Ultrasonic level switch RIZUR-900

Intended use and application area

Ultrasonic level switches RIZUR-900 are designed to control the level of liquids in open or closed tanks, including the ones under pressure, in processing units at facilities of chemical, petrochemical, pharmaceutical, food and other industries. It can also be used as an indicator of liquid presence/absence at a predetermined height of the tank.

Controlled media: water, petroleum products, oils, and other liquids. The level switches can be used in systems of automatic control, regulation and management of technological objects, or in other automation units. Also it can be used in cleaning and filtering systems, in vessels or tanks with cooling and lubricating liquids, in pump protection systems, as well as in the food industry in contact with food products.

When the controlled medium reaches the specified level the level switch generates different types of signal - «dry contact», «current loop», «NAMUR». The ultrasonic level switch operation is not affected by turbulent flows, foam and external vibrations. Level switch RIZUR-900 has increased reliability.

Level switches RIZUR-900 are unique in price and quality as an alternative to the outdated level control relays, e.g. ROS 101(I), ROS 102(I), UZS, ROS-400, ROS-501(I), etc., and expensive foreign level switches, e.g., VEGASWING, Liquiphant, SITRANS, Optiswitch and other float, electrocontact, vibrating, and optical switches.

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

- **Pressure - up to 45 MPa**
- **Temperature range -196°C ... +500°C**
- **New rod sensing element operates with all types of liquids of any density**

Technical specifications

Medium temperature,°C	-196...+500 (see order code)
Process pressure, MPa	6,0; 10,0; 16,0; 25,0; 35,0; 45,0
Medium viscosity, Pa·c	up to 10
Minimum medium density, kg/m³	300
Accuracy, mm, no more than	2
Number of controlled level points	up to 8
Switching time delay, sec	0,3; 1,0; 3,0; 10,0; 30,0
Supply voltage, DC	24 V or acc. to NAMUR standard
Current consumption, mA, no more than	20
Ambient temperature, °C	-55...+60 (the range can be extended up to -63 ... +80 on request)
Ingress protection	IP67 (IP68 on request)
Explosion protection marking	0ExiaIICT6X; 1ExdIICT6X; without ex-protection
Switch orientation during installation	any kind
Materials in contact with the media	12X18H10T (or different, on request)
Number of cable glands	1 or 2 (customized)
Average operation time, years	20

Design and operating principle

Level switch measuring principle is based on determination of acoustic impulses dampening in the sensor, which is significantly increased when the sensor is immersed into the controlled medium.

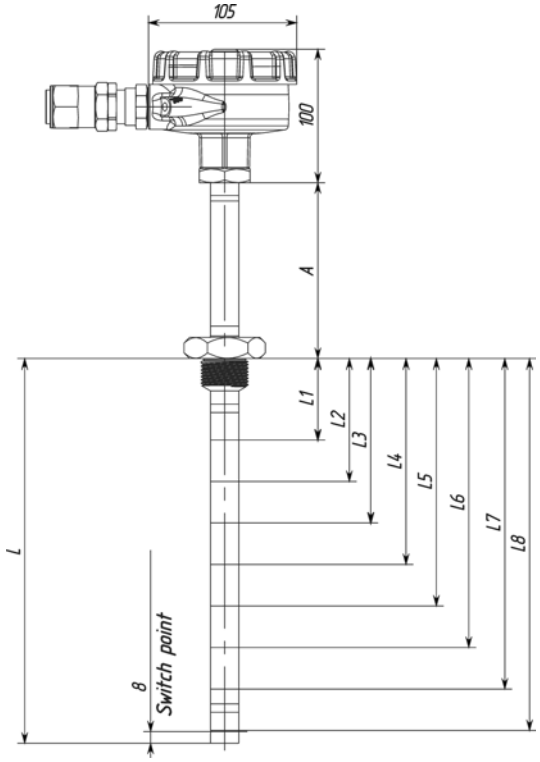
The housing and the cover are made of cast aluminium alloy (the housing can be made of stainless steel if requested). Under the cover, there are clamps for the cable inserted into the housing through the cable gland. There's a LED indicator on the switch housing to show the state of the controlled mediumand the equipment's state of health.

The level switch RIZUR-900 has a sensor made of a tube with a diameter of 16...20mm. The piezoelectric transducer is located close to the housing and generates and receives ultrasonic impulses.

