RIZUR

EXPLOSION-PROOF HEATING SYSTEMS RIZUR

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NPO RIZUR manufactures a wide range of explosion-proof equipment for heating, temperature maintenance, protection against freezing of equipment and instrumentation in hazardous areas. Since 2003 RIZUR has a series production of heaters RIZUR-OShA-R and RIZUR-OUR.

In 2009 we started manufacturing digital control systems for the heaters – thermoregulators RIZUR-TB and RIZUR-DCS, in 2014 – explosion-proof heating sections RIZUR on the basis of RIZUR-SGL heating cable. Since 2016 we manufacture explosion-proof heaters RIZUR-TERM of high and low capacity.

All of the equipment has different design variants depending on the parameters required in specific operating conditions.

Due to the operational resources, RIZUR specialists can conduct the whole range of actions on the engineering, manufacturing, and realization of heatinsulating soft enclosures. Each working stage is controlled by the quality division of NPO RIZUR.

Product design developments are constantly being improved. It's possible to manufacture standard versions of the equipment, as well as customized ones based on the technical requirements and the Customer's general assembly drawings.

Explosion-proof heaters, thermoregulators, heating sections are manufactured by «NPO RIZUR» in accordance with the requirements of regulatory documents, developed in the Company, have all the necessary certificates, and comply with the international standard ISO 9001.

If you have any questions about this type of equipment, you can contact the lead specialists of the «NPO RIZUR» Sales Department.

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Explosion-proof heaters RIZUR-TERM

Intended use and application area

Explosion-proof heaters RIZUR-TERM manufactured by OOO «NPO RIZUR» comply with Technical regulations TU-3442-001-12189681-2014 and, depending on configuration, comply with GOST R MEK 60079-0-2011, GOST IEC 60079-1- 2011 for electric equipment with explosion protection «explosion-proof enclosure(d)» and GOST R MEK 60079-18-2012 for «compound sealing(m)».

Explosion-proof heaters RIZUR-TERM are used to prevent condensation, protect the electric and electronic components from freezing, and maintain the required temperature in heating enclosures (thermoboxes) for equipment, automation cabinets, heated cabinets, various safety shields and boxes, including explosion-hazardous areas and external facilities.

The design of RIZUR-TERM heater series is of high quality and thus ensures high-class protection against overheating and voltage surges; the heaters show steady performance and high reliability in field operating conditions. Their warranty time is 36 months, and the average operation time is over 15 years.

Design description and functions

The heater consists of a section-shaped radiator made of aluminum alloy with powder-polymer coating. The shape is designed to optimize heating functionality. Inside the radiator, there is a high-endurance ceramic heating element. Reliability is enhanced due to the usage of several autonomous heating cells.

The explosion protection is accomplished with a special explosion-proof housing. A special version of RIZUR-TERM heater is available – with the electric heating element and other elements in the metal housing sealed with a sealing compound. Protection from surface overheating is ensured by the area size of the outer surface, corresponding to the nominal power of heat generation, as well as (optional) by an added temperature sensor (analogue or digital, depending on specific versions) to switch off at a set maximum temperature. Thanks to the precision of design and quality components, we can provide a 10-year warranty for heaters of this series.

The heaters are shipped with mounting components.

Technical specifications

Installation area	• General industrial areas • Explosion hazard zones V-1a and V-1g acc. to Electrical installation code (PUE), Ch. 7.3
Explosion protection marking	• 1 Exd IIC (T6...T3) Gb X • 1 Exmb IIC (T6...T3) Gb X
Heating element capacity	10 to 6000 W
Supply voltage	• 230 (±15%) V • 380 (±15%) V
Temperature on the heater's surface	• +80...+130°C • -40...+110°C, an increment of 1°C (with digital thermoregulators produced by OOO «NPO RIZUR»)
Temperature maintained	• +10...+20°C (with thermoregulators based on a bimetallic thermostat); • -40...+110°C, an increment of 1°C (with digital thermoregulators produced by OOO «NPO RIZUR»)
Ingress protection	• IP54 acc. to GOST 14254-96 • IP67 acc. to GOST 14254-96 • IP68 acc. to GOST 14254-96
Insulation strength	Min. 1500V
Insulation resistance	Min. 20 MOhm
Warranty period	36 months
Average operation time	Over 10 years

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Design variants of the explosion-proof heaters RIZUR-TERM

RIZUR-TERM-M 230 V

Explosion-proof heater RIZUR-TERM-M 230 V is manufactured in a small housing and designed for warming-up and maintaining the target temperature. It provides the desired environment for the reliable service of the equipment in places where there's not enough space for the standard heaters. In this housing it's possible to manufacture the heater with the power up to 300 W.

RIZUR-TERM-B 230 V

Explosion-proof heater RIZUR-TERM-B 230 V is manufactured in a big housing. It's suited for zones where it's required to maintain the target temperature and climate in greater volume with the help of one or several heaters for the equipment to work properly. For instance, in massive enclosures, block-boxes, in the grounds of industrial areas, hangars, warehouses. In this housing it's possible to manufacture the heater with the power from 300 W to 6 kW.

RIZUR-TERM-B 380 V

Explosion-proof heater RIZUR-TERM-B 380 V is manufactured in a big housing; however, it always consists of 3 rigidly connected sections that are a unitary structure. Depending on the size of the housing, this design variant can be used in zones that require a solution for the warming up and temperature maintenance in both small and big spaces.

RIZUR-TERM-P 230 V

Explosion-proof heater RIZUR-TERM-P 230 V is manufactured from a flat profile and represents a compact solution for zones with limited space for installation. For instance, in enclosures, protection devices, in places where the equipment is placed in such a way that leaves no room for the standard versions of the heater. In this housing it's possible to manufacture the heater with the power up to 1000 W.

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Order code for the heater RIZUR-TERM

Ordering information: RIZUR-TERM-M-230-200-Exd-T4-TB-(+10)-1-M-N

1 2 3 4 5 6 7 8 9 10 11

1. Model	
RIZUR-TERM	The model of the heater
2. Casing type	
M	Small housing
B	Big housing
P	Flat housing
3. Supply voltage	
230	230 V
380	380 V (only for RIZUR-TERM-B)
4. Capacity	
Design variants for RIZUR-TERM, 230 V	
50	50 W
75	75 W
100	100 W
150	150 W
200	200 W
300	300 W
400	400 W
500	500 W
600	600 W
700	700 W
800	800 W
900	900 W
1000	1000 W
1100	1100 W
1200	1200 W
1300	1300 W
1400	1400 W
1500	1500 W
1600	1600 W
1700	1700 W
1800	1800 W
1900	1900 W
2000	2000 W
2500	2500 W
3000	3000 W
3500	3500 W
4000	4000 W
5000	5000 W
6000	6000 W
Design variants for RIZUR-TERM, 380 V	
900	900 W
1000	1000 W
1200	1200 W
1500	1500 W
1800	1800 W
2000	2000 W
2400	2400 W
2700	2700 W
3000	3000 W
5. Explosion protection marking	
0	General purpose industrial version
Exd	1 Exd IIC T6...T3 Gb X (except for RIZUR-TERM-P, and versions F and S from section 7. «Ambient air monitoring, thermoregulator»)
Exm	1 Exmb IIC T6...T3 Gb X

6. Temperature rating	
T4	Maximum temperature on heater's surface +130 °C
T5	Maximum temperature on heater's surface +95 °C
T6	Maximum temperature on heater's surface +80 °C
X	Specify temperature on heater's surface (upon agreement with the manufacturer)
7. Ambient air monitoring, thermoregulator	
0	Without thermoregulator
F	Built-in thermoregulator based on a bimetallic thermoregulator. Temperature maintained: +10/+20°C.
TB	Thermostatic control via a bimetallic thermoregulator RIZUR-TB-FT. Temperature maintained: +10/+20°C. Please specify the thermoregulator ordering code (see page 26).
S	Built-in intellectual digital control module that consists of a microcontroller, temperature sensor and an indicator. Temperature maintained - 40°C...+50°C, with an increment of 1°C (see page 27).
ST	Thermoregulator on the basis of an intellectual digital control module of RIZUR-TB-ST series. Temperature maintained - 40°C...+50°C, with an increment of 1°C. Please specify the thermoregulator ordering code (see page 28).
C1	Thermoregulator on the basis of a digital control module RIZUR-TB-DCS. Temperature maintained -40°C...+110°C, with an increment of 1°C. Please specify the thermoregulator ordering code (see page 29) *
C2	Adjustable digital control system. Completed with a thermoregulator of RIZUR-DCS-2 series. Please specify the thermoregulator ordering code (see page 31) *
* Unless otherwise specified, RIZUR-TB thermoregulator will be offered, with appropriate explosion protection (see pages 29, 31).	
8. Temperature maintained	
(N)	Air temperature is not controlled (for the version of the heater without the thermoregulator)
(+10)	+10/+20°C (for the version F, TB)
(X)	Specify the needed temperature (for versions S, ST, C1,C2)
9. Power cable length	
1	1 m
2	2 m
3	3 m
X	Specify required cable length
10. Protection of power cable with a metal hose	
O	Without a metal hose
M	With a metal hose
11. Fastening	
D	Fastening for a DIN rail
M	Fastening for a mounting plate
N	Fastening on the floor bracket (horizontal surface)
NK	Customized fastening
P	Fastening on a plate
S	Fastening on threaded racks
T	Fastening on an end-type bracket
U	Fastening on angle bars
F	Fastening on a front bracket
X	Two types of fastening: on horizontal surface and on a wall

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Explosion-proof heaters RIZUR-OShA-R, RIZUR-OUR, RIZUR-OUR-PL, RIZUR-ONP

Intended use and application area

Explosion-proof heaters RIZUR-OShA-R, RIZUR-OUR, RIZUR-OUR-PL, RIZUR-ONP are manufactured by OOO «NPO RIZUR», according to the TU-3443-003-12189681-2014 and comply with GOST R MEK 60079-0-2011, GOST R MEK 60079-7-2012, and GOST R MEK 60079-18-2012 for electric equipment of high Ex-protection, with «compound encapsulation (m)» and and are marked 1 Ex mb IIC T6...T3 Gb X depending on the manufacturer's set values and the emergency shut-off temperature.

According to Ex-marking, Ch. 7.3 of Electrical installation code (PUE) and other relevant regulations, these heaters can be operated in explosion hazardous areas at indoor and outdoor facilities.

