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BRISBANE CITY COUNCIL BRISBANE WATER

SP302 - Progress Road Pump Station

Operation & Maintenance Manual Contract Number BW50080-04/05

Volume Number 2.4



BRISBANE CITY COUNCIL
Brisbane Water
Progress Road P/S SP302

BCC Contract No. BW50080-04/05

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tyco*Flow Control***Tyco Water****Figure 500 resilient seated gate valves are designed and manufactured to AS 2638-2.****Features**

- Ductile Iron body and bonnet for high strength and impact resistance.
- Ductile Iron gate fully encapsulated in EPDM rubber to ensure drop tight sealing.
- Grade 431 Stainless Steel spindle for high strength and corrosion resistance.
- Gunmetal dezincification resistant top casting incorporating dual O-ring seals and wiper ring for long life operation.
- Back seal facility to allow for replacement of seals under full operating pressure.
- Rilsan® Nylon 11 coating for long life corrosion protection.
- Straight through full bore to avoid debris traps.
- Isolated fasteners for corrosion protection.
- Anti-friction thrust washer for low operating torques.
- Integral cast in feet for safe and easy storage.
- Integral lifting lugs for installation convenience.
- Anticlockwise closing or clockwise closing available.
- Key, hand wheel or gearbox operation available.

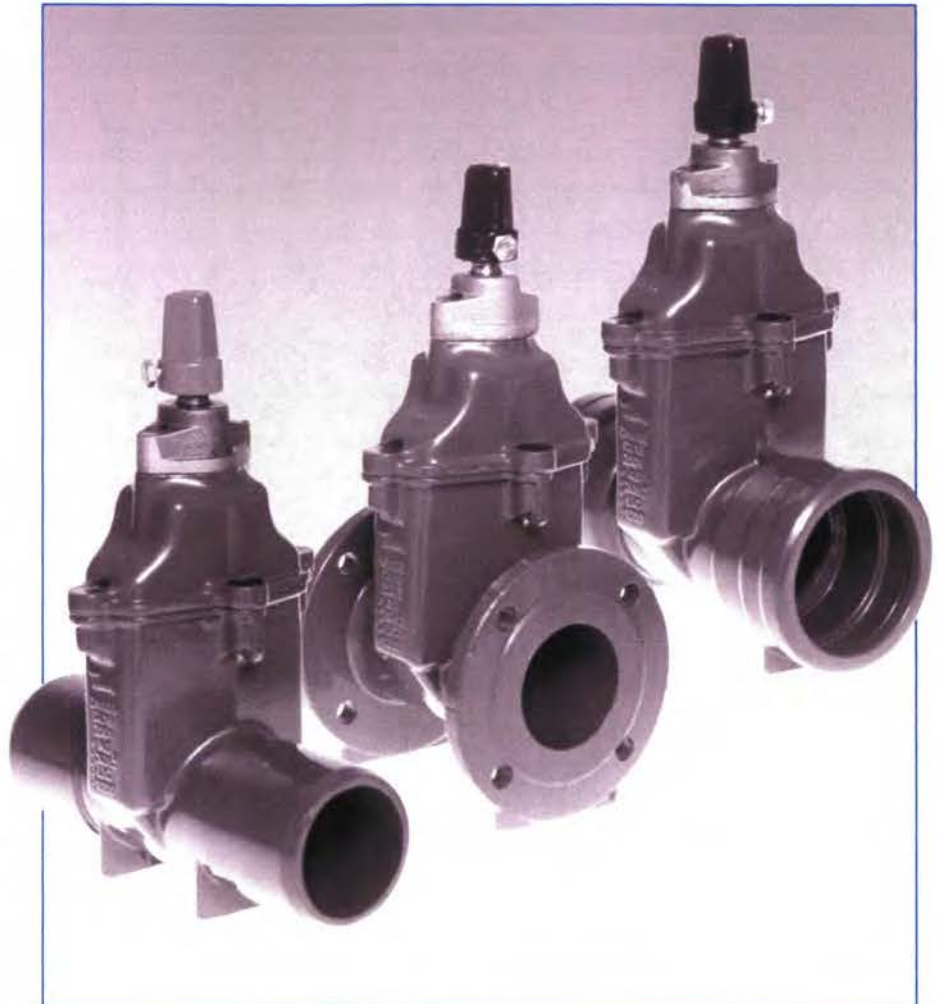
**General Application**

Figure 500 resilient seated gate valves are suitable for use with drinking water and waste water, in below or above ground applications. Used for the isolation of sections and branches in pipelines.

**Technical Data****Size Range:** DN80-DN600**Allowable Operating Pressure:** 1600 kPa**Maximum Temperature:** 40°C**End Connections:**

Flanged to AS 4087 Fig B5

TYTON® Socket

Spigot to AS/NZS 2280

Flange - TYTON Socket

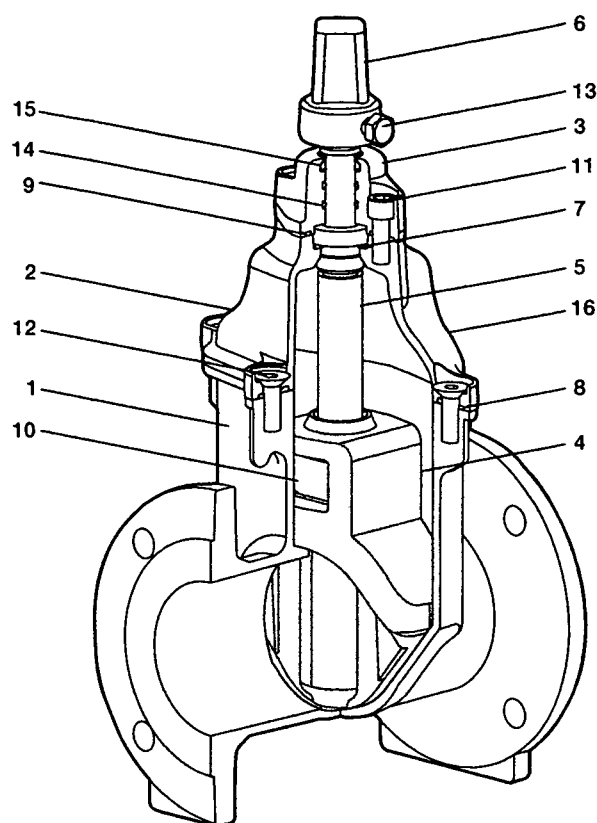
Approvals:

WSAA Appraisal No. 98/21

ISC AS 2638 Product Mark

Registration No. PRD/R61/0412/2

Certified to AS 4020 -suitable for contact with drinking water.



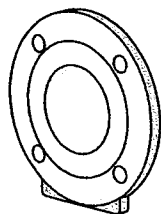
Parts List

No	Description	Material	Standard
1	Body	Ductile Iron	AS 1831 400-12
2	Bonnet	Ductile Iron	AS 1831 400-12
3	Seal Retainer	Gunmetal	AS 1565 C83600
4	Gate	Ductile Iron (EPDM Encapsulated)	AS 1831 400-12
5	Spindle	Stainless Steel	ASTM A 276 431
6	Spindle Cap	Ductile Iron	AS 1831 400-12
7	Thrust Washer	Acetal	-
8	Body Gasket	EPDM	AS 1646
9	Bonnet Gasket	EPDM	AS 1646
10	Gate Nut	Gunmetal	AS 1565 C83600
11	Socket Head Screws	High Tensile Alloy Steel	-
12	Countersunk Screws	High Tensile Alloy Steel	-
13	Hex Head Screw	Stainless Steel	ASTM A276 316
14	O-Rings	Nitrile Rubber	AS 1646
15	Wiper Ring	Nitrile Rubber	AS 1646
16	Fusion Coating	Rilsan® Nylon II	AS/NZS 4158

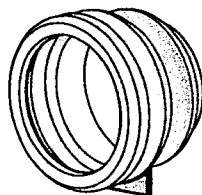
Resilient Seated Gate Valves - Figure 500

DN80 - DN600

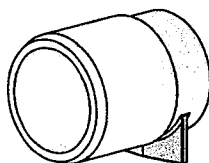
End Connections



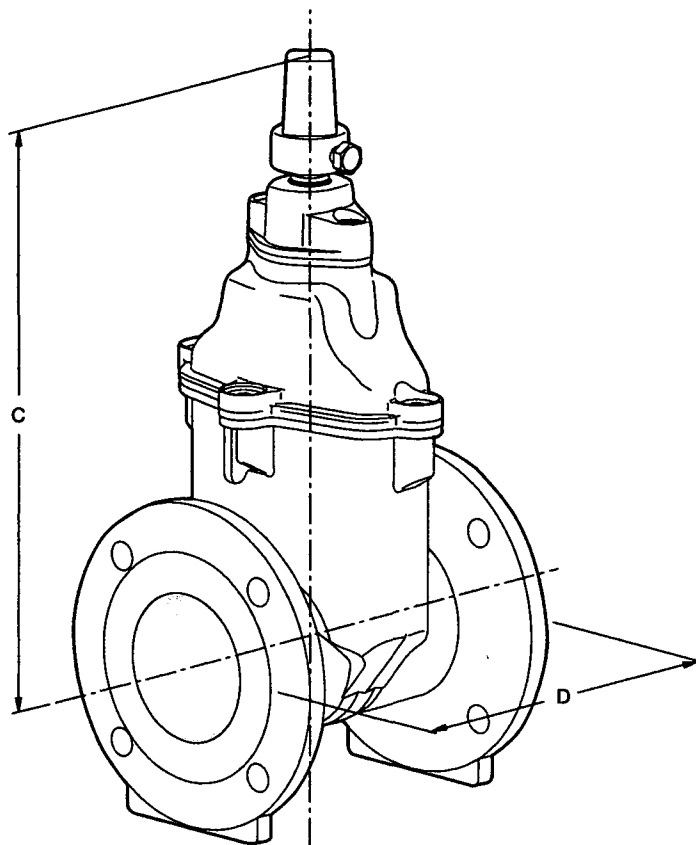
Flange



Socket



Spigot



Dimensions (mm)

Valve Size	C	D			Turns to Close	Torque to Seal Nm	Approx. Mass kg
		TYTON Socket	Flange AS4087 Fig B5	Spigot			
80*	367	-	203	305	20	40	18
100†	402	150	229	365	23	50	24
150†	502	170	267	380	26	75	43
200†	610	195	292	410	34	120	75
225†	649	205	305	420	38	140	85
250†	723	235	330	435	42	180	110
300	810	245	356	450	50	200	160
375	960	275	381	-	62	420	340
450	1145	-	432	-	76	500	560
500	1290	-	457	-	82	530	710
600	1467	-	508	-	98	550	940

Note: For compatibility with Series 1 PVC (white) pipe, PLASTYT gaskets may be used in TYTON sockets.

* Flange to Polydex socket available.

† Flange to TYTON socket available.

Available Range

DN	Resilient Seated Gate Valves					
	Inside Screw					Handwheel Operated
	Class 16					
	Key Operated					
	FI-FI	Sc-Sc	Sp-Sp	FI-Sc	FI-FI	
80	✓		✓	✓	✓	
100	✓	✓	✓	✓	✓	
150	✓	✓	✓	✓	✓	
200	✓	✓	✓	✓	✓	
225	✓	✓	✓	✓	✓	
250	✓	✓	✓	✓	✓	
300	✓	✓	✓	✓	✓	
375	✓	✓			✓	
450	✓				✓	
500	✓				✓	
600	✓				✓	
Fig No.	500	500	500	500	500H	
Coating						
Rilsan Nylon 11	✓	✓	✓	✓	✓	
Options						
Anticlockwise Closing	✓	✓	✓	✓		
Clockwise Closing	✓	✓	✓	✓	✓	
Gear Actuator	✓					
Flange Drilling Fig B5 (TC)	✓			✓	✓	

Recommended Specification

- Gate valves shall be resilient seated conforming to AS2638.2.
- The allowable operating pressure shall be 1600kPa.
- Operation shall be by means of a key/handwheel.
- The direction of closing shall be anticlockwise/clockwise.
- The valve body and bonnet shall be cast in Ductile Iron and coated with a thermally applied polymeric coating to AS/NZS 4158.
- The gate shall be cast in Ductile Iron and fully encapsulated in EPDM rubber - partially coated wedges are not acceptable.
- The spindle shall be Grade 431 Stainless Steel incorporating a failsafe thrust collar.
- The spindle seal retainer shall be manufactured from a dezincification resistant copper alloy to AS1565.
- The spindle seal shall be affected by a minimum of two O-rings, which can be replaced under full operating pressure.
- Fasteners shall be completely isolated from the external environment.
- Valves shall be manufactured under a product certification scheme and each valve marked in accordance with the certification body's requirements.

OPERATION AND MAINTENANCE MANUAL

CONTENTS

- 1.00.00 Description of DN300 Table C Resilient Seated Sluice Valve
- 1.01.00 Operating Instructions
- 1.02.00 Maintenance Instructions
- 2.00.00 Spare Parts List
- 3.00.00 Address for Queries

OPERATION AND MAINTENANCE MANUAL

1.00.00 DESCRIPTION

- 1.00.01 This section covers a manually operated DN300 Flg/Flg Class 16 Resilient Seated Sluice Valve, Table C.
- 1.00.02 Reference drawing number 12-16-02-1081.

1.01.00 OPERATING INSTRUCTIONS

- 1.01.01 The valve is operated in an anti-clockwise closing direction.
- 1.01.02 The number of turns from open to close is approximately 50.
- 1.01.03 Valves of this type are not designed for throttling purposes.

1.02.00 MAINTENANCE INSTRUCTIONS

- 1.02.01 This valve does NOT require any lubrication.
- 1.02.02 In the unlikely event of any of the long life Stem Sealing Rings (items 14 & 15) requiring replacement, ensure valve is fully OPEN and remove Cap (or Handwheel) and Stem Housing (items 6 & 3) by removing concealed Capscrews (item 12). This will permit the Stem Housing (item 3) to be removed from the stem (item 5) for replacement of the appropriate rings.
- 1.02.03 Re-assemble in the reverse sequence using any commercially available water pump grease applied to the upper end of the Stem to aid assembly. Reseal Setscrews with silicon sealant.

2.00.00 SPARE PARTS LIST

- 2.00.01 Spare parts are NOT normally required for this type of valve.
- 2.00.02 In the unlikely event of a sealing ring failure the appropriate ring may be selected from items 14 & 15 in the attached general assembly drawing No. 12-16-02-1081.

3.00.00 ADDRESS FOR QUERIES

3.00.01 Should there be any queries or additional information required, please contact:

Tubemakers Water P/L
63 Currumbin Creek Road
CURRUMBIN QLD 4223
Ph: (07) 5589 4400
Fax: (07) 5534 7079

BILL OF MATERIAL

DN300 RESILIENT SEATED SLUICE VALVE - CLASS 16
TABLE 'C'

PARENT ITEM NO. : VRDCC30500A

CHILD ITEM NO.	DESCRIPTION	MATERIAL	QTY
VZ121602601C	BODY, FL/FL 'C'	DUCTILE IRON	1
VZ121602611	BONNET	DUCTILE IRON	1
VZ101602612	STEM HOUSING	GUNMETAL	1
VZ121602624	WEDGE (SBR COATED)	DUCTILE IRON	1
VZ121602644	STEM	STAINLESS STEEL	1
VZ101602618	CAP	DUCTILE IRON	1
VZDHW25500A	HANDWHEEL	DUCTILE IRON	1
VZ101602620	THRUST WASHER	ERTACETAL	1
VZ121602629	BODY GASKET	SYNTHETIC RUBBER	1
VZ101602623	STEM HOUSING GASKET	SYNTHETIC RUBBER	1
VZ101602628	WEDGE NUT	GUNMETAL	1
ZDBMT14040	SOC. HEAD CAPSCREW	ALLOY STEEL	12
ZDSTH12020	HEX. HEAD SETSCREW	STAINLESS STEEL	1
ZSRR0221	'O' RING	SYNTHETIC RUBBER	2
ZSRRW27	WIPER RING	SYNTHETIC RUBBER	1

Ref: 173-94.MKT



PFC CONSTRUCTION PTY. LTD.

ABN 27 091 807 797

KNIFE GATE VALVES OPEN / SHUT
TURNS AND TORQUE

- 225 KGV 98 turns to open/shut, torque 50 Nm
- 450 KGV 151 turns to open/shut, torque 80 Nm

P.O. BOX 437, SURRY HILLS, NSW 2010 PHONE: (02) 9700 0577 FAX: (02)
9700 0588

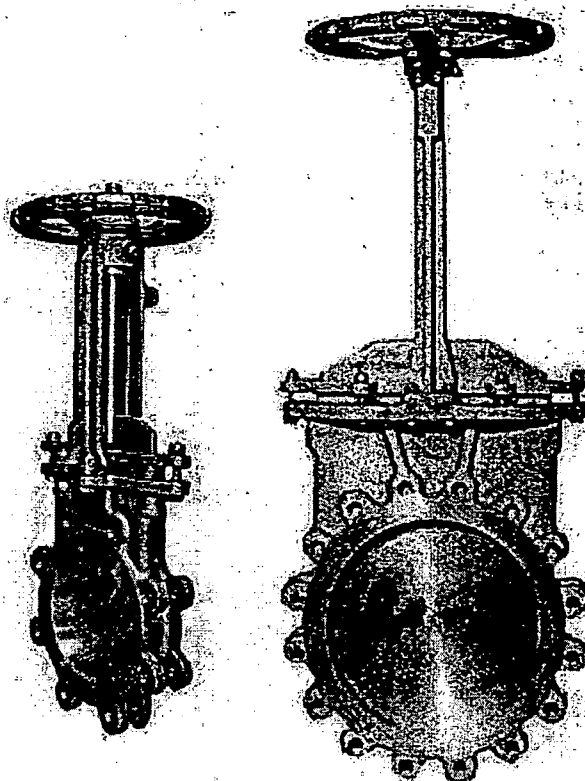


VALVECO INDUSTRIES PTY LTD –

General Purpose, Rising Spindle, Lugged Style Knifegate Valves

Features

- Compact design for easy installation and maintenance.
- Both 304S/S and 316S/S valves available.
- One piece integral cast body, chest and lugs.
- Integral cast in gate wedges minimize flow obstructions.
- High flow rates with low pressure drops.
- Gate guides to support gate.
- Complies with MSS SP-81 face to face dimensions.
- Every valve pressure tested.
- Easy maintenance.
- Gate machined over full length for optimum sealing.
- 50 to 600mm sizes available as standard. Larger sizes made to order.
- 10 bar pressure rating.
- Specifically formulated PTFE impregnated packing material for increased service life and lower friction. Specialised packing for chemical resistant or abrasive applications available on request.



Applications

The Valveco General Purpose Knifegate Valve is designed for a wide range of applications such as:

- Pulp & Paper
- Mining
- Effluent handling plants
- Chemical plants
- Food & Beverage
- Fly ash handling plants
- Bulk conveying
- Corrosive environments.



VALVECO INDUSTRIES PTY LTD
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Ph: 08 9345 3688 Fax: 08 9344 8707

Karratha Office:

712 Dolphin Way, Karratha WA 6714
Ph: 08 9144 4200 Fax: 08 9144 4300

Mackay Office:

51 Enterprise Street, Paget QLD 4740
Ph: 07 4952 5555 Fax: 07 4952 5322

Brisbane Office:

433 Logan Road, Stones Corner QLD 4120
Ph: 07 3394 8272 Fax: 07 3847 9755

Gladstone Office:

2/4 Dalrymple Drive, Gladstone QLD 4680
Ph: 07 4979 4299 Fax: 07 4979 4502

Head Office:

10 Hereford Street, Berkeley Vale NSW 2261
PO Box 5010, Chittaway NSW 2261
Ph: 02 4388 4522 Fax: 02 4388 9086

Morwell Office:

8 Jones Road, Morwell VIC 3840
Ph: 03 5134 8398 Fax: 03 5134 5702

Melbourne Office:

Office 5, 41B Bluff Road, Black Rock VIC 3193
Ph: 03 9589 5933 Fax: 03 9589 5698



VALVECO INDUSTRIES PTY. LTD.

A Division of the Halley and Mellowes Group.

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VALVECO KNIFE GATE VALVES. INSTALLATION & MAINTENANCE INSTRUCTIONS

DESCRIPTION

The Valveco Knife Gate Valve, 50mm to 600mm are bonnetless valves with a stainless steel body and gate, and an all-metal or resilient-faces seat. A choice of several actuators and accessories is available.

INSTALLATION

- Before installation, remove foreign material such as weld spatter, oil, grease and dirt from the valve and pipeline.
- Install the valve between mating pipeline flanges
- Check valve flange drilling metric / imperial tapping.
- Flange gaskets are required.
- Install the valve so that the side marked "seat" is on the lower pressure side of the valve when the valve is closed; the pipeline pressure will then help seal the valve in the closed position:

NOTE: This may be opposite to the main flow in some applications.

Observe the following points to prevent distortion of the valve body and gate when the flange bolts are tightened:

- Align the mating pipeline flanges.
- Select the length of the flange bolts so that the bolts used in the blind holes near the chest are of the valve do not bottom out when tightened.
- We recommend stud bolts and nuts. Use anti-seize or grease on the stud bolts.
Never use dry stainless steel nuts and bolts.
- Tighten the flange bolts evenly, in a crisscross pattern.

OPERATION

The gate in the valve is positioned by the valve actuator. The actuator moves the gate over the valve seat in the closed position, and withdraws the gate from the seat in the throttling and open positions.

LUBRICATION

The valve does not require lubrication.

PACKING ADJUSTMENT

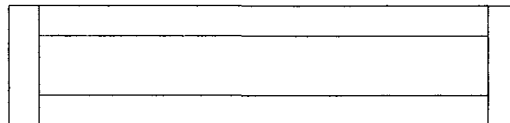
The gate packing is contained and compressed by the packing gland. If packing leakage occurs, tighten the adjustment nuts on top of the packing gland. Tighten the nuts evenly and gently-just enough to stop the leakage. Over tightening, will cause excessive operating forces, and will decrease the life of the packing.

PACKING REPLACEMENT

1. Relieve the pressure in the pipeline
2. Close the valve.
3. Disconnect and lock out pneumatic, hydraulic or electrical power to the actuator too prevent accidental operation.
4. Remove the Actuator.
5. Remove the gland bolts and gland follower.
6. Using a packing extractor remove the old packing.
7. Inspect the gate, seat and packing chamber, for damage or burrs.

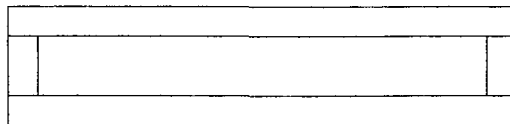
We recommend the Brick method of packing. This overcomes the problem of leakage at the corners where the packing raps around the square edge of the gate.

8. Cut the new packing to length.
9. Push the first row of packing into place using a pin punch or similar, and ensuring that the gate stays flat on the seat.

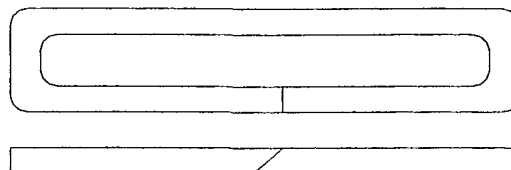


Do not use force. Gently push the packing into place if excessive force is used it will remove any resilience from the packing making a seal impossible.

10. The second row overlaps the first.



11. Cut the final row long enough to rap all the way around the gate. Cut the packing on 45 degrees so that it overlaps.



2 OF 3

12. Replace the gland following and bolts.

DO NOT OVER-TIGHTEN THE BOLTS.

Use anti-seize or grease on the bolts. Never use dry stainless steel nuts and bolts.

13. Replace the actuator.

14. Pressure the line and adjust the gland bolts only enough to stop the leaks.

REV. No.	DATE	DESCRIPTION	DRAWN	CHK'D	APP'D
A	2004/09/29	FOR APPROVAL	YAPEN	SALIM	SHUBH

ORDER No : V19339

BILL OF MATERIAL				
No	DESCRIPTION	MATERIAL	QTY	REMARK
01	BODY	A351 CF8M	1	
02	WHEEL	316SS	1	
03	PACKING	PISTE FIBER	1 SET	
04	GLAND	A351 CF8	1	
05	STEM	304SS	1	
06	YORK	A351 CF8	1	
07	HAND WHEEL	FC200	1	

- PRESSURE RATING : CMP 150
- FLANGE DIMENSION : AS2120 TABLE D
- FACE TO FACE : MSS SP-81
- OTHER DIMENSIONS : MAKER STANDARD
- SEAT TYPE : RUBBER SEAT
- TEST & INSPECTION : MSS SP-81
- CLOSING OPERATION : COUNTERWEIGHT HANDED

DIMENSION TABLE					
SIZE	L	PCD	N	M	HT
200A(8")	70	202	8	M16	425
225A(9")	70	302.5	8	M16	775

UNIT : mm			
SIZE	L	PCD	HT
200A(8")	70	202	425
225A(9")	70	302.5	775

NOTES:

1. ALL DIMENSIONS ARE IN MILLIMETERS, EXCEPT IN () ARE IN INCHES.

2. ALL DIMENSIONS WITHOUT STATED TOLERANCES ARE FOR REFERENCE ONLY.

HWSP-A005-02 REV-0

HYUNWOO INDUSTRIAL CO.,LTD.	
KNIFE GATE VALVE-MANUAL ASSEMBLY DRAWING	
KRM.S.0000.000	
SHEET	1/2

<p>ORDER No : V19339</p>	<p>REV. No. DATE DESCRIPTION FOR APPROVAL</p> <p>APPROVED: [Signature] DATE: [Date]</p>	<p>CHK'D S44M</p> <p>DATE: [Date]</p>	<p>APP'D S44M</p> <p>DATE: [Date]</p>
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THE CONTENTS OF HYUNWOO INDUSTRIAL'S DRAWING ARE SUBJECT TO CHANGE WITHOUT ANY PRIOR NOTICE TO IMPROVE QUALITY AND PERFORMANCE

BILL OF MATERIAL			
NO.	DESCRIPTION	MATERIAL	QTY
01	BODY	A351 CFB	1
02	KNIFE	316SS	1
03	PACKING	PTE FIBER 1 SET	
04	GLAND	A351 CFB	1
05	STEM	304SS	1
06	YOKER	A351 CFB	1
07	MOUNTING PAD	A351 CFB	1
08	HAND WHEEL	FC200	1

- PRESSURE RATING : CMP 150

- FLANGE DIMENSION : AS2120 TABLE D

- FACE TO FACE : MSS SP-81

- OTHER DIMENSIONS : MAKER STANDARD

- SEAT TYPE : RUBBER SEAT

- TEST & INSPECTION : MSS SP-81

- CLOSING OPERATION : DOWNRIGHT HANDLED

DIMENSION TABLE					
SIZE	L	PCD	N	M	W
450A(18")	90	884	72	424	1205
					1680
					400

UNIT : mm

NOTES:

1. ALL DIMENSIONS ARE IN MILLIMETERS, EXCEPT IN () ARE IN INCHES.

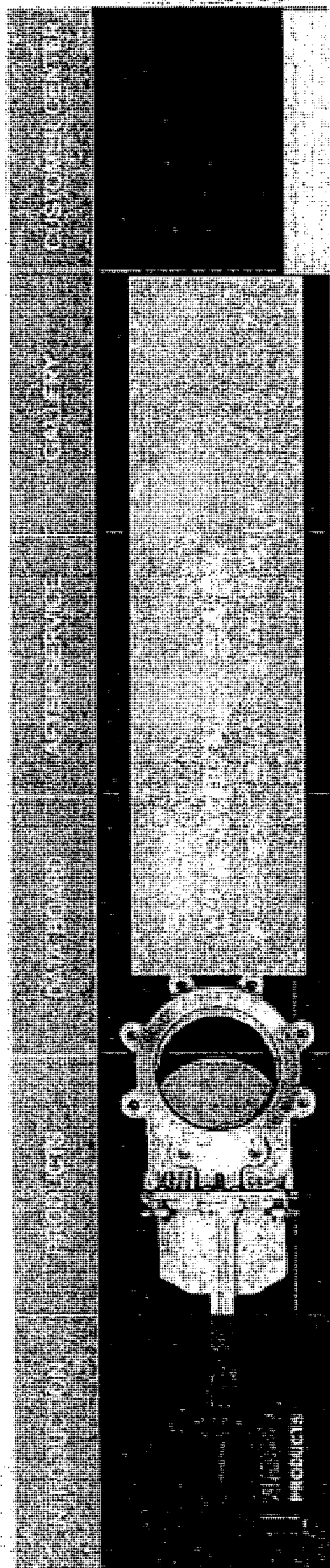
2. ALL DIMENSIONS WITHOUT STATED TOLERANCES ARE FOR REFERENCE ONLY.

<p>HYUNWOO INDUSTRIAL CO.,LTD.</p>			
<p>KNIFE GATE VALVE-MANUAL</p>			
<p>ASSEMBLY DRAWING</p>			
<p>KRM.S.0000.000</p>			
APP'D	DATE	REV	QTY
		A4	2/2

Knife Gate Valve - Integral Seat

HW HYUNWOO INDUSTRIAL CO., LTD.

HOME / KOREAN / CONTACT US / SITE MAP



HOME > Products

Products

KNIFE GATE VALVE

■ INTEGRAL SEAT

REPLACEABLE SEAT

GEAR TYPE

CHAINWHEEL

PNEUMATIC

ELECTRIC ACTUATOR

UNI-SEAT TYPE

LONG FLATE KNIFE GATE VALVE

FLAP TYPE KNIFE GATE VALVE

OTHER VALVE



KNIFE GATE VALVE

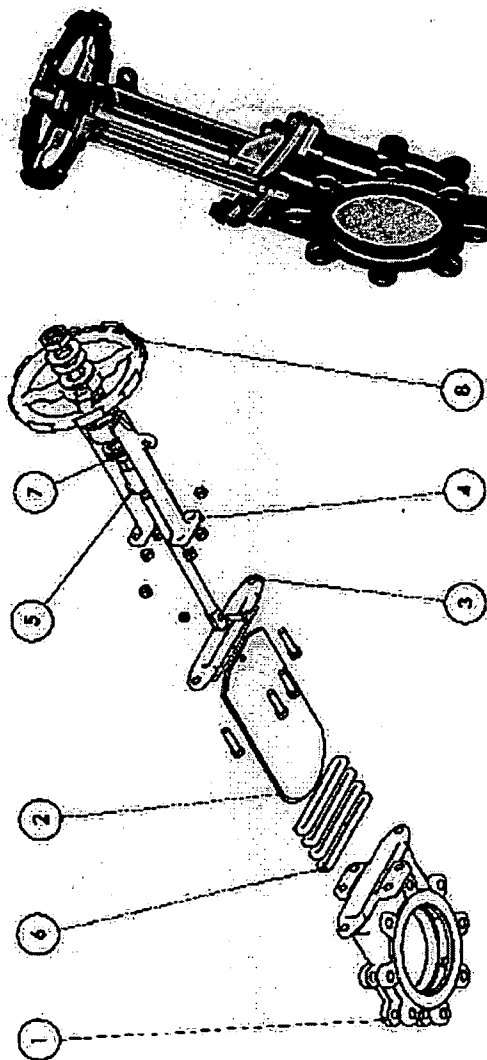
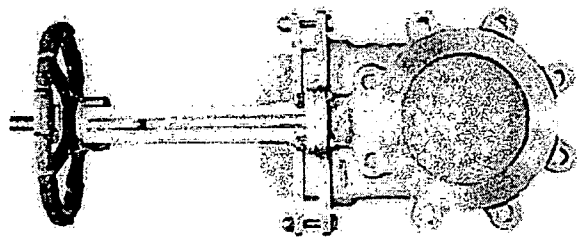
INTEGRAL SEAT

Hyunwoo (Integral seat) Knife gate valves are designed to handle the process industries (Ash, pulp&paper, power/utility, Oil and Gas production, Chemical refining) Seats is metal

Design feature also include a raised face seat with the groove that prevents clogging (As the valve is open the flow cleans the groove)

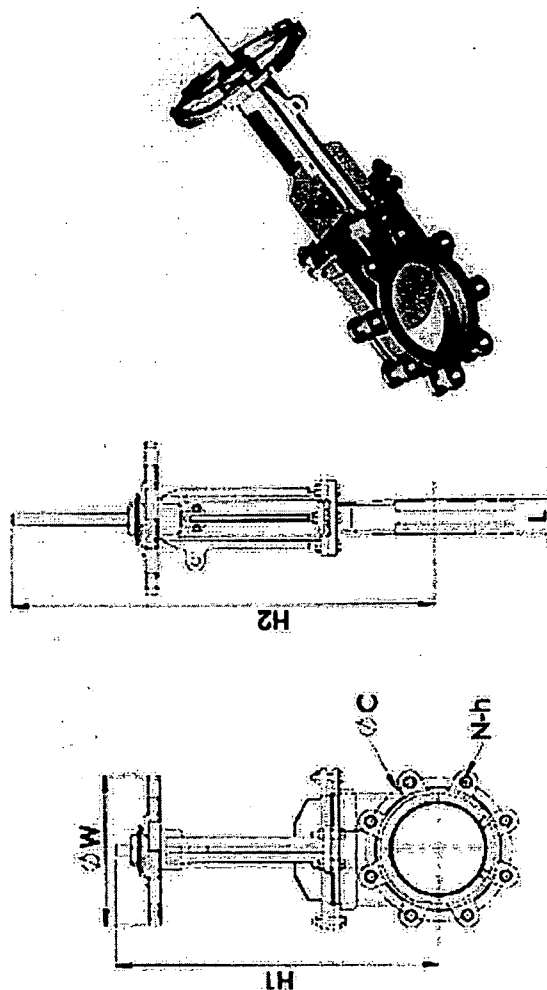
HW KGV is offered a variety of actuator including handwheel, chain, gear, electric, air or Hydraulic actuation.

Knife Gate Valve Integral Seat



•• STANDARD MATERIALS

NO.	PART NAME	MATERIAL CODE(ASTM)	MATERIAL CODE (JIS)
1	BODY	STAINLESS STEEL 304 (A351-CF8)	SCS13
		STAINLESS STEEL 316 (A351-CF8M)	SCS14
		STAINLESS STEEL 316L (A351-CF3M)	SCS16
2	DISC	STAINLESS STEEL 304 (A240-304)	SUS304
		STAINLESS STEEL 316 (A240-316)	SUS316
		STAINLESS STEEL 316L (A240-316L)	SUS316L
3	PACKING GLAND	STAINLESS STEEL 304 (A351-CF8)	SCS13
		STAINLESS STEEL 316 (A351-CF8M)	SCS14
4	YOKE	STAINLESS STEEL 304 (A351-CF8)	SCS13
5	SLEEVE	BROZE CASTING (C83600)	BOB
6	PACKING	LUBRICATED PTFE IMPREGNATED PTFE FIBER BRAIDED	+
7	THRUST BEARING	10" ~ 12" : THRUST PLATE(BRONZE) 14" ~ 24" : 51112	+
8	HANDWHEEL	CAST IRON	FC200



•• DIMENSIONS

Knife Gate Valve Integral Seat

SIZE Inch mm	ANSI 150 psi						JIS 10K					
	L	C	N	H	H1	H2	L	C	N	H	H1	H2
2"	48	120.7	4	5/8"	310	380	48	120	4	M16	310	380
2 1/2"	51	139.7	4	5/8"	370	455	51	140	4	M16	370	455
3"	51	152.4	4	5/8"	380	480	51	150	8	M16	380	480
4"	51	190.5	8	5/8"	410	535	51	175	8	M16	410	535
5"	58	215.9	8	3/4"	470	620	58	210	8	M20	470	620
6"	58	241.3	8	3/4"	520	695	58	240	8	M20	520	695
8"	70	298.5	8	3/4"	625	850	70	290	12	M20	625	850
10"	70	362	12	7/8"	775	1050	70	355	12	M22	775	1050
12"	76	431.8	12	7/8"	865	1190	76	400	16	M22	865	1190
14"	78	476.3	12	1"	975	1350	78	445	16	M22	975	1350
16"	90	539.8	16	1"	1120	1545	90	510	16	M24	1120	1545
18"	90	578	16	1 1/8"	1205	1680	90	565	20	M24	1205	1680
20"	114	635	20	1 1/8"	1330	1855	114	620	20	M24	1330	1855
24"	114	749.3	20	1 1/4"	1525	2150	114	730	24	M30	1525	2150

95-1 Gwang-ri, Paltan-myeon, Hwasung-si, Gyeonggi-do
Tel: 82-31-354-3980/5 Fax: 82-31-354-3986
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HW HYUNWOO INDUSTRIAL CO. LTD.



OPERATION AND MAINTENANCE MANUAL

Class 35, Flange / Flange, Metal Seated Gate Valves
DN80 – DN600

CONTENTS

1.00.00	DESCRIPTION	2
1.01.00	OPERATING INSTRUCTIONS	2
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3.00.00	DETAIL DRAWING.....	3
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1.00.00 DESCRIPTION

- 1.00.01 This manual covers Tyco Waters' range of Class 35, Flange / Flange, metal seated gate valves. Sizes covered are from DN80 – DN600. All flanges are drilled in accordance with AS4087 Figure B6.

1.01.00 OPERATING INSTRUCTIONS

- 1.01.01 The valves are available in clockwise and anti-clockwise closing configurations. The direction of closing for your valve will be indicated by the colour of the spindle cap or marked by an arrow on top of the handwheel. Clockwise closing valves are identified by a red spindle cap or a red mark in the centre of the handwheel.

- 1.01.02 The number of turns from open to close is shown in the table below:

Valve Size	Turns to Close
80	20
100	23
150	26
200	34
225	38
250	42
300	50
375	62
450	76
500	82
600	98

- 1.01.03 Valves of this type are not designed for throttling purposes.

- 1.01.04 The standard operating pressures for Class 35 Metal Seated Valves are:
- Allowable Operating Pressure (AOP) - 3500kPa.
 - Maximum Allowable Operating Pressure (MAOP) - 4200kPa
 - Allowable Site Test Pressure (ASTP) - 5250kPa

Seat leakage may occur at the MAOP, however structural damage will not occur. ASTP should be applied only with the gate in the fully open position.

- 1.01.05 Care should be taken to remove any foreign material from the pipeline and particularly from the well of the valve body. Closing the wedge onto solid debris may damage the gunmetal sealing rings.

1.02.00 MAINTENANCE INSTRUCTIONS

1.02.01 This type of valve does NOT require any lubrication.

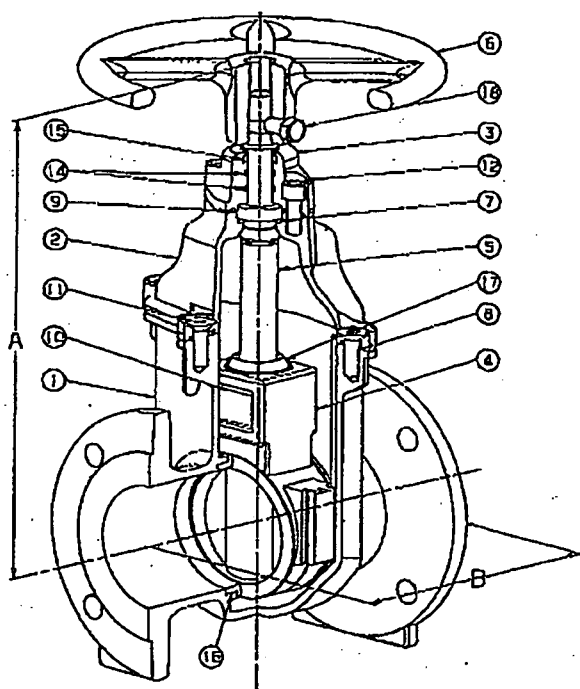
1.02.02 In the unlikely event of any of the long life Spindle Sealing Rings (items 14 & 15) requiring replacement, ensure valve is fully OPEN and remove spindle cap/handwheel and Seal Retainer (Items 6 & 3) by removing concealed Socket Head Screws (item 12). This will permit the Seal Retainer (item 3) to be removed from the Spindle (item 5) for replacement of the appropriate rings.

1.02.03 Re-assemble in the reverse sequence using any commercially available water pump grease applied to the upper end of the Spindle to aid assembly. Reseal Screws with silicon sealant.

2.00.00 SPARE PARTS LIST

2.00.01 Spare parts are NOT normally required for this type of valve.

2.00.02 In the unlikely event of a sealing ring failure the appropriate ring may be selected from items 14 & 15 in the attached general assembly drawing.

3.00.00 DETAIL DRAWING

No	Description	Material
1	Body	Ductile Iron
2	Bonnet	Ductile Iron
3	Seal Retainer	Gunmetal
4	Gate	DN80-DN200 Gunmetal DN225-DN600 Ductile Iron
5	Spindle	Stainless Steel
6	Spindle Cap/Handwheel	Ductile Iron
7	Thrust Washer	Acetyl
8	Body Gasket	EPDM
9	Bonnet Gasket	EPDM
10	Gate Nut	Gunmetal
11	Countersunk Screws	High Tensile Alloy Steel
12	Socket Head Screws	High Tensile Alloy Steel
13	Socket Head Cap Screw	Stainless Steel
14	O-Rings	Nitrile Rubber
15	Wiper Ring	Nitrile Rubber
16	Seat Rings	Gunmetal
17	Backseal Grommet	Nitrile Rubber
18	Hex Head Screw	Stainless Steel

3.00.00 ADDRESS FOR QUERIES

3.00.01 Should there be any queries or additional information required,
please contact:

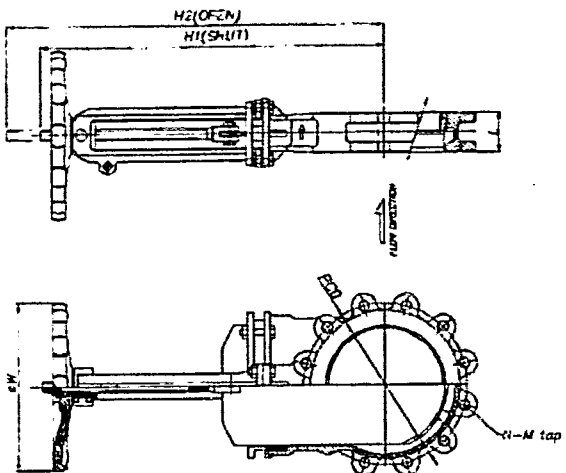


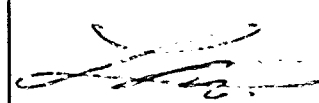
Tyco Water
63 Currumbin Creek Road
CURRUMBIN, QLD. 4223.
Ph : (+61) 7 5589 4400

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INSPECTION CERTIFICATE							PAGE 1 OF 3					
CUSTOMER	VALVECO											
PROJECT NAME												
REPORT NO.												
DESCRIPTION	HANDWHEEL OPERATED KNIFE GATE VALVE											
MANUFACTURE	HYUN WOO IND. CO., LTD.											
MODEL NO.	HW-MSKG-0018-S2-VT											
QUANTITY	1 SETS											
DATE	2005. 09. 10.											
BODY	TYPE	MATERIAL		SIZE	RATING		MAKER/SUPPLIER					
	KNIFE GATE	A351-CF8M	VTTON	450NB	AS2129 TABLE D		HYUN WOO					
ACTUATOR	TYPE	MODEL		MAKER/SUPPLIER			OTHER					
	N/A											
HAND VALVE	TYPE	MODEL		POWER	EX-PROOF <input type="checkbox"/>		MAKER					
	N/A				WEA-PROOF <input type="checkbox"/>							
LIMIT S/W	TYPE	MODEL			EX-PROOF <input type="checkbox"/>		MAKER					
	N/A				WEA-PROOF <input type="checkbox"/>							
EED CONTROLLER	MODEL	N/A		AIR UNIT		MODEL		N/A				
	MAKER					MAKER						
DIVISION (구분)	DIMENSION INSPECTION(치수검사)						HYDRO TEST (kg/cm ²)		AIR TEST (kg/cm ²)		Assembly Test With Operating	Result Holding Time BODY: 120SEC SEAT: 120SEC
	L	H1	H2	ØW	PCD	N-M	MSS SP 81					
STANDARD	90	1205	1680	400	584	12-24	BODY	SEAT	BODY	SEAT	Open, Close	
TOLERANCE	+1.6			-	+1.6	-	16	2.8			upward of three times	
#01	OK	OK	OK	OK	OK	OK	OK	OK			ACCEPT	GOOD
				*****	BLANK	*****						
Inspected by	Reviewed by		Approved by		Witnessed by							

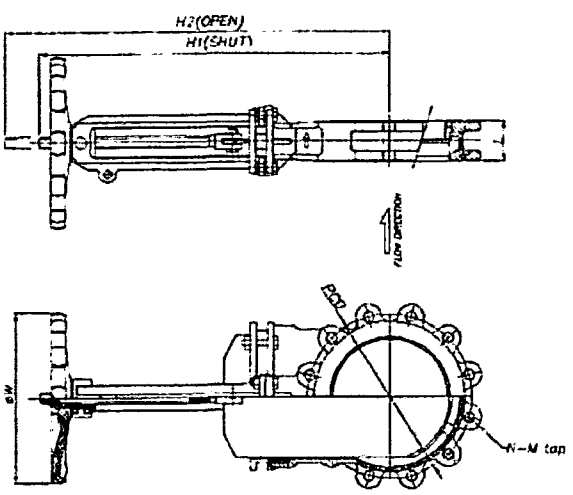


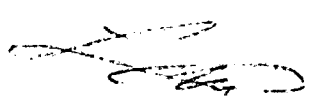
HW양식1001-3

(주)원우산업

INSPECTION CERTIFICATE								PAGE 2 OF 3				
CUSTOMER		VALVECO						Fig 				
PROJECT NAME												
REPORT NO.												
DESCRIPTION		HANDWHEEL OPERATED KNIFE GATE VALVE										
MANUFACTURE		HYUN WOO IND. CO., LTD.										
MODEL NO.		HW-MSKG-0008-S2-VT										
QUANTITY		1 SETS										
DATE		2005. 09. 10.										
BODY		TYPE		MATERIAL		SIZE		RATING		MAKER/SUPPLIER		
		KNIFE GATE		A351 CF8M VITON		200NB		AS2129 TABLE D		HYUN WOO		
ACTUATOR		TYPE		MODEL		MAKER/SUPPLIER		OTHER				
		N/A										
HAND VALVE		TYPE		MODEL		POWER		EX PROOF <input type="checkbox"/>		MAKER		
		N/A						WEA-PROOF <input type="checkbox"/>				
LIMIT S/W		TYPE		MODEL		EX-PROOF <input type="checkbox"/>		MAKER				
		N/A				WEA PROOF <input type="checkbox"/>						
SPEED CONTROLLER		MODEL		N/A		AIR UNIT		MODEL		N/A		
		MAKER						MAKER				
DIVISION (구분)		DIMENSION INSPECTION(치수검사)					HYDRO TEST (kg/cm ²)		AIR TEST (kg/cm ²)		Assembly Test With Operating Result Holding Time BODY: 120SEC SEAT: 120SEC	
		L	H1	H2	ØW	PCD	N-M	MISS SP 81		BODY		
STANDARD		70	625	850	300	292	8 16	BODY	SEAT	BODY	SEAT	Open, Close
TOLERANCE		±1.6				+1.6	-	16	2.8			upward of three times
#01		OK	OK	OK	OK	OK	OK	OK	OK			ACCEPT
					*****	BLANK	*****					
Inspected by		Reviewed by			Approved by			Witnessed by				
												

HW양식1001 3

(株)원우산업

INSPECTION CERTIFICATE								PAGE 3 OF 3				
CUSTOMER	VALVECO							Fig 				
PROJECT NAME												
REPORT NO.												
DESCRIPTION	HANDWHEEL OPERATED KNIFE GATE VALVE											
MANUFACTURE	HYUN WOO IND. CO., LTD.											
MODEL NO.	HW-MSKG-0009 S2-VT											
QUANTITY	1 SETS											
DATE	2005. 09. 10.											
BODY	TYPE	MATERIAL		SIZE	RATING		MAKER/SUPPLIER					
	KNIFE GATE	A351-CF8M	VITON	225NB	AS2129 TABLE D		HYUN WOO					
ACTUATOR	TYPE	MODEL		MAKER/SUPPLIER		OTHER						
	N/A											
HAND VALVE	TYPE	MODEL		POWER	EX PROOF	MAKER						
	N/A				WEA PROOF							
LIMIT S/W	TYPE	MODEL		EX-PROOF		MAKER						
	N/A			WEA PROOF								
FEED CONTROLLER	MODEL	N/A		AIR UNIT	MODEL		N/A					
	MAKER				MAKER							
DIVISION (구분)	DIMENSION INSPECTION(치수검사)						HYDRO TEST (kg/cm ²)		AIR TEST (kg/cm ²)		Assembly Test With Operating	Result Holding Time BODY: 120SEC SEAT: 120SEC
	L	H1	H2	ØW	PCD	N-M	MSS SP 81					
STANDARD	70	775	1053	350	322.5	8 16	BODY	SEAT	BODY	SEAT	Open, Close	
TOLERANCE	±1.6	-	-		±1.6	-	16	2.8			upward of three times	
#01	OK	OK	OK	OK	OK	OK	OK	OK			ACCEPT	GOOD
#02	OK	OK	OK	OK	OK	OK	OK	OK			ACCEPT	GOOD
				*****	BLANK	*****						
Inspected by	Reviewed by		Approved by		Witnessed by							
												

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(주)한우산업

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PAGE 03

ORDER No : V19339	HYUNWOO INDUSTRIAL CO., LTD. KNIFE GATE VALVE-MANUAL ASSEMBLY DRAWING KRM.S.0000.000	SET 2/2 NS(1:12)																																																																					
THE CONTENTS OF HYUNWOO INDUSTRIAL'S DRAWING ARE SUBJECT TO CHANGE WITHOUT ANY PRIOR NOTICE TO IMPROVE QUALITY AND PERFORMANCE																																																																							
BILL OF MATERIAL	<table border="1" style="width: 100%; border-collapse: collapse;"> <thead> <tr> <th>NO</th> <th>DESCRIPTION</th> <th>MATERIAL</th> <th>QTY</th> <th>REMARK</th> </tr> </thead> <tbody> <tr> <td>01</td> <td>BODY</td> <td>AISI CF8M</td> <td>1</td> <td></td> </tr> <tr> <td>02</td> <td>KNIFE</td> <td>316SS</td> <td>1</td> <td></td> </tr> <tr> <td>03</td> <td>PACKING</td> <td>PTFE FIBER 1 SET</td> <td></td> <td></td> </tr> <tr> <td>04</td> <td>GLAND</td> <td>AISI CF8</td> <td>1</td> <td></td> </tr> <tr> <td>05</td> <td>STEM</td> <td>316SS</td> <td>1</td> <td></td> </tr> <tr> <td>06</td> <td>YONK</td> <td>AISI CF8</td> <td>1</td> <td></td> </tr> <tr> <td>07</td> <td>MOUNTING PAD</td> <td>AISI CF8</td> <td>1</td> <td></td> </tr> <tr> <td>08</td> <td>HAND WHEEL</td> <td>FC250</td> <td>1</td> <td></td> </tr> </tbody> </table> <p> - PRESSURE RATING : CIP 150 - FLANGE DIMENSION : AS2129 TABLE D - FACE TO FACE : MSS SP-81 - OTHER DIMENSIONS : MAKER STANDARD - SEAT TYPE : RUBBER SEAT - TEST & INSPECTION : MSS SP-81 - CLOSING OPERATION : COW(RIGHT HANDED) </p> <table border="1" style="width: 100%; border-collapse: collapse;"> <thead> <tr> <th colspan="8">DIMENSION TABLE</th> </tr> <tr> <th>SIZE</th> <th>L</th> <th>P.O.D</th> <th>N</th> <th>M</th> <th>M1</th> <th>M2</th> <th>W</th> </tr> </thead> <tbody> <tr> <td>450A(18")</td> <td>90</td> <td>844</td> <td>72</td> <td>424</td> <td>1705</td> <td>1680</td> <td>400</td> </tr> </tbody> </table> <p> UNIT : mm 1. ALL DIMENSIONS ARE IN MILLIMETERS, EXCEPT IN () ARE IN INCHES. 2. ALL DIMENSIONS WITHOUT STATED TOLERANCES ARE PER AS2129 ONLY. </p>		NO	DESCRIPTION	MATERIAL	QTY	REMARK	01	BODY	AISI CF8M	1		02	KNIFE	316SS	1		03	PACKING	PTFE FIBER 1 SET			04	GLAND	AISI CF8	1		05	STEM	316SS	1		06	YONK	AISI CF8	1		07	MOUNTING PAD	AISI CF8	1		08	HAND WHEEL	FC250	1		DIMENSION TABLE								SIZE	L	P.O.D	N	M	M1	M2	W	450A(18")	90	844	72	424	1705	1680	400
NO	DESCRIPTION	MATERIAL	QTY	REMARK																																																																			
01	BODY	AISI CF8M	1																																																																				
02	KNIFE	316SS	1																																																																				
03	PACKING	PTFE FIBER 1 SET																																																																					
04	GLAND	AISI CF8	1																																																																				
05	STEM	316SS	1																																																																				
06	YONK	AISI CF8	1																																																																				
07	MOUNTING PAD	AISI CF8	1																																																																				
08	HAND WHEEL	FC250	1																																																																				
DIMENSION TABLE																																																																							
SIZE	L	P.O.D	N	M	M1	M2	W																																																																
450A(18")	90	844	72	424	1705	1680	400																																																																

13/09/2004 09:41 +61738479755

HALMELBRIS

PAGE 02

REV. NO.	DATE	DESCRIPTION	DRAWN	CHK'D	APP'D
1	2004.09.29	FOR APPROVAL	YKAM	SJLM	SJLM

ORDER No: V19339

HYUNWOO INDUSTRIAL CO., LTD.	
KNIFE GATE VALVE-MANUAL ASSEMBLY DRAWING	
KRM.S.0000.000	
REV. NO.	REV. 1/2
A4	1:6.5

BILL OF MATERIAL			
No	DESCRIPTION	MATERIAL	Q'TY
01	BODY	A351 CF8M	1
02	KNIFE	316SS	1
03	PACKING	PIPE FIBER 1 SET	
04	GLAND	A351 CF8	1
05	STEM	304SS	1
06	Yoke	A351 CF8	1
07	HAND WHEEL	FC200	1

- PRESSURE RATING : CMP 150
 - FLANGE DIMENSION : ASME/29 TABLE D
 - FACE TO FACE : MSS SP-81
 - OTHER DIMENSIONS : MANER STANDARD
 - SEAT TYPE : RUBBER SEAT
 - TEST & INSPECTION : MSS SP-81
 - CLOSING OPERATION : COUNTER HANDED

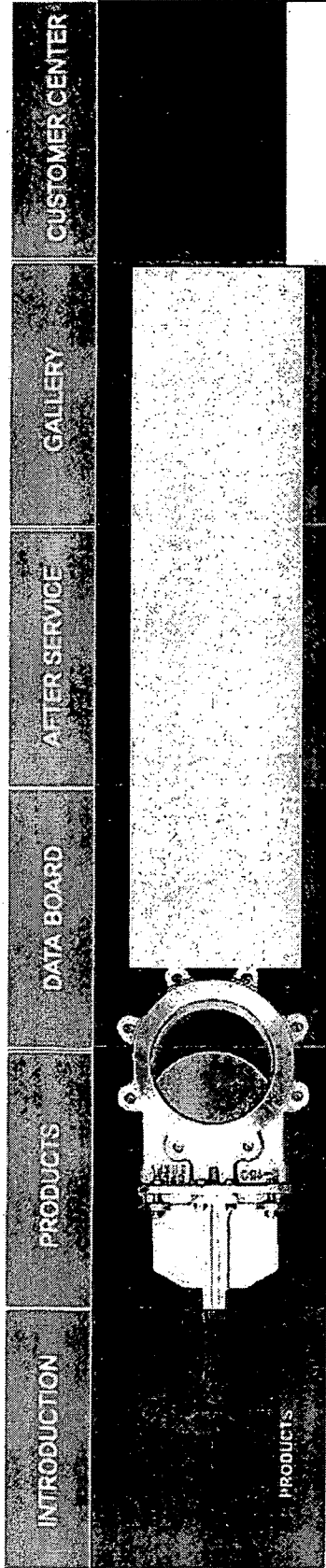
UNIT : mm

SIZE	L	PCD	N	M	H1	H2	W
200A(8")	70	282	8	119	425	890	300
225A(9")	70	322.5	8	118	775	1050	350

THE CONTENTS OF HYUNWOO INDUSTRIAL'S DRAWING ARE SUBJECT TO CHANGE WITHOUT ANY PRIOR NOTICE TO IMPROVE QUALITY AND PERFORMANCE

NOTES:
 1. ALL DIMENSIONS ARE IN MILLIMETERS, EXCEPT IN () ARE IN INCHES
 2. ALL DIMENSIONS WITHOUT SPECIFIED TOLERANCES ARE FOR REFERENCE ONLY

HWSOP-A003-02 REV-0



HOME > Products

Products

KNIFE GATE VALVE

- INTEGRAL SEAT
- ▷ REPLACEABLE SEAT
- ▷ GEAR TYPE
- ▷ CHAINWHEEL
- ▷ PNEUMATIC
- ▷ ELECTRIC ACTUATOR
- ▷ UNI-SEAT TYPE

LONG FLATE KNIFE GATE VALVE

FLAP TYPE KNIFE GATE VALVE

OTHER VALVE

KNIFE GATE VALVE

INTEGRAL SEAT

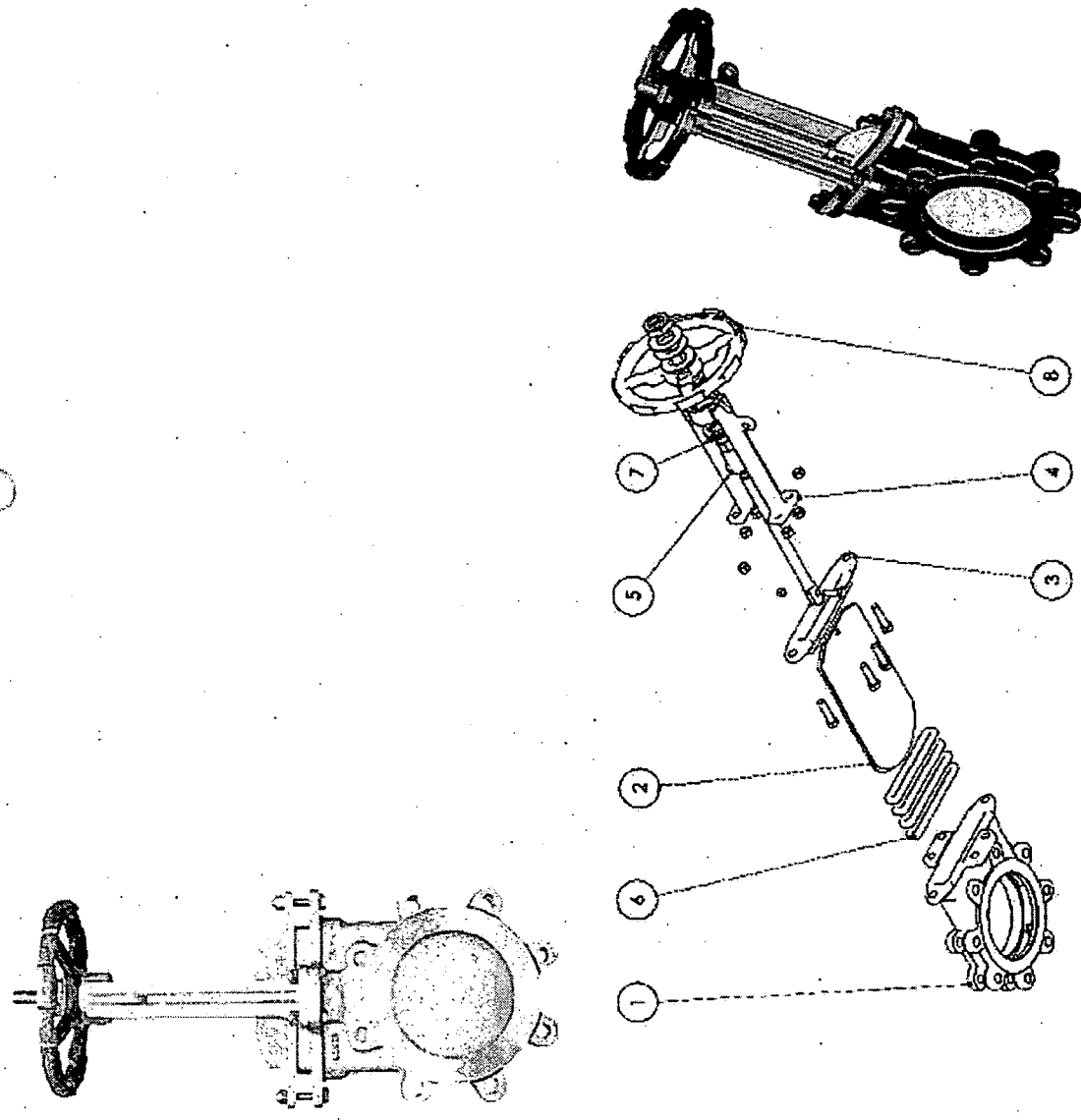
Hyunwoo (Integral seat) Knife gate valves are designed to handle the process industries (Ash, pulp&paper, power/utility, Oil and Gas production, Chemical refining)

Seats is metal

Design feature also include a raised face seat with the groove that prevents clogging (As the valve is open the flow cleans the groove)

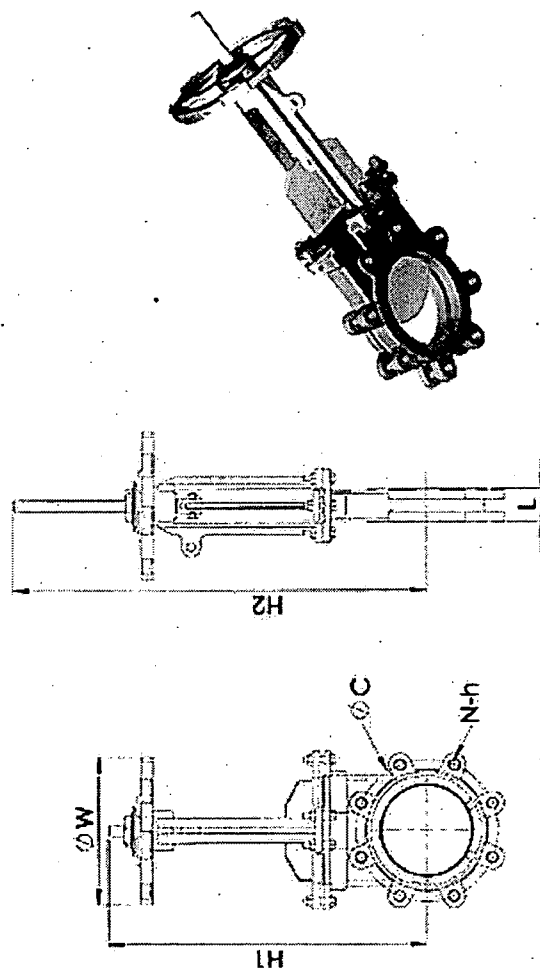
HW KGV is offered a variety of actuator including handwheel, chain, gear, electric, air or Hydraulic actuation:

Knife Gate Valve - Integral Seat



•• STANDARD MATERIALS

NO.	PART NAME	MATERIAL CODE(ASTM)	MATERIAL CODE (JIS)
1	BODY	STAINLESS STEEL 304 (A351-CF8) STAINLESS STEEL 316 (A351-CF8M) STAINLESS STEEL 316L (A351-CF3M)	SCS13 SCS14 SCS16
2	DISC	STAINLESS STEEL 304 (A240-304) STAINLESS STEEL 316 (A240-316) STAINLESS STEEL 316L (A240-316L)	SUS304 SUS316 SUS316L
3	PACKING GLAND	STAINLESS STEEL 304 (A351-CF8) STAINLESS STEEL 316 (A351-CF8M)	SCS13 SCS14
4	YOKE	STAINLESS STEEL 304 (A351-CF8)	SCS13
5	SLEEVE	BROZE CASTING (C83600)	BC8
6	PACKING	LUBRICATED PTFE IMPREGNATED PTFE FIBER BRADED	+
7	THRUST BEARING	2" ~ 8" : 51107 10" ~ 12" : THRUST PLATE(BRONZE) 14" ~ 24" : 51112	+
8	HANDWHEEL	CAST IRON	FC200



•• DIMENSIONS

SIZE inch mm	ANSI 150 psi							JIS 10K						
	L	C	N	h	H1	H2	W	L	C	N	h	H1	H2	W
2" 50	48	120.7	4	5/8"	310	380	200	48	120	4	M16	310	380	200
2 1/2" 65	51	139.7	4	5/8"	370	455	200	51	140	4	M16	370	455	200
3" 80	51	152.4	4	5/8"	380	480	200	51	150	8	M16	380	480	200
4" 100	51	190.5	8	5/8"	410	535	200	51	175	8	M16	410	535	200
5" 125	58	215.9	8	3/4"	470	620	200	58	210	8	M20	470	620	200
6" 150	58	241.3	8	3/4"	520	695	250	58	240	8	M20	520	695	250
8" 200	70	298.5	8	3/4"	625	850	300	70	290	12	M20	625	850	300
10" 250	70	362	12	7/8"	775	1050	350	70	355	12	M22	775	1050	350
12" 300	76	431.8	12	7/8"	865	1190	350	76	400	16	M22	865	1190	350
14" 350	78	476.3	12	1"	975	1350	400	78	445	16	M22	975	1350	400
16" 400	90	539.8	16	1"	1120	1545	400	90	510	16	M24	1120	1545	400
18" 450	90	578	16	1 1/8"	1205	1680	400	90	565	20	M24	1205	1680	400
20" 500	114	635	20	1 1/8"	1330	1855	500	114	620	20	M24	1330	1855	500
24" 600	114	749.3	20	1 1/4"	1525	2150	500	114	730	24	M30	1525	2150	500

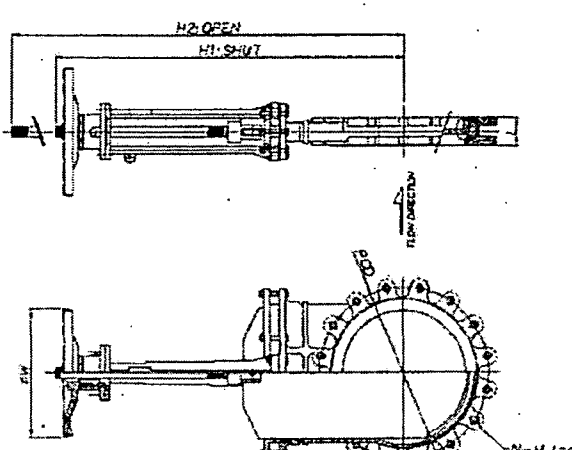
- too

95-1 Gulang-ri, Paltan-myeon, Hwasung-si, Gyeonggi-do
Tel: 82-31-354-3980/5 Fax: 82-31-354-3986
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HW HYUNWOO INDUSTRIAL CO., LTD.




INSPECTION CERTIFICATE

PAGE 1 OF 3

CUSTOMER	VALVECO	Fig 
PROJECT NAME		
REPORT NO.		
DESCRIPTION	HANDWHEEL OPERATED KNIFE GATE VALVE	
MANUFACTURE	HYUN WOO IND. CO., LTD.	
MODEL NO.	HW-MSKG-0018-S2-VT	
QUANTITY	1 SETS	
DATE	2005. 09. 10.	

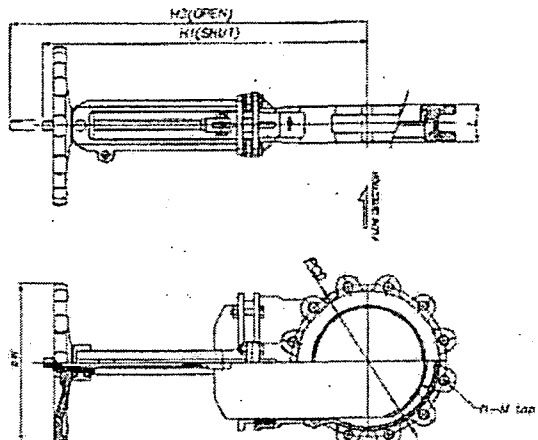



BODY	TYPE	MATERIAL		SIZE	RATING	MAKER/SUPPLIER
	KNIFE GATE	A351-CF8M	VITON	450NB	AS2129 TABLE D	HYUN WOO
ACTUATOR	TYPE	MODEL		MAKER/SUPPLIER		OTHER
	N/A					
HAND VALVE	TYPE	MODEL		POWER	EX-PROOF <input type="checkbox"/>	MAKER
	N/A				WEA-PROOF <input type="checkbox"/>	
LIMIT S/W	TYPE	MODEL			EX-PROOF <input type="checkbox"/>	MAKER
	N/A				WEA-PROOF <input type="checkbox"/>	
SPEED CONTROLLER	MODEL	N/A		AIR UNIT	MODEL	N/A
	MAKER				MAKER	

DIVISION (구분)	DIMENSION INSPECTION(치수검사)						HYDRO TEST (kg/cm ²)		AIR TEST (kg/cm ²)		Assembly Test With Operating	Result Holding Time BODY: 120SEC SEAT: 120SEC
	L	H1	H2	ØW	PCD	N-M	BODY	SEAT	BODY	SEAT		
STANDARD	90	1205	1680	400	584	12-24					Open, Close	
TOLERANCE	±1.6				±1.6		16	2.8			upward of three times	
#01	OK	OK	OK	OK	OK	OK	OK	OK			ACCEPT	GOOD
				*****	BLANK	*****						

Inspected by	Reviewed by	Approved by	Witnessed by	
				

HW양식1001-3

(주)현우산업

INSPECTION CERTIFICATE							PAGE 2 OF 3					
CUSTOMER	VALVECO						Fig 					
PROJECT NAME												
REPORT NO.												
DESCRIPTION	HANDWHEEL OPERATED KNIFE GATE VALVE											
MANUFACTURE	HYUN WOO IND. CO., LTD.											
MODEL NO.	HW-MSKG-0008-S2-VT											
QUANTITY	1 SETS											
DATE	2005. 09. 10.											
BODY	TYPE	MATERIAL		SIZE	RATING		MAKER/SUPPLIER					
	KNIFE GATE	A351-CF8M	VT0N	200NB	AS2129 TABLE D		HYUN WOO					
ACTUATOR	TYPE	MODEL		MAKER/SUPPLIER			OTHER					
	N/A											
HAND VALVE	TYPE	MODEL		POWER	EX-PROOF	<input type="checkbox"/>	MAKER					
	N/A				WEA-PROOF	<input type="checkbox"/>						
LIMIT S/W	TYPE	MODEL			EX-PROOF	<input type="checkbox"/>	MAKER					
	N/A				WEA-PROOF	<input type="checkbox"/>						
SPEED CONTROLLER	MODEL	N/A		AIR UNIT	MODEL		N/A					
	MAKER				MAKER							
DIVISION (구분)	DIMENSION INSPECTION(치수검사)						HYDRO TEST (kg/cm ²)		AIR TEST (kg/cm ²)		Assembly Test With Operating	Result Holding Time BODY: 120SEC SEAT: 120SEC
	L	H1	H2	ØW	PCD	N-M	MSS SP 81	BODY	SEAT	BODY		
STANDARD	70	625	850	300	202	8-16	BODY	SEAT			Open, Close	
TOLERANCE	±1.6	-	-	-	±1.6	-	16	2.8			upward of three times	
#01	OK	OK	OK	OK	OK	OK	OK	OK			ACCEPT	GOOD
				*****	BLANK	*****						
Inspected by	Reviewed by		Approved by		Witnessed by							
												

HW양식1001-3

(주)한우산업

INSPECTION CERTIFICATE								PAGE 3 OF 3				
CUSTOMER		VALVECO										
PROJECT NAME												
REPORT NO.												
DESCRIPTION		HANDWHEEL OPERATED KNIFE GATE VALVE										
MANUFACTURE		HYUN WOO IND. CO., LTD.										
MODEL NO.		HW-MSKG-0009-S2-VT										
QUANTITY		1 SETS										
DATE		2005. 09. 10.										
BODY	TYPE	MATERIAL		SIZE	RATING		MAKER/SUPPLIER					
	KNIFE GATE	A351-CF8M	VITON	225NB	AS2129 TABLE D		HYUN WOO					
ACTUATOR	TYPE	MODEL		MAKER/SUPPLIER				OTHER				
	N/A											
HAND VALVE	TYPE	MODEL		POWER	EX-PROOF <input type="checkbox"/>		MAKER					
	N/A				WEA-PROOF <input type="checkbox"/>							
LIMIT SW	TYPE	MODEL		EX-PROOF <input type="checkbox"/>		MAKER						
	N/A			WEA-PROOF <input type="checkbox"/>								
SPEED CONTROLLER	MODEL	N/A		AIR UNIT	MODEL		N/A					
	MAKER				MAKER							
DIVISION (구분)	DIMENSION INSPECTION(치수검사)						HYDRO TEST (kg/cm ²)		AIR TEST (kg/cm ²)		Assembly Test With Operating	Result Holding Time BODY: 120SEC SEAT: 120SEC
	L	H1	H2	ØW	PCD	N-M	MSS SP 81	BODY	SEAT	BODY		
STANDARD	70	775	1033	350	322.5	8-16	BODY	SEAT	BODY	SEAT	Open, Close	
TOLERANCE	±1.6	-	-	-	±1.6	-	16	2.8			upward of three times	
#01	OK	OK	OK	OK	OK	OK	OK	OK			ACCEPT	GOOD
#02	OK	OK	OK	OK	OK	OK	OK	OK			ACCEPT	GOOD
				*****	BLANK	*****						
Inspected by	Reviewed by		Approved by		Witnessed by							

HW양식1001-3

(株)현우산업

13/09/2004 09:41 +61738479755

HALMELBRIS

PAGE 03

ORDER No : V19339	REV. No A DATE 2004.10.29 DESCRIPTION FOR APPROVAL DRAWN VJ/MB CHECKD SJA/MB APP'D SJA/MB		HYUNWOO INDUSTRIAL CO., LTD. KNIFE GATE VALVE-MANUAL ASSEMBLY DRAWING KRM.S.0000.000 A4 NS(1:12) 2/2
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THE CONTENTS OF HYUNWOO INDUSTRIAL'S DRAWING ARE SUBJECT TO CHANGE WITHOUT ANY PRIOR NOTICE TO IMPROVE QUALITY AND PERFORMANCE				
BILL OF MATERIAL				
No	DESCRIPTION	MATERIAL	QTY	REMARK
01	BODY	A307 CF8M	1	
02	KNIFE	316SS	1	
03	PACKING	PTFE FIBER 1 SET		
04	GLAND	A307 CF8	1	
05	STEM	316SS	1	
06	YOKER	A307 CF8	1	
07	MOUNTING PAD	A307 CF8	1	
08	HAND WHEEL	FC2500	1	

- PRESSURE RATING : CIP 150
 - FLANGE DIMENSION : AS2129 TABLE D
 - FACE TO FACE : MSS SP-81
 - OTHER DIMENSIONS : MAUER STANDARD
 - SEAT TYPE : RUBBER SEAT
 - TEST & INSPECTION : MSS SP-81
 - CLOSING OPERATION : DOWN (RIGHT HAND)

- DIMENSION TABLE

SIZE	L	PCD	M	N	M1	H2	W
450A(18")	80	84	12	124	1205	1680	400

UNIT : mm

NOTES:
 1. ALL DIMENSIONS ARE IN MILLIMETERS, EXCEPT IN () ARE IN INCHES.
 2. ALL DIMENSIONS THROUGH SEATED TOLERANCES ARE FOR REFERENCE ONLY.

