EPIC® SENSORS

COMPACT RESISTANCE TEMPERATURE SENSOR WITH TRANSMITTER
TYPE W-5802
DATA SHEET 27

INSTALLATION INSTRUCTIONS AND USER MANUAL

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Lapp Automaatio Oy
Martinkyläntie 52
FI-01720 Vantaa, Finland

lappautomaatio.fi

Tekninen myynti/Technical sales:
P: +358 (0)20 764 6410

Avoimet tilaukset/Open orders:
P: +358 (0)20 764 6420

Kotipaikka/Domicile
Vantaa

Y-tunnus: 1107293-1
VAT: FI11072931

Product description and intended use

Sensor type W-5802 (resistance, RTD) has a mineral insulated sensor tube with miniature steel enclosure and miniature transmitter integrated.

Sensors are intended and specially designed for constricted spaces, with no room for installation of large connection heads and transmitters. For various industrial measuring applications, e.g., in moving machinery, to be immersed with or without thermowell, typically with compression fitting, to achieve adjustable immersion length. Standard material is AISI316/AISI316L, others on request. Sensor length can be produced according to customer needs.

Mineral insulated sensor tubes are used as such in applications, where there is no need for heavy thermowells to protect against mechanical load caused by installation or process medium.

Sensor is constructed of mineral insulated (MI) elements, which are bendable and vibration proof. Elements are RTD elements, standard versions are 3-wire Pt100. Tailored versions are produced on request.

NOTE! Do not bend the sensor tip (30 mm) of a RTD element. Bending the tip might destroy the internal sensing resistor!

The 3-wire Pt100 sensor is connected to a 2-wire mA transmitter inside a steel enclosure. A standard A-coded 4-pole M12 connector plug (male) for 2-wire mA output is available as standard. The connection varies according to the transmitter version.

EPIC® SENSORS temperature sensors are measuring devices intended for professional use. They should be mounted by professionally capable installer who understands the installations surroundings. The worker should understand mechanical and electrical needs and safety instructions of the object installation. Suitable safety gear for each installation task must be used.

Temperatures, measuring

Allowed measuring temperature range for sensor tip is:

- With Pt100 -60…+450 °C, depending on materials and length.

Temperatures, ambient

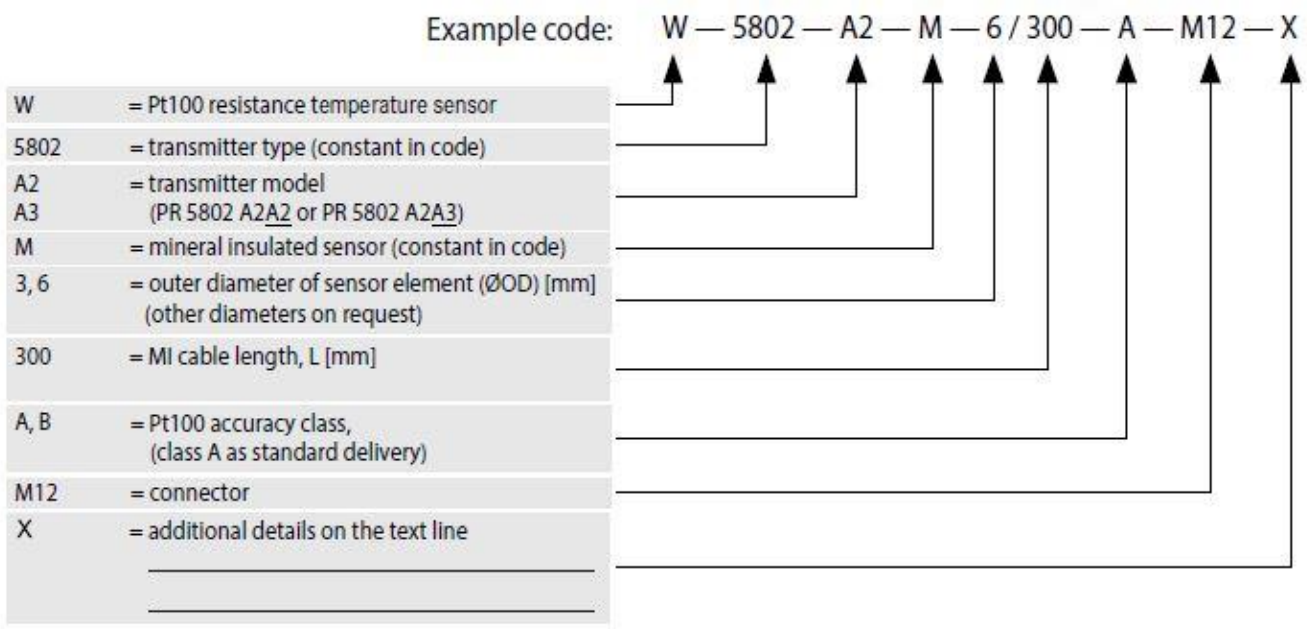
Allowed ambient temperature range for transmitter enclosure part, including transmitter, is:

- With PR5802 transmitter -40…+85 °C , according to transmitter manufacturers data.

NOTE! This sensor type has no special neck pipe for cooling purposes. The process connection (e.g., compression fitting) can be very close to the transmitter enclosure part.
Please see *Dimensional drawing.*

Make sure the process temperature is not too much for the transmitter inside and the M12 connector.

Code key



Technical data

Materials	AISI 316/AISI 316L, maximum temperature +450 °C, temporarily +550 °C
Sensor element	MI cable with diameter 3 or 6 mm, other diameters on request
Connector	4 pin, A coded M12 plug
Transmitter	Manufacturer PR electronics, model PR 5802 A2A2 or PR 5802 A2A3
Operation voltage	8,0... 35 VDC
Power loss	25 mW... 0,8 W
Response time	0,33... 60 s
Output signal	4... 20 mA
Tolerances Pt100 (IEC 60751)	A tolerance ±0.15 + 0.002 x t, operating temperature -100...+450 °C B tolerance ±0.3 + 0.005 x t, operating temperature -196...+600 °C B 1/3 DIN, tolerance ±1/3 x (0.3 + 0.005 x t), operating temperature -196...+600 °C B 1/10 DIN, tolerance ±1/10 x (0.3 + 0.005 x t), operating temperature -196...+600 °C
Temperature range	Temperature measurement range -60...+450 °C, temporarily +550 °C (Note: transmitter temperature range -40...+85 °C)
Quality certificate	ISO 9001:2015 and ISO 14001:2015 issued by DNV
IP rating	IP65, higher IP rating on request

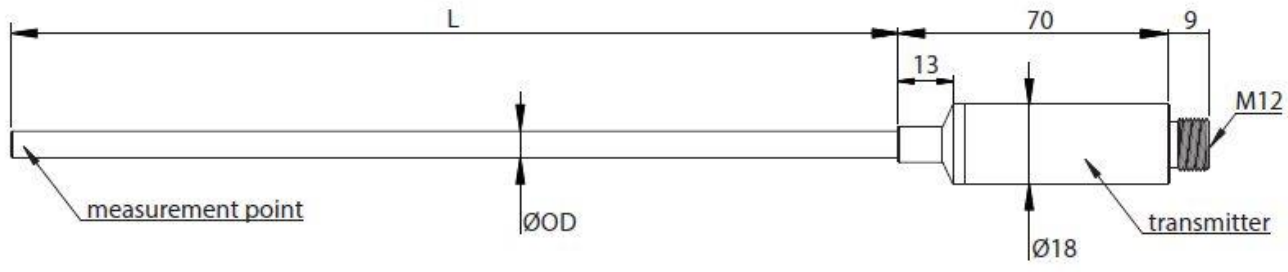
Materials

These are the standard materials of components for the sensor type W-5802.

- Transmitter enclosure — Stainless Steel AISI 316 / 316L
- Sensor element / MI cable sheath — Stainless Steel AISI 316L
- M12 connector body — UL listed polymer plastic
- M12 connector pins — gold plated

Other materials can be used on request.

Dimensional drawing



Installation instructions

Before any installation, make sure the target process/machinery and site are safe to work!

Installation phases when installing to threaded process hole/thermowell and using a compression fitting:

- Make sure the process thread matches the thread of the compression fitting.
- Screw the coupling in an applicable thread hole.
- Tighten securely with the lower nut.
- Insert the sensor element as far as needed through the coupling.
- During installation, remember the MI element minimum bending radius is 2x ØOD of the element.
- Do not bend the MI element tip (30 mm length from sensing tip) of a RTD sensor element.
- NOTE! After next phase there is no coming back, the tightened connection is permanent!
- If you are absolutely sure about the depth, screw down the cap (upper nut) to fix the depth.
- For tightening use only enough force needed. Excess force may damage the sensor element and lower the tightness of the connection.

