Features

- Level limit switch for liquids
- Large selection of process connections: universal use
- Wide variety of electronic modules (e. g., relay, thyristor signal output): the right connection for every process control system
- No calibration: quick and low-cost start up
- No mechanically moving parts: maintenance-free, no wear, long operating life
- Monitoring of the vibrating fork for damage: guaranteed function
- PROFIBUS PA protocol: commissioning and maintenance quick and easy
- Up to SIL2 acc. to IEC 61508

Function

The Vibracon is a level limit switch for use in all liquids.

- for temperature of -50 °C (223 K) to +150 °C (423 K)
- for pressures up to 64 bar
- for viscosities up to 10000 mm^2/s
- for densities up to 0.5 g/cm^3 or 0.7 g/cm^3 (other settings available on request)

The function is not affected by flow, turbulence, bubbles, foam, vibration, bulk solids content or build-up, the Vibracon is thus the ideal substitute for float switches.

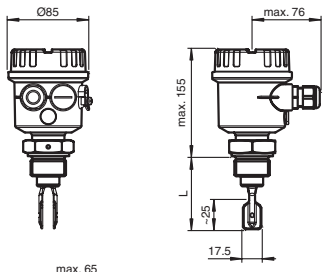
The compact version is ideal for mounting in pipes (LVL-M1). In addition there is a version with extension tube up to 6 m (20 ft) (LVL-M2).

High corrosion-resistant Alloy C4 (2.4610) is available for the vibration fork and process connection for applications in very aggressive liquids.

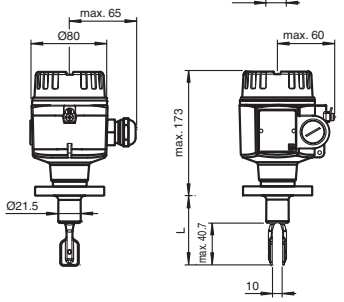
EEx ia, EEx de and EEx d protection enable it to be used in hazardous areas.

Assembly

Vibracon LVL-M* with plastic housing and process connection G**



Vibracon LVL-M* with aluminium housing and process connection with flange

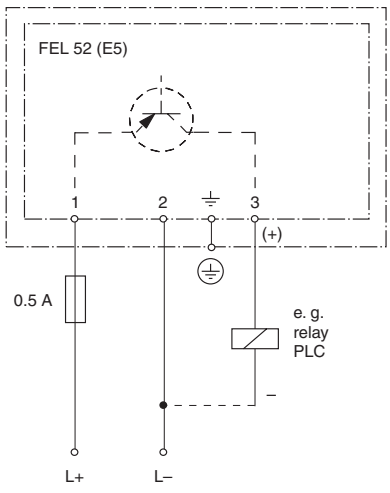


Additional dimensions see section dimensions.
Length L see process connections.

Connection

Connection FEL 52 (E5) 3-wire DC connection (example)

- preferably for use with memory programmable controls (PLC)
- positive signal at the switch output of the electronics (PNP)
- Output blocked on reaching limit level.
- also in compact housing with plug connection available



Other connection types see section electrical connection.

U ⎓ 10 V DC ... 55 V DC

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Application	
Function principle	Limit detection maximum or minimum detection in tanks or pipelines containing liquids of any kind, even in hazardous areas
Function and system design	
Measuring principle	The forks of the sensors vibrate at their intrinsic frequency. This frequency is reduced when covered with liquid. The change in frequency then activates the limit switch.
Input characteristics	
Measured variable	Limit level (limit value)
Measurement range	LVL-M1: depends on mounting point LVL-M2: depends on mounting point and pipe extension up to 6000 mm (20 ft)
Medium density	Adjustment on the electronic insert > 0,5 g/cm^3 or > 0,7 g/cm^3 (other on request)
Output characteristics	
Fail-safe mode	switch-over for minimum/maximum residual current safety on electronic insert MAX = maximum safety: The output switches to the power fail response when the fork is covered. for use with overspill protection for example MIN = minimum safety: The output switches to the power fail response when the fork is exposed. for use with dry running protection for example
Switching time	when fork is covered: approx. 0.5 s, when fork is exposed: approx. 1.0 s (other switching times on request) additionally configurable for PROFIBUS PA (electronic insert FEL50A (PA)): 0.5 ... 60 s
Switch-on response	When switching on the power supply the output assumes the alarm signal. After max. 2 s it assumes the correct switching mode.
Auxiliary energy	
Supply voltage	electronic insert FEL50A (PA): 9 ... 32 V DC electronic insert FEL51 (AC): 253 V AC, 50/60 Hz electronic insert FEL52 (E5): 10 ... 55 V DC electronic insert FEL54 (WA): 19 ... 253 V AC, 50/60 Hz or 19 ... 55 V DC electronic insert FEL55 (SI): 11 ... 36 V DC, PLC electronic insert FEL56 (N1), FEL58 (N2): isolating amplifier acc. to EN 60947-5-6 (NAMUR)
Connecting cable	Elektronic inserts: cross section max. 2.5 mm^2, lace in end splice in acc. with DIN 46228 Ground lead in housing: cross section max. 2.5 mm^2 External equipotential bonding: cross section 4 mm^2
Power consumption	electronic insert FEL52 (E5): max. 0.83 W electronic insert FEL54 (WA): max. 1.3 W
Current consumption	electronic insert FEL52 (E5): max. 15 mA
Measurement accuracy	
Reference operating conditions	ambient temperature: 23 °C (296 K), medium temperature: 23 °C (296 K), product density: 1 g/cm^3 (water), viscosity: 1 mm^2/s, medium pressure p_e: 0 bar, sensor mounting: vertical from above, density switch: to > 0.7 g/cm^3
Maximum measured error	max. ± 1 mm, specified by mounting position
Non-repeatability	0.1 mm
Hysteresis	approx. 2 mm (0.08 in)
Influence of medium density	max. +4.8 ... -3.5 mm (+0.19 ... -0.14 in) (0.5 ... 1.5 g/cm^3)
Influence of medium temperature	max. +1.4 ... -2.8 mm (+0.05 ... -0.11 in) (-40 ... +150 °C (233 ... 423 K))
Influence of medium pressure	max. 0 ... -2.5 mm (0 ... -0.1 in) (-1 ... 64 bar)
Operating conditions	
Installation conditions	
Installation position	LVL-M1: any position LVL-M2: with short pipe (up to 500 mm (19.7 in)) any position, with long pipe vertical
Ambient conditions	
Ambient temperature	-50 ... 70 °C (223 ... 343 K) , function with reduced data values see section ambient temperature
Storage temperature	-50 ... 80 °C (223 ... 353 K)
Overvoltage protected	electronic insert FEL51 (AC), electronic insert FEL52 (E5), electronic insert FEL54 (WA), electronic insert FEL55 (SI): overvoltage category III
Process conditions	
Medium temperature	-50 ... 150 °C (223 ... 423 K), for exceptions see process connections
Medium pressure	p_e = -1 ... 64 bar (-14.5 ... 928.3 psi) over the entire temperature range , exceptions see process connections
Test pressure	max. 100 bar (1.5 times the medium pressure p_e), no function during test pressure, burst pressure of diaphragm 200 bar
Thermal shock resistance	max. 120 °C/s (max. 120 K/s)
State of aggregation	liquid
Density	min. 0.5 g/cm^3 (compact housing 0.7 g/cm^3), other density settings on request
Viscosity	max. 10000 mm^2/s (max. 10000 cSt)
Solid contents	max. Ø 5 mm