HWSOP-A005-02 REV-0

13/09/2004 09:41 +61738479755

HALMELBRIS

PAGE 02

REV. No.	DATE	DESCRIPTION	DRAWN	CHK'D	APP'D
1	2004.02.29	FOR APPROVAL	YASIN	SLIM	SLIM

ORDER No : V19339

HYUNHOO INDUSTRIAL CO., LTD.	
KNIFE GATE VALVE-MANUAL ASSEMBLY DRAWING	
KRM.S.0000.000	
A4	1:6.5
REV	1/2

BILL OF MATERIAL			
No	DESCRIPTION	MATERIAL	QTY
01	BODY	A351 CF8M	1
02	WHEEL	316SS	1
03	PACKING	PITE FIBER / SET	1
04	CLAND	A351 CF8	1
05	STEM	304SS	1
06	YONE	A351 CF8	1
07	HAND WHEEL	FC300	1

- PRESSURE RATING : CNP 150
 - FLANGE DIMENSION : AS2129 TABLE D
 - FACE TO FACE : MSS SP-81
 - OTHER DIMENSIONS : WAFER STANDARD
 - SEAT TYPE : RUBBER SEAT
 - TEST & INSPECTION : MSS SP-41
 - CLOSING OPERATION : DOWN (RIGHT HAND)

DIMENSION TABLE

SIZE	L	PCD	N	M	HT	W
200A(8")	70	252	8	818	823	850
225A(9")	70	322.5	8	818	775	850

UNIT : mm

THE CONTENTS OF HYUNHOO INDUSTRIAL'S DRAWING
 ARE SUBJECT TO CHANGE WITHOUT ANY PRIOR NOTICE
 TO IMPROVE QUALITY AND PERFORMANCE

NOTES:
 1. ALL DIMENSIONS ARE IN MILLIMETERS EXCEPT IN () ARE IN INCHES.
 2. ALL DIMENSIONS WITHOUT STATED TOLERANCES ARE FOR REFERENCE ONLY.

INTRODUCTION


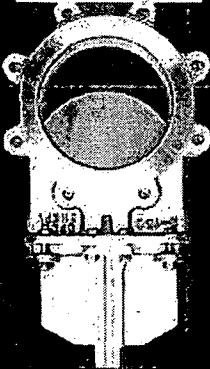
PRODUCTS

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PRODUCTS

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Products

KNIFE GATE VALVE

- INTEGRAL SEAT
- REPLACEABLE SEAT
- GEAR TYPE
- CHAINWHEEL
- PNEUMATIC
- ELECTRIC ACTUATOR
- UNI-SEAT TYPE
- LONG FLATE KNIFE GATE VALVE
- FLAP TYPE KNIFE GATE VALVE
- OTHER VALVE



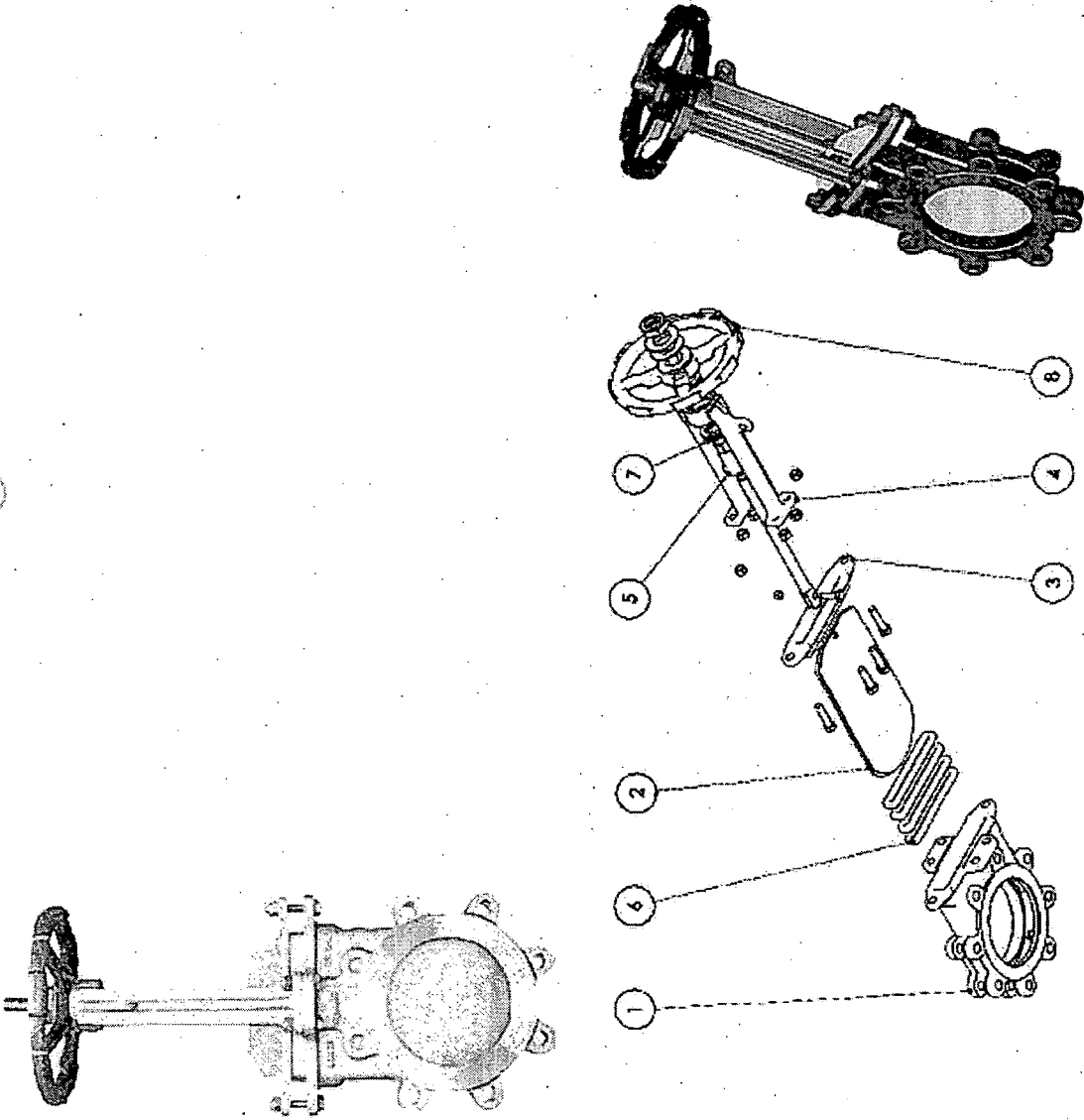
KNIFE GATE VALVE

● INTEGRAL SEAT

Hyunwoo (Integral seat) Knife gate valves are designed to handle the process industries (Ash, pulp&paper, power/utility, Oil and Gas production, Chemical refining) Seats is metal
Design feature also include a raised face seat with the groove that prevents clogging (As the valve is open the flow cleans the groove)

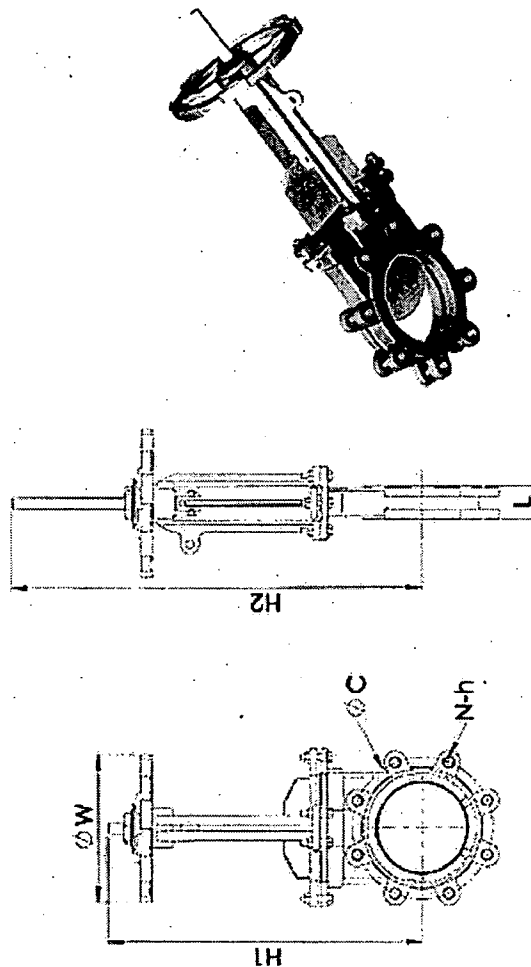
HW KGV is offered a variety of actuator including handwheel, chain, gear, electric, air or Hydraulic actuation.

Knife Gate Valve - Integral Seat



•• STANDARD MATERIALS

NO	PART NAME	MATERIAL CODE(ASTM)	MATERIAL CODE (JIS)
1	BODY	STAINLESS STEEL 304 (A351-CF8) STAINLESS STEEL 316 (A351-CF8M) STAINLESS STEEL 316L (A351-CF3M)	SCS13 SCS14 SCS16
2	DISC	STAINLESS STEEL 304 (A240-304) STAINLESS STEEL 316 (A240-316) STAINLESS STEEL 316L (A240-316L)	SUS304 SUS316 SUS316L
3	PACKING GLAND	STAINLESS STEEL 304 (A351-CF8) STAINLESS STEEL 316 (A351-CF8M)	SCS13 SCS14
4	YOKE	STAINLESS STEEL 304 (A351-CF8)	SCS13
5	SLEEVE	BROZE CASTING (C83600)	BO9
6	PACKING	LUBRICATED PTFE IMPREGNATED PTFE FIBER BRADED	+
7	THRUST BEARING	2" ~ 8" : 51107 10" ~ 12" : THRUST PLATE(BRONZE) 14" ~ 24" : 51112	+
8	HANDWHEEL	CAST IRON	FC200



•• DIMENSIONS

Knife Gate Valve - Integral Seat

SIZE Inch mm	ANSI 150 psi							JIS 10K						
	L	C	N	h	H1	H2	W	L	C	N	h	H1	H2	W
2" 50	48	120.7	4	5/8"	310	380	200	48	120	4	M16	310	380	200
2 1/2" 65	51	139.7	4	5/8"	370	455	200	51	140	4	M16	370	455	200
3" 80	51	152.4	4	5/8"	380	480	200	51	150	8	M16	380	480	200
4" 100	51	190.5	8	5/8"	410	535	200	51	175	8	M16	410	535	200
5" 125	58	215.9	8	3/4"	470	620	200	58	210	8	M20	470	620	200
6" 150	58	241.3	8	3/4"	520	695	250	58	240	8	M20	520	695	250
8" 200	70	298.5	8	3/4"	625	850	300	70	290	12	M20	625	850	300
10" 250	70	362	12	7/8"	775	1050	350	70	355	12	M22	775	1050	350
12" 300	76	431.8	12	7/8"	865	1190	350	76	400	16	M22	865	1190	350
14" 350	78	476.3	12	1"	975	1350	400	78	445	16	M22	975	1350	400
16" 400	90	539.8	16	1"	1120	1545	400	90	510	16	M24	1120	1545	400
18" 450	90	578	16	1 1/8"	1205	1680	400	90	565	20	M24	1205	1680	400
20" 500	114	635	20	1 1/8"	1330	1855	500	114	620	20	M24	1330	1855	500
24" 600	114	749.3	20	1 1/4"	1525	2150	500	114	730	24	M30	1525	2150	500

- 100 -

95-1 Gwang-ri, Paltan-myeon, Hwasung-si, Gyeonggi-do
Tel: 82-31-354-3980/5 Fax: 82-31-354-3986
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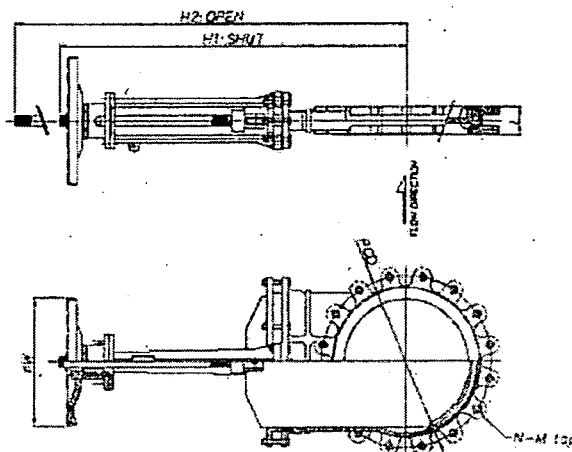
HW HYUNWOO INDUSTRIAL CO., LTD.

INSPECTION CERTIFICATE

PAGE 1 OF 3

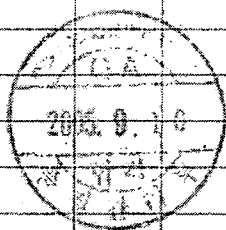
CUSTOMER	VALVECO
PROJECT NAME	
REPORT NO.	
DESCRIPTION	HANDWHEEL OPERATED KNIFE GATE VALVE
MANUFACTURE	HYUN WOO IND. CO., LTD.
MODEL NO.	HW-MSKG-0018-S2-VT
QUANTITY	1 SETS
DATE	2005. 09. 10.

Fig



BODY	TYPE	MATERIAL		SIZE	RATING	MAKER/SUPPLIER
	KNIFE GATE	A351-CF8M	VITON	450NB	AS2129 TABLE D	HYUN WOO
ACTUATOR	TYPE	MODEL		MAKER/SUPPLIER		OTHER
	N/A					
HAND VALVE	TYPE	MODEL		POWER	EX-PROOF <input type="checkbox"/>	MAKER
	N/A				WEA-PROOF <input type="checkbox"/>	
LIMIT S/W	TYPE	MODEL			EX-PROOF <input type="checkbox"/>	MAKER
	N/A				WEA-PROOF <input type="checkbox"/>	
SPEED CONTROLLER	MODEL	N/A		AIR UNIT	MODEL	N/A
	MAKER				MAKER	

DIVISION (구분)	DIMENSION INSPECTION(치수검사)						HYDRO TEST (kg/cm ²)		AIR TEST (kg/cm ²)		Assembly Test With Operating	Result Holding Time BODY: 120SEC SEAT: 120SEC
	L	H1	H2	ØW	PCD	N-M	MSS SP 81					
STANDARD	90	1205	1680	400	584	12-24	BODY SEAT	BODY SEAT	BODY SEAT	Open, Close		
TOLERANCE	+1.6	-	-	-	±1.6	-	16 2.8			upward of three times		
#01	OK	OK	OK	OK	OK	OK	OK OK			ACCEPT	GOOD	
				*****	BLANK	*****						

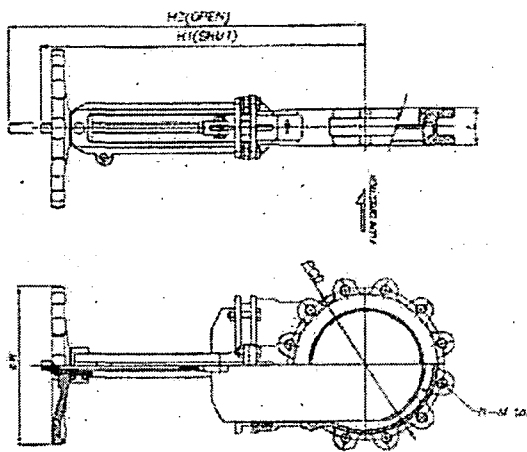

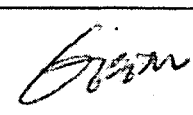
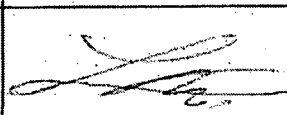


Inspected by	Reviewed by	Approved by	Witnessed by



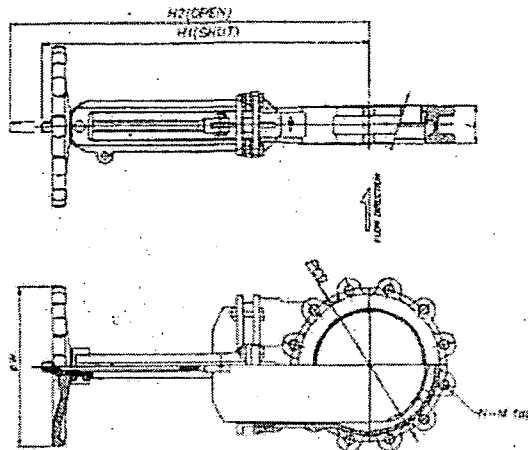

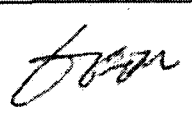
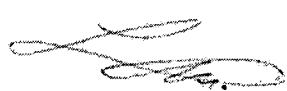
HW양식1001-3

(株)현우산업

INSPECTION CERTIFICATE							PAGE 2 OF 3					
CUSTOMER	VALVECO						Fig 					
PROJECT NAME												
REPORT NO.												
DESCRIPTION	HANDWHEEL OPERATED KNIFE GATE VALVE											
MANUFACTURE	HYUN WOO IND. CO., LTD.											
MODEL NO.	HW-MSKG-0008-S2-VT											
QUANTITY	1 SETS											
DATE	2005. 09. 10.											
BODY	TYPE	MATERIAL		SIZE	RATING		MAKER/SUPPLIER					
	KNIFE GATE	A351-CF8M	VT10N	200NB	AS2129 TABLE D		HYUN WOO					
ACTUATOR	TYPE	MODEL		MAKER/SUPPLIER			OTHER					
	N/A											
HAND VALVE	TYPE	MODEL		POWER	EX-PROOF	<input type="checkbox"/>	MAKER					
	N/A				WEA-PROOF	<input type="checkbox"/>						
LIMIT S/W	TYPE	MODEL			EX-PROOF	<input type="checkbox"/>	MAKER					
	N/A				WEA-PROOF	<input type="checkbox"/>						
SPEED CONTROLLER	MODEL	N/A		AIR UNIT	MODEL		N/A					
	MAKER				MAKER							
DIVISION (구분)	DIMENSION INSPECTION(치수검사)						HYDRO TEST (kg/cm ²)		AIR TEST (kg/cm ²)		Assembly Test With Operating	Result Holding Time
	L	H1	H2	ØW	PCD	N-M	MSS SP 81	BODY	SEAT	BODY		
STANDARD	70	625	850	300	202	8-16	BODY	SEAT	BODY	SEAT	Open/Close	BODY: 120SEC SEAT: 120SEC
TOLERANCE	±1.6	-	-	-	±1.6	-	16	2.8			upward of three times	
#01	OK	OK	OK	OK	OK	OK	OK	OK			ACCEPT	GOOD
				*****	BLANK	*****						
Inspected by	Reviewed by		Approved by		Witnessed by							
												

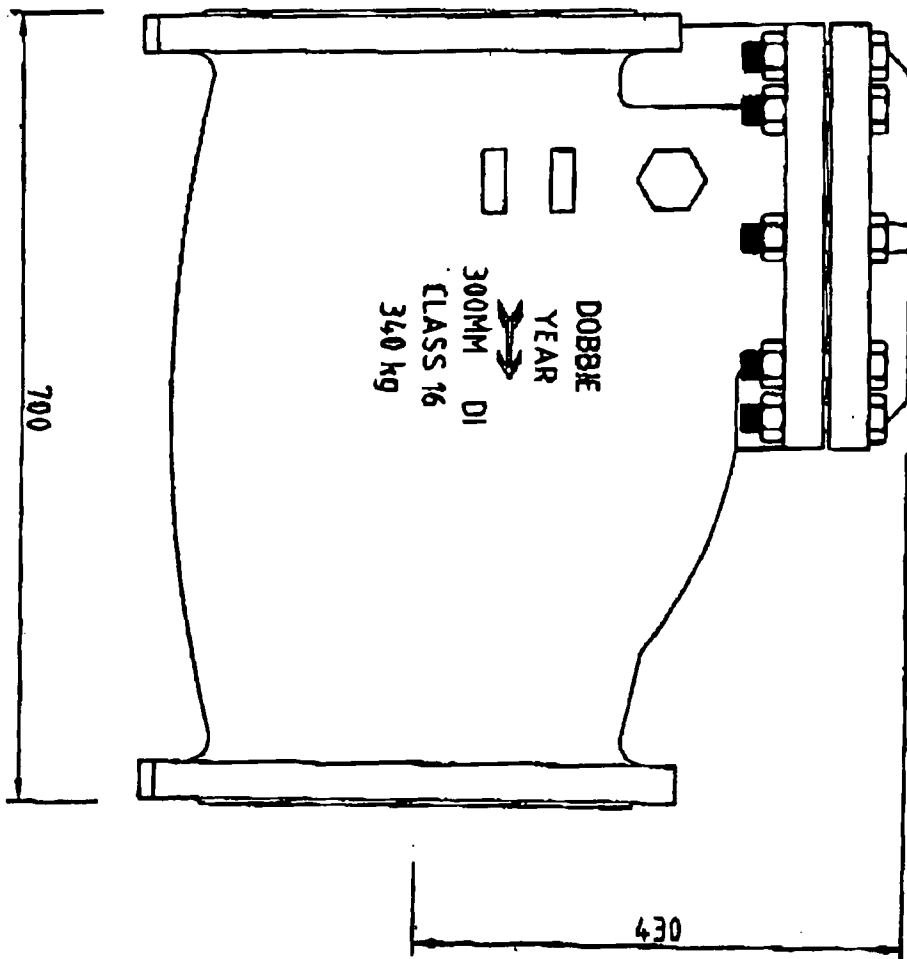
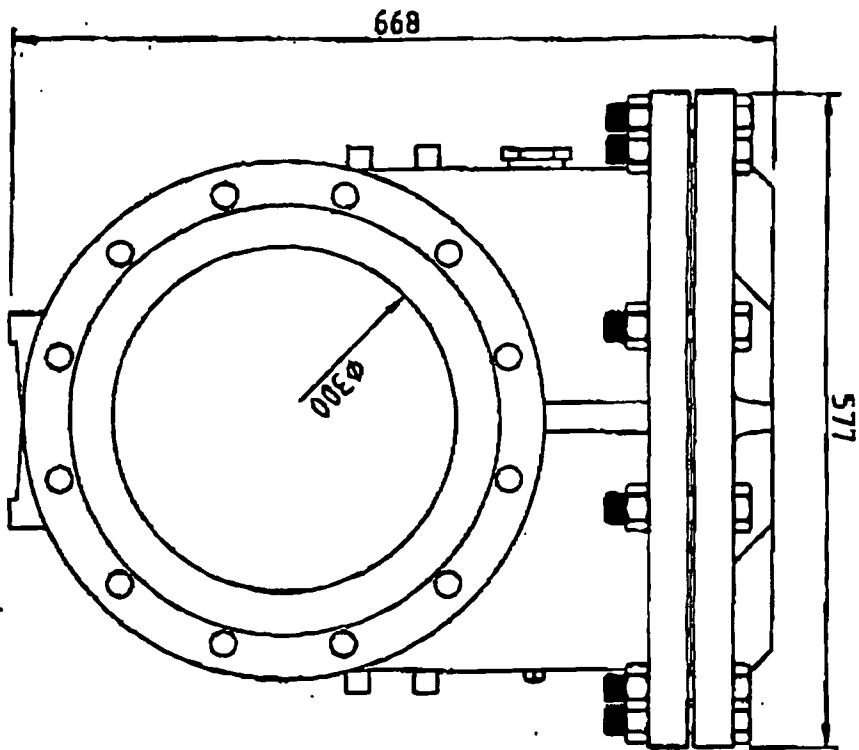
HW양식1001-3

(주)원우산업

INSPECTION CERTIFICATE								PAGE 3 OF 3				
CUSTOMER	VALVECO							Fig 				
PROJECT NAME												
REPORT NO.												
DESCRIPTION	HANDWHEEL OPERATED KNIFE GATE VALVE											
MANUFACTURE	HYUN WOO IND. CO., LTD.											
MODEL NO.	HW-MSKG-0009-S2-VT											
QUANTITY	1 SETS											
DATE	2005. 09. 10.											
BODY	TYPE	MATERIAL		SIZE	RATING		MAKER/SUPPLIER					
	KNIFE GATE	A351-CF8M	VITON	225NB	AS2129 TABLE D		HYUN WOO					
ACTUATOR	TYPE	MODEL		MAKER/SUPPLIER			OTHER					
	N/A											
HAND VALVE	TYPE	MODEL		POWER	EX-PROOF	<input type="checkbox"/>	MAKER					
	N/A				WEA-PROOF	<input type="checkbox"/>						
LIMIT S/W	TYPE	MODEL		EX-PROOF		<input type="checkbox"/>	MAKER					
	N/A			WEA-PROOF		<input type="checkbox"/>						
SPEED CONTROLLER	MODEL	N/A		AIR UNIT	MODEL		N/A					
	MAKER				MAKER							
DIVISION (구분)	DIMENSION INSPECTION(치수검사)						HYDRO TEST (kg/cm ²)		AIR TEST (kg/cm ²)		Assembly Test With Operating	Result Holding Time BODY: 120SEC SEAT: 120SEC
	L	H1	H2	ØW	PCD	N-M	MSS SP 81	BODY	SEAT	BODY		
STANDARD	70	775	1053	350	322.5	8-16	BODY	SEAT	BODY	SEAT	Open, Close	
TOLERANCE	±1.6				±1.6		16	2.8			upward of three times	
#01	OK	OK	OK	OK	OK	OK	OK	OK			ACCEPT	GOOD
#02	OK	OK	OK	OK	OK	OK	OK	OK			ACCEPT	GOOD
					BLANK							
Inspected by	Reviewed by		Approved by		Witnessed by							
												

HW양식1001-3

(株)현우산업



TYPICAL ARRANGEMENT
AND BODY MARKINGS



REV	DATE	DRN	TITLE	DRAWING NO.
1.0	13.05.02	MIKE H	300MM REFLEX VALVE	RV300/15
1.1	05.12.04	MIKE H	FREE ACTING	REV. 1.1
			CLASS 16	

THE DOBBIE DICO METER CO. PTY. LTD. (W.A.)

300mm REFLEX VALVE SPECIFICATIONS

No	PART	MATERIAL	STANDARD	GRADE
1	BODY	DUCTILE IRON	AS1831	AS 500-7
2	COVER	DUCTILE IRON	AS1831	AS 500-7
3	BOLTS	GALV. CARBON STEEL	AS1252	HIGH STRENGTH STRUCTURAL
3	BOLT ALTERNATIVE	STAINLESS STEEL	AS2837	304 OR 316
4	BLANKING PLUG	DR BRASS	BS1256	352
5	FLAP SPINDLE	STAINLESS STEEL	AS2837	316 OR 304
6	SEATING RING	GUNMETAL	AS1565	C83600
7	FLAP	GUNMETAL	AS1565	C83600
8	HINGE	GUNMETAL	AS1565	C83600
9	HINGE SPINDLE	STAINLESS STEEL	AS2837	316 OR 304
10	GASKET	RUBBER	AS4020	XB3603
11	SPINDLE BUSH	GUNMETAL OR DR BRASS	AS1565	C83600
12	WASHER	STAINLESS STEEL	AS2837	316 OR 304
13	SPLIT PIN	STAINLESS STEEL	AS2837	316 OR 304
14	GLAND NUT	GUNMETAL	AS1565	C83600
15	BLEED PLUG	DR BRASS	AS3688	352
16	LEVER ARM (IF REQ'D)	STRUCTURAL STEEL	AS3679	250
17	COUNTERWEIGHT (IF REQ'D)	GREY CAST IRON	AS1830	1220
18	LIMIT SWITCH (IF REQ'D)	AS SPECIFIED		
19	LAM (IF REQ'D)	STAINLESS STEEL	AS2837	316 OR 304

A.S. FLANGE SPECIFICATIONS

VALVE CLASS	FLANGE DIA.	FLANGE THICKNESS	FACE/LENGTH	LENGTH TOL. +/-	MIN WALL THICKNESS	No. BOLT HOLES	BOLT HOLE DIAM.	BOLT HOLE P.C.D.
16	455	30	700	2	23	12	22	406
35	490	38	700	2	23	16	26	438



DRAWING No.

RV300/1

REV. 1.0

TITLE:
300MM REFLEX VALVE
SPECIFICATIONS

REV	DATE	DRN
0.0	26.08.00	
0.1	04.05.02	MIKE H
1.0	21.01.04	MIKE H

THE DOBBIE DICO METER Co. Pty. Ltd. (W.A.)

INSTALLATION, OPERATING AND MAINTENANCE INSTRUCTIONS FOR BEVELS AND SPURS GEAR OPERATORS

This range of gearboxes is supplied to suit the order requirements but, unless specifically requested at the ordering stage, the output sleeve will be supplied blank and must be machined to suit the equipment to be operated.

The sleeve can be easily removed from the gearbox by first removing the loose piece spigot ring from the baseplate. It is imperative that the thrust bearings in the output are fitted correctly, along with the output sleeve and the spigot ring - That is: the needle thrust bearings **MUST** have a thrust washer at each side of the needle race. A bearing / washer assembly **MUST** be fitted at each side of the output sleeve thrust shoulder. All thrust elements and bearing cavities must be packed with grease of the correct specification.

MOUNTING TO THE VALVE

1. The valve spindle must be greased before assembly of the gearbox to the valve.
2. Thrust element retention device to be removed prior to assembly to the valve.
3. Do not pack the spindle cover tube with grease as this can lead to pressure build up in the gearbox.
4. Flanges to be sealed on assembly with silicone sealant.
5. Spindle cover tubes and plugs to be sealed with suitable sealant.

If the gearbox has been supplied with a handwheel, it is recommended that this be fitted to the gearbox before mounting on the valve. This will make it easier to rotate the gearing to pick up the start of a thread or key location.

On a keyed valve shaft, once the key and keyway are lined up, the gearbox can be lowered onto the mounting flange and bolted down.

On a screwed valve shaft, rotating the handwheel will cause the gearbox to screw itself down the spindle. Once in the correct position it can be bolted down.

For large Gearboxes, IB8 to IB14 and IS7 to IS20, we do recommend to fit the Thrust elements separately onto the Valve first. That means the Spigot Ring and one set of Thrust Bearings can be placed onto the Valve first, then the Drive Sleeve can be screwed down or fitted onto a keywayed shaft, with the second set of Thrust Bearings to follow. The Gearbox then can be lowered onto the Valve, taking care that the splines do not get damaged.

If an electric actuator is fitted to the gearbox, a suitable input adaptor will have been supplied. After mounting the actuator to the gearbox, the limit and torque switch settings must be made in accordance with the manufacturer's instructions.

NB. Mounting bolts or studs must be high tensile steel - 850 N/mm²

HANDLING

Combined valve and gearbox must **NOT** be slung from the gearbox.

MAINTENANCE

All gear cavities are lubricated for life with Fuchs Renolit CL-X2 grease. Under normal operating conditions, no maintenance is required for the gearbox but should the valve be taken out of service for overhaul, the gearbox baseplate may be removed and the grease changed using one of the following recommended lubricants. The baseplate must be sealed using silicone sealant on re-assembly, unless fitted with an O ring.

NB. All thrust elements and bearing cavities must be re-greased and refitted in the correct order.

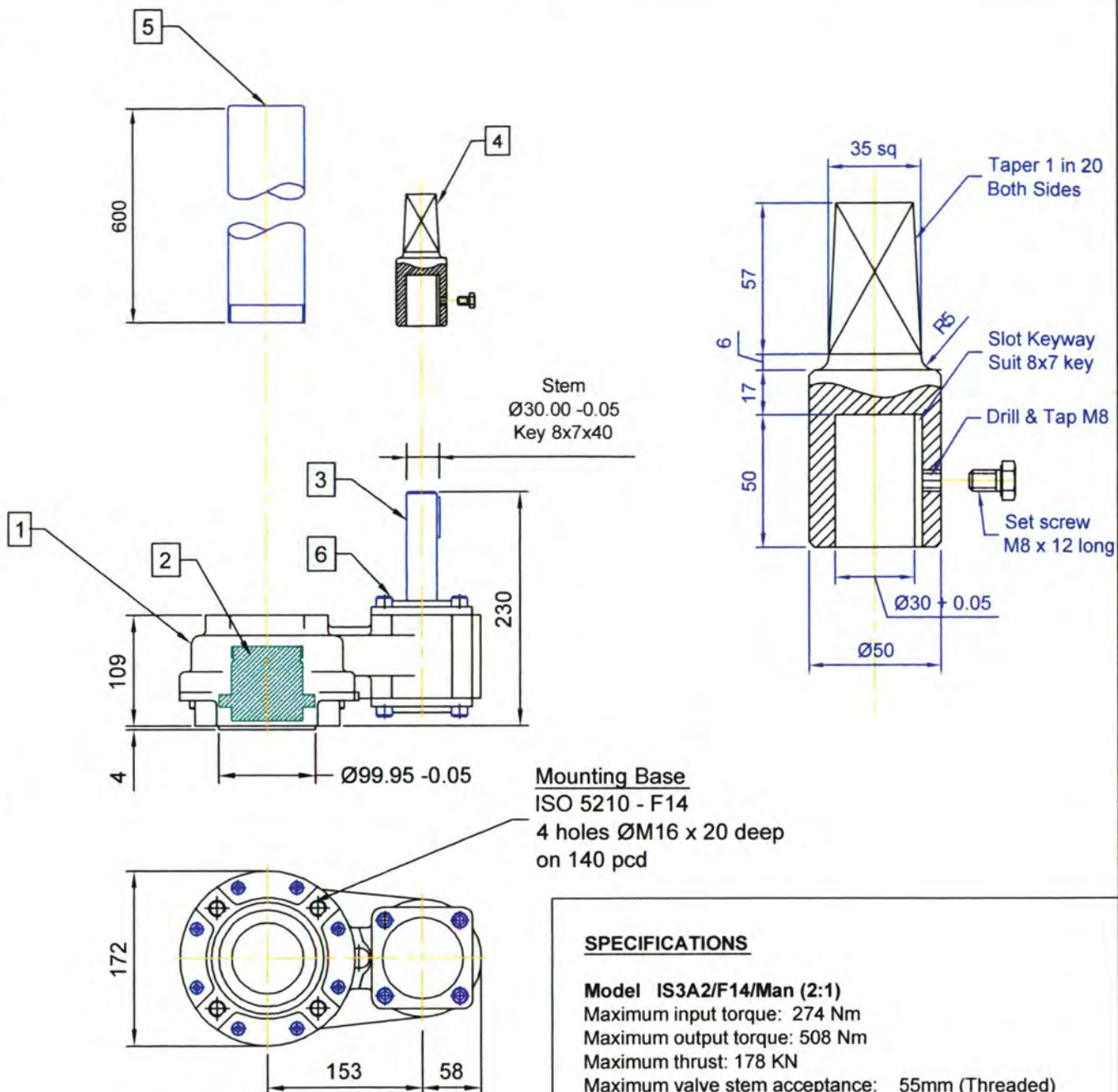
Manufacturer	Name	Temperature Range
Fuchs	Renolit CL-X2	-54°C to +120°C
Shell	Alvania EP1	-15°C to +90°C
Esso	Beacon EP2	-30°C to +125°C

An equivalent extreme pressure lubricant may be used.

For extreme temperature applications, please consult the factory.

SPARES

Spare parts must be selected from the spare parts lists.



SPECIFICATIONS

Model IS3A2/F14/Man (2:1)

Maximum input torque: 274 Nm

Maximum output torque: 508 Nm

Maximum thrust: 178 KN

Maximum valve stem acceptance: 55mm (Threaded)
52mm (Bore & Key)

Mounting flange: ISO 5210 - F14

Ratio: 2:1

Lubrication: Grease filled Renolit CL-X2

Materials: Gearcase: Cast iron to BS1452 grade 250

Input shaft: Stainless steel

Fasteners: Stainless steel

Drive nut: Aluminium bronze

Spindle cap: Stainless steel

Valve stem cover: Stainless steel

Paint: 2 Part Epoxy

7		
6		Fasteners (Stainless Steel)
5	1	Valve Stem Cover Tube (Stainless Steel)
4	1	Removable Spindle Cap (Stainless Steel)
3	1	Input Shaft (Stainless Steel)
2	1	Drive nut (Aluminium Bronze)
1	1	Rotork Model IS3A2 / F14 / Man / (2:1)
Item	Qty	Description

rotork

Rotork Australia Pty, Ltd
416 Dowling St
Ballarat, Vic 3350

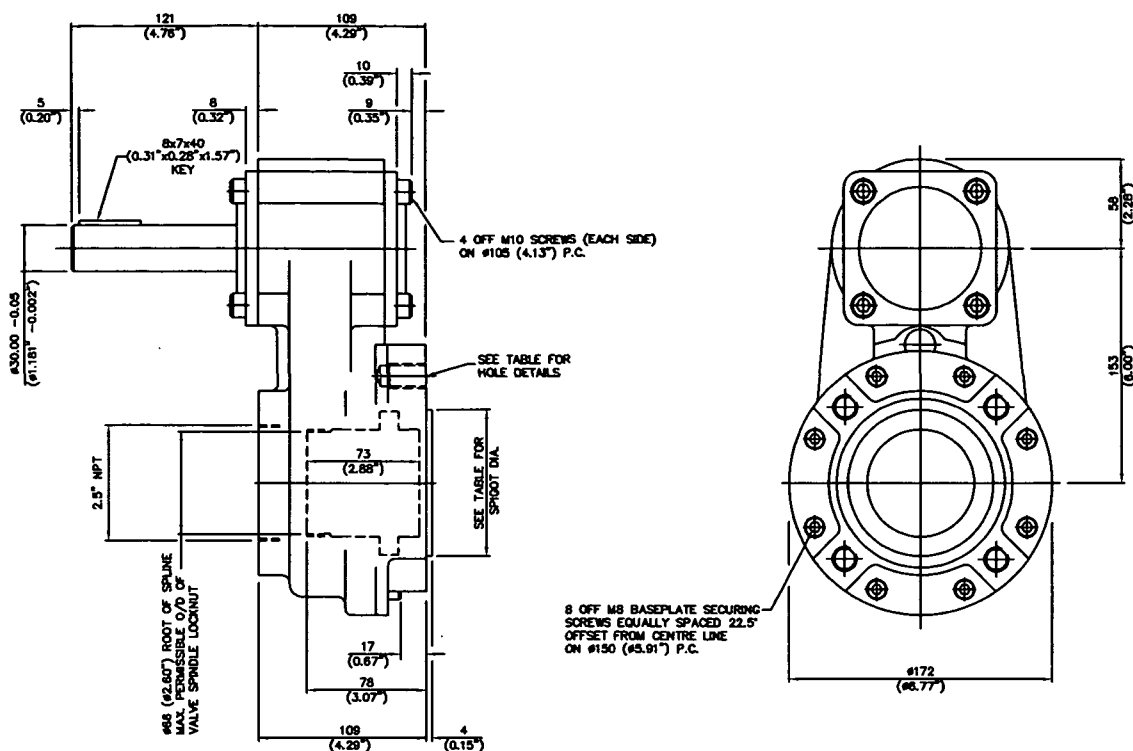
Rotork IS3 Spur Gearbox Brisbane Water Special Build

Date: 28/4/04

Scale: NTS

Drawn By: GWR

File Name: IS3 Special Bris Water.dwg



BASEPLATE DETAILS		
	SPIGOT DIA.	HOLE DETAILS (45° OFF CENTRES)
F14	#99.95 -0.05 (#3.935" -0.002")	4 HOLES M16x20 (0.79") DEEP ON #140.0 (#5.51") P.C.
FA14	#95.22 -0.10 (#3.749" -0.004")	4 HOLES 5/8"UNCx20 (0.79") DEEP ON #139.7 (#5.50") P.C.

MAX BORE RECTANGULAR KEY		
STD	BORE	KEY
BS4235 STEEL	52.0	16 x 10
BS4235 BRONZE	50.0	14 x 9
BS46 STEEL	2.000"	1/2" x 5/16"
BS46 BRONZE	1.875"	1/2" x 5/16"
ANSI B17.1 STEEL	2.000"	1/2" x 5/16"
ANSI B17.1 BRONZE	1.875"	1/2" x 5/16"

MAX BORE SQUARE KEY		
STD	BORE	KEY
BS4235 STEEL	-	-
BS4235 BRONZE	-	-
BS46 STEEL	1.875"	1/2" SQ
BS46 BRONZE	1.750"	7/16" SQ
ANSI B17.1 STEEL	1.875"	1/2" SQ
ANSI B17.1 BRONZE	1.750"	7/16" SQ

MAX ACME THREAD = 2.1/8"

IS3 SPUR GEARBOX, 1, 2 & 3:1 RATIO, MANUAL INPUT, F14 BASEPLATE

DETAILS SUBJECT TO CHANGE WITHOUT PRIOR NOTICE

FOR UP TO DATE DETAILS VISIT www.rotork.com

**rotork
gears**

Regina House
Ring Road
Bramley
Leeds
LS13 4ET
United Kingdom

DRAWING No

IS3

ISSUE

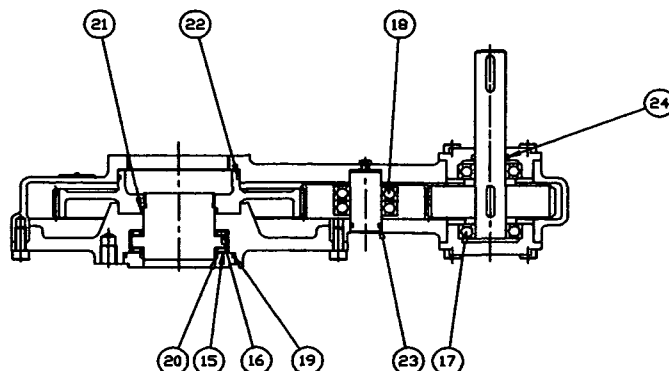
1

DATE

20/01/03

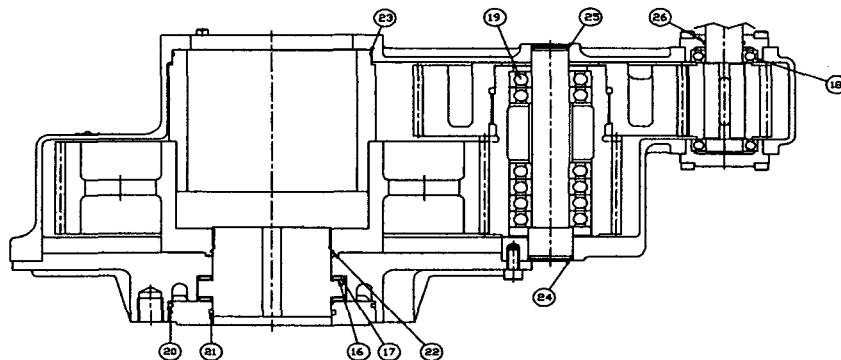
RECOMMENDED SPARES HOLDING FOR 5 YEARS OPERATION ON IS RANGE OF SPUR GEAR ACTUATORS

IS2 TO IS7



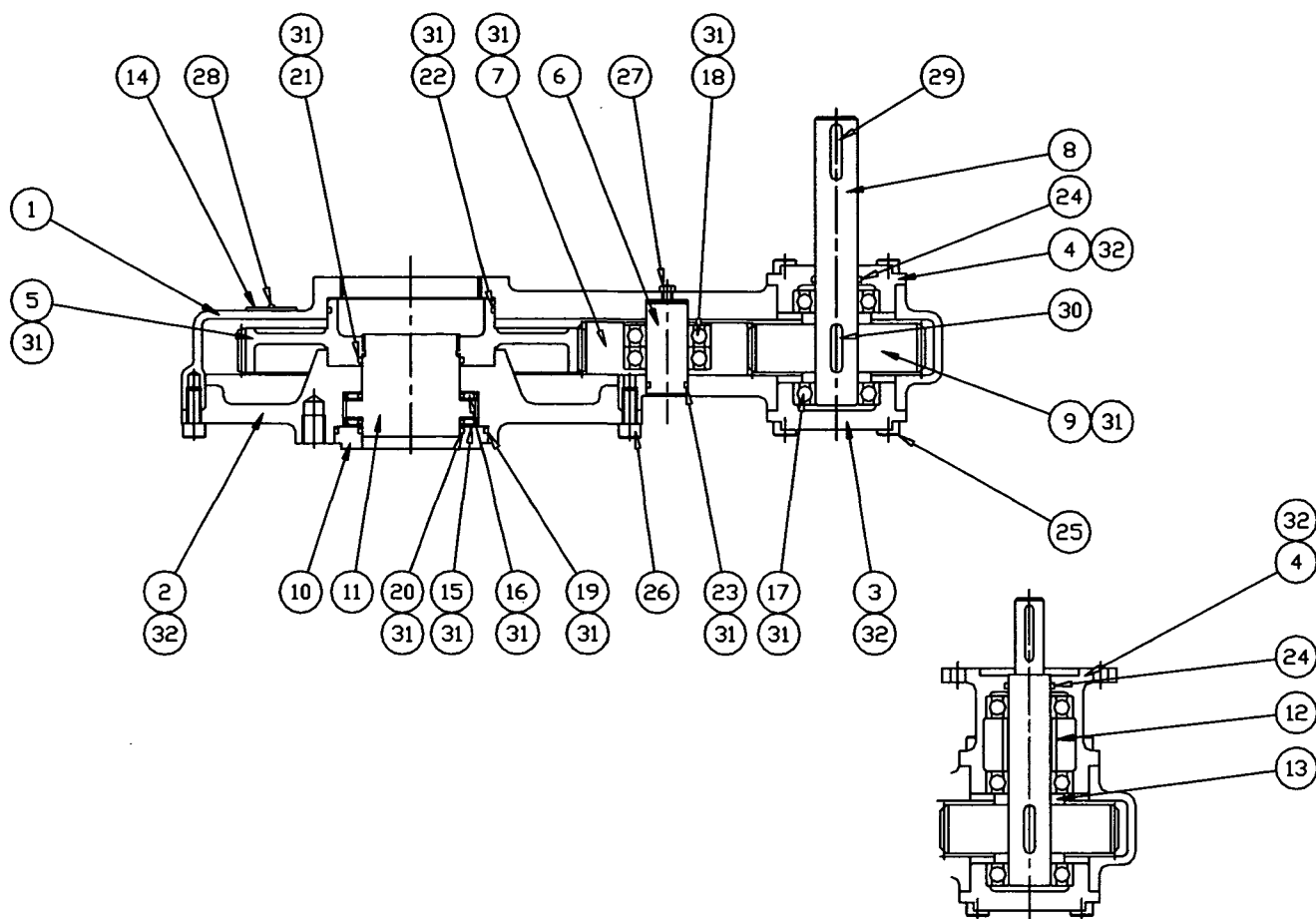
ITEM	DESCRIPTION	QUANTITY
(MOTORISED)	15 THRUST WASHER	4
	16 THRUST BEARING	2
	17 BALL BEARING	2 (MANUAL) OR 3
	18 BALL BEARING	2
	19 O RING	1
	20 O RING	1
	21 O RING	1
	22 O RING	1
	23 O RING	1
	24 O RING	1

IS8 TO IS20



ITEM	DESCRIPTION	QUANTITY
20)	16 THRUST WASHER	4
	17 THRUST BEARING	2
	18 BALL BEARING	2 (MANUAL) OR 3 (MOTORISED)
	19 BALL BEARING	3 (IS8 - 11), 4 (IS12 - 16) OR (IS17 -
	20 O RING	1
	21 O RING	1
	22 O RING	1
	23 O RING	1
	24 O RING	1
	25 O RING	1
	26 O RING	1

SPARE PARTS LIST FOR IS RANGE OF SPUR GEAR ACTUATORS IS2 TO IS7



ITEM	DESCRIPTION	QUANTITY
1	GEARCASE	1
2	BASEPLATE	1
3	ENDCAP (BLANK)	1
4	INPUT HOUSING	1
5	OUTPUT GEAR	1
6	IDLER SHAFT	1
7	IDLER GEAR	1
8	INPUT SHAFT	1
9	INPUT GEAR	1
10	SPIGOT RING	1
11	OUTPUT SLEEVE	1
12	SPACER	1
13	SPACER	2
14	NAMEPLATE	1
15	THRUST WASHER	4
16	THRUST BEARING	2
17	BALL BEARING	2 (MANUAL) or 3 (MOTORISED)
18	BALL BEARING	2
19	O RING	1
20	O RING	1
21	O RING	1
22	O RING	1
23	O RING	1
24	O RING	1
25	SOCKET HEAD CAP SCREW	8
26	SOCKET HEAD CAP SCREW	8
27	HEXAGON HEAD SCREW	1
28	RIVET	2
29	KEY	1
30	KEY	1
31	GREASE	
32	SEALANT	
33	PRIMER	

ROTORK GEARS IS GEARBOXES

IS Gearboxes General Features

- Totally enclosed gearing
- Grease filled for life and fully sealed
- Comprehensive gear ration
- Removable output sleeve facility
- Optional input flanges for motorisation
- Substantial torque range up to 46,100 Nm
- Substantial thrust range up to 3342 kN
- Input and idler gears mounted on ball bearings
- Upward and downward drive options
- Twin speed option
- Spur & bevel gear options

Standard Features on all IS Spur Gearboxes

Component	Material
Gearcase	Cast Iron
Base Plate	Cast Iron (IS2 to IS7) SG Iron (IS10 to IS20)
Gears	SG Iron Steel
O Rings	Synthetic Rubber
Fixing Screws	HT Steel Metric Standard
Input Shaft Bearings	Ball Bearings
Input Shaft	Steel
Output Thrust Bearing	Needle Roller Bearings except IS14, 16, 18, 19, 20 which have roller thrust bearings.
Output Sleeve	A1 = Steel A2 = Aluminium Bronze
Finish	PA10 Grey Primer

Additional Features for Brisbane Water Specification

- For immersion in raw sewage, Rotork Gears gearboxes are grease filled with Renolit CL-X2 to give an operating temperature range of -40°C to +120°C and are totally sealed to IP68.
- The gearbox input shafts are stainless steel.
- All fasteners are high tensile stainless steel.
- Gearcases, baseplates and input housings are cast iron to BS1452 grade 250 or SNG iron to BS2789 grade 420/12.
- For the IB bevel and IS spur ranges, this standard allows continuous submersible duty to a depth of 15 metres in raw sewage.
Note that some ancillary equipment, such as dial indicators, may not be suitable for this duty.
- Standard warranty conditions apply.
- Paint 2 part epoxy paint.
- Tapered stainless steel stem cap fitted to input shaft
- Aluminium Bronze output sleeve

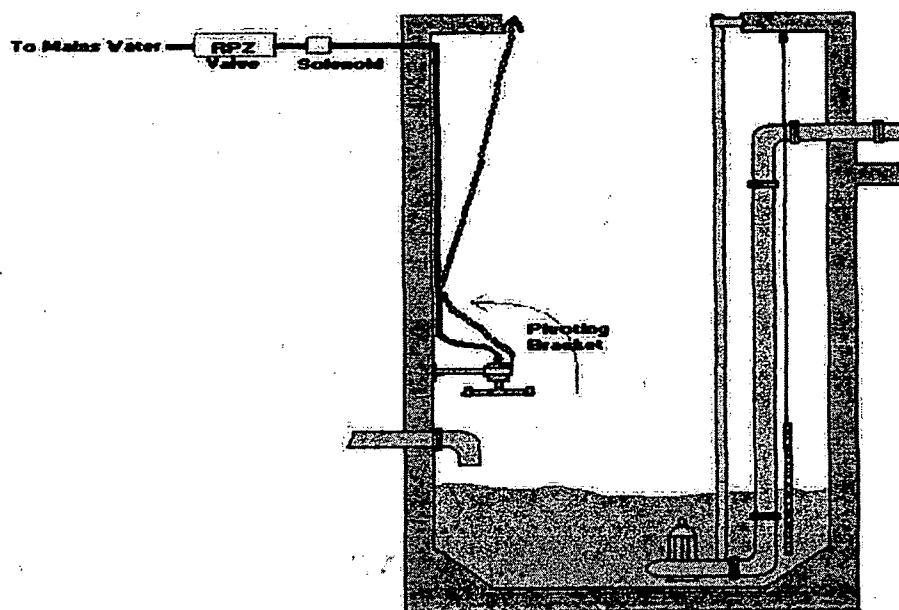
McBerns AutoWellWasher™

(Australian Patent No. 655111)
(International Patent Appl.No PCT/AU00/00084)

INSTALLATION INSTRUCTIONS for WALL MOUNT BRACKET

Positioning of the device in the well can be critical to the effectiveness of the wash system. Configuration of wells can differ but, in general the Washer should be positioned in the clearest available space to ensure the rotating arms do not come in contact with guide rails, chains, probes, etc.

The mounting bracket is designed to pivot back against the wall (see Figure 1) so as



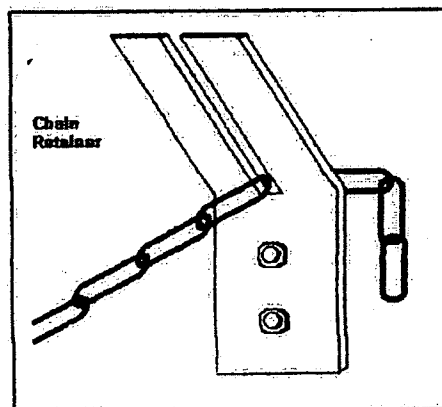
not to impede access when a pump needs to be removed.

Having chosen the position, the mounting bracket is secured to the wall by means of four 12mm stainless steel Dynabolts™. The bolt holes should be drilled approximately 1 metre above the normal high water line.

If you need to use the bracket extension piece it should now be attached. The extension piece is not needed in all wells depending on diameter and internal configuration. If not used, save it for later installations when multiple extensions may be useful.

Once the bracket is secured, the Washer head is inserted in the semi-circular clamp and the two locknuts tightened.

Now attach the pivot chain to the lug near the Washer head and pass the chain through the "eye" nut which should be installed in the wall approx. 1 metre above the Washer. The chain then attaches to the chain retainer which is fixed to the lip of the well opening.



Now the water supply can be connected to the Washer head. You can use good quality 3/4" hose (not garden hose), poly, PVC, copper or whatever best suits your requirements. From our experience the hose method is easiest, as it can be simply dropped down the wall and secured out of harms way using electrical ties.

The next step is to set the rotation speed by adjusting the spray buckets. By loosening the bolt which passes through each bucket, the nozzle housing can rotate through 360 degrees (see Figure 2). The nozzles need to be pointing in opposite directions to cause the spray arms to rotate. Speed of rotation is affected by the angle at which the nozzles are set (Figure 3). Best results are obtained with slow rotation, but care must be taken to allow for drops in water pressure at times of peak water usage in the locality. A temporary drop in water pressure can cause the Washer to stop turning if the initial speed is set too low.

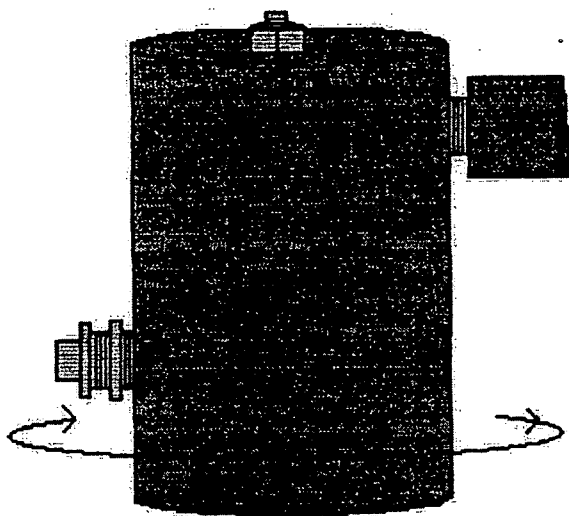


FIGURE 2

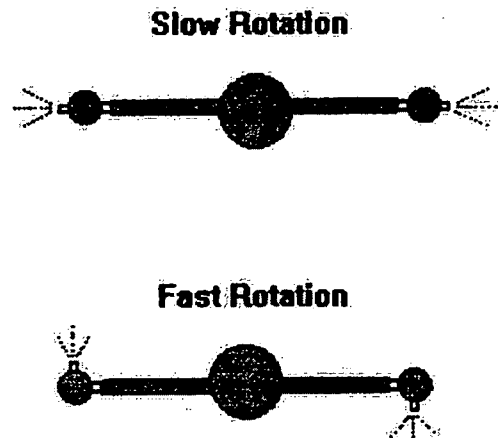


FIGURE 3

Now by twisting the nozzle buckets on the nipples which join them to the spray arms, the nozzles can be directed to wash the desired areas (Figure 4). Each nozzle gives a wide fan of spray. Usually, one would be directed to cover the well wall from high to low water line. The other can be directed at a sharper angle to

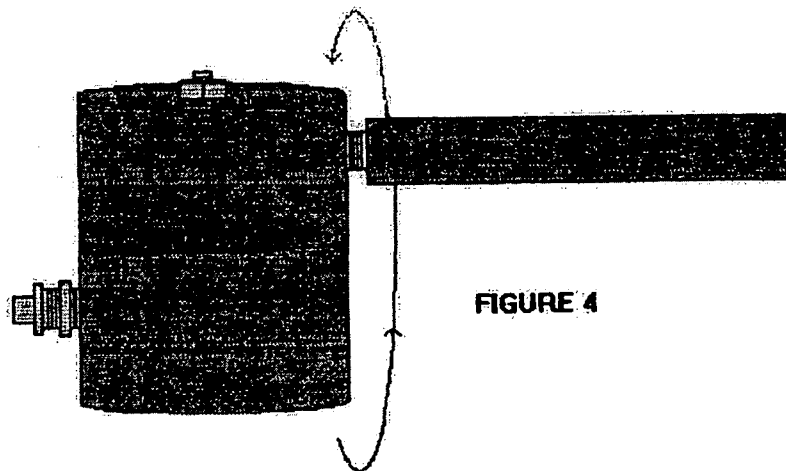


FIGURE 4

hit the top of the pumps, probe/float switches, guide rails etc.

The last task while in the well is to double check that all nuts have been tightened. Above ground you should have already installed an approved back-flow prevention device to the water supply line. Australian Standard specifies a Reduced Pressure Zone (RPZ) valve, and we recommend a 25mm model. Between this and the Washer a solenoid valve should be fitted in the water line. This solenoid is wired to the sewage pump control board so as to open when the pump turns on, and close when the pump stops. Thus the Washer operates as the well is being emptied.

THE WELL WASHER KIT CONTAINS:

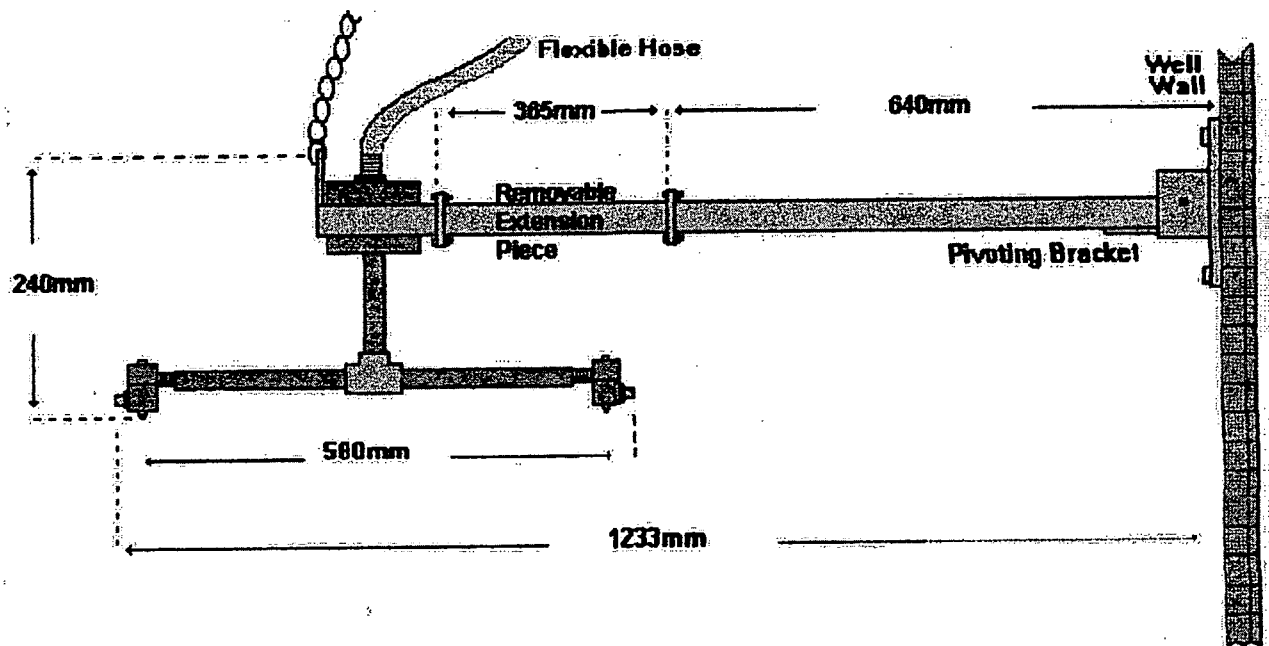
Rotating Washer Assembly	4 x 12mm SS Dynabolts
Pivoting Mounting Bracket	5 metres SS Chain
Installation Instructions	"Eye" nut & SS Dynabolt
Chain Retainer with 2 SS Dynabolts	

TO INSTALL YOU NEED TO PROCURE:

Back flow prevention device. (Brand is your choice but we recommend 25mm size.)

24volt AC Solenoid. (Brand and type is best chosen by your Electrician).

Water conduit and connectors (water inlet for Washer head is 3/4" BSP male).



Please note the dimensions above are a guide only. Slight variations may occur.

McBerns Pty Ltd

07 54467167

PO Box 304

Yandina Qld 4561 Australia

www.autowellwashers.com

©McBerns Pty Ltd April, 2004

McBerns Auto WellWasher Recommended Spare Parts List

Quantity	Description	Item Code
1	Head & Bearing Assembly	WW1001
1	Nozzle & Bucket Assembly	WW1007
1	Spray Arm	WW1008

SP302.TXT

Printed Output From File "C:\CALMAST\NEWFOL~1\SP302.MAG"
 Program v1.00 (30/08/1999) (WIN-PC)
 File Produced : 20/04/2006 11:56:21 AM

** Display Menu **

 Display Mode = 0
 Display Resolution = 1

** Flow Menu **

 Flow Range = 300.00000
 Flow Units = Ltr
 Flow Multiplier = x1
 Flow Time = s
 Flow Response = 3
 Flow Probe Ins = 1.00000
 Flow Probe Prof = 1.00000
 Flow Cutoff = 3

** Analog Menu **

 Analog FSD = 20
 Analog Zero = 4
 Analog Dir Fwd = 1
 Analog Dir Rev = 0
 Analog No. 2 = 100.00000

** Pulse Menu **

 Pulse Factor = 0.00999
 Pulse Cutoff = 0
 Pulse Max = 800
 Pulse Idle = 1
 Pulse Size = 0

** Totaliser Menu **

 Totaliser Units = Ltr
 Totaliser Multiplier = k
 Totaliser Clear Enab = 0

** Alarm No.1 Menu **

 Alarm No.1 Idle = 1
 Alarm No.1 Enable = 1
 Alarm No.1 Fault = 1
 Alarm No.1 Forward = 0
 Alarm No.1 Reverse = 0
 Alarm No.1 Cutoff = 0
 Alarm No.1 MtSensor = 1
 Alarm No.1 Hi = 0
 Alarm No.1 Lo = 0
 Alarm No.1 Analog = 0
 Alarm No.1 Pulse = 0

** Alarm No.2 Menu **

 Alarm No.2 Idle = 1
 Alarm No.2 Enable = 1
 Alarm No.2 Fault = 0
 Alarm No.2 Forward = 0
 Alarm No.2 Reverse = 1
 Alarm No.2 Cutoff = 0
 Alarm No.2 MtSensor = 0
 Alarm No.2 Hi = 0
 Alarm No.2 Lo = 0
 Alarm No.2 Analog = 0

SP302.TXT

Alarm No.2 Pulse = 0

** Alarm Trip Menu **

Alarm Trip Hi = 110
 Alarm Trip Lo = -110
 Alarm Trip Hyst = 1
 Alarm Trip Disp = 0

** Input Menu **

Input Clr
 Input Idle = 0

** MtSensor Menu **

MtSensor Trip = 50

** Sensor Menu **

Sensor Number = P/53295/2/2
 Sensor Tag = 5492212
 Sensor Size = 300
 Sensor FACTOR 1 = 1.39052
 Sensor FACTOR 2 = -8
 Sensor FACTOR 3 = 5
 Sensor FACTOR 4 = 1.00000

<<== END OF FILE ==>>

BYPASS.TXT

Printed Output From File "C:\CALMAST\NEWFOL~1\BYPASS.MAG"
 Program v1.00 (30/08/1999) (WIN-PC)
 File Produced : 20/04/2006 12:02:08 PM

** Display Menu **

 Display Mode = 0
 Display Resolution = 1

** Flow Menu **

 Flow Range = 300.00000
 Flow Units = Ltr
 Flow Multiplier = x1
 Flow Time = s
 Flow Response = 3
 Flow Probe Ins = 1.00000
 Flow Probe Prof = 1.00000
 Flow Cutoff = 3

** Analog Menu **

 Analog FSD = 20
 Analog Zero = 4
 Analog Dir Fwd = 1
 Analog Dir Rev = 0
 Analog No. 2 = 100.00000

** Pulse Menu **

 Pulse Factor = 0.00101
 Pulse Cutoff = 0
 Pulse Max = 800
 Pulse Idle = 1
 Pulse Size = 0

** Totaliser Menu **

 Totaliser Units = Ltr
 Totaliser Multiplier = k
 Totaliser Clear Enab = 0

** Alarm No.1 Menu **

 Alarm No.1 Idle = 1
 Alarm No.1 Enable = 1
 Alarm No.1 Fault = 1
 Alarm No.1 Forward = 0
 Alarm No.1 Reverse = 0
 Alarm No.1 Cutoff = 0
 Alarm No.1 MtSensor = 1
 Alarm No.1 Hi = 0
 Alarm No.1 Lo = 0
 Alarm No.1 Analog = 0
 Alarm No.1 Pulse = 0

** Alarm No.2 Menu **

 Alarm No.2 Idle = 1
 Alarm No.2 Enable = 1
 Alarm No.2 Fault = 0
 Alarm No.2 Forward = 0
 Alarm No.2 Reverse = 1
 Alarm No.2 Cutoff = 0
 Alarm No.2 MtSensor = 0
 Alarm No.2 Hi = 0
 Alarm No.2 Lo = 0
 Alarm No.2 Analog = 0

BYPASS.TXT

Alarm No.2 Pulse = 0

** Alarm Trip Menu **

Alarm Trip Hi = 110
Alarm Trip Lo = -110
Alarm Trip Hyst = 1
Alarm Trip Disp = 0

** Input Menu **

Input Clr
Input Idle = 0

** MtSensor Menu **

MtSensor Trip = 50

** Sensor Menu **

Sensor Number = P/54156/14/1
Sensor Tag = 317-200-FTR
Sensor Size = 200
Sensor FACTOR 1 = 1.51308
Sensor FACTOR 2 = 0
Sensor FACTOR 3 = 5
Sensor FACTOR 4 = 1.00000

<<== END OF FILE ==>>

Instruction Manual
IM/MM-SF_5

Electromagnetic Flowmeters

MagMaster™



Factory
Mutual
System
Approved



Cenelec/ATEX

ABB

ABB

The Company

We are an established world force in the design and manufacture of instrumentation for industrial process control, flow measurement, gas and liquid analysis and environmental applications.

As a part of ABB, a world leader in process automation technology, we offer customers application expertise, service and support worldwide.

We are committed to teamwork, high quality manufacturing, advanced technology and unrivalled service and support.

The quality, accuracy and performance of the Company's products result from over 100 years experience, combined with a continuous program of innovative design and development to incorporate the latest technology.

The UKAS Calibration Laboratory No. 0255 is just one of the ten flow calibration plants operated by the Company, and is indicative of our dedication to quality and accuracy.

EN ISO 9001:2000



Cert. No. Q5907

EN 29001 (ISO 9001)



Lenno, Italy – Cert. No. 9/90A

Electrical Safety

This instrument complies with the requirements of CEI/IEC 61010-1:2001-2 "Safety requirements for electrical equipment for measurement, control, and laboratory use". If the instrument is used in a manner NOT specified by the Company, the protection provided by the instrument may be impaired.

Symbols

One or more of the following symbols may appear on the instrument labelling:

	Warning – Refer to the manual for instructions		Direct current supply only
	Caution – Risk of electric shock		Alternating current supply only
	Protective earth (ground) terminal		Both direct and alternating current supply
	Earth (ground) terminal		The equipment is protected through double insulation

Information in this manual is intended only to assist our customers in the efficient operation of our equipment. Use of this manual for any other purpose is specifically prohibited and its contents are not to be reproduced in full or part without prior approval of the Technical Communications Department.

Health and Safety

To ensure that our products are safe and without risk to health, the following points must be noted:

1. The relevant sections of these instructions must be read carefully before proceeding.
2. Warning labels on containers and packages must be observed.
3. Installation, operation, maintenance and servicing must only be carried out by suitably trained personnel and in accordance with the information given.
4. Normal safety precautions must be taken to avoid the possibility of an accident occurring when operating in conditions of high pressure and/or temperature.
5. Chemicals must be stored away from heat, protected from temperature extremes and powders kept dry. Normal safe handling procedures must be used.
6. When disposing of chemicals ensure that no two chemicals are mixed.

Safety advice concerning the use of the equipment described in this manual or any relevant hazard data sheets (where applicable) may be obtained from the Company address on the back cover, together with servicing and spares information.

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1 INTRODUCTION

MagMaster™ is a range of high performance electromagnetic flowmeters for the measurement of electrically conductive fluids and slurries, and is normally supplied as a calibrated system, with the transmitter, factory configured, to a supplied full-bore or insertion probe sensor.

A wide range of options is available to suit most applications, including:

- Integral or remote transmitter.
- Glass loaded polypropylene or aluminium transmitter housing.
- Combined Hart™ and Keypad support in the aluminium housing transmitter.
- Flanged or wafer style sensors.
- Insertion Probes.
- Approved Versions, including:
 - Hazardous area operation.
 - Hygienic.
 - HART™ communication protocol.

Warning.

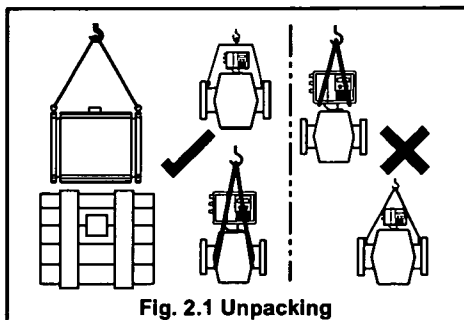
For MagMaster Approved /Hazardous Versions see the full installation manual.

Warning.

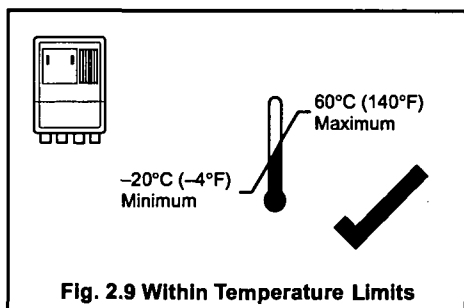
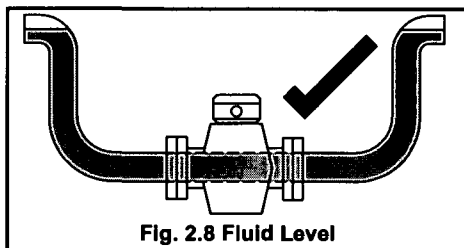
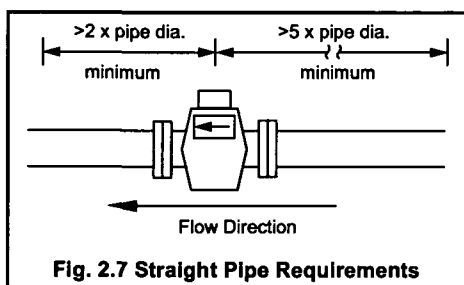
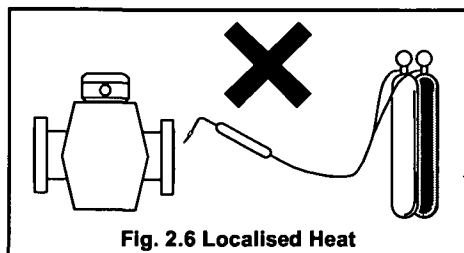
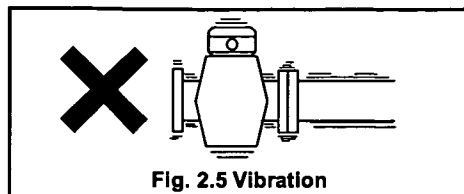
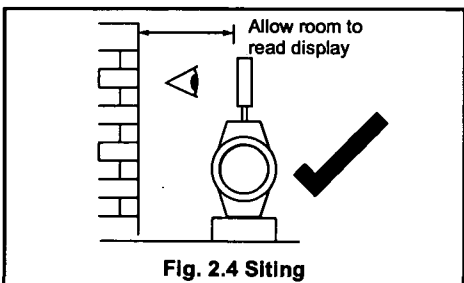
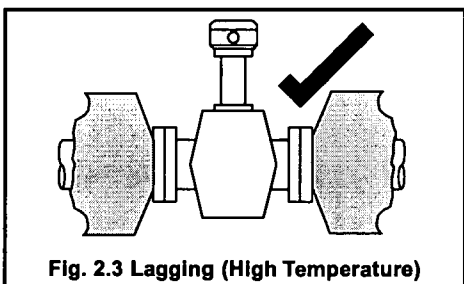
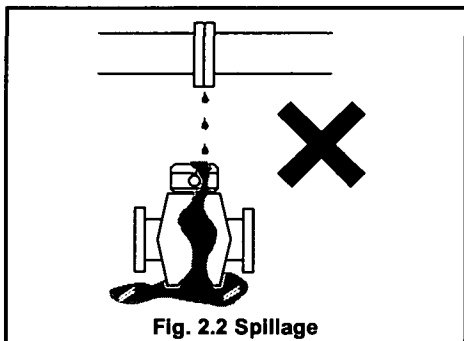
- Installation and maintenance must only be carried out by suitably trained personnel.
- All relevant sections of this manual must be read before selecting a location.
- Safety requirements of this equipment, any associated equipment and the local environment must be taken into consideration.
- The installation and use of this equipment must be in accordance with relevant national and local standards.

2 MECHANICAL INSTALLATION

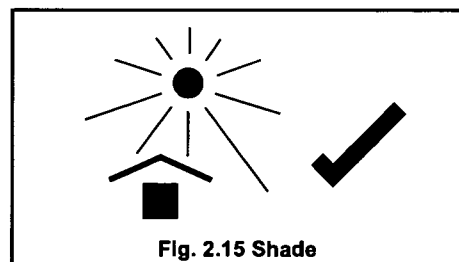
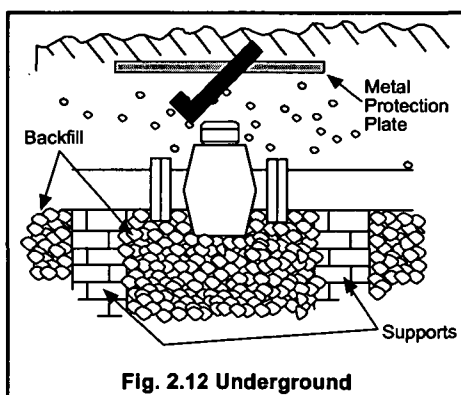
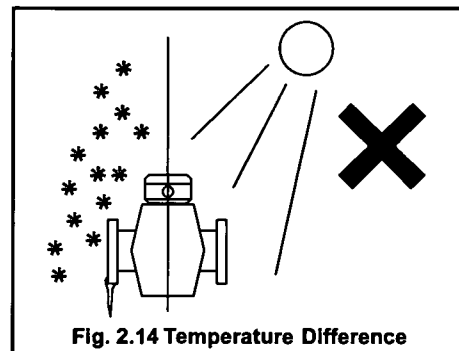
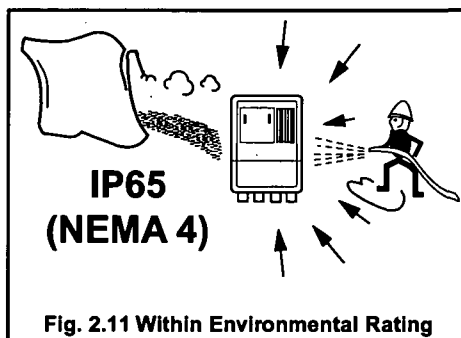
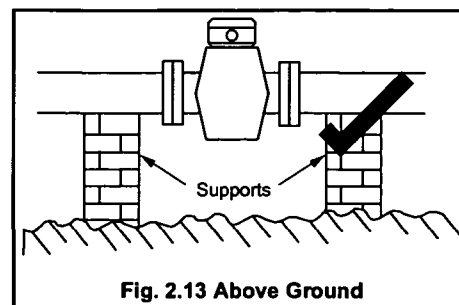
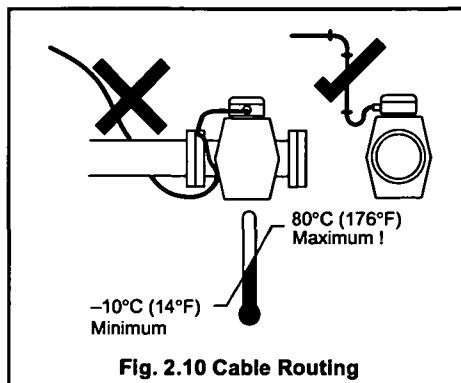
2.1 Unpacking



2.2 Installation Conditions



2 MECHANICAL INSTALLATION...



...2 MECHANICAL INSTALLATION

2.3 Mechanical Installation

2.3.1 Transmitters

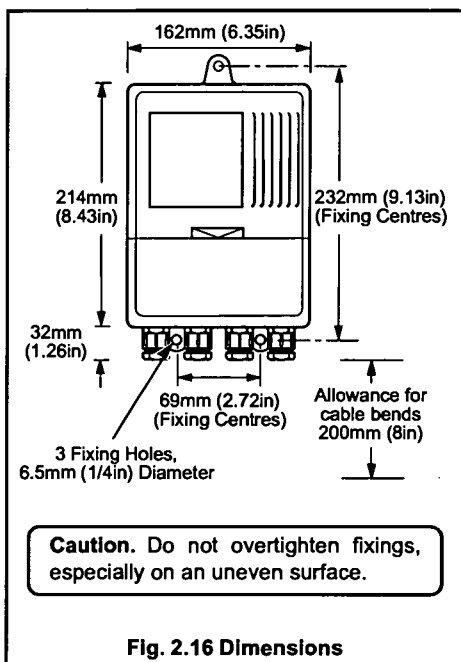


Fig. 2.16 Dimensions

2.3.2 Sensors

Caution

- Do **NOT** exceed the maximum working pressure marked on the equipment.
- Use stainless steel (austenitic) bolts, studs and nuts for flanged sensors below 200mm.

