

## ICS Components and accessories



### Connection heads

Connection heads for resistance thermometers and thermocouples

AZ, BZ, BK, BUZ | BUS, BUZH | BUSH, F

### Thermo junction

Thermo junction

TP

### Connector

Connector

SV

### Fixing materials

Stop flange

AF

Fittings

V

### Extension protecting tubes

For screwing in

ZSR

For welding in

ZSW

### Calibration block

Calibration block

KB

### Miniature fixed-point cell

Miniature fixed-point cell

MFPZ, FKS

### Reference junction

Reference junction

VGS

### Digital thermometer

Digital thermometer

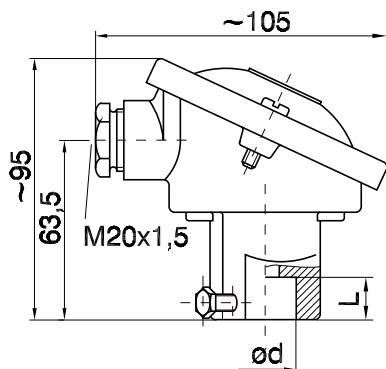
DTM3000, DTM3000 special, DTMlight, DTM5080, 999

<b>Transmitter</b>	
Transmitter for TC, 4..20mA	LKM101, LKM141
Transmitter for TC, 0..10V	LKM102
Transmitter for Pt100, Pt1000, 4..20mA	LKM103, LKM143
Transmitter for Pt100, Pt1000, 0..10V	LKM104
Switching transmitter for Pt100, freely configurable	LKM105
Transmitter with LCD-Display	LKM154
Analog power supply for transmitters	LKM207
Transmitter for TC, DIN-Rail mounting, 4..20mA	LKM211, LKM231
Transmitter for TC, DIN-Rail mounting, 0..10V	LKM212, LKM232
Transmitter for Pt100, Pt1000, DIN-Rail mounting, 4..20mA	LKM213, LKM223
Transmitter for Pt100, Pt1000, DIN-Rail mounting, 0..10V	LKM214, LKM224

## Components and accessories

### Connection heads

#### Connection head AZ



Connection head for resistance thermometers  
and thermocouples

#### Protection classification

IP 54 (for protective tube connection with thread joint)  
IP 44 (for protective tube connection with smooth borehole)

#### Application temperature

-40 °C to +100 °C

#### Housing material

light metal pressure diecast

#### Protective tube connection $\varnothing d / L$

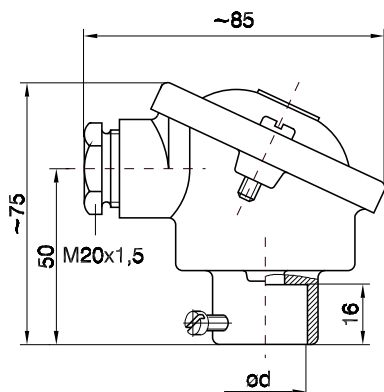
22,5 / 20  
32,5 / 20  
M24x1,5 / 16

connection measure accept to DIN 43 729  
-by protection tube connection with thread no screws

## Components and accessories

### Connection heads

#### Connection head BZ



Connection heads for resistance thermometers  
and thermocouples

#### Protection classification

IP 54 (for protective tube connection with thread joint)  
IP 44 (for protective tube connection with smooth borehole)

#### Application temperature

-40 °C to +100 °C  
-40 °C to +155 °C with silicone seal

#### Housing material

light metal pressure diecast

#### Protective tube connection $\varnothing$ d / L

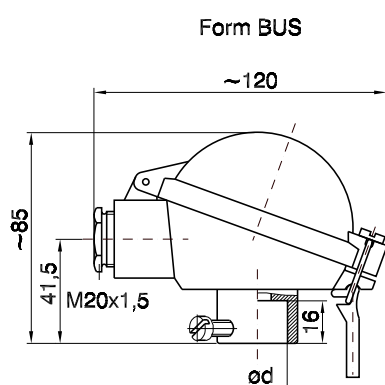
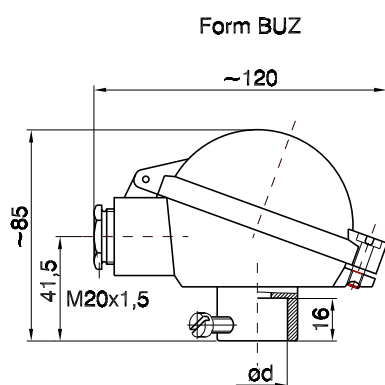
15,5 / 16  
M24x1,5 / 16

-connection dimension according to DIN 43 729  
-on protective tube connection with thread no screws

## Components and accessories

### Connection heads

### Connection head BUZ | BUS



Connection head for resistance thermometers and thermocouples

#### Form

BUZ  
BUS

#### Protection classification

IP 54 (for protective tube connection with thread joint)  
IP 53 (for protective tube connection with smooth borehole)

#### Application temperature

-40 °C to +100 °C  
-40 °C to +155 °C with silicone seal

#### Housing material

light metal pressure diecast

#### Protective tube connection $\varnothing d / L$

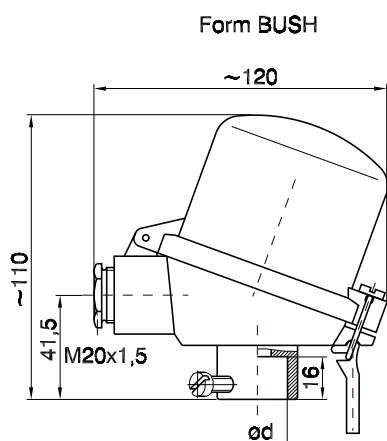
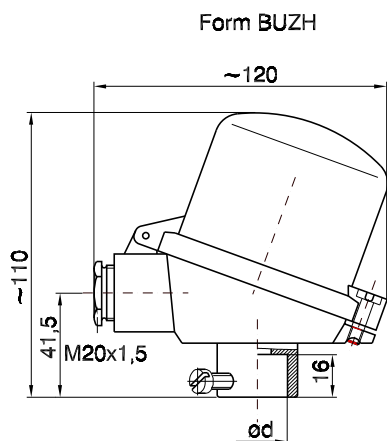
15,5 / 16  
M24x1,5 / 16

-connection dimension according to DIN 43 729  
-on protective tube connection with thread no screws

## Components and accessories

### Connection heads

#### Connection head BUZH | BUSH



Connection heads for resistance thermometers and thermocouples

#### Form

BUZH  
BUSH

#### Protection classification

IP 54 (for protective tube connection with thread joint)  
IP 53 (for protective tube connection with smooth borehole)

#### Application temperature

-40 °C to +100 °C  
-40 °C to +155 °C with silicone seal

#### Housing material

light metal pressure diecast

#### Protective tube connection $\varnothing d / L$

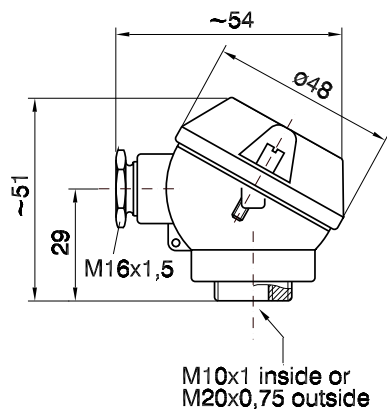
15,5 / 16  
M24x1,5 / 16

-connection dimension according to DIN 43 729  
-on protective tube connection with thread no screws

## Components and accessories

### Connection heads

#### Connection head F



connection head for resistance thermometers and thermocouples

#### Protection classification

IP 54 according DIN 60529

#### Application temperature

-40 °C to +100 °C

#### Housing material

light metal pressure diecast

#### Protective tube connection

M10x1 inside  
M20x0,75 outside

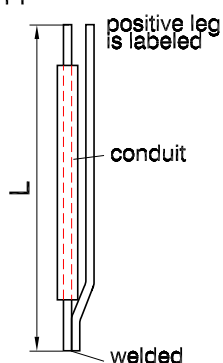


## Components and accessories

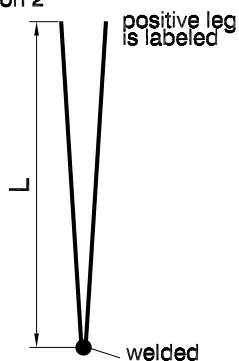
### Thermo junction

### Thermo junction TP

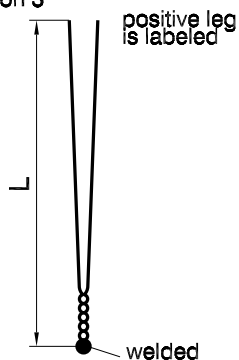
Construction 1



Construction 2



Construction 3



#### Construction

- 1
- 2
- 3

#### Thermo junction

- J (Fe-CuNi) DIN EN 60584
- K (NiCr-Ni) DIN EN 60584
- S (PtRh10-Pt) DIN EN 60584
- B (PtRh30-PtRh6) DIN EN 60584
- C (WRe5-WRe26)

