

Overview

- Level limit detection in liquids, slurries, foam, interfaces and solids
- Compact unit
- Wide range of applications
- No maintenance
- Full-, demand-, empty detector
- Extended rod version or rope version
- High pressure and high temperature
- High chemical resistance on probes
- RF technology with active shield
- Sensitivity: dielectric constant ≥ 1.5
- Simple modification of probe possible on site

Standard electronics with:

- Universal power supply
- Solid-state switch and Relay output

Digital electronics with:

- Communication via Profibus PA
- Integrated Local User Interface
- Self diagnostics

- Multiple approvals available
- 2011/65/EU RoHS conform

Approvals	CE/ UKCA		
	ATEX/ UKEX/ INMETRO/ CCC	Zone 0	Intrinsically Safe
		Zone 0/1	Flameproof
		Zone 20/21	Dust Ignition Proof or Intrinsically Safe
	FM/ CSA	General purp.	
		Cl. I Div. 1	Intrinsically Safe
		Cl. I Div. 1	Explosionproof
		Cl. II, III Div. 1	Dust Ignition Proof
	TR-CU	Ordinary Locations	
		Zone 0	Intrinsically Safe
		Zone 0/1	Flameproof
		Zone 20/21	Dust Ignition Proof
	Lloyds	Categories ENV1, ENV2, ENV3 and ENV5	
	WHG	Overfill protection	

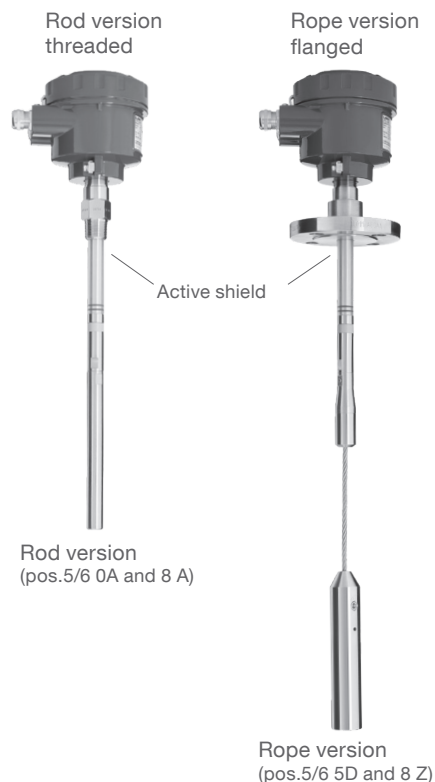
		Electronic module Standard	Electronic module Digital
Electronics	Supply voltage	12 .. 250 V AC/ DC (0 .. 60 Hz)	12 .. 30 V DC (24 V for IS version)
	Signal output	Relais SPDT Solid-state switch (30 V DC/ AC peak, 82 mA)	Profibus PA Solid-state switch (30 V DC/ AC peak, 82 mA)
	Signal output delay	Rise time or Fall time 1 .. 60 sec.	Rise time 0 .. 100 sec. Fall time 0 .. 100 sec.
	Failsafe	High or Low	High or Low
	User interface	Potentiometer, switches, 3 LED indicator	LCD local user interface or Profibus PA
	Diagnostics	-	Over and Under Range Electronics temperature Function check Maintenance alarm Internal electronic self check

Housing	Material	Aluminium, powder-coated
	Ingress protection	Type 4/ NEMA 4/ IP68 ⁽¹⁾
	Temperature extended shaft	Option for RF 8100, standard for RF 8200: Material 1.4404 (SS316L)
	Ambient temperature	-40 .. 85°C (-40 .. 185°F) With Ex-Certificate ATEX, UKEX, INMETRO, CCC, TR-CU: -40 .. 80°C (-40 .. 176°F) with Flameproof or Dust Ignition Proof -40 .. 60°C (-40 .. 140°F) with Intrinsically safe

