

# General Purpose and Special Thermometers, Contact Thermometers



Precision temperature measuring instruments for general purpose and special measuring applications as well as with ecofriendly safety features

## Catalogue 2



Ludwig Schneider

High-precision measuring instruments for temperature and density

# 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 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

## DAkks accreditation

Ludwig Schneider Messtechnik is accredited under registration number D-K-15223-01-00 by the Accreditation Body „Deutsche Akkreditierungsstelle“ and fully complies with the requirements of DIN EN 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 DIN EN ISO/IEC 17025.

## Our range of services

- 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.)

ISO  
ASTM  
BS  
DIN



Deutsche  
Akkreditierungsstelle  
D-K-15223-01-00



## Ludwig Schneider Messtechnik GmbH

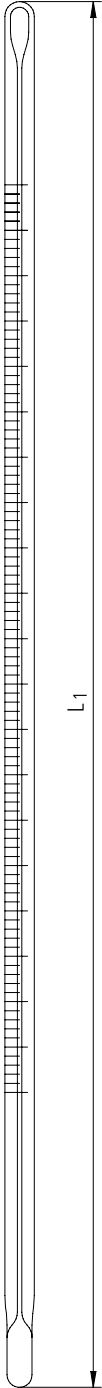
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# General Purpose Thermometers, ecofriendly



## General purpose thermometers

### ACCU-SAFE, stem type

Capillary: dia.  $6 \pm 1$  mm, white back, round

Filling: blue, organic (ecofriendly)

Permanent graduation and lettering

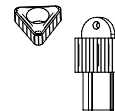
With serial number, with certificate (conformance & accuracy)

Single packed in plastic square shucks

Meas. range °C	Scale °C	Immersion mm	Total length L <sub>1</sub> mm	Ref. No.
-35 +50	1	total	305	64291
-20 +110	1	total	305	64292
-20 +150	1	total	305	64293
-10 +210	1	total	405	64294
-10 +110	1	total	200	64295
-10 +150	1	total	200	64296
-35 +50	1	76	305	64297
-20 +110	1	76	305	64298
-20 +150	1	76	305	64299
-10 +260	1	76	305	64300
-10 +110	1	50	200	64301
-10 +150	1	50	200	64302

Fahrenheit scale or double scale (°C/°F) available on request

Accessories	Ref. No.
Roll protection shuck, triangular, push-on mounting	60968
Cap with tag (roll protection and suspension)	56575



## Zertifikat Konformität & Genauigkeit / Certificate of Conformance & Accuracy

Dieses Instrument, gekennzeichnet mit der Serien-Nr.: \_\_\_\_\_  
wurde mit einem Normal-Instrument verglichen. Die Anzeigenauigkeit dieses  
Instruments ist rückführbar auf internationale Normale (PTB, NIST)

This instrument identified by above mentioned Serial-number was verified by  
direct comparison to high precision temperature calibration equipment. The accuracy  
of this Instrument is traceable to international Standards (PTB, NIST)

Datum der Prüfung / Calibration Date \_\_\_\_\_

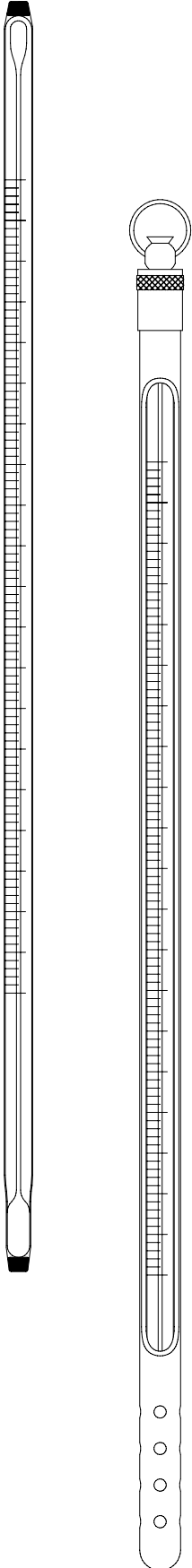
Norbert Gegenwarth

QA Calibration

Ludwig Schneider

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F 53447



### With safety coating

made of solid, high-transparent FEP/PTFE

Meas. range °C	Scale °C	Immersion mm	Total length L <sub>1</sub> mm	Ref. No.
-35+50	1	total	305	64291/80
-20+110	1	total	305	64292/80
-20+150	1	total	305	64293/80
-10+210	1	total	405	64294/80
-10+110	1	total	200	64295/80
-10+150	1	total	200	64296/80
-35+50	1	76	305	64297/80
-20+110	1	76	305	64298/80
-20+150	1	76	305	64299/80
-10+260	1	76	305	64300/80
-10+110	1	50	200	64301/80
-10+150	1	50	200	64302/80

Fahrenheit scale or double scale (°C/°F) available on request

- No infiltration, even with cracked capillary
- No contamination of measured media
- High transparency for easy legibility
- Quick response time
- Usable as stirring thermometer
- For temperatures up to 250 °C

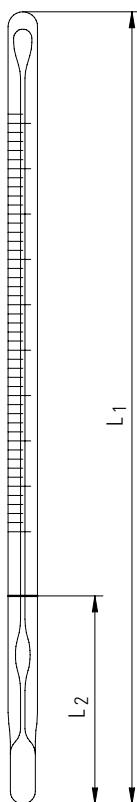
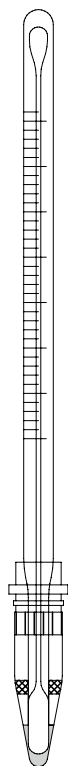
### With metal protection case, screw cap and loop

Material: brass, nickel plated

Meas. range °C	Scale °C	Immersion mm	Total length L <sub>1</sub> mm	Ref. No.
-35 +50	1	total	305	64291/60829
-20 +110	1	total	305	64292/60829
-20 +150	1	total	305	64293/60829
-10 +210	1	total	405	64294/60831
-10 +110	1	total	200	64295/60828
-10 +150	1	total	200	64296/60828
-35 +50	1	76	305	64297/60829
-20 +110	1	76	305	64298/60829
-20 +150	1	76	305	64299/60829
-10 +260	1	76	305	64300/60829
-10 +110	1	50	200	64301/60828
-10 +150	1	50	200	64302/60828

Fahrenheit scale or double scale (°C/°F) available on request

# Precision Thermometers for Special Applications



## Precision thermometers for block thermostates, stem type

Implemented in a plastic reaction tube, filled with 1 ml mineral oil

Permanent graduation and lettering

With serial number, with certificate (conformance & accuracy)

Single packed in cardboard box

Meas. range °C	Scale °C	Filling	Capillary	Immersion L <sub>2</sub> mm	Total length L <sub>1</sub> mm	Ref. No.
+18 +60	0.5	blue	white back, round	30	125	64303
+50 +110	0.5	blue	white back, round	30	165	64304

## Precision thermometers for block thermostates and water bath, stem type

Permanent graduation and lettering

With serial number, with certificate (conformance & accuracy)

Single packed in plastic square shucks

Meas. range °C	Scale °C	Filling	Capillary	Markers at °C	Immersion L <sub>2</sub> mm	Total length L <sub>1</sub> mm	Ref. No.
+24 +57	0.5	Hg	yellow back, round	25/30/37/56	35	175	64305
+24 +57	0.5	red	white back, round	25/30/37/56	35	175	64306
0 +110	0.5	Hg	yellow back, round	—	35	225	64307
0 +110	0.5	red	white back, round	—	35	225	64308

## With safety coating

made of solid, high-transparent FEP/PTFE

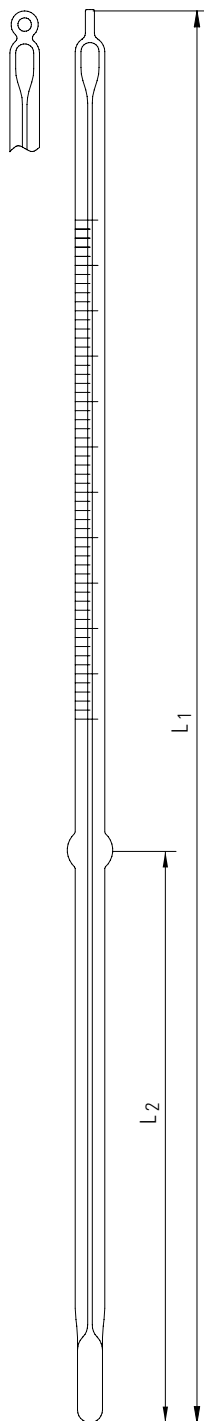
Meas. range °C	Scale °C	Filling	Capillary	Markers at °C	Immersion L <sub>2</sub> mm	Total length L <sub>1</sub> mm	Ref. No.
+24 +57	0.5	Hg	yellow back, round	25/30/37/56	35	175	64305/80
+24 +57	0.5	red	white back, round	25/30/37/56	35	175	64306/80
0 +110	0.5	Hg	yellow back, round	—	35	225	64307/80
0 +110	0.5	red	white back, round	—	35	225	64308/80

## Additional Order No.

...../03 with works certificate

...../04 with DAkkS calibration cert.

# Precision Thermometers for Special Applications



## Precision thermometers for water baths and incubators, stem type

Permanent graduation and lettering

With serial number, with certificate (conformance & accuracy)

Single packed in plastic square shucks

Meas. range °C	Scale °C	Filling	Capillary	Markers at °C	Immersion L <sub>2</sub> mm	Total length L <sub>1</sub> mm	Ref. No.
+24 +57	0.5	Hg	yellow back, round	25/37/56	76	230	64309
+24 +57	0.5	red	white back, round	25/37/56	76	230	64310
0 +50	0.5	Hg	yellow back, round	—	150*	305	64311
0 +50	0.5	red	white back, round	—	150*	305	64312
0 +70	1	Hg	yellow back, round	37/56	150*	330	64313
0 +70	1	red	white back, round	37/56	150*	330	64314
0 +80	0.5	Hg	yellow back, round	—	100	250	64315
0 +80	0.5	red	white back, round	—	100	250	64316
+20 +100	1	Hg	yellow back, round	37/56	76*	305	64317
+20 +100	0.5	red	white back, round	37/56	76*	305	64318

\* with bead (immersion depth)

## With safety coating

made of solid, high-transparent FEP/PTFE

Meas. range °C	Scale °C	Filling	Capillary	Markers at °C	Immersion L <sub>2</sub> mm	Total length L <sub>1</sub> mm	Ref. No.
+24 +57	0.5	Hg	yellow back, round	25/37/56	76	230	64309/80
+24 +57	0.5	red	white back, round	25/37/56	76	230	64310/80
0 +50	0.5	Hg	yellow back, round	—	150*	305	64311/80
0 +50	0.5	red	white back, round	—	150*	305	64312/80
0 +70	1	Hg	yellow back, round	37/56	150*	330	64313/80
0 +70	1	red	white back, round	37/56	150*	330	64314/80
0 +80	0.5	Hg	yellow back, round	—	100	250	64315/80
0 +80	0.5	red	white back, round	—	100	250	64316/80
+20 +100	1	Hg	yellow back, round	37/56	76*	305	64317/80
+20 +100	0.5	red	white back, round	37/56	76*	305	64318/80

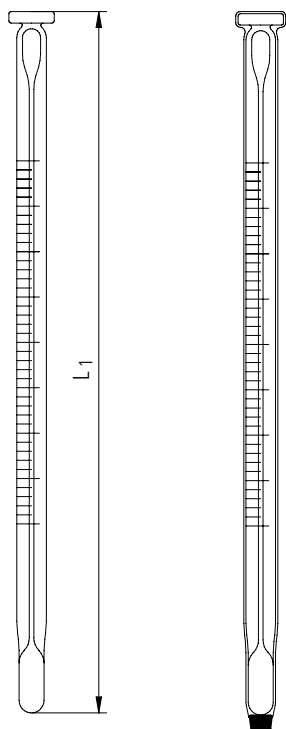
\* with bead (immersion depth)

## Additional Order No.

...../03 with works certificate

...../04 with DAkkS calibration cert.

