

TERMO *ms*



TERMO MR d.o.o., Merilna tehnika, trgovina, uvoz - izvoz

Pekre, Pod izviri 8, 2000 Maribor, Slovenija

Telefon: ++386 (0)2 6140 610, Telefaks: ++386 (0)2 6140 611

Spletna stran: <http://www.termo-mr.si>, E-mail: info@termo-mr.si

Osnovna dejavnost podjetja TERMO MR d.o.o., je proizvodnja temperaturnih tipal za meritve in regulacije temperature v vseh panogah industrije, v energetiki in v industrijskih laboratorijih.

Uporovne termometre, s senzorji Pt 100, Pt 500 in Pt 1000, izdelujemo po evropskih normah DIN IEC-751, v tolerančnih klasah A, B in 1/3 DIN B, za temperaturna območja od -250°C do $+800^{\circ}\text{C}$. Izdelujemo jih v standardnih izvedbah in po zahtevah naročnikov, po njihovih skicah ali vzorcih.

Termoelemente izdelujemo po evropskih normah DIN IEC-584 : Fe-CuNi tip »J«, NiCr-Ni tip »K« in PtRh-Pt tipa »S« in »B« ter po DIN 43710 : Fe-CuNi tip »L«. Izdelujemo jih v ravnih in kotnih izvedbah, standardnih in nestandardnih dimenzij, klasično z žičnimi termopari v zaščitnih armaturah iz nerjavečega jekla, ognjeodpornega jekla, keramike in drugih materialov, ki jih narekujejo merjeni mediji, temperature in pogoji dela.

Posebna vrsta so plaščni termoelementi, ki so zaradi svojih dimenzij in gibljivosti zelo uporabni.

Izdelujemo tudi vtične termoelemente in uporovne termometre, predvsem za potrebe industrije predelave plastičnih mas in prehrabene industrije.

Za primere kjer klasična tipala niso primerna, ponudimo stacionarne in prenosne brezkontaktno merilce temperature.

Seveda k tipalom ponudimo tudi ves pribor in opremo za njihovo vgradnjo, priklop in delovanje, kot so vgradni in priključni elementi, konektorji, izenačevalni vodniki, merilni pretvorniki, digitalni indikatorji, regulatorji in registratorji.

TERMO MR d.o.o. (ltd.) is a company which produces temperature probes to measure and regulate temperature in all types of industry, energetics and industrial laboratories.

Resistance thermometers with sensors Pt 100, Pt 500 and Pt 1000 are produced in compliance with European norm standards DIN IEC-751, in tolerance classes A, B and 1/3 DIN B, for temperature ranges from -250°C to $+800^{\circ}\text{C}$. They are made in standard form and also according to customers' requirements, their plans or samples.

Thermocouples are manufactured in compliance with European norm standards DIN IEC-584: Fe-CuNi type »J«, NiCr-Ni type »K« and PtRh-Pt type »S« and »B« as well as in compliance with DIN 43710: Fe-CuNi type »L«. They are available in straight and in angle shape, in standard and non-standard dimensions, classic models with wire thermopares in protective reinforcement made of stainless steel, fire-proof steel, ceramics and other materials which depend on the measured media, temperature and work conditions.

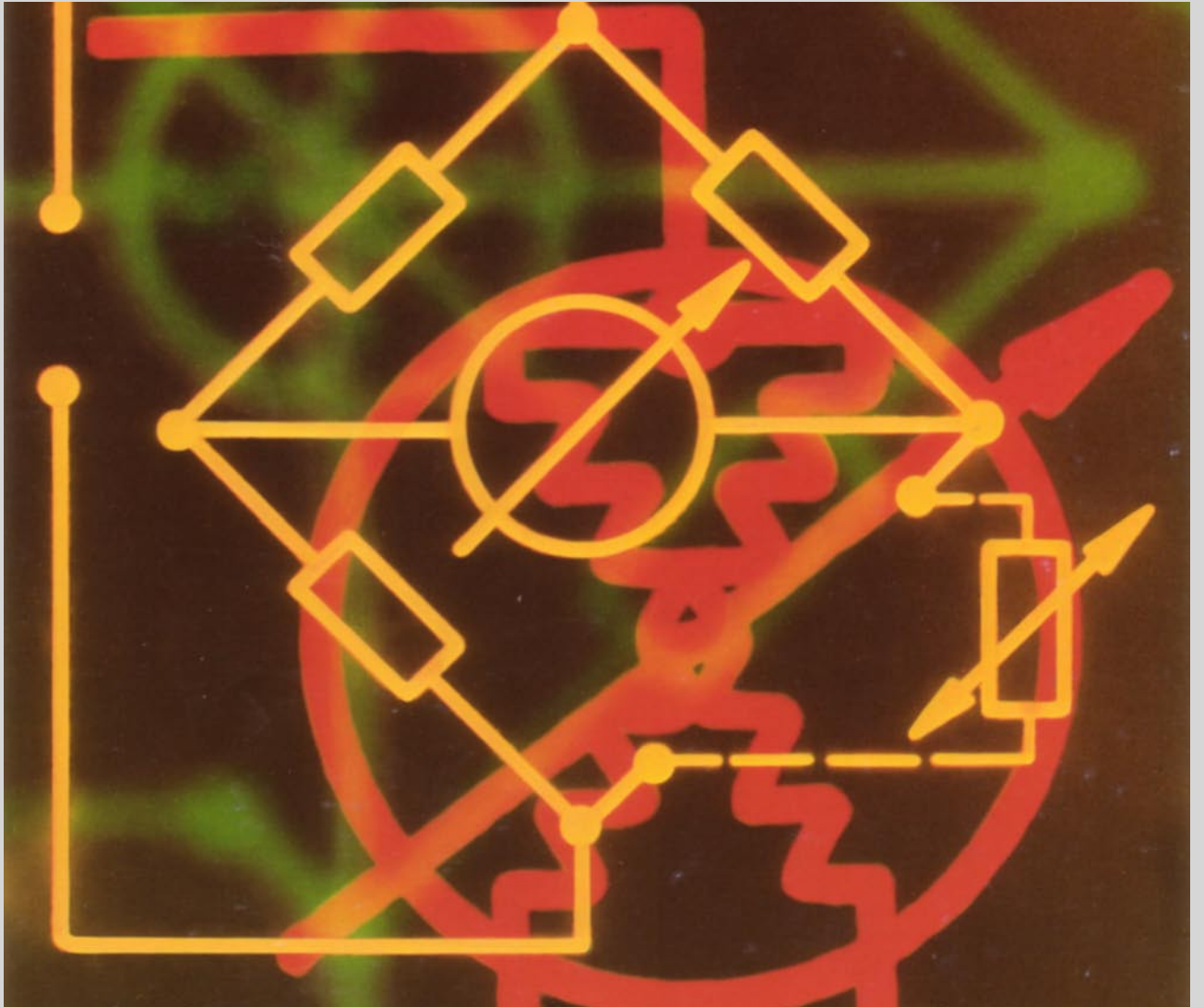
Due to their dimensions and flexibility mineral insulated thermocouples are particularly useful.

Also probes for machinery measurements and resistance thermometres are produced, mainly for plastic recycling industry and food industry.

Where classic probes are not suitable, stationary and handheld non-contact thermometers can be supplied.

Besides the probes, a complete range of tools and equipment for their installation, connection and functioning is available, e.g. installation and connection elements, connectors, conductors, transmitters, digital indicators, controllers and registrators.

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Tehnični podatki

Technical data

SMERNICE ZA PRAVILNO IZBIRO CEVI ZA TERMOELEMENTE

Material	Oznaka DIN-IEC / WNr.	Temp. °C	Mere mm	Uporabnost
Jeklo za povišane temp.	St.35.8 1.0305	550	15 x 2 22 x 2	Nevtralne in reducirane atmosfere in tekočine
Jeklo za povišane temp. Emajlirano	St.35.8 1.0305	600	15 x 2 22 x 2	Kovinske taline: svinec, cink, dimni plini, pare žveplovega dioksida, v žarilnih in vzdrževalnih pečeh
Jeklo za povišane temp.	13CrMo44 1.7335	550		Dušična atmosfera, žveplene snovi
Nerjaveče jeklo	X10CrNiTi189 1.4541	800	4-14 x 0.5-2.5	Odporno proti rji in kemičnim vplivom
Nerjaveče jeklo	X10CrNiMoTi189 1.4571	800	4-14 x 0.5-2.5	Odporno proti rji in kemičnim vplivom
Ognjeodporno jeklo	X15CrNiSi25 20 1.4841	1200	15 x 2 22 x 2	Dušična atmosfera z malo kisika
Ognjeodporno jeklo	X10CrAl24 1.4762	1200	15 x 2 22 x 2 26 x 4	Oksidirana in reducirana žveplena atmosfera Kovinske taline: baker, medenina
Tehnično čisto Fe	M2 1.1003	1200	22 x 5	Solne kopeli: soliter, cianid Kovinske taline: aluminij, cink, kositer
Termoelement keramika	C 610	1400	10 x 1.5 16 x 2 24 x 2.5	Plini vseh vrst brez alkalnih par in tekočih kislin Kovinske taline: aluminij, cink, baker, medenina
Porozna keramika	KER 530	1600	26 x 4	Plini vseh vrst ob uporabi notranjih plinotesnih cevi
Oksidna keramika	C 799	1800	7 x 1 10 x 1.5 15 x 2.5 24 x 3	Alkalne pare – peči za taljenje stekla
Grafit	GRT	1250	40 x 11	Kovinske taline: aluminij, medenina, baker
Lito železo s keramično prevleko	KIK	800	43 x 10	Kovinske taline: aluminij, cink
Si karbid z notranjo jekleno cevjo	SIC	1000	Ø 50	Kovinske taline: aluminij, cink
Industrijska keramika SYALON	SIA	1250	28 x 6	Taline aluminija

OSNOVNI PODATKI PO DIN 43760 / IEC 751 v Ohmih za Pt100

°C	-0	-1	-2	-3	-4	-5	-6	-7	-8	-9
-200	18,49	-	-	-	-	-	-	-	-	-
-190	22,80	22,37	21,94	21,51	21,08	20,65	20,22	19,79	19,36	18,93
-180	27,08	26,65	26,23	25,80	25,37	24,94	24,52	24,09	23,66	23,32
-170	31,32	30,90	30,47	30,05	29,63	29,20	28,78	28,35	27,93	27,50
-160	35,53	35,11	34,69	34,27	33,85	33,43	33,01	32,59	32,16	31,74
-150	39,71	39,30	38,88	38,46	38,04	37,63	37,21	36,79	36,37	35,95
-140	43,87	43,45	43,04	42,63	42,21	41,79	41,38	40,96	40,55	40,13
-130	48,00	47,59	47,18	46,76	46,35	45,94	45,52	45,11	44,70	44,28
-120	52,11	51,70	51,29	50,88	50,47	50,06	49,64	49,23	48,82	48,41
-110	56,19	55,78	55,38	54,97	54,56	54,15	53,74	53,33	52,92	52,52
-100	60,25	59,85	59,44	59,04	58,63	58,22	57,82	57,41	57,00	56,60
-90	64,30	63,90	63,49	63,09	62,68	62,28	61,87	61,47	61,06	60,66
-80	68,33	67,92	67,52	67,12	66,72	66,31	65,91	65,51	65,11	64,70
-70	72,33	71,93	71,53	71,13	70,73	70,33	69,93	69,53	69,13	68,73
-60	76,33	75,93	75,53	75,13	74,73	74,33	73,93	73,53	73,13	72,73
-50	80,31	79,91	79,51	79,11	78,72	78,32	77,92	77,52	77,13	76,73
-40	84,27	83,88	83,48	83,08	82,69	82,29	81,89	81,50	81,10	80,70
-30	88,22	87,83	87,43	87,04	86,64	86,25	85,85	85,46	85,06	84,67
-20	92,16	91,77	91,37	90,98	90,59	90,19	89,80	89,40	89,01	88,62
-10	96,09	95,69	95,30	94,91	94,52	94,12	93,73	93,34	92,95	92,55
0	100,00	99,61	99,22	98,83	98,44	98,04	97,65	97,26	96,87	96,48
°C	0	1	2	3	4	5	6	7	8	9
0	100,00	100,39	100,78	101,17	101,56	101,95	102,34	102,73	103,12	103,51
10	103,90	104,29	104,68	105,07	105,46	105,85	106,24	106,63	107,02	107,40
20	107,79	108,18	108,57	108,96	109,35	109,73	110,12	110,51	110,90	111,28
30	111,67	112,06	112,45	112,83	113,22	113,61	113,99	114,38	114,77	115,15
40	115,54	115,93	116,31	116,70	117,08	117,47	117,85	118,24	118,62	119,01
50	119,40	119,78	120,16	120,55	120,93	121,32	121,70	122,09	122,47	122,86
60	123,24	123,62	124,01	124,39	124,77	125,16	125,54	125,92	126,31	126,69
70	127,07	127,45	127,84	128,22	128,60	128,98	129,37	129,75	130,13	130,52
80	130,89	131,27	131,66	132,04	132,42	132,80	133,18	133,56	133,94	134,32
90	134,70	135,08	135,46	135,84	136,22	136,60	136,98	137,36	137,74	138,12
100	138,50	138,88	139,26	139,64	140,02	140,39	140,77	141,15	141,53	141,93
110	142,29	142,66	143,04	143,42	143,80	144,17	144,55	144,93	145,31	145,68
120	146,06	146,44	146,81	147,19	147,57	147,94	148,32	148,70	149,07	149,45
130	149,82	150,20	150,57	150,95	151,33	151,70	152,08	152,45	152,83	153,20
140	153,58	153,95	154,32	154,70	155,07	155,45	155,82	156,19	156,57	156,94
150	157,31	157,69	158,06	158,43	158,81	159,18	159,55	159,93	160,30	160,67
160	161,04	161,42	161,79	162,16	162,53	162,90	163,27	163,65	164,02	164,39
170	164,76	165,13	165,50	165,87	166,24	166,61	166,98	167,35	167,72	168,09
180	168,46	168,83	169,20	169,57	169,94	170,31	170,68	171,05	171,42	171,79
190	172,16	172,53	172,90	173,26	173,63	174,00	174,37	174,74	175,10	175,47
200	175,84	176,21	176,57	176,94	177,31	177,68	178,04	178,41	178,78	179,14
210	179,51	179,88	180,24	180,61	180,97	181,34	181,71	182,07	182,44	182,80
220	183,17	183,53	183,90	184,26	184,63	184,99	185,36	185,72	186,09	186,45
230	186,82	187,18	187,54	187,91	188,27	188,63	189,00	189,36	189,72	190,09
240	190,45	190,81	191,18	191,54	191,90	192,26	192,63	192,99	193,35	193,71
250	194,07	194,44	194,80	195,16	195,52	195,88	196,24	196,60	196,96	197,33
260	197,69	198,05	198,41	198,77	199,13	199,49	199,85	200,21	200,57	200,93
270	201,29	201,65	202,01	202,36	202,72	203,08	203,44	203,80	204,16	204,52
280	204,88	205,23	205,59	205,95	206,31	206,67	207,02	207,38	207,74	208,10
290	208,45	208,81	209,17	209,52	209,88	210,24	210,59	210,95	211,31	211,66
300	212,02	212,37	212,73	213,09	213,44	213,80	214,15	214,51	214,86	215,22
310	215,57	215,93	216,28	216,64	216,99	217,35	217,70	218,05	218,41	218,76

TABELA ZA UPOROVNE SENZORJE

°C	DOVOLJENA ODPSTAPANJA				1/3 DIN KLASSE B	
	Klasa A		Klasa B			
	Ω	°C	Ω	°C		
-200	± 0,24	± 0,55	± 0,56	± 1,3		
-100	± 0,14	± 0,35	± 0,32	± 0,8		
0	± 0,06	± 0,15	± 0,12	± 0,3	0,04 0,10	
100	± 0,13	± 0,35	± 0,30	± 0,8		
200	± 0,20	± 0,55	± 0,48	± 1,3		
300	± 0,27	± 0,75	± 0,64	± 1,8		
400	± 0,33	± 0,95	± 0,79	± 2,3		
500	± 0,38	± 1,15	± 0,93	± 2,8		
600	± 0,43	± 1,35	± 1,06	± 3,3		
650	± 0,46	± 1,45	± 1,13	± 3,6		
700	-	-	± 1,17	± 3,8		
800	-	-	± 1,28	± 4,3		
850	-	-	± 1,34	± 4,55		