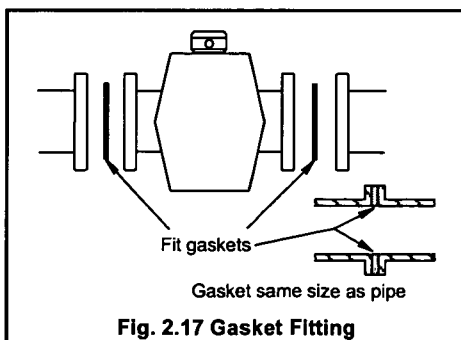


Fig. 2.17 Gasket Fitting

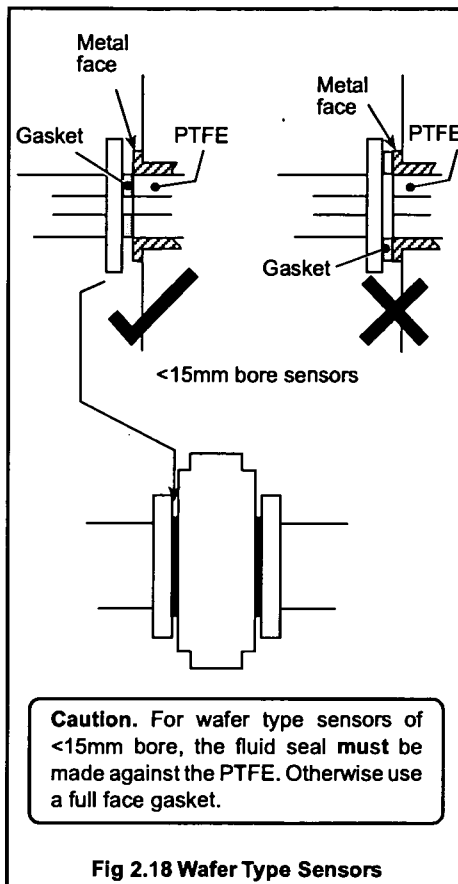
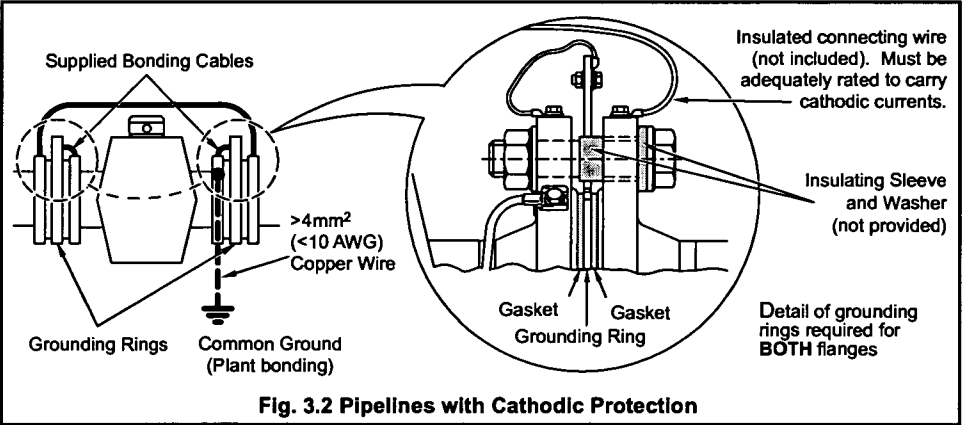
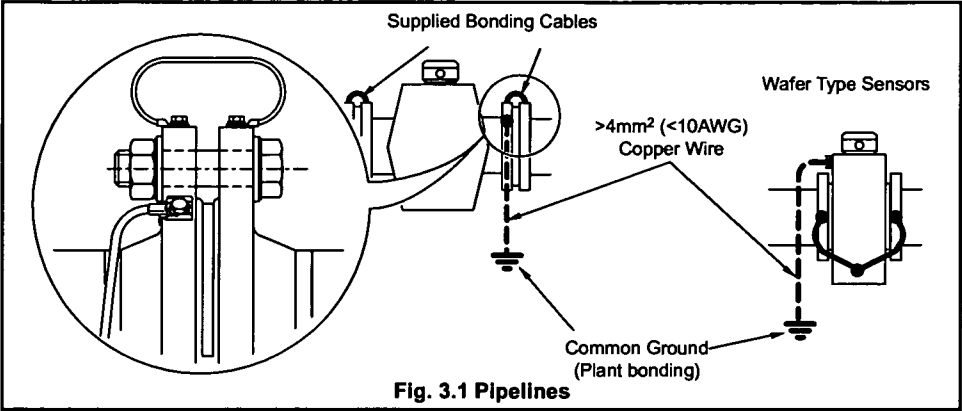


Fig 2.18 Wafer Type Sensors

3 ELECTRICAL INSTALLATION

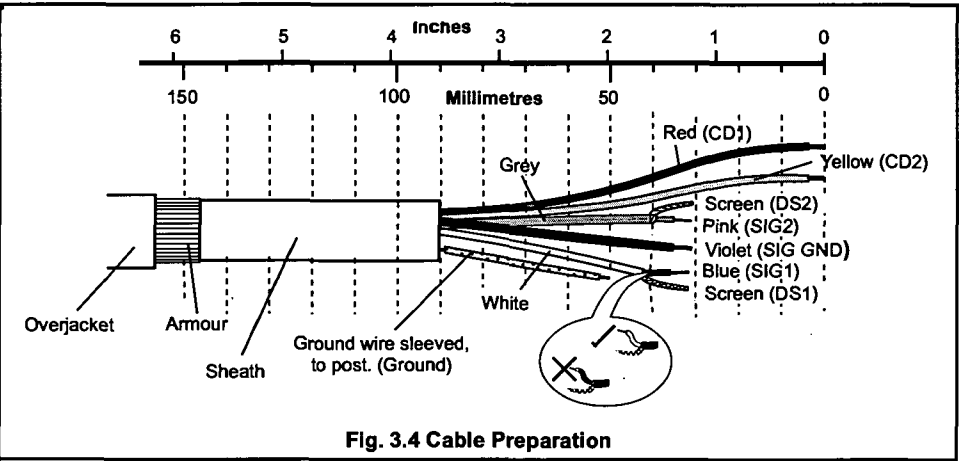
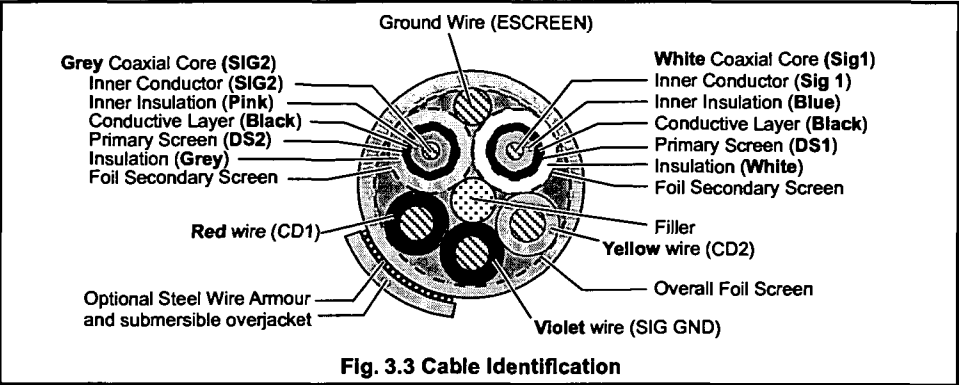
3.1 Grounding (Fig. 3.1, 3.2)



...3 ELECTRICAL INSTALLATION

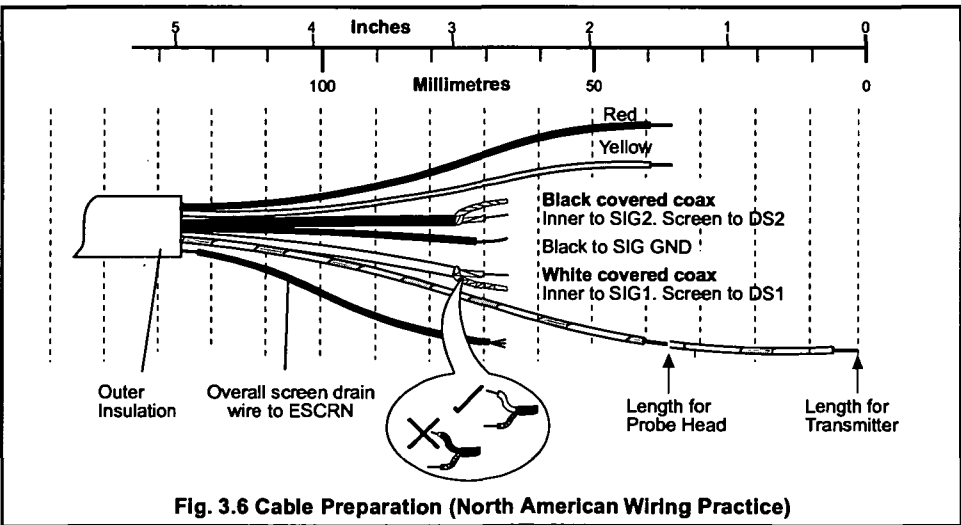
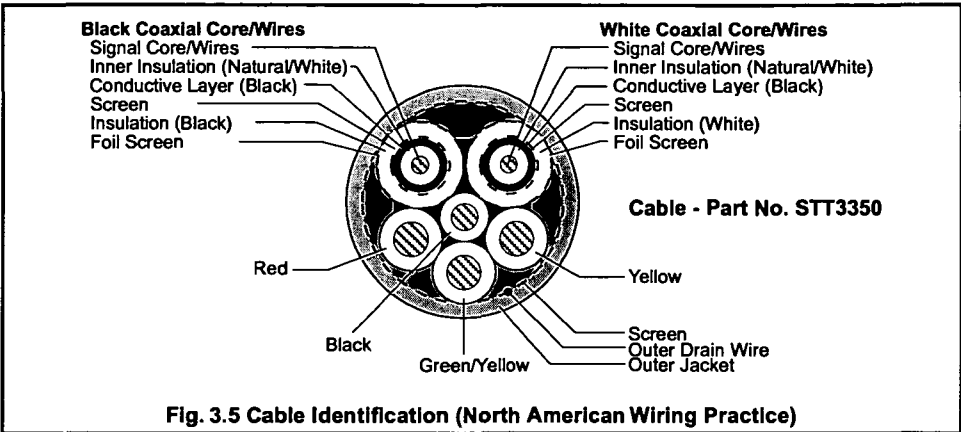
3.2 Cables

3.2.1 Cable (Remote Versions only)

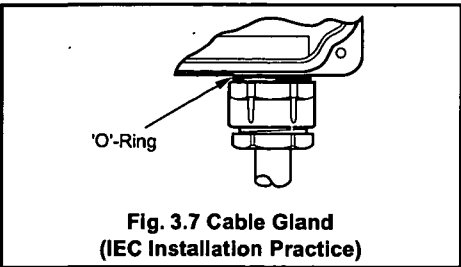


3 ELECTRICAL INSTALLATION...

3.2.2 Cable (Alternative Type – North American Wiring Practice)



3.2.3 Cable Glands (IEC Installation Practice)



Warning.

- Rigid conduit must not be fitted to the transmitter.
- Transmitter conduit adaptors must incorporate a face seal.

...3 ELECTRICAL INSTALLATION

3.2.4 Conduit Adapters and Cable Glands (North American – 0.5in)

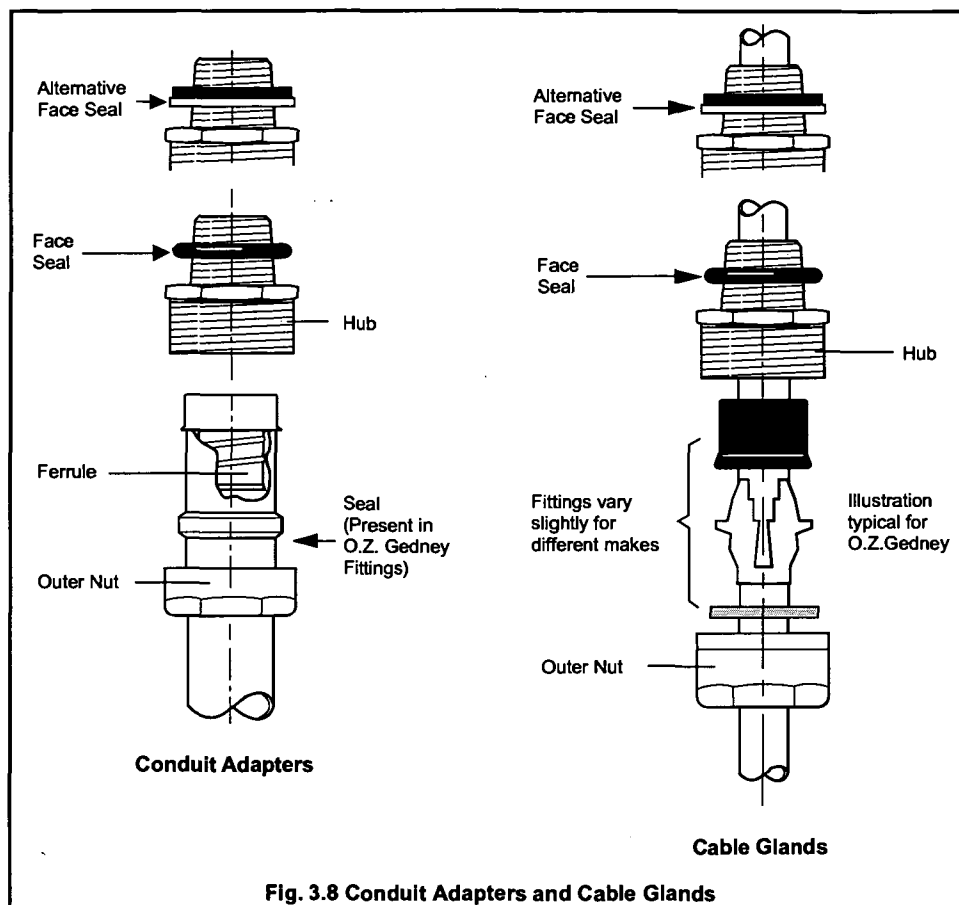


Fig. 3.8 Conduit Adapters and Cable Glands

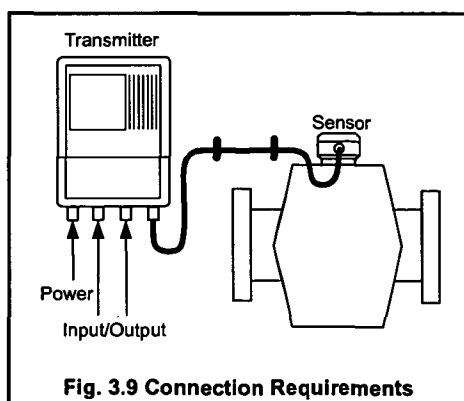


Fig. 3.9 Connection Requirements

3.3 Connection Requirements

The transmitter and sensor are supplied as a matched system. Check serial numbers to ensure they are matched.

3.3.1 Sensors

Remote sensors are usually supplied with an integral cable and potted connections. If the sensor has been supplied unpotted, connections must also be made to the sensor terminal box and then potted on completion with the supplied potting material – See Appendix A.

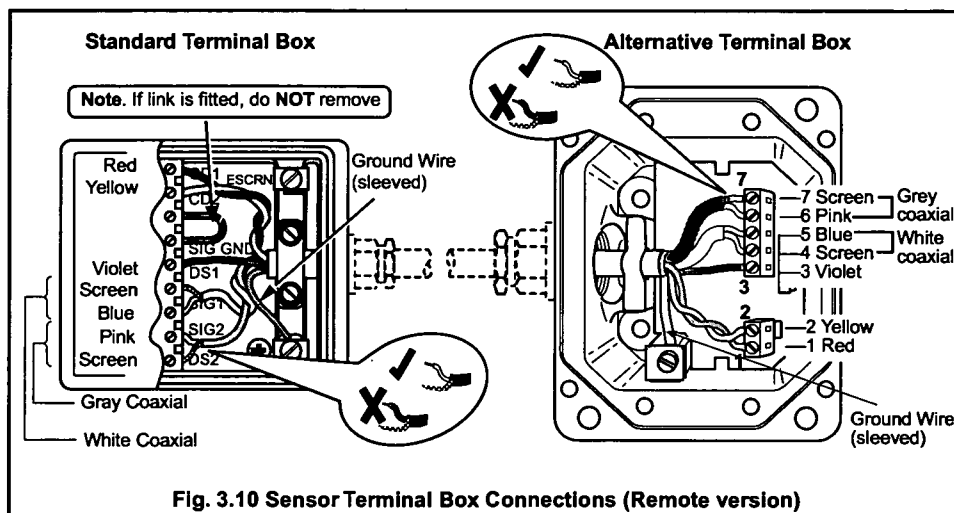
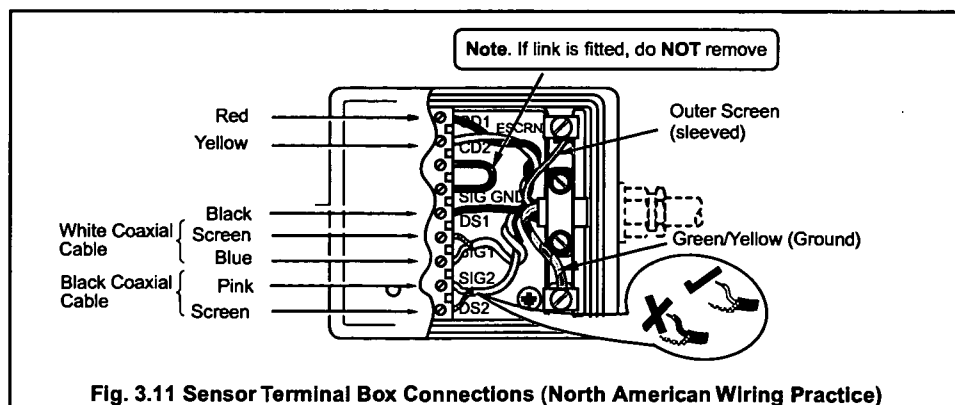
3 ELECTRICAL INSTALLATION...

Caution. (Remote versions)

- Remove any exposed black conductive layer from under coaxial screens.
- Make connections only as shown.
- Sleeve all bare wiring.
- Twist RED and YELLOW cores lightly together.
- Twist WHITE and GREY coaxial cables lightly together.
- Maintain Environmental Protection at all times.
- Conduit connections must provide cable entry sealing.

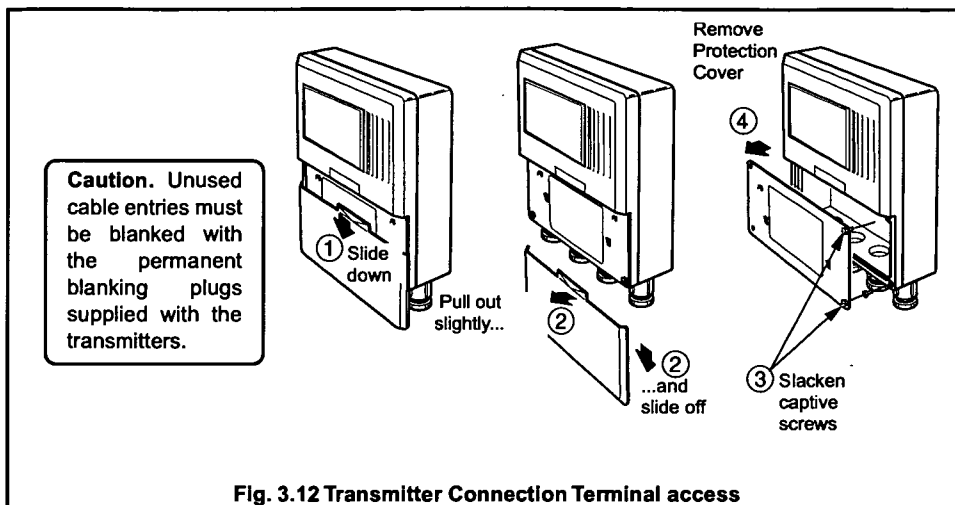
Information. (Remote versions)

- Refer to ENVIRONMENTAL PROTECTION (Appendix A).
- Internal appearance of Terminal Box may vary from that shown.


North American Wiring Practice


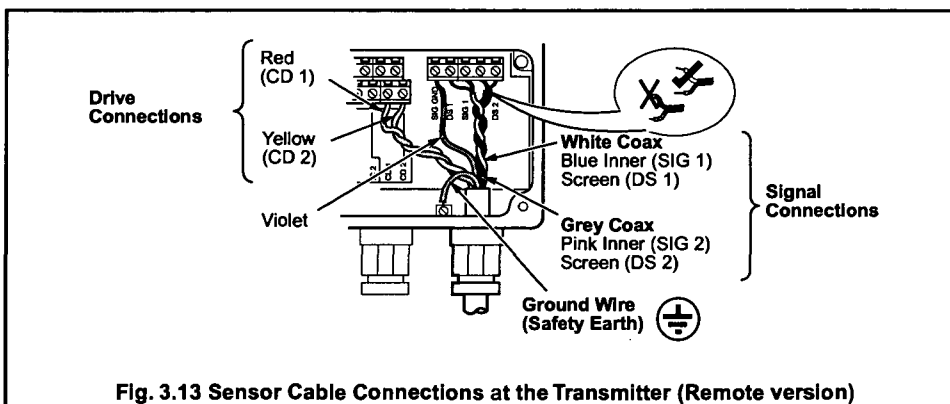
...3 ELECTRICAL INSTALLATION

3.3.2 Transmitters (All versions)



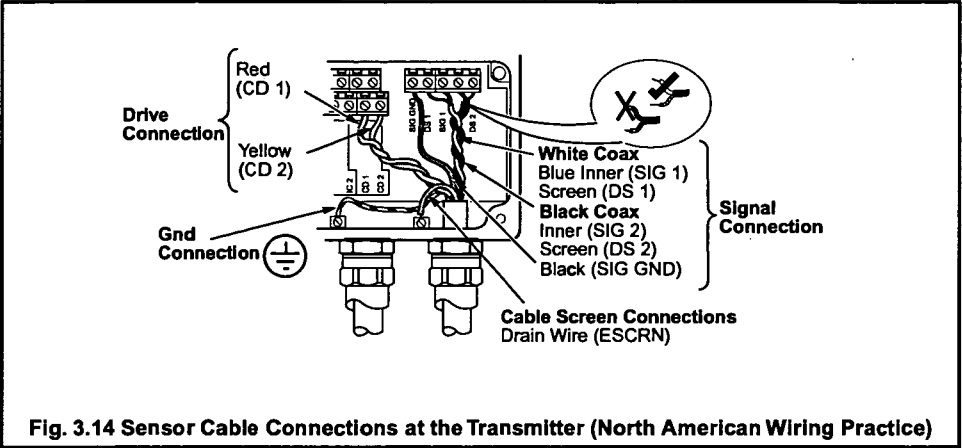
Caution.

- Remove any exposed black conductive layer from the inner insulation of both coaxial cables.
- Substitute sensor cable of any kind is not acceptable.
- Do not make connections except as shown.
- Twist cable pairs together as shown.
- Sleeve ALL bare wires.
- Sensor cable may only be joined using company supplied junction box - available separately.



3 ELECTRICAL INSTALLATION...

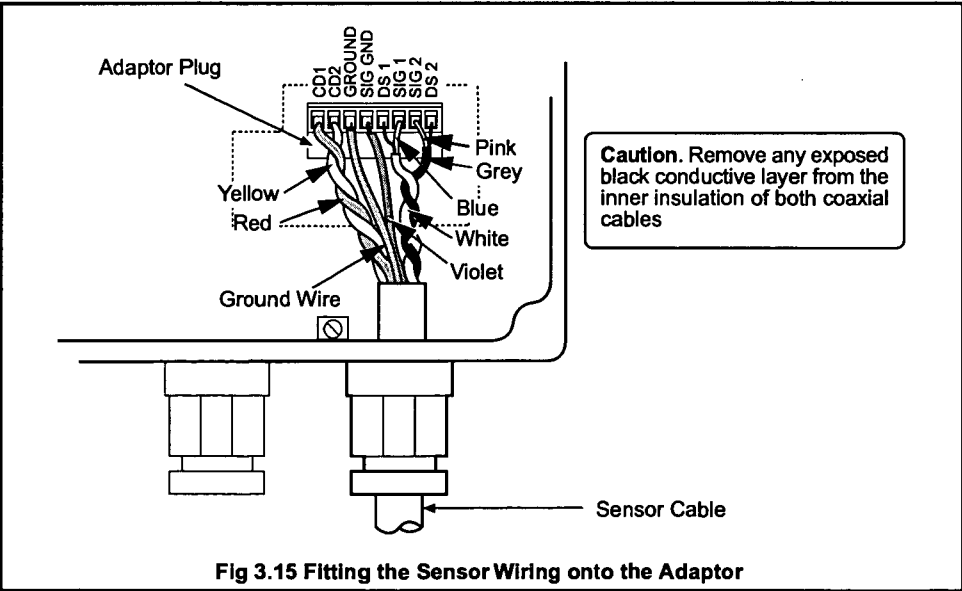
North American Wiring Practice



3.3.3 MagMaster-CalMaster Adapter

When a MagMaster Transmitter is fitted with an adaptor board for use with a CalMaster Verification Unit, wiring from the sensor to this adaptor board is shown in the following diagram.

To wire the adaptor plug, carefully pull off the plug from the adaptor board, connect the wires, using only a screwdriver with a 2.5mm blade to tighten the terminal screws, and replace the plug.



...3 ELECTRICAL INSTALLATION

3.4 Input/Output Connections

Caution.

- Refer to SPECIFICATION SHEET for Input/Output ratings.
- Inductive loads must be suppressed or clamped to limit voltage swings
- Capacitive loads must be inrush current limited.
- Hazardous area requirements are not considered in the following pages.

Note. The connection terminal markings in the metal housed transmitter are identical to those in the standard transmitter as shown in this section. However, the supply connection in the former is made using a non-reversible plug (provided).

3.4.1 Frequency Outputs – Fig. 3.16

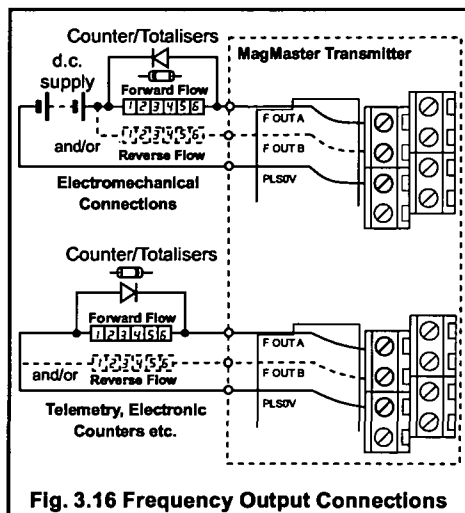


Fig. 3.16 Frequency Output Connections

3.4.2 PLC Interface – Fig. 3.17

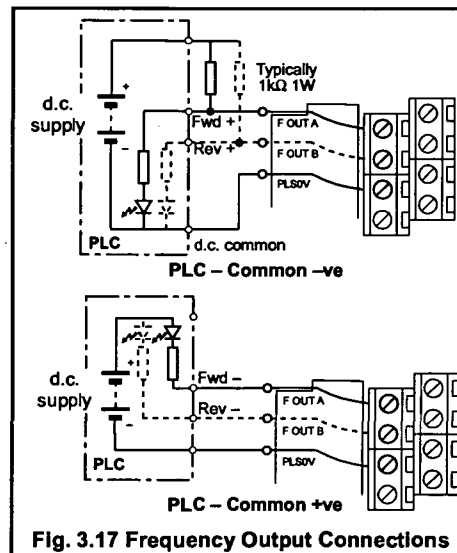


Fig. 3.17 Frequency Output Connections

3 ELECTRICAL INSTALLATION...

3.4.3 Alarm Outputs – Fig. 3.18

Information.

- Inductive loads may be suppressed by diodes (D) – 1N4004 or similar.
- Inrush currents are limited to 1 Amp by resistor R – e.g. 27Ω 1W for 24V systems.
- Operation of outputs is programmable – see Configuration Manual for details.
- Frequency and Alarm outputs share a common return with contact input.
- External isolators not normally required, as the pulse, alarm and contact circuits are electrically separated from all other Magmaster connections.

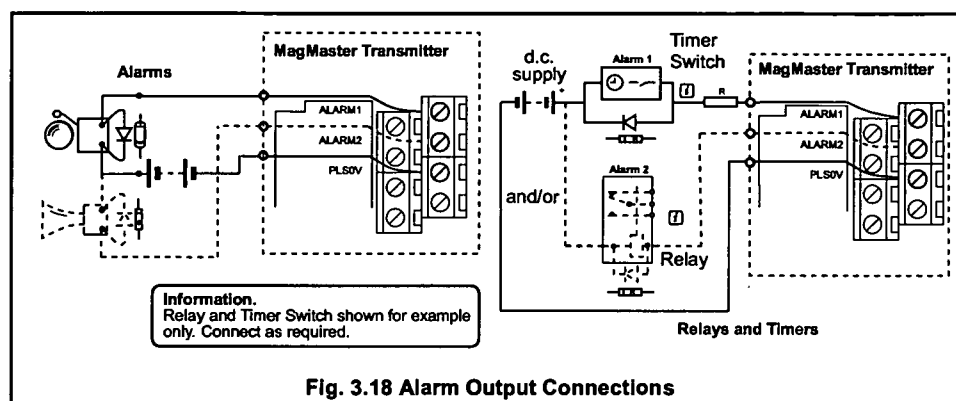


Fig. 3.18 Alarm Output Connections

3.4.4 Contact Input – Fig 3.19

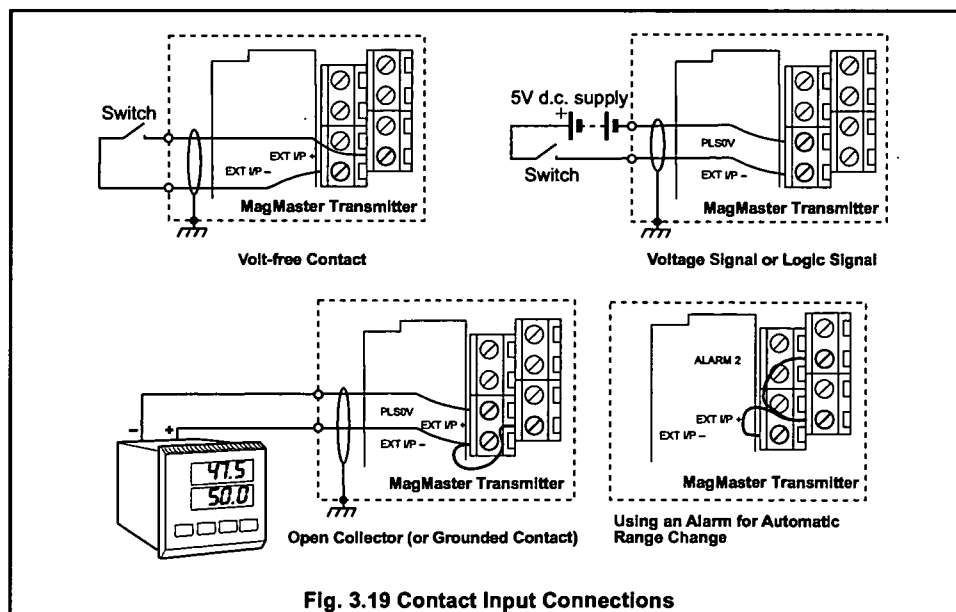


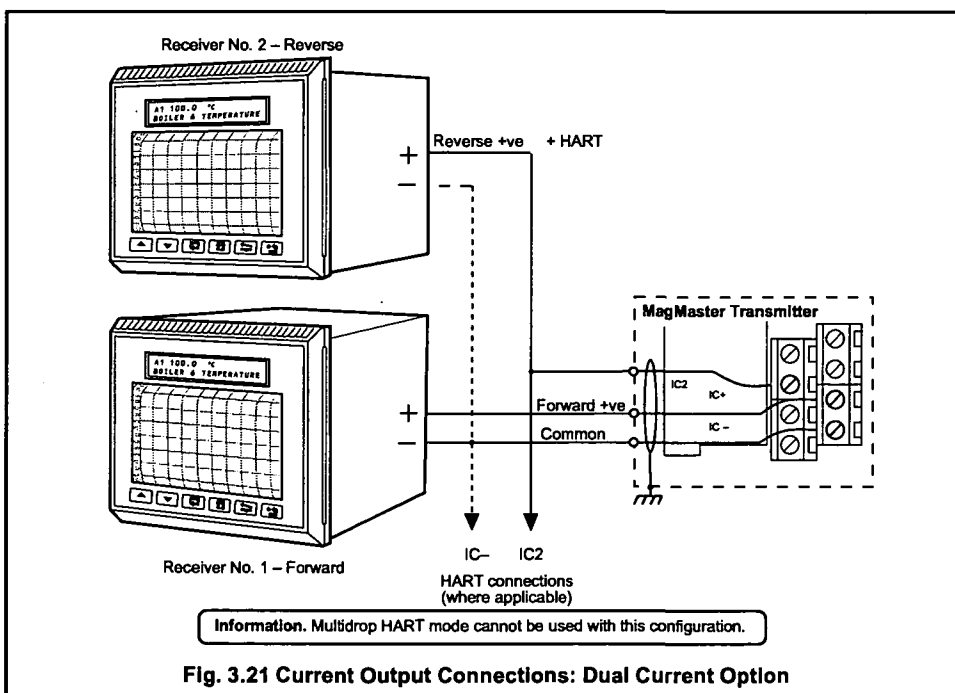
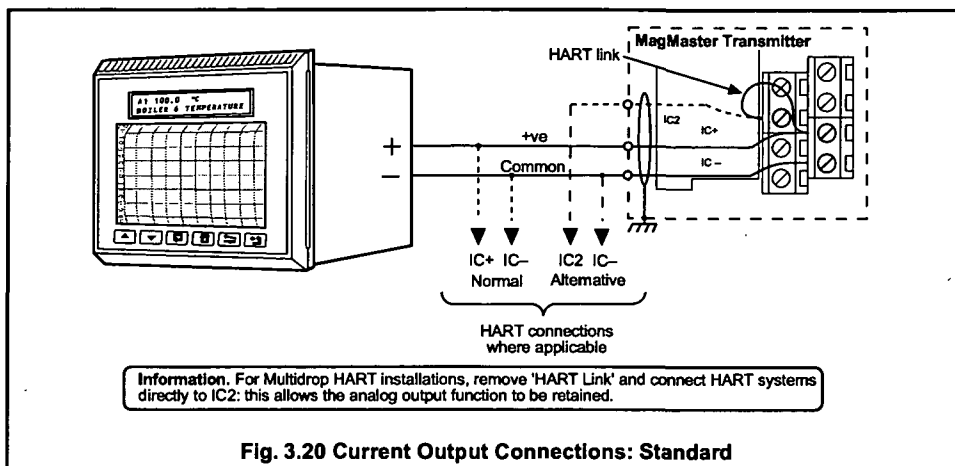
Fig. 3.19 Contact Input Connections

...3 ELECTRICAL INSTALLATION

3.4.5 Current Output – Fig. 3.20 and 3.21

Information.

- Output is fully programmable – see Programming Guide.
- Output is electrically separated from all other MagMaster connections.
- External isolators are not normally required and may significantly limit accuracy if used.



3 ELECTRICAL INSTALLATION...

3.4.6 Computer Connection – Fig. 3.22 and 3.23

Information. RS422/423 option is electrically isolated from all other MagMaster connections.

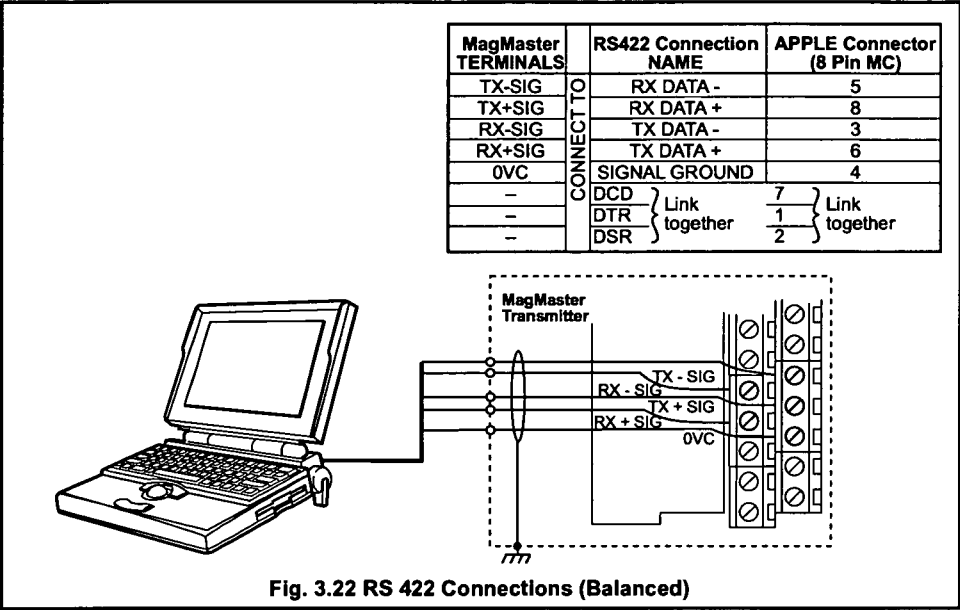


Fig. 3.22 RS 422 Connections (Balanced)

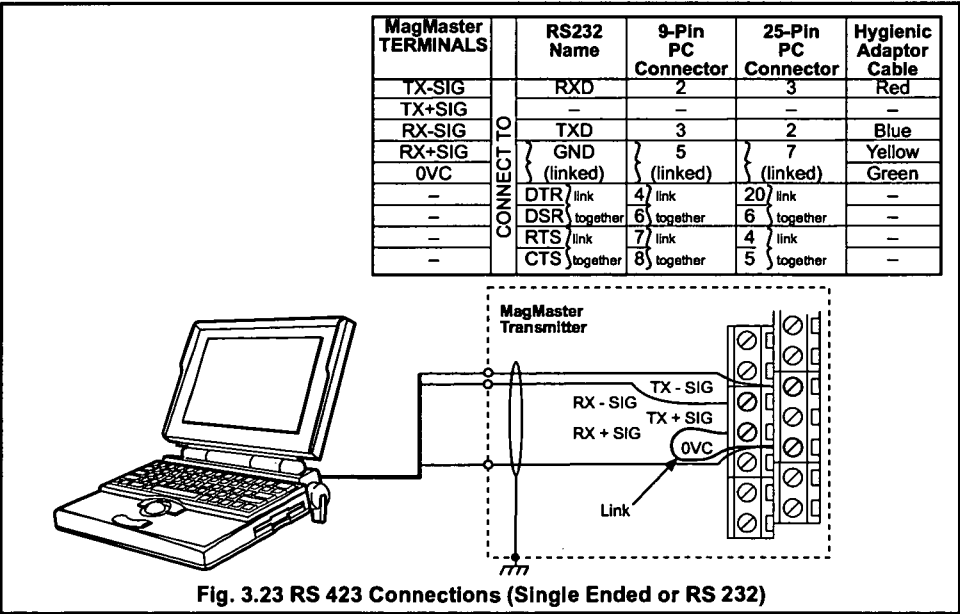


Fig. 3.23 RS 423 Connections (Single Ended or RS 232)

...3 ELECTRICAL INSTALLATION

3.4.7 Power Supply Connections – Fig. 3.24 and 3.25

Warning.

- DISCONNECT THE SUPPLY FROM ANY CABLES BEING TERMINATED ON THE TRANSMITTER.
- Electrical installation and earthing (grounding) must be in accordance with relevant national and local standards.
- Ensure that the cover of the metal housed transmitter is never cross threaded. The threads are greased (as supplied).
- Ensure that the grease is in good condition when fitting the cover, and replenish as required with a grease suitable for aluminium threads.

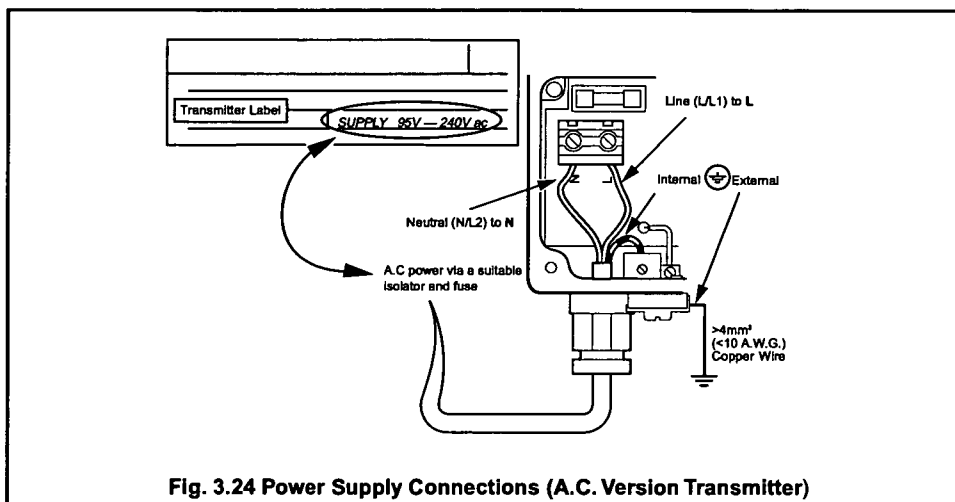


Fig. 3.24 Power Supply Connections (A.C. Version Transmitter)

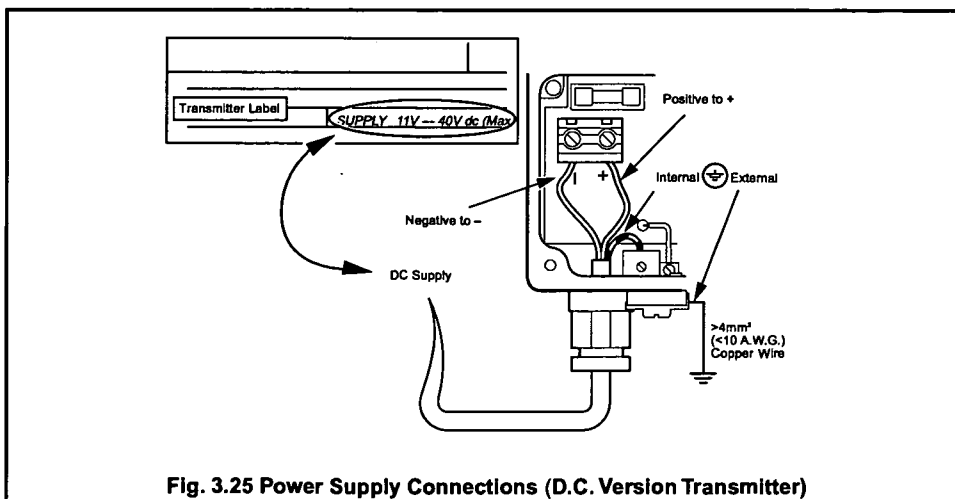



Fig. 3.25 Power Supply Connections (D.C. Version Transmitter)

4 STARTUP AND OPERATION

Warning.

- Ensure Plant Safety while configuring, at all times.
- The 9-way D-Type Serial Link is not isolated. Ensure that it is **NOT** connected to power earth (ground), with cathodically protected systems.


Application of the wand to the right hand icon, or pressing the keypad  button, resets the totaliser display, if this facility is enabled.

Information.

- For the use of local or remote serial communication, and configuration, see the Quick Reference Programming Guide or the main MagMaster manual.
- For all versions supporting HART™, see the main MagMaster manual.

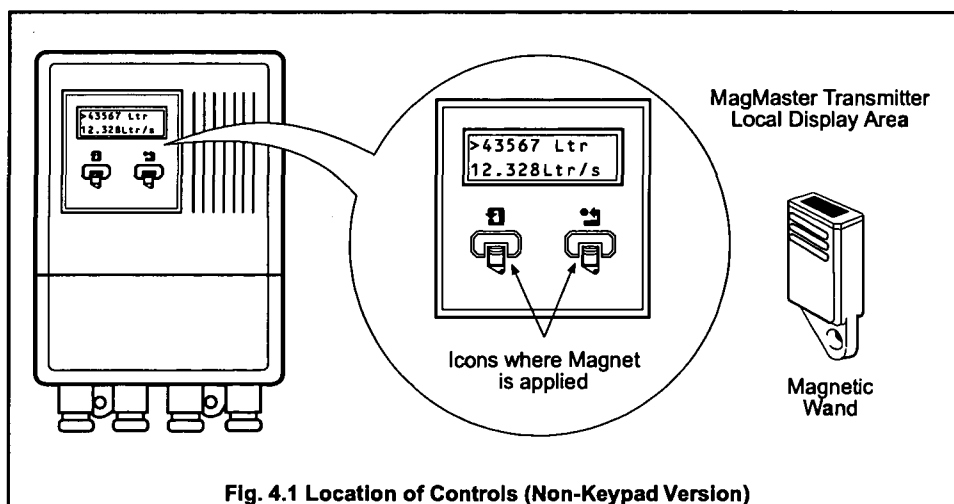
4.1 Startup

Switch on the power supply to the flowmeter, and if a transmitter with display has been ordered, the flow rate will be shown on the display as shown in Fig. 4.1 or 4.2.

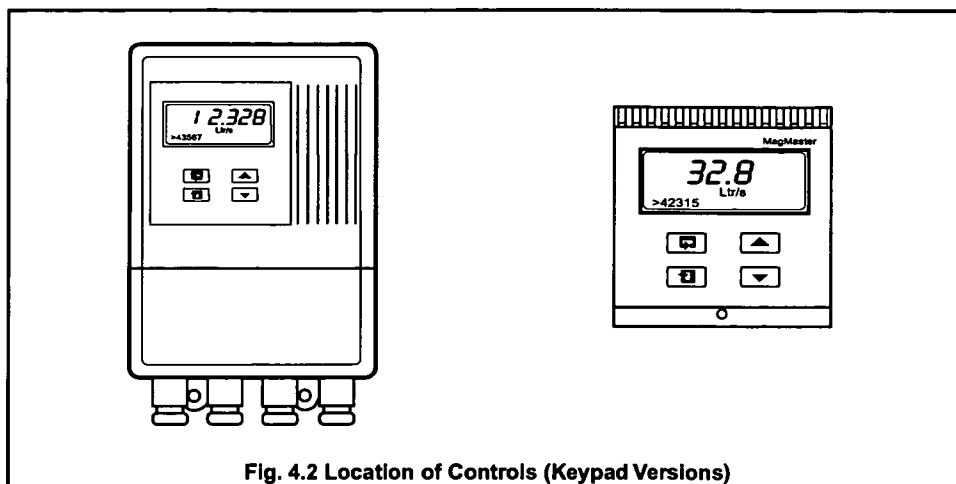
Sequential application of the provided magnetic wand to the left hand icon in the transmitter display area, or by pressing the  button on the keypad versions or the remote display, steps the display through the following sequence:

%	(Flow Rate % of Range)
>	(Forward flow total value)
<	(Reverse flow total value)
*	(Net flow total value)
Alm	(Active alarms)
Vel	(Flow Velocity in m/s or ft/s)

Any alarms are displayed sequentially if more than one alarm is present.



...4 STARTUP AND OPERATION

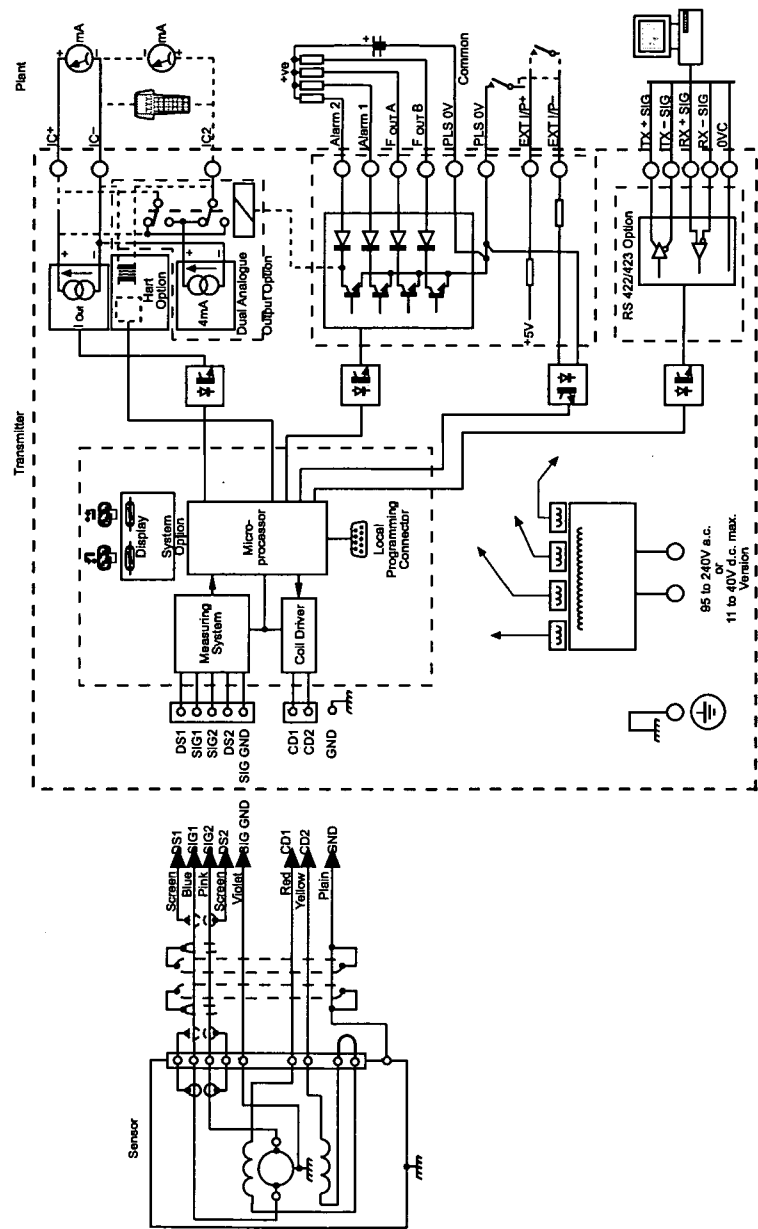


APPENDIX A – ENVIRONMENTAL PROTECTION

Warning.

- Potting materials are toxic – use suitable safety precautions.
- Read the manufacturers instructions carefully before preparing the potting material.
- The remote sensor terminal box connections must be potted immediately on completion to prevent the ingress of moisture.
- Check all connections before potting – see ELECTRICAL INSTALLATION.
- Do not overfill the terminal box or allow the potting material to come into contact with the 'O' ring or groove.
- Do not let potting material enter conduit, if used.

APPENDIX B – MAGMASTER BLOCK DIAGRAM



PRODUCTS & CUSTOMER SUPPORT

Products

Automation Systems

- *for the following Industries:*
 - Chemical & Pharmaceutical
 - Food & Beverage
 - Manufacturing
 - Metals and Minerals
 - Oil, Gas & Petrochemical
 - Pulp and Paper

Drives and Motors

- *AC and DC Drives, AC and DC Machines, AC motors to 1kV*
- *Drive systems*
- *Force Measurement*
- *Servo Drives*

Controllers & Recorders

- *Single and Multi-loop Controllers*
- *Circular Chart, Strip Chart and Paperless Recorders*
- *Paperless Recorders*
- *Process Indicators*

Flexible Automation

- *Industrial Robots and Robot Systems*

Flow Measurement

- *Electromagnetic Flowmeters*
- *Mass Flow Meters*
- *Turbine Flowmeters*
- *Flow Elements*

Marine Systems & Turbochargers

- *Electrical Systems*
- *Marine Equipment*
- *Offshore Retrofit and Refurbishment*

Process Analytics

- *Process Gas Analysis*
- *Systems Integration*

Transmitters

- *Pressure*
- *Temperature*
- *Level*
- *Interface Modules*

Valves, Actuators and Positioners

- *Control Valves*
- *Actuators*
- *Positioners*

Water, Gas & Industrial Analytics

Instrumentation

- *pH, conductivity, and dissolved oxygen transmitters and sensors*
- *ammonia, nitrate, phosphate, silica, sodium, chloride, fluoride, dissolved oxygen and hydrazine analyzers.*
- *Zirconia oxygen analyzers, katharometers, hydrogen purity and purge-gas monitors, thermal conductivity.*

Customer Support

We provide a comprehensive after sales service via a Worldwide Service Organization. Contact one of the following offices for details on your nearest Service and Repair Centre.

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ABB Limited
Tel: +44 (0)1453 826661
Fax: +44 (0)1453 829671

United States of America

ABB Inc
Tel: +1 215-674-6000
Fax: +1 215-674-7183

Client Warranty

Prior to installation, the equipment referred to in this manual must be stored in a clean, dry environment, in accordance with the Company's published specification.

Periodic checks must be made on the equipment's condition. In the event of a failure under warranty, the following documentation must be provided as substantiation:

1. A listing evidencing process operation and alarm logs at time of failure.
2. Copies of all storage, installation, operating and maintenance records relating to the alleged faulty unit.

ABB has Sales & Customer Support expertise
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The Company's policy is one of continuous product improvement
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IM/MM-SF Issue 5

INTRODUCTION

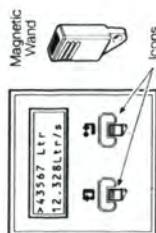
The Magmaster™ provides high-precision electromagnetic flow metering for conductive fluids of >5µS/cm, in sizes of 2.5 to 2200mm (0.1 to 86 in.). It has state-of-the-art accuracy, repeatability and rangeability.

The MagMaster offers a choice of liners and electrodes, flange or water tubes, integral or remote electronics and an optional keypad display.

Standard outputs include fully-programmable analog output (0 to 21mA), dual pulse (forward and reverse), dual alarm (flow rate, fault conditions, etc) and a RS232 connection. Optional outputs include dual analog and RS422/423.

The MagMaster has been designed to eliminate traditional noisy signals in slurry applications. It has multiple self-monitoring and diagnostic functions, and a comprehensive test mode to test the system without interrupting the process or power.

SIMPLE READ AND RESET



- Top line of display indicates flow totals, velocity, % of range and alarm status. Second line shows flow rate.
- Applying wand to the left icon steps the top line display through this sequence:
 - > Forward flow total
 - < Reverse flow total
 - Net flow total

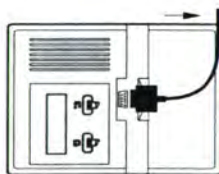
- Alm Alarms in sequence ('Alm Cr' when no alarms are activated)
- Vel Flow velocity
- % Flow rate as % of full scale range

- Applying wand to right icon resets the flow total displayed on the top line if parameter 73 (Tot Ctr En) is enabled

- For keypad/display version, see separate Quick Reference Guide.

CONFIGURATION

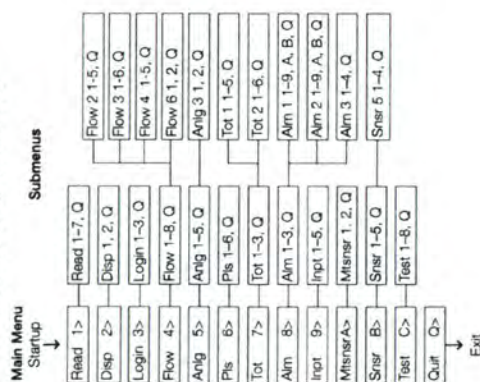
- Set up serial communications* on terminal or PC
- For PC use a laplink/hull modem cable. A cable is available from ABB.
- Connect terminal cable to transmitter's D-connector as shown
- Press RETURN or equivalent (ENTER, EXE, etc).



*Serial communications setup

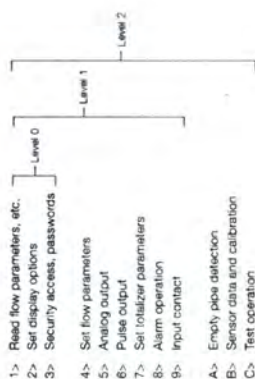
Baud rate	4800
Data bits	8
Stop bits	1
Parity	None
Handshake	None

RELATIONSHIP OF MENUS



SECURITY ACCESS

Any of three security levels can be selected. In Levels 0 and 1, the operator is restricted to certain menus as listed below. In Level 2, the operator has full access to all menus and can change passwords.



IM/MN/OPG2 Issue 5

The Company's policy is one of continuous product improvement and the right is reserved to modify the information contained herein without notice.

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MagMaster™
Electromagnetic Flowmeters



Quick Reference Programming Guide

FUNCTIONS OF KEYS

RETURNS (or ENTER, EXE, etc.)

- Scrolls through main menu or submenu

Read 1> + → Disp 2>

Flow Ring 1> + → Flow Unit 2>

• Enters default or confirms existing value.

LogIn En 1> + → LogIn En 1>

ALPHANUMERIC plus RETURN

- Selects menu (or submenu) item and advances to its first submenu

Read 1> + 5 → Ang Fsd 1>

Ang Fsd 1> + 3 → Ang Dir Fwd 1>

• Keystrokes can be combined as a shortcut

Read 1> 5 3 → Ang Dir Fwd 1>

• Selects submenu and displays current value

A "7" indicates current value is configurable

Ang Fsd 1> + 1 → Ang Fsd 1>

• Enters selected value at '7' prompt

Ang Fsd 1> + 9 → Ang Fsd 1>

• Note. In some submenus, 1 = select, 0 = deselect

QUIT plus RETURN

- In main menu, exits system (Security access reverts to Level 0)

Read 1> + Q → Bye

• In submenu, returns to top of main menu, or parent submenu

Flow Ring 1> + Q → Read 1>

Flow Unit Ltr 1> + Q → Flow Ring 1>

ESCAPE

- In any menu or submenu, returns to top of main menu

Flow Unit Ltr 1> + ESC →

CONFIGURATION PROCEDURE

Main Menu	Submenu	Description
ABB	Process & MacMaster	Indicates mode variant software version, date & or 'Surry'
V 1.10.17.05.93		
READ		
Read 1>	Flow Rate 1>	Flow rate in selected units
	Read 2>	Flow rate in % of range
	Read Fwd 3>	Total in forward totalizer ‡
	Read Rev 4>	Total in reverse totalizer ‡
	Read Net 5>	Net total (fwd minus rev)
	Read Alm 6>	Current active alarms
	Read Ver 7>	True flow velocity in m/sec, or ft/sec
		if flow units are in Ltr or ft³/s
		‡ Resettable to 0 if Tot ChEn is set

DISPLAY OPTIONS

Disp 2>	Disp Mode 1>	0 = Single line display 1 = Double line display 2 = New line for each update (for printers, etc.)
	Disp Res 2>	Resolution of flow display Enter number of decimal places required (max. = 6)

PASSWORDS

LogIn 3>	LogIn En 1>	Current Security level 0 = default For default passwords Enter 'user' For Level 1, engineer for Level 2 Note: enter these passwords in ALL lower case
	LogIn Key 2>	Changes Level 1 password
	LogIn Key 3>	Changes Level 2 password

FLOW MEASUREMENT

Flow 4>	Ang Fsd 1>	Enter 100% primary range in selected units
	Flow Unit 2>	Enter 1: ONE place only
	Ltr 1>	Litres
	m³ 2>	Cubic meters
	IGal 3>	Imperial gal
	USgal 4>	US gallons
	ft³ 5>	Cubic feet

Main Menu	Submenu	Description
PULSE OUTPUT*		
Pls 6>	# Pls Fct 1>	Enter output pulses per flow volume unit
	Pls Cutoff 2>	Flow rate in % of primary range, below which pulse output and totalizer stop
	Pls Max 3>	Maximum output freq. in Hz
	Pls Hz 4>	Frequency in Hz
	-- Pls Off 5>	Pulse output in idle (off)
	-- Pls Size 6>	Enter pulse width in msec (will round up to nearest 10msec) 0 = square wave

TOTALIZER*

Tot 7>	Tot Unit 1>	See Flow Unit 2> for parameters
	Tot Mult 2>	See Flow Mult 3> for parameters
	Tot ChEn 3>	Enables totalizer reset function from terminal, transmitter display or about contact

ALARMS*

Alm 8>	Alm No1 1>	Any combination of alarms 1 = Select 0 = Deselect
	Idle 1>	Idle state
	En 2>	0 = Disabled 1 = Enabled
	Fault 3>	Measurement fault
	Fwd 4>	Forward flow
	Rev 5>	Reverse flow
	Cutoff 6>	Pulse output cutoff
	Minsr 7>	Empty sensor
	Hi 8>	High flow
	Lo 9>	Low flow
	Ang 10>	Analog output overrange
	Pls 11>	Pulse output overrange
	Alm No2 2>	Same parameters as No. 1
		Factory default - Rev flow enabled, required for dual current option
	Alm Trip 3>	Hi 1> High flow trip-point, % range Lo 2> Low flow trip-point, % range Hyst 3> Hysteresis Dep 4> Enables display of Hi and Lo Alarms

SYSTEM TEST**

Test C>	Test Mode 1>	# 1: Transmitter is in test mode. Self-cancels after 30min, if no entry made
	# Test Flow 2>	Present flow rate. In test mode, any value may be entered manually
	Test % 3>	Flow rate in %
	Test Hz 4>	Output frequency in Hz
	Test mA 5>	Output current in mA
	Test Vel 6>	Flow velocity in sensor ‡
	Test Alm 7>	Current active alarm ‡
	Test Trv 8>	Flow velocity, uncorrected for sensor calibration
		‡ Calculated from Test Flow 2
		**Requires Level 2 access
		# The maximum no. must not exceed 21000. The value entered may display with a small error, e.g. 1,900 may display as 1,899. 1,900 is used in calculation.

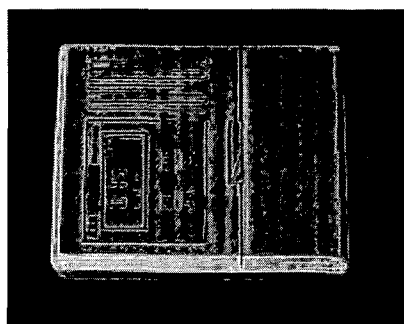
Main Menu	Submenu	Description
INPUT CONTACT*		
Input 9>	Input Analog 1>	Enter '1' to select. Active level selects second analog range
	Input Ch 2>	Active level reads all totalizers
	Input Hld 3>	Active level holds transmitter flow value
	Input Zero 4>	Active level selects overscale drive
	** Input Idle 5>	Enter inactive state of input contact 1 = Hi normal, 0 = Lo normal

EMPTY PIPE DETECTION**

Minsr A>	Minsr Trip 1>	Enter empty pipe detector (i.e. threshold) Note: Set to zero for a 'surry' MagMaster
	Minsr mv 2>	Measured indication used for empty pipe trip. When valve below trip threshold then all outputs driven to zero

SENSOR DATA AND CALIBRATION**

Snsr B>	Snsr No 1>	Serial number of sensor
	Snsr Tag 2>	Tag number of sensor
	Snsr Size 3>	Calibrated bore (mm)
	Snsr Vel 4>	Present velocity in sensor
	Snsr Fct 5>	1> 2> 3> 4> = calibration data. Same as on sensor data label



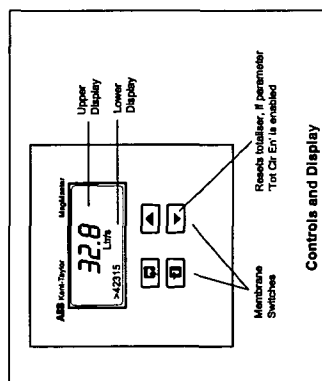
**MagMaster™
Electromagnetic
Flowmeters**

M/MM-QRG Issue 2 07.04



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CONTROLS AND DISPLAY



Upper display gives continual update of flow rate in selected units.

By pressing the **key**, the lower display steps through the following sequence:

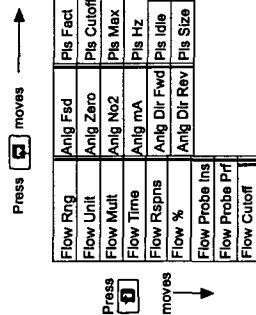
- | | | |
|-------|---------------------------|--|
| > | Forward flow total value. | |
| < | Reverse flow total value | |
| * | Net flow total value | |
| Alarm | Active alarms | - Any alarms are displayed sequentially if more than one alarm is present. |
| | | "Alm Ctr" is displayed when no alarms are present. |

Vel %	Flow Velocity % of Flow Range.
100	100
90	90
80	80
70	70
60	60
50	50
40	40
30	30
20	20
10	10
0	0

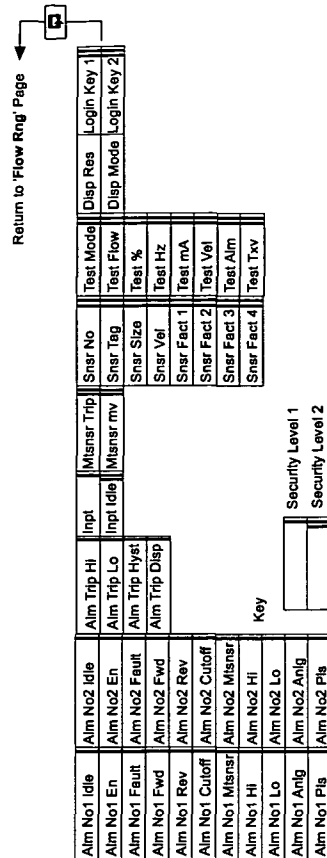
Pressing the key resets the flow total displayed on the upper display, if parameter 'Tot Clr En' is enabled.

Pressing the **key** accesses the **Login Parameter** where it is necessary to enter a security code before any other parameters can be accessed – see **SECURITY ACCESS**.

MENU LAYOUT

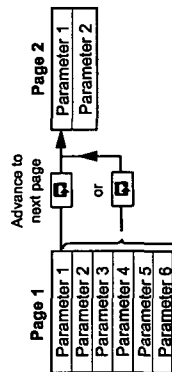


...MENU LAYOUT

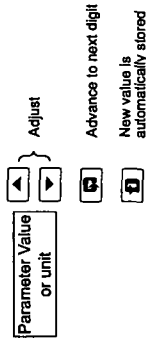


CONTROLS AND DISPLAY

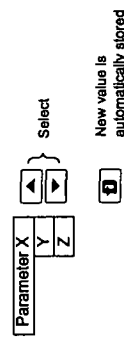
A – Advancing to Next Page



C – Adjusting and Storing a Parameter Value



D – Selecting and Storing a Parameter Choice



Depressing this switch for 5 seconds and then releasing it will exit the menu system and return to normal operating mode.

SECURITY ACCESS


Two security code levels, 1 and 2, are available, and are each accessed with a five digit number.

User Code Level 1 default number is 10760.

Engineer Code Level 2 default number is 56360.

Parameters accessible by the two levels are shown above.

At the flashing cursor on the first digit of the Login code number, press either or membrane switches to reach the required digit.

To set this digit and pass to the next digit, depress the switch. Continue until all digits have been set, depress the  switch to enter the complete code.

If an incorrect value is entered, access to subsequent programming pages is prevented and the display reverts to the **Operating Page**.

PARAMETER CHANGES

When a parameter is selected, which holds one or more variable units e.g. 'Flow Unit' parameter, which can be Liters, Cubic meters, Gallons etc, proceed as follows to change the units: ('Flow Ring' selected).

Flow Ring	3.00000
Flow Unit	m ³ /hr

'Flow Unit' selected

Press \square or \square switch to change the units.

Note. The existing units will flash at the first depression of the \square or \square switch, and further switch depressions will change the type of units displayed.

Depressing the \square switch will now enter the newly selected units.
This type of action is similar for all variable units. Where numerical values are to be changed, initial depression of the \square or \square switches cause the first of five digits to be highlighted by a flashing cursor. Change the value with the \square and \square switches, the particular digit with the \square switch, and enter the final selection with the \square switch.

PROGRAMMING

The correct security level **MUST** be selected - see SECURITY ACCESS.

Select the parameter to read the value, or to change it as necessary. All 'live' data displayed is updated each second.

Use the \square key to move between pages.

Use the \square key to move between parameters.

The \square and \square keys change displayed values and units.

The \square key will accept the chosen value or unit.

OUTPUT PULSE

PARAMETER	DESCRIPTION
Pis Fact	Enter required output pulses per flow volume unit. #
Pis Cutoff	Flow rate (%) below which pulse output and totaliser cease to operate. Maximum output frequency in Hz (five value).
Pis Max	Display of present output frequency in Hz (five value).
Pis Hz	Idle state for Pulse Output with no output pulse (e.g. at zero flow).
Pis Idle	0 = Low (output transistor ON) 1 = High (output transistor OFF) Enter output pulse width in msecs. (Value will be rounded up to nearest 10ms). Set to '0' for square wave output.
Pis Size	

TOTALIZER

PARAMETER	DESCRIPTION
Tot Unit	Select totaliser measurement units.
Tot Mult	Select multiplier units required.
Tot CirEn	Enter '1' to enable totaliser reset function to be used from front panel. (Value will be rounded up to nearest 10ms). Set to '0' for square wave output.

ALARMS

PARAMETER	DESCRIPTION
Alarm Not1 Idle	Idle state for alarm output. With no alarm active: 0 = Low (OP transistor ON) 1 = High (OP transistor OFF) 0 = Alarm output disabled (set to idle state)
Alarm Not1 En	1 = Alarm output enabled. Alarm occurs for System fault. Alarm occurs for forward flow. Alarm occurs for reverse flow. Alarm occurs for Pulse Output Cutoff.
Alarm Not1 Fault	Alarm occurs for empty sensor.
Alarm Not1 Rev	Alarm occurs for Flow \geq 'Alarm Trip Hi'.
Alarm Not1 Cutoff	Alarm occurs for Flow \leq 'Alarm Trip Lo'.
Alarm Not1 Manar	Alarm occurs for Analogue Output over range.
Alarm Not1 HI	Alarm occurs for Pulse Output over range.
Alarm Not1 Lo	Alarm occurs for Pulse Output over range.
Alarm Not1 Anlg	Alarm occurs for Pulse Output over range.
Alarm Not1 Pis	Alarm occurs for Pulse Output over range.

ALARMS (CONTD.)

PARAMETER	DESCRIPTION
Alarm No2 Idle	Identical to, but independent of Alarm No1 above.
Alarm No2 Pis	Alarm occurs for Pulse Output over range.
Alarm Trip Hi	High flow alarm trip point as % of range.
Alarm Trip Lo	Low flow alarm trip point as % of range.
Alarm Trip Hyst	Enter hysteresis for alarms as % of range.
Alarm Trip Disp	Set to '1' if Hi/Lo Alarms are to be displayed.

INPUT CONTACT

PARAMETER	DESCRIPTION
Inpt	Set up external logic input function: 'Zero' sets flowrate output to zero. 'Hi' holds flowmeter output value. 'Cir' resets all totalizers. 'Anlg' selects Anlg No2 Range. Enter inactive state of input contact: '1' for HI normal. '0' for LO normal.

EMPTY PIPE DETECTION

PARAMETER	DESCRIPTION
Manar Trip	Set empty pipe detector trip threshold.
Manar mV	Measured value related to fluid conductivity.

SENSOR CALIBRATION

PARAMETER	DESCRIPTION
Snr No	Serial No. (Up to 13 characters)
Snr Tag	Tag No. (if required).
Snr Size	Sensor calibrated bore (mm).
Snr Vel	Display of present velocity.
Snr Fact 1	Sensor calibration data - should agree with sensor data label
Snr Fact 2	
Snr Fact 3	
Snr Fact 4	

TEST MODE

PARAMETER	DESCRIPTION
Test Mode	Set to '1' to enable. Displays present flowrate. If in 'Test Mode', any value may be entered manually. #
Test %	Flowrate as a percentage
Test Hz	Output Frequency
Test mA	Output Current
Test Vel	Flow Velocity in sensor
Test Alm	Shows present active alarms sequentially. 'Cir' indicates no alarms are active. #
Test Txv	Live flow velocity (uncorrected for sensor calibration).

DISPLAY RESOLUTION

PARAMETER	DESCRIPTION
Disp Res	Enter number of decimal places required on flow display (0 to 5).
Disp Mode	Serial Communication display mode (Read Only) - attempts to edit this parameter result in display of 'Keypad Version No.' with eventual return to normal operation.

SECURITY PASSWORD

Caution. Access is NOT possible without the correct password. 'Lost passwords can ONLY be reset by the Service Engineer.

Login Key 1	Set Level 1 security password.
Login Key 2	Set Level 2 security password.

The maximum which can be entered must not exceed 21000. The value entered may be displayed with a small error in the decimal digits e.g. 1.900 may be displayed as 1.899. This is a display characteristic and the value 1.900 will be used by the MagMaster.

\$ Select both parameters for bidirectional operation (e.g. when dual current output is fitted). If both are zero, then bar is always 0%.

‡ On performing a Rapid Reset/Escape to return to 'Operation' level, 'Test Mode' is automatically cancelled.

Ø If the sensor is empty or disconnected, the alarms 'MISnr' and 'Cof' will be displayed as appropriate.

