SENS4

TDM-1 Series

Temperature measurement
-50 to +150 °C / -58 to +302 °F

| RoHS | Dual | 0-10 VDC | 4-20 mA | Vent | ON/OFF | S4-Connec | IP67 |

Advantages

- **Class AA accuracy**
- **4-20 mA current programmable output**
- **0-10 VDC voltage programmable output**
- **Robust 316 stainless steel design**
- **IP67 enclosure for harsh environments**
- **200 bar process compatibility**
- **Compact and low mass sensor probe**
- **Optional solid state setpoint relay for process control**
- **Dual sensor design**

Applications

- **Food and beverage processing**
- **Sterilization process SIP and CIP**
- **Water treatment and supply**
- **Oil and gas**
- **Wind turbines**
- **HVAC installations**
- **Chemical processing**
- **Hydraulic oil**
- **Engine gearbox oil**
- **Plastic molding**

The TDM-1 series temperature transmitter is designed for gas and liquid measurement in a variety of industrial applications. Its modular compact design offers a unique combination of high measurement performance, flexible configuration and a robust stainless steel design.

Sensor technology

Traditional temperature measurement is based on thermistor, thermocouple or RTD sensors. The TDM-1 is based on semiconductor diode junction sensor technology. The sensor technology offers high measurement accuracy and repeatability in combination with a fast response to temperature changes.

The novel dual sensor probe design offers two individually calibrated sensors for improved measurement stability and redundancy in critical applications.

Measurement performance

Each product is individually tested and calibrated to comply to DIN 60751 class AA accuracy. The calibration sheet is supplied with the product and is also stored electronically in the product's internal memory.
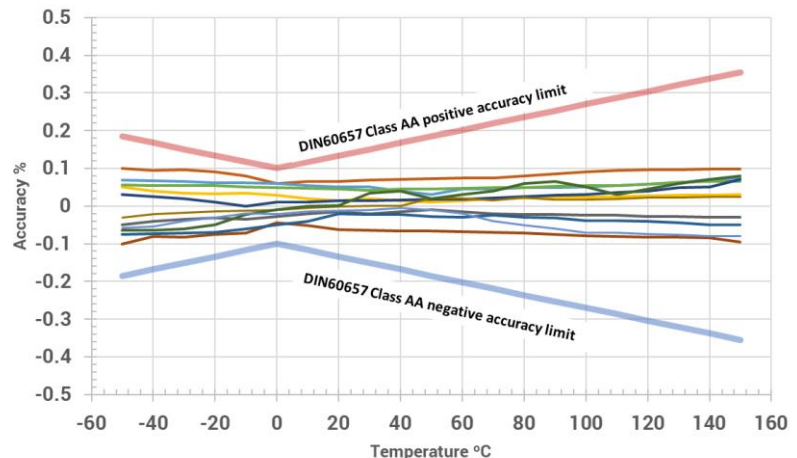
Advanced enclosure design

The IP67 sealed 316 stainless steel enclosure with integrated hydrophobic membrane is designed for extreme environments. The innovative moisture control barrier prevents internal moisture accumulation and water condensation when changes in ambient pressure, temperature and humidity occur.

S4-Connect™

The innovative S4-Connect USB digital communication interface provides access to the powerful digital core. It enables digital communication over the power supply line, thus eliminating the need for additional connector pins. The interface can be used for diagnostics, maintenance, service, calibration, setpoint configuration and setting of other customized parameters. Furthermore, the products offer pin compatibility with industry standard pin-outs for analog transducers.

Customized settings

The transmitter can be delivered with a custom configuration to match specific application and requirements. Examples of pre-configured options include measurement range, pressure unit, setpoint configuration and output signal scaling. Customized products will be assigned a unique part number for easy and simple future reordering.

Process temperature control

The optional setpoint can be either used for controlling or surveillance of the measured temperature via a solid-state relay. The basic control uses on/off regulation.

Analog and digital options

The TDM-1 is available in versions with traditional analog output (e.g. 4-20 mA and 0-10 VDC) and various optional digital interfaces. Advantages by using digital communication include more noise-robust measurements and user-configurable settings such as relay switching, output scaling, etc.

