

DTCXX4

Resistance thermometer

Short guide

This manual is intended to familiarize service personnel with the installation and operation of the resistance thermometer OBEH DTC with the cable terminal (hereinafter referred as sensor).

More detailed information about the sensor is given in the Operation Manual (see the device page on the website: www.owen.ru).

Scope

The sensor is designed for continuous measurement of the temperature of liquid, vapor and gaseous media, bulk materials and solids that are non-corrosive to the material of the sensor body.

The sensor can be used in various industries.

Versions

OBEH X DTC XX4-X.XX.X/X.Exi-X

Number of sensitive elements: – one sensitive element, (standard), not specified 2 – two sensitive elements		Temperature class in explosion protection marking: – not specified for common industrial sensor T1 – max. 425 °C T2 – max. 275 °C T3 – max. 195 °C T4 – max. 130 °C T5 – max. 95 °C T6 – max. 80 °C
Version: XX4 – sensor with cable outlet		Explosion proof: – common industrial sensor (not specified) Exi – intrinsic safety
Nominal static characteristic: 50M (standard) Pt100 (standard) 50P Pt500 100P Pt1000		Cable outlet length: – 0.2 m (standard), not specified 0,3...20,0 – up to 20.0 m (on request)
Tolerance class: A, B (standard), C		Mounting length L, mm
Internal wiring: 2 – two-wire 3 – three-wire (standard) 4 – four-wire		

Specification

Table 1 – General specifications

Characteristic	Value								
Nominal static characteristic (NSC)	50M; 100M			50P; 100P			Pt100; Pt500; Pt1000		
Tolerance class*	B	C	A	B	C	A	B	C	
Measurement range, °C	-50	-50	-100	-196	-196	-60	-60	-60	
	
	+150	+150	+250	+250	+250	+250	+250	+250	
Thermal inertia index**, s, max.	10 ... 30								
Number of sensitive elements (SE)	1 2***								
Wiring Interconnection	two-wire**** three-wire four-wire								
Sensor	isolated from housing								
Cable output length, m	0.2 (standard) up to 20 (on request)								
Type of threaded fitting	metric thread, pipe thread								
Material of protective reinforcement	steel 12X1810T brass (models 014,034, 204)								
Nominal pressure	<ul style="list-style-type: none"> max. 0.1 MPa for protective brass fittings; max. 0.4 MPa for protective steel fittings with a diameter of the submersible part up to 6 mm; max. 0.6 MPa for protective steel fittings with a diameter of the submersible part of 6 mm; max. 6.3 MPa for protective steel fittings with a diameter of the submersible part of 8 ... 12 mm; 								
IP code (according to GOST 14254)	IP54 IP67 (versions 414, 314,174, 184, 194)								
Mean time between failures, min.	35,000 h								
Average service life, min.	8 years								
Ambient air temperature	-60...+85 °C								
* For sensors with platinum SE and two-wire wiring only classes B and C are available. ** Time required to change the sensor readings by 63.2% of the total change in the readings, with a step change in the ambient temperature, with a flow rate of max. 1 m/s in water and min. 3 m/s in air, depends on the DTC version. ***for sensors with immersion diameter of min. 8 mm. **** With a two-wire scheme, the length of the immersed part is not more than 250 mm; cable outlet length is not more than 0.5 m									

Table 2 – Maximum permissible deviation from NSC

Tolerance class according to GOST 6651	Maximum permissible deviation from NSC, °C	Measuring range*, °C	
		Platinum SE	Copper SE
A W 0.15 F 0.15	± (0.15 + 0.002 t)**	-100...+450	–
B W 0.3 F 0.3	± (0.3 + 0.005 t)	-196...+660	-50...+200
C W 0.6 F 0.6	± (0.6 + 0.01 t)	-196...+660	-180...+200

* Limit values. The specific measurement range, depending on the version, is indicated in the passport and on the sensor marking.
** |t| – absolute value of the temperature of the measured medium, °C.

Table 3 – Electrical resistance of the insulation between the circuits of the SE and between the chain of SE and the metal part of the protective armature at a test voltage of 100 V DC

Temperature range, °C	Electrical resistance of insulation, MΩ, min.
from 15 to 35	100
from 100 to 250	20
from 251 to 450	2
from 451 to 650	0.5

Table 4 – Minimum immersion depth

Outer diameter, mm	Minimum immersion depth, mm		
	Tolerance class A	Tolerance class B	Tolerance class C
5	55	50	50
6	60	55	55
8	65	60	60
10 and more	80	75	75



NOTE

For sensor with mounting length less than 50 mm minimum immersion depth equal to the mounting length

Explosion protection

DTC-Exi sensors relate to electrical equipment with explosion protection of the "intrinsically safe electrical circuit I" type, meet the requirements of GOST 30852.0, GOST 30852.10 and are intended for use in hazardous areas in accordance with the established marking of explosion protection.

These sensors are marked with **0Ex ia IIC T1 ... T6 Ga X**. The "X" means:

- connecting sensors to external circuits should be made through intrinsically safe barriers with appropriate intrinsically safe parameters that have valid certificates of conformity with the requirements of TP TC TC 012/2011;
- installation, connection, operation, maintenance and disconnection of sensors should be carried out in accordance with the technical documentation of the manufacturer;
- temperature class in the marking of the explosion-proof sensors is selected from the maximum ambient temperature and the maximum temperature of the controlled medium in accordance with Table 5.

Table 5 – Temperature classes in explosion protection marking

Temperature class in explosion protection marking	T1	T2	T3	T4	T5	T6
Ambient and monitored environment temperature, max.	425 °C	275 °C	195 °C	130 °C	95 °C	80 °C

The parameters of intrinsically safe electrical circuits for DTC-Exi are listed in the Table 6.

Table 6 – Intrinsically safe electrical parameters

Parameter	Value
Maximum input voltage	10.2 V
Maximum input current	200 mA
Maximum internal capacity	2.75 μF
Maximum internal inductance	0.75 mH

Installation and connection



CAUTION

Installation, connection and disconnection of the sensor from the line supplying the measured medium must be carried out in the absence of pressure in the line.



NOTICE

During installation and operation, the sensor must not be subjected to sudden heating or cooling, as well as mechanical shock.



CAUTION

Connect the sensor to the measuring device must be made in strict accordance with the wiring diagram, with the monitor supply voltage disconnected.



CAUTION

Connecting the sensor in an explosion-proof housing should be made through the barrier of intrinsic protection. The parameters of the intrinsically safe circuits must correspond to the values from Table 6.

Table 7 – Internal wiring

Number of SE	Internal wiring		
	2-wire	3-wire	4-wire
1			
2			

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