON PTY. LTD.	
WATER TREATMENT TECHNOLOGY AND EQUIPMENT	
ACN: 002 250 482 P.O. BOX 455 PENWYCH QLD 4205	
PH: (61) 7 3281 2269 FAX: (61) 7 3281 8259	
EMAIL: aquatec@australiamaxcon.com.au	

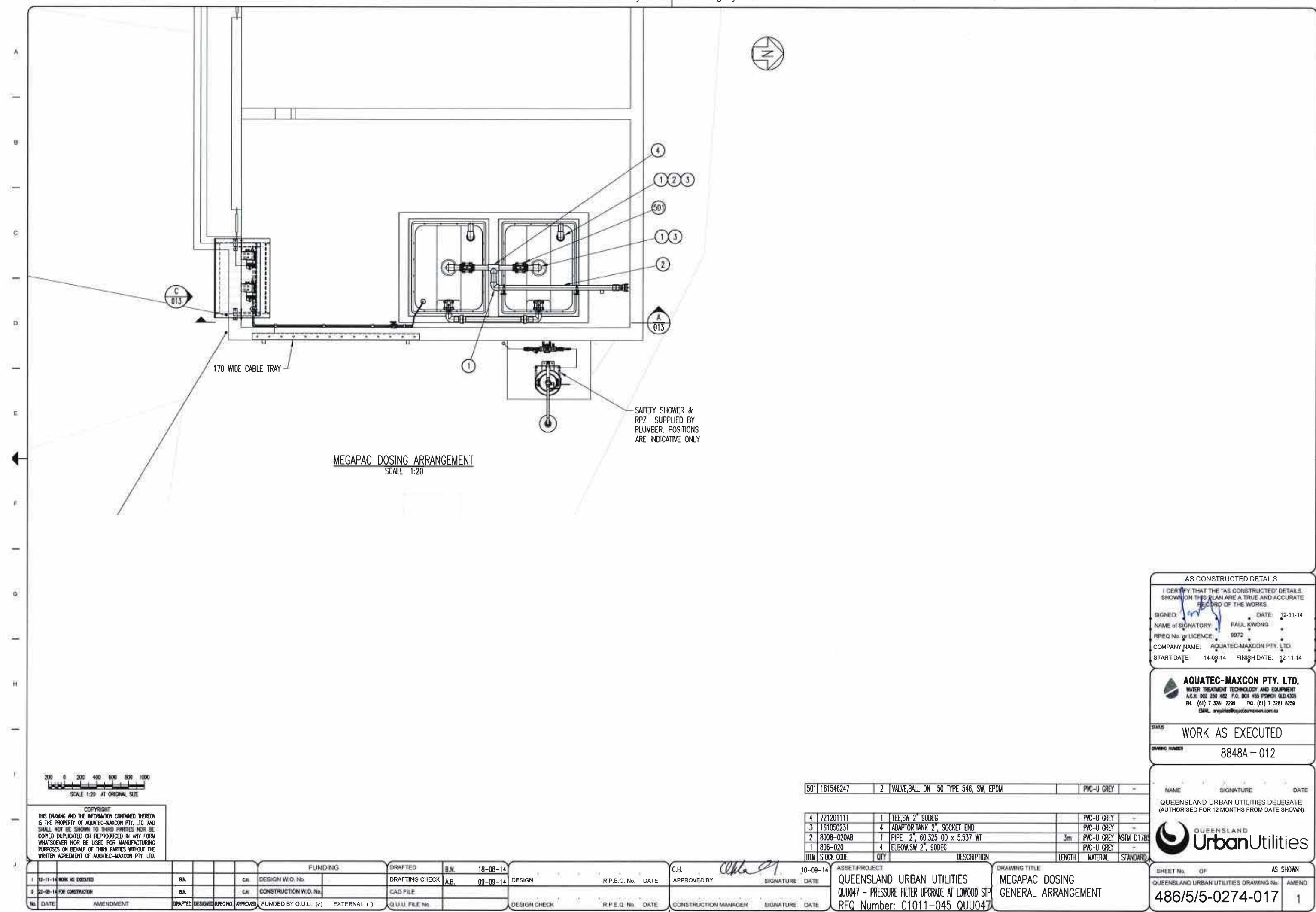
WORK AS EXECUTED		
DRAWING NUMBER:	8848A - 011	

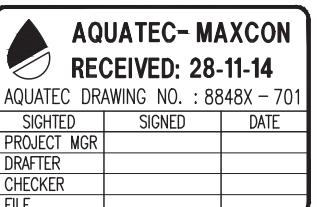
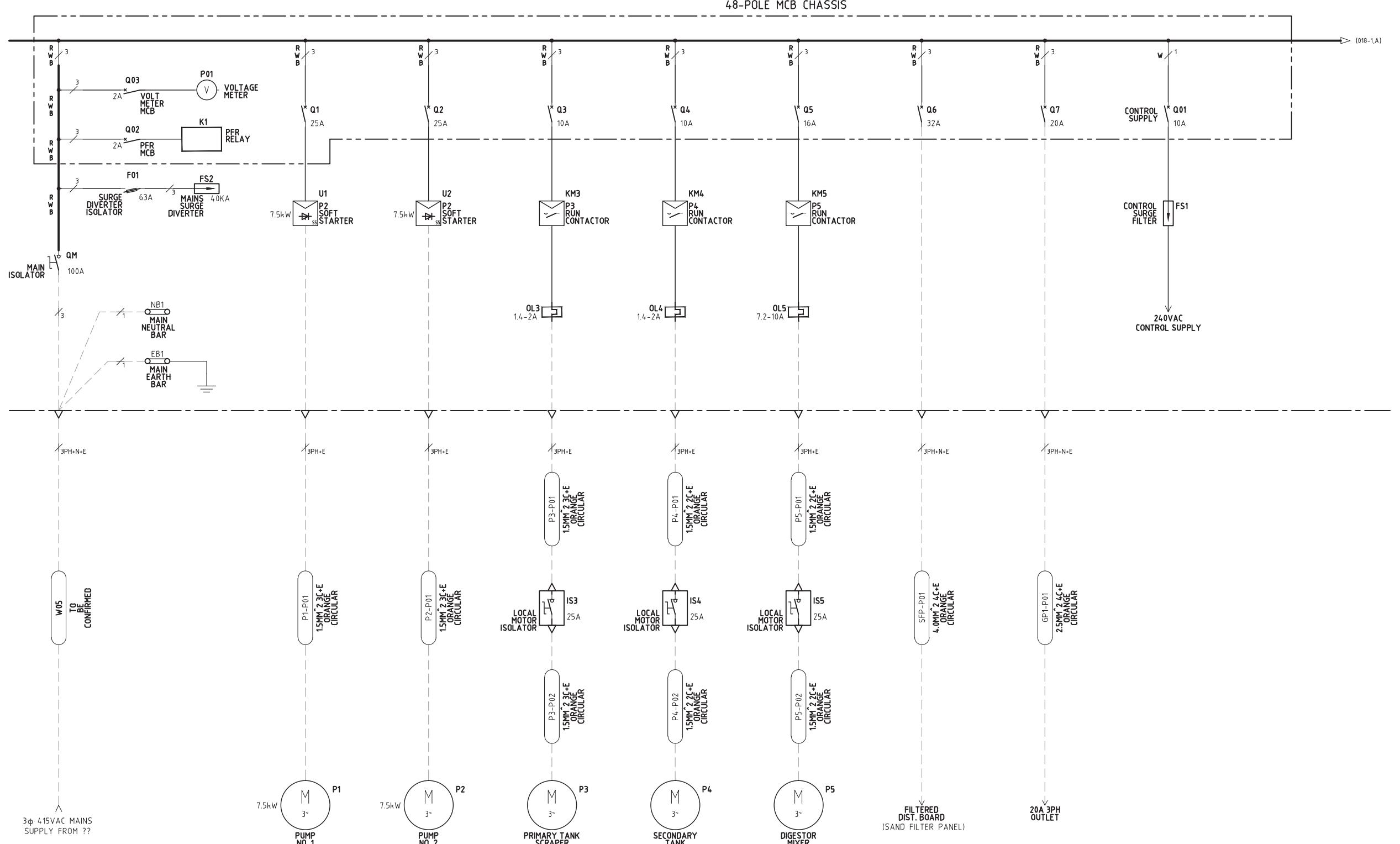
NAME	SIGNATURE	DATE
QUEENSLAND URBAN UTILITIES DELEGATE (AUTHORISED FOR 12 MONTHS FROM DATE SHOWN)		



