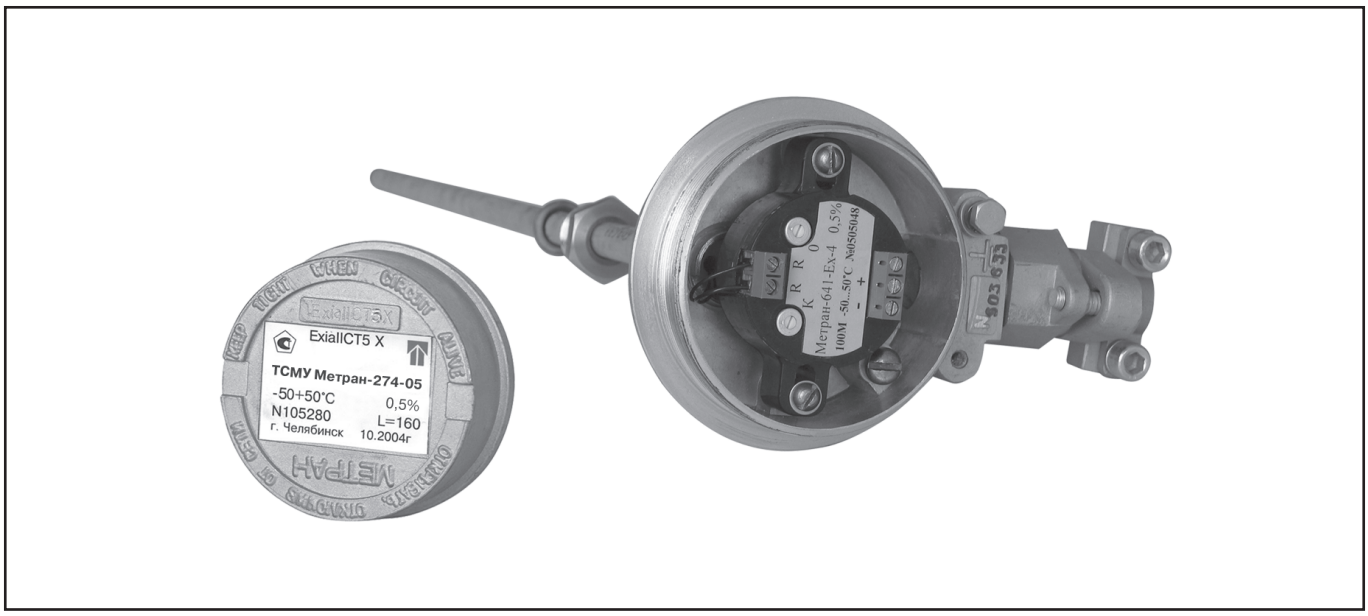
THAU Metran-271, TSMU Metran-274, TSPU Metran-276 Temperature Transmitters with Unified Output



Entered into the State Register of measuring instruments under #21968-05, certificate #20149.

Conformance certificate #ROSS RU.GB06.V00088 as per GOST R 51330.0; GOST R 51330.1; GOST R 51330.10

THAU Metran-271-Ex, TSMU Metran-274-Ex, TSPU Metran-276-Ex temperature transmitters can be used in explosion hazardous zones with explosive gas mixtures, steam, combustible fluids with air of IIA, IIB and IIC categories, T1-T6 groups per GOST 12.1.011.

Temperature transmitters are designed for temperature measurement of neutral and corrosive media to which the protection fitting material is corrosion resistant.

Primary converter sensor and measuring converter integral to the transmitter head transform measurable temperature into unified current output that gives the opportunity to create PCS (process control systems) without additional converters.

29 Komsomolsky pr., Chelyabinsk, 454138, Russia
t. +7 351 247 16 20, f. +7 351 247 16 67, e-mail: metran@metran.ru

SPECIFICATIONS AND PARAMETERS

Unified output ranges, standard curve of initial converter, converted temperature ranges, accuracy limits, output-temperature relation are given in Table 1.

Table 1

Transmitter Type and Version	RTD Type	Output, mA	Converted Temperature Range, °C	Accuracy Limit, ±γ,%	Output-Temperature Relation
THAU Metran-271	K*	4-20Ъ	-40...600, 0...600, 0...800, 0...900, 400...900, 0..1000	0.5; 1.0	linear
THAU Metran-271-Exia			0...600, 0...800		
THAU Metran-271-Exd					
TSMU Metran-274	100M	0-5 4-20Ъ	-50...100, -50...150, -50...50, 0...50, 0...100, 0...150, 0...180	0.25; 0.5	linear
TSMU Metran-274-Exia		4-20Ъ			
TSMU Metran-274-Exd					
TSPU Metran-276	100P Pt 100	0-5 4-20Ъ	-50...100, -50...150, 0...50, -50...50, 0...100, 0...200, 0...300, 0...400, 0...500	0.25; 0.5	linear
TSPU Metran-276-Exia		4-20Ъ			
TSPU Metran-276-Exd					

* In THAU Metran-271, -Exia, -Exd sensing element is made of KTMS (HA) thermocouple cable with thermoelectrodes laser welded.

