Technical Information
TI 226T/02/en
60020827

Thermocouple Insert for EEx-d omniset TEC 300

Nipple style
Mineral insulated insert dimeter 6 mm
TC type K / J / T

Description
The TEC 300 insert consists of a mineral insulatd cable of 6 mm diameter with 150 mm free connection wires for the assembly of temperature transmitterso or terminal blocks. The style of the insert and the ending of the conductor cables are of a spring loaded kind. In this way the tip of the insert is pressed against the bottom of the thermowell guaranteeing the very best thermal contact and excellent resistance to vibrations. At the same time the spring compensate for thermal expansion.

Application
The TEC 300 is the interchangeable thermocouple insert for the EEx d line. It can be used for installation in Ex-proof TSC 262, TSC 264 and TSC 266 thermocouple thermometers and in the TC compact TMT 162 thermometer.
The insert is normally installed in appropriate protection wells as it cannot be used on its own for heavy applications.

Endress + Hauser
The Power of Know How

Technical data

Mineral insulated insert

Type of thermocouple:	K (NiCr / NiAl) according to IEC 584 or ANSI MC 96.1 J (Fe / CuNi) according to IEC 584 or ANSI MC 96.1 T (Cu / CuNi) according to IEC 584 or ANSI MC 96.1
Tolerance:	class 2 or class 1 according to IEC 584-2
Operating temperature:	-40°C + 1150°C for type K -40°C + 720°C for type J -40°C + 370°C for type T (max. temperature according to ASTM E 608)
Resistance against insulation:	> 1000 MΩ of test tension 500 V at ambient temperature (according to ASTM E 608)
Electrical connections:	free wires 150 mm
Rod:	mineral insulated cable
Coating:	AISI 316 / W.1.4401 or INCONEL® 600 / W.2.4816
Standard diameter:	6 mm
Values of response time:	tested in water at 0.4 m/s t_{50} = 2 s t_{90} = 5 s for grounded junction t_{50} = 2.5 s t_{90} = 7 s for insulated junction

Installation

The spring loaded lamination nipple always guarantees perfect contact with the bottom of the thermowell for a rapid response time. It is necessary to calculate the length ML depending on the threading of the thermowell.

.

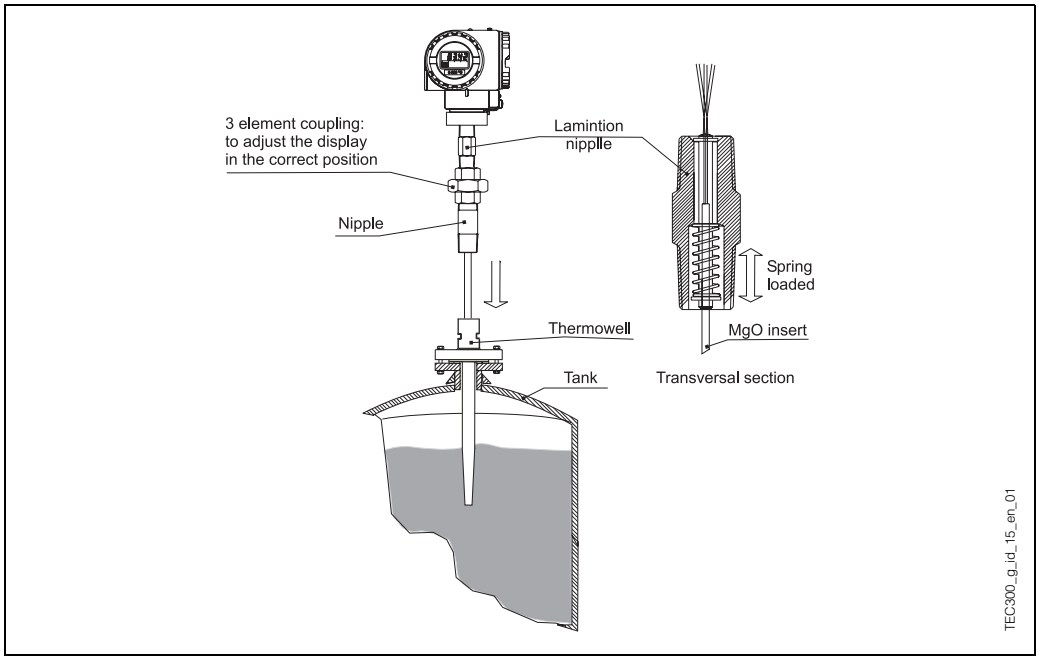
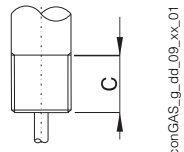
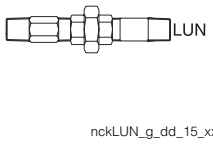
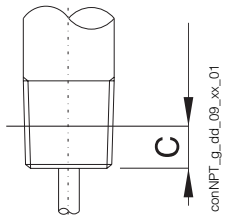
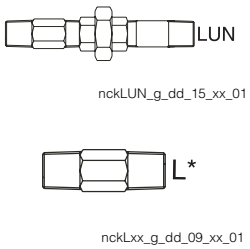
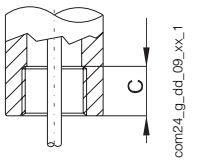
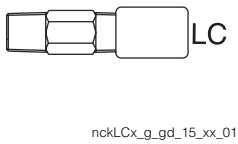
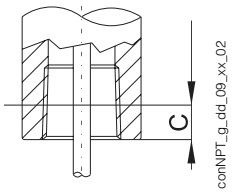
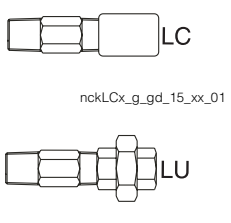


