

# 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	Level	Temperature
<b>Measuring principle</b>	Potential-free switching reed contacts are triggered by a magnet in the float	Bimetal switch or Pt100/Pt1000 measuring resistor in pipe end
<b>Measuring range</b>	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
<b>Output signal</b>	Up to 3 switch points, depending on the electrical connection: L-SP1, L-SP2 <sup>1)</sup> , L-SP3 <sup>1)</sup>	<ul style="list-style-type: none"> <li>■ Bimetal switch</li> <li>■ Pt100, 2-wire</li> <li>■ Pt1000, 2-wire</li> </ul>
<b>Switching function</b>	Alternatively normally open (NO), normally closed (NC) or change-over (SPDT) contact <sup>1)</sup> - on rising level	Normally closed (NC)
<b>Switch position</b>	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.	
<b>Distance between switch points <sup>2)</sup></b>	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	
<b>Switching power</b>		
Floats with outer Ø D = 44 mm [1.7 in] or 52 mm [2.0 in]	Normally open, normally closed: AC 230 V; 100 VA; 1 A; max. 100 Hz DC 230 V; 50 W; 0.5 A Change-over contact: AC 230 V; 40 VA; 1 A; max. 100 Hz DC 230 V; 20 W; 0.5 A	AC 250 V; 2 A (≥ 50 mA) DC 60 V; 1 A (≥ 50 mA)
Floats with outer Ø D = 25 mm [1.0 in] or 30 mm [1.2 in]	Normally open, normally closed: AC 100 V; 10 VA; 0.5 A; max. 100 Hz DC 100 V; 10 W; 0.5 A Change-over contact: AC 100 V; 5 VA; 0.25 A; max. 100 Hz DC 100 V; 5 W; 0.25 A	AC 250 V; 2 A (≥ 50 mA) DC 60 V; 1 A (≥ 50 mA)
<b>Accuracy</b>	±3 mm switch point accuracy incl. hysteresis, non-repeatability	<ul style="list-style-type: none"> <li>■ Bimetal switch: ±5 °C switch point accuracy, ±20 °C hysteresis</li> <li>■ Pt100, Pt1000: Class B per DIN EN 60751</li> </ul>
<b>Mounting position</b>	Vertical ±30°	
<b>Process connection</b>	<ul style="list-style-type: none"> <li>■ G 1/8, installation from inside <sup>3)</sup></li> <li>■ G 1/4, installation from inside <sup>3)</sup></li> <li>■ G 3/8, installation from inside <sup>3)</sup></li> <li>■ G 1/2, installation from inside <sup>3)</sup></li> <li>■ G 1, installation from outside</li> <li>■ G 1 1/2, installation from outside</li> <li>■ G 2, installation from outside</li> <li>■ Flange DN 50, form B per DIN 2527/EN 1092, PN 16, installation from outside</li> </ul>	
<b>Material</b>		
Wetted	Process connection, guide tube: Stainless steel 316Ti Float: See table on page 3	
Non-wetted	Case: Stainless steel 316Ti Electrical connection: See table on page 3	
<b>Permissible temperatures</b>		
Medium	-30 ... +80 °C [-22 ... +176 °F] -30 ... +120 °C [-22 ... +248 °F] <sup>4)</sup> -30 ... +150 °C [-22 ... +302 °F] <sup>5)</sup>	
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 mm [1.7 in] or 52 mm [2.0 in]

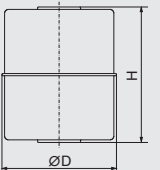
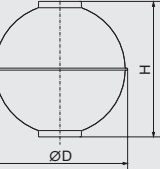
2) Smaller minimum distances on request

3) Only for versions with cable outlet

4) Not with cable material: PVC, PUR; not with float outer diameter Ø D = 25 mm [1.0 in]; not with connection housing 58 x 64 x 36 mm [2.3 x 2.5 x 1.4 in]

5) Only with cable material: Silicone or connection housing 75 x 80 x 57 mm [3.0 x 3.1 x 2.2 in]; not with float outer diameter Ø D = 25 mm [1.0 in]

Electrical connections <sup>1)</sup>	Level Max. switch point definition	Ingress protection per IEC/EN 60529 <sup>2)</sup>	Protection class	Material	Cable length
<b>Circular connector M12 x 1 (4-pin)</b>	■ 1 NO/NC	IP65	II	■ TPU ■ Brass	-
<b>Cable outlet</b>	■ 3 NO/NC ■ 3 SPDT	IP67	II	PVC	■ 2 m [6.5 ft] ■ 5 m [16.4 ft] other lengths on request
<b>Cable outlet</b>	■ 3 NO/NC ■ 3 SPDT	IP67	II	PUR	
<b>Cable outlet</b>	■ 3 NO/NC ■ 1 NO/NC + 1 SPDT	IP67	II	Silicone	
<b>Connection housing "standard"</b> 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	I	■ Aluminium ■ Glands from polyamide ■ Brass ■ Stainless steel	-
<b>Connection housing "compact"</b> 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	I		