Technical data

| Specifications	
Measuring range	-50 to +150 °C (-58 to +302 °F)
Accuracy	+/- 0.1 °C (Class AA, DIN 60751)
Measuring principle	Dual semiconductor diode junction
Sensor probe diameter	Ø3.0 mm (0.12 inch)
Sensor probe length	15-140 mm (0.59 to 5.51 inch)
Output signal (Voltage version)	0-10 VDC (Programmable scaling)
Output resolution (Voltage version)	16 bit / 150 µV
Output signal (Current version)	4-20 mA[1] (Programmable scaling)
Output resolution (Current version)	16 bit / 244 nA
Solid state relay contact rating (optional)	250 mA, 50 VDC / VAC peak
Environment conditions	
Operating ambient temperature	-40 to +100 °C
Media temperature	-50 to +150 °C
Storage ambient temperature	-40 to +125 °C
Maximum media pressure [2]	200 bar / 2,900 PSI / 20 MPa
Mounting position	Any
Protection rating, EN 60529/A2:2013	IP67 [3], IP65 [4]
Humidity, IEC 68-2-38	98%, non-condensing
Power supply	
Supply voltage	12-30 VDC
Power consumption (Voltage version)	240 mW (Max)
Power consumption (Current version)	600 mW (Max)
Reverse polarity protection	Yes
Overvoltage protection	Yes
Internal fuse	100 mA (Thermal recoverable)
Materials	
Enclosure	SS 1.4404 / AISI 316L
Electrical connector DIN 175301-803A	PA Nylon
Electrical connector M12 IEC 61076-2-101	PA Nylon, Nickel plated Zinc alloy
Process connection	SS 1.4404 / AISI 316L
Process leak tightness (ISO 27895:2009)	$<1 \cdot 10^{-9}$ mbar·l/sec.
Approvals	
CE	EN61000-6-2, EN 61000-6-3 Temperature directive 97/23/CE
RoHS compliance	Directive EU 2015/863

Contact sales@sens4.com for other approvals and certifications.

(1) 4-20 mA NAMUR NE43 compliant signal.
(2) Please consult with Sens4 application support email support@sens4.com to select the best option for the application. An assessment of stresses induced by fluid flow might be needed (following the guidelines of ASME PTC 19.3 TW – 2016).
(3) IP67 for product versions with IEC 61076-2-101 M12 connector
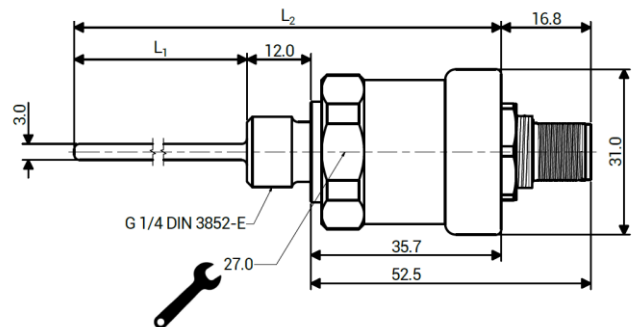(4) IP65 for product versions with DIN EN 175301-803 A connector

Dimensions

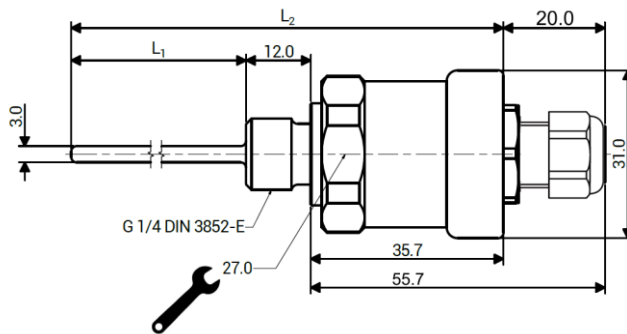**All dimensions in mm.**
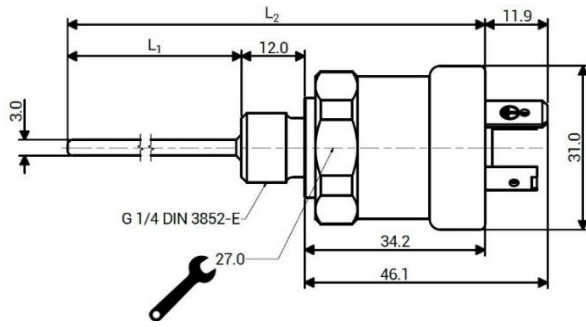
3 pin + PE DIN EN 175301-803 A

4 pin M12 connector IEC 61076-2-101

With fixed cable and flying leads

| Probe length		L₁	L₂
[mm]	[inch]	[mm]	[mm]
15	0.59	15	50.7
40	1.57	40	75.7
90	3.54	90	125.7
140	5.51	140	175.7

All dimensions are in mm unless otherwise stated – General tolerance ISO 2768-1 M

Connector pinout

4 pin DIN EN 175301-803 A, angular connector

1	Positive supply voltage (V+)
2	Supply voltage return (GND)
3	Signal output (S+) or not connected [1]
4	Shield
Chassis	Shield

(1)   3 wire version voltage output / 2 wire version not connected
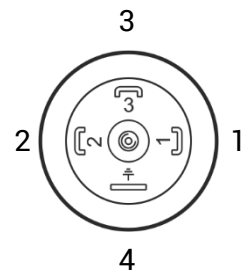
4 pin M12, IEC 61076-2-101

1	Positive supply voltage (V+)
2	Solid state relay out or not connected [2]
3	Supply voltage return (GND)
4	Signal output (S+) or not connected [1]
Chassis	Shield