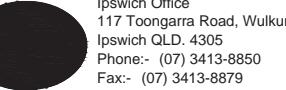
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		FUNDING	DRAFTED	AG.	14-08-14	C.H.	10-09-14	ASSET/PROJECT	DRAWING TITLE	SHEET No.	OF	NTS
1	12-11-14 WORK AS EXECUTED	IR	CM	DESIGN W.O. No.		DRAFTING CHECK	AB.	09-09-14	DESIGN	R.P.E.Q. No.	DATE	APPROVED BY
2	09-09-14 FOR CONSTRUCTION	IR	CM	CONSTRUCTION W.O. No.		CAO FILE			CONSTRUCTION			SIGNATURE DATE
3	DATE	AMENDMENT	DRAFTED DESIGNER RPEQ NO. APPROVED	FUNDED BY Q.U.U. () EXTERNAL ()	Q.U.U. FILE NO.	DESIGN CHECK	R.P.E.Q. No.	DATE	CONSTRUCTION MANAGER	SIGNATURE	DATE	RFQ Number: C1011-045 QUU047





AS CONSTRUCTED DETAILS
I CERTIFY THAT THE "AS CONSTRUCTED" DETAILS SHOWN ON THIS PLAN ARE A TRUE AND ACCURATE RECORD OF THE WORKS.
SIGNED: DATE:
NAME OF SIGNATORY: GREG BOTT
RPEQ No. or LICENCE: 10036
COMPANY NAME: MPA ENGINEERING PTY. LTD.
START DATE: FINISH DATE:

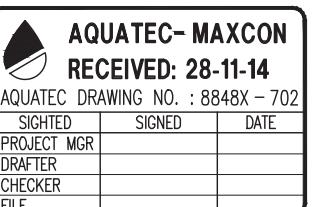
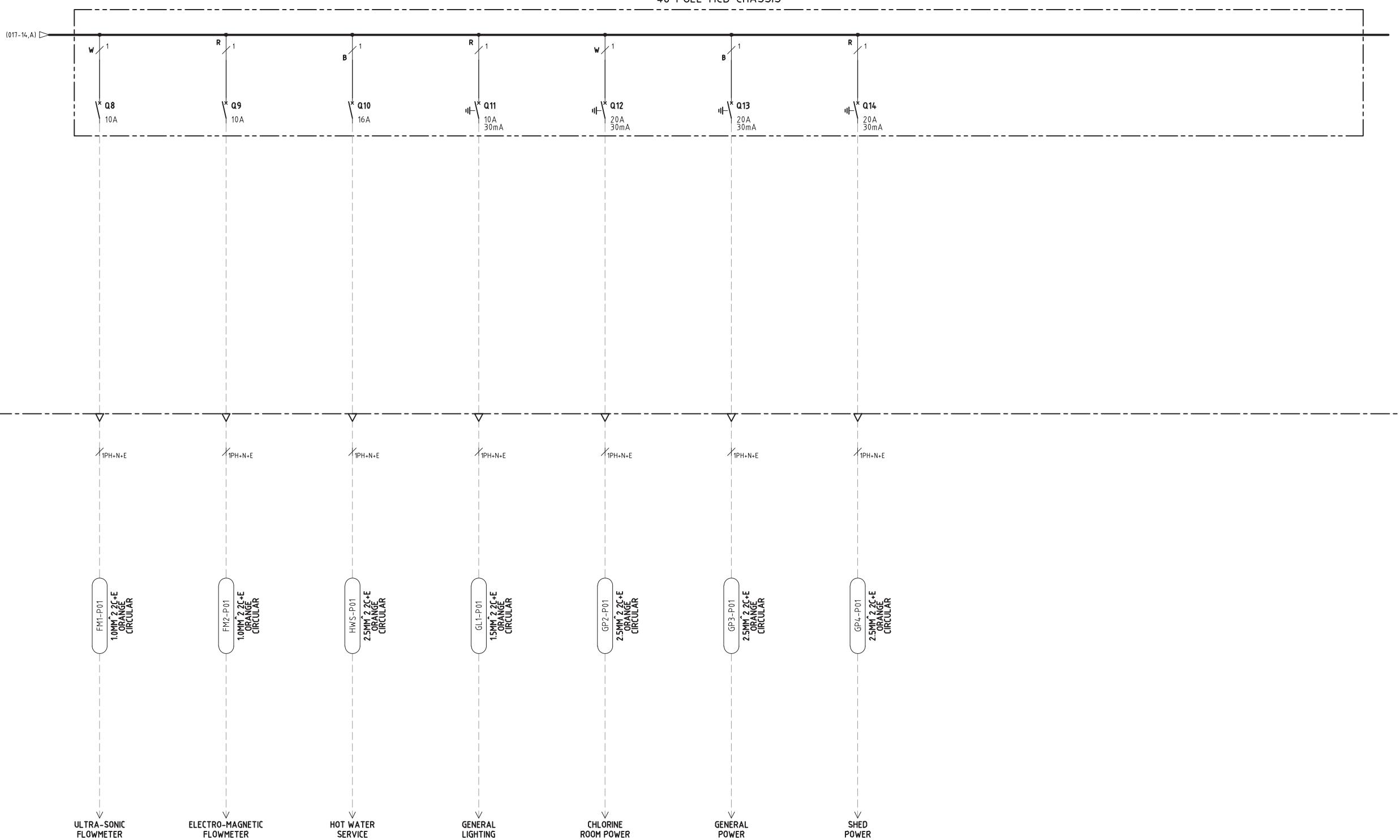
M.P.A. Engineering Pty. Ltd.
Specialists & Machine & Plant Automation