# Precision Thermometers for Special Applications



## Precision thermometers for blood banks and refrigerators, stem type

Permanent graduation and lettering

With serial number, with certificate (conformance & accuracy)

Single packed in plastic square shucks

Meas. range °C	Scale °C	Filling	Capillary	Markers at °C	Immersion mm	Total length L <sub>1</sub> mm	Ref. No.
-5 +20	1	Hg	yellow back, round	4 and 6	total	152	64319
-5 +20	1	red	white back, round	4 and 6	total	152	64320

## With safety coating

made of solid, high-transparent FEP/PTFE

Meas. range °C	Scale °C	Filling	Capillary	Markers at °C	Immersion mm	Total length L <sub>1</sub> mm	Ref. No.
-5 +20	1	Hg	yellow back, round	4 and 6	total	152	64319/80
-5 +20	1	red	white back, round	4 and 6	total	152	64320/80

## Precision thermometers for tissue culture baths, stem type

Permanent graduation and lettering

With serial number, with certificate (conformance & accuracy)

Single packed in plastic square shucks

Meas. range °C	Scale °C	Filling	Capillary	Immersion mm	Total length L <sub>1</sub> mm	Ref. No.
-20 +105	1	red	white back, round	total	140	64321

## With safety coating

made of solid, high-transparent FEP/PTFE

Meas. range °C	Scale °C	Filling	Capillary	Immersion mm	Total length L <sub>1</sub> mm	Ref. No.
-20 +105	1	red	white back, round	total	140	64321/80

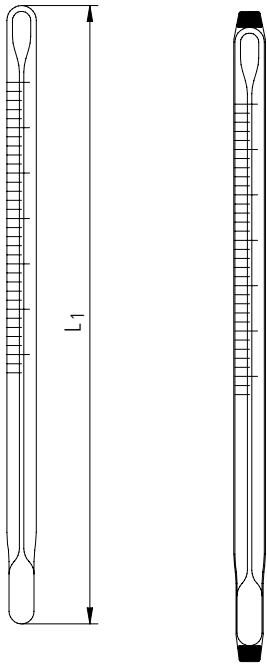
### Additional Order No.

...../03 with works certificate

...../04 with DAkkS calibration cert.



# Precision Thermometers for Special Applications



## Precision thermometers for vacuum ovens, stem type

Permanent graduation and lettering

With serial number, with certificate (conformance & accuracy)

Single packed in plastic square shucks

Meas. range °C	Scale °C	Filling	Capillary	Immersion mm	Total length L <sub>1</sub> mm	Ref. No.
+24 +130	2	Hg	yellow back, round	total	135	64322
+24 +130	1	red	yellow back, round	total	135	64323
+35 +200	1	Hg	yellow back, round	total	180	64324
+35 +200	1	red	white back, round	total	180	64325

## With safety coating

made of solid, high-transparent FEP/PTFE

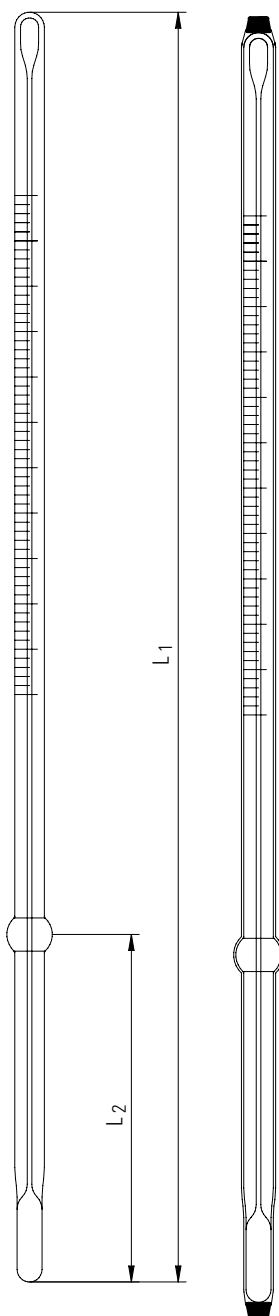
Meas. range °C	Scale °C	Filling	Capillary	Immersion mm	Total length L <sub>1</sub> mm	Ref. No.
+24 +130	2	Hg	yellow back, round	total	135	64322/80
+24 +130	1	red	yellow back, round	total	135	64323/80
+35 +200	1	Hg	yellow back, round	total	180	64324/80
+35 +200	1	red	white back, round	total	180	64325/80

### Additional Order No.

...../03 with works certificate

...../04 with DAkkS calibration cert.

# Precision Thermometers for Special Applications



## Precision thermometers for ovens and oil baths, stem type

Permanent graduation and lettering, with bead (immersion depth)

With serial number, with certificate (conformance & accuracy)

Single packed in plastic square shucks

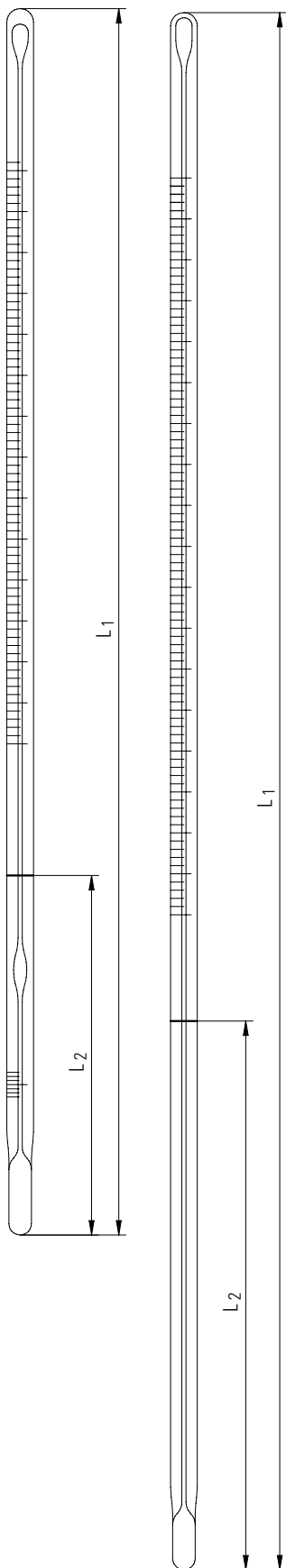
Meas. range °C	Scale °C	Filling	Capillary	Immersion L <sub>2</sub> mm	Total length L <sub>1</sub> mm	Ref. No.
0 +200	1	Hg	yellow back, round	76	280	64326
0 +200	1	red	white back, round	76	280	64327
0 +200	1	Hg	yellow back, round	125	405	64328
0 +200	1	red	white back, round	125	405	64329
0 +300	1	Hg	yellow back, round	125	405	64330
0 +300	1	Hg	yellow back, round	150	455	64331
0 +300	1	Hg	yellow back, round	305	610	64332
0 +350	1	Hg	yellow back, round	150	455	64333

## With safety coating

made of solid, high-transparent FEP/PTFE

Meas. range °C	Scale °C	Filling	Capillary	Immersion L <sub>2</sub> mm	Total length L <sub>1</sub> mm	Ref. No.
0 +200	1	Hg	yellow back, round	76	280	64326/80
0 +200	1	red	white back, round	76	280	64327/80
0 +200	1	Hg	yellow back, round	125	405	64328/80
0 +200	1	red	white back, round	125	405	64329/80

# Precision Thermometers for Special Applications



## Precision thermometers for enzymology, stem type

Permanent graduation and lettering, with auxilliary scale at 0 °C

With serial number, with certificate (conformance & accuracy)

Single packed in plastic square shucks

Meas. range °C	Scale °C	Filling	Capillary	Immersion L <sub>2</sub> mm	Total length L <sub>1</sub> mm	Ref. No.
+24 +38	0.05	Hg	yellow back, round	95	300	64334

## Precision thermometers, stem type

Capillary: white back, round

Permanent graduation and lettering

With serial number, with certificate (conformance & accuracy)

Single packed in plastic square shucks

Measuring range °C	Scale °C	Filling	Immersion L <sub>2</sub> mm	Total length L <sub>1</sub> mm	Ref. No.
-100 +50	1	red	152	380	64335
-100 +50	1	red	305	530	64336
-100 +50	1	red	76-178	480	64337
-100 +50	1	red	152-305	635	64338
-100 +50	1	red	305-457	775	64339
-20 +150	1	red	152	380	64340
-20 +150	1	red	305	530	64341
-20 +150	1	red	76-178	480	64342
-20 +150	1	red	152-305	635	64343
-20 +150	1	red	305-457	775	64344
-10 +250	1	red	152	430	64345
-10 +250	1	red	305	580	64346
-10 +250	1	red	76-178	480	64347
-10 +250	1	red	152-305	635	64348
-10 +250	1	red	305-457	775	64349

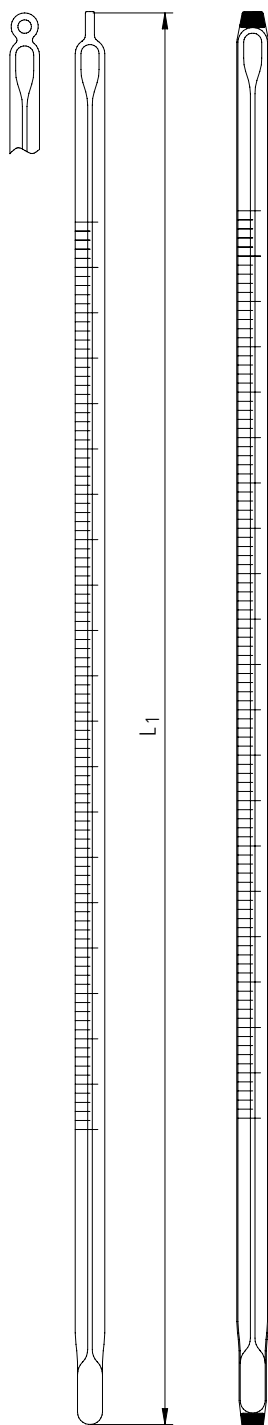
### Additional Order No.

...../03 with works certificate

...../04 with DAkkS calibration cert.

