GÜNTHER GmbH
Temperaturmesstechnik

TEMPERATURE SENSORS FOR
SHIP INDUSTRY

MarineTECH Series

Guenther. Be better. Be TECH

GML-R Series

Resistance thermometer / Widerstandsthermometer

GML-R-01	GML-R-02	GML-R-03	GML-R-06

1 **2** **3** **4**

GML-RM Series

Resistance thermometer / Widerstandsthermometer

GML-RM-07	GML-RM-08	GML-RM-09	GML-RM-10	GML-RM-11

5 **6** **7** **8** **9**

GML-T Series

Thermocouples / Thermoelemente

GML-T-01	GML-T-02	GML-T-03	GML-T-06	GML-T-04	GML-T-05

10 **11** **12** **13** **14** **15**

1

Straight resistance thermometer

The resistance thermometers are designed to measure the temperature of liquid or gaseous media, due to its construction, in particular used materials, the sensors can be used measure temperature in the range of -25 to +550°C. The temperature value is converted to resistance by the sensor Pt100 or Pt1000. The connection can be carried out in a 2-wire or 3-, 4- wire circuits as required.

Optionally can be made with temperature transmitter to convert resistance to analog signal to 4..20mA.

Basic technical data for thermometer:

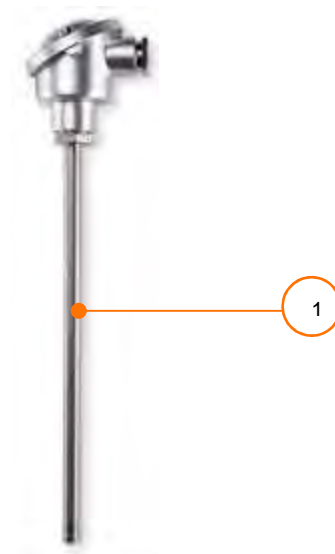|	
Measuring insert	1x Pt100, 2x Pt100, 1x Pt1000, 2x Pt1000
Connection	2-wire, 3-wire or 4-wire
Accuracy	class A or class B
Measuring range	-25…+550°C
Connection head	form B, NA, BUZH, aluminum, resistant to maritime conditions form B05 (polyamide) form B06 (stainless steel)
Protection tube diameter	standard Ø6- Ø12mm (other on request, max. Ø 22mm)
Material of protection tube	stainless steel 1.4571 (standard), other on request (e.g. 1.4404, 1.4841)
Nominal length	50mm – 800mm (max 300mm for temperature of exhaust gases)
Material of neck tube and measuring insert	stainless steel
Mineral-insulated insert diameter	min. Ø 3mm, max Ø 6mm (standard Ø 6mm)

Type Approval Certificate
No. TAA0000T6

DNV·GL

Straight resistance thermometer
GML-R-01 MarineTECH Series

Construction

1 Installation part

Diameter: standard Ø6- Ø12mm
Length: 50..800mm

Drawing

L1   - Nominal length
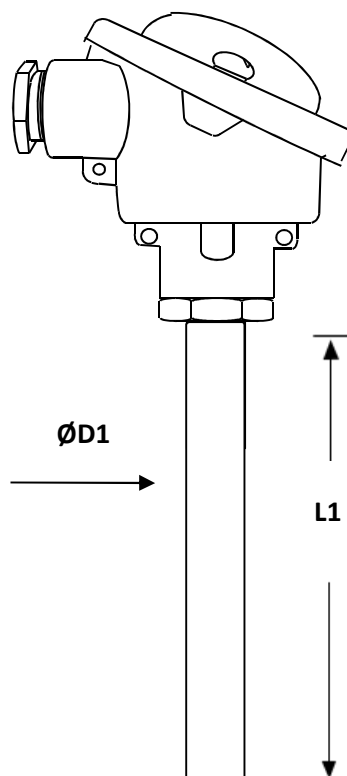
ØD1   - Protection tube diameter
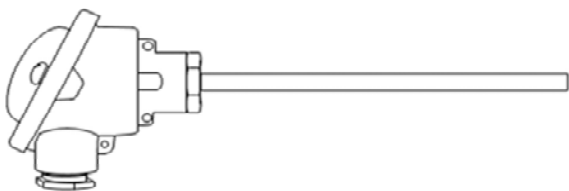
Photo of a typical version

ØD1

L1

08.17

| GML-R-01 | -75 | -1 | -12 | -2 | -10 | -100 | / |

Type designations

**Resistance thermometer with connection head
(without process connection)**

Connection head

30	B06, stainless steel
55	NA, alu, resistant to maritime conditions
75	B, alu, resistant to maritime conditions
85	BUZH, alu, resistant to maritime conditions
90	B05, polyamide head

Sensor option

| 1 | 1x |
| 2 | 2x |

Measuring insert

12	Pt100, 2-wire
13	Pt100, 3-wire
14	Pt100, 4-wire
22	Pt1000, 2-wire
23	Pt1000, 3-wire
24	Pt1000, 4-wire

Accuracy

| 1 | class A |
| 2 | class B |

Protection tube diameter (min Ø6mm, max Ø22mm) (øD1)

6	6mm
8	8mm
9	9mm
10	10mm
11	11mm
….	other
22	22mm

Nominal length (L1)

| 100 | 100mm |
| …… | other [mm] (limit: 800mm) 300mm* for exhaust gases |

Extra codes, one after the decimal

| 547 | temperature transmitter   4…20mA PR electronics 5333 (only for Pt100) |

Example: Type **GML-R-01-75-1-12-2-10-100**

Resistance thermometer with connection head type B

1xPt100, 2-wire, accuracy: class B, diameter of protection tube: 10mm, nominal length: 100mm

ver. 4.17

2

Screw-in resistance thermometer

The resistance thermometers are designed to measure the temperature of liquid or gaseous media, due to its construction, in particular used materials, the sensors can be used to measure temperature in the range of -25 to + 550°C. The temperature value is converted to resistance by the sensor Pt100 or Pt1000. The connection can be carried out in a 2-wire or 3-, 4- wire circuits as required.

Optionally can be made with temperature transmitter to convert resistance to analog signal to 4..20mA.

Basic technical data for thermometer:

Measuring insert	1x Pt100, 2x Pt100, 1x Pt1000, 2x Pt1000
Connection	2-wire, 3-wire or 4-wire
Accuracy	class A or class B
Measuring range	-25…+550°C
Connection head	form B, NA, BUZH, aluminum, resistant to maritime conditions form B05 (polyamide) form B06 (stainless steel)
Protection tube diameter	standard Ø6- Ø12mm (other on request, max. Ø 22mm)
Process connection	standard thread G1/2", M20x1.5 (possible: G1/4"-G1", M12x1-M27x2)
Protection tube length	stainless steel 1.4571 (standard), other on request (e.g. 1.4404, 1.4841)
Installation length	50mm – 800mm (300mm for temperature of exhaust gases)
Neck tube	length 145mm, standard diameter as protection tube, another on request (Ø6–Ø22, length 50-200mm)
Material of neck tube and measuring insert	stainless steel
Mineral-insulated insert diameter	min. Ø 3mm, max Ø 6mm (standard Ø 6mm)

Type Approval Certificate
No. TAA0000T6

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Screw-in resistance thermometer
GML-R-02 MarineTECH Series

Construction

1   Installation part

Diameter: standard Ø6-Ø12mm
Length: 50..800mm

2   Process connection
Standard G1/2", M20x1.5
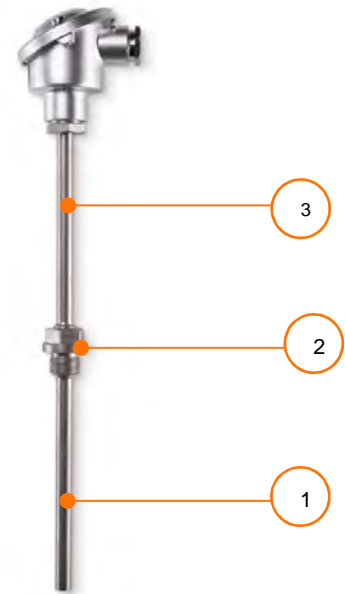
3   Neck tube
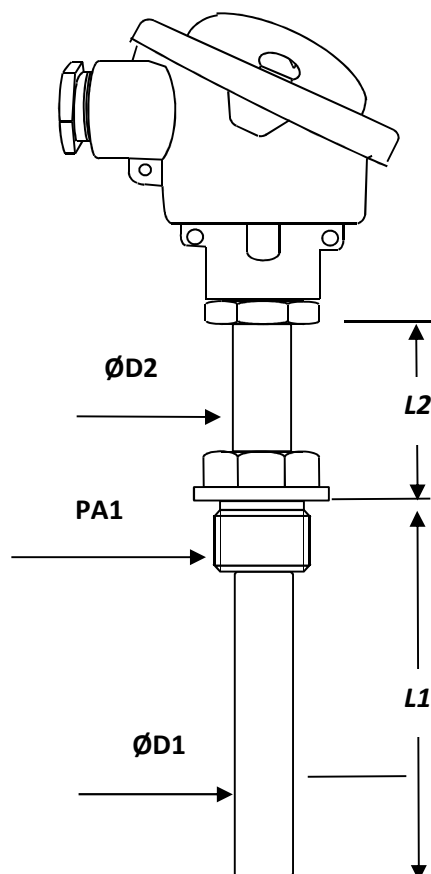Length 145mm, other on request