With measuring part installed, finally connect the M12 cable (with 4-pole A-coded M12 female socket) securely to the M12 connector plug.

Tightening torques

Use only tightening torques allowed in applicable standards of each thread size and material.

Installation of accessories

Adjustable gland couplings AISI 316:

As accessories there are adjustable gland couplings available, for occasions where the sensor should be installed to a threaded hole in process.

Gland couplings - a.k.a. compression fittings - are used with sensing inserts or sensors without wells. The immersion depth of sensing insert can be adjusted, when installing on a thread. Compression fittings have metal ferrules inside. Ferrules are made of stainless steel SS316L (other materials and sizes available upon request). Single or double ferrules are used depending on the inner diameter. By screwing the cap down, the ferrule is permanently pressed on the sensing element. This connection is pressure resistant, which is also reason for the alias name; compression fitting.

Installation phases:

- Screw the coupling in an applicable thread hole.
- Tighten securely with the lower nut.
- Insert the sensor element as far as needed through the coupling.
- NOTE! After next phase there is no coming back, the tightened connection is permanent!
- If you are absolutely sure about the depth, screw down the cap (upper nut) to fix the depth.
- For tightening use only enough force needed. Excess force may damage the sensor element and lower the tightness of the connection.

Some of the many available gland couplings are:

Product number	***Type - thread - inner diameter***
875823	Compression fitting G½ - 6 mm
1001171	Compression fitting G½ - 12 mm
914413	Compression fitting G½ - 15 mm
1010922	Compression fitting G¼ - 1.5 mm
911898	Compression fitting G¼ - 3 mm
911897	Compression fitting G¼ - 4.5 mm
920701	Compression fitting G¼ - 6 mm
920587	Compression fitting G⅛ - 1.5 mm
919178	Compression fitting G⅛ - 3 mm
1090957	Compression fitting G⅛ - 1 mm
1062720	Compression fitting M8x1 - 1.5 mm
911908	Compression fitting M8x1 - 3 mm
1040461	Compression fitting M18x1.5 - 6 mm
914237	Compression fitting NPT¼ - 3 mm.
1066586	Compression fitting NPT¼ - 6 mm
1001559	Compression fitting NPT⅛ - 3 mm
1066584	Compression fitting NPT⅛ - 6 mm

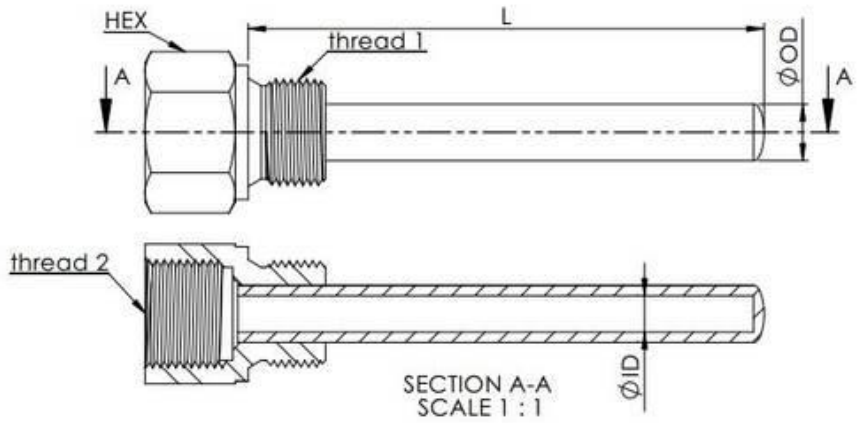
Threaded thermowells:

If sensors with compression fittings need to be installed with a thermowell, it can be done with the accessory well type TPIE. This thermowell type has both inner and outer threads, which can be produced according to customer specifications. The standard material is acid proof steel, but material can be chosen according to application, special coatings are available, and tailored solutions can be offered according to specific needs.

TPIE Code key: *TPIE - G½ / G½ - 9 / 100 - X (example code)*

- TPIE = thermowell model
- G½ = outer thread 1
- / G½ = inner thread 2
- 9 = outer diameter ØOD [mm] (ØID = 7 mm)*
- / 100 = immersion depth L [mm]
- X = additional details on the text line.

* NOTE: inner diameter ØID is not visible in code.