OSNOVNE VREDNOSTI TERMONAPETOSTI ZA TERMOELEMENTE

V mV po IEC 584 in DIN 43710

°C	IEC 584 - 1							DIN 43710		
	(IPTS 68)	Cu-CuNi (tip T)	NiCr-CuNi (tip E)	Fe-CuNi (tip J)	NiCr-Ni (tip K)	Pt10Rh-Pt (tip S)	Pt13Rh-Pt (tip R)	Pt30Rh- Pt6Rh (tip B)	Cu-CuNi (tip U)	Fe-CuNi (tip L)
-200		-5,603	-8,824	-7,890	-5,891	-	-	-	-5,7	-8,15
-100		-3,378	-5,237	-4,632	-3,553	-	-	-	-3,4	-4,75
+100		4,277	6,317	5,268	4,095	0,645	0,647	0,033	4,25	5,37
200		9,286	13,419	10,777	8,137	1,440	1,468	0,178	9,20	10,95
300		14,860	21,033	16,325	12,207	2,323	2,400	0,431	14,9	16,56
400		20,869	28,943	21,846	16,395	3,260	3,407	0,786	21,0	22,16
500			36,999	27,388	20,640	4,234	4,471	1,241	27,41	27,85
600			45,085	33,096	24,902	5,237	5,582	1,791	34,31	33,67
700			53,110	39,130	29,128	6,274	6,741	2,430		39,72
800			61,022	45,498	33,277	7,345	7,949	3,154		46,22
900			68,783	51,875	37,325	8,448	9,203	3,957		53,14
1000			76,358	57,942	41,269	9,585	10,503	4,833		
1100				63,777	45,108	10,754	11,846	5,777		
1200				69,536	48,828	11,947	13,224	6,783		
1300					52,398	13,155	14,624	7,845		
1400						14,368	16,035	8,952		
1500						15,576	17,445	10,094		
1600						16,771	18,842	11,257		
1700						17,942	20,215	12,426		
1800								13,585		

TERMONAPETOSTI PO DIN 43710

V mV

Cu-CuNi (TIP U)

°C	0	-10	-20	-30	-40	-50	-60	-70	-80	-90	-100
-100	-3,40	-3,68	-3,95	-4,21	-4,46	-4,69	-4,91	-5,12	-5,32	-5,51	-5,70
0	0	0,39	-0,77	-1,14	-1,50	-1,85	-2,18	-2,50	-2,81	-3,11	-3,40
°C	0	10	20	30	40	50	60	70	80	90	100
0	0	0,40	0,80	1,21	1,63	2,05	2,48	2,91	3,35	3,80	4,25
100	4,25	4,71	5,18	5,65	6,13	6,62	7,12	7,63	8,15	8,67	9,20
200	9,20	9,74	10,29	10,85	11,41	11,98	12,55	13,13	13,71	14,30	14,90
300	14,90	15,50	16,10	16,70	17,31	17,92	18,53	19,14	19,76	20,38	21,00
400	21,00	21,62	22,25	22,88	23,51	24,15	24,79	25,44	26,09	26,75	27,41
500	27,41	28,08	28,75	29,43	30,11	30,80	31,49	32,19	32,89	33,60	34,31

Fe-CuNi (TIP L)

°C	0	-10	-20	-30	-40	-50	-60	-70	-80	-90	-100
-100	-4,75	-5,15	-5,53	-5,90	-6,60	-6,60	-6,93	-7,25	-7,56	-7,56	-8,15
0	0	-0,51	-1,02	-1,53	-2,03	-2,51	-2,98	-3,44	-3,89	-4,33	-4,75
°C	0	10	20	30	40	50	60	70	80	90	100
0	0	0,52	1,05	1,58	2,11	2,65	3,19	3,73	4,27	4,82	5,37
100	5,37	5,92	6,47	7,03	7,59	8,15	8,71	9,27	9,83	10,39	10,95
200	10,95	11,51	12,07	12,63	13,19	13,75	14,31	14,88	15,44	16,00	16,56
300	16,56	17,12	17,68	18,24	18,80	19,36	19,92	20,48	21,04	21,60	22,16
400	22,16	22,72	23,29	23,86	24,43	25,00	25,57	26,14	26,71	27,28	27,85
500	27,85	28,43	29,01	29,59	30,17	30,75	31,33	31,91	32,49	33,08	33,67
600	33,67	34,26	34,85	35,44	36,04	36,64	37,25	37,85	38,47	39,09	39,72
700	39,72	40,35	40,98	41,62	42,27	42,92	43,57	44,23	44,89	45,55	46,22
800	46,22	46,89	47,57	48,25	48,94	49,63	50,32	51,02	51,72	52,43	53,14

TERMONAPETOSTI PO IEC 584

V mV

Cu-CuNi (TIP T)

°C	0	-10	-20	-30	-40	-50	-60	-70	-80	-90	-100
-100	-3,378	-3,656	-3,923	-4,177	-4,419	-4,648	-4,865	-5,069	-5,261	-5,439	5,603
0	0	-0,383	-0,757	-1,121	-1,475	-1,819	-2,152	-2,475	-2,788	-3,089	-3,378

°C	0	10	20	30	40	50	60	70	80	90	100
0	0	0,391	0,789	1,196	1,611	2,035	2,467	2,908	3,357	3,813	4,277
100	4,277	4,749	5,227	5,712	6,204	6,702	7,207	7,718	8,235	8,757	9,286
200	9,286	9,820	10,360	10,905	11,456	12,011	12,572	13,137	13,707	14,281	14,860
300	14,860	15,443	16,030	16,621	17,217	17,816	18,420	19,027	19,638	20,252	20,869
400	20,869										

Fe-CuNi (TIP J)

°C	0	-10	-20	-30	-40	-50	-60	-70	-80	-90	-100
-100	-4,632	-5,036	-5,426	-5,801	-6,159	-6,499	-6,821	-7,122	-7,402	-7,659	-7,890
0	0	-0,501	-0,995	-1,481	-1,960	-2,431	-2,892	-3,344	-3,785	-4,215	-4,632

°C	0	10	20	30	40	50	60	70	80	90	100
0	0	0,507	1,019	1,536	2,058	2,585	3,115	3,649	4,186	4,725	5,268
100	5,268	5,812	6,359	6,907	7,457	8,008	8,560	9,113	9,667	10,222	10,777
200	10,777	11,332	11,887	12,442	12,998	13,553	14,108	14,663	15,217	15,771	16,325
300	16,325	16,879	17,432	17,984	18,537	19,089	19,640	20,192	20,743	21,295	21,846
400	21,846	22,397	22,949	23,501	24,054	24,607	25,161	25,716	26,272	26,829	27,388
500	27,388	27,949	28,511	29,075	29,642	30,210	30,782	31,356	31,933	32,513	33,096
600	33,096	33,683	34,273	34,867	35,464	36,066	36,671	37,280	37,893	38,510	39,130
700	39,130	39,754	40,382	41,013	41,647	42,283	42,922	43,563	44,207	44,852	45,498
800	45,498	46,144	46,790	47,434	48,076	48,716	49,354	49,989	50,621	51,249	51,875
900	51,875	52,496	53,115	53,729	54,341	54,948	55,553	56,155	56,753	57,349	57,942
1000	57,942	58,533	59,121	59,708	60,293	60,876	61,459	62,039	62,619	63,199	63,777
1100	63,777	64,355	64,933	65,510	66,087	66,664	67,240	67,815	68,390	68,964	69,536

NiCr-Ni (TIP K)

°C	0	-10	-20	-30	-40	-50	-60	-70	-80	-90	-100
-100	-3,553	-3,852	-4,138	-4,410	-4,669	-4,912	-5,141	-5,354	-5,550	-5,730	-5,891
0	0	-0,392	-0,777	-1,156	-1,527	-1,889	-2,243	-2,586	-2,920	-3,242	-3,553

°C	0	10	20	30	40	50	60	70	80	90	100
0	0	0,397	0,798	1,023	1,611	2,022	2,436	2,850	3,266	3,681	4,095
100	4,095	4,508	4,919	5,327	5,733	6,137	6,539	6,939	7,338	7,737	8,137
200	8,137	8,537	8,938	9,341	9,745	10,151	10,560	10,969	11,381	11,793	12,207
300	12,207	12,623	13,039	13,456	13,874	14,292	14,712	15,132	15,552	15,974	16,395
400	16,395	16,818	17,241	17,664	18,088	18,513	18,938	19,363	19,788	20,214	20,640
500	20,640	21,066	21,493	21,919	22,346	22,772	23,198	23,624	24,050	24,476	24,902
600	24,902	25,327	25,751	26,176	26,599	27,022	27,445	27,867	28,288	28,709	29,128
700	29,128	29,547	29,965	30,383	30,799	31,214	31,629	32,042	32,455	32,866	33,277
800	33,277	33,686	34,095	34,502	34,909	35,314	35,718	36,121	36,524	36,925	37,325
900	37,325	37,724	38,122	38,519	38,915	39,310	39,703	40,096	40,488	40,879	41,269
1000	41,269	41,657	42,045	42,432	42,817	43,202	43,585	43,968	44,349	44,729	45,108
1100	45,108	45,486	45,863	46,238	46,612	46,985	47,356	47,726	48,095	48,462	48,828
1200	48,828	49,192	49,555	49,916	50,276	50,633	50,990	51,344	51,697	52,049	52,398
1300	52,398	52,747	53,093	53,439	53,782	54,125	54,466	54,807			

KLASE ZA TERMOPARE PO IEC 584

(primerjalno mesto 0°C)

TERMOPAR	MERILNO OBMOČJE	ODSTOPANJE ±
	Klasa 1	
Cu-CuNi (T)	-40...+350°C	0,5°C ali 0,004•t
Fe-CuNi (J)	-40...+750°C	1,5°C ali 0,004•t
NiCr-CuNi (E)	-40...+800°C	0,5°C ali 0,004•t
NiCr-Ni (K)	-40...+1000°C	1,5°C ali 0,004•t
Pt13Rh-Pt (R)	0...1600°C	1°C ali
Pt10Rh-Pt (S)	0...1600°C	1°C ali
Pt30Rh-Pt6Rh (B)	-	-
	Klasa 2	
Cu-CuNi (T)	-40...+350°C	1°C ali 0,0075•t
Fe-CuNi (J)	-40...+750°C	2,5°C ali 0,0075•t
NiCr-CuNi (E)	-40...+900°C	1°C ali 0,0075•t
NiCr-Ni (K)	-40...+1200°C	2,5°C ali 0,0075•t
Pt13Rh-Pt (R)	0...1600°C	1,5°C ali 0,0025•t
Pt10Rh-Pt (S)	0...1600°C	1,5°C ali 0,0025•t
Pt30Rh-Pt6Rh (B)	600...1700°C	1,5°C ali 0,0025•t

ODZIVNI ČASI PLAŠČNIH TERMOELEMENTOV

v sekundah

Merilni pogoj	Vrednostni čas	Merilno mesto izolirano (A)								Merilno mesto v plašču zavarjeno (B)							
		Plašč – ø v mm								Plašč – ø v mm							
		0,5	1	1,5	3	4,5	6	8	0,5	1	1,5	3	4,5	6	8		
Voda v = 0,2 m/s	0,5	0,06	0,15	0,21	1,2	2,5	4,0	7	0,03	0,06	0,13	0,22	0,45	0,55	0,75		
	0,9	0,13	0,5	0,6	2,9	5,9	9,6	17	0,10	0,18	0,4	0,75	1,6	2,6	4,6		
Zrak v = 2 m/s	0,5	1,80	3	8	23	37	60	100	1,80	3	8	23	33	55	97		
	0,9	5,52	10	25	80	120	200	360	5,85	10	25	80	110	185	310		

NAJVEČJE DOVOLJENE TEMPERATURE V °C

Termopar/plašč-material	Plašč – ø v mm							
	0,5	1,0	1,5	2,0	3,0	4,5	6,0	8,0
Termopar T in U, Plašč 1.4541	400	400	500	500	500	500	500	500
Termopar J, L in K, Plašč 1.4541	500	600	800	800	800	800	800	800
Termopar E, K, N, S in B, Plašč Inconel	800	800	1000	1000	1100	1100	1100	1100
Termopar K, Plašč 1.4841	850	850	1050	1050	1150	1150	1150	1150
Termopar K, Plašč Nicrobell B	850	850	1050	1050	1150	1150	1150	1150
Termopar N, Plašč Nicrobell B	900	900	1150	1150	1200	1200	1200	1200
Termopar R, S in B Plašč Pt10Rh	-	1300	1300	1300	1300	1300	1300	1300

BARVNE OZNAKE ZA TERMOPARE

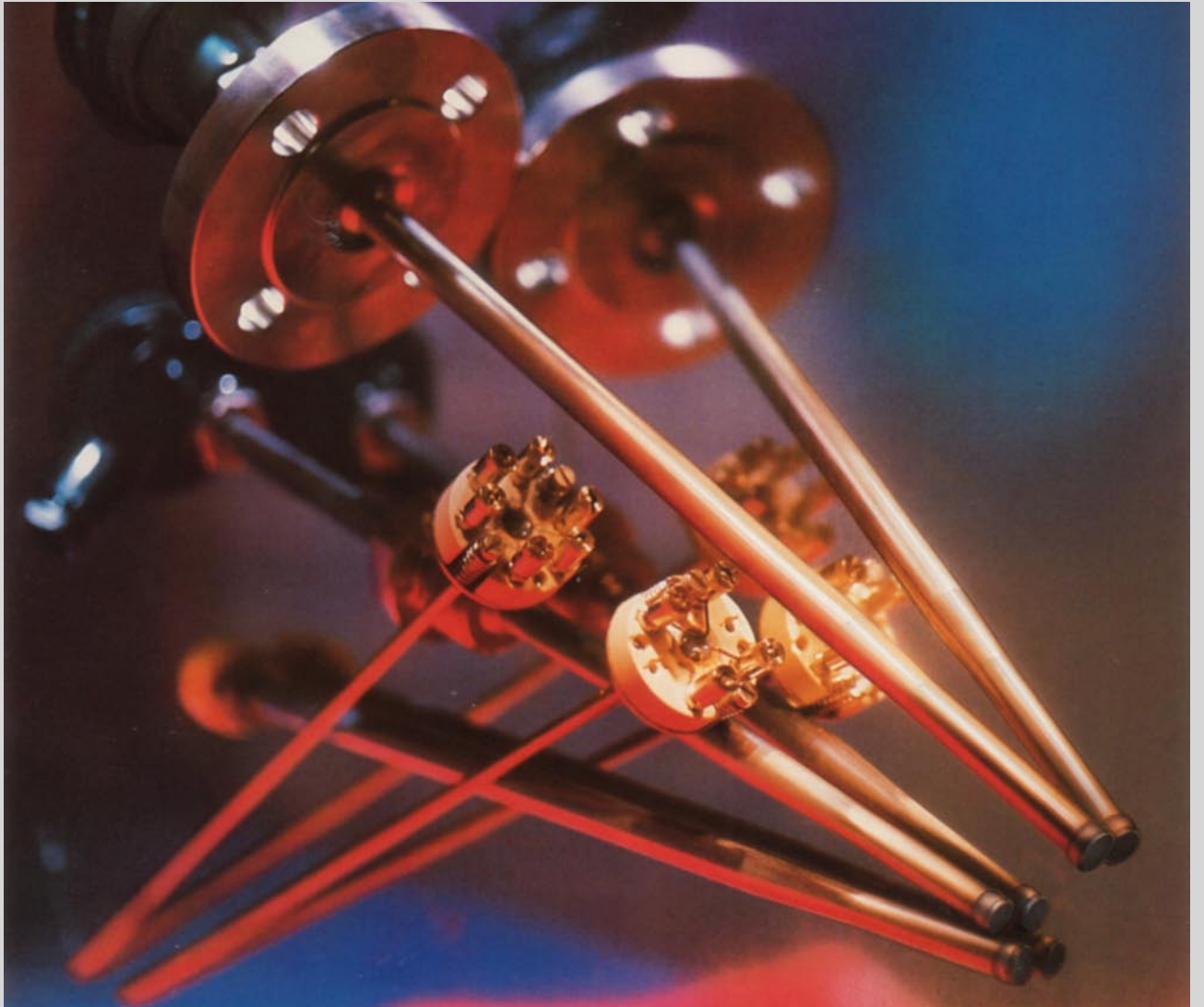
TERMOPAR + -	OZNAKA	DIN IEC - 584		DIN 433713/43714	
		Barva plašča	Barva vodnika	Barva plašča	Barva vodnika
Cu-CuNi	T	Rjava	+ Rjava - Bela	-	-
Cu-CuNi	U	-	-	Rjava	+ Rdeča - Rjava
Fe-CuNi	J	Črna	+ Črna - Bela	-	-
Fe-CuNi	L	-	-	Modra	+ Rdeča - Modra
NiCr-CuNi	E	Vijolična	+ Vijolična - Bela	-	-
NiCr-Ni	K	Zelena	+ Zelena - Bela	Zelena	+ Rdeča - Zelena
NiCrSi-NiSi	N	Roza	+ Roza - Bela	-	-
Pt13Rh-Pt	R	Oranžna	+ Oranžna - Bela	Bela	+ Rdeča - Bela
Pt10Rh-Pt	S	Oranžna	+ Oranžna - Bela	Bela	+ Rdeča - Bela
Pt30Rh-Pt	B	Siva	+ Siva - Bela	Modra	+ Siva - Bela

TERMOŽICE (DIN IEC 584-1)