Photo of a typical version

Drawing

L1   - Installation length

L2   - Neck tube length

PA1 - Process connection

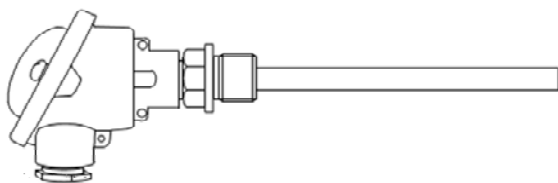Ø D1 - Protection tube diameter

Ø D2 - Neck tube diameter

ØD2

PA1

ØD1

L2

L1

| GML-R-02 | - 75 | - 1 | - 12 | - 2 | - 10 | - 100 | - G012 | / | |

Type designations

Screw-in resistance thermometer with connection head

Connection head

30	B06, stainless steel
55	NA, alu, resistant to maritime conditions
75	B, alu, resistant to maritime conditions
85	BUZH, alu, resistant to maritime conditions
90	B05, polyamide head

Sensor option

| 1 | 1x |
| 2 | 2x |

Measuring insert

12	Pt100, 2-wire
13	Pt100, 3-wire
14	Pt100, 4-wire
22	Pt1000, 2-wire
23	Pt1000, 3-wire
24	Pt1000, 4-wire

Accuracy

| 1 | class A |
| 2 | class B |

Protection tube diamter (min ø6mm, max Ø22mm) (øD1)

6	6mm
….	other
22	22mm

Installation length (L1)

| 100 | 100mm |
| …… | other [mm] (limit: 800mm) 300mm* for exhaust gases |

Process connection (PA1)

G012	thread G1/2"
G034	thread G3/4"
MF20	thread M20x1.5
MF27	thread M27x2
....	other

Extra codes, one after the decimal

| Hxxx | H, xxx - neck pipe length in [mm] |
| 547 | temperature transmitter 4…20mA PR electronics 5333 (only for Pt100) |

Example: Type **GML-R-02-75-1-12-2-10-100-G012**

Screw-in thermometer with head type B, 1x Pt100, 2-wire, class B, protection tube diameter: 10mm, installation length 100mm, G1/2" process connection

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3

Screw-in resistance thermometer without protection tube

The temperature thermometers are designed to measure the temperature of liquid or gaseous media, due to its construction, in particular used materials, the sensors can be used to measure temperature in the range of -25 to +550°C. The temperature value is converted to resistance by the sensor Pt100 or Pt1000. The connection can be carried out in a 2-wire or 3-, 4- wire circuits as required. Most often for installation in existing pocket.

Optionally can be made with temperature transmitter to convert resistance to analog signal to 4..20mA.

Basic technical data for thermometer:

Measuring insert	1x Pt100, 2x Pt100, 1x Pt1000, 2x Pt1000
Connection	2-wire, 3-wire or 4-wire
Accuracy	class A or class B
Measuring range	-25…+550°C
Connection head	form B, NA, BUZH, aluminum, resistant to maritime conditions form B05 (polyamide) form B06 (stainless steel)
Mineral-insulated insert diameter	min. Ø 3mm, max Ø 6mm (standard Ø 6mm)
Thermometer connection (to pocket)	thread M14x1.5, M18x1.5, M20x1.5, G1/2"
Installation length (to pocket)	50mm – 800mm (300mm for temperature of exhaust gases)
Neck tube	length 145mm, standard diameter Ø11mm, another on request (Ø6–Ø22, length 50-200mm)
Neck tube and insert material	stainless steel

Type Approval Certificate
No. TAA0000T6

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Screw-in resistance thermometer without protection tube
GML-R-03 MarineTECH Series

Construction

1 Installation part

Insert diameter: standard Ø6mm
Length: 50..800mm

2 Thermometer connection to pocket
Thread M14x1.5, M18x1.5, M20x1.5, G1/2"

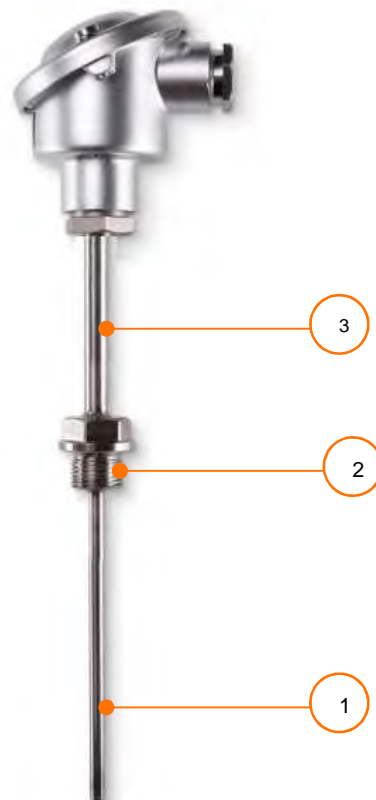**3 Neck tube**
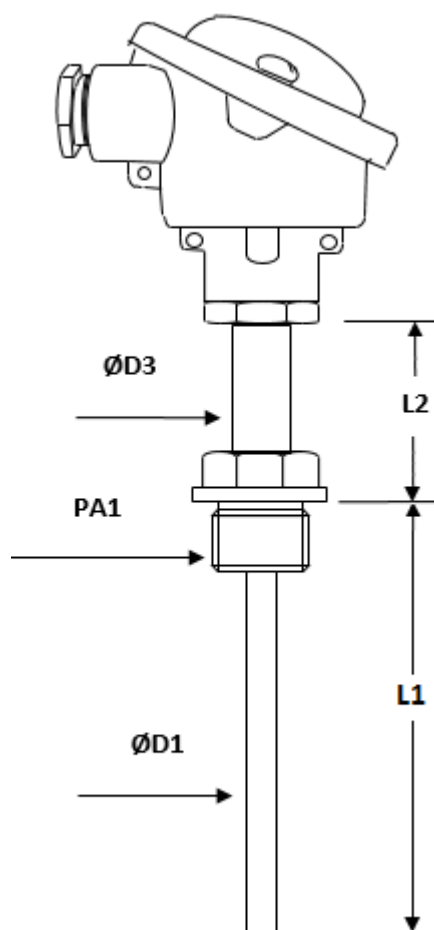Length 145mm, other on request

Photo of a typical version

Drawing

L1 - Installation length
L2 - Neck tube length
PA1 - Thermometer connection
      (standard M14x1,5)
Ø D1 - Insert diameter
        (standard 6mm)
Ø D3 - Neck tube diameter
        (standard 11mm)

| GML-R-03 | -75 | -1 | -12 | -2 | -6 | -100 | -MF14 | / | H145 |

Type designations

**Screw-in resistance thermometer
without protection tube**

Connection head

30	B06, stainless steel
55	NA, alu, resistant to maritime conditions
75	B, alu, resistant to maritime conditions
85	BUZH, alu, resistant to maritime conditions
90	B05, polyamide head

Sensor option

| 1 | 1x |
| 2 | 2x |

Measuring insert

12	Pt100, 2-wire
13	Pt100, 3-wire
14	Pt100, 4-wire
22	Pt1000, 2-wire
23	Pt1000, 3-wire
24	Pt1000, 4-wire

Accuracy

| 1 | class A |
| 2 | class B |

Insert diameter (ØD1)

| 6 | 6mm | standard |

Installation length to pocket (L1)

| 100 | 100mm |
| …… | other [mm] (limit: 800mm) 300mm* for exhaust gases |

Thermometer connection (to pocket) (PA1)

G012	thread G1/2"
MF14	thread M14x1.5
MF18	thread M18x1.5
MF20	thread M20x1.5

Extra codes, one after the decimal

| Hxxx | H, xxx - neck pipe length in [mm] |
| 547 | temperature transmitter 4…20mA PR electronics 5333 (only for Pt100) |

Example: Type **GML-R-03-75-1-12-2-6-100-MF14/H050**

Screw-in resistance thermometer without protection tube with head type B

1x Pt100, 2-wire, accuracy class B, measuring insert Ø6mm, installation length to pocket: 100mm,

M14x1.5 thermometr connection (to pocket), neck pipe length: 145mm

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4

Screw-in resistance thermometer with additional pocket

The resistance thermometers are designed to measure the temperature of liquid or gaseous media, due to its construction, in particular used materials, the sensors can be used to measure temperature in the range of -25 to + 550°C. The temperature value is converted to resistance by the sensor Pt100 or Pt1000. The connection can be carried out in a 2-wire or 3-, 4- wire circuits as required.

Optionally can be made with temperature transmitter to convert resistance to analog signal to 4..20mA.