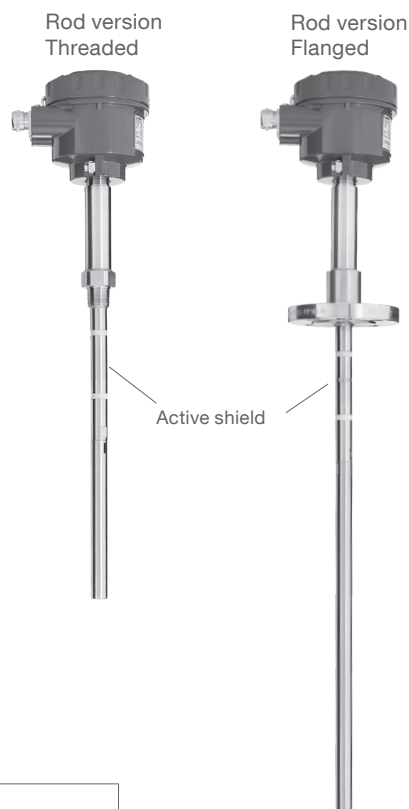
⁽¹⁾ For version with plug the type of protection can be lower (see pos.35).

Overview

RF 8100 Standard version			
Mechanics and Process	Length of extension "L"	Rod Rope	350 .. 1,000 mm (13.78 .. 39.37") 550 .. 25,000 mm (19.7 .. 984.3")
	Active shield length	Threaded Flanged	125 .. 400 mm (4.92 .. 15.75") 105 .. 380 mm (4.13 .. 14.96")
	Diameter of rod/ rope	Rod Rope	ø19 mm (ø0.75") ø6 mm (ø0.3")
	Materials	Process connection	1.4404 (SS316L)
		Active shield area	PFA coated
		Rod	1.4404 (SS316L)
		Rope	1.4404 (SS316L)
		Rope insulation	PFA (optional)
		Probe isolators	PEEK
		Wetted seals	FKM or FFKM
	Process temperature	Without temperature extended shaft: -40 .. 85°C (-40 .. 185°F) With temperature extended shaft: -40 .. 200°C (-40 .. 392°F)	
	Process pressure	-1 .. 35 bar g (-14.6 .. 511 psi g) nominal Observe Pressure versus Temperature Curves	
	Tensile load	max. 18.5 kN (rope version)	



RF 8200 High temperature version (400°C)			
Mechanics and Process	Length of extension "L"	Rod	350 .. 1,000 mm (13.78 .. 39.37")
	Active shield length	Threaded Flanged	125 .. 400 mm (4.92 .. 15.75") 105 .. 380 mm (4.13 .. 14.96")
	Diameter	Rod	ø19 mm (ø0.75")
	Materials	Process connection	1.4404 (SS316L)
		Rod	1.4404 (SS316L)
		Probe isolators	Ceramic
	Process temperature	-40 .. 400°C (-40 .. 752°F)	
	Process pressure	-1 .. 35 bar g (-14.6 .. 511 psi g) nominal Observe Pressure versus Temperature Curves	



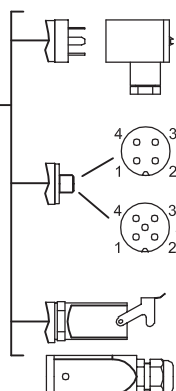
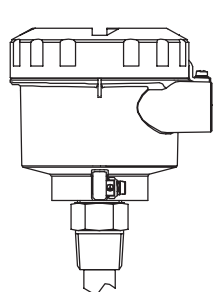
Cable entries (by default)

Depending on model selected, the following cable entries are supported (options see pos.33):

Version:	Cable entries:
Flameproof (pos.2 T,L,5)	M20 x 1.5 (1x open conduit + 1x blind plug)
FM/FMc (pos.2 M,U,P,N)	NPT ½" tapered ANSI B1.20.1 (1x open conduit + 1x blind plug)
All other versions	M20 x 1.5 (1x screwed cable gland + 1x blind plug)

