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Mineral-insulated resistance thermometers to EN 60 751



- **for temperatures from -50 (-200) to +600°C**
- **flexible sheath with shock-protected sensor**
- **as single or twin resistance thermometer in 2-wire, 3-wire or 4-wire circuit**
- **fast response time**
- **application-specific fitting length**

Thanks to their special properties, mineral-insulated resistance thermometers are used in chemical plants, power stations, pipelines, in engine construction, on test beds and in all applications where flexibility and problem-free replacement are required. The low-resistance internal copper conductors are embedded in compressed heat-resistant magnesium oxide inside a flexible thin-walled sheath in stainless steel.

The temperature sensor in 2-wire, 3-wire or 4-wire circuit is connected to the internal wires and fitted in the stainless steel protection tube. Protection tube and sheath are welded together. Diameters as small as 1.9mm are available.

The excellent heat transfer between the protection tube and the temperature sensor enables short response times ($t_{0.5}$ from 0.7sec) and high accuracy. The shock-proof construction ensures a long life. The flexible probe tube permits temperature measurement at points that are difficult to reach. The smallest bending radius is 5 times the external diameter.

The measuring insert is normally fitted with a Pt100 temperature sensor to EN 60 751, Class B in 2-wire circuit. Versions with Pt500 or Pt1000 are also available. 3-wire or 4-wire circuit connections can be provided.

Technical data

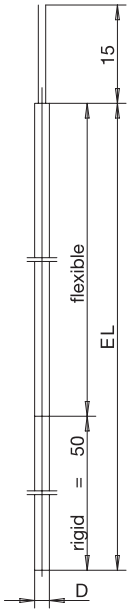
Terminal head	Form J, aluminium die-casting, M 16x1.5; IP54, ambient temperature -40 to +100°C Caution: reduced ambient temperature when using transmitters, Data Sheet 70.7030 (95.6530)
Connection	cable ends available as: bare wires, with ferrules, receptacles or multipole connector
Connecting cable	silicone, ambient temperature -50 to +180°C PTFE, ambient temperature -190 to +260°C metal braiding, ambient temperature -50 to +350°C
Process connection	thread, stainless steel 1.4571
Protection tube	stainless steel 1.4541, 1.9mm, 3mm and 6mm dia.
Measuring insert	Pt100 temperature sensor, EN 60 751, Cl. B, 2-wire circuit
Response times	in water with 0.4m/sec / in air with 3m/sec 1.9mm dia.: water $t_{0.5}$ = 0.7sec, $t_{0.9}$ = 2.1sec / air $t_{0.5}$ = 7.2sec, $t_{0.9}$ = 20.5sec 3.0mm dia.: water $t_{0.5}$ = 1.3sec, $t_{0.9}$ = 4.0sec / air $t_{0.5}$ = 13.5sec, $t_{0.9}$ = 41.0sec 6.0mm dia.: water $t_{0.5}$ = 5.0sec, $t_{0.9}$ =11.5sec / air $t_{0.5}$ = 37.5sec, $t_{0.9}$ = 117.5sec
Transmitter	analog transmitter, output 4 - 20mA, Data Sheet 70.7030 (95.6530)

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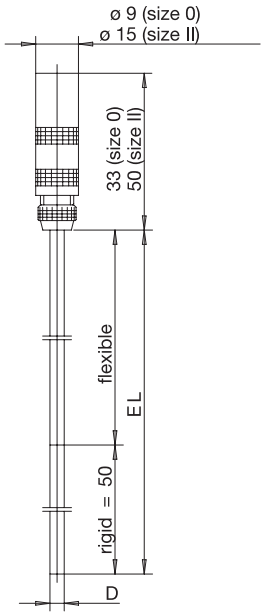
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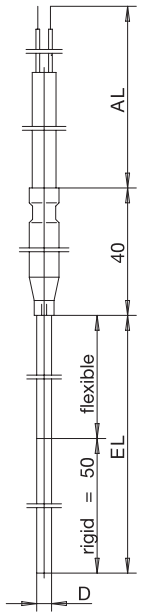
Dimensions