Ipswich Office
117 Toongarra Road, Wulkuraka
Ipswich QLD. 4305
Phone:- (07) 3413-8850
Fax:- (07) 3413-8879
Website:- www.mpaeng.com.au
Job No:- 18542

NAME SIGNATURE DATE
QUEENSLAND URBAN UTILITIES DELEGATE
(AUTHORISED FOR 12 MONTHS FROM DATE SHOWN)

QUEENSLAND Urban Utilities

AS CONSTRUCTED

		FUNDING		DRAFTED	DJW	KG	24/10/2011	ASSET/PROJECT		DRAWING TITLE		
O	26/11/14	AS CONSTRUCTED, BORDER REVISED [WAS 18542-017_1]	DJW	MW	CONSTRUCT W.O. No.	DRAFTING CHK	DESIGN	R.P.E.Q. No.	DATE	LOWOOD	SHEET No. 01 OF 02	
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No.	DATE	AMENDMENT	DWN	APD	FUNDED BY Q.U.U. (✓)	EXTERNAL ()	CAD FILE	486-5-0274-040_0.dwg	10036	WASTE WATER	QUEENSLAND URBAN UTILITIES DRAWING NO. 486/5/5-0274-040	
Q-Pulse ID: TMS116U	2	3	4	5	6	7	8	9	10	11	12	



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SIGNED: DATE:
NAME of SIGNATORY: GREG BOTT
RPEQ No. or LICENCE: 10036
COMPANY NAME: MPA ENGINEERING PTY. LTD.
START DATE: FINISH DATE:

M.P.A. Engineering Pty. Ltd.
Specialists & Machine & Plant Automation

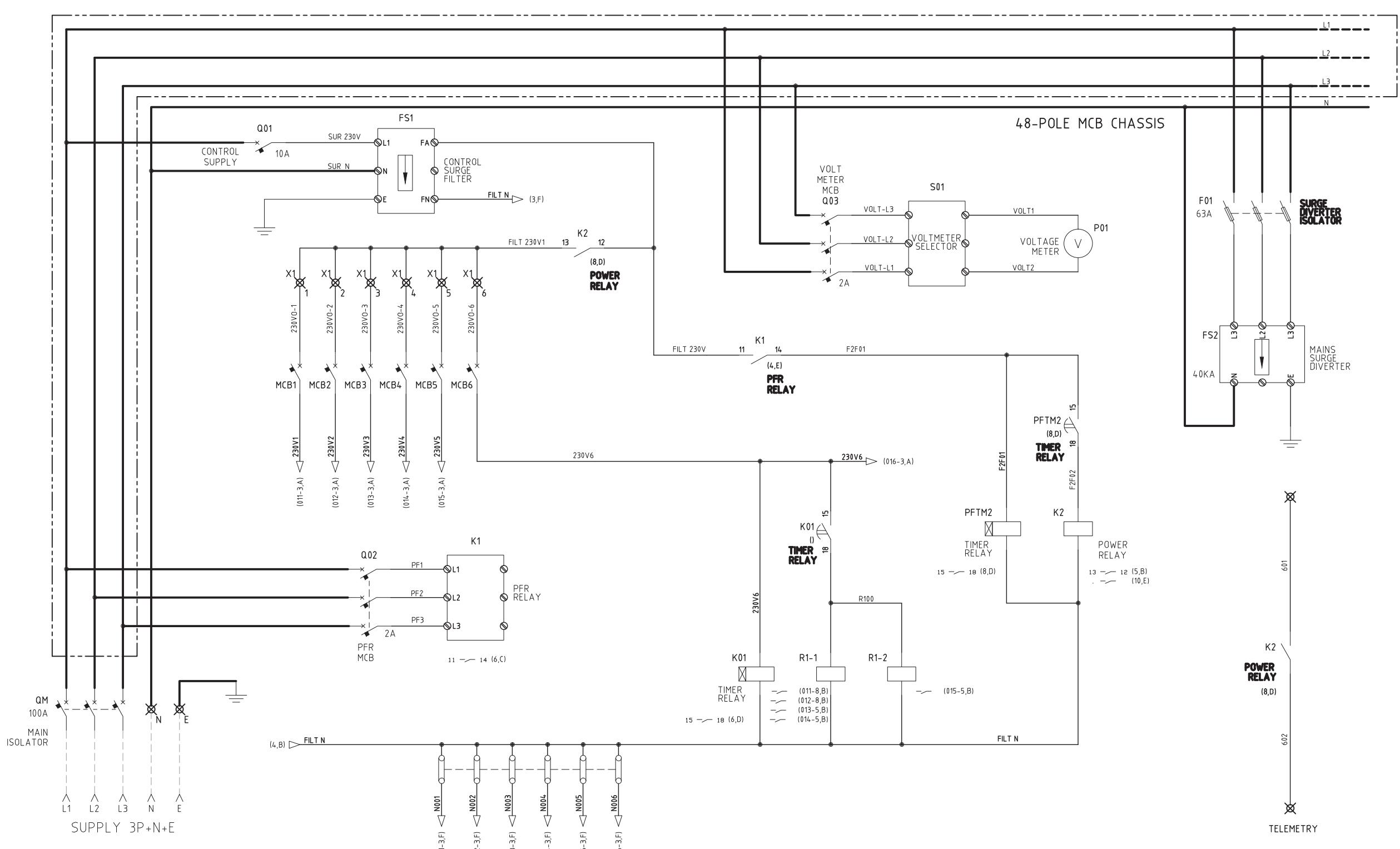
Ipswich Office
117 Toongarra Road, Wulkuraka
Ipswich QLD. 4305
Phone:- (07) 3413-8850
Fax:- (07) 3413-8879
Website:- www.mpaeng.com.au
Job No:- 18542