Release date 2013-01-07 09:24 Date of issue 2013-01-07 t2733_eng.xml

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Mechanical specifications	
Protection degree	polyester, steel, and aluminum housing: IP66/IP67 compact housing: - IP65 with valve connector PG11 or ½ NPT - IP66/IP68 with M12 x 1 connector without LEDs (1.4435/316L) - IP69K with M12 x 1 connector with LEDs (1.4435/316L)
Mechanical construction	
Construction type	LVL-M1: compact design LVL-M2: version with extension tube
Dimensions	housing: diameter max. 85 mm (3.3 in), height max. 173 mm (6.8 in) temperature separator, pressure-tight bushing: additional length L 140 mm (5.5 in) process connection: length L 66.5 ... 80 mm (2.6 ... 3.1 in) Extension: any length L from 148 ... 3000 mm (6 ... 115 inch), depending on the process connection extension: length type II, for vertical installation from above same switching point as Vibracon LVL1, LVL2 vibration fork: width 17.5 mm (0.7 in), fork width 10 mm (0.4 in), length 25 mm (1 in)
Mass	600 g , basic weight: compact sensor, electronic insert, stainless steel housing, process connection G2*, additional weight is dependent on extension tube, housing and process connection
Additional weight	process connections: - A3* 1000 g, A4* 1200 g, A5* 1500 g, A6* 2400 g, A72 4800 g, A81 4900 g, A82 6800 g, A91 7000 g, A92 11.5 kg, A93 17.3 kg - C45 1400 g, C51 1200 g, C71 1600 g, C75 3200 g, C95 5900 g, CA3 5600 g - D45 1400 g, D51 1200 g, D71 1600 g, D75 3200 g, D7A 300 g, D7D 300 g, D95 5900 g, DA3 5600 g - F45 1400 g, F51 1200 g, F55 2000 g, F61 1400 g, F65 2400 g, F71 1600 g, F75 3200 g, F7F 2600 g, F81 2400 g, F85 4300 g, F93 4800 g, F95 5900 g, FA3 5600 g, FA5 7500 g - G3* 200 g - J13 no information, J16 no information, J17 1700 g, J19 no information, J1A no information, J1C 1700 g - N3* 200 g, N75 2900 g - R3* 200 g - T51 no information, T61 100 g length, spacers, bushings: - B* 900 g/m, C* 2300 g/100 in - D* 100 g - I* 600 g - J* 900 g/m and 600 g, K* 2300 g/100 in and 600 g - L*, Q* 700 g - R* 900 g/m and 700 g, S* 2300 g/100 in and 700 g - T* 800 g
Material	length, spacers, bushings: - B* 900 g/m, C* 2300 g/100 in - D* 100 g - I* 600 g - J* 900 g/m and 600 g, K* 2300 g/100 in and 600 g - L*, Q* 700 g - R* 900 g/m and 700 g, S* 2300 g/100 in and 700 g - T* 800 g housings: - polyester housing: PBT-FR with PBT-FR cover or with PA12 cover with sight glass, cover seal: EPDM - stainless steel housing: 1.4435/316L, cover seal: silicone - aluminium housing: EN-AC-AlSi10Mg, plastic-coated, cover seal: EPDM - compact housing with valve connector or M12 connector: 1.4435/316L cable gland: polyamide or brass, nickel-plated temperature spacer: 1.4435/316L pressure-tight bushing: 1.4435/316L
Surface quality	R_a < 3.2 µm/80 grit: length, spacer, bushings *A, *B, *E
Switching point	see section switch point
Process connection	- cylindrical thread G¾A, G1A to DIN ISO 228/1 with flat seal to DIN 7603 - conical thread R¾, R1 to DIN 2999, part 1 - conical thread ¾ -14 NPT, 1 - 11½ NPT to ANSI B 1.20.1 - flush-mounted with welding sleeve to factory standard (G¾A, G1A) - flush-mounted with welding neck to factory standard (1"), sensor can be positioned - Triclamp 1½", 2" to ISO 2852 - flanges to EN 1092-1 from DN25, to ANSI B 16.5 from 1", to JIS B 2238 (RF) from DN25 For further information see type code.
Indication and operation	

