

Optical Level Control Unit LC-XP

Extended Pressure and Temperature Model



Main Features

- The absence of mechanical moving parts ensures **High reliability**
- Well consolidated steel with fused glass technology ensures **no leakage** and good chemical compatibility.
- Electronic sensor **can be easily replaced** without empty and/or depressurize the plant due to the two parts design.
- **Extended working temperature range**
- **No need for calibrations on the field**
- **Direct mounting** onto various types of compressors and tanks (1"1/8 – 18 UNEF, 1/2"NPT, 3/4"NPT, 1"NPT, 1/2" BSPP, 3/4" BSPP)
- **Customizable delays** on request
- Also suitable for use in ambient with presence of **flammable gas refrigerants**, safety classes as per ISO 817 and EN 378-1: A1, A2, A2L, A3, B1, B2L, B2 belonging to the gas group IIA (as per EN 60079-10-1).
- Unit conform to directives:
 - * 2004-108-CE
 - * CEI EN 60204-1:2006

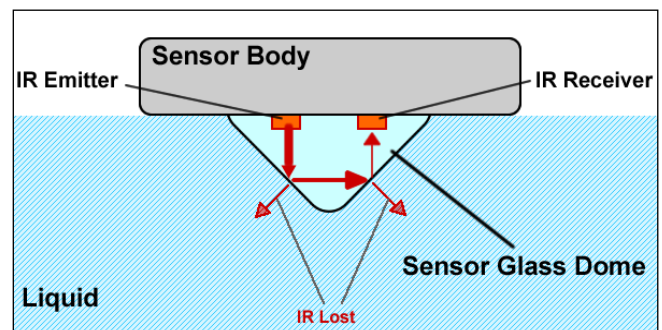
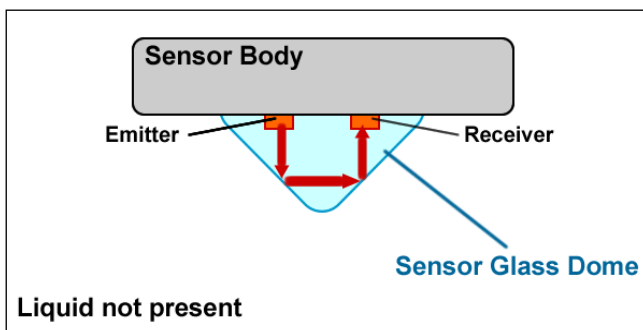
Application Description

The optical level switch has been designed for use in level monitoring applications for the control of low viscosity liquids. It comprises an optical sensor and an output switch. It is realized in two parts to let possible to replace the electronic without the needing of empty or depressurize the plant.

The sensor is suitable as minimum or maximum alarm.

Delays can be introduced in order to satisfy particular needing or avoid false alarms.

Operating Principle



The LC units contain an infrared-ray emitter and an optical receiver. In air (liquid not present), all the light emitted is reflected - internally - by the dome and then redirected to the receiver. When the liquid reaches the sensor dome, a big amount of the light emitted is lost in the liquid and the sensor senses its presence.

Technical Data

Supply voltage (± 10%)	230VAC@50Hz or 115VAC@60Hz or 24 VAC@50/60Hz / 24VDC depending on selected model
Electronic Protections	Over voltage protection
Electrical connection	EN 175301-803A connector (EX DIN 43650 size A)
Output signal	Solid state output Normally Open or Normally Close in air. PNP or NPN (alternatively) open collector output options for 24V DC power supply.
Supply Current	20mA max. during normal operation
Output max. current	Up to 100 mA (depending on the ambient temperature)
Housing material	Sensor Housing: Stainless steel Liquid monitoring prism: Nickel plated steel
Enclosure protection class	IP 65 (with connector properly assembled)
Ambient Temperature range	-40°C ÷ +85°C
Media Temperature range	-40°C ÷ +125°C (please contact us for wider media temperature range)
Maximum Pressure	130 bar (please contact us for higher limits)
Torque Tighten	60 Nm for adapter installation on the system. Socket wrench must be used for assembling the adapter on the system Hand Screw with strength the sensor to the adapter



Electrical Connections / Wiring



Sensor rear view

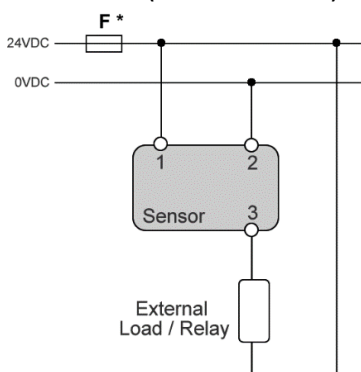
- 1: Power supply wire
- 2: Power supply wire
- 3: Output wire
- 4: Earth Ground

Pin 4 must be properly connected to Earth (not shown in the drawings)

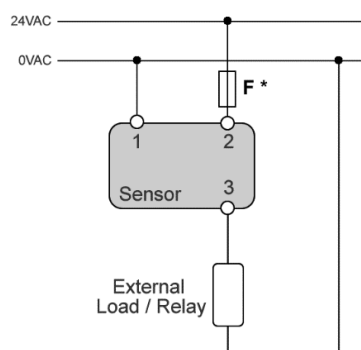


For proper wiring, please check the correct diagram corresponding to the different power supply models. Any error can cause permanent damage to the sensor.