NAME SIGNATURE DATE
QUEENSLAND URBAN UTILITIES DELEGATE
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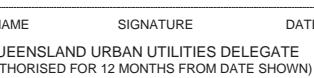
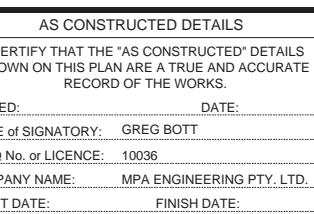
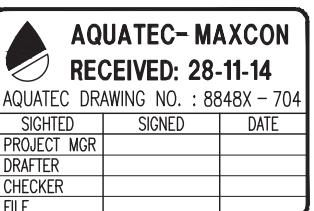
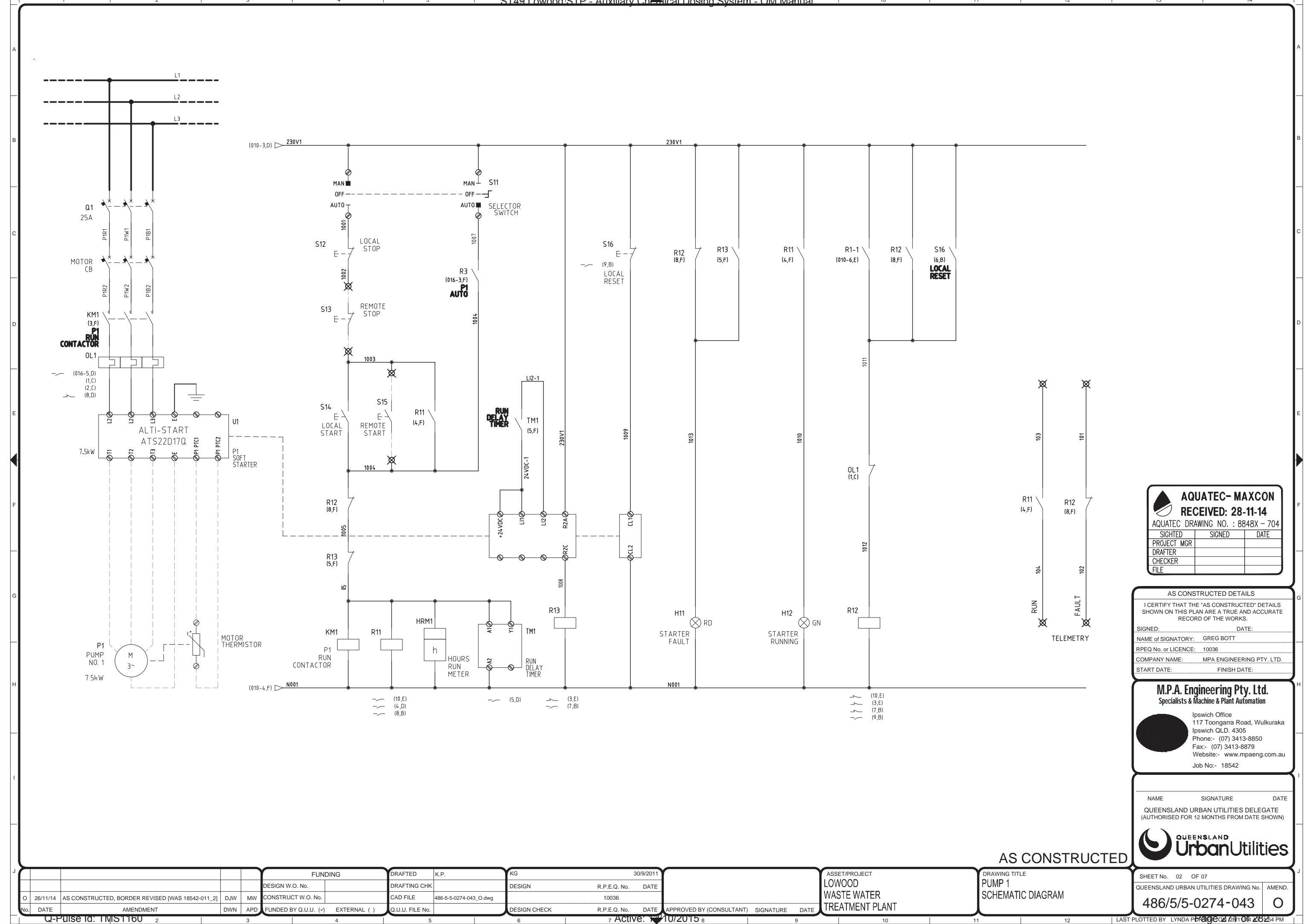
QUEENSLAND Urban Utilities

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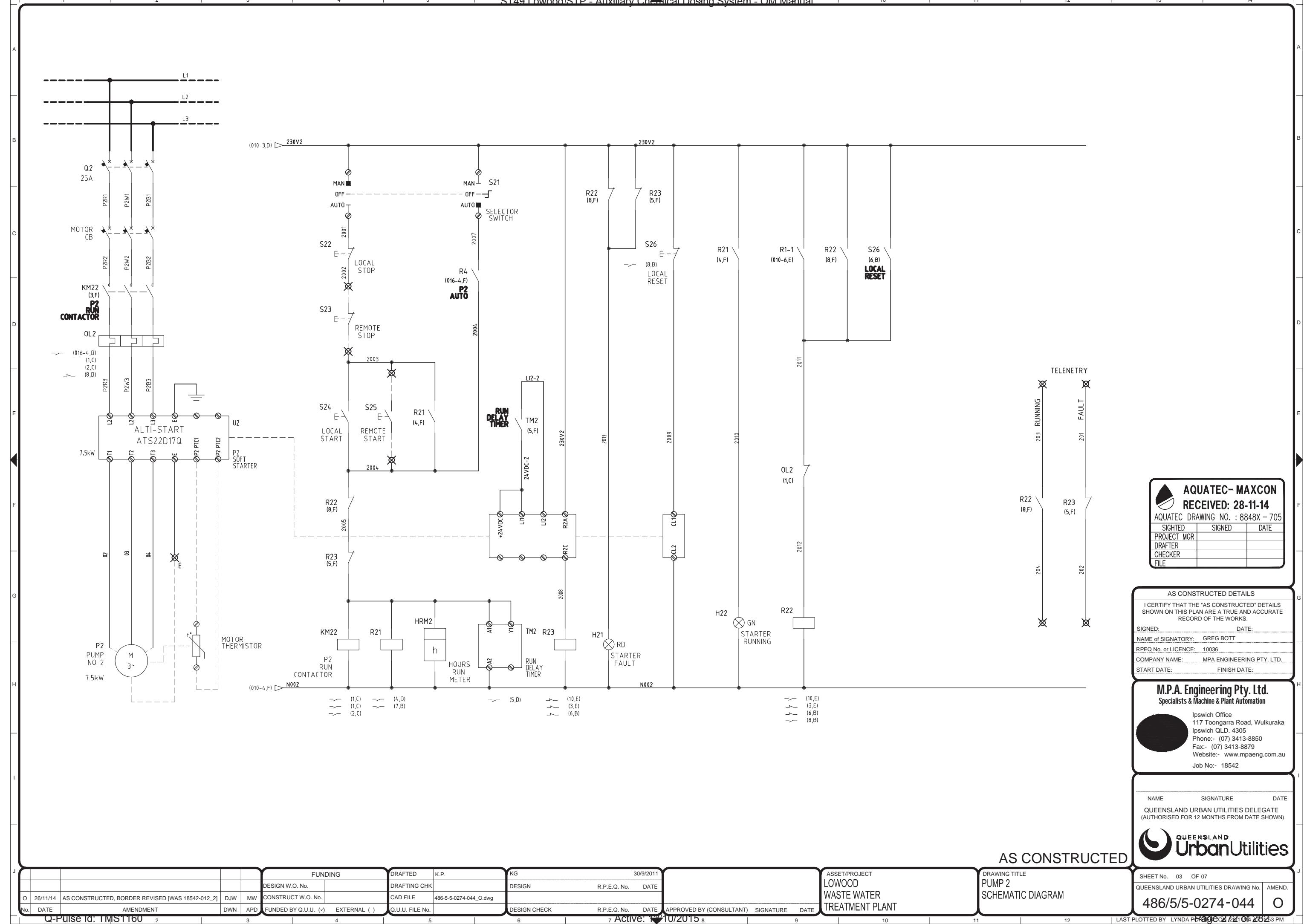


