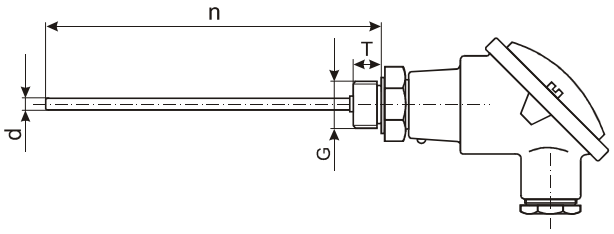
(MI) RTD PROBE WITH PROTECTION HEAD TSCx

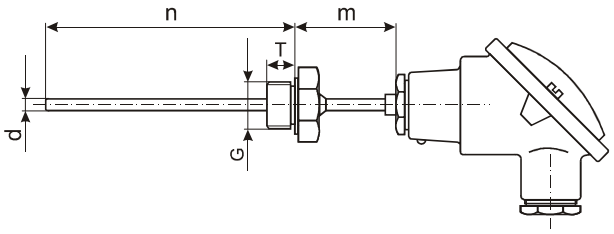
- FOR IN-HEAD TRANSMITTER ** TSOCx

Sheath - stainless steel (see Appendix - Sheath materials)
Head - aluminum, stainless steel, iron, or plastic (see Appendix - Protection heads)

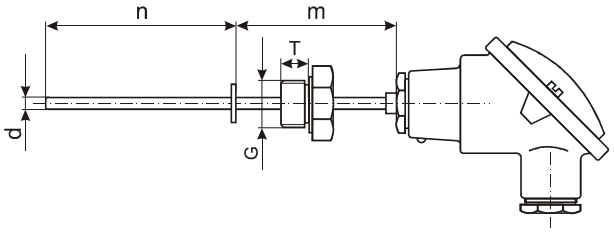
DESIGN WITHOUT EXTENSION (TS(O)C)



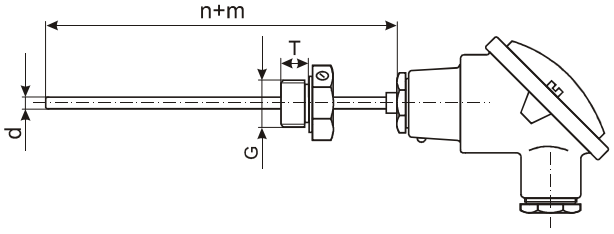
EXTENDED DESIGN WITH WELDED CONNECTION (TS(O)C1)



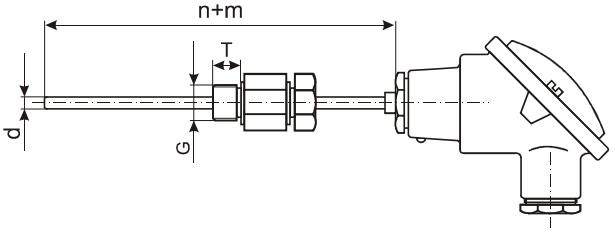
EXTENDED DESIGN WITH MOVABLE CONNECTION (TS(O)C2)



DESIGN WITH ADJUSTABLE CONNECTION (TS(O)C3)



DESIGN WITH GLAND-TYPE CONNECTION (TS(O)C4)



SENSITIVE ELEMENT	TEMPERATURE RANGE	DIMENSIONS n [mm]	DIMENSIONS d [mm]	DIMENSIONS wires
Regular Design				
1 x Pt (RB,RD,RF,RG)	T9 -50...200 °C T1 -50...400 °C T24 -50...500 °C T11* -50...600 °C T2* -200...600 °C T4* 0...800 °C T26 -200...150 °C T22 -200...200 °C	50…500	4	2, 3*
			5	
		50…1500	6	2, 3, 4*
		50…3000	8, 10, 12, 14, 16, 20	2, 3, 4
2(3) x Pt (RB,RD,RF,RG)		50…3000	6*, 8, 10	2x2(3)*
			12, 14, 16, 20	2x2(3), 3x2
1 x Cu (RH, RK)	T9 -50...200 °C	50…1500	6	2, 3, 4*
		50…3000	8, 10, 12, 14, 16, 20	
2 x Cu (RH, RK)	T9 -50...200 °C	50…3000	8, 10	2x2
			12, 14, 16, 20	2x2(3)*
1 x PTC (RP, RQ)	T12 -50...100 °C	50…1500	6	2, 3
		50…3000	8, 10, 12, 14	
2 x PTC (RP, RQ)		50…3000	8, 10, 12, 14	2x2
MI Design				
1 x Pt (RB,RD,RF,RG)	T9 -50...200 °C T1 -50...400 °C T24 -50...500 °C T11* -50...600 °C T2* -200...600 °C T4* 0...800 °C T22 -200...200 °C	50...50000	3*	2, 3*
			4.5	2, 3*
			6	2, 3, 4*
			8	2, 3, 4
2 x Pt (RB,RD,RF,RG)		50...50000	6, 8	2x2, 2x3*

