

Engine Thermometers

Engine thermometers acc. to DIN 16181-16195

Catalogue 1



Ludwig Schneider 

*High-precision measuring instruments for
temperature and density*

DKD/DAkkS calibration laboratory for temperature and density

Ludwig Schneider is one of the world's leading manufacturers of precision measuring instruments for temperature and density. Based on these experiences its subsidiary company Ludwig Schneider Messtechnik GmbH (LSM) has been offering calibration services for temperature measurements for more than 20 years.

Since 2005 LSM has been the first private-sector company in Germany with DKD/DAkkS accreditation for density measurements of hydrometers.

International customers of the chemical, pharmaceutical, mineral oil/refinery, food processing industries and oceanography are using the LSM calibration services.

DKD/DAkkS accreditation

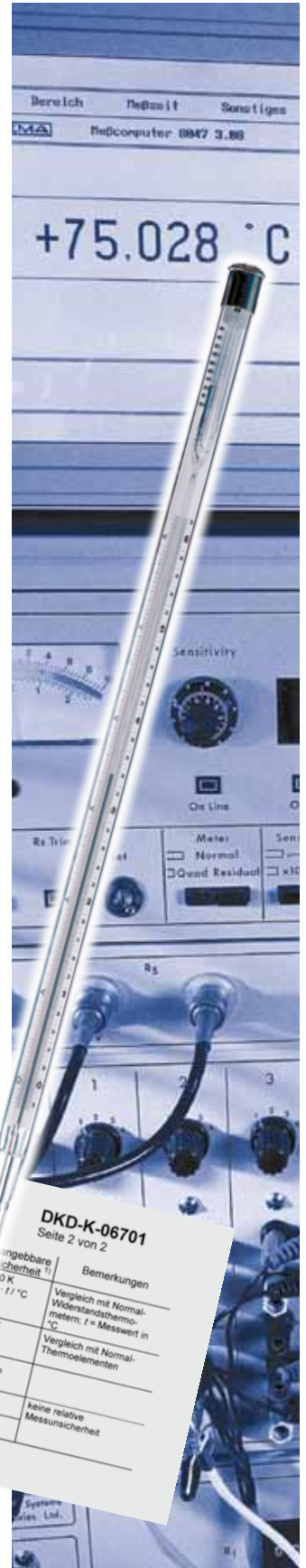
Ludwig Schneider Messtechnik is accredited under registration number DKD-K-06701 by the Accreditation Body „Deutscher Kalibrierdienst“ and fully complies with the requirements of ISO/IEC 17025.

United under the International Laboratory Accreditation Cooperation (ILAC), 52 nations at present have contractually agreed to mutually accept the calibration results of the signatories' accredited calibration laboratories according to ISO/IEC 17025.



Our range of services

- Fixed-point calibration of interpolation thermometers
- Comparative measurements of resistance thermometers, thermocouples, liquid-in-glass thermometers, temperature indicators, temperature block calibrators
- Adjustment of digital/analog measured data acquisition systems
- Calculation of specific constants on the basis of ITS-90 deviation functions, Van Dusen equations, polynomial functions
- Documentation of calibration results: DKD/DAkkS calibration certificates, manufacturers' test certificates, conformity statements, compliance with QM codes and standards (DIN, ASTM, BS, IEC, etc.)



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Anlage 04 zur Akkreditierungsurkunde des Kalibrierlaboratoriums

Messgröße / Kalibriergegenstand	Messbereich / Messspanne	Messbedingungen / Verfahren	k:	M:
Temperatur-Blockkalibratoren	-30 °C bis > 133 °C	133 °C bis 660 °C		
Dichte-Arätometer und abgeleitete Instrumente	0 °C bis > 860 °C	660 °C bis 1000 °C		
Gehalt-Alkoholometer	450 kg/m ³ bis 2000 kg/m ³	Auftriebswägung		
Gehalt-Saccharimeter	0 % bis 100 %	Auftriebswägung		
	0 % bis 70 %	Auftriebswägung		

angegebene Sicherheit (%)	Bemerkungen
20 K	Vergleich mit Normal-Widerstandsthermometern; t = Messwert in °C
5 K	Vergleich mit Normal-Thermoelementen
5 K	
5 K	
1 kg/m ³	
18 %	keine relative Messunsicherheit
12 %	

DKD-K-06701
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Our Engine Thermometer Program

Top Quality and Flexibility

A complete product range for all requirements

Ludwig Schneider manufactures a great variety of instruments in their engine thermometer program which is highly appreciated by leading industries all over the world.

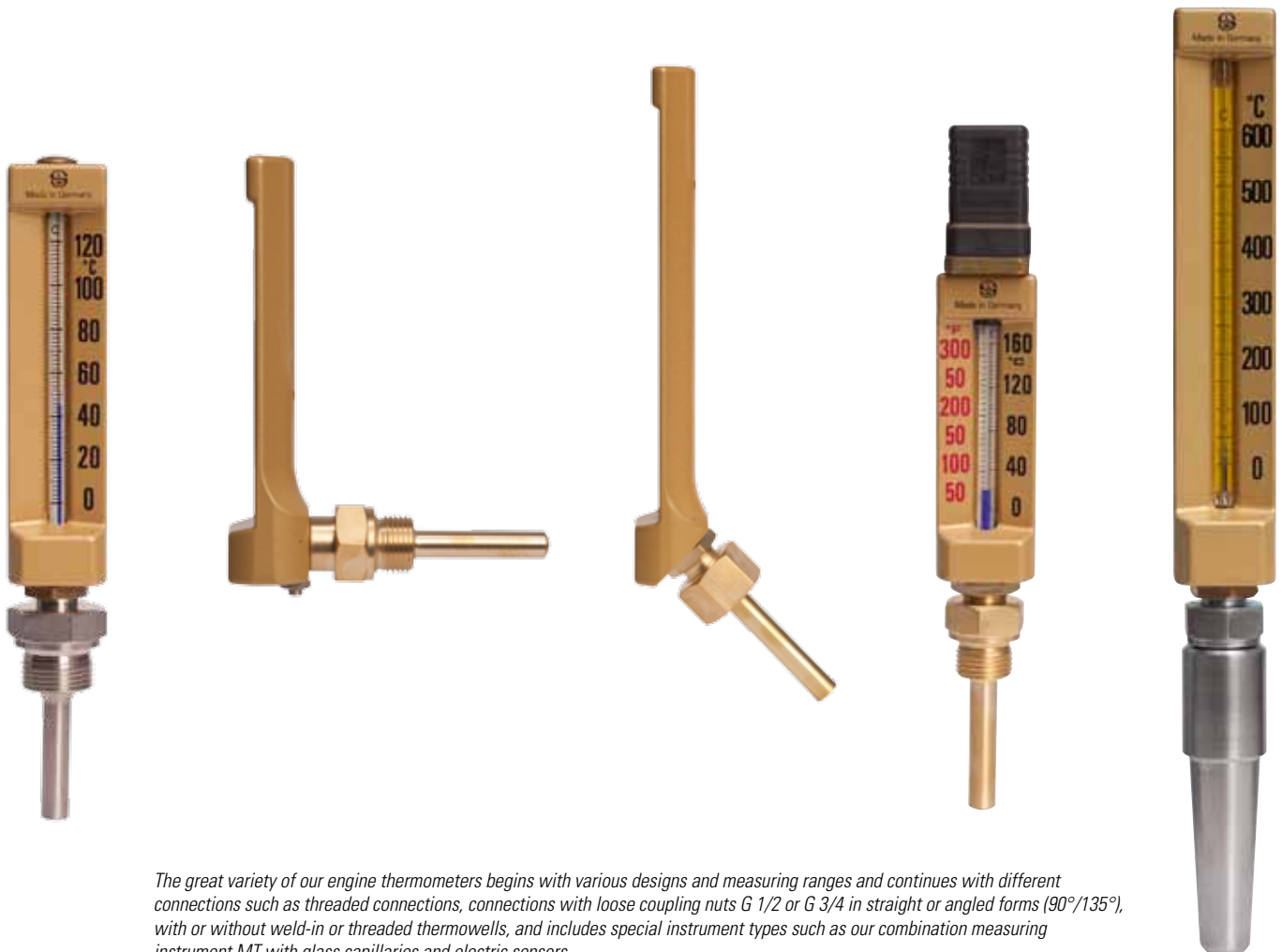
Our international customers in the petrochemical field, in ship building and other related industries always find the right, high-precision instrument in our extensive program for their product control, for monitoring industrial processes and for quality assurance.

In order to guarantee accuracy requirements our products are under careful quality control during all separate production steps and also undergo a final quality check as end products.

If required these precision instruments are also available with DKD/DAkkS Calibration Certificates or Works Certificates.

Product features

- Top quality "Made in Germany"
- Precise, easy-to-read scales
- Available with environment-safe filling
- Manufactured acc. to DIN standards
- Made from highest-quality materials
- Thermowells acc. to DIN and in completion of DIN standards
- Available with Works Certificates and DKD/DAkkS Calibration Certificates
- Instruments can be manufactured acc. to special requirements



The great variety of our engine thermometers begins with various designs and measuring ranges and continues with different connections such as threaded connections, connections with loose coupling nuts G 1/2 or G 3/4 in straight or angled forms (90°/135°), with or without weld-in or threaded thermowells, and includes special instrument types such as our combination measuring instrument MT with glass capillaries and electric sensors.

A Great Variety of Instruments

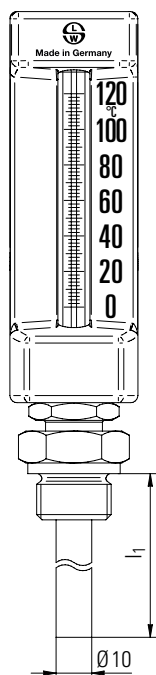
Options – add these symbols to your order number

Complete Engine Thermometers

Types	Symbol for option*
Case (standard type: brass-colored aluminum case)	
Plastic case (up to measuring ranges of +200 °C)	/K
Aluminum case (silver-colored)	/S
Scale Lettering (standard black, °C scale on right side)	
With double scale °C/°F (°C scale on right side in black, °F on left side in red)	/C+F
Connections (standard type: G 1/2)	
Threaded connection G 3/4	/G3/4
Threaded connection G 3/8	/G3/8
Threaded connection G 1	/G1
Threaded connection M20 x 1.5	/M20x1,5
Threaded connection 1/2" NPT	/1/2"NPT
Threaded connection 3/4" NPT	/3/4"NPT
Loose coupling nut G 1/2	/ÜWM1/2
Loose coupling nut G 3/4	/ÜWM3/4
Shaft Form A, dia. 17 mm, with groove	/FormA17
Shaft Form A, dia. 28 mm	/FormA28
Stem materials (standard, brass)	
Special brass SoMs76	/Soms
Stainless steel 1.4571	/VA
CuNi30Mn1Fe	/CuNi
Calibration of engine thermometers (standard: no calibration)	
With works certificate	/03
With DKD/DAkkS calibration certificate	/04
Thermowell material tests (standard: no test)	
Works certificate 2.1 acc. to DIN EN 10204	/WAZ2.1
Works testing 3.1B acc. to DIN EN 10204, restamping of material and certificate	/WAZ3.1
Other available options (on request)	
Teflon-coated capillary	
Different stem diameters	
Different stem lengths	
Different measuring ranges	
V-Shape engine thermometers with fixed contact	
V-Shape glass maximum engine thermometers with steel marker	
Different threading (e.g. M20 x 1.5, M27 x 2, G1)	
Different thermowell diameters	
Different thermowell lengths	

* You may add several symbols to your order number e.g. 1674004/S/G1/CuNi/04

V-Shape Glass Engine Thermometers, Form B, G 1/2, 110 x 36, Straight Type



Complete instruments acc. to DIN 16181, straight type, threaded connection

Case: 110 x 36 mm, aluminum brass-colored,

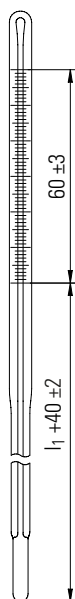
Threading: G 1/2, Stem: dia. 10 mm

Scale lettering: black

Capillary: white back prismatic, blue filling

Accuracy: 1% of scale value

Measuring range °C	Scale division °C	Order numbers					
		Built-in length l_1 (mm)					
		$l_1 = 30$	$l_1 = 40$	$l_1 = 50$	$l_1 = 63$	$l_1 = 100$	$l_1 = 160$
-60 +40	2	1681001	1681002	1681003	1681004	1681007	1681011
-30 +50	2	1681101	1681102	1681103	1681104	1681107	1681111
0 +60	1	1681151	1681152	1681153	1681154	1681157	1681161
0 +100	2	1681201	1681202	1681203	1681204	1681207	1681211
0 +120	2	1681251	1681252	1681253	1681254	1681257	1681261
0 +160	5	1681301	1681302	1681303	1681304	1681307	1681311



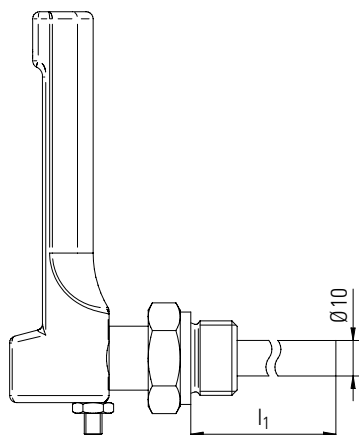
Spare capillaries acc. to DIN 16195

Measuring range °C	Scale division °C	Order numbers					
		Built-in length l_1 (mm)					
		$l_1 = 30$	$l_1 = 40$	$l_1 = 50$	$l_1 = 63$	$l_1 = 100$	$l_1 = 160$
-60 +40	2	1684001	1684002	1684003	1684004	1684007	1684011
-30 +50	2	1684101	1684102	1684103	1684104	1684107	1684111
0 +60	1	1684151	1684152	1684153	1684154	1684157	1684161
0 +100	2	1684201	1684202	1684203	1684204	1684207	1684211
0 +120	2	1684251	1684252	1684253	1684254	1684257	1684261
0 +160	5	1684301	1684302	1684303	1684304	1684307	1684311

Note for ordering:

When ordering standard types use the order numbers in the tables. For further options see page 5 "Options".

V-Shape Glass Engine Thermometers, Form B, G 1/2, 110 x 36, 90° Angle



Complete instruments acc. to DIN 16182, 90° angle, for insertion

Case: 110 x 36 mm, aluminum brass-colored,

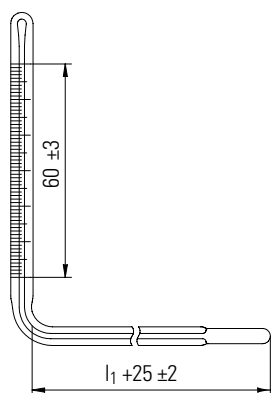
Threading: G 1/2, Stem: dia. 10 mm

Scale lettering: black

Capillary: white back prismatic, blue filling

Accuracy: 1% of scale value

Measuring range °C	Scale division °C	Order numbers					
		Built-in length l_1 (mm)					
		$l_1 = 30$	$l_1 = 40$	$l_1 = 50$	$l_1 = 63$	$l_1 = 100$	$l_1 = 160$
-60 +40	2	1672001	1672002	1672003	1672004	1672007	1672011
-30 +50	2	1672101	1672102	1672103	1672104	1672107	1672111
0 +60	1	1672151	1672152	1672153	1672154	1672157	1672161
0 +100	2	1672201	1672202	1672203	1672204	1672207	1672211
0 +120	2	1672251	1672252	1672253	1672254	1672257	1672261
0 +160	5	1672301	1672302	1672303	1672304	1672307	1672311



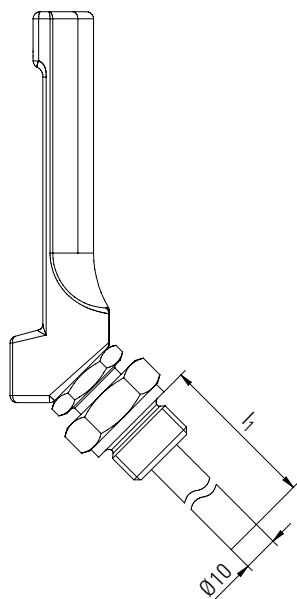
Spare capillaries acc. to DIN 16195

Measuring range °C	Scale division °C	Order numbers					
		Built-in length l_1 (mm)					
		$l_1 = 30$	$l_1 = 40$	$l_1 = 50$	$l_1 = 63$	$l_1 = 100$	$l_1 = 160$
-60 +40	2	1674001	1674002	1674003	1674004	1674007	1674011
-30 +50	2	1674101	1674102	1674103	1674104	1674107	1674111
0 +60	1	1674151	1674152	1674153	1674154	1674157	1674161
0 +100	2	1674201	1674202	1674203	1674204	1674207	1674211
0 +120	2	1674251	1674252	1674253	1674254	1674257	1674261
0 +160	5	1674301	1674302	1674303	1674304	1674307	1674311

Note for ordering:

When ordering standard types use the order numbers in the tables. For further options see page 5 "Options".

