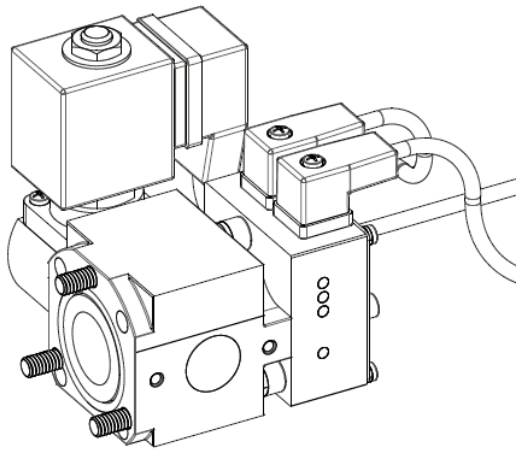
Optical Level Control Unit TK3



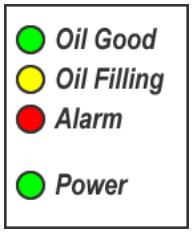
Sight glass on left side (TK3 bottom view).
TK3 is designed also for right side mounting.

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 bolts compressors**
- **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:
  *2004-108-CE *CEI EN 60204-1:2006

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 gives 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.
In each phase if the correct oil level is restored the oil feeding is stopped and the alarm is deactivated.
In standard model the functioning sequence is the following:

- 10 sec of continuative absence of oil before start the filling phase
- 5 sec of oil injection
- 55 sec of oil monitoring before fill again or return to normal condition
- 10 filling cycles (resulting in 10minutes) before giving alarm in case of oil lack.

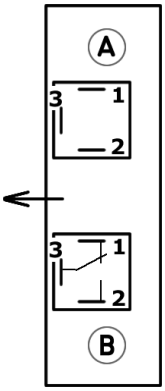
Functioning and alarm delay times can be customized in order to follow customer needing.

Technical Data

Supply voltage	24 VAC ± 10% @ 50 / 60Hz
Supply Current	0,6A (depending on the solenoid valve)
Electrical connection	9.4mm Industry Standard Connectors / EN175301-803A Connector
Output signal	Contact free relay output NO and NC
Relay outputs	Up to 230VAC @2A The Normally Open (NO) alarm contact (blue wire) is closed when power is applied to the TK3
Housing material	Nickel plated steel
Enclosure protection class	IP 65
Media Temperature	-40°C..+85°C
Ambient temperature	-40°C..+60°C
Max working pressure	45 bar (up to 90 bar upon request)
MOPD	45 bar (up to 60 bar upon request)
Oil Return Line	7/16 – 20 UNEF male

Electrical Connections

Electronic Sensor Connections (Industry Std. 9.4mm).



Top View. The arrow indicates the glass side where the sensor is mounted on TK3 body. The 90° female flying part exit on the other side.

A – Power Supply (cable with 2 wires and valve derivation)
2: Brown (24VAC)
3: Blue (24VAC)

B – Relay (cable with 3 wires)
1: Brown (close in alarm)
2: Blue or Gray (open in alarm)
3: Black (common)

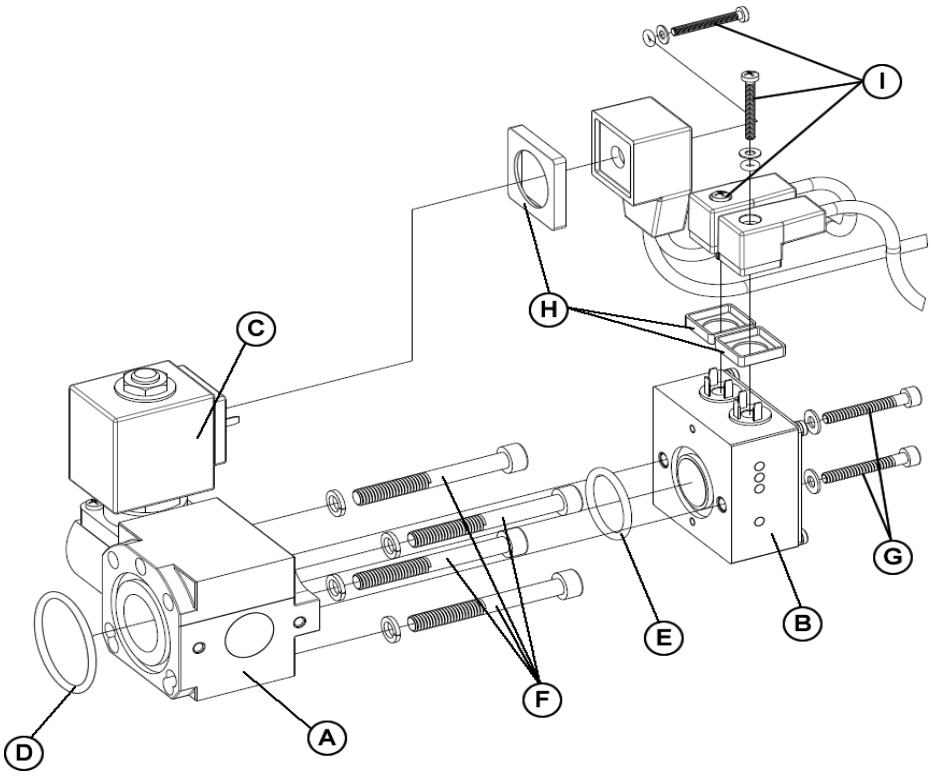
Solenoid Valve Connection EN 175301-803 (EX DIN 43650 size A)

