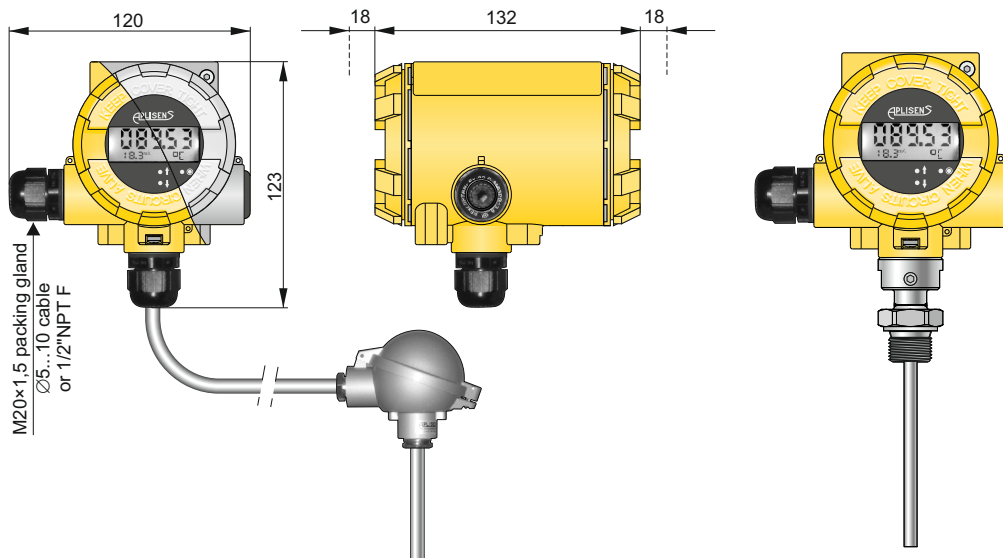


Smart temperature transmitter LI-24ALW



- ✓ Output signal 4...20mA with Hart7 protocol
- ✓ Galvanic insulation (In, Out)
- ✓ Programmable sensor type
- ✓ Programmable measuring range
- ✓ Thermoresistance line compensation
- ✓ Compensation of thermocouple cold junction
- ✓ Autodiagnostic system
- ✓ Intrinsic safety certificate (ATEX, IECEx)
- ✓ Explosion proof certificate (ATEX, IECEx)
- ✓ Safety version SIL2/SIL3
- ✓ Special version compatible with MID directive



LI-24ALW with remote mounted temperature sensor

LI-24ALW with direct mounted temperature sensor

Application and function

The temperature transmitter LI-24ALW is applicable to converting resistance of temperature or voltage of thermocouple sensor to standard current signal 4-20mA. The transmitter has two separate channels enabling measurement of temperature difference, average, average with redundancy, max. or min. temperature. Transmitter has compensation of ambient temperature influence and compensation of thermocouple cold junction using internal/external (Pt100) sensor or constant temperature. Most of parameters such as: sensor type, measuring range, current alarm signal when electric circuit is broken, output characteristic correction, user characteristic (60 points) are programmed using PC with HART/USB converter and Aplisens RAPORT 2 configuration software. For request Aplisens can set temperature transmitter parameters like measuring range, type of sensor. Their values are printed on label. Transmitter LI-24/ALW is designed for field use. LI-24ALW can be used with temperature sensors mounted directly in transmitter's casing or with external sensors connected with cable.

Technical data

| | |
|-------------------------------|---|
| Input signal | Resistance: Pt100, Ni100 Voltage: K, J, S, B, N, T, R, E |
| Limit process | -10mV < E < 100mV or -100mV < E < 1000mV 0Ω < R < 400Ω or 0Ω < R < 2000Ω |
| Min. measuring range | 10mV or 10Ω or 10K |
| Output signal | 4 - 20 mA + Hart 7 11...36 VDC Exia: 11...30 VDC Exd: 11...36 VDC Exia/Exd: 11...30 VDC |
| Power supply | Safety, Safety Exd: 12,5...36 VDC Safety Exia: 12,5...30 VDC Safety Exia/Exd: 12,5...30 VDC |
| Max. wires resistance | 500Ω |
| Alarm signal | 3,75 mA / 21,6 mA (NORMAL) 3,6 mA / 21 mA (NAMUR NE89) |
| Sensor current | 0,42mA Safety: 0,25mA |
| Galvanic insulation | Optoelectrical |
| Time constant | 0,3s |
| Additional electronic damping | 0..60s |
| Ambient temperature | -40...+80°C Exia: -40...+80°C Exd: -40...+75°C Safety: -40...+85°C Safety Exia, Safety Exd: -40...+75°C |

