

# Level sensor

## For industrial applications, plastic version

### Model RLT-2000

WIKA data sheet LM 50.01

#### Applications

- Level measurement of liquids in machine building
- Control and monitoring tasks for critical media

#### Special features

- Media compatibility: aqueous media and corrosive liquids
- Wetted parts: PP or PVDF
- Output signal: Resistance in a 3-wire potentiometer circuit, current output 4 ... 20 mA
- Accuracy, resolution: 24 mm [0.9 in], 12 mm [0.5 in], 10 mm [0.4 in], 6 mm [0.2 in] or 3 mm [0.1 in]



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

#### Description

The model RLT-2000 level sensor has been developed for measuring the level of liquids.

#### Measuring principle

A permanent magnet built into the float triggers, with its magnetic field, the resistance measuring chain built into the guide tube. The entire assembly corresponds to a 3-wire potentiometer circuit. The measured resistance signal is proportional to the level. The model RLT-2000 is optionally available with a 4 ... 20 mA output signal.

## Specifications

Level sensor, model RLT-2000					
<b>Measuring principle</b>	Reed-chain technology with optional analogue amplifier				
<b>Measuring range M</b>	The measuring range is determined from the selected guide tube length L and the position of the 100 % mark. For dimensions see drawing				
<b>Guide tube length L</b>	150 ... 1,500 mm [6 ... 59 in]				
<b>Output signal</b>	<ul style="list-style-type: none"> <li>■ Variable resistance The overall resistance of the reed chain is approx. 1 ... 10 kΩ, depending on the measuring range Max. voltage &lt; DC 40 V</li> <li>■ Current output, 4 ... 20 mA, 2-wire Power supply: DC 12 ... 32 V Load in Ω: ≤ (power supply - 12 V) / 0.02 A</li> </ul>				
<b>Accuracy, resolution</b>	<ul style="list-style-type: none"> <li>■ 24 mm [0.9 in] <sup>1)</sup></li> <li>■ 12 mm [0.5 in] <sup>1)</sup></li> <li>■ 10 mm [0.4 in] <sup>2)</sup></li> <li>■ 6 mm [0.2 in] <sup>1)</sup></li> <li>■ 3 mm [0.1 in] <sup>1)</sup></li> </ul>				
<b>Mounting position</b>	Vertical ±30°				
<b>Process connection</b>	<ul style="list-style-type: none"> <li>■ G 1 ½, installation from outside <sup>3)</sup></li> <li>■ G 2, installation from outside</li> <li>■ G ¾, installation from inside <sup>4)</sup></li> <li>■ G ½, installation from inside <sup>4)</sup></li> </ul>				
<b>Material</b>	<ul style="list-style-type: none"> <li>■ Wetted</li> <li>■ Non-wetted</li> </ul>				
	Process connection, guide tube: PP, PVDF (option)      Float: See table page 3 Case: PP, PVDF (option)      Electrical connection: See table below				
<b>Permissible temperatures</b>	<table border="0" style="width: 100%;"> <tr> <td style="width: 50%; vertical-align: top;">           PP version  <ul style="list-style-type: none"> <li>■ Medium</li> <li>■ Ambient</li> <li>■ Storage</li> </ul> </td> <td style="width: 50%; vertical-align: top;">           PVDF version (option)  <ul style="list-style-type: none"> <li>-10 ... +80 °C [14 ... 176 °F]</li> <li>-10 ... +80 °C [14 ... 176 °F]</li> <li>-10 ... +80 °C [14 ... 176 °F]</li> </ul> </td> </tr> <tr> <td></td> <td style="vertical-align: top;"> <ul style="list-style-type: none"> <li>-10 ... +80 °C [14 ... 176 °F], option: -30 ... +120 °C [-22 ... +248 °F] <sup>5)</sup></li> <li>-30 ... +80 °C [-22 ... +176 °F]</li> <li>-30 ... +80 °C [-22 ... +176 °F]</li> </ul> </td> </tr> </table>	PP version <ul style="list-style-type: none"> <li>■ Medium</li> <li>■ Ambient</li> <li>■ Storage</li> </ul>	PVDF version (option) <ul style="list-style-type: none"> <li>-10 ... +80 °C [14 ... 176 °F]</li> <li>-10 ... +80 °C [14 ... 176 °F]</li> <li>-10 ... +80 °C [14 ... 176 °F]</li> </ul>		<ul style="list-style-type: none"> <li>-10 ... +80 °C [14 ... 176 °F], option: -30 ... +120 °C [-22 ... +248 °F] <sup>5)</sup></li> <li>-30 ... +80 °C [-22 ... +176 °F]</li> <li>-30 ... +80 °C [-22 ... +176 °F]</li> </ul>
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	<ul style="list-style-type: none"> <li>-10 ... +80 °C [14 ... 176 °F], option: -30 ... +120 °C [-22 ... +248 °F] <sup>5)</sup></li> <li>-30 ... +80 °C [-22 ... +176 °F]</li> <li>-30 ... +80 °C [-22 ... +176 °F]</li> </ul>				