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

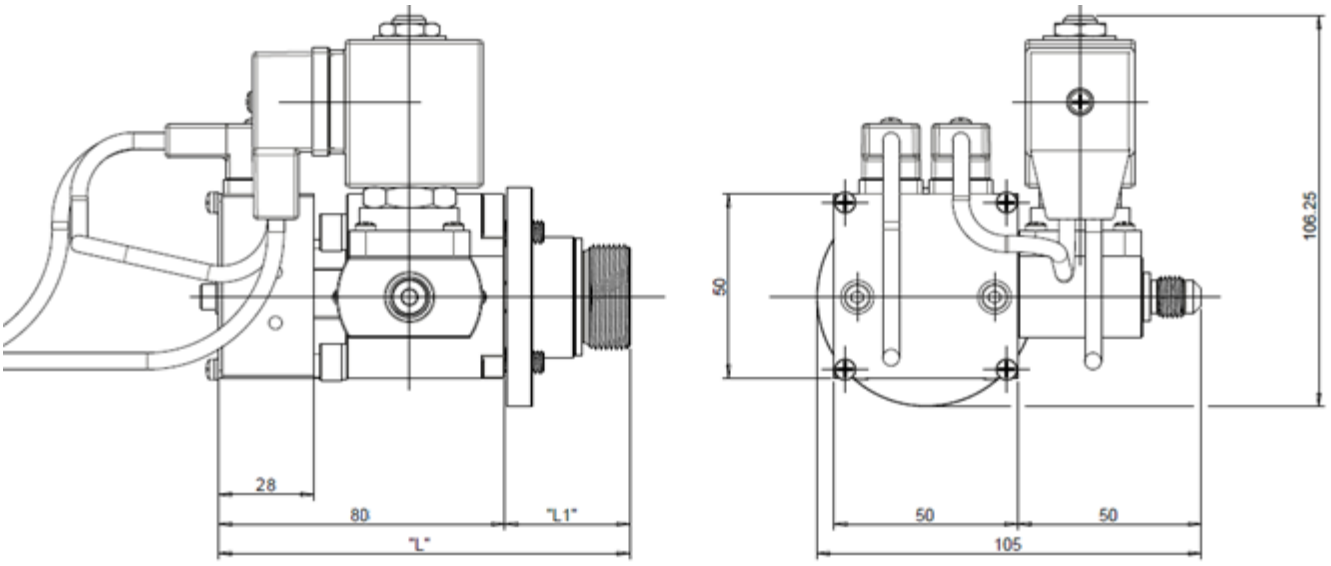


A: TK3 Body
B: Electro-optic Sensor
C: Solenoid Valve
D: O-ring for TK3 mounting
E: O-ring for sensor mounting
F: TK3 mounting Bolts
G: Sensor mounting bolts
H: Connectors gasket
I: Connectors screws

- Ensure that both the glass surfaces of the Electronic Box and of the TK3 for the electronic are dry and clean.
- Mount the TK3 body (A) on the compressor with 3 or 4 supplied bolts and washers (F) using proper o-ring (D) for the flange.
- Mount the electro-optic sensor (B) on the TK3 body using the 2 supplied bolts and plastic washers (G) using supplied o-ring for electronic (E).
- Plug the Valve connector to the coil of the valve (C) using supplied gasket (H) and screw (I).
- Plug the Alarm and the Power connectors to the electro-optic sensor using supplied gaskets (H) and screws (I).

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.

Mechanical Dimensions



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

Ordering Code Examples (Other possibilities available on request)

	Std. Refrigerants (45 bar) Left Version	CO2 Systems (60 bar) Left Version	Std. Refrigerants (45 bar) Right Version	CO2 Systems (60 bar) Right Version
No Adapter	TK3-0000010005055600	TK3-0003010005055600	TK3-1000010005055600	TK3-1003010005055600
1 1/8 " – 18 UNEF Adapter	TK3-0100010005055600	TK3-0103010005055600	TK3-1100010005055600	TK3-1103010005055600
¾" NPT Adapter	TK3-0200010005055600	TK3-0203010005055600	TK3-1200010005055600	TK3-1203010005055600
3/4/6 bolts flange Adapter	TK3-0300010005055600	TK3-0303010005055600	TK3-1300010005055600	TK3-1303010005055600

Recommendations

Teklab recommend the use of a 10 micron filter in the oil line to protect the sensor from contamination. While the device is totally maintenance free we recommend that the optical lens be cleaned during major servicing.

Teklab S.r.l.

Via Emilia Ovest, 1179 - 41123 Modena - Italy
tel. +39 059 375498 - fax +39 059 376294
website: http://www.teklab.biz - email: info@teklab.biz