The heater's operational safety at explosion-hazardous areas is confirmed by the Customs Union's Certificate of compliance, «On safety of equipment operation in explosive areas» № EAEU RU CRU. ME92.B.00041/19, as well as a Certificate of compliance with Industrial safety requirements № S-RTE.002.TU.00198.

Explosion-proof heaters RIZUR-OShA-R are designed for heating and temperature maintenance in the enclosures, insulation jackets, block-boxes, and instrumentation rooms with equipment that requires specific temperature for stable and reliable service. Heaters RIZUR-OUR and RIZUR-OUR-PL for EC&I equipment are designed for the heating of the instrumentation that has condensation of moisture in the form of frost or ice appear inside at negative temperatures preventing the successful operation of the EC&I equipment, electronic devices, and LCD-elements.

Explosion-proof heaters RIZUR-ONP can be used for oil heating at the exit out of the well in the winter season, as well as for local heating of the freezing parts of the industrial pipelines, e.g. in the places of Xmas needle valves, pipe valves, etc. used in fuel-power complexes, oil, gas, chemical, and other branches of the industry. Thanks to the quality design and multilayer testing during the manufacturing process, including run-to-failure tests, explosion-proof heaters RIZUR-OShA-R, RIZUR-OUR, RIZUR-OUR-PL, RIZUR-ONP manufactured by OOO «NPO RIZUR» are defined by reliably stable operation and the absence of failures in the field conditions.

Warranty period is 24 months from the start-up date while service life is over 10 years.

Design description and functions

In terms of design, the heater consists of a radiator - two plates made of aluminum alloy with powderpolymer coating and an electric heating element placed between them.

Explosion protection is provided by sealing the electric heater and other electric components in the metal housing with a sealing compound. The minimum thickness of the compound layer between electric elements and the housing should be no less than 1 mm. The minimum thickness of the compound layer between the electical elements and the outer surface is no less than 3 mm.

Protection from the surface overheating is ensured by the external surface area that matches the nominal heat capacity, and (additionally) by placing a temperature sensor (bimetallic or digital - depending on the design variant) to switch off at a set maximum temperature. To prevent pulling and disconnection of the power cable, the cable gland is sealed and equipped with a lock.

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Technical specifications

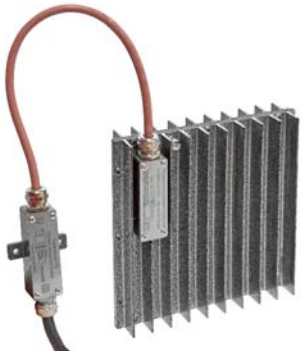
Installation area	• General industrial areas • Explosion hazard zones V-1a and V-1g acc. to Regulations of equipment installation (PUE), Ch. 7.3
Explosion protection marking	1Ex mb IIC T6...T3 Gb X
Heating element capacity	40 to 2000 W
Power supply	• 230 (±15%) V • 24, 36-48 V DC/AC (upon an agreement with the manufacturer)
Temperature on heater's surface	• +90...+100°C • -30...+90°C, an increment of 1°C (with digital thermoregulators manufactured by OOO «NPO RIZUR»)
Temperature maintained in the box	• +10...+20°C (for design variants F, FT) • -40...+50°C, an increment of 1°C (for design variants S, ST, SR, AR)
Ingress protection	• IP54 acc.to GOST 14254-96 • IP66 acc.to GOST 14254-96 (upon an agreement with the manufacturer) • IP67 acc.to GOST 14254-96 (upon an agreement with the manufacturer)
Electric strength of the insulation	Min. 1500 V
Insulation resistance	Min. 20 MOhm
Class of personnel protection against electric shock	Class 1 acc. to GOST 12.2.007.0
Indication of achieving maximum set temperature	Relay «Dry» contact; Break-before-make contact (for design variants SR, AR)
Warranty period	24 months
Average operation time	Over 10 years

Technical specifications of RIZUR-OSha-R, -OUR, -ONP

Design variant	Nominal capacity, W	Resistance in the heater's circuit, Ohm	Dimensions, mm	Heated pipe diameter, mm	Weight, kg
RIZUR-OShA-R-1	100	478±10%	200x100x45	-	0,67
RIZUR-OShA-R-2	200	241±10%	200x200x45	-	1,24
RIZUR-OShA-R-3	300	161±10%	300x200x45	-	1,78
RIZUR-OShA-R-4	400	121±10%	300x300x45	-	2,7
RIZUR-OShA-R-10	1000	48±10%	500x400x45	-	5,75
RIZUR-OShA-R-15	1500	32±10%	700x400x45	-	8,33
RIZUR-OShA-R-20	2000	24±10%	700x500x45	-	10,77
RIZUR-OUR-1	75	650±10%	120x90x50	60	0,18
RIZUR-OUR-2	40	1235±10%	120x60x30	80	0,17
RIZUR-OUR-3	75	650±10%	120x90x60	42	0,15
RIZUR-OUR-PL-1	60	810±10%	120x120x32	-	0,21
RIZUR-OUR-PL-2	100	494±10%	120x220x32	-	0,36
RIZUR-OUR-PL-3	75	650±10%	140x140x32	-	0,28
RIZUR-OUR-PL-4	150	320±10%	220x220x32	-	0,59
RIZUR-ONP-1	500	97±10%	300x140x80	89	0,55
RIZUR-ONP-2	1000	48±10%	580x140x80	89	0,58
RIZUR-ONP-3	500	97±10%	300x150x85	100	0,6
RIZUR-ONP-4	1000	48±10%	580x150x85	100	0,91

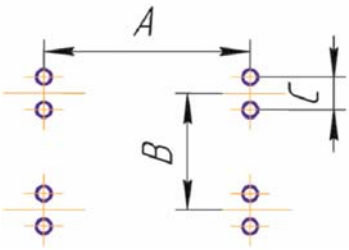
Mounting dimensions

Mounting on a vertical surface			
Design variant	Dimensions, mm		
	A	B	C
OShA-R-1	218...226(248)	-(-)	44(15)
OShA-R-2	218...226(248)	-103	44(15)
OShA-R-3	218...226(248)	-203	44(15)
OShA-R-4	318...326(348)	-203	44(15)
OShA-R-10	518...526(548)	345(303)	44(15)
OShA-R-15	718...726(748)	345(303)	44(15)
OShA-R-20	718...726(748)	445(403)	44(15)



Mounting on a horizontal surface			
Design variant	Dimensions, mm		
	A	B	C
OShA-R-1	218...226(248)	-	44(15)
OShA-R-2	218...226(248)	-	44(15)
OShA-R-3	218...226(248)	-	44(15)
OShA-R-4	318...326(348)	-	44(15)
OShA-R-10	518...526(548)	-	44(15)
OShA-R-15	718...726(748)	-	44(15)
OShA-R-20	718...726(748)	-	44(15)

Location of holes to drill for the installation of OShA-R heaters



Design variants of the explosion-proof heaters RIZUR-OShA-R, RIZUR-OUR, RIZUR-OUR-PL, and RIZUR-ONP

F-variant

The explosion-proof heater is equipped with inbuilt thermoregulators of the heater's surface and the ambient air temperature in the heated area that switch off the power supply when air and\or surface temperature reaches the set limits. Temperature control is carried out by a bimetallic thermostat that's designed for opening and closing the small-signal and electric power circuits upon reaching the set temperature. The base of the thermostat is a bimetallic disc tightly connected with a group of electric contacts. It undergoes deformation when the temperature changes. All of the electric elements are in a metal casing and the jacket cavities are filled with heat-resistant heatconductive compound. The heater in F-variant is supplied with a power cable. The length of the power cable is specified at the time of order (standard length - 1m). This design variant does not allow for changes in temperature settings. The heaters in F-variant can be repaired by the manufacturer only.

FT-variant

The explosion-proof heater has a built-in thermoregulator of the heater's surface on the base of a bimetallic thermostat (similar to F-variant).

Ambient air temperature control is performed by the independent thermoregulator RIZUR-TB-FT on the base of a bimetallic thermostat. This design variant of the heater allows maintenance and repairs on site (see more information about RIZUR-TB-FT on page 26).

Design variants of the explosion-proof heaters RIZUR-OShA-R, RIZUR-OUR, RIZUR-OUR-PL, and RIZUR-ONP

S-variant

This version is equipped with an inbuilt intelligent digital control module that consists of a microcontroller, temperature sensor (based on semiconductive materials) and an indicator which are all placed in an aluminum housing. The heater also has another similar housing with a temperature sensor, a control element, and a thermal switch inside. At the software level, the heater is controlled by Jack E. Bresenham's modified adaptive algorithm. This algorithm ensures smooth long-time control of the heater's capacity and allows to maintain ambient air temperature in the heated area within an accuracy of 1°C.

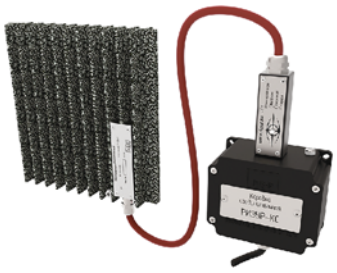
Once the mode is activated, the microcontroller will gradually adjust the heating spiral to the precise level that is required for the loss compensation and temperature maintenance inside the housing. This communication mode does not add noise, gaps or voltage surges that could impact the measuring equipment.

For the visual inspection, the heater's control module is equipped with an LED indicator that makes it possible to identify the system mode without opening the box (if there's an observation window):

Red light indicates that the temperature is below the set minimum.	Green light indicates that the temperature is within the set limits.	Yellow light means that the temperature is above the set maximum.
Flashing red light during operation indicates an emergency; it might be necessary to check the heater spiral. **Important!** Flashing red light at the heater's launch does not indicate a failure; it means that the heater runs at full capacity.	Flashing green light means that the temperature is within the set limits but the warranty for the equipment has ended (the warranty is for 15 000 hours of the heater's work). S-version heaters are shipped with a power cable. The length of the power cable should be specified in the order code (the standard length is 1 m).	Red and yellow flashing light indicates that the heater's surface temperature is above the set limits while the media temperature is below the set limits. In this case, the heater is turned off but the heating has been performed. It's possible that the heater's capacity had been chosen incorrectly.

ST-variant

This design variant of the explosion-proof heater is equipped with an inbuilt surface thermoregulator. Temperature control of the surface and air is carried out by the digital control modules (similar to S-variant). In this design variant, the thermoregulator is located on a metal housing that performs the function of a junction box, meaning that there's a terminal block inside and ex-protected cable glands for power cables outside. This design variant can maintain the necessary temperature with an accuracy of 1°C.



