

**Sensors Ferrum provide 17 500+ executions**, presented by 32 standard lengths:

- measurement accuracy of class A with repairing categories of mechanical executions 1-st and 2-nd with a weather range of temperature group  $-40.. +60$  °C;
- measurement accuracy of classes S and P with repairing and not repairing category of mechanical execution 1-st with a weather range of temperature group  $-40.. +60$  °C;
- measurement accuracy of class A with repairing and not repairing category of mechanical execution 3-rd with three weather ranges of temperature groups  $-40.. +85$  °C,  $-60.. +85$  °C,  $-100.. +85$  °C.

The sensor parameters are filled in ordering form:

Temperature sensor Ferrum **constructive execution (1) – measuring substance (2) – DN (3) – PN (4) – measuring temperature range (5) – montage plug (6) – output (7) – measurement accuracy (8) – mechanical execution (9) – cable plug (10) – galvanic isolation (11) – automatic heating of interface plug at weather lower  $-40$  °C (12) – supply voltage (13) – isolated seal material (14):**

1) sensor constructive execution according with a table 1 in Manual Operation: sinking gloved **TS-xx**, **TSL-xx**, sinking non-gloved **TSG-xx**, **TSL-xx**, surface montage **TSK** (sensor, not aimed for sinking and work in liquid and aggressive substance without special protective cup; the state montage means specifier at order separately); **TSR**, **TSS** – with a shape form of measuring cup, mostly for loose materials, applied as non-gloved modification of **TSG**, **TSL** and **TS**, index at order **/TSR**, **/TSS**, example: **TSG-32/TSR**;

2) measuring substance (type of characteristic): **liquid, gas, steam, surface**;

3) montage pipeline diameter, **DN-15.. 2000 mm**; defines type-dimension of montage parts;

4) working pressure of measuring substance, **PN**: non-gloved sensors **TSG – 2,5 MPa**, gloved sensors **TS – 4 MPa, 50 MPa**; sensors **TSL – 0,025 MPa** non-gloved, **MPa** gloved;

5) temperature range of measuring substance with limits: **1** –  $-40...+70$  °C, **2** –  $-40...+170$  °C; **3** –  $-40...+200$  °C; **4** –  $-60...+70$  °C, **5** –  $-60...+170$  °C; **6** –  $-60...+200$  °C; **7** –  $-100...+200$  °C; gradations 1.. 3 belong to sensors of  $-40$  °C, gradations 4.. 6 belong to sensors of  $-60$  °C, gradation 7 not certified and belongs to sensors with range of  $-100$  °C;

6) montage plug: **1** – for welding, **2** – for montage screw;

7) output: **1** – electric connector, **2/x** – a connection with a screened cable, x – cable length, m;

8) sensor execution with measurement accuracy according the norms of International Temperature Scale MTC-90: **A** (class A according GOST 6651/IEC 60751, absolute error limits  $\pm(0,15+0,002 \cdot |t|)$  °C), **S** (error limits  $\pm 0,1$  °C), **P** (error limits  $\pm 0,03$  °C); all limits for error shown working conditions of sensors exploitation;

9) mechanical execution category of sensor:

**1** – repairing product of accuracy executions A, S, P; climate execution **YXЛ2**; working ambient temperature range  $-40.. +60$  °C; temperature group on intrinsic safety according GOST 31610.11 – T6 Ga; an average operational service 50 years; vibro protection group N2 according GOST R 52931; groups M1, M2 according GOST 30631 and GOST 17516.1; sing Ga in intrinsic safety marking means, that intrinsic safety level for gases is very high;

**2** – repairing product of accuracy execution A; climate execution **YXЛ2**; working ambient temperature range  $-40.. +60$  °C; temperature group on intrinsic safety according GOST 31610.11 – T6 Ga; an average operational service 10 years; vibro protection V3 according GOST R 52931; groups of mechanical execution M1-M8, M13, M25, M26, M28, M29, M36, M38-M40 according GOST 30631 and GOST 17516.1;

**3** – repairing and not repairing product of accuracy execution A; climate execution **YXЛ2**, **YXЛ5**, **OM2**; working ambient temperature ranges; working ambient temperature range  $-40.. +85$  °C,  $-60.. +85$  °C,  $-100.. +85$  °C; temperature group on intrinsic safety according GOST 31610.11 – T6...T5 Ga; an average operational service 5 years; groups of mechanical execution M1-M9, M12, M13, M18, M21-M29, M31, M32, M35-M44, M46 according GOST 30631 and GOST 17516.1; protection to atmosphere pressure with execution **И** according GOST 15150, pressure 1,3.. 106,7 kPa.

10) cable length between measuring sensor plug and interface plug **xx cm**: for all sensors – 15 cm, for sensors **TSK** also 25 cm, for sensors of accuracy class A also 53, 90 cm;

11) galvanic division of sensor output: **1** – no, **2** – yes;

12) automatic interface plug heating at weather from: **1** – no, **2** – yes;

13) supply voltage: **1** – 3,3 V, **2** – 5 V;

14) seal defend material, see chapter 2 of Manual Operation.

**Order example:** temperature sensor Ferrum **TS-50 – liquid – DN50 – PN 4 MPa – 1 – 1 – 1 – A – 3 – 15 sm – 1 – 1 – 1 – fluoroplast. Plus commentary in free form.**

**Transducer order specification:** transducer Ferrum **RS485-USB (or RS485-RS485)**, dust and water protection IP66, category of mechanical execution 3 not repairing, input supply voltage  $+2.. +15$  V, nominal voltage of informative signals **RS485 or USB – 5 V**, with 7-contact connector of transducer and **USB cable (responsibly RS485 cable)** 1 m length with standard connector, **output voltage** of sensors supply **3,3 V or 5 V**.

**Guaranty term** for sensors and transducers of mechanical category 1-st on 60 months, 2-nd category on 36 months, 2-nd category on 18 months.

**Dear Customer!**

Our sensor is a high precision measuring tool.

In a case of neat and careful attitude provides the dozens years of unproblematic operation. If you have a necessity to adopt sensor Ferrum to some specific tasks, the Enterprise is ready to study such possibility.