V-Shape Glass Engine Thermometers, Form B, G 1/2, 110 x 36, 135° Angle



Complete instruments nominal size 110,

135° angle, threaded connection

Case: 110 x 36 mm, aluminum brass-colored,

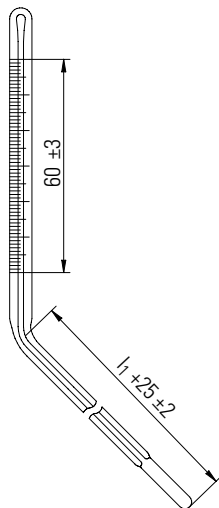
Threading: G 1/2, Stem: dia. 10 mm

Scale lettering: black

Capillary: white back prismatic, blue filling

Accuracy: 1% of scale value

Measuring range °C	Scale division °C	Order numbers				
		Built-in length l_1 (mm)				
		$l_1 = 40$	$l_1 = 50$	$l_1 = 63$	$l_1 = 100$	$l_1 = 160$
-60 +40	2	1673002	1673003	1673004	1673007	1673011
-30 +50	2	1673052	1673053	1673054	1673057	1673061
0 +60	1	1673102	1673103	1673104	1673107	1673111
0 +100	2	1673152	1673153	1673154	1673157	1673161
0 +120	2	1673202	1673203	1673204	1673207	1673211
0 +160	5	1673252	1673253	1673254	1673257	1673261



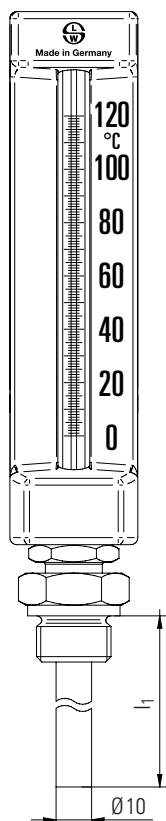
Spare capillaries acc. to DIN 16195

Measuring range °C	Scale division °C	Order numbers				
		Built-in length l_1 (mm)				
		$l_1 = 40$	$l_1 = 50$	$l_1 = 63$	$l_1 = 100$	$l_1 = 160$
-60 +40	2	1675002	1675003	1675004	1675007	1675011
-30 +50	2	1675052	1675053	1675054	1675057	1675061
0 +60	1	1675102	1675103	1675104	1675107	1675111
0 +100	2	1675152	1675153	1675154	1675157	1675161
0 +120	2	1675202	1675203	1675204	1675207	1675211
0 +160	5	1675252	1675253	1675254	1675257	1675261

Note for ordering:

When ordering standard types use the order numbers in the tables. For further options see page 5 "Options".

V-Shape Glass Engine Thermometers, Form B, G 1/2, 150 x 36, Straight Type



Complete instruments acc. to DIN 16185,

straight type, threaded connection

Case: 150 x 36 mm, aluminum brass-colored,

Threading: G 1/2, Stem: dia. 10 mm

Scale lettering: black

Capillary: white back prismatic, blue filling ($\leq +200$ °C)

yellow back prismatic, Hg filling ($> +200$ °C)

Accuracy: 1% of scale value

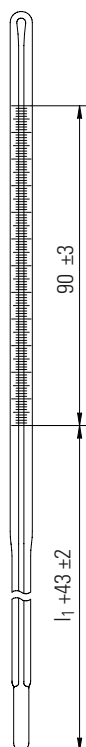
Measuring range °C	Scale division °C	Order numbers				
		Built-in length l_1 (mm)				
		$l_1 = 40$	$l_1 = 50$	$l_1 = 63$	$l_1 = 100$	$l_1 = 160$
-60 +40	2	1685002	1685003	1685004	1685007	1685011
-30 +50	1	1685102	1685103	1685104	1685107	1685111
0 +60	1	1685152	1685153	1685154	1685157	1685161
0 +100	2	1685202	1685203	1685204	1685207	1685211
0 +120	2	1685252	1685253	1685254	1685257	1685261
0 +160	2	1685302	1685303	1685304	1685307	1685311
0 +200	2	1685352	1685353	1685354	1685357	1685361
0 +300	5	1685452	1685453	1685454	1685457	1685461
0 +600	10	1685602	1685603	1685604	1685607	1685611

Spare capillaries acc. to DIN 16195

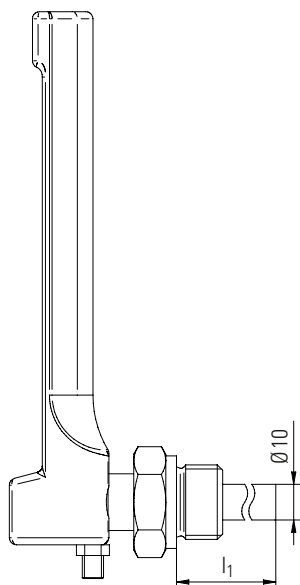
Measuring range °C	Scale division °C	Order numbers				
		Built-in length l_1 (mm)				
		$l_1 = 40$	$l_1 = 50$	$l_1 = 63$	$l_1 = 100$	$l_1 = 160$
-60 +40	2	1688002	1688003	1688004	1688007	1688011
-30 +50	1	1688102	1688103	1688104	1688107	1688111
0 +60	1	1688152	1688153	1688154	1688157	1688161
0 +100	2	1688202	1688203	1688204	1688207	1688211
0 +120	2	1688252	1688253	1688254	1688257	1688261
0 +160	2	1688302	1688303	1688304	1688307	1688311
0 +200	2	1688352	1688353	1688354	1688357	1688361
0 +300	5	1688452	1688453	1688454	1688457	1688461
0 +600	10	1688602	1688603	1688604	1688607	1688611

Note for ordering:

When ordering standard types use the order numbers in the tables. For further options see page 5 "Options".



V-Shape Glass Engine Thermometers, Form B, G 1/2, 150 x 36, 90° Angle



Complete instruments acc. to DIN 16186,

90° angle, for insertion

Case: 150 x 36 mm, aluminum brass-colored,

Threading: G 1/2, Stem: dia. 10 mm

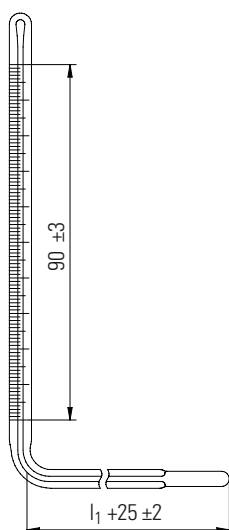
Scale lettering: black

Capillary: white back prismatic, blue filling ($\leq +200\text{ }^{\circ}\text{C}$)

yellow back prismatic, Hg filling ($> +200\text{ }^{\circ}\text{C}$)

Accuracy: 1% of scale value

Measuring range °C	Scale division °C	Order numbers				
		Built-in length l_1 (mm)				
		$l_1 = 40$	$l_1 = 50$	$l_1 = 63$	$l_1 = 100$	$l_1 = 160$
-60 +40	2	1676002	1676003	1676004	1676007	1676011
-30 +50	1	1676102	1676103	1676104	1676107	1676111
0 +60	1	1676152	1676153	1676154	1676157	1676161
0 +100	2	1676202	1676203	1676204	1676207	1676211
0 +120	2	1676252	1676253	1676254	1676257	1676261
0 +160	2	1676302	1676303	1676304	1676307	1676311
0 +200	2	1676352	1676353	1676354	1676357	1676361
0 +300	5	1676452	1676453	1676454	1676457	1676461
0 +600	10	1676602	1676603	1676604	1676607	1676611



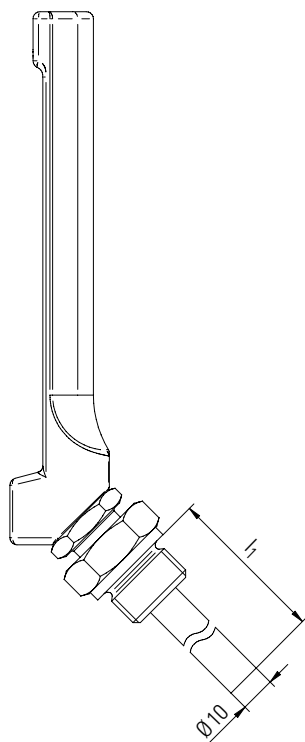
Spare capillaries acc. to DIN 16195

Measuring range °C	Scale division °C	Order numbers				
		Built-in length l_1 (mm)				
		$l_1 = 40$	$l_1 = 50$	$l_1 = 63$	$l_1 = 100$	$l_1 = 160$
-60 +40	2	1678002	1678003	1678004	1678007	1678011
-30 +50	1	1678102	1678103	1678104	1678107	1678111
0 +60	1	1678152	1678153	1678154	1678157	1678161
0 +100	2	1678202	1678203	1678204	1678207	1678211
0 +120	2	1678252	1678253	1678254	1678257	1678261
0 +160	2	1678302	1678303	1678304	1678307	1678311
0 +200	2	1678352	1678353	1678354	1678357	1678361
0 +300	5	1678452	1678453	1678454	1678457	1678461
0 +600	10	1678602	1678603	1678604	1678607	1678611

Note for ordering:

When ordering standard types use the order numbers in the tables. For further options see page 5 "Options".

V-Shape Glass Engine Thermometers, Form B, G 1/2, 150 x 36, 135° Angle



Complete instruments nominal size 110,

135° angle, threaded connection

Case: 150 x 36 mm, aluminum brass-colored,

Threading: G 1/2, Stem: dia. 10 mm

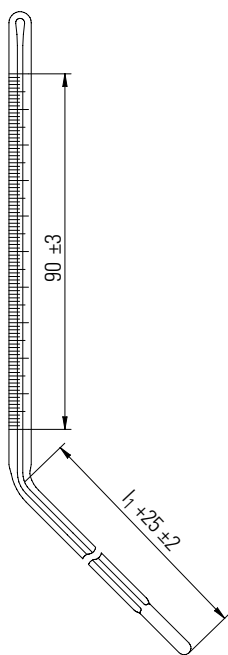
Scale lettering: black

Capillary: white back prismatic, blue filling ($\leq +200$ °C)

yellow back prismatic, Hg filling ($> +200$ °C)

Accuracy: 1% of scale value

Measuring range °C	Scale division °C	Order numbers				
		Built-in length l_1 (mm)				
		$l_1 = 40$	$l_1 = 50$	$l_1 = 63$	$l_1 = 100$	$l_1 = 160$
-60 +40	2	1687002	1687003	1687004	1687007	1687011
-30 +50	1	1687052	1687053	1687054	1687057	1687061
0 +60	1	1687102	1687103	1687104	1687107	1687111
0 +100	2	1687152	1687153	1687154	1687157	1687161
0 +120	2	1687202	1687203	1687204	1687207	1687211
0 +160	2	1687252	1687253	1687254	1687257	1687261
0 +200	2	1687302	1687303	1687304	1687307	1687311
0 +300	5	1687402	1687403	1687404	1687407	1687411
0 +600	10	1687552	1687553	1687554	1687557	1687561



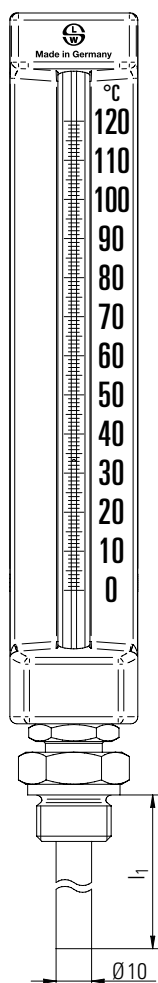
Spare capillaries acc. to DIN 16195

Measuring range °C	Scale division °C	Order numbers				
		Built-in length l_1 (mm)				
		$l_1 = 40$	$l_1 = 50$	$l_1 = 63$	$l_1 = 100$	$l_1 = 160$
-60 +40	2	1679002	1679003	1679004	1679007	1679011
-30 +50	1	1679052	1679053	1679054	1679057	1679061
0 +60	1	1679102	1679103	1679104	1679107	1679111
0 +100	2	1679152	1679153	1679154	1679157	1679161
0 +120	2	1679202	1679203	1679204	1679207	1679211
0 +160	2	1679252	1679253	1679254	1679257	1679261
0 +200	2	1679302	1679303	1679304	1679307	1679311
0 +300	5	1679402	1679403	1679404	1679407	1679411
0 +600	10	1679552	1679553	1679554	1679557	1679561

Note for ordering:

When ordering standard types use the order numbers in the tables. For further options see page 5 "Options".

V-Shape Glass Engine Thermometers, Form B, G 1/2, 200 x 36, Straight Type



Complete instruments acc. to DIN 16189,

straight type, threaded connection

Case: 200 x 36 mm, aluminum brass-colored,

Threading: G 1/2, Stem: dia. 10 mm

Scale lettering: black

Capillary: white back prismatic, blue filling ($\leq +200\text{ }^{\circ}\text{C}$)

yellow back prismatic, Hg filling ($> +200\text{ }^{\circ}\text{C}$)

Accuracy: 1% of scale value

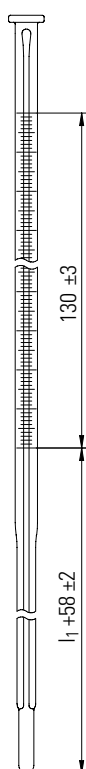
Measuring range $^{\circ}\text{C}$	Scale division $^{\circ}\text{C}$	Order numbers						
		Built-in length l_1 (mm)						
		$l_1 = 40$	$l_1 = 50$	$l_1 = 63$	$l_1 = 100$	$l_1 = 160$	$l_1 = 250$	$l_1 = 400$
-60 +40	1	1689102	1689103	1689104	1689107	1689110	1689112	1689114
-30 +50	1	1689202	1689203	1689204	1689207	1689210	1689212	1689214
0 +60	1	1689252	1689253	1689254	1689257	1689260	1689262	1689264
0 +100	1	1689302	1689303	1689304	1689307	1689310	1689312	1689314
0 +120	1	1689352	1689353	1689354	1689357	1689360	1689362	1689364
0 +160	2	1689402	1689403	1689404	1689407	1689410	1689412	1689414
0 +200	2	1689452	1689453	1689454	1689457	1689460	1689462	1689464
0 +300	2	1689552	1689553	1689554	1689557	1689560	1689562	1689564
0 +400	5	1689652	1689653	1689654	1689657	1689660	1689662	1689664
0 +500	5	1689702	1689703	1689704	1689707	1689710	1689712	1689714
0 +600	5	1689752	1689753	1689754	1689757	1689760	1689762	1689764

Spare capillaries acc. to DIN 16195

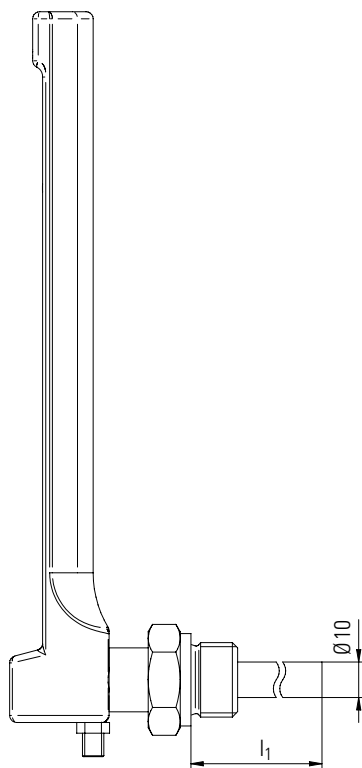
Measuring range $^{\circ}\text{C}$	Scale division $^{\circ}\text{C}$	Order numbers						
		Built-in length l_1 (mm)						
		$l_1 = 40$	$l_1 = 50$	$l_1 = 63$	$l_1 = 100$	$l_1 = 160$	$l_1 = 250$	$l_1 = 400$
-60 +40	1	1693102	1693103	1693104	1693107	1693110	1693112	1693114
-30 +50	1	1693202	1693203	1693204	1693207	1693210	1693212	1693214
0 +60	1	1693252	1693253	1693254	1693257	1693260	1693262	1693264
0 +100	1	1693302	1693303	1693304	1693307	1693310	1693312	1693314
0 +120	1	1693352	1693353	1693354	1693357	1693360	1693362	1693364
0 +160	2	1693402	1693403	1693404	1693407	1693410	1693412	1693414
0 +200	2	1693452	1693453	1693454	1693457	1693460	1693462	1693464
0 +300	2	1693552	1693553	1693554	1693557	1693560	1693562	1693564
0 +400	5	1693652	1693653	1693654	1693657	1693660	1693662	1693664
0 +500	5	1693702	1693703	1693704	1693707	1693710	1693712	1693714
0 +600	5	1693752	1693753	1693754	1693757	1693760	1693762	1693764

Note for ordering:

When ordering standard types use the order numbers in the tables. For further options see page 5 "Options".