Level switch RIZUR-900 has a self-diagnosis function for the electronics and sensor reliability. There is a control point on the housing of the level switch. If one places a magnet close to the control point than the self-diagnosis is activated and it is possible to start the level switch adjustment.

In accordance with the instruction manual, with the help of the magnet it's possible to: change the switch delay time; inverse the output signal; select the switch sensitivity mode; select of response level; calibrate the «dry» and «wet» states of the sensor.

Dimensional specifications



L= up to 6 000 mm (for rod sensor)
L= up to 20 000 mm (for flexible sensor)

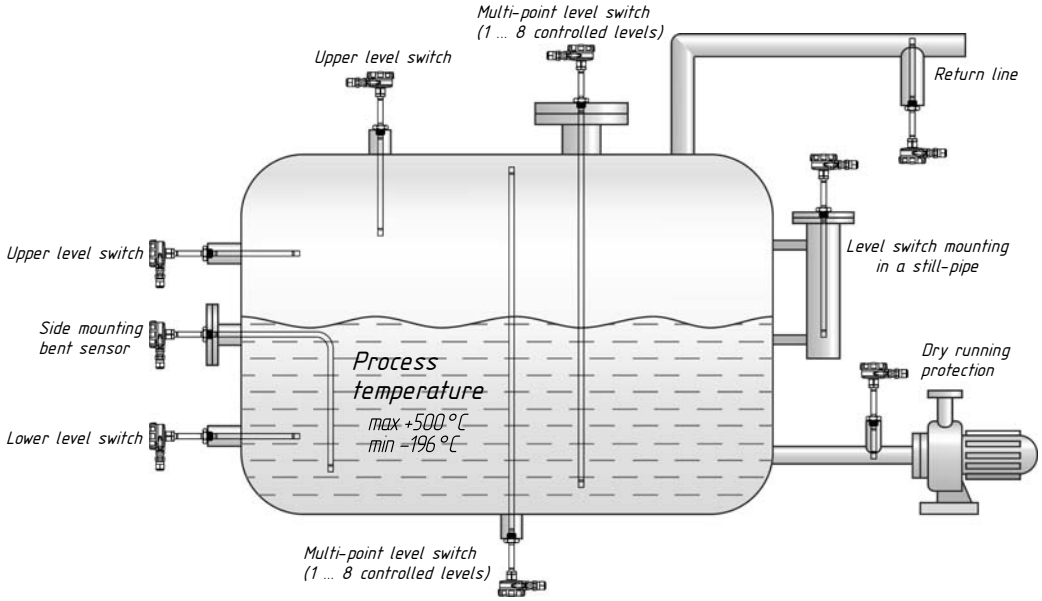
The drawing shows level switch RIZUR-900 with male thread. The switch can be produced with other types of process connection: flange, sleeve nut, for welding, etc.

Process temperature	Value A*
-60... +150 °C	100 mm
-60... +250 °C	200 mm
-196... +350 °C	250 mm
-196... +500 °C	300 mm

* The value of size A is standard.

Other sizes are possible upon special request, but A+L1 can not be less than 200mm.
The minimum distance from the lower control point to the end of the sensor is 8 mm.

Installation variants



Note:

One ultrasonic level switch can control up to 8 points of liquid level.

Maximum rod sensor length – 6000 mm, flexible sensor length – up to 20 m.

Vibration, foam and suspended solids do not influence level switch operation.

+7 (4912) 20-20-80
marketing@rizur.ru

Order code for the ultrasonic level switch

RIZUR-900

Ordering information: RIZUR-902-0-0-3-250-16-M-300/3200-I-4-0-930-KBU-0-0

1 2 3 4 5 6 7 8 9 10 11 12 13 14 15

Please, attach an inquiry form to the order code.

1. Design variant	
RIZUR-901	One control point
RIZUR-902	Two control points
RIZUR-903	Three control points
RIZUR-904	Four control points
RIZUR-905	Five control points
RIZUR-906	Six control points
RIZUR-907	Seven control points
RIZUR-908	Eight control points

2. Housing material	
0	Aluminum (standard)
1	Stainless steel 12H18N10T

3. Sensor type and material	
0	Rod sensor, stainless steel 12H18N10T
1	Flexible sensor, composite materials
2	Rod sensor, PTFE (for aggressive liquids)
3	Rod sensor, stainless steel 10H17N13M2T
X	Other materials are upon special request (should be specified in writing outside the order code)