Basic technical data for thermometer:

Measuring insert	1x Pt100, 2x Pt100, 1x Pt1000, 2x Pt1000
Connection	2-wire, 3-wire or 4-wire
Accuracy	class A or class B
Measuring range	-25…+550˚C
Connection head	form B, NA, BUZH, aluminum, resistant to maritime conditions form B05 (polyamide) form B06 (stainless steel)
Mineral-insulated insert diameter	min. Ø 3mm, max Ø 6mm (standard Ø6mm)
Thermometer connection (to pocket)	thread M14x1.5, M18x1.5, M20x1.5, G1/2"
Installation length (to pocket)	50mm – 300mm
Neck tube	length 145mm, standard diameter Ø11mm, another on request (Ø6–Ø22, length 50-200mm)
Material of neck tube and measuring insert	stainless steel

Basic technical for pocket:

Construction	welded version – standard, drilled on request
Pocket diameter	1.4571 standard, other on request
Protection tube diameter	ф 11mm standard, other on request
Thermometer connection	thread M14x1.5, M18x1.5, M20x1.5, G1/2"
Process connection	thread M20x1.5, G1/2" other on request
Installation length	50mm – 800mm (300mm for temperature of exhaust gases)

Type Approval Certificate
No. TAA0000T6

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Screw-in resistance thermometer with additional pocket
GML-R-06 MarineTECH Series

Construction

1   Installation part

Diameter: standard 11mm
Length: 50..800mm

2   Process connection

Standard M20x1.5, G1/2"
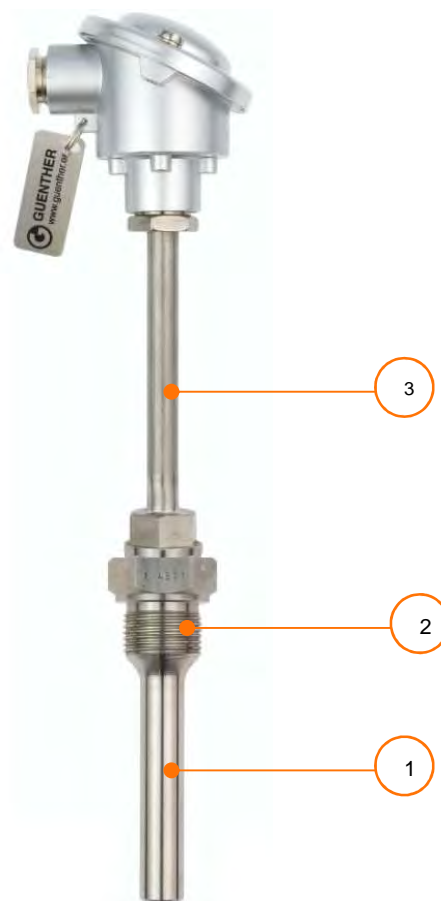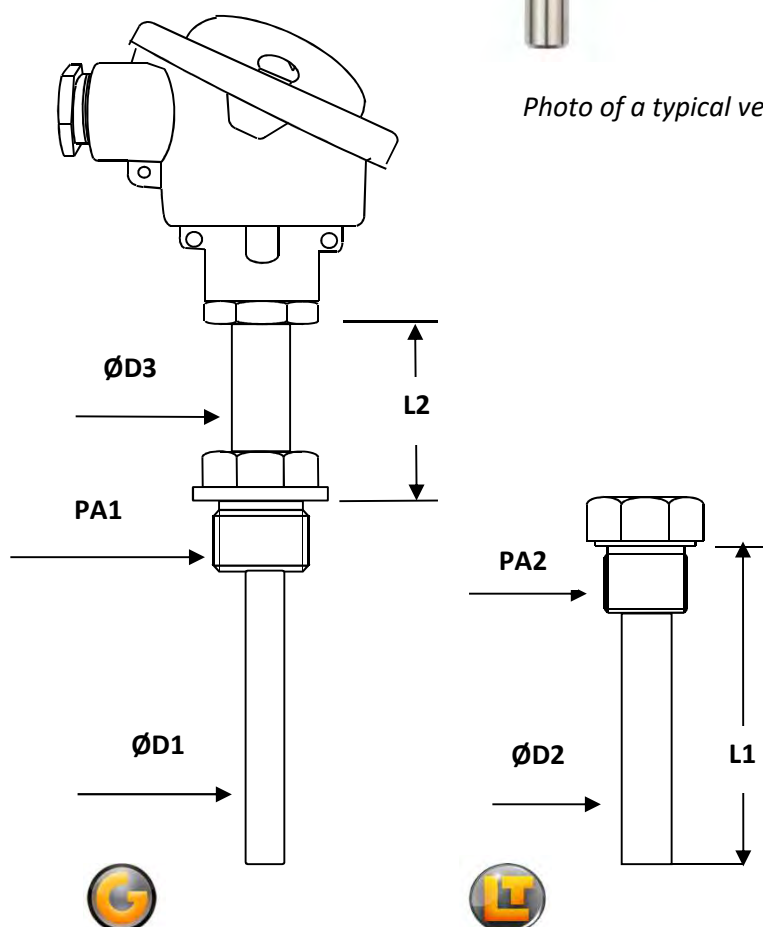
3   Neck tube

Length 145mm, other on request

Drawing

L1   - Installation length

L2   - Neck tube length

PA1 – Thermometer connection
         to pocket

PA2 – Process connection

Ø D1 - Insert diameter
         (standard 6mm)

Ø D2 -Pocket diameter
         (standard 11mm)

Ø D3 -Neck tube diameter
         (standard 11mm)

ØD3

L2

PA1

ØD1

PA2

ØD2

L1

Photo of a typical version

08.17

GML-R-06 - **75** - **1** - **12** - **2** - **11** - **100** - **MF20** / **H145**

Type designations

Screw-in resistance thermometer with additional pocket

Connection head

30	B06, stainless steel
55	NA, alu, resistant to maritime conditions
75	B, alu, resistant to maritime conditions
85	BUZH, alu, resistant to maritime conditions
90	B05, polyamide head

Sensor option

1	1x
2	2x

Measuring insert

12	Pt100, 2-wire
13	Pt100, 3-wire
14	Pt100, 4-wire
22	Pt1000, 2-wire
23	Pt1000, 3-wire
24	Pt1000, 4-wire

Accuracy

1	class A
2	class B

Pocket diameter (ØD2)

11	11mm	standard, other on request

Installation length (L1)

100	100mm
……	other [mm] (limit: 800mm) 300mm* for exhaust gases

Process connection (other thread on request) (PA2)

G012	thread G1/2"
MF20	thread M20x1.5

Extra codes, one after the decimal

Hxxx	H, xxx - neck pipe length in [mm]
547	temperature transmitter 4…20mA PR electronics 5333 (only for Pt100)

Example: Type **GML-R-06-75-1-12-2-11-100-MF20/H145**

Screw-in resistance thermometer with additional pocket, with head type B

1x Pt100, 2-wire, accuracy class B, pocekt diameter: 11mm, installation length of pocket: 100mm,

Process connection: M20x1.5, neck tube length: 145mm

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5

Resistance thermometer with plug connector according to EN 175301

The temperature sensors are designed to measure the temperature of liquid or gaseous media, due to its construction, in particular used materials, the sensors can be used to a temperature in the range of from -50 to + 250°C . The temperature value is converted to resistance by the sensor Pt100 or Pt1000. The connection can be carried out in a 2-wire or 3-, 4- wire circuits as required. The sensors are made in technology resistant to shock and vibration.

Optionally can be made with built-in temperature transmitter to convert resistance an analog signal to 4..20mA.

4..20mA

Basic technical data

Sensor	Pt100, Pt1000
Connection / accuracy	2-wire, class B
	3-, 4- wire, class A
Measuring range	-50…+250˚C
Electrical connection	Plug-in connector according to EN 175301
Protection tube diameter	Standard Ø6mm (other possible: Ø8mm, Ø9mm)
Installation length	50..300mm
Process connenction	Standard: G1/4", G1/2", M20x1.5, other on request
Material	Stainless steel (1.4571, 1.4404, 1.4301)

DNV·GL

Type Approval Certificate
No. TAA0000T6

Resistance thermometer with plug connector according to EN 175301
GML-RM-07 MarineTECH Series

Construction

1 Installation part

Diameter: 6mm – 9mm
Length: min 50.. max 300mm

2 Process connection

Standard: G1/4", G1/2", M20x1.5,
other on request

3 Neck tube

with or without, depending on requirement
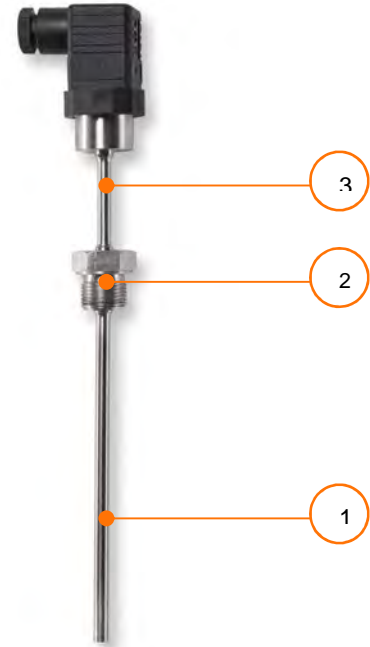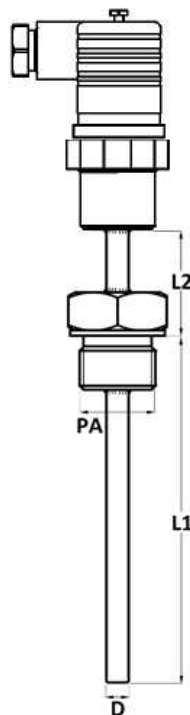recommended for temperature over 100°C

Photo of a typical version

Drawing

L1 - Installation length

L2 - Neck tube length (if present)

PA - Process connection

D - Protection tube diameter

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DNV·GL

GML-RM-07	- 21	- 1	- 13	- 1	- 6	- 100	- G012	/

Type designations

Resistance thermometer with angle plug connector

Connection

21   angle plug connector

22   angle plug connector with transmitter 4..20mA (only Pt100)

Sensor option

1   1x

2   2x

Measuring insert

12   Pt100, 2-wire

13   Pt100, 3-wire

14   Pt100, 4-wire

22   Pt1000, 2-wire

23   Pt1000, 3-wire

24   Pt1000, 4-wire

Accuracy

1   class A

2   class B

Protection tube diameter

6   6mm

8   8mm

9   9mm

Installation length

100   100mm

……   other [mm] (limit: 300mm)

Process connection

G014   thread G1/4"

G012   thread G1/2"

MF20   thread M20x1.5

….   other

0   without thread

Extra codes, one after the decimal

Hxxx   H, xxx - neck pipe length in [mm]

Example:

Type **GML-RM-07-21-1-13-1-6-100-G012**

Screw-in thermometer with angle plug connector, 1x Pt100, 3-wire, class A, diameter 6mm, installation length 100mm, process conntection G1/2"

ver 12.16

6

Resistance thermometer

with M12 connector

The temperature sensors are designed to measure the temperature of liquid or gaseous media, due to its construction, in particular used materials, the sensors can be used to a temperature in the range of from -50 to +250°C. The temperature value is converted to resistance by the sensor Pt100 or Pt1000. The connection can be carried out in a 2-wire or 3-, 4- wire circuits as required. The sensors are made in technology resistant to shock and vibration.

