# Float switch
# For industrial applications
# Model RLS-1000



## Applications

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

## Special features

- Media compatibility: Oil, water, diesel, refrigerants and other liquids
- Permissible medium temperature range: -30 ... +150 °C (-22 ... +302 °F)
- Up to 4 switching outputs freely definable as normally open, normally closed or change-over contact
- Potential-free switching reed contacts

**Fig. left: Mounting thread, angular connector, float from NBR**
**Fig. right: Mounting thread, circular connector M12 x 1, float from stainless steel**

## Description

The model RLS-1000 float switch has been developed for monitoring the level of liquids. 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.



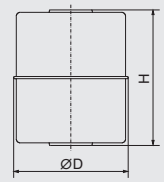
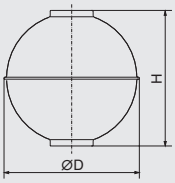
Data sheets showing similar products:
Float switch, plastic version; model RLS-2000; see data sheet LM 50.04
Float switch with temperature output; model RLS-3000; see data sheet LM 50.06
Float switch, intrinsic safety Ex i; model RLS-4000; see data sheet LM 50.07

## Specifications

| Float switch, model RLS-1000 | |
|---|---|
| **Measuring principle** | Potential-free switching reed contacts are triggered by a magnet in the float. |
| **Guide tube length L** | 60 ... 1,500 mm (2.5 ... 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)<br>At the end of the guide tube ≈ 45 mm (≈ 1.8 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)<br>Minimum distance between the switch points:<br>50 mm (2.0 in), for floats with outer Ø = 44 mm (1.7 in), 52 mm (2.0 in)<br>30 mm (1.2 in), for floats with outer Ø = 25 mm (1.0 in), 30 mm (1.2 in)<br>Minimum distance with 3 switch points: 80 mm (3.1 in), either between SP1 and SP2 or SP2 and SP3<br>Minimum distance with 4 switch points: 80 mm (3.1 in), between SP2 and SP3 |
| **Switching power** | **Floats with outer Ø = 44 mm (1.7 in), 52 mm (2.0 in)**<br>Normally open, normally closed: AC 230 V; 100 VA; 1 A<br>DC 230 V; 50 W; 0.5 A<br>Change-over contact: AC 230 V; 40 VA; 1 A<br>DC 230 V; 20 W; 0.5 A<br>**Floats with outer Ø = 25 mm (1.0 in), 30 mm (1.2 in)**<br>Normally open, normally closed: AC 100 V; 10 VA; 0.5 A<br>DC 100 V; 10 W; 0.5 A<br>Change-over contact: AC 100 V; 5 VA; 0.25 A<br>DC 100 V; 5 W; 0.25 A |
| **Accuracy** | ±3 mm switch point accuracy incl. hysteresis, non-repeatability |
| **Mounting position** | Vertical ±30° |
| **Process connection** | ■ G 1, installation from outside<br>■ G 1 ½, installation from outside<br>■ G 2, installation from outside<br>■ Flange DN 50, form B per EN 1092-1 (DIN 2527), PN 16, installation from outside<br>■ G ⅛, installation from inside [2] [3]<br>■ G ¼, installation from inside [2] [3]<br>■ G ⅜, installation from inside [2]<br>■ G ½, installation from inside [2] |
| **Material**<br>■ Wetted<br>■ Non-wetted | Process connection, guide tube: Stainless steel 316Ti<br>Float: See table on page 3<br>Case: Stainless steel 316Ti<br>Electrical connection: See table on page 3 |
| **Permissible temperatures**<br>■ Medium<br>■ Ambient<br>■ Storage | -30 … +80 °C (-22 … +176 °F)<br>-30 … +120 °C (-22 … +248 °F) [4] [6]<br>-30 … +150 °C (-22 … +302 °F) [5] [6]<br>-30 … +80 °C (-22 … +176 °F)<br>-30 … +80 °C (-22 … +176 °F) |

