

Float switch

For industrial applications, with temperature output

Model RLS-3000

WIKA data sheet LM 50.06

Applications

- Combined level and temperature measurement of liquids in machine building
- Control and monitoring tasks for hydraulic power packs, compressors and in cooling systems

Special features

- Media compatibility: Oil, water, diesel, refrigerants and other liquids
- Level: Up to 3 switching outputs, freely definable as normally open, normally closed or change-over contact
- Temperature: 1 bimetal temperature switch or Pt100/Pt1000, accuracy: Class B
- Potential-free switching reed contacts



Fig. left: With cable outlet and spherical float
Fig. right: With circular connector M12 x 1 and cylindrical float

Description

The model RLS-3000 float switch with temperature output combines the recording of the level and temperature of liquids in a single measuring point. The stainless steel used is suitable for a multitude of media, such as, for example, oil, water, diesel and refrigerants.

Measuring principle

A permanent magnet built into the float triggers, with its magnetic field, the potential-free reed contacts built into the guide tube. The triggering of the reed contacts by the permanent magnet is contact-free and thus free from wear.

Depending on customer wishes, the switching functions of normally open, normally closed or change-over can be realised for the defined liquid level.

The additional temperature output enables the medium temperature to be monitored by means of a preconfigured bimetal temperature switch or a Pt100/Pt1000 resistance signal.

Specifications

Float switch, model RLS-3000	Level	Temperature
Measuring principle	Potential-free switching reed contacts are triggered by a magnet in the float	Bimetal switch or Pt100/Pt1000 measuring resistor in pipe end
Measuring range	Guide tube length L: 60 ... 1,500 mm (2.5 ... 59 in), other lengths on request	Bimetal switch: 30 ... 150 °C (86 ... 302 °F) Pt100/Pt1000
Output signal	Up to 3 switch points, depending on the electrical connection: L-SP1, L-SP2 ¹⁾ , L-SP3 ¹⁾	<ul style="list-style-type: none"> ■ Bimetal switch ■ Pt100, 2-wire ■ Pt1000, 2-wire
Switching function	Alternatively normally open (NO), normally closed (NC) or change-over (SPDT) contact ¹⁾ - on rising level	Alternatively normally open (NO) or normally closed (NC)
Switch position	Specified in mm, starting from the upper sealing face (L-SP1 ... L-SP3) At the end of the guide tube ≈ 45 mm (≈ 1.8 in) cannot be used for switch positions.	
Distance between switch points ²⁾	Minimum distance L-SP1 to the upper sealing face: 50 mm (2.0 in) Minimum distance between the switch points: 50 mm (2.0 in), for floats with outer diameter Ø D = 44 mm (1.7 in), 52 mm (2.0 in) 30 mm (1.2 in), for floats with outer diameter Ø D = 25 mm (1.0 in), 30 mm (1.2 in) Minimum distance with 3 switch points: 80 mm (3.1 in), either between L-SP1 and L-SP2 or L-SP2 and L-SP3	
Switching power	<p>Floats with outer Ø D = 44 mm (1.7 in), 52 mm (2.0 in) Normally open, normally closed: AC 230 V; 100 VA; 1 A DC 230 V; 50 W; 0.5 A</p> <p>Change-over contact: AC 230 V; 40 VA; 1 A DC 230 V; 20 W; 0.5 A</p> <p>Floats with outer Ø D = 25 mm (1.0 in), 30 mm (1.2 in) Normally open, normally closed: AC 100 V; 10 VA; 0.5 A DC 100 V; 10 W; 0.5 A</p> <p>Change-over contact: AC 100 V; 5 VA; 0.25 A DC 100 V; 5 W; 0.25 A</p>	Normally open, normally closed: AC 250 V; 2 A (≥ 50 mA) DC 60 V; 1 A (≥ 50 mA)
Accuracy	±3 mm switch point accuracy incl. hysteresis, non-repeatability	<ul style="list-style-type: none"> ■ Bimetal switch: ±5 °C switch point accuracy, ±20 °C hysteresis ■ Pt100, Pt1000: Class B per DIN EN 60751
Mounting position	Vertical ±30°	
Process connection	<ul style="list-style-type: none"> ■ G 1, installation from outside ■ G 1 ½, installation from outside ■ G 2, installation from outside ■ Flange DN 50, form B per EN 1092-1 (DIN 2527), PN 16, installation from outside 	<ul style="list-style-type: none"> ■ G ⅛, installation from inside ³⁾ ■ G ¼, installation from inside ³⁾ ■ G ⅜, installation from inside ³⁾ ■ G ½, installation from inside ³⁾
Material	<ul style="list-style-type: none"> ■ Wetted Process connection, guide tube: Stainless steel 1.4571 (316Ti) Float: See table on page 3 ■ Non-wetted Case: Stainless steel 1.4571 (316Ti) Electrical connection: See table on page 3 	
Permissible temperatures	<ul style="list-style-type: none"> ■ Medium -30 ... +80 °C (-22 ... +176 °F) -30 ... +120 °C (-22 ... +248 °F) ⁴⁾ -30 ... +150 °C (-22 ... +302 °F) ⁵⁾ ■ Ambient -30 ... +80 °C (-22 ... +176 °F) ■ Storage -30 ... +80 °C (-22 ... +176 °F) 	