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Display elements	electronic inserts: - electronic inserts FEL50 A (PA), FEL58 (N2): green LED, yellow LED - electronic inserts FEL51 (AC), FEL52 (E5), FEL54 (WA), FEL55 (SI), FEL56 (N1): green LED, red LED compact housings: compact housing with valve connector - electronic version FEL51 (AC), FEL52 (E5): green LED, red LED - electronic version FEL58 (N2): green LED, yellow LED compact housing with M12 x 1 round connector without LEDs - electronic version FEL52 (E5): green LED, yellow LED, red LED - electronic version FEL58 (N2): green LED, yellow LED compact housing with M12 x 1 round connector with LEDs - electronic version FEL52 (E5): green LED, two yellow LEDs
Controls	electronic insert FEL50A (PA): 8 switches for device address setting electronic inserts FEL51 (AC), FEL52 (E5), FEL54 (WA), FEL55 (SI), FEL56 (N1): two switches for fail-safe mode and density change electronic insert FEL58 (N2): two switches for fail-safe mode and density change and one test button interrupts lead
Function test	compact housing: function test with test magnet electronic versions FEL51 (AC), FEL52 (E5) and FEL58 (N2): During the test, the current state of the electronic switch is reversed.
Certificates and approvals	
Ex approval	KEMA 01 ATEX 1089, KEMA 01 ATEX 1147 X, KEMA 01 ATEX 2117 , for additional certificates see www.pepperl-fuchs.com
Type of protection	⟨Ex⟩ II 1/2G EEx ia IIC T3 ... T6 or EEx ia IIB T3 ... T6 and ⟨Ex⟩ II 1/2D T80°C (KEMA 01 ATEX 1089) ⟨Ex⟩ II 1G EEx ia IIC T3 ... T6 or EEx ia IIB T3 ... T6 (KEMA 01 ATEX 1147 X) ⟨Ex⟩ II 1/2G EEx d IIC T3 ... T6 or EEx d IIB T3 ... T6 (KEMA 01 ATEX 2117) ⟨Ex⟩ II 3G EEx nA/nC II T6 and ⟨Ex⟩ II 3D T85°C
SIL classification	up to SIL2 acc. to IEC 61508
Overspill protection	Z-65.11-306 (overspill protection in acc. with WHG)
General information	
Directive conformity	
Directive 73/23/EEC (Low Voltage Directive)	EN 61010-1
Directive 89/336/EEC (EMC)	emitted interference to EN 61326, class B equipment noise immunity to EN 61326, annex A (industrial sector) If the fork tines are joined together on account of build-up, the useful signal is attenuated to such an extent that the original EMC values can no longer be completely observed (EN 61000-4-3 electromagnetic fields, EN 61000-4-6 HF coupling).
Directive 94/9/EC (ATEX)	EN 50014, EN 50018, EN 500020, EN 500021, EN 50284, EN 50281-1-1
Conformity	
Electromagnetic compatibility	NE 21
Protection degree	EN 60529
Climate class	EN 60068, part 2-38, fig. 2a
Vibration resistance	EN 60068-2-6 , 10 ... 50 Hz, 0.15 mm, 100 cycles
Supplementary documentation	technical information TI328O operating instructions KA143O (LVL-M*) operating instructions KA220O (LVL-M** with compact housing) operating instructions BA141O (electronic insert FEL50A (PA)) operating instructions KA140O weld-in socket G1 (LVL-Z102) operating instructions KA141O weld-in adapter G1 (LVL-Z101) operating instructions KA142O weld-in adapter G¾ (LVL-Z100) operating instructions KA151O sliding sleeve for unpressurised operation G1A, 1 NPT (LVL-Z120, LVL-Z122) operating instructions KA152O sliding sleeve for unpressurised operation G1½A, 1½ NPT (LVL-Z121, LVL-Z123) operating instructions KA153O high pressure sliding sleeve G1A, 1 NPT (LVL-Z124, LVL-Z125, LVL-Z128, LVL-Z129) operating instructions KA154O high pressure sliding sleeve G1A, 1 NPT (LVL-Z126, LVL-Z127, LVL-Z130, LVL-Z131) safety information SI031O (KEMA 01 ATEX 2117) safety information SI063O (KEMA 01 ATEX 1089) safety information SI064O (KEMA 01 ATEX 1147 X) safety information SI154O (KEMA 01 ATEX 1089), PROFIBUS PA version safety information SI159O (KEMA 01 ATEX 11147 X), PROFIBUS PA version safety information SI182O (⟨Ex⟩ II 3G EEx nA/nC II T6 and ⟨Ex⟩ II 3D T85°C) approval ZE233O overspill protection acc. to WHG (Z-65.11-306) FM installation drawing ZD041O CSA control drawing ZD042O
Supplementary information	EC-Type Examination Certificate, Statement of Conformity, Declaration of Conformity, Attestation of Conformity and instructions have to be observed where applicable. For information see www.pepperl-fuchs.com.

Release date 2013-01-07 09:24 Date of issue 2013-01-07 t2733_eng.xml

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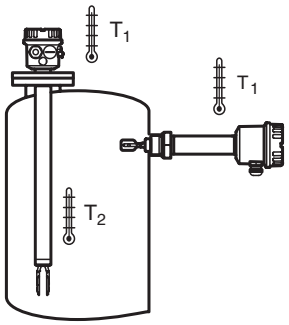
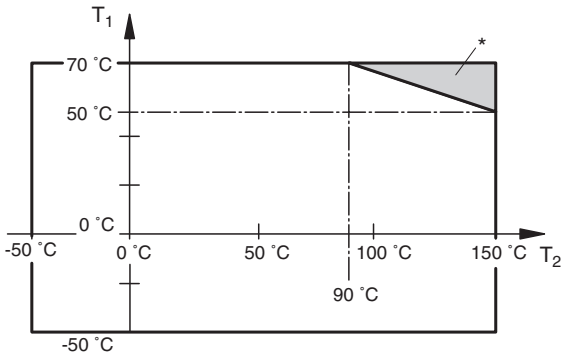
Ambient temperature

Permissible ambient temperature T_1 at the housing depends on the product temperature T_2 in the vessel:





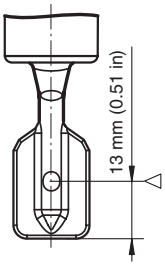
* additional temperature range for sensors with a temperature separator or pressure-tight bushing

Switch point

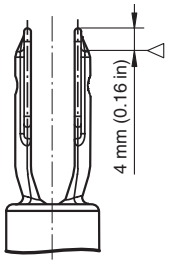
Switch point ▷ on the sensor depend on the mounting position, with reference to water, density 1 g/cm³, 23 °C (296 K), p_e 0 bar.

Note:

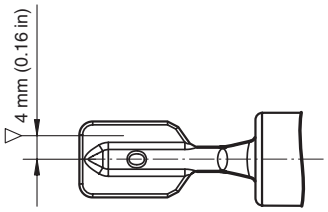
The switch points of the Vibracon LVL-M2C are at other positions to those of the previous versions LVL1, LVL2.



