

Conductivity Sensors

OLS 15

Two-electrode sensors
Connector or Fixed cable version
with integrated temperature sensor Pt 100
Cell constant $k=0.01/\text{cm}$ or $k=0.1/\text{cm}$



Sensors with a temperature sensor Pt 100 are used together with a conductivity measuring instrument equipped with an integrated temperature compensation.

The compact conductivity sensors have been designed specifically for measurement in pure and ultrapure water. The measuring range for sensors with a cell constant of $k = 0.01/\text{cm}$ is from $0.04 \mu\text{S}/\text{cm}$ to $20 \mu\text{S}/\text{cm}$, for sensors with $k = 0.1/\text{cm}$ from $0.1 \mu\text{S}/\text{cm}$ to $200 \mu\text{S}/\text{cm}$.

Areas of application

- Monitoring ion exchangers
- Reverse osmosis
- WFI (Water for Injection)
- Chip cleaning.

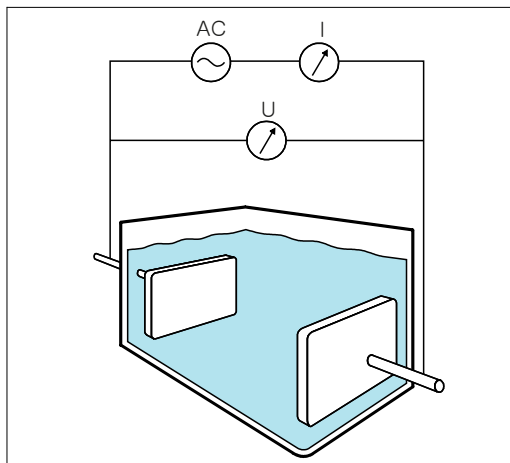
Benefits at a glance

- High measuring accuracy as cell constant is individually measured
- Installation in pipes or flow chambers
- Compact design
- Available with circular plug or fixed cable
- Ingress protection IP 67 / NEMA 6
- Easy to clean due to polished measuring surfaces
- Can be sterilized up to max. 140°C

Function and system design

Measuring principle

Conductive conductivity measurement



The conductivity of liquids is measured with a measuring system that has two coaxially arranged electrodes like a capacitor. The electric resistance or its reciprocal value, the conductance G , is measured according to Ohm's law. The specific conductivity κ is determined using the cell constant k that is dependent on the sensor geometry.

Conductive conductivity measurement

AC Power supply
I Current meter
U Voltage meter

Important properties OLS 15

- **Electrodes**
OLS 15 has two coaxial measuring electrodes made of polished, stainless steel 1.4435 (AISI 316L).
- **Temperature sensor**
In addition, a Pt 100 temperature sensor is installed in the inside electrode to measure the medium temperature.
- **Easy connection**
The connector versions are connected via a 4-pole circular plug. For introduction of the measuring cable, the plug is equipped with a Pg 9 cable gland.
The fixed cable versions are ready for operation and do not need any further cable connection.
- **Installation**
The sensors are available with various process connections and can be installed directly. For simple installation in cross or T-pieces with DN 32, 40 or 50, adapter couplings (made of PVC for cementing) are available.
- **Durable and sterilisable**
The sensor is pressure-proof up to 12 bar / 174 psi (at 20 °C / 68 °F) and can be applied with temperatures of up to 120 °C / 248 °F (at 1 bar / 14.5 psi), short-time up to 150 °C / 302 °F (at 1 bar / 14.5 psi).

Operating principle

The two-electrode sensor OLS 15 is supplied with an alternating measuring voltage by the conductivity measuring transmitter. The alternating current flowing through measuring electrodes and medium is determined by the conductivity of the liquid.

The coaxially arranged measuring surfaces are made of polished stainless steel 316L, the sensor shaft is made of PES.

The connector versions can be connected via a 4-pin circular plug. For introduction of the measuring cable, the plug is equipped with a Pg 9 cable gland.

The fixed cable versions are ready for operation and do not need any further cable connection.

The sensor is easily screwed in and pressure-proof up to 12 bar / 180 psi. There are adapter couplings available (made of PVC for cementing) for simple installation of the sensors in cross or T-pieces with DN 32, 40 or 50.