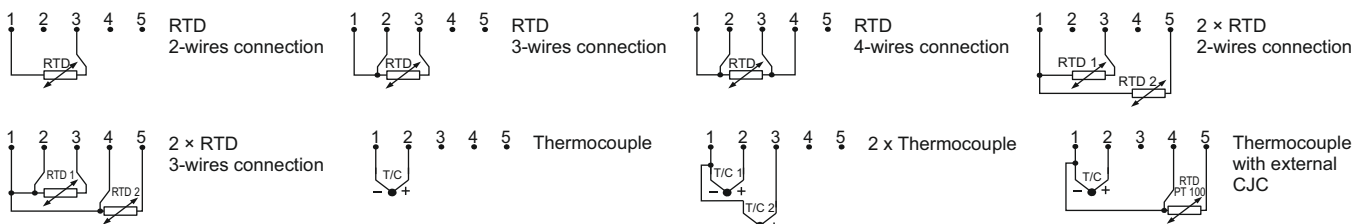
Factory settings

Sensor type: **Pt100**
No. of wires: **3-wires**
Measuring range: **0÷100°C**

Type of input signals and metrological parameters

| RTD sensors | | | Thermocouples | | |
|--------------------------------------|----------------------------|-----------------|-----------------------------|--|-----------------|
| Thermal resistance sensors | 2, 3 or 4 wires connection | | Input impedance | >10MΩ | |
| Sensor current | ~250 μA | | Maximum wires resistance | 500 Ω (wires + thermocouple) | |
| Maximum wires resistance | 40 Ω | | Cold junctions compensation | Internal sensor, external sensor Pt100, constant value | |
| Sensor type | Basic range (FSO) | Min. range span | Sensor type | Basic range (FSO) | Min. range span |
| | °C | K | | °C | K |
| Pt100 | -200+850 | 10 | B | 500+1820 | 50 |
| Pt200 | -200+850 | 10 | E | -150+1000 | 50 |
| Pt500 | -200+850 | 10 | J | -210+1200 | 50 |
| Pt1000 | -200+266 | 10 | K | -150+1372 | 50 |
| Ni100 | -60+180 | 10 | N | -150+1300 | 50 |
| Cu100 | -50+180 | 10 | R | 50+1768 | 50 |
| | | | S | 50+1768 | 50 |
| | | | T | -150+400 | 50 |
| Resistance (resistor, potentiometer) | | | Internal sensor CJC | -40+80 (Safety -40+85) | - |
| | | | Voltage | | |
| | Ω | Ω | | mV | mV |
| Measuring range No.1 | 0+400 | 10 | Measuring range No.1 | -10+100 | 10 |
| Measuring range No.2 | 0+2000 | 10 | Measuring range No.2 | -100+1000 | 10 |

Electrical diagrams

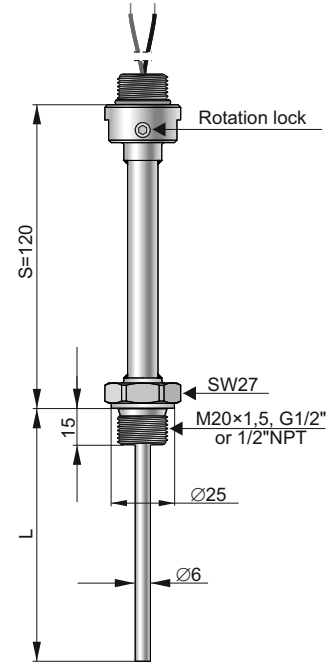
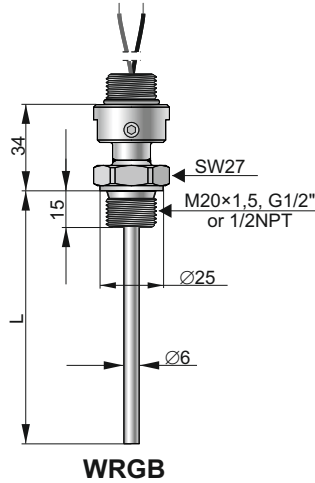