Electrical connections <sup>6)</sup>	Ingress protection <sup>7)</sup>	Material	Cable length
<b>Angular connector DIN 175301-803 A</b>	IP65	PA	-
<b>Cable outlet</b>	IP67	PVC	<ul style="list-style-type: none"> <li>■ 2 m [6.5 ft]</li> <li>■ 5 m [16.4 ft]</li> </ul>
<b>Cable outlet</b>	IP67	Silicone	other lengths on request
<b>Connection housing</b> 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]	IP66	Polycarbonate, glands from polyamide, brass, stainless steel	-

1) Not with float diameter 44 mm [1.7 in] from PP

2) Only with float diameter 44 mm [1.7 in] from PP and guide tube length L ≤ 500 mm (L ≤ 19,68 in)

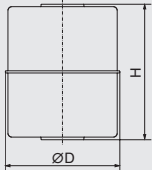
3) Only with float diameter 44 mm [1.7 in] from PP

4) Only with cable outlets

5) Not with PVC cable

6) Cable outlets not available with current output, 4 ... 20 mA


7) 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 $\varnothing D$	Height H	Operating pressure	Medium temperature	Density	Material
	Cylinder <sup>8)</sup>	44 mm [1.7 in]	44 mm [1.7 in]	≤ 3 bar [≤ 43.5 psi]	≤ 80 °C [≤ 176 °F]	≥ 500 kg/m <sup>3</sup> [31.2 lbs/ft <sup>3</sup> ]	PP
	Cylinder <sup>9)</sup>	55 mm [2.2 in]	55 mm [2.2 in]	≤ 3 bar [≤ 43.5 psi]	≤ 80 °C [≤ 176 °F]	≥ 500 kg/m <sup>3</sup> [31.2 lbs/ft <sup>3</sup> ]	PP
	Cylinder <sup>9)</sup>	55 mm [2.2 in]	65 mm [2.6 in]	≤ 3 bar [≤ 43.5 psi]	≤ 120 °C [≤ 248 °F]	≥ 850 kg/m <sup>3</sup> [53.1 lbs/ft <sup>3</sup> ]	PVDF

8) Guide tube length  $L \leq 500$  mm [ $L \leq 19,68$  in], not with process connection G 2

9) Not with process connection G 1 1/2

## Connection diagram

Angular connector DIN 175301-803 A				
	Variable resistance		Current output, 4 ... 20 mA, 2-wire	
	Overall resistance	Pin 2 / 3	U+	Pin 1
	100 ... 0 %	Pin 1 / 3	U-	Pin 2
	0 ... 100 %	Pin 1 / 2		

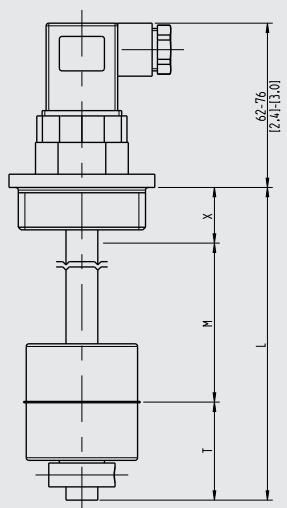
Cable outlet		
	Variable resistance	
	Overall resistance	green / white
	100 ... 0 %	white / brown
	0 ... 100 %	brown / green