Optionally can be made with built-in temperature transmitter to convert resistance an analog signal to 4..20mA.

4..20mA

Basic technical data

Sensor	Pt100, Pt1000
Connection / accuracy	2-wire, class B 3-, 4- wire, class A
Measuring range	-50…+250˚C
Electrical connection	M12
Protection tube diameter	Standard ϕ6mm (other possible: ϕ 8mm, ϕ9mm)
Installation length	50..300mm
Process connenction	Standard: G1/4", G1/2", M20x1.5, other on request
Material	Stainless steel (1.4571, 1.4404, 1.4301)

DNV·GL

Type Approval Certificate
No. TAA0000T6

Resistance thermometer with M12 connector
GML-RM-08 MarineTECH Series

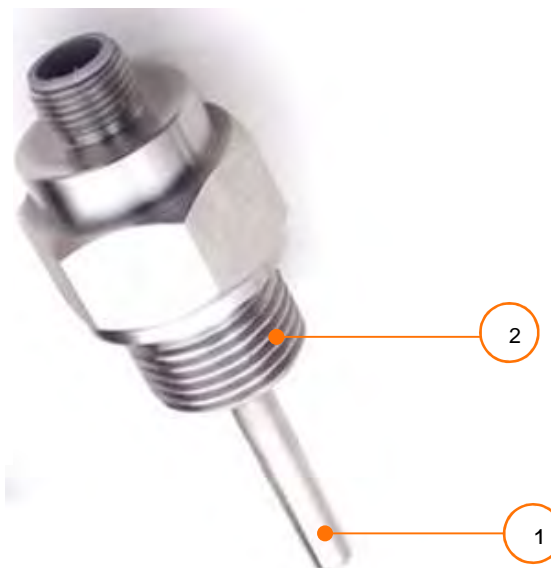## Construction

1   Instalattion part

Diameter: Ø6mm – Ø9mm
Length: min 50.. max 300mm

2   Process connection

Standard: G1/4", G1/2", M20x1.5
other on request

Neck tube

with or without, depending on requirement
recommended for temperature over 100°C

Photo of a typical version

Drawing

L1- Installation length

L2- Neck tube length (if present)

PA - Process connection

D - Protection tube diameter

08.17

Type Approval Certificate
No. TAA0000T6

DNV·GL

GML-RM-08	- 10	- 1	- 13	- 1	- 6	- 100	- G012	/

Type designations

Resistance thermometer with M12 connector

Connection

10	connector M12
20	connector M12 with transmitter 4..20mA (only Pt100)

Sensor option

1	1x
2	2x

Measuring insert

12	Pt100, 2-wire
13	Pt100, 3-wire
14	Pt100, 4-wire
22	Pt1000, 2-wire
23	Pt1000, 3-wire
24	Pt1000, 4-wire

Accuracy

1	class A
2	class B

Protection tube diameter

6	6mm
8	8mm
9	9mm

Installation length

100	100mm
……	other [mm] (limit: 300mm)

Process connection

G014	thread G1/4"
G012	thread G1/2"
MF20	thread M20x1.5
....	other
0	without thread

Extra codes, one after the decimal

Hxxx	H, xxx - neck pipe length in [mm]

Example:

Type **GML-RM-08-10-1-13-1-6-100-G012**

Screw-in thermometer with M12 connector, 1x Pt100, 3-wire, class A, diameter 6mm, installation length 100mm, process conntection G1/2"

ver 12.16

7

Outdoor/indoor temperature sensor

Temperature sensors are designed to measure air temperature. Guarantee protection of sensor: IP65. The temperature value is converted to resistance by the sensor Pt100 or Pt1000 or other on request. The connection can be carried out in a 2-wire or 3-, 4- wire circuits as required. The sensors are made in technology resistant to shock and vibration.

Optionally can be made with built-in temperature transmitter to convert resistance an analog signal to 4..20mA.

4..20mA

Basic technical data

Sensor	Pt100, Pt1000
Connection / accuracy	2-wire, class B
	3-, 4- wire, class A or B
Measuring range	-25…+80˚C
Housing	66x59x38mm, polyamide
Protection tube	28mm, tapered, stainless steel

Type Approval Certificate
No. TAA0000T6

DNV·GL

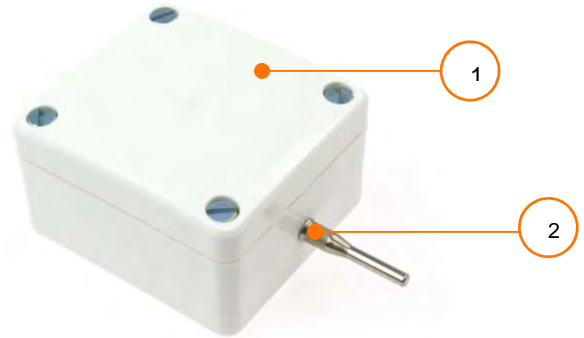# Resistance thermometer – outdoor/indoor temperature sensor
GML-RM-09 MarineTECH Series
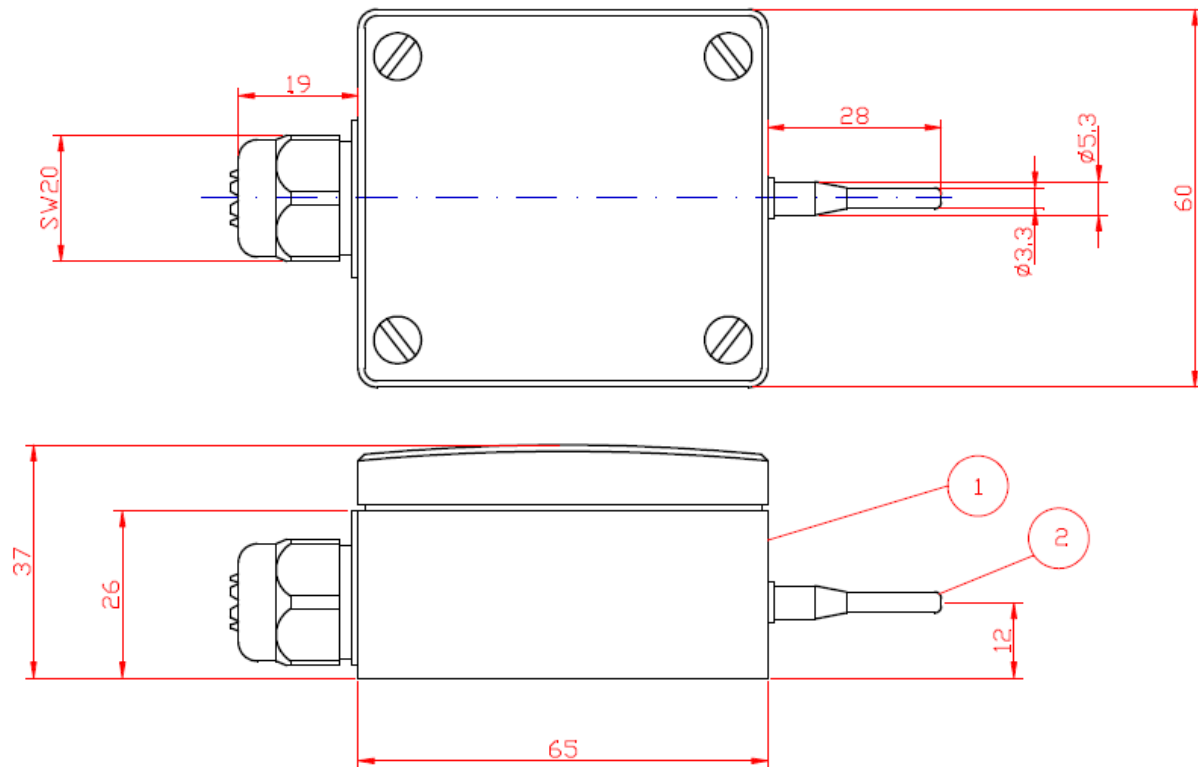
Sensor description

1   Housing

Polyamide, protection class: IP65
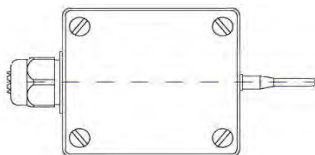
2   Protection tube
Stainless steel, L=28mm, tapered

Drawing

GML-RM-09	-13-	1	-5.3-	28 /

Type designations

Resistance thermometer - outdoor/indoor temperature sensor

Measuring insert

12	Pt100, 2-wire
13	Pt100, 3-wire
22	Pt1000, 2-wire
23	Pt1000, 3-wire
56	2x Pt100, 3-wire
67	2x Pt100, 4-wire

Accuracy

1	class A
2	class B

Protection tube diameter

5.3	5.3 tapered to 3.3mm (standard)
…….	other on request
-	without protection tube

Protection tube length

28	28mm (standard)
……	other on request

Extra codes, one after the decimal

547	temperature transmitter 4…20mA PR electronics 5333 (only for Pt100)

Example:

Type **GML-RM-09-13-1-5.3-28**

Resistance thermometer - outdoor/indoor temperature sensor, 1x Pt100, 3-wire, class A, protection tube diameter 5.3mm tapered to 3.3mm, length 28mm

ver 02.17

8

Duct temperature sensor

Our sensors measures air flow temperature in duct work areas. The sensor is supplied with 100mm length probe and an IP65 enclosure which is screwed close to protect the sensor from exposure to conditions within the duct work. The temperature value is converted to resistance by the sensor Pt100 or Pt1000 or other on request. The connection can be carried out in a 2-wire or 3-, 4- wire circuits as required. The sensors are made in technology resistant to shock and vibration**.**

Optionally can be made with built-in temperature transmitter to convert resistance an analog signal to 4..20mA.