Protection head:
B, MA, MB, G, N, Cx, Dx, Ex (see Appendix - Protection Heads)

Process connection 'G' (nipple or union nut):
- M16x1.5(Q0), M18x1.5(Q1), M20x1.5(Q2), M27x2(Q5), M33x2(Q25)
- 3/8"(Q3/Q9), 1/2"(Q4/Q10), 3/4"(Q6/Q11), 1"(Q12/Q15)
- welded or adjustable flange
- other
- w/o mounting appliances

Thread length:
- cylindrical thread: T = 15 mm
- NPT thread: according to ANSI B1.20.1

Thermal isolation between nipple and metal head: (for TS(O)C only)

Protection head	Length 'n'
MA, MB	up to 50 mm
B	up to 100 mm
other	up to 150 mm

Maximum temperature	Insulation material
200 °C	POM
400 °C	Teflon®

Extension length:
m = 0…1500 mm

Extension diameter: (for TS(O)C1 and TS(O)C2 only, [mm])

Ext. length 'm' \ Probe diameter 'd'	3, 4 mm	4.5...6 mm	8 mm	10 mm	10+ mm
up to 50 mm	8	d	d	d	d
50...150 mm	8	8	d	d	d
150...500 mm	10	10	10	d	d
500+ mm	14	14	14	14	d

Tip shape:
standard, narrowed, pitted (see Appendix - Tip Shapes)

Process pressure:

Probe design	TS(O)C, TS(O)C1	TS(O)C2	TS(O)C4	TS(O)C3
Max. pressure *	25 bar	16 bar	6 bar	0 bar

Sheath material:
1.4301(M1), 1.4401/1.4404(M9), 1.4541(M2), 1.4571(M3), 1.4362(M15)

Wire material:
Cu, Ni, or Ag

Accuracy class:
'A', 'B', or '2xB' (see Appendix - RTD Tolerance)

* Please contact COMECO!

** Order transmitter separately!!!

Ordering code TS✶(1,2,3,4) - (MI -) G0.G1G2.G3.G4.G6.G7.G9'9".G10.G11.G12.G13.G14 - #1.#2

Code	Feature or option		Code values
✶	Base model variant		C - standard (w/ terminal block), OC - prepared for in-head transmitter (w/o terminal block)
G0	Protection head		B - type "B", CC - type "CC", CS - type "CS" (11), D - type "D", DH - type "DH", DHW - type "DHW", DW - type "DW", E - type "E", EG - type "EG", EGS - type "EGS", EGSS - type "EGSS" (11), EGW - type "EGW", EGWSS - type "EGWSS" (11), ES - type "ES" (11), G - type "G", MA - type "MA", MB - type "MB", N - type "N"
G1	Number of RTD sensors		1, 2, or 3 (11)
G2	Sensor		RB - Pt50, RD - Pt100, RF - Pt500, RG - Pt1000, RH - Cu50, RK - Cu100, RP - PTC 1k, RQ - PTC 2k
G3	Temperature range		T1 - -50…400 °C, T2 - -200…600 °C, T4 - 0…800 °C, T9 - -50…200 °C, T11 - -50…600 °C, T22 - -200…200 °C, T24 - -50…500 °C, T26 - -200…150 °C
G4	Diameter 'd' [mm]	regular design	4, 5, 6, 8, 10, 12, 14, 16, 20
		MI design	3 (11), 4.5, 6, 8
G6	Probe length 'n' [mm] (1)		50…50000 (see table overleaf)
G7	Probe length 'm' [mm] (2)		0…1500
G9'	Mounting connection		X - no mounting appliances , Q0 - M16x1.5, Q1 - M18x1.5, Q2 - M20x1.5, Q3 - G3/8", Q4 - G1/2", Q5 - M27x2, Q6 - G3/4", Q9 - 3/8" NPT, Q10 - 1/2" NPT, Q11 - 3/4" NPT, Q12 - G1", Q15 - 1" NPT, Q25 - M33x2, Uxx - union nut (xx - same as for Qxx), F - flange (specify!), Z - other connection (specify!)
G9"	Compression fitting ferrule (4)		BR - brass, GR - graphite, SS - stainless steel, TF - Teflon®
G10	Sheath material (wetted parts)	regular design	M1 - 1.4301, M2 - 1.4541, M3 - 1.4571, M9 - 1.4401 (1.4404), M15 - 1.4362 (11)
		MI design	M2 - 1.4541, M3 - 1.4571, M9 - 1.4401 (1.4404)
G11	Accuracy class		X - none (5), A - 'A', B - 'B', C - '2xB'
G12	Number of wires		2, 3, 4 (11)
G13	Wire material (6)		CU - copper (7), NI - nickel, AG - silver (8)
G14	Tip shape		X - standard closed, N - narrowed (8), P - pitted (8)
#1	Options		X - none, OV - vibration proof (spring terminals, MgO or Silicone filled, secured screws) , OT - thermal isolation (3), OP - electrochemically polished sheath surface (8)
#2	Incorporated devices		X - none, T - in-head transmitter (9), A - local indicator (10)

