

Float switch

For industrial applications, plastic version

Model RLS-2000

WIKA data sheet LM 50.04

Applications

- Level measurement of liquids in machine building
- Control and monitoring tasks for critical media: Oil, corrosive liquids and aqueous media

Special features

- Highest reliability in aggressive media
- Optimum process safety thanks to SMD production
- Simple and fast installation

Description

The RLS-2000 is a reliable and inexpensive float switch made of high-quality plastic. It is particularly suited for measuring the levels of aggressive and corrosive media, such as bases and acids. Float switches are an ideal solution for cost-sensitive applications such as the monitoring of levels or overflow and dry-run protection.

The RLS-2000 detects the level by means of a permanent magnet and frictionless reed contacts at up to 4 defined switch points, without contact and thus free from wear. Integration as a limit level switch is simple, convenient and fast, because no adaptation or calibration is required during installation. Its robust design minimises service and maintenance costs.



Fig. left: Mounting thread, angular connector
Fig. right: Cable outlet

Specifications

Float switch, model RLS-2000		
Measuring principle	Potential-free switching reed contacts are triggered by a magnet in the float.	
Guide tube length L		
PP version	100 ... 1,500 mm [4 ... 59 in]	
PVDF version	120 ... 1,500 mm [4.7 ... 59 in]	
PVC version	70 ... 1,500 mm [2.8 ... 59 in]	
	Other lengths on request	
Output signal	Up to 4 switch points, depending on the electrical connection: SP1, SP2, SP3, SP4	
Switching function	Alternatively normally open (NO), normally closed (NC) or change-over (SPDT) contact - on rising level	
Switch position	Specified in mm, starting from the upper sealing face (SP1 ... SP4)	
PP and PVC version	At the end of the guide tube ≈ 45 mm [≈ 1.8 in] cannot be used for switch positions.	
PVDF version	At the end of the guide tube ≈ 65 mm [≈ 2.6 in] cannot be used for switch positions.	
Distance between switch points ¹⁾	Minimum distance SP1 to the upper sealing face: 50 mm [2.0 in] Minimum distance between the switch points: 50 mm [2.0 in] Minimum distance with 3 switch points: 80 mm [3.1 in], either between SP1 and SP2 or SP2 and SP3 Minimum distance with 4 switch points: 80 mm [3.1 in], between SP2 and SP3	
Switching power ²⁾	Floats with outer diameter $\varnothing D = 44$ mm [1.7 in], 55 mm [2.2 in] Normally open, normally closed: AC 230 V; 100 VA; 1 A; 50 ... 60 Hz DC 230 V; 50 W; 0,5 A Change-over contact: AC 230 V; 40 VA; 1 A; 50 ... 60 Hz DC 230 V; 20 W; 0,5 A Floats with outer diameter $\varnothing D = 18$ mm [0.7 in], 25 mm [1.0 in] Normally open, normally closed: AC 100 V; 10 VA; 0.5 A; 50 ... 60 Hz DC 100 V; 10 W; 0.5 A Change-over contact: AC 100 V; 5 VA; 0.25 A; 50 ... 60 Hz DC 100 V; 5 W; 0.25 A	
Accuracy	± 3 mm switch point accuracy incl. hysteresis, non-repeatability	
Mounting position	Vertical $\pm 30^\circ$	
Process connection	■ G 1/2, installation from outside ³⁾ ■ G 1 1/2, installation from outside ⁵⁾ ■ G 3/8, installation from inside ⁶⁾ ■ G 3/4, installation from outside ³⁾ ■ G 2, installation from outside ■ G 1/2, installation from inside ⁶⁾ ■ G 1, installation from outside ⁴⁾	
Material		
Wetted	Process connection, guide tube	PP, PVC or PVDF
	Float	See table on page 3
Non-wetted	Case	PP, PVDF (option)
	Electrical connection	See table on page 3
Permissible temperatures		
Medium	PP version	-10 ... +80 °C [14 ... 176 °F]
	PVDF version	-10 ... +80 °C [14 ... 176 °F] ⁷⁾ Option: -30 ... +120 °C [-22 ... +248 °F] ⁷⁾
	PVC version	-10 ... +60 °C [14 ... 140 °F]
Ambient	PP version	-10 ... +80 °C [14 ... 176 °F]
	PVDF version	-30 ... +80 °C [-22 ... +176 °F]
	PVC version	-10 ... +60 °C [14 ... 140 °F]
Storage	PP version	-10 ... +80 °C [14 ... 176 °F]
	PVDF version	-30 ... +80 °C [-22 ... +176 °F]
	PVC version	-10 ... +60 °C [14 ... 140 °F]