Options

Plug



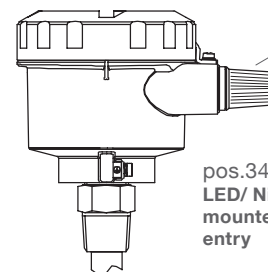
pos.35 x
Valve connector
 max. 230 V
 Enclosure plastic
 Protection IP65
 $-40\text{ °C} \leq T_a \leq +125\text{ °C}$

pos.35 a,b
Plug M12
 max. 25 V (4-pole), 60 V (5-pole)
 Enclosure brass
 Protection IP66
 $-25\text{ °C} \leq T_a \leq +80\text{ °C}$

pos.35 c
Plug Han 4A
 max. 230 V
 Enclosure zinc
 Protection IP65
 $-40\text{ °C} \leq T_a \leq +125\text{ °C}$

Connection of the plug wires to the internal terminals of the unit refer to documentation "Plugs and Signal lamps - Connecting diagram".

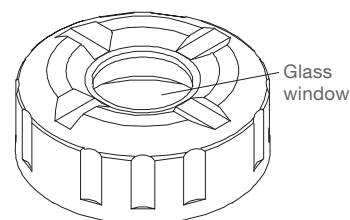
Signal lamp



LED/ NivoLED

pos.34 a,c,2,3,4
LED/ NivoLED
 mounted in cable entry

Connection of the wires to the internal terminals of the unit refer to documentation "Plugs and Signal lamps - Connecting diagram".



Glass window

pos.36 x
Glass window in lid

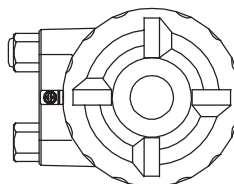
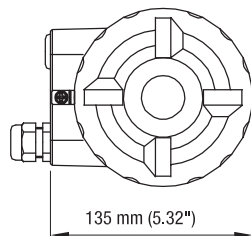
Dimensions

Enclosure

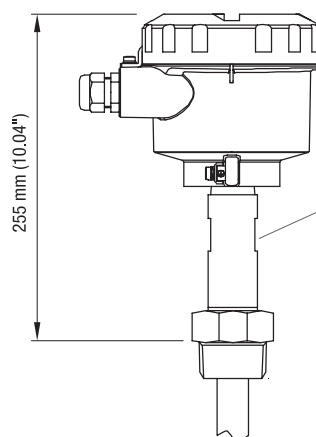
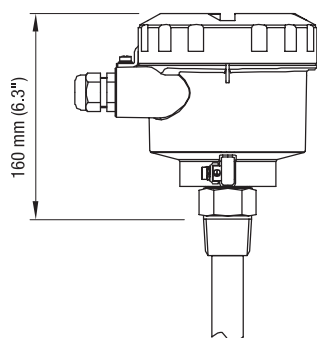
Top view

M20 x 1.5 cable gland

NPT 1/2" conduit

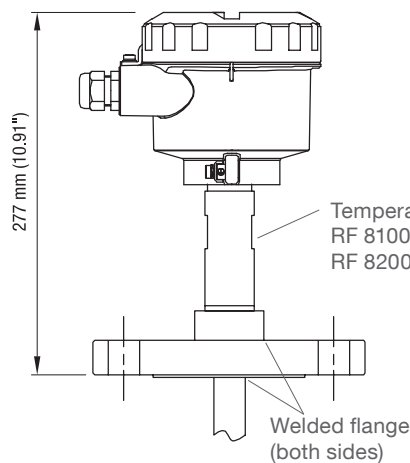
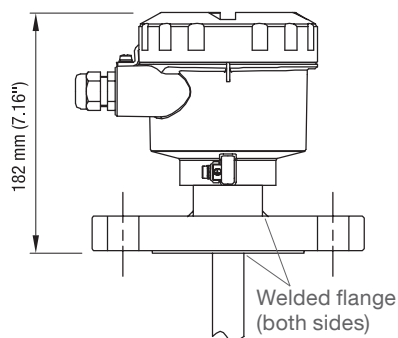