Φ ŽICE mm	PREREZ mm ²	MAX. TEMP. °C	UPORNOST Ω/m pri 20 °C	TEŽA g/m
Fe - železo				
0,5	0,196	400	0,57	1,53
1,0	0,785	600	0,14	6,15
2,0	3,140	800	0,035	24,50
3,0	7,070	900	0,015	55,00
CuNi – baker / nikelj				
0,5	0,196	400	2,70	1,75
1,0	0,785	600	0,65	7,00
2,0	3,140	800	0,16	28,00
3,0	7,070	900	0,07	63,00
NiCr – nikelj / krom				
0,5	0,196	900	4,00	1,69
1,0	0,785	900	0,97	6,80
1,38	1,500	900	0,50	13,10
2,0	3,140	1000	0,24	27,00
2,5	5,850	1100	0,15	45,00
3,0	7,070	1200	0,108	60,80
Ni - nikelj				
0,5	0,196	900	1,16	1,75
1,0	0,785	900	0,30	7,00
1,38	1,500	900	0,14	13,40
2,0	3,140	1000	0,07	28,00
2,5	5,850	1100	0,02	48,00
3,0	7,070	1200	0,033	63,00
PtRh90/10 – platina / rodij				
0,35	0,0962	1300	2,10	1,95
0,5	0,1963	1600	1,02	3,90
PtRh70/30 – platina / rodij				
0,35	0,0962	1600	2,06	1,68
0,5	0,1963	1800	1,01	3,44
PtRh94/6 – platina / rodij				
0,35	0,0962	1600	1,87	1,95
0,5	0,1963	1800	0,92	3,68
Pt – platina				
0,35	0,0962	1300	1,15	2,05
0,5	0,1963	1600	0,55	4,20

MATERIALI ZAŠČITNIH CEVI PO NORMAH

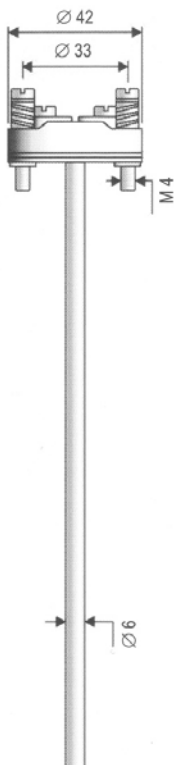
W. Nr.	DIN	AISI
1.4000	X 6 Cr 13	410 S
1.4005	X 12 CrS 13	416
1.4006	X10 Cr 13	410
1.4016	X 6 Cr 17	430
1.4021	X 20 Cr 13	420
1.4028	X 30 Cr 13	420 F
1.4034	X 46 Cr 13	-----
1.4057	X 17 CrNi 16-2	431
1.4104	X 14 CrMoS 17	430 F
1.4112	X 90 CrMoV 18	440 B
1.4122	X 39 CrMo 17-1	-----
1.4301	X 5 CrNi 18-10	304, 304 H
1.4303	X 4 CrNi 18-12	305
1.4305	X 10 CrNiS 18-9	303
1.4306	X 2 CrNi 19-11	304 L
1.4310	X 2 CrNiN 18-8	301
1.4311	X 2 CrMiN 18-10	304 LN
1.4362	X 2 CrNiN 23-4	-----
1.4401	X 5 CrNiMo 17-12-2	316
1.4404	X 2 CrNiMo 17-12-2	316 L
1.4406	X 2 CrNiMoN 17-11-2	316 LN
1.4417	X 26 NiMoSi 19-5	-----
1.4418	X 4 CrNiMo 16-5-1	-----
1.4429	X 2 CrNiMoN 17-13-3	316 LN
1.4435	X 2 CrNiMo 18-14-3	316 L
1.4436	X 3 CrNiMo 17-13-3	316
1.4438	X 2 CrNiMo 18-15-4	317
1.4439	X 2 CrNiMoN 17-13-5	317 LN
1.4449	X 5 CrNiMo 17-13	317
1.4460	X 3 CrNiMoN 27-5-2	329
1.4462	X 2 CrNiMoN 22-5-3	-----
1.4512	X 6 CrTi 12	409
1.4539	X 1 NiCrMoCuN 25-20-5	-----
1.4541	X 6 CrNiTi 18-10	321
1.4550	X 6 CrNiNb 18-10	347, 348
1.4570	X 6 CrNiCuS 18-9-2	-----
1.4571	X 6 CrNiMoTi 17-12-2	316 TI
1.4713	X 10 CrAl 7	-----
1.4724	X 10 CrAl 13	405
1.4742	X 10 CrAl 18	-----
1.4762	X 10 CrAl 24	446
1.4821	X 20 CrNiSi 25-4	327
1.4828	X 15 CrNiSi 20-12	309
1.4833	X 7 CrNi 23-14	309 S
1.4835	X 9 CrNiSiNCe 21-11-2	-----
1.4841	X 15 CrNiSi 25-21	314, 310
1.4845	X 12 CrNi 25-21	310 S
1.4864	X 12 NiCrSi 36-16	330
1.4876	X 10 NiCrAlTi 32-20	B 163
1.4878	X 18 CrNiTi 18-10	321
1.4891	X 4 CrNiSiN 18-10	153 MA*
1.4893	X 8 CrNiSiN 21-11	253 MA*
1.4547	X 2 CrNiMoNCu 20-18-6	254 SMO*
1.4410	X 2 WniMoN 25-7-4	SAF 2507*



Merilni vložki

Thermocouple inserts

MV-MET



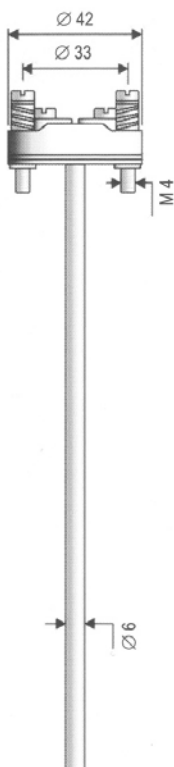
Priključek <i>Connection</i>	Keramično podnožje tip B z 2 ali 4 kontakti, vgradnja v glavo tip B <i>Ceramic Terminal block type B with 2 or 4 clamps, walled in head type B</i>	
Merilni element <i>Measuring insert</i>	1 ali 2 x Pt 100	
Zaščitna cev <i>Protection Tube</i>	W.Nr. 1.4541 DIN X 6 CrNiTi 18-10	Ø 6mm Ø 8mm
Merilno območje <i>Measuring range</i>	max. 850°C	
Standardne dolžine <i>Standard length</i>	Ø 6: 275, 375, 435, 525, 555, 655, 735 Ø 8: 340, 430, 525, 655, 735, 825, 1025	

W

06

08

MV-OTE



Priključek <i>Connection</i>	Keramično podnožje tip B z 2 ali 4 kontakti, vgradnja v glavo tip B <i>Ceramic Terminal block type B with 2 or 4 clamps, walled in head type B</i>	
Merilni element <i>Measuring insert</i>	1 ali 2 x Fe – CuNi 1 ali 2 x NiCr – Ni 1 ali 2 x Pt10Rh-Pt	
Material plašča <i>Material</i>	W.Nr. 1.4541 DIN X 6 CrNiTi 18-10 INCONEL	Tip L,J Tip K,S
Premer plašča <i>Diameter</i>	Ø 3mm Ø 4,5mm Ø 6mm Ø 8mm	30 45 60 80
Merilno območje <i>Measuring range</i>	Fe – CuNi max. 800°C	NiCr - Ni max. 1200° C
Standardne dolžine <i>Standard length</i>	Ø 3 : 275, 375, 435, 525, 555, 655, 735 Ø 6, Ø 8 : 340, 430, 525, 655, 735, 825, 1025	

L/J

K

S

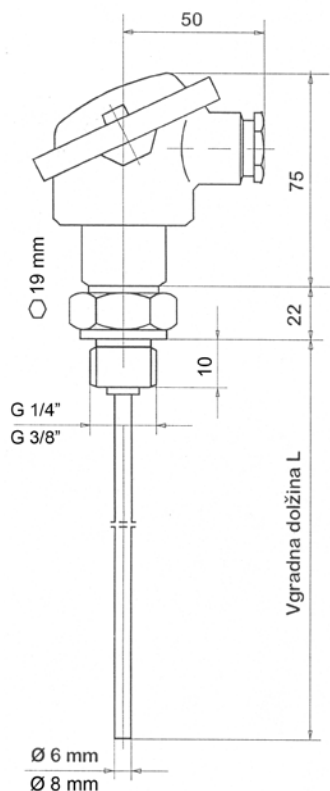


Mali uporovni termometri in termoelementi

Small resistance thermometer and thermocouples

Ključ za naročilo

OZNAKA	mali uporovni termometri mali termoelementi	UT MT
IZVEDBA		G4J G8J G2J V4J V8J V2J V1J MP MNZ
PREMER CEVI	Ø 6 mm Ø 8 mm Ø 9 mm Ø 11 mm Ø 14 mm	06 08 09 11 14
ŠTEVILO MERILNIH ELEMENTOV	enojni dvojni	1 2
TIP MERILNIH ELEMENTOV	Pt 100 Pt 500 Pt 1000 Cu-CuNi Fe - CuNi NiCr - Ni Pt10Rh-Pt Pt30Rh-Pt6Rh (EL18)	W W5 W1 T L/J K S B
STANDARDNE VGRADNE DOLŽINE		100 150 200 250 300 400 Drugačno mero vpiši
SPREMEMBA ALI DODATEK PO ŽELJI		X

UT-G4J, UT-G8J / MT-G4J, MT-G8J


Priključek
 Connection

Priključna glava iz aluminija tip ML ali BL
 Connection head made from Aluminium type
 ML or BL

Merilni element
 Measuring insert

1 ali 2 x Pt100
 1 ali 2 x Fe - CuNi
 1 ali 2 x NiCr - Ni

W
 L/J
 K

Zaščitna cev
 Protection tube

W.Nr. 1.4571 Ø 6x1mm
 DIN X 6 CrNiMoTi 17-12-2 Ø 8x1mm

06
 08

Vgradni element
 Walled insert

W.Nr. 1.4571 G 1/4"
 DIN X 6 CrNiMoTi 17-12-2 G 3/8"

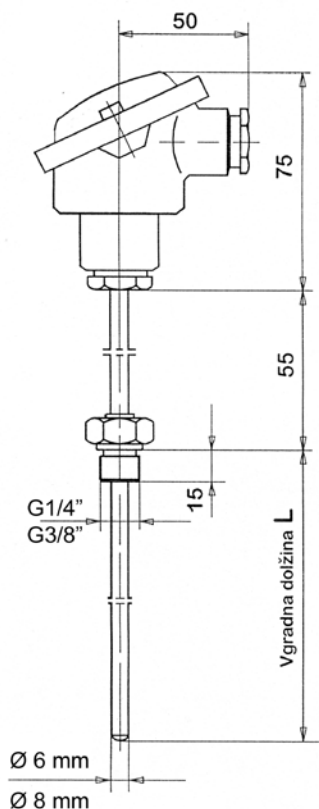
G4
 G8

Merilno območje
 Measuring range

Pt100 400°C
 Tip L/J 400°C
 Tip K 550°C

Standardne dolžine
 Standard length

100, 150, 200, 250, 300 mm

UT-V4J, UT-V8J / MT-V4J, MT-V8J


Priključek
 Connection

Priključna glava iz aluminija tip ML ali BL
 Connection head made from Aluminium type
 ML or BL

Merilni element
 Measuring insert

1 ali 2 x Pt100
 1 ali 2 x Fe - CuNi
 1 ali 2 x NiCr - Ni

W
 L/J
 K

Zaščitna cev
 Protection tube

W.Nr. 1.4571 Ø 6x1mm
 DIN X 6 CrNiMoTi 17-12-2 Ø 8x1mm

06
 08

Vgradni element
 Walled insert

W.Nr. 1.4571 G 1/4"
 DIN X 6 CrNiMoTi 17-12-2 G 3/8"

V4
 V8

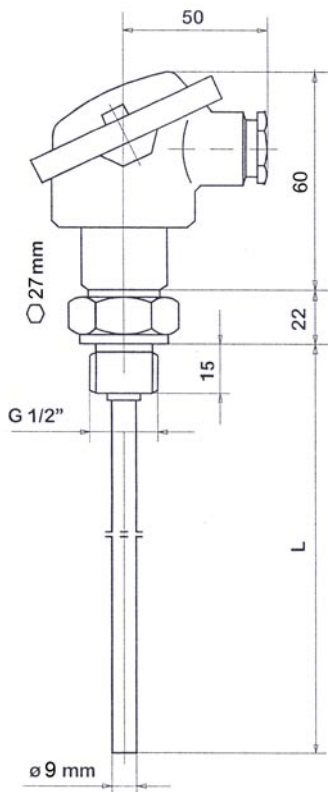
Merilno območje
 Measuring range

Pt100 400°C
 Tip L/J 400°C
 Tip K 550°C

Standardne dolžine
 Standard length

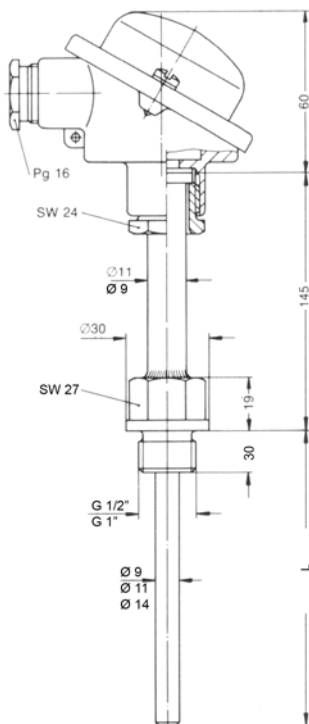
100, 150, 200, 250, 300 mm

UT-G2J / MT-G2J



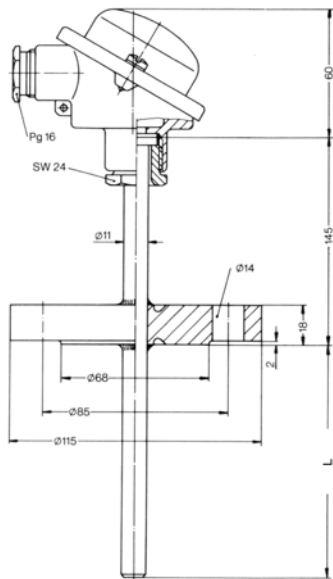
Priključek <i>Connection</i>	Priključna glava iz aluminija tip BL ali iz umetne mase tip BP <i>Connection head made from Aluminium type BL or Polyamide type BP</i>	
Merilni element <i>Measuring insert</i>	1 ali 2 x Pt100 1 ali 2 x Fe - CuNi 1 ali 2 x NiCr - Ni	W L/J K
Zaščitna cev <i>Protection tube</i>	W.Nr. 1.4571 DIN X 6 CrNiMoTi 17-12-2	Ø 9x1mm 09
Vgradni element <i>Walled insert</i>	W.Nr. 1.4571 DIN X 6 CrNiMoTi 17-12-2	G ½" G2
Merilno območje <i>Measuring range</i>	Pt100 400°C Tip L/J 400°C Tip K 550°C	
Standardne dolžine <i>Standard length</i>	160, 250, 400 mm	

UT-V2J, UT-V1J / MT-V2J, MT-V1J



Priključek <i>Connection</i>	Priključna glava iz aluminija tip BL ali iz umetne mase tip BP <i>Connection head made from Aluminium type BL or Polyamide type BP</i>	
Merilni element <i>Measuring insert</i>	1 ali 2 x Pt100 1 ali 2 x Fe - CuNi 1 ali 2 x NiCr - Ni	W L/J K
Zaščitna cev <i>Protection tube</i>	W.Nr. 1.4571 DIN X 6 CrNiMoTi 17-12-2	Ø 9x1mm Ø 11x1mm Ø 14x2,5mm 09 11 14
Vgradni element <i>Walled insert</i>	W.Nr. 1.4571 DIN X 6 CrNiMoTi 17-12-2	G ½" G 1" V2 V1
Merilno območje <i>Measuring range</i>	Pt100 400°C Tip L/J 400°C Tip K 550°C	
Standardne dolžine <i>Standard length</i>	160, 250, 400 mm	

UT-MP / MT-MP



Priključek
Connection

Priključna glava iz aluminija tip BL ali iz umetne mase tip BP
Connection head made from Aluminium type BL or Polyamide type BP

Merilni element
Measuring insert

1 ali 2 x Pt 100
1 ali 2 x Fe - CuNi
1 ali 2 x NiCr - Ni

N
L/J
K

Zaščitna cev
Protection tube

W.Nr. 1.4571
DIN X 6 CrNiMoTi 17-12-2

Ø 11x2mm

11

Vgradni element
Walled insert

Prirobnica
Flanges

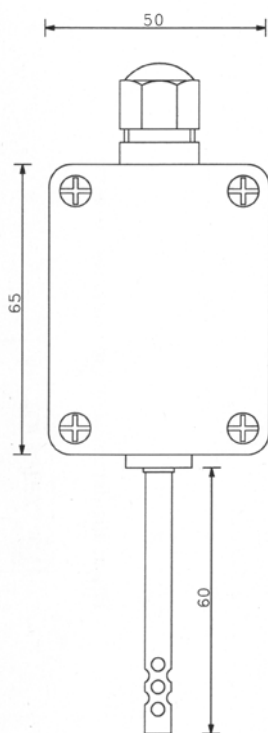
Merilno območje
Measuring range

400°C

Standardne dolžine
Standard length

160, 250, 400 mm

UT-MNZ



Priključek
Connection

Zunanje ali prostorsko tipalo za montažo na zid s plastičnim ali kovinskim zaščitnim ohišjem
Outdoor or indoor probe for wall mounting with plastic or metal case