#### Wire size

- 0,35 mm
- 0.5 mm
- 1 mm
- 3 mm

#### Nominal length L

on inquiry

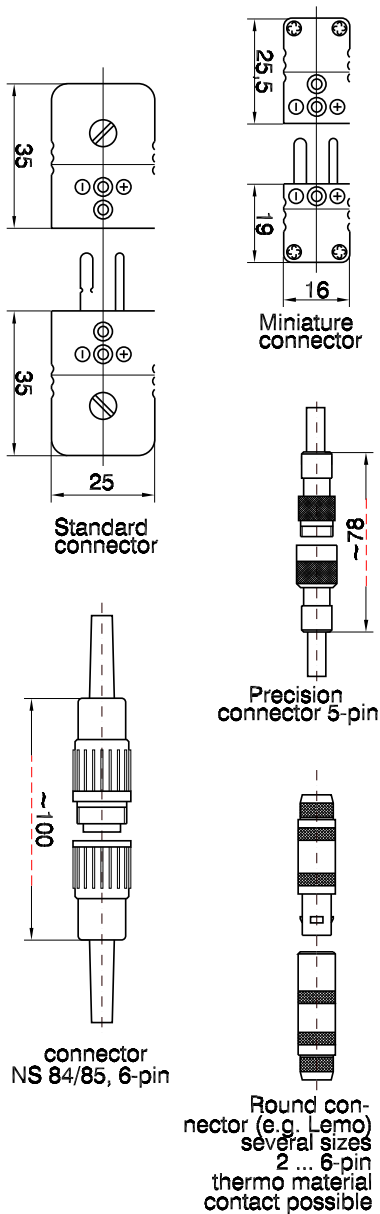
-Reference table of thermovoltage according DIN EN 60584 (Typ J, K, S und B) respectively according manufacturer's instructions (Typ C)

-Thermocouple with wire size  $\leq 1$  mm deliverable with conduit according DIN EN 50113

# Components and accessories

## Connector

### Connector SV



#### Connector

- Standard thermocouple plug (male)
- Standard thermocouple plug box (female)
- Standard thermocouple plug connection
- Miniature thermocouple plug (male)
- Miniature thermocouple plug box (female)
- Miniature thermocouple plug connection
- Round connector (e.g. LEMO connectors)
- Precision connector 5-pin
- Connector NS 84/85 6-pin
- on inquiry

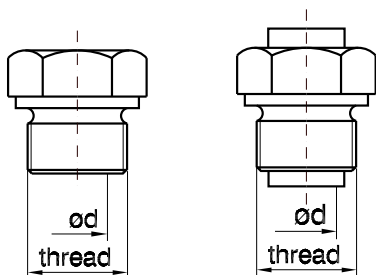
#### Number of pins

- 2
- 3
- 4
- 5
- 6

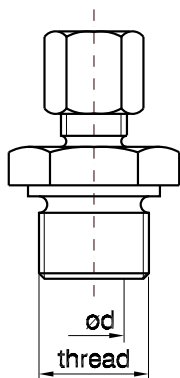
## Components and accessories

### Fixing materials

#### Thread joint V



Solderable / weldable  
thread joint



adjustable thread joint

- with PTFE-clamp ring or
- with metal clamp ring or
- with cutting ring

#### Threaded joint

adjustable with PTFE clamp ring  
adjustable with metal clamp ring  
adjustable with cutting ring  
solderable  
weldable

#### Material

stainless steel  
zincd steel

#### Diameter d

on inquiry

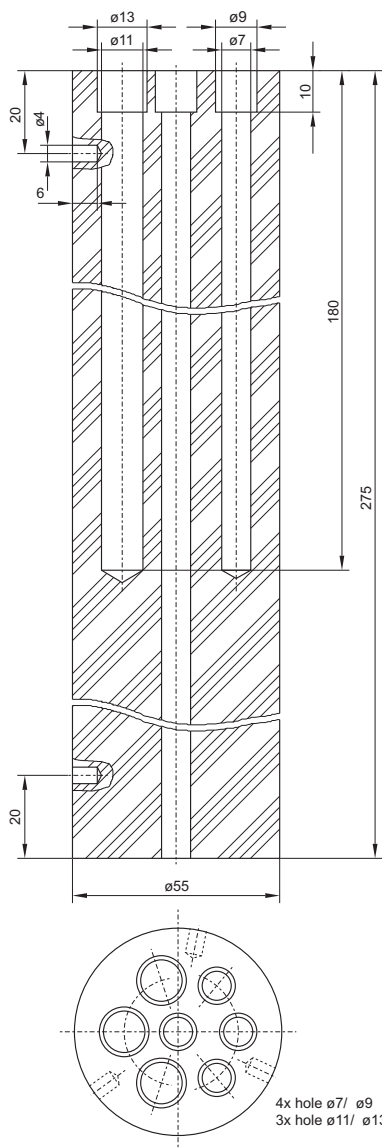
#### Thread

on inquiry

## Components and accessories

### Calibration block

### Calibration block KB



#### Thermal equalising block from aluminium nitride

for improving thermal uniformity of a calibration furnace

- high thermal conductivity ( → figure next page)
- low density (3.3 g/cm<sup>3</sup>)
- low specific heat (32.1 J/molK)
- high chemical resistance
- high operating temperature range 0-1100 °C (short 1200 °C)
- high heat shock resistance up to 180 K

#### Structure:

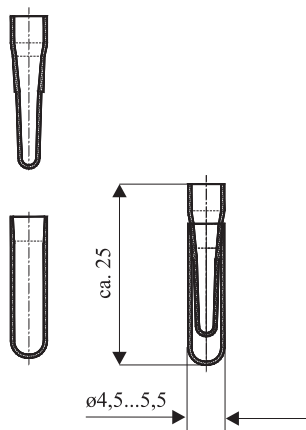
- outer dimensions  $\varnothing$  55 mm x 275 mm
  - 3 holes  $\varnothing$  11 mm x 180 mm
  - 3 holes  $\varnothing$  7 mm x 180 mm
  - 1 hole  $\varnothing$  7 mm
  - additional 6 radial insert holes ( $\varnothing$  4mm) for application of distance pieces (providing a central positioning of the calibration block in different furnace geometries)
- other dimensions on demand  
The region of the best uniformity of the furnace can be found by means of the central 7

mm hole. The position varies depending on operational temperature and inserts. The block should have an optimal position where the temperature gradients surrounding the sensing elements of thermometers under test are minimal.

## Components and accessories

### Miniature fixed-point cell

### Miniature fixed-point cell MFPZ



#### Application areas

in-situ-calibration of thermocouples or thermocouple measuring systems by means of temperature fixed-points ("self-calibrating thermocouple")

changeable insert for precision thermocouples (@ type SKTE) or integrated part of industrial thermocouples

recognition and correction of emf-drifts in restricted access areas

improved measurement accuracy, reduced expenses for the preventive replacement of sensors, longer calibration periods in quality management systems

#### Technical specification:

Twin-wall ceramic crucible approx.  $\varnothing$  5x $\varnothing$  12x25mm

Crucible material: AlN, Al<sub>2</sub>O<sub>3</sub>, Si<sub>3</sub>N<sub>4</sub> or Y<sub>2</sub>O<sub>3</sub> (depending on used fixed-point substance and operating conditions)

ingot material: high purity metal or alloy with phase change transition point within

the desired temperature range, purity 99.99% or better

e.g.: Sn (231.93 °C)

Pb (327.46 °C)

Zn (419.53 °C)

Al<sub>67</sub>/Cu<sub>33</sub> (548.16 °C)

Al<sub>83</sub>/In<sub>17</sub> (638.4 °C)

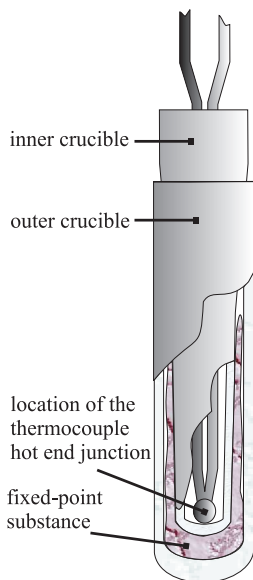
Al (660.32 °C)

Ag<sub>28</sub>/Cu<sub>72</sub> (779.63 °C)

Au (1064.18 °C)

Pd (1553.4 °C)

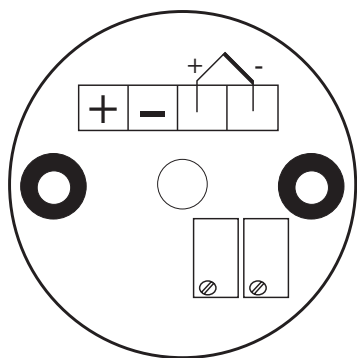
further fixed-point materials on request



## Components and accessories

### Transmitter

#### Transmitter LKM 101



∅ 44 mm  
26,5 mm high



#### In-Head Transmitter LKM 101

##### Thermocouples, B-head, 4..20mA, 24V supply voltage

The LKM 101 is an analogue transducer for thermocouples acc. DIN EN 60584 or DIN 43713.

The temperature-sensitive voltage will be transformed voltage-linearly into a current output of 4..20mA. The transducer LKM 101 is to be mounted inside the protection head type B.

The working range of the instrument needs a span of at least 200°C. The transducer LKM 101 is tuned within a customized span ex works. Further fine-tuning can be arranged by adjusting zero and span.

