

# Float switch with two switching contacts and one temperature contact

**RE 50212/04.07**  
Replaces: AB 31-35

1/8

**Type ABZMS-35**

Component series 1X



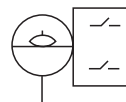
## Table of contents

Contents	Page
Features, symbol	1
Ordering code	2
Standard types	2, 3
Technical data	3, 4
Plug-in connectors	4
Float switch with two switching contacts:	
• Unit dimensions	5
• Contact assignment	5
• Function of the level switch	5
Float switch with two switching contacts and one temperature contact:	
• Unit dimensions	6
• Contact assignment	6
• Function of the level switch and temperature contact	6
Spare parts	7
Assignment to reservoirs	7
Installation notes	8
Use in potentially explosive atmospheres (ATEX)	8
Normative cross-reference	8

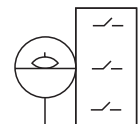
## Features

- Float switches are switching devices, which are operated by a float that is moved by a fluid. They are used for the regulation of fluid levels in reservoirs of type ABSKG ... small power units, sizes 10; 20; 40 and 60, according to data sheet RE 51013.
- Two firmly set reed contacts (normally closed and normally open), which are switched by permanent magnets integrated in the float, are provided in the sliding tubes.
- For monitoring the max. hydraulic fluid temperature, firmly set temperature contacts (option) are installed.

## Symbol



With two switching contacts

With two switching contacts  
and one temperature contact

## Ordering code

<div> <div>ABZM</div> <div>S</div> <div>35</div> <div>1X</div> <div>/</div> <div>F</div> <div></div> <div></div> <div></div> <div></div> </div>									
<div> <div>Power unit accessories</div> <div>Measuring instruments = ABZM</div> <div>Float switch = S</div> <div>Version = 35</div> <div>Component series 10 to 19 (10 to 19: unchanged installation and connection dimensions) = 1X</div> <div>Minimum contact</div> <div>Switching point L1 in mm, e.g. 120 mm = 120</div> <div>Normally closed contact = F</div> <div>Maximum contact</div> <div>Switching point L2 in mm, e.g. 50 mm = 050</div> </div>									
<div> <div>2) Electrical connection</div> <div>K24 = Male connector 04-pin M12x1</div> <div>K14 = Male connector 04-pin (3+PE) DIN EN 175301-803 (float switch <b>without</b> temperature contact)</div> <div>K6 = Male connector 07-pin (6+PE) DIN EN 175201-804 (float switch <b>with</b> temperature contact)</div> <div>Temperature contact</div> <div>No code = Without switching contact</div> <div>T63F = <sup>1)</sup> Switching contact n/c at 63 °C</div> <div>T70F = Switching contact n/c at 70 °C</div> <div>T80F = <sup>1)</sup> Switching contact n/c at 80 °C</div> <div>F = Normally closed</div> <div>S = Normally open</div> </div>									

<sup>1)</sup> Only on enquiry

<sup>2)</sup> Plug-in connectors are **not** included in the scope of supply and must be ordered separately, if required (see pag 4).

### Order example:

- Float switch with connection thread M20x1.5, with 2 firmly set switching contacts,
- switching point L1 = 90 mm normally closed,
- switching point L2 = 30 mm, normally open
- Male connector K24 for female connector Z24 (M12x1)

**ABZMS-35-1X/090F030S-K24** Material no. **R901057912**

## Standard types: Float switches with two switching contacts

The switching points of the float switches are matched to small power units of type ABSKG ... according to data sheet RE 51013.

### Float switches with min./max. switching points

Selection for ABSKG ...	Switching point in mm [ <i>inch</i> ]		Type	Material number
	L1	L2		
ABSKG 10 ...	90 [3.54]	30 [1.18]	ABZMS-35-1X/090F030S-K24	R901057912
ABSKG 20 ...	120 [4.72]	50 [1.97]	ABZMS-35-1X/120F050S-K24	R901057913
ABSKG 40 ... and 60 ...	165 [6.50]	85 [3.35]	ABZMS-35-1X/165F085S-K24	R901057914

### Float switches with min./max. early warning switching points

Selection for ABSKG ...	Switching point in mm [ <i>inch</i> ]		Type	Material number
	L1	L2		
ABSKG 10 ...	90 [3.54]	60 [2.36]	ABZMS-35-1X/090F060S-K24	R901088809
ABSKG 20 ...	120 [4.72]	90 [3.54]	ABZMS-35-1X/120F090S-K24	R901088810
ABSKG 40 ... and 60 ...	165 [6.50]	135 [5.32]	ABZMS-35-1X/165F135S-K24	R901088811