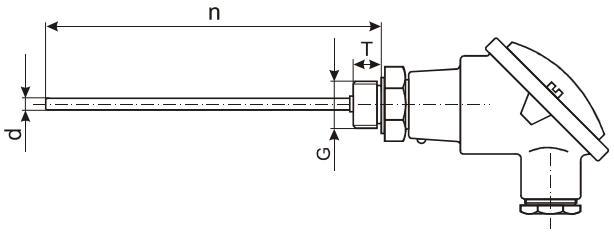
(1) 'n+m' for TS(O)C3 and TS(O)C4!
(2) Only for TS(O)C1 and TS(O)C2!
(3) Only for TS(O)C!
(4) Only for TS(O)C4!
(5) For non-Pt sensors
(6) Only for Pt sensors!
(7) Not applicable to non-MI (regular) RTDs for above 500 °C!
(8) Only for non-MI (regular) design!
(9) Only for variant 'OC'! See transmitter datasheets and order separately!
(10) With windowed head only! See indicator datasheets and order separately!
(11) Contact COMECO!

(MI) T/C PROBE WITH PROTECTION HEAD **TSCx**

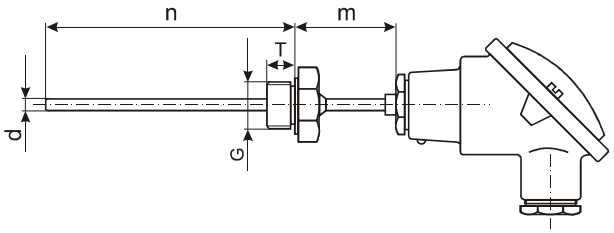
- FOR IN-HEAD TRANSMITTER ** **TSOCx**

Sheath - stainless steel (see Appendix - Sheath materials)
Head - aluminum, stainless steel, iron, or plastic (see Appendix - Protection heads)

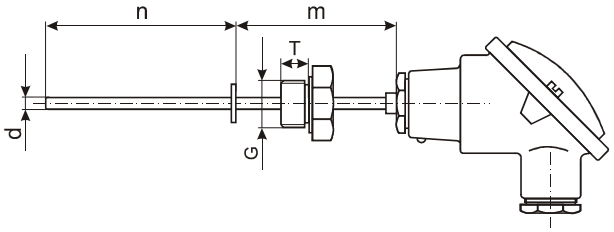
DESIGN WITHOUT EXTENSION (TS(O)C)



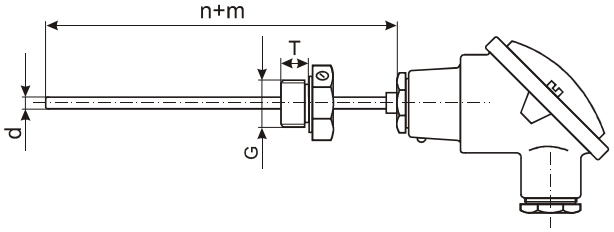
EXTENDED DESIGN WITH WELDED CONNECTION (TS(O)C1)