Protection Fitting Material

Table 2

Material	Max Application Temperature, °C	Material Type Code
12Cr18Ni10Ti	800	N10
10Cr17Ni13Mo2Ti	800	N13
CrNi78Ti	1000	N78

Head material

- Technamid® A-SV-L poliamide - for standard version;
- AK12 alloy - for explosion-proof version.

Maximum Pressure (Pmax), Thermal Inertia Index (T)

Table 3

Fig.	Pmax, MPa	T, s
1	0.4	40
2	6.3	
3		20
4	0.4	40
5	6.3	
6		20
7	0.4	
8	6.3	
9		8
10		30
11		20
12, 13, 14, 15, 16, 17, 18, 19	0.4	8

Dust and water tightness for temperature transmitter is IP65 per GOST 14254.

Vibration proof - version Group V1 per GOST 12997.

Explosion protection marking

- ExiaIICT5, ExiaIICT6 with explosion protection "intrinsically safe electrical circuit" - "ia";
- 1ExdIICT5, 1ExdIICT6 with explosion protection "explosion- proof casing d".

Supply voltage

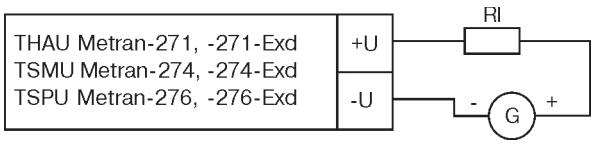
- **from 18 to 42 V** dc - for temperature transmitters with 4-20 mA output;
- **36 V** dc - for temperature transmitters with 0-5 mA output. Supply voltage tolerance is no more than ±2%;
- **from intrinsically safe (IS) power units (barriers) circuits** with explosion protection type "intrinsically safe electrical circuit" of "ia" level for explosive blends of IIC group per GOST 12.1.011 with Uxx **J** 24 V floating voltage, Isc **J** 120 mA short circuit current - for Exia temperature transmitters.

Power consumption

- no more than 0.9 W - for standard type temperature transmitters;
- no more than 0.5 W - for explosion-proof temperature transmitters.

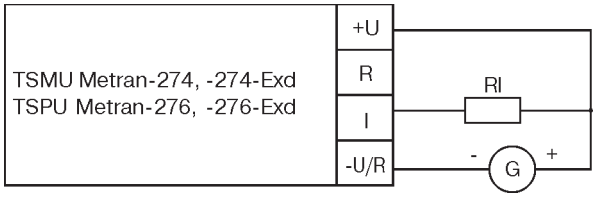
EXTERNAL WIRING DIAGRAM

4-20 mA output



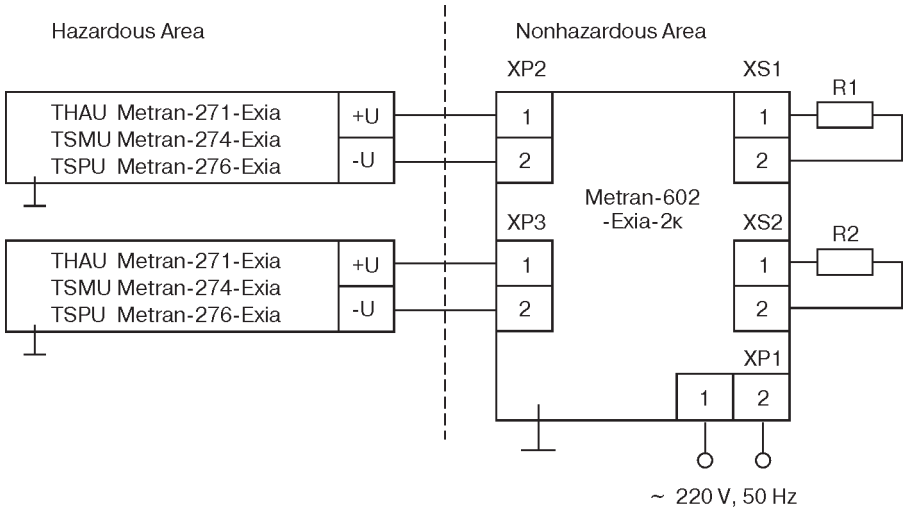
Rl - load resistance
100 < Rн < 1000 Ohm
G - power supply