Fig. 1: Measuring point of the temperature with display

Selection of the insert

In order to easily select the correct connection to the thermowell refer to the table below. All of the information related to the threading of the extension neck is indicated. The following pages explain in detail how to calculate the length of the immersion ML of the insert for each type of thermometer coupling / thermowell.

Connection to the thermowell					
Type	**Male**				
	Thread	Digit (*)	C (mm)	Engagement	Neck model
Cylindrical	G 1/2"	D	15		
	G 3/4"	F	15		
	M 14x1.5	V	14		
	M 18x1.5	W	14		
Conical	1/2" NPT	N	8		
	3/4" NPT	P	8.5		
(*) see order code TEC 300: connection to the well (the letter identifies the option)					

Connection to the thermowell					
Type	**Female**				
	Thread	Digit (*)	C (mm)	Engagement	Neck model
Cylindrical	M 24x1.5	U	16		
Conical	1/2" NPT	5	8		
	3/4" NPT	6	8.5		
(*) see order code TEC 300: connection to the thermowell (the letter identifies the option)					

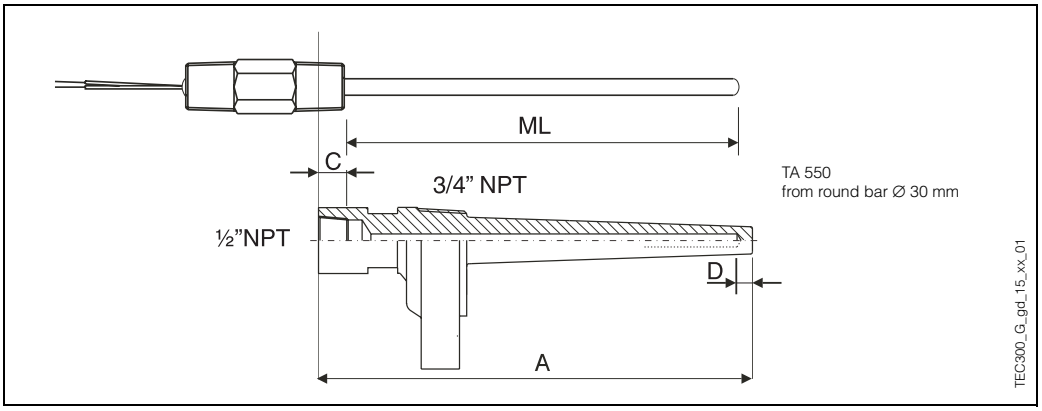
Thermowell selection and calculation of length ML