CERTIFICATE OF CALIBRATION

0061 Issue 2

World Technology Centres

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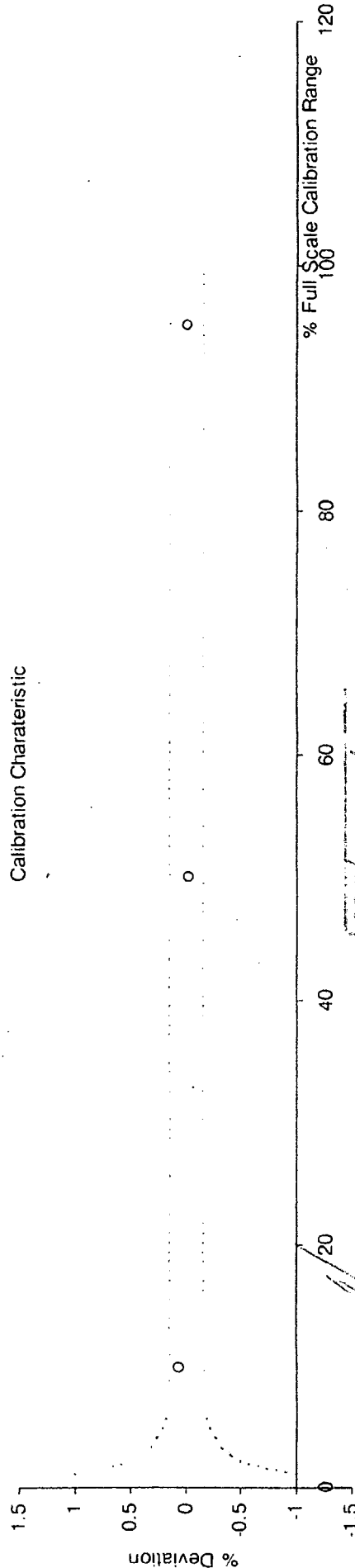
Customer name: ABB AUSTRALIA PTY LTD
Customer ref.: 5178114
Serial number: P/53295/2/2
Order reference: EXP/P/53295/EJW
Meter type: MagMaster
Tag Number: 317-300-FTR

Meter code: MF/F30124110A005ER1301111
Calibration output: Digital
Customer full scale: 200.000 l/s
Calibration range: 500.00 l/s
Meter bore: 300 mm

Certificate number: 05/69622
Date of calibration: 01 Mar 2005
Test plant: Rig 9 9000m³/h
Sensor factor 1: 1.3905
Sensor factor 2/3/4: -8 / 5 / 1.0000
Transmitter No: vkh020218

Reference

Test Run number	Run Time sec	Water Temp °C		Stream 1 l/s	Stream 2 l/s	Stream 3 l/s	Stream 4 l/s	Stream 5 l/s	Total Flow l/s	Flowrate l/s	% Cal. range	% Error
		Int	Ext									
1	300	18.5	18.5	0	0	356.693	119.679	0	476.372	476.357	95.3	0
2	301	18.5	18.5	0	0	189.273	61.183	0	250.456	250.392	50.1	-0.03
3	301	18.5	18.5	0	0	0	49.402	0	49.402	49.435	9.9	0.07

Calibration Characteristic

Calibrator: ABB 402

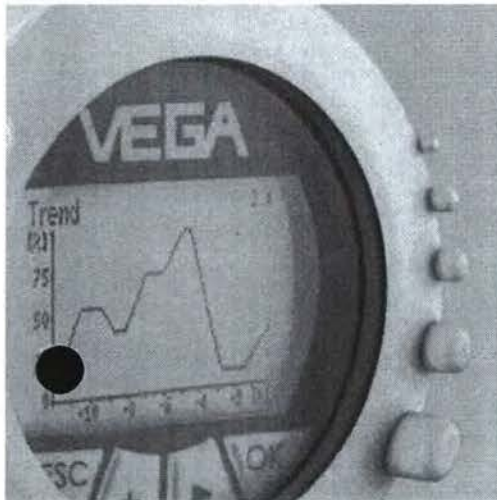
Approved by

Witnessed by

Page 1 of 1

Process pressure/Hydrostatic

VEGABAR 61
VEGABAR 63
VEGABAR 64
VEGABAR 65



Product Information

VEGA

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Take note of safety instructions for Ex applications

Please note the Ex specific safety information which you can find on our homepage www.vega.com/services/downloads and which comes with every instrument. In hazardous areas you should take note of the appropriate regulations, conformity and type approval certificates of the sensors and power supply units. The sensors must only be operated on intrinsically safe circuits. The permissible electrical values are stated in the certificate.

29235-EN-061205

1 Application, function, configuration

Area of application

VEGABAR series 60 sensors are pressure transmitters with a deviation in characteristics of 0.1 % or 0.075 % for process pressure and level measurement. They are suitable for all applications with gases, vapours and liquids in which product-resistant sensors and high accuracy are required. An IP 68 version is available for extremely humid areas. The instruments are provided with comprehensive adjustment and indicating options either on site on the measurement loop, but also remote. The electronics modules are available with analogue and digital signal outputs 4 ... 20 mA, 4 ... 20 mA/HART, Profibus PA and Foundation Fieldbus. This enables either the configuration of economic individual measurements as well as the connection to DCS and PLC systems.

Features of **VEGABAR 61** are the isolating system, front-flush process as well as hygienic fittings. This instrument covers mainly applications in highly corrosive and hot products as well as high pressures.

VEGABAR 63 has a metal measuring cell with different sensor elements. It offers a variety of front-flush process fittings with thread or in hygienic version. The instrument is particularly suitable for viscous but also corrosive liquids, especially in the food processing industry, power stations and the chemical industry.

VEGABAR 64 with the CERTEC® measuring cell is available with small process fittings from G½ A, front-flush process fittings as well as manifold threaded and flange fittings. It is thus particularly suitable for applications in the paper, chemical and pharmaceutical industry as well as in water/sewage water applications.

VEGABAR 65 with METEC® measuring cell offers a number of hygienic fittings. It is thus particularly suitable for applications in the chemical, food processing and pharmaceutical industry.

User advantages

- small deviation in characteristics <0.1 %, <0.075 %, optional <0.05 %
- up to 150-fold overload resistance
- Product temperature up to 200 °C
- Measuring ranges -1 ... 72 bar
- Completely flush process fittings
- Functional safety according to IEC 61508-4/61511 up to SIL3
- Exchangeable indicating and adjustment module
- Quick setup via easy menu guidance
- Comprehensive monitoring and diagnostics functions

Measuring principle

The process pressure causes via the diaphragm a change of an electrical parameter of the measuring cell. This change is converted into an appropriate output signal. Since the instruments are all designed for specific application areas, different sensor elements i.e. measuring units are used for detecting the pressure.

VEGABAR 61

The sensor element in VEGABAR 61 is the CERTEC® measuring cell with isolating system and metallic process diaphragm. A strain gauge element is implemented for measuring ranges over 100 bar.

VEGABAR 63

With VEGABAR 63 a measuring cell with a piezoresistive sensor element and internal transmission liquid is used for measuring ranges up to 16 bar.

For measuring ranges from 25 bar, there is a dry strain gauge (DMS) mounted on the back side of the process diaphragm.

The process diaphragm consists of stainless steel.

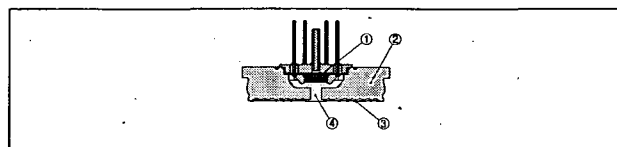


Fig. 1: Configuration of the piezoresistive measuring cell in VEGABAR 63

- 1 Sensor element
- 2 Base element
- 3 Diaphragm
- 4 Filling of silicone oil

The features of the piezoresistive measuring cell are:

- Elastomere-free
- Wetted parts of stainless steel
- Small hysteresis

VEGABAR 64

The sensor element of VEGABAR 64 is the dry ceramic-capacitive CERTEC® measuring cell. Base element and diaphragm consist of high purity sapphire-ceramic®.

The CERTEC® measuring cell is also equipped with a temperature sensor. The temperature value can be displayed via the indicating and adjustment module or processed via the signal output.

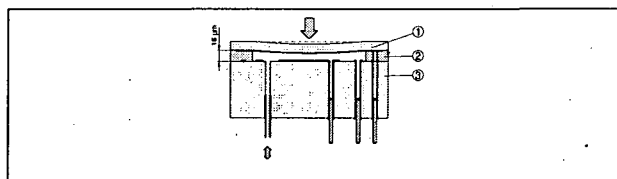


Fig. 2: Configuration of the CERTEC® measuring cell in VEGABAR 64

- 1 Diaphragm
- 2 Soldered glass bond
- 3 Base element

The features of the CERTEC® measuring cell are:

- Very high overload resistance
- Good corrosion resistance
- Very high abrasion resistance
- No hysteresis

VEGABAR 65

The METEC® measuring cell is the measuring unit of VEGABAR 65. This unit consists of a CERTEC® measuring cell and a special isolating system with metallic process diaphragm. A special feature of this isolating system is that the temperature influence is directly compensated mechanically.

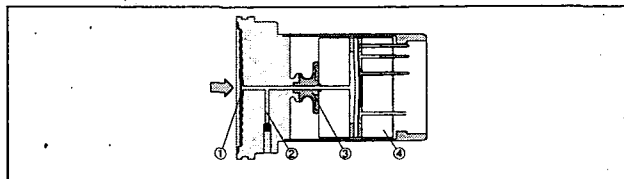


Fig. 3: Configuration of the METEC® measuring cell in VEGABAR 65

- 1 Process diaphragm
- 2 Isolating liquid
- 3 FeNi adapter
- 4 CERTEC® measuring cell

The features of the METEC® measuring cell are:

- completely welded, elastomer-free
- Good thermo-shock reaction
- excellent long-term stability
- High degree of flushness.

Configuration

VEGABAR 61, 63, 64 and 65 pressure transmitters are available with different housing protections:

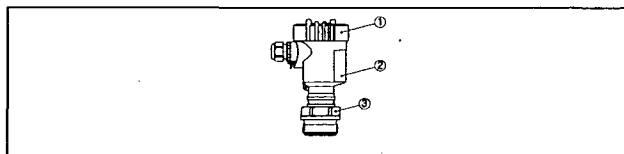


Fig. 4: Example of a VEGABAR 64 with connection G1 A and plastic housing in protection IP 66/IP 67

- 1 Housing cover with integrated PLICSCOM (optional)
- 2 Housing with electronics
- 3 Process fitting with measuring cell

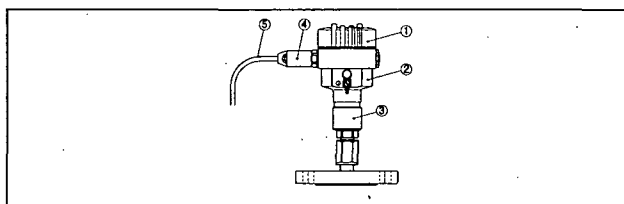


Fig. 5: Example of a VEGABAR 61 with flange and Aluminium housing in protection IP 66/IP 68, 1 bar

- 1 Housing cover with integrated PLICSCOM (optional)
- 2 Housing with electronics
- 3 Process fitting with measuring cell
- 4 Cable gland
- 5 Connection cable

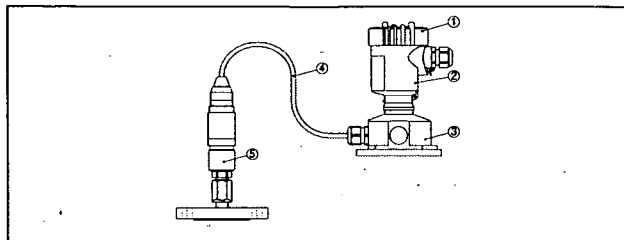


Fig. 6: Example of a VEGABAR 61 with flange and stainless steel housing in protection IP 68 and remote electronics

- 1 Housing cover with integrated PLICSCOM (optional)
- 2 Housing with electronics
- 3 Housing socket
- 4 Connection cable
- 5 Process fitting with measuring cell

1.1 Application examples

Reaction vessel

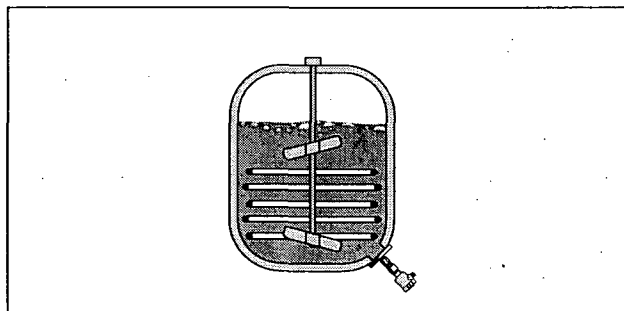


Fig. 7: Level measurement on the reaction vessel with VEGABAR 61

VEGABAR 61 can be also used in high temperatures. The instrument measures the hydrostatic pressure of the liquid column independent of foam on the product surface. Its advantages are high resistance diaphragm materials and low oil volume of the isolating diaphragm. This keeps the temperature influence of the isolating diaphragm low.

Chemical pump

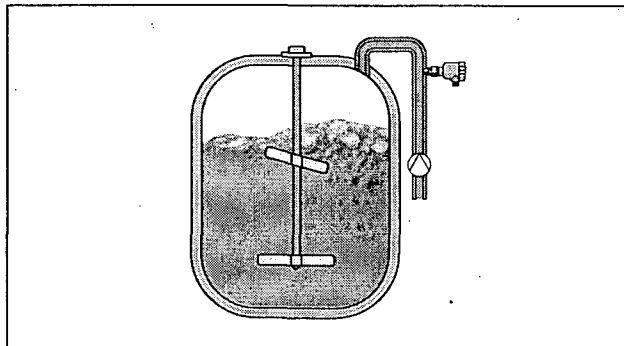


Fig. 8: Dry run protection on a chemical pump with VEGABAR 63

VEGABAR 63 pressure transmitter with piezoresistive measuring cell and metal diaphragm is used for dry run protection of chemical pumps. Its strengths are the front-flush process fitting also for small tube diameters as well as the chemically resistant process diaphragm.

Pressurised screen

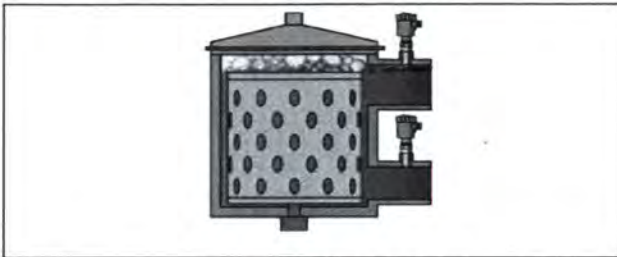


Fig. 9: Pressure measurement on a screen with VEGABAR 64

In the paper industry, screens are used for fibre separation. For effective screening, the machine must be run with the correct operating parameters. For this purpose, the pressure is measured at the inlet and discharge areas. For this measurement the pressure transmitter VEGABAR 64 with the small ceramic CERTEC® measuring cell is used. It is front-flush and thus self-cleaning as well as highly resistant.

Feeding vessels

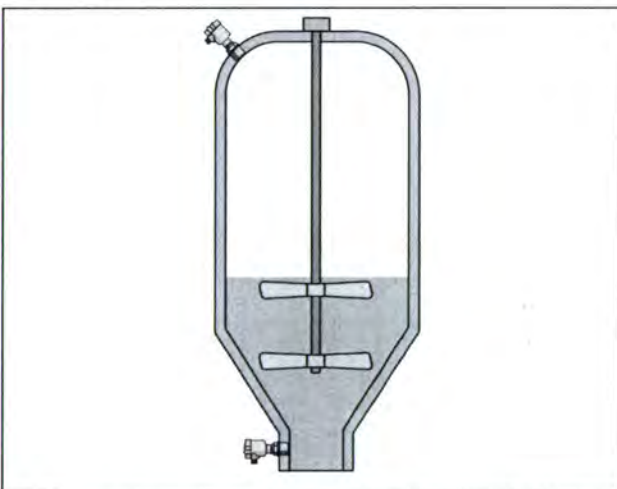


Fig. 10: Level and pressure measurement in a feeding vessel with VEGABAR 65

In the cosmetics industry, batch vessels are used for a wide variety of products. Frequent, powerful cleaning processes accompany every product and batch change. The total pressure as well as the overpressure are detected by two VEGABAR 65 pressure transmitters. VEGABAR 65 is especially characterised by its reliable thermo-shock reaction and vacuum resistance.

Bitumen vessel



Fig. 11: Level measurement in a bitumen vessel with VEGABAR 65

VEGABAR 65 pressure transmitters are particularly suitable for hydrostatic level measurement of hot bitumen. The special configuration of its metal METEC® measuring cell ensures the temperature decoupling between process fitting and electronics and thus enables the use up to 200 °C (392 °F).



Information:

Continuative documentation:

- Operating instructions manual "VEGABAR 61"
- Operating instructions manual "VEGABAR 63"
- Operating instructions manual "VEGABAR 64"
- Operating instructions manual "VEGABAR 65"
- Safety Manual "Functional safety VEGABAR series 50 and 60 - 4 ... 20 mA/HART"



2 Type overview

VEGABAR 61



VEGABAR 63



VEGABAR 64



Measuring cell:	small CERTEC®	Piezoresistive/DMS	CERTEC®
Diaphragm:	Ceramic	Metal	Ceramic
Media:	gases, vapours and liquids, also with abrasive substances	Gas, vapours and liquids, also viscous	gases, vapours and liquids, also with abrasive substances
Process fitting:	Threads from ½", flanges from DN 25, fittings for the paper industry thread 1" suitable for PASVE, thread M30x1.5; PMC from 1"	Manometer connection G½ A or ½ NPT, connection G1 A or G½ A flush, hygienic fitting	thread from 1", flanges from DN 25, fittings for the food processing and paper industry
Material process fitting:	316L	316Ti	316L, PVDF, PVDF plated, Hastelloy C4 plated
Material diaphragm:	316L, Hastelloy C276, Hastelloy C2, Tantalum, Titanium, PTFE on 316Ti, gold-coating on 316L	316Ti, Elgiloy 2.4711	Ceramic
Measuring range:	-1 ... 0 bar up to -1 ... 72 bar (-14.5 ... 0 psi up to -14.5 ... 1044 psi)	-1 ... 3 bar up to 0 ... 600 bar (-14.5 ... 44 psi up to 0 ... 8702 psi)	-1 ... 0 bar up to -1 ... 72 bar (-14.5 ... 0 psi up to -14.5 ... 1044 psi)
Process temperature:	-40 ... +120 °C (-40 ... +248 °F)	-40 ... +120 °C (-40 ... +248 °F)	-40 ... +150 °C (-40 ... +302 °F)
Deviation in characteristics:	<0.1 %	<0.1 %	<0.075 % or <0.05 %
Signal output:	4 ... 20 mA/HART, Profibus PA, Foundation Fieldbus	4 ... 20 mA/HART, Profibus PA, Foundation Fieldbus	4 ... 20 mA/HART, Profibus PA, Foundation Fieldbus
Connection:	Housing with terminal	Housing with terminal	Housing with terminal
Adjustment/Indication:	PLICSCOM	PLICSCOM	PLICSCOM
Remote adjustment/indication:	VEGADIS 61	VEGADIS 61	VEGADIS 61
Functional safety:	up to SIL3	--	up to SIL3

Type overview

VEGA

VEGABAR 65



Measuring cell:	METEC®
Diaphragm:	Metal
Media:	gases, vapours and liquids also with higher temperatures
Material process fitting:	thread from 1½", flanges from DN 20, fittings for the food processing industry
Material diaphragm:	Hastelloy C276, gold-coated, gold/rhodium-coated
Material:	316L, Hastelloy C276
Measuring range:	-1 ... 0 bar up to -1 ... 25 bar (-14.5 ... 0 psi up to -14.5 ... 363 psi)
Process temperature:	-12 ... +200 °C (-10 ... +392 °F)
Deviation in characteristics:	<0.075 %
Signal output:	4 ... 20 mA/HART, Profibus PA, Foundation Fieldbus
Connection:	Housing with terminal
Adjustment/Indication:	PLICSCOM
Remote adjustment/indication:	VEGADIS 61
Functional safety:	up to SIL3

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Type overview

Indicating and adjustment module



PLICSCOM

Housing



Plastic



Stainless steel



Aluminium



Aluminium (double chamber)

Electronics



4 ... 20 mA/HART



Profibus PA



Foundation Field-bus

Process fitting



Thread



Flange



Sanitary

Sensors



CERTEC® measuring cell



METEC® measuring cell



Piezoresistive measuring cell

Approvals



SIL



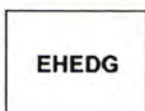
Overfill protection



Gas explosion protection



Dust explosion protection



EHEDG



Ship



FM



CSA

3 Mounting instructions

Installation position

VEGABAR functions in any installation position. Depending on the measuring system, the installation position can influence the measurement. This can be compensated by a position correction.

Select an installation position for the plics® instruments you can easily reach for mounting and connecting as well as later retrofitting of an indicating and adjustment module. The housing can be rotated by 330° without the use of any tools. You can also install the indicating and adjustment module in four different positions (each displaced by 90°).

4 Electrical connection

4.1 General requirements

The supply voltage range can differ depending on the instrument version. You can find exact specifications in chapter "Technical data".

Take note of country-specific installation standards (e.g. the VDE regulations in Germany) as well as prevailing safety regulations and accident prevention rules.



In hazardous areas you should take note of the appropriate regulations, conformity and type approval certificates of the sensors and power supply units.

4.2 Voltage supply

Generally

Voltage supply and current signal are carried along the same two-wire connection cable or via separate connection cables (depending on the version). The requirements to the voltage supply are specified in chapter "Technical data".

4 ... 20 mA/HART two-wire

The VEGA power supply units VEGATRENN 149AEx, VEGAS-TAB 690, VEGADIS 371 as well as VEGAMET signal conditioning instruments are suitable for power supply. When one of these instruments is used, a reliable separation of the supply circuits from the mains circuits according to DIN VDE 0106 part 101 is ensured for VEGABAR.

Profibus PA

Power is supplied by a Profibus DP/PA segment coupler or a VEGALOG 571 EP input card.

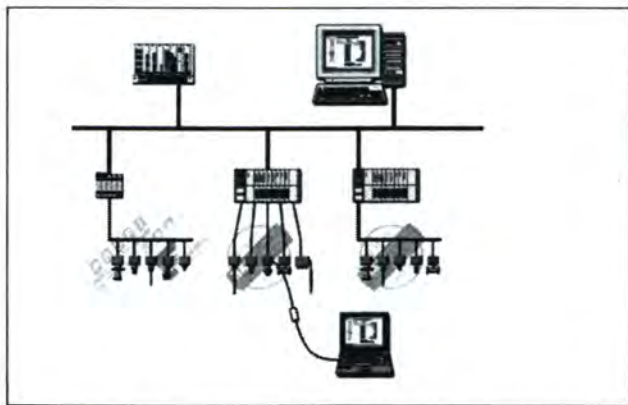


Fig. 12: Integration of instruments in a Profibus PA system via segment coupler DP/PA or data recording systems with Profibus PA input card

Foundation Fieldbus

Power supply via the H1 Fieldbus cable.

4.3 Connection cable

Generally

The sensors are connected with standard cable without screen. An outer cable diameter of 5 ... 9 mm ensures the seal effect of the cable entry.

4 ... 20 mA/HART two-wire and four-wire

If electromagnetic interference is expected which is above the test values of EN 61326 for industrial areas, screened cable should be used. In HART multidrop mode the use of screened cable is generally recommended.

Profibus PA, Foundation Fieldbus

The installation must be carried out according to the appropriate bus specification. VEGABAR is connected respectively with screened cable according to the bus specification. Power supply and digital bus signal are transmitted via the same two-wire connection cable. Make sure that the bus is terminated via appropriate terminating resistors.



In Ex applications, the corresponding installation regulations must be noted for the connection cable.

4.4 Cable screening and grounding

If screened cable is necessary, the cable screen must be connected on both ends to ground potential. If potential equalisation currents are expected, the connection on the evaluation side must be made via a ceramic capacitor (e.g. 1 nF, 1500 V).

Profibus PA, Foundation Fieldbus

In systems with potential separation, the cable screen is connected directly to ground potential on the power supply unit, in the connection box and directly on the sensor.

In systems without potential equalisation, connect the cable screen directly to ground potential only at the power supply unit and at the sensor - do not connect to ground potential in the connection box or T-distributor.

4.5 Wiring plan

Single chamber housing

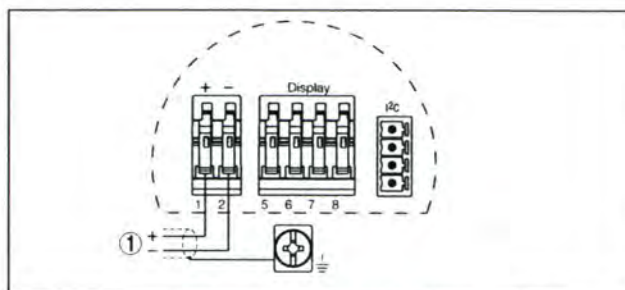


Fig. 13: Connection HART two-wire, Profibus PA, Foundation Fieldbus

1 Power supply and signal output

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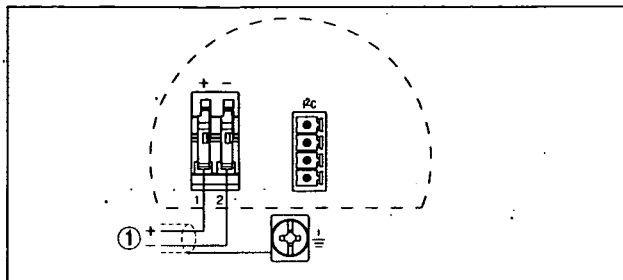
Double chamber housing - two-wire

Fig. 14: Connection HART two-wire, Profibus PA, Foundation Fieldbus

1 Power supply and signal output

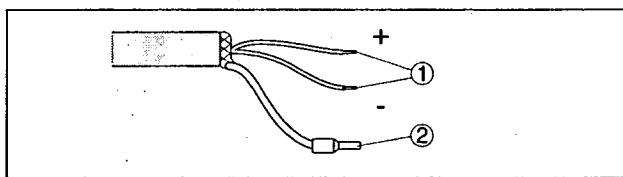
Wire assignment, connection cable with version IP.66/IP 68, 1 bar

Fig. 15: Wire assignment, connection cable

1 brown (+) and blue (-) to power supply or to the processing system
 2 Screen

5 Operation

5.1 Overview

VEGABAR can be adjusted with the following adjustment media:

- the indicating and adjustment module
- an adjustment software according to FDT/DTM standard, e.g. PACTware™ and PC

and, depending on the signal output, also with:

- a HART handheld (4 ... 20 mA/HART)
- the adjustment program AMS (4 ... 20 mA/HART and Foundation Fieldbus)
- the adjustment program PDM (Profibus PA)
- a configuration tool (Foundation Fieldbus)

The entered parameters are generally saved in VEGABAR, optionally also in PLICSCOM or in the adjustment program.

5.2 Compatibility according to NAMUR NE 53

VEGABAR meet NAMUR recommendation NE 53. VEGA instruments are generally upward and downward compatible:

- Sensor software to DTM VEGABAR HART, PA or FF
- DTM VEGABAR for adjustment software PACTware™
- Indicating and adjustment module PLICSCOM for sensor software

The parameter adjustment of the basic sensor functions is independent of the software version. The range of available functions depends on the respective software version of the individual components.

5.3 Adjustment with the indicating and adjustment module PLICSCOM

Setup and indication

PLICSCOM is a pluggable indication and adjustment module for plics® sensors. It can be placed in four different positions on the instrument (each displaced by 90°). Indication and adjustment are made via four keys and a clear, graphic-capable dot matrix indication. The adjustment menu with language selection is clearly structured and enables easy setup. After setup, PLICSCOM serves as indicating instrument through the screwed cover with glass insert, measured values can be read directly in the requested unit and presentation.

Depending on the hardware version of PLICSCOM or the respective sensor electronics, an integrated backlight can be switched on via the adjustment menu.¹⁾

PLICSCOM adjustment

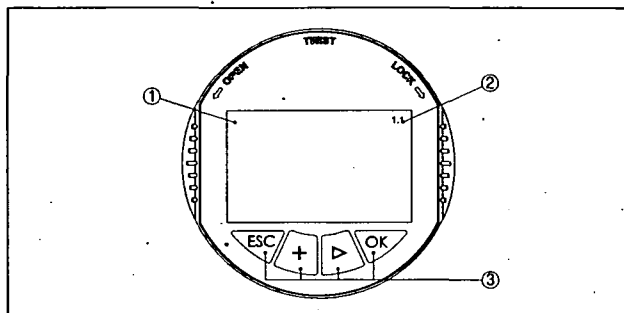


Fig. 16: Indicating and adjustment elements

- 1 LC display
- 2 Indication of the menu item number
- 3 Adjustment keys

Key functions

- **[OK]** key:
 - move to the menu overview
 - confirm selected menu
 - edit parameter
 - save value
- **[→]** key to select:
 - menu change
 - list entry
 - Select editing position
- **[+]** key:
 - Change value of a parameter
- **[ESC]** key:
 - interrupt input
 - jump to the next higher menu

5.4 Adjustment with PACTware™

PACTware™/DTM

The sensors VEGABAR can be adjusted via PACTware™ independent of the respective signal output 4 ... 20 mA/HART, Profibus PA or Foundation Fieldbus directly on the instrument. To adjust with PACTware™, an instrument driver for the particular VEGABAR model is required.

All currently available VEGA DTMs are provided in a DTM Collection with the current PACTware™ version on CD. They are available from the responsible VEGA agency for a token fee. The basic version of this DTM Collection incl. PACTware™ is available as a free-of-charge download from the Internet.

To use the entire range of functions of the DTM incl. project documentation, a DTM licence is required for the particular instrument family, e.g. VEGABAR. This licence can be acquired from the VEGA agency serving you.

¹⁾ This function is for instruments with StEx, WHG or ship approval as well as country-specific approvals such as those according to FM or CSA, available at a later date.

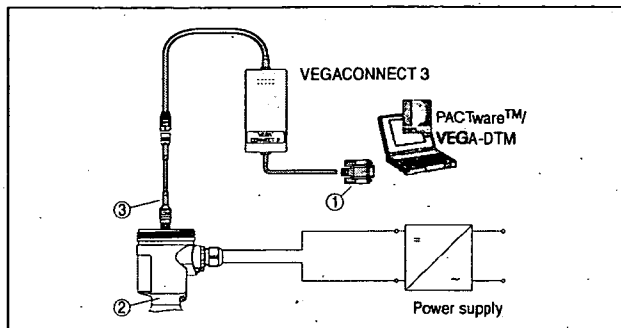
Connecting the PC directly to the sensor

Fig. 17: Connection directly to the sensor

- 1 RS232 connection
- 2 VEGABAR
- 3 I²C adapter cable for VEGACONNECT 3

To adjust with PACTware™, a VEGACONNECT 3 with I²C adapter cable (art. no. 2.27323) as well as a power supply unit is necessary in addition to the PC and the suitable VEGA-DTM.

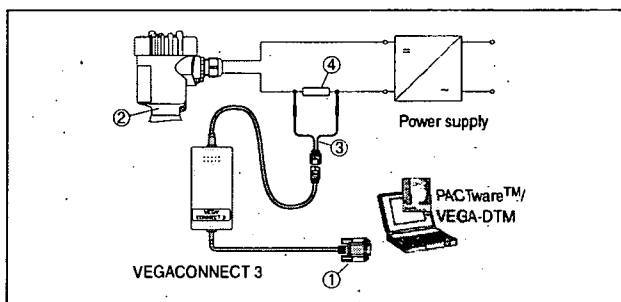
Connecting the PC to the signal cable (4 ... 20 mA/HART)

Fig. 18: Connecting the PC to the signal cable

- 1 RS232 connection
- 2 VEGABAR
- 3 HART adapter cable for VEGACONNECT 3
- 4 HART resistance 250 Ohm

To adjust with PACTware™, a VEGACONNECT 3 with HART adapter cable (art. no. 2.25397) as well as a power supply unit and a HART resistor with approx. 250 Ohm is required in addition to the PC and the suitable VEGA DTM.

**Note:**

With power supply units with integrated HART resistance (internal resistance approx. 250 Ohm), an additional external resistance is not necessary (e.g. VEGA-TRENN 149A, VEGADIS 371, VEGAMET 381/624/625, VEGASCAN 693). In such cases, VEGACONNECT can be connected parallel to the 4 ... 20 mA cable.

5.5 Adjustment with other adjustment programs**PDM**

For VEGA PA sensors, device descriptions are also available as EDD for the adjustment program PDM. The device descriptions are already implemented in the current versions of PDM. For older versions of PDM they are available as a free-of-charge download from the Internet.

AMS

For VEGA FF sensors, device descriptions are also available as DD for the adjustment program AMS™. The device descriptions are already implemented in the current version of AMS™. For older versions of AMS™, a free-of-charge download is available via Internet.

6 Technical data

General data

Common data

316L corresponds to 1.4404 or 1.4435

Materials, non-wetted parts

- Electronics housing
- Remote electronics housing
- Socket, wall mounting plate, remote electronics housing
- Seal between housing socket and wall mounting plate
- Seal ring, housing cover
- Inspection window in housing cover for indicating and adjustment module
- Ground terminal
- Connection cable between IP 68 transmitter and remote electronics housing
- Type plate support with IP 68 version on cable

Plastic PBT (Polyester), Alu die-casting powder-coated, 316L plastic PBT (Polyester)
 plastic PBT (Polyester)
 TPE (fixed connected)
 NBR (stainless steel housing), silicone (Alu/plastic housing)
 Polycarbonate (UL-746-C listed)

316Ti/316L
 PUR, FEP, PE

PE hard

VEGABAR 61

Materials, wetted parts

- Process fitting
- Diaphragm

Weight

316L
 316L, Hastelloy C276, Hastelloy C2, Tantalum, Titanium, PTFE on 316Ti
 approx. 0.8 ... 8 kg (1.8 ... 17.6 lbs), depending on the housing material and process fitting

VEGABAR 63

Materials, non-wetted parts

- Internal transmission liquid

Materials, wetted parts

- Process fitting
- Diaphragm standard
- Diaphragm from measuring range 25 bar, with not flush version
- Seal ring, O-ring

Weight

Synthetic oil, Halocarbon oil²⁾³⁾

316Ti

316Ti

Elgiloy 2.4711

FKM (Viton), EPDM, NBR

approx. 0.8 ... 8 kg (1.8 ... 17.6 lbs), depending on the housing material and process fitting

VEGABAR 64

Materials, wetted parts

- Process fitting
- Diaphragm
- Seal, measuring cell
- Seal, process fitting thread G1½ A

Weight

316L, PVDF, PVDF plated, Hastelloy C4 plated

sapphire ceramic® (99.9 % oxide ceramic)

Viton, Kalrez 6375, EPDM, Chemraz 535

Klingsil C-4400

approx. 0.8 ... 8 kg (1.8 ... 17.6 lbs), depending on the housing material and process fitting

VEGABAR 65

Materials, non-wetted parts

Isolating liquid

Materials, wetted parts

- Process fitting
- Process diaphragm
- Process seal other hygienic fittings

- Process seal hygienic fitting with compression nut

- Seal, process fitting thread G1½ A

Weight

Essomarcil (med. white oil, FDA-approved)

316L

Hastelloy C276, gold-coated, gold/rhodium-coated

EPDM: Version up to 140 °C (284 °F) Viton: Version up to 180/200 °C (356/392 °F)

FEP-O-Seal

Klingsil C-4400

approx. 0.8 ... 8 kg (1.8 ... 17.6 lbs), depending on the housing material and process fitting

²⁾ Synthetic oil: For measuring ranges up to 16 bar, FDA listed for the food processing industry. For measuring ranges up to 25 bar dry measuring cell.

³⁾ Halocarbon oil: Generally in oxygen applications, not with vacuum measuring ranges, not with absolute measuring ranges <1 bar_{abs}.

Technical data

VEGA

Output variable

4 ... 20 mA/HART

Output signal,

Signal resolution

Failure signal

Max. output current

Load

Damping

Step response or adjustment time

Fulfilled NAMUR recommendation

Profibus PA

Output signal

– Sensor address

Current value

Integration time

Foundation Fieldbus

Output

– Signal

– Physical layer

Channel Numbers

– Channel 1

– Channel 2

– Channel 3

– Channel 4

Current value

4 ... 20 mA/HART

1.6 μ A

Current output unchanged, 20.5 mA, 22 mA, <3.6 mA (adjustable)

22 mA

see load diagram under Power supply

0 ... 999 s, adjustable

150 ms (ti: 0 s, 0 ... 100 %)

NE 43

digital output signal, format according to IEEE-754

126 (default setting)

constantly 10 mA, ± 1 mA

0 ... 999 s, adjustable

digital output signal, Foundation Fieldbus protocol
according to IEC 61158-2

Primary Value

Secondary Value 1

Secondary Value 2

Temperature Value

10 mA, ± 0.5 mA**Additional output variable, temperature (VEGABAR 64, 66)**

Processing is made via HART multidrop, Profibus PA and

Foundation Fieldbus

Range

-50 ... +150 °C (-58 ... +302 °F)

Resolution

1 °C (1.8 °F)

Accuracy

– in the range of 0 ... +100°C (+32 ... +212 °F)

 ± 3 K– in the range of -50 ... 0 °C (-58 ... +32 °F) and +100 ... +150 °C
(+212 ... +302 °F)typ. ± 4 K**Input variable**

Parameter

Measuring ranges

Recommended max. turn down

Process pressure

see product code

1:10 (no limitation)

Reference conditions and actuating variables (similar to DIN EN 60770-1)

Reference conditions according to DIN EN 61298-1

– Temperature

18 ... 30 °C (64 ... 86 °F)

– Relative humidity

45 ... 75 %

– Air pressure

860 ... 1060 mbar/86 ... 106 kPa (12.5 ... 15.4 psi)

Determination of characteristics

limit point adjustment according to DIN 16086

Characteristics

linear

Calibration position

upright, diaphragm points downward

Influence of the installation position

– VEGABAR 66

<0.2 mbar/20 Pa (0.003 psi)

– VEGABAR 67

<5 mbar/0.5 kPa (0.07 psi)



Technical data

Deviation determined according to the limit point method according to IEC 60770⁴⁾

Applies to **digital** interfaces (HART, Profibus PA, Foundation Fieldbus) as well as for the **analogue** current output 4 ... 20 mA.
Specification refer to the set span. Turn down (TD) = nominal measuring range/set span.

VEGABAR 61

Deviation

- Turn down 1:1 up to 5:1 <0.1 %
- Turn down >5:1 <0.02 % x TD

VEGABAR 63

Deviation

- Turn down 1:1 up to 5:1 <0.1 %
- Turn down >5:1 <0.02 % x TD

VEGABAR 64

Deviation

- Turn down 1:1 up to 5:1 <0.075 %
- Turn down >5:1 <0.015 % x TD

Deviation with absolutely flush process fittings EV, FT

- Turn down 1:1 up to 5:1 <0.05 %
- Turn down >5:1 <0.01 % x TD

VEGABAR 65

Deviation

- Turn down 1:1 up to 5:1 <0.075 %
- Turn down >5:1 <0.015 % x TD

Influence of the product or ambient temperature

Applies to **digital** interfaces (HART, Profibus PA, Foundation Fieldbus) as well as for the **analogue** current output 4 ... 20 mA.
Specification refer to the set span. Turn down (TD) = nominal measuring range/set span.

Thermal change zero signal, reference temperature 20 °C (68 °F):

- in the compensated temperature range 0 ... 100 °C (32 ... 212 °F) <0.05 %/10 K
- outside the compensated temperature range typ. <0.1 %/10 K

Applies also to the **analogue** 4 ... 20 mA current output and refers to the set span.

Thermal change, current output <0.15 % at -40 ... +80 °C (-40 ... +176 °F)

Long-term stability (similar to DIN 16086, DINV 19259-1 and IEC 60770-1)

Applies to **digital** interfaces (HART, Profibus PA, Foundation Fieldbus) as well as for the **analogue** current output 4 ... 20 mA.
Specification refer to the set span. Turn down (TD) = nominal measuring range/set span.

Long-term drift of the zero signal <(0.1 % x TD)/1 year

Ambient conditions

Ambient, storage and transport temperature

- without PLICSCOM -40 ... +80 °C (-40 ... +176 °F)
- with PLICSCOM -20 ... +70 °C (-4 ... +158 °F)
- IP 66/IP 68 and IP 68 version with PE connection cable -40 ... +60 °C (-40 ... +140 °F)

⁴⁾ Incl. non-linearity, hysteresis and non-repeatability.

Technical data

VEGA

Process conditions

VEGABAR 61

Product temperature depending on the isolating liquid (temperature: $p_{abs} > 1 \text{ bar} / > 14.5 \text{ psi}$ / $p_{abs} < 1 \text{ bar} / < 14.5 \text{ psi}$)⁵⁾

- silicone oil KN2.2 -40 ... +150 °C / -40 ... +150 °C (-40 ... +302 °F / -40 ... +302 °F)
- silicone oil KN2.2 and cooling element -40 ... +200 °C / -40 ... +150 °C (-40 ... +392 °F / -40 ... +302 °F)
- High temperature oil KN3.2 and cooling element -10 ... +300 °C / -10 ... +200 °C (+14 ... +572 °F / +14 ... +572 °F)
- High temperature oil KN3.2 and cooling element 300 mm (11.81 in) -10 ... +400 °C / -10 ... +200 °C (+14 ... +752 °F / +14 ... +392 °F)
- Halocarbon oil KN21 -40 ... +150 °C / -40 ... +80 °C (-40 ... +302 °F / -40 ... +176 °F)
- Silicone-free liquid KN70 -40 ... +70 °C (-40 ... +158 °F), no vacuum
- med. white oil KN62 and cooling element -12 ... +150 °C / -12 ... +150 °C (+10 ... +302 °F / +10 ... +302 °F)
- Med. white oil KN62 (FDA) and cooling element -12 ... +200 °C / -12 ... +150 °C (+10 ... +392 °F / +10 ... +302 °F)
- Med. white oil KN62 (FDA) and temperature adapter 300 mm -12 ... +250 °C / -12 ... +170 °C (+10 ... +482 °F / +10 ... +338 °F)

VEGABAR 63

Product temperature, threaded fittings depending on the seal⁶⁾

- FKM (e.g. Viton) -20 ... +105 °C (-4 ... +221 °F)
 - EPDM -40 ... +105 °C (-40 ... +221 °F)
 - NBR -25 ... +105 °C (-13 ... +221 °F)
- Product temperature, threaded fitting M44x1.25 as well as fittings bolting according to DIN 11851 or DIN 11851 -40 ... +150 °C (-40 ... +302 °F)

VEGABAR 64

Product temperature standard version, depending on the meas. cell seal⁷⁾

- FKM (e.g. Viton) -20 ... +120 °C (-4 ... +248 °F)
- EPDM -40 ... +120 °C (-40 ... +248 °F), 1 h: 140 °C / 284 °F cleaning temperature
- Kalrez 6375 (FFKM) -10 ... +120 °C (+14 ... +248 °F)
- Chemraz -30 ... +120 °C (-22 ... +248 °F)

Product temperature version with extended temperature range, depending on the meas. cell seal as well as order specification

- FKM (e.g. Viton) -20 ... +150 °C (-4 ... +302 °F)
- EPDM -40 ... +150 °C (-40 ... +302 °F)
- Kalrez 6375 (FFKM) -10 ... +150 °C (+14 ... +302 °F)
- Chemraz -30 ... +150 °C (-22 ... +302 °F)

VEGABAR 65

Product temperature, depending on the version

- Standard -12 ... +140 °C (+10 ... +284 °F)
- with extension, extended thread or Clamp 2½" -12 ... +140 °C (+10 ... +284 °F)
- with cooling element -12 ... +180 °C (+10 ... +356 °F)
- with cooling element and screening sheet -12 ... +200 °C (+10 ... +392 °F)

Common data

Vibration resistance

mechanical vibrations with 4 g and 5 ... 100 Hz⁸⁾

VEGABAR 64, 65

Shock resistance

Acceleration 100 g⁹⁾

Electromechanical data - version IP 66/IP 67

Cable entry/plug¹⁰⁾

- Single chamber housing

- 1x cable entry M20x1.5 (cable-ø 5 ... 9 mm), 1x blind stopper M20x1.5

or:

- 1x closing cap ½ NPT, 1x blind plug ½ NPT

or:

- 1x plug (depending on the version), 1x blind plug M20x1.5

- Double chamber housing

- 1x cable entry M20x1.5 (cable-ø 5 ... 9 mm), 1x blind stopper M20x1.5, plug M12x1 for VEGADIS 61 (optional)

⁵⁾ Version for oxygen applications up to 60 °C (140 °F).⁶⁾ Version for oxygen applications up to 60 °C (140 °F).⁷⁾ With process fitting PVDF, max. 100 °C (212 °F).⁸⁾ Tested according to the regulations of German Lloyd, GL directive 2⁹⁾ Tested according to EN 60068-2-27.¹⁰⁾ Depending on the version M12x1, according to DIN 43650, Harting, Amphenol-Tuchel, 7/8" FF.

Spring-loaded terminals

or:

- 1x closing cap ½ NPT, 1x blind stopper ½ NPT, plug M12x1 for VEGADIS 61 (optional)

or:

- 1x plug (depending on the version), 1x blind stopper M20x1.5, plug M12x1 for VEGADIS 61 (optional)

for wire cross-section up to 2.5 mm²

Indicating and adjustment module

Power supply and data transmission

Indication

Adjustment elements

Protection

- unassembled
- mounted into the sensor without cover

Materials

- Housing
- Inspection window

through sensor via gold-plated sliding contacts (I²C bus)

LC display in dot matrix

4 keys

IP 20

IP 40

ABS

Polyester foil

Supply voltage - 4 ... 20 mA/HART

VEGABAR 61

Supply voltage

- Non-Ex instrument
- EEx ia instrument
- Exd instrument

12 ... 36 V DC¹¹⁾12 ... 30 V DC¹²⁾18 ... 36 V DC¹³⁾

Supply voltage with lighted indicating and adjustment module

- Non-Ex instrument
- EEx ia instrument
- EExd ia instrument

22.5 ... 36 V DC

22.5 ... 30 V DC

22.5 ... 36 V DC

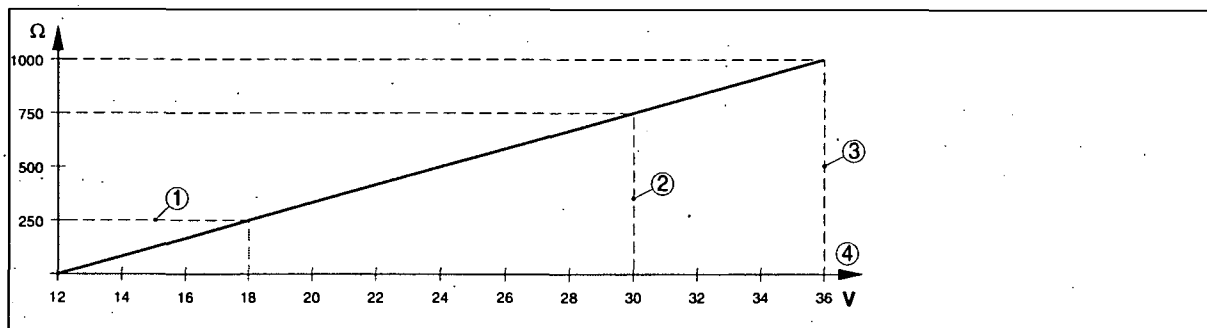


Fig. 19: Voltage diagram VEGABAR 61

1 HART load

2 Voltage limit EEx ia instrument

3 Voltage limit non-Ex/Ex instrument

4 Supply voltage

VEGABAR 63

Supply voltage

- Non-Ex instrument
- EEx ia instrument
- Exd instrument

14 ... 36 V DC

14 ... 30 V DC

20 ... 36 V DC

¹¹⁾ From measuring range 100 bar, 14 ... 36 V DC.¹²⁾ From measuring range 100 bar, 14 ... 30 V DC.¹³⁾ From measuring range 100 bar, 20 ... 36 V DC.

Technical data

VEGA

Supply voltage with lighted indicating and adjustment module

- Non-Ex instrument	22.5 ... 36 V DC
- EEx ia instrument	22.5 ... 30 V DC
- EExd ia instrument	22.5 ... 36 V DC
Load	see diagram

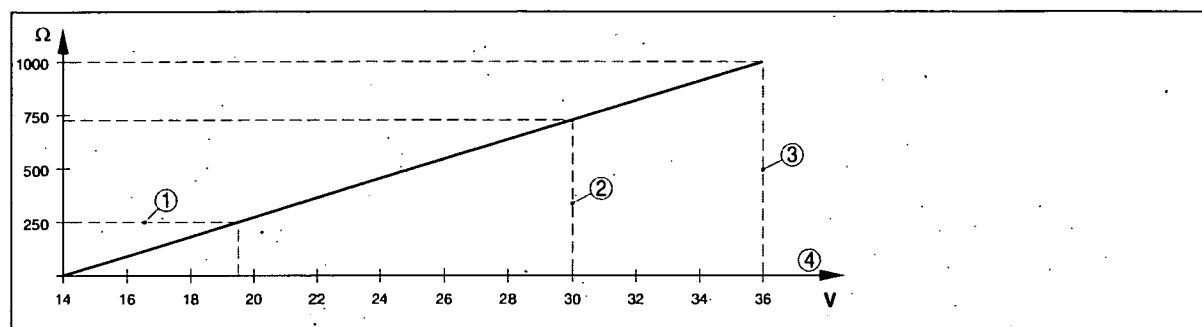


Fig. 20: Voltage diagram VEGABAR 63

- 1 HART load
- 2 Voltage limit EEx ia instrument
- 3 Voltage limit non-Ex/Ex instrument
- 4 Supply voltage

VEGABAR 64, 65

Supply voltage

- Non-Ex instrument	12 ... 36 V DC
- EEx ia instrument	12 ... 30 V DC
- Exd instrument	18 ... 36 V DC

Supply voltage with lighted indicating and adjustment module

- Non-Ex instrument	20 ... 36 V DC
- EEx ia instrument	20 ... 30 V DC
- EExd ia instrument	20 ... 36 V DC
Load	see diagram

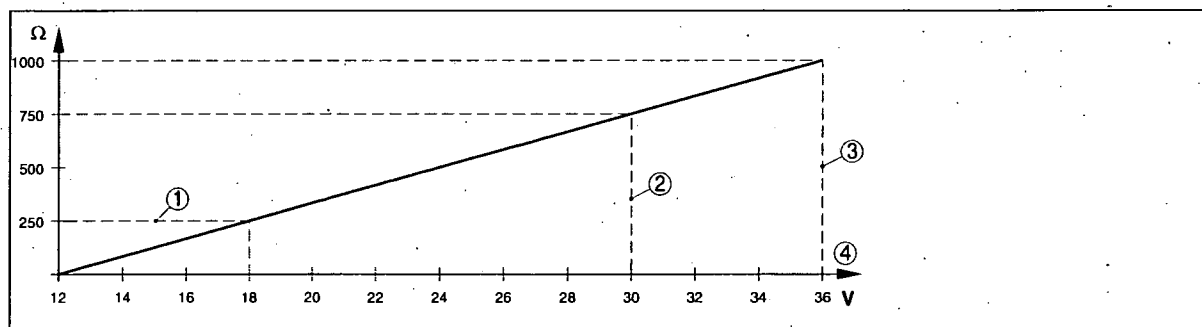


Fig. 21: Voltage diagram VEGABAR 64, 65

- 1 HART load
- 2 Voltage limit EEx ia instrument
- 3 Voltage limit non-Ex/Ex instrument
- 4 Supply voltage

Power supply - Profibus PA

Supply voltage

- Non-Ex instrument	9 ... 32 V DC
- EEx ia instrument	9 ... 24 V DC

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Technical data

Supply voltage with lighted indicating and adjustment module¹⁴⁾

- Non-Ex instrument 12 ... 36 V DC
- EEx ia instrument 12 ... 30 V DC

Power supply by/max. number of sensors

- DP/PA segment coupler max. 32 (max. 10 with Ex)
- VEGALOG 571 EP card max. 15 (max. 10 with Ex)

Power supply - Foundation Fieldbus

Supply voltage

- Non-Ex instrument 9 ... 32 V DC
- EEx ia instrument 9 ... 24 V DC

Supply voltage with lighted indicating and adjustment module¹⁵⁾

- Non-Ex instrument 12 ... 32 V DC
- EEx ia instrument 12 ... 24 V DC

Power supply by/max. number of sensors

- H1 Fieldbus cable/Voltage supply max. 32 (max. 10 with Ex)

Electrical protective measures

Protection

- Housing, standard IP 66/IP 67¹⁶⁾
- Alu and stainless housing (optionally available) IP 66/IP 68 (1 bar)¹⁷⁾
- Transmitter in IP 68 version IP 68
- Remote housing IP 65

Overvoltage category

III

Protection class

II

Available approvals or approvals applied for¹⁸⁾¹⁹⁾

- | | |
|-----------------|---|
| ATEX ia | ATEX II 1G, 1/2G, 2G EEx ia IIC T6 |
| ATEX ia und d | ATEX II 1/2G, 2G EEx d ia IIC T6 |
| ATEX D | ATEX II 1/2D, 2D IP6X T |
| IEC | IEC Ex ia IIC T6 |
| FM | FM Cl.I, Div2 (NI)+II, II, Div1 (DIP), FM Cl.I-III, Div 1 (IS), FM Cl.I-III, Div 1 (IS)+Cl.I-III, Div1 Gr.C-G(XP) |
| Ship approval | GL, LRS, ABS, CCS, RINA, DNV |
| Other approvals | WHG, VLAREM |

CE conformity

EMC (89/336/EWG)

Emission EN 61326: 1997 (class B), susceptibility EN 61326: 1997/A1: 1998

LVD (73/23/EWG)

EN 61010-1: 2001

Functional safety (SIL)

You can find detailed information in the supplementary instructions manual "Functional safety VEGABAR series 50 and 60" or under www.vega.com.

Functional safety according to IEC 61508-4/61511

- Single channel architecture (1oo1 D) up to SIL2
- Double channel architecture (1oo2 D) up to SIL3

¹⁴⁾ This function is for instruments with StEx, WHG or ship approval as well as country-specific approvals such as those according to FM or CSA, available at a later date.

¹⁵⁾ This function is for instruments with StEx, WHG or ship approval as well as country-specific approvals such as those according to FM or CSA, available at a later date.

¹⁶⁾ Instruments with gauge pressure measuring ranges cannot detect the ambient pressure when submerged, e.g. in water. This can lead to falsification of the measured value.

¹⁷⁾ Only with instruments with absolute pressure ranges.

¹⁸⁾ Deviating data in Ex applications: see separate safety instructions.

¹⁹⁾ Depending on order specification.

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Technical data

VEGA

Environmental instructions

VEGA environment management system²⁰⁾

certified according to DIN EN ISO 14001

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²⁰⁾ You can find detailed information under www.vega.com.

7 Dimensions

Housing in protection IP 66/IP 67

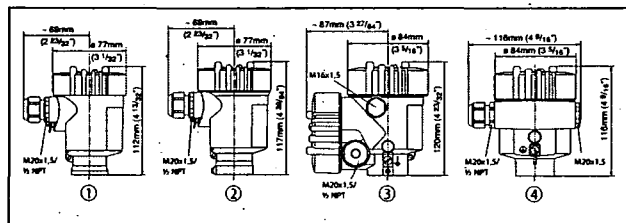


Fig. 22: Housing versions in protection IP 66/IP 67, with integrated indicating and adjustment module the housing is 9 mm (1/64") higher

- 1 Plastic housing
- 2 Stainless steel housing
- 3 Aluminium double chamber housing
- 4 Aluminium housing

IP 68 version with remote housing

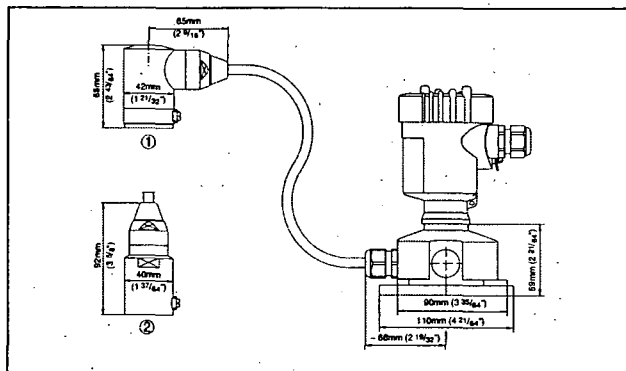


Fig. 23: Transmitter and remote housing with IP 68 version

- 1 Lateral cable outlet
- 2 Axial cable outlet

VEGABAR 61, flange version

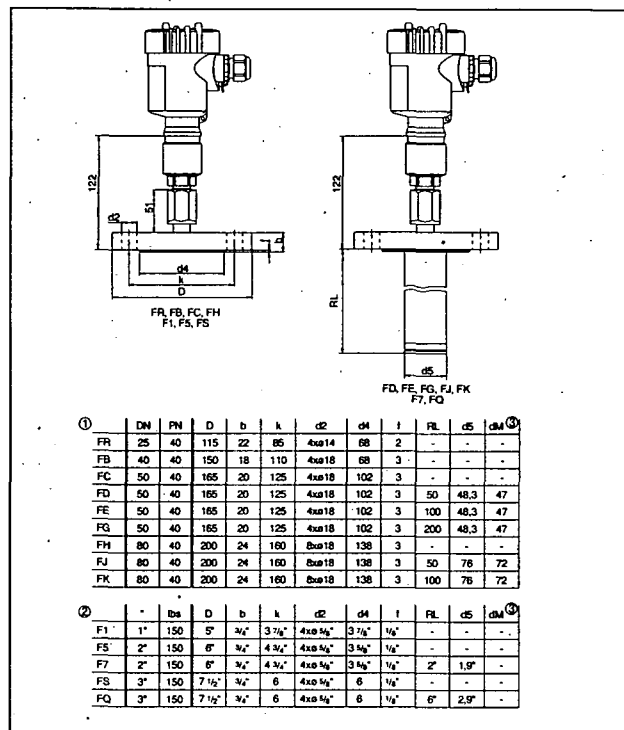


Fig. 24: VEGABAR 61, flange version

- 1 Flange connection according to DIN 2501
- 2 Flange fitting according to ANSI B16.5
- 3 Diaphragm diameter

VEGABAR 61, threaded version

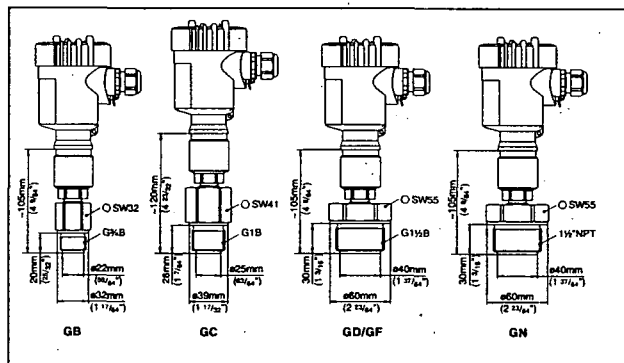


Fig. 25: VEGABAR 61, threaded version

Dimensions

VEGA

VEGABAR 61, tube isolated diaphragm

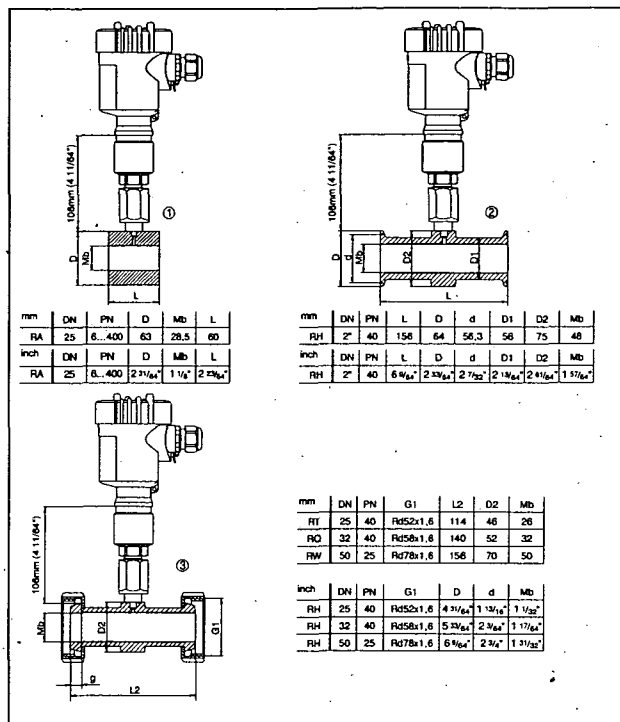


Fig. 26: VEGABAR 61, tube isolated diaphragm

- 1 Tube isolating diaphragm for mounting between flanges
- 2 Tube isolating diaphragm with Clamp connection 2"
- 3 Tube isolating diaphragm with threaded fitting according to DIN 11851

VEGABAR 63 threaded fitting

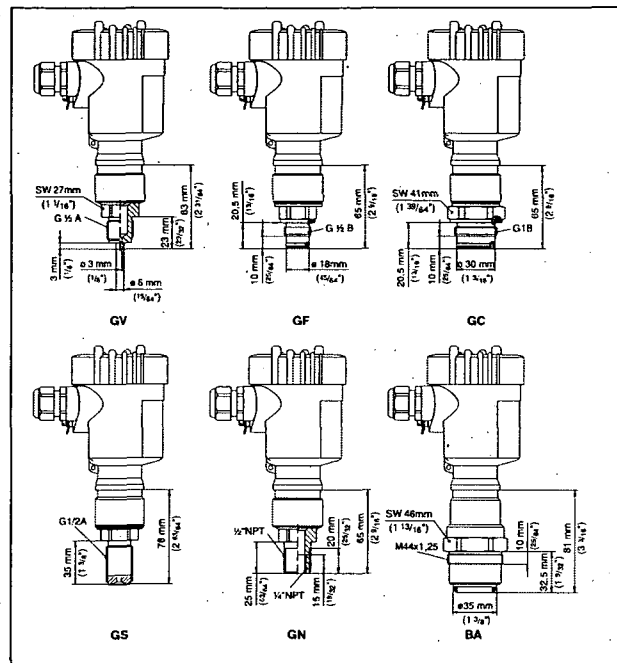


Fig. 27: VEGABAR 63 GV = G 1/2 A manometer connection, GF = G 1/2 A flush, GC = G 1 A flush, GS = G 1/2 A outer, GN = 1/2 NPT, BA = M44x1.25

VEGABAR 63, hygienic fitting

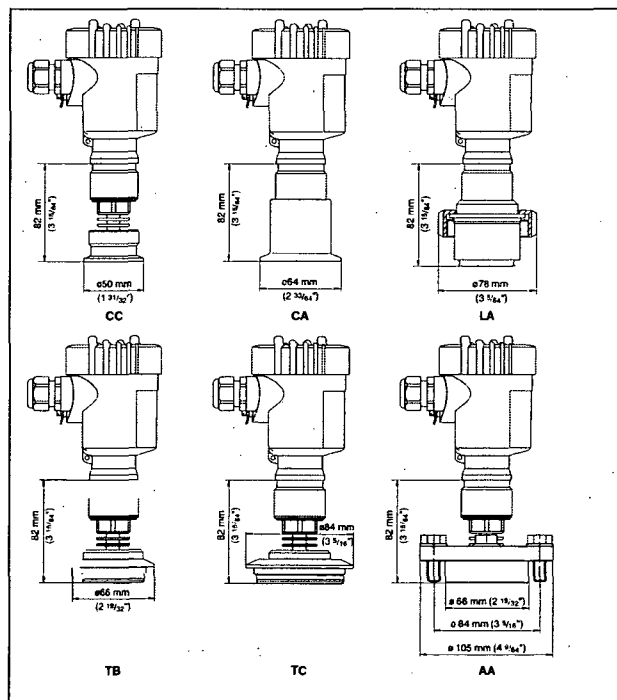


Fig. 28: VEGABAR 63 CC = Tri-Clamp 1 1/2", CA = Tri-Clamp 2", LA = hygienic fitting with compression nut, TB = Tuchenhausen Varivent DN 25, TC = Tuchenhausen Varivent DN 32, AA = DRD

VEGA

Dimensions

VEGABAR 64, threaded fitting 1

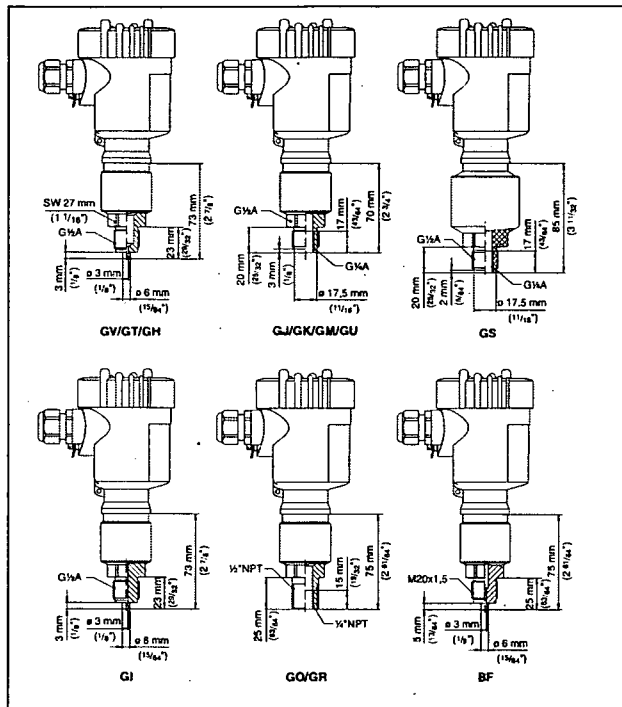


Fig. 29: VEGABAR 64 threaded fitting: GV/GT/GH = G $\frac{1}{2}$ A manometer connection EN 837, GJ/GK/GM/GU = G $\frac{1}{2}$ A inner G $\frac{1}{4}$ A, GS = G $\frac{1}{2}$ A inner G $\frac{1}{4}$ A PVDF, GI = G $\frac{1}{2}$ A manometer connection volume-reduced, GQ/GR = $\frac{1}{2}$ NPT, BF = M20x1.5 manometer connection EN 837

VEGABAR 64, threaded fitting 2

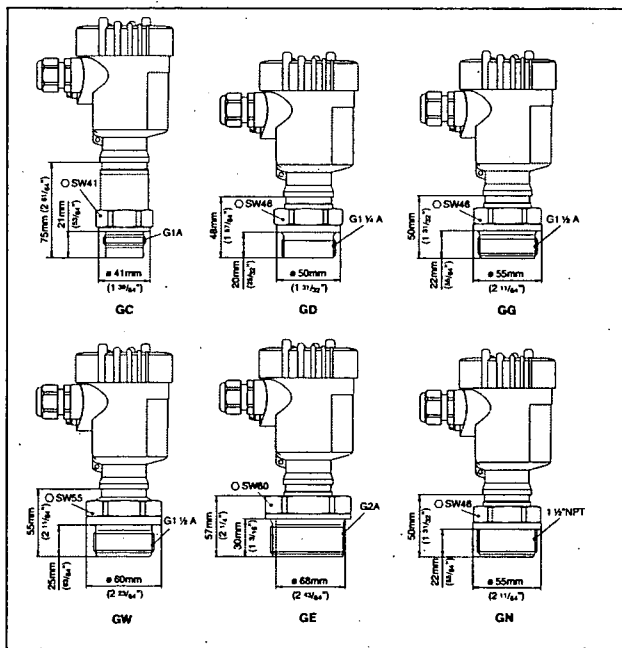


Fig. 30: VEGABAR 64 threaded fitting: GC = G1 A, GD = G1 $\frac{1}{4}$ A, GG = G1 $\frac{1}{2}$ A, GW = G1 $\frac{1}{2}$ A PVDF, GE = G2 A, GN = $\frac{1}{2}$ NPT

VEGABAR 64, hygienic fitting 1

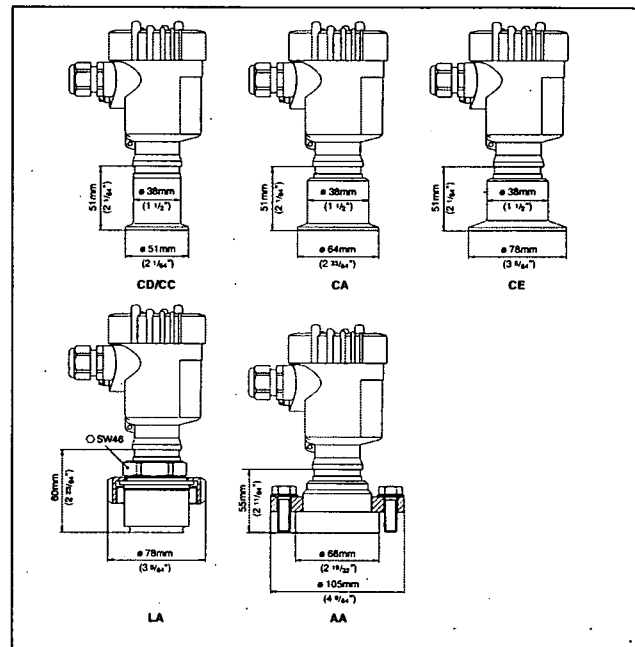


Fig. 31: VEGABAR 64 hygienic fitting: CD/CC = Tri-Clamp 1\"/>

VEGABAR 64, hygienic fitting 2

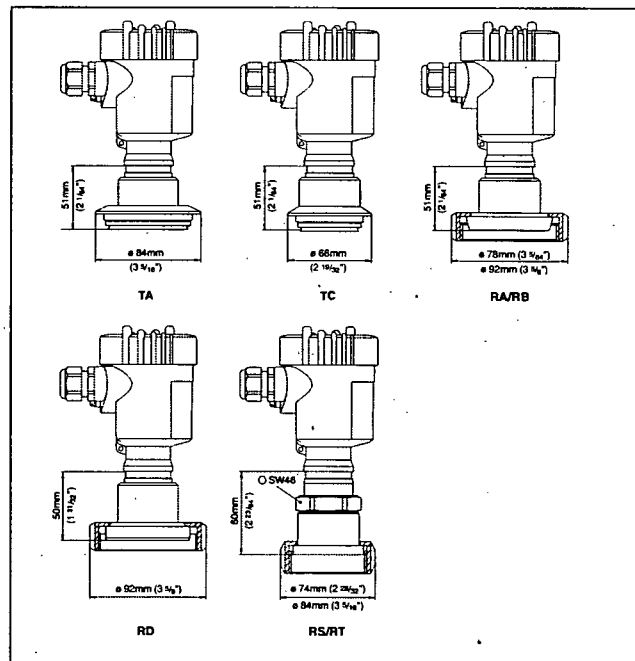


Fig. 32: VEGABAR 64 hygienic fitting: TA = Tuchenhausen Varivent DN 32, TB = Tuchenhausen Varivent DN 25, RA/RB = bolting DN 40/DN 50 according to DIN 11851, RD = bolting DN 50 according to DIN 11864, RS/RT = SMS DN 38/DN 51

Dimensions

VEGA

VEGABAR 64, flange fitting

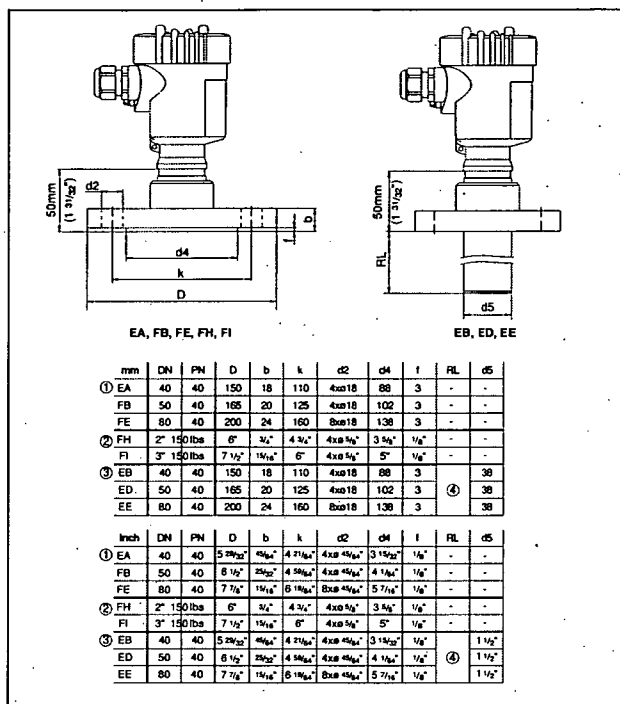


Fig. 33: VEGABAR 64, flange fitting

- 1 Flange connection according to DIN 2501
- 2 Flange fitting according to ANSI B16.5
- 3 Flange fitting according to DIN 2501 with extension
- 4 Extension length, order-specific

VEGABAR 64, flange fitting with extension

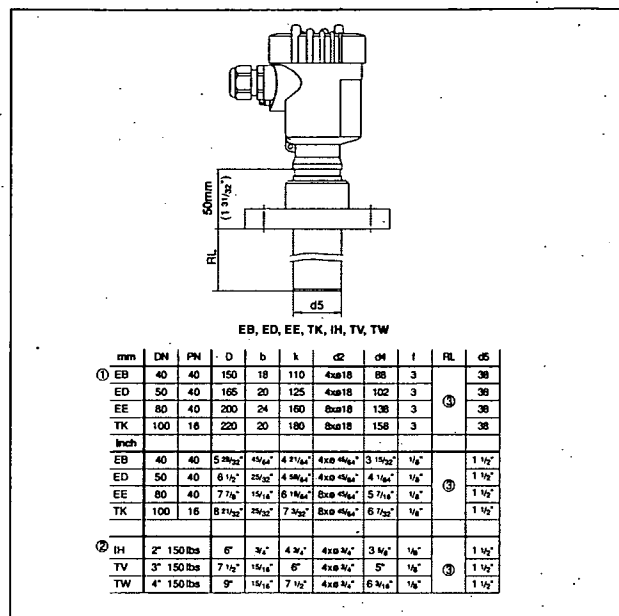


Fig. 34: VEGABAR 64, flange fitting with extension

- 1 Flange connection according to DIN 2501
- 2 Flange fitting according to ANSI B16.5
- 3 Order-specific

VEGABAR 64, threaded fitting for paper industry

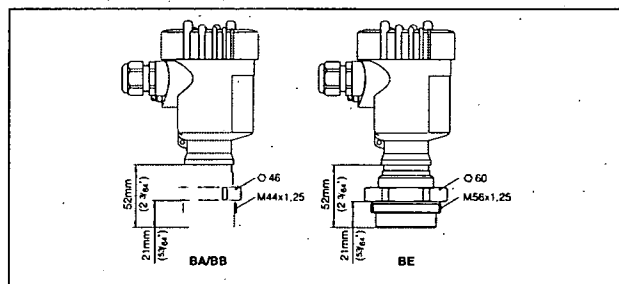


Fig. 35: VEGABAR 64, threaded fitting for the paper industry; BA/BB = M44x1.25; BE = M56x1.25

VEGA

Dimensions

VEGABAR 64, extension fitting for paper industry

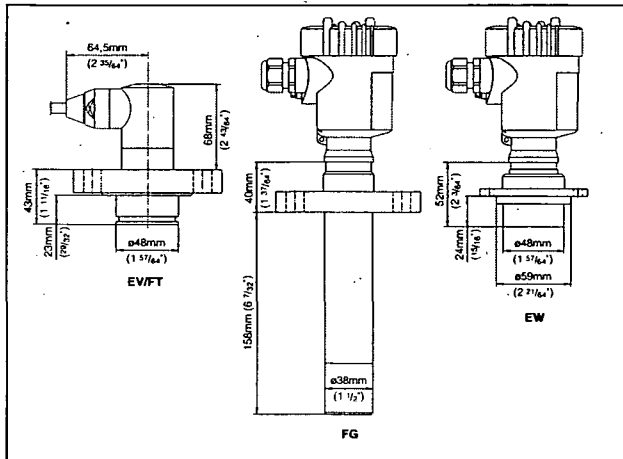


Fig. 36: VEGABAR 64 extension fitting for paper industry: EV/FT = absolutely flush for pulper (EV 2-times flattened), FG = extension for ball valve fitting, EW = flange for manometer lug

VEGABAR 65, threaded fitting

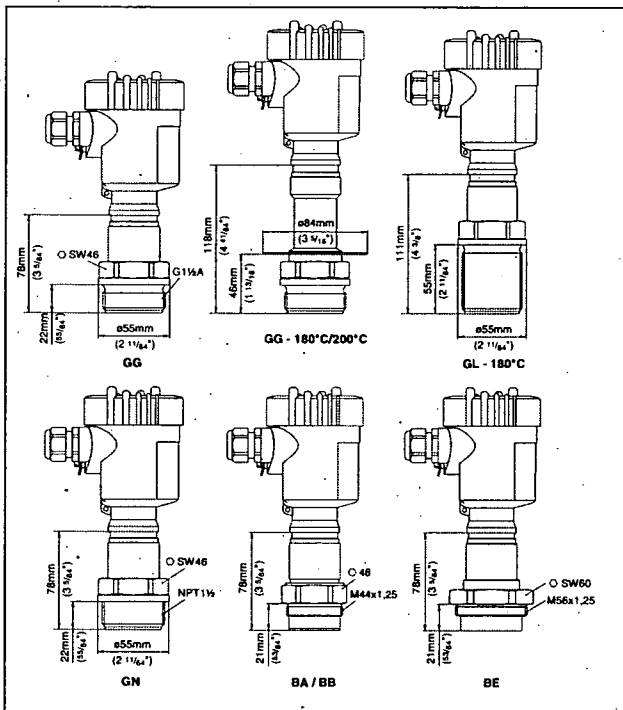


Fig. 37: VEGABAR 65, threaded fitting: GG = G1 1/2 A, GL = G1 1/2 A thread length 55 mm, GN = 1 1/2 NPT, BA/BB = M44x1.25; BE = M56x1.25

VEGABAR 65, hygienic fitting 1

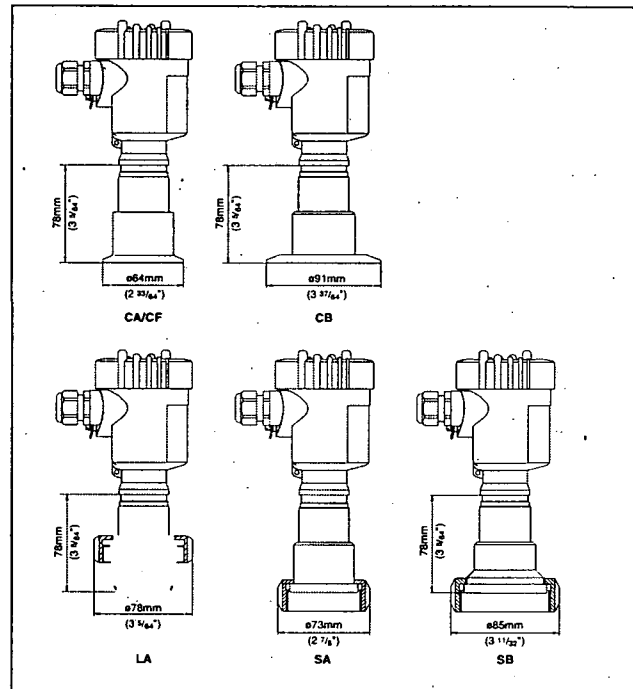


Fig. 38: VEGABAR 65, hygienic fitting: CA/CF = Tri-Clamp 2\"/>

VEGABAR 65, hygienic fitting 2

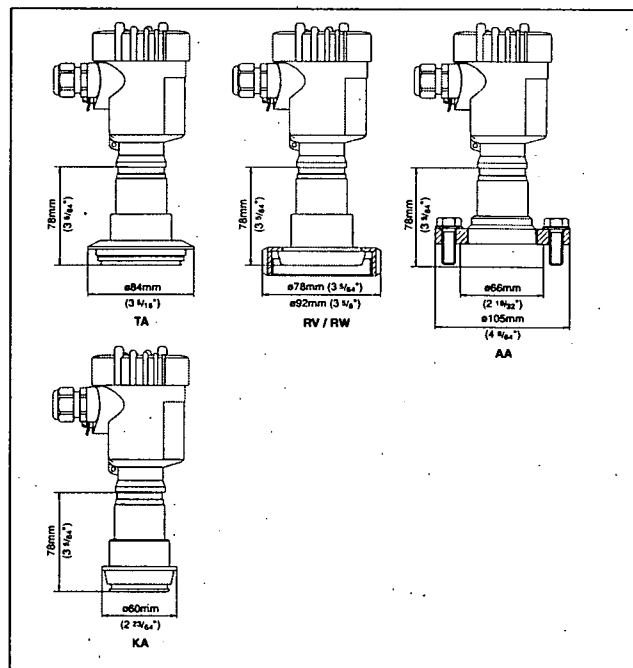


Fig. 39: VEGABAR 65, hygienic fitting: TA = Tuchenhagen Varivent DN 32, RV/RW = bolting DN 40/DN 50 according to DIN 11851, AA = DRD, KA = conus DN 40

Dimensions

VEGA

VEGABAR 65, flange fitting

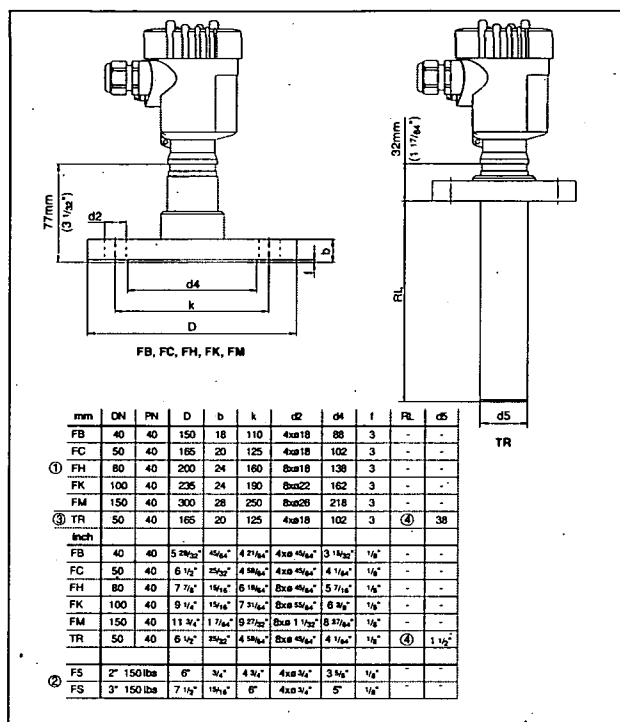


Fig. 40: VEGABAR 65, flange fitting

- 1 Flange connection according to DIN 2501
- 2 Flange fitting according to ANSI B16.5
- 3 Flange with extension
- 4 Order-specific

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VEGA

Dimensions

8 Product code

VEGABAR 61

Zulassung

XX ohne

XM Schiffzulassung

CX ATEX II 1G, 1/2G, 2G EEx ia IIC T6

CA ATEX II 1G, 1/2G, 2G EEx ia IIC T6 + WHG

CM ATEX II 1G, 1/2G, 2G EEx ia IIC T6 + Schiffzulassung

DX ATEX II 1/2G, 2G EEx d ia IIC T6¹⁾

Prozessanschluss / Werkstoff

FR Flansch DN25PN40 Form D, DIN2501 / 316L

FC Flansch DN50PN40 Form D, DIN2501 / 316L

FD Flansch DN50PN40 mit Tubus 50mm/ø48,5 / 316L

FH Flansch DN80PN40 Form D, DIN2501 / 316L

FJ Flansch DN80PN40 mit Tubus 50mm/ø74 / 316L

F1 Flansch 1" 150lb RF, ANSI B16.5 / 316L

F5 Flansch 2" 150lb RF, ANSI B16.5 / 316L

F7 Flansch 2" 150lb RF, ANSI mitTubus 2"/ø1,9" / 316L

FS Flansch 3" 150lb RF, ANSI B16.5 / 316L

FQ Flansch 3" 150lb RF, ANSI mitTubus 6"/ø2,9" / 316L

RA Rohrdruckmitter z.Einbau zw.Flansche DN25 / 316L

RH Rohrdruckmitter m. Clamp-Anschluss 2" / 316L

RT Rohrverschraubung DN25PN40, DIN11851 / 316L

RQ Rohrverschraubung DN32PN40, DIN11851 / 316L

RW Rohrverschraubung DN50PN25, DIN11851 / 316L

Druckmittlerflüssigkeit / Temperatur

A Silikonöl KN2.2 / -40...150°C (Pabs <1bar-40...150°C)

C Silikonöl KN3.2+Köhl. / -40...200°C (Pabs <1bar-40...150°C)

G HT-Öl KN3.2+Köhl. / -10...300°C (Pabs <1bar-10...200°C)

H HT-Öl KN3.2+Köhl. 1mV / -10...400°C (Pabs <1bar-10...200°C)

I Halocarbonöl KN21 / -40...150°C (Pabs <1bar-40...80°C)

J silikonfreie Flüssigkeit KN70 / -40...70°C (kein Vakuum)

M Med.Weißöl KN62(FDA) / -15...150°C (Pabs <1bar-15...150°C)

R Med.Weißöl+Köhl.KN62 / -15...200°C (Pabs <1bar-15...150°C)

Werkstoff Membran

1 316L

2 Hastelloy C276

5 Tantal²⁾7 PTFE³⁾

8 1.4435 mit Goldbeschichtung (25µm)

Druckart / Messbereich

C rel. / 0...0,4 bar (0...40 kPa)

D rel. / 0...1 bar (0...100 kPa)

E rel. / 0...2,5 bar (0...250 kPa)

W rel. / 0...100 bar (0...10000 kPa)

J rel. / 0...250 bar (0...25000 kPa)

F rel. / 0...5 bar (0...500 kPa)

G rel. / 0...10 bar (0...1000 kPa)

T rel. / 0...25 bar (0...2500 kPa)

N rel. / 0...60 bar (0...6000 kPa)

P rel. / -1...0 bar (-100...0 kPa)

Q rel. / -1...1,5 bar (-100...150 kPa)

R rel. / -1...5 bar (-100...500 kPa)

S rel. / -1...10 bar (-100...1000 kPa)

H rel. / -1...25 bar (-100...2500 kPa)

V rel. / -1...60 bar (-100...6000 kPa)

M rel. / -0,2...0,2 bar (-20...20 kPa)

O rel. / -0,5...0,5 bar (-50...50 kPa)

1 abs. / 0...1 bar (0...100 kPa)⁴⁾2 abs. / 0...2,5 bar (0...250 kPa)⁴⁾3 abs. / 0...5 bar (0...500 kPa)⁴⁾4 abs. / 0...10 bar (0...1000 kPa)⁴⁾5 abs. / 0...25 bar (0...2500 kPa)⁴⁾

Elektronik

H 4...20mA/HART®

P Profibus PA

F Foundation Fieldbus

Gehäuse / Schutzart

K Kunststoff / IP66/IP67

A Aluminium / IP66/IP67

D Aluminium-Zweikammer / IP66/IP67

V Edelstahl 316L / IP66/IP67

T PE-Kabel axial IP68, ext. Gehäuse Kunststoff IP68/67⁴⁾U PE-Kabel axial IP68, ext. Gehäuse 316L IP68/67⁴⁾

Kabelinführung / Steckeranschluss

M M20x1,5 / ohne

N 1/2NPT / ohne

Anzeige-/Bedienmodul (PLICSCOM)

X ohne

A oben eingebaut

BR61.