Threaded process connection



Temperature extended shaft:
 RF 8100 optional
 RF 8200 standard

Flanged process connection



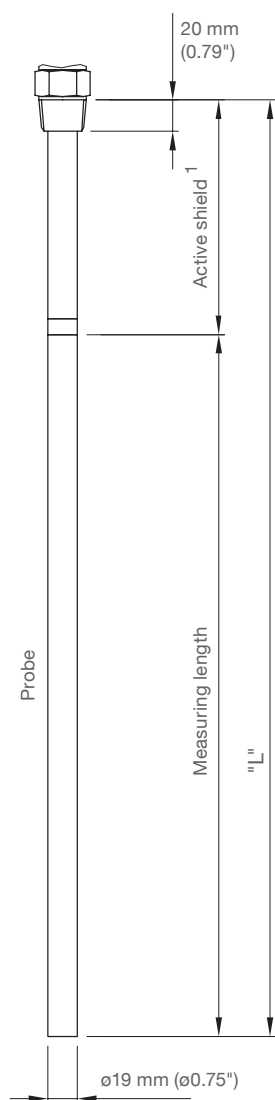
Temperature extended shaft:
 RF 8100 optional
 RF 8200 standard

Dimensions

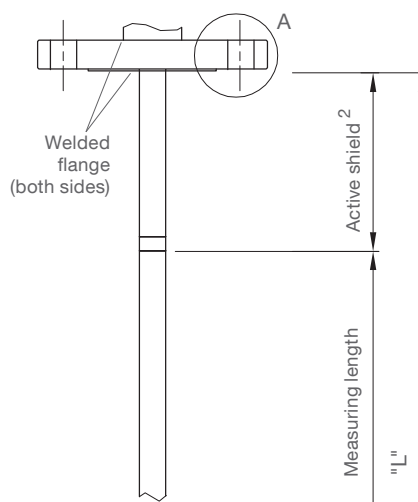
RF 8100 Rod version

RF 8200 Rod version (high temperature)

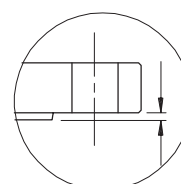
Threaded process connection



Flanged process connection



Detail "A"



"L" does not include any raised face

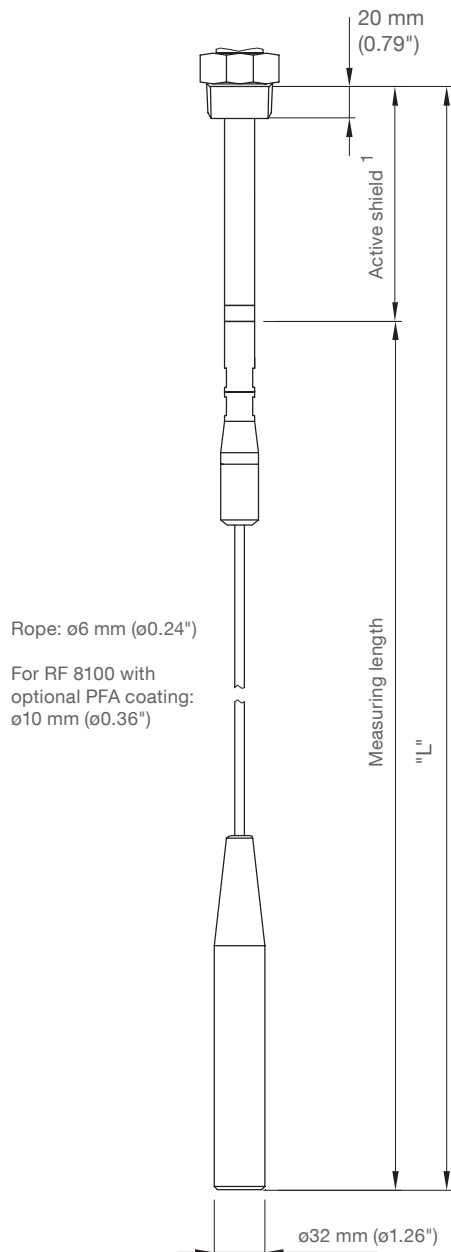
¹ For RF 8100 coated with PFA
 Standard 125 mm (4.92")
 Optional 250 mm (9.84") or
 400 mm (15.75")