V-Shape Glass Engine Thermometers, Form B, G 1/2, 200 x 36, 90° Angle



Complete instruments acc. to DIN 16186,

90° angle, for insertion

Case: 200 x 36 mm, aluminum brass-colored,

Threading: G 1/2, Stem: dia. 10 mm

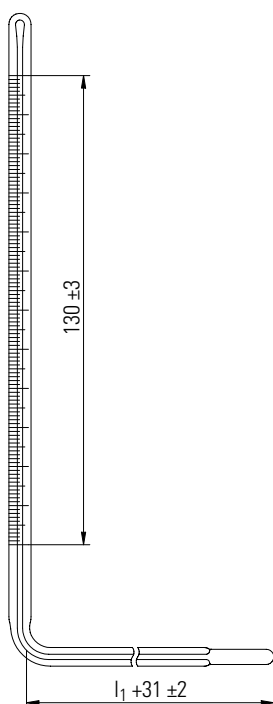
Scale lettering: black

Capillary: white back prismatic, blue filling ($\leq +200\text{ }^{\circ}\text{C}$)

yellow back prismatic, Hg filling ($> +200\text{ }^{\circ}\text{C}$)

Accuracy: 1% of scale value

Measuring range °C	Scale division °C	Order numbers						
		Built-in length l_1 (mm)						
		$l_1 = 40$	$l_1 = 50$	$l_1 = 63$	$l_1 = 100$	$l_1 = 160$	$l_1 = 250$	$l_1 = 400$
-60 +40	1	1680102	1680103	1680104	1680107	1680110	1680112	1680114
-30 +50	1	1680202	1680203	1680204	1680207	1680210	1680212	1680214
0 +60	1	1680252	1680253	1680254	1680257	1680260	1680262	1680264
0 +100	1	1680302	1680303	1680304	1680307	1680310	1680312	1680314
0 +120	1	1680352	1680353	1680354	1680357	1680360	1680362	1680364
0 +160	2	1680402	1680403	1680404	1680407	1680410	1680412	1680414
0 +200	2	1680452	1680453	1680454	1680457	1680460	1680462	1680464
0 +300	2	1680552	1680553	1680554	1680557	1680560	1680562	1680564
0 +400	5	1680652	1680653	1680654	1680657	1680660	1680662	1680664
0 +500	5	1680702	1680703	1680704	1680707	1680710	1680712	1680714
0 +600	5	1680752	1680753	1680754	1680757	1680760	1680762	1680764



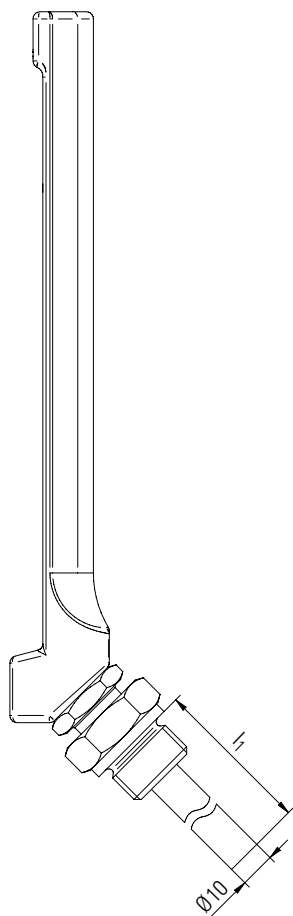
Spare capillaries acc. to DIN 16195

Measuring range °C	Scale division °C	Order numbers						
		Built-in length l_1 (mm)						
		$l_1 = 40$	$l_1 = 50$	$l_1 = 63$	$l_1 = 100$	$l_1 = 160$	$l_1 = 250$	$l_1 = 400$
-60 +40	1	1694102	1694103	1694104	1694107	1694110	1694112	1694114
-30 +50	1	1694202	1694203	1694204	1694207	1694210	1694212	1694214
0 +60	1	1694252	1694253	1694254	1694257	1694260	1694262	1694264
0 +100	1	1694302	1694303	1694304	1694307	1694310	1694312	1694314
0 +120	1	1694352	1694353	1694354	1694357	1694360	1694362	1694364
0 +160	2	1694402	1694403	1694404	1694407	1694410	1694412	1694414
0 +200	2	1694452	1694453	1694454	1694457	1694460	1694462	1694464
0 +300	2	1694552	1694553	1694554	1694557	1694560	1694562	1694564
0 +400	5	1694652	1694653	1694654	1694657	1694660	1694662	1694664
0 +500	5	1694702	1694703	1694704	1694707	1694710	1694712	1694714
0 +600	5	1694752	1694753	1694754	1694757	1694760	1694762	1694764

Note for ordering:

When ordering standard types use the order numbers in the tables. For further options see page 5 "Options".

V-Shape Glass Engine Thermometers, Form B, G 1/2, 200 x 36, 135° Angle



Complete instruments acc. to DIN 16191,

135° angle, threaded connection

Case: 200 x 36 mm, aluminum brass-colored,

Threading: G 1/2, Stem: dia. 10 mm

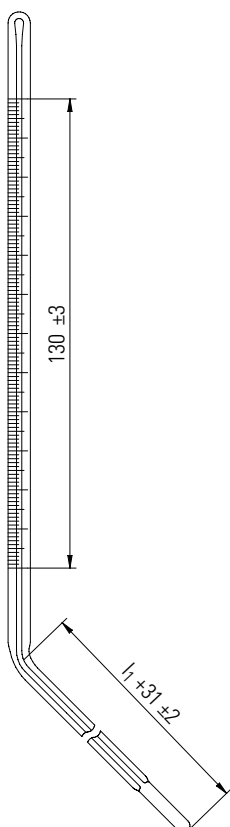
Scale lettering: black

Capillary: white back prismatic, blue filling ($\leq +200\text{ }^{\circ}\text{C}$)

yellow back prismatic, Hg filling ($> +200\text{ }^{\circ}\text{C}$)

Accuracy: 1% of scale value

Measuring range °C	Scale division °C	Order numbers						
		Built-in length l_1 (mm)						
		$l_1 = 40$	$l_1 = 50$	$l_1 = 63$	$l_1 = 100$	$l_1 = 160$	$l_1 = 250$	$l_1 = 400$
-60 +40	1	1691102	1691103	1691104	1691107	1691110	1691112	1691114
-30 +50	1	1691202	1691203	1691204	1691207	1691210	1691212	1691214
0 +60	1	1691252	1691253	1691254	1691257	1691260	1691262	1691264
0 +100	1	1691302	1691303	1691304	1691307	1691310	1691312	1691314
0 +120	1	1691352	1691353	1691354	1691357	1691360	1691362	1691364
0 +160	2	1691402	1691403	1691404	1691407	1691410	1691412	1691414
0 +200	2	1691452	1691453	1691454	1691457	1691460	1691462	1691464
0 +300	2	1691552	1691553	1691554	1691557	1691560	1691562	1691564
0 +400	5	1691652	1691653	1691654	1691657	1691660	1691662	1691664
0 +500	5	1691702	1691703	1691704	1691707	1691710	1691712	1691714
0 +600	5	1691752	1691753	1691754	1691757	1691760	1691762	1691764



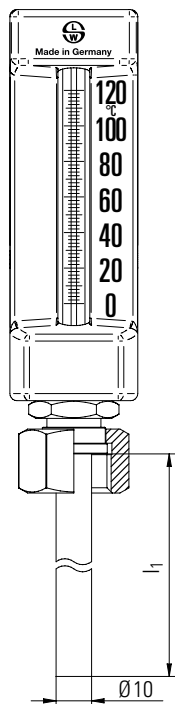
Spare capillaries acc. to DIN 16195

Measuring range °C	Scale division °C	Order numbers						
		Built-in length l_1 (mm)						
		$l_1 = 40$	$l_1 = 50$	$l_1 = 63$	$l_1 = 100$	$l_1 = 160$	$l_1 = 250$	$l_1 = 400$
-60 +40	1	1695102	1695103	1695104	1695107	1695110	1695112	1695114
-30 +50	1	1695202	1695203	1695204	1695207	1695210	1695212	1695214
0 +60	1	1695252	1695253	1695254	1695257	1695260	1695262	1695264
0 +100	1	1695302	1695303	1695304	1695307	1695310	1695312	1695314
0 +120	1	1695352	1695353	1695354	1695357	1695360	1695362	1695364
0 +160	2	1695402	1695403	1695404	1695407	1695410	1695412	1695414
0 +200	2	1695452	1695453	1695454	1695457	1695460	1695462	1695464
0 +300	2	1695552	1695553	1695554	1695557	1695560	1695562	1695564
0 +400	5	1695652	1695653	1695654	1695657	1695660	1695662	1695664
0 +500	5	1695702	1695703	1695704	1695707	1695710	1695712	1695714
0 +600	5	1695752	1695753	1695754	1695757	1695760	1695762	1695764

Note for ordering:

When ordering standard types use the order numbers in the tables. For further options see page 5 "Options".

V-Shape Glass Engine Thermometers, Form C, 110 x 36, Straight Type, Nut G 1/2



Complete instruments acc. to DIN 16181, straight type, threaded connection

Case: 110 x 36 mm, aluminum brass-colored,
Loose coupling nut: G 1/2, Stem: dia. 10 mm
Scale lettering: black
Capillary: white back prismatic, blue filling
Accuracy: 1% of scale value

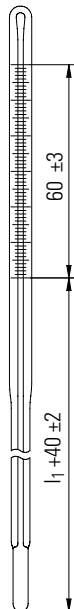
Measuring range °C	Scale division °C	Order numbers		
		Built-in length l_1 (mm)		
		$l_1 = 89$	$l_1 = 126$	$l_1 = 186$
-60 +40	2	1681017	1681018	1681019
-30 +50	2	1681117	1681118	1681119
0 +100	2	1681167	1681168	1681169
0 +120	2	1681217	1681218	1681219
0 +160	2	1681267	1681268	1681269
0 +200	5	1681317	1681318	1681319

Spare capillaries acc. to DIN 16195

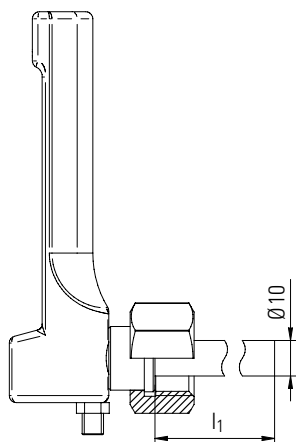
Measuring range °C	Scale division °C	Order numbers		
		Built-in length l_1 (mm)		
		$l_1 = 89$	$l_1 = 126$	$l_1 = 186$
-60 +40	2	1684017	1684018	1684019
-30 +50	2	1684117	1684118	1684119
0 +100	2	1684167	1684168	1684169
0 +120	2	1684217	1684218	1684219
0 +160	2	1684267	1684268	1684269
0 +200	5	1684317	1684318	1684319

Note for ordering:

When ordering standard types use the order numbers in the tables. For further options see page 5 "Options".



V-Shape Glass Engine Thermometers, Form C, 110 x 36, 90° Angle, Nut G 1/2



Complete instruments acc. to DIN 16182, 90° angle, for insertion

Case: 110 x 36 mm, aluminum brass-colored,

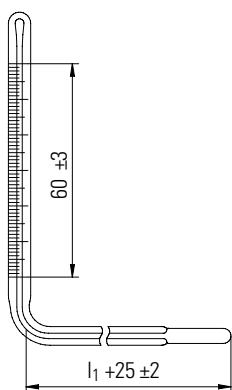
Loose coupling nut: G 1/2, Stem: dia. 10 mm

Scale lettering: black

Capillary: white back prismatic, blue filling

Accuracy: 1% of scale value

Measuring range °C	Scale division °C	Order numbers		
		Built-in length l_1 (mm)		
		$l_1 = 89$	$l_1 = 126$	$l_1 = 186$
-60 +40	2	1682017	1682018	1682019
-30 +50	1	1682117	1682118	1682119
0 +100	1	1682167	1682168	1682169
0 +120	2	1682217	1682218	1682219
0 +160	2	1682267	1682268	1682269
0 +200	5	1682317	1682318	1682319



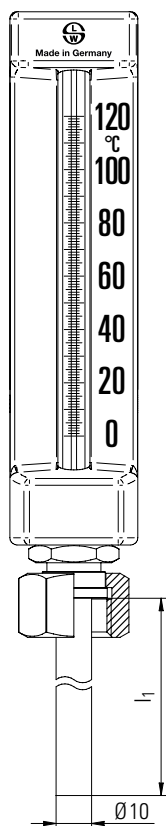
Spare capillaries acc. to DIN 16195

Measuring range °C	Scale division °C	Order numbers		
		Built-in length l_1 (mm)		
		$l_1 = 89$	$l_1 = 126$	$l_1 = 186$
-60 +40	2	1674017	1674018	1674019
-30 +50	1	1674117	1674118	1674119
0 +100	1	1674167	1674168	1674169
0 +120	2	1674217	1674218	1674219
0 +160	2	1674267	1674268	1674269
0 +200	5	1674317	1674318	1674319

Note for ordering:

When ordering standard types use the order numbers in the tables. For further options see page 5 "Options".

V-Shape Glass Engine Thermometers, Form C, 150 x 36, Straight Type, Nut G 1/2



Complete instruments acc. to DIN 16185,

straight type, threaded connection

Case: 150 x 36 mm, aluminum brass-colored,

Loose coupling nut: G 1/2, Stem: dia. 10 mm

Scale lettering: black

Capillary: white back prismatic, blue filling

Accuracy: 1% of scale value

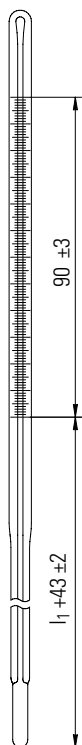
Measuring range °C	Scale division °C	Order numbers		
		Built-in length l_1 (mm)		
		$l_1 = 89$	$l_1 = 126$	$l_1 = 186$
-60 +40	2	1685017	1685018	1685019
-30 +50	1	1685117	1685118	1685119
0+60	1	1685167	1685168	1685169
0 +100	2	1685217	1685218	1685219
0 +120	2	1685267	1685268	1685269
0 +160	2	1685317	1685318	1685319
0 +200	2	1685367	1685368	1685369

Spare capillaries acc. to DIN 16195

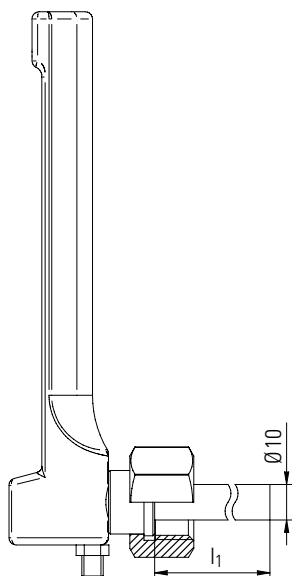
Measuring range °C	Scale division °C	Order numbers		
		Built-in length l_1 (mm)		
		$l_1 = 89$	$l_1 = 126$	$l_1 = 186$
-60 +40	2	1688017	1688018	1688019
-30 +50	1	1688117	1688118	1688119
0+60	1	1688167	1688168	1688169
0 +100	2	1688217	1688218	1688219
0 +120	2	1688267	1688268	1688269
0 +160	2	1688317	1688318	1688319
0 +200	2	1688367	1688368	1688369

Note for ordering:

When ordering standard types use the order numbers in the tables. For further options see page 5 "Options".



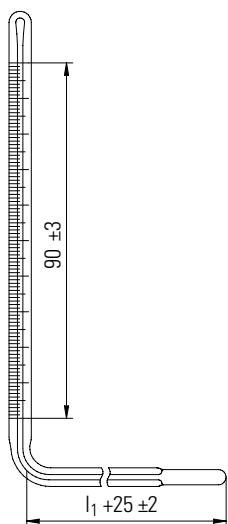
V-Shape Glass Engine Thermometers, Form C, 150 x 36, 90° Angle, Nut G 1/2



Complete instruments acc. to DIN 16186, 90° angle, for insertion

Case: 150 x 36 mm, aluminum brass-colored,
Loose coupling nut: G 1/2, Stem: dia. 10 mm
Scale lettering: black
Capillary: white back prismatic, blue filling
Accuracy: 1% of scale value

Measuring range °C	Scale division °C	Order numbers		
		Built-in length l_1 (mm)		
		$l_1 = 89$	$l_1 = 126$	$l_1 = 186$
-60 +40	2	1676017	1676018	1676019
-30 +50	1	1676117	1676118	1676119
0+60	1	1676167	1676168	1676169
0 +100	2	1676217	1676218	1676219
0 +120	2	1676267	1676268	1676269
0 +160	2	1676317	1676318	1676319
0 +200	2	1676367	1676368	1676369

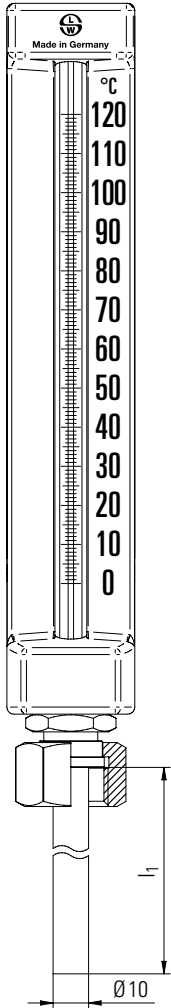


Spare capillaries acc. to DIN 16195

Measuring range °C	Scale division °C	Order numbers		
		Built-in length l_1 (mm)		
		$l_1 = 89$	$l_1 = 126$	$l_1 = 186$
-60 +40	2	1678017	1678018	1678019
-30 +50	1	1678117	1678118	1678119
0+60	1	1678167	1678168	1678169
0 +100	2	1678217	1678218	1678219
0 +120	2	1678267	1678268	1678269
0 +160	2	1678317	1678318	1678319
0 +200	2	1678367	1678368	1678369

Note for ordering:

When ordering standard types use the order numbers in the tables. For further options see page 5 "Options".