For further standard types,  
see page 3

## Standard types: Float switches with two switching contacts and one temperature contact

### Float switches with min./max. switching points and temperature contact

Selection for ABSKG ...	Switching point in mm [inch]		Type	Material number
	L1	L2		
ABSKG 10 ...	90 [3.54]	30 [1.18]	ABZMS-35-1X /090F030S-T70F-K24	R901057916
ABSKG 20 ...	120 [4.72]	50 [1.97]	ABZMS-35-1X /120F050S-T70F-K24	R901057918
ABSKG 40 ... and 60 ...	165 [6.50]	85 [3.35]	ABZMS-35-1X /165F085S-T70F-K24	R901057920

### Float switches with min. early warning switching points and temperature contact

Selection for ABSKG ...	Switching point in mm [inch]		Type	Material number
	L1	L2		
ABSKG 10 ...	90 [3.54]	60 [2.36]	ABZMS-35-1X /090F060S-T70F-K24	R901088812
ABSKG 20 ...	120 [4.72]	90 [3.54]	ABZMS-35-1X /120F090S-T70F-K24	R901088813
ABSKG 40 ... and 60 ...	165 [6.50]	135 [5.32]	ABZMS-35-1X /165F135S-T70F-K24	R901088814

## Technical data (for applications outside these parameters, please contact us!)

### General

Temperature range	°C [°F]	0 to 90 [32 to 194]
Installation orientation		Vertical ±10 °
Ambient temperature range	°C [°F]	−30 to +50 [−22 to +122]
Material	– Tube and thermostat	CU alloy
	– Float	PUR rigid foam
	– Flange	CU alloy
Seal material		NBR seals
Maximum switching point L1	mm [inch]	400 [15.75]
Weight with L1 = 300 mm	kg [lbs]	0.16 [0.35]

### Hydraulic

Maximum operating pressure	bar [psi]	1 [14.5]			
Hydraulic fluid					
– Specific weight	g/cm³	> 0.7			
– Resistance					
• Mineral oils		Mineral oil	HLP	to DIN 51524	Resistant
• Flame-retardant hydraulic fluids		Emulsions	HFA-E	to DIN 24320	Not resistant
		Watery solutions	HFC	to VDMA 24317	
		Phosphate esters	HFD-R		
		Organic esters	HFD-U		
• Fast bio-degradable hydraulic fluids		Triglycerides (rape seed oil)	HETG	to VDMA 24568	
		Synthetic esters	HEES		
		Polyglycols	HEPG		

### Electrical

Type of protection to DIN EN 60529	IP 65
Plug-in connection	M12x1; 4-pin (material: metal) DIN EN 175301-803 / DIN EN 175201-804

Technical data (for applications outside these parameters, please contact us!)

Reed contacts of float switches with K24 connection for plug-in connector M12x1; 4-pin		
Switching voltage range	VDC	10 to 50
Max. switching current	A	0.5
Max. switching power	W	10

Reed contacts of float switches with K14 connection to DIN EN 175301-803 / K6 to DIN EN 175201-804		
Switching voltage range	VAC	10 to 230
Max. switching current	A	0.5
Max. switching power	W/VA	10/30

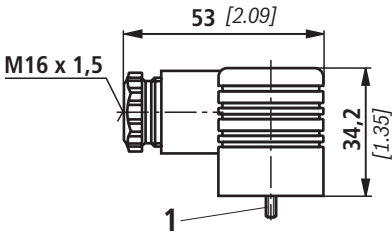
In the case of inductive and capacitive loads, suppressor circuits must be provided (diode, RC-element, varistor).

Temperature contacts of float switches with K24 connection for plug-in connector M12x1; 4-pin		
Switching voltage range	VDC	10 to 50
Max. switching current	A	2
Max. number of switching cycles		10 000
Response tolerance	K	± 4
Hysteresis range	K	2 to 10
Max. temperature change rate	K/min	1

Temperature contacts of float switches with K14 connection to DIN 175301-803 / K6 to DIN EN 175201-804		
Switching voltage range	VAC	10 to 230
Max. switching current	A	2
Max. number of switching cycles		10 000
Response tolerance	K	± 5
Hysteresis range	K	2 to 10
Max. temperature change rate	K/min	1

Plug-in connectors (nominal dimensions in mm [inch]) – for detailed information, see RE 08006