Selection of the well for TEC 300 with neck type L

A = total length of the thermowell
C = thread engagement
D = thickness of pit base*
F = expansion length of spring under pressure
ML = immersion length
(*) For the thickness of the thermowell bottom D, refer to the technical information TI 138T/02 related to the TA range of thermowells

Formula for the calculation of ML - Neck L				
TW model	**TEC 300 threading at**	**Formula (1)**	**C (mm)**	**D (mm)**
TA 550	1/2" NPT	ML = A-11	8	6

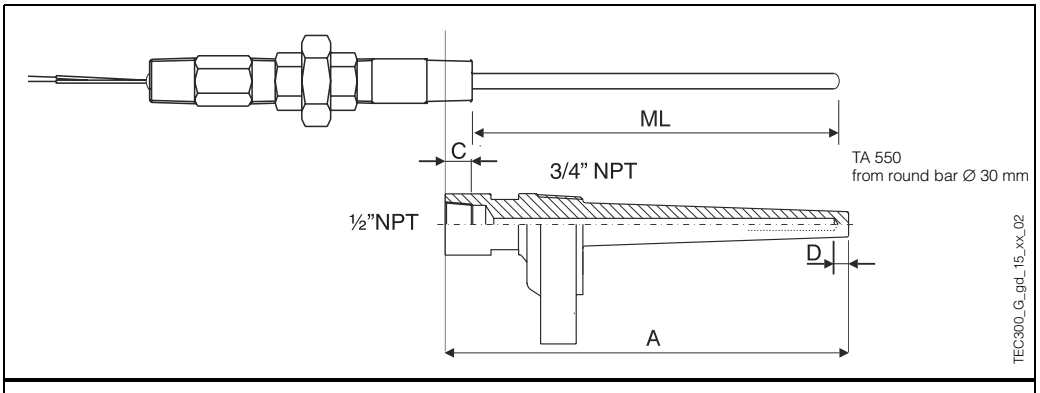
Tab.1: (1) Calculation of ML means: ML=A-(D+C)+F

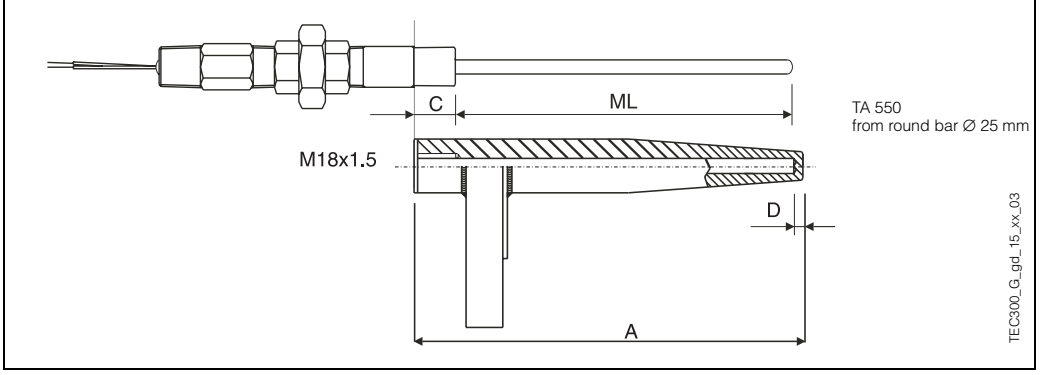


Selection of the well for TEC 300 with neck type LUN

Formula for the calculation of ML - Neck LUN				
TW model	**TEC 300 threading at**	**Formula (1)**	**C (mm)**	**D (mm)**
TA 550	1/2" NPT	ML = A-11	8	6
TW 15	M18x1.5	ML = A-12	14	3

