

Oil Level Regulator with increased oil mass flow TK3@100bar – 230Vac – Connectors Version



Main Features

- **High reliability** ensured by absence of mechanical moving parts.
- **Sight glass and electronic LEDs** can be checked **on the same side** where is **more comfortable** to do **inspections**.
- Well consolidated steel with fused glass technology and the absence of seals ensures **no leakage** and **good chemical compatibility**.
- **Direct mounting onto 3/4/6 bolts compressors**
- **Left/Right mounting possibilities with the same TK3⁺**.
- **Easy maintenance of the coil of the valve and of the Electro-Optic sensor** that can be easily replaced **without emptying or depressurizing the plant**.
- **No need to use external pressure reduction devices**
- **Maximum compatibility with particular media** due to the possibility of mounting of different/custom valves
- 230 VAC /2A alarm relay output suitable for **direct connection in the security chain** of the system
- **Adapters suitable for various types of compressors**
- **Unit conform to directives:**
 - * 2014/30/UE
 - * 2014/35/UE

Application Description

The TK3⁺ is designed to control the oil level in the compressor crankcase in order to avoid the compressor to run without oil and so improve its lifetime. TK3⁺ monitors the oil level with the embedded electro-optic sensor and comprises a solenoid valve for oil filling and a relay output contact to give an alarm or directly stop the compressor (through a separate power relay). The output contact (normally open) is closed when the oil level is enough and open if after a determined number of filling cycles the oil level is not restored. Alarm state is represented by the red LED.

The LEDs on the Electronic box give immediately info on the status of the system and act as follows:

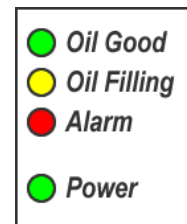
Power Light (green colour): always on when power is applied.

Oil Good (green colour): steady on while oil level is good, blinking for a first period of oil missing (even due to turbulence, undulations, etc.) before start filling and is off when filling.

Oil Filling (yellow colour): Off while oil level is good, steady on while injecting oil, blinking while (after filling) TK3⁺ check if the oil level is restored.

Alarm (red colour): Off while oil level is enough, steady on if after a determined number of filling cycles the oil level is not restored.

Filling cycles continue also in alarm condition and in each phase if the correct oil level is restored the oil feeding is stopped and the alarm is deactivated (auto restore from alarm).



In this model (where the MOPD in std. working conditions is expected to be considerably less than the maximum specified), the functioning sequence is the following:

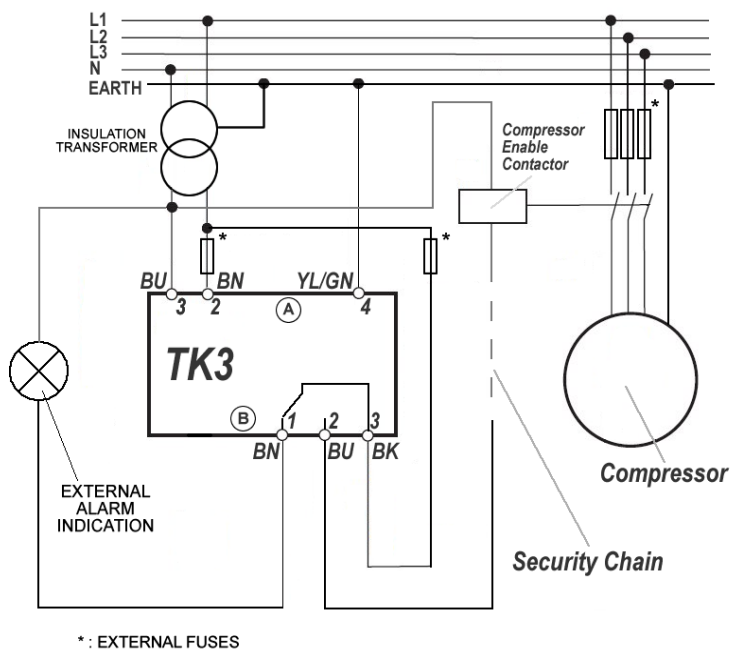
- 10 sec of continuative absence of oil before starting the filling phase
- 5 sec of oil injection for the first cycle up to a maximum of 30 sec
- Variable length of oil monitoring delay (after each oil injection) before filling again or returning to normal condition
- 7,5 minutes before giving alarm in case of oil lack.

Functioning and alarm delay times can be customized in order to follow customer needing.

Technical Data

Supply voltage	230 Vac $\pm$ 10% @50 Hz
Supply Current	Each TK3 ⁺ require 50VA.
Electrical connection	9.4mm Industry Standard Connectors / EN175301-803A connector
Output signal	Contact free relay output NO and NC Up to 230VAC @2A
Relay output	Minimum switching load: 500 mW (10V / 5mA) The Normally Open (NO) alarm contact is closed when power is applied to the TK3 ⁺
Housing material	Nickel plated steel for regulator body PA glass fibre reinforced for electronics
Enclosure protection class	IP 65
Media Temperature	-40°C ÷ +85°C
Ambient temperature	-40°C ÷ +60°C
Max working pressure	100 bar
MOPD	25 bar
Oil Return Line	7/16 – 20 UNEF male
Cable Type	PVC cable CEI 20-22. Working temp.: -20 ÷ +70 °C (fixed laying)

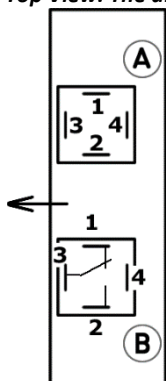
Electrical Connections



Wiring Example.