Polycarbonate case				
	Variable resistance		Current output, 4 ... 20 mA, 2-wire	
	Overall resistance	Terminal W1 / W3	U+	Terminal U+
	100 ... 0 %	Terminal W1 / W2	U-	Terminal U-
	0 ... 100 %	Terminal W2 / W3		

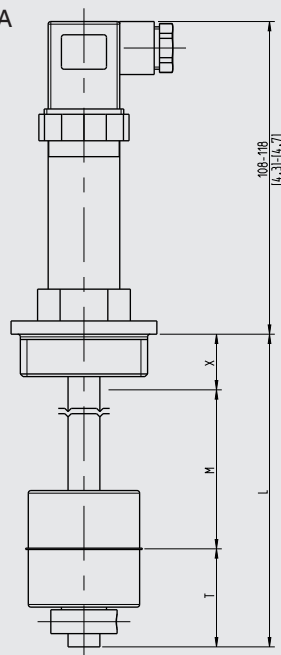
Electrical safety	
Reverse polarity protection	U+ vs. U-
Overvoltage protection	DC 40 V

## Dimensions in mm [in]

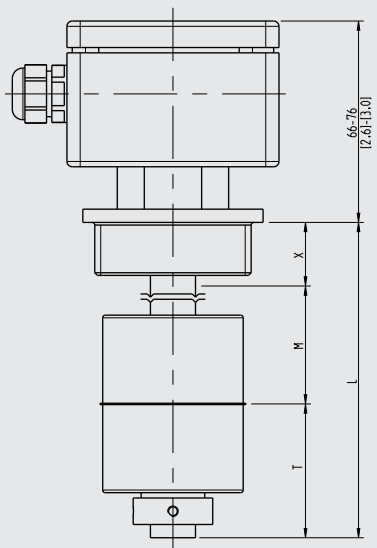
with angular connector form A  
Resistance signal



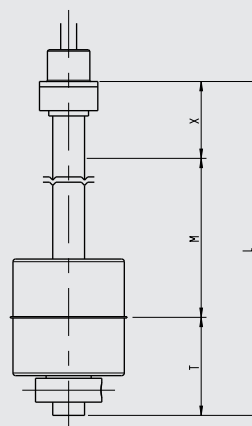
with angular connector form A  
Current output 4 ... 20 mA



with connection housing



with cable outlet  
Resistance signal



### Legend

- L Guide tube length
- M Measuring range
- X Distance sealing face to 100 % mark  
( $X \geq$  dead band T in mm [in] (from sealing edge))
- T Dead band (pipe end)

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

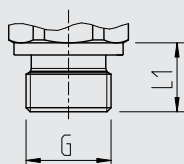
Process connection	Outer diameter float Ø D		
	Ø 44 mm [1.7 in]	Ø 55 mm [2.2 in]	Ø 55 mm PVDF [2.2 in]
G 1 ½ (from outside)	45 mm [1.8 in]	-	-
G 2 (from outside)	-	55 mm [2.2 in]	65 mm [2.6 in]
G ¾ B (from inside)	50 mm [2.0 in]	55 mm [2.2 in]	60 mm [2.4 in]
G ½ B (from inside)	50 mm [2.0 in]	55 mm [2.2 in]	60 mm [2.4 in]

### Dead band T in mm [in] (pipe end)

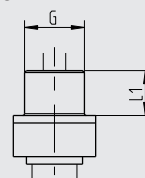
Dead band	Outer diameter float Ø D		
	Ø 44 mm [1.7 in]	Ø 55 mm [2.2 in]	Ø 55 mm PVDF [2.2 in]
T	40 mm [1.6 in]	45 mm [1.8 in]	55 mm [2.2 in]

### Process connection

Installation from outside




Installation from inside



G	L <sub>1</sub>	Spanner width
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 <sub>1</sub>	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
	<b>EU declaration of conformity</b> <ul style="list-style-type: none"><li>■ EMC directive</li><li>■ EN 61326 emission (group 1, class B) and interference immunity (industrial application)</li><li>■ RoHS directive</li></ul>	European Union

## Manufacturer's information and certifications

Logo	Description
-	China RoHS directive

Approvals and certificates, see website

### Ordering information

Model / Output signal / Electrical connection / Process connection / Guide tube length L / 100 % mark (optional) / Accuracy, resolution / Medium temperature / Float