0-5 mA output



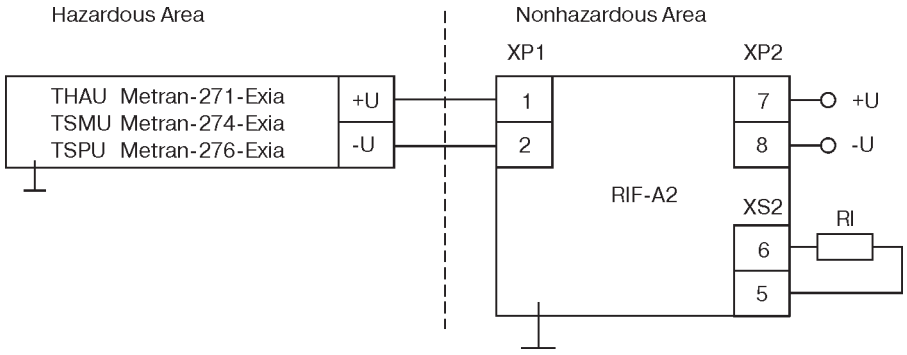
Rl - load resistance
100 < Rl < 2500 Ohm
G - power supply

With Metran-602-Exia-2k power unit



Communication Line Parameters, max	
R0	200 Ohm
C cable	0.1 mkF
L cable	1 mH
Line length	1000 m

With RIF-A2 IS barrier



Communication Line Parameters, max	
Rl	200 Ohm
C cable	0.1 mkF
L cable	1 mH
Line length	1000 m

Load resistance Rl:

- for 0-5 mA output - Rl=0.1...2.5 kOhm; Rnom=1000 Ohm;
- for 4-20 mA output - Rl=0.1...1.0 kOhm; Rnom=500 Ohm;
- for temperature transmitters of "intrinsically safe" version - Rnom ≤ 200 Ohm.

OVERALL AND MOUNTING DIMENSIONS

THAU Metran-271, TSMU Metran-274, TSPU Metran-276

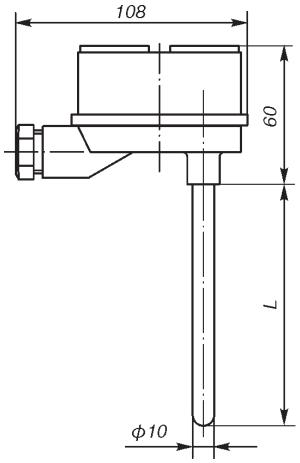


Fig.1.
THAU Metran-271-01
TSMU Metran-274-01
TSPU Metran-276-01

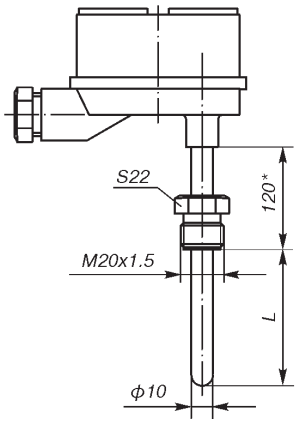


Fig.2. (refer to Fig.1).
THAU Metran-271-02
TSMU Metran-274-02
TSPU Metran-276-02

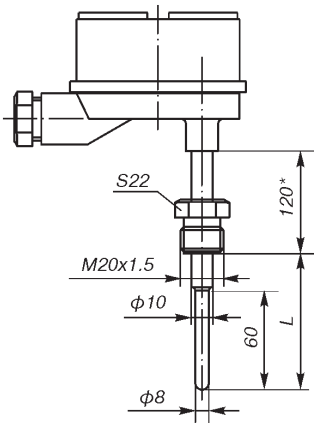


Fig.3. (refer to Fig.1).
THAU Metran-271-03
TSMU Metran-274-03
TSPU Metran-276-03