¹⁾ nur in Verbindung mit Gehäuse / Schutzart "D"²⁾ nur bei Flanschdurchführung³⁾ max. Mediumtemperatur 200°C⁴⁾ Bei allen Absolutdruckmessbereichen wird automatisch ein Vakuumservice durchgeführt

VEGABAR 63

Zulassung

XX ohne

XM Schiffzulassung

CX ATEX II 1G, 1/2G, 2G EEx ia IIC T6

CA ATEX II 1G, 1/2G, 2G EEx ia IIC T6 + WHG

CM ATEX II 1G, 1/2G, 2G EEx ia IIC T6 + Schiffzulassung

DX ATEX II 1/2G, 2G EEx d ia IIC T6¹⁾GX ATEX II 1/2G, 2G EEx d ia IIC T6¹⁾

UX FM Cl.I, Div2 (NI)+Cl.II, III, Div1 (DIP)

UF FM Cl.I-III, Div 1 (IS)

Prozessanschluss / Werkstoff

GV G1/4, Manometerschluss EN837 PN160 / 316L

GF G1/4, frontbündig / 316Ti mit O-Ring ab 2,5bar

GC G1/4, frontbündig / 316Ti mit O-Ring bis 1,6bar

GG G1/4, frontbündig / 316Ti

GN Gewinde 1/2NPT/316Ti

CC Tri-Clamp 1/2" PN16 / 316L

CA Tri-Clamp 2" PN16 / 316L

LA asept. Anschluss mit Nulöbenvorwurfmutter F40 PN40 / 316L

RA Rohrverschraubung DN40PN40 DIN11851 / 316L

RC Rohrverschraubung DN40PN25 DIN11864 ZG2820/316L

RB Rohrverschraubung DN50PN25 DIN11851 / 316L

RD Rohrverschraubung DN50PN25 Form A DIN11864 / 316L

AA DRD PN40 / 316L

EA Flansch DN40PN40 Form C, DIN2501 / 316L

FB Flansch DN50PN40 Form C, DIN2501 / 316L

FM Flansch DN80PN40 Form C, DIN2501/316L

Dichtung

1 FKM (Viton)²⁾3 EPDM²⁾4 NBR²⁾

X ohne

R Chemraz

Druckart / Messbereich

C rel. / 0...0,4 bar (0...40 kPa)

D rel. / 0...1,6 bar (0...160 kPa)

U rel. / 0...40,0 bar (0...4000 kPa)

W rel. / 0...100,0 bar (0...10000 kPa)

X rel. / 0...250,0 bar (0...25000 kPa)

O rel. / -1...3,0 bar (-100...3000 kPa)

P rel. / -1...5,0 bar (-100...5000 kPa)

Q rel. / -1...15,0 bar (-100...15000 kPa)

Z rel. / 0...800,0 bar (0...80000 kPa)

1 abs. / 0...0,4 bar (0...40 kPa)

2 abs. / 0...1,6 bar (0...160 kPa)

3 abs. / 0...8,0 bar (0...8000 kPa)

4 abs. / 0...16,0 bar (0...16000 kPa)

Y Bitte Messbereich bekanntgeben!

Elektronik

H 4...20mA/HART®

P Profibus PA

F Foundation Fieldbus

Gehäuse / Schutzart

K Kunststoff / IP66/IP67

A Aluminium / IP66/IP67

D Aluminium-Zweikammer / IP66/IP67

V Edelstahl 316L / IP66/IP67

T PE-Kabel axial IP68, ext. Gehäuse Kunststoff IP68/67⁴⁾U PE-Kabel axial IP68, ext. Gehäuse 316L IP68/67⁴⁾

Kabelinführung / Steckeranschluss

M M20x1,5 / ohne

N 1/2NPT / ohne

Anzeige-/Bedienmodul (PLICSCOM)

X ohne

A oben eingebaut

BR63.

¹⁾ nur in Verbindung mit Gehäuse / Schutzart "D"²⁾ nur bei frontbündiger Gewindeausführung³⁾ 6 m Anschlusskabel PE mit Druckausgleichskapillare inkl. Wand- und Hutschienenmontageset

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VEGABAR 65

Zufassung

XX ohne
XM Schiffszufassung
CX ATEX II 1G, 1/2G, 2G EEx ia IIC T6
CA ATEX II 1G, 1/2G, 2G EEx ia IIC T6 + WHG
CM ATEX II 1G, 1/2G, 2G EEx ia IIC T6 + Schiffszufassung
DX ATEX II 1/2G, 2G EEx d ia IIC T6¹⁾

Prozessanschluss/Werkstoff (weitere auf Anfrage)

GC Gewinde G1A PN60/1.4435(316L)²⁾
GN Gewinde 1½NPT PN60/1.4435(316L)
CA Tri-Clamp 2" PN10/1.4435(316L)
LA sept. Anschluss mit Nutüberwurfmutter F40 PN40/1.4435
TA Tuchenhagen Variant DN32...1½"...PN25/1.4435(316L)
RA Rohrverschraubung DN40/PN40 DIN1185/1.4435(316L)
RS SMS DN38 PN6/1.4435(316L)
AA ORD PN40/1.4435(316L)
BA M44x1.25,Alt.-Druckschraube PN25/1.4435(316L)
EA Flansch DN40/PN40 Form C,DIN2501/1.4435(316L)

Dichtung Messzeile

1 Viton
2 Kalrez 6375
3 EPDM

Druckart/Messbereich (weitere auf Anfrage)

K Überdruck/-0.05...0.05 bar(-5...5 kPa)
A Überdruck/0...0.1 bar(0...10 kPa)
E Überdruck/0...2.5 bar(0...250 kPa)
I Absolutdruck/0...1 bar(0...100 kPa)

Elektronik

H 4...20mA HART®
P Profibus PA
F Foundation Fieldbus

Gehäuse/Schutzart

K Kunststoff/IP66/IP67
A Aluminium/IP66/IP67
D Aluminium-Zweikammer/IP66/IP67
V Edelstahl 1.4435(316L)/IP66/IP67
T PE-Kabel axial IP68, ext. Gehäuse Kunststoff IP65³⁾
U PE-Kabel axial IP68, ext. Gehäuse 1.4435 IP65³⁾

Kabeleinführung/Steckeranschluss

M M20x1,5/ohne
N ½NPT/ohne

X ohne
A oben eingebaut
B seitlich eingebaut

BR64.

¹⁾ nur in Verbindung mit Gehäuseausführung "D"
²⁾ nicht mit Kalrez Dichtung
³⁾ 6 m Anschlusskabel PE mit Druckausgleichskapillare inkl. Wand- und Hutschienenmontageset

Zulassung
XX ohne
XM Schiffszulassung
CX ATEX II 1G, 1/2G, 2GEE ex IIC T6
CA ATEX II 1G, 1/2G, 2GEE ex IIC T6 + WHG
CM ATEX II 1G, 1/2G, 2GEE ex IIC T6 + Schiffszulassung
DX ATEX II 1/2G, 2GEE ex IIA IIC T6¹⁾

Prozessanschluss / Werkstoff
FB Flansch DN40PN40 Form C, DIN2501 / 316L
FC Flansch DN50PN40 Form C, DIN2501 / 316L
TR Flansch m.Tubus DN50PN40 ZG287/3, 316L
FH Flansch DN80PN40 Form C, DIN2501 / 316L
F5 Flansch 2" 150lb RF, ANSI B16.5 / 316L
GG Gewinde G1½A PN60 / 316L
GN Gewinde 1½NPT PN60 / 316L
CA Tri-Clamp 2" PN10 / 316L
LA asept. Anschluss m.Nüßtenwurfmutter F40PN40 / 316L
TA Tuchenhagen Varivent DN32...1½"; PN25 / 316L
RV Rohrverschraubung DN40PN40, DIN11851 / 316L
RW Rohrverschraubung DN50PN25, DIN11851 / 316L
AA DRD PN40 / 316L
BB M44x1,25 mit Druckschraube 316L PN60 / 316L
SB SMS DN51 PN6 / 316L

Druckmittlerflüssigkeit / Temperatur
M Med.Weißöl (FDA) / -12...140°C (Pabs<1bar-12...130°C)
N Med.Weißöl (FDA) / -12...120°C (Pabs<1bar-12...120°C)
S Med.Weißöl/Köhl (FDA) / -12...180°C (Pabs<1bar-12...130°C)
R Med.Weißöl/Köhl (FDA) / -12...200°C (Pabs<1bar-12...130°C)

Druckart / Messbereich
A rel. / 0...0,1bar (0...10kPa)
B rel. / 0...0,2bar (0...20kPa)
C rel. / 0...0,4bar (0...40kPa)
D rel. / 0...1,0bar (0...100kPa)
E rel. / 0...2,5bar (0...250kPa)
F rel. / 0...5,0bar (0...500kPa)
G rel. / 0...10,0bar (0...1000kPa)
T rel. / 0...25,0bar (0...2500kPa)
P rel. / -1...0,0bar (-100...0kPa)
Q rel. / -1...1,5bar (-100...150kPa)
R rel. / -1...5,0bar (-100...500kPa)
S rel. / -1...10,0bar (-100...1000kPa)
H rel. / -1...25,0bar (-100...2500kPa)
K rel. / -0,05...0,05bar (-5...5kPa)
L rel. / -0,1...0,1bar (-10...10kPa)
M rel. / -0,2...0,2bar (-20...20kPa)
O rel. / -0,5...0,5bar (-50...50kPa)
1 abs. / 0...1,0bar (0...100kPa)
2 abs. / 0...2,5bar (0...250kPa)
3 abs. / 0...5,0bar (0...500kPa)
4 abs. / 0...10,0bar (0...1000kPa)
5 abs. / 0...25,0bar (0...2500kPa)

Elektronik
H 4...20mA/HART®
P Profibus PA
F Foundation Fieldbus

Gehäuse / Schutzart
K Kunststoff / IP66/IP67
A Aluminium / IP66/IP67
D Aluminium-Zweikammer / IP66/IP67
V Edelstahl 316L / IP66/IP67
T PE-Kabel axial IP68, ext. Gehäuse Kunststoff IP65²⁾

Kabeleinführung / Steckeranschluss
M M20x1,5 / ohne
N ½NPT / ohne
Anzeig-/Bedienmodul (PLICSCOM)
X ohne
A oben eingebaut

BR65.

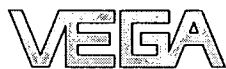
¹⁾ nur in Verbindung mit Gehäuse / Schutzart "D"
²⁾ 6 m Anschlusskabel PE mit Druckausgleichskapillare inkl. Wand- und Hutschienenmontageset

VEGA

29235-061205

VEGA

29235-61205



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www.vega.com



You can find at www.vega.com
downloads of the following

- operating instructions manuals
- menu schematics
- software
- certificates
- approvals
- and much, much more

Subject to change without prior notice

29235-EN-061205

VEGA

Operating Instructions

VEGABAR 64

4 ... 20 mA/HART



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VEGABAR 64 - 4 ... 20 mA/HART

3

Supplementary operating instructions manuals



Information:

VEGABAR 64 is available in many versions and is thus supplied according to customer order. Depending on the selected version, supplementary operating instructions manuals also come with the delivery. You will find the supplementary operating instructions manuals in chapter "*Product description*".

Operating instructions manuals for accessories and replacement parts



Tip:

To ensure reliable setup and operation of your VEGABAR 64, we offer accessories and replacement parts. The associated documents are:

- Supplementary instructions manual "*Welded socket and seals*"
- Operating instructions manual "*External indicating and adjustment unit VEGADIS 61*"
- Operating instructions manual "*Oscillator VEGABAR series 50 and 60*"

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1 About this document

1.1 Function

This operating instructions manual has all the information you need for quick setup and safe operation. Please read this manual before you start setup.

1.2 Target group

This operating instructions manual is directed to trained personnel. The contents of this manual should be made available to these personnel and put into practice by them.

1.3 Symbolism used



Information, tip, note

This symbol indicates helpful additional information.



Caution: If this warning is ignored, faults or malfunctions can result.

Warning: If this warning is ignored, injury to persons and/or serious damage to the instrument can result.

Danger: If this warning is ignored, serious injury to persons and/or destruction of the instrument can result.



Ex applications

This symbol indicates special instructions for Ex applications.



List

The dot set in front indicates a list with no implied sequence.



Action

This arrow indicates a single action.



Sequence

Numbers set in front indicate successive steps in a procedure.

For your safety

VEGA

2 For your safety

2.1 Authorised personnel

All operations described in this operating instructions manual must be carried out only by trained specialist personnel authorised by the operator. For safety and warranty reasons, any internal work on the instruments must be carried out only by personnel authorised by the manufacturer.

2.2 Appropriate use

VEGABAR 64 is a pressure transmitter for measurement of gauge pressure, absolute pressure and vacuum.

2.3 Warning about misuse

Inappropriate or incorrect use of the instrument can give rise to application-specific hazards, e.g. vessel overfill or damage to system components through incorrect mounting or adjustment.

2.4 General safety instructions

VEGABAR 64 is a high-tech instrument requiring the strict observance of standard regulations and guidelines. The user must take note of the safety instructions in this operating instructions manual, the country-specific installation standards (e.g. the VDE regulations in Germany) as well as all prevailing safety regulations and accident prevention rules.

2.5 CE conformity

VEGABAR 64 is in CE conformity with EMC (89/336/EEG), fulfils NAMUR recommendation NE 21 and is in CE conformity with LVD (73/23/EEG).

Conformity has been judged according to the following standards:

- EMC:
 - Emission EN 61326: 2004 (class B)
 - Susceptibility EN 61326: 2004 including supplement A
- LVD: EN 61010-1: 2001

VEGABAR 64 is not subject to the pressure device guideline.¹⁾

¹⁾ Due to the flush diaphragm, no own pressure compartment is formed.

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For your safety

2.6 Fulfilling NAMUR recommendations

With regard to interference resistance and interference emission, VEGABAR 64 fulfils NAMUR recommendation NE 21.

VEGABAR 64 and its indicating and adjustment components fulfill NAMUR recommendation NE 53 in respect to compatibility. VEGA instruments are generally upward and downward compatible:

- Sensor software to DTM-VEGABAR 64 HART, PA or FF
- DTM VEGABAR 64 for adjustment software PACTware™
- Indicating and adjustment module for sensor software

The parameter adjustment of the basic sensor functions is independent of the software version. The range of available functions depends on the respective software version of the individual components.

The software version of VEGABAR 64 can be determined as follows:

- via PACTware™
- on the type label of the electronics
- via the indicating and adjustment module

You can view all software histories on our website www.vega.com. Make use of this advantage and get registered for update information via e-mail.

2.7 SIL conformity

VEGABAR 64 fulfills the requirements for functional safety according to IEC 61508/IEC 61511. You find further information in the Safety Manual "VEGABAR series 50 and 60 - 4 ... 20 mA/HART".

2.8 Safety instructions for Ex areas

Please note the Ex-specific safety information for installation and operation in Ex areas. These safety instructions are part of the operating instructions manual and come with the Ex-approved instruments.

2.9 Manufacturer declaration

In conformity with DIN EN 60079-14/2004, para. 5.2.3, point c1, VEGABAR 64 is suitable for use in zone 2.

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VEGABAR 64 - 4 ... 20 mA/HART

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For your safety

VEGA

The operator must use the instrument as it was intended to be used and follow the specifications of the following documents:

- this operating instructions manual
- this manufacturer declaration (24633)
- the applicable installation regulations

Max. increase of the surface temperature during operation:
50 K (individual component in the instrument)

With an ambient temperature of 70 °C (158 °F) on the housing and a process temperature of 70 °C (158 °F), the max. surface temperature during operation (single component in the instrument) is 120 °C (248 °F).

Measures to maintain explosion protection during operation:

- Operate the instrument in the range of the specified electrical limit values. Permissible supply voltage: see "Technical data"
- Mount and operate the instrument in such a way that no danger of ignition by electrostatic charges is to be expected. Process fitting or housing (as the case may be depending on instrument version) are made of electrically non-conductive plastic.
- Make sure that the seal is mounted correctly between lower part of the housing and cover. Screw the cover on tightly.
- Make sure there is no explosive atmosphere present if you intend to operate the instrument with opened cover
- Make sure that the cable gland is tight and strain-relieved. The outer diameter of the connection cable must be adapted to the cable gland. Tighten the pressure screw of the cable gland carefully.
- Cover unused openings for cable glands tightly
- Mount the instrument in such a position that the sensor cannot touch the vessel wall or vessel installations. Keep the influence of product movement in the vessel in mind.
- The surface temperature of the housing must not exceed the ignition temperature of the surrounding explosive atmosphere

This instrument was assessed by a person who fulfils the DIN EN 60079-14 requirements.

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For your safety

2.10 Functional range of approved instruments

Instruments with StEx, WHG or ship approval as well as national approvals such as according to FM or CSA are partly supplied with a previous hardware or software version. For approval-technical reasons, some functions for these instruments will be only available at a later date.

You will find corresponding instructions in the description of the individual functions in this operating instructions manual.

2.11 Environmental instructions

Protection of the environment is one of our most important duties. That is why we have introduced an environment management system with the goal of continuously improving company environmental protection. The environment management system is certified according to DIN EN ISO 14001.

Please help us fulfil this obligation by observing the environmental instructions in this manual:

- Chapter "*Storage and transport*"
- Chapter "*Disposal*".

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VEGABAR 64 - 4 ... 20 mA/HART

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3 Product description

3.1 Configuration

Scope of delivery

The scope of delivery encompasses:

- VEGABAR 64 pressure transmitter
- Documentation
 - this operating instructions manual
 - Supplementary instructions manual "Safety Manual according to IEC 61508/IEC 61511 (SIL)"
 - Operating instructions manual "Indicating and adjustment module" (optional)
 - Supplementary instructions manual "Heating for indicating and adjustment module" (optional)
 - Supplementary instructions manual "Plug connector for continuously measuring sensors" (optional)
 - Ex-specific "Safety instructions" (with Ex-versions)
 - if necessary, further certificates

Components

VEGABAR 64 consists of the following components:

- Process fitting with measuring cell
- Housing with electronics, optionally available with plug connector
- Housing cover, optionally available with indicating and adjustment module PLICSCOM

The components are available in different versions.

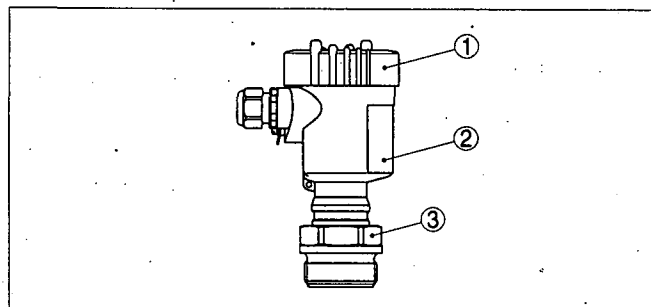


Fig. 1: Example of a VEGABAR 64 with process fitting G1½ A and plastic housing

- 1 Housing cover with integrated PLICSCOM (optional)
- 2 Housing with electronics
- 3 Process fitting with measuring cell

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3.2 Principle of operation

Area of application

VEGABAR 64 is a pressure transmitter for use in the paper, food processing and pharmaceutical industries as well as in water/sewage water plants. Depending on the version, it is used for level, gauge, absolute pressure or vacuum measurement. Measured products are gases, vapours and liquids, also those containing abrasive substances.

Physical principle

The sensor element is the CERTEC® measuring cell with flush, abrasion resistant ceramic diaphragm. The hydrostatic pressure of the medium or the process pressure causes a capacitance change in the measuring cell via the diaphragm. This change is converted into an appropriate output signal and outputted as measured value.

The CERTEC® measuring cell is also equipped with a temperature sensor. The temperature value can be displayed via the indicating and adjustment module or processed via the signal output.

Power supply

Two-wire electronics 4 ... 20 mA/HART for power supply and measured value transmission on the same cable.

The voltage supply range can differ depending on the instrument version.

The data for power supply are stated in chapter "Technical data" in the "Supplement".

The backlight of the indicating and adjustment module is powered by the sensor. The prerequisite for this is a supply voltage at a certain level. The exact voltage specifications are stated in chapter "Technical data" in the "Supplement".

This function is for instruments with StEx, WHG or ship approval as well as country-specific approvals such as those according to FM or CSA, available at a later date.

The optional heating requires its own power supply. You can find further details in the supplementary instructions manual "Heating for indicating and adjustment module".

This function is generally not available for approved instruments.

3.3 Operation

VEGABAR 64 can be adjusted with different adjustment media:

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VEGABAR 64 - 4 ... 20 mA/HART

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Product description



- with indicating and adjustment module
- with the suitable VEGA DTM in conjunction with an adjustment software according to the FDT/DTM standard, e.g. PACTware™ and PC
- with manufacturer-specific adjustment programs AMS™ or PDM
- a HART handheld

The entered parameters are generally saved in VEGABAR 64, optionally also in the indicating and adjustment module or in PACTware™.

3.4 Storage and transport

Packaging

Your instrument was protected by packaging during transport. Its capacity to handle normal loads during transport is assured by a test according to DIN EN 24180.

The packaging of standard instruments consists of environment-friendly, recyclable cardboard. For special versions, PE foam or PE foil is also used. Dispose of the packaging material via specialised recycling companies.

Storage and transport temperature

- Storage and transport temperature see "*Supplement - Technical data - Ambient conditions*"
- Relative humidity 20 ... 85 %

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4 Mounting

4.1 General instructions

Materials, wetted parts

Make sure that the wetted parts of VEGABAR 64, especially the seal and process fitting, are suitable for the existing process conditions such as pressure, temperature etc. as well as the chemical properties of the medium.

You will find specification in chapter "*Technical data*" in the "*Supplement*".

Installation location

Select an installation position you can easily reach for mounting and connecting as well as later retrofitting of an indicating and adjustment module. The housing can be rotated by 330° without the use of any tools. You can also install the indicating and adjustment module in four different positions (each displaced by 90°).

Moisture

Use the recommended cables (see chapter "*Connecting to power supply*") and tighten the cable gland.

You can give your VEGABAR 64 additional protection against moisture penetration by leading the connection cable downward in front of the cable entry. Rain and condensation water can thus drain off. This applies mainly to mounting outdoors, in areas where moisture is expected (e.g. by cleaning processes) or on cooled or heated vessels.

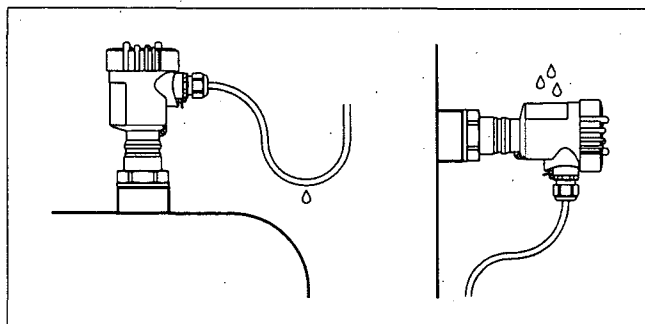


Fig. 2: Measures against moisture penetration

4.2 Mounting steps

Welding the socket

For mounting VEGABAR 64, a welded socket is required. You find the components in the line of the VEGA accessory in the

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Mounting

VEGA

supplementary instructions manual "*Welded socket and seals*".

Sealing/Screwing in threaded versions

Seal the thread with teflon, hemp or a similar resistant seal material on the process fitting thread 1½ NPT.

→ Turn VEGABAR 64 with a suitable wrench on the hexagon of the process fitting into the welded socket. Wrench size see "*Dimensions*".



Warning:

The housing must not be used to screw the instrument in! Applying tightening force on the housing can damage its rotational mechanical parts.

Sealing/Screwing in flange versions

Seal the flange connections acc. to DIN/ANSI with a suitable, resistant seal and mount VEGABAR 64 with suitable screws.

Sealing/Screwing in hygienic fittings

Use the seal suitable for the respective process fitting. You find the components in the line of VEGA accessories in the supplementary instructions manual "*Welded socket and seals*".

4.3 Mounting steps, remote housing

Wall mounting

- 1 Mark the holes acc. to the following drilling template
- 2 Depending on the mounting surface, fasten the wall mounting plate with 4 screws

VEGA

Mounting

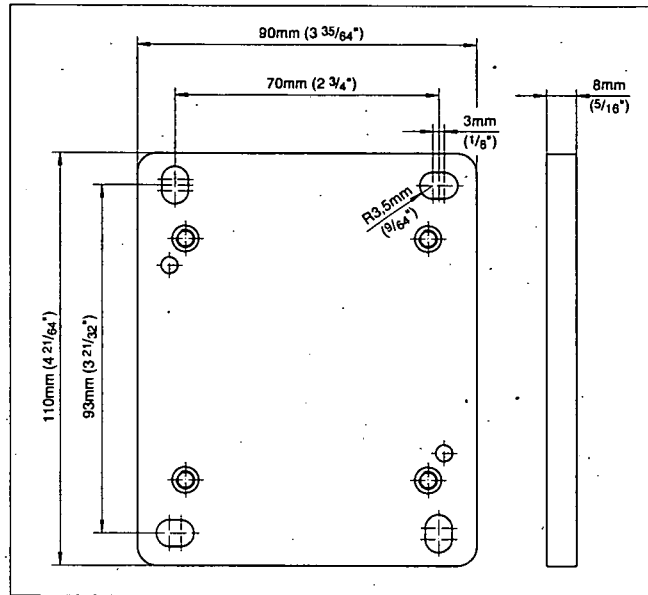


Fig. 3: Drilling template - wall mounting plate

**Tip:**

Mount the wall mounting plate so that the cable entry of the socket housing points downward. The socket housing can be displaced by 180° to the wall mounting plate.

**Warning:**

The four screws for the socket housing must only be hand-screwed. A torque >5 Nm can damage the wall mounting plate.

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5 Connecting to voltage supply

5.1 Preparing the connection

Note safety instructions

Generally not the following safety instructions:

- Connect only in the complete absence of line voltage
- If overvoltage surges are expected, overvoltage arresters should be installed



Tip:

We recommend using VEGA overvoltage arresters ÜS-F-LB-I and ÜSB 62-36G.X.

Take note of safety instructions for Ex applications



In hazardous areas you should take note of the appropriate regulations, conformity and type approval certificates of the sensors and power supply units.

Select power supply

Power supply and current signal are carried on the same two-wire cable. The voltage supply range can differ depending on the instrument version.

The data for power supply are stated in chapter "*Technical data*" in the "*Supplement*".

Provide a reliable separation between the supply circuit and the mains circuits acc. to DIN VDE 0106 part 101. The VEGA power supply units VEGATRENN 149AEx, VEGASTAB 690, VEGADIS 371 as well as all VEGAMETs meet this requirement.

Bear in mind the following factors regarding supply voltage:

- Output voltage of the power supply unit can be lower under nominal load (with a sensor current of 20.5 mA or 22 mA in case of failure message)
- Influence of further instruments in the circuit (see load values in chapter "*Technical data*")

Selecting connection cable

VEGABAR 64 is connected with standard two-wire cable without screen. A outer cable diameter of 5 ... 9 mm ensures the seal effect of the cable gland. If electromagnetic interference is expected which is above the test values of EN 61326 for industrial areas, screened cable should be used. For HART multidrop operation we recommend as standard practice the use of screened cable.

Cable gland ½ NPT

On VEGABAR 64 with cable gland ½ NPT and plastic housing, a metal ½" threaded insert is moulded in the plastic housing.

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Connecting to voltage supply

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- 9 Check the hold of the wires in the terminals by lightly pulling on them
 - 10 Connect the screen to the internal ground terminal and the external ground terminal to potential equalisation
 - 11 Tighten the compression nut of the cable entry, the seal ring must completely encircle the cable
 - 12 Screw the housing cover back on
- The electrical connection is hence finished.



Fig. 4: Connection steps 6 and 7

IP 68 version with remote housing

Proceed as follows:

- 1 Loosen the four screws on the housing socket with an Allen key size 4
- 2 Remove the mounting plate from the housing socket

VEGA

Connecting to voltage supply

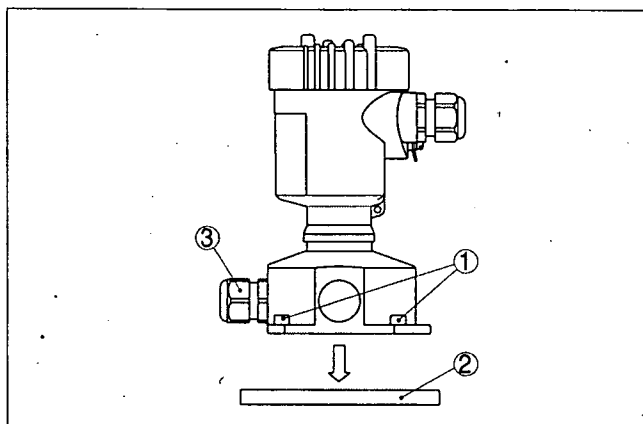


Fig. 5: Components of the remote housing for plics® devices

- 1 Screws
- 2 Wall mounting plate
- 3 Cable gland

- 3 Lead the connection cable through the cable gland on the housing socket²⁾



Information:

The cable gland can be mounted in three positions each displaced by 90°. Simply exchange the cable gland against the blind plug in the suitable thread opening.

- 4 Connect the wire ends as described under "Single/Double chamber housing" acc. to the numbering
- 5 Connect the screen to the internal ground terminal and the external ground terminal on top of the housing to potential equalisation
- 6 Tighten the compression nut of the cable entry, the seal ring must completely encircle the cable
- 7 Attach the mounting plate again and tighten the screws

The electrical connection of the sensor to the remote housing is finished.

²⁾ The connection cable is already preconfecteded. If necessary, shorten it to the requested length, cut the breather capillaries clean. Remove approx. 5 cm of the cable mantle, strip approx. 1 cm insulation from the ends of the individual wires. After shortening the cable, fasten the type plate with support back onto the cable.

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Connecting to voltage supply

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5.3 Wiring plan, single chamber housing

The following illustrations apply to the non-Ex as well as to the Ex ia version.



Housing overview

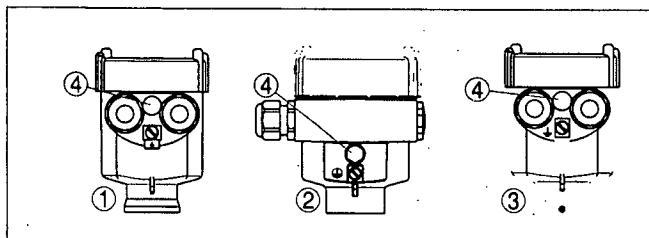


Fig. 6: Material versions, single chamber housing

- 1 Plastic
- 2 Aluminium
- 3 Stainless steel
- 4 Filter element for pressure compensation or blind stopper with version IP 66/
IP 68, 1 bar

Electronics and connection compartment

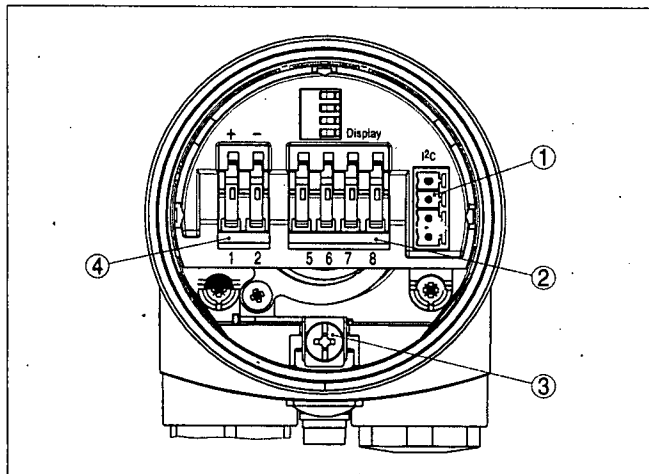


Fig. 7: Electronics and connection compartment, single chamber housing

- 1 Plug connector for VEGACONNECT (I²C interface)
- 2 Spring-loaded terminals for connection of the external indication VEGADIS 61
- 3 Ground terminal for connection of the cable screen
- 4 Spring-loaded terminals for voltage supply

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Connecting to voltage supply

Wiring plan

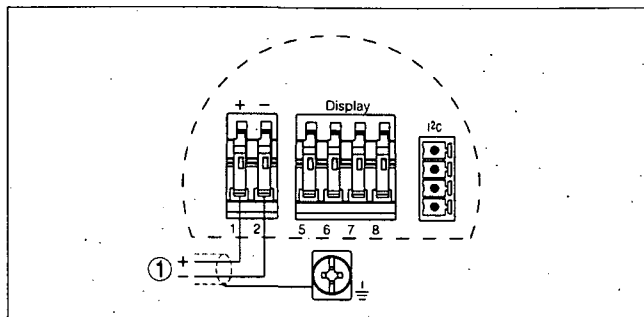


Fig. 8: Wiring plan, single chamber housing
1 Power supply/Signal output

5.4 Wiring plan, double chamber housing



The following illustration apply to non-Ex as well as Ex ia versions. The Exd version is described in the next subchapter.

Housing overview

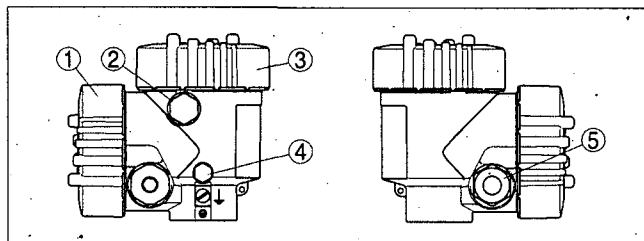


Fig. 9: Double chamber housing
1 Housing cover, connection compartment
2 Blind stopper or plug M12x1 for VEGADIS 61 (option)
3 Housing cover, electronics compartment
4 Filter element for pressure compensation or blind stopper with version IP 66/
IP 68, 1 bar³⁾
5 Cable entry or plug

³⁾ Version IP 66/IP 68, 1 bar not with four-wire instruments

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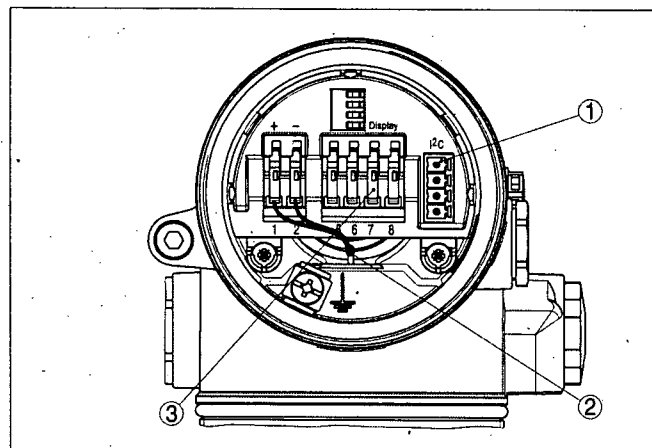
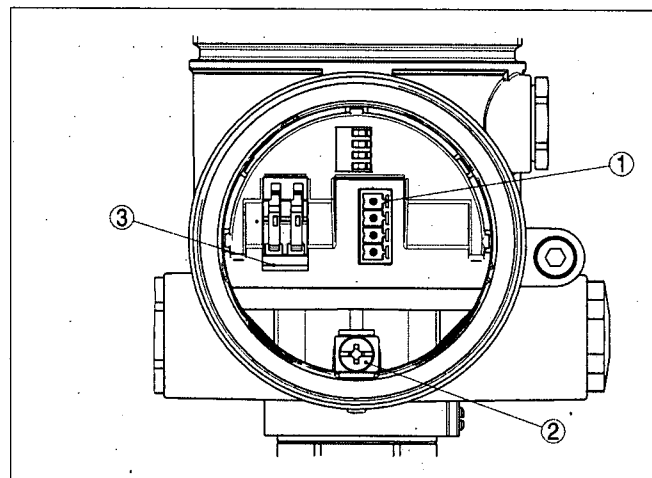


Fig. 10: Electronics compartment, double chamber housing
 1 Plug connector for VEGACONNECT (I²C interface)
 2 Internal connection cable to the connection compartment
 3 Terminals for VEGADIS 61



VEGA

Connecting to voltage supply

Wiring plan

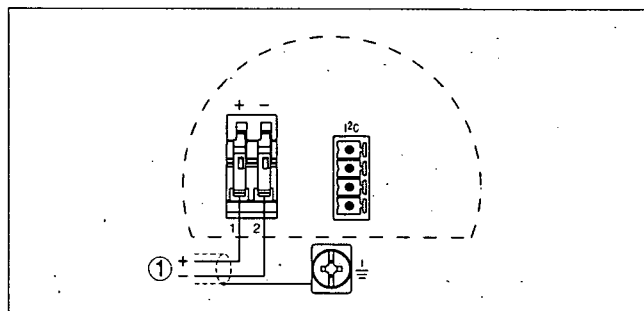


Fig. 12: Wiring plan, double chamber housing

1 Power supply/Signal output

5.5 Wiring plan, double chamber housing Exd

Housing overview

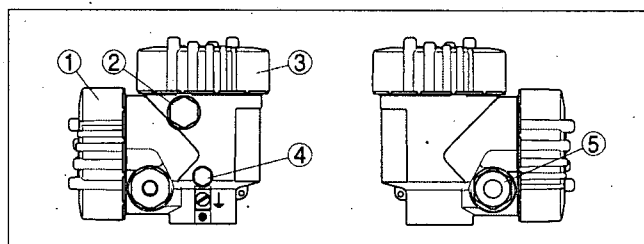


Fig. 13: Double chamber housing

- 1 Housing cover, connection compartment
- 2 Blind stopper or plug M12x1 for VEGADIS 61 (option)
- 3 Housing cover, electronics compartment
- 4 Filter element for pressure compensation or blind stopper with version IP 66/
IP 68, 1 bar⁴⁾
- 5 Cable entry or plug

⁴⁾ Version IP 66/IP 68, 1 bar not with four-wire instruments

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Connecting to voltage supply

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Electronics compartment

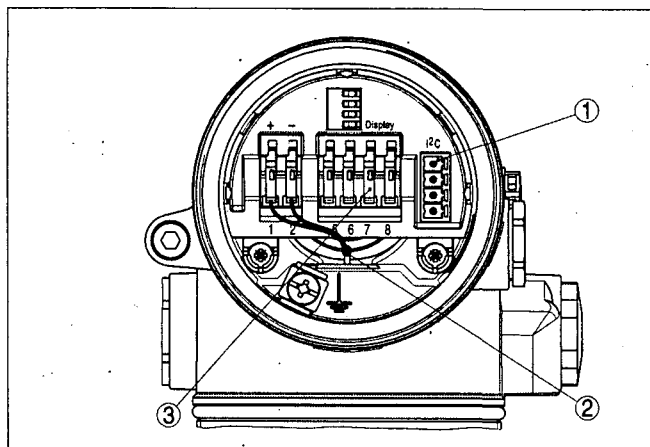


Fig. 14: Electronics compartment, double chamber housing
 1 Plug connector for VEGACONNECT (I²C interface)
 2 Internal connection cable to the connection compartment
 3 Terminals for VEGADIS 61

Connection compartment

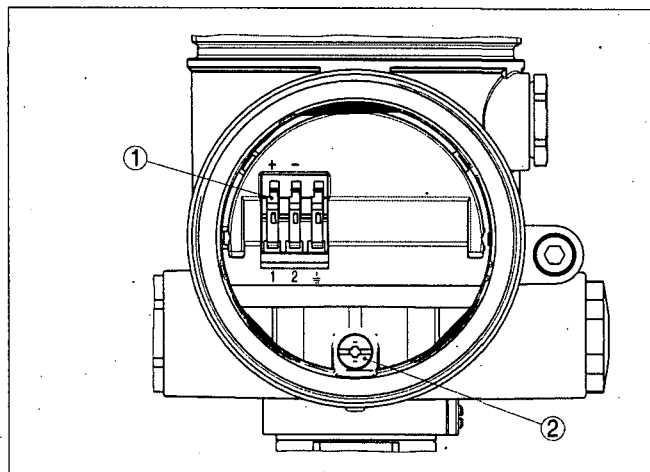


Fig. 15: Connection compartment, double chamber housing Exd
 1 Spring-loaded terminals for power supply and cable screen
 2 Ground terminal for connection of the cable screen

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Connecting to voltage supply

Wiring plan

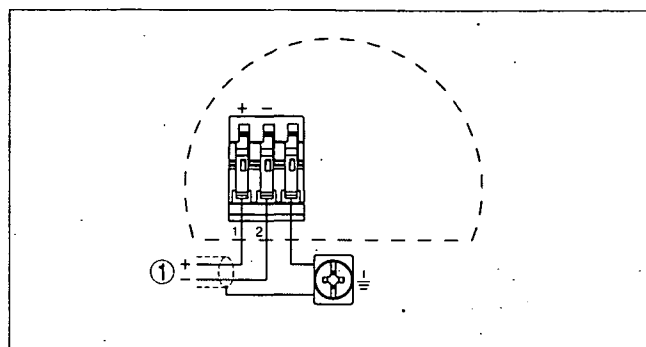


Fig. 16: Wiring plan, double chamber housing Exd
1 Power supply/Signal output

5.6 Wiring plan, version IP 66/IP 68, 1 bar

This version is only available for instruments with absolute pressure measuring ranges.

Wire assignment, connection cable

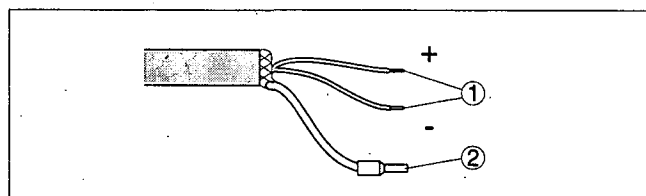


Fig. 17: Wire assignment, connection cable
1 brown (+) and blue (-) to power supply or to the processing system
2 Screen

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Connecting to voltage supply

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5.7 Wiring plan, remote housing with version IP 68

Overview

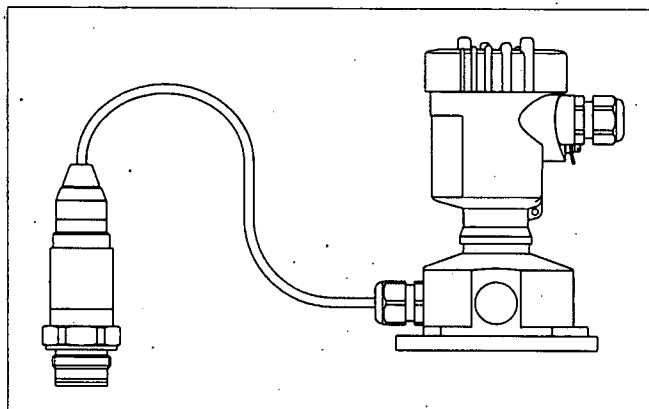


Fig. 18: VEGABAR 64 in IP 68 version 25 bar non-Ex and axial cable outlet, remote housing

Electronics and connection compartment

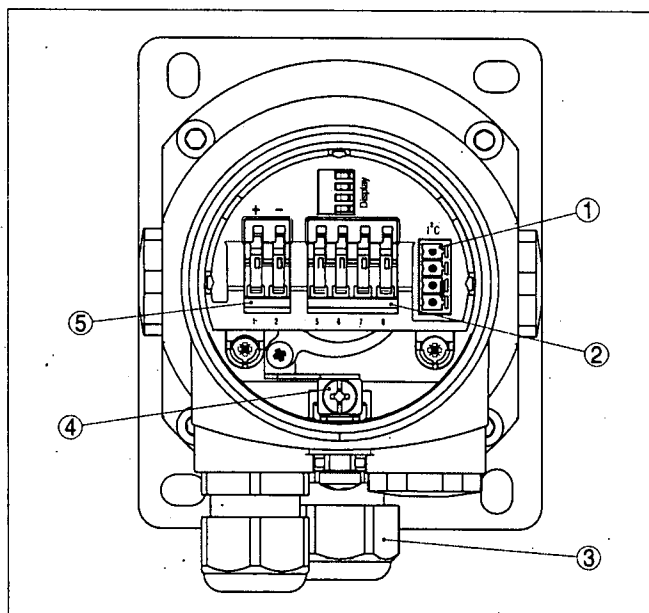


Fig. 19: Electronics and connection compartment

- 1 Plug connector for VEGACONNECT (I²C interface)
- 2 Spring-loaded terminals for connection of the external indication VEGADIS 61
- 3 Cable gland to VEGABAR
- 4 Ground terminal for connection of the cable screen
- 5 Spring-loaded terminals for voltage supply

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Connecting to voltage supply

Terminal compartment, housing socket

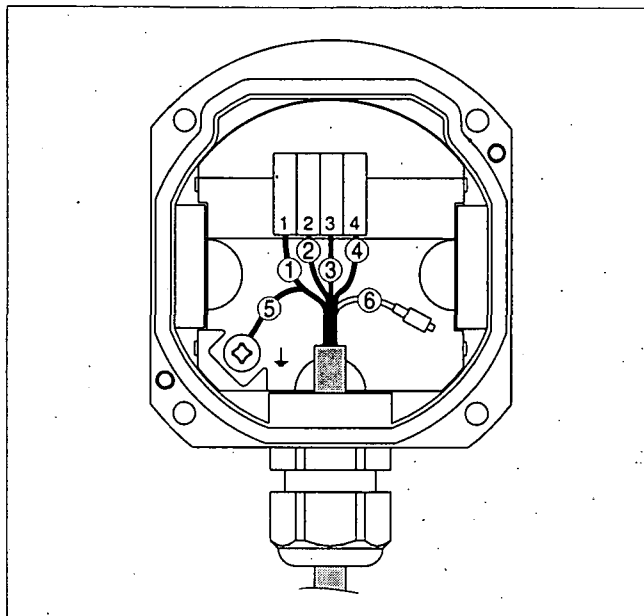


Fig. 20: Connection of the sensor in the housing socket

- 1 Brown
- 2 Blue
- 3 Yellow
- 4 White
- 5 Screen
- 6 Breather capillaries

Wiring plan, remote electronics

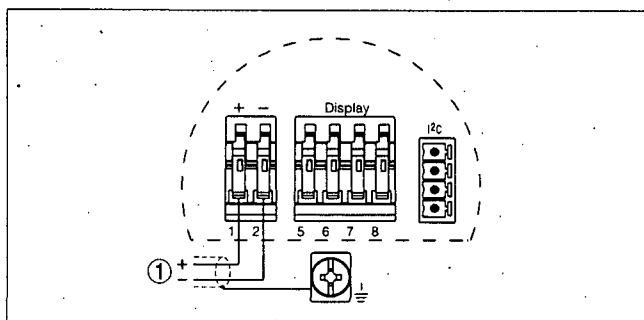


Fig. 21: Wiring plan, remote electronics

- 1 Voltage supply

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Connecting to voltage supply

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5.8 Switch-on phase

Switch-on phase

After connecting VEGABAR 64 to power supply or after a voltage recurrence, the instrument carries out a self-check for approx. 30 seconds:

- Internal check of the electronics
- Indication of the instrument type, the firmware as well as the sensor TAGs (sensor designation)
- Output signal jumps briefly (approx. 10 seconds) to the set fault current

Then the corresponding current is transmitted to the cable.⁵⁾

⁵⁾ The value corresponds to the actual measured level as well as to the settings already carried out, e.g. default setting.



Setup with the indicating and adjustment module PLICSCOM

6 Setup with the indicating and adjustment module PLICSCOM

6.1 Short description

Function/Configuration

The indicating and adjustment module is used for measured value display, adjustment and diagnosis. It can be mounted in the following housing versions and instruments:

- All sensors of the plics® instrument family, in the single as well as in the double chamber housing (optionally in the electronics or connection compartment)
- External indicating and adjustment unit VEGADIS 61

From a hardware revision ...- 01 or higher of the indicating and adjustment module resp. ...- 02 or higher of the corresponding sensor electronics, an integrated backlight can be switched via the adjustment menu. The hardware revision is stated on the type label of the indicating and adjustment module or the sensor electronics.



Information:

This function is for instruments with StEx, WHG or ship approval as well as country-specific approvals such as those according to FM or CSA, available at a later date.



Note:

You will find detailed information on the adjustment in the operating instructions manual of the "*Indicating and adjustment module*".

6.2 Insert the indicating and adjustment module

Mounting/dismounting the indicating and adjustment module

The indicating and adjustment module can be inserted in the sensor and removed at any time. It is not necessary to interrupt the voltage supply.

Proceed as follows:

- 1 Unscrew the housing cover
- 2 Place the indicating and adjustment module in the desired position on the electronics (you can choose any one of four different positions - each displaced by 90°)
- 3 Press the indicating and adjustment module onto the electronics and turn it to the right until it snaps in.

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Setup with the indicating and adjustment module PLICSCOM

VEGA

- 4 Screw housing cover with inspection window tightly back on

Removal is carried out in reverse order.

The indicating/adjustment module is powered by the sensor, an additional connection is not necessary.



Fig. 22: Installation of the indicating and adjustment module

i

Note:

If you intend to retrofit VEGABAR 64 with an indicating and adjustment module for continuous measured value indication, a higher cover with an inspection glass is required.



Setup with the indicating and adjustment module PLICSCOM

6.3 Adjustment system

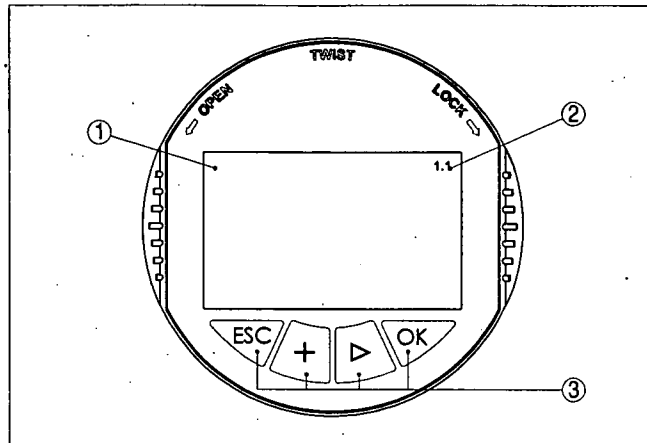


Fig. 23: Indicating and adjustment elements

- 1 LC display
- 2 Indication of the menu item number
- 3 Adjustment keys

Key functions

- **[OK]** key:
 - move to the menu overview
 - confirm selected menu
 - edit parameter
 - save value
- **[→]** key to select:
 - menu change
 - list entry
 - Select editing position
- **[+]** key:
 - Change value of a parameter
- **[ESC]** key:
 - interrupt input
 - jump to the next higher menu

Adjustment system

The sensor is adjusted via the four keys of the indicating and adjustment module. The LC display indicates the individual menu items. The functions of the individual keys are shown in the above illustration. Approx. 10 minutes after the last pressing of a key, an automatic reset to measured value indication is triggered. Any values not confirmed with **[OK]** will not be saved.

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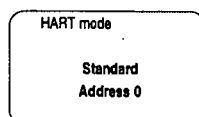
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6.4 Setup procedure

Address setting HART-Multidrop

In HART-Multidrop mode (several sensors on one input) the address must be set before continuing with the parameter adjustment. You will find a detailed description in the Operating instructions manual "*Indicating and adjustment module*" or in the online help of PACTware™ or DTM.



Level or process pressure measurement

VEGABAR 64 can be used for level as well as for process pressure measurement. Default setting is level measurement. The mode can be changed in the adjustment menu.

Depending on your application, only the respective subchapter "Level measurement" or "Process pressure measurement" will apply. There you will find the individual adjustment steps.

Parameter adjustment "Level measurement"

Level measurement

Set up VEGABAR 64 in the following sequence:

- 1 Selecting adjustment unit/density unit
- 2 Carry out position correction
- 3 Carry out min. adjustment
- 4 Carrying out max. adjustment

In the menu item "*Adjustment unit*" you select the physical unit in which the adjustment should be carried out, e.g. mbar, bar, psi...

The position correction compensates the influence of the mounting position or static pressure on the measurement. It does not influence the adjustment values.



Information:

These steps are not necessary for instruments which are already preset acc. to customer specifications!

You can find these data on the type label on the instrument and in the menu items of the min./max. adjustment.

The indicating and adjustment module enables the adjustment without filling or pressure. You can carry out the settings in the workshop without the instrument having to be installed.

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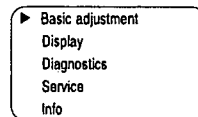
Setup with the indicating and adjustment module PLICSCOM

Selecting adjustment unit/
density unit

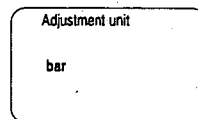
The actual measured value is also displayed in the menu items for min./max. adjustment.

To switch over to another adjustment unit (in the example from bar to mbar), proceed as follows:⁶⁾

- 1 Push the **[OK]** button in the measured value display, the menu overview is displayed.



- 2 Confirm the menu "**Basic adjustment**" with **[OK]**, the menu item "**Units of measurement**" will be displayed.



- 3 Activate the selection with **[OK]** and select the requested unit with **[->]** (in the example mbar).
- 4 Confirm with **[OK]** and move to position correction with **[->]**.

The adjustment unit is now changed from bar to mbar.

**Information:**

When changing over to a height unit (in the example from bar to m), also the density has to be entered.

Proceed as follows:

- 1 Push the **[OK]** button in the measured value display, the menu overview is displayed.
- 2 Confirm the menu "**Basic adjustment**" with **[OK]**, the menu item "**Units of measurement**" will be displayed.
- 3 Activate the selection with **[OK]** and select the requested unit with **[->]** (in the example m).
- 4 Confirm with **[OK]**, the submenu "**Density unit**" appears.

⁶⁾ Selection options: mbar, bar, psi, Pa, kPa, MPa, inHg, mmHg, inH₂O, mmH₂O, mm, cm, m, in, ft.

Setup with the indicating and adjustment module PLICSCOM

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Adjustment unit
Density unit
► kg/dm ³
pcf

- 5 Select the requested unit, e.g. kg/dm³ with [->] and confirm with [OK], the submenu "Density" appears.

Adjustment unit
Density
0001000
kg/dm ³

- 6 Enter the requested density value with [->] and [+], confirm with [OK] and move to position correction with [->].

The adjustment unit is now changed from bar to m.

Carry out position correction

Proceed as follows:

- 1 Activate in the menu item "Position correction" the selection with [OK]

Position correction
Offset
=
+0000 mbar
53 mbar

- 2 Select with [->], e.g. to accept actual measured value.

Position correction
Accept current measured value?
► Accept
Edit

- 3 Confirm with [OK] and move to min. (zero) adjustment with [->].

**Information:**

The function "Accept measured value" is available at a later date for instruments with StEx, WHG or ship approval as well as country-specific approvals such as those acc. to FM or CSA.

Carry out min. adjustment

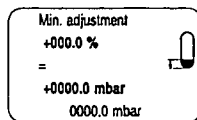
Proceed as follows:

- 1 Edit in the menu item "Min. adjustment" the % value with [OK].

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Setup with the indicating and adjustment module PLICSCOM



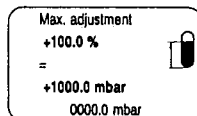
- 2 Set the requested % value with **[+]** and **[->]**.
 - 3 Edit the requested mbar value with **[OK]**.
 - 4 Set the requested mbar value with **[+]** and **[->]**.
 - 5 Confirm with **[+]** and move to max. adjustment with **[->]**.
- The min. adjustment is finished.

**Information:**

To adjust with filling, you simply enter the indicated actual measured value. If the adjustment ranges are exceeded, the message "*Outside parameter limits*" is displayed. The editing procedure can be interrupted with **[ESC]** or the displayed limit value can be accepted with **[OK]**.

Carrying out max. adjustment Proceed as follows:

- 1 Edit the % value in the menu item "*Max. adjustment*" with **[OK]**.

**Information:**

The displayed pressure for 100 % corresponds to the nominal measuring range of the sensor (in the above example 1 bar = 1000 mbar).

- 2 Set the requested % value with **[->]** and **[OK]**.
- 3 Edit the requested mbar value with **[OK]**.
- 4 Set the requested mbar value with **[+]** and **[->]**.
- 5 Confirm with **[OK]** and move to the menu overview with **[ESC]**.

The max. adjustment is finished.

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Setup with the indicating and adjustment module PLICSCOM

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**Information:**

To adjust with filling, you simply enter the indicated actual measured value. If the adjustment ranges are exceeded, the message "*Outside parameter limits*" is displayed. The editing procedure can be interrupted with **[ESC]** or the displayed limit value can be accepted with **[OK]**.

Parameter adjustment "Process pressure measurement"**Process pressure measurement**

Set up VEGABAR 64 in the following sequence:

- 1 Select application "Process pressure measurement"
- 2 Select adjustment unit
- 3 Carry out position correction
- 4 Carry out zero adjustment
- 5 Carry out span adjustment

In the menu item "*Adjustment unit*" you select the physical unit in which the adjustment should be carried out, e.g. mbar, bar, psi...

The position correction compensates the influence of the mounting position or static pressure on the measurement. It does not influence the adjustment values.

In the menu items "*zero*" and "*span*" you determine the span of the sensor, the span corresponds to the end value.

**Information:**

These steps are not necessary for instruments which are already preset acc. to customer specifications!

You can find these data on the type label on the instrument and in the menu items of the zero/span adjustment.

The indicating and adjustment module enables the adjustment without filling or pressure. You can carry out the settings in the workshop without the instrument having to be installed.

The actual measured value is displayed in addition to the menu items for zero/span adjustment.

Select application "Process pressure measurement"

VEGABAR 64 is preset to application "Level measurement". Proceed as follows when switching over to application "Process pressure measurement":

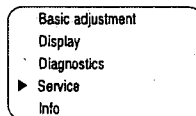
- 1 Push the **[OK]** button in the measured value display, the menu overview is displayed.

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Setup with the indicating and adjustment module PLICSCOM

- 2 Select the menu "**Service**" with [->] and confirm with [OK]



- 3 Select the menu item "**Application**" with [->] and edit with [OK].

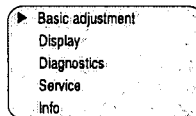
**Warning:**

Note the warning: "Output can change".

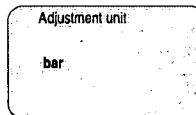
- 4 Select with [->] "OK" and confirm with [OK].
- 5 Select "Process pressure" from the list and confirm with [OK].

Select adjustment unitTo switch over to another adjustment unit (in the example from bar to mbar), proceed as follows:⁷⁾

- 1 Push the [OK] button in the measured value display, the menu overview is displayed.



- 2 Confirm the menu "**Basic adjustment**" with [OK], the menu item "Units of measurement" will be displayed.



- 3 Activate the selection with [OK] and select the requested unit with [->] (in the example mbar).
- 4 Confirm with [OK] and move to position correction with [->].

The adjustment unit is now changed from bar to mbar.

Carry out position correction

Proceed as follows:

- 1 Activate in the menu item "Position correction" the selection with [OK]
- ⁷⁾ Selection options: mbar, bar, psi, Pa, kPa, MPa, inHg, mmHg, inH₂O, mmH₂O.

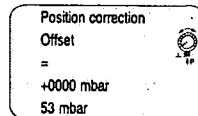
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VEGABAR 64 - 4 ... 20 mA/HART

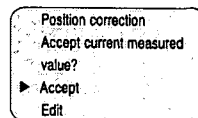
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- 2 Select with **[>]**, e.g. to accept actual measured value.



- 3 Confirm with **[OK]** and move to min. (zero) adjustment with **[>]**.

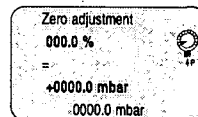
**Information:**

The function "Accept measured value" is available at a later date for instruments with StEx, WHG or ship approval as well as country-specific approvals such as those acc. to FM or CSA.

Carry out zero adjustment

Proceed as follows:

- 1 Edit the mbar value in the menu item "zero" with **[OK]**.



- 2 Set the requested mbar value with **[+]** and **[>]**.
3 Confirm with **[+]** and move to span adjustment with **[>]**.
The zero adjustment is finished.

**Information:**

The zero adjustment shifts the value of the span adjustment. The span, i.e. the difference between these values, however, remains unchanged.

**Information:**

To adjust with pressure, you simply enter the indicated actual measured value. If the adjustment ranges are exceeded, the message "Outside parameter limits" is displayed. The editing procedure can be interrupted with **[ESC]** or the displayed limit value can be accepted with **[OK]**.

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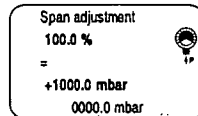


Setup with the indicating and adjustment module PLICSCOM

Carry out span adjustment

Proceed as follows:

- 1 Edit the mbar value in the menu item "span" with **[OK]**.

**Information:**

The displayed pressure for 100 % corresponds to the nominal measuring range of the sensor (in the above example 1 bar = 1000 mbar).

- 2 Set the requested mbar value with **[<->]** and **[OK]**.
- 3 Confirm with **[OK]** and move to the menu overview with **[ESC]**.

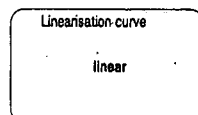
The span adjustment is finished.

**Information:**

To adjust with pressure, you simply enter the indicated actual measured value. If the adjustment ranges are exceeded, the message "Outside parameter limits" is displayed. The editing procedure can be interrupted with **[ESC]** or the displayed limit value can be accepted with **[OK]**.

Linearisation curve

A linearization is necessary for all vessels in which the vessel volume does not increase linearly with the level - e.g. with a cylindrical or spherical tank - and the indication or output of the volume is required. Corresponding linearization curves are preprogrammed for these vessels. They represent the correlation between the level percentage and vessel volume. By activating the appropriate curve, the volume percentage of the vessel is displayed correctly. If the volume should not be displayed in percent but e.g. in l or kg, a scaling can be also set in the menu item "Display".



Enter the requested parameter via the appropriate keys, save your settings and jump to the next menu item with the **[<->]** key.

Caution:

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Setup with the indicating and adjustment module PLICSCOM



Note the following, if VEGABAR 64 is used as part of an overfill protection system according to WHG:

If a linearisation curve is selected, the measuring signal is no longer compulsorily linear proportional to the level. This must be taken into consideration by the user, particularly when adjusting the switching point on the level switch.

Copy sensor data

This function enables reading out parameter adjustment data as well as writing parameter adjustment data into the sensor via the indicating and adjustment module. A description of the function is available in the operating instructions manual "*Indicating and adjustment module*".

The following data are read out or written with this function:

- Measured value presentation
- Adjustment
- Damping
- Linearisation curve
- Sensor-TAG
- Displayed value
- Display unit
- Scaling
- Current output
- Adjustment unit
- Language

The following safety-relevant data are **not** read out or written:

- SIL
- HART mode
- PIN
- Application

Copy sensor data

Copy sensor data?

Reset

Basic adjustment

If the "*Reset*" is carried out, the sensor resets the values of the following functions to the reset values (see chart):

Function	Reset value
Zero/Min. adjustment	0 mbar
Span/Max. adjustment	mbar/bar value corresponding to the nominal measuring range

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Damping	1 s
Linearization	linear
Sensor-TAG	Sensor
Displayed value	Distance
Current output - characteristics	4 ... 20 mA
Current output - max. current	20 mA
Current output - min. current	4 mA
Current output - failure	<3.6 mA
Adjustment unit	bar

The values of the following functions are *not* reset to the reset values (see chart) with "**Reset**":

Function	Reset value
Lighting	no reset
SIL	no reset
Language	no reset
HART mode	no reset

Factory setting

Like basic setting, in addition special parameters are reset to default values.⁸⁾

Pointer

The min. and max. distance values are reset to the actual value.

Optional settings

Additional adjustment and diagnosis options such as e.g. scaling, simulation or trend curve presentation are shown in the following menu schematic. You will find a detailed description of these menu items in the operating instructions manual of the "*Indicating and adjustment module*".

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⁸⁾ Special parameters are parameters which are set customer-specifically on the service level with the adjustment software PACTware™.

Setup with the indicating and adjustment module PLICSCOM

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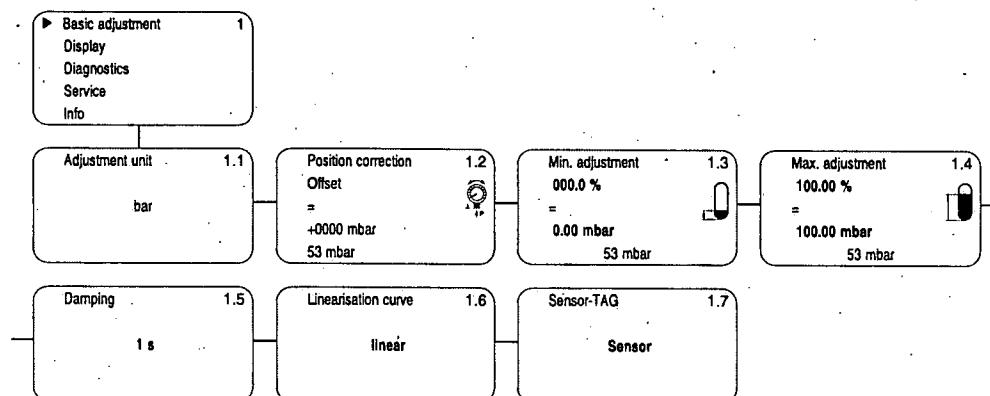
6.5 Menu schematic



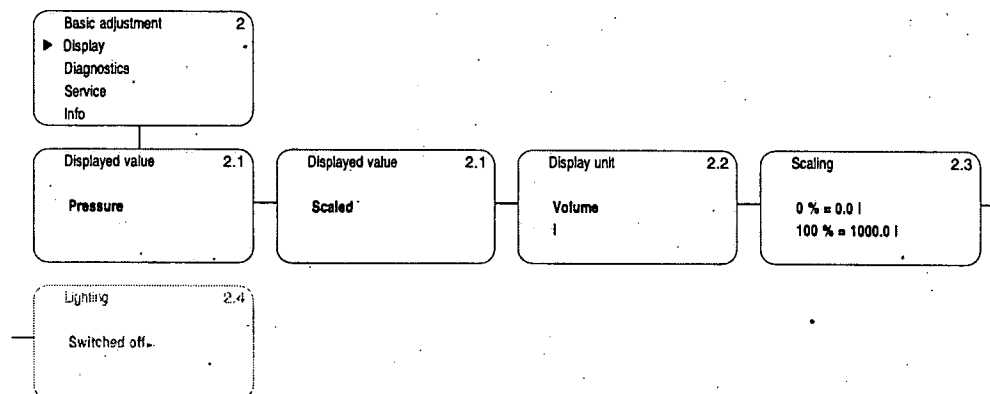
Information:

Depending on the version and application, the highlighted menu windows are not always available.