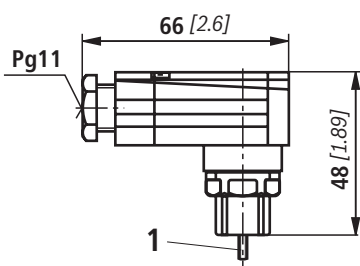
Female connector for K14 male connector to DIN EN 175301-803



1 Mounting screw M3, tightening torque  $M_T = 0.5 \text{ Nm}$

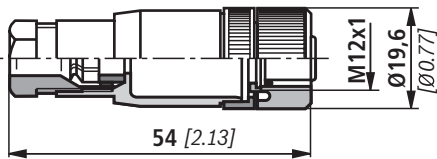
Designation	Material no.
LEITUNGSDOSE 4P Z14 M SW SPEZ	R901017012

Female connector for K6 male connector to DIN EN 175201-804

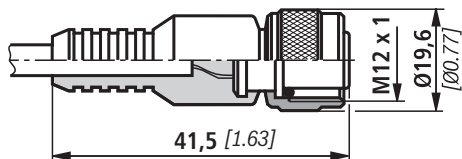


Designation	Material no.
LEITUNGSDOSE 7P Z6 N6RFFK	R900002803

Cable socket for plug K24 with moulded-on PVC cable, 3 m long



Designation	Material no.
LEITUNGSDOSE 4P Z24 SPEZ	R900031155

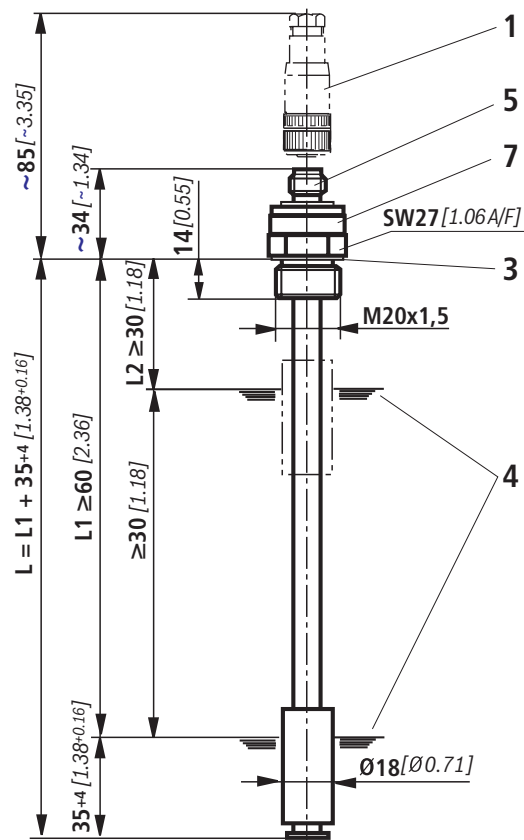


Designation	Material no.
LEITUNGSDOSE 4P Z24M12X1 +3MSPEZ	R900064381

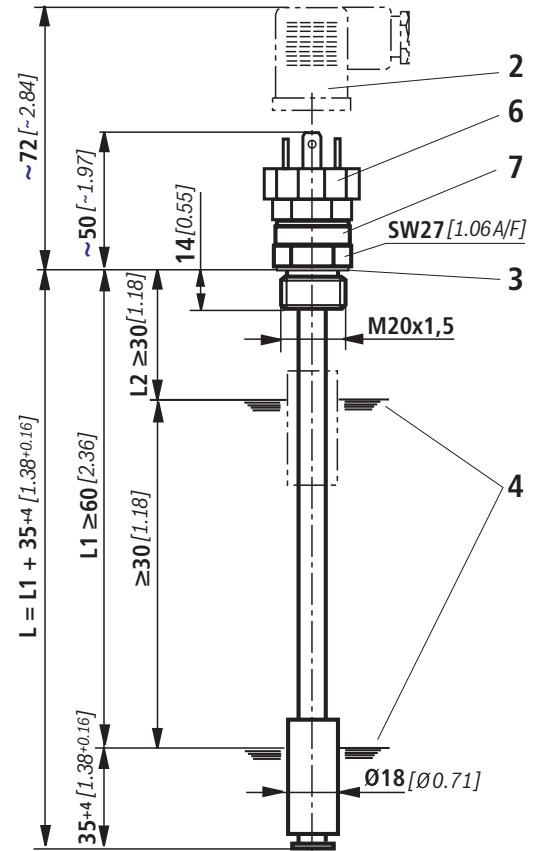
## Float switches with two switching contacts