Welded threaded sleeves:

As accessories there are welded threaded sleeves available, for occasions where the thread is not readily available.

The sleeve material must be chosen according to the process media and structure material to be welded on.

Before any installation, make sure the target process/machinery and site are safe to work!

Also, make sure there are no obstacles to welding work.

Installation phases:

- First drill a hole large enough for the lower end of the sleeve to enter.
- Weld the sleeve securely to the process material.
- After cooling, finalizing the welding process and getting approved by inspectors (if needed), finally install the sensor to the welded thread, as presented on page Installation instructions.

Connections

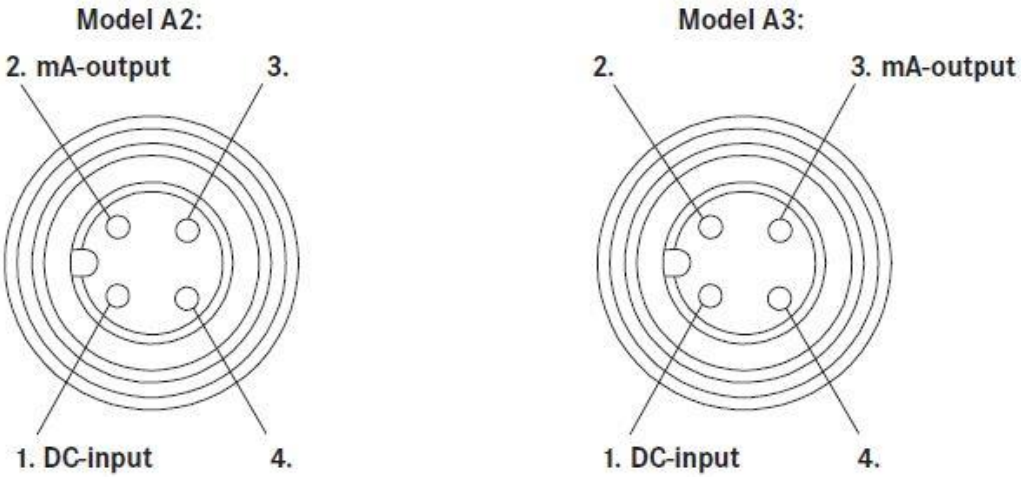
Before any connection work make sure the M12 connector plug is clean and dry. Do not connect the M12 cable if there is a risk of dirt or moisture/liquids entering the connection pin space inside the connector!

Image below:

Pins 1…4 of the integrated 4-pole A-coded M12 plug (male),

connection to 2-wire mA output of the transmitter

NOTE! Only two pins are connected.



DC-input range is 8.0 … 35 VDC,

mA-output range is 4 … 20 mA.

Please see also part *Transmitter setup*.

Pt100; measuring current

The transmitter inside W-5802 is using 0.2 … 0.4 mA sensor current for measuring.