Basic adjustment



Display

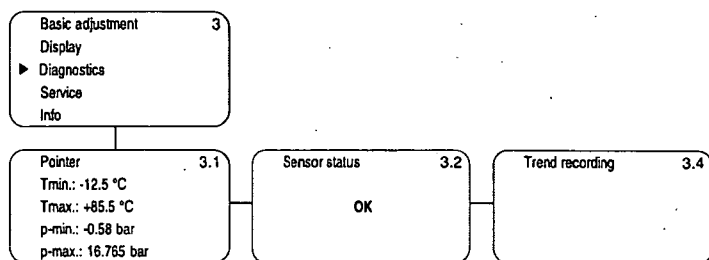


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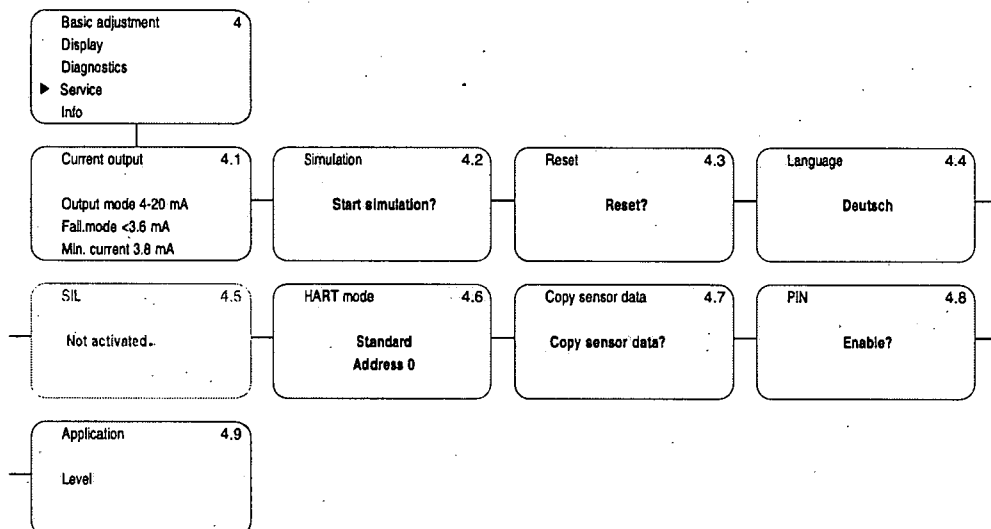


Setup with the indicating and adjustment module PLICSCOM

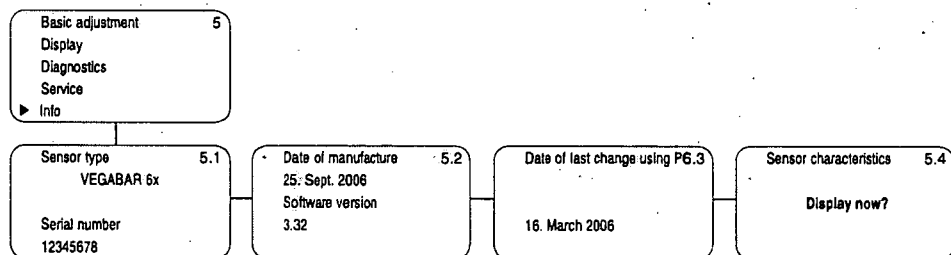
Diagnostics



Service



Info



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Setup with PACTware™ and other adjustment programs

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7 Setup with PACTware™ and other adjustment programs

7.1 Connecting the PC

Connecting the PC directly to the sensor

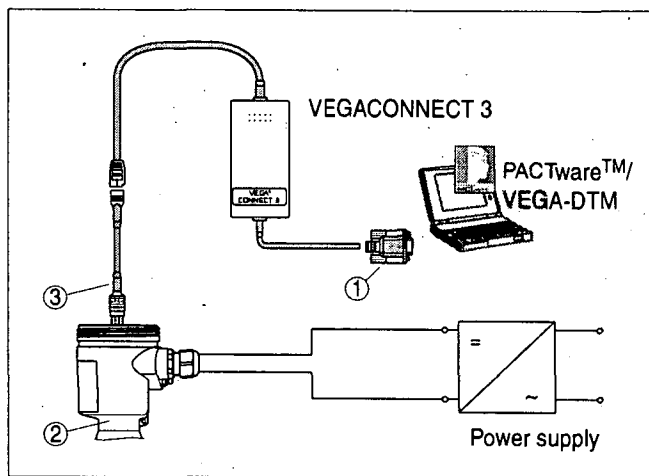


Fig. 24: Connection directly to the sensor

- 1 RS232 connection
- 2 VEGABAR 64
- 3 I²C adapter cable for VEGACONNECT 3

Necessary components:

- VEGABAR 64
- PC with PACTware™ and suitable VEGA DTM
- VEGACONNECT 3 with I²C adapter cable (article no. 2.27323)
- Power supply unit

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Setup with PACTware™ and other adjustment programs

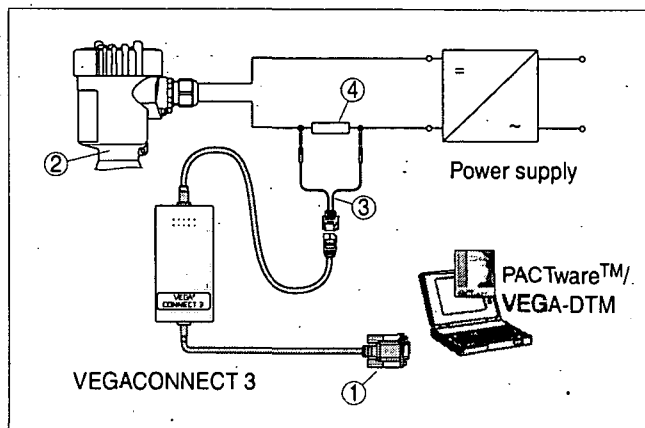
Connecting the PC to the signal cable

Fig. 25: Connecting the PC to the signal cable

- 1 RS232 connection
- 2 VEGABAR 64
- 3 HART adapter cable for VEGACONNECT 3
- 4 HART resistance 250 Ohm

Necessary components:

- VEGABAR 64
- PC with PACTware™ and suitable VEGA DTM
- VEGACONNECT 3 with HART adapter cable (art. no. 2.25397)
- HART resistance approx. 250 Ohm
- Power supply unit

**Note:**

With power supply units with integrated HART resistance (internal resistance approx. 250 Ohm), an additional external resistance is not necessary. This applies, e.g. to the VEGA instruments VEGATRENN 149A, VEGADIS 371, VEGAMET 381. Also standard Ex separators are most of the time equipped with a sufficiently high current limitation resistor. In such cases, VEGACONNECT 3 can be connected in parallel to the 4 ... 20 mA cable.

7.2 Parameter adjustment with PACTware™

Further setup steps are described in the operating instructions manual "DTM Collection/PACTware™" attached to each CD and which can also be downloaded from our homepage. A

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Setup with PACTware™ and other adjustment programs



detailed description is available in the online help of PACTware™ and the VEGA DTMs.



Note:

Keep in mind that for setup of VEGABAR 64, DTM-Collection 10/2005 or a newer version must be used.

All currently available VEGA DTMs are provided in the DTM Collection on CD and can be obtained from the responsible VEGA agency for a token fee. This CD includes also the up-to-date PACTware™ version. The basic version of this DTM Collection incl. PACTware™ is also available as a free-of-charge download from the Internet.

Go via www.vega.com and "Downloads" to the item "Software".

7.3 Parameter adjustment with AMS™ and PDM

For VEGA sensors, instrument descriptions for the adjustment programs AMS™ and PDM are available as DD or EDD. The instrument descriptions are already implemented in the current versions of AMS™ and PDM. For older versions of AMS™ and PDM, a free-of-charge download is available via Internet.

Go via www.vega.com and "Downloads" to the item "Software".

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8 Maintenance and fault rectification

8.1 Maintenance

When used as directed in normal operation, VEGABAR 64 is completely maintenance free.

8.2 Rectify faults

Causes of malfunction

VEGABAR 64 offers maximum reliability. Nevertheless faults can occur during operation. These may be caused by the following, e.g.:

- Sensor
- Process
- Power supply
- Signal processing

Fault rectification

The first measures to be taken are to check the output signals as well as to evaluate the error messages via the indicating and adjustment module. The procedure is described below. Further comprehensive diagnostics can be carried out on a PC with the software PACTware™ and the suitable DTM. In many cases, the causes can be determined in this way and faults can be rectified.

24 hour service hotline

However, should this measures not be successful, call the VEGA service hotline in urgent cases under the phone no. **+49 1805 858550**.

The hotline is available to you 7 days a week round-the-clock. Since we offer this service world-wide, the support is only available in the English language. The service is free of charge, only the standard telephone costs will be charged.

Checking the 4 ... 20 mA signal

Connect a handheld multimeter in the suitable measuring range according to the wiring plan.

? 4 ... 20 mA signal not stable

- Level fluctuations
 - Set the integration time via the indicating and adjustment module or PACTware™
- no atmospheric pressure compensation
 - check the pressure compensation in the housing and clean the filter element, if necessary

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- ? 4 ... 20 mA signal missing
- Incorrect connection to power supply
 - Check connection according to chapter "*Connection procedure*" and, if necessary, correct according to chapter "*Wiring plan*"
 - No supply voltage
 - check cables for line break, repair, if necessary
 - supply voltage too low or load resistance too high
 - Check, adapt, if necessary
- ? Current signal greater than 22 mA or less than 3.6 mA
- electronics module or measuring cell defective
 - Exchange instrument or return instrument for repair



In Ex applications, the regulations for the wiring of intrinsically safe circuits must be observed.

Fault messages via the indicating/adjustment module

- ? E013
- no measured value available⁹⁾
 - Exchange instrument or return instrument for repair
- ? E017
- Adjustment span too low
 - repeat with modified values
- ? E036
- no operable sensor software
 - Carry out a software update or send the instrument for repair
- ? E041
- Hardware error
 - Exchange instrument or return instrument for repair

⁹⁾ Fault message can also appear if the pressure is higher than the nominal range



8.3 Exchanging the electronics module

The electronics of VEGABAR 64 consists of the measuring cell electronics and the processing electronics. The measuring cell electronics in the process fitting is not accessible to the user. The processing electronics is in the form of a module in the housing. If this electronics is defective, it can be exchanged by the user.

The electronics modules differ only in their signal output and are suitable for all VEGABAR series 50 and 60 sensors. The following types are available:

- BR-E.60H. (4 ... 20 mA/HART)
- BR-E.60P. (Profibus PA)
- BR-E.60F. (Foundation Fieldbus)

If there is no electronics module available on site, you can order it from the responsible VEGA agency. You can order the electronics module **with** or **without** serial number.

The electronics module **with** serial number contains **order-specific** data such as factory setting, seal material etc. The electronics module **without** serial number contains **no order-specific** data.

The serial number is stated on the type label of VEGABAR 64 or on the delivery note.

8.4 Instrument repair

If a repair is necessary, please proceed as follows:

You can download a return form (23 KB) in the Internet from our homepage www.vega.com under: "*Downloads - Forms and Certificates - Repair form*".

By doing this you help us carry out the repair quickly and without having to call back for needed information.

- Print and fill out one form per instrument
- Clean the instrument and pack it damage-proof
- Attach the filled in form and if necessary, a safety data sheet to the instrument
- Please contact the agency serving you for the address of the return shipment

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9 Dismounting

9.1 Dismounting procedure



Warning:

Before dismounting, be aware of dangerous process conditions such as e.g. pressure in the vessel, high temperatures, corrosive or toxic products etc.

Take note of chapters "*Mounting*" and "*Connecting to power supply*" and carry out the listed steps in reverse order.

9.2 Disposal

The instrument consists of materials which can be recycled by specialised recycling companies. We use recyclable materials and have designed the electronic modules to be easily separable.

WEEE directive 2002/96/EG

This instrument is not subject to the WEEE directive 2002/96/EG and the respective national laws (in Germany, e.g. ElektroG). Pass the instrument directly on to a specialised recycling company and do not use the municipal collecting points. These may be used only for privately used products according to the WEEE directive.

Correct disposal avoids negative effects to persons and environment and ensures recycling of useful raw materials.

Materials: see "*Technical data*"

If you cannot dispose of the instrument properly, please contact us about disposal methods or return.

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Supplement

10. Supplement

10.1 Technical data

General data

Manufacturer	VEGA Grieshaber KG, D-77761 Schiltach
Type name	VEGABAR 64
Parameter, pressure	Gauge pressure, absolute pressure, vacuum
Measuring principle	Ceramic-capacitive, dry measuring cell
Communication interface	I ² C bus

Materials and weights

Material 316L corresponds to 1.4404 or 1.4435

Materials, wetted parts

– Process fitting	316L, PVDF, PVDF plated, Hastelloy C4 plated
– Diaphragm	sapphire ceramic® (99.9 % oxide ceramic)
– Seal, measuring cell	Viton, Kalrez 6375, EPDM, Chemraz 535
– Seal, process fitting thread G1½ A	Klingsil C-4400

Materials, non-wetted parts

– Electronics housing	Plastic PBT (Polyester), Alu die-casting powder-coated, 316L
– Remote electronics housing	plastic PBT (Polyester)
– Socket, wall mounting plate, remote electronics housing	plastic PBT (Polyester)
– Seal between housing socket and wall mounting plate	TPE (fixed connected)
– Seal ring, housing cover	NBR (stainless steel housing), silicone (Alu/plastic housing)
– Inspection window in housing cover for indicating and adjustment module	Polycarbonate (UL-746-C listed)
– Ground terminal	316Ti/316L
– Connection cable between IP 68 transmitter and remote electronics housing	PUR, FEP, PE
– Type plate support with IP 68 version on cable	PE hard

Weight	0.8 ... 8 kg (1.8 ... 17.6 lbs), depending on the process fitting
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Output variable

Output signal	4 ... 20 mA/HART
Signal resolution	1.6 μ A
Failure signal	Current output unchanged, 20.5 mA, 22 mA, <3.6 mA (adjustable)
Max. output current	22 mA
Load	see load diagram in voltage supply
Damping (63 % of the input variable)	0 ... 999 s, adjustable
Step response or adjustment time	≤ 250 ms (ti: 0 s, 10 ... 90 %)
Fulfilled NAMUR recommendation	NE 43

Additional output parameter - temperature

Processing is made via HART multidrop, Profibus PA and Foundation Fieldbus

Range	-50 ... +150 °C (-58 ... +302 °F)
Resolution	1 °C (1.8 °F)
Accuracy	
– in the range of 0 ... +100 °C (+32 ... +212 °F)	± 3 K
– in the range of -50 ... 0 °C (-58 ... +32 °F) and +100 ... +150 °C (+212 ... +302 °F)	typ. ± 4 K

Input variable**Adjustment**

Adjustment range of the min./max. adjustment:

- percentage value from -10 ... 110 % of the nominal measuring range
- pressure value from -20 ... 120 % of the nominal measuring range

Adjustment range of the zero/span adjustment:

- zero -20 ... +95 % of the nominal measuring range
- span -120 ... +120 % of the nominal measuring range¹⁰⁾
- Difference between zero and span max. 120 % of the nominal range

Recommended max. turn down 10:1 (no limitation)

Nominal measuring ranges and overload resistance¹⁰⁾ Values less than -1 bar cannot be adjusted.



Supplement

Nominal range	Overload, max. pressure	Overload, min. pressure
Gauge pressure		
0 ... 0.1 bar/0 ... 10 kPa	15 bar/1500 kPa	-0.2 bar/-20 kPa
0 ... 0.2 bar/0 ... 20 kPa	20 bar/2000 kPa	-0.4 bar/-40 kPa
0 ... 0.4 bar/0 ... 40 kPa	30 bar/3000 kPa	-0.8 bar/-80 kPa
0 ... 1 bar/0 ... 100 kPa	35 bar/3500 kPa	-1 bar/-100 kPa
0 ... 2.5 bar/0 ... 250 kPa	50 bar/5000 kPa	-1 bar/-100 kPa
0 ... 5 bar/0 ... 500 kPa	65 bar/6500 kPa	-1 bar/-100 kPa
0 ... 10 bar/0 ... 1000 kPa	90 bar/9000 kPa	-1 bar/-100 kPa
0 ... 25 bar/0 ... 2500 kPa	130 bar/13000 kPa	-1 bar/-100 kPa
0 ... 60 bar/0 ... 6000 kPa	200 bar/20000 kPa	-1 bar/-100 kPa
-1 ... 0 bar/-100 ... 0 kPa	35 bar/3500 kPa	-1 bar/-100 kPa
-1 ... 1.5 bar/-100 ... 150 kPa	50 bar/5000 kPa	-1 bar/-100 kPa
-1 ... 5 bar/-100 ... 500 kPa	65 bar/6500 kPa	-1 bar/-100 kPa
-1 ... 10 bar/-100 ... 1000 kPa	90 bar/9000 kPa	-1 bar/-100 kPa
-1 ... 25 bar/-100 ... 2500 kPa	130 bar/13000 kPa	-1 bar/-100 kPa
-1 ... 60 bar/-100 ... 6000 kPa	200 bar/20000 kPa	-1 bar/-100 kPa
-0.05 ... 0.05 bar/-5 ... 5 kPa	15 bar/1500 kPa	-0.2 bar/-20 kPa
-0.1 ... 0.1 bar/-10 ... 10 kPa	20 bar/2000 kPa	-0.4 bar/-40 kPa
-0.2 ... 0.2 bar/-20 ... 20 kPa	30 bar/3000 kPa	-0.8 bar/-80 kPa
-0.5 ... 0.5 bar/-50 ... 50 kPa	35 bar/3500 kPa	-1 bar/-100 kPa
Absolute pressure		
0 ... 0.1 bar/0 ... 10 kPa	15 bar/1500 kPa	
0 ... 1 bar/0 ... 100 kPa	35 bar/3500 kPa	
0 ... 2.5 bar/0 ... 250 kPa	50 bar/5000 kPa	
0 ... 5 bar/0 ... 500 kPa	65 bar/6500 kPa	
0 ... 10 bar/0 ... 1000 kPa	90 bar/9000 kPa	
0 ... 25 bar/0 ... 2500 kPa	130 bar/13000 kPa	
0 ... 60 bar/0 ... 6000 kPa	200 bar/20000 kPa	

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Reference conditions and influencing variables (similar to DIN EN 60770-1)

Reference conditions according to DIN EN 61298-1

- Temperature +18 ... +30 °C (+64 ... +86 °F)
- Relative humidity 45 ... 75 %
- Air pressure 860 ... 1060 mbar/86 ... 106 kPa
(12.5 ... 15.4 psi).

Determination of characteristics Limit point adjustment acc. to IEC 61298-2

Characteristics linear

Reference installation position upright, diaphragm points downward

Influence of the installation position <0,2 mbar/20 Pa (0.003 psi)

Deviation determined according to the limit point method according to IEC 60770¹⁾

Applies to **digital** interfaces (HART, Profibus PA, Foundation Fieldbus) as well as for the **analogue** current output 4 ... 20 mA. Specification refer to the set span. Turn down (TD) = nominal measuring range/set span.

Deviation

- Turn down 1:1 up to 5:1 <0.075 %
- Turn down > 5:1 <0.015 % x TD

Deviation with absolutely flush process fittings EV, FT.

- Turn down 1:1 up to 5:1 <0.05 %
- Turn down > 5:1 <0.01 % x TD

Deviation with absolute pressure measuring range 0.1 bar

- Turn down 1:1 up to 5:1 <0.25 % x TD
- Turn down > 5:1 <0.05 % x TD

Influence of the product or ambient temperature

Applies to **digital** interfaces (HART, Profibus PA, Foundation Fieldbus) as well as for the **analogue** current output 4 ... 20 mA. Specification refer to the set span. Turn down (TD) = nominal measuring range/set span.

Thermal change zero signal, reference temperature 20 °C (68 °F):

- in the compensated temperature <0.05 %/10K
range 0 ... 100 °C (32 ... 212 °F)
- outside the compensated temperature range typ. <0.1 %/10K

¹⁾ Incl. non-linearity, hysteresis and non-repeatability



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Thermal change, zero signal with absolute pressure measuring range 0.1 bar:

- in the compensated temperature range 0 ... 100 °C (32 ... 212 °F) $<0.1\% + 0.05\%/10K$
- outside the compensated temperature range typ. $<0.1\% + 0.1\%/10K$

It also applies for the **analogue** current output 4 ... 20 mA and refers to the set span.

Thermal change, current output $<0.15\%$ at -40 ... +80°C (-40 ... +176°F)

Long-term stability (similar to DIN 16086, DINV 19259-1 and IEC 60770-1)

Applies to **digital** interfaces (HART, Profibus PA, Foundation Fieldbus) as well as for the **analogue** current output 4 ... 20 mA. Specification refer to the set span. Turn down (TD) = nominal measuring range/set span.

Long-term drift of the zero signal $<(0.1\% \times TD)/1 \text{ year}$

Total deviation (similar to DIN 16086)

The total deviation (max. practical deviation) is the sum of basic accuracy and long-term stability:

$$F_{\text{total}} = F_{\text{perf}} + F_{\text{stab}}$$

$$F_{\text{perf}} = \sqrt{(F_T)^2 + (F_{KI})^2}$$

With

- F_{total} : Total deviation
- F_{perf} : Basic accuracy
- F_{stab} : Long-term drift
- F_T : Temperature coefficient (influence of medium or ambient temperature)
- F_{KI} : Deviation

Ambient conditions

Ambient, storage and transport temperature -40 ... +80 °C (-40 ... +176 °F)

Process conditions

The specifications of the pressure stage are used as an overview. The specifications on the type plate are applicable.

Pressure stage, process fitting

- Thread 316L PN 60
- Thread Alu PN 25

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- Thread PVDF	PN 10
- Hygienic fittings 316L	PN 6, PN 10, PN 25, PN 40
- Flange 316L	PN 16, PN 40 or 150 lbs, 300 lbs, 600 lbs
- Flange with extension 316L	without PN specification, PN 16, PN 40 or 150 lbs, 300 lbs, 600 lbs
- Flange PVDF	PN 16
Product temperature standard version, depending on the meas. cell seal ¹²⁾	
- FKM (e.g. Viton)	-20 ... +120 °C (-4 ... +248 °F)
- EPDM	-40 ... +120 °C (-40 ... +248 °F), (1 h: 140 °C/ 284 °F cleaning temperature)
- Kalrez 6375 (FFKM)	-10 ... +120 °C (+14 ... +248 °F)
- Chemraz	-30 ... +120 °C (-22 ... +248 °F)
Product temperature version with extended temperature range, depending on the meas. cell seal as well as order specification	
- FKM (e.g. Viton)	-20 ... +150 °C (-4 ... +302 °F)
- EPDM	-40 ... +150 °C (-40 ... +302 °F)
- Kalrez 6375 (FFKM)	-10 ... +150 °C (+14 ... +302 °F)
- Chemraz	-30 ... +150 °C (-22 ... +302 °F)
Vibration resistance	mechanical vibrations with 4 g and 5 ... 100 Hz ¹³⁾
Shock resistance	Acceleration 100 g/6 ms ¹⁴⁾

¹²⁾ With process fitting PVDF, max. 100 °C (212 °F).¹³⁾ Tested according to the regulations of German Lloyd, GL directive 2¹⁴⁾ Tested acc. to EN 60068-2-27.

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Supplement

Electromechanical data - version IP 66/IP 67

Cable entry/plug¹⁵⁾

– Single chamber housing

- 1x cable entry M20x1.5 (cable-ø 5 ... 9 mm), 1x blind stopper M20x1.5

or:

- 1x closing cap ½ NPT, 1x blind plug ½ NPT

or:

- 1x plug (depending on the version), 1x blind plug M20x1.5

or:

- 2x blind stopper M20x1.5

– Double chamber housing

- 1x cable entry M20x1.5 (cable-ø 5 ... 9 mm), 1x blind stopper M20x1.5, plug M12x1 for VEGADIS 61 (optional)

or:

- 1x closing cap ½ NPT, 1x blind stopper ½ NPT, plug M12x1 for VEGADIS 61 (optional)

or:

- 1x plug (depending on the version), 1x blind stopper M20x1.5, plug M12x1 for VEGADIS 61 (optional)

or:

- 2x blind stopper M20x1.5; plug M12x1 for VEGADIS 61 (optional)

Spring-loaded terminalsfor wire cross-section up to 2.5 mm²

Electromechanical data - version IP 66/IP 68, 1 bar

Version IP 66/IP 68, 1 bar is only available for instruments with absolute pressure measuring ranges.

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¹⁵⁾ Depending on the version M12x1, according to DIN 43650, Harting, Amphenol-Tuchel, 7/8" FF.

Supplement

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Cable entry

– Single chamber housing

- 1x IP 68 cable entry M20x1.5; 1x blind stopper M20x1.5

or:

– Double chamber housing

- 1x closing cap ½ NPT, 1x blind plug ½ NPT
- 1x IP 68 cable entry M20x1.5; 1x blind stopper M20x1.5; plug M12x1 for VEGADIS 61 (optional)

or:

- 1x closing cap ½ NPT, 1x blind stopper ½ NPT, plug M12x1 for VEGADIS 61 (optional)

Connection cable

– Configuration

four wires, one suspension cable, one breather capillary, screen braiding, metal foil, mantle

– Wire cross-section

0.5 mm² (AWG no. 20)

– wire resistance

<0,036 Ohm/m (<0,011 Ohm/ft)

– Tensile strength

>1200 N (270 pounds force)

– Standard length

5 m (16.4 ft)

– Max. length

1000 m (3280 ft)

– Min. bending radius at 25 °C/77 °F

25 mm (0.985 in)

– Diameter

ca: 8 mm (0.315 in)

– Colour - standard PE

Black

– Colour - standard PUR

Blue

– Colour - Ex version

Blue

Electromechanical data - version IP 68Cable entry/plug¹⁶⁾

– Remote housing

- 1x cable entry M20x1.5 (cable-ø 5 ... 9 mm), 1x blind stopper M20x1.5

or:

- 1x closing cap ½ NPT, 1x blind plug ½ NPT

or:

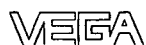
- 1x plug (depending on the version), 1x blind plug M20x1.5

Spring-loaded terminals

for wire cross-section up to 2.5 mm² (AWG no. 13)

¹⁶⁾ Depending on the version M12x1, according to DIN 43650, Harting, Amphenol-Tuchel, 7/8" FF.

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Supplement

Connection cable between IP 68 instrument and remote housing:

- Configuration	four wires, one suspension cable, one breather capillary, screen braiding, metal foil, mantle
- Wire cross-section	0.5 mm ² (AWG no. 20)
- wire resistance	<0,036 Ohm/m (<0,011 Ohm/ft)
- Standard length	5 m (16.4 ft)
- Max. length	180 m (591 ft)
- Min. bending radius at 25 °C/77 °F	25 mm (0.985 in)
- Diameter	ca. 8 mm (0.315 in)
- Colour - standard PE	Black
- Colour - standard PUR	Blue
- Colour - Ex version	Blue

Indicating and adjustment module

Power supply and data transmission	through sensor via gold-plated sliding contacts (I ² C bus)
Indication	LC display in dot matrix
Adjustment elements	4 keys
Protection	
- unassembled	IP 20
- mounted into the sensor without cover	IP 40
Materials	
- Housing	ABS
- Inspection window	Polyester foil

Voltage supply

Supply voltage	
- Non-Ex instrument	12 ... 36 V DC
- EEx ia instrument	12 ... 30 V DC
- Exd instrument	18 ... 36 V DC

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VEGABAR 64 - 4 ... 20 mA/HART

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Supplement

VEGA

Supply voltage with lighted indicating and adjustment module¹⁷⁾

- Non-Ex instrument 20 ... 36 V DC
- EEx ia instrument 20 ... 30 V DC
- EExd ia instrument 20 ... 36 V DC

Permissible residual ripple

- <100 Hz $U_{ss} < 1 \text{ V}$
- 100 Hz ... 10 kHz $U_{ss} < 10 \text{ mV}$

Load

see diagram

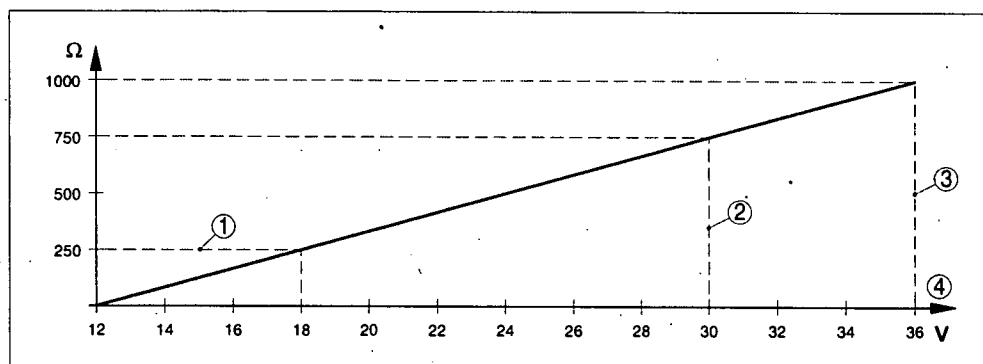


Fig. 26: Voltage diagram

- 1 HART load
- 2 Voltage limit EEx ia instrument
- 3 Voltage limit non-Ex/Ex instrument
- 4 Supply voltage

Electrical protective measures

Protection

- Housing, standard IP 66/IP 67¹⁸⁾
- Alu and stainless housing, optionally available IP 68 (1 bar)¹⁹⁾
- Transmitter in IP 68 version IP 68
- Remote housing IP 65

Overvoltage category

III

¹⁷⁾ This function is for instruments with StEx, WHG or ship approval as well as country-specific approvals such as those according to FM or CSA, available at a later date.

¹⁸⁾ Instruments with gauge pressure measuring ranges cannot detect the ambient pressure when submerged, e.g. in water. This can lead to falsification of the measured value.

¹⁹⁾ Only with instruments with absolute pressure ranges.



Supplement

Protection class II

Functional safety (SIL)

Functional safety according to IEC 61508-4/IEC 61511

- Single channel architecture (1oo1 D) up to SIL2
- double channel diversitary redundant architecture (1oo2 D) up to SIL3

Available approvals or approvals applied for²⁰⁾²¹⁾

ATEX ia	ATEX II 1G, 1/2G, 2G EEx ia IIC T6
ATEX ia und d	ATEX II 1/2G, 2G EEx d ia IIC T6
ATEX D	ATEX II 1/2D, 2D IP6X T
IEC	IEC Ex ia IIC T6
FM	FM Cl.I, Div2 (NI)+II.II, II, Div1 (DIP), FM Cl.I-III, Div 1 (IS), FM Cl.I-III, Div 1 (IS)+Cl.I-III, Div1 Gr. C-G(XP)
Ship approval	GL, LRS, ABS, CCS, RINA, DNV
Other approvals	WHG, VLAREM

²⁰⁾ Deviating data in Ex applications: see separate safety instructions.

²¹⁾ Depending on order specification.

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VEGABAR 64 - 4 ... 20 mA/HART

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10.2 Dimensions

Housing

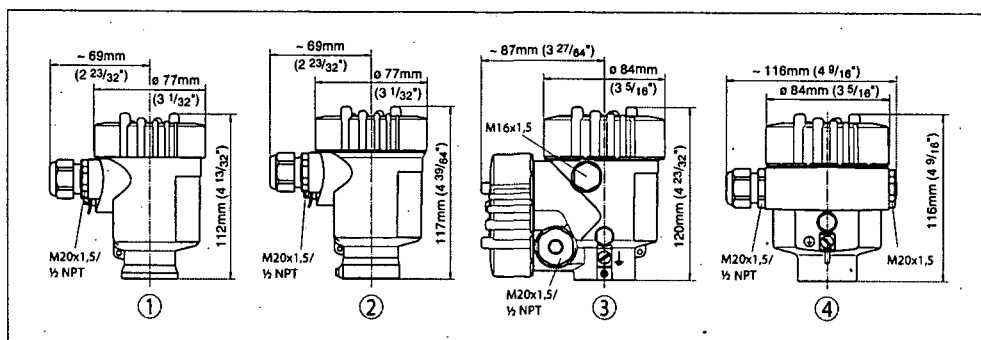


Fig. 27: Housing versions (with integrated PLICSCOM the housing is 9 mm/0.35 in higher)

- 1 Plastic housing
- 2 Stainless steel housing
- 3 Aluminium double chamber housing
- 4 Aluminium housing

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Supplement

Remote housing with IP 68 version

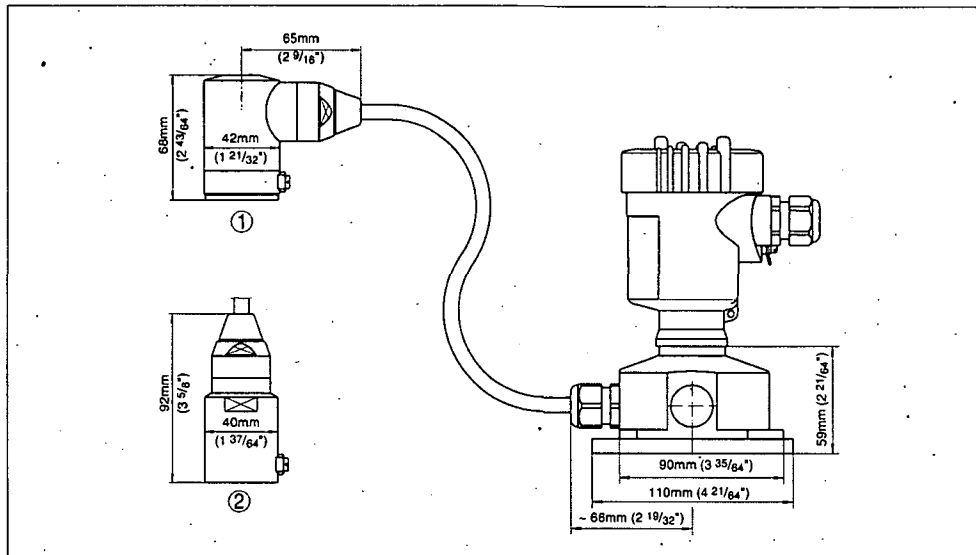


Fig. 28: IP 68 version with remote housing - non-Ex

- 1 Lateral cable outlet
- 2 Axial cable outlet

For the version with temperature range up to 150 °C/ 302 °F, the measure of length increases by 28 mm (1.1 in).

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VEGABAR 64 - 4 ... 20 mA/HART

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Supplement

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VEGABAR 64, threaded fitting 1

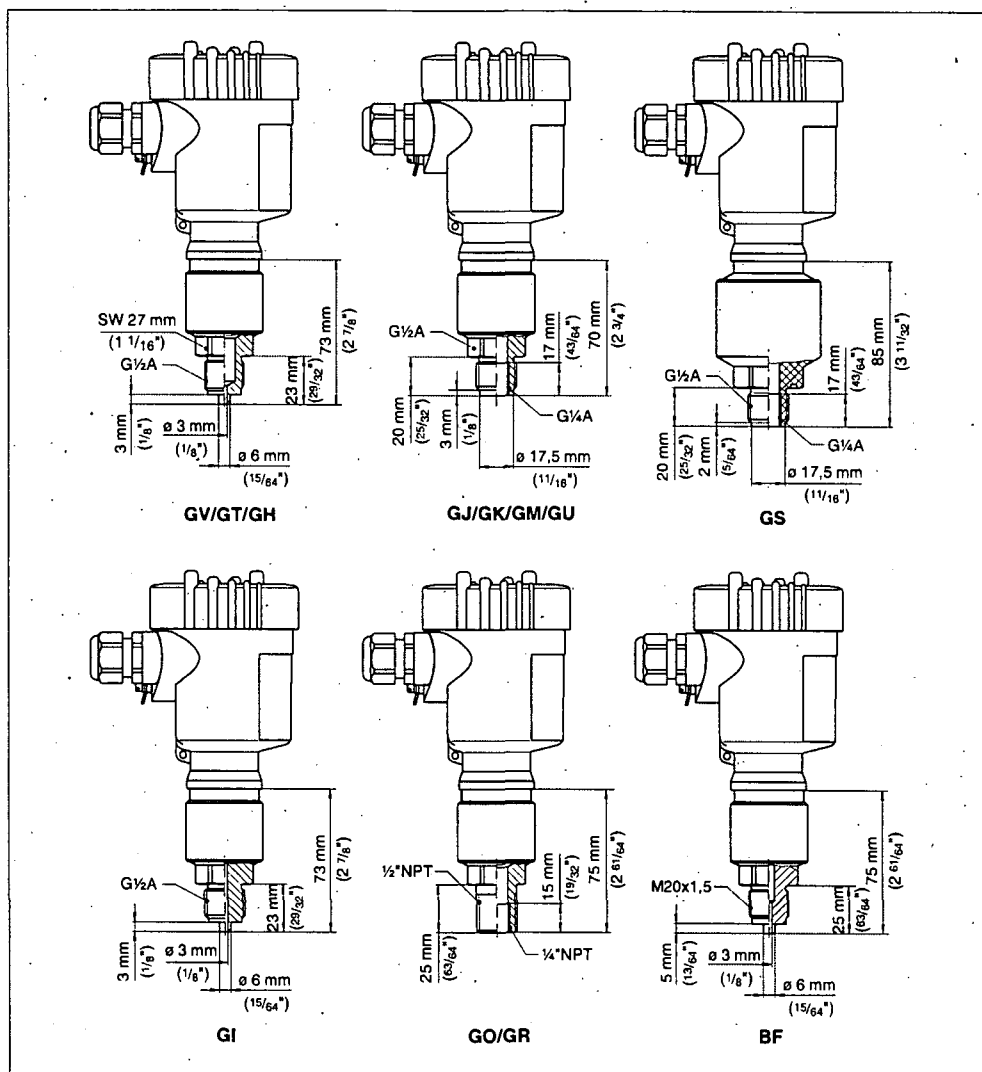


Fig. 29: VEGABAR 64 threaded fitting: GV/GT/GH = G 1/2 A manometer connection EN 837, GJ/GK/GM/GU = G 1/2 A inner G 1/4 A, GS = G 1/2 A inner G 1/4 A PVDF, GI = G 1/2 A manometer connection volume-reduced, GO/GR = 1/2 NPT, BF = M20x1.5 manometer connection EN 837

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Supplement

VEGABAR 64, threaded fitting 2

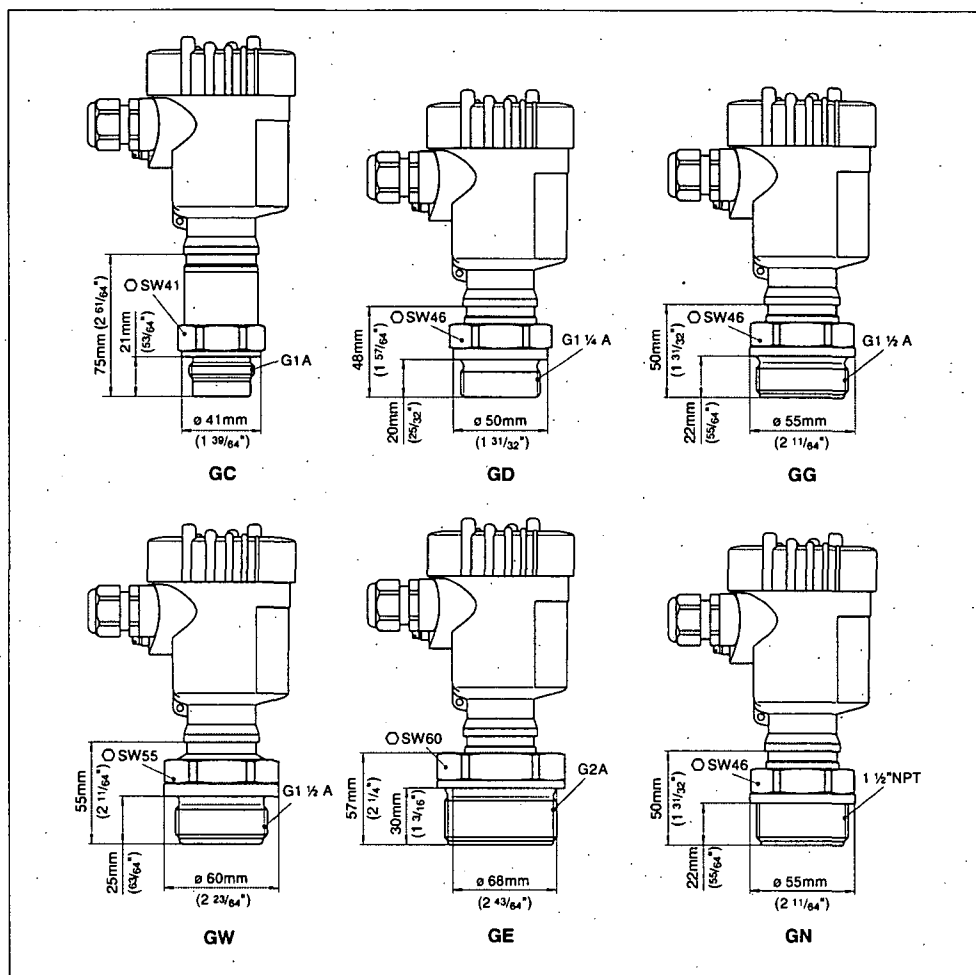


Fig. 30: VEGABAR 64 threaded fitting: GC = G1 A, GD = G1 1/4 A, GG = G1 1/2 A, GW = G1 1/2 A PVDF, GE = G2 A, GN = 1 1/2" NPT

For the version with temperature range up to 150 °C/ 302 °F, the measure of length increases by 28 mm (1.1 in).

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VEGABAR 64 - 4 ... 20 mA/HART

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Supplement

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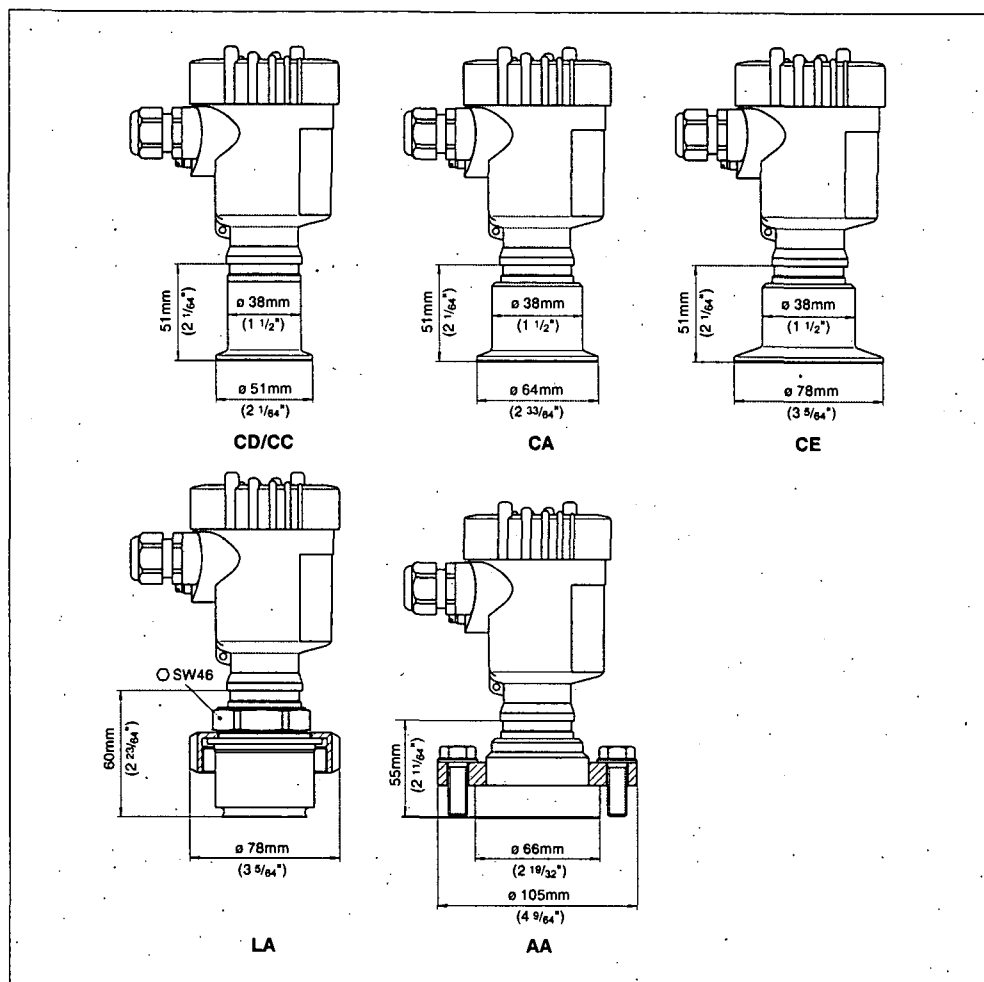
VEGABAR 64, hygienic fitting 1

Fig. 31: VEGABAR 64 hygienic fitting: CD/CC = Tri-Clamp 1"/Tri-Clamp 1½", CA = Tri-Clamp 2", CA = Tri-Clamp 2½", LA = hygienic fitting with compression nut F40, AA = DRD

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Supplement

VEGABAR 64, hygienic fitting 2

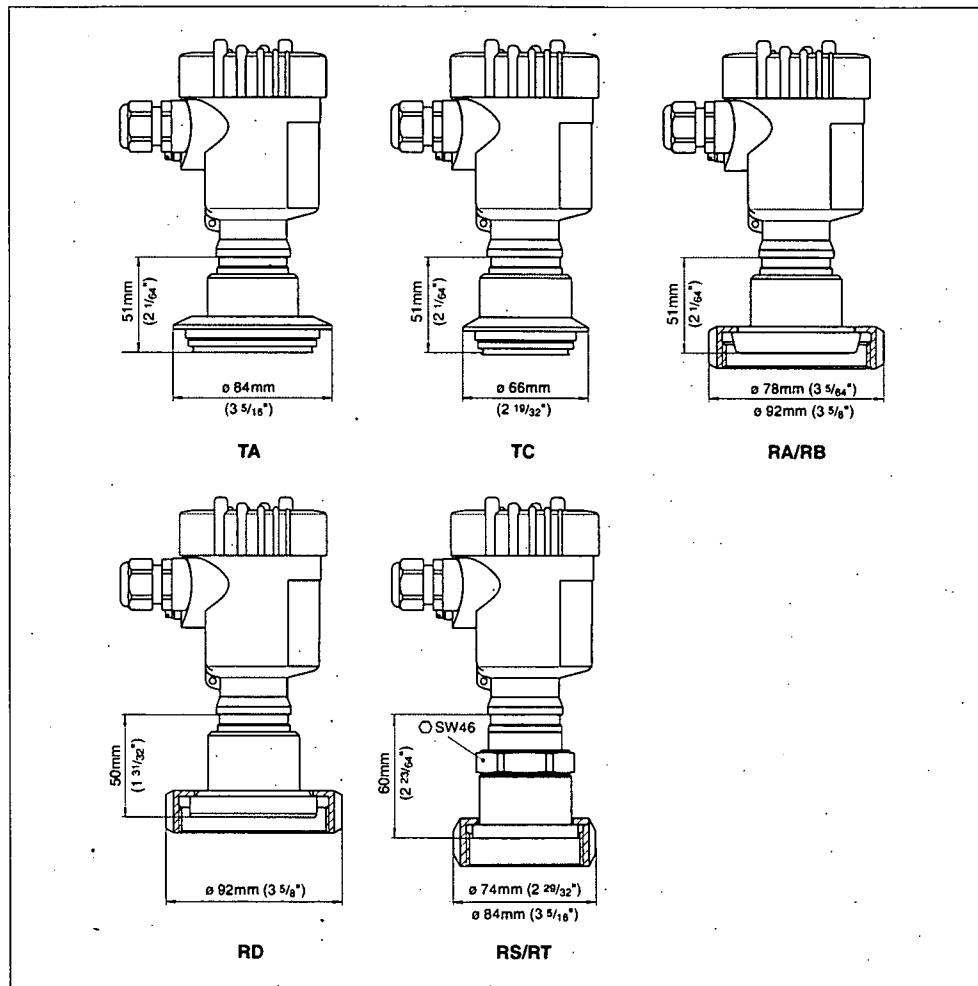


Fig. 32: VEGABAR 64 hygienic fitting: TA = Tuchenhausen Varivent DN 32, TB = Tuchenhausen Varivent DN 25, RA/RB = bolting DN40/DN50 according to DIN 11851, RD = bolting DN50 according to DIN 11864, RS/RT = SMS DN38/DN51

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VEGABAR 64 - 4 ... 20 mA/HART

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VEGABAR 64, flange connection

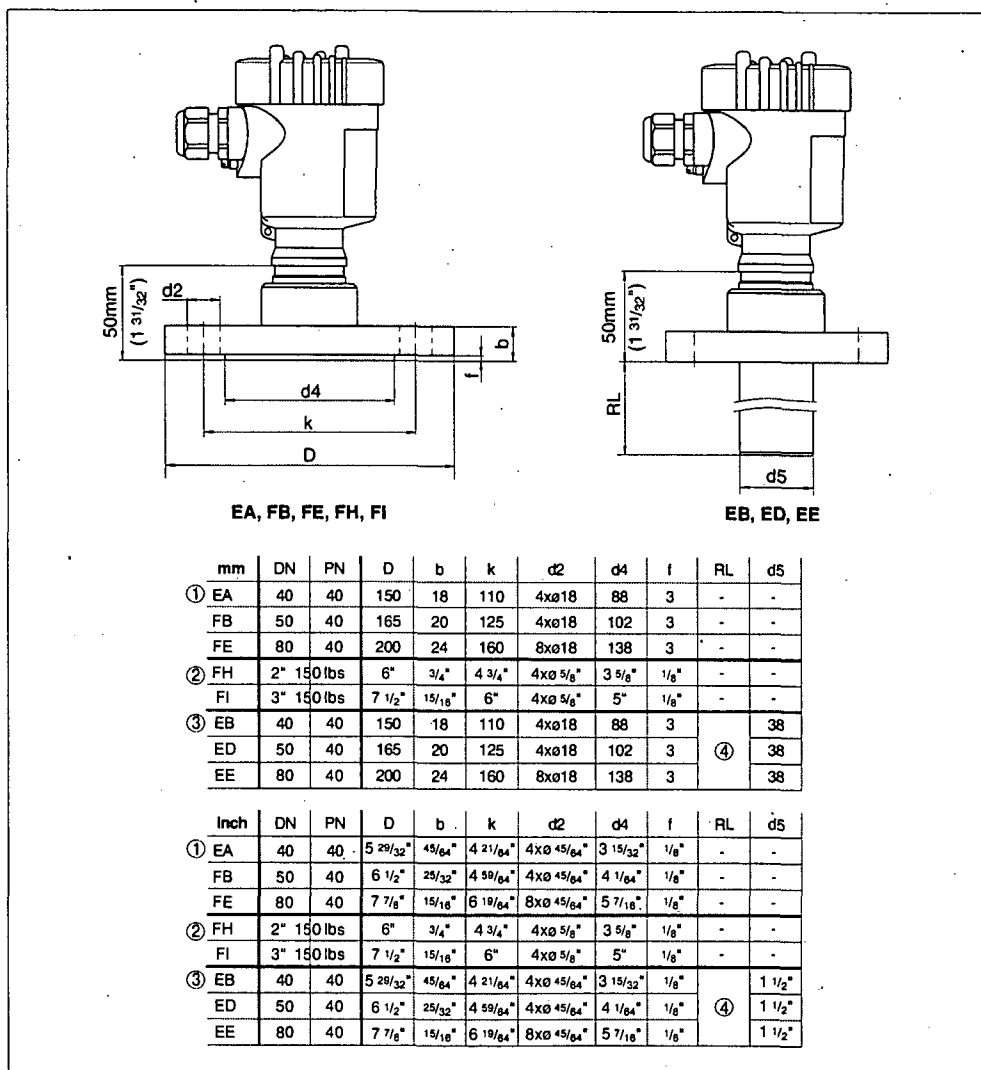


Fig. 33: VEGABAR 64, flange connection

1 Flange connection acc. to DIN 2501

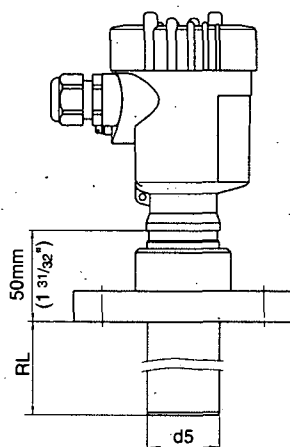
2 Flange fitting acc. to ANSI B16.5

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Supplement

VEGABAR 64, flange connection with extension



EB, ED, EE, TK, IH, TV, TW

mm	DN	PN	D	b	k	d2	d4	f	RL	d5
EB	40	40	150	18	110	4xØ18	88	3	③	38
ED	50	40	165	20	125	4xØ18	102	3		38
EE	80	40	200	24	160	8xØ18	138	3		38
TK	100	16	220	20	180	8xØ18	158	3		38
Inch										
EB	40	40	5 29/32"	45/64"	4 21/64"	4xØ 45/64"	3 15/32"	1/8"	③	1 1/2"
ED	50	40	6 1/2"	25/32"	4 59/64"	4xØ 45/64"	4 1/64"	1/8"		1 1/2"
EE	80	40	7 7/8"	15/16"	6 19/64"	8xØ 45/64"	5 7/16"	1/8"		1 1/2"
TK	100	16	8 21/32"	25/32"	7 3/32"	8xØ 45/64"	6 7/32"	1/8"		1 1/2"
② IH	2" 150 lbs		6"	3/4"	4 3/4"	4xØ 3/4"	3 5/8"	1/8"	③	1 1/2"
TV	3" 150 lbs		7 1/2"	15/16"	6"	4xØ 3/4"	5"	1/8"		1 1/2"
TW	4" 150 lbs		9"	15/16"	7 1/2"	4xØ 3/4"	6 3/16"	1/8"		1 1/2"

Fig. 34: VEGABAR 64, flange connection with extension

1 Flange connection acc. to DIN 2501

2 Flange fitting acc. to ANSI B16.5

3 Order-specific

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VEGABAR 64, threaded fitting for paper industry

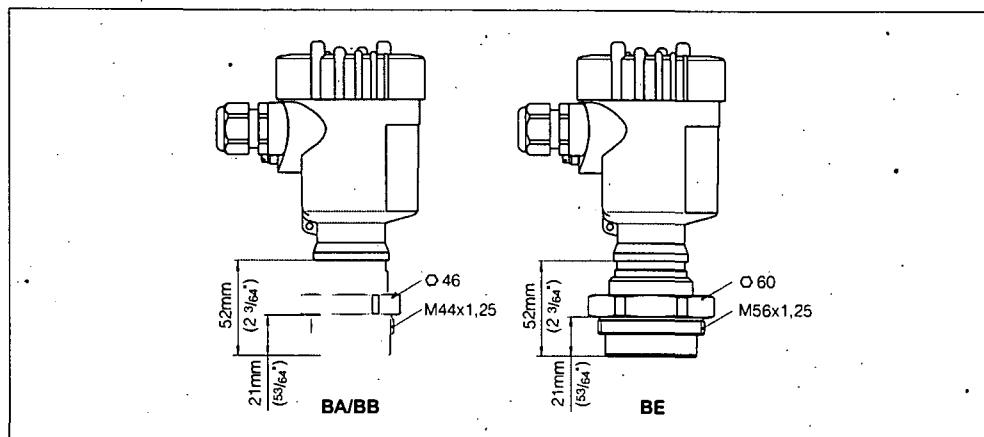


Fig. 35: VEGABAR 64, threaded fitting for paper industry: BA/BB = M44x1.25, BE = M 56x1.25

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Supplement

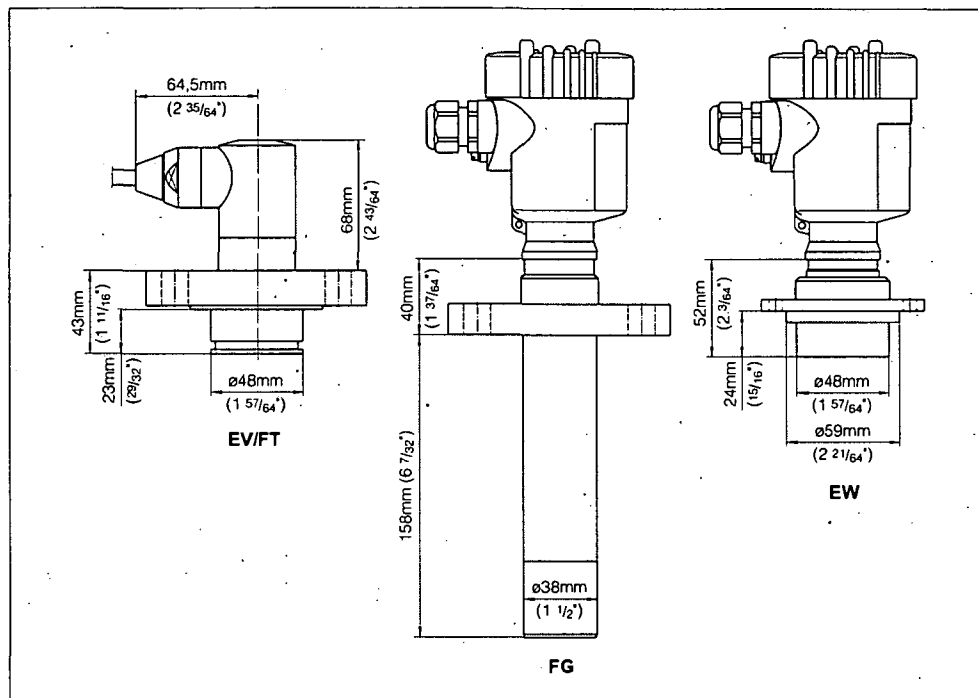
VEGABAR 64, extension fitting for paper industry

Fig. 36: VEGABAR 64, extension fitting for paper industry: EV/FT = absolutely flush for pulper (EV 2-times flattened), FG = extension for ball valve fitting, EW = flange for manometer lug

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VEGABAR 64 - 4 ... 20 mA/HART

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Supplement



10.3 Industrial property rights

VEGA product lines are global protected by industrial property rights.
Further information see <http://www.vega.com>.
Only in U.S.A.: Further information see patent label at the sensor housing.
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10.4 Trademark

All brands used as well as trade and company names are property of their lawful proprietor/originator.

VEGA

Supplement

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VEGABAR 64 - 4 ... 20 mA/HART

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VEGABAR 64 - 4 ... 20 mA/HART

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VEGABAR 64 - 4 ... 20 mA/HART

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Germany
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www.vega.com



All statements concerning scope of delivery, application, practical use and operating conditions of the sensors and processing systems correspond to the information available at the time of printing.

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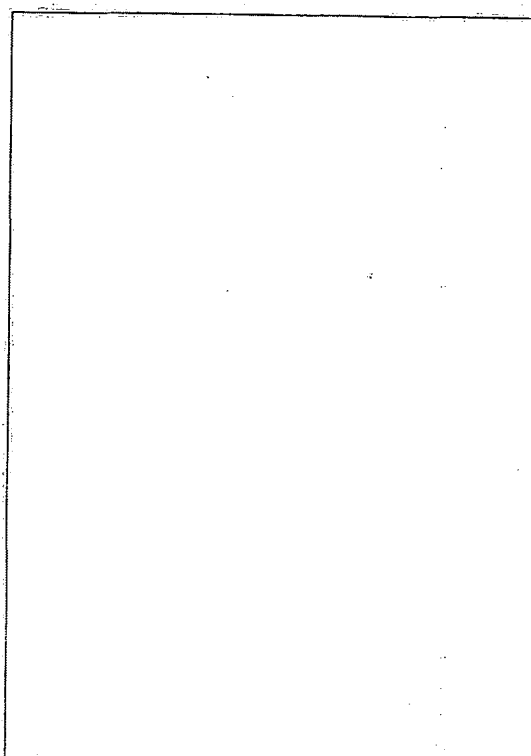
Subject to change without prior notice

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VEGA

Sensor documentation



VEGA DTM Collection 4/2005

Date
Generated using

17/05/2006 14:50
Pressure/Hydrostatic-DTM Version 1
(Professional)

Notes
Contents

Sensor documentation
- Standard parameter

[Handwritten signature]
16-5-06

2/3

Standard parameter

VEGA

Sensor documentation

Device data

Serial number	14574055
Device name	VEGABAR 64
Electronics	Two wire HART
Target address	0
Device address	0
Software version	3.22
Meas. Range	0.00 ... 10.00 bar. (relative)
	0.0 ... 1000.0 kPa
First saved using DTM version	1.45:0.0
Last saved with DTM-version	1.45:0.0

Standard parameter

Basic adjustment

Sensor tag	Sp 302 delivery
Density	1.000 kg/dm ³
Units of measurement	m
Sensor acc. to WHG	OFF

Sensor mounting correction

Offset	0.0000 m
--------	----------

Min-Max adjustment

Min. adjustment	0.00 %
Min. adjustment	0.0000 m
Max. adjustment	100.00 %
Max. adjustment	70.0011 m

Damping

Integration time	1 s
------------------	-----

Linearization

Linearization	linear
---------------	--------

Display

Menu language (PLICSCOM)	English
Display value 1	Scaled [m]
Display value 2	Temperature [°C]
Scaling 0%	0
Scaling 100%	70
Parameter	Hoehe
Units	m
Graph	Measurement value with units and sensor tag

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VEGA

Standard parameter

Diagnostics

Pressure (minimum)	-0.039 bar
Pressure (maximum)	5.774 bar
Temperature (minimum)	21.7 °C
Temperature (maximum)	35.6 °C

Device trend

Measured value	Level
At time interval	1 min
At measurement value difference	non active
Temperature recording	No
Start at	non active
Stop at	non active
Stop recording when memory full	No

Application

Application	Level
-------------	-------

Current output

Output characteristics	4...20 mA
Failure mode	< 3.6mA
Minimum current	3.8 mA

PIN

Activate PIN	not activated
PIN	0000

Info

Last change	15/05/2006 12:02
Date of manufacture	22/09/2005

Sensor details

Details	Version
Approval	without
Process connection / Material	Thread G1½A PN60 / 316L
Seal measuring cell	FKM (Viton) / 120°C
Pressure / Measuring range	rel. / 0...10.0bar (0...1000kPa)
Electronics	4...20mA/HART®
Housing / Protection	PE-cable axial IP68, ext. housing plastic IP65
Cable entry / Plug connection	M20x1.5 / without
Indicating/adjustment module (PLICSCOM)	top mounted
Cable length in m	25.000

bc0333/lb

PFC – PROGRESS ROAD – B79800
Instrumentation Calibration Report – 15.5.06

- The Vega level probe has been recalibrated by using a DRVCK DP1 610 pressure calibrator Serial No. 2957-99/04 (recal. Date 25.9.06) to read 0-4M by using a Fluke meter M08980 (recal. date 21.9.06) to the following :-

- 20mA – 4M h20
- 15.99mA – 3M h20
- 12mA – 2M h20
- 7.94mA – 1M h20
- 4mA – 0

The above calibration was carried out by Mr. Russell Stanaway (JPR) in the presence of Mr. Bill Collie (BW).

- The following megger readings were taken by Mr. Russell Stanaway (JPR) using meter number M00075 (five).

- Pump No. 1 – Serial No. 402622
 - Read to Earth – Infinity
 - White to Earth – Infinity
 - Blue to Earth – Infinity
- Pump No. 2 – Serial No. 402623
 - Red to Earth – Infinity
 - White to Earth – Infinity
 - Blue to Earth – Infinity

Signed



18.5.06

Prüfzertifikat

für Druckmessumformer

Test certificate for pressure transmitters



VEGA bestätigt, dass die zur Qualitätsprüfung des Erzeugnisses eingesetzten Messmittel gültig kalibriert und auf nationale Normale der Physikalischen Technischen Bundesanstalt (PTB) rückführbar sind.
VEGA confirms that all instruments used to assure the quality of our products are calibrated and traceable to national standards of PTB (Physikalischen Technischen Bundesanstalt)

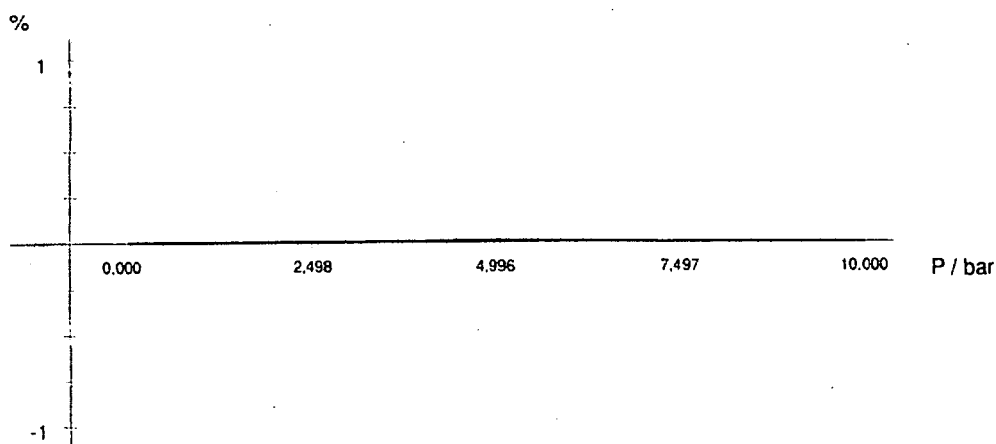
VEGA Grieshaber KG, Am Hohenstein 113, 77761 Schiltach, Tel. 0 78 36/50-0, Fax. 0 78 36/50 201

Druckmessumformer / Pressure transmitter:	BAR64	Kundennummer / Customer ID	44741
Messbereich / Measuring range:	0 bis/to 10,0bar rel. 0 bis/to 1000 kPa rel.	Auftragsnummer / Order number	1225475
Seriennummer / Series no.:	14574055	Auftragsposition / Order position	1
Ausgang / Output:	4 ... 20mA, HART		
Zulassungen / Approvals:	OHNE		
Kennwerte / Characteristics:	0,000 bis/to 10,000 bar rel. 0,00 bis/to 100,01 %		

Kennliniencharakteristik / Output characteristics:

max. zul. Abweichung bezogen auf Messbereich: < 0,08 %
/ Dev. in linearity rel. to measuring range

Ref.-Druck / Ref. pressure [bar]:	0,000	2,498	4,996	7,497	10,000
Soll-Ausgang / Ideal output [%]:	0,00	24,98	49,96	74,98	100,01
Ist-Ausgang / Real output [%]:	0,00	24,98	49,97	74,98	100,01
Abweichung / Accuracy [%]:	0,00	0,00	0,01	0,00	0,00

**Temperatureinfluss**

/ Temperature influence:

Temperaturfehler bei 0 bar rel.

/ Temperature accuracy at 0 bar rel.

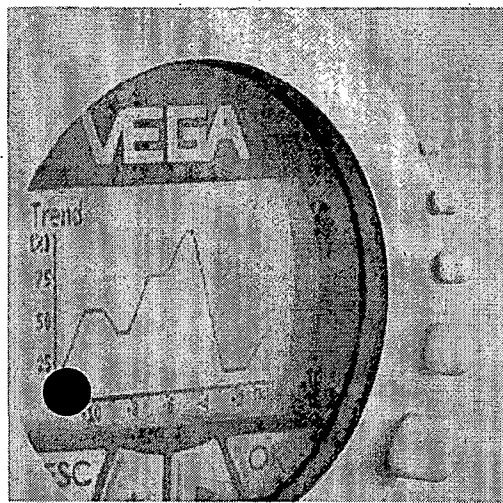
Bezogen auf den Messbereich / Related to the measuring range**Bezugstemperatur 20 °C / Ref. temperature 20 °C**

Temperatur [°C] Temperature	0	20	60	100
Ist-Ausgang [%] Real output	0,01	0,00	0,00	-0,03
Abweichung [%] Accuracy	0,01	0,00	0,00	-0,03

Datum / Date: 21.09.2005**Unterschrift / Signature:**

Level measurement
Hydrostatic

VEGAWELL 72



Product Information

VEGA

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Note safety instructions for Ex applications



Please note the Ex specific safety information which you will find on our homepage www.vega.com/services/downloads and which comes with each instrument. In hazardous areas you should take note of the appropriate regulations, conformity and type approval certificates of the sensors and power supply units. The sensors must only be operated on intrinsically safe circuits. The permissible electrical values are stated in the certificate.

30046-60828

1 Description of the measuring principle

Measuring principle

VEGAWELL 72 pressure transmitters work according to the hydrostatic measuring principle, which functions independently of the dielectric properties of the product and is not influenced by foam generation.

The sensor element of VEGAWELL 72 is the dry ceramic-capacitive CERTEC® measuring cell. Base element and diaphragm consist of high purity sapphire-ceramic®.

The hydrostatic pressure of the product causes via the diaphragm a capacitance change in the measuring cell. This capacitance change is converted into an appropriate output signal.

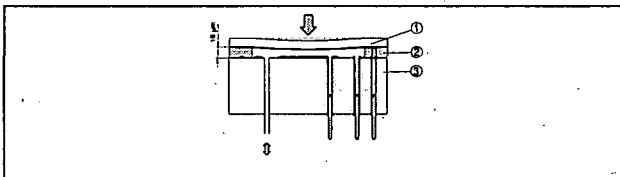


Fig. 1: Configuration of the CERTEC® measuring cell with VEGAWELL 72

- 1 Diaphragm
- 2 Glass soldering connection
- 3 Basic element

The advantages of the CERTEC® measuring cell are:

- very high overload resistance
- no hysteresis
- excellent long-term stability
- completely flush mounting
- good corrosion resistance
- very good abrasion resistance

Wide application range

VEGAWELL 72 is suitable for level measurement in deep wells and ballast tanks as well as for gauge measurement in open flumes. Typical media are drinking water and waste water as well as abrasive substances. All signal outputs are available in 4 ... 20 mA and 4 ... 20 mA/HART.

In the 4 ... 20 mA version, a temperature sensor PT100 is optionally integrated in the transducer. The resistance value can be measured via the wires of the suspension cable.

2 Type overview

VEGAWELL 72



Measuring cell:	CERTEC®
Products:	Drinking water and waste water
Process fitting:	Straining clamp, threaded connection, thread, flange
Material, process fitting:	316L, PVDF, PA
Material, suspension cable:	PE, PUR, FEP
Material, transmitter:	316L, PE-coating, PVDF
Diameter, transmitter:	depending on material min. 32 mm
Measuring range:	0 ... 0.1 bar up to 0 ... 25 bar
Process temperature:	-20 ... +100 °C (-4 ... +212 °F)
Deviation in characteristics:	<0.25 %, <0.1 %
Signal output:	4 ... 20 mA, 4 ... 20 mA/HART
Remote adjustment/ indication:	VEGADIS 12 (4 ... 20 mA/HART)

3 Mounting instructions

Installation location

The following illustration shows a mounting example for VEGA-WELL 72. The VEGA price list contains suitable mounting brackets under the section Accessories. With these parts, standard mounting arrangements can be realised quickly and reliably.



Fig. 2: Version with closing screw in a pump shaft

VEGAWELL 72 must be mounted in a calm area or in a suitable protective tube. This prevents lateral movement of the transmitter and the resulting corruption of measurement data.



Note:

As an alternative, we recommend using the instrument holder from the line of VEGA accessories, article no. BARMONT.B, to fasten the transmitter.

The suspension cable contains apart from the connection cables and the suspension wire also a capillary for atmospheric pressure compensation. All versions can be shortened on site.

With VEGAWELL 72, the electronics is completely integrated in the transmitter. The cable end can be looped directly into the dry connection compartment. The pressure compensation is then carried out via the filter element of the capillaries.



Note:

For connection of VEGAWELL 72 - 4 ... 20 mA, the breather housing VEGABOX 01 is recommended.
For connection of VEGAWELL 72 - 4 ... 20 mA/HART, the adjustment/indication VEGADIS 12 is recommended.

Both connection units contain a high-quality ventilation filter and terminals. A protective cover is optionally available for use outdoors.

Mounting versions

The following illustrations show the different mounting versions depending on the instrument type and version.

Mounting with straining clamp



Fig. 3: Straining clamp

- 1 Suspension cable
- 2 Suspension opening
- 3 Clamping jaws

Mounting with threaded connection



Fig. 4: Threaded connection

- 1 Suspension cable
- 2 Seal screw
- 3 Cone sleeve
- 4 Seal cone
- 5 Threaded connection
- 6 Seal ring

Mounting with housing and thread



Fig. 5: Plastic housing with threaded socket G1½ A

- 1 Housing
- 2 Seal
- 3 Thread

4 Electrical connection

4.1 General requirements

The voltage supply range can be different depending on the instrument version. Detailed specifications are listed in the "Technical data".

Take note of country-specific installation standards (e.g. the VDE regulations in Germany) as well as prevailing safety regulations and accident prevention rules.



In hazardous areas you should take note of the appropriate regulations, conformity and type approval certificates of the sensors and power supply units.

4.2 Voltage supply

Power supply and current signal are carried over the same two-wire connection cable. The requirements on the power supply are stated in the Technical data of this Product Information manual.

VEGA power supply units VEGATRENN 149AEx, VEGASTAB 690, VEGADIS 371 as well as VEGAMET signal conditioning instruments are suitable for voltage supply. With these instruments, a reliable separation of the supply circuit from the mains circuits is ensured according to DIN VDE 0106 part 101 for VEGAWELL 72.

4.3 Connection cable

In general

An outer diameter of 5 ... 9 mm ensures the seal effect of the cable entry. If electromagnetic interference is expected, screened cable should be used for the signal lines.

The sensors are connected with standard two-wire cable without screen.



In Ex applications, the corresponding installation regulations must be noted for the connection cable.

4.4 Cable screening and grounding

The cable screen must be connected on both ends to ground potential.

If potential equalisation currents are expected, the connection on the evaluation side must be provided via a ceramic capacitor (e.g. 1 nF, 1500 V).