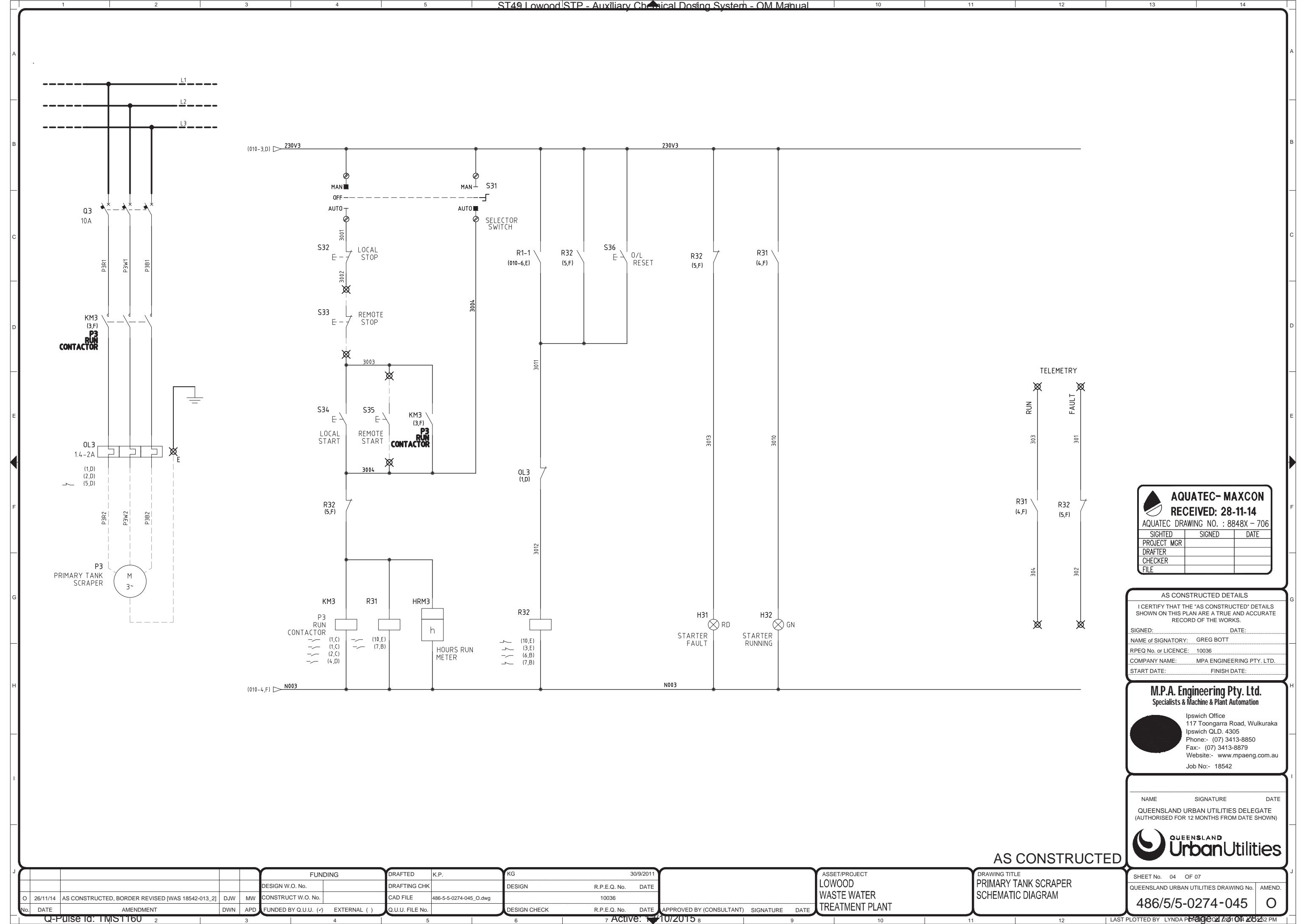
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							Active: 14/10/2015								