#### Input

thermocouple K, J(L), T(U), N, E;  
S B with higher fault

#### Output

4...20mA current loop

#### Range

> 200°C\*

#### Zero point

> -270°C\*

#### Loop voltage

10...35VDC, reverse protection

#### Sensor fracture

>20 mA

#### Shorted Sensor

ambient temperature

#### Permissible ripple

< 10 %

#### Reaction time

< 0.1s

## Components and accessories

### Transmitter

#### Transmitter LKM 101

**Vibration**

5g/10-200Hz

**Linearity error**

<1% FS\*

**Error of compensation**

<± 0.5°C

**TCR**

<100ppm/°C

**Operating temperature range**

-25°C ... +85°C

**Terminal type**

screw terminal

**Clamping range**

0.13...1.5mm<sup>2</sup>

**Humidity**

< 95%

**EMC emission**

EN 61000-6-3:2001

**EMC interference rejection ratio**

EN 61000-6-3:2001

**Mounting**

B-Head

**Dimension**

44mm x 26,5mm (DxH)

**Sealing compound**

Polyurethan, black

**Weight**

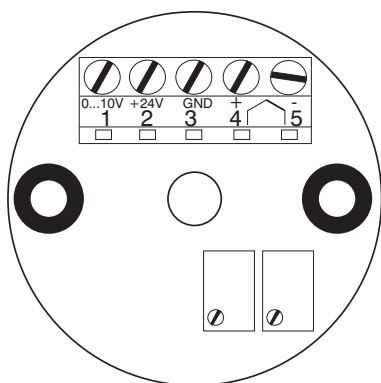
approx. 30g

\*dependent upon thermocouple

## Components and accessories

### Transmitter

#### Transmitter LKM 102



∅ 44 mm  
26,5 mm high



#### In-Head Transmitter LKM 102

##### Thermocouples, B-head, 0..10V, 24V supply voltage

The LKM 102 is an analogue transducer for thermocouples acc. DIN EN 60584 or DIN 43713.

The temperature-sensitive voltage will be transformed voltage-linearly into a voltage output of 0..10V.

The transducer LKM 102 is to be mounted inside the protection head type B. The working range of the instrument needs a span of at least 200°C. The transducer LKM 102 is tuned within a customized span ex works. Further fine-tuning can be arranged by adjusting zero and span.

#### Input

thermocouple K, J(L), T(U), N, E;  
S B with higher fault

#### Output

0...10V short-circuit-proof

#### Range

> 200°C\*

#### Zero point

> -270°C\*

#### Loop voltage

10...35VDC, reverse protection

#### Sensor fracture

>10V

#### Shorted Sensor

ambient temperature

#### Permissible ripple

< 10 %

#### Reaction time

< 0.1s

#### Vibration

5g/10-200Hz



## Components and accessories

### Transmitter

#### Transmitter LKM 102

**Linearity error**

<1% FS\*

**Error of compensation**

<± 0.5°C

**TCR**

<100ppm/°C

**Operating temperature range**

-25°C ... +85°C

**Terminal type**

screw terminal

**Clamping range**

0.13...1.5mm<sup>2</sup>

**Humidity**

< 95%

**EMC emission**

EN 61000-6-3:2001

**EMC interference rejection ratio**

EN 61000-6-3:2001

**Mounting**

B-Head

**Current consumption**

max. 10 mA

**Supply voltage**

15...35V DC reverse protection

**Dimension**

44mm x 26,5mm (DxH)

**Sealing compound**

Polyurethan, black

**Weight**

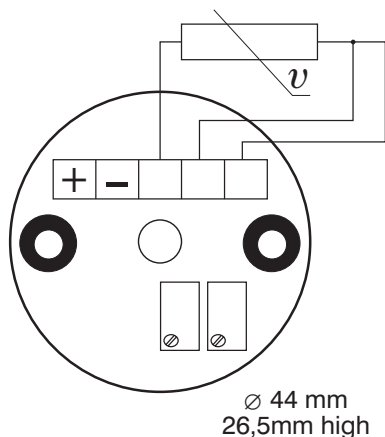
approx. 30g

\* dependent upon thermocouple

## Components and accessories

### Transmitter

#### Transmitter LKM 103



#### In-Head Transmitter LKM 103

Pt100/Pt1000, B-head, 4..20mA, 24V supply voltage

The LKM 103 is an analogue transducer for Pt100/Pt1000 sensors acc. DIN EN 60751. The temperature sensitive resistance will be transformed into an extreme precise, temperature-linear current output of 4..20mA. The transducer LKM 103 can be mounted inside the protection head type B. The span needs at least a working range of 20°C. The transducer LKM 103 is tuned acc. customized needs ex works. Further fine-tuning can be arranged by span and zero controller. Please note: Using Pt 100 in 2-wire connection clamps 4 and 5 must be jumpered!

#### Input

Pt100/Pt1000, 2-/3 wire circuit

#### Output

4...20mA current loop

#### Range

20 °C ... 850 °C\*

#### Zero point

-200 °C ... +600 °C\*

#### Loop voltage

10...35VDC, reverse protection

#### Test current

0.8 ... 1mA\*

#### Sensor fracture

>20 mA

#### Shorted Sensor

<4 mA

#### Permissible ripple

< 10 %

## Components and accessories

### Transmitter

#### Transmitter LKM 103

**Reaction time**

< 0.1s

**Vibration**

5g/10-200Hz

**Linearity error**

<0.1% FS

**TCR**

<100ppm/°C

**Operating temperature range**

-25°C ... +85°C

**Terminal type**

screw terminal

**Clamping range**

0.13...1.5mm<sup>2</sup>

**Humidity**

< 95%

**EMC emission**

EN 61000-6-3:2001

**EMC interference rejection ratio**

EN 61000-6-3:2001

**Mounting**

B-Head

**Dimension**

44mm x 26,5mm (DxH)

**Sealing compound**

Polyurethan, black

**Weight**

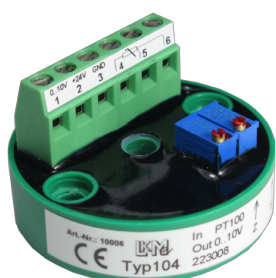
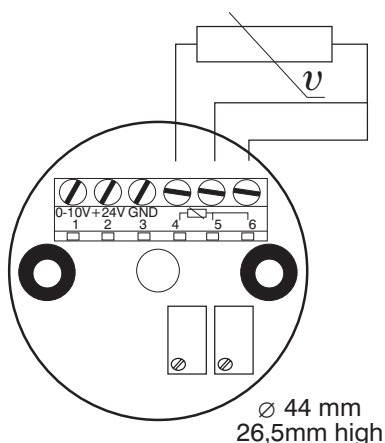
approx. 30g

\*depend on Sensor

## Components and accessories

### Transmitter

### Transmitter LKM 104



#### In-Head Transmitter LKM 104

#### Pt100/Pt1000, B-head, 0..10V, 24V supply voltage

The LKM 104 is a transducer providing a direct connection to an PLC or PC-AD-Converter card. The temperature-sensitive resistance of a Pt 100 will be transformed into a voltage output of 0..10V with high precision. Other resistance sensors (Pt50, Pt1000, Ni100) on require. The transducer LKM 104 can be mounted inside the DIN protection head type B. It operates in 2-/3- wire connection. The working range of the 104 has been tuned ex works according to the needs of the customer between -200°C and 600°C, for instance 0..150°C.

For higher precision in transmitting the wire resistance of the Pt 100 probe can be considered by the zero controller.

#### Input

Pt100/Pt1000, 2-/3 wire circuit

#### Output

0 ... 10V

#### Range

20 °C ... 850 °C\*

#### Zero point

-200°C ... +600°C\*

#### Test current

0.8 ... 1mA\*

#### Sensor fracture

>10V

#### Shorted Sensor

0V

#### Permissible ripple

< 10 %

#### Reaction time

< 0.1s

#### Vibration

5g/10-200Hz

## Components and accessories

### Transmitter

#### Transmitter LKM 104

**Linearity error**

<0.1% FS

**TCR**

<100ppm/°C

**Operating temperature range**

-25°C ... +85°C

**Terminal type**

screw terminal

**Clamping range**

0.13...1.5mm<sup>2</sup>

**Humidity**

< 95%

**EMC emission**

EN 61000-6-3:2001

**EMC interference rejection ratio**

EN 61000-6-3:2001

**Mounting**

B-Head

**Supply voltage**

21 ... 27 VDC / 15mA

**Dimension**

44mm x 26,7mm (DxH)

**Sealing compound**

Polyurethan, black

**Weight**

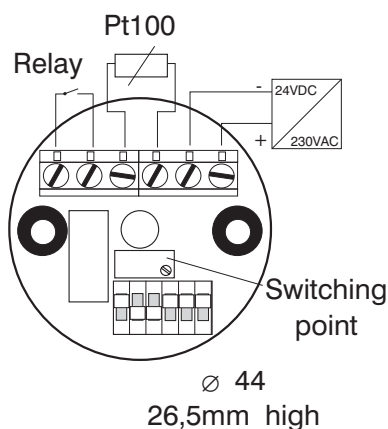
approx. 30g

\*dependent upon sensor resistance

## Components and accessories

### Transmitter

#### Transmitter LKM 105



#### In-Head-Switch Transmitter LKM 105

##### Pt100, B-head, free configurable, 24V supply voltage

The LKM 105 is a free configurable transmitter for RTD's Pt100 according to DIN EN 60751.

It observes the temperature dependence resistance with high accuracy and switches the relay if switch temperature is reached. With the help of 6 Dip-switches and a potentiometer one may adjust the LKM 105. The measuring range, the switching temperature, the switching function (open or close) and the hysteresis may be adjusted (see also operating instructions LKM 105). The transmitter is designed for mounting in protection head DIN B. One can also buy this transmitter with customized adjustments.