1) For medium temperatures > 80 °C (> 176 °F) switch points only with float outer diameter Ø D = 44 or 52 mm

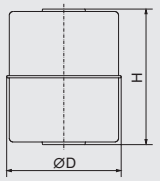
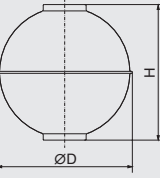
2) Smaller minimum distances on request

3) Only for versions with cable outlet

4) Not with cable material: PVC, PUR; not with float outer diameter Ø D = 25; not with connection housing 58 x 64 x 36 mm

5) Only with cable material: Silicone or connection housing 75 x 80 x 57 mm; not with float outer diameter Ø D = 25 mm

Electrical connections ¹⁾	Level Max. switch point definition	Ingress protection per IEC/EN 60529 ²⁾	Protection class	Material	Cable length
Circular connector M12 x 1 (4-pin)	■ 1 NO/NC	IP65	SK II	TPU, brass	-
Cable outlet	■ 3 NO/NC ■ 3 SPDT	IP67	SK II	PVC	■ 2 m (6.5 ft) ■ 5 m (16.4 ft) other lengths on request
Cable outlet	■ 3 NO/NC ■ 3 SPDT	IP67	SK II	PUR	
Cable outlet	■ 3 NO/NC ■ 1 NO/NC + 1 SPDT	IP67	SK II	Silicone	
Connection housing "standard" Dimensions: 75 x 80 x 57 mm (3.0 x 3.1 x 2.2 in) For cable diameter: 5 ... 10 mm (0.2 ... 0.4 in)	■ 3 NO/NC ■ 3 SPDT	IP66	SK I	Aluminium, glands from polyamide, brass, stainless steel	-
Connection housing "compact" Dimensions: 58 x 64 x 36 mm (2.3 x 2.5 x 1.4 in) For cable diameter: 5 ... 10 mm (0.2 ... 0.4 in)	■ 3 NO/NC ■ 1 NO/NC + 1 SPDT	IP66	SK I		

Float	Form	Outer diameter Ø D	Height H	Operating pressure	Medium temperature	Density	Material
	Cylinder ^{3) 6)}	44 mm (1.7 in)	52 mm (2.0 in)	≤ 16 bar (≤ 232 psi)	≤ 150 °C (≤ 302 °F)	≥ 750 kg/m ³ (46.8 lbs/ft ³)	316Ti
	Cylinder ⁴⁾	30 mm (1.2 in)	36 mm (1.4 in)	≤ 10 bar (≤ 145 psi)	≤ 150 °C (≤ 302 °F)	≥ 850 kg/m ³ (53.1 lbs/ft ³)	316Ti
	Cylinder ⁴⁾	25 mm (1.0 in)	17 mm (0.7 in)	≤ 16 bar (≤ 232 psi)	≤ 80 °C (≤ 176 °F)	≥ 750 kg/m ³ (46.8 lbs/ft ³)	Buna / NBR
	Sphere ^{5) 6)}	52 mm (2.0 in)	52 mm (2.0 in)	≤ 40 bar (≤ 580 psi)	≤ 150 °C (≤ 302 °F)	≥ 750 kg/m ³ (46.8 lbs/ft ³)	316Ti

1) Versions with protective conductor on request

2) The stated ingress protection (per IEC/EN 60529) only applies when plugged in using mating connectors that have the appropriate ingress protection.