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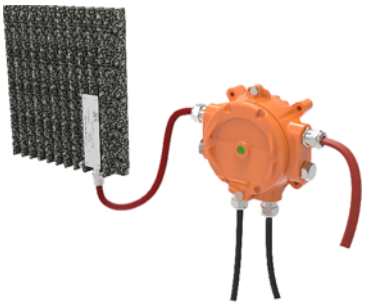
Design variants of the explosion-proof heaters RIZUR-OShA-R, RIZUR-OUR, RIZUR-OUR-PL, and RIZUR-ONP

SR-variant

This version of the explosion-proof heater is equipped with a built-in thermoregulator RIZUR-TB-DCS based on the digital control system consisting of a microcontroller, operating under the software, and a remote digital temperature sensor RIZUR-TD. This design variant can maintain the necessary temperature to an accuracy of 5°C. It also has a signaling feature of the temperature reaching the set limits thanks to the additional relay output (see more information on the thermoregulator RIZUR-TB-DCS on page 29).



AR-variant

This version of the heater is equipped with a built-in thermoregulator RIZUR-DCS-2 and is actually an intelligent heating system that can not only maintain the required temperature in the heating area with an accuracy of 1°C but also perform remote operating control of the climate conditions, as well as signal the increase/decrease of the temperature above/below the set limits thanks to an additional relay output.

Explosion-proof heaters in the AR-design variants are built out of modern electronic components and thus satisfy the strictest requirements, such as:

1. High-quality complex algorithm for reaching and maintaining the necessary temperature;
2. High precision of the required temperature maintenance, within the accuracy of 1°C (granted correct power level choice);
3. Flexibility in self-adjustment, depending on set values and dynamics of temperature indications in the box;
4. Operational control of ambient temperatures and sensor measurements via inbuilt displays;
5. Precise modification of ambient temperature and heater set values, both at manufacturing facility and on the site;
6. High electromagnetic compatibility – there is practically no impact on the voltage at the moment of the heater's switch on/off;
7. Absence of mechanical components under voltage impacting accuracy or reliability;
8. Remote control using RS 485 interface and a connection to the SCADA or a similar system in the AR design variant;
9. Alarm signaling when the temperature in the box reaches the set limits;
10. Energy efficiency (see more information on the digital thermoregulator RIZUR-DCS-2 on page 31)

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Order code for explosion-proof heater RIZUR-OShA-R

Ordering information: RIZUR-OShA-R-4-S-(+5)-T6-230-25-0-1-0

1 2 3 4 5 6 7 8 9 10

1. Model	
RIZUR-OShA-R	Model of the heater
2. Capacity	
1	100 W
2	200 W
3	300 W
4	400 W
10	1000 W
15	1500 W
20	2000 W
X	Specify the required capacity (upon an agreement with the manufacturer)
3. Heater's design variants	
F	F-variant. Thermoregulator based on bimetallic thermostat. (page 25)
FT	FT-variant. Thermoregulator based on bimetallic thermostat. Please, also specify the order code for the thermoregulator RIZUR-TB-FT. (page 26)
S	S-variant. Thermoregulator based on digital controls. (page 27)
ST	ST-variant. Thermoregulator based on digital controls.
SR	SR-variant. Thermoregulator based on digital controls, with alarm signaling. Please, specify the order code for the thermoregulator RIZUR-TB-DCS. (page 29)
AR	AR-variant. Thermoregulator based on digital controls with local or remote controls and an emergency alarm. Please, specify the order code for the thermoregulator RIZUR-DCS-2. (see page 31)
4. Air temperature maintained	
-10	+10/+20°C (for F, FT design variants)
(X)	Specify the required temperature in the range of 40°C... +50°C (for S, ST, SR design variants)

5. Temperature rating	
T4	Temperature on the heater's surface is under +135°C
T5	Temperature on the heater's surface is under +100°C
T6	Temperature on the heater's surface is under +85°C
X	Specify the required temperature on the heater's surface (upon an agreement with the manufacturer)
6. Supply voltage	
230	230 V AC
24	24 V DC (upon an agreement with the manufacturer only)
380	380 V AC (upon an agreement with the manufacturer only)
X	Specify the required power supply voltage (upon an agreement with the manufacturer)
7. Cable length to thermoregulator, L2	
25	250 mm
30	300 mm
50	500 mm
X	Specify the required cable length
8. L2 cable protection with a metal hose	
0	Without a metal hose
M	With a metal hose
9. Cable length from the thermoregulator , L1 (only for the S- and F-variants)	
0	For the following heater design variants: FT, ST, SR, AR
1	1 m
2	2 m
3	3 m
X	Specify the required cable length
10. L1 cable protection with a metal hose	
0	Without a metal hose
M	With a metal hose

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Order code for explosion-proof heater RIZUR-OUR, RIZUR-ONP

Ordering information: RIZUR-OUR-PL-1-F-(-10)-T6-230-20-0-2-M

1 2 3 4 5 6 7 8 9

1. Model	
RIZUR-OUR-PL-1	Ex-proof heater RIZUR-OUR-PL-1, 60 W
RIZUR-OUR-PL-2	Ex-proof heater RIZUR-OUR-PL-2, 100 W
RIZUR-OUR-PL-3	Ex-proof heater RIZUR-OUR-PL-3, 75 W
RIZUR-OUR-PL-4	Ex-proof heater RIZUR-OUR-PL-4, 150 W
RIZUR-OUR-1	Ex-proof heater RIZUR-OUR-1, 75 W
RIZUR-OUR-2	Ex-proof heater RIZUR-OUR-2, 40 W
RIZUR-OUR-3	Ex-proof heater RIZUR-OUR-3, 75 W
RIZUR-ONP-1	Ex-proof heater RIZUR-ONP-1, 500 W
RIZUR-ONP-2	Ex-proof heater RIZUR-ONP-2, 1000 W
RIZUR-ONP-3	Ex-proof heater RIZUR-ONP-3, 500 W
RIZUR-ONP-4	Ex-proof heater RIZUR-ONP-4, 1000 W

2. Heater's design variant	
F	F-variant. Thermoregulator based on bimetallic thermostat (page 25)
FT	FT-variant. Thermoregulator based on bimetallic thermostat. Please, also specify the order code for the thermoregulator RIZUR-TB-FT (page 26)
S	S-variant. Thermoregulator based on digital controls (page 27)
ST	ST-variant. Thermoregulator based on digital controls (page 28)
SR	SR-variant. Thermoregulator based on digital controls, with alarm signaling. Please, specify the order code for the thermoregulator RIZUR-TB-DCS (page 29).
AR	AR-variant. Thermoregulator based on digital control system with local or remote controls and an emergency alarm. Please, specify the order code for the thermoregulator (see page 31)

3. Air temperature maintained	
-10	+10/+20°C (for F, FT design variants))
(X)	Specify the required temperature in the range of 40°C ...+50°C (for S, ST, SR design variants)

4. Temperature rating	
T4	Temperature on the heater's surface is under +135°C
T5	Temperature on the heater's surface is under +100°C
T6	Temperature on the heater's surface is under +85°C
X	Specify the required temperature on the heater's surface under (upon an agreement with the manufacturer)

5. Supply voltage	
230	230 V AC
24	24 V DC (upon an agreement with the manufacturer only)
380	380 V AC (upon an agreement with the manufacturer only)
X	Specify the required power supply voltage (upon an agreement with the manufacturer)

6. Cable length to thermoregulator, L2	
20	200 mm
25	250 mm
30	300 mm
50	500 mm
X	Specify the required cable length

7. L2 cable protection with a metal hose	
0	Without a metal hose
M	With a metal hose

8. Cable length from the thermoregulator , L1 (only for the S- and	
0	For the following heater design variants: FT, ST, SR, AR
1	1 m
2	2 m
3	3 m
X	Specify the required cable length

9. L1 cable protection with a metal hose	
0	Without a metal hose
M	With a metal hose

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General purpose industrial grade heaters for control cabinets RIZUR-OShA-IP20

Intended use and application area

Heaters for control cabinets RIZUR-OShA-IP20 (budget version). Designed for use outside of hazardous areas. Heating element - PTC thermistor.

The majority of the manufacturers nowadays switch onto PTC thermistors because they not only provide heating but also guarantee safety and long service life.

Heaters for control cabinets (OShA) are designed for setting and maintaining the required temperature range in the control cabinets. It's important for the protection of control elements against negative temperatures and moisture to have heating systems in the control cabinets. Heating element used is PTC thermistor.

RIZUR-OShA-IP20 heaters are manufactured in accordance with the requirements of the regulatory documents developed at the company, that comply with the international standards ISO 9001.

Design description and functions

It's recommended that the heater should be mounted vertically with space above and below left empty for better convection. The heater is mounted in place with mounting brackets that are in the scope of supply (DIN rail or screw-type fittings). In case there's a need for temperature maintenance in the set range, then it's best to use temperature limiters (air temperature sensors, thermostats) along with the heater. («NPO RIZUR» has its own series of this equipment - see more on pages 25 and 31)

There're two types of the RIZUR-OShA-IP20 connection: terminal connection (standard version) and cable connection. The second one has high-temperature power cables out, the length is specified by the customer.

For installation, the heater can be equipped with screws, M5 bolts, a bracket for a standard DIN rail 35 mm.

Technical specifications

Design version	Heater's dimensions MDxHxWxD,mm	Capacity, W	Weight, kg (or less)
RIZUR-OShA-IP20-50W	105 x 70 x 92 x 33	50	0,78
RIZUR-OShA-IP20-75W	125 x 90 x 92 x 33	75	0,98
RIZUR-OShA-IP20-100W	170 x 135 x 92 x 33	100	1,34
RIZUR-OShA-IP20-120W	180 x 145 x 122 x 45	120	1,41
RIZUR-OShA-IP20-150W	200 x 165 x 122 x 45	150	1,52
RIZUR-OShA-IP20-180W	235 x 200 x 122 x 45	180	1,85
RIZUR-OShA-IP20-250W	305 x 270 x 122 x 45	250	2,51

Heaters for control cabinets with a ventilator
RIZUR-OShA-IP20-V

Intended use and application area

Heaters for control cabinets RIZUR-OShA-IP20-V with a ventilator (standard version). Designed for use outside of hazardous areas. Heating element - PTC thermistor. The majority of the manufacturers nowadays switch onto PTC thermistors because they not only provide heating but also guaranty safety and long service life.