THAU Metran-271-Exia, TSMU Metran-274-Exia, TSPU Metran-276-Exia

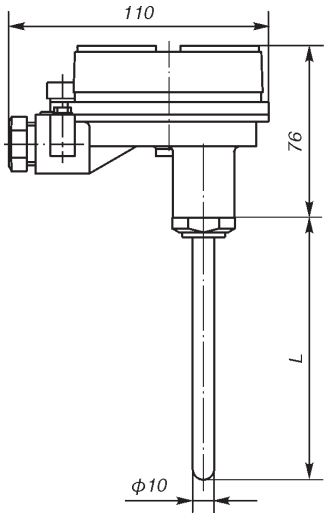


Fig.4.
THAU Metran-271-04-Exia
TSMU Metran-274-04-Exia
TSPU Metran-276-04-Exia

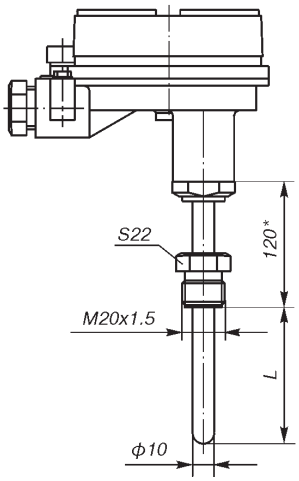


Fig.5.
THAU Metran-271-05-Exia
TSMU Metran-274-05-Exia
TSPU Metran-276-05-Exia

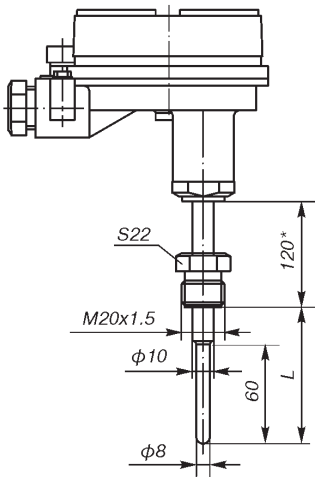


Fig.6.
THAU Metran-271-06-Exia
TSMU Metran-274-06-Exia
TSPU Metran-276-06-Exia

Standard Immersion Lenghts

Table 4

Fig.	Transmitter Type and Version	Immersion Length, L, mm																	
		60	80	100	120	160	200	250	320	400	500	630	800	1000	1250	1600	2000	2500	3150
1,4	TSMU Metran-274, -Exia, TSPU Metran-276, -Exia	-	-	C	+	+	+	+	+	+	+	+	+	+	+	-	-	-	-
2,5		+	+	+	+	+	+	+	+	+	+	+	+	+	+	-	-	-	-
3,6		C	C	+	+	+	+	+	+	+	+	+	+	+	+	-	-	-	-
Weight, kg		0.32...0.52				0.45...0.65							0.75...0.83		1.00...1.25			1.5...1.6	
1,4	THAU Metran-271, -Exia	-	-	C	+	+	+	+	+	+	+	+	+	+	+	+	+	*	*
2,5		+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+
3,6		C	C	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+
Weight, kg		0.4...0.55				0.5...0.70							0.80...0.95		1.10...1.35			1.55...1.65	

Orders taken:

For measured temperature range: -50...300°C

For measured temperature range: 0...500°C

C — After supplementary agreement

THAU Metran-271-Exd, TSMU Metran-274-Exd, TSPU Metran-276-Exd

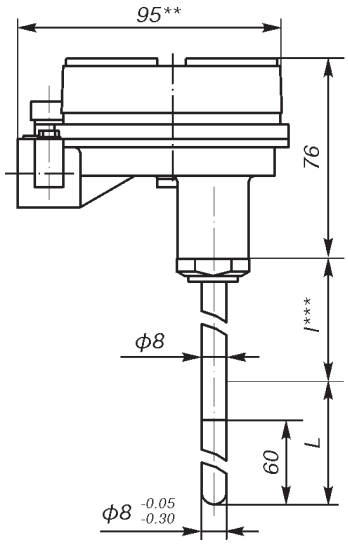


Fig.7.
THAU Metran-271-07-Exd
TSMU Metran-274-07-Exd
TSPU Metran-276-07-Exd

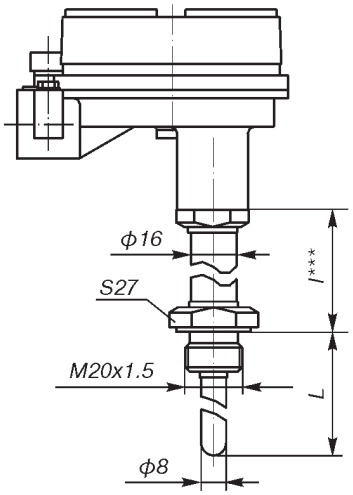


Fig.8 (refer to Fig.7)
THAU Metran-271-08- Exd
TSMU Metran-274-08-Exd
TSPU Metran-276-08-Exd