### Unit dimensions (nominal dimensions in mm[inch])

Plug-in connection M12x1, max. 50 VDC



Plug-in connection DIN EN 175301-803, max. 230 VAC

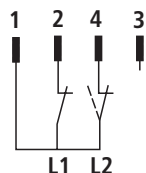


- 1 For female connector for plug-in connections K24 (M12x1), see page 4
- 2 For female connector for plug-in connections K14, see page 4
- 3 Profiled seal M20x1.5 RNI 18104

- 4 Switching point
- 5 Male connector "K24" 04pin12x1
- 6 Male connector "K14" 04-pin (3+PE) DIN EN 175301-803
- 7 Nameplate

### Contact assignment

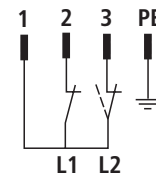
Switching function with plug-in connection M12x1



L1 = normally closed contact at min.

L2 = normally closed or normally open contact as early warning

Switching function with plug-in connection DIN EN 175301-803



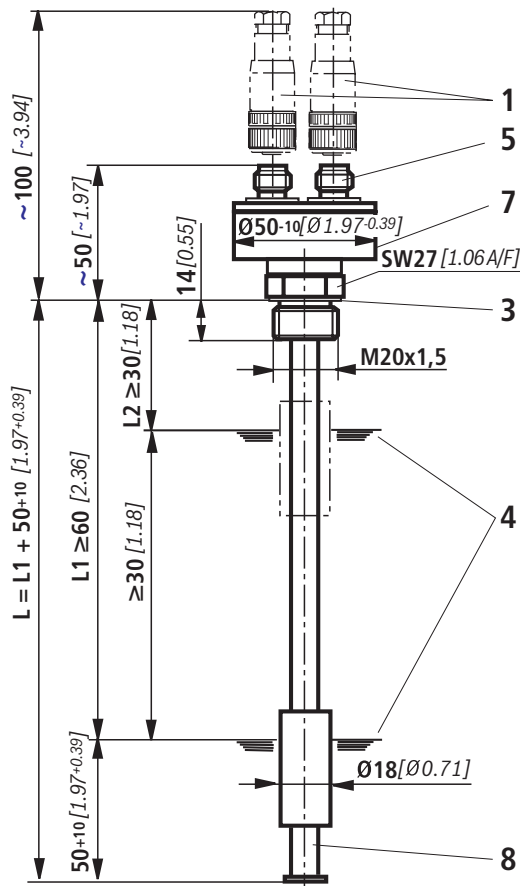
### Function of level switch

When the float reaches the switching points while the oil level is falling, the contacts are operated magnetically. The switching positions of the contacts are maintained until the float passes the switching points again due to a rising oil level. Switching point L1 is a normally closed contact, the contact function of switching point L2 is optionally a normally closed or normally open contact.

## Float switches with two switching contacts and temperature contact

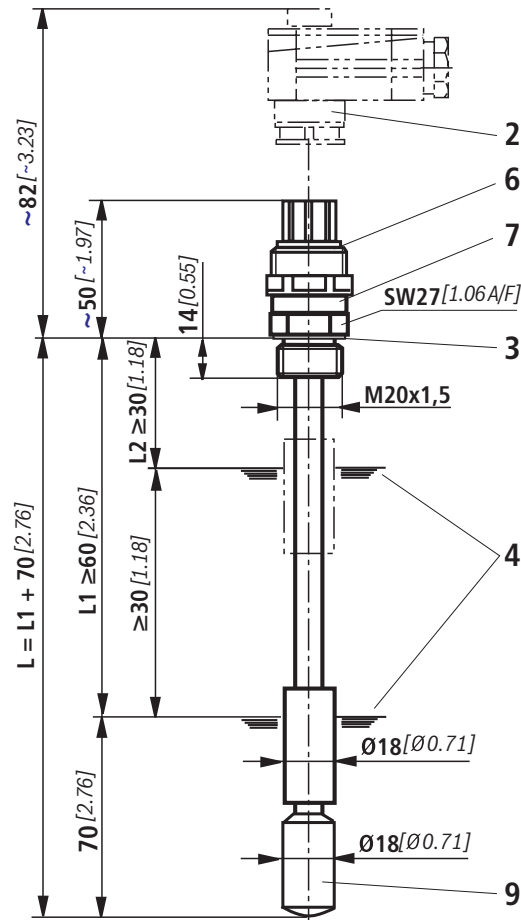
### Unit dimensions (nominal dimensions in mm[inch])