4.5 Wiring plan, VEGAWELL 72 - 4 ... 20 mA

Direct connection - 4 ... 20 mA

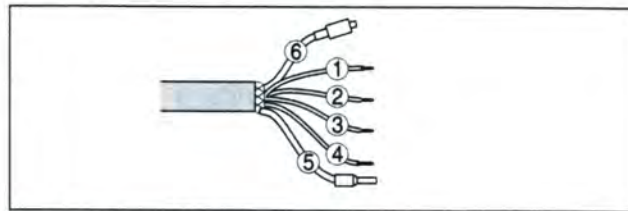


Fig. 6: Wire assignment, suspension cable

- 1 brown (+): to power supply or to the processing system
- 2 blue (-): to power supply or to the processing system
- 3 yellow: to processing of the integrated PT100 (option)
- 4 white: to processing of the integrated PT100 (option)
- 5 Screen
- 6 Breather capillaries with filter element

Connection via plastic housing - 4 ... 20 mA

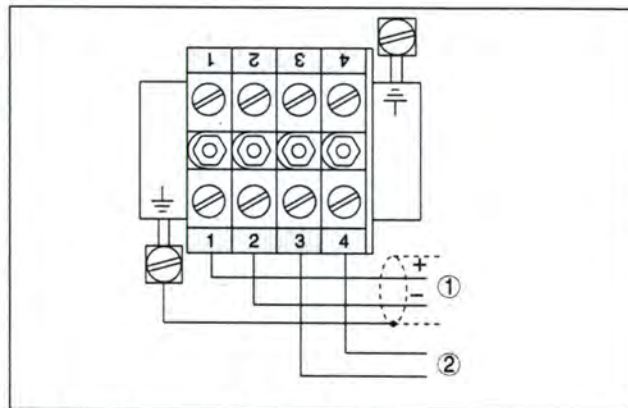


Fig. 7: Terminal assignment of the plastic housing

- 1 To power supply or to the processing system
- 2 To processing of the integrated PT100 (option)

Connection via VEGABOX 01 - 4 ... 20 mA

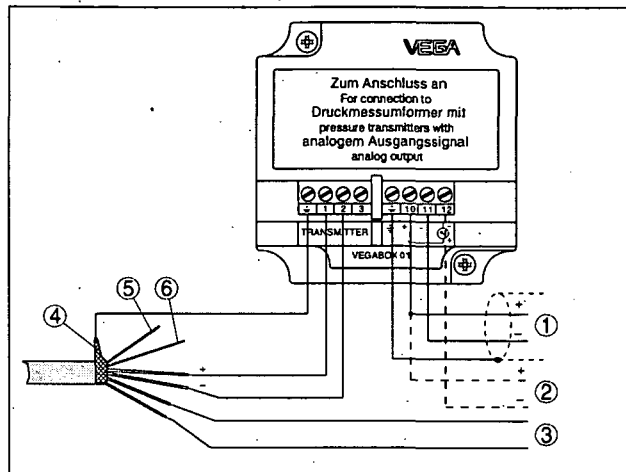


Fig. 8: Terminal assignment VEGABOX 01

- 1 To power supply or to the processing system
- 2 Control instrument (4 ... 20 mA measurement)
- 3 To processing of the integrated PT100 (option)

4.6 Wiring plan, VEGAWELL 72 - 4 ... 20 mA/HART

Direct connection - 4 ... 20 mA/HART

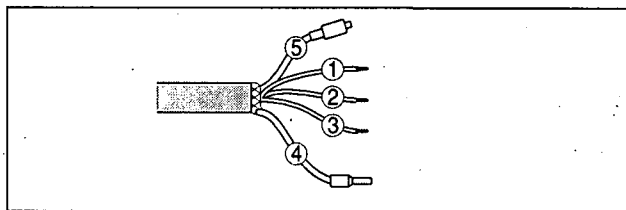


Fig. 9: Wire assignment, suspension cable

- 1 brown (+): to power supply or to the processing system
- 2 blue (-): to power supply or to the processing system
- 3 yellow: is only required with VEGADIS 12, otherwise connect to minus or with VEGABOX 01 to terminal 3
- 4 Screen
- 5 Breather capillaries with filter element

Connection via plastic housing - 4 ... 20 mA/HART

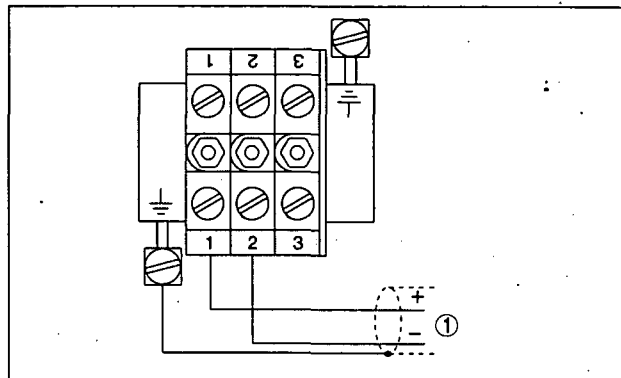


Fig. 10: Terminal assignment, plastic housing

- 1 Power supply and signal output

Connection via VEGADIS 12

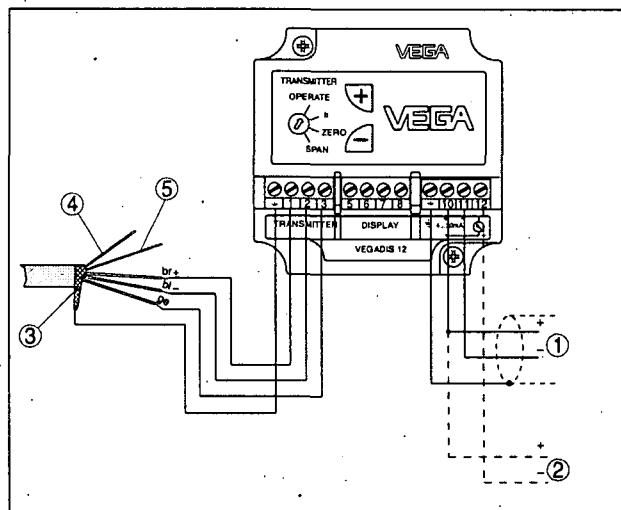


Fig. 11: Terminal assignment, VEGADIS 12

- 1 Power supply and signal output
- 2 Control instrument (4 ... 20 mA measurement)

5 Operation

5.1 Overview

4 ... 20 mA

VEGAWELL 72 - 4 ... 20 mA has no adjustment options.

4 ... 20 mA/HART

VEGAWELL 72 - 4 ... 20 mA/HART can be adjusted with the following adjustment media:

- Indication/Adjustment VEGADIS 12
- Adjustment software according to FDT/DTM standard, e.g. PACTware™ and PC
- Hart handheld

5.2 Adjustment with VEGADIS 12

VEGADIS 12

VEGADIS 12 is connected directly to the connection or suspension cable of VEGA WEL 72 - 4 ... 20 mA/HART. It is looped into the supply and signal circuit and requires no separate external energy.

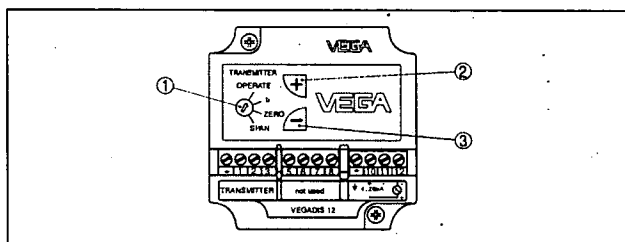


Fig. 12: Adjustment elements of VEGADIS 12

- 1 Rotary switch: choose the requested function
- 2 [+] key: change value
- 3 [-] key: change value

5.3 Adjustment with PACTware™

Connecting the PC to the signal cable

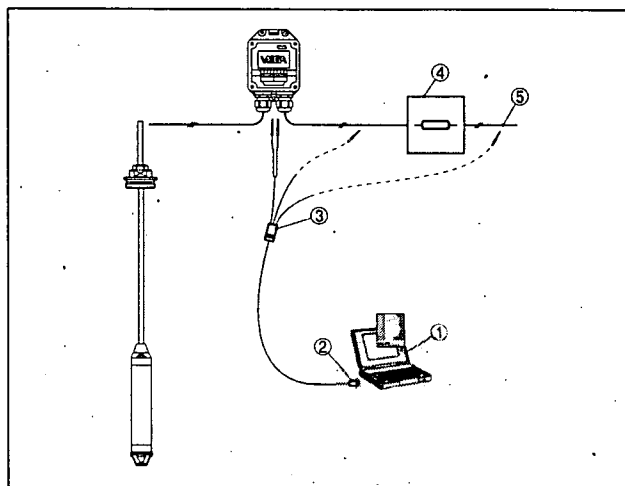


Fig. 13: Connection of the PC to VEGADIS 12 or to the communication resistance

- 1 PC with PACTware™
- 2 RS232 connection
- 3 VEGACONNECT 3
- 4 Communication resistor 250 Ohm
- 5 Power supply unit

Necessary components:

- VEGA WEL 72
- PC with PACTware™ and suitable VEGA DTM
- VEGACONNECT 3 with HART adapter cable
- HART resistance approx. 250 Ohm
- Power supply unit



Note:

With power supply units with integrated HART resistance (internal resistance approx. 250 Ohm), an additional external resistance is not necessary (e.g. VEGA-TRENN 149A, VEGADIS 371, VEGAMET 381/624/625, VEGASCAN 693). In such cases, VEGACONNECT 3 can be connected parallel to the 4 ... 20 mA cable.

6 Technical data

General data

Materials, wetted parts

- Transmitter
- Protective cover
- End cap for deep well version
- Diaphragm
- Measuring cell seal
- Suspension cable
- Connection tube
- Straining clamp
- Threaded connection
- Socket on the plastic housing
- Process fitting/cable outlet
- Flange

316L, Titanium, PVDF, 316L with PE coating

PA, PE

316L

sapphire ceramic® (99.9 % oxide ceramic)

FKM (FDA and KTW approved, e.g. Viton®), FFKM (e.g. Kalrez® 6375)

PE (FDA and KTW-approved), FEP, PUR

316L

1.4301

316L, PVDF

PA

316L

316L, PPH

Materials, non-wetted parts

- Plastic housing
- type label support on cable
- transport protection net

plastic PBT (Polyester)

PE hard

PE

Weights

- Basic weight
- Suspension cable
- Straining clamp
- Threaded connection
- Connection tube (max. 4.5 m/14.8 ft)
- Plastic housing

0.8 kg (1.7 lbs)

approx. 0.1 kg/m (0.07 lbs/ft)

approx. 0.2 kg (0.4 lbs)

approx. 0.4 kg (0.9 lbs)

approx. 1.5 kg/m (1 lbs/ft)

approx. 0.8 kg (1.8 lbs)

Output variable

4 ... 20 mA

Output signal

4 ... 20 mA

Resolution

6 µA

Fault signal

>22 mA

Rise time

70 ms (ti: 0 s, 0 ... 63 %)

4 ... 20 mA/HART

Output signal

4 ... 20 mA/HART

Resolution

6 µA

Fault signal

>22 mA; 3.6 mA (adjustable via PACTware™)

Current limitation

20.5 mA

Rise time

70 ms (ti: 0 s, 0 ... 63 %)

Load

see load diagram under Power supply

Integration time

0 ... 999 s, adjustable

Input variable

Parameter

Level

Measuring ranges

see product code

Turn down

- recommended

1:10

- max.

1:30

Reference conditions and actuating variables (similar to DIN EN 60770-1)

Reference conditions according to DIN EN 61298-1

- Temperature

+18 ... +30 °C (+64 ... +86 °F)

- Relative humidity

45 ... 75 %

- Air pressure

860 ... 1060 mbar/86 ... 106 kPa (12.5 ... 15.4 psi)

Determination of characteristics

Limit point adjustment according to DIN 16086

Characteristics

linear

Calibration position

upright, diaphragm points downward

Influence of the installation position

depending on the isolating diaphragm version



Technical data

Deviation in characteristics¹⁾²⁾

Deviation in characteristics <0.25 %	
- Turn down 1:1	<0.25 %
- Turn down up to 1:5	<0.3 %
- Turn down up to 1:10	<0.4 %
Deviation in characteristics <0.1 %	
- Turn down 1:1	<0.1 %
- Turn down up to 1:5	<0.1 %
- Turn down up to 1:10	<0.15 %

Influence of the ambient temperature

Average temperature coefficient of the zero signal, accuracy class 0.1 ³⁾	
- Turn down 1:1	0.05 %/10 K
- Turn down up to 1:5 ⁴⁾	0.1 %/10 K
- Turn down up to 1:10 ⁵⁾	0.15 %/10 K

Long-term stability

Long-term drift of the zero signal ⁶⁾⁷⁾	<0.1 %/2 years
--	----------------

Ambient conditions

Ambient temperature	
- Suspension cable PE	-40 ... +60 °C (-40 ... +140 °F)
- Suspension cable PUR, FEP	-40 ... +85 °C (-40 ... +185 °F)
Storage and transport temperature	-20 ... +100 °C (-4 ... +212 °F)

Process conditions

Calibration position	upright, diaphragm points downward
Influence of the installation position	<0.2 mbar/20 Pa (0.003 psi)
Vibration resistance	mechanical vibrations with 4 g and 5 ... 100 Hz ⁸⁾

Process pressure

Process pressure, transmitter	
- with meas. ranges 0.1 bar (1.5 psi) or 0.2 bar (2.9 psi)	max. 15 bar (218 psi) or max. 20 bar (290 psi) ⁹⁾
- with meas. ranges from 0.4 bar (5.8 psi)	max. 25 bar (363 psi) ¹⁰⁾

Pressure stage, process fitting

- Threaded connection	316L PN 3, PVDF PN 5 ¹¹⁾
- Thread	316L PN 25, PVDF unpressurized

Product temperature

Product temperature, suspension cable/seal meas. cell	
- PE/Viton	-20 ... +60 °C (-4 ... +140 °F)
- PUR/Viton	-20 ... +80 °C (-4 ... +176 °F)
- FEP/Kalrez	-10 ... +80 °C (+14 ... +176 °F)
Product temperature, connection tube/seal meas. cell	
- Viton	-20 ... +80 °C (-4 ... +176 °F)
Product temperature, transmitter protection/seal meas. cell	
- PVDF/Kalrez	-10 ... +60 °C (+14 ... +140 °F)
- PE/Viton	-20 ... +60 °C (-4 ... +140 °F)

¹⁾ Relating to the nominal measuring range, incl. hysteresis and repeatability, determined according to the limit point method.

²⁾ Deviation of characteristics <0.1 % as well as Turn down 1:5 and 1:10 only with 4 ... 20 mA/HART version

³⁾ In the compensated temperature range of 0 ... +80 °C (+32 ... +176 °F), reference temperature 20 °C (68 °F).

⁴⁾ Only with version 4 ... 20 mA/HART.

⁵⁾ Only with version 4 ... 20 mA/HART.

⁶⁾ Similar to DIN 16086, DIN V 19259-1 and IEC 60770-1.

⁷⁾ According to IEC 60770-1, relating to the nominal measuring range.

⁸⁾ Tested according to the regulations of German Lloyd, GL directive 2

⁹⁾ Limited by the gauge pressure resistance of the measuring cell.

¹⁰⁾ Limitation by the pressure-tightness of the cable connection.

¹¹⁾ Limited by the gauge pressure resistance of the measuring cell.

Electromechanical data

Suspension cable

– Configuration

– wire cross section

– wire resistance

– Tensile strength

– Max. length

– Min. bending radius

– Diameter

– colour (non-Ex/Ex) - PE

– colour (non-Ex/Ex) - PUR, FEP

Cable entry, plastic housing or VEGABOX 01/VEGADIS 12

Screw terminals

four wires, one suspension cable, one breather capillary, screen braiding, foil, mantle

0.5 mm²

<=0.036 Ohm/m

>= 1200 N (270 pound force)

1000 m (3280 ft)¹²⁾

25 mm (with 25 °C/77 °F)

approx. 8 mm (0.3 in)

black/blue

blue/blue

1x cable entry M20x1.5 (cable-ø 5 ... 9 mm), 1x blind stopper M20x1.5

for wire cross section 1.5 mm², screen up to 4 mm²**Voltage supply**

Supply voltage

– Non-Ex instrument

– EEx ia instrument

Permissible residual ripple

– <100 Hz

– 100 Hz ... 10 kHz

Load

12 ... 36 V DC

12 ... 29 V DC

 $U_{ss} < 1 \text{ V}$ $U_{ss} < 10 \text{ mV}$

see diagrams

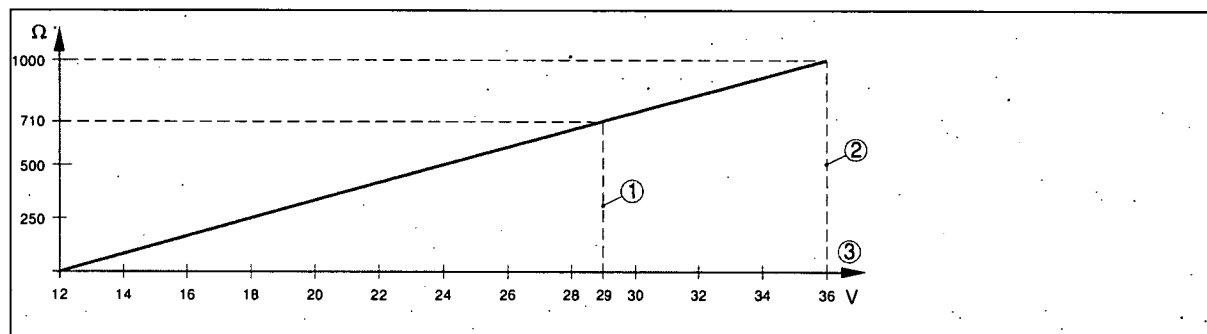


Fig. 14: Voltage diagram 4 ... 20 mA

1 Voltage limit Ex instrument

2 Voltage limit non-Ex instrument

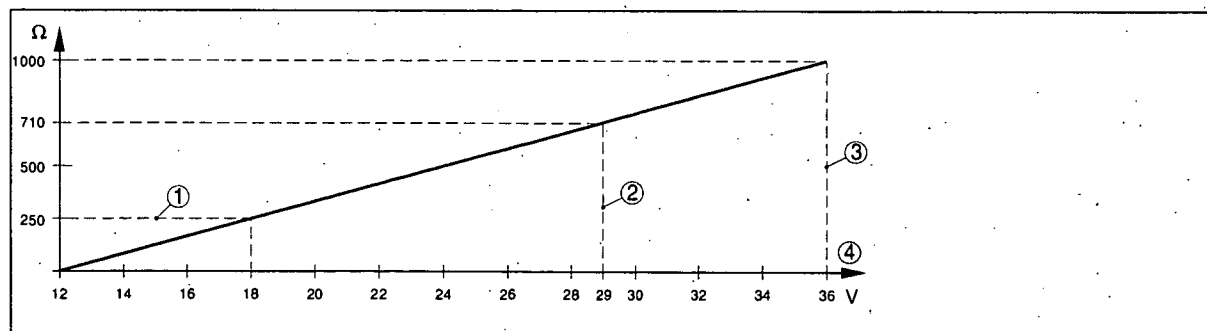


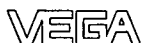
Fig. 15: Voltage diagram 4 ... 20 mA/HART

1 HART load

2 Voltage limit Ex instrument

3 Voltage limit non-Ex instrument

¹²⁾ With VEGADIS 12: 200 m (656 ft).



Technical data

Electrical protective measures

Protection	
- Transmitter	IP 68 (25 bar)
- Plastic housing	IP 65
- VEGABOX 01, VEGADIS 12	IP 65
Overvoltage category	III
Protection class	III

Approvals¹³⁾¹⁴⁾

ATEX	ATEX II 2G EEx ia IIC T6
IEC	IEC Ex ia IIC T6
PTB	Ex-Zone 2
Ship approvals	GL, LRS, ABS, CCS, RINA, DNV
Others	WHG

CE conformity

EMC (89/336/EWG)	Emission EN 61326: 1997/A1: 1998 (class B), susceptibility EN 61326: 1997/A1: 1998
LVD (73/23/EWG)	EN 61010-1: 1993

Environmental instructions

VEGA environment management system ¹⁵⁾	certified acc. to DIN EN ISO 14001
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¹³⁾ Deviating data in Ex applications; see separate safety instructions.

¹⁴⁾ You can find detailed information under www.vega.com.

¹⁵⁾ You can find detailed information under www.vega.com.

7 Dimensions

VEGAWELL 72 - 4 ... 20 mA - suspension cable

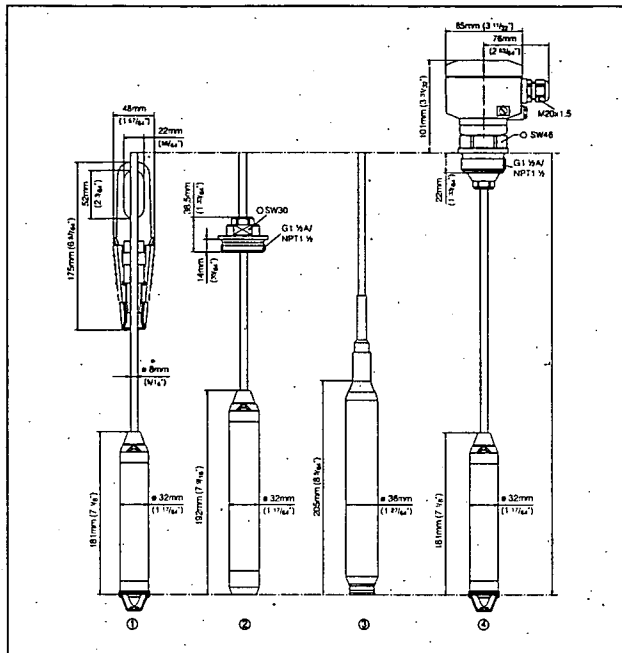


Fig. 16: VEGAWELL 72, suspension cable

- 1 with straining clamp
- 2 with threaded fitting, unassembled G1½ A (1½ NPT)
- 3 with PE plastic coating
- 4 with thread G1½ A (1½ NPT) and plastic housing

VEGAWELL 72 - 4 ... 20 mA - connection tube, extension

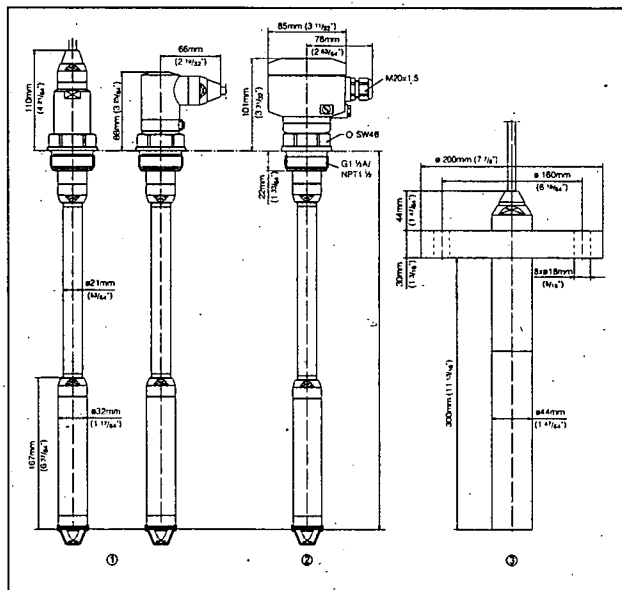


Fig. 17: VEGAWELL 72, connection tube, extension

- 1 Connection tube, cable outlet axial or lateral
- 2 Connection tube with plastic housing
- 3 Extension of PVDF

VEGAWELL 72 - 4 ... 20 mA - suspension cable

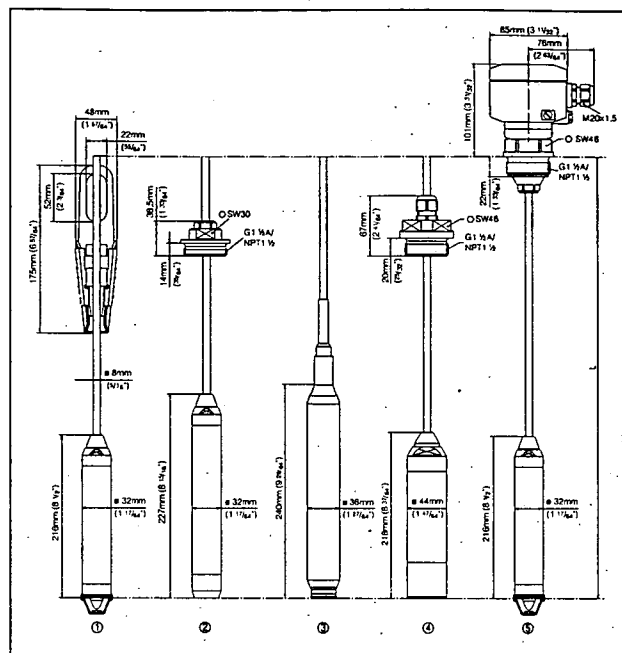


Fig. 18: VEGAWELL 72, suspension cable

- 1 with straining clamp
- 2 with threaded fitting, unassembled G1½ A (1½ NPT)
- 3 with PE plastic coating
- 4 Transmitter with screwed connection of PVDF
- 5 with thread G1½ A (1½ NPT) and plastic housing

VEGAWELL 72 - 4 ... 20 mA/HART - connection tube, extension

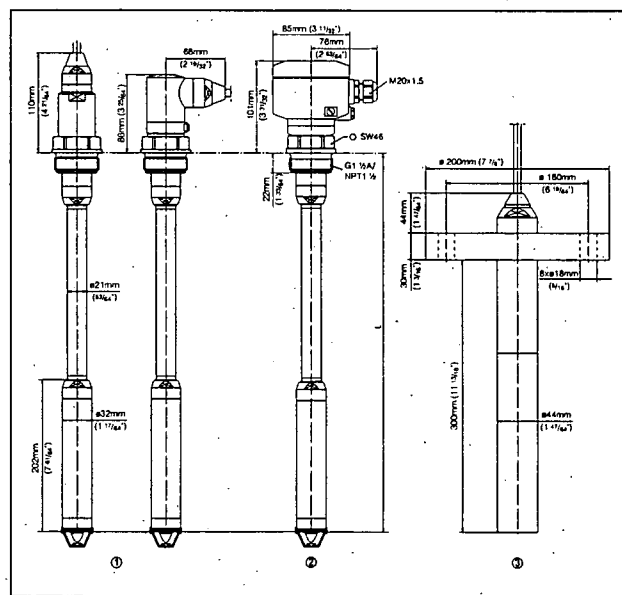


Fig. 19: VEGAWELL 72, connection tube, extension

- 1 Connection tube, cable outlet axial or lateral
- 2 Connection tube with plastic housing
- 3 Extension of PVDF

VEGA

Dimensions

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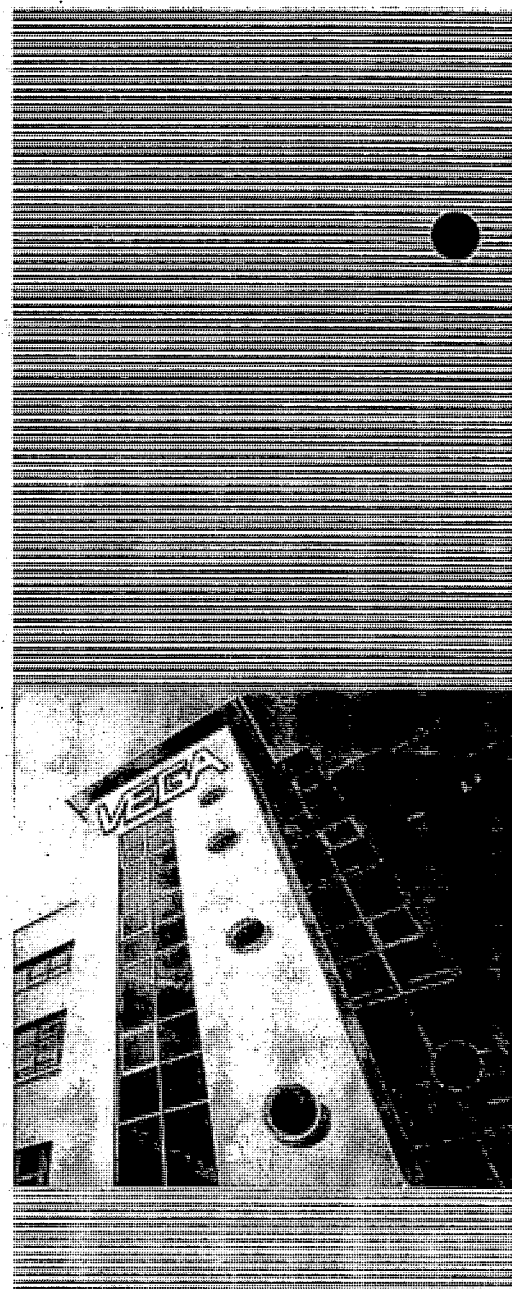
8 Product code

VEGAWELL 72

Approval	
XX without	
XM Ship approval	
AX ATEX II 2G EEx ia IIC T6	
AM ATEX II 2G EEx ia IIC T6 + Ship approval	
Version	
A PE suspension cable ¹⁾	
D PUR suspension cable ¹⁾	
B FEP suspension cable ²⁾	
Process connection / Material	
X4 without / 316Ti	
A4 Straining clamp / 1.4301	
GA Screw G1½A PN3 / 316L	
GB Screw 1½NPT PN3 / 316L	
GI Plastic housing G1½A with threaded fitting	
Transmitter protection	
X without	
P PE-plastic coating	
V Special version for deep wells	
Deviation in characteristic	
1 0.25	
2 0.10 ³⁾	
Pressure / Measuring range	
A rel. / 0...0.1 bar (0...10 kPa)	
B rel. / 0...0.2 bar (0...20 kPa)	
C rel. / 0...0.4 bar (0...40 kPa)	
D rel. / 0...1 bar (0...100 kPa)	
E rel. / 0...2.5 bar (0...250 kPa)	
F rel. / 0...5 bar (0...500 kPa)	
G rel. / 0...10 bar (0...1000 kPa)	
H rel. / 0...25 bar (0...2500 kPa)	
1 abs. / 0...1bar (0...100kPa)	
2 abs. / 0...2.5bar (0...250kPa)	
3 abs. / 0...5bar (0...500kPa)	
4 abs. / 0...10bar (0...1000kPa)	
5 abs. / 0...25bar (0...2500kPa)	
Electronics	
H 4...20mA/HART®	
C 4...20mA	
Length	
K 6m PE suspension cable	
L 12m PE suspension cable	
M 27m PE suspension cable	
T Special length (PE,PUR,FEP)	

WELL72.

¹⁾ Measuring cell seal FKM(Viton)²⁾ Measuring cell seal Kalrez³⁾ Only in conjunction with HART® electronics



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You can find at www.vega.com
downloads of the following

- operating instructions manuals
- menu schematics
- software
- certificates
- approvals
- and much, much more

Subject to change without prior notice

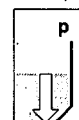
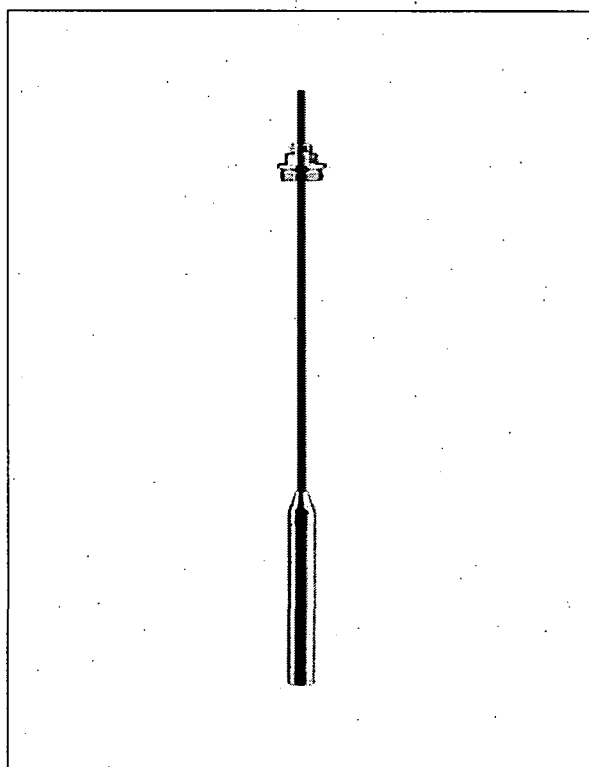
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VEGA

Operating Instructions

VEGAWELL 72

4 ... 20 mA



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Supplementary operating instructions manuals



Information:

VEGAWELL 72 is available in many versions and is thus supplied according to customer order. Depending on the selected version, supplementary operating instructions manuals also come with the delivery. You will find the supplementary operating instructions manuals in chapter "*Product description*".

Operating instructions manuals for accessories and replacement parts



Tip:

To ensure reliable setup and operation of your VEGAWELL 72, we offer accessories and replacement parts. The associated documents are:

- Operating instructions manual "*Breather housing VEGA-BOX 02*"

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1 About this document

1.1 Function

This operating instructions manual has all the information you need for quick setup and safe operation. Please read this manual before you start setup.

1.2 Target group

This operating instructions manual is directed to trained, qualified personnel. The contents of this manual should be made available to these personnel and put into practice by them.

1.3 Symbolism used



Information, tip, note

This symbol indicates helpful additional information.



Caution: If this warning is ignored, faults or malfunctions can result.

Warning: If this warning is ignored, injury to persons and/or serious damage to the instrument can result.

Danger: If this warning is ignored, serious injury to persons and/or destruction of the instrument can result.



Ex applications

This symbol indicates special instructions for Ex applications.



List

The dot set in front indicates a list with no implied sequence.



Action

This arrow indicates a single action.



Sequence

Numbers set in front indicate successive steps in a procedure.

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For your safety

2 For your safety

2.1 Authorised personnel

All operations described in this operating instructions manual must be carried out only by trained specialist personnel authorised by the operator. For safety and warranty reasons, any internal work on the instruments must be carried out only by personnel authorised by the manufacturer.

2.2 Appropriate use

VEGAWELL 72 is a suspension pressure transmitter for level and gauge measurement.

2.3 Warning about misuse

Inappropriate or incorrect use of the instrument can give rise to application-specific hazards, e.g. vessel overfill or damage to system components through incorrect mounting or adjustment.

2.4 General safety instructions

VEGAWELL 72 is a high-tech instrument requiring the strict observance of standard regulations and guidelines. The user must take note of the safety instructions in this operating instructions manual, the country-specific installation standards (e.g. the VDE regulations in Germany) as well as all prevailing safety regulations and accident prevention rules.

2.5 CE conformity

VEGAWELL 72 is in CE conformity with EMC (89/336/EEG) and LVD (73/23/EEG).

Conformity has been judged according to the following standards:

- EMC:
 - Emission EN 61326: 1997/A1: 1998 (class B)
 - Susceptibility EN 61326: 1997/A1: 1998
- LVD: EN 61010-1: 1993

2.6 Fulfilling NAMUR recommendations

VEGAWELL 72 fulfills the following NAMUR recommendations:

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VEGAWELL 72 - 4 ... 20 mA

5

For your safety

VEGA

- NE 21 (interference resistance and emitted interference)
- NE 43 (signal level for failure information)

2.7 Safety instructions for Ex areas

Please note the Ex-specific safety information for installation and operation in Ex areas. These safety instructions are part of the operating instructions manual and come with the Ex-approved instruments.

2.8 Manufacturer declaration

In conformity with DIN EN 60079-14/1998, paragraph 5.2.3, item c1, VEGAWELL 72 is suitable for use in zone 2.

The operator must use the instrument as it was intended to be used and follow the specifications of the following documents:

- the installation and operating instructions of this operating instructions manual
- the data and instructions of this manufacturer declaration (24619)
- the applicable installation regulations

The max. increase of the surface temperature (individual part in the instrument) during operation is 51 K.

With an ambient/product temperature of 60 °C (140 °F), the max. surface temperature (individual component in the instrument) occurring during operation is 111 °C (232 °F).

Measures to maintain explosion protection during operation:

- Operate the instrument in the range of the specified electrical limit values. Permissible supply voltage: see "Technical data"
- If the free end of the connection cable terminates in zone 2, it must be ensured that the end is protected (ex) respectively.

This instrument was assessed by a person who fulfils the DIN EN 60079-14 requirements.

2.9 Environmental instructions

Protection of the environment is one of our most important duties. That is why we have introduced an environment management system with the goal of continuously improving company environmental protection. The environment management system is certified according to DIN EN ISO 14001.

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For your safety

Please help us fulfil this obligation by observing the environmental instructions in this manual:

- Chapter "*Storage and transport*"
- Chapter "*Disposal*"

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VEGAWELL 72 - 4 ... 20 mA

7

Product description



3 Product description

3.1 Configuration

Scope of delivery

The scope of delivery encompasses:

- VEGAWELL 72 pressure transmitter with suspension cable
- optionally available with straining clamp, screwed connection or plastic housing with cable locking
- or VEGAWELL 72 pressure transmitter with connection tube
- Documentation
 - this operating instructions manual
 - test certificate
 - Ex specific safety instructions (with Ex versions), if necessary further certificates

Components

VEGAWELL 72 with suspension cable consists of the following components:

- Transmitter
- suspension cable (optionally available with plastic housing)

VEGAWELL 72 with connection tube consists of the following components:

- Transmitter
- Connection tube
- Socket with cable outlet
- or plastic housing with socket

The components are available in different versions.

VEGA

Product description

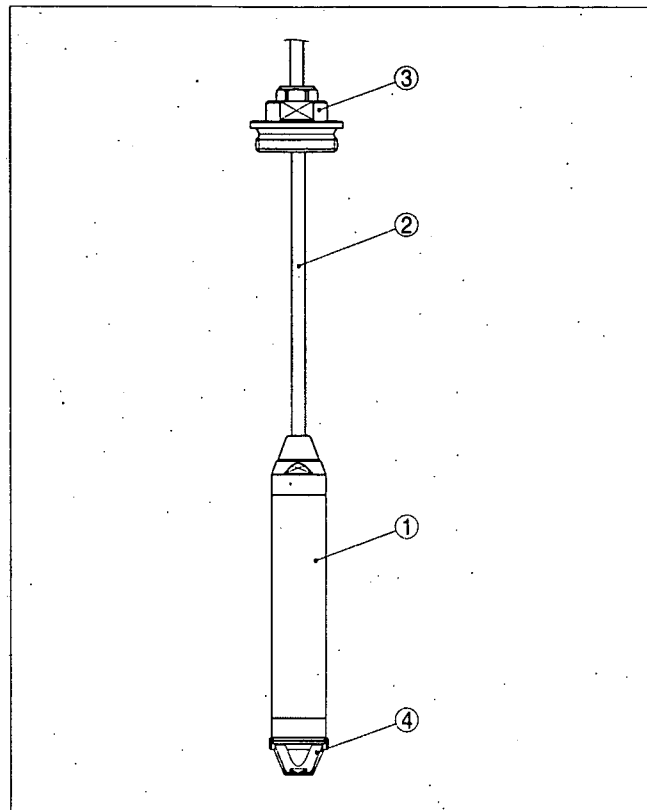


Fig. 1: Example of a VEGAWELL 72 with screwed connection

- 1 Transmitter
- 2 Suspension cable
- 3 Threaded fitting
- 4 Protective cover

3.2 Principle of operation

Area of application

VEGAWELL 72 is used for level and gauge measurement in wells, basins and atmospherically open vessels particularly in the water/waste water industry as well as on ships.¹⁾

¹⁾ For use in closed vessels under vacuum, VEGAWELL 72 is available with absolute pressure measuring ranges.

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VEGAWELL 72 - 4 ... 20 mA

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Product description

VEGA

Functional principle

Sensor element is the CERTEC® measuring cell with rugged ceramic diaphragm. The hydrostatic pressure causes a capacitance change in the measuring cell via the ceramic diaphragm. This change is converted into an appropriate output signal.

Optionally a temperature sensor PT 100 is mounted into the transmitter. The resistance value can be measured via the wires of the suspension cable.

Supply

Two-wire electronics 4 ... 20 mA for power supply and measured value transmission on the same cable.

The supply voltage range can differ depending on the instrument version.

The data for power supply are stated in chapter "*Technical data*" in the "*Supplement*".

3.3 Operation

VEGAWELL 72 with 4 ... 20 mA electronics has no adjustment option.

3.4 Storage and transport

Packaging

Your instrument was protected by packaging during transport. Its capacity to handle normal loads during transport is assured by a test according to DIN EN 24180.

The packaging of standard instruments consists of environment-friendly, recyclable cardboard. For special versions, PE foam or PE foil is also used. Dispose of the packaging material via specialised recycling companies.

Storage and transport temperature

- Storage and transport temperature see "*Supplement - Technical data - Ambient conditions*"
- Relative humidity 20 ... 85 %



4 Mounting

4.1 General instructions

Installation position

Note the following facts when selecting the installation location.

- Side movements of the transmitter can cause measurement errors
- Therefore mount VEGAWELL 72 in a calm area or in a suitable protective tube



Information:

We recommend the measuring instrument holder from the VEGA line of accessory (article no. BARMONT.B) to fasten VEGAWELL 72.

Connection

- The protective cover prevents from mechanical damages on the measuring cell. It should only be removed when being used in extremely polluted water.
- The connection cable has a capillary for atmospheric pressure compensation
- Lead the cable end into a dry space or into a suitable terminal housing.



Information:

VEGA recommends VEGABOX 01. It contains the terminals and a filter element for pressure compensation. For mounting outdoors, a suitable protective cover is available. On the version with plastic housing, the terminals and the filter housing are already integrated in the plastic housing.

Mounting examples

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VEGAWELL 72 - 4 ... 20 mA

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Mounting

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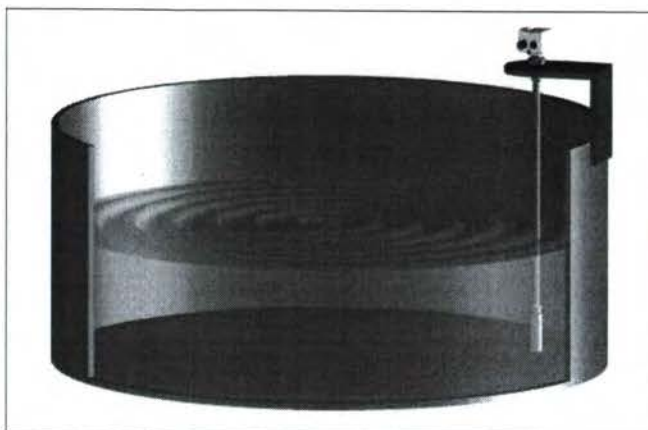


Fig. 2: Mounting example: Version with connection tube in an open vessel



Fig. 3: Mounting example: Version with suspension cable in a well shaft

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4.2 Mounting steps with straining clamp



Fig. 4: Straining clamp
1 Suspension cable
2 Suspension opening
3 Clamping jaws

Mount VEGAWELL 72 with straining clamp as follows:

- 1 Hang the straining clamp to a suitable wall hook
- 2 Lower VEGAWELL 72 to the requested height
- 3 Slide the clamping jaws upward and push the suspension cable between them
- 4 Hold the suspension cable, push the clamping jaws downward and fix them with a light blow

Removal is carried out in reverse order.

4.3 Mounting steps with screwed connection

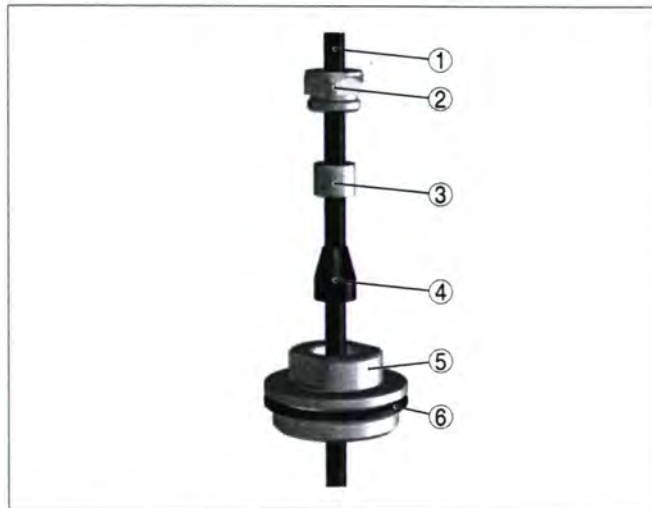


Fig. 5: Threaded fitting

- 1 Suspension cable
- 2 Seal screw
- 3 Cone sleeve
- 4 Seal cone
- 5 Threaded fitting
- 6 Seal ring

Mount VEGAWELL 72 with screwed connection as follows:

- 1 Weld the welded socket into the vessel top
- 2 Lower VEGAWELL 72 to the requested height by means on the welded socket G1½ A or 1½ NPT on the vessel side
- 3 Insert the suspension cable from below into the open screwed connection
- 4 Shift the seal cone and the cone sleeve to the suspension cable, fasten manually with the seal screw
- 5 Screw the screwed connection into the socket, fasten with SW 30 and then fasten seal screw with SW 19

How to correct the height:

- 1 Loosen seal screw with SW 19
- 2 Shift seal cone and cone sleeve to the requested position on the cable
- 3 Fasten the seal screw

Removal is carried out in reverse order.

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4.4 Mounting steps with socket and plastic housing



Fig. 6: Plastic housing

- 1 Housing
- 2 Seal
- 3 Thread

The following description applies to VEGAWELL 72 in the following versions:

- Socket with cable outlet
- Plastic housing

Mount into the vessel

Mount VEGAWELL 72 as follows:

- 1 Weld the welded socket G1½ A or 1½ NPT to the vessel top
- 2 Insert the transmitter with connection tube or suspension cable into the opening
- 3 Turn the thread with seal into the socket and tighten with SW 46²⁾

Removal is carried out in reverse order.

Mounting into the basin

Mount VEGAWELL 72 as follows:

- 1 Fasten the mounting bracket at the suitable height on the basin wall



Information:

We recommend articles for the line of VEGA accessories:

- Mounting bracket of stainless steel, article no. 2.21615
- Counter nut of PP, article no. 2.10371

²⁾ Seal the 1½ NPT thread with teflon, hemp or a similar resistant material.

Mounting

VEGA

- 2 Insert the transmitter with connection tube or suspension cable into the opening of the mounting bracket and counter nut
- 3 Fasten the counter nut to the thread with SW 46



5 Connecting to voltage supply

5.1 Preparing the connection

Note safety instructions

Generally note the following safety instructions:

- Connect only in the complete absence of line voltage
- If overvoltage surges are expected, overvoltage arresters should be installed



Tip:

We recommend the following VEGA overvoltage arresters:

- ÜS-F-LB-I (use in plastic housing of VEGAWELL 72)
- ÜSB 62-36G.X (use in a separate housing)

Take note of safety instructions for Ex applications



In hazardous areas you should take note of the appropriate regulations, conformity and type approval certificates of the sensors and power supply units.

Select power supply

Power supply and current signal are carried on the same two-wire cable. The voltage supply range can differ depending on the instrument version.

The data for power supply are stated in chapter "*Technical data*" in the "*Supplement*".

Provide a reliable separation of the supply circuit from the mains circuits according to DIN VDE 0106 part 101.

The VEGA power supply units VEGATRENN 149AEx, VEGASTAB 690, VEGADIS 371 as well as all VEGAMETs meet this requirement. If one of these instruments is used, protection class III is ensured for VEGAWELL 72.

Bear in mind the following factors regarding supply voltage:

- Output voltage of the power supply unit can be lower under nominal load (with a sensor current of 20.5 mA or 22 mA in case of failure message)
- Influence of additional instruments in the circuit (see load values in chapter "*Technical data*")

Selecting connection cable

VEGAWELL 72 is connected with standard two-wire cable without screen. An outer cable diameter of 5 ... 9 mm ensures the seal effect of the cable entry. If electromagnetic interference is expected which are above the test values of EN 61326 for industrial areas, we recommend the use of screened cable.

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Connecting to voltage supply

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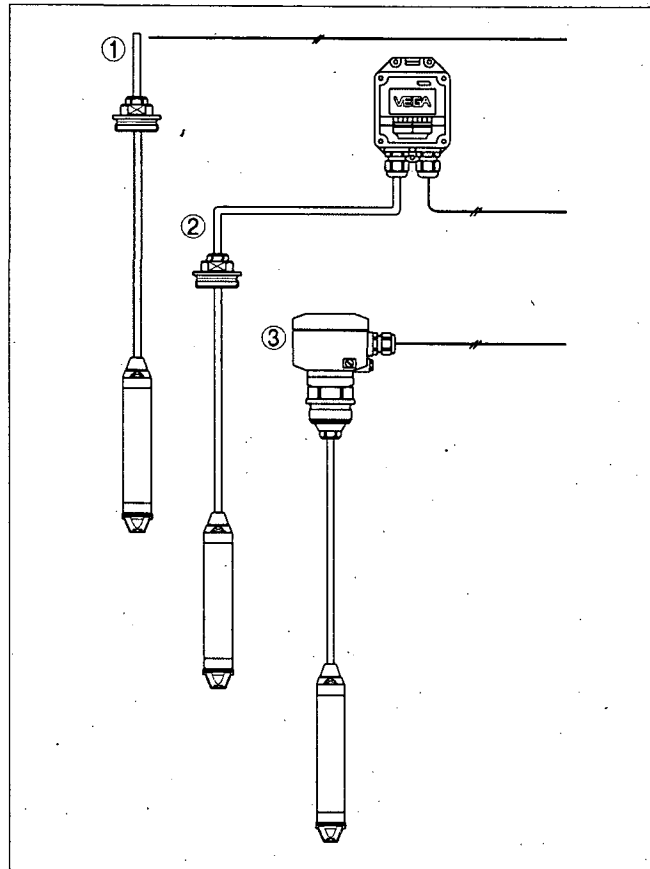


Fig. 7: Connect VEGAWELL 72 to power supply

- 1 Direct connection
- 2 Connection via VEGABOX 01
- 3 Connection via plastic housing

Cable screening and grounding

If screened cable is necessary, connect the cable screen on both ends to ground potential. In the plastic housing, in VEGABOX 01, the screen must be connected directly to the internal ground terminal. The ground terminal outside on the housing must be connected to the potential equalisation.

If potential equalisation currents are expected, the connection on the processing side must be made via a ceramic capacitor (e.g. 1 nF, 1500 V). The low frequency potential equalisation currents are thus suppressed, but the protective effect against high frequency interference signals remains.

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Select connection
cable for Ex applica-
tions.



Take note of the corresponding installation regulations for Ex applications.

5.2 Connection procedure

Direct connection

Proceed as follows:

- 1 Wire the connection cable up to the connection compartment. The bending radius must be at least 25 mm.³⁾
- 2 Connect the wire ends to the screw terminals according to the wiring plan

Connection via VEGABOX 01

Proceed as follows:

- 1 Snap VEGABOX 01 onto the carrier rail or screw it to the mounting plate
- 2 Loosen the cover screws and remove the cover
- 3 Insert the cable through the cable entry into VEGABOX 01
- 4 Loosen the screws with a screwdriver
- 5 Insert the wire ends into the open terminals according to the wiring plan
- 6 Tighten the screws with a screwdriver
- 7 Check the hold of the wires in the terminals by lightly pulling on them
- 8 Tighten the compression nut of the cable entry. The seal ring must completely encircle the cable
- 9 Connect the supply cable according to steps 3 to 8
- 10 Screw the housing cover back on

The electrical connection is finished.

Via the plastic housing

Proceed as follows:

- 1 Loosen the cover screws and remove the cover
- 2 Insert the connection cable through the cable entry into the plastic housing
- 3 Loosen the screws with a screwdriver
- 4 Insert the wire ends into the open terminals according to the wiring plan
- 5 Tighten the screws with a screwdriver

³⁾ The connection cable is already preconfecteded. After shortening the cable, fasten the type plate with support again to the cable.

Connecting to voltage supply

VEGA

- 6 Check the hold of the wires in the terminals by lightly pulling on them
 - 7 Tighten the compression nut of the cable entry. The seal ring must completely encircle the cable
 - 8 Retighten the housing cover
- The electrical connection is finished.

5.3 Wiring plan

Direct connection

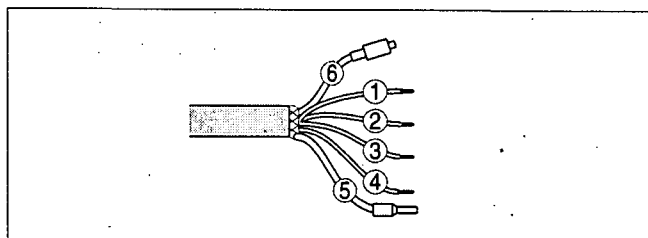


Fig. 8: Wire assignment, suspension cable

- 1 brown (+): to power supply or to the processing system
- 2 blue (-): to power supply or to the processing system
- 3 yellow: to processing of the integrated PT100 (option)
- 4 white: to processing of the integrated PT100 (option)
- 5 Screen
- 6 Breather capillaries with filter element

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Connecting to voltage supply

Connection via VEGABOX 01

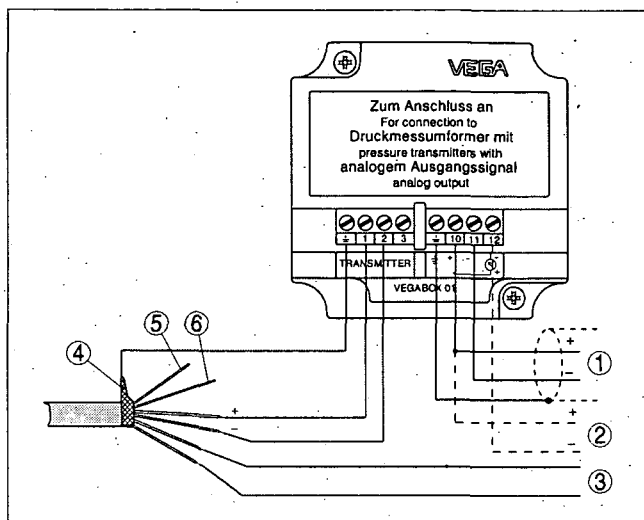


Fig. 9: Terminal assignment VEGABOX 01

- 1 To power supply or the the processing system
- 2 Control instrument (4 ... 20 mA measurement)
- 3 Yellow and white to processing of the integrated PT100 (option)
- 4 Screen⁴⁾
- 5 Breather capillaries
- 6 Suspension cable

Connection via plastic housing

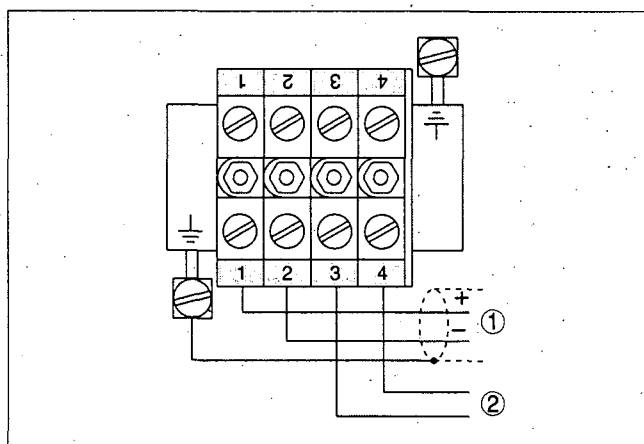


Fig. 10: Terminal assignment of the plastic housing

- 1 To power supply or the the processing system
- 2 To processing of the integrated PT100 (option)

⁴⁾ Connect screen to ground terminal. Connect ground terminal outside on the housing as prescribed. The two terminals are galvanically connected.

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Setup

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6 Setup

6.1 Setup procedure

After mounting and electrical connection, VEGAWELL 72 is ready for operation.

→ Switch on voltage

VEGAWELL 72 delivers a current of 4 ... 20 mA according to the actual level.

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7 Maintenance and fault rectification

7.1 Maintenance

When used as directed in normal operation, VEGAWELL 72 is completely maintenance free.

7.2 Remove interferences

Causes of malfunction

VEGAWELL 72 offers maximum reliability. Nevertheless faults can occur during operation. These may be caused by the following, e.g.:

- Sensor
- Process
- Supply
- Signal processing

Fault rectification

The first measure to be taken is to check the output signal. In many cases, the causes can be determined this way and the faults rectified.

24 hour service hotline

However, should this measures not be successful, call the VEGA service hotline in urgent cases under the phone no. **+49 1805 858550**.

The hotline is available to you 7 days a week round-the-clock. Since we offer this service world-wide, the support is only available in the English language. The service is free of charge, only the standard telephone costs will be charged.

Checking the 4 ... 20 mA signal

Connect a handheld multimeter in the suitable measuring range according to the wiring plan.

? 4 ... 20 mA signal not stable

- no atmospheric pressure compensation
- Check the capillaries and cut them clean
- Check pressure compensation in VEGABOX 02, if necessary clean filter element

? 4 ... 20 mA signal missing

- Incorrect connection to power supply
- Check connection according to chapter "*Connection steps*" and if necessary, correct according to chapter "*Wiring plan*"

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- No supply voltage
 - Check cables on interruption, repair, if necessary
- supply voltage too low or load resistance too high
 - Check, adapt if necessary



In Ex applications, the regulations for the wiring of intrinsically safe circuits must be observed.

7.3 Shorten suspension cable

The suspension cable of all VEGAWELL 72 models can be shortened individually. For the version with plastic housing, proceed as follows:

- 1 Loosen the cover screws and remove the cover
- 2 Loosen the screw terminals and remove the wire ends of the suspension cable out of the screw terminals
- 3 Loosen the screws of the mounting plate and remove the plate
- 4 Hold the hexagon on the screwed socket with SW 46 and loosen with seal screw SW 22



Caution:

Seal screw is secured with Loctide pink, note breakaway torque!



Fig. 11: Step 4

- 1 SW 46
- 2 SW 22

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- 5 Pull the suspension cable out of the screwed socket, remove the pressure screw, cone sleeve and seal cone from the cable
- 6 Remove the filter adapter from the transparent capillary line



Fig. 12: Configuration of the cable seal

- 1 Connection cables brown (+) and blue (-) for voltage supply
- 2 Cable screen
- 3 Breather capillaries with filter element
- 4 Seal cone
- 5 Suspension cable
- 6 Cone sleeve
- 7 Seal screw

- 7 Cut the suspension cable with an edge cutter to the requested length
 - 8 Remove approx. 10 cm of the cable mantle, strip off approx. 1 cm of the wire ends, insert the filter adapter
 - 9 Shift the seal screw, cone sleeve and seal cone to the suspension cable and insert the cable into the screwed socket, insert the wire ends through the cable entry into the mounting plate
 - 10 Fasten the mounting plate and clamp the wire ends
- The work steps are finished.

7.4 Instrument repair

If a repair is necessary, please proceed as follows:

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You can download a return form (23 KB) in the Internet from our homepage www.vega.com under: "*Downloads - Forms and Certificates - Repair form*".

By doing this you help us carry out the repair quickly and without having to call back for needed information.

- Print and fill out one form per instrument
- Clean the instrument and pack it damage-proof
- Attach the filled in form and if necessary, a safety data sheet to the instrument
- Please ask the agency serving you for the address of your return shipment. You find the respective agency on our website www.vega.com under: "*Company - VEGA world-wide*"

8 Dismounting

8.1 Dismounting procedure

**Warning:**

Before dismounting, be aware of dangerous process conditions such as e.g. pressure in the vessel, high temperatures, corrosive or toxic products etc.

Take note of chapters "*Mounting*" and "*Connecting to power supply*" and carry out the listed steps in reverse order.

8.2 Disposal

The instrument consists of materials which can be recycled by specialised recycling companies. We use recyclable materials and have designed the electronic modules to be easily separable.

WEEE directive 2002/96/EG

This instrument is not subject to the WEEE directive 2002/96/EG and the respective national laws (in Germany, e.g. ElektroG). Pass the instrument directly on to a specialised recycling company and do not use the municipal collecting points. These may be used only for privately used products according to the WEEE directive.

Correct disposal avoids negative effects to persons and environment and ensures recycling of useful raw materials.

Materials: see "*Technical data*"

If you cannot dispose of the instrument properly, please contact us about disposal methods or return.

Supplement

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9 Supplement**9.1 Technical data****General data****Materials, wetted parts**

– Transmitter	316L, Titanium, PVDF, 316L with PE coating
– Protective cover	PA, PE
– Connection cover for deep well version	316L
– Diaphragm	sapphire ceramic® (99.9 % oxide ceramic)
– Measuring cell seal	FKM (FDA and KTW approved, e.g. Viton®), FFKM (e.g. Kalrez® 6375)
– Suspension cable	PE (FDA and KTW-approved), FEP, PUR
– Connection tube	316L
– Straining clamp	1.4301
– Threaded fitting	316L, PVDF
– Socket on the plastic housing	PA
– Flange	316L, PPH
– Process fitting/cable outlet	316L

Materials, non-wetted parts

– Plastic housing	plastic PBT (Polyester)
– type label support on cable	PE hard
– transport protection net	PE

Weights

– Basic weight	0.8 kg (1.8 lbs)
– Suspension cable	approx. 0.1 kg/m (0.07 lbs/ft)
– Straining clamp	approx. 0.2 kg (0.4 lbs)
– Threaded fitting	approx. 0.4 kg (0.9 lbs)
– connection tube (max. 4.5 m/14.8 ft)	approx. 1.5 kg/m (1 lbs/ft)
– Plastic housing	approx. 0.8 kg (1.8 lbs)

Output variable

Output signal	4 ... 20 mA
Failure message	>22 mA
Rise time	70 ms (ti: 0 s, 0 ... 63 %)
Fulfilled NAMUR recommendations	NE 43

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Input variable

Nominal range	Overload resistance ⁵⁾	Vacuum resistance
Gauge pressure		
0 ... 0.1 bar/0 ... 10 kPa	15 bar/1500 kPa	-0.2 bar/-20 kPa
0 ... 0.2 bar/0 ... 20 kPa	20 bar/2000 kPa	-0.4 bar/-40 kPa
0 ... 0.4 bar/0 ... 40 kPa	30 bar/3000 kPa	-0.8 bar/-80 kPa
0 ... 1 bar/0 ... 100 kPa	35 bar/3500 kPa	-1 bar/-100 kPa
0 ... 2.5 bar/0 ... 250 kPa	50 bar/5000 kPa	-1 bar/-100 kPa
0 ... 5 bar/0 ... 500 kPa	65 bar/6500 kPa	-1 bar/-100 kPa
0 ... 10 bar/0 ... 1000 kPa	90 bar/9000 kPa	-1 bar/-100 kPa
0 ... 25 bar/0 ... 2500 kPa	130 bar/13000 kPa	-1 bar/-100 kPa
Absolute pressure		
0 ... 1 bar/0 ... 100 kPa	35 bar/3500 kPa	
0 ... 2.5 bar/0 ... 250 kPa	50 bar/5000 kPa	
0 ... 5 bar/0 ... 500 kPa	65 bar/6500 kPa	
0 ... 10 bar/0 ... 1000 kPa	90 bar/9000 kPa	
0 ... 25 bar/0 ... 2500 kPa	130 bar/13000 kPa	
0 ... 60 bar/0 ... 6000 kPa	200 bar/20000 kPa	

Accuracy (similar to DIN EN 60770-1)

Reference conditions according to DIN EN 61298-1

- Temperature 18 ... 30 °C (64 ... 86 °F)
- Relative humidity 45 ... 75 %
- Air pressure 860 ... 1060 mbar/86 ... 106 kPa (12.5 ... 15.4 psi)

Determination of characteristics limit point adjustment according to DIN 16086

Characteristics linear

Deviation in characteristics⁶⁾

Deviation in characteristics

- Turn down 1:1 <0.25 %

⁵⁾ The values relate to the measuring cell; note the max. process pressure, see Process conditions.

⁶⁾ Relating to the nominal range, incl. hysteresis and repeatability, determined according to the limit point method.

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Influence of the ambient temperatureAverage temperature coefficient of the zero signal⁷⁾

- Turn down 1:1 0.2 %/10 K

Long-term stability (similar to DIN 16086, DINV 19259-1 and IEC 60770-1)

Long-term drift of the zero signal <0.1 %/2 years

Ambient conditions

Ambient temperature

- Connection cable PE -40 ... +60 °C (-40 ... +140 °F)
- Connection cable PUR, FEP -40 ... +85 °C (-40 ... +185 °F)
- Connection tube -40 ... +85 °C (-40 ... +185 °F)

Storage and transport temperature -40 ... +100 °C (-40 ... +212 °F)

Process conditions

Process pressure, transmitter

- with measuring ranges 0.1 bar (1.5 psi) or 0.2 bar (2.9 psi) max. 15 bar (218 psi) or max. 20 bar (290 psi)⁸⁾
- with meas. ranges from 0.4 bar (5.8 psi) max. 25 bar (363 psi)⁹⁾

Pressure stage, process fitting

- Threaded fitting 316L PN 3, PVDF unpressurized
- Thread on the plastic housing 316L PN 3

Product temperature, suspension cable/seal meas. cell

- PE/Viton -20 ... +60 °C (-4 ... +140 °F)
- PUR/Viton -20 ... +80 °C (-4 ... +176 °F)
- FEP/Kalrez -10 ... +100 °C (+14 ... +212 °F)

Product temperature, connection tube/seal meas. cell

- Viton -20 ... +100 °C (-4 ... +212 °F)

Product temperature, transmitter protection/seal meas. cell

- PVDF/Kalrez -10 ... +60 °C (+14 ... +140 °F)
- PE/Viton -20 ... +60 °C (-4 ... +140 °F)

Calibration position

upright, diaphragm points downward

Influence of the installation position

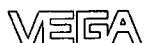
<0,2 mbar/20 Pa (0.003 psi)

⁷⁾ In the compensated temperature range of 0 ... 80 °C (176 °F), reference temperature 20 °C (68 °F).

⁸⁾ Limited by the gauge pressure resistance of the measuring cell.

⁹⁾ Limitation by the pressure-tightness of the cable connection.

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Vibration resistance

mechanical vibrations with 4 g and 5 ... 100 Hz¹⁰⁾

Electromechanical data

Suspension cable

- | | |
|--|--|
| <ul style="list-style-type: none"> – Configuration – Wire cross-section – wire resistance – Tensile strength – Max. length – Min. bending radius – Diameter – colour (non-Ex/Ex) - PE – colour (non-Ex/Ex) - PUR, FEP | <p>four wires, one suspension cable, one breather capillary, screen braiding, foil, mantle</p> <p>0.5 mm²</p> <p>≤0.036 Ohm/m</p> <p>≥1200 N (270 pound force)</p> <p>1000 m (3280 ft)¹¹⁾</p> <p>25 mm (with 25 °C/77 °F)</p> <p>approx. 8 mm</p> <p>black/blue</p> <p>blue/blue</p> |
|--|--|

Cable entry, plastic housing or VEGA-BOX 01/VEGADIS 12

1x cable entry M20x1.5 (cable-ø 5 ... 9 mm), 1x blind stopper M20x1.5

Screw terminals

for wire cross section 1.5 mm², screen up to 4 mm²

Voltage supply

Supply voltage

- | | |
|--|---|
| <ul style="list-style-type: none"> – Non-Ex instrument – EEx ia instrument | <p>12 ... 36 V DC</p> <p>12 ... 29 V DC</p> |
|--|---|

Permissible residual ripple

- | | |
|---|---|
| <ul style="list-style-type: none"> – <100 Hz – 100 Hz ... 10 kHz | <p>$U_{ss} < 1 \text{ V}$</p> <p>$U_{ss} < 10 \text{ mV}$</p> |
|---|---|

Load

see diagram

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¹⁰⁾ Tested according to the regulations of German Lloyd, GL directive 2¹¹⁾ With VEGADIS 12: 200 m (656 ft).

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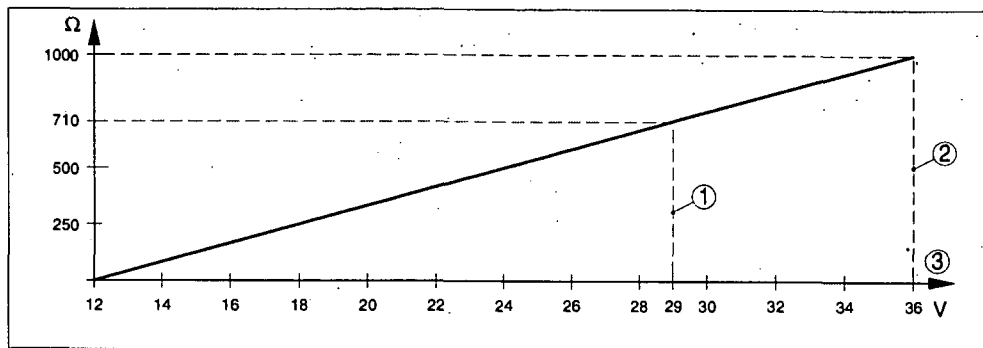


Fig. 13: Voltage diagram

- 1 Voltage limit Ex instrument
2 Voltage limit non-Ex instrument

Integrated overvoltage protection

Nominal leakage current (8/20 μ s)	10 kA
Min. response time	<25 ns

Electrical protective measures

Protection	
– Transmitter	IP 68 (25 bar)
– Plastic housing	IP 65
Overvoltage category	III
Protection class	III

Approvals¹²⁾

ATEX	ATEX II 2G EEx ia IIC T6
IEC	IEC Ex ia IIC T6
PTB	Ex-Zone 2
Ship approvals	GL, LRS, ABS, CCS, RINA, DNV
Others	WHG

¹²⁾ Deviating data in Ex applications: see separate safety instructions.

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9.2 Dimensions

VEGAWELL 72, suspension cable

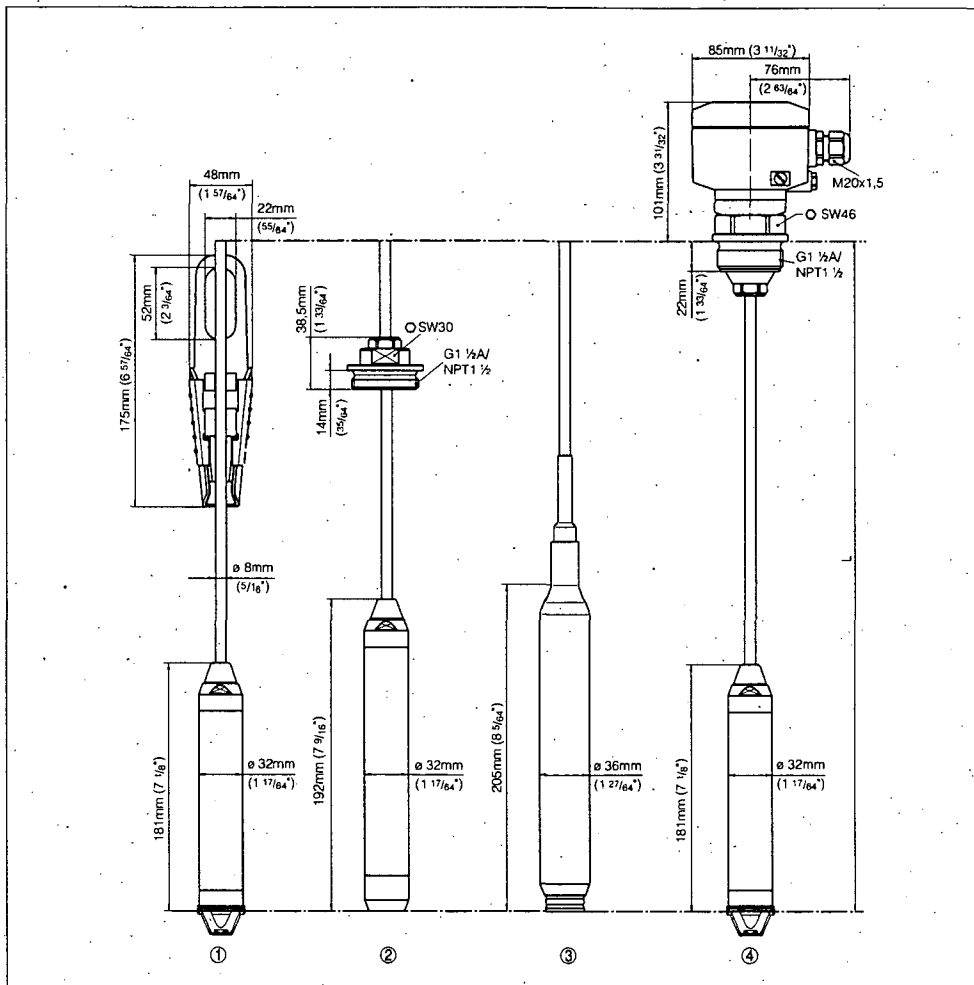


Fig. 14: VEGAWELL 72, suspension cable

- 1 with straining clamp
- 2 with threaded fitting, unassembled G1 1/2 A (1 1/2 NPT)
- 3 with PE plastic coating
- 4 with thread G1 1/2 A (1 1/2 NPT) and plastic housing

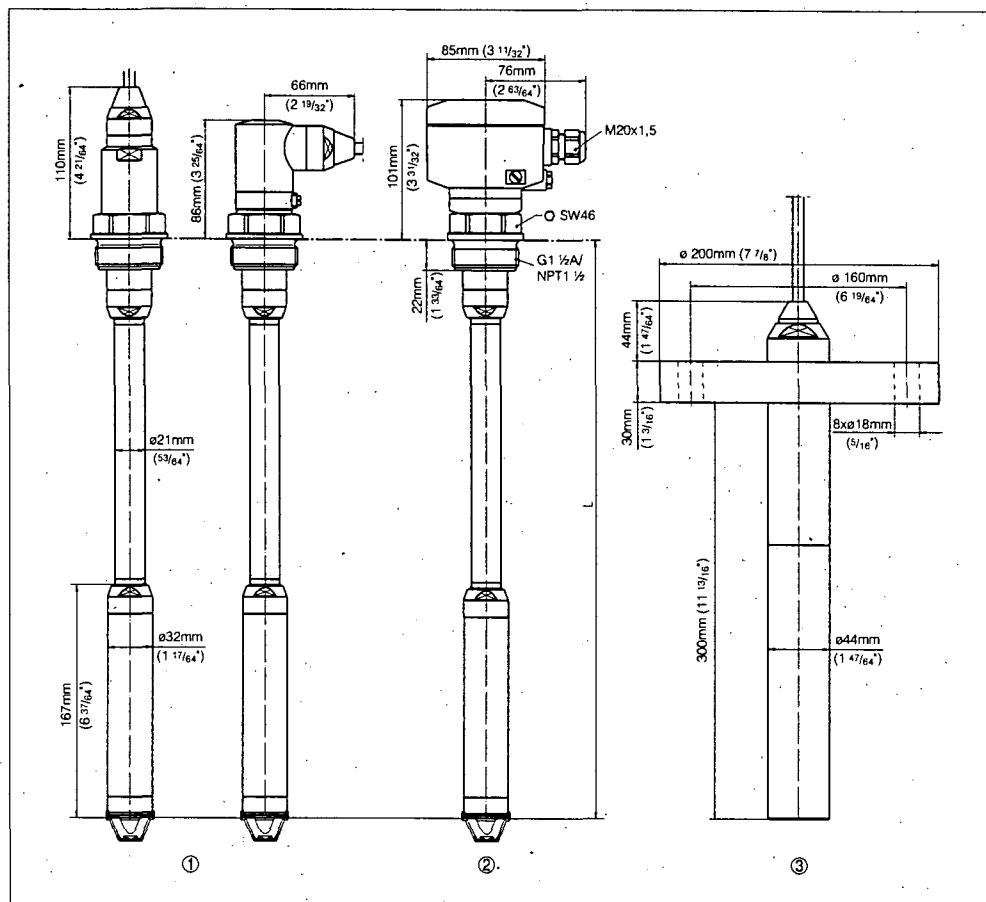
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VEGAWELL 72, connection tube, extension**Fig. 15: VEGAWELL 72, connection tube, extension**

- 1 Connection tube, cable outlet axial or lateral
- 2 Connection tube with plastic housing
- 3 Extension of PVDF



9.3 Industrial property rights

VEGA product lines are global protected by industrial property rights.

Further information see <http://www.vega.com>.

Only in U.S.A.: Further information see patent label at the sensor housing.

VEGA Produktfamilien sind weltweit geschützt durch gewerbliche Schutzrechte.

Nähere Informationen unter <http://www.vega.com>.

Les lignes de produits VEGA sont globalement protégées par des droits de propriété intellectuelle.

Pour plus d'informations, on pourra se référer au site <http://www.vega.com>.

VEGA líneas de productos están protegidas por los derechos en el campo de la propiedad industrial.

Para mayor información revise la pagina web <http://www.vega.com>.

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Дальнейшую информацию смотрите на сайте <http://www.vega.com>.

德 VEGA公司列品在全球享有知保。

一步信息网站<<http://www.vega.com>>。

9.4 Trademark

All brands used as well as trade and company names are property of their lawful proprietor/originator.



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All statements concerning scope of delivery, application, practical use and operating conditions of the sensors and processing systems correspond to the information available at the time of printing.