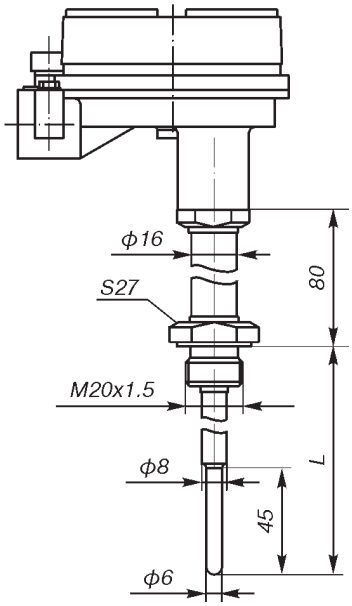


Fig.9 (refer to Fig.7)
TSMU Metran-274-09-Exd, TSPU Metran-276-09-Exd

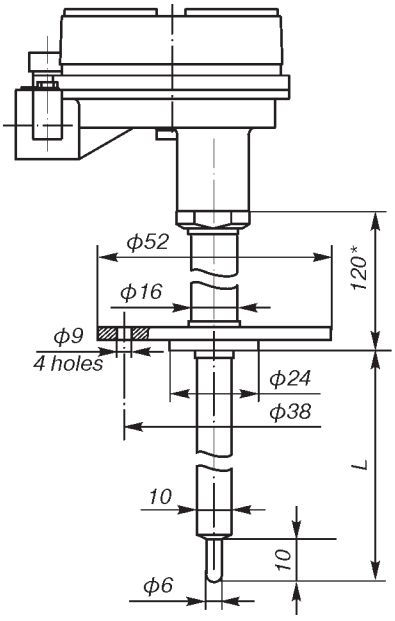


Fig.10 (refer to Fig.7)
THAU Metran-271-10-Exd

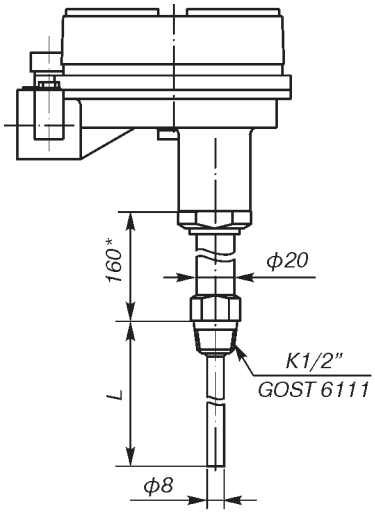


Fig.11 (refer to Fig.7)
THAU Metran-271-11-Exd

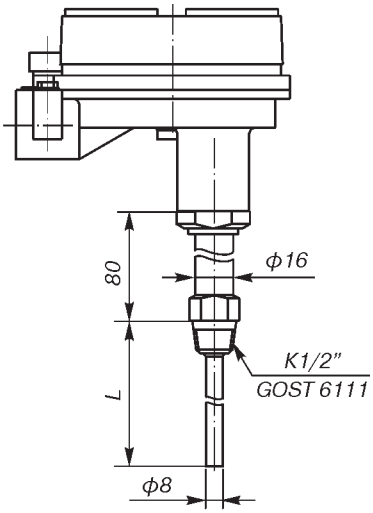


Fig.12* (refer to Fig. 7)
TSPU Metran-276-12-Exd

* In order to prevent the influence of process temperature on electronic transmitter for high-temperature processes it is possible to manufacture THAU Metran-271, -Exia, -Exd with 160 mm or 200 mm extension length under special order. 160 or 200 mm extension length is manufactured after supplementarry agreement.

** Cable entries are not symbolically shown, ref."Mounting Sets for Cable Entry" section.

*** l = 120, 160, 200 mm (see ref.*) - for THAU Metran-271-Exd in Fig.7, 8;
l = 80 mm - for TSMU Metran-274-Exd in Fig.7, 8 and for TSPU Metran-276-Exd in Fig.7, 8.

Standard Immersion Lengths

Table 5

Fig.	Transmitter Type and Version	Immersion Length, L, mm																	
		60	**80**	**100**	**120**	**160**	**200**	**250**	**320**	**400**	**500**	**630**	**800**	**1000**	**1250**	**1600**	**2000**	**2500**	**3150**
7	TSMU Metran-274 Exd, TSPU Metra-276 Exd	C	C	C	+	+	+	+	+	+	+	+	+	+	+	-	-	-	-
8		+	+	+	+	+	+	+	+	+	+	+	+	+	+	-	-	-	-
9		C	C	+	+	+	+	+	+	C	C	C	C	C	C	-	-	-	-
Weight, kg		0.93...0.95				0.85...1.05			0.92...1.05				1.2...2.7						
		60	**80**	**100**	**120**	**160**	**200**	**250**	**320**	**400**	**500**	**630**	**800**	**1000**	**1250**	**1600**	**2000**	**2500**	**3150**
7	THAU Metran-271 Exd	C	C	C	C	+	+	+	+	+	+	+	+	+	+	+	+	C	C
8		+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	C	C
10		+	+	+	+	+	+	+	+	C	C	C	C	C	C	C	C	C	C
11		C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C
12*	TSPU Metran-276-12-Exd	-	-	-	-	+	+	+	+	+	+	-	-	-	-	-	-	-	-
Weight, kg		0.93...0.95				0.85...1.05			0.92...1.05				1.2...2.7						

Orders taken:

For measured temperature range: -50...300°C

For measured temperature range: 0...500°C

C — After supplementary agreement

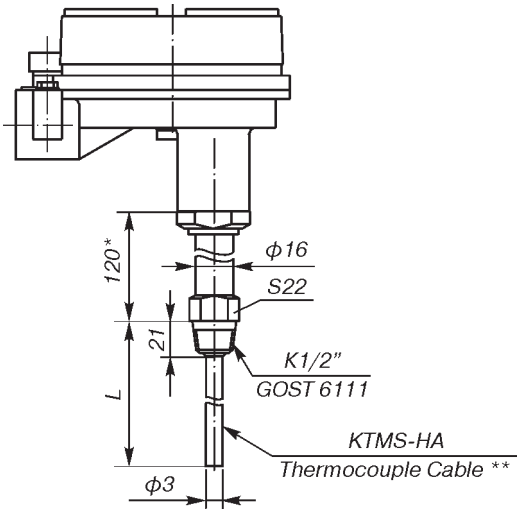


Fig. 12 (refer to Fig.7)
THAU Metran-271-12-Exd

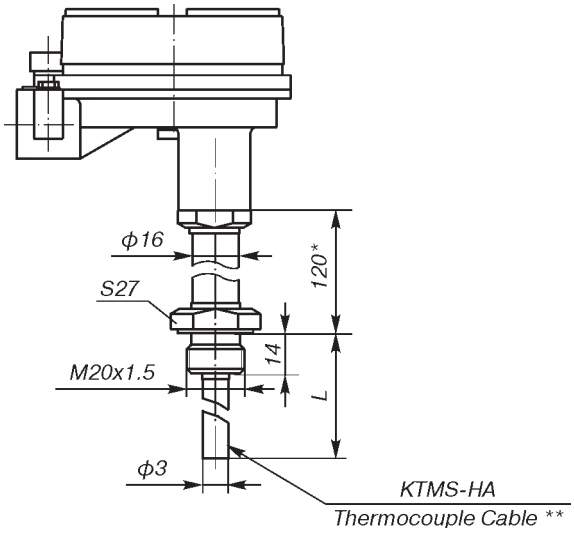


Fig.13 (refer to Fig.7)
THAU Metran-271-13-Exd

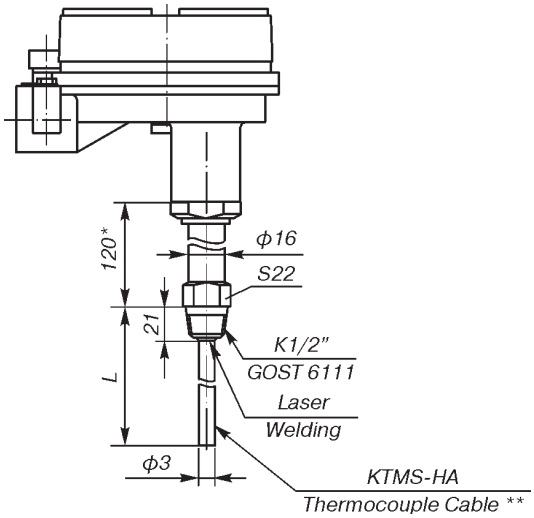


Fig.14 (refer to Fig.7)
THAU Metran-271-14-Exd

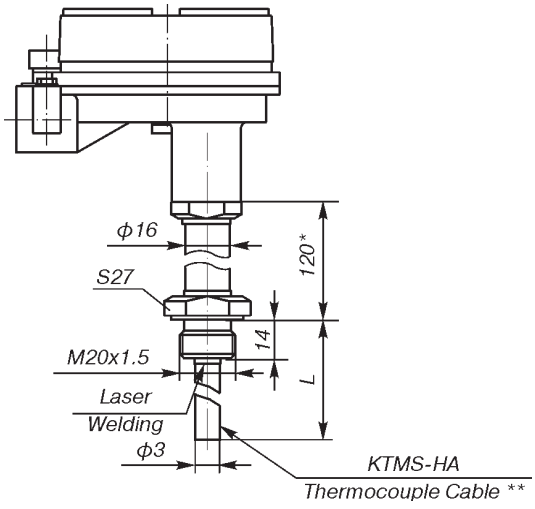


Fig.15 (refer to Fig.7)
THAU Metran-271-15-Exd

* In order to prevent the influence of process temperature on electronic transmitter for high-temperature processes it is possible to manufacture THAU Metran-271, -Exia, -Exd with 160 mm or 200 mm extension length under special order. 160 or 200 mm extension length is manufactured after supplementarry agreement.

** Submersible part of THAU Metran-271-12, -13, -14, -15-Exd is made of KTMS-HA thermocouple cable. When mounting, the submersible part can be bent, arranged in hard-to-reach places and pressed to the surface to measure the temperature.