# General Purpose Thermometers

## Organic Filling, Stem Type



### General purpose thermometers, stem type

Capillary: dia.  $6 \pm 1$  mm, white back, round

Filling: red (organic), with loop

Permanent graduation and lettering

Single packed in plastic square shucks

Meas. range °C	Scale °C	Immersion mm	Total length $L_1$ mm	Ref. No.
-35 +50	1	total	300	1011203
-10 +60	1	total	200	1011213
-20 +110	1	total	300	1011223
-20 +150	1	total	300	1011233
-10 +200	1	total	300	1011243
-10 +250	1	total	300	1011253
-35 +50	1	76	300	1011303
-10 +60	1	76	300	1011313
-20 +110	1	76	300	1011323
-20 +150	1	76	300	1011343
-10 +200	1	76	300	1011353

Fahrenheit scale or double scale (°C/°F) available on request

### With safety coating

made of solid, high-transparent FEP/PTFE

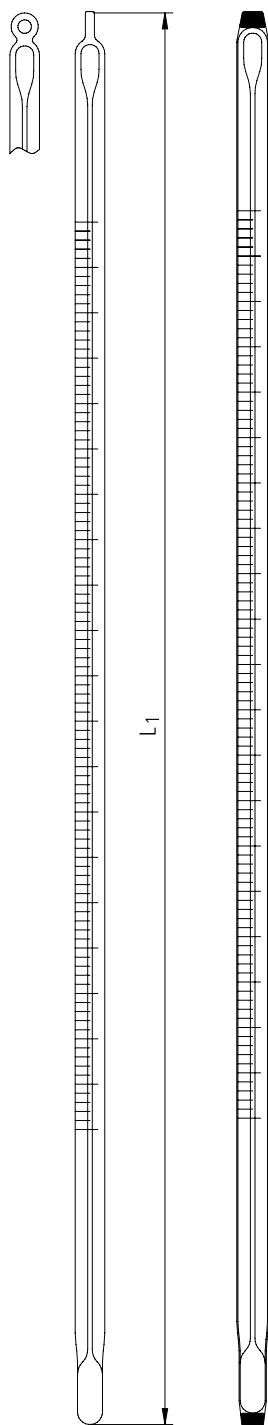
Meas. range °C	Scale °C	Immersion mm	Total length $L_1$ mm	Ref. No.
-35 +50	1	total	300	1011203/80
-10 +60	1	total	200	1011213/80
-20 +110	1	total	300	1011223/80
-20 +150	1	total	300	1011233/80
-10 +200	1	total	300	1011243/80
-10 +250	1	total	300	1011253/80
-35 +50	1	76	300	1011303/80
-10 +60	1	76	300	1011313/80
-20 +110	1	76	300	1011323/80
-20 +150	1	76	300	1011343/80
-10 +200	1	76	300	1011353/80

Fahrenheit scale or double scale (°C/°F) available on request

- No infiltration, even with cracked capillary
- No contamination of measured media
- High transparency for easy legibility
- Quick response time
- Usable as stirring thermometer
- For temperatures up to 250 °C

# General Purpose Thermometers

## Mercury Filling, Stem Type



### General purpose thermometers, stem type

Capillary: dia.  $6 \pm 1$  mm, yellow back, round

Filling: mercury (Hg), with loop

Permanent graduation and lettering

Single packed in plastic square shucks

Meas. range °C	Scale °C	Immersion mm	Total length L <sub>1</sub> mm	Ref. No.
-35 +50	1	total	300	1011001
-10 +60	1	total	200	1011011
-20 +110	1	total	300	1011021
-20 +150	1	total	300	1011041
-10 +200	1	total	300	1011051
-10 +250	1	total	300	1011061
-10 +300	1	total	340	1011071
-10 +360	1	total	340	1011081
-10 +420	1	total	340	1011091
-35 +50	1	76	300	1011101
-10 +60	1	76	200	1011111
-20 +110	1	76	300	1011121
-20 +150	1	76	300	1011141
-10 +200	1	76	300	1011151
-10 +250	1	76	300	1011161
-10 +300	1	76	340	1011171
-10 +360	1	76	340	1011181
-10 +420	1	76	340	1011191

Fahrenheit scale or double scale (°C/°F) available on request

### With safety coating

made of solid, high-transparent FEP/PTFE

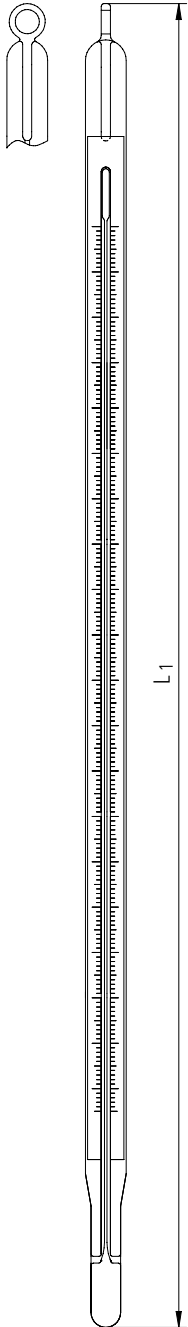
Meas. range °C	Scale °C	Immersion mm	Total length L <sub>1</sub> mm	Ref. No.
-35 +50	1	total	300	1011001/80
-10 +60	1	total	200	1011011/80
-20 +110	1	total	300	1011021/80
-20 +150	1	total	300	1011041/80
-10 +200	1	total	300	1011051/80
-10 +250	1	total	300	1011061/80
-35 +50	1	76	300	1011101/80
-10 +60	1	76	200	1011111/80
-20 +110	1	76	300	1011121/80
-20 +150	1	76	300	1011141/80
-10 +200	1	76	300	1011151/80
-10 +250	1	76	300	1011161/80

Fahrenheit scale or double scale (°C/°F) available on request

- No infiltration, even with cracked capillary
- No contamination of measured media
- High transparency for easy legibility
- Quick response time
- Usable as stirring thermometer
- For temperatures up to 250 °C

# General Purpose Thermometers

## Organic Filling, Enclosed Type



### General purpose thermometers, enclosed type

Capillary: dia.  $8 \pm 1$  mm, colourless, prismatic

Filling: red (organic), with flat scale, with loop

Single packed in plastic square shucks

Meas. range °C	Scale °C	Immersion mm	Total length $L_1$ mm	Ref. No.
-35 +50	1	total	260	1011403
-10 +60	1	total	200	1011413
-10 +110	1	total	260	1011423
-10 +150	1	total	260	1011433
-10 +200	1	total	300	1011443
-10 +250	1	total	300	1011453

### With safety coating

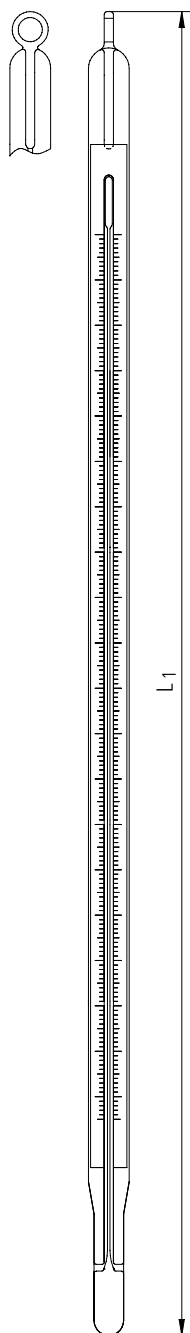
made of solid, high-transparent FEP/PTFE

Meas. range °C	Scale °C	Immersion mm	Total length $L_1$ mm	Ref. No.
-35 +50	1	total	260	1011403/80
-10 +60	1	total	200	1011413/80
-10 +110	1	total	260	1011423/80
-10 +150	1	total	260	1011433/80
-10 +200	1	total	300	1011443/80
-10 +250	1	total	300	1011453/80

- No infiltration, even with cracked capillary
- No contamination of measured media
- High transparency for easy legibility
- Quick response time
- Usable as stirring thermometer
- For temperatures up to 250 °C

# General Purpose Thermometers

## Mercury Filling, Enclosed Type



### General purpose thermometers, enclosed type

Capillary: dia.  $8 \pm 1$  mm, colourless, prismatic

Filling: mercury (Hg), with flat scale, with loop

Single packed in plastic square shucks

Meas. range °C	Scale °C	Immersion mm	Total length $L_1$ mm	Ref. No.
-35 +50	1	total	260	1011402
-10 +60	1	total	200	1011412
-10 +110	1	total	260	1011422
-10 +150	1	total	260	1011432
-10 +200	1	total	300	1011442
-10 +250	1	total	300	1011452
-10 +300	1	total	340	1011462
-10 +360	1	total	340	1011472
-10 +420	1	total	340	1011482

### With safety coating

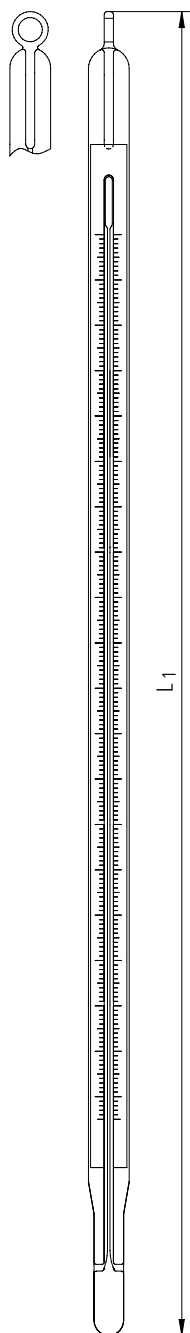
made of solid, high-transparent FEP/PTFE

Meas. range °C	Scale °C	Immersion mm	Total length $L_1$ mm	Ref. No.
-35 +50	1	total	260	1011402/80
-10 +60	1	total	200	1011412/80
-10 +110	1	total	260	1011422/80
-10 +150	1	total	260	1011432/80
-10 +200	1	total	300	1011442/80
-10 +250	1	total	300	1011452/80

- No infiltration, even with cracked capillary
- No contamination of measured media
- High transparency for easy legibility
- Quick response time
- Usable as stirring thermometer
- For temperatures up to 250 °C

# General Purpose Thermometers

## Mercury Filling, Enclosed Type



### General purpose thermometers, enclosed type

Capillary: dia.  $8 \pm 1$  mm, blue reflecting, prismatic

Filling: mercury (Hg), with flat scale, with loop

Single packed in plastic square shucks

Meas. range °C	Scale °C	Immersion mm	Total length $L_1$ mm	Ref. No.
-35 +50	1	total	260	1011401
-10 +60	1	total	200	1011411
-10 +110	1	total	260	1011421
-10 +150	1	total	260	1011431
-10 +200	1	total	300	1011441
-10 +250	1	total	300	1011451
-10 +300	1	total	340	1011461
-10 +360	1	total	340	1011471
-10 +420	1	total	340	1011481

### With safety coating

made of solid, high-transparent FEP/PTFE

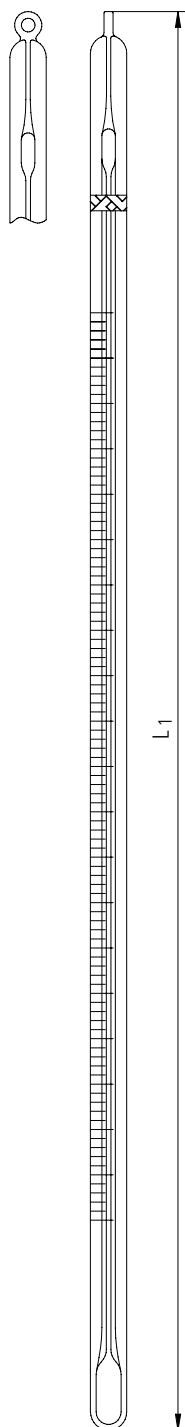
Meas. range °C	Scale °C	Immersion mm	Total length $L_1$ mm	Ref. No.
-35 +50	1	total	260	1011401/80
-10 +60	1	total	200	1011411/80
-10 +110	1	total	260	1011421/80
-10 +150	1	total	260	1011431/80
-10 +200	1	total	300	1011441/80
-10 +250	1	total	300	1011451/80