4..20mA

Basic technical data

Sensor	Pt100, Pt1000
Connection / accuracy	2-wire, class B
	3-, 4- wire, class A or B
Measuring range	-25…+80˚C
Housing	66x59x38mm, polyamide
Protection tube	Ø6 x 100mm, stainless steel

Type Approval Certificate
No. TAA0000T6

DNV·GL

Resistance thermometer – duct temperature sensor
GML-RM-10 MarineTECH Series

Sensor description

1 Housing

Polyamide, protection class: IP65

2 Protection tube
Stainless steel, L=100mm

Drawing

08.17

DNV·GL

GML-RM-10	-13	-1	-6	-100	/

Type designations

Resistance thermometer - duct temperature sensor

Measuring insert

12   Pt100, 2-wire

13   Pt100, 3-wire

22   Pt1000, 2-wire

23   Pt1000, 3-wire

Accuracy

1   class A

2   class B

Protection tube diameter

6   6mm (standard)

…….   other on request

Protection tube length

100   100mm (standard)

……   other on request

Extra codes, one after the decimal

547   temperature transmitter   4…20mA PR electronics 5333 (only for Pt100)

Example:

Type **GML-RM-10-13-1-6-100**

Resistance thermometer - duct temperature sensor, 1x Pt100, 3-wire, class A, protection tube: 6x100mm

ver 02.17

9

Cable resistance thermometer

Cable sensors are designed to measure the temperature of liquid and gaseous media. Due to its construction, in particular, the materials used, the sensors can be used to a temperature in the range -50 to 180°C. There is a possibility to produce sensors with various measuring elements: Pt100, Pt1000 or Ni1000-LG.

For installation of sensors are available additional accessories as flanges, mounting threads. In the case of use with pocket to improve contact can be used optional thermal paste.

Basic technical data

Sensor, connection	Pt1000, 2-wire, 3-wire
Accuracy	
2-wire circuit	class B, according to EN 60751
3-wire circuit	class A, according to EN 60751
Measuring range	Silicon cable -50 .. +180°C
	PVC cable -5 .. +105°C
Protection tube diameter	Diameter 6mm
	Length: 50mm, 80mm, 100mm, other on request
Material of protection tube	Stainless steel

Main application

Measuring the temperature of the liquid

HVAC

Type Approval Certificate
No. TAA0000T6

DNV·GL

Cable resistance rhermometer
GML-RM-11 MarineTECH Series

Sensor description

1   Cable

PVC
Silicon
other on request

2   Sensor in protection tube

Stainless steel, diameter ϕ6 Length by type
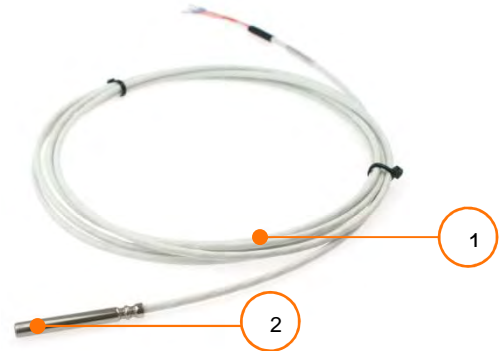
Drawing

D: Diameter

L1: Protection tube length

L2: Cable length
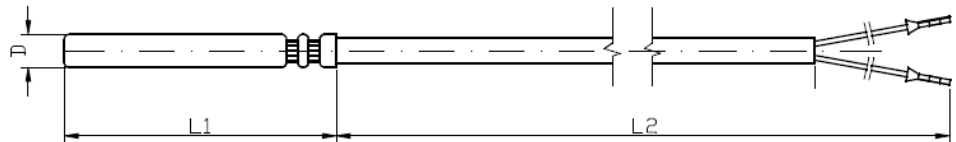
Connection

Sensor Pt1000 in
2 or 3-wire circuit

05.17

| GML-RM-11 | - | 13 | - | 1 | - | 6 | - | 50 | - | 1.5 | - | ES | / | |

Type designations

Cable resistance thermometer

Measuring insert

12	Pt100, 2-wire
13	Pt100, 3-wire
14	Pt100, 4-wire
22	Pt1000, 2-wire
23	Pt1000, 3-wire
23	Pt1000, 4-wire

Accuracy

1	class A
2	class B

Protection tube diameter

6	6mm (standard)
…….	other on request

Protection tube length

50	50mm (standard)
80	80mm
100	100mm
……	other on request

Cable length

1.5	1500mm
……	other on request

Cable insulation

ES	teflon/silikon
ECE	teflon FEP /metal braid/teflon FEP
ASA	teflon PFA/silikon/teflon PFA
……	other on request

Extra codes, one after the decimal

Example:

Type **GML-RM-11-13-1-6-50-1.5-ES**

Cable resistance thermometer, 1x Pt100, 3-wire, class A, protection tube: 6x50mm, 1.5 meters cable in teflon/silikon insulation

ver 06.17

10

Straight thermocouple

The straight thermocouple are designed to measure the temperature of gaseous media, due to its construction, in particular used materials, the thermocouple can be used measure temperature in the range of -25 to +1000°C.

Optionally can be made with temperature transmitter to convert emf to analog signal to 4..20mA.

Basic technical data for thermocouple:

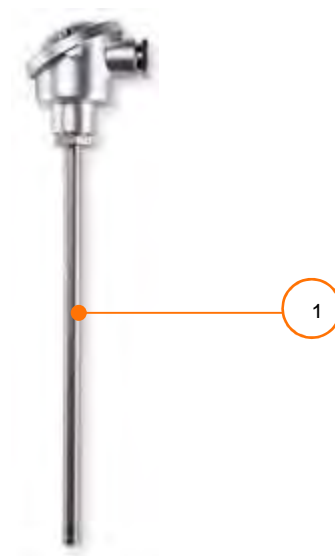|	
Measuring insert	1x NiCr-Ni/K, 2x NiCr-Ni/K, 1x Fe-CuNi/J, 2x FeCuNi/J
Accuracy	class 1
Measuring range	-25…+1000°C (up to +700°C for type J)
Connection head	form B, NA, BUZH, aluminum, resistant to maritime conditions form B05 (polyamide) form B06 (stainless steel)
Protection tube diameter	standard Ø8- Ø22mm (other on request, min Ø 6mm, max. Ø 22mm)
Protection tube material	stainless steel 1.4571 or heat resistance 1.4841 other on request
Nominal length	50mm – 800mm (300mm for temperature of exhaust gases)
Material of neck tube and measuring insert	stainless steel / Inconel
Mineral-insulated insert diameter	min. Ø 3mm, max Ø 6mm (standard Ø 6mm)

Type Approval Certificate
No. TAA0000T6

DNV·GL

Straight thermocouple
GML-T-01 MarineTECH Series

Construction

1   Installation part

Diameter: standard Ø8-Ø22mm
Length: 50..800mm

① 1

Drawing
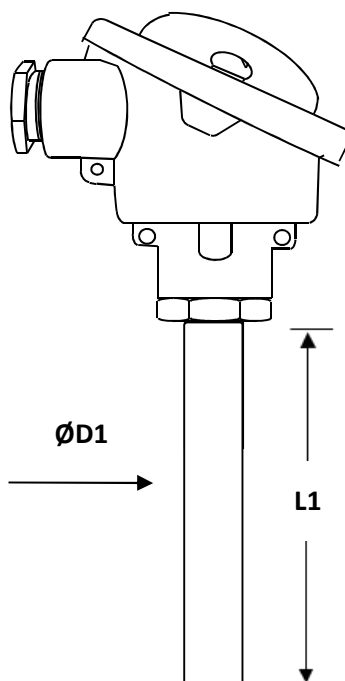
L1   - Nominal length
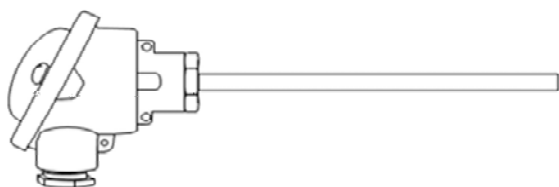ØD1   - Protection tube diameter

Photo of a typical version

ØD1

L1

08.17

| GML-T-01 | -75 | -1 | -K | -1 | -10 | -100 | / | 0 |

Type designations

**Thermocouple with connection head
(without process connection)**

Connection head

30	B06, stainless steel
55	NA, alu, resistant to maritime conditions
75	B, alu, resistant to maritime conditions
85	BUZH, alu, resistant to maritime conditions
90	B05, polyamide head

Sensor option

| 1 | 1x |
| 2 | 2x |

Measuring insert

| K | NiCr-Ni/K |
| J | Fe-CuNi/J |

Accuracy

| 1 | class 1 |

Protection tube diameter (min Ø6mm, max Ø22mm) (øD1)

6	6mm
8	6mm
9	6mm
10	6mm
11	6mm
….	other
22	22mm

Nominal length (L1)

| 100 | 100mm |
| …… | other [mm] (limit: 800mm) 300mm* for exhaust gases |

Extra codes, one after the decimal

| 549 | temperature transmitter 4…20mA PR electronics 5334 |

Example:

Type **GML-T-01-75-1-K-1-10-100**

Thermocouple with connection head type B

1x NiCr-Ni/K, accuracy: class 1, diameter of protection tube 10mm, nominal length 100mm

ver 4.17

11

Screw-in thermocouple

The straight thermocouple are designed to measure the temperature of gaseous media, due to its construction, in particular used materials, the thermocouple can be used measure temperature in the range of -25 to +1000°C.