Mounting from above



Mounting from below



Mounting from the side

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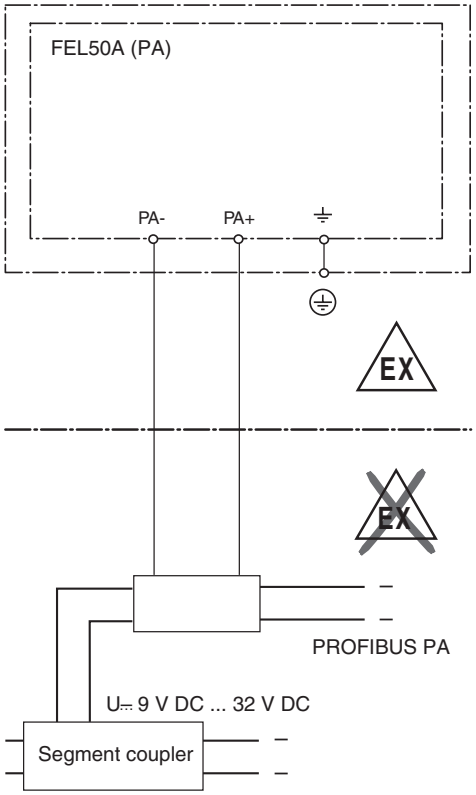
Electrical connection

Electronic insert FEL50A (PA)

Two-wire connection for power supply and data transfer for connecting to PROFIBUS PA

Additional functions:

- Digital communication enables the representation, reading and editing of the following parameters: fork frequency, switch-on frequency, switch-off frequency, switch-on time and switch-off time, status, measured value, density switch.
- Matrix locking possible.
- Switch to WHG mode possible (WHG approval).
- You can also visit www.profibus.com for more information.



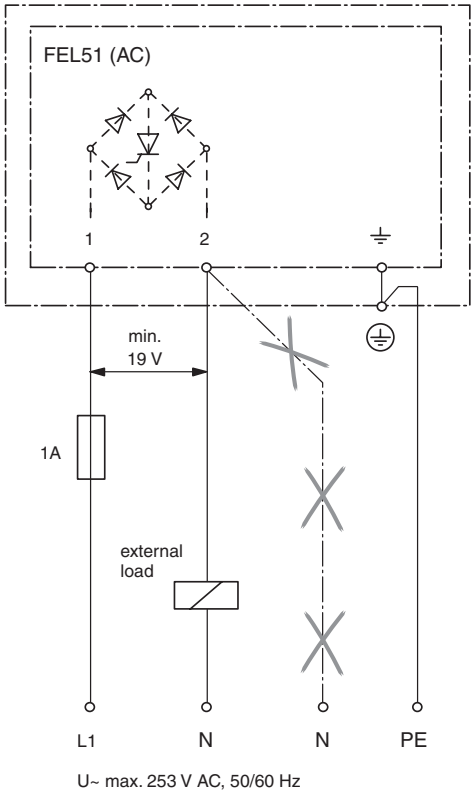
Electronic insert FEL51 (AC)

Two-wire AC connection

Always connect in series with a load!

Check the following:

- the residual current in blocked state (up to 3.8 mA)
- that for low voltage
  - The voltage drop across the load is such that the minimum terminal voltage at the electronic insert (19 V) when blocked is not undershot.
  - The voltage drop across the electronics when switched through is observed (up to 12 V).
- that a relay cannot de-energise with holding power below 3.8 mA If this is the case, a resistor should be connected parallel to the relay (RC module available on request).
- When selecting the relay, pay attention to the holding power/rated power (see connectable load).



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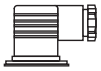
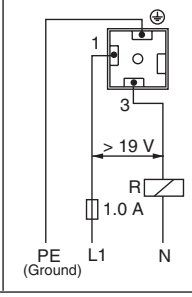
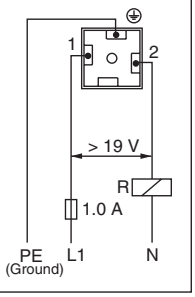
Electrical connection

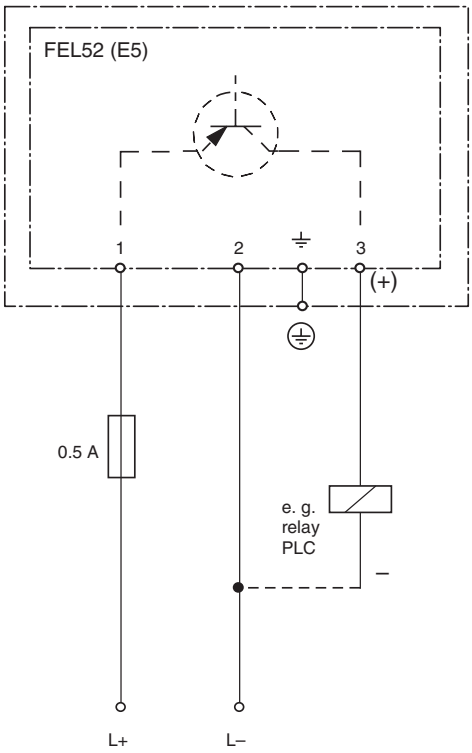
Electronic FEL51 (AC) in compact housing

Connection	MAX	MIN
Housing C2 (½ NPT) or Housing C6 (PG11) 		

Electronic insert FEL52 (E5)

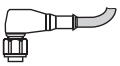
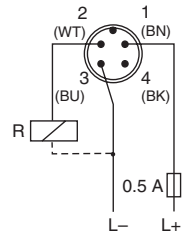
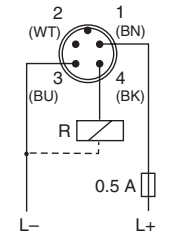
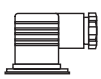
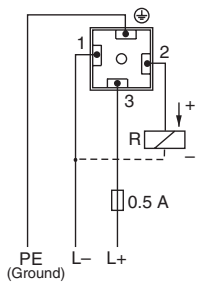
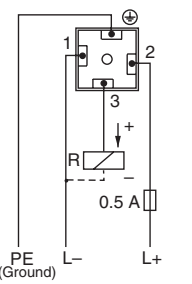
Three-wire DC connection

- preferably used with programmable logic controllers (PLC), DI module as per EN 61131-2.
- positive signal at switching output of the electronics (PNP)
- Output blocked on reaching limit.