- No infiltration, even with cracked capillary
- No contamination of measured media
- High transparency for easy legibility
- Quick response time
- Usable as stirring thermometer
- For temperatures up to 250 °C



# General Purpose Thermometers

## Original LSW Type



### General purpose thermometers original LSW type

#### Filling: red (organic)

Glass cylinder: dia.  $8 \pm 1$  mm, white back, with loop,

Capillary: colourless, prismatic, Filling: red (organic)

Permanent graduation and lettering

Single packed in plastic square shucks



Meas. range °C	Scale °C	Immersion mm	Total length $L_1$ mm	Ref. No.
-35 +50	1	total	260	1481401
-10 +60	1	total	200	1481402
-10 +110	1	total	260	1481403
-10 +150	1	total	260	1481405
-10 +200	1	total	300	1481406

### General purpose thermometers original LSW type

#### Filling: mercury (Hg)

Glaszylinder: dia.  $8 \pm 1$  mm, white back, with loop,

Capillary: yellow back, prismatic, Filling: mercury (Hg)

Permanent graduation and lettering

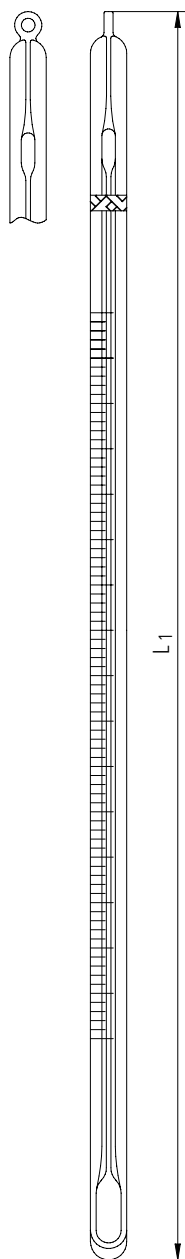
Single packed in plastic square shucks



Meas. range °C	Scale °C	Immersion mm	Total length $L_1$ mm	Ref. No.
-35 +50	1	total	260	1481201
-10 +60	1	total	200	1481202
-10 +110	1	total	260	1481203
-10 +150	1	total	260	1481205
-10 +200	1	total	300	1481206
-10 +250	1	total	300	1481207
-10 +360	1	total	340	1481209
-10 +420	1	total	340	1481210

# General Purpose Stirring Thermometers

## Original LSW Type



### General purpose stirring thermometers

#### original LSW type, filling: red (organic)

Glass cylinder: dia.  $8 \pm 1$  mm, white back

With loop, with reinforced glass bottom

Capillary: colourless, prismatic, filling: red (organic)

Permanent graduation and lettering

Single packed in plastic square shucks



Meas. range °C	Scale °C	Immersion mm	Total length L <sub>1</sub> mm	Ref. No.
-35 +50	1	total	260	1481441
-10 +60	1	total	200	1481442
-10 +110	1	total	260	1481443
-20 +110	1	total	260	1481444
-10 +150	1	total	260	1481445
-10 +200	1	total	300	1481446

### General purpose stirring thermometers

#### original LSW type, filling: mercury (Hg)

Glass cylinder: dia.  $8 \pm 1$  mm, white back,

With loop, with reinforced glass bottom

Capillary: yellow back, prismatic, filling: mercury (Hg)

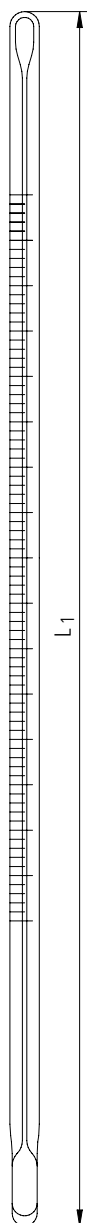
Permanent graduation and lettering

Single packed in plastic square shucks



Meas. range °C	Scale °C	Immersion mm	Total length L <sub>1</sub> mm	Ref. No.
-35 +50	1	total	260	1481241
-10 +60	1	total	200	1481242
-10 +110	1	total	260	1481243
-20 +110	1	total	260	1481244
-10 +150	1	total	260	1481245
-10 +200	1	total	300	1481246
-10 +250	1	total	300	1481247
-10 +300	1	total	340	1481248
-10 +360	1	total	340	1481249
-10 +420	1	total	340	1481250

# General Purpose Stirring Thermometers Stem Type



## General purpose stirring thermometers

### stem type, filling: red (organic)

Capillary: dia.  $6 \pm 1$  mm, white back, round

With loop, with reinforced glass bottom

Filling: red (organic)

Permanent graduation and lettering

Single packed in plastic square shucks

Meas. range °C	Scale °C	Immersion mm	Total length $L_1$ mm	Ref. No.
-35 +50	1	total	260	1011703
-10 +60	1	total	200	1011713
-10 +110	1	total	260	1011723
-10 +150	1	total	260	1011733
-10 +200	1	total	300	1011734

## General purpose stirring thermometers

### stem type, filling: mercury (Hg)

Capillary: dia.  $6 \pm 1$  mm, yellow back, round

With loop, with reinforced glass bottom

Filling: mercury (Hg)

Permanent graduation and lettering

Single packed in plastic square shucks

Meas. range °C	Scale °C	Immersion mm	Total length $L_1$ mm	Ref. No.
-35 +50	1	total	260	1011601
-10 +60	1	total	200	1011611
-10 +110	1	total	260	1011621
-10 +150	1	total	260	1011631
-10 +200	1	total	300	1011641
-10 +250	1	total	300	1011651
-10 +300	1	total	340	1011661
-10 +360	1	total	340	1011671
-10 +420	1	total	340	1011681

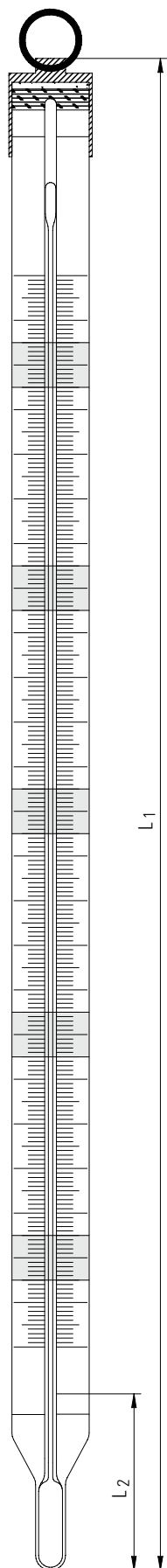
# *Instruction Thermometer for Education Purposes*

## **Instruction thermometer, enclosed type**

Capillary: colourless, prismatic, filling: blue (organic)

Easy reading due to wide indication column and colour marks

<b>Meas. range</b>	<b>Scale</b>	<b>Immersion L<sub>2</sub></b>	<b>Total length L<sub>1</sub></b>	<b>Ref. No.</b>
<b>°C</b>	<b>°C</b>	<b>mm</b>	<b>mm</b>	
-60 +160	1	60	530	1451601



# Digital Exact-Temp Thermometers

High-precision instruments to monitor refrigerators, blood bank freezers, incubators, climate chambers freezers and ovens. Each sensor is mounted in an unbreakable plastic bottle, filled with a special medium to ensure accurate measurements even at open doors.

Digital Exact-temp thermometers offer the simultaneous display of 3 temperatures (beside the minimum and maximum temperature the ambient temperature is indicated). The plastic bottle with liquid and precision sensor has to be placed into the device to be monitored, while the display unit remains visible outside.

An audible alarm will sound when the temperature rises above or goes below the set temperature.

## Produkt features

- Thermometers traceable to international standards (with certificate of conformance & accuracy: accuracy  $\pm 0.5$  °C, resolution 0.1 °C)
- Temperature units: °C or °F
- 3 display modes: maximum, minimum and ambient temperature
- Alarm function
- Alkaline battery (AAA) included
- Breakage protected PETG plastic bottles (with 30 ml ethylene glycol mixture)
- Bottles with attached magnets for easy wall or door mounting
- Individual serial number

Exact-temp thermometer bottles are supplied with magnets for space-saving wall or door fixing.

Digital Exact-temp thermometers are calibrated with one temperature and will be delivered with certificate of conformance & accuracy.

**The instruments are available with works certificate on request (Ref.-No.: ...../03).**

Application	Ref.-No.	Measuring range (°C)	Certified temperature (°C)	Bottle filling
Freezers	<b>63927</b>	-50 to 70	-20	Ethylene glycol mixture
Ice point	<b>63801</b>	-50 to 70	0	Ethylene glycol mixture
Refrigerators	<b>63893</b>	-50 to 70	4	Ethylene glycol mixture
Incubators/water baths	<b>63894</b>	-50 to 70	37	Ethylene glycol mixture
Ambient/room	<b>63895</b>	-50 to 70	21	Ethylene glycol mixture



# Exact-Temp Thermometers

## Continuously precise measurements

Exact-temp thermometers are high-precision instruments to monitor cooling and tempering devices in laboratories, medical technology and R&D. Each thermometer is mounted in an unbreakable plastic bottle, filled with a special medium to ensure accurate measurements even at open doors. They are supplied with magnets for space-saving wall or door fixing. Exact-temp thermometers are very reliable and economical because they work independent from any mains or battery connection.

## Traceable to international standards

Exact-temp thermometers are available with organic or mercury filling in varying measuring ranges and scale units. The instruments are carefully aged to ensure a high accuracy. Exact-temp thermometers are calibrated with a reference and are therefore traceable to international standards. All instruments will be delivered with a certificate of conformance and accuracy.

On request we provide also a works certificate or DAkkS-Calibration certificate (two calibration points as standard). These high precision thermometers are especially suitable for monitoring certified quality management systems.