Merilni element
Measuring insert

1 ali 2 x Pt 100

W

Zaščitna cev
Protection tube

W.Nr. 1.4571
DIN X 6 CrNiMoTi 17-12-2

Ø 6x1mm

06

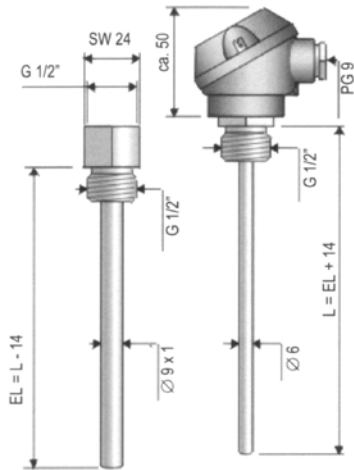
Merilno območje
Measuring range

-50°C...+90°C

Standardne dolžine
Standard length

60mm

UT-KAL


Priključek
Connection

Priključna glava iz aluminija tip ML ali iz umetne mase tip MP
Connection head made from Aluminium type ML or Polyamide type MP

Merilni element
Measuring insert

1 ali 2 x Pt 100

W

Zaščitna cev
Protection tube

W.Nr. 1.4571
 DIN X 6 CrNiMoTi 17-12-2

Ø 6x0.5mm

06

Merilno območje
Measuring range

20°C...150°C

Vgradno ohišje
Walled casing

z notranjim navojem
 with inside thread

Vgradni element
Walled insert

W.Nr. 1.4571
 DIN X 6 CrNiMoTi 17-12-2

G ½"

Zaščitna cev
Protection tube

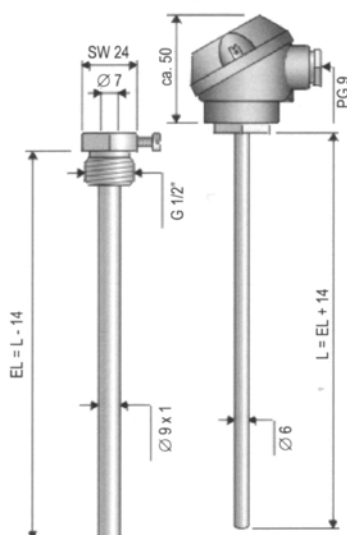
W.Nr. 1.4571
 DIN X 6 CrNiMoTi 17-12-2

Ø 9x1mm

Standardne dolžine
Standard length

65, 100, 150 mm

UT-KAL


Priključek
Connection

Priključna glava iz aluminija tip ML ali iz umetne mase tip MP
Connection head made from Aluminium type ML or Polyamide type MP

Merilni element
Measuring insert

1 ali 2 x Pt 100

W

Zaščitna cev
Protection tube

W.Nr. 1.4571
 DIN X 6 CrNiMoTi 17-12-2

Ø 6x0.5mm

06

Merilno območje
Measuring range

20°C...150°C

Vgradno ohišje
Walled casing

s plombirnim vijakom
 with fixation screw

Vgradni element
Walled insert

W.Nr. 1.4571
 DIN X 6 CrNiMoTi 17-12-2

G ½"

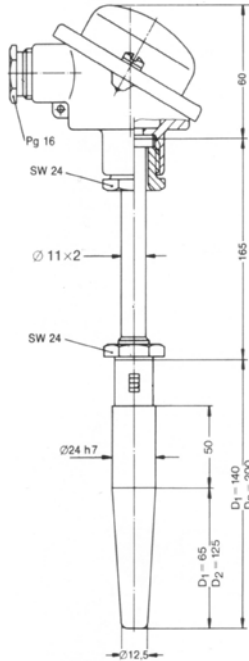
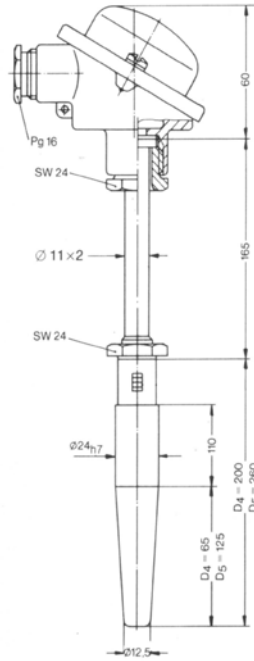
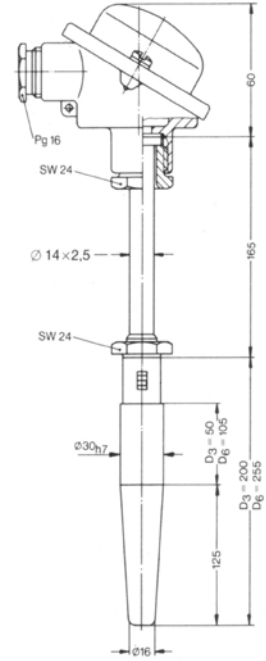
Zaščitna cev
Protection tube

W.Nr. 1.4571
 DIN X 6 CrNiMoTi 17-12-2

Ø 9x1mm

Standardne dolžine
Standard length

65, 100, 150 mm

TERMoeLEMENT Z ZAŠČITNIM TULCEM ZA UVARJENJE TIP D
T-D1, T-D2

T-D4, T-D5

T-D3, T-D6

Priključek
 Connection

 Priključna glava iz aluminija tip BL
 Connection head made from Aluminium type BL

Merilni element
 Measuring insert

 Merilni vložek tip MET ali OTE Pt100
 Fe – CuNi
 NiCr – Ni
 D1, D2, D4, D5 Ø 6mm
 D3, D6 Ø 8mm

Material tulca
 Material tube

 Jeklo za povišane temperature W.Nr. 1.7335 / DIN 13 CrMo 44
 Nerjaveče jeklo W.Nr. 1.4571 / DIN X6CrNiMoTi 17-12-2

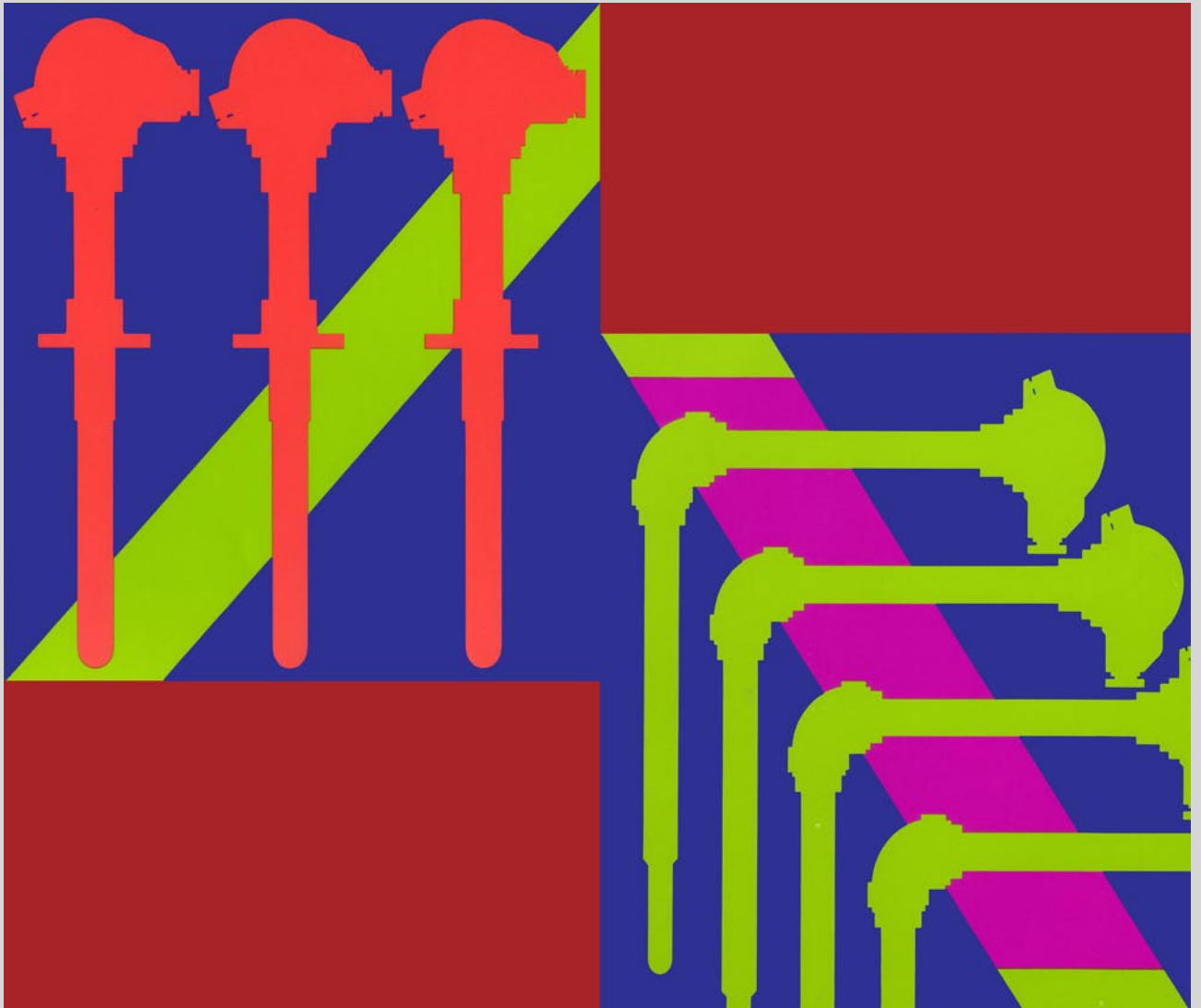
Merilno območje
 Measuring range

550°C

Dimenzije
 Dimension

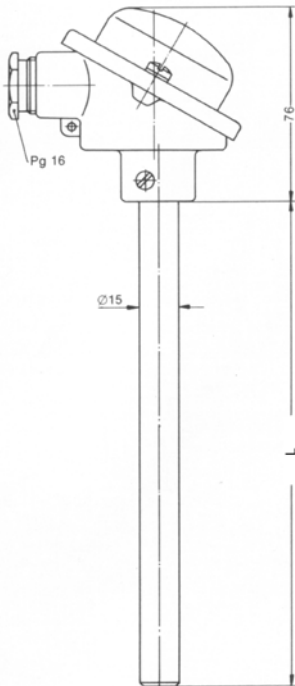
	Premer	Ravni del	Konus	Skupna dolžina
D1	24	50	65	140
D2	24	50	125	200
D3	30	50	125	200
D4	24	110	65	200
D5	24	110	125	260
D6	30	105	125	255

 W
 L/J
 K

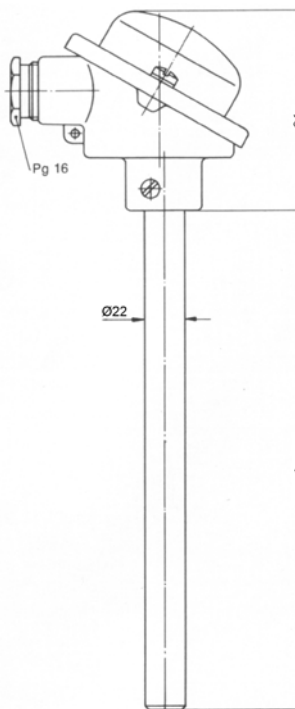


Veliki ravni in kotni termoelementi

Large straight and angle thermocouples

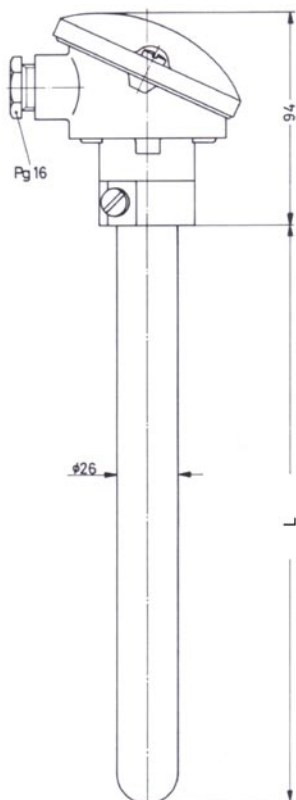
TP-ST, EM, MX / STK, EMK, MXK


Priključek <i>Connection</i>	Priključna glava iz aluminija tip BL <i>Connection head made from Aluminium type BL</i>	
Merilni element <i>Measuring insert</i>	1 ali 2 x Fe – CuNi 1 ali 2 x NiCr - Ni	L/J K
Zaščitna cev <i>Protection tube</i>	W.Nr. 1.0305 / DIN St 35.8 Ø 15x2mm W.Nr. 1.0305 / DIN St 35.8 Ø 15x2mm emajl. W.Nr. 1.4762 / DIN X 10 CrAl 24 Ø 15x2mm	ST EM MX
Notranja cev <i>Inside tube</i>	C 610 Ø 10x1mm	STK EMK MXK
Merilno območje <i>Measuring range</i>	ST 500°C EM 600°C MX 1200°C	
Standardne dolžine <i>Standard length</i>	180, 250, 355, 500	

TP-EM, CS, MX, CC / EMK, CSK, MXK, CCK


Priključek <i>Connection</i>	Priključna glava iz aluminija tip AL ali BL <i>Connection head made from Aluminium type AL or BL</i>	
Merilni element <i>Measuring insert</i>	1 ali 2 x Fe – CuNi 1 ali 2 x NiCr - Ni	L/J K
Zaščitna cev <i>Protection tube</i>	W.Nr. 1.0305 / DIN St 35.8 Ø 22x2mm emajl. W.Nr. 1.4841 Ø 22x2mm W.Nr. 1.4762 Ø 22x2mm Tehnično čisto Fe Ø 22x5mm	EM CS MX CC
Notranja cev <i>Inside tube</i>	C 610 Ø 16x2mm	EMK CSK MXK CCK
Merilno območje <i>Measuring range</i>	EM 600°C CS 1200°C MX 1200°C CC 1000°C	
Standardne dolžine <i>Standard length</i>	500, 710, 1000, 1400, 2000	

TP-FF / FFK



Priključek
Connection

Priključna glava iz aluminija tip AL
Connection head made from Aluminium type AL

Merilni element
Measuring insert

1 ali 2 x Fe - CrNi
1 ali 2 x NiCr - Ni
1 ali 2 x Pt10Rh - Pt

L/J
K
S

Zaščitna cev
Protection tube

W.Nr. 1.4749
DIN X 18 CrN 28

Ø 26x4mm

FF

Notranja cev
Inside tube

C 610

Ø 16x2mm

FFK

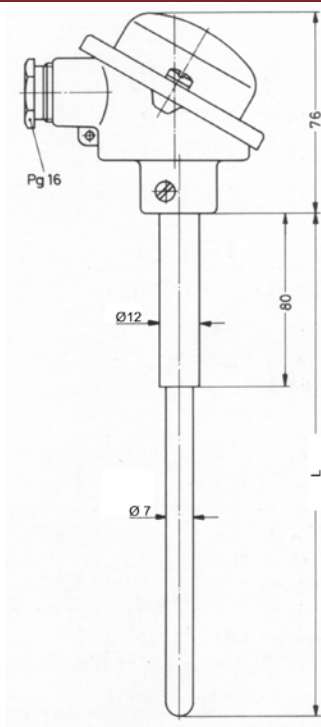
Merilno območje
Measuring range

1200°C

Standardne dolžine
Standard length

500, 710, 1000

TP-KER



Priključek
Connection

Priključna glava iz aluminija tip ML ali BL
Connection head made from Aluminium type ML or BL

Merilni element
Measuring insert

1 x Pt10Rh - Pt
1 x Pt30Rh - Pt6Rh (EL18)