1) Smaller minimum distances on request

2) Higher switching power ratings on request

3) Only with float outer diameter $\varnothing D = 18$ mm [0.7 in]

4) Only with float outer diameter $\varnothing D \leq 25$ mm [1.0 in]

5) Only with float outer diameter $\varnothing D = 44$ mm [1.7 in] from PP, not with 3 x change-over contact

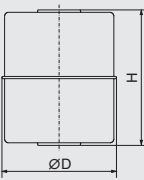
6) Only with cable outlet

7) Not with PVC cable

Electrical connections ¹⁾	Max. switch point definition	Ingress protection per IEC/EN 60529 ²⁾	Protection class	Material	Cable length
Angular connector DIN EN 175301-803 A	<ul style="list-style-type: none"> ■ 2 NO/NC ■ 1 SPDT 	IP65	II	PA	-
Circular connector M12 x 1 (4-pin)	<ul style="list-style-type: none"> ■ 3 NO/NC ■ 1 NO/NC + 1 SPDT 	IP65	II	TPU, brass	-
Cable outlet	<ul style="list-style-type: none"> ■ 4 NO/NC ■ 4 SPDT 	IP67	II	PVC	<ul style="list-style-type: none"> ■ 2 m [6.5 ft] ■ 5 m [16.4 ft] other lengths on request
Cable outlet	<ul style="list-style-type: none"> ■ 4 NO/NC ■ 2 NO/NC + 1 SPDT 	IP67	II	Silicone	
Connection housing Dimensions: 80 x 82 x 55 mm [3.1 x 3.2 x 2.2 in] For cable diameter: 5 ... 10 mm [0.2 ... 0.4 in]	<ul style="list-style-type: none"> ■ 4 NO/NC ■ 4 SPDT 	IP66	II	Polycarbonate, glands from polyamide, brass, stainless steel	-

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.

Float	Form	Outer diameter Ø D	Height H	Operating pressure	Medium temperature	Density	Material
	Cylinder ¹⁾ _{2) 3) 5)}	44 mm [1.7 in]	44 mm [1.7 in]	≤ 3 bar [≤ 43.5 psi]	≤ 80 °C [≤ 176 °F]	≥ 500 kg/m ³ [31.2 lbs/ft ³]	PP
	Cylinder ²⁾ _{3) 4)}	55 mm [2.2 in]	55 mm [2.2 in]	≤ 3 bar [≤ 43.5 psi]	≤ 80 °C [≤ 176 °F]	≥ 500 kg/m ³ [31.2 lbs/ft ³]	PP
	Cylinder ²⁾ _{3) 4)}	55 mm [2.2 in]	65 mm [2.6 in]	≤ 3 bar [≤ 43.5 psi]	≤ 120 °C [≤ 248 °F]	≥ 800 kg/m ³ [49.9 lbs/ft ³]	PVDF
	Cylinder ²⁾ _{4) 5)}	25 mm [1.0 in]	23 mm [0.9 in]	≤ 4 bar [≤ 58 psi]	-25 ... +80 °C [-13 ... +176 °F]	≥ 700 kg/m ³ [43.7 lbs/ft ³]	PP
	Cylinder ²⁾ _{4) 5)}	25 mm [1.0 in]	23 mm [0.9 in]	≤ 4 bar [≤ 58 psi]	"-25 ... +80 °C [-13 ... +176 °F]	≥ 750 kg/m ³ [46.8 lbs/ft ³]	PA6.6
	Cylinder ²⁾ _{4) 5)}	25 mm [1.0 in]	17 mm [0.7 in]	≤ 16 bar [≤ 232 psi]	-30 ... 80 °C [-22 ... 176 °F]	≥ 750 kg/m ³ [46.8 lbs/ft ³]	Buna / NBR
	Cylinder ²⁾ _{4) 5)}	18 mm [0.7 in]	32 mm [1.3 in]	≤ 16 bar [≤ 232 psi]	-30 ... 80 °C [-22 ... 176 °F]	≥ 750 kg/m ³ [46.8 lbs/ft ³]	Buna / NBR