Standard Immersion Lengths

Table 6

Fig.	Transmitter Type and Version	Immersion Length, L, mm																	
		60	**80**	**100**	**120**	**160**	**200**	**250**	**320**	**400**	**500**	**630**	**800**	**1000**	**1250**	**1600**	**2000**	**2500**	**3150**
12	THAU Metran-271 Exd	C	C	C	C	C	+	+	+	+	+	+	+	+	+	+	+	C	C
13		C	C	C	C	C	+	+	+	+	+	+	+	+	+	+	+	C	C
14		C	C	C	C	C	+	+	+	+	+	+	+	+	+	+	+	C	C
15		C	C	C	C	C	+	+	+	+	+	+	+	+	+	+	+	C	C
Weight, kg		0.95				1.1			1.15				1.25		1.36				

Orders taken:

For measured temperature range -50...300°C

C — After supplementary agreement

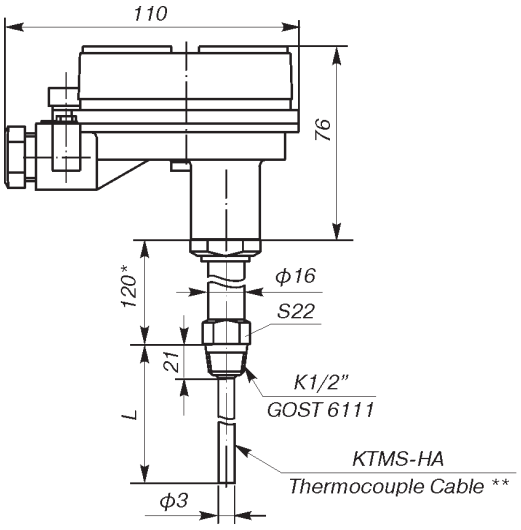


Fig.16
THAU Metran-271-16, -Exia

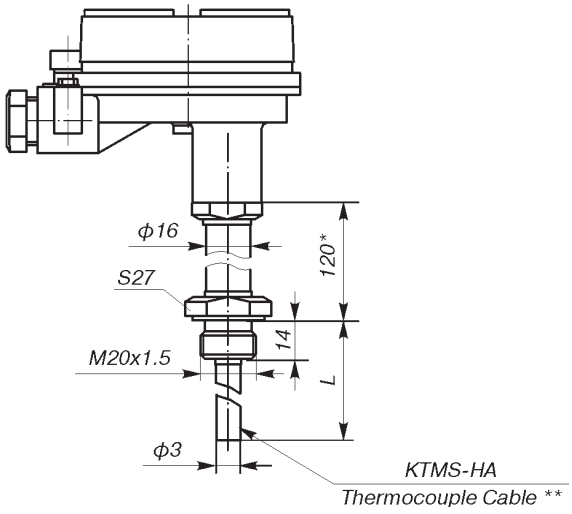


Fig.17 (refer to fig.16)
THAU Metran-271-17, -Exia

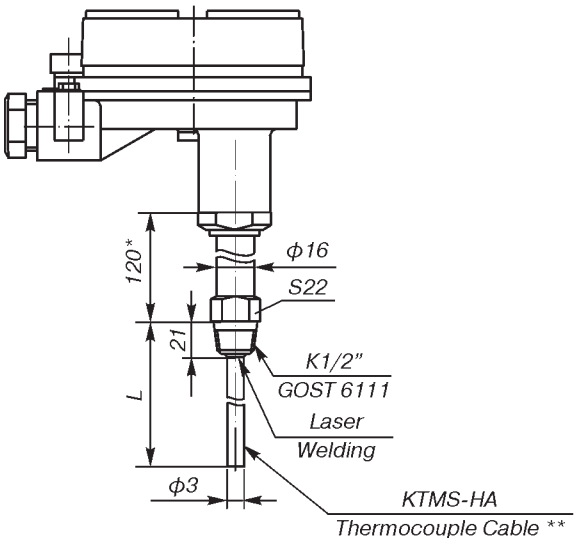


Fig.18 (refer to fig.16)
THAU Metran-271-18, -Exia

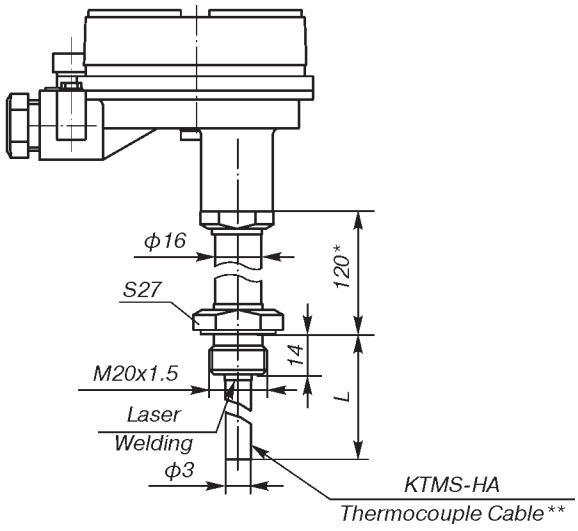


Fig.19 (refer to fig.16)
THAU Metran-271-19, -Exia

* In order to prevent the influence of process temperature on electronic transmitter for high-temperature processes it is possible to manufacture THAU Metran-271, -Exia, -Exd with 160 mm or 200 mm extension length under special order. 160 or 200 mm extension length is manufactured after supplementarry agreement.

