



Capacitive level switch **RIZUR-100**

Intended use and application area

RIZUR-100 is a universal device used as a capacitive relay sensor that signals the presence of the medium and its exceeding the set limits. It's used for level control of conductive and non-conductive media - liquids, cohesive products, solids, and granulated media.

Capacitive level switches RIZUR-100 are designed for signalling presence/absence of media, level control of conductive and non-conductive liquids, solids (powder and granulated products, etc), as well as interface level control, for example: water-hydrocarbons.

The device is used in the oil refining, food, chemical, metal, pulp and paper, pharmaceutical and other branches of the industry where efficient control, moderation and coordination of the technology processes are essential. Capacitive relay switch RIZUR-100 has proved itself as a safe and reliable device with its operation not affected by adverse factors such as foam, suspended solids, and significant vibrations.

The design variant of the relay sensor with a coaxial probe allows to use it in non-metal tanks, as well as in reservoirs with complex structure and presence of extending elements, such as mixers, ladders, etc.

Devices of RIZUR-100 series are used in mild and frigid climate, in the temperature range of -40 to +60 °C (-60... +75 °C with a soft enclosure). They are vibration- and shake-proof, the mechanical stability parameter complies with the requirements of category N3 acc. to GOST 12997-84. The housing is protected against dust and moisture penetration - ingress protection is equal to IP67 or IP68.

Design and operating principle

Operating principle is based on the measuring the electric capacity between the electrode of the probe and the grounded surface of the tank. When the tank is filling up, the electric capacity value will grow proportionally with the level and the dielectric properties of the medium.

It'll be necessary to install an additional grounding electrode or use a relay sensor with a coaxial probe if the tank is manufactured from a non-conductive material.

When the controlled media reaches the set limits, the electric capacity value will change and cause the change of the frequency of the electric oscillations of the measuring circuit.

Frequency-response method of transforming the value of the electric capacity into the corresponding output signal (4...20mA, relay, NAMUR, etc.) is used to ensure high accuracy of operation.

RIZUR-100 is manufactured as a mono-block construction where the probe (primary transducer) is combined with an electric block (secondary transducer). The housing and the cover are manufactured from an aluminum alloy by a casting method (it's possible to manufacture the housing from stainless steel on request).

There're a grounding screw, a cover fixation screw, a marking plate, and two openings for the cable glands located on the housing. The cover has a translucent part for the visual control of the sensor's indicator. There's also an electric unit with terminals for cable connection located inside the housing. Supply and signalling circuits can be connected through one or two cable glands.

There's also an LED indicator inside the electronic unit of the housing that signals the state of the controlled media and device itself. Depending on the conditions of the technological process and the characteristics of the controlled media, the probe of the relay sensor can be a rod, a wire rope or a coaxial one, manufactured from either stainless steel or with a PTFE coating.



Technical regulations
TU 26.51.52-001-12189681-2018
TR Customs Union
conformity certificate
№EAEU RU C-RU.HA91.B.00029/19