4. Process connection	
0	Thread M20x1,5, male
1	Thread G3/4", male
2	Thread G1", male
3	Thread G3/4", sleeve nut
4	Thread M30x2", sleeve nut
5	Other types of process connection - thread, flange, welded, etc. (should be specified in writing outside the order code)

5. Process temperature	
150	-60... +150 °C («spacer» height A=100 mm)
250	-60... +250 °C («spacer» height A=200 mm)
350	-196... +350 °C («spacer» height A=250 mm)
500	-196... +500 °C («spacer» height A=300 mm)
X	Other temperature conditions (should be specified in writing outside the order code)

6. Process pressure	
6	up to 6 MPa
10	up to 10 MPa
16	up to 16 MPa
25	up to 25 MPa
35	up to 35 MPa
45	up to 45 MPa

7. Cable gland (the required cable gland is specified in the inquiry form)	
M	One entry for the cable gland M20x1,5; without cable glands*
MM	Two entries for cable glands M20x1,5; without cable glands*

* Cable gland is specified in writing outside the order code.

8. Sensor length, L from 80 up to 6000 mm	
xx	Specify the required sensor length in mm (in mulpoint version - specify switching points L1/L2/L3/.../L8)

9. 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

10. Output signal	
0	Relay DPDT/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)

* Relay operation mode is selected with the help a magnet.

11. Functional check	
0	Not installed
1	Relay indication (available for RIZUR-901 only)

12. Medium density	
XX*	Specify medium density, kg/m³

*it is allowed to specify a density range (e.g., 800...1000 kg/m³)

13. 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)

14. IS barrier	
0	Without IS barrier
IS	With IS barrier*

* Please, attach an order code or an inquiry form for the IS barrier

15. Soft enclosure	
0	Without soft enclosure
SE	With soft enclosure*

* Please, attach an inquiry form for soft enclosure RIZUR

marketing@rizur.ru
+7 (4912) 20-20-80

ООО «НПО RIZUR» www.rizur.ru +7 (4912) 20-20-80

INQUIRY FORM №_____

Ultrasonic level switch RIZUR-900

Technical regulations
TU 26.51.52-001-12189681-2018

Company name	
Contact person, position	
Contact details, tel., e-mail	
Number of level switches, pcs.	
Name of the controlled media	
Liquid density, kg/m^3 (Please, specify the densities of both liquids for interface level measurement)	
Viscosity, cP	
Operating temperature range, °C	from _____ to _____
Operating pressure range, MPa	from _____ to _____
Medium characteristics: aggressive to stainless steel, crystallization, adhesion, gas saturation, etc.	
Ambient temperature range, °C	from _____ to _____
Process connection (sleeve nut, thread, flange – please specify size, thread type, flange sealing surface)	
Housing material: – aluminum – stainless steel	
Sensing element type and material: – rod, stainless steel 12X18H10T – flexible, stainless steel AISI316 – rod, stainless steel 10X17H13M2T – other material	
Length of the sensing element*, mm From 80** to 6000 for the rod sensing element From 500 to 20000 for the flexible sensing element *Length of the sensing element is 8 mm longer that the farthest control point ** If the length of the sensing element is smaller, the top part is longer, leg A	
Number and location of switch points	
Distance from the insulated surface to the control point(s) L	L1 _____, mm L5 _____, mm L2 _____, mm L6 _____, mm L3 _____, mm L7 _____, mm L4 _____, mm L8 _____, mm
Output signal: Dry contact (changeover relay contacts, 2 control points max); 8/16 mA; 7/14 mA; 4-20 mA; Rs485; NAMUR *Confirm current values for the control points at order time	
Relay functional indication (available for RIZUR-901 only)	☐ Yes ☐ No
Explosion protection: – none – 0Ex ia IIC T6 Ga X – intrinsically safe circuit – 1Ex d IIC T6 Gb X – explosion-proof housing	
Actuation time: 1, 3, 10, 30 sec (1 sec – standard)	
Order code in accordance with catalogue ordering information (desirable)	
Entrance cable specification or a desirable model and the number of the cable glands (1 or 2 pcs)	
Bypass chamber (Please, attach an order code (p.37) or an inquiry form (p.38) for a bypass chamber)	
IS barrier (Please, attach an order code or an inquiry form for an IS barrier)	
Soft enclosure (Please, attach an inquiry form for soft enclosure RIZUR)	