#### Input

Pt100, 2 wire circuit

#### Sensor fracture

like high temperature

#### Shorted Sensor

like low temperature

#### Permissible ripple

< 10 %

#### Vibration

5g/10-200Hz

#### Switching current

max. 5A

#### switching range

16 ranges between -200°C ... 480°C

#### Switching precision

<1%

#### Contact rating

150W / 1250VA

#### Switching voltage

30VDC, 250VAC

## Components and accessories

### Transmitter

#### Transmitter LKM 105

**TCR**

<50ppm/°C

**Accuracy**

<1% FS

**Operating temperature range**

-25°C ... +70°C

**Terminal type**

screw terminal

**Clamping range**

0.13...1.5mm<sup>2</sup>

**Humidity**

< 95%

**EMC emission**

EN 61000-6-3:2001

**EMC interference rejection ratio**

EN 61000-6-3:2001

**Mounting**

B-Head

**Supply voltage**

21 ... 27 VDC / 15mA

**Dimension**

44mm x 26,5mm (DxH)

**Sealing compound**

Polyurethan, black

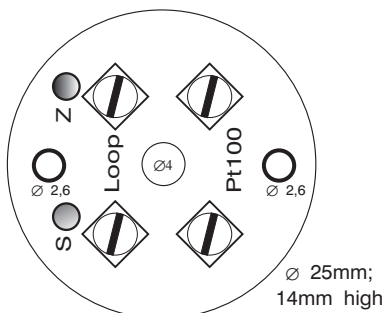
**Weight**

approx. 40g

## Components and accessories

### Transmitter

#### Transmitter LKM 141



#### In-Head Transmitter LKM 141

Thermocouples, J-head, 4..20mA, 24V supply voltage

The LKM 141 is an analogue transducer for thermo couples acc. DIN EN 60584 or DIN 43713.

The temperature-sensitive voltage will be transformed into an analogue current output of 4..20mA.

The LKM 141 can be mounted inside the protection head type J. The span needs at least a range of 200 °C.

The transducer LKM 141 is tuned ex works according to the customized requires. Further fine-tuning can be arranged by span and zero controller.

#### Input

thermocouple K, J(L), T(U), N, E;  
S B with higher fault

#### Output

4...20mA current loop

#### Range

> 200 °C\*

#### Zero point

> -270 °C\*

#### Loop voltage

10...35VDC, reverse protection

#### Sensor fracture

>20 mA

#### Shorted Sensor

ambient temperature

#### Permissible ripple

< 10 %

#### Reaction time

< 0.1s



## Components and accessories

### Transmitter

#### Transmitter LKM 141

**Vibration**

5g/10-200Hz

**Linearity error**

<0.1% FS\*

**Error of compensation**

<± 0.5°C

**TCR**

<100ppm/°C

**Operating temperature range**

-25°C ... +85°C

**Terminal type**

screw terminal

**Clamping range**

0.13...0.75mm<sup>2</sup>

**Humidity**

< 95%

**EMC emission**

EN 61000-6-3:2001

**EMC interference rejection ratio**

EN 61000-6-3:2001

**Mounting**

J-head

**Dimension**

25mm x 14 mm (DxH)

**Sealing compound**

Polyurethan, black

**Weight**

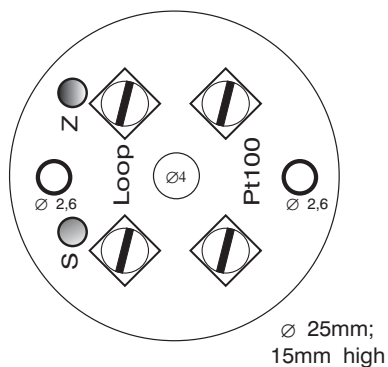
approx. 10g

\* dependent upon thermocouple

## Components and accessories

### Transmitter

### Transmitter LKM 143



#### In-Head Transmitter LKM 143

#### Pt100/Pt1000, J-head, 4..20mA, 24V supply voltage

The LKM 143 is an analogue transducer for Pt100/Pt1000 temperature sensors acc. DIN EN 60751.

The temperature-sensitive resistance of the Pt100 will be transformed into an analogue current output of 4..20mA. The LKM 143 can be mounted inside the protection head type J. The span needs at least a range of 20°C. The transducer

LKM 143 is tuned ex works according to the customized requires. Further fine-tuning can be arranged by span and zero controller.

#### Input

Pt100/Pt1000, 2 wire circuit

#### Output

4...20mA current loop

#### Range

20 °C ... 850 °C\*

#### Zero point

-200 °C ... +600 °C\*

#### Loop voltage

10...35VDC, reverse protection

#### Test current

0.8 ... 1mA\*

#### Sensor fracture

>20 mA

#### Shorted Sensor

<4 mA

#### Permissible ripple

< 10 %

#### Reaction time

< 0.1s

## Components and accessories

### Transmitter

#### Transmitter LKM 143

**Vibration**

5g/10-200Hz

**Linearity error**

<0.1% FS

**TCR**

<100ppm/°C

**Operating temperature range**

-25°C ... +85°C

**Terminal type**

screw terminal

**Clamping range**

0.13...0.75mm<sup>2</sup>

**Humidity**

< 95%

**EMC emission**

EN 61000-6-3:2001

**EMC interference rejection ratio**

EN 61000-6-3:2001

**Mounting**

J-head

**Dimension**

25mm x 15mm (DxH)

**Sealing compound**

Polyurethan, black

**Weight**

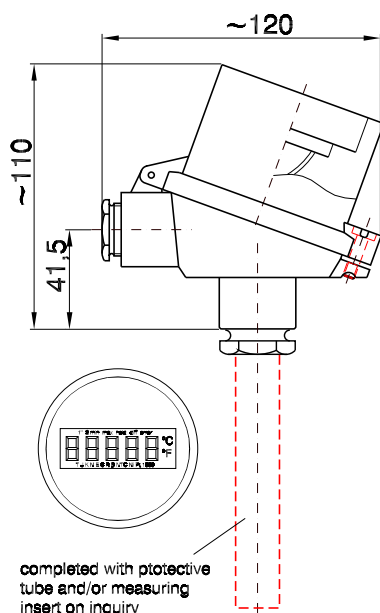
approx. 10g

\* dependent upon sensor resistance

## Components and accessories

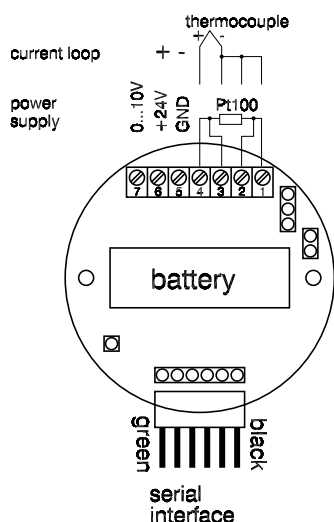
### Transmitter

#### Transmitter LKM 154



#### Programmable connection head transmitter for Pt100/Pt1000 and thermocouples with a variety of output signals and an LCD Display

The LKM 154 is a programmable transmitter for Pt100/Pt1000 and various thermocouples with an LCD display installed in a special connection head. It converts the temperature signal linearly with high accuracy into a standard current signal or an output voltage. A battery variant without an output signal is also available. The LKM 154 can be integrated with temperature sensors using an M12 connection thread to form a complete measurement module. For the range an adjustment capability of at least 20°C is required. The transmitter can be configured by the customer using a programming module that can be obtained separately. No recalibration is required. The output signals can similarly be scaled as required. Using this programming module it is also possible to record the measurement data digitally with a PC. The different variants are identified by an additional letter. We can also supply complete temperature sensors with this transmitter.



#### Construction

- U- Display and output signal 0...10V, serial interface (external voltage supply 24 V)
- I- Display and Output 4...20 mA, serial Interface (Voltage supply from loop)
- B- Display (Voltage supply 9V battery, shutdown after 5 min.)

#### Connection head

BUZH

#### Protection classification

IP 65 according DIN 60529

## Components and accessories

### Transmitter

#### Transmitter LKM 154

##### Input

Pt100  
Pt1000  
Thermocouple Typ K  
Thermocouple Typ T  
Thermocouple Typ J  
Thermocouple Typ S  
on inquiry

##### Circuitry

2 wire circuit  
3 wire circuit  
4 wire circuit

##### Output

0 ... 10V  
4 ... 20mA

##### Measuring range

Typ K -200 °C ... +1370 °C  
Typ T -200 °C ... +400 °C  
Typ J -200 °C ... +1200 °C  
Typ S 0 °C ... +1760 °C  
Pt100/Pt1000 -200 °C ... 835 °C

##### Range

domain of definition of sensor, minimal 20 °C \*

##### Zero point

as defined for the sensor\*

##### Resolution

0.1 °C/1 °C° \*

##### Display

LCD 5-digit, 10mm character height, rotatable

##### Test current

0.2mA

##### Sensor fracture

approx. 11V for voltage output  
approx. 21 mA for current loop

## Components and accessories

### Transmitter

#### Transmitter LKM 154

##### Shorted Sensor

at resistance sensors approx. 0V for voltage output and approx 3 mA for current loop;  
Temperature value on fracture point for thermocouples

##### Permissible ripple

< 10 %

##### Messgenauigkeit

0,5°C ± 1Digit

##### Accuracy

0.2°C ± 1Digit for resistance sensors  
0.5°C for thermocouples  
0.2°C ± 1Digit for resistance sensors  
0.5°C for thermocouples

##### Temperature drift

<150ppm/°C

##### Operating temperature range

0°C ... +60°C

##### Mounting

Thread M24x1.5

##### Power supply

3.3V Lithium (CR123)

##### Supply voltage

24VDC ± 30% reverse protection

##### Sampling rate

>0.25/s\*

##### Battery operation time

>1000h on automatic switch off after 3 min \*

##### Features

Maximum, Minimum, Hold

##### Weight

approx. 290g

##### Interface

USB

## Components and accessories

### Transmitter

#### Transmitter LKM 154

---

##### **cold-junction compensation**

internal

\* programmable

## Components and accessories

### Transmitter

#### Transmitter LKM 207



#### Analog power supply for transmitter

The power supply LKM 207 is provided for the power supply of up to 10 transmitters. The output voltage is stabilized and short circuit protection. The power supply is built into a compact case (40mm x 84mm x 79.5 mm) of the IP 20 protection from break-resistant polyamide 6.6 "KRILEN".