Tab. 2: (1) Calculation of ML means: ML=A-(D+C)+F

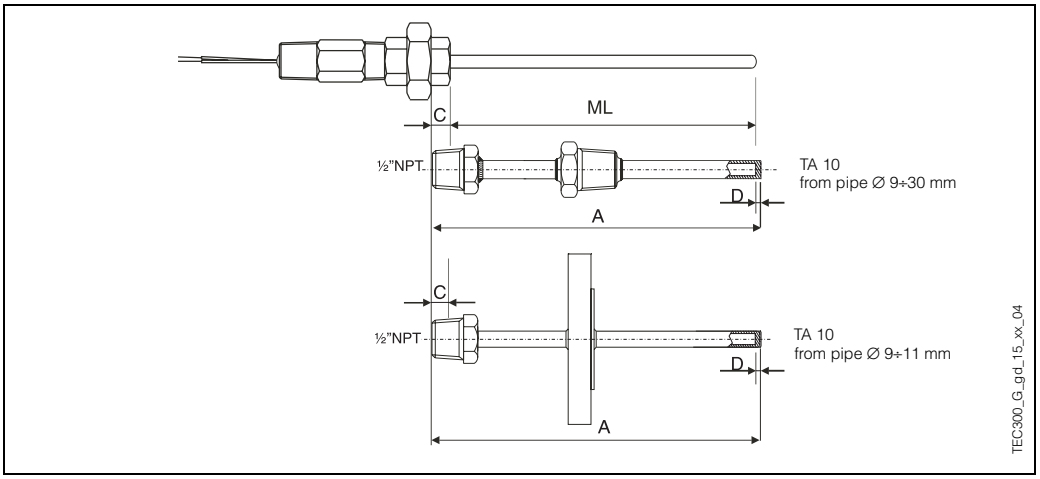




Selection of the well for TEC 300 with neck type LU

Formula for the calculation of ML - Neck LU				
TW model	**TEC 300 threading at**	**Formula (2)**	**C (mm)**	**D (mm)**
TW 10	1/2" NPT	ML = A-8	8	3
TW 13	M18x1.5	ML = A-8	8	3

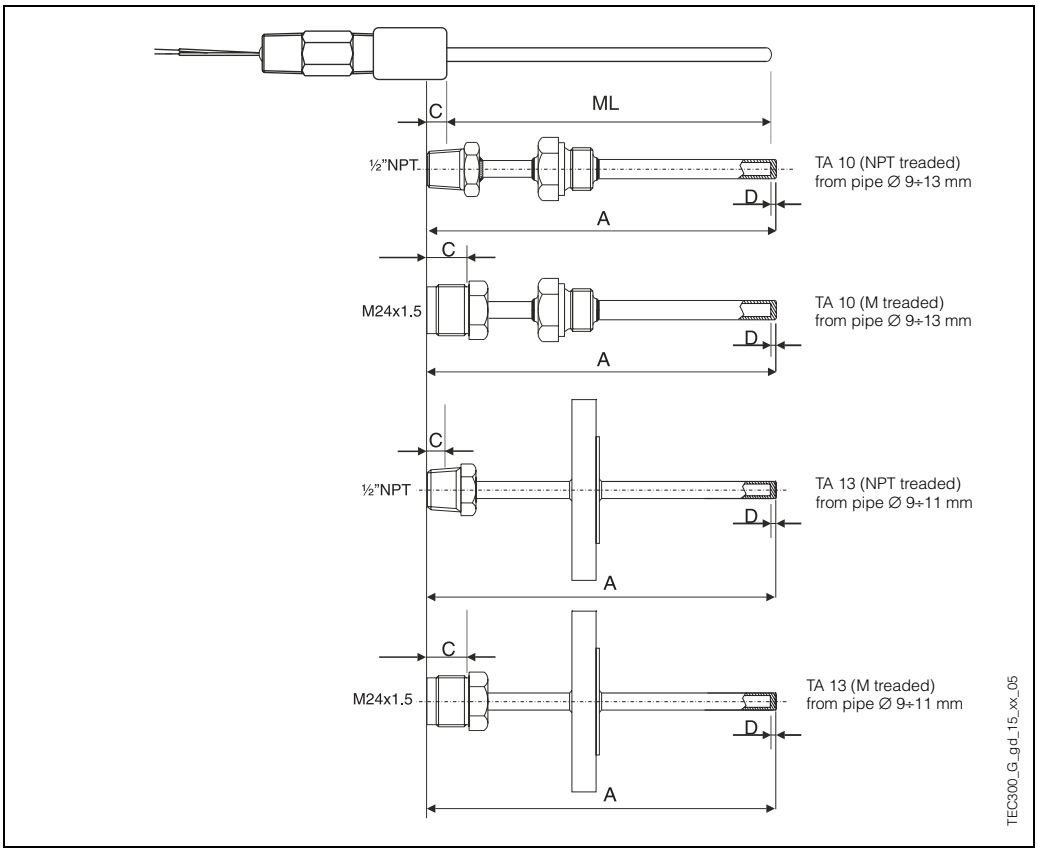
Tab. 3: (2) Calculation of ML means: ML=A-(D+C)