Heaters for control cabinets (OShA) with a ventilator are designed for setting and maintaining the required temperature range in the control cabinets. It's important for the protection of control elements against negative temperatures and moisture to have heating systems in the control cabinets. Heating element used is PTC thermistor.

RIZUR-OShA-IP20-V heaters are manufactured in accordance with the requirements of the regulatory documents developed at the company, that comply with the international standard ISO 9001.

The aluminum body of the heaters designed for the DIN-rail mounting is manufactured in the form of a radiator, with a heating element inside that is protected by an aluminum plate with mounting holes. There's a special cable channel on the plate created for the convenience of the cable output.

The heater is self-regulating but this system controls only the heater's temperature (saves it from over-heating). In order to control the temperature in the control cabinet, one should use thermoregulators of the ambient temperature (a different device).

It's recommended that the heater should be mounted vertically with space above and below left empty for better convection. The heater is mounted in place with mounting brackets that are in the scope of supply (DIN-rail or screw-type fittings). In case there's a need for temperature maintenance in the set range, then it's best to use temperature limiters (air temperature sensors, thermostats) along with the heater. (NPO RIZUR has its own series of this equipment - see more on pages 25 and 31).

There're two types of the RIZUR-OShA-IP20-V connection: terminal connection (standard version) and cable connection. The second one has high-temperature power cables out, the length is specified by the customer.

For installation, the heater can be equipped with screws, M5 bolts, and a bracket for a standard DIN-rail 35 mm.

Technical specifications

Design version	Heater's dimensions MDxHxWxD,mm	Capacity, W	Weight, kg (or less)
RIZUR-OShA-IP20-50W	105 x 70 x 92 x 33	50	0,78
RIZUR-OShA-IP20-75W	125 x 90 x 92 x 33	75	0,98
RIZUR-OShA-IP20-100W	170 x 135 x 92 x 33	100	1,34
RIZUR-OShA-IP20-120W	180 x 145 x 122 x 45	120	1,41
RIZUR-OShA-IP20-150W	200 x 165 x 122 x 45	150	1,52
RIZUR-OShA-IP20-180W	235 x 200 x 122 x 45	180	1,85
RIZUR-OShA-IP20-250W	305 x 270 x 122 x 45	250	2,51

Order code for heaters RIZUR-OShA-IP20 and RIZUR-OShA-IP20-V

Ordering information: RIZUR-OShA-IP20-100-0-DIN
1 2 3 4

1. Design version	
RIZUR-OShA-IP20	General purpose industrial grade heaters for control cabinets RIZUR-OShA-IP20
RIZUR-OShA-IP20-V	General purpose industrial grade heaters for control cabinets with a ventilator RIZUR-OShA-IP20-V
2. Capacity	
50	50 W
75	75 W
100	100 W
120	120 W
150	150 W
180	180 W
250	250 W
3. Cable length	
0	Without a cable
X	Specified the required cable length in mm
4. Fastening type	
DIN	DIN rail
V	Screw-type fittings

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Explosion-proof inductive heater RIZUR-VIN

Intended use and application area

Explosion-proof inductive heater RIZUR-VIN is designed for heating and freezing protection of the backpressure valves of the wellhead equipment at the oil and gas producing as well as pipeline shut-off valves that require positive temperatures for operation; quick defrosting of the tank vessel's overflow valves, etc.

Explosion-proof inductive heater RIZUR-VIN is used in the hazardous areas in the indoor and outdoor facilities in accordance with the explosion protection marking acc. to GOST 30852.13-2002, Regulations of equipment installation (PUE), Ch.7.3, and other regulatory documents concerning the usage of the electric equipment in the hazardous areas. As required by the explosion protection regulations, the heater's design complies with GOST 30852.0-2002 and GOST 30852.17-2002 as electric equipment of high ex-protection, with «compound encapsulation (m)».

All of the heater's electric elements have a metal coating with the wall thickness of at least 2 mm. In accordance with the GOST requirements, all of the current-conducting elements inside the housing are sealed with a joint compound. Electrical insulation should withstand dielectric strength tests for 1 minute with the testing voltage at no more than 500 V (AC current, 50 Hz) without breakdown and surface discharge.

The heater has inside and outside grounding in accordance with the GOST 22782.3-77. Cable connection is done through the clamping device that prevents the cable's pull-out.

- **Quick and steady heating with minimum energy consumption**

Design description

Structurally, RIZUR-VIN consists of a processing module, a resonant converter module, and an external temperature sensor. Due to the complexity of implementing sustainable resonance in the converter, latest developments and lots of protective functions (overvoltage, current, excessive temperatures, resonance change connected with the change in the housing parameters) are used.

After power supply connection, there's a first initialization of the process module and the light-emitting diode is blinking green. After that comes a functional check of all the sensors. If any of the temperature sensors are broken (quintuple check of the sensor's responses) then the indicator signalizes emergency mode, signaling that the relay is activated and the indicator has an error code displayed. If all of the sensors passed the tests then the main algorithm for the heating control is activated. Each cycle of the temperature testing (about 1 sec) has a sensors check.

If there's a current overload then an inbuilt protection is activated, which turns off the inductor, the indicator signalizes emergency mode and the light-emitting diode is red. Error reset (hester's reboot) is done with putting a magnet close to the housing of the enclosure (10 mm lower than the light-emitting diode).

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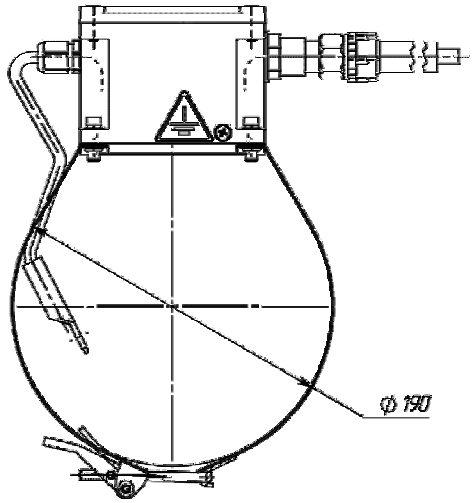
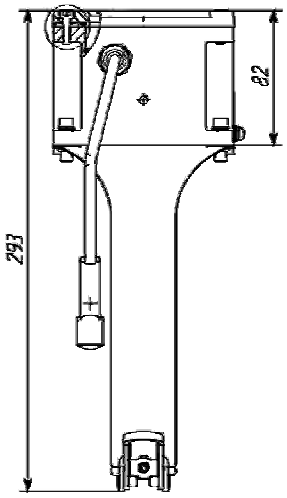
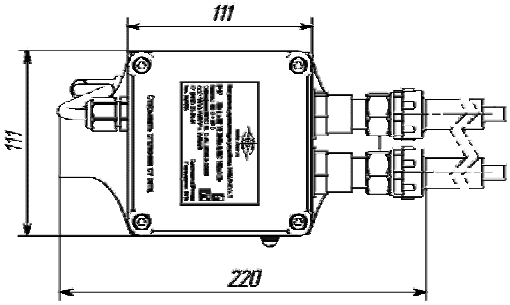
Technical specifications

Installation area	• General industrial areas • Explosion hazard zones V-1a and V-1g acc. to Electrical installation code (PUE), Ch.7.3
Explosion protection marking	• 1Exmb [ia IIC Ga] IIC T4GbX
Nominal capacity, W	150
Supply voltage	230 (±15%)
Operational temperature	-60...+40°C
Ingress protection	IP 66

Dimensional specifications







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Explosion-proof self-regulating heating cable RIZUR-SGL

Intended use and application area

Explosion-proof self-regulating heating cable RIZUR-SGL manufactured by OOO «NPO RIZUR» in compliance with Technical regulations TU 27.32.13-001-12189681-2018 is designed for electrical heating of devices, valves, process tubes (including small diameter ones), pipelines, as well as any other equipment and constructions, installed both in explosion-hazardous areas, where explosive mixtures of gas and flammable vapours of liquids with air of categories IIA, IIB, IIC, groups T1...T6 in accordance with GOST R 51330.9-99 may be formed, and in general purpose industrial areas.

RIZUR-SGL explosion-proof self-regulating heating cable is used for heating and temperature control, to protect equipment from low-temperature impact, condensate formation, and icing. RIZUR-SGL is used as a heating element in RIZUR soft enclosures, as well as for assembling heating sections intended for reinforced fiberglass enclosures heating.

The operational safety of the heating cable when used at explosion-hazardous areas is confirmed by the Customs Union's Certificate of Compliance, «On Safety of equipment for operation in explosive areas» № ТС RU.ME92.B.00999 and a Certificate of conformity with industrial safety regulation № C-RTE.002.TU.00198.

- **Automatic regulation of heat radiation in response to changes in heating surface temperature.**
- **Can be cut to the desired lengthwithout the characteristics changing.**
- **Doesn't overheat and doesn't overburn even during self-crossing.**

Design description and functions

RIZUR-SGL explosion-proof self-regulating heating cable consists of a semiconductor matrix, placed between two current-carrying copper conductors, which provide DC voltage supply throughout the length of the cable. The elastomer thermoplastic coating protects the matrix from moisture and abrasion, while a polyester coating (plastificate, fluoroplastic or polyurethane) serves as an additional protection for a semiconductor matrix. The tinned copper braid provides shielding and earthing of the cable, as well as protects it from external mechanical impact. The connection with a supply cable can be made in two ways: either with the help of a special junction with further sealing or a coupling.

Heating temperature control is provided by precise thermo-technical calculation, that helps to determine capacity requirements of RIZUR-SGL heating cable, as well as by the additional use of RIZUR-TB and thermoregulators. (See pages 25, 31).