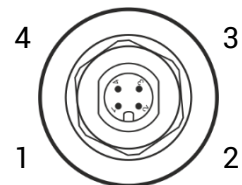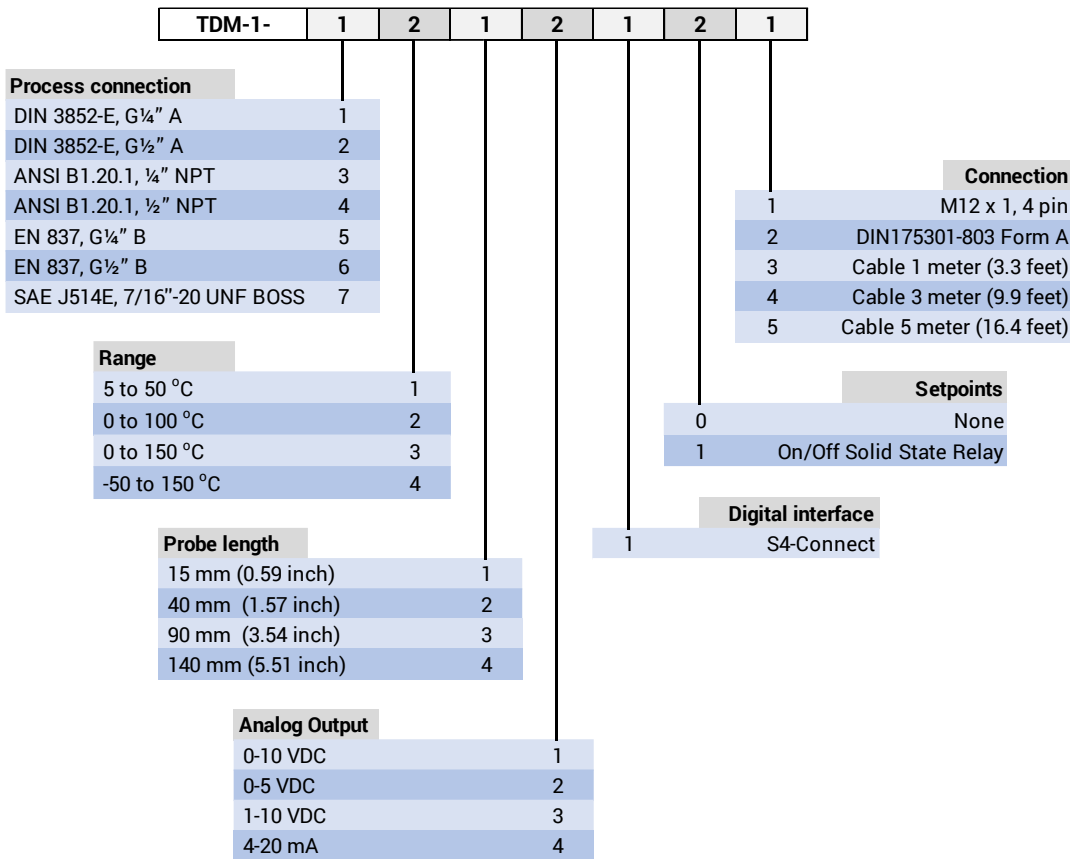(1)   3 wire version voltage output / 2 wire version not connected
(2)   Optional setpoint output or IO-Link communication pin

Order guide:

TDM-1-	1	2	1	2	1	2	1

Process connection

DIN 3852-E, G¼″ A	1
DIN 3852-E, G½″ A	2
ANSI B1.20.1, ¼″ NPT	3
ANSI B1.20.1, ½″ NPT	4
EN 837, G¼″ B	5
EN 837, G½″ B	6
SAE J514E, 7/16″-20 UNF BOSS	7

Connection

1	M12 x 1, 4 pin
2	DIN175301-803 Form A
3	Cable 1 meter (3.3 feet)
4	Cable 3 meter (9.9 feet)
5	Cable 5 meter (16.4 feet)

Range

5 to 50 ^{o}C	1
0 to 100 ^{o}C	2
0 to 150 ^{o}C	3
-50 to 150 ^{o}C	4

Setpoints

0	None
1	On/Off Solid State Relay

Probe length

15 mm (0.59 inch)	1
40 mm (1.57 inch)	2
90 mm (3.54 inch)	3
140 mm (5.51 inch)	4

Digital interface

1	S4-Connect

Analog Output

0-10 VDC	1
0-5 VDC	2
1-10 VDC	3
4-20 mA	4

Accessories

Connectors	Part number
M12 x 1, 4 pin female metal connector	CON-FM12-001
3 + PE DIN EN 175301-803 A female	CON-FDN8-001
Cables	**Part number**
M12 x 1, 4 pin Connector with 3 m cable	CAB-M12-003
M12 x 1, 4 pin Connector with 5 m cable	CAB-M12-005
M12 x 1, 4 pin Connector with 10 m cable	CAB-M12-010
DIN Connector with 3 m cable	CAB-DIN1-003
DIN Connector with 5 m cable	CAB-DIN1-005
DIN Connector with 10 m cable	CAB-DIN1-010
Programming device	
S4-Connect programmer USB	PRG-S4-001

IO-Link is a registered trademark of PROFIBUS Nutzerorganisation (PNO) e.V.

About

Sens4 develops, manufactures, markets and distributes measuring equipment for industrial applications worldwide. Our products are designed, engineered and manufactured in Denmark to the highest quality standards.

Our mission is to continuously endeavor to provide customer centric state of the art measurement solutions.

Our passion | Your value™

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