² For RF 8100 coated with PFA
 Standard 105 mm (4.13")
 Optional 230 mm (9.06") or
 380 mm (14.96")

Dimensions

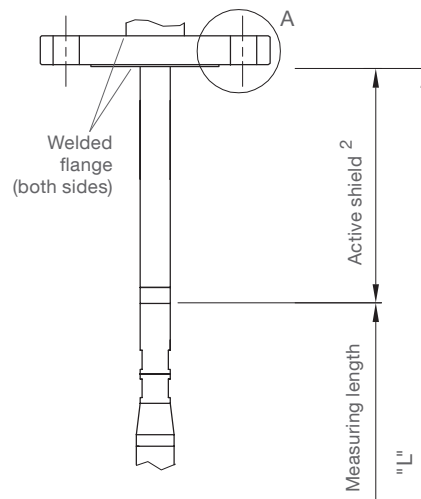
RF 8100 Rope version

Threaded process connection

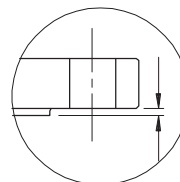


¹ Coated with PFA
 Standard 125 mm (4.92")
 Optional 250 mm (9.84") or 400 mm (15.75")

Flanged process connection



Detail "A"



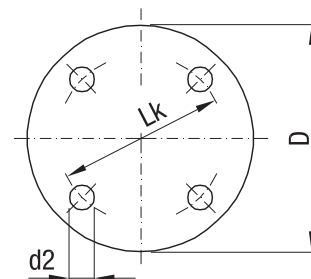
"L" does not include any raised face

² Coated with PFA
 Standard 105 mm (4.13")
 Optional 230 mm (9.06") or 380 mm (14.96")