V-Shape Glass Engine Thermometers, Form C, 200 x 36, Straight Type, Nut G 1/2 or 3/4

Complete instruments acc. to DIN 16189, straight type, threaded connection

Case: 200 x 36mm, aluminum brass-colored, Loose coupling nut: G 1/2, Stem: dia. 10 mm

Scale lettering: black; Accuracy: 1% of scale value

Capillary: white back prismatic, blue filling ($\leq +200$ °C)

yellow back prismatic, Hg filling ($> +200$ °C)

With loose coupling nut G 1/2

Measuring range °C	Scale division °C	Order numbers				
		Built-in length l_1 (mm)				
		$l_1 = 89$	$l_1 = 126$	$l_1 = 186$	$l_1 = 276$	$l_1 = 426$
-60 +40	1	1689117	1689118	1689119	1689120	1689121
-30 +50	1	1689217	1689218	1689219	1689220	1689221
0 +60	1	1689267	1689268	1689269	1689270	1689271
0 +100	1	1689317	1689318	1689319	1689320	1689321
0 +120	1	1689367	1689368	1689369	1689370	1689371
0 +160	2	1689417	1689418	1689419	1689420	1689421
0 +200	2	1689467	1689468	1689469	1689470	1689471
0 +300	2	1689567	1689568	1689569	1689570	1689571
0 +400	5	1689667	1689668	1689669	1689670	1689671
0 +500	5	1689717	1689718	1689719	1689720	1689721
0 +600	5	1689767	1689768	1689769	1689770	1689771

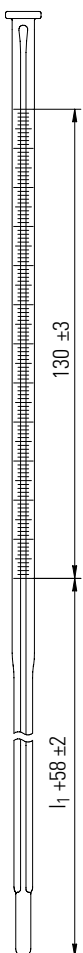
Engine thermometers with loose coupling nut G 3/4: please state an additional-1, e.g. 1689569-1

Spare capillaries acc. to DIN 16195

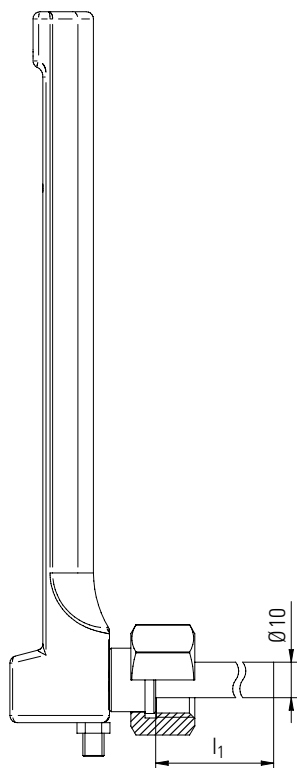
Measuring range °C	Scale division °C	Order numbers				
		Built-in length l_1 (mm)				
		$l_1 = 89$	$l_1 = 126$	$l_1 = 186$	$l_1 = 276$	$l_1 = 426$
-60 +40	1	1693117	1693118	1693119	1693120	1693121
-30 +50	1	1693217	1693218	1693219	1693220	1693221
0 +60	1	1693267	1693268	1693269	1693270	1693271
0 +100	1	1693317	1693318	1693319	1693320	1693321
0 +120	1	1693367	1693368	1693369	1693370	1693371
0 +160	2	1693417	1693418	1693419	1693420	1693421
0 +200	2	1693467	1693468	1693469	1693470	1693471
0 +300	2	1693567	1693568	1693569	1693570	1693571
0 +400	5	1693667	1693668	1693669	1693670	1693671
0 +500	5	1693717	1693718	1693719	1693720	1693721
0 +600	5	1693767	1693768	1693769	1693770	1693771

Note for ordering:

When ordering standard types use the order numbers in the tables. For further options see page 5 "Options".



V-Shape Glass Engine Thermometers, Form C, 200 x 36, 90°, Nut G 1/2 or 3/4



Complete instruments acc. to DIN 16190, 90° angle, for insertion

Case: 200 x 36mm, aluminum brass-colored, Loose coupling nut: G 1/2, Stem: dia. 10 mm

Scale lettering: black; Accuracy: 1% of scale value

Capillary: white back prismatic, blue filling ($\leq +200$ °C)

yellow back prismatic, Hg filling ($> +200$ °C)

With loose coupling nut G 1/2

Measuring range °C	Scale division °C	Order numbers				
		Built-in length l_1 (mm)				
		$l_1 = 89$	$l_1 = 126$	$l_1 = 186$	$l_1 = 276$	$l_1 = 426$
-60 +40	1	1680117	1680118	1680119	1680120	1680121
-30 +50	1	1680217	1680218	1680219	1680220	1680221
0 +60	1	1680267	1680268	1680269	1680270	1680271
0 +100	1	1680317	1680318	1680319	1680320	1680321
0 +120	1	1680367	1680368	1680369	1680370	1680371
0 +160	2	1680417	1680418	1680419	1680420	1680421
0 +200	2	1680467	1680468	1680469	1680470	1680471
0 +300	2	1680567	1680568	1680569	1680570	1680571
0 +400	5	1680667	1680668	1680669	1680670	1680671
0 +500	5	1680717	1680718	1680719	1680720	1680721
0 +600	5	1680767	1680768	1680769	1680770	1680771

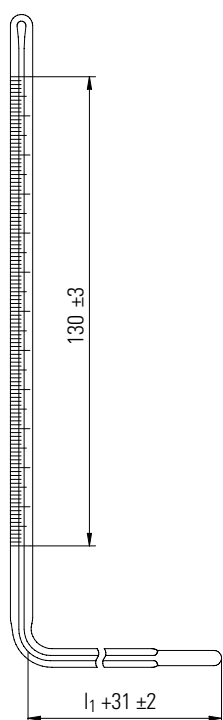
For engine thermometers with loose coupling nut G 3/4 please state an additional-1

Spare capillaries acc. to DIN 16195

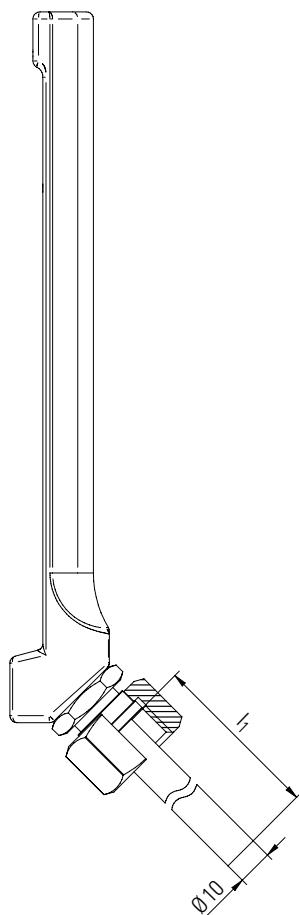
Measuring range °C	Scale division °C	Order numbers				
		Built-in length l_1 (mm)				
		$l_1 = 89$	$l_1 = 126$	$l_1 = 186$	$l_1 = 276$	$l_1 = 426$
-60 +40	1	1694117	1694118	1694119	1694120	1694121
-30 +50	1	1694217	1694218	1694219	1694220	1694221
0 +60	1	1694267	1694268	1694269	1694270	1694271
0 +100	1	1694317	1694318	1694319	1694320	1694321
0 +120	1	1694367	1694368	1694369	1694370	1694371
0 +160	2	1694417	1694418	1694419	1694420	1694421
0 +200	2	1694467	1694468	1694469	1694470	1694471
0 +300	2	1694567	1694568	1694569	1694570	1694571
0 +400	5	1694667	1694668	1694669	1694670	1694671
0 +500	5	1694717	1694718	1694719	1694720	1694721
0 +600	5	1694767	1694768	1694769	1694770	1694771

Note for ordering:

When ordering standard types use the order numbers in the tables. For further options see page 5 "Options".



V-Shape Glass Engine Thermometers, Form C, 200 x 36, 135°, Nut G 1/2 or 3/4



Complete instruments acc. to DIN 16191, 135° angle, threaded connection

Case: 200 x 36mm, aluminum brass-colored, Loose coupling nut: G 1/2, Stem: dia. 10 mm

Scale lettering: black; Accuracy: 1% of scale value

Capillary: white back prismatic, blue filling ($\leq +200$ °C)

yellow back prismatic, Hg filling ($> +200$ °C)

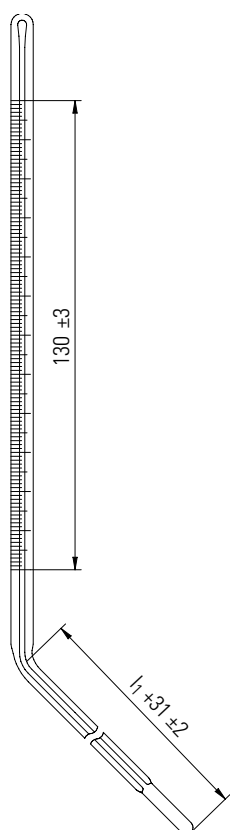
With loose coupling nut G 1/2

Measuring range °C	Scale division °C	Order numbers				
		Built-in length I_1 (mm)				
		$I_1 = 89$	$I_1 = 126$	$I_1 = 186$	$I_1 = 276$	$I_1 = 426$
-60 +40	1	1691117	1691118	1691119	1691120	1691121
-30 +50	1	1691217	1691218	1691219	1691220	1691221
0 +60	1	1691267	1691268	1691269	1691270	1691271
0 +100	1	1691317	1691318	1691319	1691320	1691321
0 +120	1	1691367	1691368	1691369	1691370	1691371
0 +160	2	1691417	1691418	1691419	1691420	1691421
0 +200	2	1691467	1691468	1691469	1691470	1691471
0 +300	2	1691567	1691568	1691569	1691570	1691571
0 +400	5	1691667	1691668	1691669	1691670	1691671
0 +500	5	1691717	1691718	1691719	1691720	1691721
0 +600	5	1691767	1691768	1691769	1691770	1691771

For engine thermometers with loose coupling nut G 3/4 please state an additional-1

Spare capillaries acc. to DIN 16195

Measuring range °C	Scale division °C	Order numbers				
		Built-in length I_1 (mm)				
		$I_1 = 89$	$I_1 = 126$	$I_1 = 186$	$I_1 = 276$	$I_1 = 426$
-60 +40	1	1695117	1695118	1695119	1695120	1695121
-30 +50	1	1695217	1695218	1695219	1695220	1695221
0 +60	1	1695267	1695268	1695269	1695270	1695271
0 +100	1	1695317	1695318	1695319	1695320	1695321
0 +120	1	1695367	1695368	1695369	1695370	1695371
0 +160	2	1695417	1695418	1695419	1695420	1695421
0 +200	2	1695467	1695468	1695469	1695470	1695471
0 +300	2	1695567	1695568	1695569	1695570	1695571
0 +400	5	1695667	1695668	1695669	1695670	1695671
0 +500	5	1695717	1695718	1695719	1695720	1695721
0 +600	5	1695767	1695768	1695769	1695770	1695771



Note for ordering:

When ordering standard types use the order numbers in the tables. For further options see page 5 "Options".

Combination Engine Thermometers with Electrical Temperature Sensors

Combination engine thermometers with additional electrical temperature sensors Pt 100 or NiCr-Ni type K (optional), straight type

Case: 110 x 36 mm, aluminium brass-colored

Threaded connection: G 1/2, Stem (brass): dia. 10 mm

Scale lettering: black (red scale lettering is also available, e.g. for an additional scale in °F)

Capillary: white back prismatic, blue filling

Accuracy: 1% of scale value

Pt 100 acc to DIN EN 60751, Class B, 3-wire system

Connection: plug and socket acc. to DIN 43650

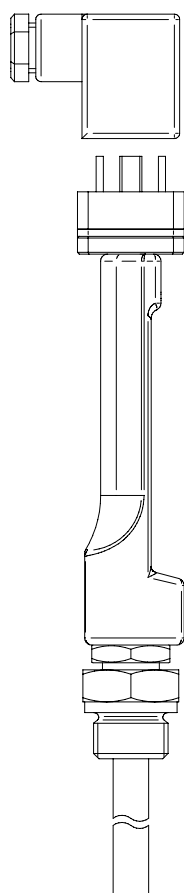
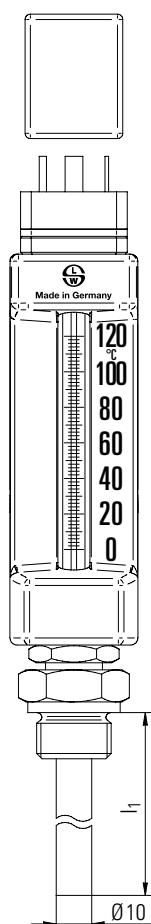
Product features

- Additional accurate sensor
- Design analogues to that of standard engine thermometers
- Temperatures can be read in one place whereas the electrical temperature signal is taken and processed in another place

Complete instruments with sensors Pt 100, straight form

Measuring range	Scale division	Order numbers			
		°C	°C		
			I₁ = 63	I₁ = 100	I₁ = 160
-30+50	2		62810	62812	62813
0+100	2		62008	62814	62815
0+160	5		62809	62816	62817
0+200	5		62811	62818	62819

Complete instruments with sensors type K acc. to DIN EN 66584 class 2 are available on request



Combination Engine Thermometers with Electrical Temperature Sensors, 90°

Combination engine thermometers with additional electrical temperature sensors Pt 100 or NiCr-Ni type K (optional), 90° angle form

Case: 110 x 36 mm, aluminium brass-colored

Threaded connection: G 1/2, Stem (brass): dia. 10 mm

Scale lettering: black (red scale lettering is also available, e.g. for an additional scale in °F)

Capillary: white back prismatic, blue filling

Accuracy: 1% of scale value

Pt 100 acc to DIN EN 60751, Class B, 3-wire system

Connection: plug and socket acc. to DIN 43650

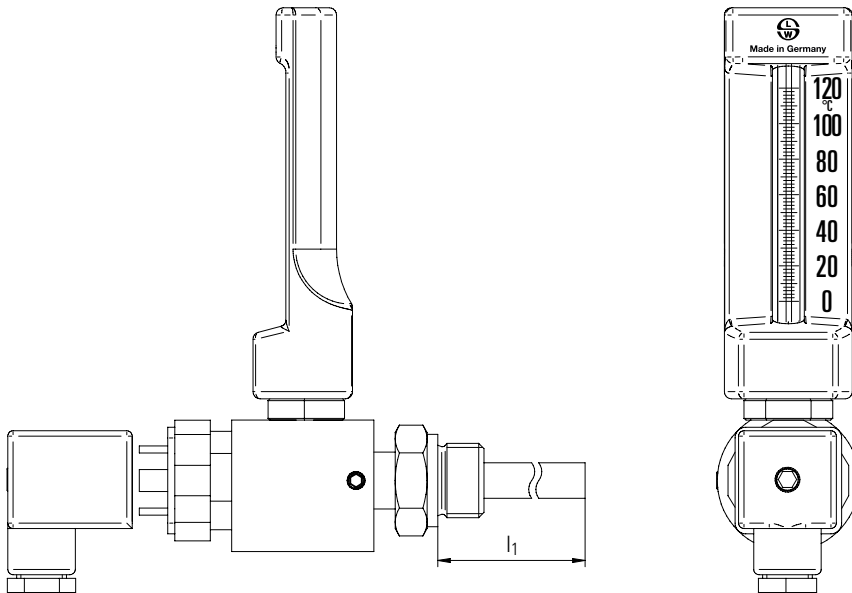
Product features

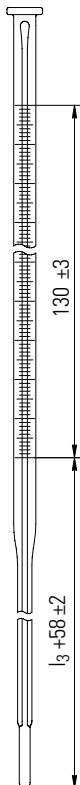
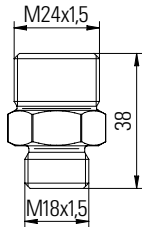
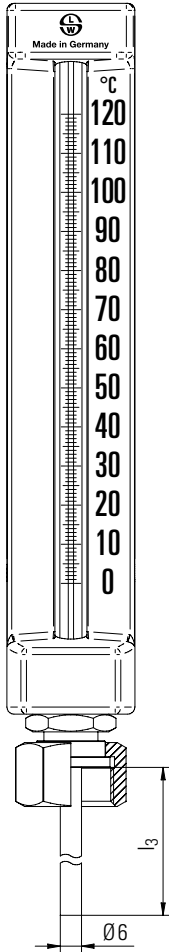
- Additional accurate sensor
- Design analogues to that of standard engine thermometers
- Temperatures can be read in one place whereas the electrical temperature signal is taken and processed in another place