Application	Ref.-No.	Type	Measuring range (°C)	Scale unit (°C)	Accuracy (°C)	Length (mm)	Thermometer filling	Volume, bottle material	Bottle filling
<b>Thermometers with organic filling</b>									
Ultralow freezers	<b>70 001 11</b>	ULF-010S	-90 to +20	1.0	± 2	180	red	60 ml, PETG	Sand
Freezers	<b>70 101 11</b>	F-100-01S	-25 to -5	0.1	± 0.2	235	blue	60 ml, PETG	Ethylene glycol mixture
	<b>70 001 12</b>	F-010-1S	-30 to 0	0.5	± 1	130	red	30 ml, PETG	Ethylene glycol mixture
Refrigerators	<b>70 101 12</b>	R-200-01S	-2 to +10	0.1	± 0.2	230	blue	60 ml, PETG	Ethylene glycol mixture
	<b>70 001 14</b>	R-020-1S	-5 to +15	0.5	± 1	130	rot	30 ml, PETG	Ethylene glycol
Blood bank freezers	<b>70 001 13</b>	BB-100S	-5 to +20	0.5	± 1	150	red	250 ml, PETG	Ethylene glycol mixture
	<b>70 101 13</b>	BB-210-01S	-2 to +10	0.1	± 0.2	230	blue	250 ml, PETG	Ethylene glycol mixture
Incubators	<b>70 101 14</b>	I-300-01S	+15 to +30	0.1	± 0.2	180	blue	60 ml, PETG	Ethylene glycol mixture
	<b>70 001 15</b>	I-030-1S	+18 to +50	0.5	± 1	130	red	30 ml, PETG	Ethylene glycol mixture
	<b>70 101 15</b>	I-310-01S	+25 to +45	0.1	± 0.2	190	blue	60 ml, PETG	Ethylene glycol mixture
Ovens	<b>70 001 16</b>	OV-070S	+20 to +130	1.0	± 2	135	red	30 ml, PC	Vermiculite
	<b>70 001 17</b>	OV-080-S	+35 to +200	1.0	± 2 (>100°C: ±3)	180	red	60 ml, PFA	Vermiculite
	<b>70 101 16</b>	OV-700S	+50 to +115	0.5	± 1°C	240	blue	60 ml, PC	Vermiculite
<b>Thermometers with mercury filling (Hg)</b>									
Freezers	<b>70 101 43</b>	F-100-01	-25 to -5	0.1	± 0.1	210	Hg	60 ml, PETG	Ethylene glycol mixture
	<b>70 001 43</b>	F-010-1	-30 to 0	0.5	± 0.5	110	Hg	30 ml, PETG	Ethylene glycol mixture
Refrigerators	<b>70 001 44</b>	R-020-1	-5 to +15	0.5	± 0.5	120	Hg	30 ml, PETG	Ethylene glycol mixture
	<b>70 101 44</b>	R-200-01	-2 to +10	0.1	± 0.1	180	Hg	60 ml, PETG	Ethylene glycol mixture
Blood bank freezers	<b>70 101 45</b>	BB-210-01	-2 to +10	0.1	± 0.1	180	Hg	250 ml, PETG	Ethylene glycol mixture
	<b>70 101 46</b>	I-300-01	+15 to +30	0.1	± 0.1	180	Hg	60 ml, PETG	Ethylene glycol mixture
Incubators	<b>70 001 45</b>	I-030-1	+18 to +50	0.5	± 0.5	130	Hg	30 ml, PETG	Ethylene glycol mixture
	<b>70 101 47</b>	I-310-01	+25 to +45	0.1	± 0.1	190	Hg	60 ml, PETG	Ethylene glycol mixture
	<b>70 001 46</b>	OV-070	+20 to +130	1.0	± 1	135	Hg	30 ml, PC	Vermiculite
Ovens	<b>70 001 47</b>	OV-080	+35 to +200	1.0	± 1 (>100°C: ±1.5)	180	Hg	60 ml, PFA	Vermiculite
	<b>70 101 48</b>	OV-700-01	+95 to +115	0.1	± 0.1	200	Hg	60 ml, PC	Vermiculite

# Exact-Temp Thermometers with Safety Coating

Application	Ref.-No.	Type	Measuring range (°C)	Scale unit (°C)	Accuracy (°C)	Length (mm)	Thermometer filling	Volume, bottle material	Bottle filling
<b>Thermometers with organic filling</b>									
Ultralow freezers	<b>80 001 11</b>	ULF-010S	-90 to +20	1.0	± 2	180	red	60 ml, PETG	Sand
Freezers	<b>80 101 11</b>	F-100-01S	-25 to -5	0.1	± 0.2	235	blue	60 ml, PETG	Ethylene glycol mixture
	<b>80 001 12</b>	F-010-1S	-30 to 0	0.5	± 1	130	red	30 ml, PETG	Ethylene glycol mixture
Refrigerators	<b>80 101 12</b>	R-200-01S	-2 to +10	0.1	± 0.2	230	blue	60 ml, PETG	Ethylene glycol mixture
	<b>80 001 14</b>	R-020-1S	-5 to +15	0.5	± 1	130	red	30 ml, PETG	Ethylene glycol mixture
Blood bank freezers	<b>80 001 13</b>	BB-100S	-5 to +20	0.5	± 1	150	red	250 ml, PETG	Ethylene glycol mixture
	<b>80 101 13</b>	BB-210-01S	-2 to +10	0.1	± 0.2	230	blue	250 ml, PETG	Ethylene glycol mixture
Incubators	<b>80 101 14</b>	I-300-01S	+15 to +30	0.1	± 0.2	180	blue	60 ml, PETG	Ethylene glycol mixture
	<b>80 001 15</b>	I-030-1S	+18 to +50	0.5	± 1	130	red	30 ml, PETG	Ethylene glycol mixture
	<b>80 101 15</b>	I-310-01S	+25 to +45	0.1	± 0.2	190	blue	60 ml, PETG	Ethylene glycol mixture
Ovens	<b>80 001 16</b>	OV-070S	+20 to +130	1.0	± 2	135	red	30 ml, PC	Vermiculite
	<b>80 001 17</b>	OV-080-S	+35 to +200	1.0	± 2 (>100 °C: ±3)	180	red	60 ml, PFA	Vermiculite
	<b>80 101 16</b>	OV-700S	+50 to +115	0.5	± 1°C	240	blue	60 ml, PC	Vermiculite
<b>Thermometers with mercury filling (Hg)</b>									
Freezers	<b>80 101 43</b>	F-100-01	-25 to -5	0.1	± 0.1	210	Hg	60ml / PETG	Ethylene glycol mixture
	<b>80 001 43</b>	F-010-1	-30 to 0	0.5	± 0.5	110	Hg	30ml / PETG	Ethylene glycol mixture
Refrigerators	<b>80 001 44</b>	R-020-1	-5 to +15	0.5	± 0.5	120	Hg	30ml / PETG	Ethylene glycol mixture
	<b>80 101 44</b>	R-200-01	-2 to +10	0.1	± 0.1	180	Hg	60ml / PETG	Ethylene glycol mixture
Blood bank freezers	<b>80 101 45</b>	BB-210-01	-2 to +10	0.1	± 0.1	180	Hg	250ml / PETG	Ethylene glycol mixture
	<b>80 101 46</b>	I-300-01	+15 to +30	0.1	± 0.1	180	Hg	60ml / PETG	Ethylene glycol mixture
Incubators	<b>80 001 45</b>	I-030-1	+18 to +50	0.5	± 0.5	130	Hg	30ml / PETG	Ethylene glycol mixture
	<b>80 101 47</b>	I-310-01	+25 to +45	0.1	± 0.1	190	Hg	60ml / PETG	Ethylene glycol mixture
	<b>80 001 46</b>	OV-070	+20 to +130	1.0	± 1	135	Hg	30ml / PC	Vermiculite
Ovens	<b>80 001 47</b>	OV-080	+35 to +200	1.0	± 1 (>100 °C: ±1.5)	180	Hg	60ml / PFA	Vermiculite
	<b>80 101 48</b>	OV-700-01	+95 to +115	0.1	± 0.1	200	Hg	60ml / PC	Vermiculite

## Thermometers with safety coating

All thermometers are encapsulated with a high-grade safety coating to protect contents, users and environment from splintered glass or display fluid leakage.  
Coating: PTFE/FEP, transparent

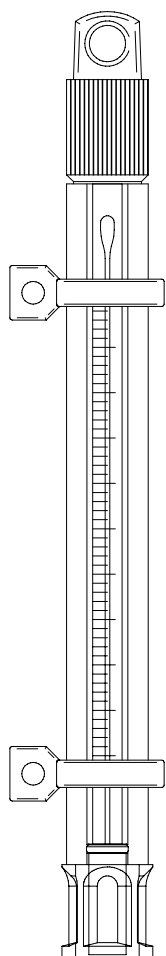
### Additional Order No.

...../03 with works certificate

...../04 with DAkkS calibration cert.



# Precision Deep-Freeze Thermometers for the Food Industry



## Precision deep-freeze thermometers, food-safe version

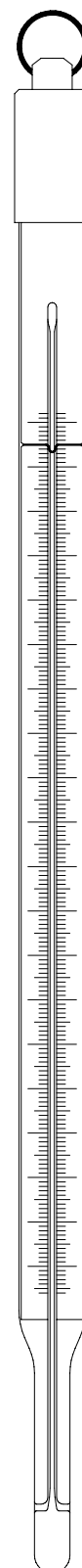
Capillary: colourless, prismatic; Filling: blue (organic),  
With loop and two bores for screw fixing

### Suitable for official certification

Measuring range °C	Scale °C	Immersion mm	Total length mm	Ref. No.
-30 +25	0.5	total	210	1482163

### Officially calibrated, without certificate

Measuring range °C	Scale °C	Immersion mm	Total length mm	Ref. No.
-30+25	0.5	total	210	1454403



# Precision Cold Store Thermometer

## Precision cold store thermometer

Capillary: blue reflecting, prismatic; filling: mercury (Hg)  
Top part: dia. 15 ±0,5 mm, with flat scale  
With metal cap and ring

### Suitable for official certification

Measuring range °C	Scale °C	Immersion mm	Total length mm	Ref. No.
-10 +18	0.2	total	330	31805

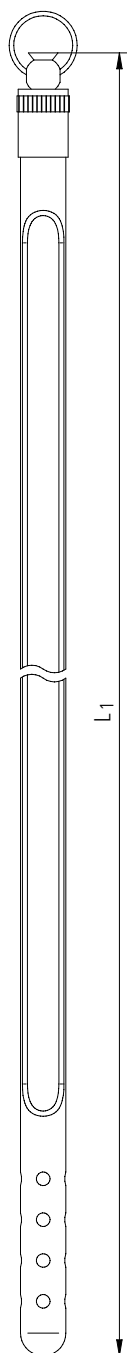
### Additional Order No.

...../03 with works certificate

...../04 with DAkkS calibration cert.



# Accessories



## Metal protection tubes for stem type thermometers

Material: brass, nickel plated

Outer dia.: 9.7 mm

Screw cap with bore and ring

For thermometer length mm	Protection tube total length $L_1$ mm	Ref. No.
150	170	60827
200	220	60828
300	320	60829
350	370	60830
400	420	60831



## Lab clip

Support for up to 5 thermometers

Robust design

Material: stainless steel with foam insert

Operating temperature: -40 up to +120 °C

**Ref. No.: 6786**



## Mercury collecting box

The mercury collecting box consists of a plastic case with screen and lid which carries a special sponge. If you press this lid with sponge on mercury globes, the foam pores open and adhere the globes. During the screwing of the lid on the box the perforated plate releases the mercury globes which drop into the bottom part.