To obtain a better immunity against noise eventually present on power wires it is recommended to use an insulation transformer to power the TK3⁺

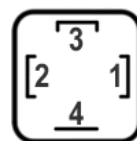
Electronic Sensor Connections (Industry Std. 9.4mm).
Top View. The arrow indicates the glass side



Connector A – Power Supply
(cable with 3 wires and valve derivation)
2. Brown (BN): LINE
3. Blue (BU): NEUTRAL
4. Yellow/Green (YL/GN): EARTH

Connector B – Relay
(cable with 3 wires)
1. Brown(BN): close in alarm
2. Blue (BU): open in alarm
3. Black (BK): common

Valve Connection EN 175301-803 (EX DIN 43650 size A)

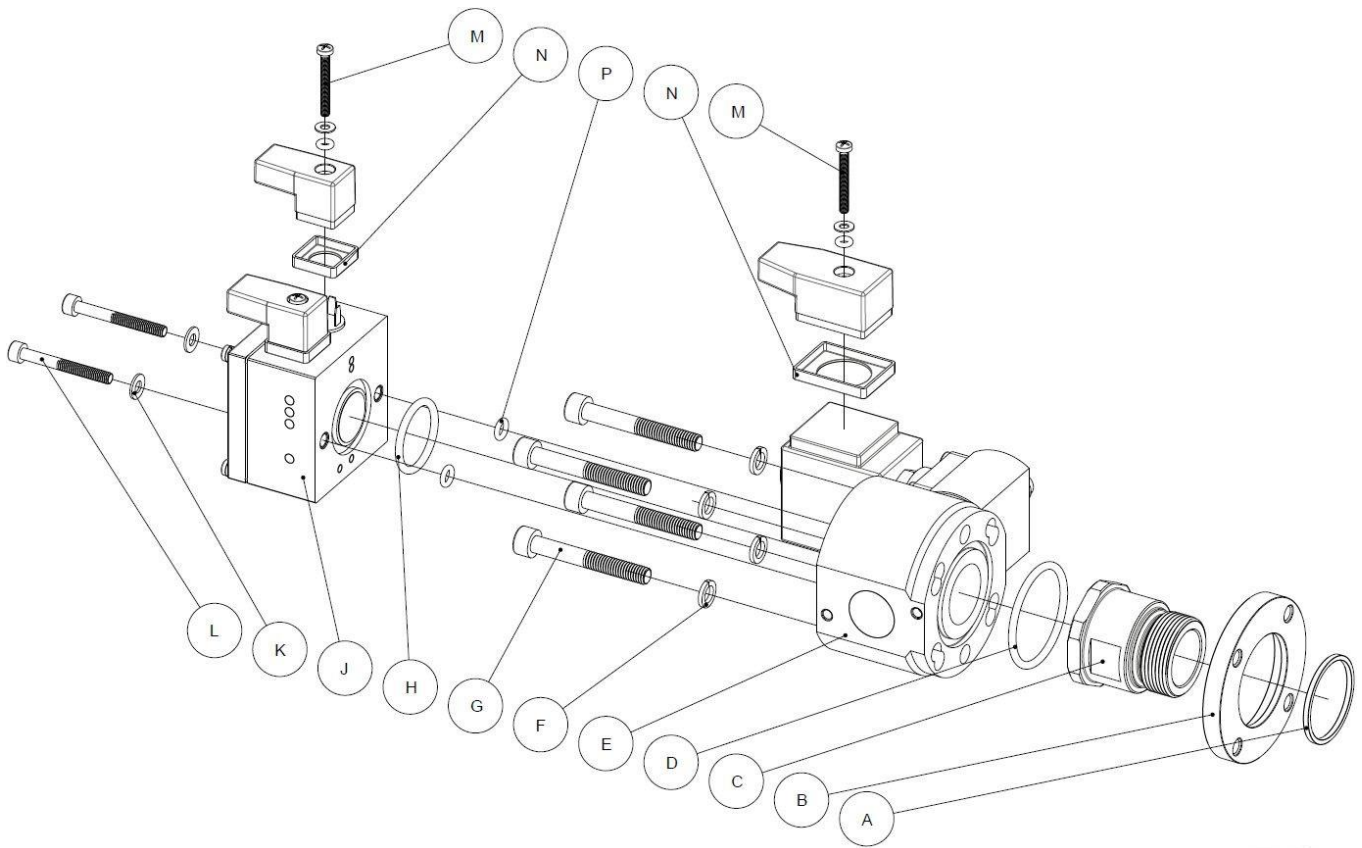


The coil is connected between pins 1 and 2 and in the supplied harness is properly wired to the A connector of the Electronic Sensor.