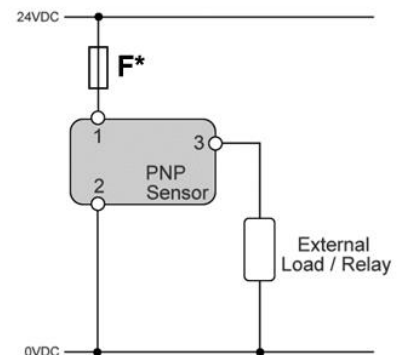
24VDC (NPN OUTPUT)



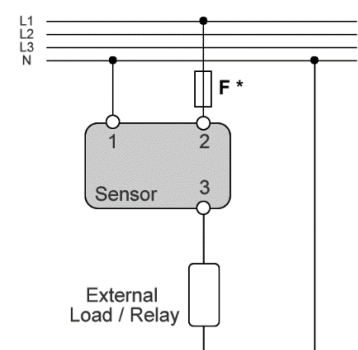
24VAC MODEL



24VDC (PNP OUTPUT)



230VAC MODEL



Wiring diagram examples

* External fuses are generally recommended and mandatory for applications with flammable gas refrigerants (i.e. A2L)

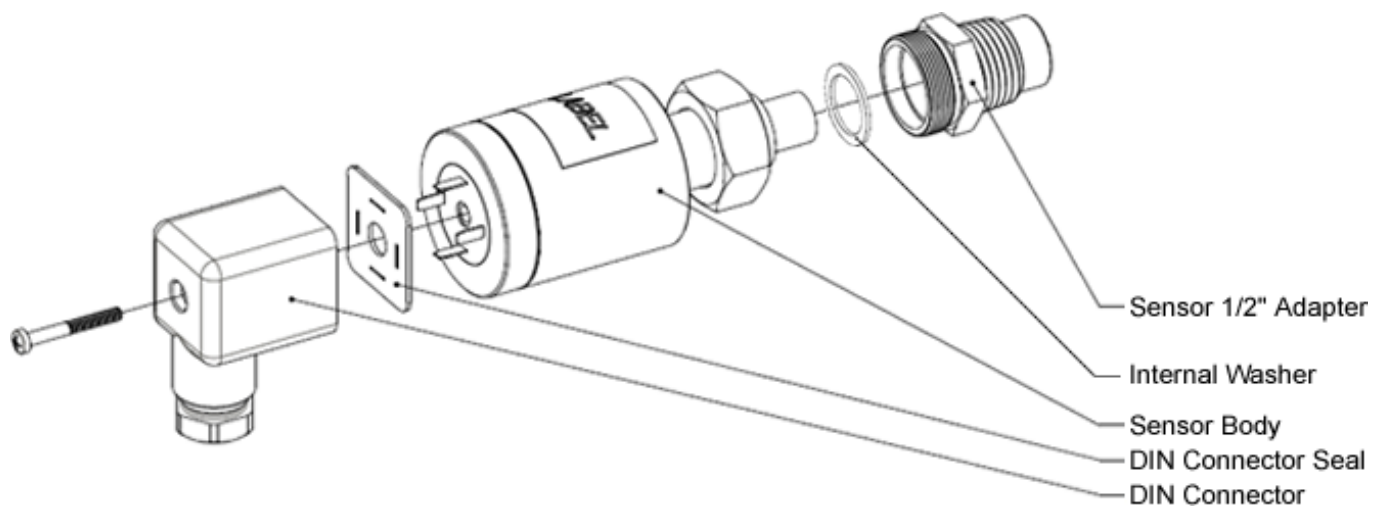
** When connecting the output of the sensor to a relay, please ensure that a suppression module interface or a free-wheeling diode (for DC powered units) is externally connected in parallel with the coil of the relay.

The output of the sensor is not protected against short-circuit. Exceeding indicated max current limit could damage the unit.