**Ref. No.: 61208**

# Precision Pocket Thermometers

## Precision pocket thermometers, stem type

Filling: red (organic)

Permanent graduation and lettering, suitable for official certification

With serial number, with certificate (conformance & accuracy)

Single packed in plastic square shucks

### Without protection tube

Measuring range °C	Scale °C	Capillary	Immersion mm	Total length L <sub>1</sub> mm	Ref. No.
-35 +50	1	white back, round	total	140	64350
-20 +105	1	white back, round	total	140	64351

Fahrenheit scale or double scale (°C/°F) available on request

### With closed protection tube and clip

Measuring range °C	Scale °C	Capillary	Immersion mm	Total length L <sub>1</sub> mm	Ref. No.
-35 +50	1	white back, round	total	140	64350/60949
-20 +105	1	white back, round	total	140	64351/60949

Fahrenheit scale or double scale (°C/°F) available on request

### With nickel-plated brass protection tube, with ring

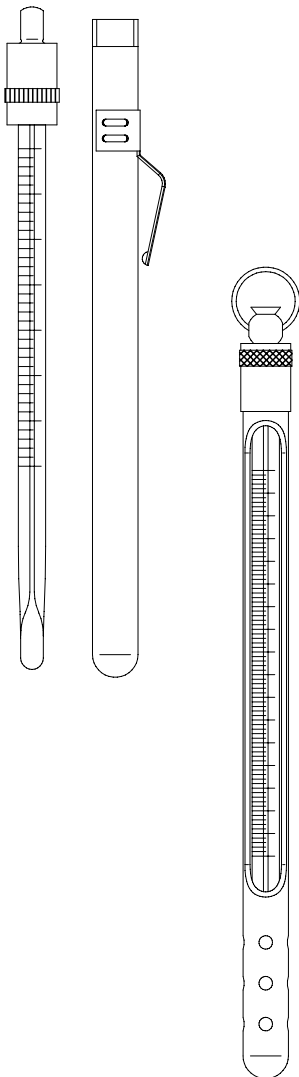
Measuring range °C	Scale °C	Capillary	Immersion mm	Total length L <sub>1</sub> mm	Ref. No.
-35 +50	1	white back, round	total	140	64350/60827
-20 +105	1	white back, round	total	140	64351/60827

Fahrenheit scale or double scale (°C/°F) available on request

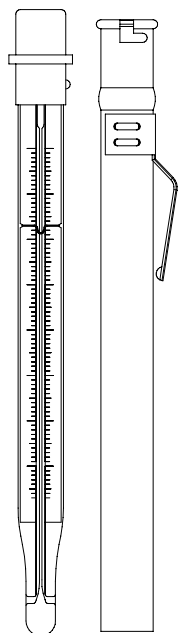
### Additional Order No.

...../03 with works certificate

...../04 with DAkkS calibration cert.



# Pocket Thermometers

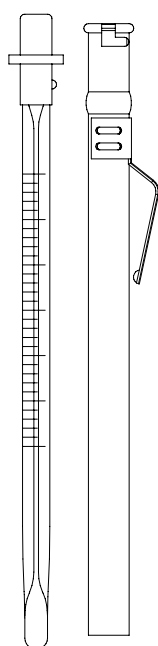


## Pocket thermometers, enclosed type

Capillary: colourless, prismatic; with flat scale

Complete with nickel-plated brass tube with bayonet joint and clip

Measuring range °C	Scale °C	Filling	Immersion mm	Total length L <sub>1</sub> mm	Ref. No.
-38 +50	1	red (organic)	total	140	1021011
-10 +50	1	red (organic)	total	140	1021021
-10 +100	1	red (organic)	total	140	1021041
-38 +50	1	blue (organic)	total	140	1021111
-10 +50	1	blue (organic)	total	140	1021121
0 +60	1	blue (organic)	total	140	1021131
-10 +100	1	blue (organic)	total	140	1021141
-38 +50	1	mercury (Hg)	total	140	1021201
-10 +100	1	mercury (Hg)	total	140	1021231



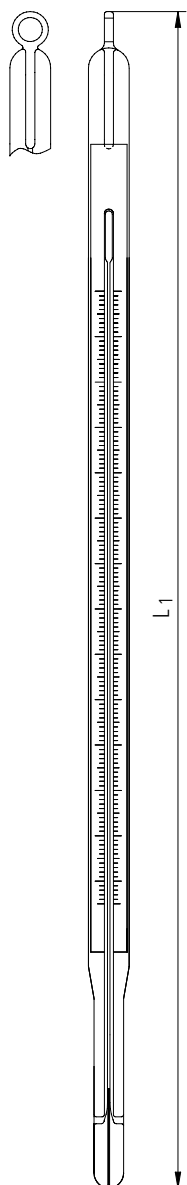
## Pocket thermometers, stem type

Capillary: white back, prismatic

Complete with nickel-plated brass tube with bayonet joint and clip

Measuring range °C	Scale °C	Filling	Immersion mm	Total length L <sub>1</sub> mm	Ref. No.
0 +60	1	red (organic)	total	140	1021331
-10 +100	1	red (organic)	total	140	1021341
-38 +50	1	blue (organic)	total	140	1021411
-10 +50	1	blue (organic)	total	140	1021421
0 +60	1	blue (organic)	total	140	1021431
-10 +100	1	blue (organic)	total	140	1021441

# Precision Maximum Thermometers Enclosed Type



## Precision maximum thermometers, enclosed type,

### Suitable for official certification

Capillary: dia.  $8 \pm 1$  mm, colourless, prismatic; filling: mercury (Hg)

Resetting by shaking, with flat scale, with loop

Single packed in plastic square shucks

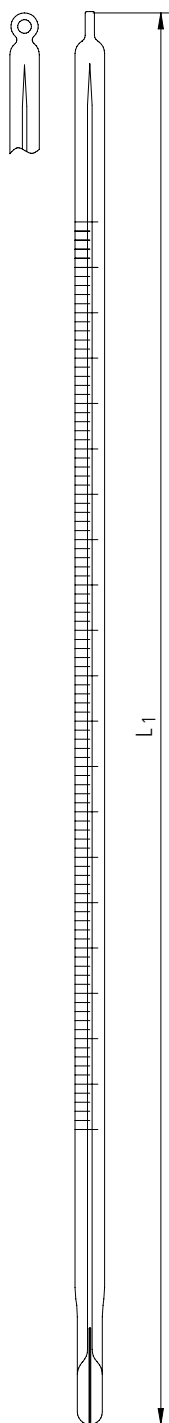
Meas. range °C	Scale °C	Immersion mm	Total length L <sub>1</sub> mm	Ref. No.
-35 +50	1	total	260	1142901
-10 +100	1	total	260	1142902
-10 +150	1	total	260	1142903
-10 +200	1	total	300	1142904
-10 +250	1	total	300	1142905

### Additional Order No.

...../03 with works certificate

...../04 with DAkkS calibration cert.

# Precision Maximum Thermometers Stem Type



## Precision maximum thermometers, stem type,

### Suitable for official certification

Capillary: dia.  $6 \pm 1$  mm; filling: mercury (Hg)

Permanent graduation and lettering, with loop

Resetting by shaking

Single packed in plastic square shucks

### Capillary: white back, round, without protection tube

Meas. range °C	Scale °C	Immersion mm	Total length $L_1$ mm	Ref. No.
-35 +50	1	total	260	1141701
-10 +100	1	total	260	1141721
-10 +150	1	total	260	1141731
-10 +200	1	total	300	1141741
-10 +250	1	total	300	1141751

### Capillary: yellow back, round, without protection tube

Meas. range °C	Scale °C	Immersion mm	Total length $L_1$ mm	Ref. No.
-35 +50	1	total	260	1141703
-10 +100	1	total	260	1141723
-10 +150	1	total	260	1141733
-10 +200	1	total	300	1141743
-10 +250	1	total	300	1141753

### Capillary: yellow back, round, with nickel-plated brass protection tube, with ring

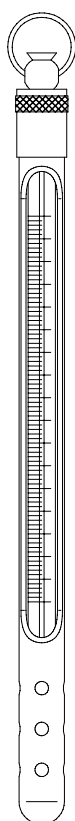
Meas. range °C	Scale °C	Immersion mm	Total length $L_1$ mm	Ref. No.
-15 +100	1	total	160	64395/60827
-20 +150	1	total	160	64396/60827

Auf Anfrage auch in °F oder mit Doppelskala (°C/°F) lieferbar

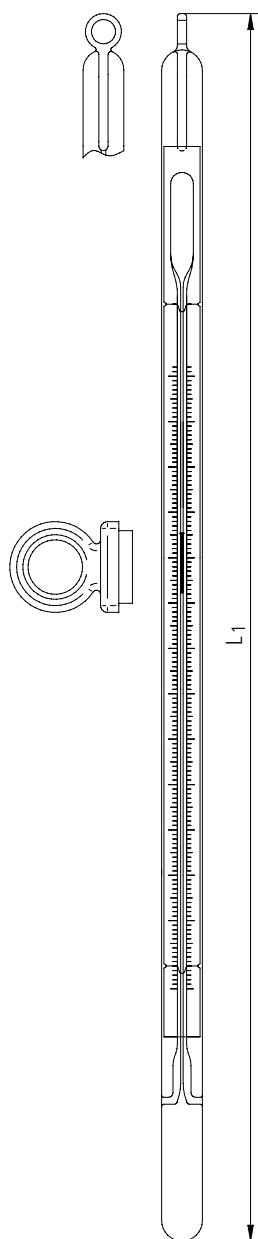
#### Additional Order No.

...../03 with works certificate

...../04 with DAkkS calibration cert.



# Precision Maximum Thermometers Enclosed Type, with Steel Mark



**Precision maximum thermometers, enclosed type,  
Suitable for official certification, with steel mark, with separate magnet**

Capillary: dia.  $9 \pm 1$  mm, colourless, prismatic; filling: mercury (Hg)

Resetting by shaking, with flat scale, with loop

Single packed in plastic square shucks

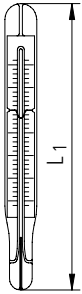
Meas. range °C	Scale °C	Immersion mm	Total length $L_1$ mm	Ref. No.
-30 +50	1	total	260	1152201
-10 +50	1	total	260	1152202
-10 +100	1	total	260	1152203
-10 +150	1	total	260	1152204
-10 +200	1	total	300	1152205
-10 +250	1	total	300	1152206
-10 +300	1	80	340	1152207
-10 +360	1	80	360	1152208
-10 +420	1	80	400	1152209

**Additional Order No.**

...../03 with works certificate

...../04 with DAkkS calibration cert.

# Sterilisation Maximum Thermometers



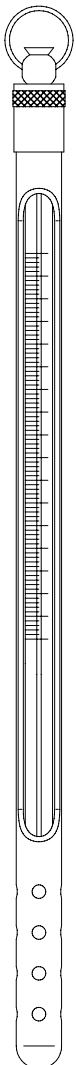
## Sterilisation maximum thermometer, enclosed type

Capillary: dia.  $7 \pm 1$  mm, colourless, prismatic; filling: mercury (Hg)

Resetting by shaking, with flat scale, with loop

Single packed in plastic square shucks

Meas. range °C	Scale °C	Immersion mm	Total length $L_1$ mm	Ref. No.
+80 +130	2	total	60	1152601
+50 +100	2	total	60	31955



## Sterilisation maximum thermometers, stem type

Capillary: dia.  $6 \pm 1$  mm, yellow back, round; filling: mercury (Hg)

Resetting by shaking,

Permanent graduation and lettering,

With serial number, with certificate (conformance & accuracy)

Single packed in plastic square shucks

Meas. range °C	Scale °C	Immersion mm	Total length $L_1$ mm	Ref. No.
+80 +135	0.5	total	200	64352

## With safety coating

made of solid, high-transparent FEP/PTFE

Meas. range °C	Scale °C	Immersion mm	Total length $L_1$ mm	Ref. No.
+80 +135	0.5	total	200	64352/80

## With nickel-plated brass protection tube, with ring

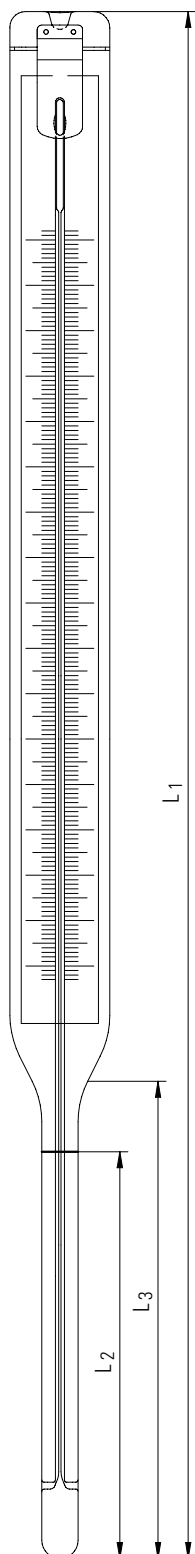
Meas. range °C	Scale °C	Immersion mm	Total length $L_1$ mm	Ref. No.
+80 +135	0.5	total	200	64352/60828

### Additional Order No.

...../03 with works certificate

...../04 with DAkkS calibration cert.