Technical specifications

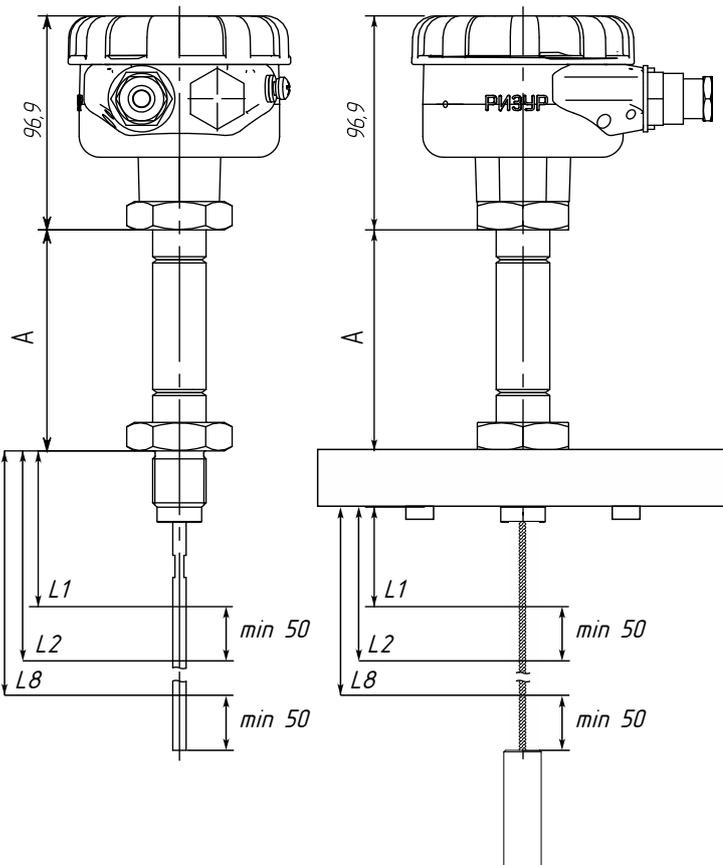
Housing material	Aluminum alloy; Stainless steel
Probe type and material	<ul style="list-style-type: none"> - Rod 12 X 18 H 10 T /AISI321, non-insulated, 4 mm, length from 100 to 3000 mm; - Rod 12 X 18 H 10 T /AISI321, insulated with PTFE, 6 mm, length from 100 to 2500 mm; - Wire rope 12 X 18 H 10 T /AISI321, non-insulated, 4 mm, no more than 25 mm, length from 2500 to 20000 mm; - Wire rope 12 X 18 H 10 T /AISI321, insulated with PTFE, 6 mm, no more than 25 mm, length from 1500 to 3000 mm; - Coaxial 12 X 18 H 10 T /AISI321, non-insulated, 4 mm, length from 100 to 3000 mm; - Coaxial 12 X 18 H 10 T /AISI321, insulated with PTFE, 6 mm, length from 100 to 3000 mm*
Explosion protection marking	1 Exd IIC T6 Gb X; 0 Exia IIC T6 Ga X; without explosion protection
Ingress protection	IP67 IP68 (on request)
Mechanical	shake- and vibration-proof design variant, category N3
Stability mounting	any
Power supply	230 V 12 ... 30 V DC
Current consumption for each control point, no more than	12 mA, at 24 V (for relay output signal)
Operating media temperature	-196 ... +250 (see order code)
Pressure, MPa	0,6; 1,6; 2,5; 6,3; 10
Dielectric capacitivy of the operating media (for non-insulated probes)	≥ 1,5
Dynamic viscosity, Pa-sec, no more than	5
Number of control points	up to 8
Operation time, sec	1; 3; 10; 30
Output signal	Relay output SPDT; 4...20 mA two-wire connection; RS485 Modbus RTU; NAMUR; 8/16 mA two-wire connection; 7/14 mA two-wire connection
Max permissible voltage on the relay contacts, no more than	250 V, 1 A, 30 W
Ambient air temperature, °C	-40...+60 -60 ... +75 (on request)
Warranty period, months	24
Average service life, years	15

* Is used for electrically conductive media. Coaxial probe has only measuring part coated with PTFE. Still pipe is manufactured from 12 X 18 H 10 T / AISI321 and doesn't have any additional coating.

Technical specifications of the probe

Probe material	Rod probe		Wire rope probe		Coaxial probe	
	non-insulated	insulated with PTFE	non-insulated	insulated with PTFE	non-insulated	insulated with PTFE
	12H18N10T / AISI 321	12H18N10T / AISI 321	12H18N10T / AISI 321	12H18N10T / AISI 321	12H18N10T / AISI 321	12H18N10T / AISI 321
Probe length, mm	from 100 to 3 000	from 100 to 2500	from 2 500 to 20 000 (counterweight 22 mm)	from 1500 to 3000 (counterweight 22 mm)	from 100 to 3 000	from 100 to 3000
Probe diameter, mm	4	6	4	6	4	6
Min. distance to the 1st control point, mm	80		80		50	
Min. distance between control points, mm	50		50		50	
Min. distance from the last control point to the end of the probe, mm	50		50		50	
Max. probe load	6 Nm (lateral load)		5 kN (tensile load)		100 Nm (lateral load)	
Ambient air temperature, °C	-40... +60 -60... +75 (with an enclosure or a soft enclosure)		-40... +60 -60... +75 (with an enclosure or a soft enclosure)		-40... +60 -60... +75 (with an enclosure or a soft enclosure)	
Operating media temperature, °C	-196... +250		-196... +250		-196... +250	

Dimensional specifications



Process temperature	Value A*
-40... +100 °C	100 mm
-60... +150 °C	100 mm
-100... +200 °C	200 mm
-196... +250 °C	200 mm

* The value of size A is standard.
The minimum distance from the lower control point to the end of the sensor is 50 mm.