#### Protection classification

IP 20 according DIN 60529

#### Input voltage

230VAC

#### Input frequency

50 ... 60Hz

#### Input fuse

100 mA fast-acting (extern)

#### Output

short-circuit-proof

#### Output voltage

24VDC

#### Nominal current

400mA

#### Continuous rating

max. 9,6VA

#### Ripples

< 10mV

#### Stability

< 1% (full load)

#### Transformer

VDE 0551, EN 60742

#### Testing voltage

5000V



## Components and accessories

### Transmitter

#### Transmitter LKM 207

**Operating temperature range**

0 °C ... +60 °C

**Terminal type**

screw terminal

**Clamping range**

0.13...0.75mm<sup>2</sup>

**Mounting**

35mm DIN rail

**Case material**

unbreakable polyamide

**Dimension**

79.5 x 40 x 84mm (HxWxD)

**Weight**

approx. 420g

**Storage temperature**

-20 °C ... +80 °C

## Components and accessories

### Transmitter

#### Transmitter LKM 211



#### Din-Rail Transmitter LKM 211

Thermocouples, rail mounting, 4..20mA, 24V supply voltage

The LKM 211 is an analogue transducer for base thermocouples acc. DIN EN 60584 and DIN 43713.

The temperature-sensitive thermo voltage will be transformed voltage-linearly into an analogue current output of 4..20mA. The transducer LKM 211 can be mounted on customary rail systems. The transducer has been tuned ex works according to the customized requires. Further fine-tuning can be arranged by span and zero controller.

#### Protection classification

IP 20 according DIN 60529

#### Input

thermocouple K, J(L), T(U), N, E;  
S B with higher fault

#### Output

4...20mA current loop

#### Range

> 200 °C\*

#### Zero point

-200 °C ... +600 °C\*

#### Loop voltage

10...35VDC, reverse protection

#### Sensor fracture

>20 mA

#### Shorted Sensor

room ambient temperature

#### Permissible ripple

< 10 %

#### Reaction time

< 0.1s

## Components and accessories

### Transmitter

#### Transmitter LKM 211

**Vibration**

5g/10-200Hz

**Linearity error**

<0.1% FS\*

**Error of compensation**

<± 0.5°C

**TCR**

<100ppm/°C

**Operating temperature range**

-25°C ... +85°C

**Terminal type**

screw terminal

**Clamping range**

0.2...2.5mm<sup>2</sup>

**Humidity**

< 95%

**EMC emission**

EN 61000-6-3:2001

**EMC interference rejection ratio**

EN 61000-6-3:2001

**Mounting**

35mm DIN rail

**Case**

EMG25-LG

**Case material**

Polycarbonat

**Case dimension (HxWxD)**

75 x 25 x 53 mm

**Weight**

approx. 60g

\*dependent upon thermocouple

## Components and accessories

### Transmitter

#### Transmitter LKM 212



#### Din-Rail Transmitter LKM 212

Thermocouples, rail mounting, 0..10V, 24V supply voltage

The LKM 212 is an analogue transducer for base thermocouples acc. DIN EN 60584 and DIN 43713.

The temperature-sensitive thermo voltage will be transformed temperature-linearly into an analogue voltage output of 0..10V. The transducer LKM 212 can be mounted on customary rail systems. The LKM 212 has been tuned according to the customized requires ex works. Further fine-tuning can be arranged by span and zero controller.

#### Input

thermocouple K, J(L), T(U), N, E;  
S B with higher fault

#### Output

0 ... 10V

#### Range

> 200 °C\*

#### Zero point

-200 °C ... +600 °C\*

#### Sensor fracture

>10V

#### Shorted Sensor

ambient temperature

#### Permissible ripple

< 10 %

#### Reaction time

< 0.1s

#### Vibration

5g/10-200Hz

#### Linearity error

<0.1% FS\*

## Components and accessories

### Transmitter

#### Transmitter LKM 212

**Error of compensation**

<± 0.5°C

**TCR**

<100ppm/°C

**Operating temperature range**

-25°C ... +85°C

**Terminal type**

screw terminal

**Clamping range**

0.2...2.5mm<sup>2</sup>

**Humidity**

< 95%

**EMC emission**

EN 61000-6-3:2001

**EMC interference rejection ratio**

EN 61000-6-3:2001

**Mounting**

35mm DIN rail

**Supply voltage**

15...35V DC reverse protection

**Case**

EMG25-LG

**Case material**

Polycarbonat

**Case dimension (HxWxD)**

75 x 25 x 53 mm

**Weight**

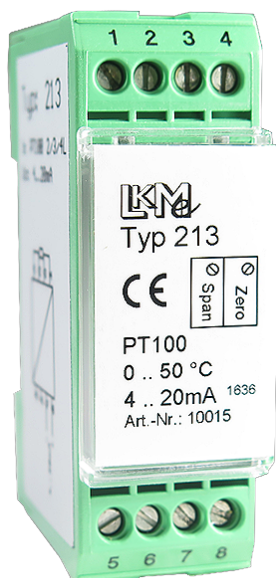
approx. 60g

\* dependent upon thermocouple

## Components and accessories

### Transmitter

#### Transmitter LKM 213



#### Din-Rail Transmitter LKM 213

Pt100/Pt1000, rail mounting, 4..20mA, 24V supply voltage

The LKM 213 is an analogue transducer for Pt 100/Pt1000-temperature sensors according DIN EN 60751. The temperature-sensitive resistance will be transformed into an analogue current

output of 4..20mA. The transducer LKM 213 can be mounted on customary rail systems.

The LKM 213 has been tuned ex works according to customized requires. Further fine-tuning can be arranged by span and zero controller.

#### Input

Pt100/Pt1000, 2-/3-/4 wire circuit

#### Output

4...20mA current loop

#### Range

> 20 °C\*

#### Zero point

-200 °C ... +600 °C\*

#### Loop voltage

10...35VDC, reverse protection

#### Test current

0.8 ... 1mA\*

#### Sensor fracture

>20 mA

#### Shorted Sensor

<4 mA

## Components and accessories

### Transmitter

#### Transmitter LKM 213

**Permissible ripple**

< 10 %

**Reaction time**

< 0.1s

**Vibration**

5g/10-200Hz

**Linearity error**

<0.1% FS

**TCR**

<100ppm/°C

**Operating temperature range**

-25°C ... +85°C

**Terminal type**

screw terminal

**Clamping range**

0.2...2.5mm<sup>2</sup>

**Humidity**

< 95%

**EMC emission**

EN 61000-6-3:2001

**EMC interference rejection ratio**

EN 61000-6-3:2001

**Mounting**

35mm DIN rail

**Case**

EMG25-LG

**Case material**

Polycarbonat

**Case dimension (HxWxD)**

75 x 25 x 53 mm

## Components and accessories

### Transmitter

### Transmitter LKM 213

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**Weight**

approx. 60g

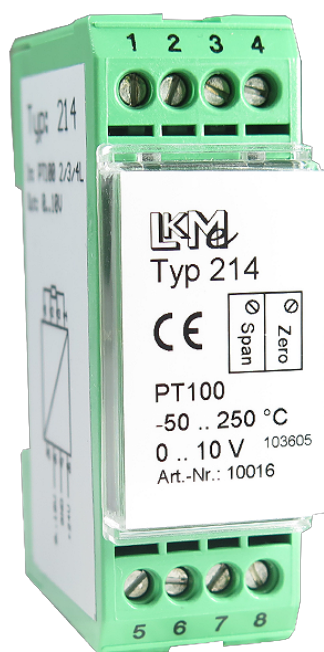
\* dependent upon sensor resistance



## Components and accessories

### Transmitter

#### Transmitter LKM 214



#### Din-Rail Transmitter LKM 214

**Pt100/Pt1000, Rail mounting, 0..10V, 24V supply voltage**

The LKM 214 is an analogue transducer for Pt 100/Pt1000-temperature sensors according DIN EN 60751. The temperature-sensitive resistance will be transformed into a voltage output of 0..10V. The transducer LKM 214 can be mounted on customary rail systems.

The LKM 214 has been tuned ex works according to the customized requires. Further fine-tuning can be arranged by span and zero controller.