*Other sensor connection diagrams are given in the LI-24L and LI-24G transmitter operation manual

Direct mounted sensors

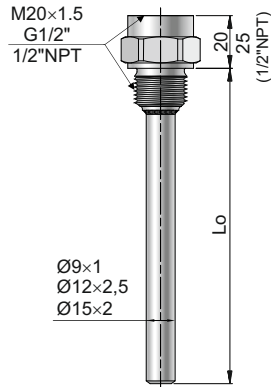
| Thermowell length | Sensor length L |
|---------------------|-----------------|
| OG2 (M20×1,5/G1/2") | L=Lo+20 |
| OG2 (1/2"NPT) | L=Lo+35 |
| OG3 (M20×1,5/G1/2") | L=Lo+50 |
| OG3 (1/2"NPT) | L=Lo+60 |
| OGT (M20×1,5/G1/2") | L=Lo+50 |
| SWG (M20×1,5/G1/2") | L=Lo+15 |
| SWG (1/2"NPT) | L=Lo+30 |
| SW2 (M20×1,5/G1/2") | L=Lo-5 |
| SWT (M20×1,5/G1/2") | L=Lo+45 |

| Code | Description | Shield material | Connector material |
|---------------|--|----------------------------------|--------------------|
| WRGN, WRGB | Spring-loaded sensors (to use with additional thermowell) | 316L (Pt100) Inconel 600 (TC) | 316 |

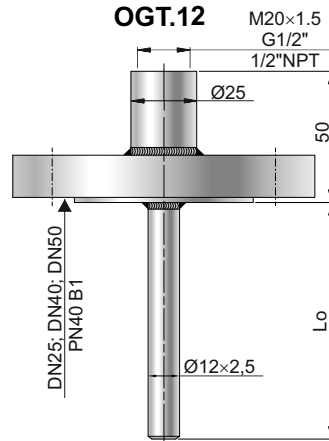


Welded thermowells

OG2.9; OG2.12; OG2.15



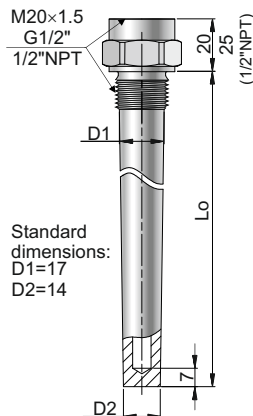
OGT.12



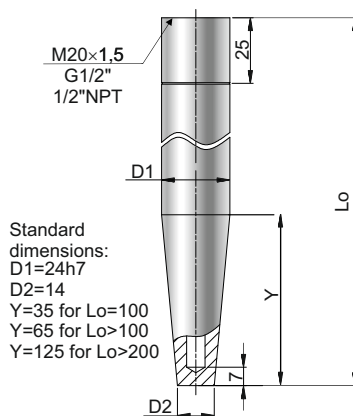
Standard material: (pipe/connectors, flanges) stainless steel 316Ti/316L, others on request