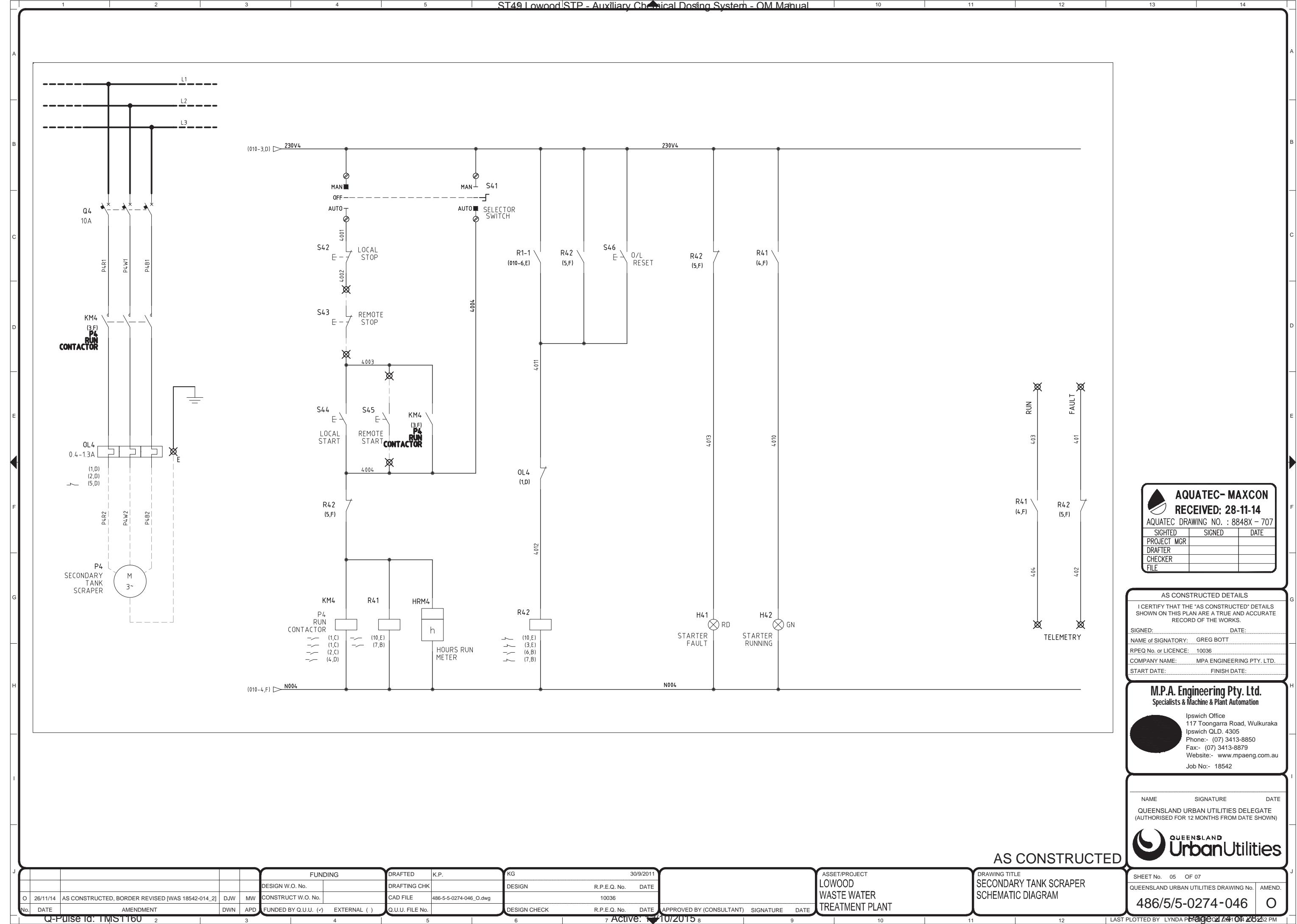


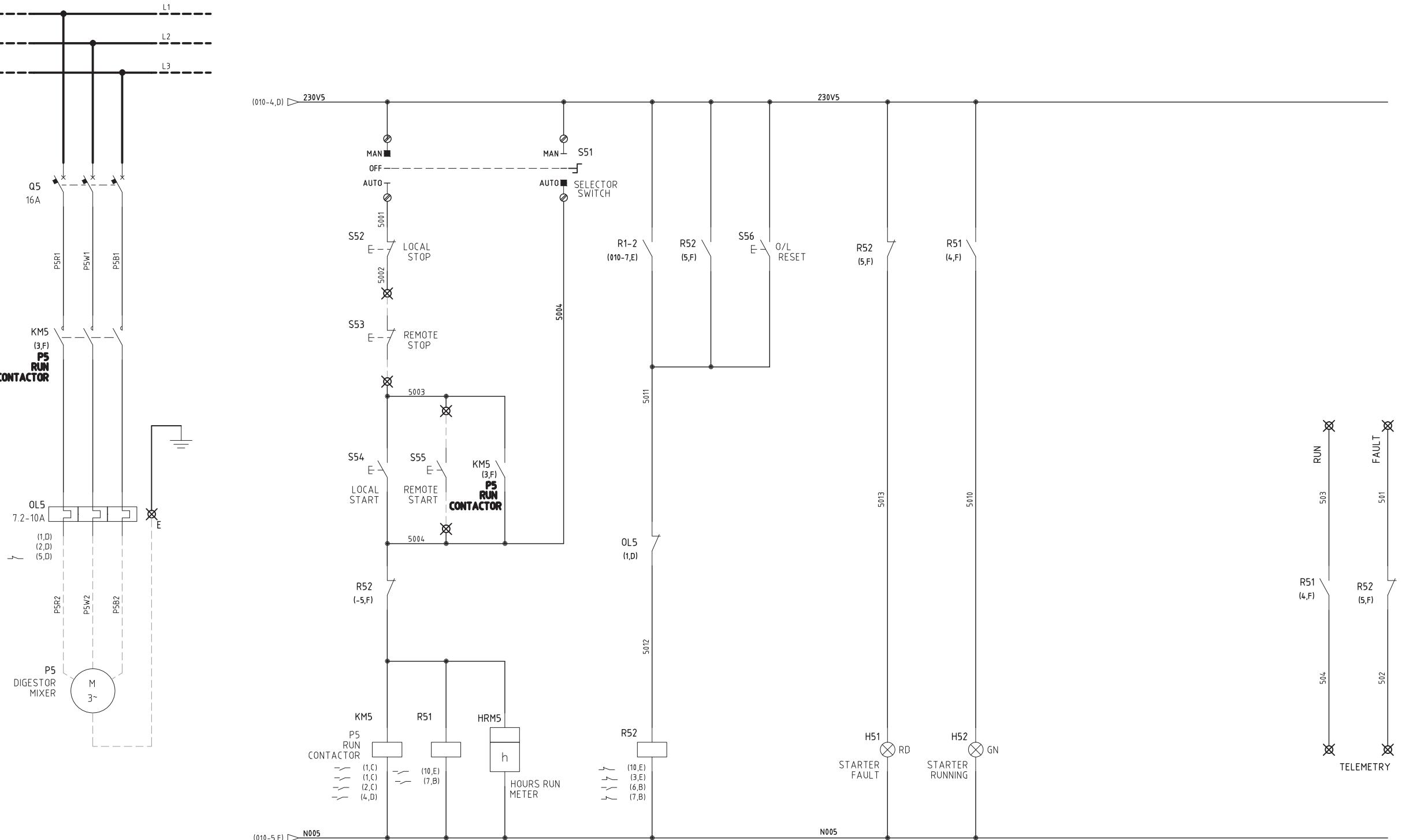
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Q-Pulse ID: TMS116U	2		3			4		5		6	7 Active: 14/10/2015	8	9	10	11	12	13	14