Optionally can be made with temperature transmitter to convert emf to analog signal to 4..20mA.

Basic technical data for thermocouple:

Measuring insert	1x NiCr-Ni/K, 2x NiCr-Ni/K, 1x Fe-CuNi/J, 2x FeCuNi/J
Accuracy	class 1
Measuring range	-25…+1000°C (up to +700 °C for type J)
Connection head	form B, NA, BUZH, aluminum, resistant to maritime conditions form B05 (polyamide) form B06 (stainless steel)
Protection tube diameter	standard Ø8- Ø22mm (other on request, min Ø 6mm, max. Ø 22mm)
Process connection	standard thread G1/2", M20x1.5 (other possible: G1/4"-G1", M14x1-M27x2)
Protection tube material	stainless steel 1.4571 or heat resistance 1.4841 other on request
Installation length	50mm – 800mm (300mm for temperature of exhaust gases)
Neck tube	length 145mm, standard diameter as protection tube, another on request (Ø6–Ø22, length 50-200mm)
Material of neck tube and measuring insert	stainless steel / Inconel
Mineral-insulated insert diameter	min. Ø 3mm, max Ø 6mm (standard Ø 6mm)

Type Approval Certificate
No. TAA0000T6

DNV·GL

Screw-in thermocouple
GML-T-02 MarineTECH Series

Construction

1 Installation part

Diameter: standard Ø8-Ø22mm
Length: 50..800mm

2 Process connection
Standard G1/2", M20x1.5
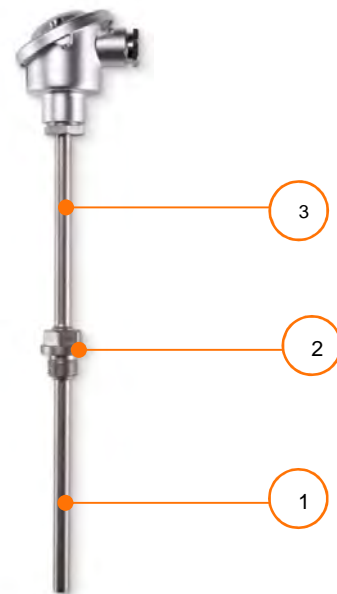
3 Neck tube
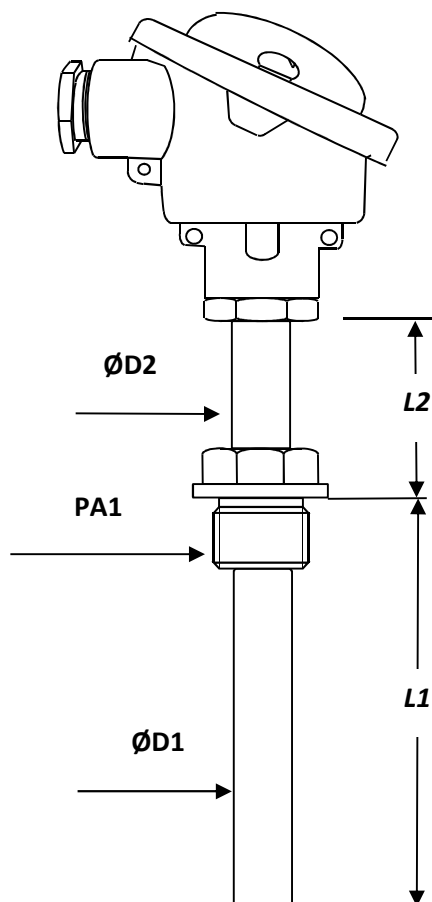Length 145mm, other on request

Photo of a typical version

Drawing

L1   - Installation length
L2   - Neck tube length
PA1 - Process connection
Ø D1 - Protection tube diameter
Ø D2 - Neck tube diameter

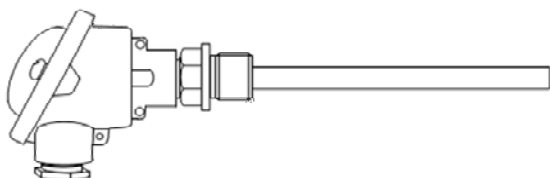| GML-T-02	-75	-1	-K	-1	-9	-100	-G012	/

Type designations

**Screw-in thermocouple
with connection head**

Connection head

30	VA(BEG), stainless steel
55	NA, alu, resistant to maritime conditions
75	B, alu, resistant to maritime conditions
85	BUZH, alu, resistant to maritime conditions
90	polyamide head

Sensor option

1	1x
2	2x

Measuring insert

K	NiCr-Ni/K
J	Fe-CuNi/J

Accuracy

1	class 1

Protection tube diameter (min Ø6mm, max Ø22mm) (ØD1)

6	6mm
8	8mm
9	9mm
…..	other
22	22mm

Installation length (L1)

100	100mm
……	other [mm] (limit: 800mm) 300mm* for exhaust gases

Process connection (PA1)

G012	thread G1/2"
G034	thread G3/4"
MF20	thread M20x1.5
MF27	thread M27x2
....	other

Extra codes, one after the decimal

Hxxx	H, xxx - neck pipe length in [mm]
549	temperature transmitter 4…20mA PR electronics 5334

Example:

Type **GML-T-02-75-1-K-1-9-100-G012**

Screw-in thermocouple with connection head type B

1x NiCr-Ni/K, accuracy: class 1, diameter 9mm, installation length 100mm, G1/2" process connection

ver 4.17

12

Screw-in thermocouple without protection tube

The straight thermocouple are designed to measure the temperature of gaseous media, due to its construction, in particular used materials, the thermocouple can be used measure temperature in the range of -25 to +1000°C. Most often for installation in existing pocket.

Optionally can be made with temperature transmitter to convert emf to analog signal to 4..20mA.

Basic technical data for thermocouple:

Measuring insert	1x NiCr-Ni/K, 2x NiCr-Ni/K, 1x Fe-CuNi/J, 2x FeCuNi/J
Accuracy	class 1
Measuring range	-25…+1000°C (up to +700 °C for type J)
Connection head	form B, NA, BUZH, aluminum, resistant to maritime conditions form B05 (polyamide) form B06 (stainless steel)
Mineral-insulated insert diameter	min. Ø 3mm, max Ø 6mm (standard Ø 6mm)
Thermometer connection (to pocket)	thread M14x1.5, M18x1.5, M20x1.5, G1/2"
Installation length (to pocket)	50mm – 800mm (300mm for temperature of exhaust gases)
Neck tube	length 145mm, standard diameter Ø11mm, another on request (Ø6–Ø22, length 50-200mm)
Neck tube and insert material	stainless steel, 2.4816 (insert)

Type Approval Certificate
No. TAA0000T6

DNV·GL

Screw-in thermocouple without protection tube
GML-T-03 MarineTECH Series

Construction

1 Installation part

Insert diameter: standard 6mm
Length: 50..800mm

2 Sensor connection to pocket
Thread M14x1.5, M18x1.5, M20x1.5, G1/2"
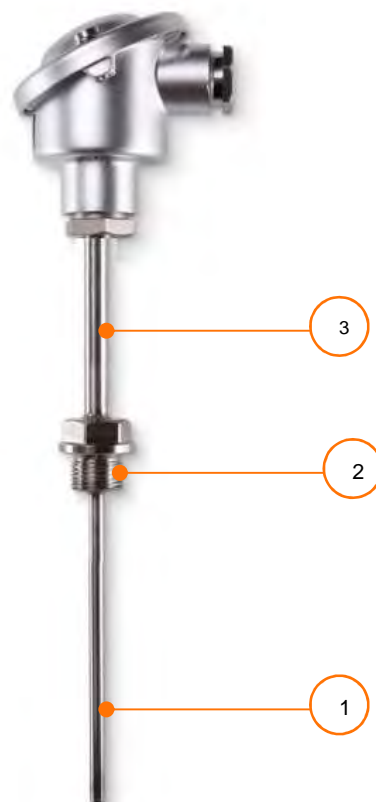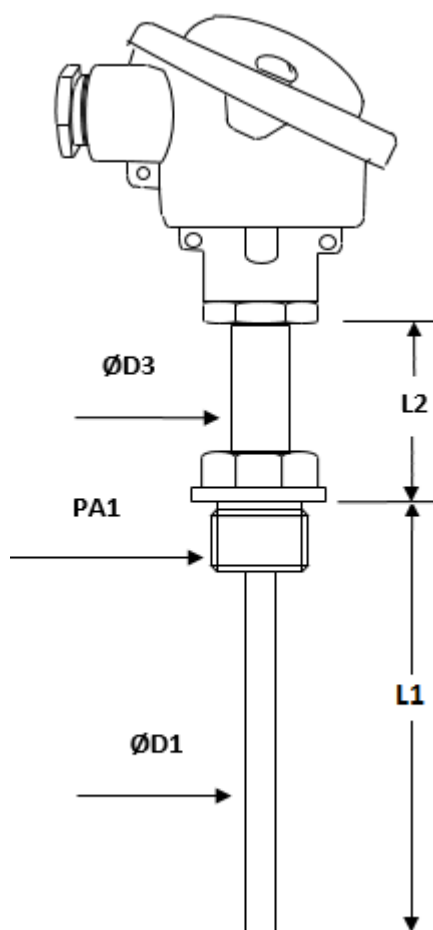
3 Neck tube
Length 145mm, other on request