Plug-in connection M12x1, max. 50 VDC



- 1 2x female connector for plug-in connections K24 (M12x1), see page 4
- 2 Female connector for plug-in connections K6, see page 4
- 3 Profiled seal M20x1.5 RNI 18104
- 4 Switching point

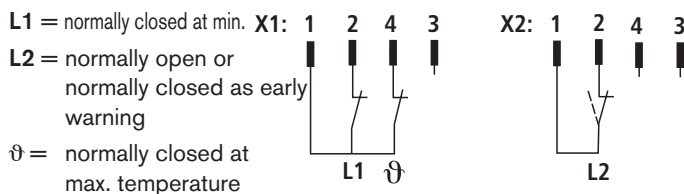
Plug-in connection DIN EN 175201-804, max. 230 VAC



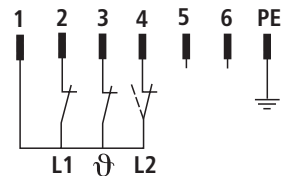
- 5 2x male connector "K24" 04-pin12x1
- 6 Male connector "K6" 07-pin (6+PE) DIN EN 175201-804
- 7 Nameplate
- 8 Temperature contact in sliding tube
- 9 Temperature contact

### Contact assignment

Switching function with plug-in connection M12x1



Switching function with plug-in connection DIN EN 175201-804



### Level switch function

When the float reaches the switching points while the oil level is falling, the contacts are operated magnetically. The switching positions of the contacts are maintained until the float passes the switching points again due to a rising oil level. Switching point L1 is a normally closed contact, the contact function of switching point L2 is optionally a normally closed or normally open contact.

### Temperature contact function

A bimetal plate, which is influenced by temperature, switches when a firmly set response temperature is reached. The temperature contact is not suitable for temperature controlling, but merely for a shutdown function.

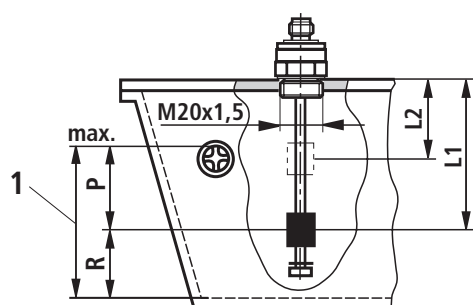
## Spare parts

- When ordering spare parts for the float switch, indicate the complete type code.
- Profiled seal M20x1.5 NBR Material no. **R900012471**

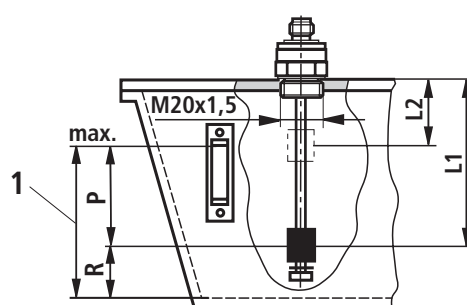
## Assignment to reservoirs

### Float switches with min./max. switching points

Reservoir DN 10 and 20



Reservoir DN 40 and 60

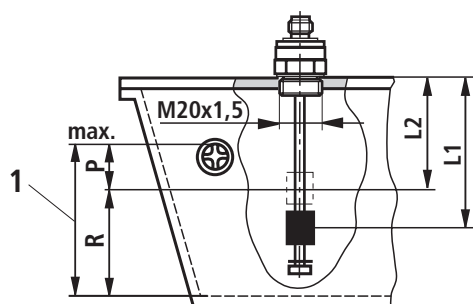


1 Maximum oil level

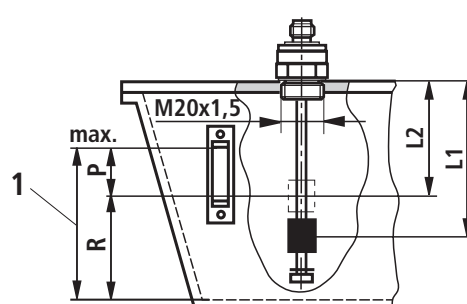
Float switch ABZMS-35-1X/...	Reservoir capacity (RE 51013) DN	Max. oil volume in litres [US gal]	Volume fluctuation P in litres [US gal]	Residual volume R in litres [US gal]	Switching point L1 in mm [inch]	Switching point L2 in mm [inch]
090F030S-K24	10	9.6 [2.54]	3.8 [0.26]	5.8 [1.53]	90 [3.54]	30 [1.18]
120F050S-K24	20	18.0 [4.76]	6.8 [1.8]	11.2 [2.96]	120 [4.72]	50 [1.97]
165F085S-K24	40	33.0 [8.72]	12.2 [3.22]	20.8 [5.49]	165 [6.50]	85 [3.35]
165F085S-K24	60	54.0 [14.27]	17.0 [4.5]	37.0 [9.77]	165 [6.50]	85 [3.35]