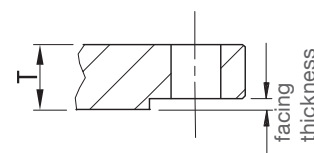
Dimensions

Flanges

	Code	Type	Number of holes	d2 mm (inch)	Lk mm (inch)	D mm (inch)	T (thickness) mm (inch)
ASME B16.5, raised face	5A	1" 150 lbs	4	15.9 (0.63")	79.3 (3.12")	108.0 (4.25")	14.3 (0.56")
	5B	1" 300 lbs	4	19.1 (0.75")	88.9 (3.5")	123.8 (4.87")	17.5 (0.69")
	5C	1" 600 lbs	4	19.1 (0.75")	88.9 (3.5")	123.8 (4.87")	17.5 (0.69")
	5D	1½" 150 lbs	4	15.9 (0.63")	98.6 (3.88")	127.0 (5.0")	17.5 (0.69")
	5E	1½" 300 lbs	4	22.2 (0.87")	114.3 (4.5")	155.6 (6.13")	20.6 (0.81")
	5F	1½" 600 lbs	4	22.2 (0.87")	114.3 (4.5")	155.6 (6.13")	22.4 (0.88")
	5G	2" 150 lbs	4	19.1 (0.75")	120.7 (4.75")	152.4 (6.01")	19.1 (0.75")
	5H	2" 300 lbs	8	19.1 (0.75")	127.0 (5.0")	165.1 (6.5")	22.2 (0.87")
	5J	2" 600 lbs	8	19.1 (0.75")	127.0 (5.0")	165.1 (6.5")	25.4 (1.0")
	5K	3" 150 lbs	4	19.1 (0.75")	152.4 (6.01")	190.5 (7.5")	23.9 (0.94")
	5L	3" 300 lbs	8	22.2 (0.87")	168.2 (6.62")	209.6 (8.25")	28.6 (1.13")
	5M	3" 600 lbs	8	22.2 (0.87")	168.2 (6.62")	209.6 (8.25")	31.7 (1.25")
	5N	4" 150 lbs	8	19.1 (0.75")	190.5 (7.5")	228.6 (9.0")	23.9 (0.94")
	5P	4" 300 lbs	8	22.2 (0.87")	200.0 (7.87")	254.0 (10.0")	31.7 (1.25")
	5Q	4" 600 lbs	8	25.4 (1.0")	215.9 (8.5")	273.1 (10.75")	38.1 (1.5")
EN 1092-1 type A, flat faced	6A	DN25 PN16	4	14.0 (0.55")	85.0 (3.35")	115.0 (4.53")	18.0 (0.71")
	6B	DN25 PN40	4	14.0 (0.55")	85.0 (3.35")	115.0 (4.53")	18.0 (0.71")
	6C	DN40 PN16	4	18.0 (0.71")	110.0 (4.33")	150.0 (5.91")	18.0 (0.71")
	6D	DN40 PN40	4	18.0 (0.71")	110.0 (4.33")	150.0 (5.91")	18.0 (0.71")
	6E	DN50 PN16	4	18.0 (0.71")	125.0 (4.92")	165.0 (6.5")	18.0 (0.71")
	6F	DN50 PN40	4	18.0 (0.71")	125.0 (4.92")	165.0 (6.5")	20.0 (0.79")
	6G	DN80 PN16	8	18.0 (0.71")	160.0 (6.3")	200.0 (7.87")	20.0 (0.79")
	6H	DN80 PN40	8	18.0 (0.71")	160.0 (6.3")	200.0 (7.87")	24.0 (0.94")
	6J	DN100 PN16	8	18.0 (0.71")	180.0 (7.09")	220.0 (8.66")	20.0 (0.79")
	6K	DN100 PN40	8	22.0 (0.87")	190.0 (7.48")	235.0 (9.25")	24.0 (0.94")



Raised face



Type	Facing thickness
ASME 150 lbs ASME 300 lbs	2 mm (0.08")
ASME 600 lbs	7 mm (0.28")