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Subject to change without prior notice

27501-EN-070108

Prüfzertifikat

für Druckmessumformer

Test certificate for pressure transmitters



VEGA bestätigt, dass die zur Qualitätsprüfung des Erzeugnisses eingesetzten Messmittel gültig kalibriert und auf nationale Normale der Physikalischen Technischen Bundesanstalt (PTB) rückführbar sind.
VEGA confirms that all instruments used to assure the quality of our products are calibrated and traceable to national standards of PTB (Physikalischen Technischen Bundesanstalt)

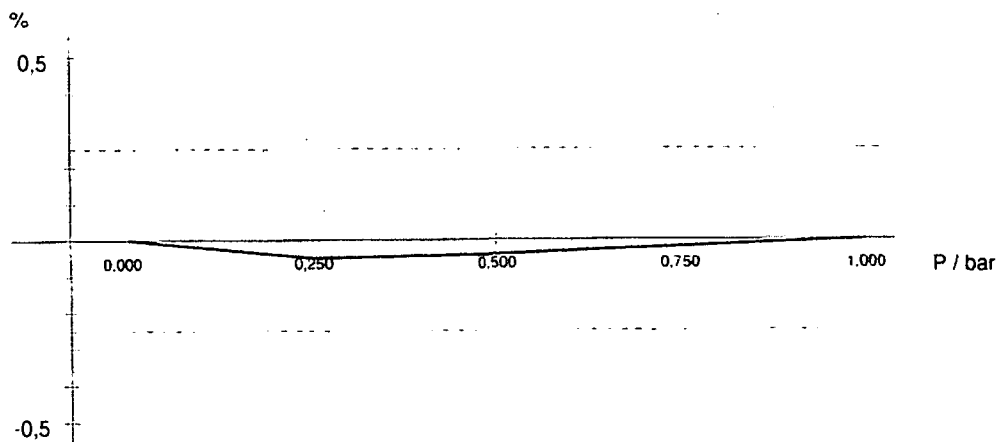
VEGA Grieshaber KG, Am Hohenstein 113, 77761 Schiltach, Tel. 0 78 36/50-0, Fax. 0 78 36/50 201

Druckmessumformer / Pressure transmitter:	WELL72	Kundennummer / Customer ID	44741
Messbereich / Measuring range:	0 bis/to 1bar rel. 0 bis/to 100 kPa rel.	Auftragsnummer / Order number	1225475
Seriennummer / Series no.:	14562023	Auftragsposition / Order position	3
Ausgang / Output:	4 ... 20mA, HART		
Zulassungen / Approvals:	OHNE		
Kennwerte / Characteristics:	0,000 bis/to 1,000 bar rel. 4,008 bis/to 20,003 mA		

Kennliniencharakteristik / Output characteristics:

max. zul. Abweichung bezogen auf Messbereich: < 0,25 %
/ Dev. in linearity rel. to measuring range

Ref.-Druck / Ref. pressure [bar]:	0,000	0,250	0,500	0,750	1,000
Soll-Ausgang / Ideal output [mA]:	4,008	8,007	12,006	16,004	20,003
Ist-Ausgang / Real output [mA]:	4,008	8,000	12,000	16,000	20,003
Abweichung / Accuracy [%]:	0,00	-0,05	-0,04	-0,02	0,00

**Temperatureinfluss**

/ Temperature influence:

Temperaturfehler bei 0 bar rel.

/ Temperature accuracy at 0 bar rel.

Bezogen auf den Messbereich / Related to the measuring range

Bezugstemperatur 20 °C / Ref. temperature 20 °C

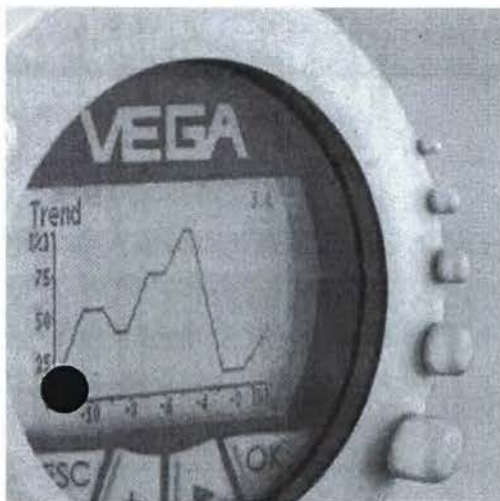
Temperatur [°C] Temperature	0	20	60	100
Ist-Ausgang [mA] Real output	4,007	4,008	4,001	4,003
Abweichung [%] Accuracy	-0,01	0,00	-0,05	-0,03

Datum / Date: 21.09.2005

Unterschrift / Signature:

Indicating instruments

VEGADIS 11
VEGADIS 12
VEGADIS 61
PLICSCOM
VEGADIS 175



Product Information

VEGA

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Take note of safety instructions for Ex applications

Please note the Ex specific safety information which you will find on our homepage www.vega.com/services/downloads and which come with the appropriate instrument with Ex approval. In hazardous areas you should take note of the appropriate regulations, conformity and type approval certificates of the sensors and power supply units. Each VEGADIS with Ex approval is a corresponding, intrinsically safe instrument and must not be installed in hazardous areas.

30143-60407

1 Product description

In continuous measurement, the level in a vessel or the pressure in a pipeline, for example, is detected by a sensor. The measured value is converted into an analogue 4 ... 20 mA output signal or a digital output signal, e.g. Profibus PA. The output signal is then further processed, e.g. in a PLC or a control system.

On-site indication of the measured value or sensor adjustment is often desired. To fulfill this need, VEGA offers a wide range of indicating instruments. Indication, power supply and mounting differ depending on the model. This product information manual provides an overview and helps you select a suitable instrument.

VEGADIS 11

VEGADIS 11 is a universal, digital indicating instrument that operates without additional power. It is used for remote (i.e. at some distance from the measuring site) measured value indication. VEGADIS 11 can be connected at any point to the 4 ... 20 mA signal cable. It is suitable for any VEGA sensor as well as sensors from other manufacturers, i.e. for active (four-wire) as well as passive (two-wire) sensors.



Fig. 1: Configuration VEGADIS 11

- 1 To the sensor
- 2 To the processing system

Advantages:

- Universal use for active or passive 4 ... 20 mA sensors
- No separate external energy required
- mounting to the wall or on carrier rail

VEGADIS 12

VEGADIS 12 is a digital indicating instrument that operates without additional power. It is used for remote (i.e. at some distance from the measuring site) measured value indication and adjustment of VEGABAR 74, 75 and VEGAWELL 72 - 4 ... 20 mA/HART hydrostatic pressure transmitters. VEGADIS 12 can be connected at any point to the 4 ... 20 mA signal cable. It is provided with a breather facility for sensor ventilation via the capillary line in the special cable.



Fig. 2: Configuration VEGADIS 12

- 1 To the sensor
- 2 To the processing system

Advantages:

- No separate external energy required
- mounting to the wall or on carrier rail

VEGADIS 61

VEGADIS 61 is an external indicating and adjustment module that operates without additional power. It is used for remote (i.e. at some distance from the measuring site) measured value indication and adjustment of VEGA plics® sensors. The sensors can be 4 ... 20 mA, Profibus PA or Foundation Fieldbus sensors. VEGADIS 61 is connected to the sensors with a standard four-wire screened cable up to 25 m long. Communication is carried out via this cable and, what is more, VEGADIS 61 is powered by the sensor. An additional power supply is not required.

PLICSCOM

The indicating and adjustment module PLICSCOM is used for measured value indication, adjustment and diagnosis of VEGA plics® sensors. It is mounted in the respective sensor housing or in the external indicating and adjustment module VEGADIS 61. After mounting, the sensor and PLICSCOM are splash-proof even without housing cover.

An integrated backlight enables reading even under unfavourable lighting conditions. As an option, the display can also be equipped with heating that ensures good readability at low temperatures down to -40°C (-40°F).



Fig. 3: Configuration VEGADIS 61 and PLICSCOM

- 1 Sensor
- 2 VEGADIS 61
- 3 PLICSCOM

Advantages:

- Universal use for all plics® sensors
- Splash-proof adjustment with open cover
- No separate external energy required
- mounting VEGADIS 61 to the wall, on carrier rail or tube

VEGADIS 175

VEGADIS 175 is a digital indicating instrument for front panel mounting. It can be connected at any point to the 4 ... 20 mA signal cable and is suitable for active (four-wire) as well as passive (two-wire) sensors.



Fig. 4: Configuration VEGADIS 175

- 1 To the sensor
- 2 VEGADIS 175
- 3 To the processing system

Advantages:

- Universal use for passive or 4 ... 20 mA sensors
- No separate external energy required

1.1 Application examples

Pump shaft



Fig. 5: Level measurement in a pump shaft with VEGAWELL 72, remote indication and adjustment with VEGADIS 12

For hydrostatic level measurement in a pump shaft, VEGADIS 12 together a VEGAWELL 72 is well suited for remote indication and adjustment. The min./max. adjustment is carried out on site and the actual measured value can be read out during operation.

Chip silo

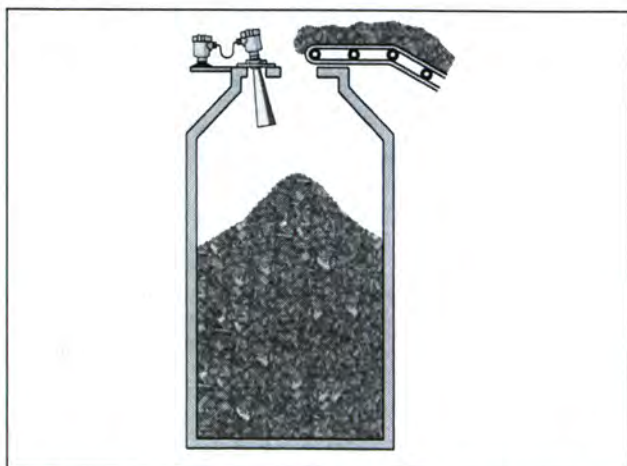


Fig. 6: Level measurement in a chip silo with VEGAPULS 68, remote indication and adjustment with VEGADIS 61

In non-contact level measurement in a chip silo with VEGAPULS 68, the mounting location is not directly accessible. For that reason VEGADIS 61 is an excellent solution for remote indication

and adjustment. The min./max. adjustment can be carried out locally with or without filling.

2 Type overview

VEGADIS 11



VEGADIS 12



VEGADIS 61



Display:	digital and quasi-analogue	digital and quasi-analogue	Dot-Matrix
Signal:	4 ... 20 mA, 4 ... 20 mA/HART	4 ... 20 mA, 4 ... 20 mA/HART	I ² C bus
Sensors:	4 ... 20 mA passive or active	VEGABAR 74, 75; VEGAWELL 72 - 4 ... 20 mA/HART	plics [®] sensors
Mounting:	Wall, rail mounting	Wall, rail mounting	Wall, rail, tube mounting
Ambient temperature:	-20 ... +70°C (-4 ... +158°F)	-20 ... +70°C (-4 ... +158°F)	-20 ... +70°C (-4 ... +158°F)

PLICSCOM



VEGADIS 175



Display:	Dot-Matrix	digital
Signal:	I ² C bus	4 ... 20 mA, 4 ... 20 mA/HART
Sensors:	plics [®] sensors	4 ... 20 mA passive or active
Mounting:	in the sensor or in VEGADIS 61	Front panel
Ambient temperature:	-15 ... +70°C (+5 ... +158°F)	-10 ... +60°C (+14 ... +140°F)

3 Mounting information

VEGADIS 11 and VEGADIS 12

VEGADIS 11 and VEGADIS 12 are configured for the following installation and mounting options:

- Carrier rail 35x7.5 acc. to EN 50022
- Wall mounting

Carrier rail mounting

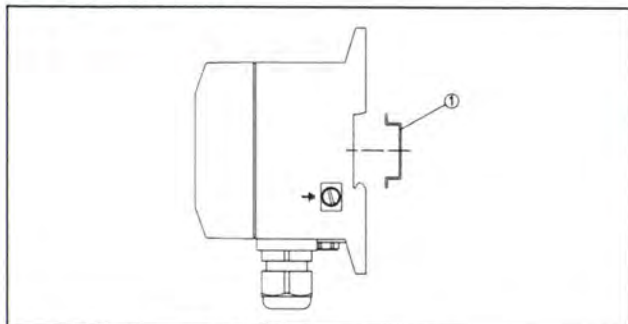


Fig. 7: VEGADIS 11 and VEGADIS 12 carrier rail mounting

1 Carrier rail

Wall mounting

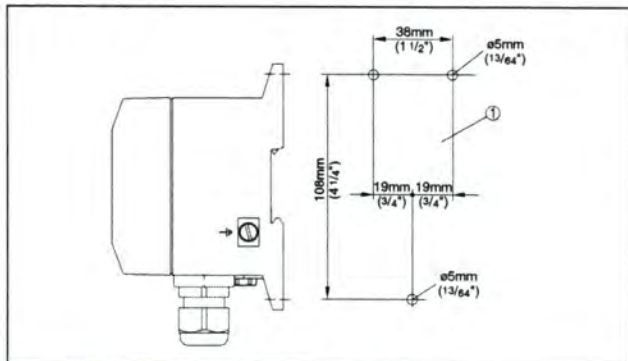


Fig. 8: VEGADIS 11 and VEGADIS 12 wall mounting

1 Drill dimension

VEGADIS 61

VEGADIS 61 can be mounted in the following ways:

- Carrier rail 35x7.5 acc. to EN 50022
- Wall mounting
- Tube mounting

Wall mounting

VEGADIS 61 for wall mounting is supplied with a mounting socket.

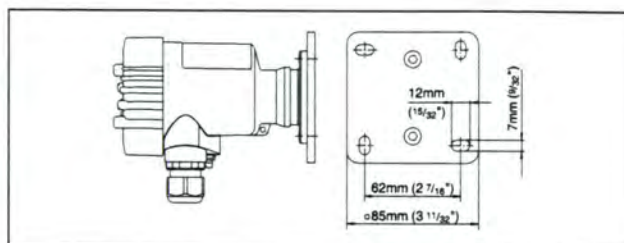


Fig. 9: VEGADIS 61 for wall mounting, bottom view of mounting plate.

1 Drill dimension

Carrier rail mounting

VEGADIS 61 for mounting on carrier rail is supplied with a mounting adapter.

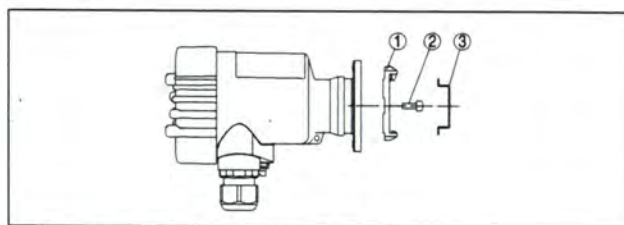


Fig. 10: VEGADIS 61 for mounting on carrier rail

- 1 Adapter plate
- 2 Screw M4x6
- 3 Carrier rail

Tube mounting

VEGADIS 61 for tube mounting is supplied with the measuring instrument holder BARMONT.C (comes with delivery as mounting accessory).

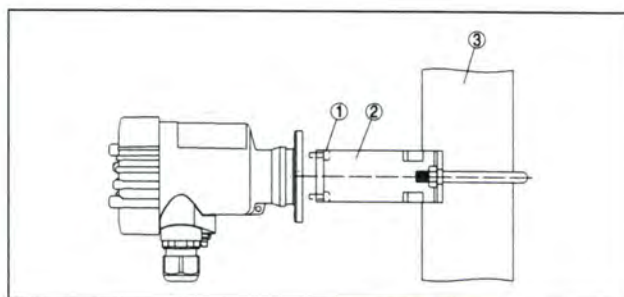


Fig. 11: VEGADIS 61 for tube mounting

- 1 4 screws M5x12
- 2 Measuring instrument holder BARMONT.C
- 3 Tube

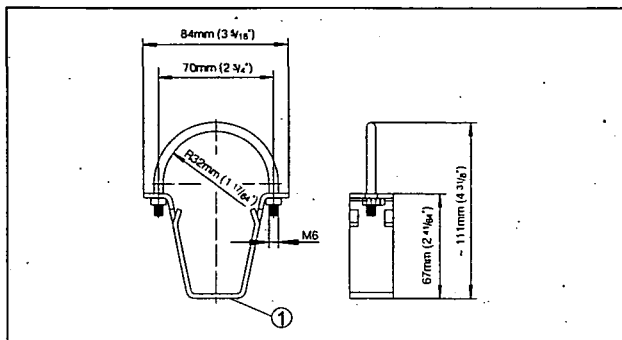


Fig. 12: Measuring instrument holder BARMONT.C

1 4x holes 5 mm for mounting screws M5x12

PLICSCOM

The indicating and adjustment module PLICSCOM can be inserted in the following housing versions and instruments:

- All sensors of the plics® instrument family, in the single as well as in the double chamber housing (optionally in the electronics or connection compartment)
- External indicating and adjustment unit VEGADIS 61

VEGADIS 175

VEGADIS 175 can be mounted in the following ways:

- Front panel mounting

Front panel mounting

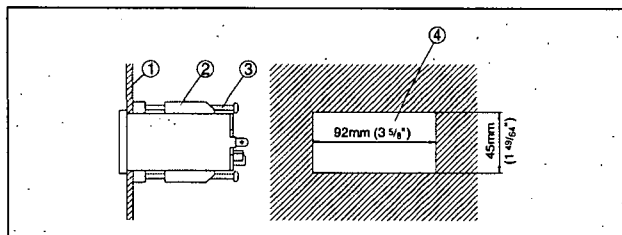


Fig. 13: VEGADIS 175 for panel mounting

- 1 Front panel
- 2 Fixing hook
- 3 Screw

4 Connecting to power supply

4.1 Preparing the connection

Note safety instructions

Always observe the following safety instructions:

- Connect only in the complete absence of line voltage
- If overvoltages are expected, overvoltage arresters should be installed.



Tip:

We recommend VEGA overvoltage arresters B61-300 (power supply VEGADIS) and B62-36G (sensor supply).

Take note of safety instructions for Ex applications



In hazardous areas you should take note of the appropriate regulations, conformity and type approval certificates of the sensors and power supply units.

Select connection cable

Standard two-wire cable without screen is used for connection of the sensors.

Cable screening and grounding

Connect the cable screen on both ends to ground potential. In the sensor, the screen must be connected directly to the internal ground terminal. The ground terminal outside on the housing must be connected to the potential equalisation.

If potential equalisation currents are expected, the screen connection on the VEGADIS must be made via a ceramic capacitor (e.g. 1 nF, 1500 V). The low frequency potential equalisation currents are thus suppressed, but the protective effect against high frequency interference signals remains.

Select connection cable for Ex applications



Take note of the corresponding installation regulations for Ex applications. In particular, make sure that no potential equalisation currents flow over the cable screen. In case of grounding on both sides this can be achieved by the use of a capacitor or a separate potential equalisation.

4.2 Wiring plans, VEGADIS 11

Passive sensors

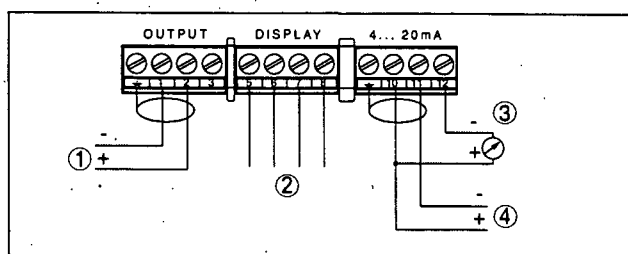


Fig. 14: Wiring plan, VEGADIS 11 for passive sensors

- 1 Sensor (passive)
- 2 Indicating module (assignment see chart)
- 3 Control instrument



Note:

Passive sensors need a power supply. They represent current sinks and emboss a current of 4 ... 20 mA to the supply circuit. The supply voltage is loop through VEGADIS 11. On the output (terminals 1/2), VEGADIS 11 provides the power supply for the connected sensors. Power supply and measured value transmission are carried along the same two-wire cable.

Active sensors

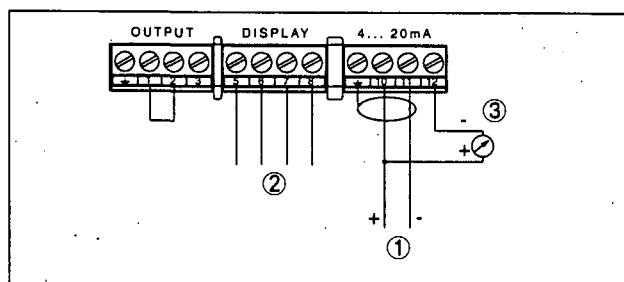


Fig. 15: Wiring plan, VEGADIS 11 for active sensors

- 1 Sensor (active)
- 2 Indicating module
- 3 Control instrument
- 4 Power supply/Signal output



Note:

The input (terminals 10/11) is provided for connection of transmitters with own, separate power supply. The output (terminal 1/2) is bridged.

Sensors with signal conditioning instrument

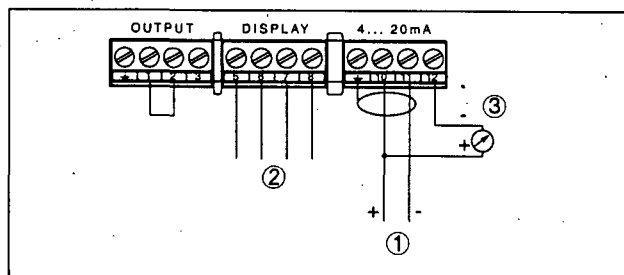


Fig. 16: Wiring plan, VEGADIS 11 for signal conditioning instrument

- 1 Signal conditioning instrument
- 2 Indicating module
- 3 Control instrument



Note:

The input (terminals 10/11) is provided for connection of signal conditioning instruments. Connection and operation in Ex ia is not possible. The output (terminal 1/2) is bridged.

4.3 Wiring plans, VEGADIS 12

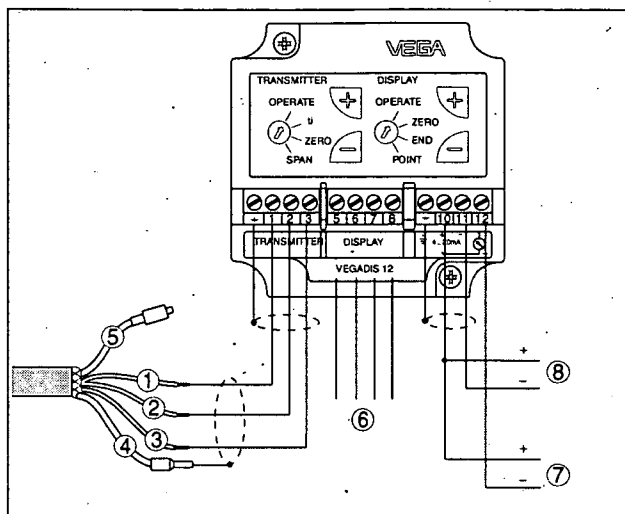


Fig. 17: Wiring plan, VEGADIS 12

- 1 brown (+)
- 2 blue (-)
- 3 Yellow
- 4 Screen
- 5 Breather capillaries with filter element
- 6 Indicating module
- 7 Control instrument
- 8 Power supply/Signal output

4.4 Wiring plans, VEGADIS 61

Wiring plan

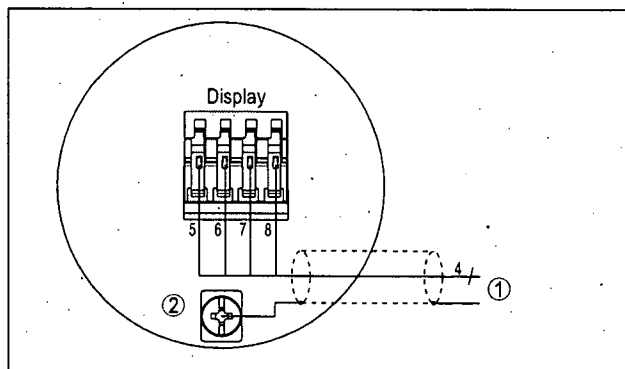


Fig. 18: Wiring plan, single chamber housing

- 1 plics® sensor
- 2 Grounding on both ends with non-Ex. With Ex, grounding at one sensor end is recommended, see EN 60079-14.

4.5 Wiring plans, VEGADIS 175

Passive sensors

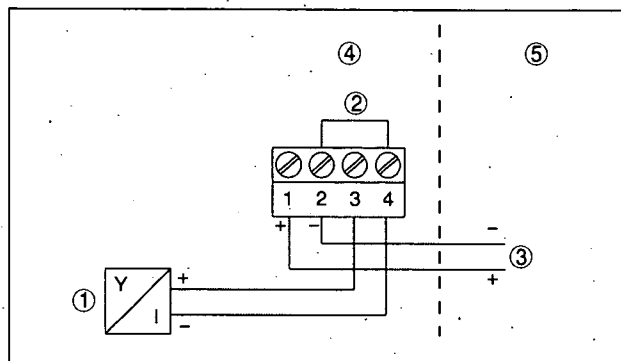


Fig. 19: Wiring plan, VEGADIS 175 for passive sensors

- 1 Sensor (passive)
- 2 Bridged internally
- 3 Power supply/Signal output
- 4 Ex area
- 5 Non-Ex area

Active sensors

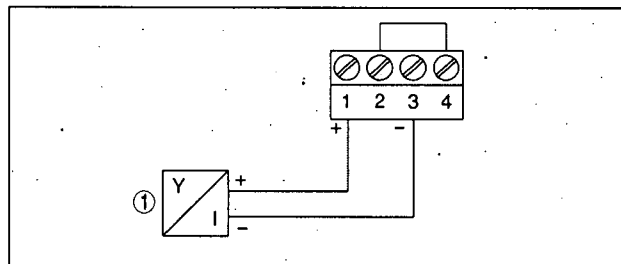


Fig. 20: Wiring plan, VEGADIS 175 for active sensors

- 1 Sensor (active)
- 2 Bridged internally

5 Adjustment

5.1 Adjustment on VEGADIS 11

The display is located in the housing cover, the adjustment elements are accessible after removing the cover.

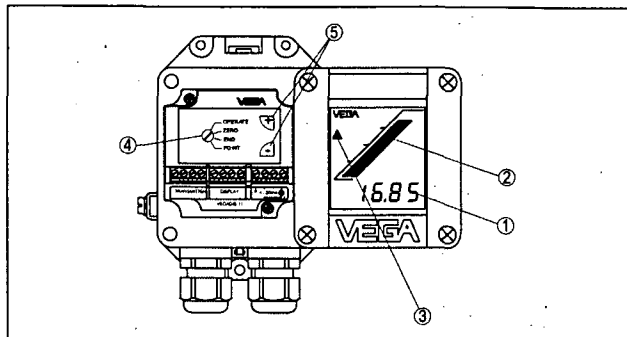


Fig. 21: Indicating and adjustment elements

- 1 Digital indication
- 2 Bar graph indication
- 3 Tendency indication
- 4 Rotary switch
- 5 Adjustment keys +/-

Key functions

- **[Rotary switch]** to select:
 - Operate = Measured value indication
 - ZERO = Adjustment of the min. value
 - SPAN = Adjustment of the max. value
 - Point = Shifting of the decimal point
- **[+/-] key:**
 - Change value of the digital indication

5.2 Adjustment on VEGADIS 12

The display is located in the housing cover, the adjustment elements are accessible after removing the cover.

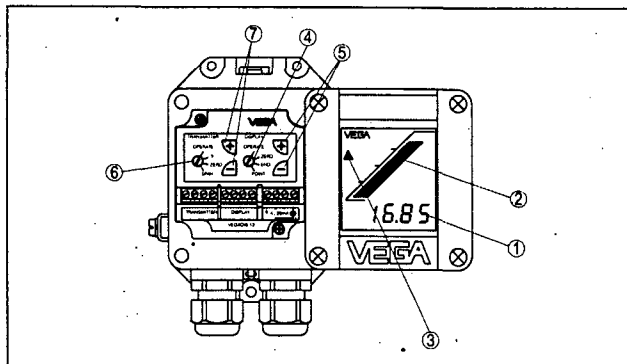


Fig. 22: Indicating and adjustment elements

- 1 Digital indication
- 2 Bar graph indication
- 3 Tendency indication
- 4 Rotary switch "Indication"
- 5 Adjustment keys +/- Display
- 6 Rotary switch "Pressure transmitter"
- 7 Adjustment keys +/- Pressure transmitter

Key functions

- **[Rotary switch]** to select:
 - Operate = Measured value indication
 - ZERO = Adjustment of the min. value
 - SPAN = Adjustment of the max. value
 - Point = Shifting of the decimal point
- **[+/-] key:**
 - Change value of the digital indication

5.3 Adjustment on VEGADIS 61 and PLICSCOM

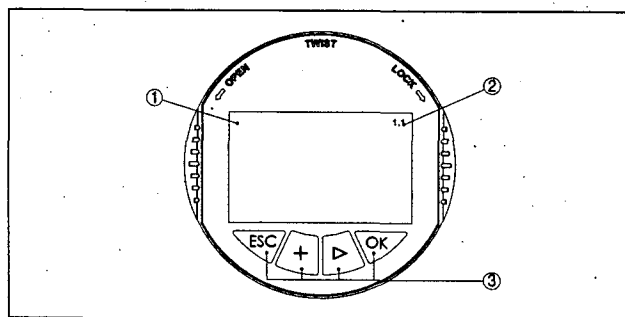


Fig. 23: Indicating and adjustment elements

- 1 LC display
- 2 Indication of the menu item number
- 3 Adjustment keys

Key functions

- **[OK] key:**
 - move to the menu overview
 - confirm selected menu
 - edit parameter
 - save value
- **[>-] key to select:**
 - menu change
 - list entry
 - editing position
- **[+] key:**
 - modify value of a parameter
- **[ESC] key:**
 - interrupt input
 - jump to the next higher menu

5.4 Adjustment on VEGADIS 61 with PACTware™

PACTware™/DTM

Independent of the respective signal output, whether 4 ... 20 mA/HART, Profibus PA or Foundation Fieldbus, plics sensors can be adjusted directly on VEGADIS 61 via PACTware™. To adjust with PACTware™, an instrument driver for the particular sensor is required.

All currently available VEGA DTMs are provided in a DTM Collection with the current PACTware™ version on CD. They are available from the responsible VEGA agency for a token fee. The basic version of this DTM Collection incl. PACTware™ is available as a free-of-charge download from the Internet.

To use the entire range of functions of a DTM, incl. project documentation, a DTM licence is required for that particular instrument family. This licence can be bought from the VEGA agency serving you.

Connection of the PC to VEGADIS 61

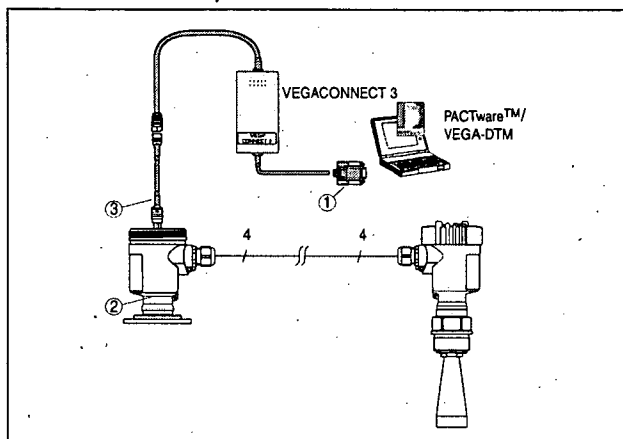


Fig. 24: Connection to VEGADIS 61

- 1 RS232 connection
- 2 VEGADIS 61
- 3 I²C adapter cable for VEGACONNECT 3

To adjust with PACTware™, a VEGACONNECT 3 with I²C adapter cable (art. no. 2.27323) as well as a power supply unit is necessary in addition to the PC and the suitable VEGA-DTM.

5.5 Adjustment on VEGADIS 175

Indication and adjustment are carried out on the front via a clear LC display and three keys.

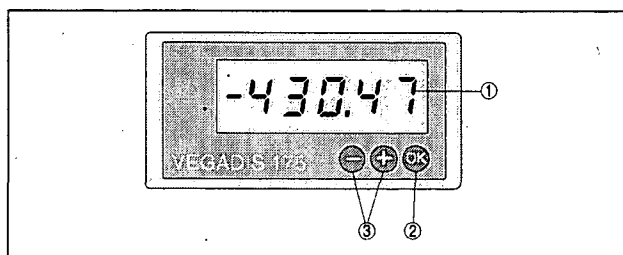


Fig. 25: Indicating and adjustment elements

- 1 Digital indication
- 2 Key (OK)
- 3 Adjustment keys +/-

Key functions

- [OK] key:
 - move to the menu overview

- confirm selected menu
- edit parameter
- save value
- [+/–] keys:
 - modify value of a parameter



Technical data

6 Technical data

General data

VEGADIS 11 and 12

Series

instrument for panel or wall mounting or mounting on carrier rail 35x7.5
acc. to EN 50022

Materials

- Housing
- Inspection window of the indication
- Breather facility
- Ground terminal

plastic PBT
Lexan
PTFE filter element
316Ti/316L
approx. 400 g (0.88 lbs)

Weight

VEGADIS 61

Series

instrument for panel or wall mounting or mounting on carrier rail 35x7.5
acc. to EN 50022

Materials

- Housing
- Inspection window in housing cover
- Ground terminal

plastic PBT, Alu die-casting powder-coated, 316L
Polycarbonate (UL746-C listed)
316Ti/316L
approx. 500 ... 1300 g (1.10 ... 2.87 lbs)

Weight, depending on the housing material and mounting
technology

PLICSCOM

Series

Module for insertion in VEGADIS 61

Materials

- Housing
- Inspection window

ABS
Polyester foil
approx. 100 g (0.22 lbs)

Weight

VEGADIS 175

Series

Module unit for front panel mounting

Materials

- Housing front
- Housing
- Rear of the housing

Alu die-casting
Sheet steel galvanized
ABS
approx. 300 g (0.66 lbs)

Weight

Input

VEGADIS 11

Connection to

individual passive or active sensors 4 ... 20 mA/HART

Transmission

max. input current

Connection cable to the sensor

Voltage loss

analogue, 4 ... 20 mA
150 mA
2-wire
4.5 V at 20 mA

VEGADIS 12

Connection to

VEGAWELL 72 - 4 ... 20 mA/HART, VEGABAR 74 and 75

Transmission

max. input current

Connection cable to the sensor

Cable length

Voltage loss

analogue, 4 ... 20 mA
150 mA
3-wire (VEGA special cable with breather capillaries or standard cable)
max. 200 m
4.5 V at 20 mA

VEGADIS 61

Connection to

VEGA plics® sensors

Data transmission

Connection cable

Cable length

digital (I²C-Bus)
4-wire, screened
max. 25 m

30143-E
80407

Technical data

VEGA

VEGADIS 175

Transmission

HART protocol

max. input current

Voltage loss

analogue, 4 ... 20 mA (reverse battery protection)

The indicator is suitable for transmission of the HART protocol

150 mA (shortcircuit current)

<2 V at 20 mA

Displays**VEGADIS 11 and 12**

LC multiple function display

- Bar graph (quasi-analogue indication)
- Digital value
- Tendency indicators

20 segments

-9999 ... 9999

Symbols for rising or falling values

VEGADIS 61 and PLICSCOM

LC display

in dot matrix

Power supply display light

through the sensor, voltage range see sensor operating instructions manual

Power supply display heating

- Operating voltage
- Power
- Switch on point

24 V DC +5 %

1.7 W

-5°C (+23°F)

VEGADIS 175

LC display

- Height of figures
- Indication range
- Offset

17 mm

-19999 ... 19999

-19999 ... 32767

Ambient conditions**VEGADIS 11 and 12**

Ambient temperature

-20 ... +70°C (-4 ... +158°F)

Storage and transport temperature

-40 ... +85°C (-40 ... +185°F)

VEGADIS 61 and PLICSCOM

Ambient temperature

-15 ... +70°C (+5 ... +158°F)

Ambient temperature with heating

-40 ... +70°C (-40 ... +158°F)

Storage and transport temperature

-40 ... +80°C (-40 ... +176°F)

VEGADIS 175

Ambient temperature

-10 ... +60°C (+14 ... +140°F)

Storage and transport temperature

-25 ... +70°C (-13 ... +158°F)

Climatic class

acc. to EN 60654-1, class B2

Electrical protective measures**VEGADIS 11 and 12**

Protection

IP 67

Overvoltage category

III

Protection class

III

VEGADIS 61

Protection

IP 66/IP 67

Overvoltage category

III

Protection class

II

PLICSCOM

Protection

- unassembled

IP 20

- mounted into VEGADIS 61 without cover

IP 40



Technical data

VEGADIS 175

Protection

- between front frame and front panel
- Terminals

IP 65

IP 20

ESD

6 kV/8 kV

Electromagnetic fields

10 V/m

Burst (power supply)

2 kV

Surge

1 kV

Electromagnetic fields

10 V/m

Approvals¹⁾

VEGADIS 11

ATEX

ATEX II 2G EEx ia IIC T6

VEGADIS 12

ATEX

ATEX II 2G EEx ia IIC T6

UL

Cl. I,II,III; Div. 1; Gr. A-G

VEGADIS 61

ATEX ia

ATEX II 1G, 2G EEx ia IIC T6

ATEX D

ATEX II 1/2D IP6X T

IEC

IEC Ex ia IIC T6

FM

FM Cl.I-III, Div 1 (IS)

CSA

CSA Cl.I-III, Div1 (IS)

VEGADIS 175

ATEX

ATEX II 1G EEx ia IIC T6

Environmental instructions

VEGA environment management system²⁾

certified acc. to DIN EN ISO 14001

¹⁾ Deviating data in Ex applications: see separate safety instructions.

²⁾ You will find detailed information under www.vega.com.

7 Dimensions

VEGADIS 11 and 12

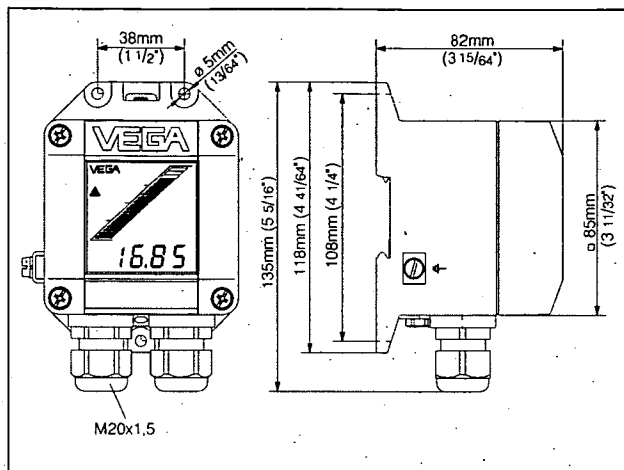


Fig. 26: Dimensions VEGADIS 11 and 12

VEGADIS 61

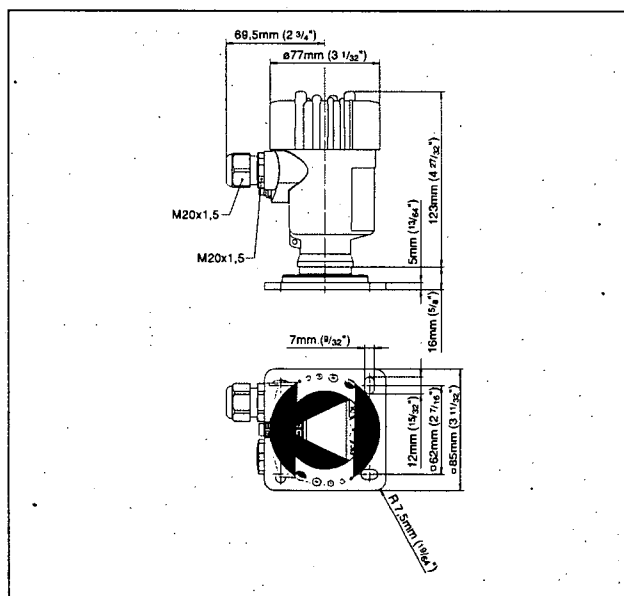


Fig. 27: Dimensions VEGADIS 61

PLICSCOM

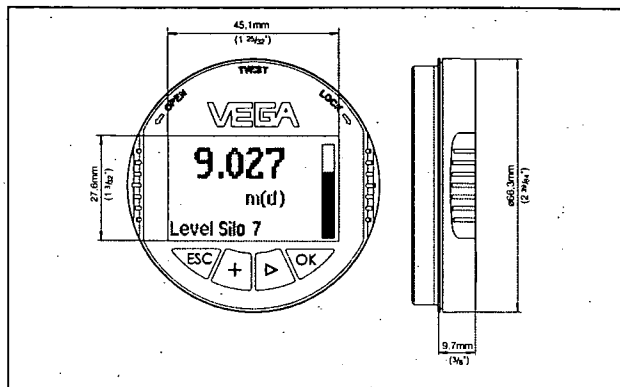


Fig. 28: Dimensions PLICSCOM

VEGADIS 175

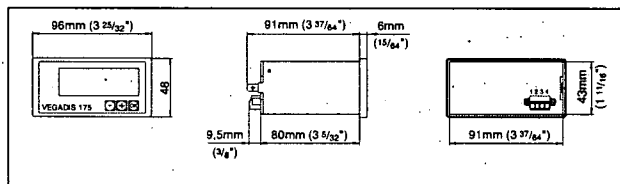


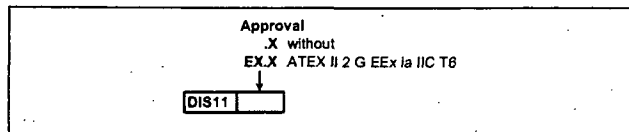
Fig. 29: Dimensions VEGADIS 175

VEGA

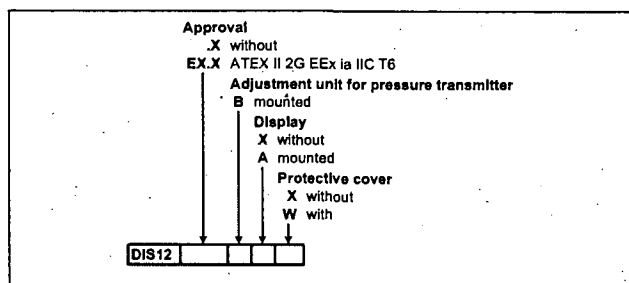
Product code

8 Product code

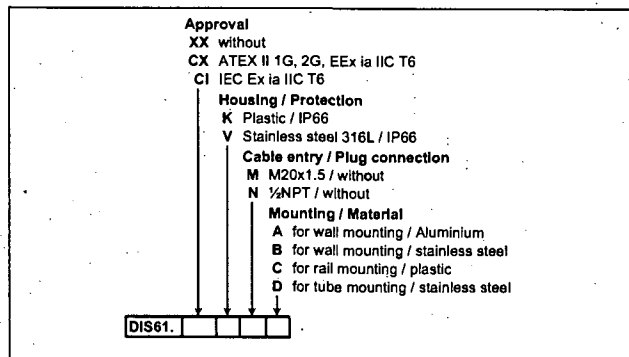
VEGADIS 11



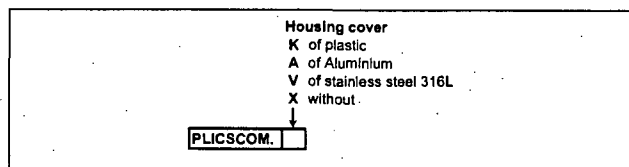
VEGADIS 12



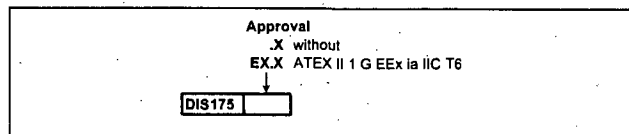
VEGADIS 61



PLICSCOM



VEGADIS 175



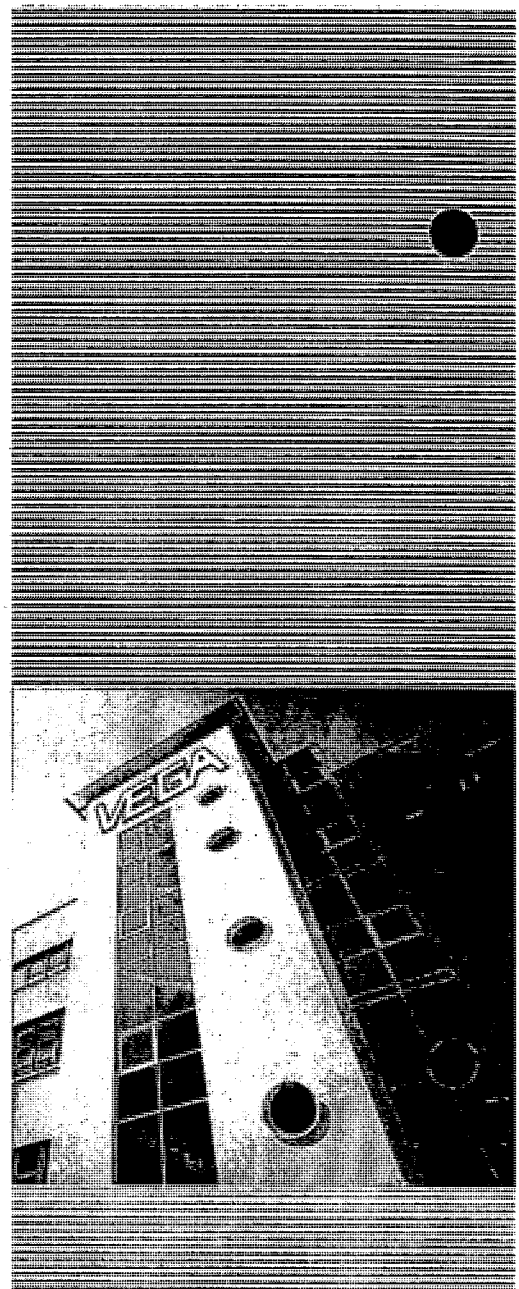
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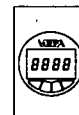
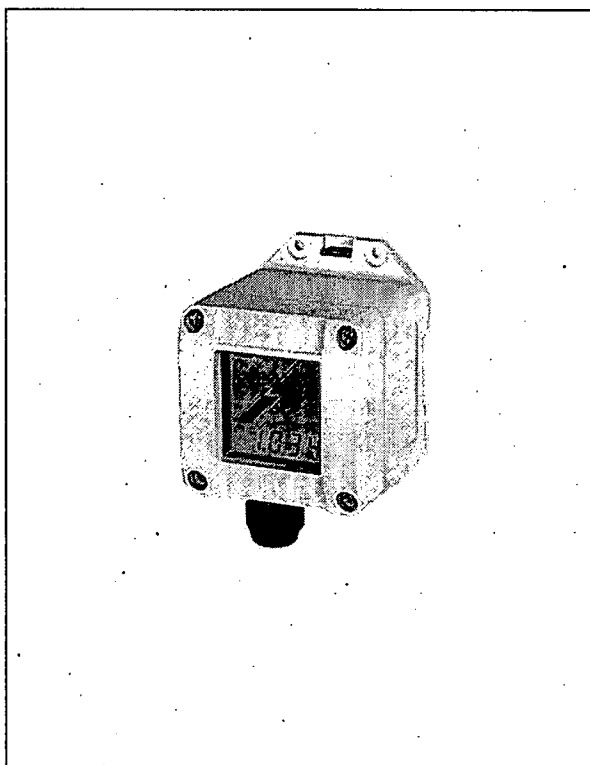
You can find at www.vega.com
downloads of the following

- operating instructions manuals
- menu schematics
- software
- certificates
- approvals
- and much, much more

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VEGA

Operating Instructions VEGADIS 12



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VEGA

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VEGADIS 12

3

1 About this document

1.1 Function

This operating instructions manual has all the information you need for quick setup and safe operation. Please read this manual before you start setup.

1.2 Target group

This operating instructions manual is directed to trained personnel. The contents of this manual should be made available to these personnel and put into practice by them.

1.3 Symbolism used



Information, tip, note

This symbol indicates helpful additional information.



Caution: If this warning is ignored, faults or malfunctions can result.

Warning: If this warning is ignored, injury to persons and/or serious damage to the instrument can result.

Danger: If this warning is ignored, serious injury to persons and/or destruction of the instrument can result.



Ex applications

This symbol indicates special instructions for Ex applications.



List

The dot set in front indicates a list with no implied sequence.



Action

This arrow indicates a single action.



Sequence

Numbers set in front indicate successive steps in a procedure.



For your safety

2 For your safety

2.1 Authorised personnel

All operations described in this operating instructions manual must be carried out only by trained specialist personnel authorised by the operator. For safety and warranty reasons, any internal work on the instruments must be carried out only by personnel authorised by the manufacturer.

2.2 Appropriate use

VEGADIS 12 is an adjustment and indicating unit for VEGA pressure transmitters.

2.3 Warning about misuse

Inappropriate or incorrect use of the instrument can give rise to application-specific hazards, e.g. vessel overfill or damage to system components through incorrect mounting or adjustment.

2.4 General safety instructions

VEGADIS 12 is a high-tech instrument requiring the strict observance of standard regulations and guidelines. The user must take note of the safety instructions in this operating instructions manual, the country-specific installation standards (e.g. the VDE regulations in Germany) as well as all prevailing safety regulations and accident prevention rules.

2.5 CE conformity

VEGADIS 12 is in CE conformity with EMC (89/336/EEG) and LVD (73/23/EEG) and fulfills NAMUR recommendation NE 21.

Conformity has been judged according to the following standards:

- EMC:
 - Emission EN 50081
 - Susceptibility EN 50082
- LVD: EN 61010

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VEGADIS 12

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For your safety

VEGA

2.6 Safety instructions for Ex areas

Please note the Ex-specific safety information for installation and operation in Ex areas. These safety instructions are part of the operating instructions manual and come with the Ex-approved instruments.

2.7 Manufacturer declaration

In conformity with DIN EN 60079-14/1998, paragraph 5.2.3, item c1, VEGADIS 12 is suitable for use in zone 2.

The operator must use the instrument as it was intended to be used and follow the specifications of the following documents:

- this operating instructions manual
- this manufacturer declaration (24607)
- the applicable installation regulations

Max. increase of the surface temperature during operation:
45 K (individual component in the instrument)

With an ambient temperature of 60 °C (140 °F) on the housing and a process temperature of 60 °C (140 °F), the max. surface temperature during operation (single component in the instrument) is 105 °C (221 °F).

Measures to maintain explosion protection during operation:

- Only use an instrument with warning label attached in the production plant: "Suitable for use in zone 2 according to EN 60079-14/1998 paragraph 5.2.3, take note of manufacturer declaration no. 24697"
- Operate the instrument in the range of the specified electrical limit values. Permissible supply voltage: see "Technical data"
- Mount and operate the instrument in such a way that no danger of ignition by electrostatic charges is to be expected. The housing material is electrically non-conductive.
- The seal between lower part of the housing and cover must be correctly in place and in faultless condition; the fixing screws of the cover must be tightened carefully.
- Make sure there is no explosive atmosphere present if you intend to operate the instrument with opened cover
- Make sure that the cable gland is tight and strain-relieved. The outer diameter of the connection cable must be adapted to the cable gland. Tighten the pressure screw of the cable gland carefully.

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For your safety

- Cover unused openings for cable glands tightly
- The surface temperature of the housing must not exceed the ignition temperature of the surrounding explosive atmosphere

This instrument was assessed by a person who fulfils the DIN EN 60079-14 requirements.

2.8 Environmental instructions

Protection of the environment is one of our most important duties. That is why we have introduced an environment management system with the goal of continuously improving company environmental protection. The environment management system is certified according to DIN EN ISO 14001.

Please help us fulfil this obligation by observing the environmental instructions in this manual:

- Chapter "*Storage and transport*"
- Chapter "*Disposal*"

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VEGADIS 12

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3 Product description

3.1 Configuration

Scope of delivery

The scope of delivery encompasses:

- Adjustment and indicating unit VEGADIS 12
- Documentation
 - this operating instructions manual
 - Ex specific safety instructions (with Ex versions), if necessary further certificates.

Components

VEGADIS 12 consists of the following components:

- Housing with adjustment elements
- Housing cover with integrated indicating module

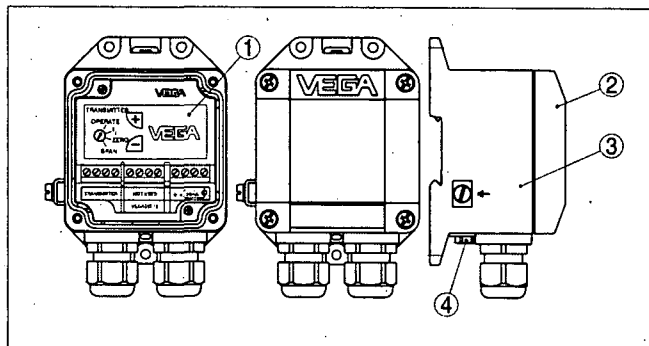


Fig. 1: VEGADIS 12 without display

- 1 Adjustment insert
- 2 Cover
- 3 Housing
- 4 Breather facility



Product description

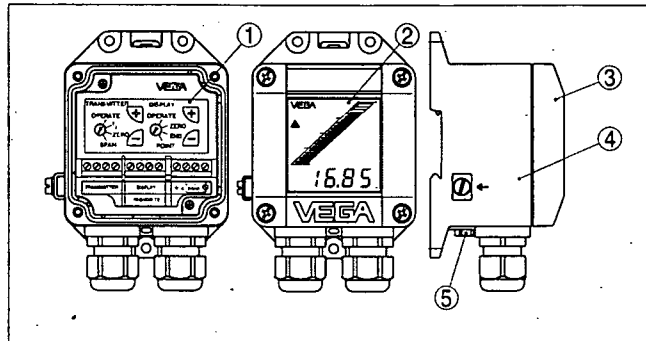


Fig. 2: VEGADIS 12 with display

- 1 Adjustment insert
- 2 Indication
- 3 Cover
- 4 Housing
- 5 Breather facility

3.2 Principle of operation

Area of application

VEGADIS 12 is an adjustment and indicating unit for the following VEGA pressure transmitters:

- VEGAWELL 72 4 ... 20 mA/HART
- VEGABAR 74 4 ... 20 mA/HART
- VEGABAR 75 4 ... 20 mA/HART

Power supply

VEGADIS 12 is looped in the supply and signal circuit of the pressure transmitter and requires no separate external energy. Connection is carried out via screw terminals in the housing.

3.3 Operation

VEGADIS 12 has the following functions:

- atmospheric pressure compensation for the pressure transmitter
- Adjustment of the pressure transmitter
- Indication of the measured value (optional)

For this purpose, VEGADIS 12 is equipped as a standard feature with an adjustment module for the pressure transmitter. The optional display is located in the housing cover and is equipped with a bar graf and a digital indication. This version has integrated adjustment elements for scaling the indication.

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VEGADIS 12

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Product description



3.4 Storage and transport

Packaging

Your instrument was protected by packaging during transport. Its capacity to handle normal loads during transport is assured by a test according to DIN EN 24180.

The packaging of standard instruments consists of environment-friendly, recyclable cardboard. For special versions, PE foam or PE foil is also used. Dispose of the packaging material via specialised recycling companies.

Storage and transport temperature

- Storage and transport temperature see "*Supplement - Technical data - Ambient conditions*"
- Relative humidity 20 ... 85 %



4 Mounting

4.1 General instructions

Installation position

VEGADIS 12 can be mounted in any position. However, vertical mounting is recommended. This avoids pollution of the breather facility and moisture penetration.



Note:

There must be the same atmospheric pressure on the breather facility as well as on the measurement loop. Otherwise the measured value can be adulterated.

Moisture

Use the recommended cables (see chapter "*Connecting to power supply*") and tighten the cable gland.

4.2 Mounting instructions

Mounting versions

VEGADIS 12 can be mounted as follows:

- on carrier rail 35x7.5 according to EN 50022
- on mounting plate or on the wall

Connecting to voltage supply

VEGA

5 Connecting to voltage supply

5.1 Preparing the connection

Note safety instructions

Generally note the following safety instructions:

- Connect only in the complete absence of line voltage

Take note of safety instructions for Ex applications



In hazardous areas you should take note of the appropriate regulations, conformity and type approval certificates of the sensors and power supply units.

Selecting connection cable

VEGABOX 01 or VEGADIS 12 is connected with standard two-wire cable without screen. An outer cable diameter of 5 ... 9 mm ensures the seal effect of the cable entry. If electromagnetic interference is expected which are above the test values of EN 61326 for industrial areas, we recommend the use of screened cable.

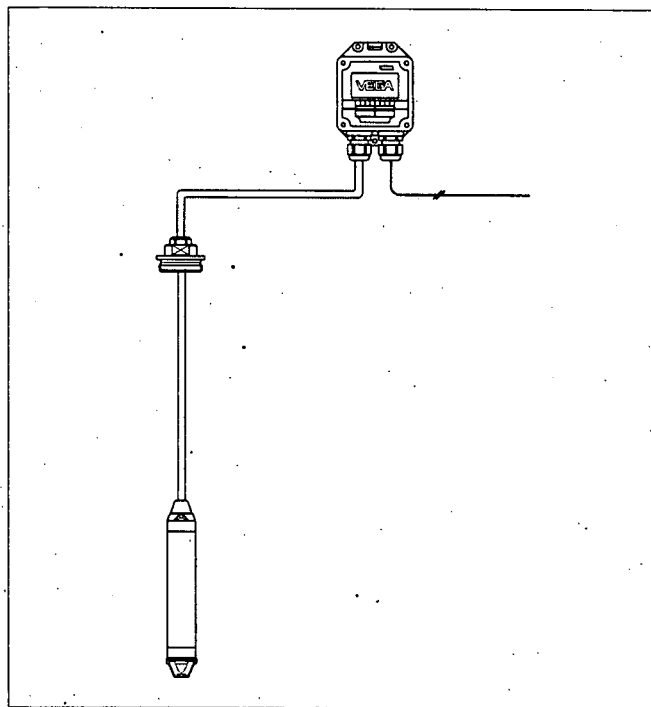


Fig. 3: Connection of VEGADIS 12 to the sensor

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Connecting to voltage supply

Select connection
cable for Ex applica-
tions



Take note of the corresponding installation regulations for Ex applications.

Cable screening and ground-
ing

If screened cable is necessary, connect the cable screen on both ends to ground potential. In the VEGABOX 01 or VEGADIS 12, the screen must be connected directly to the internal ground terminal. The ground terminal on the outside of the housing must be connected to the potential equalisation (low impedance).

If potential equalisation currents are expected, the connection on the processing side must be made via a ceramic capacitor (e.g. 1 nF, 1500 V). The low frequency potential equalisation currents are thus suppressed, but the protective effect against high frequency interference signals remains.

Cable screen and grounding
for Ex applications

In Ex applications, grounding on one sensor side is recommended, see EN 60079-14.

5.2 Connection procedure

Proceed as follows:

- 1 Unscrew the housing cover
 - 2 Loosen compression nut of the cable entry
 - 3 Remove approx. 10 cm of the cable mantle, strip approx. 1 cm insulation from the individual wires
 - 4 Insert the cable into VEGADIS 12 through the cable entry
 - 5 Loosen the screw terminals with a screwdriver
 - 6 Insert the wire ends into the open terminals according to the wiring plan
 - 7 Tighten screw terminals again
 - 8 Check the hold of the wires in the terminals by lightly pulling on them
 - 9 Connect the screen to the ground terminal
 - 10 Connect the ground terminal outside on the housing according to specification (low impedance)
 - 11 Tighten the compression nut of the cable entry. The seal ring must completely encircle the cable
 - 12 Screw the housing cover back on
- The electrical connection is finished.

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Connecting to voltage supply

VEGA

5.3 Wiring plan

Wire assignment, connection
cable pressure transmitter

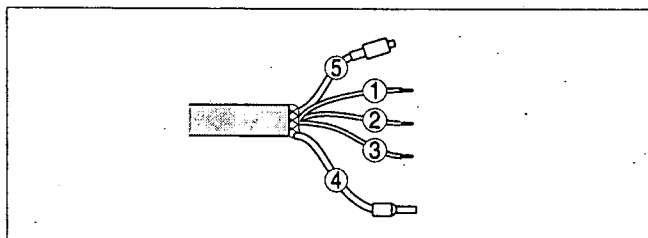


Fig. 4: Wire assignment, connection cable

- 1 brown (+): to power supply or to the processing system
- 2 blue (-): to power supply or to the processing system
- 3 yellow: for adjustment information of VEGADIS 12
- 4 Screen
- 5 Breather capillaries with filter element

Connection of VEGADIS 12
without display

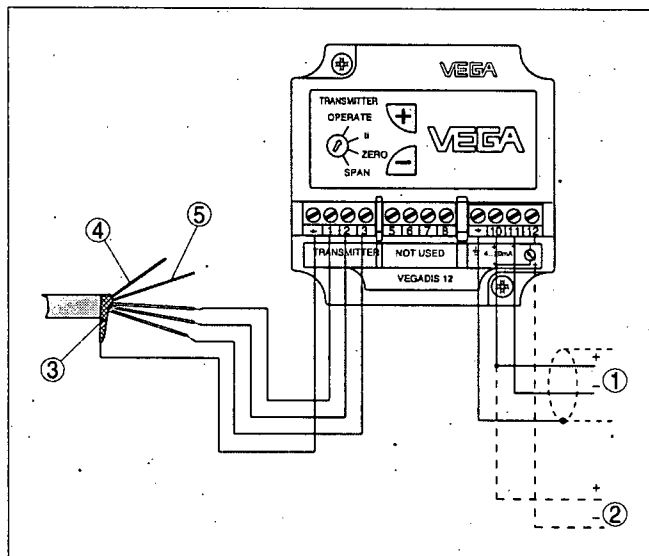


Fig. 5: Terminal assignment, VEGADIS 12

- 1 To power supply or the the processing system
- 2 Control instrument (4 ... 20 mA measurement)
- 3 Screen¹⁾
- 4 Breather capillaries
- 5 Suspension cable

¹⁾ Connect screen to ground terminal. Connect ground terminal outside on the housing as prescribed. The two terminals are galvanically connected.

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Connecting to voltage supply

Wire number	Wire colour/Polarity	Terminal VEGADIS 12
1	brown (+)	1
2	blue (-)	2
3	Yellow	3

Connection of VEGADIS 12 without display

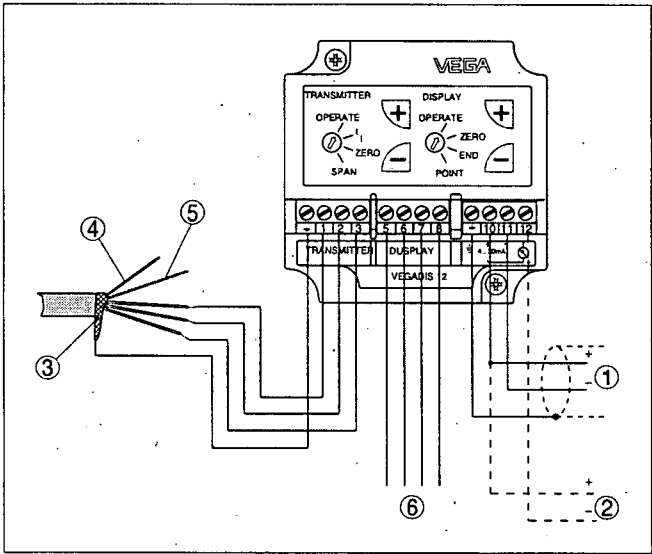


Fig. 6: Terminal assignment, VEGADIS 12
1 To power supply or the the processing system
2 Control instrument (4 ... 20 mA measurement)
3 Screen²⁾
4 Breather capillaries
5 Suspension cable
6 for indication

Wire number	Wire colour/Polarity	Terminal VEGADIS 12
1	brown (+)	1
2	blue (-)	2
3	Yellow	3

²⁾ Connect screen to ground terminal. Connect ground terminal outside on the housing as prescribed. The two terminals are galvanically connected.

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Connecting to voltage supply

VEGA

Wire number	Wire colour	Terminal VEGADIS 12
5	red	5
6	White	6
7	Violet	7
8	Orange	8

VEGA

Set up

6 Set up

6.1 Adjustment of the pressure transmitter

Adjustment volume

- zero - measuring range begin
- span - measuring range end
- ti - Integration time

Adjustment elements

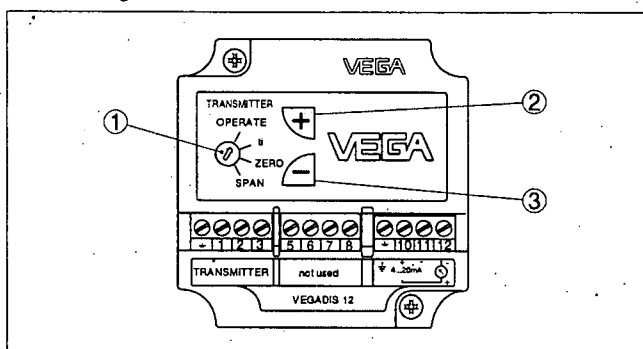


Fig. 7: Adjustment elements of VEGADIS 12 without display

- 1 Rotary switch: choose the requested function
- 2 [+] key, change value (rising)
- 3 [-] key, change value (falling)

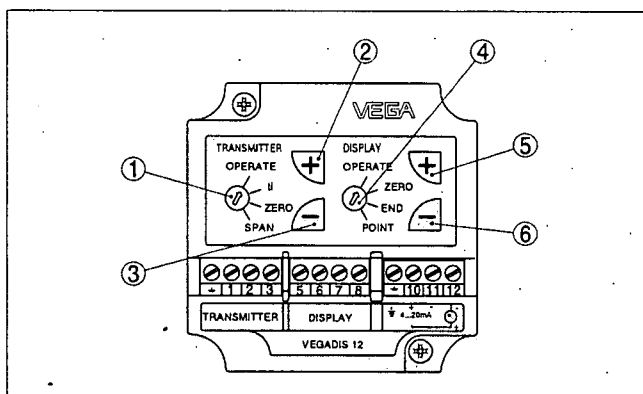


Fig. 8: Adjustment elements of VEGADIS 12 without display

- 1 Rotary switch pressure transmitter: select requested function
- 2 [+] key, change adjustment value (rising)
- 3 [-] key, change adjustment value (falling)
- 4 Rotary switch indication: choose the requested function
- 5 [+] key, change scaling (rising)
- 6 [-] key, change scaling (falling)

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VEGADIS 12

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Set up

**Adjustment system**

- The requested function is selected with the rotary switches
- With the **[+]** and **[-]** keys the signal current or the integration time is set or the indication is scaled
- The respective rotary switch is finally set to position **"OPERATE"**

The set values are transmitted to the EEPROM memory and remain there even in case of voltage loss.

Adjustment steps, adjustment

Proceed as follows for adjustment with VEGADIS 12:

- 1 Open housing cover
- 2 Connect hand multimeter to terminals 10 and 12
- 3 Meas. range begin: Set rotary switch to **"zero"**
- 4 Empty the vessel or reduce process pressure
- 5 Set a current of 4 mA with the **[+]** and **[-]** keys
- 6 Meas. range end: Set rotary switch to **"span"**
- 7 Fill the vessel or increase process pressure
- 8 Set a current of 20 mA with the **[+]** and **[-]** keys
- 9 Operation: Set rotary switch to **"OPERATE"**
- 10 Close housing cover

The adjustment data are effective, the output current 4 ... 20 mA corresponds to the actual level or pressure.

Adjustment steps, integration time

Proceed as follows for the adjustment of the integration time with VEGADIS 12:

- 1 Open housing cover
- 2 Set rotary switch to **"ti"**
- 3 By pushing the **[-]** key 10-times, make sure that the integration time is set to 0 sec.
- 4 For every 1 sec. requested integration time, push the **[+]** key once.
- 5 The integration time is the time required by the output current signal to reach 90 % of the actual height after a sudden level change.
- 6 Set rotary switch to **"OPERATE"**
- 7 Close housing cover

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VEGA

Set up

6.2 Indication scaling

Indicating elements

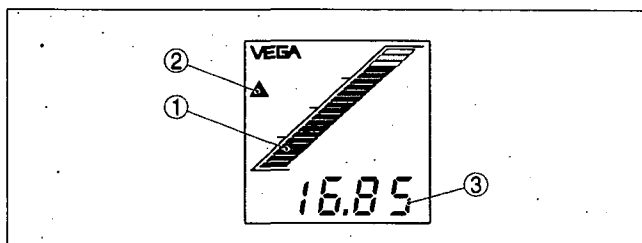


Fig. 9: Indicating elements of VEGADIS 12

- 1 Bar graph
- 2 Tendency indication
- 3 Digital value
 - four positions as well as sign and decimal point
 - individual scaling between -9999 ... +9999

The display outputs the current 4 ... 20 mA as bar graph and digital value.

With 4 mA no segment of the bar graph appears, with 20 mA all segments appear. This assignment is fix.

You can scale the digital value to any value between -9999 ... +9999 via the adjustment module.

Adjustment steps, scaling

To scale, proceed as follows:

- 1 Open housing cover
- 2 Initial value: Set rotary switch to "zero"
- 3 Set the requested value, e.g. 0 with the **[+]** and **[-]** keys
- 4 Final value: Set the rotary switch to "span"
- 5 Set the requested value, e.g. 1000 with the **[+]** and **[-]** keys
- 6 Decimal point: Set the rotary switch to "point"
- 7 With the **[+]** and **[-]** keys you can adjust the requested value, e.g. 8888 (no decimal point)
- 8 Set rotary switch to "OPERATE"
- 9 Close housing cover

The adjustment data are effective, the output current 4 ... 20 mA corresponds to the actual level.

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7 Maintenance and fault rectification

7.1 Maintenance

When used as directed in normal operation, VEGADIS 12 is completely maintenance free.

7.2 Rectify faults

Causes of malfunction

VEGADIS 12 offers maximum reliability. Nevertheless faults can occur during operation. These may be caused by the following, e.g.:

- Sensor
- Process
- Power supply
- Signal processing

Fault rectification

The first measure to take is to check the output signal as well as the atmospheric pressure compensation. The procedure is described below. Further comprehensive diagnostics can be carried out on a PC with the software PACTware™ and the suitable DTM. In many cases, the causes can be determined in this way and faults can be rectified.

24 hour service hotline

However, should this measures not be successful, call the VEGA service hotline in urgent cases under the phone no. **+49 1805 858550**.

The hotline is available to you 7 days a week round-the-clock. Since we offer this service world-wide, the support is only available in the English language. The service is free of charge, only the standard telephone costs will be charged.

Check pressure compensation

First of all open the housing cover. The indicated measured value must not change. However, if the indicated value changes nevertheless, the compensation of the atmospheric pressure is not ensured. Check the breather facility on the housing and the capillaries in the special cable.

Checking the 4 ... 20 mA signal

Connect a handheld multimeter in the suitable measuring range according to the wiring plan.

? 4 ... 20 mA signal not stable

- Level fluctuations
- Set integration time via VEGADIS 12 or PACTware™

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- no atmospheric pressure compensation
 - Check the capillaries and cut them clean
 - check the pressure compensation in the housing and clean the filter element, if necessary
- ? 4 ... 20 mA signal missing
 - Incorrect connection to power supply
 - Check connection according to chapter "*Connection procedure*" and, if necessary, correct according to chapter "*Wiring plan*"
 - No supply voltage
 - check cables for line break, repair, if necessary
 - supply voltage too low or load resistance too high
 - Check, adapt, if necessary
- ? Current signal 22 mA
 - electronics module or measuring cell defective
 - Exchange instrument or return instrument for repair



In Ex applications, the regulations for the wiring of intrinsically safe circuits must be observed.

7.3 Instrument repair

If a repair is necessary, please proceed as follows:

You can download a return form (23 KB) in the Internet from our homepage www.vega.com under: "*Downloads - Forms and Certificates - Repair form*".

By doing this you help us carry out the repair quickly and without having to call back for needed information.

- Print and fill out one form per instrument
- Clean the instrument and pack it damage-proof
- Attach the filled in form and if necessary, a safety data sheet to the instrument
- Please ask the agency serving you for the address of your return shipment. You find the respective agency on our website www.vega.com under: "*Company - VEGA world-wide*"

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8 Dismounting

8.1 Dismounting procedure



Warning:

Before dismounting, be aware of dangerous process conditions such as e.g. pressure in the vessel, high temperatures, corrosive or toxic products etc.

Take note of chapters "*Mounting*" and "*Connecting to power supply*" and carry out the listed steps in reverse order.

8.2 Disposal

The instrument consists of materials which can be recycled by specialised recycling companies. We use recyclable materials and have designed the electronic modules to be easily separable.

WEEE directive 2002/96/EG

This instrument is not subject to the WEEE directive 2002/96/EG and the respective national laws (in Germany, e.g. ElektroG). Pass the instrument directly on to a specialised recycling company and do not use the municipal collecting points. These may be used only for privately used products according to the WEEE directive.

Correct disposal avoids negative effects to persons and environment and ensures recycling of useful raw materials.

Materials: see "*Technical data*"

If you cannot dispose of the instrument properly, please contact us about disposal methods or return.

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Supplement

9 Supplement

9.1 Technical data

General data

316L corresponds to 1.4404 or 1.4435, 316Ti corresponds to 1.4571

Materials

- Housing plastic PBT
- Ground terminal 316Ti/316L
- Inspection window of the indication

Weight approx. 0.5 kg (1.102 lbs)

Ambient conditions

Ambient temperature

- without display -40 ... +85 °C (-40 ... +185 °F)
- with display -20 ... +70 °C (-40 ... +158 °F)

Storage and transport temperature -40 ... +85 °C (-40 ... +185 °F)

Electromechanical data

Cable gland 2x cable entry M20x1.5 (cable- ϕ 5 ... 9 mm)

Screw terminals for wire cross-section up to 2.5 mm²

Adjustment and indicating elements

Adjustment elements 2x2 keys, 2x1 rotary switch

Adjustment elements with display 2 keys, 1 rotary switch

Display (optional) LC multiple function display with bar graph (20 segments, digital value 4-digit), tendency indicator for rising or falling values

Adjustment circuit

Connection to VEGAWELL 72 4 ... 20 mA/HART, VEGABAR 74, VEGABAR 75

Connection cable to the sensor VEGA special cable with breather capillaries

Cable length max. 200 m

Voltage supply

Supply voltage

- without display 12 ... 36 V DC
- with display 17 ... 36 V DC

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Supplement**VEGA**

Load without display

see diagram in the operating instructions
manual of the respective sensor**Electrical protective measures**

Protection IP 65

Overvoltage category III

Protection class III

Approvals³⁾

ATEX ia ATEX II 2G EEx ia IIC T6

³⁾ Deviating data in Ex applications: see separate safety instructions.



9.2 Dimensions

VEGADIS 12 without display

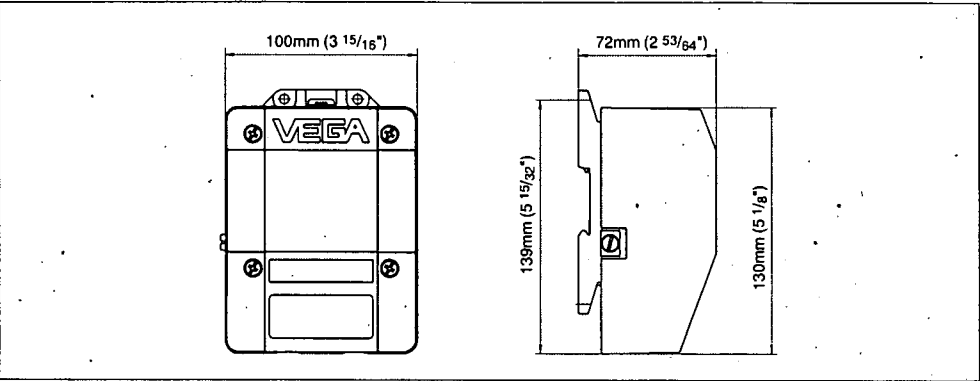


Fig. 10: VEGADIS 12 without display (protective cover optional)

VEGADIS 12 with display

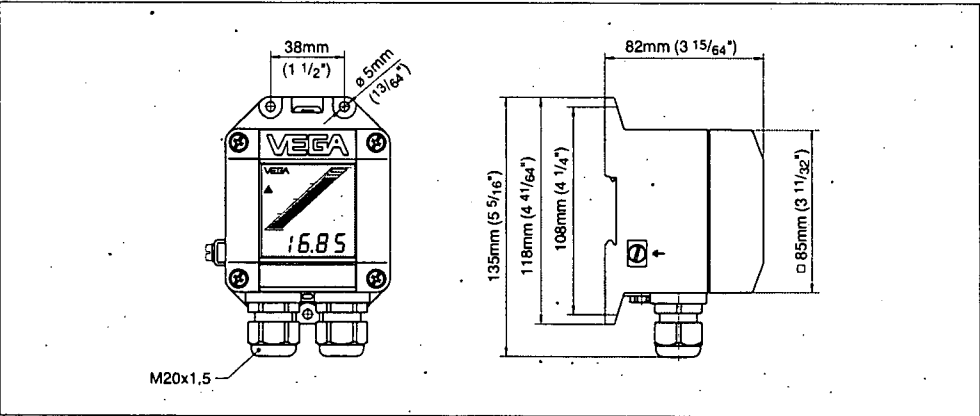


Fig. 11: VEGADIS 12 with display

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9.3 Industrial property rights

VEGA product lines are global protected by industrial property rights.

Further information see <http://www.vega.com>.

Only in U.S.A.: Further information see patent label at the sensor housing.

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一步信息网站<<http://www.vega.com>>。

9.4 Trademark

All brands used as well as trade and company names are property of their lawful proprietor/originator.

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All statements concerning scope of delivery, application, practical use and operating conditions of the sensors and processing systems correspond to the information available at the time of printing.

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Subject to change without prior notice

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