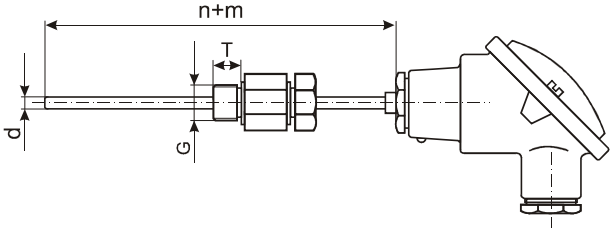
EXTENDED DESIGN WITH MOVABLE CONNECTION (TS(O)C2)



DESIGN WITH ADJUSTABLE CONNECTION (TS(O)C3)



DESIGN WITH GLAND-TYPE CONNECTION (TS(O)C4)



SENSITIVE ELEMENT	TEMPERATURE RANGE	DIMENSIONS n [mm]	d [mm]	wires
Regular Design				
1(2) x J 1(2) x L	T4 0...800 °C	50...1500 50...3000	6 8, 10, 12, 14, 16, 20, 22	2 (2x2)
1(2) x K	T3 0...850 °C T16 0...1100 °C T6* 0...1150 °C	50...1500 50...3000	6 8, 10, 12, 14, 16, 20, 22	2 (2x2)
1(2) x E	T3 0...850 °C T13 0...1000 °C	50...1500 50...3000	6 8, 10, 12, 14, 16, 20, 22	2 (2x2)
1(2) x S 1(2) x R	T16 0...1100 °C T6* 0...1150 °C	50...1500 50...3000	6 8, 10, 12, 14, 16, 20, 22	2 (2x2)
MI Design				
1 x J	T4 0...800 °C	50...50000	3, 4.5, 6, 8, 10*	2
2 x J				2x2
1 x T	T8 0...400 °C	50...50000	3, 4.5, 6, 8, 10*	2
2 x T				2x2
1 x K 1 x N, 1 x E	T3 0...850 °C T16 0...1100 °C	50...50000	3, 4.5, 6, 8, 10*	2
2 x K 2 x N, 2 x E	T6* 0...1150 °C T6* 0...1250 °C	50...50000	3, 4.5, 6, 8, 10*	2x2
2 x S 2 x R	T16 0...1100 °C T6* 0...1150 °C	50...10000	3, 4.5, 6	2x2

Protection head:
B, MA, MB, G, N, Cx, Dx, Ex (see Appendix - Protection Heads)

Process connection 'G' (nipple or union nut):
- M16x1.5(Q0), M18x1.5(Q1), M20x1.5(Q2), M27x2(Q5), M33x2(Q25)
- 3/8"(Q3/Q9), 1/2"(Q4/Q10), 3/4"(Q6/Q11), 1"(Q12/Q15)
- welded or adjustable flange
- other
- w/o mounting appliances

Thread length:
- cylindrical thread: T = 15 mm
- NPT thread: according to ANSI B1.20.1

Thermal isolation between nipple and metal head: (for TS(O)C only)

Protection head	Length 'n'
MA, MB	up to 50 mm
B	up to 100 mm
other	up to 150 mm

Maximum temperature	Insulation material
200 °C	POM
400 °C	Teflon®

Extension length:
m = 0…1500 mm

Extension diameter: (for TS(O)C1 and TS(O)C2 only, [mm])

Probe diameter 'd' / Ext. length 'm'	3 mm	4.5, 6 mm	8 mm	10 mm	10+ mm
up to 50 mm	6	d	d	d	d
50...150 mm	8	8	d	d	d
150...500 mm	10	10	10	d	d
500+ mm	14	14	14	14	d

Tip shape (hot junction design):
standard (isolated), grounded, open-tube, exposed (see Appendix - Tip Shapes)

Process pressure:

Probe design	TS(O)C, TS(O)C1	TS(O)C2	TS(O)C4	TS(O)C3
Max. pressure *	25 bar	16 bar	6 bar	0 bar

Sheath material:
1.4401/1.4404(M9), 1.4541(M2), 1.4571(M3), 1.4762/1.4749(M4), 1.4841(M5), 1.4845(M6), 1.4876(M7), 2.4816(M8), 1.4362(M15)

MI sheath material:
1.4401/1.4404(M9), 1.4541(M2), 1.4571(M3), 1.4762/1.4749(M4), 1.4841(M5), 1.4876(M7), 2.4816(M8), Nicrobell®(M10)

Accuracy class:
'1' or '2' (see Appendix - T/C Tolerance)

* Please contact COMECO!