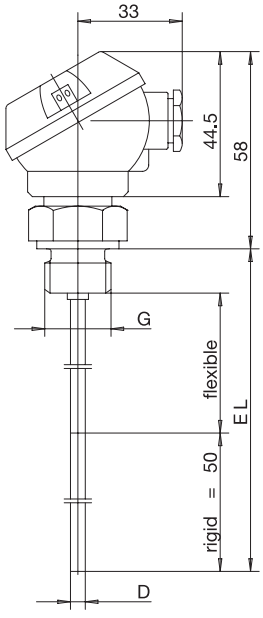
Type 902210/10



Type 902240/20



Type 902250/3x



Type 902230/40

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Order details: Mineral-insulated resistance thermometers to EN 60 751

(1) Basic version

902210/10 Mineral-insulated resistance thermometer with bare connecting wires



902240/20 Mineral-insulated resistance thermometer with Lemosa connector



			(2) Operating temperature in °C
x	x	150	-200 to +600°C
x	x	415	-50 to +600°C (standard)
			(3) Measuring insert
x	x	1001	1 x Pt100 in 3-wire circuit
x	x	1003	1 x Pt100 in 2-wire circuit
x	x	1005	1 x Pt1000 in 2-wire circuit (only for -50 to +600°C)
x	x	1006	1 x Pt1000 in 3-wire circuit (only for -50 to +600°C)
x	x	1011	1 x Pt100 in 4-wire circuit
x		2001	2 x Pt100 in 3-wire circuit (only in conjunction with D 6mm)
x	x	2003	2 x Pt100 in 2-wire circuit
			(4) Tolerance class to EN 60 751
x	x	1	Class B (standard)
x	x	2	Class A
x	x	3	Class 1/3 DIN
			(5) Protection tube diameter D in mm
x	x	1.9	1.9mm, with Type 902240/20 incl. Lemosa connector Size 0
x	x	3	3.0mm, with Type 902240/20 incl. Lemosa connector Size 0
x	x	6	6.0mm, with Type 902240/20 incl. Lemosa connector Size 2
			(6) Fitting length EL in mm (70≤ EL ≤1000)
x	x	100	100mm
x	x	200	200mm
x	x	300	300mm
x	x	...	please specify in plain text (50mm steps)

	(1)		(2)		(3)		(4)		(5)		(6)
Order code		-		-		-		-		-	
Order example	902240/20	-	415	-	1001	-	1	-	6	-	200

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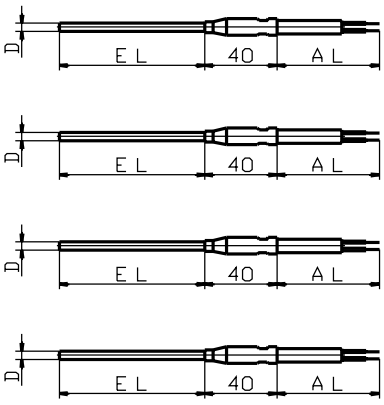
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Order details: Mineral-insulated resistance thermometers to EN 60 751

(1) Basic version

902250/30	Mineral-insulated resistance thermometer with PVC cable (cable temperature range -5 to +80 (+105°C)
902250/32	Mineral-insulated resistance thermometer with silicone cable (cable temperature range -50 to +180°C)
902250/33	Mineral-insulated resistance thermometer with PTFE cable (cable temperature range -190 to +260°C)
902250/34	Mineral-insulated resistance thermometer with metal-braided cable (cable temperature range -50 to +350°C)



					(2) Operating temperature in °C
x	x	x	x	150	-200 to +600°C
x	x	x	x	415	-50 to +600°C (standard)
					(3) Measuring insert
x	x	x	x	1001	1 x Pt100 in 3-wire circuit
x	x	x	x	1003	1 x Pt100 in 2-wire circuit
x	x	x	x	1005	1 x Pt1000 in 2-wire circuit (only for -50 to +600°C)
x	x	x	x	1006	1 x Pt1000 in 3-wire circuit (only for -50 to +600°C)
x	x	x	x	1011	1 x Pt100 in 4-wire circuit
	x	x	x	2001	2 x Pt100 in 3-wire circuit (only in conjunction with D 6mm)
x	x	x	x	2003	2 x Pt100 in 2-wire circuit
					(4) Tolerance class to EN 60 751
x	x	x	x	1	Class B (standard)
x	x	x	x	2	Class A
x	x	x	x	3	Class 1/3 DIN
					(5) Protection tube diameter D in mm
x	x	x	x	1.9	1.9mm
x	x	x	x	3	3mm
x	x	x	x	6	6mm
					(6) Fitting length EL in mm (70≤ EL ≤1000)
x	x	x	x	100	100mm
x	x	x	x	200	200mm
x	x	x	x	300	300mm
x	x	x	x	...	please specify in plain text (50mm steps)
					(7) Connecting cable end
x	x	x	x	03	bare cable ends
x	x	x	x	11	ferrules to DIN 46 228 Part 4 (standard)
x	x	x	x	13	receptacle 6.3 to DIN 46 247
x	x	x	x	80	multipole connector (please specify type in plain text)
					(8) Connecting cable length AL in mm (500≤ AL ≤500000)
x	x	x	x	2500	2500mm
x	x	x	x	...	please specify in plain text (500mm steps)
					(9) Extra codes
x	x	x	x	000	no extra code
x	x	x	x	317	shielded connecting cable