Complete instruments with sensors Pt 100, 90° angle form

Measuring range °C	Scale division °C	Order numbers		
		I ₁ = 63	I ₁ = 100	I ₁ = 160
-30+50	2	62820	62821	62822
0+100	2	62823	62824	62825
0+160	5	62826	62827	62828
0+200	5	62829	62830	62831

Complete instruments with sensors type K acc. to DIN EN 66584 class 2 are available on request





V-Shape Glass Engine Thermometers, Form F, 200 x 36 for Double Nipples & Thermowells

Complete instruments acc. to DIN 16189, straight type, Form F, for weld-in thermowells DIN 43772 Form 4

Case: 200 x 36 mm, aluminum brass-colored, with loose coupling nut M 24 x 1,5

Stem: dia. 6 mm, Scale lettering: black, Accuracy: 1% of scale value

Capillary: white back prismatic, blue filling ($\leq +200$ °C)

yellow back prismatic, Hg filling ($> +200$ °C)

Measuring range °C	Scale division °C	Order numbers		
		Built-in length l_3 (mm)		
		D1	D2 and D4	D5
		$l_3 = 155$	$l_3 = 215$	$l_3 = 275$
-60 +40	1	1657901	1660901	1659901
-30 +50	1	1657902	1660902	1659902
0 +100	1	1657903	1660903	1659903
0 +120	1	1657904	1660904	1659904
0 +160	2	1657905	1660905	1659905
0 +200	2	1657906	1660906	1659906
0 +300	2	1657907	1660907	1659907
0 +400	5	1657908	1660908	1659908
0 +500	5	1657909	1660909	1659909
0 +600	5	1657910	1660910	1659910

Double nipples for engine thermometers Form F and weld-in thermowells DIN 43772 Form 4

Type	Order no.
Double nipple, steel, with threading M 24 x 1,5 and M 18 x 1,5	437700

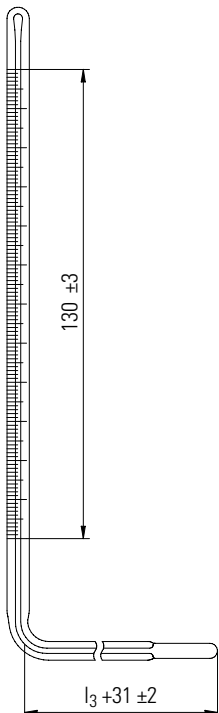
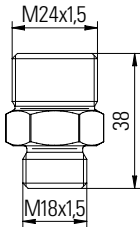
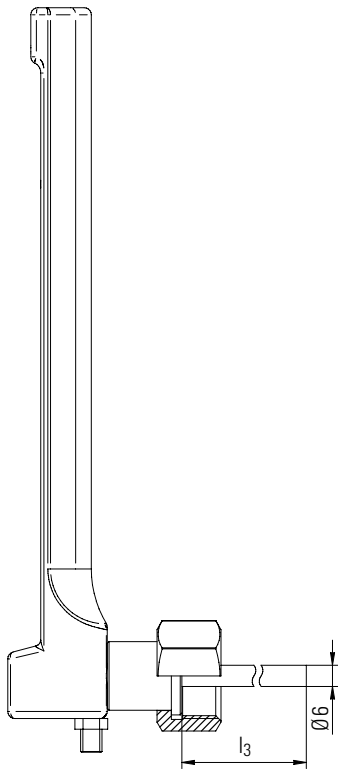
Spare capillaries acc. to DIN 16195

Measuring range °C	Scale division °C	Order numbers		
		Built-in length l_3 (mm)		
		D1	D2 and D4	D5
		$l_3 = 155$	$l_3 = 215$	$l_3 = 275$
-60 +40	1	1693031	1693032	1693035
-30 +50	1	1693081	1693082	1693085
0 +100	1	1693181	1693182	1693185
0 +120	1	1693281	1693282	1693285
0 +160	2	1693331	1693332	1693335
0 +200	2	1693531	1693532	1693535
0 +300	2	1693631	1693632	1693635
0 +400	5	1693831	1693832	1693835
0 +500	5	1693887	1693888	1693889
0 +600	5	1693981	1693982	1693985

Note for ordering:

When ordering standard types use the order numbers in the tables. For further options see page 5 "Options".

V-Shape Glass Engine Thermometers, Form F, 200 x 36 for Double Nipples & Thermowells



Complete instruments acc. to DIN 16189, 90° angle, Form F, for weld-in thermowells DIN 43772 Form 4

Case: 200 x 36 mm, aluminum brass-colored, with loose coupling nut M 24 x 1,5

Stem: dia. 6 mm, Scale lettering: black, Accuracy: 1% of scale value

Capillary: white back prismatic, blue filling ($\leq +200$ °C)

yellow back prismatic, Hg filling ($> +200$ °C)

Measuring range °C	Scale division °C	Order numbers		
		Built-in length l_3 (mm)		
		D1	D2 and D4	D5
		$l_3 = 155$	$l_3 = 215$	$l_3 = 275$
-60 +40	1	1661901	1662901	1658901
-30 +50	1	1661902	1662902	1658902
0 +100	1	1661903	1662903	1658903
0 +120	1	1661904	1662904	1658904
0 +160	2	1661905	1662905	1658905
0 +200	2	1661906	1662906	1658906
0 +300	2	1661907	1662907	1658907
0 +400	5	1661908	1662908	1658908
0 +500	5	1661909	1662909	1658909
0 +600	5	1661910	1662910	1658910

Double nipples for engine thermometers Form F and weld-in thermowells DIN 43772 Form 4

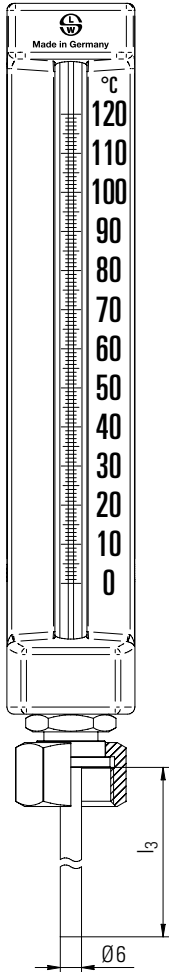
Type	Order no.
Double nipple, steel, with threading M 24 x 1,5 and M 18 x 1,5	437700

Spare capillaries acc. to DIN 16195

Measuring range °C	Scale division °C	Order numbers		
		Built-in length l_3 (mm)		
		D1	D2 and D4	D5
		$l_3 = 155$	$l_3 = 215$	$l_3 = 275$
-60 +40	1	1694031	1694032	1694035
-30 +50	1	1694081	1694082	1694085
0 +100	1	1694181	1694182	1694185
0 +120	1	1694281	1694282	1694285
0 +160	2	1694331	1694332	1694335
0 +200	2	1694531	1694532	1694535
0 +300	2	1694631	1694632	1694635
0 +400	5	1694831	1694832	1694835
0 +500	5	1694881	1694882	1694885
0 +600	5	1694931	1694932	1694935

Note for ordering:

When ordering standard types use the order numbers in the tables. For further options see page 5 "Options".



V-Shape Glass Engine Thermometers, Form F, 200 x 36, for Lagging Tubes & Thermowells

Complete instruments acc. to DIN 16189, straight type, Form F, for weld-in thermowells DIN 43772 Form 4

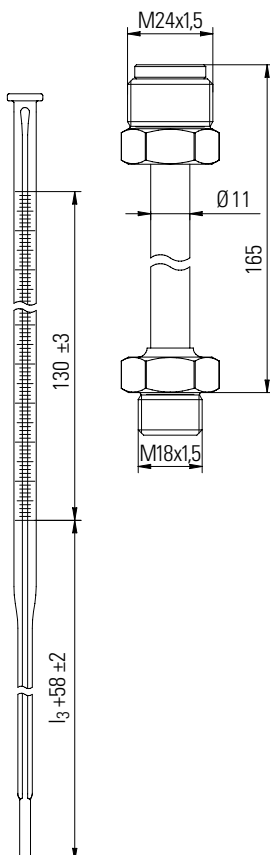
Case: 200 x 36 mm, aluminum brass-colored, with loose coupling nut M 24 x 1,5

Stem: dia. 6 mm, Scale lettering: black, Accuracy: 1% of scale value

Capillary: white back prismatic, blue filling ($\leq +200$ °C)

yellow back prismatic, Hg filling ($> +200$ °C)

Measuring range °C	Scale division °C	Order numbers		
		Built-in length l_3 (mm)		
		D1	D2 and D4	D5
		$l_3 = 295$	$l_3 = 355$	$l_3 = 415$
-60 +40	1	1651901	1654901	1653901
-30 +50	1	1651902	1654902	1653902
0 +100	1	1651903	1654903	1653903
0 +120	1	1651904	1654904	1653904
0 +160	2	1651905	1654905	1653905
0 +200	2	1651906	1654906	1653906
0 +300	2	1651907	1654907	1653907
0 +400	5	1651908	1654908	1653908
0 +500	5	1651909	1654909	1653909
0 +600	5	1651910	1654910	1653910



Lagging tube for engine thermometers Form F and weld-in thermowells DIN 43772 Form 4

Type	Order no.
Lagging tube, dia. 11 mm, 165 mm, stainless steel, with threading M 24 x 1,5 and M 18 x 1,5	437600

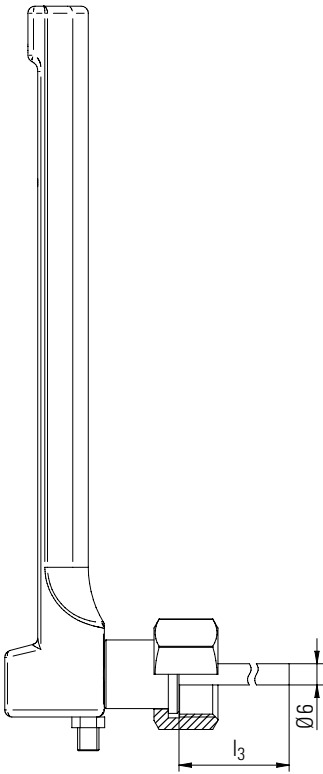
Spare capillaries acc. to DIN 16195

Measuring range °C	Scale division °C	Order numbers		
		Built-in length l_3 (mm)		
		D1	D2 and D4	D5
		$l_3 = 295$	$l_3 = 355$	$l_3 = 415$
-60 +40	1	1693131	1693132	1693135
-30 +50	1	1693231	1693232	1693235
0 +100	1	1693337	1693338	1693339
0 +120	1	1693381	1693382	1693385
0 +160	2	1693431	1693432	1693435
0 +200	2	1693481	1693482	1693485
0 +300	2	1693581	1693582	1693585
0 +400	5	1693681	1693682	1694685
0 +500	5	1693731	1693732	1694735
0 +600	5	1693781	1693782	1694785

Note for ordering:

When ordering standard types use the order numbers in the tables. For further options see page 5 "Options".

V-Shape Glass Engine Thermometers, Form F, 200 x 36, for Lagging Tubes & Thermowells



Complete instruments acc. to DIN 16189, straight type, Form F, for weld-in thermowells DIN 43772 Form 4

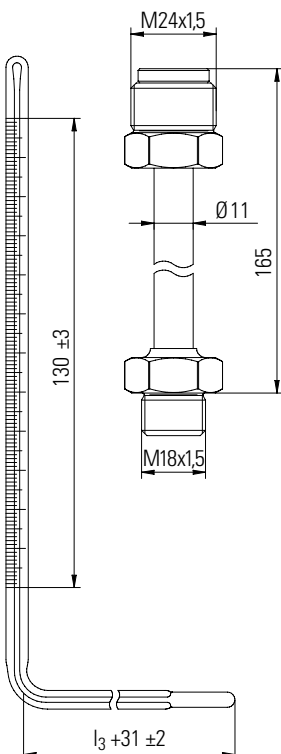
Case: 200 x 36 mm, aluminum brass-colored, with loose coupling nut M 24 x 1,5

Stem: dia. 6 mm, Scale lettering: black, Accuracy: 1% of scale value

Capillary: white back prismatic, blue filling ($\leq +200$ °C)

yellow back prismatic, Hg filling ($> +200$ °C)

Measuring range °C	Scale division °C	Order numbers		
		Built-in length l_3 (mm)		
		D1	D2 and D4	D5
		$l_3 = 295$	$l_3 = 355$	$l_3 = 415$
-60 +40	1	1655901	1656901	1652901
-30 +50	1	1655902	1656902	1652902
0 +100	1	1655903	1656903	1652903
0 +120	1	1655904	1656904	1652904
0 +160	2	1655905	1656905	1652905
0 +200	2	1655906	1656906	1652906
0 +300	2	1655907	1656907	1652907
0 +400	5	1655908	1656908	1652908
0 +500	5	1655909	1656909	1652909
0 +600	5	1655910	1656910	1652910



Lagging tube for engine thermometers Form F and weld-in thermowells DIN 43772 Form 4

Type	Order no.
Lagging tube, dia. 11 mm, 165 mm, stainless steel, with threading M 24 x 1,5 and M 18 x 1,5	437600

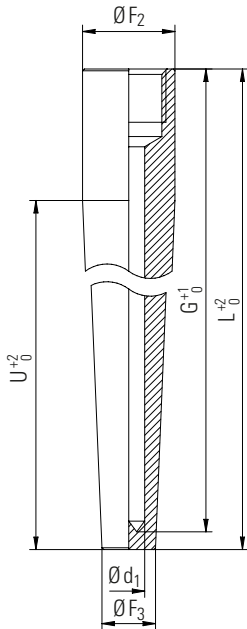
Spare capillaries acc. to DIN 16195

Measuring range °C	Scale division °C	Order numbers		
		Built-in length l_3 (mm)		
		D1	D2 and D4	D5
		$l_3 = 295$	$l_3 = 355$	$l_3 = 415$
-60 +40	1	1694131	1694132	1694135
-30 +50	1	1694231	1694232	1694235
0 +100	1	1694337	1694338	1694339
0 +120	1	1694381	1694382	1694385
0 +160	2	1694431	1694432	1694435
0 +200	2	1694481	1694482	1694485
0 +300	2	1694581	1694582	1694585
0 +400	5	1694681	1694682	1694685
0 +500	5	1694731	1694732	1694735
0 +600	5	1694781	1694782	1694785

Note for ordering:

When ordering standard types use the order numbers in the tables. For further options see page 5 "Options".

Weld-in Thermowells acc. to DIN 43772 Form 4



Weld-in thermowells acc. to DIN 43772 Form 4 and in addition to the DIN standard, for V-shape engine thermometers

Made from one piece, suitable for extreme pressures

With inside threading G 1/2 for stems Ø 10 mm

For sockets Form B	Thermowell sizes (mm)						Thermowell materials			
	L	U	G	Ø F ₂	Ø F ₃	Ø d ₁	St37.2	C22.8	13CrMo44	St. Steel
l ₁ (mm)								1.0460	1.7335	1.4571
63	73	34	68	26 h7	17	11	493101-1	494101-1	453101-1	433101-1
100	110	65	105	26 h7	17	11	493104-1	494104-1	453104-1	433104-1
160	170	133	165	26 h7	17	11	493108-1	494108-1	453108-1	433108-1
250	260	125	255	26 h7	17	11	493110-1	494110-1	453110-1	433110-1
400	410	275	405	26 h7	17	11	493112-1	494112-1	453112-1	433112-1

With inside threading G 3/4 for stems Ø 10 mm

For sockets Form B	Thermowell sizes (mm)						Thermowell materials			
	L	U	G	Ø F ₂	Ø F ₃	Ø d ₁	St37.2	C22.8	13CrMo44	St. Steel
l ₁ (mm)								1.0460	1.7335	1.4571
63	73	34	68	32 h7	17	11	493201-1	494201-1	453201-1	433201-1
100	110	65	105	32 h7	17	11	493204-1	494204-1	453204-1	433204-1
160	170	133	165	32 h7	17	11	493208-1	494208-1	453208-1	433208-1
250	260	125	255	32 h7	17	11	493210-1	494210-1	453210-1	433210-1
400	410	275	405	32 h7	17	11	493212-1	494212-1	453212-1	433212-1

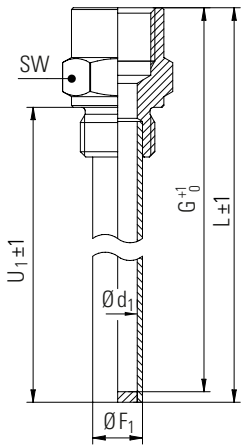
With inside threading M 18 x 1,5 for stems Ø 6 mm

Für sockets Form F with double nipple/lagging tube (165 mm)	Thermowell sizes (mm)						Thermowell materials					
	L	U	G	Ø F ₂	Ø F ₃	Ø d ₁	St37.2	C22.8	16Mo3	13CrMo44	10CrMo9-10	St. steel
l ₃ (mm)								1.0460	1.5415	1.7335	1.7380	1.4571
155/295	140	65	135	24 h7	12,5	7	437001-1	437006-1	1437002	437003-1	437004-1	437005-1
215/355	200	65	195	24 h7	12,5	7	437101-1	437106-1	1437102	437103-1	437104-1	437105-1
215/355	200	125	195	24 h7	12,5	7	437301-1	437306-1	1437302	437303-1	437304-1	437305-1
275/415	260	125	255	24 h7	12,5	7	437401-1	437406-1	1437402	437403-1	437404-1	437405-1

Note for ordering:

When ordering standard types use the order numbers in the tables. For further options see page 5 "Options".