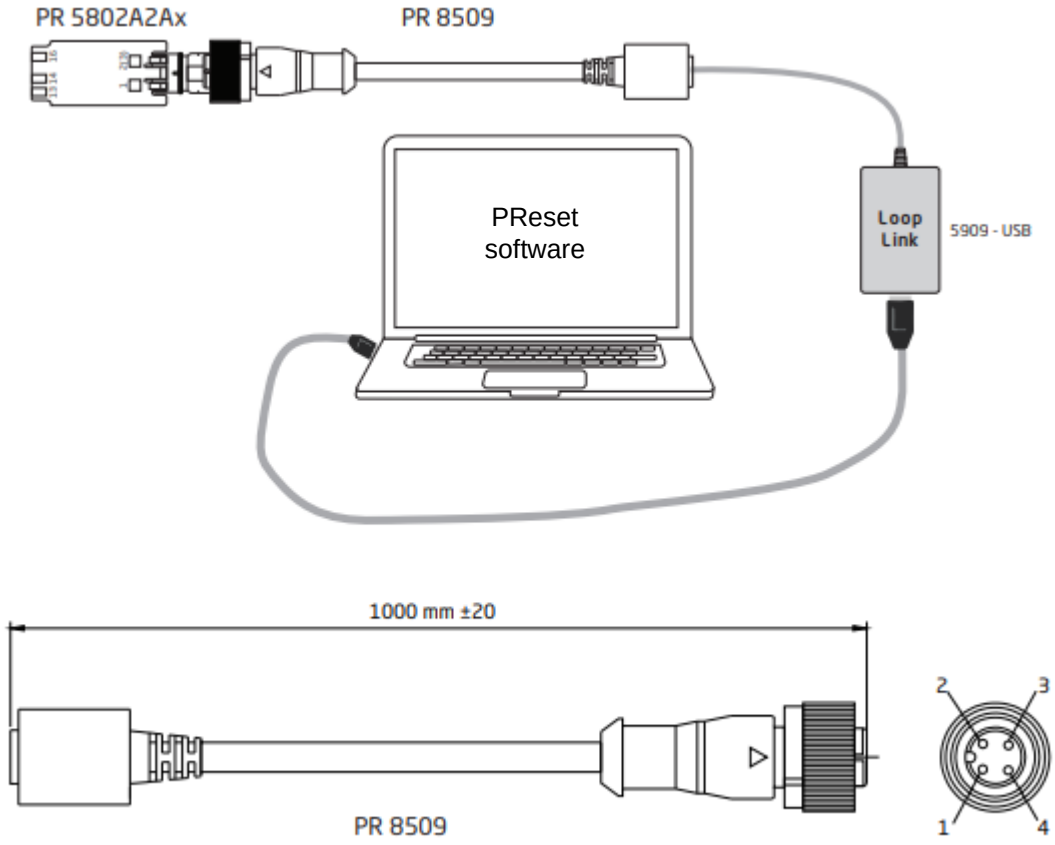
Transmitter setup

Transmitter inside the W-5802 sensor can be programmed before delivery according to customer specification, or it can be configured after delivery, with applicable accessories presented below, following the instructions of the PR 5802 product manual, which can be found on this web site:
https://www.prelectronics.com/products/temperature-transmitters/5800/compact-rtd-temperature-transmitter-5802/

Setup is done using applicable accessories:

- PR 5909 USB Loop Link device,
- PR 8509 interface cable, and
- PReset configuration software for PC.

Image below: accessories needed for transmitter configuration

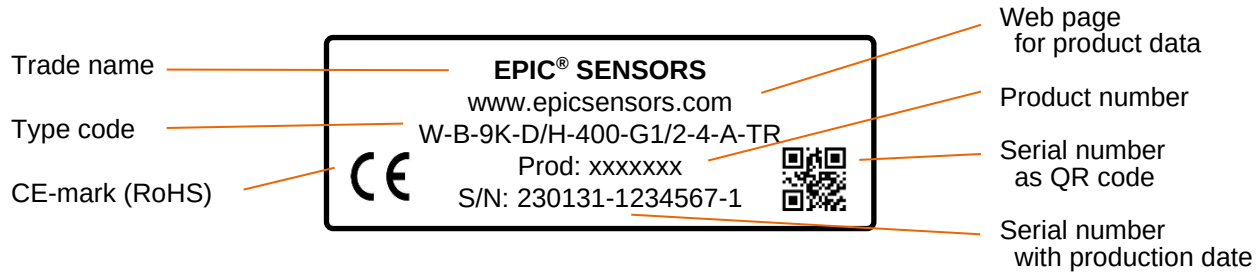


For further details of these accessories, please visit manufacturer's web site: www.prelectronics.com.

Type label of standard versions

Each sensor has a type label attached to. It is a moisture and wear proof industrial grade sticker, with black text on white label. This label has printed information of trade name, web page, type code, CE-mark, product number and serial number, including production date. For these sensors manufacturer contact information is printed on a separate label.

Image below: Example of a standard sensor type label.



Serial number information

Serial number S/N is always printed on type label in the following form: yymmdd-xxxxxxx-x:

- yymmdd production date, e.g. “230131” = 31.1.2023
- -xxxxxxx production order, e.g. “1234567”
- -x sequential ID number within this production order, e.g. “1”

EU Declaration of Conformity

The EU Declaration of Conformity, declaring products‘ conformance to the European Directives, is delivered with products or sent on request.

Manufacturer contact information

Manufacturer HQ main office:

	Lapp Automaatio Oy
Street address	Martinkyläntie 52
Postal address	FI-01720 Vantaa, Finland

Production site and logistics:

	Lapp Automaatio Oy
Street address	Varastokatu 10
Postal address	FI-05800 Hyvinkää, Finland
Phone (sales)	+358 20 764 6410
Email	epicsensors.fi.lav@lapp.com
Https	www.epicsensors.com

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