Photo of a typical version

Drawing

L1 - Installation length
L2 - Neck tube length
PA1 - Thermocouple connection
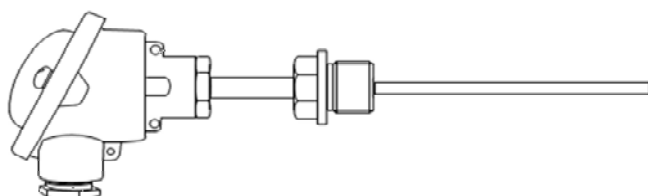Ø D1 - Insert diameter
Ø D3 - Neck tube diameter
(standard 11mm)

05.17

| GML-T-03 | -75 | -1 | -K | -1 | -6 | -100 | -MF14 | / | H145 |

Type designations

Screw-in thermocouple without protection tube

Connection head

30	B06, stainless steel
55	NA, alu, resistant to maritime conditions
75	B, alu, resistant to maritime conditions
85	BUZH, alu, resistant to maritime conditions
90	B05, polyamide head

Sensor option

| 1 | 1x |
| 2 | 2x |

Measuring insert

| K | NiCr-Ni/K |
| J | Fe-CuNi/J |

Accuracy

| 1 | class 1 |

Insert diameter (ØD1)

| 6 | 6mm | standard |

Installation length to pocket (L1)

| 100 | 100mm |
| ...... | other [mm] (limit: 800mm) 300mm* for exhaust gases |

Thermocouple connection (to pocket) (PA1)

G012	thread G1/2"
MF14	thread M14x1.5
MF18	thread M18x1.5
MF20	thread M20x1.5

Extra codes, one after the decimal

| H050 | H, xxx - neck pipe length in [mm] |
| 549 | temperature transmitter 4…20mA PR electronics 5334 |

Example:

Type **GML-T-03-75-1-K-1-6-100-MF14/H145**

Screw-in thermocouple without protection tube with connection head type B

1x NiCr-Ni/K, accuracy: class 1, measuring insert: 6mm, installation length: 100mm,

M14x1.5 thermometr connection (to pocket), neck pipe length: 145mm

ver 4.17

13

Screw-in thermocouple with additional pocket

The straight thermocouple are designed to measure the temperature of gaseous media, due to its construction, in particular used materials, the thermocouple can be used measure temperature in the range of -25 to +1000°C. Optionally can be made with temperature transmitter to convert emf to analog signal to 4..20mA.

Basic technical data for thermocouple:

Measuring insert	1x NiCr-Ni/K, 2x NiCr-Ni/K, 1x Fe-CuNi/J, 2x FeCuNi/J
Accuracy	class 1
Measuring range	--25…+1000°C (up to +700°C for type J)
Connection head	form B, NA, BUZH, aluminum, resistant to maritime conditions form B05 (polyamide) form B06 (stainless steel)
Mineral-insulated insert diameter	min. Ø 3mm, max Ø 6mm (standard Ø 6mm)
Thermometer connection (to pocket)	thread M14x1.5, M18x1.5, M20x1.5, G1/2"
Installation length (to pocket)	50mm – 800mm (300mm for temperature of exhaust gases)
Neck tube	length 145mm, standard diameter Ø11mm, another on request (Ø6–Ø22, length 50-200mm)
Material of neck tube and measuring insert	stainless steel / Inconel

Basic technical for pocket:

Construction	welded version – standard, drilled on request
Pocket material	1.4571 standard, other on request
Pocket diameter	Ø11mm standard, other on request
Thermometer connection	thread M14x1.5, M18x1.5, M20x1.5, G1/2"
Process connection	thread M20x1.5, G1/2" other on request
Installation length	50mm – 800mm

Type Approval Certificate
No. TAA0000T6

DNV·GL

Screw-in thermocouple with additional pocket
GML-T-06 MarineTECH Series

Construction

1 Installation part

Diameter: standard 11mm
Length: 50..800mm

2 Process connection
Standard M20x1.5, G1/2"

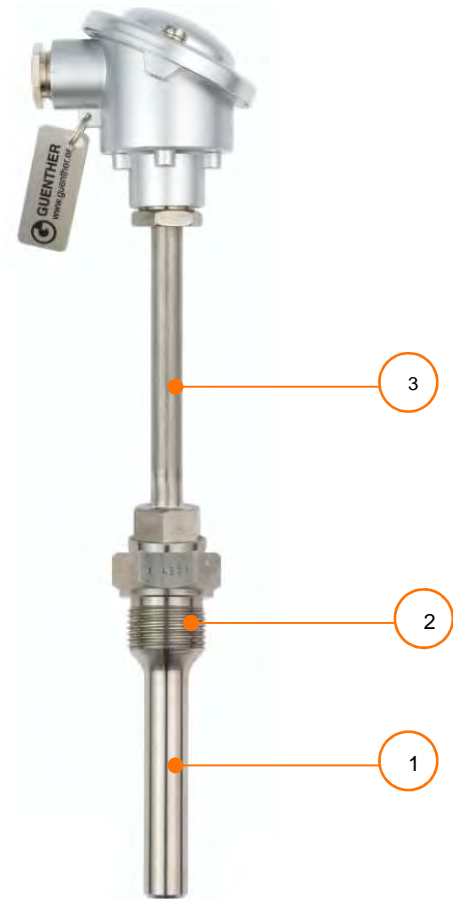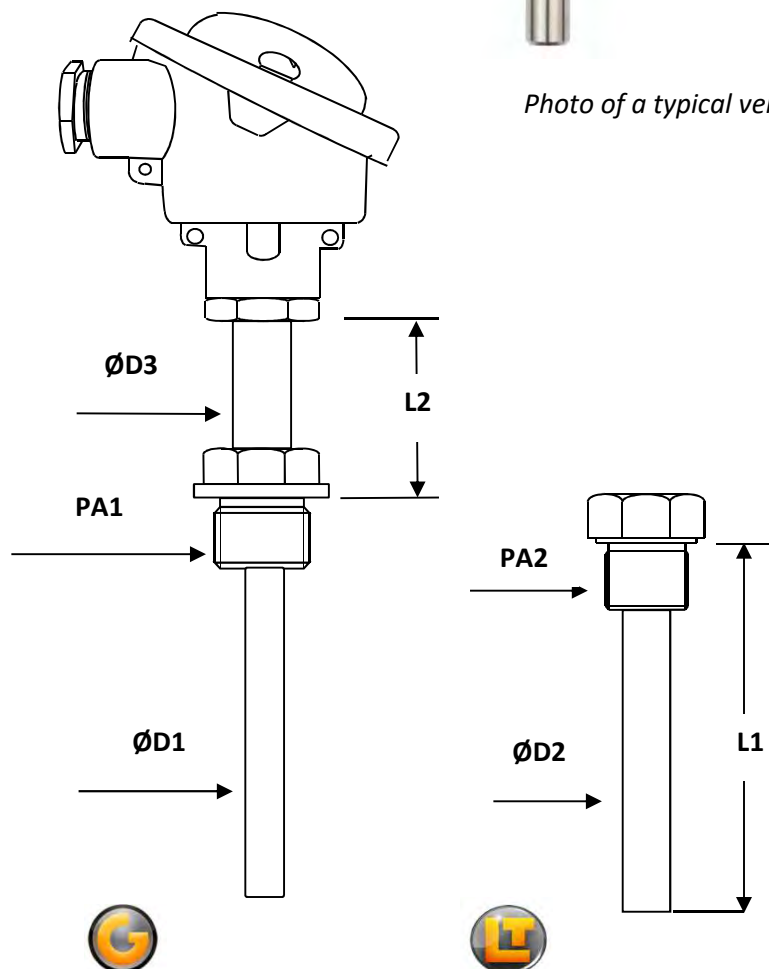**3 Neck tube**
Length 145mm, other on request

Photo of a typical version

Drawing

L1   - Installation length
L2   - Neck tube length
PA1 – Thermometer connection
          to pocket
PA2 – Process connection
Ø D1 - Insert diameter
         (standard 6mm)
Ø D2 - Pocket diameter
          (standard 11mm)
Ø D3 - Neck tube diameter
         (standard 11mm)

08.17

| GML-T-06 | -75 | -1 | -K | -1 | -11 | -100 | -MF20 | / | H145 |

Type designations

Screw-in thermocouple with additional pocket

Connection head

30	B06, stainless steel
55	NA, alu, resistant to maritime conditions
75	B, alu, resistant to maritime conditions
85	BUZH, alu, resistant to maritime conditions
90	B05, polyamide head

Sensor option

| 1 | 1x |
| 2 | 2x |

Measuring insert

| K | NiCr-Ni/K |
| J | Fe-CuNi/J |

Accuracy

| 1 | class 1 |

Pocket diameter (ØD2)

| 11 | 11mm | standard, other on request |

Installation length (L1)

| 100 | 100mm |
| …… | other [mm] (limit: 800mm) 300mm* for exhaust gases |

Process connection (other thread on request) (PA2)

| G012 | thread G1/2" |
| MF20 | thread M20x1.5 |

Extra codes, one after the decimal

| Hxxx | H, xxx - neck pipe length in [mm] |
| 549 | temperature transmitter 4…20mA PR electronics 5334 |