Threaded Thermowells acc. to DIN 43772 Form 5



Threaded thermowells acc. to DIN 43772 Form 5 and in addition to the DIN standard, for V-shape engine thermometers

Consisting of several pieces (hard-soldered, hard-welded), suitable for use in low pressures

With inside and outside threading G 1/2 for stems Ø 10 mm

For sockets Form B	Thermowell sizes (mm)						Thermowell materials			
	l_1 (mm)	L	U_1	G	$\varnothing F_1$	$\varnothing d_1$	Ms58 2.0380	St. steel 1.4571	SoMs76/2.0460 (nipple: Ms58)	CuNi30Mn1Fe 2.0882
63	73	45	68	14	11	27	411101-1	431101-1	451101-1	481101-1
100	110	82	105	14	11	27	411104-1	431104-1	451104-1	481104-1
160	170	142	165	14	11	27	411108-1	431108-1	451108-1	481108-1
250	260	232	255	14	11	27	411110-1	431110-1	451110-1	481110-1
400	410	382	405	14	11	27	411112-1	431112-1	451112-1	481112-1

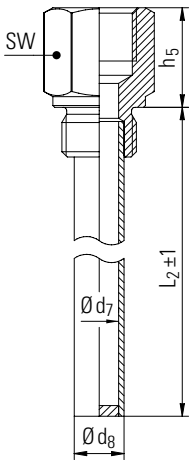
With inside and outside threading G 3/4 for stems Ø 10 mm

For sockets Form B	Thermowell sizes (mm)						Thermowell materials			
	l_1 (mm)	L	U_1	G	$\varnothing F_1$	$\varnothing d_1$	Ms58 2.0380	St. steel 1.4571	SoMs76/2.0460 (nipple: Ms58)	CuNi30Mn1Fe 2.0882
63	73	45	68	14	11	32	411201-1	431201-1	451201-1	481201-1
100	110	82	105	14	11	32	411204-1	431204-1	451204-1	481204-1
160	170	142	165	14	11	32	411208-1	431208-1	451208-1	481208-1
250	260	232	255	14	11	32	411210-1	431210-1	451210-1	481210-1
400	410	382	405	14	11	32	411212-1	431212-1	451212-1	481212-1

Note for ordering:

When ordering standard types use the order numbers in the tables. For further options see page 5 "Options".

Threaded Thermowells acc. to DIN 16179 Form BD



Threaded thermowells acc. to DIN 16179 Form BD, for V-shape engine thermometers

Consisting of several pieces (hard-soldered, hard-welded), suitable for use in low pressures

With inside and outside threading G 1/2 for stems Ø 10 mm

For sockets Form B	Thermowell sizes (mm)						Thermowell materials			
	l_1 (mm)	l_2	h_5	$\varnothing d_8$	$\varnothing d_7$	SW	Ms58	Stainless steel	SoMs76/2.0460 (nipple: Ms58)	CuNi30Mn1Fe
63	45	25	13	11	27	2.0380	411101	1.4571	451101	2.0882
100	82	25	13	11	27	411104	431104	451104	481104	
160	142	25	13	11	27	411108	431108	451108	481108	
250	232	25	13	11	27	411110	431110	451110	481110	
400	382	25	13	11	27	411112	431112	451112	481112	

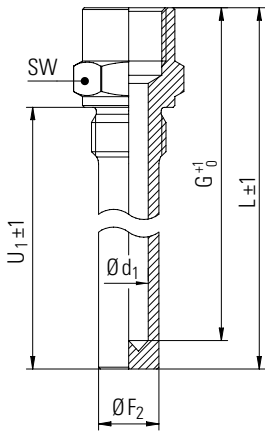
With inside and outside threading G 3/4 for stems Ø 10 mm

For sockets Form B	Thermowell sizes (mm)						Thermowell materials			
	l_1 (mm)	l_2	h_5	$\varnothing d_8$	$\varnothing d_7$	SW	Ms58	Stainless steel	SoMs76/2.0460 (nipple: Ms58)	CuNi30Mn1Fe
63	45	29	13	11	32	2.0380	411201	1.4571	451201	2.0882
100	82	29	13	11	32	411204	431204	451204	481204	
160	142	29	13	11	32	411208	431208	451208	481208	
250	232	29	13	11	32	411210	431210	451210	481210	
400	382	29	13	11	32	411212	431212	451212	481212	

Note for ordering:

When ordering standard types use the order numbers in the tables. For further options see page 5 "Options".

Threaded Thermowells acc. to DIN 43772 Form 6



Threaded thermowells acc. to DIN 43772 Form 6 and in addition to the DIN standard, for V-shape engine thermometers

Made from one piece, suitable for extreme pressures

With inside and outside threading G 1/2 for stems Ø 10 mm

For sockets Form B	Thermowell sizes (mm)						Thermowell materials			
	l_1 (mm)	L	U_1	G	$\varnothing F_2$	$\varnothing d_1$	SW	Ms58	9SMn20	Stainless steel
63	73	45	68	17	11	27	412201-1	422201-1	432201-1	482201-1
100	110	82	105	17	11	27	412204-1	422204-1	432204-1	482204-1
160	170	142	165	17	11	27	412208-1	422208-1	432208-1	482208-1
250	260	232	255	17	11	27	412210-1	422210-1	432210-1	482210-1
400	410	382	405	17	11	27	412212-1	422212-1	432212-1	482212-1

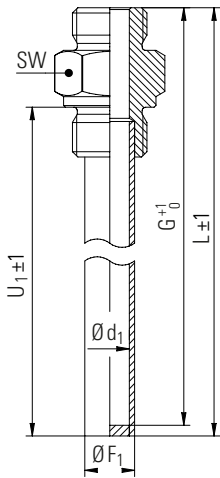
With inside and outside threading G 3/4 for stems Ø 10 mm

For sockets Form B	Thermowell sizes (mm)						Thermowell materials			
	l_1 (mm)	L	U_1	G	$\varnothing F_2$	$\varnothing d_1$	SW	Ms58	9SMn20	Stainless steel
63	73	45	68	19	11	32	412401-1	422401-1	432401-1	482401-1
100	110	82	105	19	11	32	412404-1	422404-1	432404-1	482404-1
160	170	142	165	19	11	32	412408-1	422408-1	432408-1	482408-1
250	260	232	255	19	11	32	412410-1	422410-1	432410-1	482410-1
400	410	382	405	19	11	32	412412-1	422412-1	432412-1	482412-1

Note for ordering:

When ordering standard types use the order numbers in the tables. For further options see page 5 "Options".

Threaded Thermowells acc. to DIN 43772 Form 8



Threaded thermowells acc. to DIN 43772 Form 8 and in addition to the DIN standard, for V-shape engine thermometers with loose coupling nuts

Consisting of several pieces (hard-soldered, hard-welded) suitable for use in low pressures

With inside and outside threading G 1/2 for stems Ø 10 mm

For sockets Form C with loose coupling nut	Thermowell sizes (mm)							Thermowell materials			
	L	U ₁	G	ØF ₁	Ød ₁	SW	Ms58 2.0380	St. steel SoMs76/2.0460 1.4571	(nipple: Ms58)	CuNi30Mn1Fe 2.0882	
l ₁ (mm)											
89	101	73	96	14	11	27	414115-1	434115-1	454115-1	484115-1	
126	138	110	133	14	11	27	415116-1	434116-1	454116-1	484116-1	
186	198	170	193	14	11	27	414117-1	434117-1	454117-1	484117-1	
276	288	260	283	14	11	27	414118-1	434118-1	454118-1	484118-1	
426	438	410	433	14	11	27	414119-1	434119-1	454119-1	484119-1	

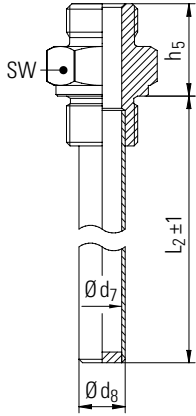
With inside and outside threading G 3/4 for stems Ø 10 mm

For sockets Form C with loose coupling nut	Thermowell sizes (mm)							Thermowell materials			
	L	U ₁	G	ØF ₁	Ød ₁	SW	Ms58 2.0380	St. steel SoMs76/2.0460 1.4571	(nipple: Ms58)	CuNi30Mn1Fe 2.0882	
l ₁ (mm)											
89	101	73	96	14	11	32	414215-1	434215-1	454215-1	484215-1	
126	138	110	133	14	11	32	414216-1	434216-1	454216-1	484216-1	
186	198	170	193	14	11	32	414217-1	434217-1	454217-1	484217-1	
276	288	260	283	14	11	32	414218-1	434218-1	454218-1	484218-1	
426	438	410	433	14	11	32	414219-1	434219-1	454219-1	484219-1	

Note for ordering:

When ordering standard types use the order numbers in the tables. For further options see page 5 "Options".

Threaded Thermowells acc. to DIN 16179 Form CD



Threaded thermowells acc. to DIN 16791 Form CD, for V-shape engine thermometers with loose coupling nuts

Consisting of several pieces (hard-soldered, hard-welded) suitable for use in low pressures

With inside and outside threading G 1/2 for stems Ø 10 mm

For sockets Form C with loose coupling nut	Thermowell sizes (mm)					Thermowell materials				
	l_1 (mm)	l_2	h_5	$\varnothing d_8$	$\varnothing d_7$	SW	Ms58	St. steel	SoMs76/2.0460 (nipple: Ms58)	CuNi30Mn1Fe
63	45	25	13	11	27	2.0380	1.4571	434101	454101	2.0882
89	71	25	13	11	27	414115	434115	454115	484115	484115
126	108	25	13	11	27	415116	434116	454116	484116	484116
186	168	25	13	11	27	414117	434117	454117	484117	484117

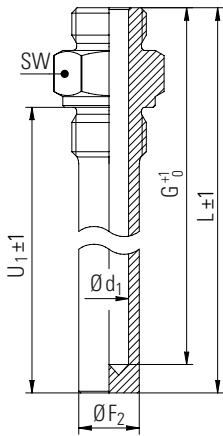
With inside and outside threading G 3/4 for stems Ø 10 mm

For sockets Form C with loose coupling nut	Thermowell sizes (mm)					Thermowell materials				
	l_1 (mm)	l_2	h_5	$\varnothing d_8$	$\varnothing d_7$	SW	Ms58	St. steel	SoMs76/2.0460 (nipple: Ms58)	CuNi30Mn1Fe
89	71	29	13	11	32	414215	434215	454215	484215	484215
126	108	29	13	11	32	414216	434216	454216	484216	484216
186	168	29	13	11	32	414217	434217	454217	484217	484217
276	258	29	13	11	32	414218	434218	454218	484218	484218
426	408	29	13	11	32	414219	434219	454219	484219	484219

Note for ordering:

When ordering standard types use the order numbers in the tables. For further options see page 5 "Options".

Threaded Thermowells acc. to DIN 43772 Form 9



Threaded thermowells acc. to DIN 43772 Form 9 and in addition to the DIN standard, for V-shape engine thermometers with loose coupling nuts

Made from one piece, suitable for use in extreme pressures

With inside and outside threading G 1/2 for stems Ø 10 mm

For sockets Form C with loose coupling nut	Thermowell sizes (mm)						Thermowell materials			
	L	U ₁	G	Ø F ₂	Ø d ₁	SW	Ms58 2.0380	9SMn20 1.0711	St. steel 1.4571	CuNi30Mn1Fe 2.0882
l ₁ (mm)										
89	101	73	96	17	11	27	415115-1	425115-1	435115-1	485115-1
126	138	110	133	17	11	27	415116-1	425116-1	435116-1	485116-1
186	198	170	193	17	11	27	415117-1	425117-1	435117-1	485117-1
276	288	260	283	17	11	27	415118-1	425118-1	435118-1	485118-1
426	438	410	433	17	11	27	415119-1	425119-1	435119-1	485119-1

With inside and outside threading G 3/4 for stems Ø 10 mm

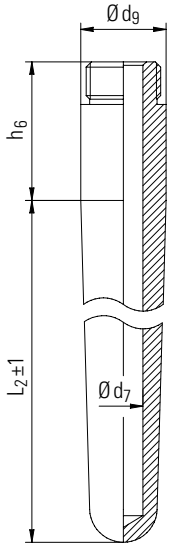
For sockets Form C with loose coupling nut	Thermowell sizes (mm)						Thermowell materials			
	L	U ₁	G	Ø F ₂	Ø d ₁	SW	Ms58 2.0380	9SMn20 1.0711	St. steel 1.4571	CuNi30Mn1Fe 2.0882
l ₁ (mm)										
89	101	73	96	19	11	32	415215-1	425215-1	435215-1	485215-1
126	138	110	133	19	11	32	415216-1	425216-1	435216-1	485216-1
186	198	170	193	19	11	32	415217-1	425217-1	435217-1	485217-1
276	288	260	283	19	11	32	415218-1	425218-1	435218-1	485218-1
426	438	410	433	19	11	32	415219-1	425219-1	435219-1	485219-1

Note for ordering:

When ordering standard types use the order numbers in the tables. For further options see page 5 "Options".

Weld-In Thermowells

acc. to DIN 16179 Form CS



Weld-In Thermowells acc. to DIN 16791 Form CS
for V-shape engine thermometers with loose coupling nut Form C
 Made from one piece, suitable for extreme pressures

With inside and outside threading G 1/2 for stems Ø 10 mm

For sockets Form C with loose coupling nut	Thermowell sizes (mm)				Thermowell materials				
	l_1 (mm)	l_2	h_6	$\varnothing d_g$	$\varnothing d_7$	Steel	Steel	Stainless steel	Steel
89	63	39	24 h11	11	496115	1.0460	494115	1.4571	456115
126	100	39	24 h11	11	496116	1.0460	494116	1.4571	456116
186	160	39	24 h11	11	496117	1.0460	494117	1.4571	456117
276	250	39	24 h11	11	496118	1.0460	494118	1.4571	456118
426	400	39	24 h11	11	496119	1.0460	494119	1.4571	456119

With inside and outside threading G 3/4 for stems Ø 10 mm

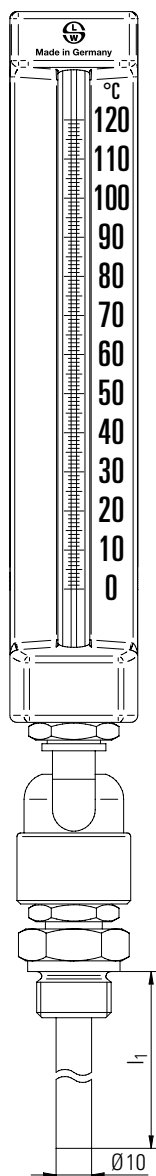
For sockets Form C with loose coupling nut	Thermowell sizes (mm)				Thermowell materials				
	l_1 (mm)	l_2	h_6	$\varnothing d_g$	$\varnothing d_7$	Steel	Steel	Stainless steel	Steel
89	63	45	30 h11	11	496215	1.0460	494215	1.4571	456215
126	100	45	30 h11	11	496216	1.0460	494216	1.4571	456216
186	160	45	30 h11	11	496217	1.0460	494217	1.4571	456217
276	250	45	30 h11	11	496218	1.0460	494218	1.4571	456218
426	400	45	30 h11	11	496219	1.0460	494219	1.4571	456219

Note for ordering:

When ordering standard types use the order numbers in the tables. For further options see page 5 "Options".

V-shape Glass Engine Thermometers

Type 2000, turnable/pivotable



Complete instruments acc. to DIN 16181,

with ball-joint: 360° rotation, 180° swiveling range

Case: 200 x 36 mm, aluminum brass-colored,

Threading: G 1/2, Stem: Ø 10 mm, Threaded connection

with loose coupling nut G 1/2 (material: brass Ms58,

stainless steel 1.4571 for temperatures > +300 °C

Scale lettering: black,

Capillary: white back prismatic, blue filling ($\leq +200$ °C)

yellow back prismatic, Hg filling ($> +200$ °C)

Constant high accuracy due to aged sensors

(Material: N16B glass), Accuracy: 1% of scale value

Product features

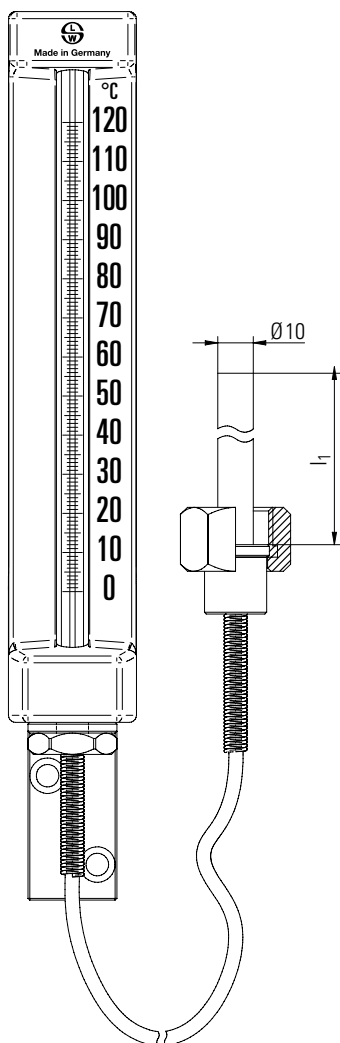
- Break-resistant
- Resistant against aggressive vapors
- Quick, easy-to-read indication
- Indelible graduation diffused into glass
- No measuring errors due to mechanical parts
- Protected design

Measuring range °C	Scale division °C	Order numbers				
		Built-in length l_1 (mm)				
		$l_1 = 63$	$l_1 = 100$	$l_1 = 160$	$l_1 = 200$	$l_1 = 400$
-30 +50	1	1696301	1696302	1696303	1696304	1696305
0 +120	1	1696351	1696352	1696353	1696354	1696355
0 +200	2	1696401	1696402	1696403	1696404	1696405
0 +300	2	1696451	1696452	1696453	1696454	1696455
0 +400	5	1696501	1696502	1696503	1696854	1696505

Note for ordering:

When ordering standard types use the order numbers in the tables. For further options see page 5 "Options".

