

# Optical Level Switch Model: Oil Control TK5



Sight glass on left side (TK5 bottom view) picture example. Sight glass on right side also available.

## Operating Instructions

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### 1. Note

Please read and take note of these operating instructions before unpacking and commissioning. The instruments may only be used, maintained and installed by personnel familiar with the operating instructions and the applicable health and safety requirements.

### 2. Product Conformance

The above product conforms to the following standards noted below:  
EN 50081-1 1993.03  
Electromagnetic compatibility (EMC) - Generic emission standard  
EN-50082-2 1996.12  
Electromagnetic compatibility (EMC) - Generic immunity standard

### 3. Instrument Inspection

The instruments are inspected before dispatch and sent out in perfect condition. Should damage to the instrument be visible, we recommend close inspection of the delivery package. In cases of damage, please immediately inform the forwarder as he is liable for any damage in transit.

Scope of Supply

\*Compact Optical Level Switch TK5 incl. electronic

\*separate 4-pin circular connector plug

## 4. Specific Application

The Model TK5 Opti-Level Electronic Oil Level Control monitors the oil level in the compressors crankcase thanks to the optical level switch. It has been designed to be mounted directly onto Reciprocating Compressors. Our dual pitch flange design eliminates the need for additional Adapter Kits: the TK5 can be bolted directly on to Copeland 3 Bolt and Bitzer 4 Bolt Compressors.

The TK5 comprises an optical sensor and a monitoring electronic. The optical sensor tip monitors the level of the liquid by electro-optic infrared technology. It is horizontally mounted in the tank to be monitored.

The switch is designed to control the oil level of the compressor by activating a solenoid valve for oil filling and a separate alarm contact.

During normal operation the valve is closed and both the alarm led (the red one) and the oil filling led (the yellow one) are turned off. The green lights (power and oil level good) are on and the Alarm contact Closed.

When a low oil level condition is detected (even at the start-up of the compressor) the system continues to work normally for a delay time of 10 seconds. If the level is low for more than 10 sec. the contact connected to the valve will pulse on and off (5 sec. on and 5 sec. off) to provide oil filling. The oil level good (green) led is then turned off and the yellow light blinks together with the valve. If the oil level is not restored after 2 minutes the red light will be turned on and the alarm output is being switched (Alarm contact Open). During the alarm period the Solenoid will continue working in pulsing mode.

In each phase if the correct oil level is restored the oil feeding is stopped and the alarm is deactivated (AUTORESTORE FEATURE).

Delay times can be customized in order to follow customer needing.

## 5. Operating Principle

The TK5 is equipped with an infrared electro-optical level sensor.

When the sensor tip is wetted with liquid the infrared light will not be reflected by the lens and loss into the liquid.

When the sensor tip is not wetted by any liquid the infrared light will be reflected back and this will cause an alarm internally. The compact mounted electronic continuously monitors the liquid status and drives the switches for oil control and the signalling lights.

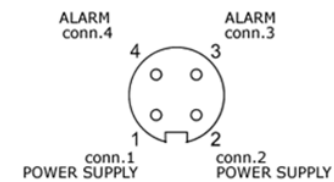
## 6. Technical Data of the Instrument

<b>Supply voltage</b>	24 VAC ± 10% @ 50Hz
<b>Supply Current</b>	0,6A (depending on the solenoid valve)
<b>Electrical connection</b>	4 pin M12x1 connector
<b>Output signal</b>	Contact free relay output
<b>Relay outputs</b>	24VDC @2A – 230VAC @2A The alarm contact is closed when power is applied
<b>Housing</b>	Nickel plated iron
<b>Enclosure</b>	Housing: IP 65, terminals: IP 65
<b>Media Temperature</b>	-20°C..+85°C
<b>Ambient temperature</b>	-20°C..+60°C
<b>Operating pressure</b>	max. 40 bar
<b>Differential pressure</b>	max. 24 bar
<b>Oil Return Line</b>	7/16 – 20 UNEF

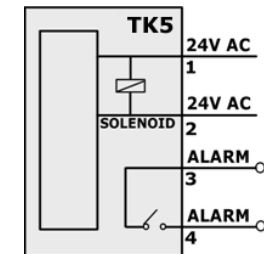
## 7. Installation instruction

- 1) Only qualified personnel should carry out installation
- 2) Protect hands and face from contacting the oil, which may contain harmful acid.
- 3) Depressurize the system before attempting any work
- 4) Switch off power supply and isolate compressor
- 5) If fitting to an existing installation, drain the compressor crankcase to just under the oil level sight glass. It is not necessary to reduce the oil level below this.
- 6) Assemble the TK5 on the compressor
- 7) The correct oil level in the compressor crankcase must be reached before restarting the system.

## 8. Electrical Connection



4 pin round connector M12x1  
Frontal view



## 9. Switching Functions

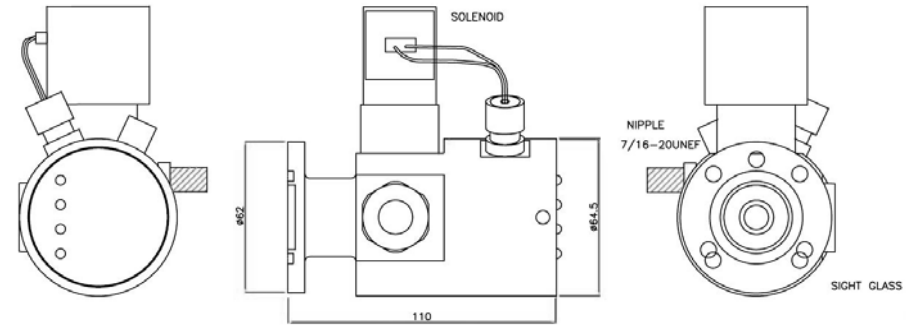
### LED Characteristics

<b>Power:</b>	<b>Green LED</b> LED on when connected to power	
<b>Oil Filling:</b>	<b>Yellow LED</b> - LED off (steady) when oil level is good. - LED blink when oil level is low for more than 10 sec.	
<b>Oil Level good:</b>	<b>Green LED</b> - LED on (steady) when oil level is good - LED off in filling phase (level low for more than 10 sec.)	
<b>Alarm:</b>	<b>Red LED</b> - LED off when liquid level is <u>not</u> low - LED on (steady) when liquid level low for more than 2 minutes.	

### Switching Characteristics

Liquid Level <u>NOT</u> low	→ Valve closed Alarm contact CLOSED
Liquid Level low but less than 10 sec.	→ No action Valve closed Alarm contact CLOSED
Liquid Level low more than 10 sec. but less than 2 minutes.	→ Valve open/closed Alarm contact CLOSED
Liquid Level low more than 2 minutes.	→ Valve open/closed Alarm contact OPEN

## 10. Mechanical Drawing



*Sight glass on left side (TK5 bottom view) drawing example.  
Sight glass on right side also available.*

## 11. Recommendation

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.

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