	(1)		(2)		(3)		(4)		(5)		(6)		(7)		(8)		(9)
Order code		-		-		-		-		-		-		-		/	
Order example	902250/32	-	415	-	1001	-	1	-	3	-	200	-	11	-	2500	/	000

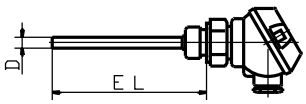
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Order details: Mineral-insulated resistance thermometers to EN 60 751

			(1) Basic version
	902230/40		Mineral-insulated resistance thermometer with terminal head Form J
			(2) Operating temperature in °C
x	150		-200 to +600°C
x	415		-50 to +600°C (standard)
			(3) Measuring insert
x	1001		1 x Pt100 in 3-wire circuit
x	1003		1 x Pt100 in 2-wire circuit
x	1005		1 x Pt1000 in 2-wire circuit (only for -50 to +600°C)
x	1006		1 x Pt1000 in 3-wire circuit (only for -50 to +600°C)
x	1011		1 x Pt100 in 4-wire circuit
x	2003		2 x Pt100 in 2-wire circuit
			(4) Tolerance class to EN 60 751
x	1		Class B (standard)
x	2		Class A
x	3		Class 1/3 DIN
			(5) Protection tube diameter D in mm
x	3		3mm
x	6		6mm
			(6) Fitting length EL in mm (100≤ EL ≤10000)
x	100		100mm
x	200		200mm
x	300		300mm
x	...		please specify in plain text (50mm steps)
			(7) Process connection
x	104		thread 1/2"pipe
x	105		thread 3/4"pipe
			(8) Extra codes
x	000		no extra code
x	330		1 x analog transmitter, output 4 - 20mA[2], Data Sheet 70.7030 (95.6530)



	(1)		(2)		(3)		(4)		(5)		(6)		(7)		(8)
Order code		-		-		-		-		-		-		/	
Order example	902230/40	-	415	-	1001	-	1	-	6	-	100	-	104	/	000

2. Please specify range in plain text.

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Stock versions

(1)		(2)		(3)		(4)		(5)		(6)		(7)		(8)		(9)	Sales No.
902250/32	-	150	-	1011	-	1	-	1,9	-	300	-	11	-	2500	/	000	90/00066531
902250/32	-	415	-	1003	-	1	-	3	-	100	-	11	-	2500	/	000	90/00068243
902250/32	-	415	-	1003	-	1	-	3	-	200	-	11	-	2500	/	000	90/00068244
902250/32	-	415	-	1003	-	1	-	3	-	300	-	11	-	2500	/	000	90/00055763
902250/32	-	415	-	1001	-	1	-	3	-	100	-	11	-	2500	/	000	90/00068247
902250/32	-	415	-	1001	-	1	-	3	-	300	-	11	-	2500	/	000	90/00055764
902250/32	-	415	-	1001	-	1	-	3	-	500	-	11	-	2500	/	000	90/00068248
902250/32	-	415	-	1001	-	1	-	6	-	300	-	11	-	2500	/	000	90/00055767
902250/32	-	415	-	1001	-	1	-	6	-	500	-	11	-	2500	/	000	90/00068250

Stock versions

(1)		(2)		(3)		(4)		(5)		(6)		(7)		(8)	Sales No.
902230/40	-	415	-	1003	-	1	-	3	-	100	-	104	/	000	90/00066731
902230/40	-	415	-	1003	-	1	-	3	-	300	-	104	/	000	90/00057512
902230/40	-	415	-	1003	-	1	-	6	-	200	-	104	/	000	90/00068252
902230/40	-	415	-	1003	-	1	-	6	-	300	-	104	/	000	90/00055775