Design variants of explosion-proof self-regulating heating cable RIZUR-SGL

Design variant of RIZUR-SGL	Advantages
RIZUR-SGL-65/85-F, RIZUR-SGL-65/85-T	• Doesn't overheat and doesn't overburn even in case of self-crossing; • Easy and quick mounting that does not require any special instruments; • Resistant to chemical attack due to the use of external cable covering made of ftoroplast (RIZUR-SGL-65/85-F)
RIZUR-SGL-120/190-F	• Doesn't overheat and doesn't overburn even in case of self-crossing; • High heat radiation – up to 60 W/m • Easy and quick mounting that does not require any special instruments; • Heat resistance up to 190 °C • Resistant to chemical attack due to the use of external cable covering made of ftoroplast
RIZUR-SGL-190/240-F	• High heat radiation – up to 60 W/m • Doesn't overheat and doesn't overburn even in case of self-crossing; • Easy and quick mounting that does not require any special skills or instruments; • Has an increased safety due to the use of the tinned copper braid and an external coating • Heat resistance up to 240 °C

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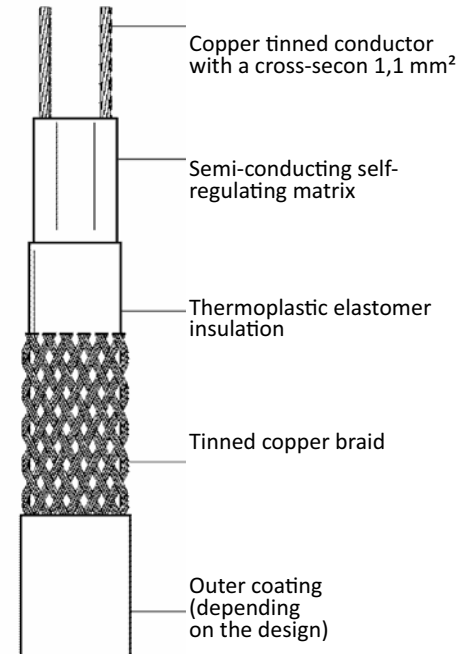
RIZUR-SGL-65/85-F, RIZUR-SGL-65/85-T

Technical specifications

Heat capacity, at 10 °C	10, 17, 25, 31, 40 W/m
Maximum temperature	65 °C
Maximum permissible temperature at no-load posion (1000 hours total)	85 °C
Minimal installation temperature	-60 °C
Supply voltage	230 (±15%) V
Temperature class	T6
Maximum resistance of the protection braid	No more than 10 Ohm/km
Explosion protection marking	1Ex e IIC T3...T6 Gb X
Outer coating material of the self-regulating heating cable	Thermoplastic elastomer for additional protection (SGL-65/85-T) Fluoropolymer for protection against corrosive chemical solutions and vapor (SGL-65/85-F)



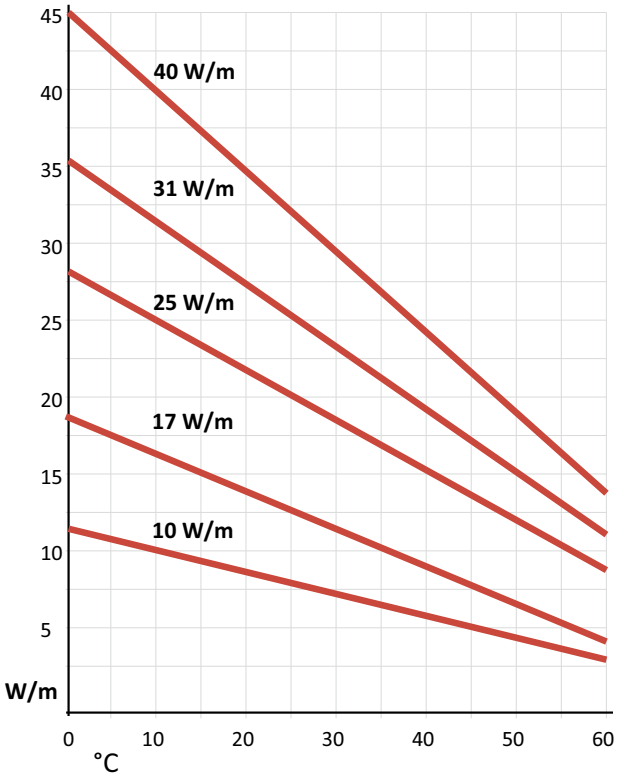
Other technical specificaons for the self-regulang heating cable RIZUR-SGL are provided upon request.

Maximum section length, m

Heat capacity, W/m	Cut-in tempe-rature,°C	Starting current*, A/m	6A	10A	16A	20A	25A
10	10	0,07	90	150	-	197	-
	0	0,08	75	121	195	198	-
	-20	0,12	50	85	135	169	197
	-40	0,14	45	75	120	150	185
17	10	0,01	60	101	155	-	-
	0	0,12	48	81	130	155	-
	-20	0,15	40	65	105	131	155
	-40	0,20	30	50	80	100	125
25	10	0,13	45	75	121	125	-
	0	0,16	35	63	100	120	125
	-20	0,21	20	35	55	70	89
	-40	0,25	20	33	50	65	80
31	10	0,16	29	45	75	91	110
	0	0,19	20	35	55	65	85
	-20	0,24	16	25	40	50	64
	-40	0,28	15	25	40	49	60
40	10	0,21	20	35	55	70	90
	0	0,26	15	25	40	50	60
	-20	0,32	12	20	30	38	47
	-40	0,37	10	19	30	37	46

*Time of starting current decrease to the nominal value is about 300 sec.

Temperature specifications



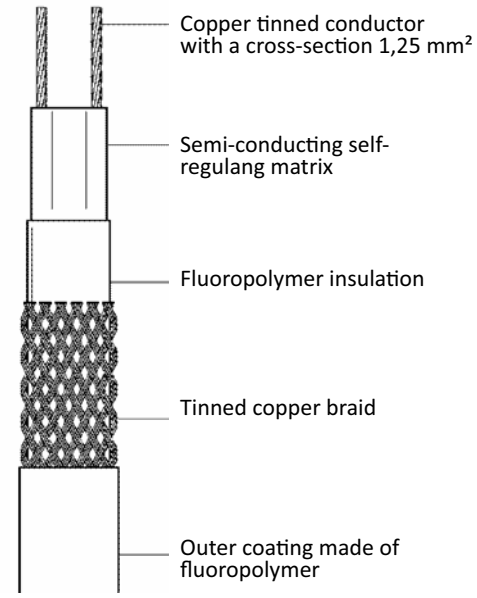
Upon an agreement with the manufacturer it's possible to supply RIZUR-SGL as a heating section with mounting elements of the necessary length. Installation of the self-regulating heating cable RIZUR-SGL does not require any special skills or equipment. All the necessary mounting accessories can also be supplied by NPO RIZUR.

For temperature maintenance in the heating area it's recommended to use thermoregulators. NPO RIZUR produces explosion-proof bi-metallic and digital regulators RIZUR-TB and RIZUR-DCS-2 (see pages 29 and 31 of this catalogue) and is also ready to complete RIZUR-SGL with any other thermoregulator in accordance with the Customer's requirements.

RIZUR-SGL-120/200-F

Technical specifications

Heat capacity, at 10 °C	15, 30, 45, 60 W/m
Maximum temperature	120 °C
Maximum permissible temperature at no-load posion (1000 hours total)	190 °C
Minimal installation temperature	-60 °C
Supply voltage	230 (±15%) V
Temperature class	T4
Maximum resistance of the protection braid	No more than 10 Ohm/km
Explosion protection marking	1Ex e IIC T3...T6 Gb X
Outer coating material of the self-regulating heating cable	Fluoropolymer for protection against corrosive chemical solutions and vapor

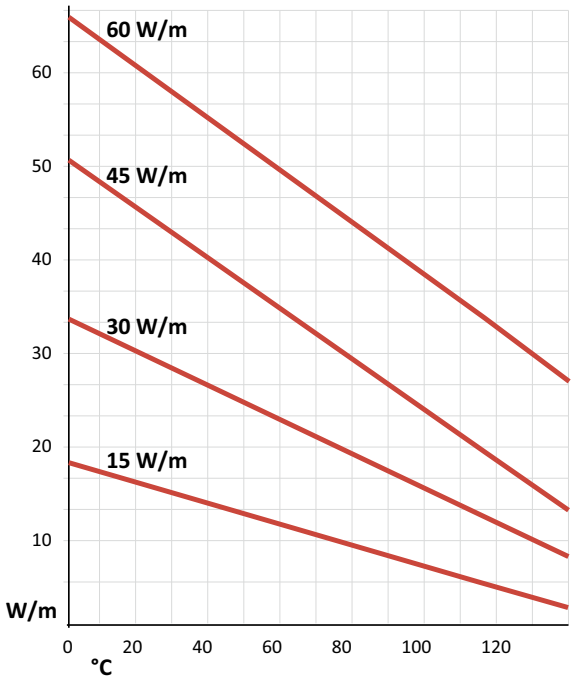


Other technical specifications for the self-regulating heating cable RIZUR-SGL are provided upon request.

Maximum section length, m

Heat capacity, W/m	Cut-in tempe-rature,°C	Starting current*, A/m	6A	10A	16A	20A	25A	32A
15	10	0,09	67	112	162	-	-	-
	0	0,10	61	101	162	-	-	-
	-20	0,11	57	94	151	162	-	-
	-40	0,12	50	84	134	162	-	-
30	10	0,17	35	58	92	114	-	-
	0	0,18	33	56	89	111	114	-
	-20	0,20	30	51	81	102	114	-
	-40	0,22	28	47	74	93	114	-
45	10	0,23	26	44	70	82		-
	0	0,26	23	39	62	78	82	-
	-20	0,31	19	32	51	64	80	82
	-25	0,33	18	31	49	61	76	82
	-40	0,40	16	27	43	54	68	82
60	10	0,31	19	32	52	65	81	84
	0	0,32	19	31	49	62	77	84
	-20	0,36	17	28	45	56	70	84
	-40	0,40	15	26	41	51	64	84

Temperature specifications



*Time of starting current decrease to the nominal value is about 300 sec.

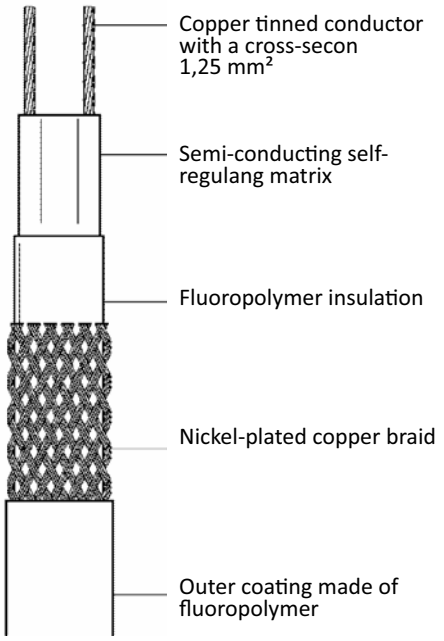
Upon an agreement with the manufacturer it's possible to supply RIZUR-SGL as a heating section with mounting elements of the necessary length. Installation of the self-regulating heating cable RIZUR-SGL does not require any special skills or equipment. All the necessary mounting accessories can also be supplied by NPO RIZUR.