1) Smaller minimum distances on request
2) Only for versions with cable outlet
3) Not with 4 switch points
4) Not with cable material: PVC, PUR; max. 1 change-over contact or 2 normally closed/normally open contacts with float outer diameter Ø D = 30 mm; 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
6) Not for shipbuilding version

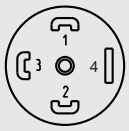
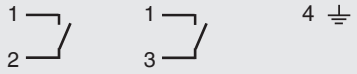
| Electrical connections [2] | Max. switch point definition | Ingress protection per IEC/EN 60529 [3] | Protection class | Material | Cable length |
|---|---|---|---|---|---|
| **Angular connector DIN EN 175301-803 A** [1] | ■ 2 NO/NC<br>■ 1 SPDT | IP65 | SK I | PA | - |
| **Circular connector M12 x 1 (4-pin)** [1] | ■ 3 NO/NC<br>■ 1 NO/NC + 1 SPDT | IP65 | SK II | TPU, brass | |
| **Cable outlet** [1] | ■ 4 NO/NC<br>■ 4 SPDT | IP67 | SK II | PVC | ■ 2 m (6.5 ft)<br>■ 5 m (16.4 ft)<br>■ other lengths on request |
| **Cable outlet** [1] | ■ 4 NO/NC<br>■ 4 SPDT | IP67 | SK II | PUR | |
| **Cable outlet** [1] | ■ 4 NO/NC<br>■ 2 NO/NC + 1 SPDT | IP67 | SK II | Silicone | |
| **Cable outlet "shipbuilding"** | ■ 4 NO/NC<br>■ 4 SPDT | IP67 | SK II | Polyolefin | |
| **Connection housing "standard"**<br>Dimensions: 75 x 80 x 57 mm (3.0 x 3.1 x 2.2 in)<br>For cable diameter: 5 ... 10 mm (0.2 ... 0.4 in) | ■ 4 NO/NC<br>■ 4 SPDT | IP66 | SK I | Aluminium, glands from polyamide, brass, stainless steel | - |
| **Connection housing "compact"**<br>Dimensions: 58 x 64 x 36 mm (2.3 x 2.5 x 1.4 in)<br>For cable diameter: 5 ... 10 mm (0.2 ... 0.4 in) | ■ 4 NO/NC<br>■ 2 NO/NC + 1 SPDT<br>■ 2 SPDT | IP66 | SK I | | |

| Float | Form | Outer diameter Ø D | Height H | Operating pressure | Medium temperature | Density | Material |
|---|---|---|---|---|---|---|---|
|  | Cylinder [4] [7] | 44 mm (1.7 in) | 52 mm (2.0 in) | ≤ 16 bar (≤ 232 psi) | ≤ 150 °C (≤ 302 °F) | ≥ 750 kg/m³ (46.8 lbs/ft³) | 316Ti |
| | Cylinder [5] | 30 mm (1.2 in) | 36 mm (1.4 in) | ≤ 10 bar (≤ 145 psi) | ≤ 120 °C (≤ 248 °F) | ≥ 850 kg/m³ (53.1 lbs/ft³) | 316Ti |
| | Cylinder [5] [1] | 25 mm (1.0 in) | 17 mm (0.7 in) | ≤ 16 bar (≤ 232 psi) | ≤ 80 °C (≤ 176 °F) | ≥ 750 kg/m³ (46.8 lbs/ft³) | Buna / NBR |
|  | Sphere [6] [7] | 52 mm (2.0 in) | 52 mm (2.0 in) | ≤ 40 bar (≤ 580 psi) | ≤ 150 °C (≤ 302 °F) | ≥ 750 kg/m³ (46.8 lbs/ft³) | 316Ti |

1) Not for shipbuilding version
2) Versions with protective conductor on request
3) The stated ingress protection (per IEC/EN 60529) only applies when plugged in using mating connectors that have the appropriate ingress protection.
4) Not with process connection G 1, guide tube length L ≥ 100 mm (L ≥ 3.94 in)
5) Guide tube length L ≤ 1,000 mm (L ≤ 39.37 in), switch points max. 3 NO/NC or 2 SPDT definable
6) Not with process connection G 1, G 1 ½, guide tube length L ≥ 100 mm (L ≥ 3.94 in)
7) Not with process connection G ⅛