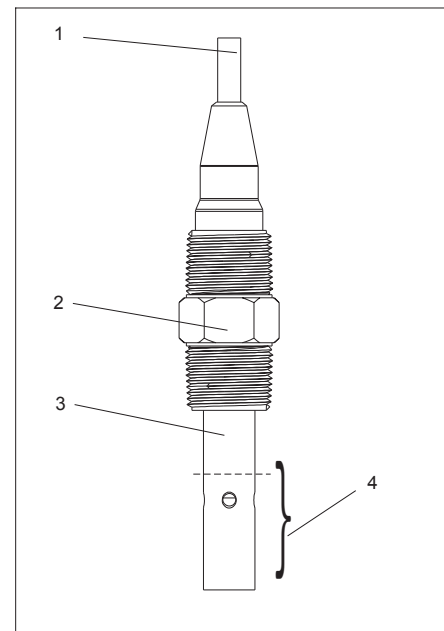
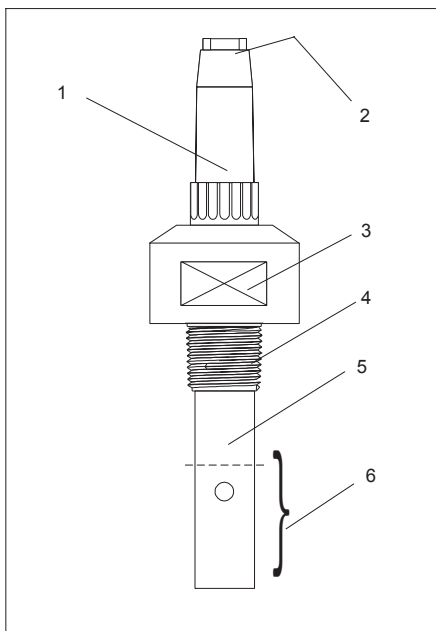
When installing the sensor, the measuring surfaces must be completely wetted by the medium during operation. When working in ultrapure water, ingress of air must be prevented since dissolved air, particularly CO₂, may increase the conductivity.

left:
OLS 15 connector version with
½" NPT thread

- 1 Connector
- 2 Measuring cable outlet
- 3 Connection head with wrench area, PES
- 4 Threaded shaft
- 5 Coaxial measuring electrode made of polished stainless steel 316L
- 6 Measuring surface

right:
OLS 15 fixed cable version with
¾" NPT thread

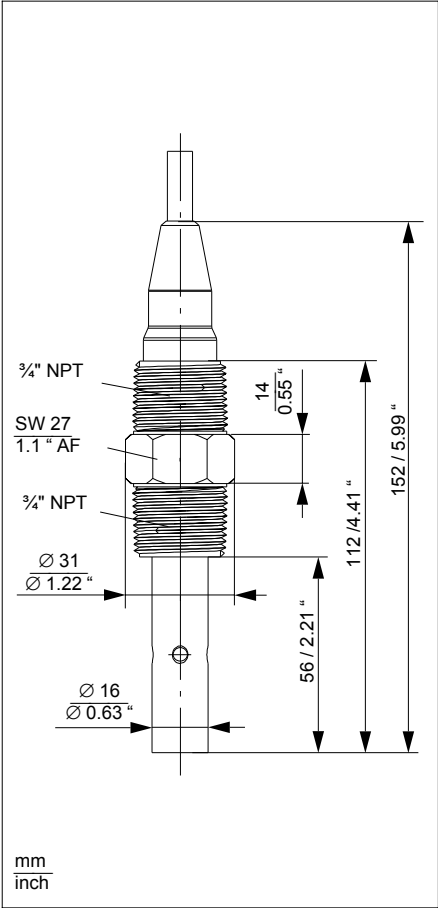
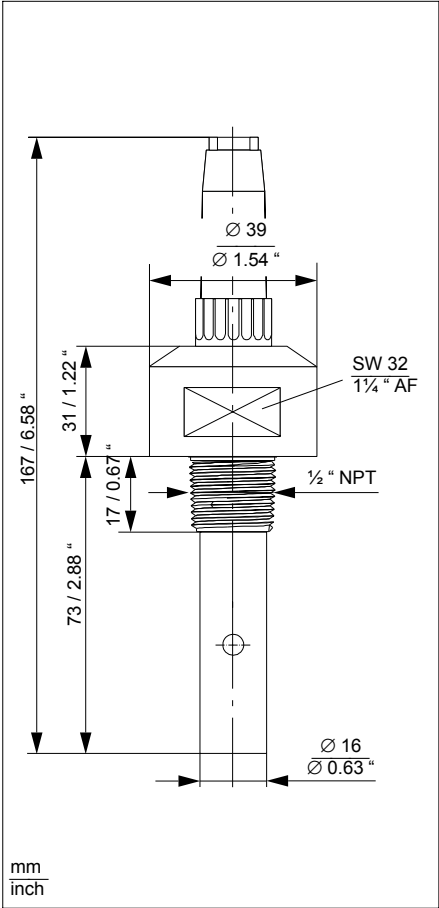
- 1 Fixed cable
- 2 Threaded shaft
- 3 Coaxial measuring electrode made of polished stainless steel 316L
- 4 Measuring surface