1) Permissible guide tube length L ≤ 500 mm [19.68 in]

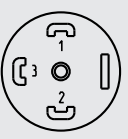


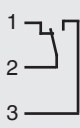
2) Not possible with G 1/2 installation from outside and G 3/4 installation from outside




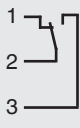



3) Not possible with G 1 installation from outside






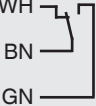

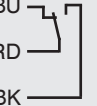
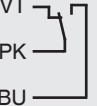




4) Not possible with G 1 1/2 installation from outside





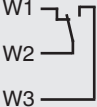
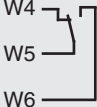
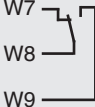
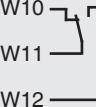
5) Not possible with G 2 installation from outside

Connection diagram

Angular connector DIN EN 175301-803 A		
	Normally open/normally closed (NO/NC)	Change-over contact (SPDT)
	2 switch points SP1 SP2  	1 switch point SP1 

Circular connector M12 x 1 (4-pin)		
	Normally open/normally closed (NO/NC)	Change-over contact (SPDT)
	2 switch points SP1 SP2  	1 switch point SP1 
	3 switch points SP1 SP2 SP3   	

Cable outlet		
	Normally open/normally closed (NO/NC)	Change-over contact (SPDT)
	4 switch points SP1 SP2 SP3 SP4    	4 switch points SP1 SP2 SP3 SP4    
	   	

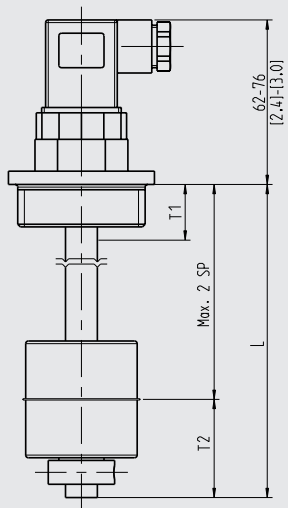
Connection housing			
Normally open/normally closed (NO/NC)	Change-over contact (SPDT)		
4 switch points SP1 SP2 SP3 SP4    	4 switch points SP1 SP2 SP3 SP4    		

Legend

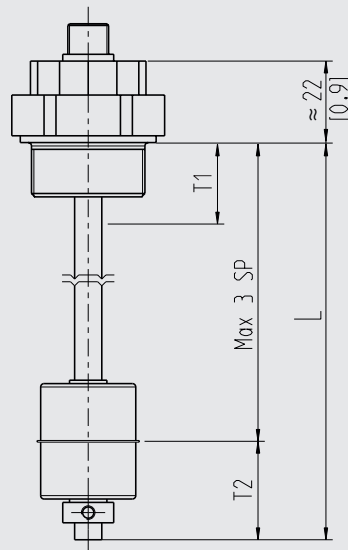
SP1 - SP4	Switch points	GY	Grey	BK	Black
WH	White	PK	Pink	VT	Violet
BN	Brown	BU	Blue	GYPK	Grey/Pink
GN	Green	RD	Red	RDBU	Red/Blue
YE	Yellow				

Dimensions in mm [in]