** Order transmitter separately!!!

Ordering code TS✶(1,2,3,4) - (MI -) G0.G1G2.G3.G4.G6.G7.G9'9".G10.G11.G14 - #1.#2

Code	Feature or option		Code values
✶	Base model variant		**C** - standard (w/ terminal block), **OC** - prepared for in-head transmitter (w/o terminal block)
G0	Protection head		**B** - type "B", **CC** - type "CC", **CS** - type "CS" [9], **D** - type "D", **DH** - type "DH", **DHW** - type "DHW", **DW** - type "DW", **E** - type "E", **EG** - type "EG", **EGS** - type "EGS" [9], **EGSS** - type "EGSS" [9], **EGW** - type "EGW", **EGWSS** - type "EGWSS" [9], **ES** - type "ES" [9], **G** - type "G", **MA** - type "MA", **MB** - type "MB", **N** - type "N"
G1	Number of thermocouples		**1** or **2**
G2	Thermocouple	regular design	**E** - type "E", **J** - type "J", **K** - type "K", **L** - type "L", **R** - type "R", **S** - type "S"
		MI design	**E** - type "E", **J** - type "J", **K** - type "K", **N** - type "N", **R** - type "R", **S** - type "S", **T** - type "T"
G3	Temperature range		**T3** - 0…850 °C, **T4** - 0…800 °C, **T6** - 0…1200 °C [9], **T13** - 0…1000 °C, **T16** - 0…1100 °C
G4	Diameter 'd' [mm]	regular design	**6**, **8**, **10**, **12**, **14**, **16**, **20** [1], **22** [1]
		MI design	**3**, **4.5**, **6**, **8**, **10**
G6	Probe length 'n' [mm] [2]		**50…50000** (see table overleaf)
G7	Probe length 'm' [mm] [3]		**0…1500**
G9'	Mounting connection		**X** - no mounting appliances [4], **Q0** - M16x1.5, **Q1** - M18x1.5, **Q2** - M20x1.5, **Q3** - G3/8", **Q4** - G1/2", **Q5** - M27x2, **Q6** - G3/4", **Q9** - 3/8" NPT, **Q10** - 1/2" NPT, **Q11** - 3/4" NPT, **Q12** - G1", **Q15** - 1" NPT, **Q25** - M33x2, **Uxx** - union nut (xx - same as for Qxx), **F** - flange (specify!), **Z** - other connection (specify!)
G9"	Compression fitting ferrule [5]		**BR** - brass, **GR** - graphite, **SS** - stainless steel, **TF** - Teflon®
G10	Sheath material (wetted parts)	regular design	**M2** - 1.4541, **M3** - 1.4571, **M4** - 1.4762 (1.4749), **M5** - 1.4841, **M6** - 1.4845, **M7** - 1.4876, **M8** - 2.4816, **M9** - 1.4401 (1.4404), **M15** - 1.4362
		MI design	**M2** - 1.4541, **M3** - 1.4571, **M4** - 1.4762 (1.4749), **M5** - 1.4841, **M7** - 1.4876, **M8** - 2.4816, **M9** - 1.4401 (1.4404), **M10** - Nicrobell®
G11	Accuracy class		**1** - '1' [9], **2** - '2'
G14	Tip shape (hot junction)		**X** - standard (isolated from sheath), **G** - grounded, **E** - exposed hot junction, **O** - open-tube design
#1	Options		**X** - none, **OV** - vibration proof (spring terminals [9], secured screws), **OT** - thermal isolation [4], **OP** - electrochemically polished sheath surface [6]
#2	Incorporated devices		**X** - none, **T** - in-head transmitter [7], **A** - local indicator [8]

[1] d = 21.3 mm for sheath materials 'M5' and 'M6'
[2] 'n+m' for TS(O)C3 and TS(O)C4!
[3] Only for TS(O)C1 and TS(O)C2!
[4] Only for TS(O)C!
[5] Only for TS(O)C4!
[6] Only for non-MI (regular) design!
[7] Only for variant 'OC'! See transmitter datasheets and order separately!
[8] With windowed head only! See indicator datasheets and order separately!
[9] Contact COMECO!