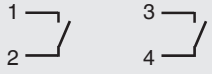
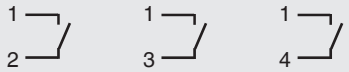
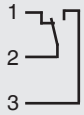
## Connection diagram

### Angular connector DIN EN 175301-803 A

| | Normally open/normally closed (NO/NC) | Change-over contact (SPDT) |
|---|---|---|
|  | 2 switch points<br>SP1 SP2<br>  | 1 switch point<br>SP1<br>  |

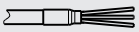
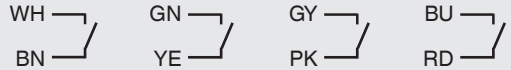
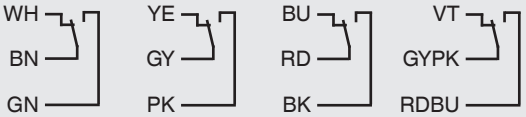


### Circular connector M12 x 1 (4-pin)

| | Normally open/normally closed (NO/NC) | Change-over contact (SPDT) |
|---|---|---|
|  | 2 switch points<br>SP1 SP2<br>  <br>3 switch points<br>SP1 SP2 SP3<br>  | 1 switch point<br>SP1<br>  |

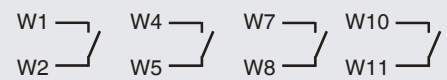
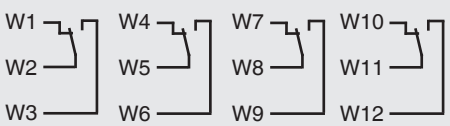
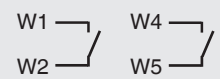
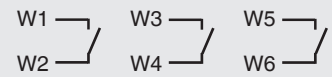
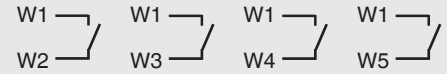
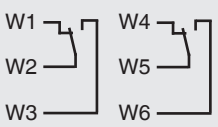


### Cable outlet [1)]

| | Normally open/normally closed (NO/NC) | Change-over contact (SPDT) |
|---|---|---|
|  | 4 switch points<br>SP1 SP2 SP3 SP4<br>  | 4 switch points<br>SP1 SP2 SP3 SP4<br>  |



1) For combinations of different switching output functions the PIN assignment is marked on the product label.

| Aluminium case | | |
|---|---|---|
| **"Standard"** | **Normally open/normally closed (NO/NC)** | **Change-over contact (SPDT)** |
| | 4 switch points<br>SP1 SP2 SP3 SP4<br>  | 4 switch points<br>SP1 SP2 SP3 SP4<br>  |
| **"Compact" 1)** | **Normally open/normally closed (NO/NC)** | **Change-over contact (SPDT)** |
| | 2 switch points<br>SP1 SP2<br>  <br>3 switch points<br>SP1 SP2 SP3<br>  <br>4 switch points<br>SP1 SP2 SP3 SP4<br>  | 2 switch points<br>SP1 SP2<br>  |

1) For combinations of different switching output functions the PIN assignment is marked on the product label.

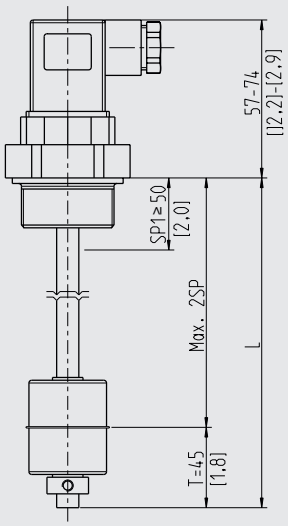
Legend

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

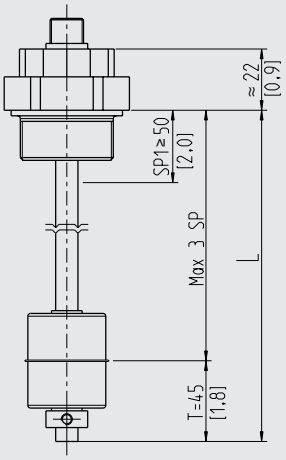
| Electrical safety | |
|---|---|
| **Insulation voltage** | DC 2,120 V |