Example: Type **GML-T-06-75-1-12-2-11-100-MF20/H145**

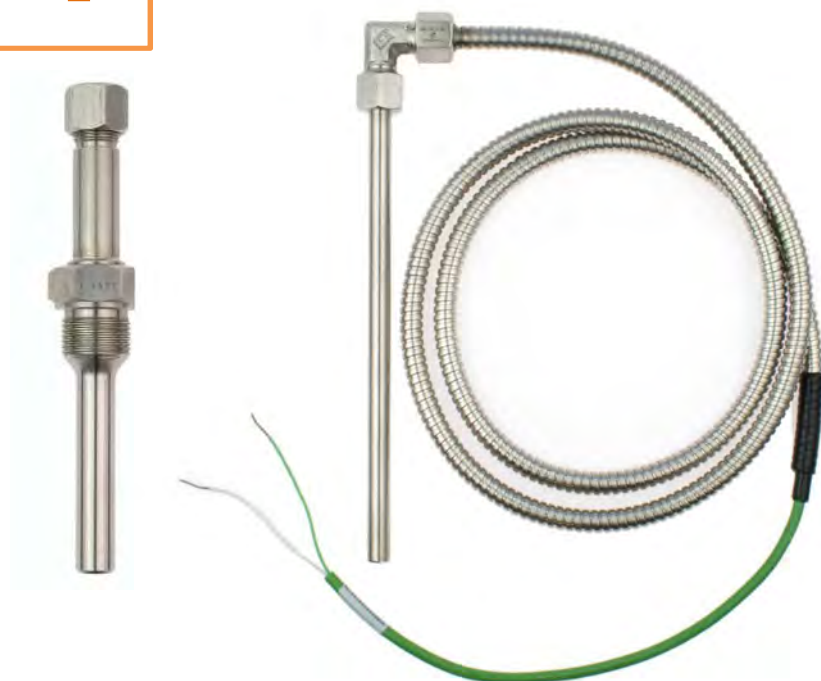Screw-in thermocouple with additional pocket, with head type B

1x NiCr-Ni/K, accuracy: class 1, pocket diameter: 11mm, installation length: 100mm,

Process connection: M20x1.5, neck tube length: 145mm

ver.4.17

14

Thermocouple with angle connector

Extreme operating temperatures and high vibrations generated in the exhaust gas pipes require a very robust design. Our solutions can be fully customized and have already proven themselves countless times in generators, turbines and compressors for example.

Basic technical data

Thermocouple type	type K (NiCr-Ni)
Measuring range	0…+800˚C
Compesation cable	cable in flexible stainless steel conduit (Peshel)
Protection tube diameter	standard Ø9.5mm (other possible: Ø10mm)
Nominal length	50...300mm
Material	stainless steel 1.4571
Accessories	drilled protection tube, material 1.4571 – to order separatly

Type Approval Certificate
No. TAA0000T6

DNV·GL

Thermocouple with angle connector

GML-T-04 MarineTECH Series

Construction

1	**Immersion part**	
	diameter: standard 9.5mm	

2	**Cable protection**	
	stainless steel conduit	

3	**Compensation cable**	
	teflon/silicon 2x0.50mm²	

Photo of a typical version
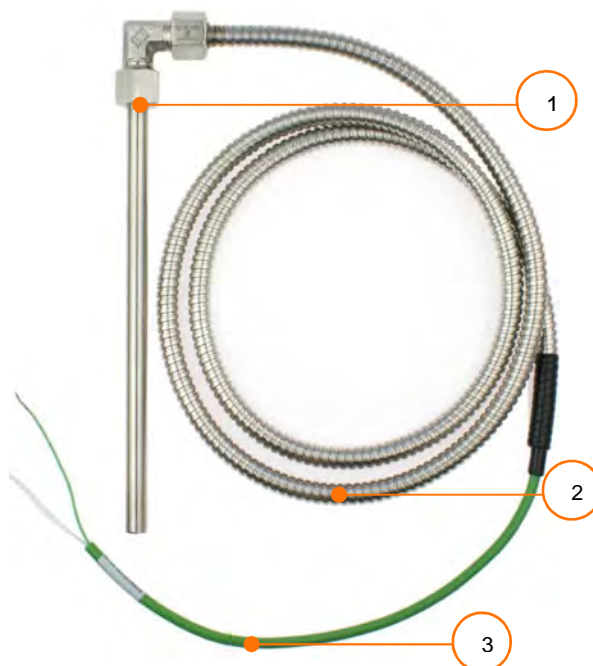
Drawing

L1 – Nominal length
L2 – Cable length
L3 – Conduit length

05.17
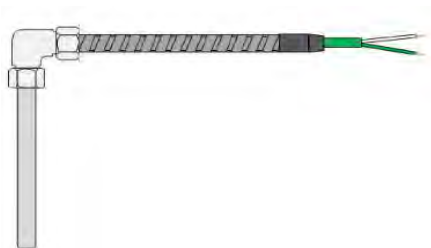
| GML-T-04 | -91 | -1 | -K | -1 | -9.5 | -100 | / | P2 |

Type designations

Thermocouple with angle connector

Connection

91   angle connecor, resistant to martime conditions

Sensor option

1   1x
2   2x

Measuring insert

K   NiCr-Ni/K

Accuracy

1   klasa 1

Protection tube diameter:

12/8   12mm x 50mm and next 8mm
10   10mm all along
9.5   9.5mm all along
8   8mm all along

Nominal length (L1)

100   100mm
……   other [mm] (limit: 300mm)

Extra codes, one after the decimal (L2, L3)

Px   where x is the length of cable in flexible stainless steel conduit (Peshel) in [m]
Cx   where x is the length of cable in [m]

Example: Type **GML-T-04-91-1-K-1-9.5-100/P2**

Thermocouple with angle connector, 1x NiCr-Ni/K, accuracy: class 1,

diameter 9.5mm, nominal length 100mm, 2 meters cable in stainless steel conduit

ver 12.16

15

Thermocouple with spherical head

Extreme operating temperatures and high vibrations generated in the exhaust gas pipes require a very robust design. Our solutions can be fully customized and have already proven themselves countless times in generators, turbines and compressors for example.

Basic technical data

Thermocouple type	type K (NiCr-Ni)
Measuring range	0…+800˚C
Compesation cable	silicon/silicon/metal braid
Protection tube diameter	Ø12x50mm and next 8mm (standard), 8mm-9.5mm-10mm all allong optional
Nominal length	50...300mm
Material	stainless steel 1.4571
Accessories	drilled protection tube, material 1.4571 – to order separately
Additional option	inspection hole for reference thermocouple

Type Approval Certificate
No. TAA0000T6

DNV·GL

Thermocouple with spherical head

GML-T-05 MarineTECH Series

Construction

1   Installation part

diameter: standard 8.0mm

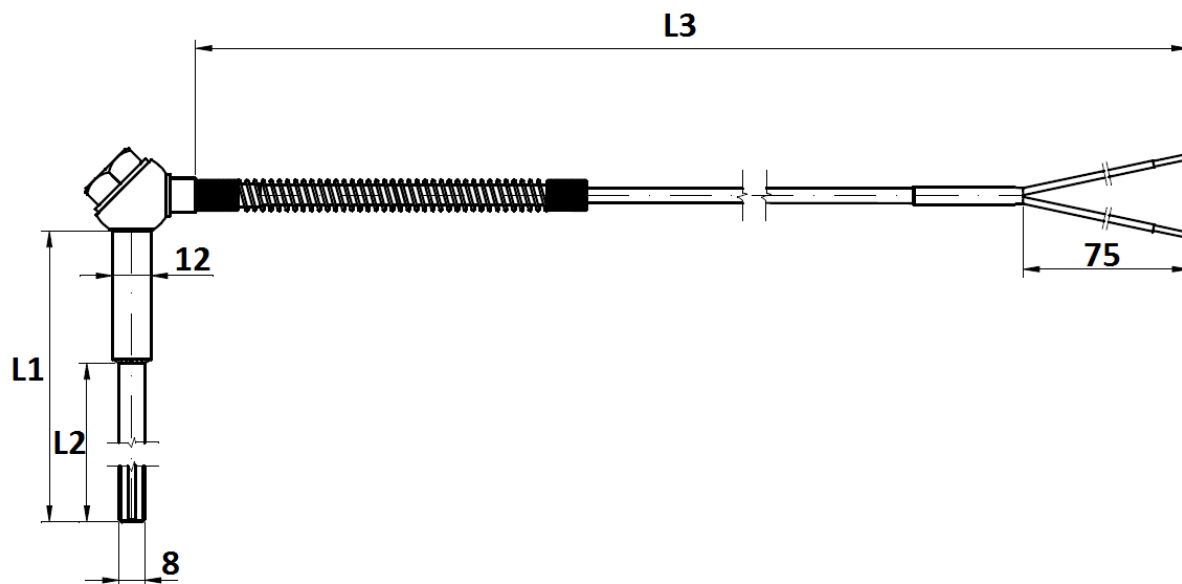**2**   Compensation cable

silicon/silicon/metal braid, 2x0.75mm²

Photo of a typical version

Drawing

L1 – Nominal length
L2 – Ø 8mm part length
L3 – Cable length

GML-T-05	-	92	-	1	-	K	-	1	-	9.5	-	100	/	C2

Type designations

    Thermocouple with spherical head

Connection

  92   spherical head , resistant to martime conditions

Sensor option

  1   1x

  2   2x

Measuring insert

  K   NiCr-Ni/K

Accuracy

  1   klasa 1

Protection tube diameter

  12/8   12mm x 50mm and next 8mm (standard)

  10   10mm all along

  9.5   9.5mm all along

  8   8mm all along

Nominal length (L1)

  100   100mm

  ……   other [mm] (limit: 300mm)

Extra codes, one after the decimal

  Cx   where x is the length of cable in [m]

Example: Type **GML-T-05-92-1-K-1-9.5-100/C2**

Thermocouple with spherical head, 1x NiCr-Ni/K, accuracy: class 1,

diameter 9.5mm, nominal length 100mm, cable 2 meters

ver 12.16