For temperature maintenance in the heating area it's recommended to use thermoregulators. NPO RIZUR produces explosion-proof bi-metallic and digital regulators RIZUR-TB and RIZUR-DCS-2 (see pages 29 and 31 of this catalogue) and is also ready to complete RIZUR-SGL with any other thermoregulator in accordance with the Customer's requirements.

RIZUR-SGL-200/250-F

Technical specifications

Heat capacity, at 10 °C	15, 30, 45, 60, 75, 90 W/m
Maximum temperature	200 °C
Maximum permissible temperature at no-load posion (1000 hours total)	250 °C
Minimal installation temperature	-20 °C
Supply voltage	230 (±15%) V
Temperature class	T3
Maximum resistance of the protection braid	No more than 10 Ohm/km
Explosion protection marking	1Ex e IIC T3...T6 Gb X
Outer coating material of the self-regulating heating cable	Fluoropolymer for protection against corrosive chemical solutions and vapor

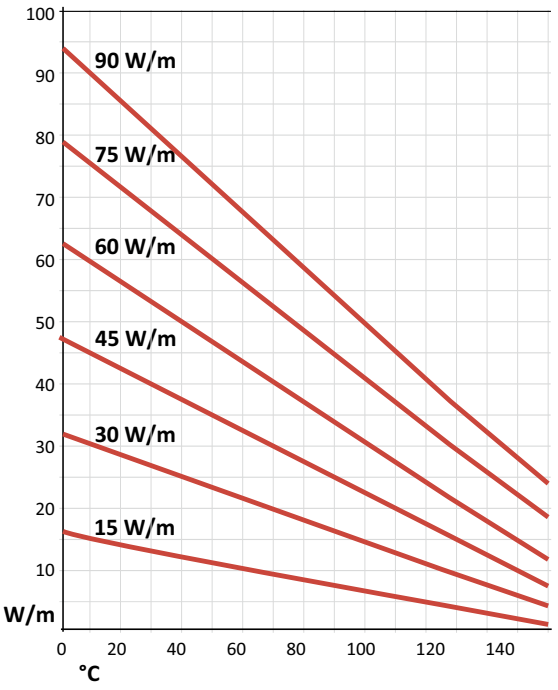


Other technical specificaons for the self-regulang heating cable RIZUR-SGL are provided upon request.

Maximum section length, m

Heat capacity, W/m	Cut-in tempe-rature,°C	Starting current*, A/m	6A	10A	16A	20A	25A	32A
15	10	0,13	48	78	126	154	-	-
	0	0,13	46	76	120	150	154	-
	-20	0,15	40	68	108	136	154	-
30	10	0,20	30	52	82	102	108	-
	0	0,21	30	48	78	96	108	-
	-20	0,23	26	44	70	88	108	-
45	10	0,26	24	38	62	78	88	-
	0	0,28	22	36	58	74	88	-
	-20	0,31	20	34	52	66	82	88
60	10	0,33	18	30	50	62	6	-
	0	0,35	18	30	46	58	72	76
	-20	0,39	16	26	42	52	66	76
75	10	0,38	16	26	42	52	64	82
	0	0,41	14	24	40	48	60	78
	-20	0,45	14	22	36	44	54	70
90	10	0,47	12	22	34	42	54	68
	0	0,50	12	20	32	40	50	64
	-20	0,56	10	18	30	36	46	58

Temperature specifications



*Time of starting current decrease to the nominal value is about 300 sec.

Upon an agreement with the manufacturer it's possible to supply RIZUR-SGL as a heating section with mounting elements of the necessary length. Installation of the self-regulating heating cable RIZUR-SGL does not require any special skills or equipment. All the necessary mounting accessories can also be supplied by NPO RIZUR.

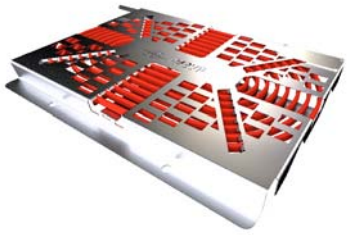
For temperature maintenance in the heating area it's recommended to use thermoregulators. NPO RIZUR produces explosion-proof bi-metallic and digital regulators RIZUR-TB and RIZUR-DCS-2 (see pages 29 and 31 of this catalogue) and is also ready to complete RIZUR-SGL with any other thermoregulator in accordance with the Customer's requirements.

Ex-proof heating section RIZUR based on a self-regulating heating cable

Intended use and application area

RIZUR explosion-proof heating sections based on a self-regulating heating cable are manufactured by OOO «NPO RIZUR» in compliance with the Technical regulations TU-3442-001-12189681-2014 and meet the requirements of GOST R MEK 60079-0-2011, GOST R MEK 60079-7-2012 standards as equipment with enhanced explosion protection of «e» class, and have 1ExeIIT6...T6Gb3 explosion-proof marking depending on the self-regulating heating cable used.

According to the explosion-proof marking, Ch. 7.3 of Electrical installation code (PUE) and other regulations governing the use of electrical equipment in Ex-areas, the heating section is authorized for use in Ex-areas of indoor and outdoor facilities.



The RIZUR explosion-proof heating section is designed for electrical heat tracing of instruments and process equipment in ex-areas, where explosive air-gas and flammable vapor mixtures (belonging to categories IIA, IIB, IIC of groups T6... T3 according to GOST R51330.9-99) can generate, as well as for general industrial facilities. The RIZUR explosion-proof heating section is used for heating and temperature control in enclosures, heated cabinets, block-boxes, etc. with equipment that requires certain ambient temperature for stable and failure-free performance.

Design description and functions

The heating element of the RIZUR explosion-proof heating section is an explosion-proof self-regulating heating cable. The cable type, heat capacity, and length depend on the operating conditions and thermal design. Standard RIZUR heating sections have wattage from 30 to 500 W.

The heating cable is mounted on a metal grid, which also performs the function of a mounting panel for the heating cable, ensures air convection, and protects the staff against thermal injury during maintenance of the heating enclosures. The grid can be made out of stainless steel, galvanized steel or carbon steel with protective polymer-powder coating.

To make the mounting of the heating section more convenient there are legs on the metal grid, which enable the mounting of the RIZUR heating section on both vertical and horizontal surfaces.

The construction of the RIZUR heating section has no solid metal surfaces, which ensures optimal convection of air and, consequently, maximum heat output.

The RIZUR heating section has a power cable (1 m long) for power connection. (You can specify the required length of the power cable in the order).

For temperature control, the RIZUR heating section can be used together with analog or digital explosion-proof thermoregulators RIZUR-TB or RIZUR-DCS-2. (see pages 29,31)

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Technical specifications

Installation area	• General industrial areas • Explosion hazard zones V-1a and V-1g acc. to Electrical installation code (PUE)
Explosion protection marking	1ExeIICT6...T3Gb
Heating capacity	30... 500 W
Supply voltage	230 (±15%) V
Ingress protection	0
Warranty period	24 months
Average operation time	Over 10 years

The dimensions of the heating sections depend on the heating section capacity. In order to receive the drawings with exact dimensions, please contact the OOO «NPO RIZUR» engineering department +7 (4912) 20-20-80, marketing@rizur.ru

Order code for the heating section RIZUR

Ordering information: RIZUR–100–1–T6–1–M

1 2 3 4 5 6

1. Design variant	
RIZUR	Design variant of the heating section
2. Heat capacity	
50	50 W
100	100 W
150	150 W
200	200 W
250	250 W
300	300 W
X	Please specify the required wattage of the heating section in W
3. Explosion protection	
0	General purpose industrial version
1	Explosion-proof version
4. Temperature class	
T4	Surface temperature is below 135°C
T5	Surface temperature is below 100°C
T6	Surface temperature is below 85°C
5. Power cable length	
1	1 m
2	2 m
3	3 m
X	Please specify the required cable length in meters
6. Metal hose protection for the cable	
0	None
M	Metal hose

Explosion-proof thermoregulators RIZUR-TB

Intended use and application area

Explosion-proof thermoregulators RIZUR-TB manufactured by OOO «NPO RIZUR» comply with Technical regulations TU-3442-003-12189681-2014, GOST R MEK 60079-0-2011, GOST R MEK 60079-7-2012, GOST R MEK 60079-18-2012 as high-reliability electric equipment with Ex-protection class «compound sealing» (m)», GOST IEC 60079-1-2011 as equipment with Ex-protection «explosion-proof casing «d», intended for use in explosion-hazardous gas areas, and are marked as 1Exmb IIC T6 Gb X, 1 Exd IIC T6 GbX (depending on the version). According to the Ex-marking, Ch. 7.3 of PUE (Electrical installation code) and other regulatory documents governing the use of electrical equipment in hazardous areas these heaters can be used in explosion-hazardous areas of internal and external facilities.

RIZUR-TB explosion-proof thermoregulators are used for control and maintenance of required ambient air temperature in heating/cooling systems that protect the equipment against excessively high/low temperatures and significant fluctuations that are averse to time and stability of performance of such control and measurement equipment.

RIZUR-TB-F*

Thermoregulator RIZUR-TB-F is an explosion-proof version, based on a bimetallic thermostat. This bimetallic thermostat is used for connecting and disconnecting power and low-signal electric circuits at a set temperature. The base of the thermostat is a bimetallic disc, tightly integrated with a group of electric contacts and undergoing deformation when the temperature changes. All electric elements of the thermostat have a metal housing. The standard version is designed for use in ambient air temperature ranging from 10°C to 20°C. The temperature range can be different upon request.

In a RIZUR-TB-F* thermoregulator with an Ex-protection class explosion-proof housing «d», the metal housing is explosion-proof.

In a RIZUR-TB-F* thermoregulator with an Ex-protection class «compound sealing (m)», all cavities of the thermostat's housing are filled with thermoresistant heat-conductive compound.

The RIZUR-TB-F* thermoregulator has three design variants.

Design variants of the thermoregulator RIZUR-TB-F*

RIZUR-TB-F

Built-in compact design of the thermoregulator based on a bimetallic thermostat. RIZUR-TB-F can help maintain the temperature range of +10°C to +20°C (not including the thermal lag of the thermoregulator's body). The thermoregulator is shipped with a power cable. Cable length is specified in the ordering code (the standard cable length is 1 m). Such design is possible only with the ex-marking 1ExmbIICT6GbX.

Thermoregulator RIZUR-TB-F is supplied only as a part of the heaters manufactured by OOO «NPO RIZUR».