Detailed Ex-markings

Detailed Ex-markings

Code	Certificate	RF 8100	RF 8200	Protection method
pos.2 T	ATEX II 1/2G ATEX II 1/2D	Ex ia/db [ia Ga] IIC T  Ga/Gb Ex ia/tb [ia Da] IIIC T  Da/Db	Ex ia/db [ia Ga] IIC T  Ga/Gb Ex ia/tb [ia Da] IIIC T  Da/Db	Flameproof, Dust Ignition Proof
pos.2 Y	ATEX II 1G ATEX II 1/2D	Ex ia IIC T  Ga Ex ia IIIC T  Da/Db	Ex ia IIC T  Ga Ex ia IIIC T  Da/Db	Intrinsically Safe
pos.2 W	ATEX II 1/2D	Ex ia/tb [ia Da] IIIC T  Da/Db	Ex ia/tb [ia Da] IIIC T  Da/Db	Dust Ignition Proof
pos.2 U	FM/ CSA	XP-IS Class I, Div.1, Gr. A, B, C, D DIP-IS Class II, Div.1, Gr. E, F, G DIP-IS Class III T4	XP-IS Class I, Div.1, Gr. A, B, C, D DIP-IS Class II, Div.1, Gr. E, F, G DIP-IS Class III T4	Explosion Proof, Dust Ignition Proof
pos.2 P	FM/ CSA	IS Class I, Div.1, Gr. A, B, C, D IS Class II, Div.1, Gr. E, F, G IS Class III T4	IS Class I, Div.1, Gr. A, B, C, D IS Class II, Div.1, Gr. E, F, G IS Class III T4	Intrinsically Safe
pos.2 N	FM/ CSA	DIP-IS Class II, Div.1, Gr. E, F, G DIP-IS Class III T4	DIP-IS Class II, Div.1, Gr. E, F, G DIP-IS Class III T4	Dust Ignition Proof
pos.2 L	TR-CU	Ga/Gb Ex ia/d IIC T6...T3 X Ex ia/tb IIIC T ₂₀₀ 80°C...T ₂₀₀ 195°C Da/Db X	Ga/Gb Ex ia/d IIC T6...T1 X Ex ia/tb IIIC T ₂₀₀ 80°C...T ₂₀₀ 405°C Da/Db X	Flameproof, Dust Ignition Proof
pos.2 V	TR-CU	0Ex ia IIC T6...T3 Ga X Ex ia IIIC T ₂₀₀ 80°C...T ₂₀₀ 195°C Da/Db X	0Ex ia IIC T6...T1 Ga X Ex ia IIIC T ₂₀₀ 80°C...T ₂₀₀ 405°C Da/Db X	Intrinsically Safe
pos.2 E	TR-CU	Ex ia/tb IIIC T ₂₀₀ 80°C...T ₂₀₀ 195°C Da/Db X	Ex ia/tb IIIC T ₂₀₀ 80°C...T ₂₀₀ 405°C Da/Db X	Dust Ignition Proof
pos.2 5 +pos.20 a	INMETRO	Ex ia/db [ia Ga] IIC T6...T3 Ga/Gb Ex ia/tb [ia Da] IIIC T* Da/Db	Ex ia/db [ia Ga] IIC T6...T1 Ga/Gb Ex ia/tb [ia Da] IIIC T* Da/Db	Flameproof, Dust Ignition Proof
pos.2 3 +pos.20 a	INMETRO	Ex ia IIC T6...T3 Ga Ex ia IIIC T* Da/Db	Ex ia IIC T6...T1 Ga Ex ia IIIC T* Da/Db	Intrinsically Safe
pos.2 2 +pos.20 a	INMETRO	Ex ia/tb [ia Da] IIIC T* Da/Db	Ex ia/tb [ia Da] IIIC T* Da/Db	Dust Ignition Proof
Pos.2 5 +Pos.20 c	CCC	Ex ia/db [ia Ga] IIC TX Ga/Gb Ex ia/tb [ia Da] IIIC TX Da/Db	Ex ia/db [ia Ga] IIC TX Ga/Gb Ex ia/tb [ia Da] IIIC TX Da/Db	Flameproof, Dust Ignition Proof
Pos.2 3 +Pos.20 c	CCC	Ex ia IIC TX Ga Ex ia IIIC TX Da/Db	Ex ia IIC TX Ga Ex ia IIIC TX Da/Db	Intrinsically Safe
Pos.2 2 +Pos.20 c	CCC	Ex ia/tb [ia Da] IIIC TX Da/Db	Ex ia/tb [ia Da] IIIC TX Da/Db	Dust Ignition Proof
Pos.2 5 +Pos.20 e	UKEX II 1/2G UKEX II 1/2D	Ex ia/db [ia Ga] IIC T  Ga/Gb Ex ia/tb [ia Da] IIIC T  Da/Db	Ex ia/db [ia Ga] IIC T  Ga/Gb Ex ia/tb [ia Da] IIIC T  Da/Db	Flameproof, Dust Ignition Proof
Pos.2 3 +Pos.20 e	UKEX II 1G UKEX II 1/2D	Ex ia IIC T  Ga Ex ia IIIC T  Da/Db	Ex ia IIC T  Ga Ex ia IIIC T  Da/Db	Intrinsically Safe
Pos.2 2 +Pos.20 e	UKEX II 1/2D	Ex ia/tb [ia Da] IIIC T  Da/Db	Ex ia/tb [ia Da] IIIC T  Da/Db	Dust Ignition Proof