Order code for the capacitive level switch

RIZUR-100

Ordering information:

RIZUR-104-1-S0-M7-100-16-500/1500/1500/2000-D-1-M-20/1,6/1066-KBU-IS-SE

1 2 3 4 5 6 7 8 9 10 11 12 13 14

1. Design variant	
RIZUR – 101	One control point
RIZUR – 102	Two control points
RIZUR – 103	Three control points
RIZUR – 104	Four control points
RIZUR – 105	Five control points
RIZUR – 106	Six control points
RIZUR – 107	Seven control points
RIZUR – 108	Eight control points
RIZUR – 10X	Customized (specified in written form outside the order code)
2. Housing material	
0	Aluminum (standard)
1	Stainless steel 12X18H10T/AISI
3. Material and type of the probe	
S0	Rod 12X18H10T/AISI321, non-insulated, 4 mm, length from 100 to 3000 mm
S1	Rod 12X18H10T/AISI321, insulated with PTFE, 6 mm, length from 100 to 2500 mm
T0	Wire rope 12X18H10T/AISI321, non-insulated, ϕ 4 mm, counterweight ϕ 22 mm, length from 2500 to 20000 mm
T1	Wire rope 12X18H10T/AISI321, insulated with PTFE, ϕ 6 mm, counterweight ϕ 22 mm, length from 1500 to 3000 mm
K0	Coaxial 12X18H10T/AISI321, non-insulated, 4 mm, length from 100 to 3000 mm
K1	Coaxial 12X18H10T/AISI321, insulated with PTFE, 6 mm, length from 100 to 3000 mm*
X	Customized (specified in written form outside the order code)
* Is used for electrically conductive media. Coaxial probe has only the measuring part coated with PTFE. Still pipe is manufactured from 12X18H10T/ AISI321 and does not have any additional coating.	
4. Process connection	
M0	Thread - nozzle M20*1,5
M7	Thread - nozzle M27*1,5
D3	Thread - nozzle G 3/4" (standard)
D1	Thread - nozzle G1"
N3	Thread - sleeve nut G 3/4"
N0	Thread - sleeve nut M30x2
X	Customized process connection: thread, flange, welded, etc. (specified in written form outside the order code)
5. Process temperature	
100	-40 ... +100 °C (standard) («spacer» height A=100 mm)
150	-60 ... +150 °C («spacer» height A=100 mm)
200	-100 ... +200 °C («spacer» height A=200 mm)
250	-196 ... +250 °C («spacer» height A=200 mm)
X	Customized process temperature (specified in written form outside the order code)
6. Process pressure	
10	Up to 1,0 MPa
16	Up to 1,6 MPa
25	Up to 2,5 MPa
63	Up to 6,3 MPa
100	Up to 10,0 MPa
X	Customized (specified in written form outside the order code)
7. Probe length	
xx	Specify the distance from the insulator to the control point (if there're multiple control points, then specify all of them L1/L2/L3/.../L8)*
* Please, take into account that the minimal distance from the lowest control point to the end of the probe is 50 mm (see p.10).	
8. Type of explosion protection	
N	Without explosion protection
D	1Ex d IIC T6 Gb X - ex-housing
I	0Ex ia IIC T6 Ga X - intrinsically safe circuit
9. Output signal	
0	Relay SPDT*
1	4...20 mA two-wire circuit
3	RS485 Modbus RTU
4	NAMUR**
5	8/16 mA two-wire circuit
6	7/14 mA two-wire circuit
X	Other output signals are upon special request (should be specified in writing outside of the order code)
* Only for design variants RIZUR-101 ... RIZUR-104	
** Only for the design variant RIZUR-101	
10. Cable gland	
0	Without cable glands (plug M20x1,5)
M	One cable gland M20x1,5 for the non-armoured cable
MM	Two cable glands M20x1,5 for the non-armoured cable
B	One cable gland M20x1,5 for the armoured cable
BB	Two cable glands M20x1,5 for the armoured cable
X	Customized (the number and type of the cable glands is specified in written form outside the order code)
11. Media density	
XX	Specify media density, kg/m3
12. Bypass chamber	
0	Without a bypass chamber
KBU	With a bypass chamber*
* Please, attach an order code or an inquiry form for the bypass chamber (see pages 37, 38)	
13. IS barrier	
0	Without IS barrier
IS	With IS barrier*
* Please, attach an order code or an inquiry form for the IS barrier	
14. Soft enclosure	
0	Without soft enclosure
SE	With soft enclosure*
* Please, attach an inquiry form for soft enclosure RIZUR	