Dimensions

left:
OLS 15 connector version with
1/2" NPT thread

right:
OLS 15 fixed cabel version with
3/4" NPT thread



Installation

OLS 15 connector versions

left:

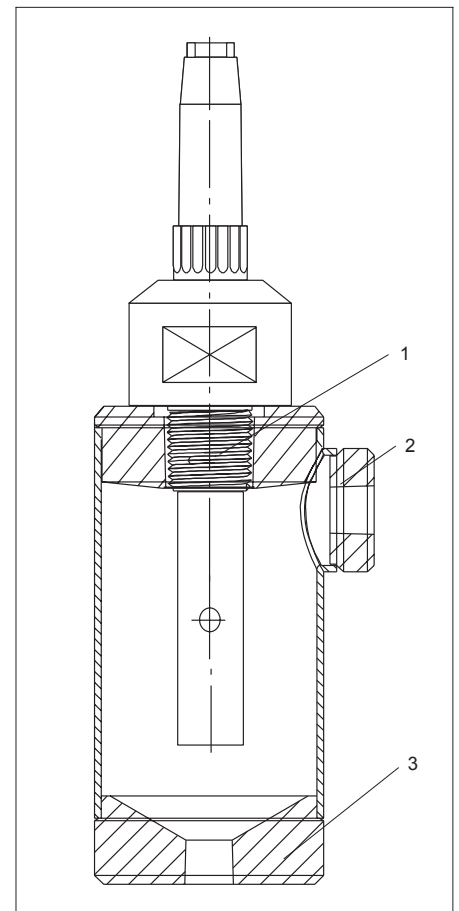
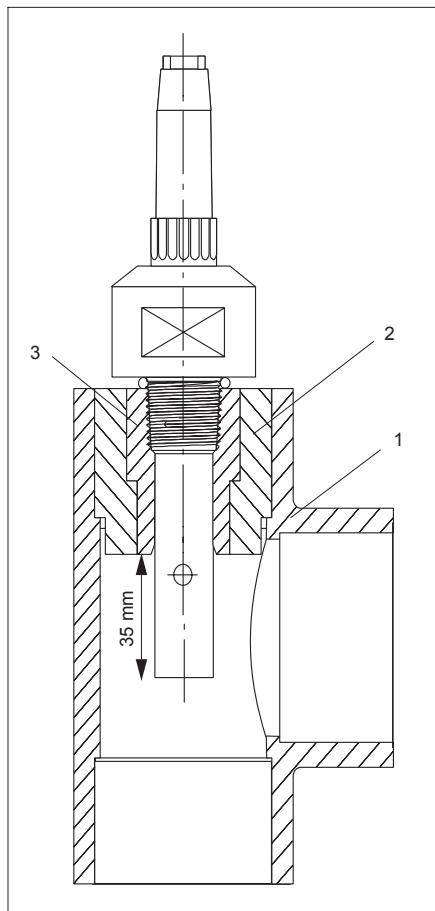
OLS 15 screwed in T-piece

- 1 T- or cross piece DN 32, 40 or 50
- 2 Adapter coupling for cementing (for DN 32, 40 or 50)
- 3 PVC threaded coupling

right:

OLS 15 in flow vessel TSP 4377, made of stainless steel

- 1 Sensor support 1/2" NPT
- 2 Outlet 1/4" NPT
- 3 Inlet 1/4" NPT



OLS 15 fixed cable version

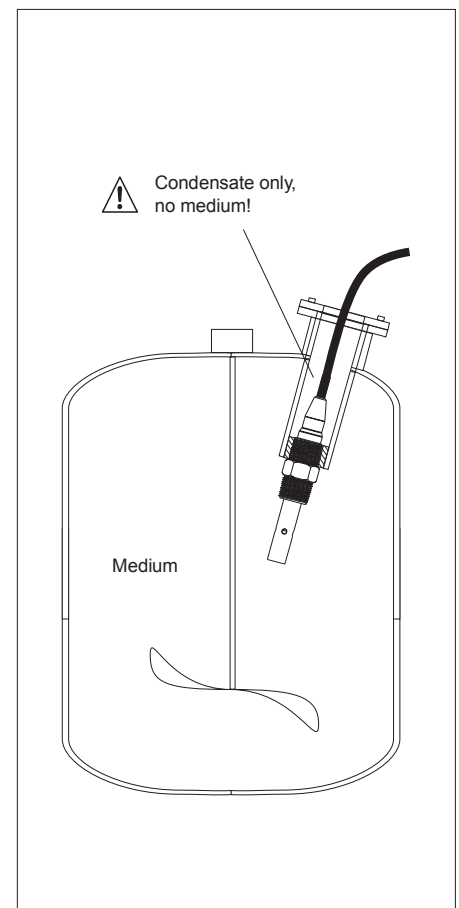
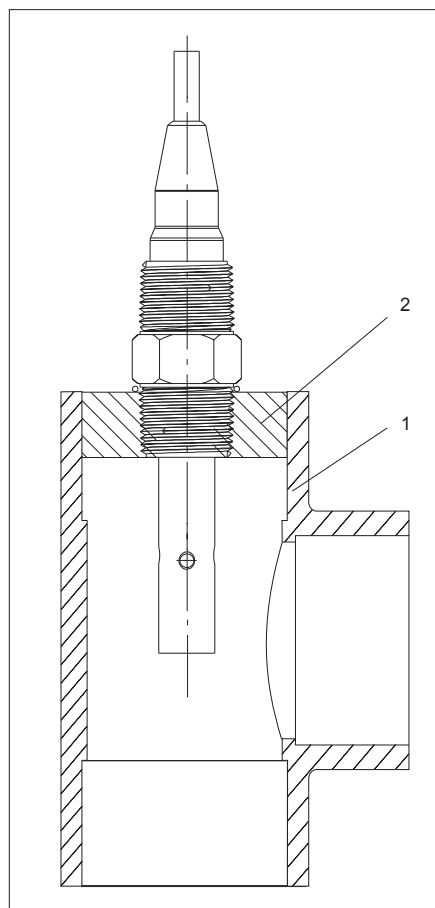
left:

OLS 15 screwed in T-piece

- 1 T- or cross piece
- 2 3/4" NPT threaded coupling

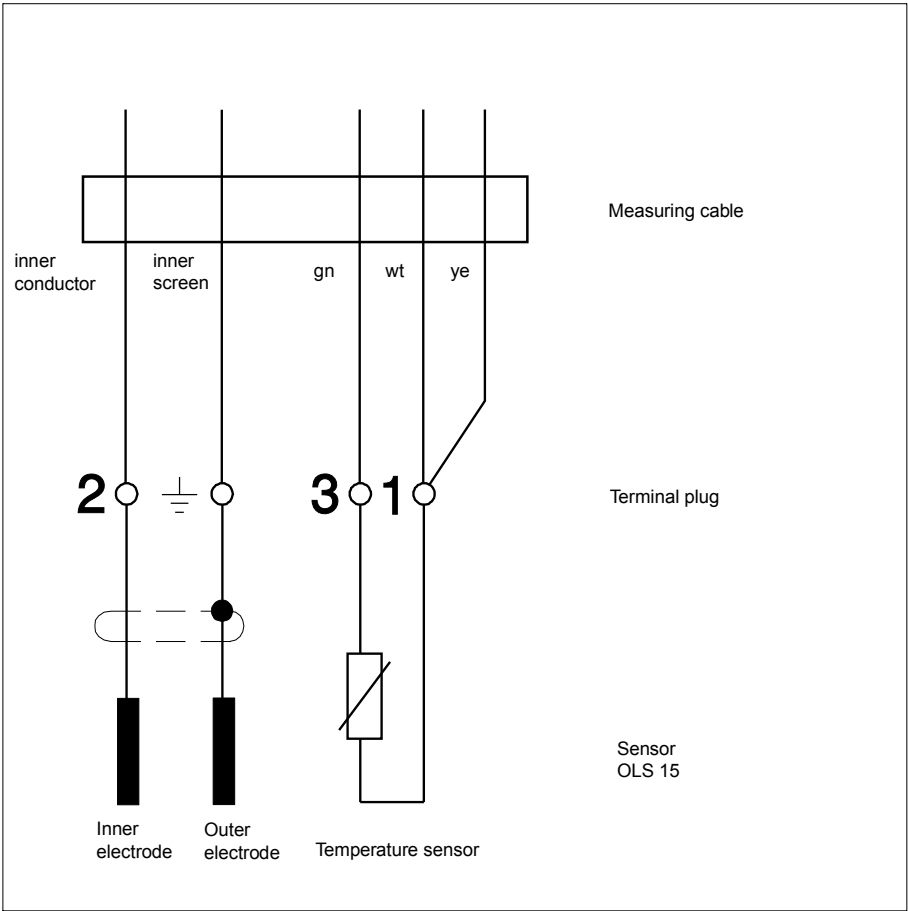
right:

OLS 15 used with immersion assembly CYA 611 or with an immersion pipe

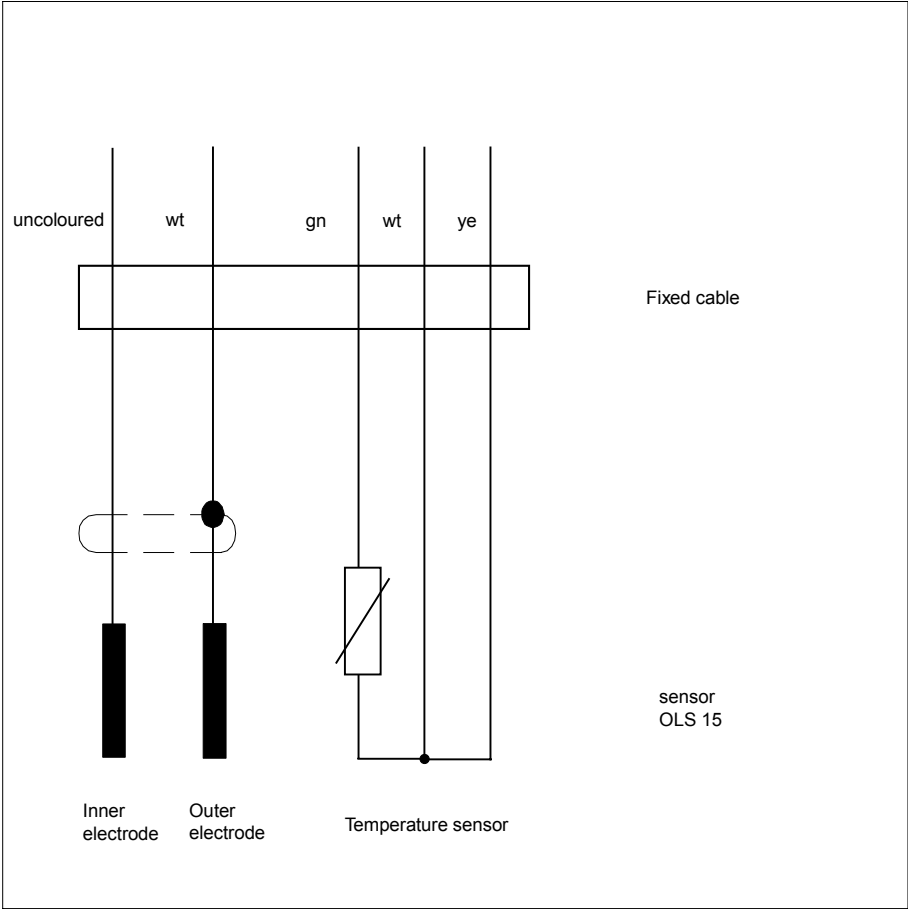


Electrical connection

Electrical connection
OLS 15
connector versions



Electrical connection
OLS 15
fixed cable versions



Technical data

Mechanical data

Electrode length thread versions	54 mm / 2.13 "
Electrode diameter	16 mm / 0.63 "