S
B

Zaščitna cev
Protection tube

C 799

Ø 7x1mm

07

Nosilna cev
Holding tube

W.Nr. 1.4571
DIN X 6 CrNiMoTi 17-12-2

Ø 12x1.5mm

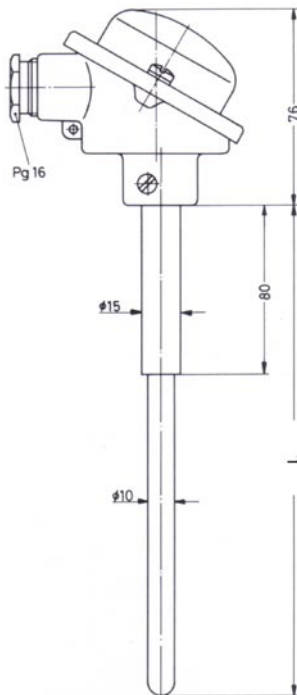
Merilno območje
Measuring range

Tip S 1600°C
Tip B 1800°C

Standardne dolžine
Standard length

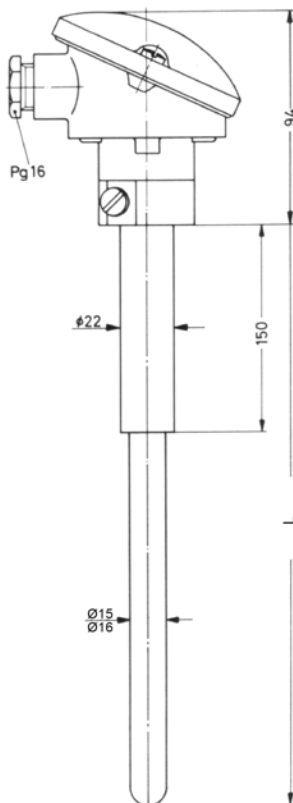
180, 250, 355, 500

TP-KER



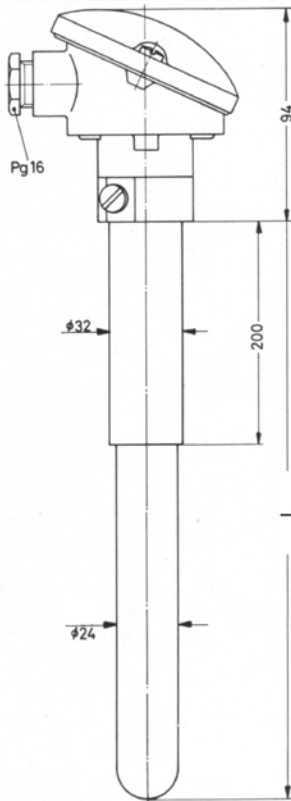
Priključek <i>Connection</i>	Priključna glava iz aluminija tip BL <i>Connection head made from Aluminium type BL</i>		
Merilni element <i>Measuring insert</i>	1 ali 2 x NiCr - Ni 1 ali 2 x Pt10Rh - Pt 1 ali 2 x Pt30Rh - Pt6Rh (EL18)		K S B
Zaščitna cev <i>Protection tube</i>	C 610 C 799	$\varnothing 10 \times 1 \text{mm}$ $\varnothing 10 \times 1.5 \text{mm}$	10 11
Nosilna cev <i>Holding tube</i>	W.Nr. 1.0305 DIN St 35.8	$\varnothing 15 \times 2 \text{mm}$	
Merilno območje <i>Measuring range</i>	Tip K 1200°C Tip S 1500°C Tip B 1800°C		
Standardne dolžine <i>Standard length</i>	180, 250, 355, 500, 710, 1000		

TP-KER



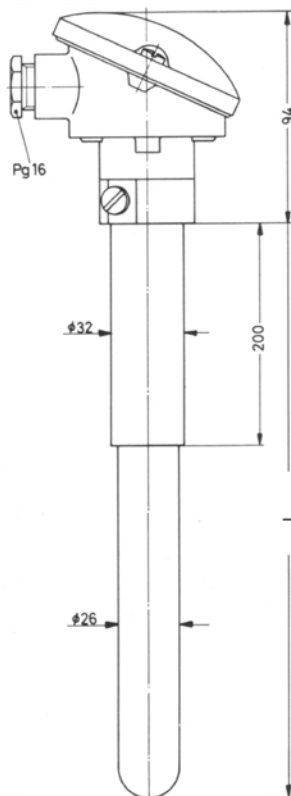
Priključek <i>Connection</i>	Priključna glava iz aluminija tip AL <i>Connection head made from Aluminium type AL</i>		
Merilni element <i>Measuring insert</i>	1 ali 2 x NiCr - Ni 1 ali 2 x Pt10Rh - Pt 1 ali 2 x Pt30Rh - Pt6Rh (EL18)		K S B
Zaščitna cev <i>Protection tube</i>	C 610 C 799	$\varnothing 16 \times 2 \text{mm}$ $\varnothing 15 \times 2.5 \text{mm}$	16 15
Nosilna cev <i>Holding tube</i>	W.Nr. 1.0305 DIN St 35.8	$\varnothing 22 \times 2 \text{mm}$	
Merilno območje <i>Measuring range</i>	Tip K 1200°C Tip S 1500°C Tip B 1800°C		
Standardne dolžine <i>Standard length</i>	500, 710, 1000, 1400		

TP-KER



Priključek <i>Connection</i>	Priključna glava iz aluminija tip AL <i>Connection head made from Aluminium type AL</i>		
Merilni element <i>Measuring insert</i>	1 ali 2 x NiCr - Ni 1 ali 2 x Pt10Rh - Pt 1 ali 2 x Pt30Rh - Pt6Rh (EL18)		K S B
Zaščitna cev <i>Protection tube</i>	C 610 C 799	Ø 24x2.5mm Ø 24x3mm	24 25
Notranja cev <i>Inside tube</i>	C 610 C 799	Ø 16x2mm Ø 15x2.5mm	
Nosilna cev <i>Holding tube</i>	W.Nr. 1.0305 DIN St 35.8	Ø 32x2mm	
Merilno območje <i>Measuring range</i>	Tip K 1200°C Tip S 1500°C Tip B 1800°C		
Standardne dolžine <i>Standard length</i>	500, 710, 1000, 1400		

TP-KER



Priključek <i>Connection</i>	Priključna glava iz aluminija tip AL <i>Connection head made from Aluminium type AL</i>		
Merilni element <i>Measuring insert</i>	1 ali 2 x NiCr - Ni 1 ali 2 x Pt10Rh - Pt		K S
Zaščitna cev <i>Protection tube</i>	KER 530	Ø 26x4mm	26
Notranja cev <i>Inside tube</i>	C 610	Ø 16x2mm	
Nosilna cev <i>Holding tube</i>	W.Nr. 1.0305 DIN St 35.8	Ø 32x2mm	
Merilno območje <i>Measuring range</i>	Tip K 1200°C Tip S 1500°C		
Standardne dolžine <i>Standard length</i>	500, 710, 1000, 1400		

KT-EM, CC, MX, SIC, TI

Priključek
Connection

 Priključna glava iz aluminija tip AL
Connection head made from Aluminium type AL
Merilni element
Measuring insert

 1 ali 2 x NiCr - Ni
 1 ali 2 x Pt10Rh - Pt

Zaščitna cev
Protection tube

 Jeklo emajlirano
 Tehnično čisto Fe
 W.Nr. 1.4762
 SIC
 Titan

Notranja cev
Inside tube

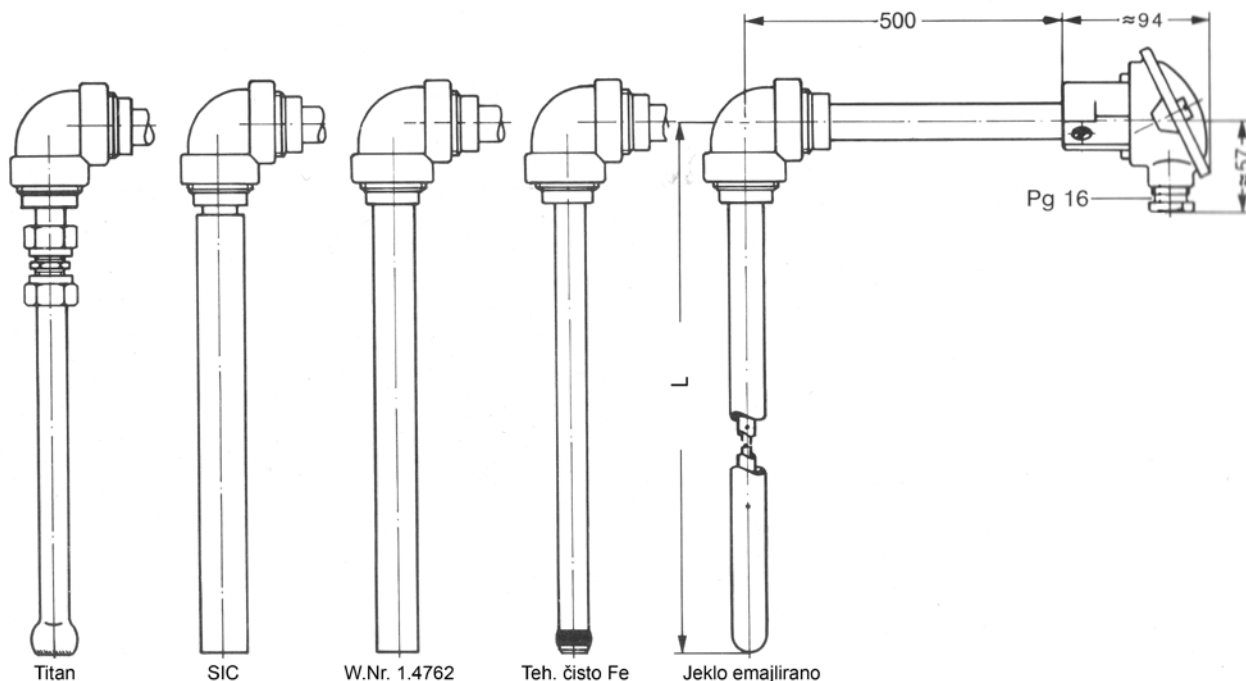
 C 610 Ø 16x2mm
Merilno območje
Measuring range

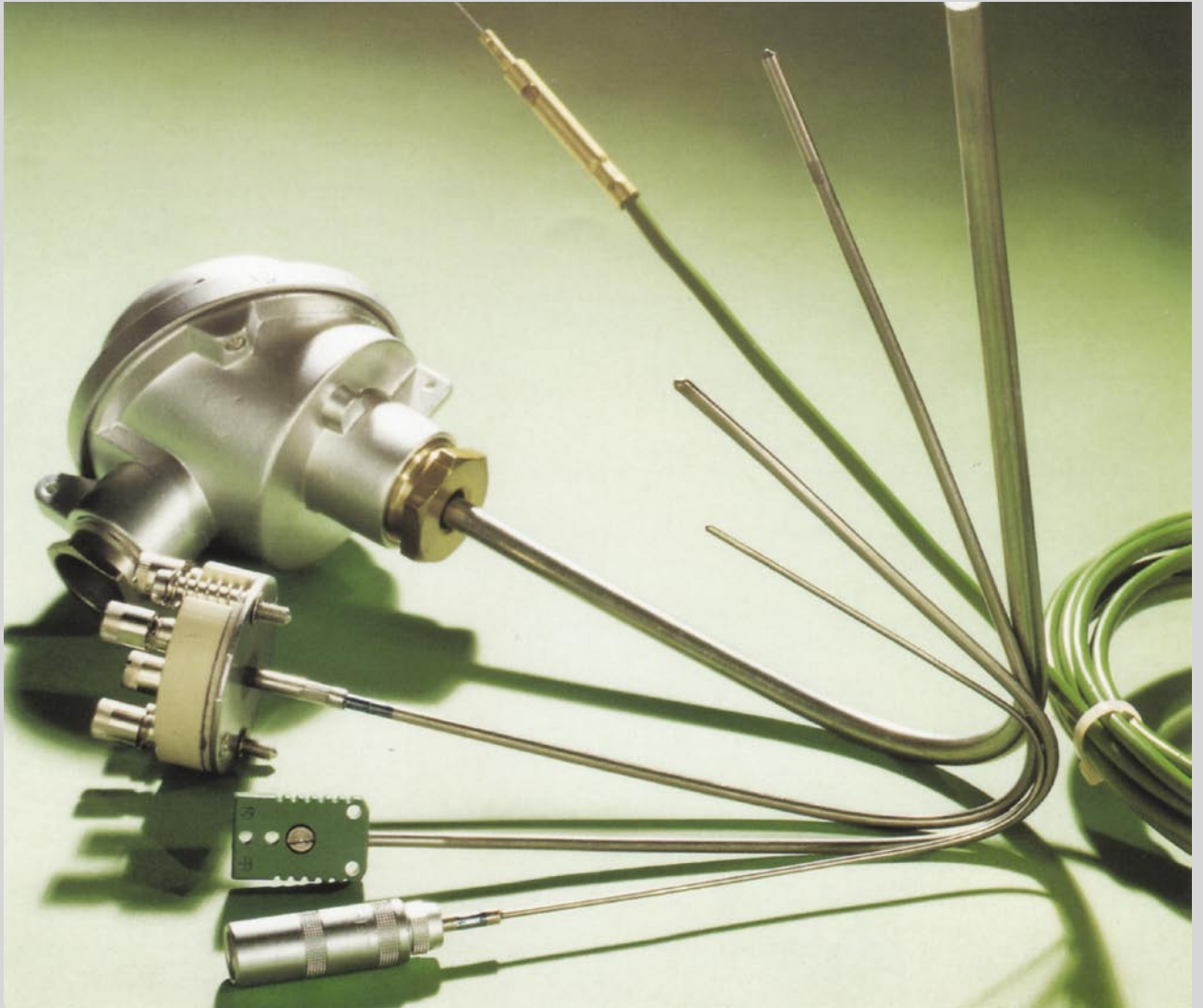
EM	600°C
CC	1000°C
MX	1200°C
SIC	1000°C
TI	600°C

Standardne dolžine
Standard length

500, 710, 1000

 K
 S

 EM
 CC
 MX
 SIC
 TI




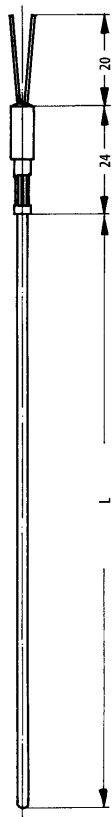
Plaščni termoelementi

Mineral isolated thermocouples

Ključ za naročilo

OZNAKA	plaščni termoelement	OT
IZVEDBA	Prost izvod termožic	IPI
	Kompenzacijski kabel	PKK
	Element z navojem	PNM
	Lemo vtikač / vtičnica	PKS/PKD
	Mini vtikač / vtičnica	PSM/PVM
	Standardni vtikač / vtičnica	PSS/PVS
	Priključna glava tip ML	MLG
	Priključna glava tip BL	BLG
PREMER PLAŠČA	Ø 1.5 mm	15
	Ø 3.0 mm	30
	Ø 4.5 mm	45
	Ø 6.0 mm	60
	Ø 8.0 mm	80
ŠTEVILO MERILNIH ELEMENTOV	enojni	1
	dvojni	2
TIP MERILNIH ELEMENTOV	Cu - CuNi	T
	Fe - CuNi	L/J
	NiCr - Ni	K
	Pt 10Rh - Pt	S
STANDARDNE VGRADNE DOLŽINE	Vpiši vgradno dolžino v mm	
SPREMEMBA ALI DODATEK PO ŽELJI		X

OT-IP1



Priključek
Connection

Izvod termožic
Free ends

Merilni element
Measuring insert

1 ali 2 x Fe – CuNi
1 ali 2 x NiCr - Ni

L/J
K

Material plašča
Material

W.Nr. 1.4541
DIN X 6 CrNiTi 18-10
INCONEL

za tip L/J

za tip K

Premer plašča
Diameter

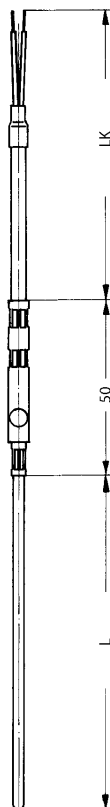
Ø 1.5mm
Ø 3.0mm
Ø 4.5mm
Ø 6.0mm
Ø 8.0mm

15
30
45
60
80

Merilno območje
Measuring range

Odvisno od tipa termoelementa, premera in kakovosti zaščitnega plašča
Depend on type of thermocouples, diameter and quality of protection sheath

OT-PKK



Priključek
Connection

Kompenzacijski kabel
Compensation cables

Merilni element
Measuring insert

1 ali 2 x Fe – CuNi
1 ali 2 x NiCr - Ni

L/J
K

Material plašča
Material

W.Nr. 1.4541
DIN X 6 CrNiTi 18-10
INCONEL

za tip L/J

za tip K

Premer plašča
Diameter

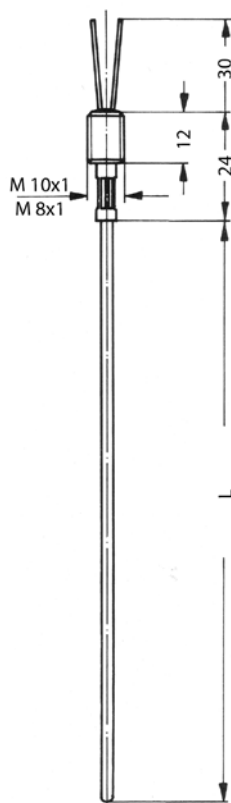
Ø 1.5mm
Ø 3.0mm
Ø 4.5mm
Ø 6.0mm
Ø 8.0mm

15
30
45
60
80

Merilno območje
Measuring range

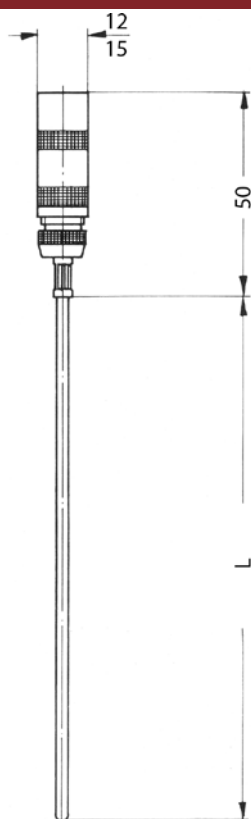
Odvisno od tipa termoelementa, premera in kakovosti zaščitnega plašča
Depend on type thermocouples, diameter and quality of protection sheath