$U_{\text{---}}$ 10 V DC … 55 V DC

Electronic FEL52 (E5) in compact housing

Connection	MAX	MIN
Housing C4 (M12 x 1), connector with LEDs  Housing C4 (M12 x 1), connector without LEDs 		
Housing C2 (½ NPT) or Housing C6 (PG11) 		

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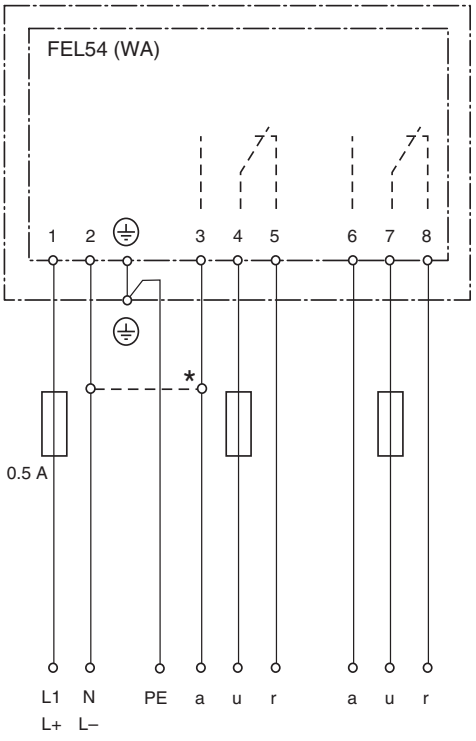
Electrical connection

Electronic insert FEL54 (WA)

Universal current connection with relay output

- Power supply:
  Please note the different voltage ranges for AC and DC.
- Output:
  When connecting an instrument with high inductance, provide a spark arrester to protect the relay contact.
  A fine-wire fuse (depending on the load connected) protects the relay contact on short-circuiting.
  Both relay contacts switch simultaneously.

* When jumpered, the relay output works with NPN logic.

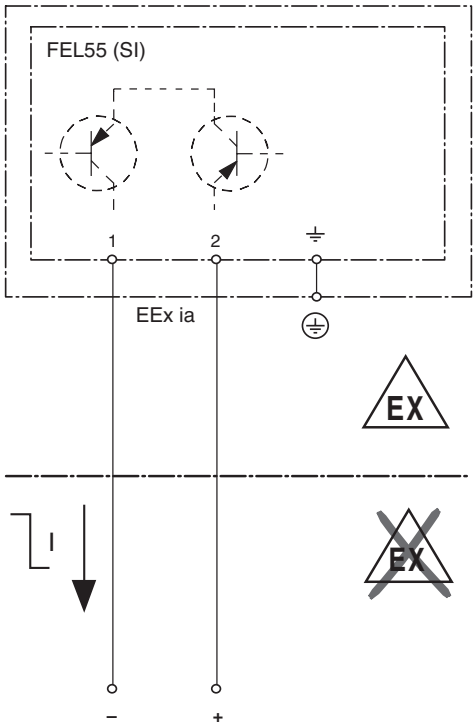


U~ 19 V AC ... 253 V AC, 50/60 Hz
U– 19 V DC ... 55 V DC

Electronic insert FEL55 (SI)

Two-wire connection for separate switching unit

- for connecting to programmable logic controllers (PLC) for example, AI module 4 mA ... 20 mA to EN 61131-2
- Output signal jump from high to low current on limit **(H-L edge)**



U⎓ 11 V DC ... 36 V DC
e. g. PLC

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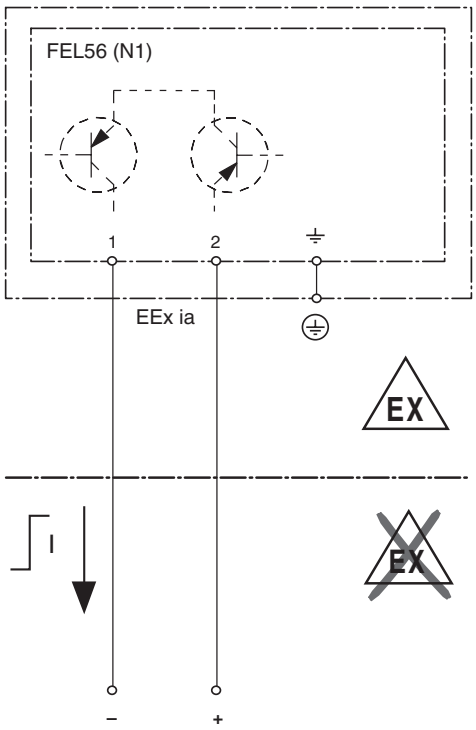
Electrical connection

Electronic insert FEL56 (N1)

Two-wire connection for separate switching unit

- for connecting to isolating amplifiers acc. to NAMUR (IEC 60947-5-6), e. g. isolating amplifier KFD2-SR2-Ex1.W or remote process interface KSD-BI-Ex2 from Pepperl+Fuchs
- Output signal jump from low to high current on limit **(L-H edge)**

Connecting to multiplexer: set clock time to min. 2 s.



Isolated switch amplifiers
according to IEC 60947-5-6 (NAMUR)

Electronic insert FEL58 (N2)

Two-wire connection for separate switching unit

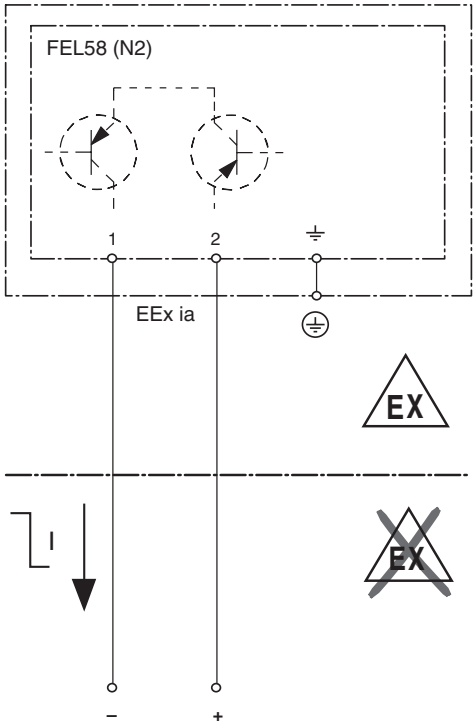
- for connecting to isolating amplifiers acc. to NAMUR (IEC 60947-5-6), e. g. Isolating amplifier KFD2-SR2-Ex1.W or remote process interface KSD-BI-Ex2 from Pepperl+Fuchs
- Output signal jump from high to low current on limit **(H-L edge)**

Additional function:
Test key on the electronic insert. Pressing the key breaks the connection to the isolating amplifier.

Connecting to multiplexer: set clock time to min. 2 s.

Note

For Ex-d applications, the additional function can only be used if the housing is not exposed to an explosive atmosphere.