#### Input

Pt100/Pt1000, 2-/3-/4 wire circuit

#### Output

0 ... 10V

#### Range

> 20 °C\*

#### Zero point

-200 °C ... +600 °C\*

#### Test current

0.8 ... 1mA\*

#### Sensor fracture

>10V

#### Shorted Sensor

0V

#### Permissible ripple

< 10 %

#### Reaction time

< 0.1s

#### Vibration

5g/10-200Hz

## Components and accessories

### Transmitter

#### Transmitter LKM 214

**Linearity error**

<0.1% FS

**TCR**

<100ppm/°C

**Operating temperature range**

-25°C ... +85°C

**Terminal type**

screw terminal

**Clamping range**

0.2...2.5mm<sup>2</sup>

**Humidity**

< 95%

**EMC emission**

EN 61000-6-3:2001

**EMC interference rejection ratio**

EN 61000-6-3:2001

**Mounting**

35mm DIN rail

**Current consumption**

max. 20mA

**Supply voltage**

15...35V DC reverse protection

**Case**

EMG25-LG

**Case material**

Polycarbonat

**Case dimension (HxWxD)**

75 x 25 x 53 mm

**Weight**

approx. 60g

## Components and accessories

### Transmitter

### Transmitter LKM 214

---

\* dependent upon sensor resistance

## Components and accessories

### Transmitter

### Transmitter LKM 223



#### Din-Rail Transmitter LKM 223

**Pt100/Pt1000, rail mounting, 4..20mA, 24V Supply voltage**

The LKM 223 is an analogue transducer for Pt 100/Pt1000-temperature sensors according DIN EN 60751. The temperature-sensitive resistance will be transformed into an analogue current output of 4...20mA. The transducer LKM 223 can be mounted on customary rail systems. The LKM 223 has been tuned ex works according to customized requires. Further fine-tuning can be arranged by span and zero controller.

#### Input

Pt100/Pt1000, 2-/3 wire circuit

#### Output

4...20mA current loop

#### Range

> 20 °C\*

#### Zero point

-200 °C ... +600 °C\*

#### Loop voltage

10...35VDC, reverse protection

#### Test current

0.8 ... 1mA\*

#### Sensor fracture

>20 mA

#### Shorted Sensor

<4 mA

#### Permissible ripple

< 10 %

#### Reaction time

< 0.1s

## Components and accessories

### Transmitter

#### Transmitter LKM 223

**Vibration**

5g/10-200Hz

**Linearity error**

<0.1% FS

**TCR**

<100ppm/°C

**Operating temperature range**

-25°C ... +85°C

**Terminal type**

screw terminal

**Clamping range**

0.2...2.5mm<sup>2</sup>

**Humidity**

< 95%

**EMC emission**

EN 61000-6-3:2001

**EMC interference rejection ratio**

EN 61000-6-3:2001

**Mounting**

35mm DIN rail

**Case**

EMG25-LG

**Case material**

Polycarbonat

**Case dimension (HxWxD)**

75 x 25 x 53 mm

**Weight**

approx. 60g

\* dependent upon sensor resistance

## Components and accessories

### Transmitter

#### Transmitter LKM 224



#### Din-Rail Transmitter LKM 224

**Pt100/Pt1000, rail mounting, 0..10V, 24V supply voltage**

The LKM 224 is an analogue transducer for Pt 100/Pt1000-temperature sensors according DIN EN 60751. The temperature-sensitive resistance will be transformed into an analogue current output of 4...20mA. The transducer LKM 224 can be mounted on customary rail systems.

The LKM 224 has been tuned ex works according to customized requires. Further fine-tuning can be arranged by span and zero controller.

#### Input

Pt100/Pt1000, 2-/3 wire circuit

#### Output

0 ... 10V

#### Range

> 20 °C\*

#### Zero point

-200 °C ... +600 °C\*

#### Test current

0.8 ... 1mA\*

#### Sensor fracture

>10V

#### Shorted Sensor

0V

#### Permissible ripple

< 10 %

#### Reaction time

< 0.1s

#### Vibration

5g/10-200Hz

## Components and accessories

### Transmitter

#### Transmitter LKM 224

**Linearity error**

<0.1% FS

**TCR**

<100ppm/°C

**Operating temperature range**

-25°C ... +85°C

**Terminal type**

screw terminal

**Clamping range**

0.2...2.5mm<sup>2</sup>

**Humidity**

< 95%

**EMC emission**

EN 61000-6-3:2001

**EMC interference rejection ratio**

EN 61000-6-3:2001

**Mounting**

35mm DIN rail

**Current consumption**

max. 40 mA

**Supply voltage**

15...35V DC reverse protection

**Case**

EMG25-LG

**Case material**

Polycarbonat

**Case dimension (HxWxD)**

75 x 25 x 53 mm

**Weight**

approx. 60g

## Components and accessories

### Transmitter

### Transmitter LKM 224

---

\* dependent upon sensor resistance



## Components and accessories

### Transmitter

#### Transmitter LKM 231



#### Transmitter for thermocouples - DIN rail mounting - with galvanic isolation

The LKM 231 is an analog transmitter for several thermocouples acc. to DIN EN 60584 and DIN 43710. It changes the temperature-dependent thermovoltage of the sensors in an analog standard output current signal of 4...20mA. It has an galvanic isolation from input to output. The cold-junction compensation happens inside the transmitter by self. The transmitter LKM 231 will be delivered with the configuration as desired.

The alignment takes place depending upon measuring range and type of thermocouple in such way that the arising temperature errors are minimized. A voltage-linear alignment for the subsequent treatment of the measured values in PC or SPS can be made likewise. This should be indicated for the order as. The final adjustment takes place by means of span and zero regulators.

#### Input

thermocouple K, J(L), T(U), N, E;  
S B with higher fault

#### Output

4 ... 20mA

#### Range

> 200 °C\*

#### Zero point

-200 °C ... +600 °C\*

#### Loop voltage

10...35VDC, reverse protection

## Components and accessories

### Transmitter

#### Transmitter LKM 231

**Sensor fracture**

>20 mA

**Shorted Sensor**

room ambient temperature

**Auxiliary supply**

24V DC  $\pm$  10%, reverse protection

**Permissible ripple**

< 10 %

**Reaction time**

< 0.1s

**Vibration**

5g/10-200Hz

**Insulation voltage**

1 kV

**Linearity error**

<0.1% FS\*

**Error of compensation**

< $\pm$  0.5°C

**TCR**

<100ppm/°C

**Operating temperature range**

-25°C ... +85°C

**Terminal type**

screw terminal

**Clamping range**

0.2...2.5mm<sup>2</sup>

**Humidity**

< 95%

**EMC emission**

EN 61000-6-3:2001

## Components and accessories

### Transmitter

#### Transmitter LKM 231

---

**EMC interference rejection ratio**

EN 61000-6-3:2001

**Mounting**

35mm DIN rail

**Current consumption**

max. 40 mA

**Case**

EMG25-LG

**Case material**

Polycarbonat

**Case dimension (HxWxD)**

75 x 25 x 53 mm

**Weight**

approx. 60g

\*depend on thermocouple

## Components and accessories

### Transmitter

#### Transmitter LKM 232



#### Din-Rail Transmitter LKM 232

Thermocouples, rail mounting, 0..10V, 24V supply voltage

The LKMe Type 232 is an analog measuring transducer for base metal thermocouples in accordance with DIN EN 60584 and DIN 43510. It converts the temperature-dependent thermocouple voltage into an output signal of 0..10V that is linear with voltage.

The LKMe Type 424 measuring transducer is designed for installation on a mounting rail. The measuring transducer is delivered with a calibration to customer requirements. A null point potentiometer and a range potentiometer enable fine adjustments to be performed on site.

#### Protection classification

IP 20 according DIN 60529

#### Input

thermocouple K, J(L), T(U), N, E;  
S B with higher fault

#### Output

0 ... 10V

#### Range

> 200 °C\*

#### Zero point

-200 °C ... +600 °C\*

#### Sensor fracture

>10V

#### Shorted Sensor

ambient temperature

#### Permissible ripple

< 10 %

## Components and accessories

### Transmitter

#### Transmitter LKM 232

**Reaction time**

< 0.1s

**Vibration**

5g/10-200Hz

**Insulation voltage**

1 kV

**Linearity error**

<0.1% FS\*

**Error of compensation**

<± 0.5°C

**TCR**

<100ppm/°C

**Operating temperature range**

-25°C ... +85°C

**Terminal type**

screw terminal

**Clamping range**

0.2...2.5mm<sup>2</sup>

**Humidity**

< 95%

**EMC emission**

EN 61000-6-3:2001

**EMC interference rejection ratio**

EN 61000-6-3:2001

**Mounting**

35mm DIN rail

**Current consumption**

max. 40 mA

**Supply voltage**

24VDC ± 10%

## Components and accessories

### Transmitter

#### Transmitter LKM 232

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**Case**

EMG25-LG

**Case material**

Polycarbonat

**Case dimension (HxWxD)**

75 x 25 x 53 mm

**Weight**

approx. 60g

\*depend upon thermocouple

## Components and accessories

### Digital thermometer

#### Digital thermometer DTM 3000



#### **Cost-effective high-accuracy manual thermometer for Pt100 and Pt1000 probes and thermocouples NiCr-Ni, Fe-CuNi oder Cu-CuNi controlled by a microcontroller**

The DTM3000 electronic digital thermometer stands out primarily in terms of its very high accuracy, low power consumption, low weight, simplicity of operation, and a low price.

The DTM3000 unit has been designed for accurate measurements over a very large temperature range. The resolution of the unit is 0.1 °C over the whole temperature range.

The unit is switched on by actuating the on/off button. A segment check is then performed, during which all segments of the display are activated for a few seconds. Two additional buttons provide convenient measurement operations. Using the max/min button calls up the maximum and minimum measured values. If this button is actuated for approx. 3 sec., the previous values are deleted. The hold button enables the last measured value to be stored. If this button is actuated a second time the unit goes back into normal measurement operation mode. If a reading lies above the top value of the measurement range Err2 is displayed, if it lies below the bottom end Err1 is displayed.