## Dimensions in mm (in)

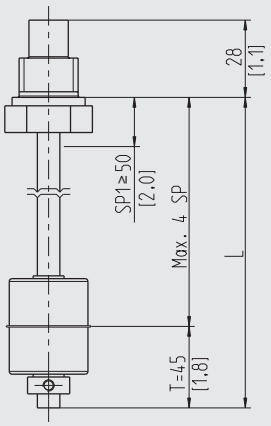
with angular connector form A



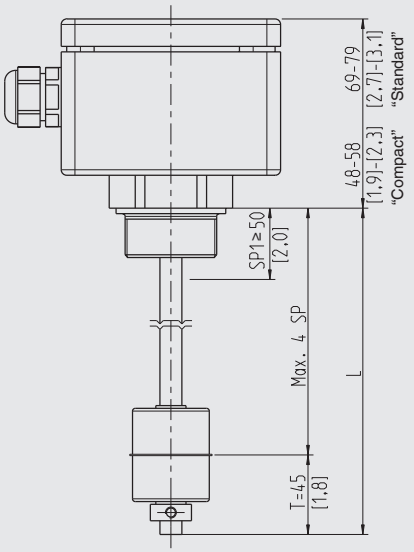

with M12 x 1 circular connector




with cable outlet




with connection housing




Angled version (on request)

Legend

L Guide tube length

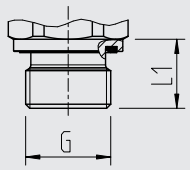
T Non-usable range for switching points

**Float stop**

- Adjusting collar, for medium temperature ≤ 80 °C (≤ 176 °F)
- Pipe clamp, for medium temperature > 80 °C (> 176 °F) and shipbuilding versions

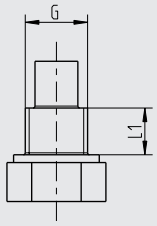
## Process connection

Installation from outside



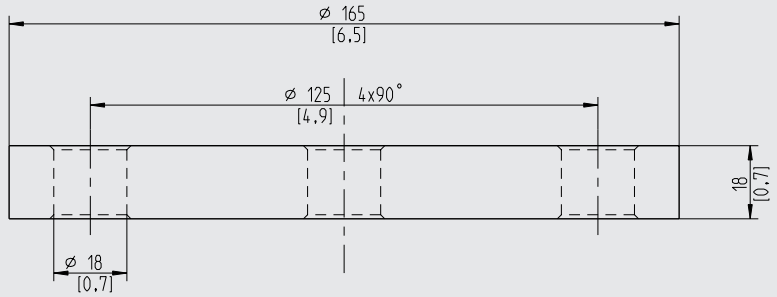

| G | $L_1$ |
|---|---|
| G 1 | 16 mm (0,63 in) |
| G 1 ½ | 18 mm (0,71 in) |
| G 2 | 20 mm (0,79 in) |

Installation from inside




| 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 |
|---|---|---|
| CE | **EU declaration of conformity**<br>■ Low voltage directive<br>■ RoHS directive | European Union |
| | **DNV GL** [1)]<br>Ships, shipbuilding (e.g. offshore) | International |

1) Only for shipbuilding version

## Manufacturer‘s information and certificates

| Logo | Description |
|---|---|
| - | **China RoHS directive** |

Approvals and certificates, see website

**Ordering information**
Model / Output signal / Switching function / Electrical connection / Process connection / Guide tube length L / Medium temperature







**WIKA Alexander Wiegand SE & Co. KG**
Alexander-Wiegand-Straße 30
63911 Klingenberg/Germany
Tel. +49 9372 132-0
Fax +49 9372 132-406
info@wika.de
www.wika.de

11/2017 EN