Isolated switch amplifiers
according to IEC 60947-5-6 (NAMUR)

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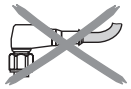
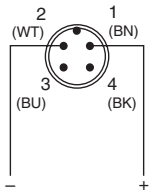
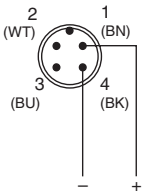
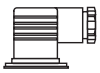
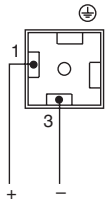
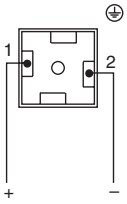
Electrical connection

Electronic FEL58 (N2) in compact housing

Connection	MAX	MIN
Housing C4 (M12 x 1), connector with LEDs 		
Housing C4 (M12 x 1), connector without LEDs 		
Housing C2 (½ NPT) or Housing C4 (PG11) 		

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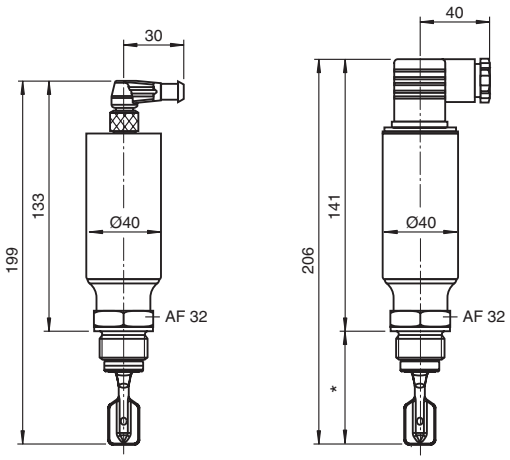
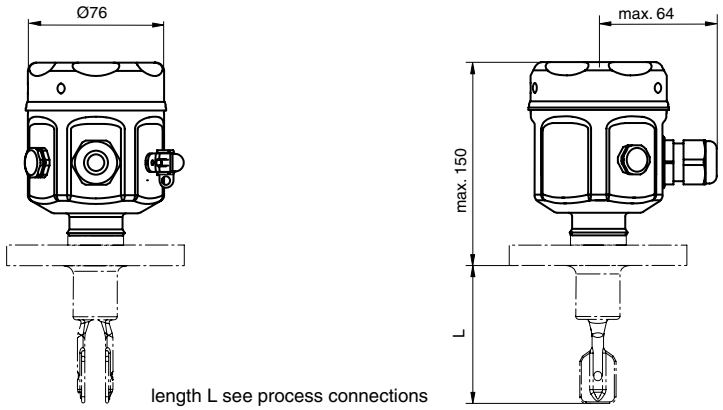
Dimensions

Compact housing C*

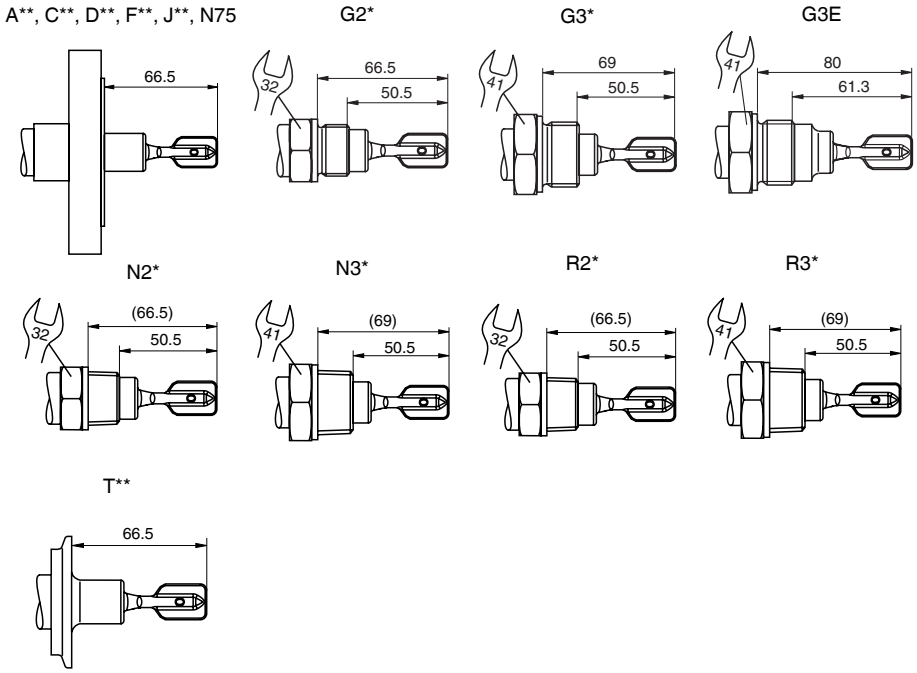


Stainless steel housing E*



length L see process connections

Process connections



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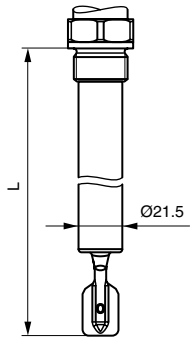
Dimensions

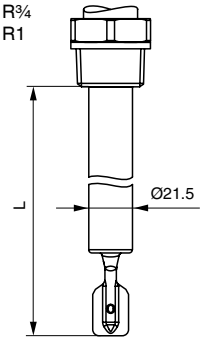
Extension tube

Thread: G¾A
G1A



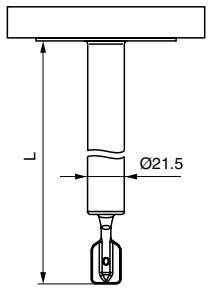
from seal surface of thread adapter

Thread: ¾ NPT
1 NPT
R¾
R1

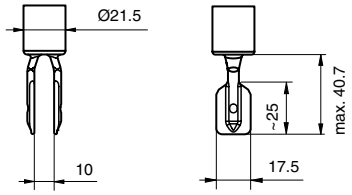


from lower egde of thread

Flanges and flange-like process connections



Vibration fork



Release date 2013-01-07 09:24 Date of issue 2013-01-07 t2733_eng.xml

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Accessories

Welding sleeves

- LVL-Z100, welding sleeve G¾ for flush mounting for process connection G21
- LVL-Z101, welding sleeve G1 for flush mounting for process connection G3E
- LVL-Z102, welding sleeve G1 for flush mounting for process connection G3E