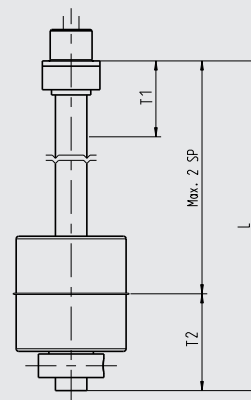
With angular connector form A



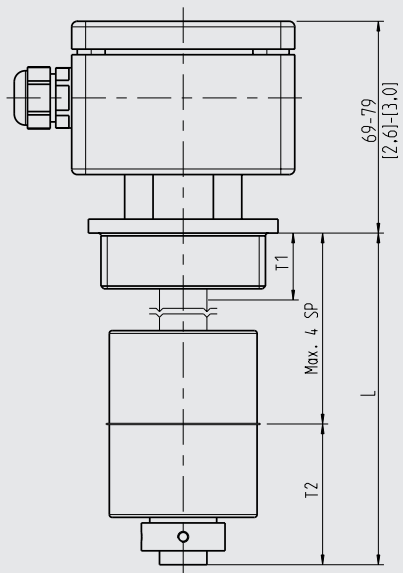
With M12 x 1 circular connector



With cable outlet



With connection housing



Legend

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

Dead band T1 float switch in mm [in] (from sealing edge)

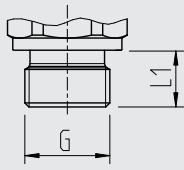
Process connection	Dead band in mm					
Outer diameter float Ø D	Ø 18 mm [0.7 in]	Ø 25 mm [1.0 in]	Ø 25 mm [1.0 in]	Ø 44 mm [1.7 in]	Ø 55 mm [2.2 in]	Ø 55 mm [2.2 in]
Float height H	H 32 mm [1.3 in]	H 17 mm [0.7 in]	H 23 mm [0.9 in]	H 52 mm [2.0 in]	H 55 mm [2.2 in]	H 65 mm [2.6 in]
G ½ (from outside)	35 mm [1.4 in]	-	-	-	-	-
G ¾ (from outside)	35 mm [1.4 in]	-	-	-	-	-
G 1 (from outside)	35 mm [1.4 in]	25 mm [1.0 in]	35 mm [1.4 in]	-	-	-
G 1 ½ (from outside)	-	-	-	45 mm [1.8 in]	-	-
G 2 (from outside)	-	-	-	-	55 mm [2.2 in]	65 mm [2.6 in]
G ¾ B (from inside)	20 mm [0.8 in]	20 mm [0.8 in]	25 mm [1.0 in]	50 mm [2.0 in]	55 mm [2.2 in]	60 mm [2.4 in]
G ½ B (from inside)	20 mm [0.8 in]	20 mm [0.8 in]	25 mm [1.0 in]	50 mm [2.0 in]	55 mm [2.2 in]	60 mm [2.4 in]

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

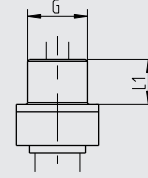
Dead band in mm						
Outer diameter float Ø D	Ø 18 mm [0.7 in]	Ø 25 mm [1.0 in]	Ø 25 mm [1.0 in]	Ø 44 mm [1.7 in]	Ø 55 mm [2.2 in]	Ø 55 mm [2.2 in]
Float height H	H 32 mm [1.3 in]	H 17 mm [0.7 in]	H 23 mm [0.9 in]	H 52 mm [2.0 in]	H 55 mm [2.2 in]	H 65 mm [2.6 in]
T2	30 mm [1.2 in]	30 mm [1.2 in]	25 mm [1.0 in]	40 mm [1.6 in]	45 mm [1.8 in]	55 mm [2.2 in]

Process connection

Installation from outside



Installation from inside



G	L ₁	Spanner width
G ½	15 mm [0.59 in]	27 mm [1.1 in]
G ¾	15 mm [0.59 in]	31 mm [1.2 in]
G 1	16 mm [0.63 in]	41 mm [1.6 in]
G 1 ½	16 mm [0.63 in]	30 mm [1.2 in]
G 2	20 mm [0.79 in]	36 mm [1.4 in]

G	L ₁	Spanner width
G ¾ B	12 mm [0.47 in]	22 mm [0.9 in]
G ½ B	14 mm [0.55 in]	27 mm [1.1 in]

Approvals

Logo	Description	Country
CE	EU declaration of conformity ■ 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 / Output signal / Switching function / Switch point position / Electrical connection / Material / Process connection / Guide tube length L / Medium temperature / Float

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