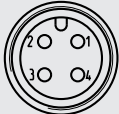



3) Not with process connection G 1, guide tube length L ≥ 100 mm (L ≥ 3.94 in)

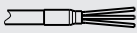
4) Guide tube length L ≤ 1,000 mm (L ≤ 39.37 in), switch points for level max. 2 NO/NC or 1 SPDT definable

5) Not with process connection G 1, G 1 ½, guide tube length L ≥ 100 mm (L ≥ 3.94 in)

6) Not with process connection G ½

Connection diagram

Circular connector M12 x 1 (4-pin)			
	Level	Temperature	
	Normally open/normally closed (NO/NC)	Bimetal switch	Platinum measuring resistor
	Switch point L-SP1	Switch point T-SP	Platinum measuring resistor
			

Cable outlet ¹⁾			
	Level	Temperature	
	Normally open/normally closed (NO/NC)	Bimetal switch	Platinum measuring resistor
	3 switch points L-SP1 L-SP2 L-SP3 GN ——— GY ——— BU ——— YE ——— PK ——— RD ———	Switch point T-SP WH ——— BN ———	Pt100/Pt1000 WH + BN -
	Change-over contact (SPDT)	Bimetal switch	Platinum measuring resistor
	3 switch points L-SP1 L-SP2 L-SP3 YE ——— BU ——— VT ——— GY ——— RD ——— GYPK ——— PK ——— BK ——— RDBU ———	Switch point T-SP WH ——— BN ———	Pt100/Pt1000 WH + BN -

Aluminium case			
"Standard"	Level	Temperature	
	Normally open/normally closed (NO/NC)	Bimetal switch	Platinum measuring resistor
	3 switch points L-SP1 L-SP2 L-SP3 W1 ——— W4 ——— W7 ——— W2 ——— W5 ——— W8 ———	Switch point T-SP1 W10 ——— W11 ———	Pt100/Pt1000 W10 + W11 -
	Change-over contact (SPDT)	Bimetal switch	Platinum measuring resistor
	2 switch points L-SP1 L-SP2 L-SP3 W1 ——— W4 ——— W7 ——— W2 ——— W5 ——— W8 ——— W3 ——— W6 ——— W9 ———	Switch point T-SP1 W10 ——— W11 ———	Pt100/Pt1000 W10 + W11 -
"Compact" ²⁾	Normally open/normally closed (NO/NC)	Bimetal switch	Platinum measuring resistor
	1 switch point L-SP1 W1 ——— W2 ———	Switch point T-SP1 W4 ——— W5 ———	Pt100/Pt1000 W4 + W5 -
	Change-over contact (SPDT)	Bimetal switch	Platinum measuring resistor
	1 switch point L-SP1 W1 ——— W2 ——— W3 ———	Switch point T-SP1 W4 ——— W5 ———	Pt100/Pt1000 W4 + W5 -

1) For combinations of different switching output functions the PIN assignment is marked on the product label.
2) In variants with 2 or 3 switching outputs for level, the deviating pin assignment is noted on the product label

Legend

SP1 - SP3	Switch points	GY	Grey	BK	Black
WH	White	PK	Pink	VT	Violet
BN	Brown	BU	Blue	GYPK	Grey/Pink
GN	Green	RD	Red	RDBU	Red/Blue
YE	Yellow				

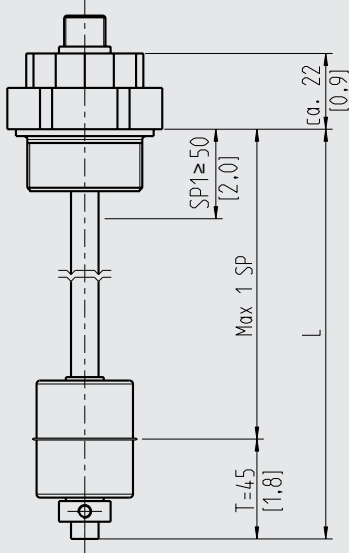
Electrical safety

Insulation voltage

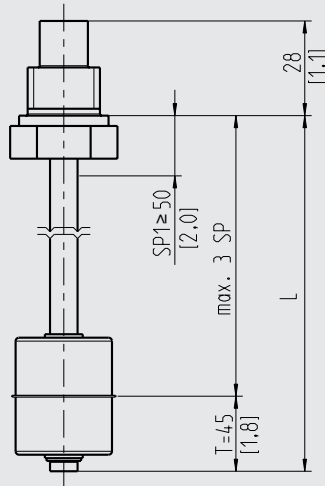
DC 2,120 V

Dimensions in mm (in)