Flanges

- LVL-Z105, lap joint round flange DN50 PN40 form A with G1 thread for process connection G31
- LVL-Z106, lap joint round flange ANSI 2" with G1 thread for process connection G31
- LVL-Z107, lap joint square flange with G1 thread for process connection G31

Sliding sleeves

- LVL-Z120, sliding sleeve for unpressurised operation G1A
- LVL-Z121, sliding sleeve for unpressurised operation G1½A
- LVL-Z122, sliding sleeve for unpressurised operation 1 NPT
- LVL-Z123, sliding sleeve for unpressurised operation 1½ NPT
- LVL-Z124, high pressure sliding sleeve G1A
- LVL-Z125, high pressure sliding sleeve G1A, Alloy C4/2.4610
- LVL-Z126, high pressure sliding sleeve G1½A
- LVL-Z127, high pressure sliding sleeve G1½A, Alloy C4/2.4610
- LVL-Z128, high pressure sliding sleeve 1 NPT
- LVL-Z129, high pressure sliding sleeve 1 NPT, Alloy C4/2.4610
- LVL-Z130, high pressure sliding sleeve 1½ NPT
- LVL-Z131, high pressure sliding sleeve 1½ NPT, Alloy C4/2.4610

Further accessories

- LVL-Z108, cover with glass sight glass for stainless steel housing E*
- LVL-Z109, cover with PC sight glass for stainless steel housing E*
- LVL-Z110, transparent cover for polyester housing P*
- V1-G, mating connector, straight
- V1-W, mating connector, 90° angled

Release date 2013-01-07 09:24 Date of issue 2013-01-07 t2733_eng.xml

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Type code/model number

Specification of length without unit for design M2

Certificates

- **NA** for non-hazardous areas
- **WH** WHG overspill protection
- **E1** Ex II 1G EEx ia IIC T6
- **E2** Ex II 1/2G EEx ia IIC T6
- **E3** Ex II 1/2G EEx d IIC T6
- **EA** Ex II 1G EEx ia IIC T6, WHG
- **EB** Ex II 1/2G EEx ia IIC T6, WHG
- **EC** Ex II 1/2G EEx d IIC T6, WHG
- **EN** Ex II 3G EEx nC IIC T6, WHG
- **EM** Ex II 3G EEx nA IIC T6, WHG
- **FI** FM, IS, CI I, II, III, Div1, Group A–G
- **FN** FM, NI, CI I, Div2, Group A–D
- **FX** FM, XP, CI I, II, III, Div1, Group A–G
- **CG** CSA, General Purpose
- **CI** CSA, IS, CI I, II, III, Div1, Group A–G
- **CX** CSA, XP, CI I, II, III, Div1, Group A–G

Optional equipment

- **NA** without optional equipment
- **Z3** 3.1.B material, wetted parts 1.4435, inspection certificate to EN 10204

Electronic insert

- **PA** FEL50 A, PROFIBUS PA
- **AC** FEL51, contactless 2-wire switch, 19 V AC ... 253 V AC
- **E5** FEL52, PNP 3-wire, 10 V DC ... 55 V DC
- **WA** FEL54, potential-free change-over contact, DPDT, 19 V AC ... 253 V AC, 19 V DC ... 55 V DC
- **SI** FEL55, 8/16 mA, 11 V DC ... 36 V DC
- **N1** FEL56, NAMUR, L-H edge
- **N2** FEL58, NAMUR with push button, H-L edge

Housing, cable entry

- **A1** aluminium housing, IP66, cable gland M20
- **A2** aluminium housing, Nema 4x, ¾ NPT
- **A3** aluminium housing, IP66, entry G½A
- **A4** aluminium housing, IP66, plug connector M12 x 1
- **A5** aluminium housing, IP66, PA plug connector M12 x 1
- **C2** compact housing, Nema 4x, ½ NPT plug connector, 1.4435/316L
- **C4** compact housing, IP66, plug connector M12 x 1, 1.4435/316L
- **C6** compact housing, IP66, PG11 plug connector, 1.4435/316L
- **E1** stainless steel housing, IP66, cable gland M20
- **E2** stainless steel housing, Nema 4x, ½ NPT
- **E3** stainless steel housing, IP66, entry G½A
- **E4** stainless steel housing, IP66, plug connector M12 x 1
- **E5** stainless steel housing, IP66, PA plug connector M12 x 1
- **P1** polyester housing, IP66, cable gland M20
- **P2** polyester housing, Nema 4x, ½ NPT
- **P3** polyester housing, IP66, entry G½A
- **P4** polyester housing, IP66, plug connector M12 x 1
- **P5** polyester housing, IP66, PA plug connector M12 x 1

Length, temperature spacer, pressure-tight bushing

design M1	**AA**	66 mm/2.6 in, R_a < 3.2 µm/80 grit
design M1	**IA**	66 mm/2.6 in, R_a < 3.2 µm/80 grit, with temperature spacer
design M1	**QA**	66 mm/2.6 in, R_a < 3.2 µm/80 grit, with pressure-tight bushing
design M2	**BB**	mm L 1.4435/316L, R_a < 3.2 mm/80 grit
design M2	**BE**	mm L 2.4610/Alloy C4, R_a < 3.2 mm/80 grit
design M2	**CB**	in L 1.4435/316L, R_a < 3.2 mm/80 grit
design M2	**CE**	in L 2.4610/Alloy C4, R_a < 3.2 mm/80 grit
design M2	**DB**	special length L II, 1.4435/316L, R_a < 3.2 mm/80 grit, switch point = Vibracon compact
design M2	**DE**	special length L II, 2.4610/Alloy C4, R_a < 3.2 mm/80 grit, switch point = Vibracon compact
design M2	**JB**	mm L 1.4435/316L, with temperature spacer
design M2	**JE**	mm L 2.4610/Alloy C4, with temperature spacer
design M2	**KB**	in L 1.4435/316L, with temperature spacer
design M2	**KE**	in L 2.4610/Alloy C4, with temperature spacer
design M2	**LB**	special length L II, 1.4435/316L, with temperature spacer, switch point = Vibracon compact
design M2	**LE**	special length L II, 2.4610/Alloy C4, with temperature spacer, switch point = Vibracon compact
design M2	**RB**	mm L 1.4435/316L, with pressure-tight bushing
design M2	**RE**	mm L 2.4610/Alloy C4, with pressure-tight bushing
design M2	**SB**	in L 1.4435/316L, with pressure-tight bushing
design M2	**SE**	in L 2.4610/Alloy C4, with pressure-tight bushing
design M2	**TB**	special length L II, 1.4435/316L, with pressure-tight bushing, switch point = Vibracon compact
design M2	**TE**	special length L II, 2.4610/Alloy C4, with pressure-tight bushing, switch point = Vibracon compact

Design

- **M1** compact design
- **M2** extended design (148 mm/6 in ... 6,000 mm/20 ft)

Continued on next page.