A serial RS232 interface is installed as standard.

A large number of Pt100/Pt1000 sensors and thermocouple sensors are available for the DTM3000 digital thermometer for practically any application. For particular measurement problems we can also manufacture economical customised sensors to meet your requirements.

#### **Input**

Thermocouple Typ K  
Thermocouple Typ T  
Thermocouple Typ J  
Thermocouple Typ S  
Pt100, 4 wire circuit  
Pt1000, 3 wire circuit  
on inquiry

Components and accessories  
Digital thermometer  
Digital thermometer DTM 3000

**Measuring range**

Type K -200 °C ... +1370 °C  
Type T -200 °C ... +400 °C  
Type J -200 °C ... +1200 °C  
Type S 0 °C ... +1760 °C  
Pt100 -200 ... +830 °C  
P1000 -50 °C ... +400 °C  
on inquiry

**Resolution**

0.1 °C/1 °C° \*

**Accuracy**

0.5% FS

**Operating temperature range**

0 °C ... +60 °C

**Power supply**

9 Volt battery, 6F22

**Sampling rate**

maximal 4/s

**Battery operation time**

>500h at 1/s

**Features**

Maximum, Minimum, Hold

**Connector**

Miniatur thermocouple socket  
Pt100 Binder 719 4-pole  
Pt1000 Binder 719 3-pole

**Interface**

RS232\*\*  
USB\*\*

**cold-junction compensation**

internal



## Components and accessories

### Digital thermometer

### Digital thermometer DTM 3000

---

Thermocouples or resistance sensors Pt100/Pt1000 are adjusted by manufacturer.

\* can be configured via Software

\*\* interface cable and evaluation software must be purchased as optional extras

## Components and accessories

### Digital thermometer

### Digital thermometer DTM light



#### Cost-effective portable digital thermometer for thermocouples type K

The DTMlight electronic digital thermometer stands out primarily in terms of its accuracy, low power consumption, low weight, simplicity of operation, and a low price. The DTMlight unit has been designed for simple measurements over a very large temperature range.

The unit is switched on by actuating the switch on the left side of the housing.

If the input is open (no probe connected) strikes ?1? on the Display. Now the thermometer is ready for measurement. If a probe is connected when the DTMlight switched on it will directly shows the registered temperature of the probe.

The switch of is funded also by actuating the on/off switch.

A large number of thermocouple sensors are available for the DTM3000 digital thermometer for practically any application. (28 standard configurations).

The probes have a green flex and a green miniature thermocouple socket.

For particular measurement problems we can also manufacture economical customized sensors to meet your requirements.

#### Input

thermocouples type K NiCr-Ni  
( miniature thermocouple female connector )

#### Measuring range

-100 °C ... +1370 °C

#### Resolution

1 °C

#### Display

LCD 3 1/2-digit, 12.7mm character high

#### Accuracy

-100 °C... -50 °C: 1% FS  
-50 °C...1100 °C: 0.5% FS  
1100 °C...1350 °C: 3% FS

## Components and accessories

### Digital thermometer

#### Digital thermometer DTM light

---

**Operating temperature range**

0°C ... +50°C

**Power supply**

9 Volt battery, 6F22

**Battery operation time**

2000h

**Case dimension (HxWxD)**

123 x 72,5 x 27,5 mm

## Components and accessories

### Digital thermometer

### Digital thermometer DTM 5080

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#### **Cost-effective digital temperature logging module for the RS232 and USB interface for sensing devices with temperature resistance sensors**

The DTM5080 temperature-logging module is simply inserted into the serial RS 232 interface of a PC. For use of the computer's USB connection a variant with a USB adapter can be obtained (specify on ordering). It is suitable for the logging of temperature resistance sensors such as Pt100/1000, Ni100/1000, as well as other resistance sensors up to a maximum value of 2.5 k $\Omega$ . The corresponding temperature or resistance value is outputted. The data-logging program that is also supplied validates the measured values and stores them as required. By means of control via simple ASCII characters data logging using programming languages such as C or Visual Basic is also not a problem. The module stands out primarily in terms of its very high accuracy, simplicity of operation, and a very favourable price. It has been designed for accurate measurements over a wide range of temperatures. When the sensor is connected up using 4-lead technology a high overall accuracy of the device can be achieved when used in conjunction with a high-precision sensor. The resolution of the device is 0.01  $^{\circ}\text{C}$ .

The DTM5080 temperature-logging module is supplied with a standard Pt100 cable sensing device, Class B, 3.5x30mm, 1m cable, and a 2m extension cable for the RS 232 interface or a USB adapter cable. For particular measurement problems we can also manufacture cost-effective, customer-specific sensing devices to your specifications.

#### **Input**

Pt100/1000, Ni100/1000 as soon as other resistance sensors, sensor replaceable

#### **Kind of connection**

4 wire circuit

## Components and accessories

### Digital thermometer

#### Digital thermometer DTM 5080

##### Measuring range

Pt100 -200°C..845°C  
Pt1000 -50..400°C  
Ni100 -60..230°C  
Ni1000 -60..230°C  
resistance range 1 0..380W  
resistance range 2 0..2,500 kW

##### Resolution

0.01°C

##### Linearization accuracy

± 0,02°C

##### System accuracy

without sensor typ. <0,06°C

##### Female connector

Binder 719 4-polig

##### Operating temperature range

0°C ... +70°C

##### Power supply

6mA out from interface

##### Sampling rate

approx. 3/s

##### Case dimension (HxWxD)

32 x 58 x 16mm

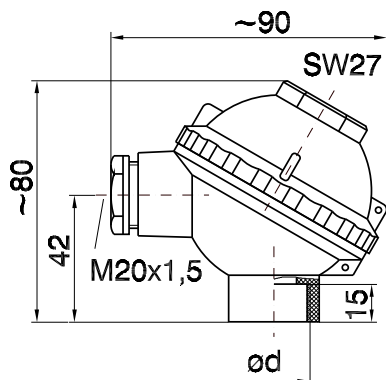
##### Weight

approx. 23g

## Components and accessories

### Connection heads

#### Connection head BK



Connection head for resistance thermometers  
and thermocouples

#### Protection classification

IP 54 according DIN 60529

#### Application temperature

for Polyamid (PA) to 80 °C  
for Polyphenylenoxid (PPO) to 120 °C

#### Housing material

plastic Polyamid (PA)  
plastic Polyphenylenoxid (PPO)

#### Protective tube connection $\varnothing$ d / L

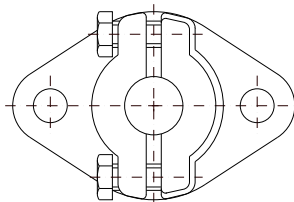
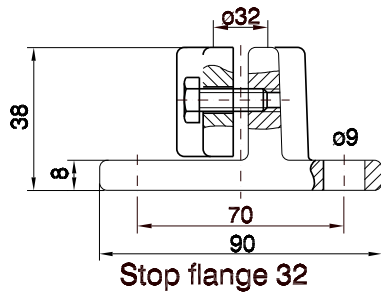
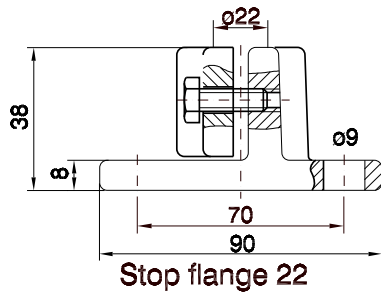
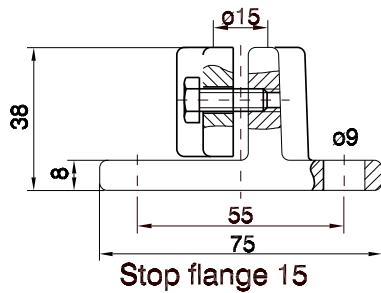
M24x1,5 / 16

-connection dimension accept to DIN 43 729

## Components and accessories

### Fixing materials

### Stop flange AF



Adjustable clamp flange

#### Stop flange for protective tube- $\emptyset$

15  
22  
32

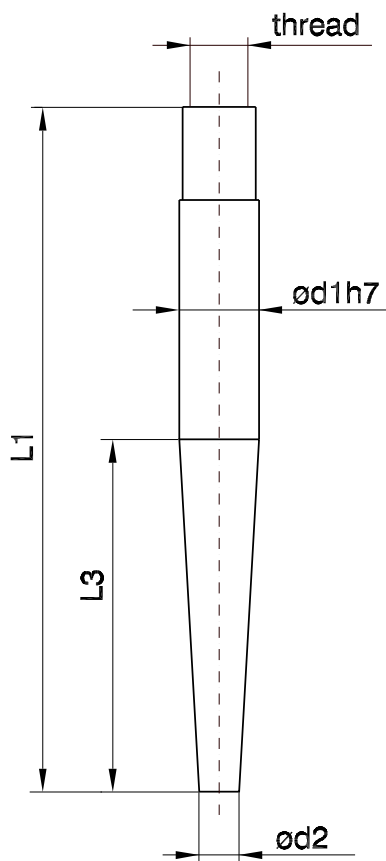
#### Material

ligh metal  
gray iron

## Components and accessories

### Extension protecting tubes

#### additional protective tube for welding in ZSW



#### Protective tube material

1.0460 (C22.8)  
1.4571  
on inquiry

#### Protective tube Form 4 for welding in according DIN 43 772

Form; L1; L3; ø d1; ø d2; measuring insert-ø ; thread

D1; 140; 65; 24; 12,5; 6; M18x1,5  
D2; 200; 125; 24; 12,5; 6; M18x1,5  
D3\*; 200; 125; 30; 12,5; 8  
D4; 200; 65; 24; 12,5; 6; M18x1,5  
D4S\*; 140; 65; 18; 9; 3; M14x1,5  
D5; 260; 125; 24; 12,5; 6; M18x1,5  
D6\*; 255; 125; 30; 16; 8  
on inquiry