Electrical installation

Standard

Relay SPDT/
 Solid state switch

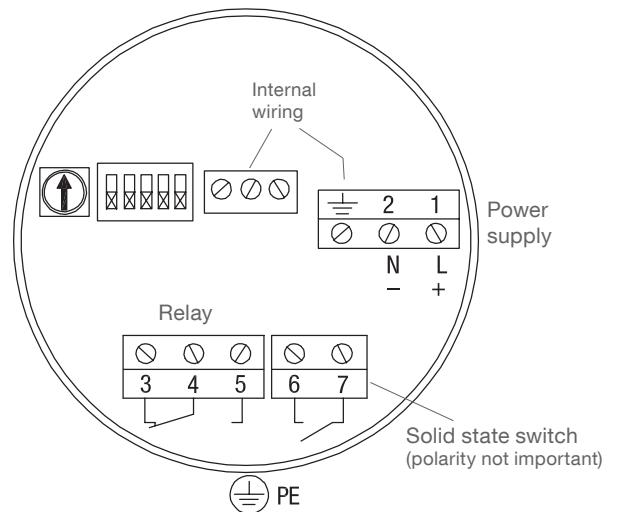
Power supply:

12 .. 250 V AC/ DC (0 .. 60 Hz)
 2 W max.

Signal output:

Relay:
 Floating relay SPDT
 AC max. 250 V, 8 A, 2000 VA, non inductive
 DC max. 30 V, 5 A, 150 W, non inductive

Solid state switch:
 30 V DC or 30 V AC (peak), 82 mA
 Observe protection (see below)



Digital

Profibus PA/
 Solid state switch

Power supply:

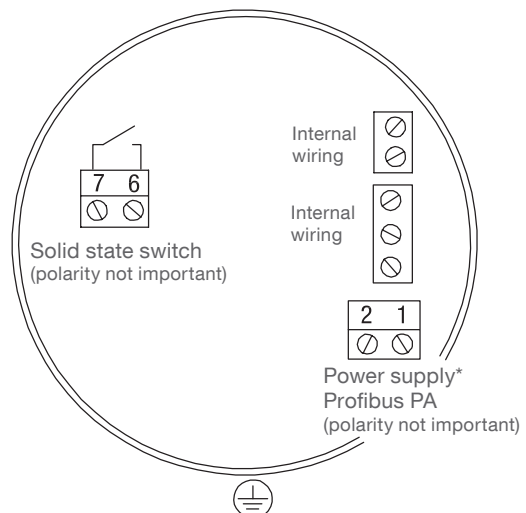
12 .. 30 V DC, 12.5 mA

Intrinsically Safe:
 12 .. 24 V DC, 12.5 mA
 Intrinsically safe barrier required
 For ATEX, UKEX, TR-CU, INMETRO, CCC:
 $U_i = 24 \text{ V}$ $I_i = 380 \text{ mA}$ $P_i = 5.32 \text{ W}$ $C_i = 5 \text{ nF}$ $L_i = 10 \text{ uH}$
 For FM/ CSA:
 See "Connection drawing" in the
 Instruction Manual

Signal output:

Solid state switch:
 30 V DC or 30 V AC (peak), 82 mA
 Observe protection (see below)

With Intrinsically safe:
 Intrinsically safe barrier required
 For ATEX, UKEX, TR-CU, INMETRO, CCC:
 $U_i = 30 \text{ V}$ $I_i = 200 \text{ mA}$ $P_i = 350 \text{ mW}$ $C_i = 0$ $L_i = 0$
 For FM/ CSA:
 See "Connection drawing" in the Instruction Manual



* With use of Profibus the wiring must be according to Profibus PA standards.
 If Profibus is not used, a shielded cable is recommended to ensure stable measurement.

Protection of Solid State Switch

Observe a Protection diode in case of connecting an external relay to the Solid state switch.