AQUATEC- MAXCON RECEIVED: 28-11-14
AQUATEC DRAWING NO. : 8848X - 708
SIGHTED SIGNED DATE
PROJECT MGR
DRAFTER
CHECKER
FILE

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I CERTIFY THAT THE "AS CONSTRUCTED" DETAILS SHOWN ON THIS PLAN ARE A TRUE AND ACCURATE RECORD OF THE WORKS.
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(AUTHORISED FOR 12 MONTHS FROM DATE SHOWN)

QUEENSLAND Urban Utilities

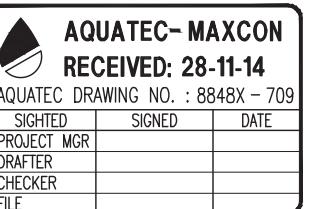
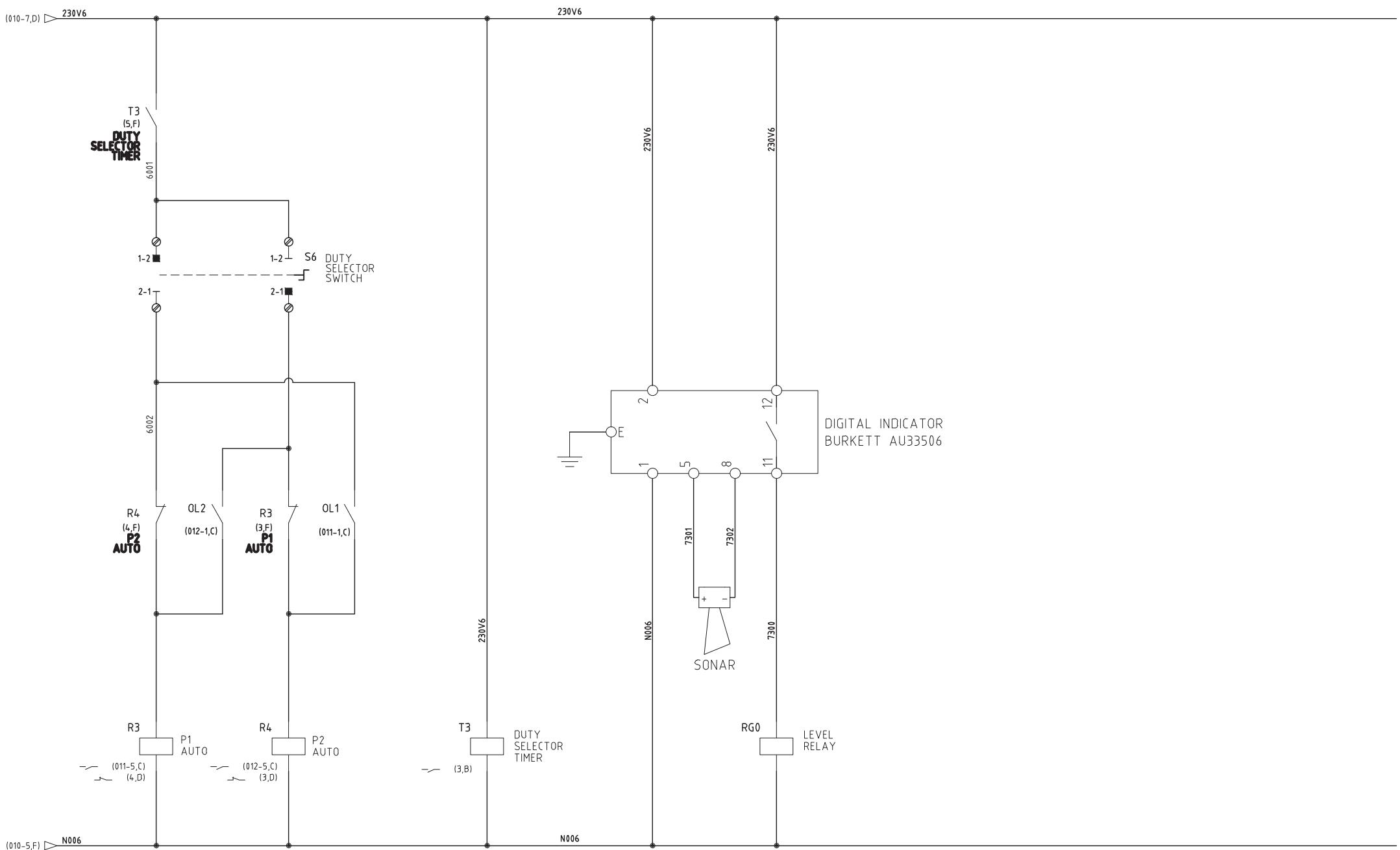
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ASSET/PROJECT
LOWOOD
WASTE WATER
TREATMENT PLANT

DRAWING TITLE
DIGESTOR MIXER
SCHEMATIC DIAGRAM

SHEET No. 06 OF 07
QUEENSLAND URBAN UTILITIES DRAWING NO. AMEND.
486/5/5-0274-047 O

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QUEENSLAND Urban Utilities

AS CONSTRUCTED

		FUNDING		DRAFTED	K.P.	KG	30/9/2011	ASSET/PROJECT		DRAWING TITLE		
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4. Liquid Aluminium Chlorohydrate (Megapac 23) Data Sheet I

OMEGACHEMICALS

MEGAPAC 23

(Aluminium Chlorohydrate)

Polyaluminium Hydroxychloride coagulants are becoming increasingly popular in the treatment of municipal water and wastewater. Other applications in the paper making, deodorant and cosmetics industry are also experiencing growth both locally and internationally. The market is experiencing rapid growth in Australia, Japan and the United States.

Since commencing production of **Megapac 23** (Aluminium Chlorohydrate) in early 1999, Omega Chemicals has fielded many enquiries into the benefits of **Megapac 23** over traditional aluminium and iron based coagulants. This brochure provides details of the potential benefits associated with Polyaluminium Hydroxychloride coagulants over traditional coagulants.

Lower Dose Rates

Compared with alum, **Megapac 23** has a higher proportion of active ingredient. The following table compares the concentration of active ingredient on the basis of Al_2O_3 content:

Product	Active Ingredient (as wt% Al_2O_3)	pH
Megapac 23	23 - 24	3 - 4
Liquid alum	7.5 - 8.3	2 - 3
Alum powder	17 - 18	2 - 3*

* In a 50% solution

Megapac 23 has around 3 times as much active ingredient as liquid alum. On this basis alone, **Megapac 23** can treat 3 times as much water as an equivalent amount of liquid alum. In reality, many of Omega's customers that have trialed **Megapac 23** have reported that its actual efficiency is between 500 - 600% when compared with liquid alum.