Installation notes and special conditions for safe use

- Only qualified personnel should carry out installation.
- Protect hands and face from contacting the liquids, which may contain harmful acid.
- The mounting position corresponds to the desired switching point.
- If possible, let the sensor work in horizontal position. In case of vertical working operation, please contact Teklab.
- Depressurize the system before attempting any work.
- Switch off power supply and isolate the system.
- If fitting to an existing installation, drain the liquid under sensor connection.
- Install the Sensor (see below).
- The correct level in the system must be reached before restarting it.
- Do not install sensor close to infrared sources.
- Do not use for detecting frozen liquids.
- Dome of the sensor must be at least 2" (~ 50mm) from any reflective surface. Please contact Teklab for lower distances.
- Do not install the sensor in a stagnation point of the liquid.
- The optical sensor tip must be free of insulating materials or other interferences.
- The threaded monitoring prism must be installed in a way that it is not in contact with any moving part.
- During installation avoid to scratch or damage the glass dome in any way.
- Proper sealing must be used depending on the application. The switch should then be threaded and sealed by using a correct wrench and under no circumstances by using any other device which may damage it.
- When used in Explosive Atmospheres, no cleaning or rubbing is allowed to avoid electrostatic charging. Cleaning, repair and maintenance must be performed in non-Explosive Atmosphere.
- User must ensure that the equipment is not subjected to mechanical impact and must prevent it for falling. Damaged products must be stopped from being used immediately.

Installation instructions

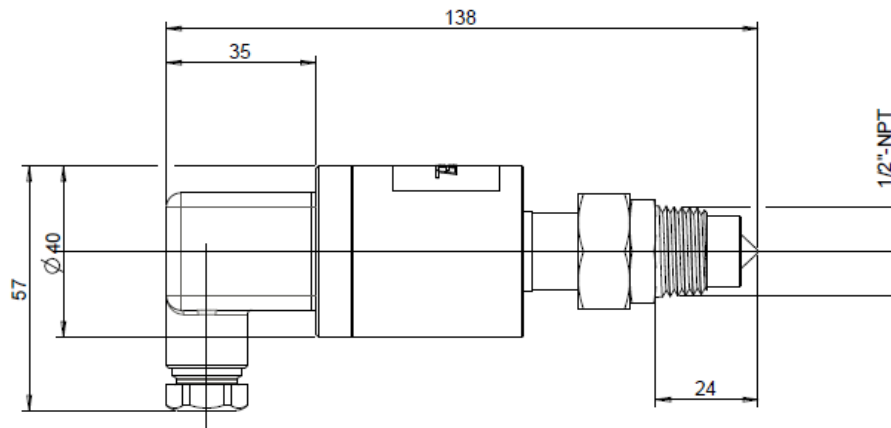


Note. Select proper sealing depending on the thread

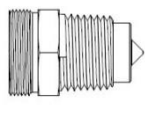
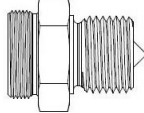
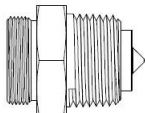
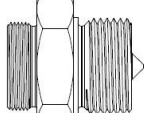
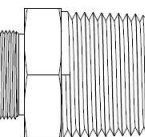
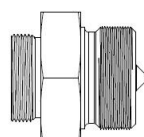
- Ensure that both the glass surfaces of the Electronic Sensor and of the adapter are dry and clean.
- Mount the LC adapter on the system using proper sealing.
- Check for the presence of the internal PTFE washer inside the monitoring prism.
- Keeping the label on top, mount the Sensor Body on the sensor adapter screwing the nut that comes together with the Sensor Body. Hand Screw with strength the sensor to the adapter.
- Turn the internal part of the flying connector in order to have the cable exiting from the connector to fall down.
- Provide proper electrical connection to the sensor

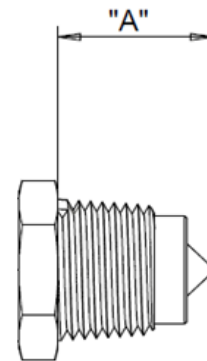
Mechanical Dimensions and available adapters

LC-XP 1/2" NPT example



Available adapters:

 1/2" NPT	 1/2" BSPP
 3/4" NPT	 3/4" BSPP
 1" NPT	 1" 1/8 – 18 UNEF



"A" Dimension depending on the adapter

1/2" NPT: 24 mm	1/2" BSPP: 21 mm
3/4" NPT: 22 mm	3/4" BSPP: 19.5 mm
1" NPT: 24 mm	1" 1/8 – 18 UNEF: 19 mm

Recommendations

Teklab recommends the use of a 10-micron filter in the oil line in order to protect the sensor from contamination.

The device does not need maintenance, but it is recommended to check and keep clean sensitive surfaces during major servicing.

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