Release date 2013-01-07 09:24 Date of issue 2013-01-07 t2733_eng.xml

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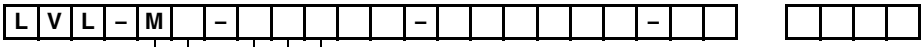
Type code/model number



Process connection and material

A31	1", ANSI B 16.5, 150 lbs RF, 1.4435/316L	
A41	1¼", ANSI B 16.5, 150 lbs RF, 1.4435/316L	
A42	1¼", ANSI B 16.5, 300 lbs RF, 1.4435/316L	design M2
A51	1½", ANSI B 16.5, 150 lbs RF, 1.4435/316L	
A52	1½", ANSI B 16.5, 350 lbs RF, 1.4435/316L	design M2
A61	2", ANSI B 16.5, 150 lbs RF, 1.4435/316L	
A6C	2", ANSI B 16.5, 150 lbs RF, Alloy C4, platinised	
A62	2", ANSI B 16.5, 300 lbs RF, 1.4435/316L	design M2
A63	2", ANSI B 16.5, 600 lbs RF, 1.4435/316L	design M2
A72	2½", ANSI B 16.5, 300 lbs RF, 1.4435/316L	design M2
A81	3", ANSI B 16.5, 150 lbs RF, 1.4435/316L	
A82	3", ANSI B 16.5, 300 lbs RF, 1.4435/316L	design M2
A91	4", ANSI B 16.5, 150 lbs RF, 1.4435/316L	
A92	4", ANSI B 16.5, 300 lbs RF, 1.4435/316L	design M2
A93	4", ANSI B 16.5, 600 lbs RF, 1.4435/316L	design M2
F45	DN25 PN25/40 A, EN 1092-1, 1.4435/316L	
F51	DN32 PN6 A, EN 1092-1, 1.4435/316L	
F55	DN32 PN25/40 A, EN 1092-1, 1.4435/316L	
F61	DN40 PN6 A, EN 1092-1, 1.4435/316L	
F65	DN40 PN25/40 A, EN 1092-1, 1.4435/316L	
F71	DN50 PN6 A, EN 1092-1, 1.4435/316L	
F75	DN50 PN25/40 A, EN 1092-1, 1.4435/316L	
F81	DN65 PN6 A, EN 1092-1, 1.4435/316L	
F85	DN65 PN25/40 A, EN 1092-1, 1.4435/316L	
F93	DN80 PN10/16 A, EN 1092-1, 1.4435/316L	
F95	DN80 PN25/40 A, EN 1092-1, 1.4435/316L	
FA3	DN100 PN10/16 A, EN 1092-1, 1.4435/316L	
FA5	DN100 PN25/40 A, EN 1092-1, 1.4435/316L	
D45	DN25 PN25/40 B1, EN 1092-1, 1.4435/316L	
C45	DN25 PN25/40, EN 1092-1, 2.4610/Alloy C4, 1.4435/316L, platinised	
D51	DN32 PN6 B1, EN 1092-1, 1.4435/316L	
C51	DN32 PN6, EN 1092-1, 2.4610/Alloy C4, 1.4435/316L, platinised	
D71	DN50 PN6 B1, EN 1092-1, 1.4435/316L	
C71	DN50 PN6, EN 1092-1, 2.4610/Alloy C4, 1.4435/316L, platinised	
D75	DN50 PN25/40 B1, EN 1092-1,1.4435/316L	
C75	DN50 PN25/40, EN 1092-1, 2.4610/Alloy C4, 1.4435/316L, platinised	
D95	DN80 PN25/40 B1, EN 1092-1, 1.4435/316L	
C95	DN80 PN25/40, EN 1092-1, 2.4610/Alloy C4, 1.4435/316L, platinised	
DA3	DN100 PN10/16 B1, EN 1092-1, 1.4435/316L	
CA3	DN100 PN10/16, EN 1092-1, 2.4610/Alloy C4, 1.4435/316L, platinised	
F7F	DN50 PN40 C, EN 1092-1, 1.4435/316L	
N75	DN50 PN40 D, EN 1092-1, 1.4435/316L	
R2C	R¾ BSP, DIN 2999, 2.4610/Alloy C4, platinised	
R31	R1 BSP, DIN 2999, 1.4435/316L	
R3C	R1 BSP, DIN 2999, 2.4610/Alloy C4	
N21	¾ NPT, ANSI B 1.20.1, 1.4435/316L	
N2C	¾ NPT, ANSI B 1.20.1, 2.4610/Alloy C4	
N31	1 NPT, ANSI B 1.20.1, 1.4435/316L	
N3C	1 NPT, ANSI B 1.20.1, 2.4610/Alloy C4	
G21	G¾, DIN ISO 228/1, BSP, 1.4435/316L, mounting for welded sleeve	design M1
G2C	G¾, DIN ISO 228/1, BSP, 2.4610/Alloy C4	
G31	G1, DIN ISO 228/1, BSP, 1.4435/316L	
G3C	G1, DIN ISO 228/1, BSP, 2.4610/Alloy C4	
G3E	G1, DIN ISO 228/1, BSP, 1.4435/316L, mounting for welded sleeve	
J13	10K 25A, JIS B 2238 RF, 1.4435/316L	
J16	10K 40A, JIS B 2238 RF, 1.4435/316L	
J17	10K 50A, JIS B 2238 RF, 1.4435/316L	
J1C	10K 50A, JIS B 2238 RF, 2.4610/Alloy C4, platinised	
J19	10K 80A, JIS B 2238 RF, 1.4435/316L	
J1A	10K 100A, JIS B 2238 RF, 1.4435/316L	
N75	DN50 PN40, EN 1092-1, groove, 1.4435/316L	
T51	1½", DN25-38, Triclamp ISO 2852, 1.4435/316L	
T61	2", DN40-51, Triclamp ISO 2852, 1.4435/316L	
XXX	special version	

Design

M1	compact design
M2	extended design (148 mm/6 in ... 6,000 mm/20 ft)

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