OT-PNM

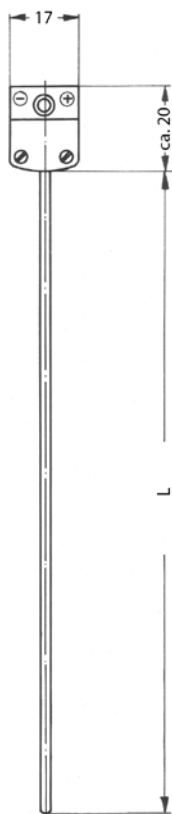


Priključek <i>Connection</i>	Element z navojem M 8x1 ali M 10x1 <i>Thread M 8x1 or M 10x1</i>	
Merilni element <i>Measuring insert</i>	1 ali 2 x Fe – CuNi 1 ali 2 x NiCr - Ni	L/J K
Material plašča <i>Material</i>	W.Nr. 1.4541 DIN X 6 CrNiTi 18-10 INCONEL	tip L/J tip K
Premer plašča <i>Diameter</i>	Ø 1.5mm Ø 3.0mm	15 30
Merilno območje <i>Measuring range</i>	Odvisno od tipa termoelementa, premera in kakovosti zaščitnega plašča <i>Depend on type of thermocouples, diameter and quality of protection sheath</i>	

OT-PKS / PKD



Priključek <i>Connection</i>	Lemo vtikač ali vtičnica <i>Lemo plug or socket</i>	
Merilni element <i>Measuring insert</i>	1 ali 2 x Fe – CuNi 1 ali 2 x NiCr - Ni	L/J K
Material plašča <i>Material</i>	W.Nr. 1.4541 DIN X 6 CrNiTi 18-10 INCONEL	za tip L/J za tip K
Premer plašča <i>Diameter</i>	Ø 1.5mm Ø 3.0mm Ø 4.5mm Ø 6.0mm	15 30 45 60
Merilno območje <i>Measuring range</i>	Odvisno od tipa termoelementa, premera in kakovosti zaščitnega plašča <i>Depend on type of thermocouples, diameter and quality of protection sheath</i>	

OT-PSM / PVM


Priključek
Connection

Miniaturni vtikač ali vtičnica
Mini plug or socket

Merilni element
Measuring insert

1 ali 2 x Fe – CuNi
 1 ali 2 x NiCr - Ni

L/J
 K

Material plašča
Material

W.Nr. 1.4541 tip L/J
 DIN X 6 CrNiTi 18-10
 INCONEL tip K

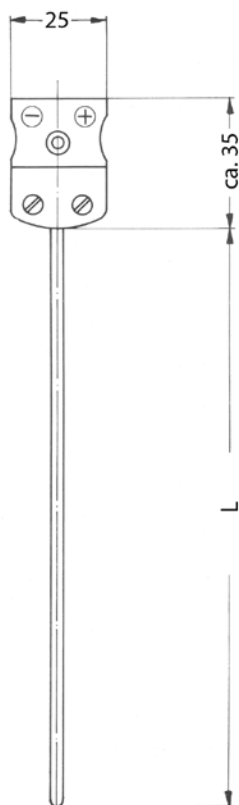
Premer plašča
Diameter

Ø 1.5mm
 Ø 3.0mm

15
 30

Merilno območje
Measuring range

Odvisno od tipa termoelementa, premera in kakovosti zaščitnega plašča
Depend on type of thermocouples, diameter and quality of protection sheath

OT-PSS / PVS


Priključek
Connection

Standardni vtikač ali vtičnica
 Standard plug or socket

Merilni element
Measuring insert

1 ali 2 x Fe – CuNi
 1 ali 2 x NiCr - Ni

L/J
 K

Material plašča
Material

W.Nr. 1.4541 tip L/J
 DIN X 6 CrNiTi 18-10
 INCONEL tip K

Premer plašča
Diameter

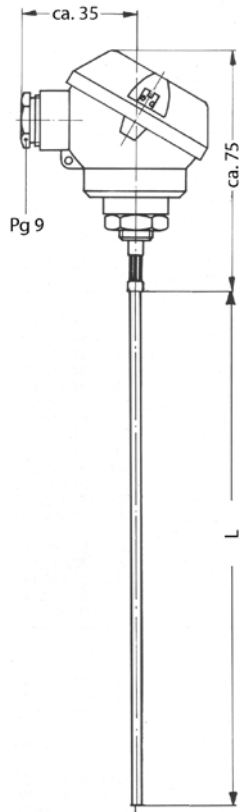
Ø 3.0mm
 Ø 4.5mm
 Ø 6.0mm

30
 45
 60

Merilno območje
Measuring range

Odvisno od tipa termoelementa, premera in kakovosti zaščitnega plašča
Depend on type of thermocouples, diameter and quality of protection sheath

OT-MLG


Priključek
Connection

 Priključna glava iz aluminija tip ML
Connection head made from Aluminium type ML
Merilni element
Measuring insert

 1 x Fe – CuNi
 1 x NiCr - Ni

 L/J
 K

Material plašča
Material

 W.Nr. 1.4541 za tip L/J
 DIN X6CrNiTi 18-10
 INCONEL za tip K

Premer plašča
Diameter

 Ø 1.5mm
 Ø 3.0mm
 Ø 4.5mm
 Ø 6.0mm

 15
 30
 45
 60

Merilno območje
Measuring range

 Odvisno od tipa termoelementa, premera in kakovosti zaščitnega plašča
 Depend on type of thermocouples, diameter and quality of protection sheath

OT-BLG


Priključek
Connection

 Priključna glava iz aluminija
Connection head made from Aluminium
Merilni element
Measuring insert

 1 ali 2 x Fe – CuNi
 1 ali 2 x NiCr - Ni

 L/J
 K

Material plašča
Material

 W.Nr. 1.4541 za tip L/J
 DIN X6CrNiTi 18-10
 INCONEL za tip K

Premer plašča
Diameter

 Ø 3.0mm
 Ø 4.5mm
 Ø 6.0mm
 Ø 8.0mm

 30
 45
 60
 80

Merilno območje
Measuring range

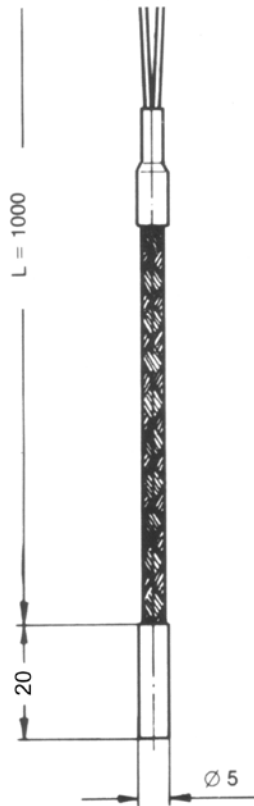
 Odvisno od tipa termoelementa, premera in kakovosti zaščitnega plašča
 Depend on type of thermocouples, diameter and quality of protection sheath



Vtični uporovni termometri in kabelski termoelementi

Probes for machinery and surface measurements

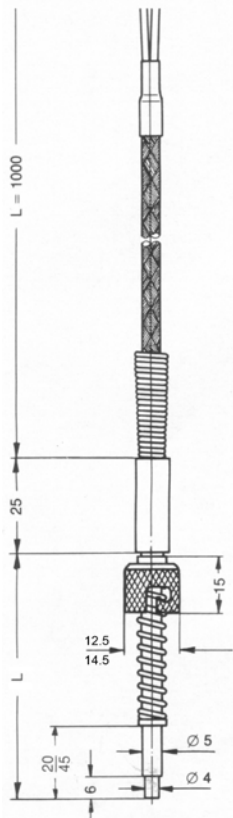
VT-R1K



Priključek <i>Connection</i>	Termokabel Fe – CuNi/NiCr - Ni, izolacija VO <i>Thermocable Fe – CuNi/NiCr - Ni isolation VO</i>
Merilni element <i>Measuring insert</i>	Fe - CuNi NiCr - Ni
Zaščitna cev <i>Protection tube</i>	W.Nr. 1.4571 DIN X 6 CrNiMoTi 17-12-2
Merilno območje <i>Measuring range</i>	Max. 400°C
Standardne dolžine <i>Standard length</i>	1020mm

L/J
K

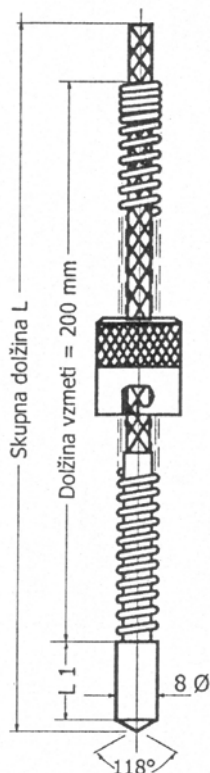
VT-R2B



Priključek <i>Connection</i>	Termokabel Fe – CuNi, izolacija VO <i>Thermocable Fe – CuNi, insulation VO</i>
Merilni element <i>Measuring insert</i>	Fe - CuNi NiCr - Ni
Zaščitna cev <i>Protection tube</i>	W.Nr. 1.4571 DIN X 6 CrNiMoTi 17-12-2
Priključek <i>Connection</i>	Bajonetna kapa iz medenine, nikljana, notranji premer 12.8mm ali 14.8mm <i>Bayonet cap Brass Nickel plated, inside diameter 12.8mm or 14.8mm</i>
Merilno območje <i>Measuring range</i>	Max. 400°C
Standardne dolžine <i>Standard length</i>	67mm, 92mm

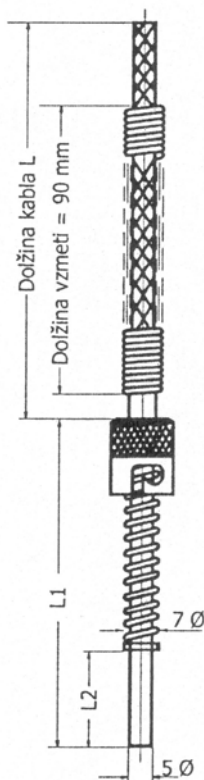
L/J
K

VT-R3B



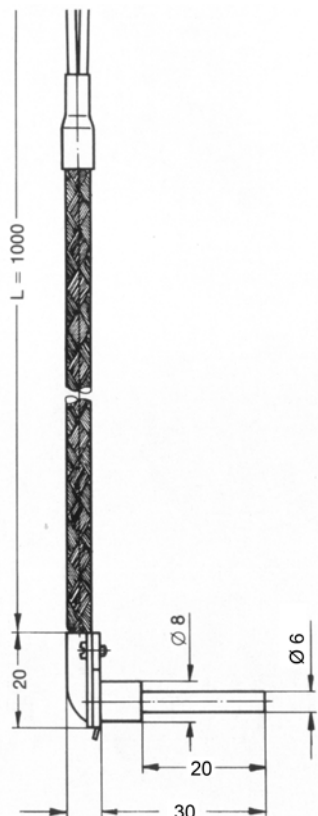
Priključek <i>Connection</i>	Termokabel Fe – CuNi ali NiCr - Ni izolacija VO <i>Thermocable Fe – CuNi or NiCr – Ni isolation VO</i>	
Merilni element <i>Measuring insert</i>	Fe – CuNi NiCr - Ni	L/J K
Bajonetna vzmet <i>Bayonet Spring</i>	W.Nr. 1.4301 DIN X 5 CrNi 18-10	Ø 6mm Ø 8mm 06 08
Priključek <i>Connection</i>	Bajonetna kapa iz medenine, nikljana, notranji premer 12.8mm ali 14mm <i>Bayonet cap Brass Nickel plated, inside diameter 12.8mm or 14mm</i>	
Merilno območje <i>Measuring range</i>	Max. 400°C	
Standardne dolžine <i>Standard length</i>	2000mm	

VT-R4B



Priključek <i>Connection</i>	Kabel z Cu vodniki ali termokabel Fe – CuNi ali NiCr - Ni <i>Cable with Cu guide or Thermocable Fe – CuNi or NiCr – Ni</i>	
Merilni element <i>Measuring insert</i>	Pt 100 Fe – CuNi NiCr - Ni	W L/J K
Bajonetna vzmet <i>Bayonet Spring</i>	W.Nr. 1.4301 DIN X 5 CrNi 18-10	Ø 6mm Ø 8mm 06 08
Priključek <i>Connection</i>	Bajonetna kapa iz medenine, nikljana, notranji premer 12.8mm ali 14mm <i>Bayonet cap Brass Nickel plated, inside diameter 12.8mm or 14mm</i>	
Zaščitna cev <i>Protection tube</i>	W.Nr. 1,4571 DIN X 6 CrNiMoTi 17-12-2	
Merilno območje <i>Measuring range</i>	Max. 400°C	
Standardne dolžine <i>Standard length</i>	2000mm	

VT-K1K



Priključek
Connection

Kabel z Cu vodniki ali termokabel Fe - CuNi ali NiCr - Ni, izolacija VVO
Cable with Cu guide or Thermocable Fe - CuNi or NiCr - Ni, isolation VVO

Merilni element
Measuring insert

Pt 100
Fe - CuNi
NiCr - Ni

W
L/J
K

Zaščitna cev
Protection tube

W.Nr. 1.4571
DIN X 6 CrNiMoTi 17-12-2

Ø 6mm

06

Kotni element
Angle insert

Cu podložka in Al pokrov
Cu lining and Al cover

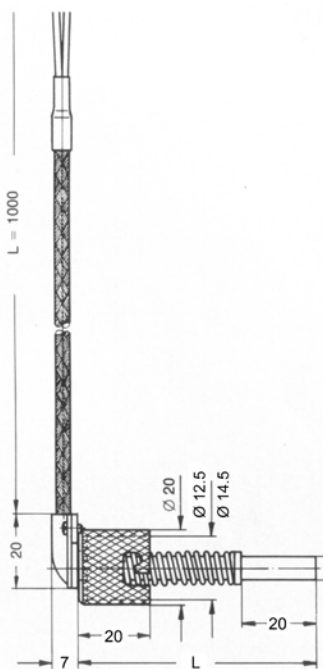
Merilno območje
Measuring range

Max. 400°C

Standardne dolžine
Standard length

30mm

VT-K2B



Priključek
Connection

Kabel z Cu vodniki ali termokabel Fe - CuNi ali NiCr - Ni, izolacija VVO
Cable with Cu guide or Thermocable Fe - CuNi or NiCr - Ni, isolation VVO

Merilni element
Measuring insert

Pt 100
Fe - CuNi
NiCr - Ni

W
L/J
K

Zaščitna cev
Protection tube

W.Nr. 1.4571
DIN X 6 CrNiMoTi 17-12-2

Ø 6mm

06

Priključni element
Connection element

Bajonetna kapa iz medenine, nikljana. Notranji premer 12.5mm ali 14.5mm
Bayonet cap brass nickel plated, inside diameter 12.5mm or 14.4mm

Kotni element
Angle insert

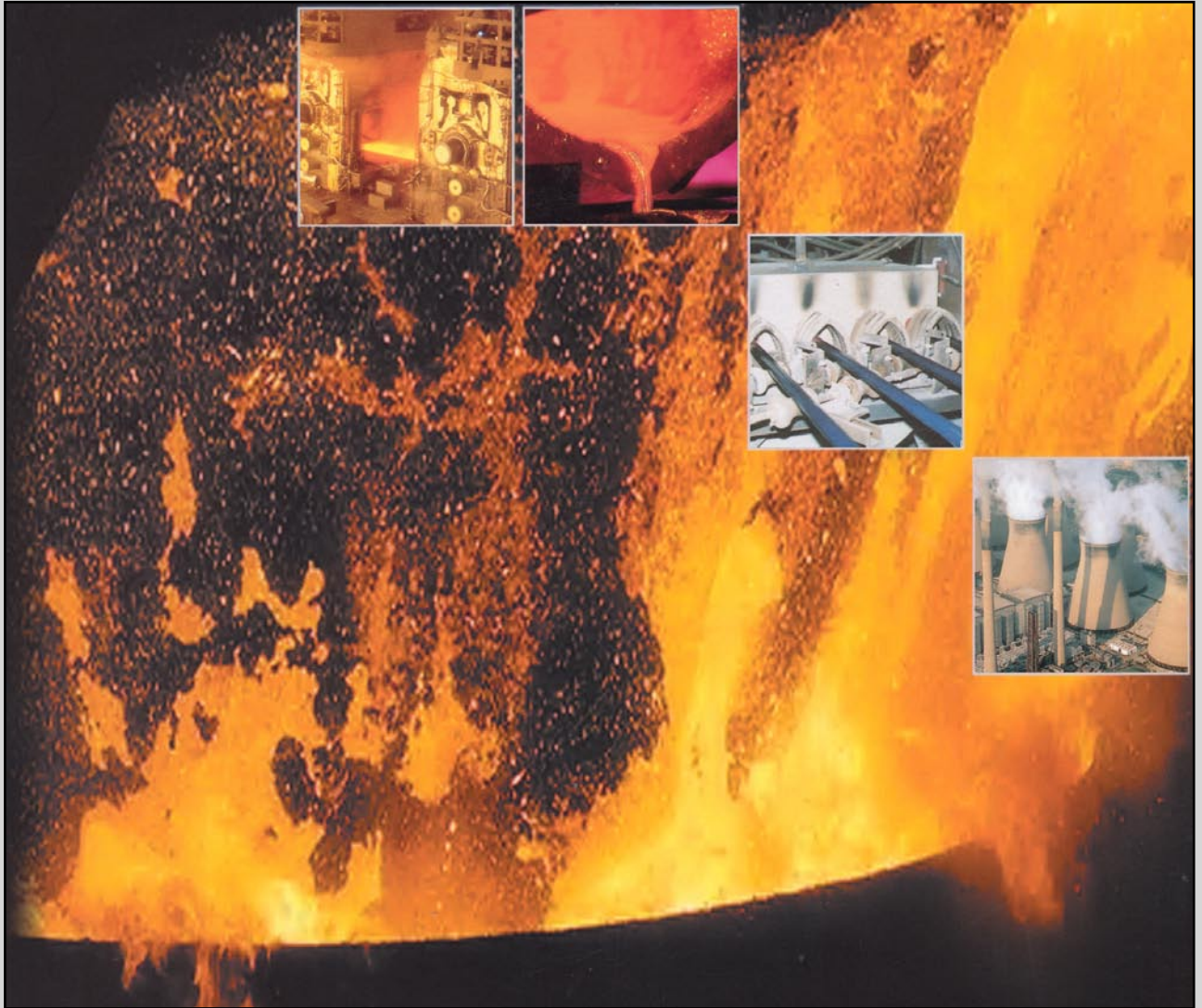
Cu podložka in Al pokrov
Cu lining and Al cover