Selection of the well for TEC 300 with neck type LC

Formula for the calculation of ML - Neck LC				
TW model	**TEC 300 threading at**	**Formula (2)**	**C (mm)**	**D (mm)**
TW 10	1/2" NPT	ML = A-8	8	3
	M24x1.5	ML = A-15	16	3
TW 13	1/2" NPT	ML = A-8	8	3
	M24x1.5	ML = A-15	16	3

Tab. 4: (2) Calculation of the MLmeans: ML=A-(D+C)



Ordering information

Sales structure

TEC300	Application							
	R	General purpose						
		Connection type, material						
		A	Nipple, St.St. type L (size 1/2" only)					
		B	Nipple, C.S. Union, type LU					
		D	Nipple, St.St. Union, type LU					
		E	Nipple, St.St. Coupling, type LC					
		F	Nipple, C.S. Union+Nipple, type LUN					
		H	Nipple, St.St. Union+Nipple, type LUN					
		Y	Nipple, connection, material to specify					
			Connection thread to thermowell					
			D	G 1/2 B male (BSP parallel) connection				
			F	G 3/4 B male (BSP parallel) connection				
			N	1/2 NPT male connection				
			5	1/2 NPT female connection				
			P	3/4 NPT male connection				
			6	3/4 NPT female connection				
			U	M 24x1.5 female connection (type LC only)				
			V	M 14x1.5 male connection (type LUN only)				
			W	M 18x1.5 male connection (type LUN only)				
			Y	Connection thread to specify				
				Insertion length ML (50-4000 mm)				
				XX	mm thermowell lenth ML to specify			
				YY	mm special thermowell length ML			
					Inset			
					AF	1xTC IEC 584 type K, Inconel® 600 W2.4816		
					AQ	2xTC IEC 584 type K, Inconel® 600 W2.4816		
					BE	1xTC IEC 584 type J, AISI 316/W1.4401		
					BP	2xTC IEC 584 type J, AISI 316/W1.4401		
					CE	1xTC IEC 584 type T, AISI 316/W1.4401		
					CP	2xTC IEC 584 type T, AISI 316 W1.4401		
					DF	1xTC ANSI type K, Inconel® 600/W2.4816		
					DQ	2xTC ANSI type K, Inconel® 600/W2.4816		
					EE	1xTC ANSI type J, AISI 316/W1.4401		
					EP	2xTC ANSI type J, AISI 316/W1.4401		
					FE	1xTC ANSI type T, AISI 316/W1.4401		
					FP	2xTC ANSI type T, AISI 316/W1.4401		
						MgO type IEC 584-2 (ANSI MC 96.1)		
						1	Std. purity, cl.2, hot junction grounded	
						2	Std. purity, cl.1, hot junction grounded	
						5	Std. purity, cl.2, hot junction insulated	
						6	Std. purity, cl.1, hot junction insulated	
TEC300-								Complete order code

Supplementary documentation

❑ Compact thermocouple thermometer - Omnigrad S TMT162C	TI 267T/02/en
❑ Industrial protecting tubes - Omnigrad TA series	TI 138T/02/en
❑ EEx d themocouple thermometer - Omnigrad TSC 262	TI 165T/02/en
❑ EEx d thermocouple thermometer - Omnigrad TSC 264	TI 164T/02/en
❑ Temperature thermocouple sensor - Omnigrad S TSC 266	TI 248T/02/en

Subject to modification

Endress+Hauser
Gmbh+Co.
Instruments International
P.O. Box 2222
D-79574 Weil am Rhein
Germany

Tel. (07621) 975-02
Tx 773926
Fax (07621) 975 345
http://www.endress.com
info@ii.endress.com

Endress + Hauser
The Power of Know How

TI 226T/02/en/12.02
60020827
FM+SGML 6.0