# Stock Thermometers acc. to DIN 16178, Mercury Filling



## Stock thermometers acc. to DIN 16178

Capillary: blue reflecting, prismatic, filling: mercury (Hg)

Top part: length  $235 \pm 5$  mm, dia.  $20.5 \pm 1$  mm

Bottom part: dia.  $8 \pm 0.5$  mm

With flat scale, suitable for official certification

Measuring range °C	Scale °C	Bottom part length L <sub>3</sub> mm	Immersion L <sub>2</sub> mm	Total length L <sub>1</sub> mm	Ref. No.
-30 +50	1	68	52	303	1332301
-30 +50	1	105	89	340	1332302
-30 +50	1	165	149	400	1332303
-30 +50	1	255	239	490	1332304
-30 +50	1	405	389	640	1332305
0 +100	1	68	52	303	1332401
0 +100	1	105	89	340	1332402
0 +100	1	165	149	400	1332403
0 +100	1	255	239	490	1332404
0 +100	1	405	389	640	1332405
0 +160	2	68	52	303	1332501
0 +160	2	105	89	340	1332502
0 +160	2	165	149	400	1332503
0 +160	2	255	239	490	1332504
0 +160	2	405	389	640	1332505
0 +200	2	68	52	303	1332601
0 +200	2	105	89	340	1332602
0 +200	2	165	149	400	1332603
0 +200	2	255	239	490	1332604
0 +200	2	405	389	640	1332605
0 +300	2	68	52	303	1332701
0 +300	2	105	89	340	1332702
0 +300	2	165	149	400	1332703
0 +300	2	255	239	490	1332704
0 +300	2	405	389	640	1332705

### Available on request:

- Further measuring ranges or angle versions
- Metal protection tubes acc. to DIN 16174 made of brass or stainless steel
- Maximum versions with steel mark

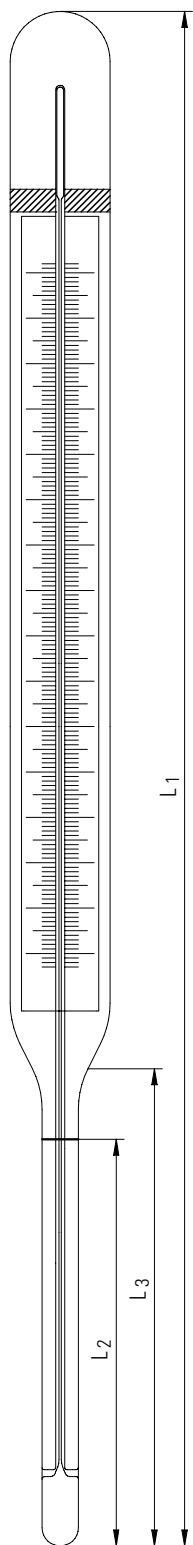
### Additional Order No.

...../03 with works certificate

...../04 with DAkkS calibration cert.



# Stock Thermometers similar to DIN 16178, Alcohol Filling



## Stock thermometers similar to DIN 16178

Capillary: colourless, prismatic, filling: red (organic)

Top part: length  $235 \pm 5$  mm, dia.  $20.5 \pm 1$  mm

Bottom part: dia.  $8 \pm 0.5$  mm

With flat scale, suitable for official certification

Measuring range °C	Scale °C	Bottom part length $L_3$ mm	Immersion $L_2$ mm	Total length $L_1$ mm	Ref. No.
-30 +50	1	68	52	303	1332301/red
-30 +50	1	105	89	340	1332302/red
-30 +50	1	165	149	400	1332303/red
-30 +50	1	255	239	490	1332304/red
-30 +50	1	405	389	640	1332305/red
0 +100	1	68	52	303	1332401/red
0 +100	1	105	89	340	1332402/red
0 +100	1	165	149	400	1332403/red
0 +100	1	255	239	490	1332404/red
0 +100	1	405	389	640	1332405/red
0 +160	2	68	52	303	1332501/red
0 +160	2	105	89	340	1332502/red
0 +160	2	165	149	400	1332503/red
0 +160	2	255	239	490	1332504/red
0 +160	2	405	389	640	1332505/red
0 +200	2	68	52	303	1332601/red
0 +200	2	105	89	340	1332602/red
0 +200	2	165	149	400	1332603/red
0 +200	2	255	239	490	1332604/red
0 +200	2	405	389	640	1332605/red

## Available on request:

- Further measuring ranges or angle versions
- Metal protection tubes acc. to DIN 16174 made of brass or stainless steel
- Maximum versions with steel mark

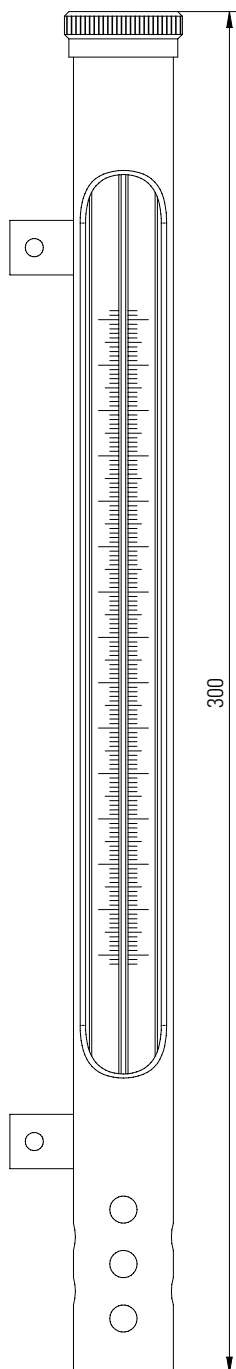
## Additional Order No.

...../03 with works certificate

...../04 with DAkkS calibration cert.

# Precision Ship Thermometers

## DHI Class II



### Precision ship thermometers, DHI class II

Capillary: blue reflecting prismatic; filling: mercury (Hg)

Top part: dia.  $18 \pm 0.5$  mm, with flat scale, thermometer insert

Meas. range °C	Scale °C	Immersion mm	Total length L <sub>1</sub> mm	Ref. No.
-30 +50	0.5	total	280	1452101

### Brass protection tube

With two lateral bores for screw fixing, total length: 300 mm

**Ref. No.: 1454101**

### Thermometer with protection tube

Thermometer, complete, with mounted protection tube

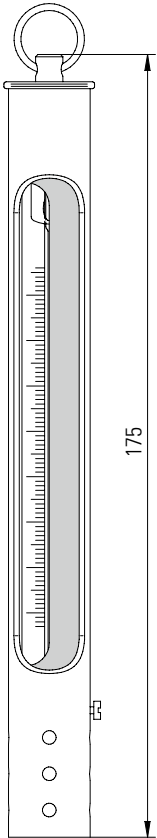
**Ref. No.: 1452101/1454101**

### Additional Order No.

...../03 with works certificate

...../04 with DAkkS calibration cert.

# Precision Mining Thermometers



## Precision mining thermometer

Capillary: yellow back, prismatic; filling: mercury (Hg)

Red mark at +28 °C

Top part: dia.  $14 \pm 0.5$  mm, with flat scale, thermometer insert

Meas. range °C	Scale °C	Immersion mm	Total length L <sub>1</sub> mm	Ref. No.
0 +60	0.5	total	165	1282301

## Brass protection tube, nickel-plated

With turnable scale protection,

With ring, total length: 175 mm

**Ref. No.: 210651**

## Thermometer with protection tube

Thermometer, complete, with mounted protection tube

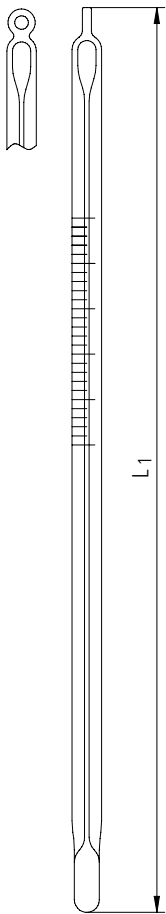
**Ref. No.: 1282303**

### Additional Order No.

...../03 with works certificate

...../04 with DAkkS calibration cert.

# Precision Incubator Thermometers



## Precision incubator thermometers, stem type

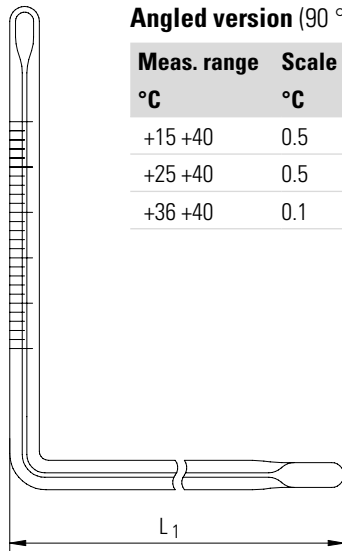
Capillary: dia.  $6 \pm 1$  mm, yellow back, prismatic; filling: mercury (Hg)  
Permanent graduation and lettering, with loop

### Straight version

Meas. range °C	Scale °C	Immersion mm	Total length $L_1$ mm	Ref. No.
+15 +40	0.5	total	200	41691
+20 +40	0.5	total	200	41688
+36 +40	0.1	total	250	41690

### Angled version (90° to back, top part: length 100 mm)

Meas. range °C	Scale °C	Immersion mm	Bottom part length $L_1$ mm	Ref. No.
+15 +40	0.5	total	180	41685
+25 +40	0.5	total	180	41686
+36 +40	0.1	total	180	41687



#### Available on request:

- Fahrenheit scale
- Further dimensions

## Precision incubator thermometers with metal cap

Capillary: blue reflecting prismatic; filling: mercury (Hg)  
Top part:  $90 \times 14 \pm 1$  mm, bottom part: dia.  $8 \pm 1$  mm,  $L_1$  200 mm  
With flat scale, mark at  $+37.8$  °C

### Straight version

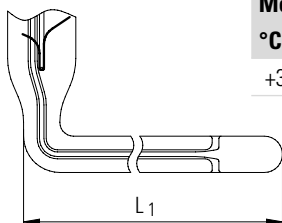
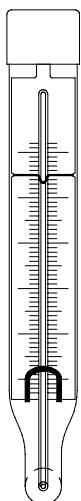
Meas. range °C	Scale °C	Immersion mm	Ref. No.
+35 +41	0.1	180	1362501

### Angled version 90°

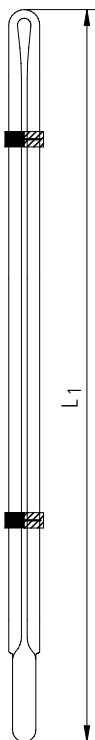
Meas. range °C	Scale °C	Immersion mm	Ref. No.
+35 +41	0.1	180	1362551