Installation notes

- Only qualified personnel should carry out installation/maintenance
- Protect hands and face from contacting the oil, which may contain harmful acid.
- Depressurize the system before attempting any work
- Switch off power supply and isolate compressor
- If fitting to an existing installation, drain the compressor crankcase to just under the oil level sight glass.
- Mount the TK3⁺ body on the compressor (see below).
- The correct oil level in the compressor crankcase must be reached before restarting the system.

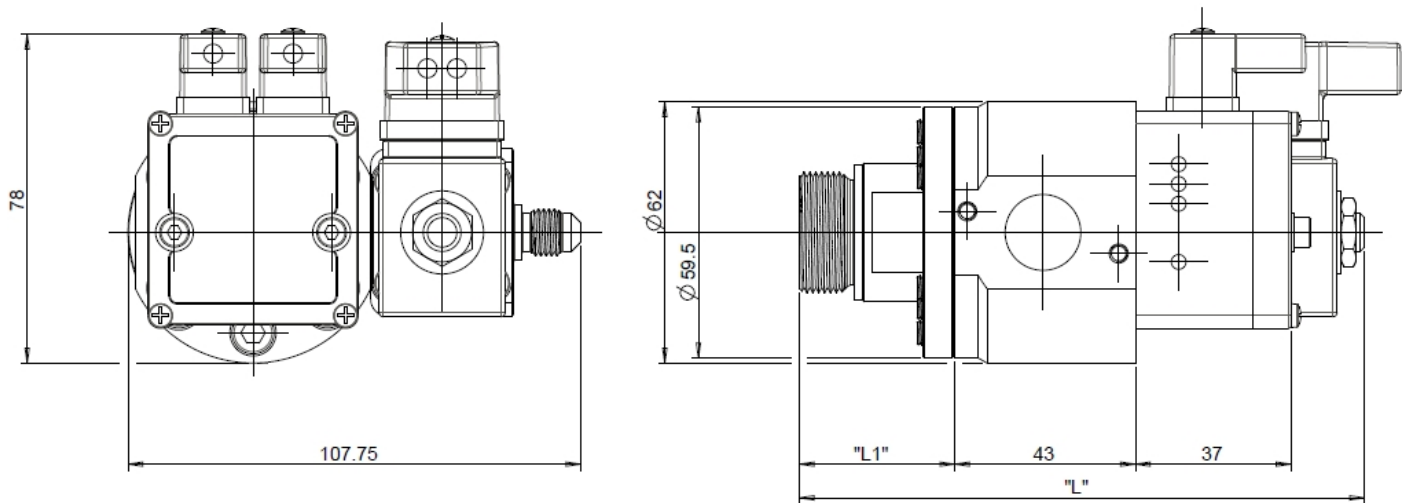
Installation instructions



- Ensure that both the glass surfaces of the Electronic Module and of the TK3⁺ for the electronics are dry and clean.
- Mount the TK3⁺ body on the compressor with supplied bolts and washers using proper o-ring for the flange.
- Mount the electro-optic sensor on the TK3⁺ body using the supplied bolts and plastic washers and o-ring for the electronics.
 NOTE. Do not apply too much strength during the screwing of the electronic module to avoid damages to the sealings of the electronic module and/or to the electrical module itself.
- Plug the Valve connector to the coil of the valve using supplied gasket and screw.
- Plug the Alarm and the Power connectors to the electro-optic sensor using supplied gaskets and screws.

NOTE. If the TK3⁺ need an adapter to be mounted onto the compressor, first mount the adapter onto the compressor then assemble the TK3⁺ with the adapter. In this case for the sealing between the regulator and the adapter, do not use the o-ring to be positioned on the flange's groove but only the o-ring intended for the adapter's groove.

Mechanical Dimensions



Note. - Quotes in mm -. L and L1 can vary depending on the adapter (see TK3⁺ Adapter Addendum)

Ordering Code Examples with mentioned timings (Other possibilities and timings available on request)

	230Vac Connectors version + 6 m cables
TK3 ⁺ Oil Level regulator	TK3P-E60BC16-07
1" 1/8 – 18 UNEF Adapter	TKX-A001
¾" NPT Adapter	TKX-A002
3/4/6 bolts flange Adapter	TKX-A003

Recommendations

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

It is recommended to check and keep clean sensitive surfaces during major servicing.

The selection of the orifice of the solenoid valve and of the functioning and alarm timings has to be carried out considering all possible working conditions of the regulator in the system such as the type of compressor, the pressure differential across the valve (in the various application conditions), etc.

If the functional parameters are different from one installation to the other (also between compressors within the same compressor's pack), make sure to use always the most appropriate product for the characteristics of the single installation. Please contact Teklab for more details about available products.

Teklab cannot be held responsible for any error on any information present in this document. The products, specifications and data reported here can be changed without the need to give any notice. The information contained in this document are based on data collected by Teklab that are considered valid and which are aligned with the technical knowledge of today. Use of this document and related products is intended only to persons having the necessary skills and knowledge at their own risk and discretion.

Since conditions of use are outside the control of Teklab, we cannot assume any liability for any damage caused by the use of our equipment.

This document replaces all earlier versions.