Ordering information:

RIZUR-TB-F-Exm – (10/20) – 1- M
1 2 3 4 5

1. Design variant	
RIZUR-TB-F	Design variant of the thermoregulator
2. Explosion protection marking	
Exm	1ExmbIICT6GbX
3. Maintained temperature	
10/20	From 10°C to 20°C
X	Specify the required temperature (upon an agreement with the manufacturer)
4. Cable length	
1	1 m
2	2 m
X	Specify the required cable length in meters
5. Cable protection with a metal hose	
0	Without a metal hose
M	With a metal hose

RIZUR-TB-FB

Compact design of the thermoregulator. The thermoregulator is shipped with a power cable. Cable length is specified in the ordering code (the standard cable length is 1 m). If requested, it can also be shipped with a junction box for connection to the heater and power cable. Such design is possible only with the ex-marking 1ExmbIICT6GbX.

Ordering information:

RIZUR-TB-FB-Exm-(10/20) – 2- M
1 2 3 4 5

1. Design variant	
RIZUR-TB-FB	Design variant of the thermoregulator
2. Explosion protection marking	
Exm	1ExmbIICT6GbX
3. Maintained temperature	
10/20	From 10°C to 20°C
X	Specify the required temperature (upon an agreement with the manufacturer)
4. Cable length	
1	1 m
2	2 m
X	Specify the required cable length in meters
5. Cable protection with a metal hose	
0	Without a metal hose
M	With a metal hose

RIZUR-TB-FT

Integral design of the thermoregulator. In this design, the thermoregulator is located in/on a metallic housing (depending on the ex-marking). This housing also performs the function of a junction box, meaning that there's a terminal block inside and ex-protected cable glands for power cables outside.

Such design is possible only with the Ex-markings 1ExmbIICT6GbX and 1ExdIICT6GbX.

Ordering information:

RIZUR-TB-FT-Exm-(10/20) – M20
1 2 3 4

1. Design variant	
RIZUR-TB-FT	Design variant of the thermoregulator
2. Explosion protection marking	
Exm	1ExmbIICT6GbX
Exd	1ExdIICT6GbX
3. Maintained temperature	
10/20	From 10°C to 20°C
X	Specify the required temperature (upon an agreement with the manufacturer)
4. Cable gland for power cable	
M20	Cable gland M20x1,5 for cable diameter 6-12 mm
MR20	Cable gland M20x1,5 for cable diameter 6-12 mm with fastening for a metal hose DN15
MB20	Cable gland M20x1,5 for armored cable with external diameter 9-17 mm
X	Specify type and grade of cable and metal hose

RIZUR-TB-S*

Thermoregulators RIZUR-TB-S* are manufactured in the explosion-proof design and are based on an intelligent digital control module consisting of a microcontroller, a temperature sensor (based on semiconducting materials) and an indicator that is located in an aluminum housing. At the software level, the heater is controlled by Jack E. Bresenham's modified adaptive algorithm. This algorithm ensures stepless control of the heater's power in the continuous operation and helps to maintain the temperature range from -40 to +50 °C with an increment of 1°C. When the temperature is set, the microcontroller in a soft-control mode turns the helice on to such power that is necessary for loss compensation providing that the temperature inside the heated space is maintained.

The control module for the heating element has an indicator on the basis of light-emitting diode designed for the visual control - it helps to determine the system's operating mode without opening the box (if there's an observation window):

Red light means that the temperature is below the set minimum.	Green light means that the temperature is in the set range.	Yellow light means that the temperature is above the set maximum.
Blinking red light during the operating time means that there's an emergency, possibly a problem with the helice. **Important!** Blinking red light at the beginning of the operation does not mean that there's a problem - it signals that the heater is up and running at full power.	Blinking green light means that the temperature is in the set range but the warranty period has ended (the warranty is for 15000 hours of the heater's operation). The heater with an S-design is shipped with a power cable. Cable length is specified in the ordering code (the standard cable length is 1 m).	Red and yellow blinking light means that the temperature on the surface of the heater is at set maximum while the temperature inside is below the set minimum. In such a situation the heater is turned off and the heating progress is not completed. It's possible that the power of the heater is chosen incorrectly.

Design variants of the thermoregulator RIZUR-TB-S*

RIZUR-TB-S

Built-in compact design of the thermoregulator with an intelligent control module. The effectiveness of the power load and maintenance of the temperature are ensured at the software level.

RIZUR-TB-S helps to maintain the temperature from -40°C to +50°C (with an increment of 1°C). All of the settings are programmed on the basis of the ordering information at the manufacturing facility. There's no possibility to change the settings on site.

The thermoregulator is shipped with a power cable. Cable length is specified in the ordering code (the standard cable length is 1 m). Such design is possible only with the ex-marking 1ExmbIICT6GbX.

Thermoregulator RIZUR-TB-S is supplied only as a part of the heaters manufactured by OOO «NPO RIZUR».

Ordering information:

RIZUR-TB-S-Exm-(+5)-1-M
1 2 3 4 5

1. Design variant	
RIZUR-TB-FB	Design variant of the thermoregulator
2. Explosion protection marking	
Exm	1ExmbIICT6GbX
3. Maintained temperature	
X	Specify the required temperature within the limits of -40°C...+50°C, with an increment of 1°C
4. Cable length	
1	1 m
2	2 m
X	Specify the required cable length in meters
5. Cable protection with a metal hose	
0	Without a metal hose
M	With a metal hose

RIZUR-TB-ST

Built-in design of the thermoregulator with an intelligent control module.

Functionally, this thermoregulator is identical to the RIZUR-TB-S. Structurally, it's placed on the metal housing that performs the function of a junction box, meaning that there's a terminal block inside and ex-protected cable glands for power cables outside. Such design is possible only with the ex-marking 1ExmbIICT6GbX.

Thermoregulator RIZUR-TB-ST is supplied only as a part of the heaters manufactured by OOO «NPO RIZUR».

Ordering information:

RIZUR-TB-ST-Exm-(+5)-M20
1 2 3 4

1. Design variant	
RIZUR-TB-FB	Design variant of the thermoregulator
2. Explosion protection marking	
Exm	1ExmbIICT6GbX
3. Maintained temperature	
X	Specify the required temperature within the
4. Cable gland for power cable	
M20	Cable gland M20x1,5 for cable diameter 6-12 mm
MR20	Cable gland M20x1,5 for cable diameter 6-12 mm with fastening for a metal hose DN15
MB20	Cable gland M20x1,5 for armored cable with external diameter 9-17 mm
X	Specify type and grade of cable and metal hose

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RIZUR-TB-DCS

Thermoregulator RIZUR-TB-DCS is manufactured on the base of a digital control system. The module consists of a microcontroller (regulated by the software) and remote digital air temperature indicator RIZUR-DT or RT 100 (the immersible version can be used for the temperature maintenance in the liquid media).

The hardware-software solution ensures that the temperature will be maintained with the accuracy of 1 °C. The temperature parameters are programmed at the manufacturing facility on the basis of the ordering information. For the purpose of signalizing when the temperature surpasses the set limits, thermoregulator RIZUR-TB-DCS has additional relay outputs, as well as, depending on the design variant, an analogue output signal 4-20mA.

The housing of the thermoregulator also performs the function of a junction box, meaning that there's a terminal block inside and ex-protected cable glands for power cables, heater, and temperature sensors outside.

Thermoregulator RIZUR-TB-DCS is designed specifically for controlling heating elements of high power (up to 5kW), including self-regulating heating cables.

The thermoregulator can withstand the cold starting loads that surpass the nominal power load in 10 times.

Design variants of the thermoregulator RIZUR-TB-DCS

RIZUR-TB-DCS-1

RIZUR-TB-DCS-1 - this version has two digital temperature sensors RIZUR-TD and two relay outputs for signalizing when the temperature surpasses set limits causing an emergency.

Thermoregulator RIZUR-TB-DCS-1 can change and control the temperature within the limits from - 50°C to +110°C.

RIZUR-TB-DCS-3

RIZUR-TB-DCS-3 - this version has two temperature sensors RT 100 and two relay outputs for signalizing when the temperature surpasses set limits causing an emergency.

Thermoregulator RIZUR-TB-DCS-3 can change and control the temperature within the limits from -200°C to +600°C.

RIZUR-TB-DCS-4

This version has two digital temperature sensors RIZUR-TD, one relay output, and one analogue output signal 4-20mA.

Thermoregulator RIZUR-TB-DCS-4 can change and control the temperature within the limits from -50°C to +110 °C.

The relay output signal is for signalizing when the temperature surpasses set limits causing an emergency. The analogue output signal 4-20mA is for broadcasting the current temperature value.

Technical characteristics

Design variant	RIZUR-TB-DCS
Installation area	General industrial areas Explosion hazard zones V-1a and V-1g acc. to Ch. 7.3 of PUE
Explosion protection marking	1Ex d X [ia IIC Ga] IIC T6 G bX
Temperature control	Digital control system
Heating element power	Up to 5000 W
Supply voltage	230 (±15%)V, 24,36-48 V AC/DC (upon an agreement with the manufacturer)
Temperature maintained on the surface	-30°C … +90°C, an increment of 1°C
Temperature maintained inside	-40°C … +50°C, an increment of 1°C
Ingress protection	IP67
Preset temperature limit alarm	Relay, dry contact, 1 A
Warranty period	24 months
Average operation time	Over 15 years

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Order code for the thermoregulator RIZUR-TB-DCS

Ordering information:

RIZUR-TB-DCS-1-(+90/2/0)-(-10/2/0)-(-20)-(+10)-M20-M20-M20

1 2 3 4 5 6 7 8

1. Design variant	
RIZUR-TB-DCS-1	Thermoregulator with 2 digital temperature sensors RIZUR-DT and 2 relay output signals
RIZUR-TB-DCS-3	Thermoregulator with 2 digital temperature sensors RIZUR-DT and 2 relay output signals
RIZUR-TB-DCS-4	Thermoregulator with 2 digital temperature sensors RIZUR-DT, 1 relay output signal and one analogue output signal 4-20mA
RIZUR-TB-DCS-X	Version with a different combination of the temperature sensors and output signals (upon an agreement with the manufacturer)
2. Parameters of the heating element's temperature control sensor	
N	Without the temperature sensor
(X /_ /_)	Specify the target temperature, °C (for the digital sensor within the limits of -50°C...+110°C; for the temperature sensor RT 100 within the limits of -200°C...+600°C)
(_ / X /_)	Specify the sensor's cable length, meters
(_ /_ /X)	Specify the sensor's cable type: 0-standard cable M-cable protection with a metal hose B-armoured cable
3. Parameters of the surface/heated medium's temperature control sensor	
(X /_ /_)	Specify the target temperature, °C (for the digital sensor within the limits of -50°C...+110°C; for the temperature sensor RT 100 within the limits of -200°C...+600°C)
(_ / X /_)	Specify the sensor's cable length, meters
(_ /_ /X)	Specify the sensor's cable type: 0-standard cable M-cable protection with a metal hose B-armoured cable
Note: in case the sensor is used in the liquid medium, it's necessary to specify the immersion depth and process parameters outside the order code.	