** Submersible part of THAU Metran-271-16 (Exia), -17 (Exia), -18 (Exia), -19 (Exia) is made of KTMS-HA thermocouple cable. When mounting, the submersible part can be bent, arranged in hard-to-reach places and pressed to the surface to measure the temperature.кабе.

Table 7

Fig.	Transmitter Type and Version	Immersion Lengths, L, mm																	
		60	**80**	**100**	**120**	**160**	**200**	**250**	**320**	**400**	**500**	**630**	**800**	**1000**	**1250**	**1600**	**2000**	**2500**	**3150**
16	THAU Metran-271, -Exia	C	C	C	C	C	+	+	+	+	+	+	+	+	+	+	+	C	C
17		C	C	C	C	C	+	+	+	+	+	+	+	+	+	+	+	C	C
18		C	C	C	C	C	+	+	+	+	+	+	+	+	+	+	+	C	C
19		C	C	C	C	C	+	+	+	+	+	+	+	+	+	+	+	C	C
Weight, kg		0.95				1.1			1.15				1.25		1.36				

Average life time:
- TSMU, TSPU - minimum 5 years;
- THAU - minimum 2 years.

Nonfailure operating time:
- 8 hours (batch production);
- 48 hours (export version);
- 360 hours (special order - under supplementary agreement).

Warranty period: 18 months from the date of commissioning.

Verification interval: 1 year (verification procedure is given in the Operation Manual).

Climatic modification:
- U1.1 per GOST 15150 only for operation at ambient temperature values from -45 to +70°C;
for Ex version of T6 temperature class from -20 to +40°C; T5 temperature class from -45 to +70°C;
by special order from -50 to +85°C;
- T3 per GOST 15150 only for operation at ambient temperature values from -10 to +70°C;
for Ex version of T6 temperature class from-10 to 40°C; T5 temperature class from -10 to +70°C.

ORDERING INFORMATION

TSMU Metran-274-08 - Exd - 200 - 0,5 - N10 - (0...100)°C - 4-20 mA - AC - T6 - U1.1(...) - TU... - GP												
1	*2*	*3*	*4*	*5*	*6*	*7*	*8*	*9*	*10*	*11*	*12*	*13*

1. Temperature transmitter:
   - THAU Metran-271
   - TSMU Metran-274
   - TSPU Metran-276
2. Protection fitting type code:
   - **01** fig.1
   - **02** fig.2
   - **03** fig.3
   - **04** fig.4
   - **05** fig.5
   - **06** fig.6
   - **07** fig.7
   - **08** fig.8
   - **09** fig.9 (TSMU Metran-274-Exd, TSPU Metran-276-Exd only)
   - **10** fig.10 (THAU Metran-271-Exd only)
   - **11** fig.11 (THAU Metran-271-Exd only)
   - **12** fig.12* (TSPU Metran-276-Exd only)
   - **12** fig.12 (THAU Metran-271-Exd only)
   - **13** fig.13 (THAU Metran-271-Exd only)
   - **14** fig.14 (THAU Metran-271-Exd only)
   - **15** fig.15 (THAU Metran-271-Exd only)
   - **16** fig.16 (THAU Metran-271, -Exia only)
   - **17** fig.17 (THAU Metran-271, -Exia only)
   - **18** fig.18 (THAU Metran-271, -Exia only)
   - **19** fig.19 (THAU Metran-271, -Exia only)
3. Explosion protection (for explosion proof temperature transmitters only):
   - **Exia** - intrinsically safe electrical circuit;
   - **Exd** - explosion proof casing.
4. Immersion length, L (Table 4, 5, 6, 7).
5. Absolute values of reference accuracy limit (Table 1).
6. Protection fitting material type code (Table 2).
7. Converted temperature range (Table 1).
8. Output (Table 1).
9. Mounting set (for THAU Metran-271-Exd, TSMU Metran-274-Exd, TSPU Metran-276-Exd only; ref. "Mounting Sets for Cable Entry" section):
   - **AC** armored cable;
   - **MM** manifold mounting
10. Temperature class (for explosion-proof temperature transmitters only) per GOST R 51330.0
    - **T5**
    - **T6**
11. Climatic type per GOST 15150:
    - **U1.1** (indicate operation air temperature)
    - **T3**
12. Specifications TU 4211-003-12580824-2001.
13. Metrological verification:
    - **GP** Verification by GosStandard Authorities.