### Float switches with min. early warning switching points

Reservoir DN 10 and 20



Reservoir DN 40 and 60



1 Maximum oil level

Float switch ABZMS-35-1X/...	Reservoir capacity (RE 51013) DN	Max. oil volume in litres [US gal]	Volume fluctuation P in litres [US gal]	Residual volume R in litres [US gal]	Switching point L1 in mm [inch]	Switching point L2 in mm [inch]
090F060S-K24	10	9.6 [2.54]	2.0 [0.53]	7.6 [2.0]	90 [3.54]	60 [2.36]
120F090S-K24	20	18.0 [4.76]	4.0 [1.06]	14.0 [3.7]	120 [4.72]	90 [3.54]
165F135S-K24	40	33.0 [8.72]	8.0 [2.11]	25.0 [6.6]	165 [6.50]	135 [5.32]
165F135S-K24	60	54.0 [14.27]	11.0 [2.91]	43.0 [11.34]	165 [6.50]	135 [5.32]

## Installation notes

- Vertical installation according to technical data on page 3
- Avoid flows
- Do not expose switches to strong impacts and excessive bending.
- Avoid external magnetic fields. These could impair the function of the reed contacts.

### Electrical connections:

- Electrical connections may only be established by specialist personnel
- Tighten circular plug-in connectors M12x1 and female connectors after their connection
- Plug circular plug-in connectors M12x1 and female connectors only when disconnected from the power supply
- Do not overload contacts (see technical data)
- **In the case of inductive loads, provide suppressor circuit!**

## Use in potentially explosive atmospheres according to Directive 94/9/EC (ATEX)

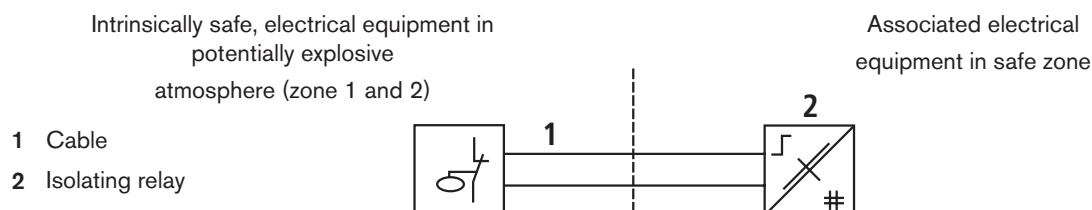
According to DIN EN 50020 float switches are simple electrical apparatus, which are not provided with voltage sources.

The electrical components consist of reed contacts, bimetal thermostats, plug-in connections and terminals.

The equipment complies with construction regulations according to DIN EN 60079-0 and DIN EN 50020.

According to DIN EN 60079-14 these simple, electrical apparatus may be used in intrinsically safe electric circuits [EEx ib] in systems for equipment class II, category 2G (Zone 1) and category 3G (Zone 2) without marking and certification.

The apparatus are assigned to category ib and temperature class T6.



## Normative cross-reference

DIN EN 50020	Electrical apparatus for potentially explosive atmospheres - intrinsic safety "i"; German version of EN 50020:2002	DIN EN 175201-804	Detail specification - round connectors - circular contacts, size diameter 1.6 mm; threaded coupling; German version of EN 175201-804:1999
DIN EN 60079-0	Electrical apparatus for explosive gas atmospheres - Part 0: General requirements (IEC 60079-0:2004); German version of EN 60079-0:2004	DIN EN 175301-803	Detail specification: Rectangular connectors - flat contacts 0.8 mm thickness - locking screw not detachable; German version EN 175301-803:1999
DIN EN 60079-14	Electrical apparatus for explosive gas atmospheres - Part 14: Electrical installations in hazardous areas (other than mines) (IEC 60079-14:2002); German version of EN 60079-14:2003		