Drilled thermowells

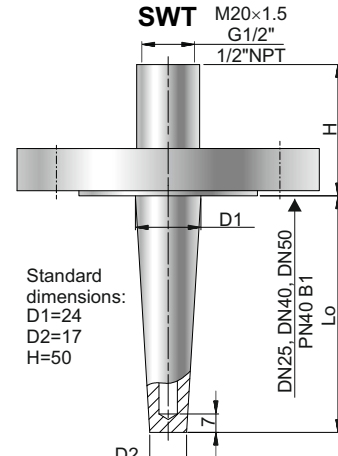
SWG



SW2



SWT



Standard material: stainless steel 316L, others on request

Ordering code

| Model | Code | Description |
|--|------------------------|--|
| LI-24 | | Smart temperature transmitter |
| Versions | /ALW..... | With display, output 4-20mA + Hart 7 |
| | /ALW/Safety..... | With display, output 4-20mA + Hart 7 Functional Safety certificate according to PN-EN 61508:2010 parts 1 + 7; PN-EN 61511-1:2017 + PN-EN 61511-1:2017/A1:2018-03; PN-EN 62061:2008 + PN-EN 62061:2008/A1:2013-06 + PN-EN 62061:2008/A2:2016-01 Version compatible with MID directive - on special request |
| | /ALW/MID..... | |
| Certificates, options* | /SS..... | Stainless steel housing |
| | /Exia..... | II 1G Ex ia IIC T**/T4/T5/T6 Ga Safety version: II 2(1)G Ex ia [ia Ga] IIC T4 Gb Ex ia IIC T**/T4/T5/T6 Ga IECEX Safety version: Ex ia [ia Ga] IIC T4 Gb |
| | /Exia (Da)..... | II 1G Ex ia IIC T**/T4/T5/T6 Ga II 1 D Ex ia IIIC T*/T115°C Da I M1 Ex ia I Ma (with 316SS case) Safety version: II 2(1)G Ex ia [ia Ga] IIC T4 Gb II 1 D Ex ia IIIC T105°C Da I M1 Ex ia I Ma (with 316SS case) Ex ia IIC T**/T4/T5/T6 Ga Ex ia IIIC T*/T115°C Da Ex ia I Ma (with 316ss case) IECEX Safety version: Ex ia [ia Ga] IIC T4 Gb Ex ia IIIC T105°C Da Ex ia I Ma (with 316SS case) |
| | /Exd..... | II 2G Ex db IIC T**/T5/T6 Gb II 2D Ex tb IIIC T*/T105°C Db I M2 Ex db I Mb (with 316ss case) Safety version: II 2G Ex db IIC T**/T5/T6 Gb II 2D Ex tb IIIC T*/T100°C/T85°C Db I M2 Ex db I Mb (with 316ss case) Ex db IIC T**/T5/T6 Gb Ex tb IIIC T*/T105°C Db Ex db I Mb (with 316ss case) IECEX Safety version: Ex db IIC T**/T5/T6 Gb Ex tb IIIC T*/T100°C/T85°C Db Ex db I Mb (with 316ss case) T* - maximum surface temperature (for dust) T** - transducer temperature class (for gases) |
| | /Exia/Exd..... | Dual certification Exia and Exd |
| *more than one option is available | /IP67..... | Protection class IP67 |
| | /US..... | Electrical and sensor connection ½"NPTF |
| Configuration/programming (optional)** | /..... | type of element, element class, no. of wires, set range, alarm |
| Sensor type (optional) | / (none) | Without sensor |
| | /code of direct sensor | Direct mounted sensor according to below table |
| Accessories | /AL..... | Mounting bracket type AL for 2" pipe, material zinced steel |
| | /AL(SS)..... | Mounting bracket type AL for 2" pipe, material SS304 |
| | /AL(SS316)..... | Mounting bracket type AL for 2" pipe, material SS316 |
| | /ST..... | Stainless Steel plate fixed to the housing |
| | /MT..... | Stainless Steel Tag plate mounted on wire |
| | /PT..... | TAG sticker on transmitter's body |

**factory setting PT100, 0...100 degC, 3-wires, A-class, alarm low

| | | |
|--|---------------|--|
| Direct mounted sensor | WRGN..... | Spring loaded sensor with threaded process connection, neck S=120mm, additional TW required. |
| | WRGB..... | Spring loaded sensor with threaded process connection, additional TW required. |
| Certificate (optional) | /Exia..... | Intrinsic safe version |
| | /Exd..... | Explosion proof version |
| Length of sensor | /L=...mm..... | Required length of immersion [mm] |
| Neck extension (optional) | /S=...mm..... | Required length of neck [mm] (if different than standard 120mm) |
| Process connection | /M20x1.5..... | Thread M20x1.5 |
| | /G1/2..... | Thread G1/2" |
| | /1/2NPT..... | Thread 1/2"NPT |
| Type of measuring element | /Pt..... | RTD single Pt100 measuring element |
| | /2xPt..... | RTD double Pt100 measuring element (3-wires only) |
| | /K..... | TC single K measuring element, WRGN sensor only |
| | /2xK..... | TC double K measuring element, WRGN sensor only |
| Class of measuring element | /A..... | RTD sensor class A |
| | /1..... | TC sensor class 1 |
| Number of wires (for RTD sensors only) | /4..... | 4-wires connection |
| | /3..... | 3-wires connection |
| Type of junction (only for TC sensors) | /O..... | Ungrounded |
| | /Z..... | Grounded |
| Thermowell (optional) | /..... | Thermowell code acc. to TW datasheet (page VIII/14) |