Merilno območje
Measuring range

Max. 400°C

Standardne dolžine
Standard length

63mm



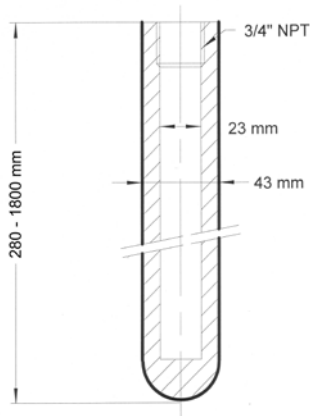
Zaščitne cevi za aluminijeve in cinkove taline

Protection tubes for use in aluminium and zinc alloys

Ključ za naročilo

OZNAKA	Zaščitna cev	ZC
	Cev za vpihovanje	BR
IZVEDBA	Litoželezna cev s keramično prevleko	KIK
	Jeklena cev z oblogo Si karbida	SIC
	Industrijska keramika SYALON	SIA
	Grafit	GRT
VGRADNA DOLŽINA	Vpiši dolžino v mm	

ZC-KIK



Uporaba
Application

Zaščitna cev za termoelemente pri kontinuiranem merjenju temperature Al in Zn talin.
Aluminium and zinc melting furnaces or other applications where mechanical impact is likely.

Material
Material

Lito železo prevlečeno s keramiko
Ceramic coated cast iron

Temperaturna obstojnost
Temperature existence

Max. 800°C

Predgretje
Preheating

Ni potrebno
Not required

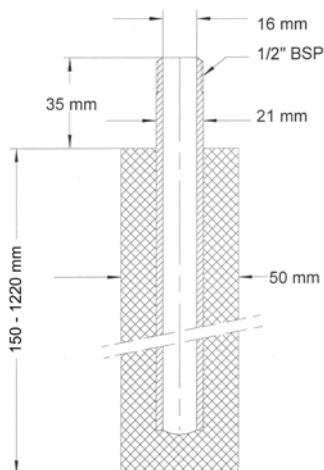
Priključek
Connection

Notranji navoj NPT 3/4"
Inside thread 3/4"

Dimenzije
Dimension

Ø 43x10xL
L = 305, 460, 610, 760, 915, 1065, 1220, 1370, 1525, 1830

ZC-SIC



Uporaba
Application

Zaščitna cev za termoelemente pri kontinuiranem merjenju temperature Al in Zn talin, posebej v odprtih plamenskih pečeh in strojih za tlačni liv.
Aluminium and zinc Holding/casting furnaces, filter boxes. Degassing units, pouring trough.

Material
Material

Jeklena cev W.Nr. 1.4762 / DIN X 10 CrAl 24 z oblogo iz silicijevega karbida.
Isostatic pressed Silicon Carbide with carbon matrix bonding.

Temperaturna obstojnost
Temperature existence

Max. 1000°C

Predgretje
Preheating

Ni potrebno
Not required

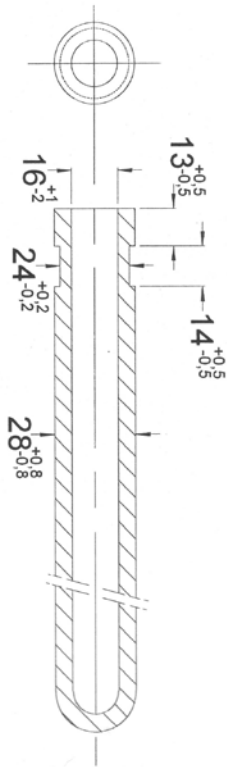
Priključek
Connection

Zunanji navoj NPT 1/2"
Outside thread NPT 1/2"

Dimenzije
Dimension

Ø 50xL
L = 405, 475, 610, 760, 915, 1065, 1220

ZC-SIA



Uporaba
Application

Zaščitna cev za termoelemente pri kontinuiranem merjenju temperature Al, Cu, Mg, Zn talin.
Aluminium, copper, magnesium, zinc. Degassing units, pouring trough.

Material
Material

Keramika SYALON, se ne sprijema z aluminijem in je zelo odporna proti keroziji. Garancija 12 mesecev
Syalon protection tubes with a specially developed high quality long life element.

Temperaturna obstojnost
Temperature existence

Max. 1350°C

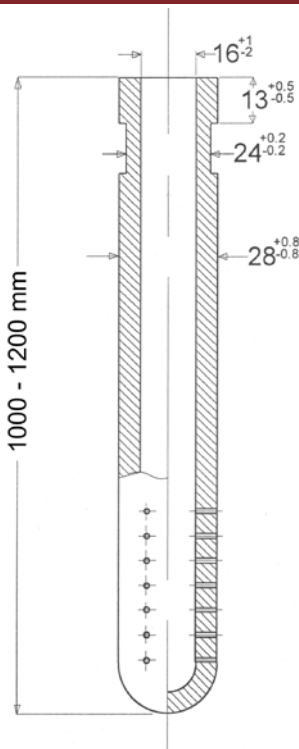
Predgretje
Preheating

Ni potrebno do 850°C
Not required up to 850°C

Dimenzije
Dimension

Ø 28x6xL
 L = 460, 610, 760, 915, 1065

SYALON-FXP



Uporaba
Application

Vpihanje plinov ali soli v Al taline.
Degassing (fluxing) of aluminium with inert or reactive gases.

Material
Material

Syalon

Temperaturna obstojnost
Temperature existence

Max. 1000°C

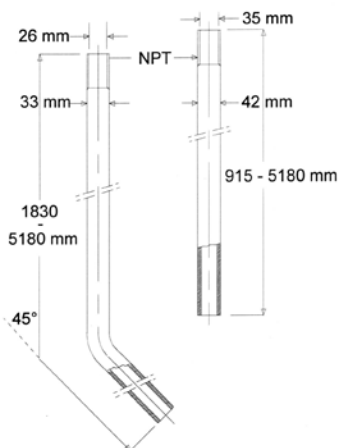
Predgretje
Preheating

Ni potrebno do 850°C
Not required up to 850°C

Dimenzije
Dimension

1000 – 1200mm

CCCI-FXP



Uporaba
Application

Vpihovanje plinov ali soli v Al taline, predvsem kjer so cevi iz grafita ali Si karbida neprimerne zaradi možnosti lomljenja
 Degassing (fluxing) of aluminium with inert or reactive gasses in environments where the tube is subjected to mechanical force

Material
Material

Litoželezna cev z zunanje in notranje strani prevlečena s keramiko
 Steel, ceramic coated in-and outside

Temperaturna obstojnost
Temperature existence

Max. 800°C

Predgretje
Preheating

Ni potrebno
 Not required

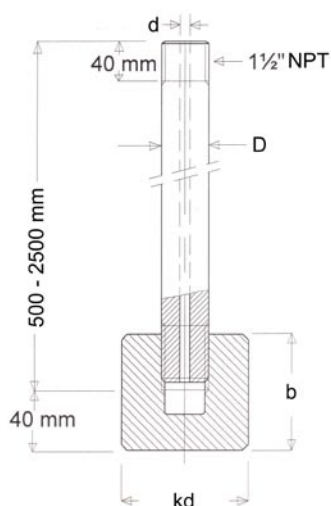
Priključek
Connection

Notranji navoj NPT 3/4"
 Inside thread NPT 3/4"

Dimenzije
Dimension

280mm...1800mm

GRAFIT-FXP



Uporaba
Application

Vpihovanje plinov ali soli v Al taline.
 Degassing pipe with or without porous head.

Material
Material

Grafit
 Graphite

Temperaturna obstojnost
Temperature existence

Max. 1000°C

Predgretje
Preheating

Ni potrebno
 Not required

Priključek
Connection

Zunanji navoj NPT 1 1/2"
 Outside thread NPT 1 1/2"

Dimenzije
Dimension

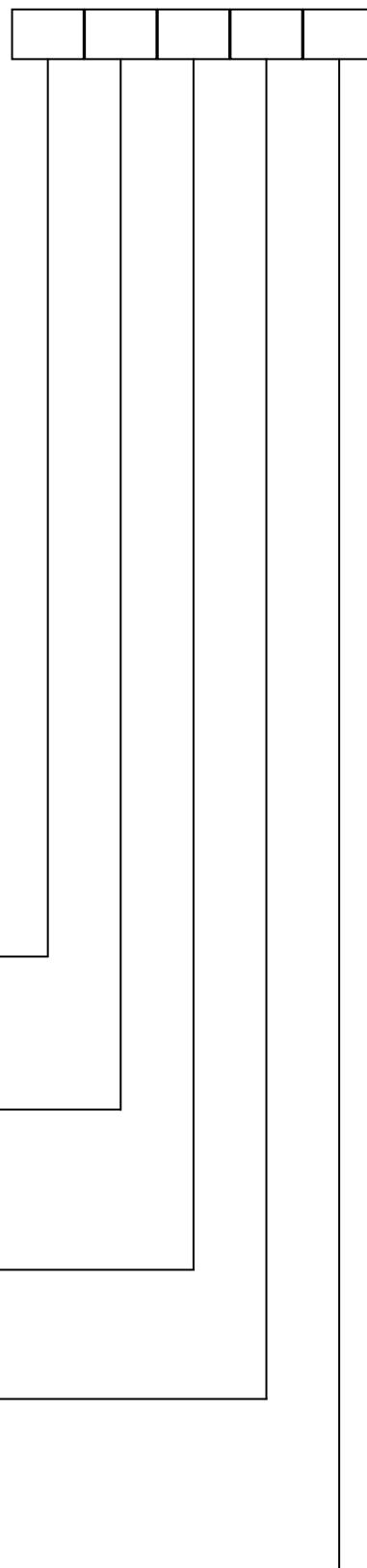
500mm do 2500mm	standardna dolžina 1250mm
CEV	POROZNA GLAVA
D x d	kd x b
52 x 12	100 x 100
102 x 20	200 x 180



Kompenzacijski kabli, termo kabli in izolirane termo žice










Compensation cables, thermo cables and isolated thermo wires

Ključ za naročilo





IZVEDBA VODNIKOV	Drobnožični (licnasti) Masivni	L M
PRESEK VODNIKOV	Ø 0.22 mm	022
	Ø 0.35 mm	035
	Ø 0.50 mm	050
	Ø 0.75 mm	075
	Ø 1.00 mm	100
	Ø 1.38 mm	138
	Ø 1.50 mm	150
ŠTEVILO VODNIKOV	2 vodnika	2
	4 vodniki	4
TIP MERILNIH ELEMENTOV	Cu - CuNi	T
	Fe - CuNi	L/J
	NiCr - Ni	K
	Pt10Rh - Pt	S
	Pt30Rh - Pt6Rh (EL18)	B
IZOLACIJA	Plastika	P
	Silikon	S
	Teflon	T
	Steklena vlakna	V
	Žični oplet	O








KOMPENZACIJSKI KABLI

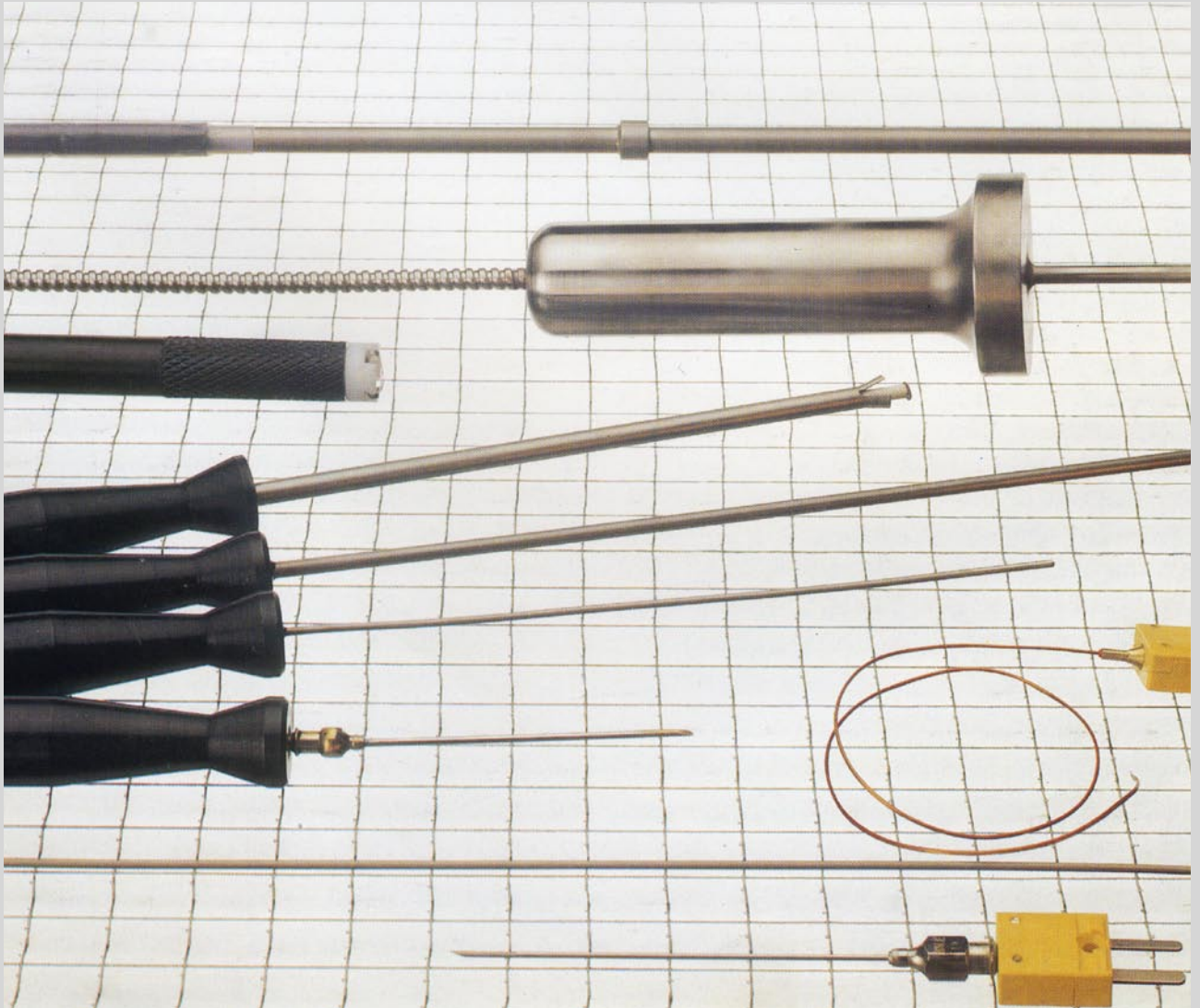
	Presek vodnikov <i>Cross section</i> mm ²	Zunanji premer <i>Outer diameter</i> Ø mm	Temperaturna obstojnost <i>Operating temperature</i> °C	Oznaka <i>Typ</i>
 Plastika - plastika	2 x L 0.22 2 x L 1.50 2 x M 1.38	3.6 x 4.1 4.4 x 7.2 4.2 x 6.8	- 10°C...+ 105°C	PP
 Silikon - silikon	2 x L 0.22 2 x L 1.50	Ø 3.5 Ø 7.2	- 60°C...+ 200°C	SS
 Plastika - plastika - žični oplet - plastika	2 / 4 x L 0.22 2 / 4 x L 1.50 2 / 4 x M 1.38	Ø 7.2 / 7.9 Ø 9.4 / 10.9 Ø 9.0 / 10.6	- 10°C...+ 105°C	PPOP
 Silikon - steklena vlakna	2 / 4 x L 1.50 2 / 4 x M 1.38	Ø 6.1 / 7.2 Ø 5.7 / 6.8	- 60°C...+ 200°C	SV
 Stekljena vlakna - steklena vlakna	2 / 4 x L 1.50 2 / 4 x M 1.38	2.5 x 4.5 / Ø 5.3 2.3 x 4.1 / Ø 4.8	max. + 200°C	VV
 Stekljena vlakna - steklena vlakna - žični oplet	2 x L 1.50 4 x L 1.50	3.5x5.5 Ø 6.3	max. + 200°C	VVO
 Silikon - steklena vlakna - žični oplet	2 / 4 x L 1.50 2 / 4 x M 1.38	Ø 6.7 / 8.2 Ø 6.9 / 8.8	- 60°C...+ 200°C	SVO
 Teflon - teflon	2 x L 0.50 2/4 x L 0.75	2.4 x 4.2 Ø 5	- 200°C...+ 200°C	TT
 Teflon - steklena vlakna - žični oplet	2/4 x L 0.22 2/4 x L 1.50	Ø 3.5 / 4.0 Ø 5.7 / 6.8	- 200°C...+ 200°C	TVO