This increased efficiency is due to the nature of the aluminium species. Aluminium chloride coagulants such as **Megapac 23** contain polynuclear species with up to 13 agglomerated aluminium molecules, yielding a highly cationic charge and enables more efficient flocculation. Flocs are also formed more rapidly improving plant efficiency.

The nature of the polynuclear species present in **Megapac 23** is determined by the **basicity** of the product. The basicity is defined as the ratio of chloride groups substituted for hydroxyl groups on the molecule and is typically above 83% for **Megapac 23**.

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WEB: www.omegachem.com.au

Active: 12/10/2015

Lower Residual Coagulant

Due to lower dose rates in the raw water, **Megapac 23** can produce treated water with lower residual coagulant concentration than can be achieved with alum or iron salts. This can result in reduced rates of metal deposition in the distribution system, which can adversely affect treated water quality.

Higher pH of Treated Water

Megapac 23 has a pH of 3 - 4 compared with a saturated alum solution which is usually in the pH range 2 - 3. Several factors influence the pH of the treated water when **Megapac 23** is compared to liquid alum.

Use of higher pH coagulants such as **Megapac 23** at a dosage rate of one fifth to one sixth of that required for liquid alum yields treated water of greater pH.

In addition, **Megapac 23** does not consume alkalinity from the solution to form flocs as alum does due to the presence of hydroxyl ions in the molecules. In many cases, **Megapac 23** eliminates the need for pH correction of the treated water.

Colour Removal

Customers of Omega Chemicals have reported that **Megapac 23** is significantly more effective in the removal of colour than alum.

Reduced Sludge Production

Because the need for pH correction of the treated water is reduced or eliminated, the production of sludge can be greatly reduced. This is especially the case where lime is used for pH correction as up to 25% of lime added can remain undissolved and ultimately require disposal as sludge.

Where pH correction cannot be totally eliminated, the use of **Megapac 23** could improve the economics of changing from lime to more soluble materials such as soda ash or caustic soda, further reducing sludge from lime residue and resulting in lower levels of turbidity in the treated water.

In addition, the quantity of coagulant used also influences the quantity of sludge produced. This is more significant where the raw water has low turbidity or the treatment is employed primarily for colour removal. Because **Megapac 23** is dosed at a significantly lower rate than alum, the amount of sludge generated should be reduced in these applications.

Coagulation Over Wider pH Range

Traditional coagulants such as alum and iron salts become less effective when the pH of the raw water exceeds 8 as the cationic charge of the aluminium species is diminished. This can be overcome by overdosing of the coagulant or use of coagulants with high free acidity however this approach could cause an increase in the generation of sludge.

High basicity coagulants such as **Megapac 23** operate effectively in raw water up to pH 9 as they are able to retain their strong cationic charge. This can be particularly useful in treating raw water where algae is present and causing high pH levels in the raw water.

Longer Filter Run Time

Literature suggests that flocs formed by coagulants such as **Megapac 23** are of a less sticky or gelatinous nature than those formed by alum and iron salts. This results in lower turbidity of the treated water and enables longer filter run times.

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This in turn reduces the number of backwashes required and therefore the amount of backwash solids that need to be handled. Fewer backwashes also result in greater overall plant efficiency.

More Economic Treatment

Although **Megapac 23** is more expensive than traditional coagulants such as alum, ferric sulphate and ferric chloride on a per tonne basis, this is offset by other potentially significant savings.

These include costs associated with the disposal of sludge, the use of chemicals to adjust pH, improved plant efficiency and improved quality of the treated water.

The greater efficiency of **Megapac 23** over alum (up to 600% more water treated) can more than offset the difference in cost.

Summary of Benefits of Megapac 23

Lower dosage rates required compared with alum and iron salts resulting in:

- Lower residual coagulant in the treated water.
- Reduced sludge in applications where raw water has low turbidity and treatment is primarily to facilitate colour removal.

Higher pH of treated water resulting in:

- Reduction or elimination of need for pH correction.
- Reduction in sludge production where lime usage is reduced or eliminated.

Reduction of overall chemical cost due to:

- Reduction or elimination of pH correction and associated storage and handling costs.
- Lower chemical cost than alum or iron salts based on quantity of water treated.
- No requirement to overdose coagulant in applications with elevated pH.

Improved plant efficiency arising from:

- Longer filter runs due to stability of flocs formed.
- Reduction in frequency of backwashes, reducing amount of backwash material requiring disposal.

Effective over wider range of applications than alum and iron salts:

- Effective in pH ranges up to 9 whereas alum and iron salts lose effectiveness above pH 8.
- More effective than alum and iron salts in some applications where algae is a problem.
- Effective in colour removal.

Availability:

- Industrial Grade
- Cosmetic Grade (low iron, < 70 ppm)

Packaging:

- Bulk - up to 19,000 litre consignments
- IBC - 1,000 litre lots
- Drum - 200 litre polydrums

NOTE:If substituting aluminium chloride coagulants such as **Megapac 23** for liquid alum, the storage and dosing system should be completely free of alum. This is because mixing with alum can cause the aluminium chloride to decompose to aluminium hydroxide.

For further information about **Megapac 23**, contact our customer service department.

Customer service number: 03 8368 8000

WEB: www.omegachem.com.au

OMEGACHEMICALS

Page 1 of 1
Issue No.2
Issue Date: 1st Jan 2006
Approved by: L.C. FRIED

PRODUCT SPECIFICATION

MEGAPAC 23 (Liquid Polyaluminium Chlorohydrate)

SPECIFICATION

Appearance	Clear to slightly hazy
Total soluble Al ₂ O ₃	23 - 24%
Basicity	83 - 85%
Chloride	7.9 - 8.4%
Insoluble suspended matter	0.01% max.
Iron	75 mg/kg max
pH	3 - 4
Specific gravity	1.33 - 1.34 at 20°C

HEAVY METAL ANALYSIS

Arsenic	0.5 mg/kg max.
Cadmium	0.1 mg/kg max.
Chromium	0.5 mg/kg max.
Lead	0.5 mg/kg max.
Mercury	0.1 mg/kg max.
Selenium	0.5 mg/kg max.
Silver	0.5 mg/kg max.
Barium	0.5 mg/kg max
Nickel	4.0 mg/kg max.

USES:

- Flocculation in municipal water supply, sewage and industrial effluent.

AVAILABLE IN:

- Bulk tankers
- 1000 litre IBC
- 200 litre Mauser

Customer service number: 03 8368 8000

5. Nuove Energie Model UL1602 Operation and Maintenance Manual

TMS307