4. Setting of the minimal temperature for signaling relay*	
(X)	Specify the target temperature for signalization, °C (signaling relay is activated when the temperature goes below the set limit)
* In case there's no sensor, (N) should be put in the order code	
5. Setting of the maximal temperature for signaling relay*/ the limits of the analogue output signal 4-20 mA	
(X)	Specify the target temperature for signalization, °C (signaling relay is activated when the temperature goes above the set limit). For RIZUR-TB-DCS-4 in this section it's necessary to specify the limits for the analogue output 4-20 mA, for example, if the limits are from -50°C to +40°C, the ordering information should have (-50/+40)
* In case there's no sensor, (N) should be put in the order code	
6. Cable gland for the heater's cable	
M20	Cable gland M20x1,5 for cable diameter 6-12 mm
MR20	Cable gland M20x1,5 for cable diameter 6-12 mm with fastening for a metal hose DN15
3	3 m
X	Specify cable's length in meters
7. Cable gland for the power cable	
M20	Cable gland M20x1,5 for cable diameter 6-12 mm
MR20	Cable gland M20x1,5 for cable diameter 6-12 mm with fastening for a metal hose DN15
MB20	Cable gland M20x1,5 for armored cable with external diameter 9-17 mm
X	Specify type and grade of cable and metal hose
8. Cable gland for the signaling cables	
M20	Cable gland M20x1,5 for cable diameter 6-12 mm
MR20	Cable gland M20x1,5 for cable diameter 6-12 mm with fastening for a metal hose DN15
MB20	Cable gland M20x1,5 for armored cable with external diameter 9-17 mm
X	Specify type and grade of cable and metal hose

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Explosion-proof digital thermoregulator RIZUR-DCS-2

Intended use and application area

The RIZUR-DCS-2 explosion-proof digital thermoregulator manufactured by OOO «NPO RIZUR» complies with Technical regulations TU-3442-001-12189681-2014, GOST R МЕК 60079-0-2011, GOST R МЕК 60079-11-2010, GOST IEC 60079-1-2011 standards for electric equipment with explosion protection type «Flameproof Enclosure (d)», «Intrinsically Safe Circuit (i)», «Intended for Use in Explosive Gas Atmospheres» , and has 1 Exd[ia IIC Ga] IIB T6 Gb X explosion protection. RIZUR-DCS-2 is supplied together with digital temperature sensors RIZUR-DT with 0 Ex ia IIC T6 Ga X explosion protection marking. According to the explosion protection marking, Ch. 7.3 of Electrical installation code (PUE) and other regulations governing the use of electrical equipment in exareas, the heater is certified for use in ex-areas of internal and external facilities.

Safety of the digital thermoregulator at explosion-hazardous areas is proved by the Customs Union's Certificate of compliance, «On safety of equipment operating in explosive areas» № EAEU RU C-RU.ME92.B.00041/19, and Certificate of compliance with Industrial safety requirements № C-RTE.002.TU.00198

Modbus RTU protocol makes it possible to control the preset values and receive information about the following heating system parameters:

- **Current ambient temperature in the enclosure (cabinet)**
- **Current surface temperature of the heater**
- **Preset ambient temperature**
- **Preset temperature limit for the heater surface;**
- **Preset ambient temperature limit for the relay output**
- **Temperature regulator communication status.**

Design description and functions

Explosion-proof digital thermoregulator RIZUR-DCS-2 is a compact unit with a display and control buttons designed to control any actuators (heating devices: a radiator, a heating cable, a water heating system, etc.; valves, contactors, valve drivers, etc.). RIZUR-DCS-2 temperature regulator is supplied together with temperature sensors, in accordance with the customer's technical specifications.

When controlling actuators, switching the power supply on and off depends on the temperature settings e.g., while working with heating systems, the thermoregulator automatically disables the power supply of the heater when the preset ambient temperature in the box or on the surface of the equipment is achieved, and, accordingly, enables the power supply when the temperature drops lower than the preset minimum value. Similarly, different actuators are controlled in accordance with temperature settings.

The explosion-proof digital thermoregulator processes data received from the temperature sensors connected to it:

- surface temperature sensor of any heating element
- air temperature sensor (in a heating enclosure or cabinet, in internal facilities, etc.)

The base version of RIZUR-DCS-2 is designed to control the operation of one heater. Versions operating with two heaters are also available. In this case, the thermoregulator will control the surface temperature of both heaters connected to it, and the temperature will be regulated when any of the heaters reaches the critical state.

Please note: this version has a number of specific technical features. Please study the design documentation carefully or negotiate exact specifications before purchasing or using the equipment.

RIZUR-DCS-2 can work both autonomously and together with external regulators or other devices (including a computer) that support Modbus RTU protocol, RS-485 physical communication channel. RIZUR-DCS-2 temperature regulator has an extra relay output for temperature alarm, to signal if the temperature surpasses the preset limits.

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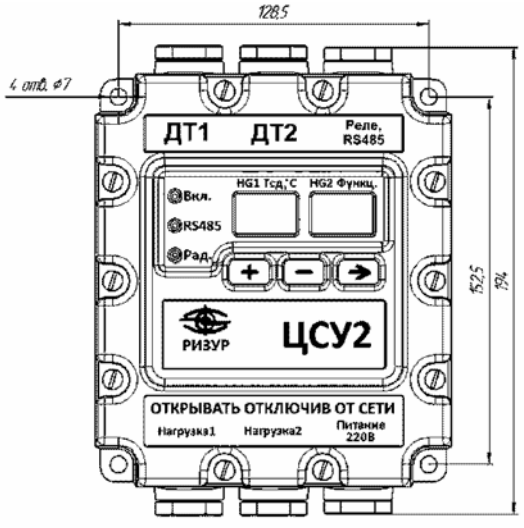
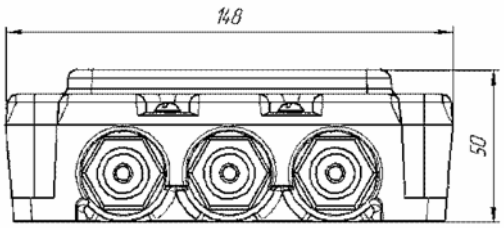
Technical specifications

RIZUR-DCS-2 Thermoregulator	
Installation area	General industrial facilities Ex-areas V-1a and V-1g, acc. to Electrical installation code (PUE), Ch. 7.3
Explosion protection marking	1 Exd [ia IIC Ga] IIB T6 Gb X
Ingress protection	IP68 acc. to GOST 14254-96
Display	LED
Control buttons	Hermetically sealed switches
Local control	Magnetic pen
Interface protocol	Modbus RTU
Physical communication channel	RS-485
Preset temperature limit alarm	Relay, changeover dry contact, 1A
Operating mode transition time after resetting	15 seconds
Heater surface temperature	-30°C...+110°C, an increment of 1°C
Temperature maintained inside	-40°C...+110°C, an increment of 1°C
Total capacity of connected actuators	от 5 W до 5 000 W
Supply voltage	220 (±15%) V (other is possible upon request)
Power consumption	5 W
Ambient temperature	-60°C...+50°C
Warranty period	24 months
Average operation time	Over 10 years

RIZUR-DT sensor	
Sensor type	Digital
Explosion protection marking	0 Exia IIC T6 Ga X
Measuring range of the digital sensor	от -55°C...+125°C, range extension is possible on request - PT100 analogue platinum sensors are used (+200°C...+600°C)
Measurement accuracy of the digital sensor	±0,5°C in the range of -10°C...+85°C ±3°C in the range from -55°C to -11°C and from +86°C to 125°C
Warranty period	24 months
Average operation time	Over 15 years

Dimensions of RIZUR-DCS-2 thermoregulator





Order code for the thermoregulator RIZUR-DCS-2

Ordering information:

RIZUR-DCS-2-	0	-	1	-	1	-	1	-	2	-	3	-	MR20	-	MR20	-	0	-	M20
1	2		3		4		5		6		7		8		9		10		11

1. Design variant	
RIZUR-DCS-2	Design variant of the thermoregulator
2. Remote control	
0	None
M	The Modbus RTU protocol, RS485
3. Relay output signal	
0	None
1	Available
4. Number of controlled heaters	
1	One
2	Two
5. Magnetic pen	
0	Not required
1	Supplied
6. Cable length for the air temperature sensor	
1	1 m
2	2 m
3	3 m
X	Specify the required cable length, m
7. Cable length for the surface temperature sensor	
1	1 m
2	2 m
3	3 m
X	Specify the required cable length, m
8. Cable gland for the heater cable	
M20	Cable gland M20x1.5 for cable diameter of 6-12 mm
MR20	Cable gland M20x1.5 for cable diameter of 6-12 mm with a metal hose DN-15
MB20	Cable gland M20x1.5 for an armored cable with an external diameter of 13-20 mm
X	Please specify type and grade of cable and of the metal hose
9. Cable gland for the power cable	
M20	Cable gland M20x1.5 for cable diameter of 6-12 mm
MR20	Cable gland M20x1.5 for cable diameter of 6-12 mm with a metal hose DN-15
MB20	Cable gland M20x1.5 for an armored cable with an external diameter of 9-17 mm
X	Please specify type and grade of cable and of the metal hose
10. Cable gland for the Modbus RTU cable	
0	None
M20	Cable gland M20x1.5 for cable diameter of 6-12 mm
MR20	Cable gland M20x1.5 for cable diameter of 6-12 mm with a metal hose DN-15
MB20	Cable gland M20x1.5 for an armored cable with an external diameter of 9-17 mm
X	Please specify type and grade of cable and of the metal hose
11. Cable gland for the relay output cable	
0	None
M20	Cable gland M20x1.5 for cable diameter of 6-12 mm
MR20	Cable gland M20x1.5 for cable diameter of 6-12 mm with a metal hose DN-15
MB20	Cable gland M20x1.5 for an armored cable with an external diameter of 9-17 mm
X	Please specify type and grade of cable and of the metal hose

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