V-shape Glass Engine Telethermometers Type 2001



Complete instruments acc. to DIN 16189

with cable (standard cable length: 1 m)

Case: 200 x 36 mm, aluminum brass-colored,
Threading: G 1/2, Stem: dia. 10 mm, Threaded connection
with loose coupling nut G 1/2 (material: brass Ms58,
stainless steel 1.4571 for temperatures > +300 °C)

Scale lettering: black,

Capillary: white back prismatic, blue filling ($\leq +200$ °C)
yellow back prismatic, Hg filling ($> +200$ °C)

Constant high accuracy due to aged sensors

(Material: N16B glass), Accuracy: 1% of scale value

Product features

- Break-resistant
- Resistant against aggressive vapors
- Quick, easy-to-read indication
- Indelible graduation diffused into glass
Graduierung
- No measuring errors due to
mechanical parts
- Protected design

Measuring range °C	Scale division °C	Order numbers				
		Built-in length l_1 (mm)				
		$l_1 = 63$	$l_1 = 100$	$l_1 = 160$	$l_1 = 200$	$l_1 = 400$
-30 +50	1	1696601	1696602	1696603	1696604	1696605
0 +120	1	1696651	1696652	1696653	1696654	1696655
0 +200	2	1696701	1696702	1696703	1696704	1696705
0 +300	2	1696751	1696752	1696753	1696754	1696755
0 +400	5	1696801	1696802	1696803	1696804	1696805

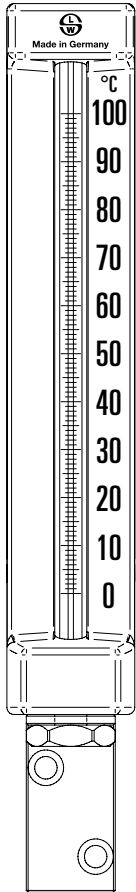
Cable length (m)	Order numbers
1,0 (standard)	780001
2,0	780002
3,0	780003
5,0	780005

The order number for the correct cable
length must be stated in your order
(standard length: 1 m)

Note for ordering:

When ordering standard types use the order numbers in the tables. For further options see page 5 "Options".

V-shape Glass Engine Room Thermometers



V-shape glass engine room thermometers acc. to DIN 16189, for use aboard ships and for rough operating conditions

Case: 200 x 36 mm, aluminum brass-colored,

Applications: storage rooms, material testing and aging cellars, beer cellars, cooling houses, hot houses, engine rooms and ship decks and for all measuring places with rough operating conditions

Scale lettering: black

Capillary: white back prismatic, blue filling

Accuracy: 1% of scale value

Product features

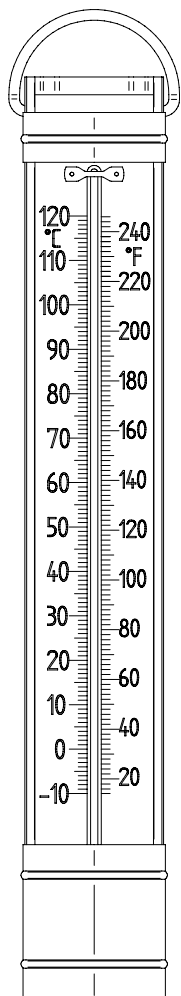
- High accuracy
- Sturdy, robust instrument
- Quick and easy to read
- Easy mounting

Measuring range °C	Scale division °C	Order numbers	
		Complete instrument	Spare capillary
-60+40	1	1689991	1693991
-30+50	1	1689992	1693992
0+30	0,5	1689993	1693993
-10+50	1	1689994	1693994
0+100	1	1689995	1693995

Note for ordering:

When ordering standard types use the order numbers in the tables. For further options see page 5 "Options".

Ship Engine Room And Dipping Thermometers With Copper Case



Ship engine room and dipping thermometers acc. to DIN 16189 for use on ships and for use in rough operating conditions

Case: 260 x 340 mm, copper

Applications: in storage rooms, material testing and aging cellars, for beer cellars, cooling houses, hot houses, engine rooms and ship decks and for all measuring places with rough operating conditions

Scale lettering: black

Capillary: white back prismatic, blue filling

Range: -10 +110 °C / +20 +240 °F

Accuracy: 1% of scale value

Order no: 1696201

Chain

Length: 1 m

Material	Order numbers
Brass, nickel-plated	306000
Stainless steel	306001

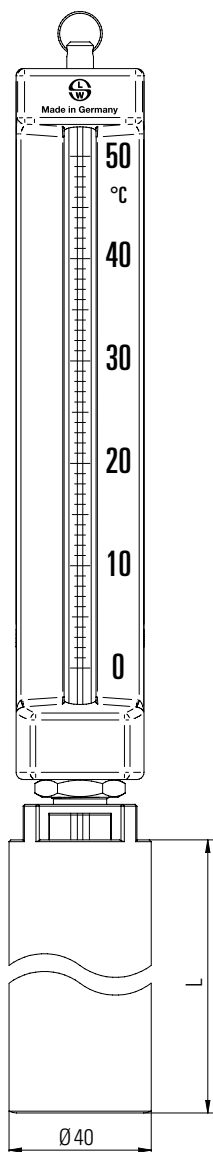
Note for ordering:

When ordering standard types use the order numbers in the tables. For further options see page 5 "Options".

Product features

- High accuracy
- Sturdy, robust instrument
- Quick and easy to read
- Easy mounting

V-shape Glass Well and Dipping Engine Thermometers



V-shape glass well and dipping engine thermometers acc. to DIN 16189 for taking liquid samples and analyzing them

Gehäuse: H 200 x B 36 mm, Messing verchromt
 Case: 200 x 36 mm, chromium-plated brass
 Applications: taking liquid samples from crank cases of big engines, taking oil and gasoline samples from storage tanks, measurements in flowing or non-flowing water
 Scale lettering: black
 Capillary: white, back prismatic, blue filling
 Range: -10 +110 °C / +20 +240 °F
 Accuracy: 1% of scale value

Produktvorteile

- High accuracy
- Sturdy, robust instrument
- Quick and easy-to read
- Sturdy metal ring to secure chain to case

Complete instruments acc. to DIN 16189 with dipper (dipper dia. 40 mm x length L)

Measuring range	Scale division	Order numbers		
		Dipper L = 50	Dipper L = 75	Dipper L = 100
-30+50	1	1669001	1669007	1669002
0+60	1	1669011	1669017	1669012
0+100	1	1669021	1669027	1669022
0+160	2	1669031	1669037	1669032
0+200	2	1669041	1669047	1669042

Spare capillaries

Measuring range	Scale division	Order numbers		
		Dipper L = 50	Dipper L = 75	Dipper L = 100
-30+50	1	1693203	1693205	1693207
0+60	1	1693253	1693255	1693257
0+100	1	1693303	1693305	1693307
0+160	2	1693403	1693405	1693407
0+200	2	1693453	1693455	1693457

Spare dippers

Material	Order numbers		
	Dipper L = 50	Dipper L = 75	Dipper L = 100
Messing, verchromt	741102	741105	741103
Edelstahl	741106	741107	741108

Chain Length: 1 m

Material	Order numbers
Brass, nickel-plated	306000
Stainless steel	306001

Note for ordering:

When ordering standard types use the order numbers in the tables. For further options see page 5 "Options".

V-Shape Glass Engine Thermometers with Insertion Tip

V-shape glass engine thermometers acc. to DIN 16189 with insertion tip for measurements in silos, ricks, hay stacks, and soil

For measurements in silos, storage rooms with bulk goods, in ricks and hay stacks, in bituminous masses (e.g. asphalt, tar, glue, liquid cement)

For soil measurements in horticulture, farming and in soil testing experimental stations

With steel insertion tip dia. 15 mm, black

Case: H 200 x B 36 mm, brass-colored aluminium

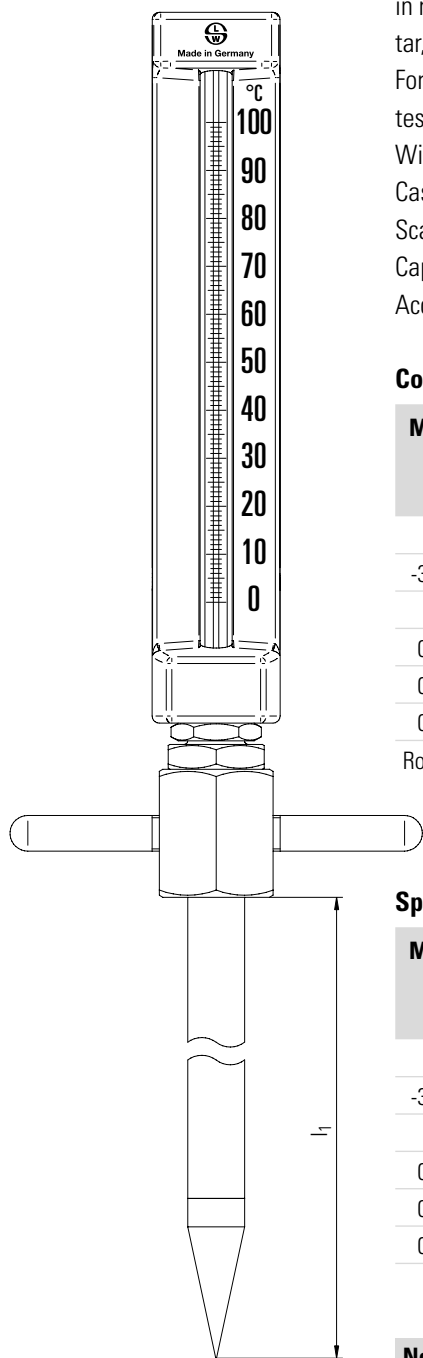
Scale lettering: black

Capillary: white back prismatic, blue filling

Accuracy: 1% of scale value

Produktvorteile

- Sturdy, robust instrument
- Quick and easy-to read
- Safe and easy insertion due to strong protection tube, tips made from one piece and sturdy handles



Complete instruments acc. to DIN 16189

Measuring range °C	Scale division °C	Order numbers				
		Built-in length l_1 (mm)				
		$l_1 = 400$	$l_1 = 600$	$l_1 = 800$	$l_1 = 1000$	$l_1 = 2000$
-30+50	1	1689904	1689905	1689906	1689907	1689908
0+60	1	1689914	1689915	1689916	1689917	1689918
0+100	1	1689924	1689925	1689926	1689927	1689928
0+200	2	1689934	1689935	1689936	1689937	1689938
0+400	5	1689944	1689945	1689946	1689947	1689948

Rounded case (top part 250 x 25 mm) on request

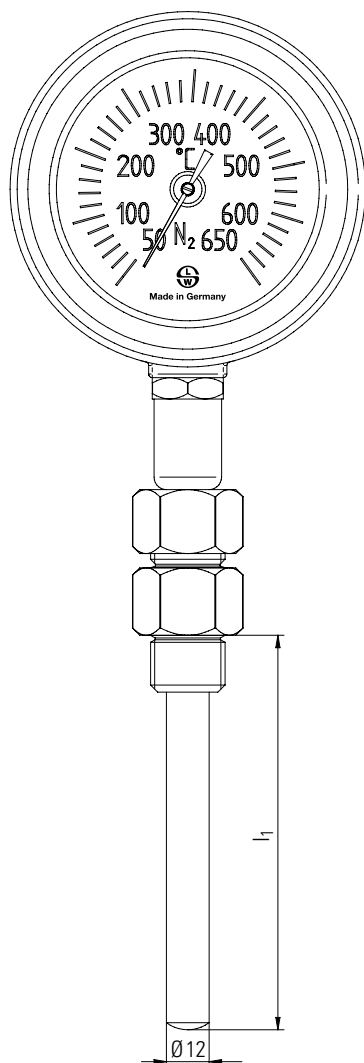
Spare capillaries acc. to DIN 16195

Measuring range °C	Scale division °C	Order numbers				
		Built-in length l_1 (mm)				
		$l_1 = 400$	$l_1 = 600$	$l_1 = 800$	$l_1 = 1000$	$l_1 = 2000$
-30+50	1	1693214	1693905	1693906	1693907	1693908
0+60	1	1693264	1693915	1693916	1693917	1693918
0+100	1	1693314	1693925	1693926	1693927	1693928
0+200	2	1693464	1693935	1693936	1693937	1693938
0+400	5	1693664	1693945	1693946	1693947	1693948

Note for ordering:

When ordering standard types use the order numbers in the tables. For further options see page 5 "Options".

Precision Dial Thermometers Type H 13 for Ship and Diesel Engines



Robust precision dial thermometers type H 13 for ship and diesel engines

These dial thermometers were made for especially tough operating conditions and can withstand the extreme shocks and vibrations of all combustion engines and exhaust ducts in the shipbuilding industry, in machine building and industry. The metal case, dia. 100 mm, is especially sturdy, the instrument can be adjusted to different levels
Stem: dia. 12 mm, security pane: Sekurit glass
Protection class: IP 54, Accuracy: 1% of scale value

Product features

- Especially stable and robust in use
- Water-, dust- and oil-resistant
- Quick response
- Liquid filling to stabilize against strong vibrations
- Corrosion-proof
- Durability even when used in tough operating conditions

Complete instruments with 3-piece steel compressions fitting

Meas. range °C	Thread	Order numbers								
		Built-in length I_1 (mm)								
		$I_1 = 125$	$I_1 = 150$	$I_1 = 200$	$I_1 = 250$	$I_1 = 300$	$I_1 = 350$	$I_1 = 400$	$I_1 = 500$	$I_1 = 600$
+50+650	G 1/2-A	4351041	4351141	4351241	4351341	4351441	4351541	4351641	4351741	4351841
+50+650	G 3/4-A	4351042	4351142	4351242	4351342	4351442	4351542	4351642	4351742	4351842

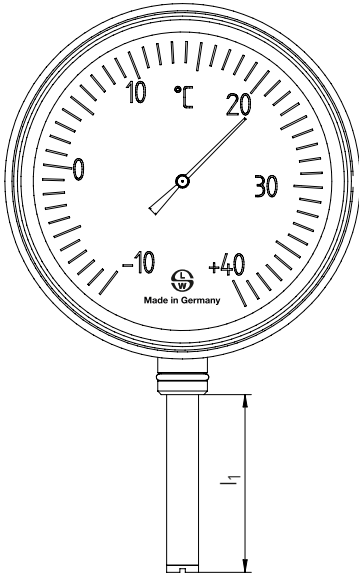
Spare parts for 3-piece compression fitting

Material	Order numbers			
	Thread G 1/2	Thread G 3/4	Thread M27 x 2	Thread M20 x 1,5
Stahl	758880	758890	759000	758882
Edelstahl	758881	758891	759001	758883

Complete instruments with loose steel coupling nut

Meas. range °C	Thread	Order numbers								
		Built-in length I_1 (mm)								
		$I_1 = 125$	$I_1 = 150$	$I_1 = 200$	$I_1 = 250$	$I_1 = 300$	$I_1 = 350$	$I_1 = 400$	$I_1 = 500$	$I_1 = 600$
+50+650	G-1/2-A	4351043	4351143	4351243	4351343	4351443	4351543	4351643	4351743	4351843
+50+650	G-3/4-A	4351044	4351144	4351244	4351344	4351444	4351544	4351644	4351744	4351844

Bimetal Dial Thermometers, Standard Type



Bimetal dial thermometers, standard type

Type: axial/radial

Accuracy class: 2.0

With separate thermowell made of brass (Ms58), dia. 12 mm

With O-ring for thermowell mounting

Case diameter: 63/80/100 or 160 mm

Case material: galvanized steel with nickered bezel

Standard measuring ranges: -30+50/-20+60/0+120/0+160 or 0+200 °C

Standard stem lengths L_1 (incl. thread): 40/63/80/100/160 or 200 mm

Options:

- With fixing screw
- With thread and Philips screw
- Bimetal surface thermometer with fixing spring
- With adjustable flange (for airducts)
- With your logo

Magnet Bimetall Dial Thermometers

Magnet bimetall dial thermometers for surface measurements on smooth surfaces

With two plain magnets in back (for temperatures over 300 °C and for vibrating measuring place, we recommend four magnets)