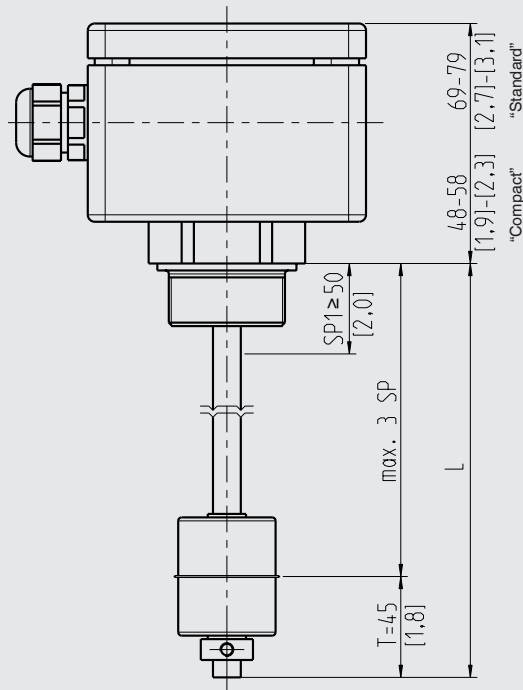
with circular connector M12 x 1



with cable outlet



with connection housing



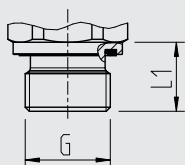
Legend

L Guide tube length

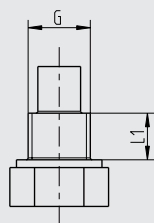
T Non-usable range for switch positions

Process connection

Installation from outside



Installation from inside

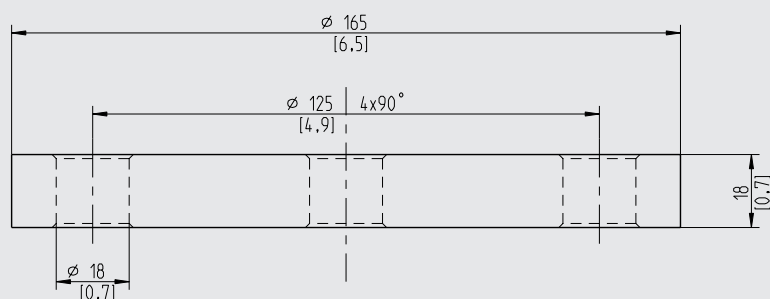


G	L ₁
G 1	16 mm (0.63 in)
G 1 ½	18 mm (0.71 in)
G 2	20 mm (0.79 in)

G	L ₁
G ⅛ B	12 mm (0.47 in)
G ¼ B	12 mm (0.47 in)
G ⅜ B	12 mm (0.47 in)
G ½ B	14 mm (0.55 in)

Flange

DN 50, form B per EN 1092-1 (DIN 2527), PN 16



Accessories

Circular connector M12 x 1 with moulded cable

	Description	Temperature range	Cable diameter	Cable length	Order no.
	Straight version, cut to length, 4-pin, PUR cable, UL listed, IP67	-20 ... +80 °C (-4 ... +176 °F)	4.5 mm (0.18 in)	2 m (6.6 ft)	14086880
				5 m (16.4 ft)	14086883
				10 m (32.8 ft)	14086884
	Angled version, cut to length, 4-pin, PUR cable, UL listed, IP67	-20 ... +80 °C (-4 ... +176 °F)	4.5 mm (0.18 in)	2 m (6.6 ft)	14086889
				5 m (16.4 ft)	14086891
				10 m (32.8 ft)	14086892

Approvals

Logo	Description	Country
	EU declaration of conformity <ul style="list-style-type: none">■ Low voltage directive■ RoHS directive	European Union

Manufacturer's information and certificates

Logo	Description
-	China RoHS directive

Approvals and certificates, see website

Ordering information

Model / Level and temperature output signals / Switching function / Electrical connection / Process connection / Guide tube length L / Medium temperature

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