#### Available on request:

- Fahrenheit scale
- Further dimensions



# Fixed Contact Thermometers Stem Type



## Incubator fixed contact thermometers

Capillary: dia.  $6.25 \pm 0.25$  mm, white back, round

Filling: mercury (Hg)

Reservoir: dia.  $5.75 \pm 0.25$  mm,

With 2 soldering rings, with one fixed contact

Switch accuracy:  $\pm 0.1$  °C /  $\pm 0.15$  °F

Total length $L_1$ mm ( $\pm 2$ )	Type No.
160	7160
190	7190

**The requested contact in °C or °F has to be specified in every order.**

### Available on request:

- More contact points
- Higher switch accuracy
- Angled versions
- With soldered strand
- Further dimensions



## Fixed contact thermometer

Capillary: dia.  $4.75 \pm 0.2$  mm, white back, round

Filling: mercury (Hg), reservoir: dia. 8.75

With 2 soldering rings, with one fixed contact

Switch accuracy:  $\pm 0.5$  °C

Total length:  $74 \pm 1$  mm

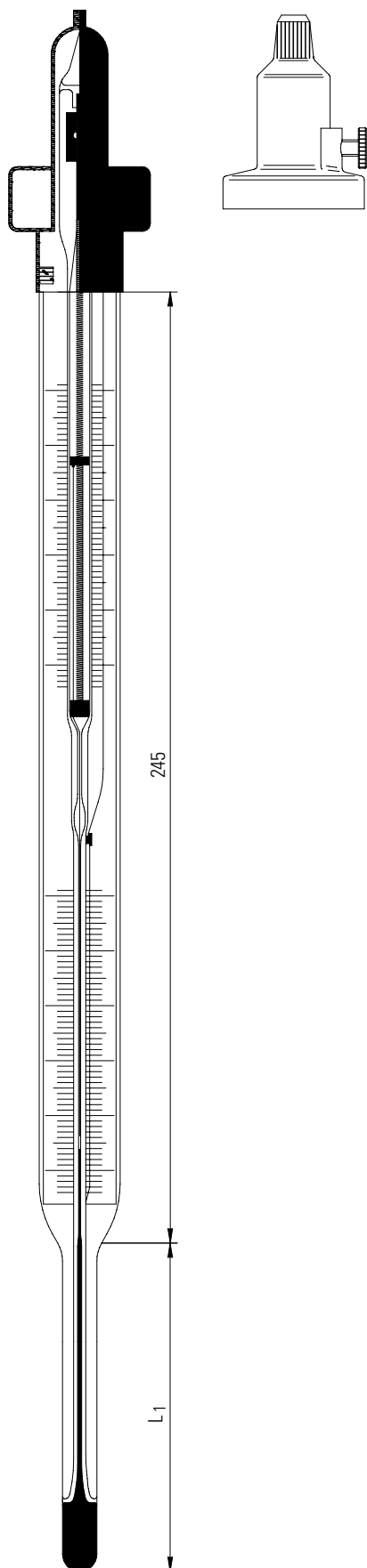
**Type No.: 7074**

**The requested contact in °C or °F has to be specified in every order.**

### Available on request:

- More contact points
- Switch accuracy up to 0.1 °C
- Angled versions
- With soldered strand
- Further dimensions

# Glass Contact Thermometers



## Adjustable contact thermometers with turning magnet

### With setting und reading scale

Capillary: yellow back, prismatic; filling: mercury (Hg)

With maxima make contact

Contact rating at max. 230 V: max. 30 mA non-inductive

Contact rating at DC voltage: max. 10 mA

With 2-pole flat coupling and turning magnet

Top part: dia. 18-19 mm, length 245 mm, bottom part: dia. 8-9 mm

Immersion = bottom part length

Measuring range °C	Scale °C	Bottom part length L <sub>1</sub> mm	Ref. No.
-30 +50	1	50	1421551
-30 +50	1	75	1421552
-30 +50	1	100	1421553
-30 +50	1	150	1421554
-30 +50	1	200	1421555
-30 +50	1	250	1421556
-30 +50	1	300	1421557
-30 +50	1	400	1421558
-10 +50	0.5	50	1421601
-10 +50	0.5	75	1421602
-10 +50	0.5	100	1421603
-10 +50	0.5	150	1421604
-10 +50	0.5	200	1421605
-10 +50	0.5	250	1421606
-10 +50	0.5	300	1421607
-10 +50	0.5	400	1421608
0 +50	1	50	1421651
0 +50	1	75	1421652
0 +50	1	100	1421653
0 +50	1	150	1421654
0 +50	1	200	1421655
0 +50	1	250	1421656
0 +50	1	300	1421657
0 +50	1	400	1421658
0 +100	1	50	1421701
0 +100	1	75	1421702
0 +100	1	100	1421703
0 +100	1	150	1421704
0 +100	1	200	1421705
0 +100	1	250	1421706
0 +100	1	300	1421707
0 +100	1	400	1421708

Measuring range °C	Scale °C	Bottom part length L <sub>1</sub> mm	Ref. No.
0 +150	2	50	1421751
0 +150	2	75	1421752
0 +150	2	100	1421753
0 +150	2	150	1421754
0 +150	2	200	1421755
0 +150	2	250	1421756
0 +150	2	300	1421757
0 +150	2	400	1421758
0 +200	2	50	1421801
0 +200	2	75	1421802
0 +200	2	100	1421803
0 +200	2	150	1421804
0 +200	2	200	1421805
0 +200	2	250	1421806
0 +200	2	300	1421807
0 +200	2	400	1421808
0 +250	2	50	1421851
0 +250	2	75	1421852
0 +250	2	100	1421853
0 +250	2	150	1421854
0 +250	2	200	1421855
0 +250	2	250	1421856
0 +250	2	300	1421857
0 +250	2	400	1421858
0 +300	2	50	1421901
0 +300	2	75	1421902
0 +300	2	100	1421903
0 +300	2	150	1421904
0 +300	2	200	1421905
0 +300	2	250	1421906
0 +300	2	300	1421907
0 +300	2	400	1421908

**Available on request:**

- Angled versions
- Further connecting cables and plugs
- Acc. to DIN 12878 with breakage protection
- With nominal ground joint NS 14/23
- Only with setting scale
- With more precise subdivision
- Metal protection tubes

# Technical information

## Filling liquids

### Thermometers with wetting liquid

Instructions for thermometers with separated indicator liquid

For many types of thermometer, the use of wetting thermometric liquids is essential. Different liquids are used according to the properties of the thermometer and their purpose (see technical data on thermometric liquids).

The following instructions only apply to procedures for thermometers filled with wetting liquids.

1. Before using these thermometers with wetting liquid, check whether any indicator liquid has separated off into the top of the capillary. Unlike the coloured indicator liquid, the separated liquid is generally colourless and can easily be overlooked.
2. All types of thermometer which are filled with wetting liquid have an expansion chamber at the top end of the capillary. By heating the temperature probe carefully, the indicator liquid can be coaxed up into this expansion chamber and combined again with the separated liquid. If necessary, it can be assisted in this by using a powerful centrifuge with the temperature probe pointing downwards.
3. If there is still a small amount of liquid remaining at the end of the expansion chamber, this has to be flame-heated carefully at this point (cigarette lighter, Bunsen burner or spirit burner) in order to combine it with the separated liquid by repeatedly heating the temperature probe while holding the thermometer upright.

The possible evaporation of the indicator liquid in the capillary is a physically induced phenomenon which cannot always be avoided in the event of poor storage or if conditions are unfavourable. It is definitely not a manufacturing defect, however, and provided that it is handled properly it will also not affect the guaranteed precision of the thermometer type used.

### Instructions for reuniting separated 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 (CO<sub>2</sub>) 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.



# Technical information

## Filling liquids

### Thermometer filling liquids

Technical data of thermometric fillings

Thermometric fillings are divided into two groups, **wetting and non-wetting** liquids.

The excellent thermometric properties of mercury (including the fact that there is no aging and no wetting of the glass surface as well as good expansion linearity over a wide temperature range) make mercury essential as an indicator liquid for precision thermometers and define the outstanding serviceability through precision and durability.

The table below gives an overview of the main filling liquids used together with their operating limits and their most common abbreviations. The upper and lower limits are defined by physical properties such as melting point and boiling point.

### Technical data of thermometric fillings

Filling liquids	Abbreviation	Lower limit °C	Upper limit °C	Characteristics
Mercury	Hg	-38.5	+800	non-wetting
Mercury thallium alloy	Hg-Tl	-58	approx. +150	non-wetting
Gallium alloy	Ga	0	approx. +1200	non-wetting
Technical pentane	C <sub>5</sub> H <sub>12</sub>	-200	approx. +35	wetting
Ethanol	C <sub>2</sub> H <sub>6</sub> O	-110	approx. +100	wetting
Pentanol	C <sub>5</sub> H <sub>12</sub> O	-115	approx. +135	wetting
Toluene	C <sub>7</sub> H <sub>8</sub>	-90	approx. +100	wetting
Creosote	—	approx. -40	approx. +210	wetting
Petroleum	C <sub>5</sub> H <sub>12</sub>	approx. -45	approx. +160	wetting
i-amyl benzoate	C <sub>12</sub> H <sub>16</sub> O <sub>2</sub>	approx. -40	approx. +220	wetting

# Technical information

## Deviation limits

### Standardized tolerances acc. to EO 14-1

According to the German standard "Eichordnung EO 14-1" the following deviation limits for the most usual thermometers are specified:

Deviation limits for thermometers with **wetting** thermometric fillings (immersion: total):

Temperature range	Calibration tolerance at scale unit			
	0.5 °C	1 °C	2 °C	5 °C
from -200 °C up to -110 °C	—	±3 °C	±4 °C	±5 °C
above -110 °C up to -10 °C	±1 °C	±2 °C	±4 °C	±5 °C
above -10 °C up to +110 °C	±1 °C	±2 °C	±3 °C	±5 °C
above +110 °C up to +210 °C	—	±3 °C	±4 °C	±5 °C

Deviation limits for thermometers with **non-wetting** thermometric fillings (immersion: total):

Temperature range	Calibration tolerance at scale unit						
	0.05 °C	0.1 °C	0.2 °C	0.5 °C	1 °C	2 °C	5 °C
from -58 °C up to -10 °C	—	±0.3 °C	±0.4 °C	±0.5 °C	±1 °C	±2 °C	±5 °C
above -10 °C up to +110 °C	±0.1 °C	±0.2 °C	±0.3 °C	±0.5 °C	±1 °C	±2 °C	±5 °C
above +110 °C up to +210 °C	—	—	±0.4 °C	±0.5 °C	±1 °C	±2 °C	±5 °C
above +210 °C up to +410 °C	—	—	—	±1 °C	±2 °C	±2 °C	±5 °C
above +410 °C up to +610 °C	—	—	—	—	±3 °C	±4 °C	±5 °C
above +610 °C	—	—	—	—	—	±10 °C	±10 °C



# Product summary

- Catalogue **Engine Thermometers**
- Catalogue **General Purpose and Special Thermometers, Contact Thermometers**
- Catalogue **Precision Laboratory Thermometers & Sets, Ground Joint Thermometers**
- Catalogue **Meteorological Thermometers and Digital Measuring Devices**
- Catalogue **Precision Thermometers for Material Testing**
- Catalogue **Precision Hydrometers and Refractometers**
- Catalogue **Digital Measuring Devices**
- Catalogue **Resistance Thermometers and Thermocouples**

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