Float	Form	Outer diameter Ø D	Height H	Operating pressure	Medium temperature	Density	Material
	Cylinder <sup>3) 6)</sup>	44 mm [1.7 in]	52 mm [2.0 in]	≤ 16 bar [≤ 232 psi]	≤ 150 °C [≤ 302 °F]	≥ 750 kg/m <sup>3</sup> [46.8 lbs/ft <sup>3</sup> ]	316Ti
	Cylinder <sup>4)</sup>	30 mm [1.2 in]	36 mm [1.4 in]	≤ 10 bar [≤ 145 psi]	≤ 120 °C [≤ 248 °F]	≥ 850 kg/m <sup>3</sup> [53.1 lbs/ft <sup>3</sup> ]	316Ti
	Cylinder <sup>4)</sup>	25 mm [1.0 in]	17 mm [0.7 in]	≤ 16 bar [≤ 232 psi]	≤ 80 °C [≤ 176 °F]	≥ 750 kg/m <sup>3</sup> [46.8 lbs/ft <sup>3</sup> ]	Buna / NBR
	Sphere <sup>5) 6)</sup>	52 mm [2.0 in]	52 mm [2.0 in]	≤ 40 bar [≤ 580 psi]	≤ 150 °C [≤ 302 °F]	≥ 750 kg/m <sup>3</sup> [46.8 lbs/ft <sup>3</sup> ]	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 <sup>1)</sup>			
	Level		Temperature
	Normally open/normally closed (NO/NC)		Bimetal switch
	3 switch points L-SP1      L-SP2      L-SP3		Switch point T-SP
	GN YE	GY PK	BU RD
			WH BN
			WH + BN -
	<b>Change-over contact (SPDT)</b>		<b>Bimetal switch</b>
	3 switch points L-SP1      L-SP2      L-SP3		Switch point T-SP
	YE GY PK	BU RD BK	VT GYPK RDBU
			WH BN
			WH + BN -

Aluminium case			
"Standard"	Level		Temperature
	Normally open/normally closed (NO/NC)		Bimetal switch
	3 switch points L-SP1      L-SP2      L-SP3		Switch point T-SP1
	W1 W2	W4 W5	W7 W8
			W10 W11
			W10 + W11 -
	<b>Change-over contact (SPDT)</b>		<b>Bimetal switch</b>
	2 switch points L-SP1      L-SP2      L-SP3		Switch point T-SP1
	W1 W2 W3	W4 W5 W6	W7 W8 W9
			W10 W11
			W10 + W11 -
"Compact" <sup>2)</sup>	<b>Normally open/normally closed (NO/NC)</b>		<b>Bimetal switch</b>
	1 switch point L-SP1		Switch point T-SP1
	W1 W2		
			W4 W5
			W4 + W5 -
	<b>Change-over contact (SPDT)</b>		<b>Bimetal switch</b>
	1 switch point L-SP1		Switch point T-SP1
	W1 W2 W3		
			W4 W5
			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	VT	Violet
WH	White	PK	Pink	GYPK	Grey/Pink
BN	Brown	BU	Blue	RDBU	Red/Blue
GN	Green	RD	Red		
YE	Yellow	BK	Black		