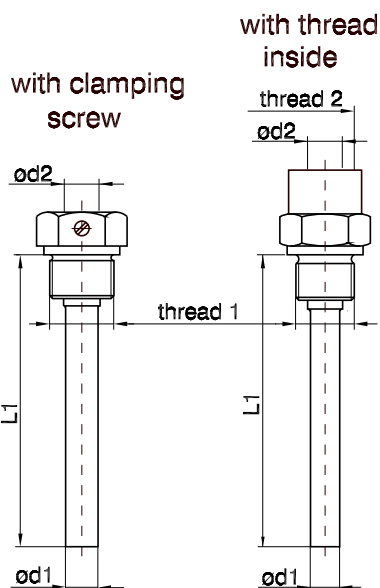
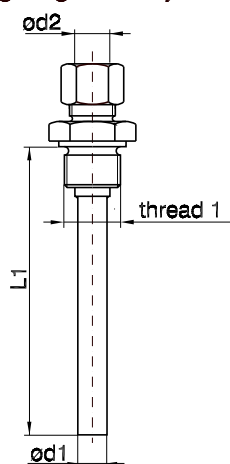


## Components and accessories

### Extension protecting tubes

#### additional protective tube for screwing in ZSR

with clamp ring or  
cutting ring thread joint



#### Construction

clamping ring screwing  
compression ring screwing  
terminal screw  
inside thread

#### Protective tube material

1.4571  
on inquiry

#### Diameter d1

on inquiry

#### Diameter d2

on inquiry

#### Insert length $L_1$

on inquiry

#### Thread 1

on inquiry

#### Thread 2

on inquiry

## Components and accessories

### Digital thermometer

#### Digital thermometer DTM 3000 special



**Cost-effective high-accuracy manual thermometer with a resolution of 0.01 °C, controlled by a microcontroller**

The DTM3000-special electronic digital thermometer stands out primarily in terms of its very high accuracy, low power consumption, low weight, simplicity of operation, and a low price. The DTM3000-special unit has been designed to provide highly accurate measurements over a range of temperatures from -20 to 110 °C. The price is only a small fraction of the price that would normally be usual for a unit of this accuracy. The sensor is permanently connected to the unit and is calibrated together with the latter. If the measurement moves out of range at the top or bottom end Err2 or Err1 is displayed respectively.

The unit is switched on by actuation of the on/off button. A segment check is then executed, during which all segments of the display are exercised for several seconds. Two additional buttons allow for convenient operation. With the max/min button the maximum and minimum measured values are stored in each case. If this button is actuated for approx. 3 secs the previous values are deleted. The hold button enables the storage of the current measured value.

A serial RS232 interface is installed as standard. The interface cable and the evaluation software can be purchased as optional extras. The DTM3000-special digital thermometer is supplied with an immersion sensor of 2x100mm immersion tube length as standard. For particular measurement problems we can also manufacture cost-effective and customer-specific sensors to your specifications.

#### Input

Pt100 permanently connected

#### Measuring range

-20 °C ... +110 °C

#### Resolution

0.01 °C

#### Display

LCD 4-digit, 11mm character height

#### Accuracy

± 0.03 °C ± 1 Digit

## Components and accessories

### Digital thermometer

#### Digital thermometer DTM 3000 special

##### Operating temperature range

0°C ... +70°C

##### Power supply

9 Volt battery, 6F22

##### Sampling rate

maximum 1/s \*

##### Battery operation time

>500h at 1/s

##### Features

Maximum, Minimum, Hold

##### Case material

ABS black

##### Dimension

60 x 120 x 26mm ( BxHxT )

##### Weight

approx. 130g

##### Interface

RS232\*\*  
USB\*\*

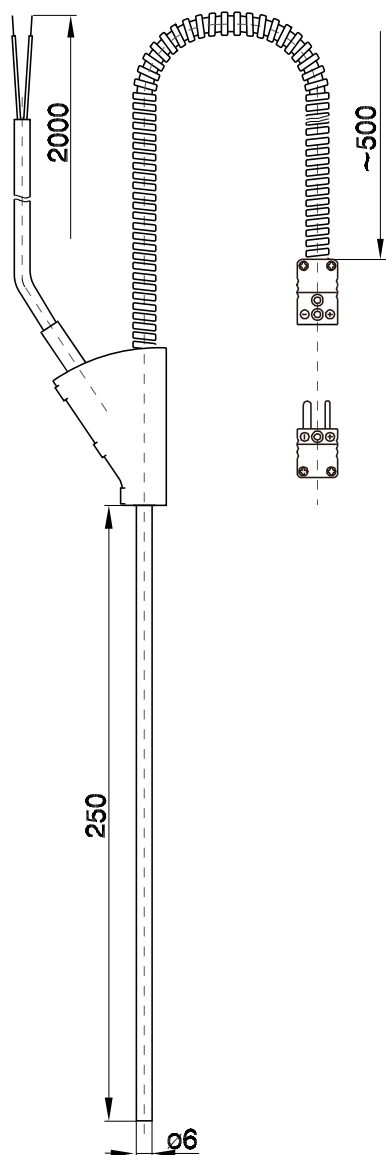
\* can be configured via Software

\*\* interface cable and evaluation software must be purchased as optional extras

## Components and accessories

### Reference junction

### Cold junction VGS



For all thermocouple tests with higher accuracy requirements, especially in calibration laboratories.

Application in compressed ice-water mixture in a Dewar container.

#### Connector

free ends  
connector on inquiry

#### Thermo junction

L (Fe-CuNi) DIN 43 710  
J (Fe-CuNi) DIN EN 60584  
K (NiCr-Ni) DIN EN 60584  
N (NiCrSi-NiAl) DIN EN 60584  
E (NiCr-CuNi) DIN EN 60584  
T (Cu-CuNi) DIN EN 60584  
S (PtRh10-Pt) DIN EN 60584  
R (PtRh13-Pt) DIN EN 60584  
B (PtRh30-PtRh6) DIN EN 60584  
Au-Pt DIN EN 62460  
Pt-Pd DIN EN 62460  
on inquiry

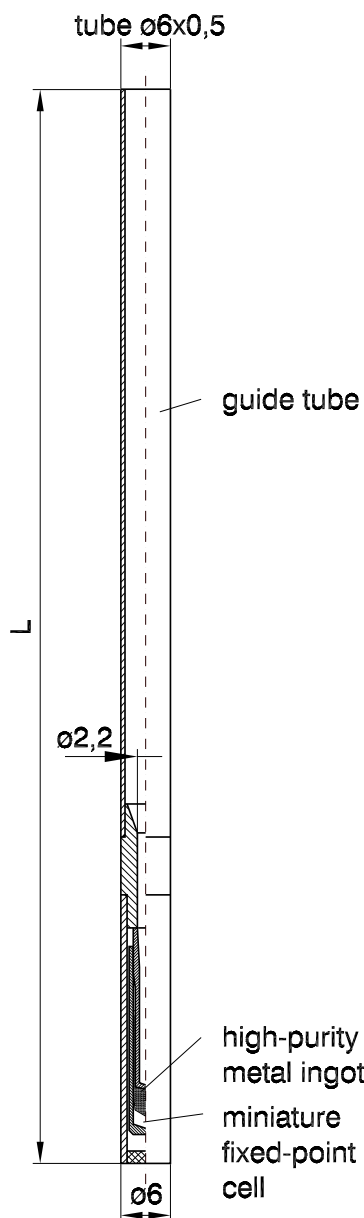
#### Type of connection cable

2m Cu stranded wire LifY 0,5 mm<sup>2</sup> , with low e.m.f.

## Components and accessories

### Miniature fixed-point cell

### Fixed-point calibration rod FKS



#### Brief description

Stainless steel tube with firmly installed miniature fixed-point cell, used for an easy calibration of slender temperature sensors ( $< \varnothing 2 \text{ mm}$ ) or their whole measuring circuits

#### Application:

Calibration or other accredited laboratories, research and development

#### Prerequisites:

Adequate installation situation, temperature of furnace/bath is controllable and its range encompasses the specific fixed-point temperature

#### Calibration uncertainty:

$U = 0.01 \dots 0.2 \text{ K}$ , depends on specific sensor structure, thermal environment, furnace control parameters e.t.c.

#### Calibration procedure:

See additional information

#### Application temperature

applicable to max. 50 K above particular fixing point temperature

#### Fixed point material

In 156,59 °C  
 Sn 231,93 °C  
 Zn 419,53 °C  
 Au58In42 495,4 °C  
 Al67Cu33 548,2 °C  
 Ag88Al12 567,8 °C  
 Al87Si13 578,8 °C  
 Al 660,32 °C  
 on inquiry dependent on application temperature

#### Protective tube material

2.4816  
 on inquiry

#### total length

250 mm  
 on inquiry