Material

Sensor shaft	PES (polyethersulfone)
Electrode	stainless steel 316L, polished
Surface roughness	$R_a \leq 0.4 \mu\text{m}$

Conductivity measurement

Measuring range (related to water at 25 °C)	for $k = 0.01/\text{cm}$: 0.04 ... 20 $\mu\text{S}/\text{cm}$ for $k = 0.1/\text{cm}$: 0.1 ... 200 $\mu\text{S}/\text{cm}$
Cell constant k	0.01/cm or 0.1/cm
Temperature sensor	Pt 100

Process connection

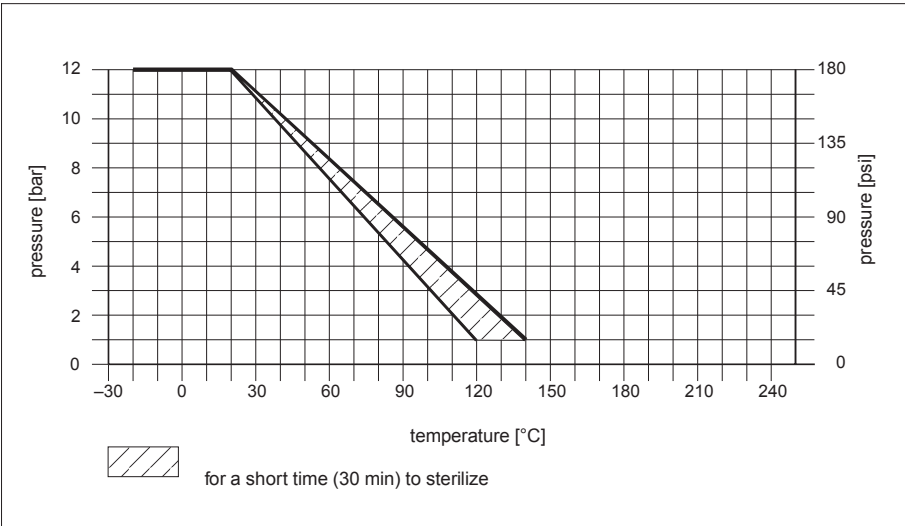
Thread connector version fixed cable version	$\frac{1}{2}$ " NPT $\frac{3}{4}$ " NPT
Cable connection connector version	SXP plug with Pg 9 cable gland

Operating data

Max. temperature thread version	120 °C (short time operation at 140 °C)
Max. pressure	12 bar / 180 psi (20 °C)
Min. flow rate	30 l/h
Ingress protection	IP 67 / NEMA 6

Pressure/temperature diagram

Pressure / temperature diagram for inline installations



Accessories

- ❑ Measuring cable for 2-electrode conductivity sensors with temperature sensor. 1 coaxial line with low signal-tonoise ratio, 4 auxiliary cores, each AWG 18 with common screen, diameter 7 mm / 0.25 inch.
Price per meter (minimum length 5 m / 15 ft).
- ❑ PVC threaded coupling with G ½ internal thread for cementing in standard PVC cross or T-pieces DN 20. G ½ internal thread seals with ½ " NPT sensor thread.
- ❑ PVDF threaded coupling with G ½ internal thread and G1 external thread, pressure-proof up to 12 bar / 180 psi (20 °C), max. temperature 120 °C; incl. O-ring. G ½ internal thread seals with ½ " NPT sensor thread.
- ❑ Adapter AM 32; PVC adapter coupling for cementing, for installation of OLS 15 with thread in a T-90 piece or DN 32 cross piece
- ❑ Adapter AM 40; as AM 32, but for DN 40
- ❑ Adapter AM 50; as AM 32, but for DN 50
- ❑ Immersion assembly OYA 611 for open tanks and channels; material PVC; with ¾ " NPT sensor connection thread

Product structure

Conductivity sensors OLS 15

Measuring range and cell constant

A 0.04 ... 20 µS/cm (k = 0.01)

B 0.1 ... 200 µS/cm (k = 0.1)

Process connection / material

1A Thread NPT ½" / PES sensor shaft (only connector)

1M Thread NPT ¾" / PES sensor shaft (only fixed cable)

Cable connection

1 4-pole SXP connector

2 with 5 m / 15 ft fixed cable

3 with 10 m / 30 ft fixed cable

Temperature sensor

A Integrated Pt 100 temperature sensor

OLS 15-

complete order code