Accuracy class: 2,5

Case diameter: 63 or 80 mm

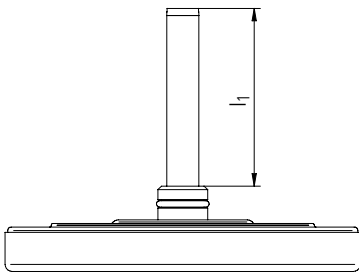
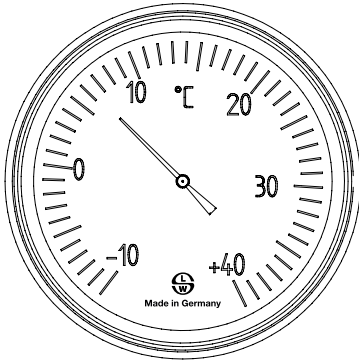
Case material: brass, nickel-plated

Standard ranges: -30+50/0+80/0+120/0+160/0+200/0+300
or 0+400 °C

Options:

- With four plain magnets
- With two strong magnets
- With four strong magnets
- With maximum drag pointer
- With max./min. drag pointer
- Ranges 0+500 or 0+600 °C (only available with case diameter 80 mm and four strong magnets)

Bimetal Dial Thermometers



Bimetal dial thermometer, standard type

Type: axial/radial

With rotating and swiveling case,

Accuracy class: 1.0/1.6

Case diameter: 63/80/100 or 160 mm (34 and 50 mm on request)

Case materials: galvanized steel with nickled bezel,
stainless steel with bezel

Bayonet ring SS 1.4301, IP 65 (water- and airtight)

Standard measuring ranges: -40+40/-30+50/-20+60/0+60/0+100/
0+120/0+160/0+200/0+250/0+300/0+400 or 0+500 °C

(other ranges on request)

Standard stem length L_1 (incl. threading): 45/63/100/160/200/250
or 300 mm (other lengths on request)

Stem diameter: 6/8/9 or 10 mm

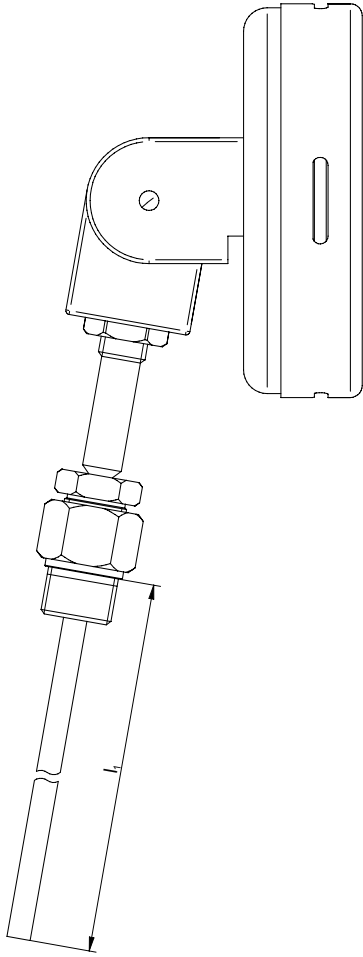
Stem materials: brass Ms58/SS 1.4305 or 1.4571

Connection: fixed thread/loose coupling nut/rotating thread on
compression fitting

Options:

- With separate thermowell (brass Ms58 or SS 1.4305),
dia. 12 mm , with lateral adjusting nut
- With safety glass
- With maximum drag pointer
- With dual scale °C and °F
- With smooth shaft, stem without thread
- With NPT thread
- With adjustable flange (for airducts)
- With insertion tip (for stem dia. 4 and 9 mm)

Gas-filled Dial Thermometers



Gas-filled dial thermometers, stainless steel

Type: axial/radial

With rotating and swiveling case,

Accuracy class: 1.0, Protection class: IP 65,

Case diameters: 63/80/100/160 or 250 mm

(Bayonet ring case SS 1.4301, IP 65)

Standard measuring ranges: -200+50/-100+100/-40+40/0+60/

0+100/0+120/0+160/0+200/0+300/0+400/0+500/0+600/

0+700 or 0+800 °C (other ranges on request)

Stem length L_1 (incl. thread): 63/100/160/200/250/300 or 400 mm

(other lengths on request)

Stem diameter: 6/8/9 or 10 mm

Stem: standard dia. 12 mm, material: 1.4541

(available stem diameters: 6/8/9/10 or 14 mm)

Connection: threaded connection/loose coupling nut/

Revolving thread on clamp mounting

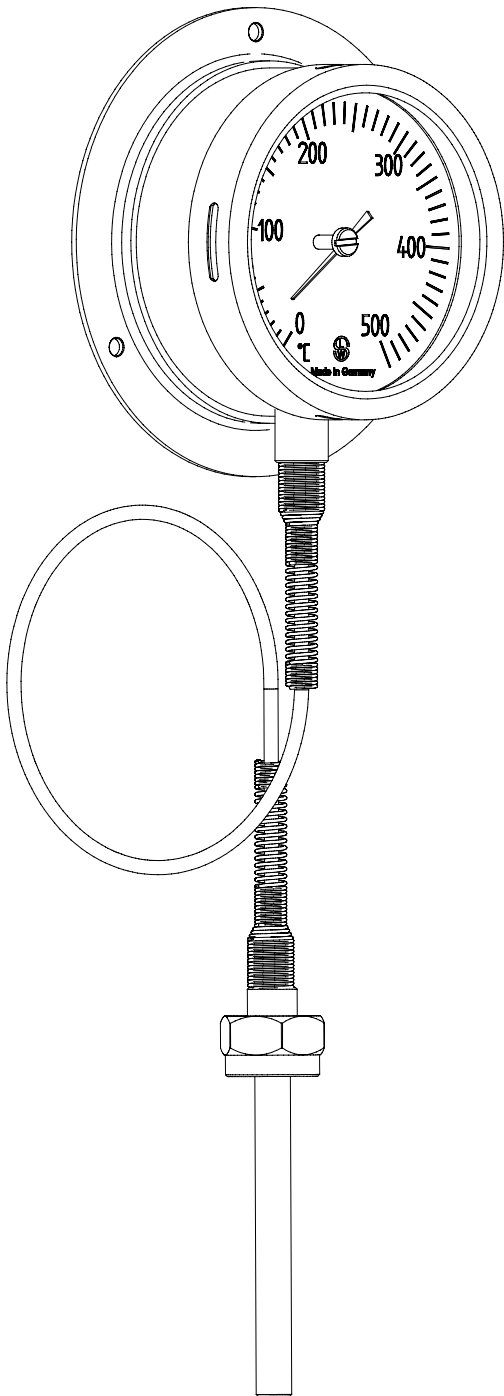
Thread connection: G 1/2; G 3/4, G 1/4; G1; M 18 x 1.5; M 20 x 1.5;

M 24 x 1.5; M 27 x 2

Options:

- With separate thermowell acc. to DIN 43772
(see pages 28, 29, 31, 32 and 34)
- With safety glass
- With maximum drag pointer
- With max./min. drag pointer
- With dual scale °C and °F
- With silicone-filled case
- With smooth shaft, stem without thread
- With contact devices (for case dia. 100 and 160 mm)

Gas-filled Dial Telethermometers



Gas-filled dial telethermometers, stainless steel

Available designs:

With wall mounting (cable going downwards)

With mounting ring against wall (cable going downwards or back)

With mounting ring in front (cable going downwards or back)

With clamp mounting (cable going downwards or back)

Accuracy: 1.0, Protection class: IP 65

Bayonet clasp case: 63/80 or 100 mm, material: SS 1.4301

Standard measuring ranges: -200+50/-100+100/-40+40/0+60/

0+100/0+120/0+160/0+200/0+300/0+400/0+500/0+600/0+700

or 0+800 °C (other ranges per your inquiry)

Standard capillary dia. 2.5 mm, SS 1.4541

(lengths in meters)

Different types of leads:

Stem in SS with PVC coating (dia. 4 mm)

Stem with spiral protection SS 1.4301 (dia. 0.6 mm)

Stem with spiral protection and PVC coating (dia. 7.5 mm)

Stem length acc. to your requirements

Stem: standard dia. 12 mm (material: 1.4541)

(available stem diameters: 6/8/9 or 10 mm)

Connection: threaded connection/loose coupling nut/revolving thread/compression fitting (on stem)/adjustable clamp mounting (on stem)

Threaded connections: G 1/2; G 3/4; G 1/4; G 1; M 18 x 1.5;

M 20 x 1.5; M 24 x 1.5; M 27 x 2

Options:

- With separate thermowell acc. to DIN 43772 (see pages 28, 29, 31, 32 and 34)
- With safety glass
- With maximum drag pointer
- With dual scale °C and °F
- With silicone-filled case
- With smooth shaft, stem without thread
- With air sensor (dia. 16 mm, spiral length: 140 mm)
- With contact devices (for case dia. 100 and 160 mm)

Technical Information

Technical Information

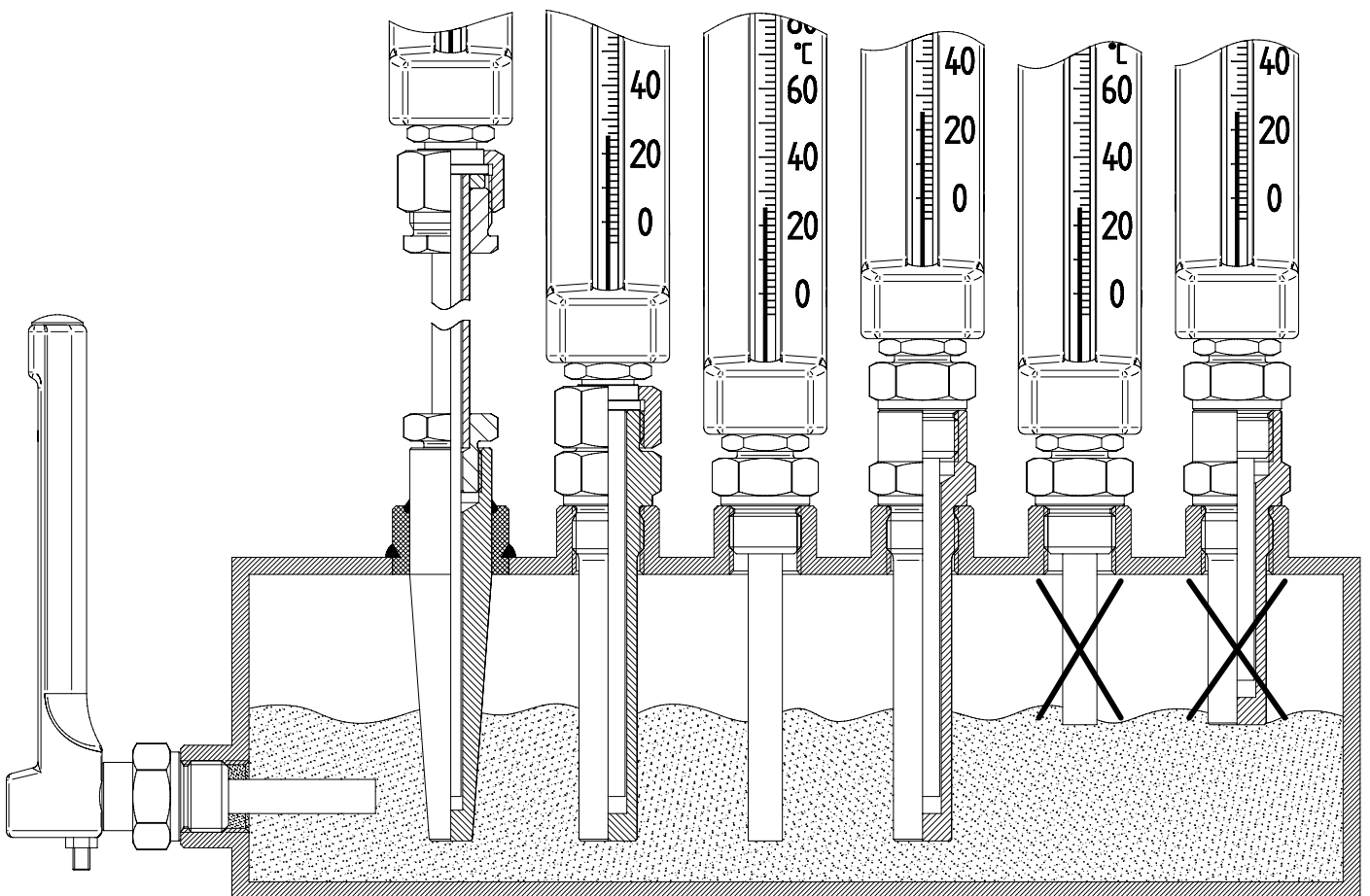
Mounting Instructions

This catalogue offers a great variety of different screw sockets and threaded or weld-in thermowells.

When using the suitable thermowell type your engine thermometer will be protected against special mechanical, thermal and chemical abrasion. A separate thermowell enables the assembly while the unit is in operation.

In order to get accurate readings it is essential that the entire built-in length of the stem is immersed in the medium to be measured. If this is not the case and a shorter length is required, you will have to state this in your order.

The cylindrical portion of the weld-in pocket must not extend into the pipe.



Technical Information

Materials

We have stated the most commonly used materials for screw cases and protection tubes in the tables. Those can be delivered ex stock. However, if the protection tube materials of this standard and those stated in the various catalogue pages are not appropriate for an operating condition, a suitable material must be chosen for the requirements of the customer. As a rule the material should be the same as that of the vessels or conduit.

In the case of aggressive agents or media it is always recommended to determine which material is to be used by experimenting in the workplace, as it only takes very small impurities to change the effect on the materials. Many not generally determinable factors may make the use of a material possible or impossible.

We are referring the reader to the FNE and VDE Guidelines about the appropriate choice of materials in Stahl-Eisen-Werkstoffblatt 472 and 440. (Verlag Stahleisen, Düsseldorf) and Dechema Werkstofftafel (Verlag Dechema, Frankfurt, Main)

Material name	Material no.	Acronym acc. to ISO 426
Trogamide/Polyamide		PA
Brass MS58	2.0380	CuZn39Pb2
Special brass – seawater resistant SOMS76	2.0460	CuZn20Al2
Steel C22.8	1.0460	C 22.8
Steel 9SMn20	1.0711	9SMn20
Steel – rust and acid resistant (V4A)	1.4571	X6CrNiMoTi-1712-2
Heat resistant steel 13CrMo44	1.7335	13CrMo44
Steel R. St37.2	1.0037	St 37.2
Stahl 16Mo3	1.5415	16Mo3
Steel 10CrMo910	1.7380	10CrMo910
CuNi30Mn1Fe	2.0882	CuNi30Mn1Fe

Technical Information

Filling Liquids

Instructions for reuniting indicator columns

Handling after shipping damage (separated indicator columns)

Rough or incorrect handling in transport may cause the thermometric indicator liquid in the capillary opening to separate. The same effect can be caused by similar circumstances or by incorrect storage and improper use. **A production fault is therefore not involved. This is purely a physically induced phenomenon.**

In most cases, columns can be reunited by the users themselves. If the following advice is not successful, the problem can only be rectified by the manufacturer. A separated and reunited indicator column does not affect the guaranteed precision of the thermometer types used.

1. Most thermometers have an expansion chamber at the top. If the thermometer's measurement range does not exceed 300 °C, the separated indicator column can be reunited by simply coaxing the mercury up by warming it with a flame. After the indicator column has been reunited, the instrument is left to cool down and it is ensured that the entire indicator liquid returns from the expansion chamber into the capillary opening. If the first attempt has been unsuccessful, we recommend repeating the procedure several times.
2. In the case of very wide capillary openings, separated indicator columns can also be reunited by powerful centrifuging as with a clinical thermometer, whereby the temperature probe must point downwards.
3. As another alternative method, we recommend undercooling the temperature probe using a salt-ice mixture or dry ice (CO₂) if available. The temperature probe is cooled down until all separated parts reunite in the indicator capillary and all entrained gases are above the indicator liquid. Particular attention must be paid to ensure that, when the thermometer warms up and the temperature increases, it is held upright in order to allow the indicator liquid to go up into the indicator capillary without any entrained gases. Particular care must be taken when checking whether there are any entrained gases remaining in the probe. If this is the case, however, the process must be repeated.

Product summary

- Catalogue 1 **Engine Thermometers**
- Catalogue 2 **General Purpose Thermometers**
- Catalogue 3/4 **Precision Laboratory Thermometers & Sets, Ground Joint Thermometers**
- Catalogue 5 **Meteorological Thermometers and Digital Measuring Devices**
- Catalogue 6 **Precision Thermometers for Material Testing**
- Catalogue 7 **Precision Contact Thermometers**
- Catalogue 8 **Thermometers for Special Applications**
- Catalogue 9 **Precision Hydrometers and Refractometers**
- Catalogue 10 **Dial Thermometers**
- Catalogue 11 **Digital Measuring Devices**
- Catalogue 12 **Resistance Thermometers and Thermocouples**
- Catalogue 13 **Cable Thermo Sensors**

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