TERMO KABLI

	Presek vodnikov Cross section mm ²	Zunanji premer Outer diameter Ø mm	Temperaturna obstojnost Operating temperature °C	Oznaka Typ
 Teflon - steklena vlakna - žični oplet	L 0.22 L 0.50	Ø 3.5 Ø 5.7	max. + 285°C	TVO
 Steklena vlakna - steklena vlakna - žični oplet	2 x L 0.22 2 x L 0.50	Ø 3.6 Ø 4.0	max. + 400°C	VVO

IZOLIRANE TERMO ŽICE







 Plastika - plastika	2 x 0.50 2 x 0.80 2 x 1.38	2.2 x 3.4 3.6 x 5.6 3.0 x 5.0	- 10°C...+ 105°C	PP
 Silikon - silikon	2 x 0.50 2 x 0.80 2 x 1.38	Ø 4.0 Ø 5.2 Ø 6.8	- 45°C...+ 200°C	SS
 Teflon - teflon	2 x 0.20 2 x 0.50 2 x 1.38	1.3 x 2.0 1.7 x 2.8 2.7 x 4.6	- 200°C...+ 205°C	TT
 Steklena vlakna - steklena vlakna	2 x 0.20 2 x 0.50 2 x 0.80 2 x 1.00	0.9 x 1.4 1.3 x 2.1 1.6 x 2.7 1.8 x 3.1	- 25°C...+ 400°C	VV
 Specialna steklena vlakna - specialna steklena vlakna	2 x 0.50 2 x 1.00	1.5 x 2.4 1.8 x 3.1	- 40°C...+ 800°C	GH
 Silika vlakna	2 x 0.80 2 x 1.00	Ø 4.5 Ø 4.9	- 40°C...+ 1000°C kratkotrajno do +1100°C	SF
 Keramična vlakna	2 x 0.80 2 x 1.00	Ø 4.5 Ø 4.9	- 40°C...+ 1200°C kratkotrajno do +1400°C	KF

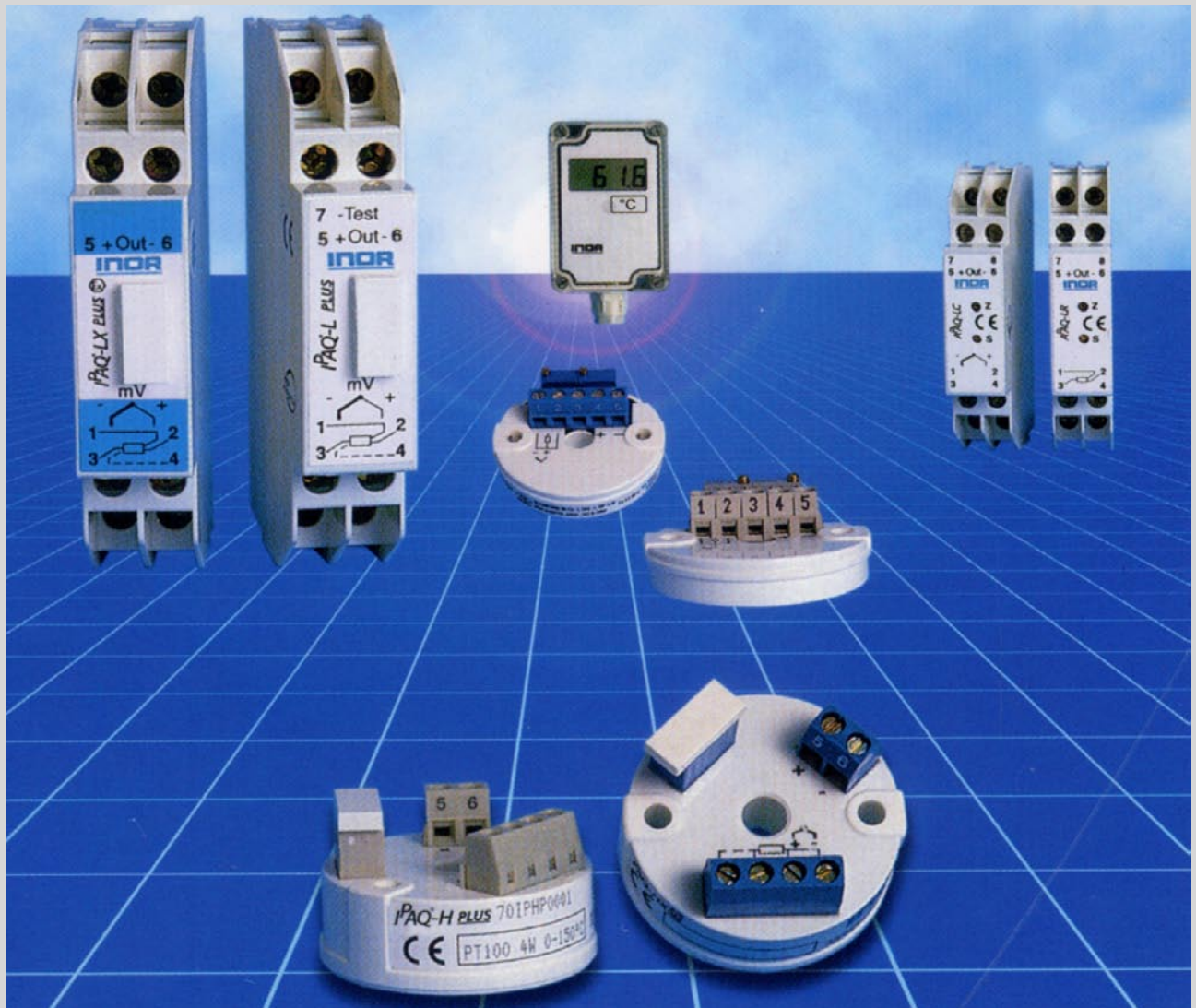


Prenosni merilci s sondami

Handheld temperature measuring instruments and probes

PRENOSNI MERILCI S SONDAMI

	Merilno območje Measuring range [°C]	Dolžina Length [mm]	Premer Diameter [Ø mm]	T90 [s]
 <p>Potopna sonda <i>Immersion probe</i></p>	-50... +1100°C -50... +600°C -50... +600°C -50... +1200°C	130 500 130 500	3 3 1,5 1,5	8 8 6 6
 <p>Vbodna sonda <i>Penetration probe with centric top</i></p>	-50... +400°C -50... +600°C	130 130	3 1,5	8 7
 <p>Hitroodzivna dotična sonda <i>Very quick temperature probe</i></p>	-50... +400°C	120	14	
 <p>Dotična sonda za enakomeren pritisk <i>With spring loaded Cu plate for steady pressure</i></p>	-50... +650°C	130	4	12
 <p>Dotična sonda z ukrivljeno konico <i>With spring loaded Cu plate and angle</i></p>	-50... +600°C	75	4	12
 <p>Hitroodzivna sonda – izolirana termožica <i>Unexpensive air probe fibre glass insulated</i></p>	-50... +400°C	100 500 1000	2,1 x 1,2 2,1 x 1,2 2,1 x 1,2	10 10 10



Merilni pretvorniki

Transmitters

INOR

DIN Rail Transmitters

Transmitter type	MESO-L	MESO-LX	IPAQ-L PLUS	IPAQ-LX PLUS	IPAQ-L	IPAQ-LX	IPAQ-2	IPAQ-2X	IPAQ-4L	APAQ-LR	APAQ-LC	TRS22-2	TRS22E
2-wire transmitter / Output: 4-20 mA	•	•	•	•	•	•	•	•		•	•	•	•
4-wire transmitter / Output: 0(4)-20 mA, 0(1)-5 V, 0(2)-10 V									•				
Fully HART compatible	•	•											
Configuration with PC under Winows	•	•	•	•	•	•	•	•	•				
Configuration with HART Communicator	•	•											
Configuration with rotary switches							•	•					
Universal input: RTD, T/C, mV, ohm	•	•	•	•	•	•	•	•	•				
Input: RTD (Pt 100), adjustable to specific ranges										•			
Input: RTD (Pt 100), continuously adjustable												•	
Input: T/C, (J, L, T, K, N) continuously adjustable											•		
Input: RTD (Pt 100), Fixed ranges													•
Input ≤50 mA					• ¹⁾		•	•	•				
Input ≤50 V									•				
Intrinsic Safety		•		•		•		• ²⁾					
Input-Output-(Supply) isolation 3750 (4000) VAC			•	•					•				
Input-Output isolation 1500 VAC	•	•			•	•	•	•					
High precision accuracy and stability			•	•									
Standard accuracy and stability	•	•			•	•	•	•	•	•	•	•	•
Temperature linearization	•	•	•	•	•	•	•	•	•	•		•	•
Advanced customized linearization	•	•	•	•									
Standard customized linearization					•	•	•	•	•				
Low isolation detection "SmartSense"	•	•	•	•			•	•	•				
Sensor break detection, user definable	•	•	•	•	•	•	•	•	•	•	•		
NAMUR-compliant			•	•	•	•							
Loop Calibration Output	•	•	•	•	•	•	•	•	•				
Sensor Error Correction	•	•	•	•	•	•	•	•	•				
System Error Correction		•	•										
High-speed measurement		•	•										
Configuration without external power		•	•										
Display connection		•	•										
Smart filter		•	•										
5 year limited warranty	•	•	•	•	•	•	•	•	•	•	•	•	•

¹⁾ Separate version of IPA-L

²⁾ Standard (non-intrinsic) power supply



Digitalni prikazovalniki in regulatorji

Digital indicators and controllers



Digitalni prikazovalniki in regulatorji



C1

Controller-Indicator-Transmitter

- single action controller
- indicator with alarms
- indicator-transmitter
- size 48 x 24 x 120 mm



M1

Controller-Indicator-Transmitter

- single action controller
- indicator with alarms
- indicator-transmitter
- size 48 x 48 x 120 mm



M3

Heat-Cool Controller

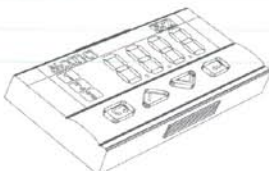
- single or double (heat-cool) action controller with current transformer input
- size 48 x 48 x 120 mm



M5

Process Controller - Setpoint Programmer

- process controller
- setpoint programmer
- continuous and floating (three steps) output
- auxiliary I/O
- adaptive tune
- size 48 x 48 x 150 mm



Digitalni prikazovalniki in regulatorji



X3

Double action controller with analogue output

- Heat-Cool
- valve drive output
- Auto/Man
- size: 48 x 96 x 110 mm



X1

Heat / Cool temperature controller

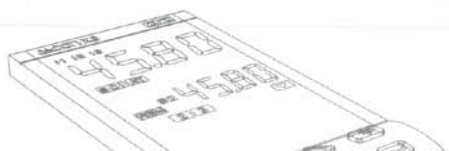
- 3 relay outputs
- Start-up
- Timer
- current transformer input
- size: 48 x 96 x 110 mm



X5

Process controller with PROFIBUS DP and Master/Slave Modbus

- update time: 50 ms
- 2 analogue outputs
- Setpoint programmer
- memory chip
- size: 48 x 96 x 110 mm



Digitalni prikazovalniki in regulatorji

The products

Multifunction Programmable Controller

AC STATION The "AC Station" is a series of powerful, flexible and expandable micro DCSs

- that fills the gap between SLC and mini DCS with:
- 4 - 8 analogue inputs
- 4 - 8 analogue outputs
- 8 - 24 digital inputs
- 8 - 24 digital outputs
- 2 - 3 serial communications ports
- 1 LAN communications port
- 4 advanced PID algorithms

Compact, 72x144 size, only 260 mm deep. High resolution graphic display with interactive guided menu, bargraph pages, trends, alarms, etc. for a simple Man Machine Interface.

Complete freedom to design your control strategy with user friendly graphic tool.

No programming language needed. Twelve of the most common pre-programmed control strategies are also included.

Serial communications, Master/Slave and high speed Peer-to-Peer for the exchange of resources and/or integration in higher level systems.

Three protected access levels for the control strategy design, start-up and operation.



- 12 Timers and counters**
Totalizers
Counters with reset
4 types of timers
- 11 Control**
Advanced PID algorithm with 2 degrees of freedom for a correct control response during both Set point and load changes.
Intelligent tune "InTune"
Gain scheduling
Bumpless
Feed forward
PID saturation signalling
- 10 Analogue outputs**
Min max Limits
Rate limits
Safety value
Tracking
Hold
Min max signal forcings
Heat/Cool outputs
- 9 Set point Management**
Local-Remote,
Safety Set point
4 stored values
4 priority levels
- 8 Complex expressions**
freely configurable
i.e. Koch's equation of state
$$v = \frac{RT}{P} - \frac{A}{\left(\frac{T}{100}\right)^{2.82}} - p^2 \left[\left(\frac{B}{T}\right)^{34} + \left(\frac{C}{T}\right)^{31.4} \right]$$
- 7 Protection**
Different access for project engineer, start-up engineer and operator
Set Point, Output, Input limits
Keyboard lock
Auto-diagnosis
Remote tech-support
- 6 Logic functions**
AND/OR/EXOR/NOT
Flip-flop
Select - deselect logic
- 5 Comparators, selectors**
Max min selection
Limiter
Rate limiter
Analogue - digital multiplexer
- 4 Alarms**
Absolute
Deviation
Rate
- 3 Mathematical functions**
Addition - Subtraction
Multiplication - Division
Absolute value
Square Root
Power
Sine - Cosine
Exponential - Derivative
Nat.-Common logarithm
- 2 Input conditioning**
Linearization Table
Polynomial linearization
Thermocouple output linearization
RTD output linearization
Scale changes
Engineering units
Square Root
Digital filter
Temperature compensation
Pressure compensation
- 1 Display pages**
Bargraphs (1, 2, 3 or 4)
Trends
Alarms, logic status and signal forcings
Guided and interactive menus
Parameters
Others, freely programmable

Digitalni prikazovalniki in regulatorji



RC/RS Series Industrial hybrid recorders

RC/RS100 series

- Recording width 100 mm
- 1,2,3,4 pens or 6 dot channels
- Universal inputs
- Accuracy $\pm 0,1\%$
- Up to 6 alarm relay outputs
- RS422
- 144x144 DIN

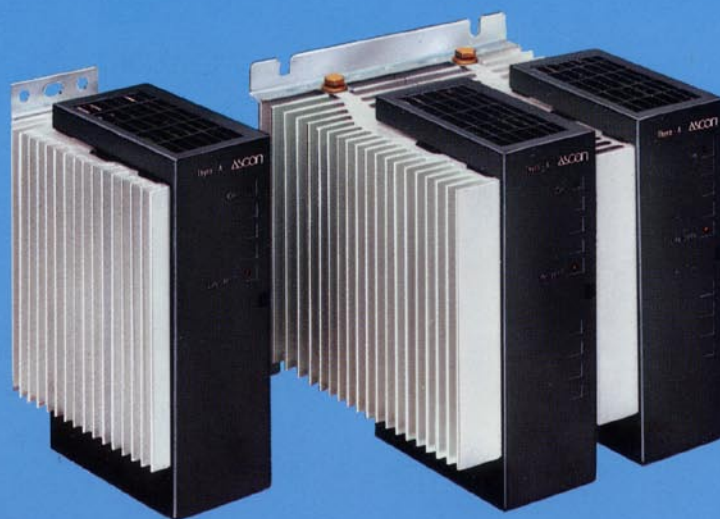
RC/RS180 series

- Recording width 180 mm
- 1,2,3,4 pens or 6,12,18,24 dot channels
- Universal inputs
- Accuracy $\pm 0,1\%$
- Up to 24 alarm relay outputs
- RS422
- 288x288 DIN

TH Series

Configurable Thyristor power controllers

- Single and three-phase
- Nominal voltage: from 230 to 660 V
- Rated current: from 30 to 1900 A
- Operating modes: full wave, switching phase, angle firing
- Control characteristics: voltage, current or power feedback
- Resistive, inductive and transformer loads





TERMO MR d.o.o., Merilna tehnika, trgovina, uvoz - izvoz

Pekre, Pod izviri 8, 2000 Maribor, Slovenija

Telefon: ++386 (0)2 6140 610, Telefaks: ++386 (0)2 6140 611

Spletna stran: <http://www.termo-mr.si>, E-mail: info@termo-mr.si