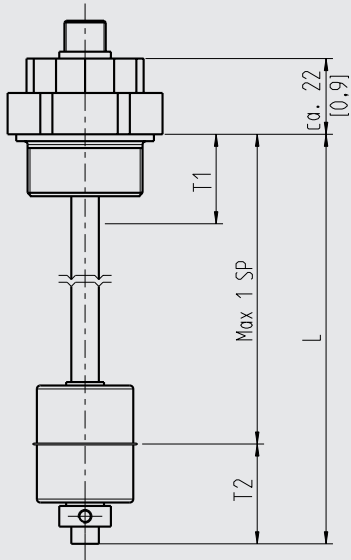
**Electrical safety**

Insulation voltage

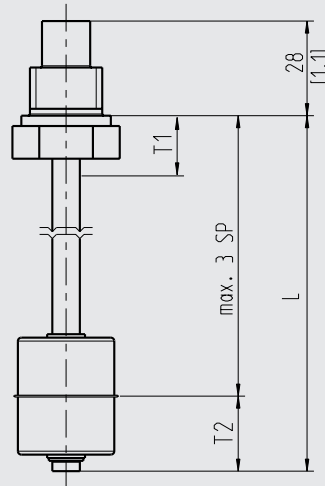
DC 2,120 V

**Dimensions in mm [in]**

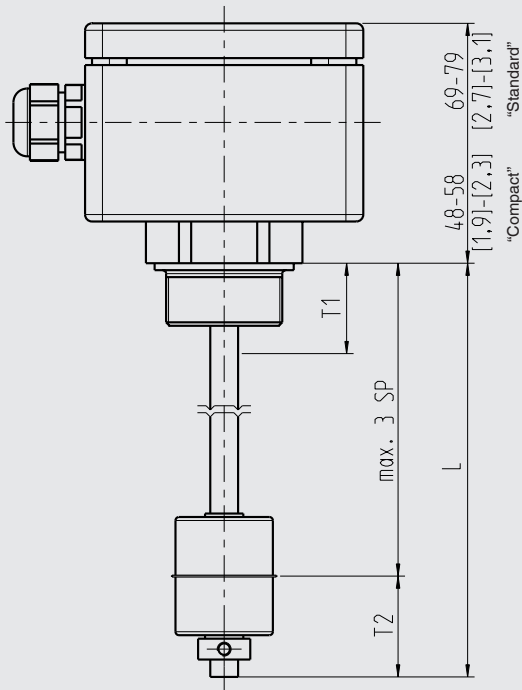
with circular connector M12 x 1



with cable outlet



with connection housing



**Legend**

- L Guide tube length
- M Measuring range
- T1 Dead band (from sealing edge)
- T2 Dead band (pipe end)

### Dead band T1 in mm [inch] (from sealing edge)

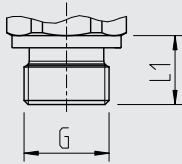
Process connection	Outer diameter float $\varnothing D$			
	$\varnothing 30$ mm [1.2 in]	$\varnothing 44$ mm [1.7 in]	$\varnothing 52$ mm [2.0 in]	$\varnothing 25$ mm [1.0 in]
G 1 (from outside)	35 mm [1.4 in]	-	-	25 mm [1.0 in]
G 1 ½ (from outside)	35 mm [1.4 in]	45 mm [1.8 in]	-	25 mm [1.0 in]
G 2 (from outside)	40 mm [1.6 in]	50 mm [2.0 in]	50 mm [2.0 in]	25 mm [1.0 in]
Flange (from outside)	20 mm [0.8 in]	30 mm [1.2 in]	30 mm [1.2 in]	5 mm [0.2 in]
G ⅛ B (from inside)	30 mm [1.2 in]	-	-	15 mm [0.6 in]
G ¼ B (from inside)	35 mm [1.4 in]	40 mm [1.6 in]	40 mm [1.6 in]	20 mm [0.8 in]
G ⅜ B (from inside)	35 mm [1.4 in]	40 mm [1.6 in]	40 mm [1.6 in]	20 mm [0.8 in]
G ½ B (from inside)	35 mm [1.4 in]	45 mm [1.8 in]	45 mm [1.8 in]	20 mm [0.8 in]

### Dead band T2 in mm [inch] (pipe end)

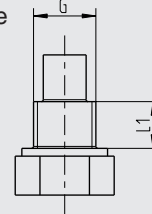
Dead band	Outer diameter float $\varnothing D$			
	$\varnothing 30$ mm [1.2 in]	$\varnothing 44$ mm [1.7 in]	$\varnothing 52$ mm [2.0 in]	$\varnothing 25$ mm [1.0 in]
T2	35 mm [1.4 in]	45 mm [1.8 in]	45 mm [1.8 in]	30 mm [1.2 in]

### Process connection

Installation from outside



Installation from inside

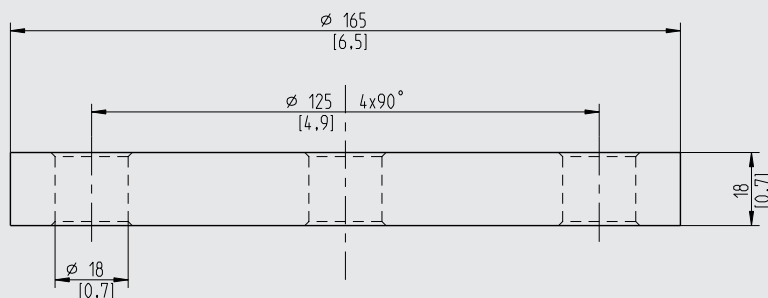


G	L <sub>1</sub>	Spanner width
G 1	16 mm [0.63 in]	41 mm [1.6 in]
G 1 ½	18 mm [0.71 in]	30 mm [1.2 in]
G 2	20 mm [0.79 in]	36 mm [1.4 in]



G	L <sub>1</sub>	Spanner width
G ⅛ B	12 mm [0.47 in]	14 mm [0.5 in]
G ¼ B	12 mm [0.47 in]	19 mm [0.7 in]
G ⅜ B	12 mm [0.47 in]	22 mm [0.9 in]
G ½ B	14 mm [0.55 in]	27 mm [1.1 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
	<b>EU declaration of conformity</b> <ul style="list-style-type: none"> <li>■ Low voltage directive</li> <li>■ RoHS directive</li> </ul>	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 / Switch point position / Electrical connection / Process connection / Guide tube length L / Medium temperature / Float

© 01/2017 WIKA Alexander Wiegand SE & Co. KG, all rights reserved.  
 The specifications given in this document represent the state of engineering at the time of publishing.  
 We reserve the right to make modifications to the specifications and materials.