

Instruction manual

HBOC OIL LEVEL CONTROL SENSOR

for stand alone oil management

The HBOC Oil Level Control Sensor is designed to control oil level in compressor crankcases and oil-separator systems. Sensor operates according to the capacitive principle being unaffected by pressure, foam, splashing and coating. Senses only on pure liquid!

APPLICATIONS:

- Compressor protection
- Automatic oil level control in separators

KEY FEATURES:

- Stand alone microprocessor sensor with controller built-in for automatic oil management
- Direct operation of solenoid valve
- Easy setup and change of timer and alarm settings
- Split design for remote programming
- Saving on installation, cost and time

ADVANTAGES:

- Operation pressure 150bar/2175PSI
- Unaffected by pressure, foam, splashing and coating
- No cleaning and no moving parts
- Split design for easy mounting and programming

SPECIFICATIONS:

Power supply: 24V AC/DC ±10%

Only DC supply for operating solenoid valves (V-type)

Current consumption: Max 30mA

Transistor output: ON/OFF
PNP or NPN, NO/NC, max 1A

Potential Free Output: Max 1A (24W)

LED Indicating: Green: oil indication

Orange: oil feed

Red: Alarm

Oil temp.: 185°F/85°C

Ambiant temp.: 122°F/50°C

Electrical Connection: M12, 5pin

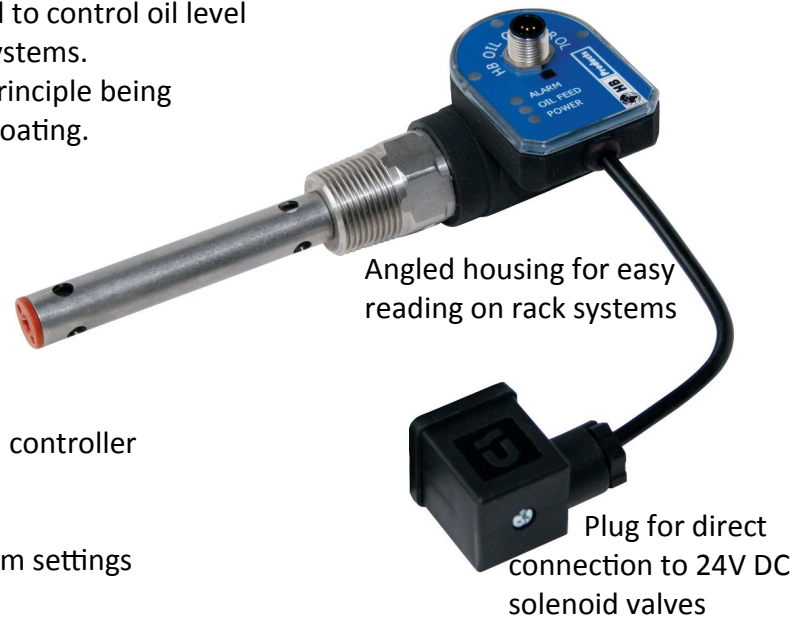
Material sensorpart: Stainless/PTFE

Mechan. Connection: 1/2", 3/4" and 1 1/8" (check ordering codes)

EMC test EN Industrial

Max operating pres.: 150 bar/2175 PSI

Cable length (HBOC-V):3 meters/118"



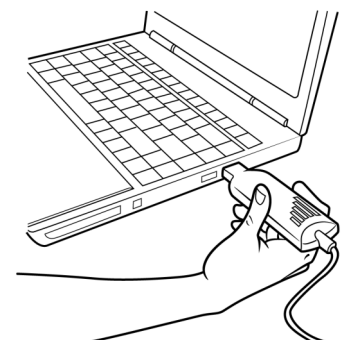
Ordering code:

HBOC - / /

Thread type/size: 1-7: 1 = 1/2" NPT
2 = 3/4" NPT
3 = 1/2" BSPT ("R")
4 = 3/4" BSPT
5 = 1/2" BSPP ("G")
6 = 3/4" BSPP

Housing type:
F = Front style
A = Angle style

V = Cable for solenoid valve (3 meters length)
C = Control & Alarm switch, PNP/NPN output



Easy and simple to configure

HBOC - OIL LEVEL CONTROL SENSOR



LED INDICATION:

- 3 x Green LED: indicates oil
- Red LED: indicates ALARM.
- Yellow LED: indicates OIL feed.
- Green LED: indicates power on

In Operation: Green power LED flashes when run signal is ON

Push button [R] for manual reset and calibration (only for calibration if activated in configuration tool)

Compressor protection and control of oil return

The oil carry over from compressors in multiple compressor parallel rack systems requires proper oil management. The HBOC has been designed to control lubrication and prevent compressor break down. Long term reliability is a obviously a must!

In order to control and secure lubrication of the compressors the oil management must be managed correct here it is important to use a control system with integrated timer and alarm functions.

HBOC is a stand alone sensor and controller for easy and safe distribution of oil.

With built-in adjustable timer, alarm, alarm reset and compressor running signal.

Local and direct connection to oil return valves, saves cabling and installation costs.

NOTE!



Only skilled technicians with thoroughly knowledge of the application are to install this product and setup parameters in the configuration tool.

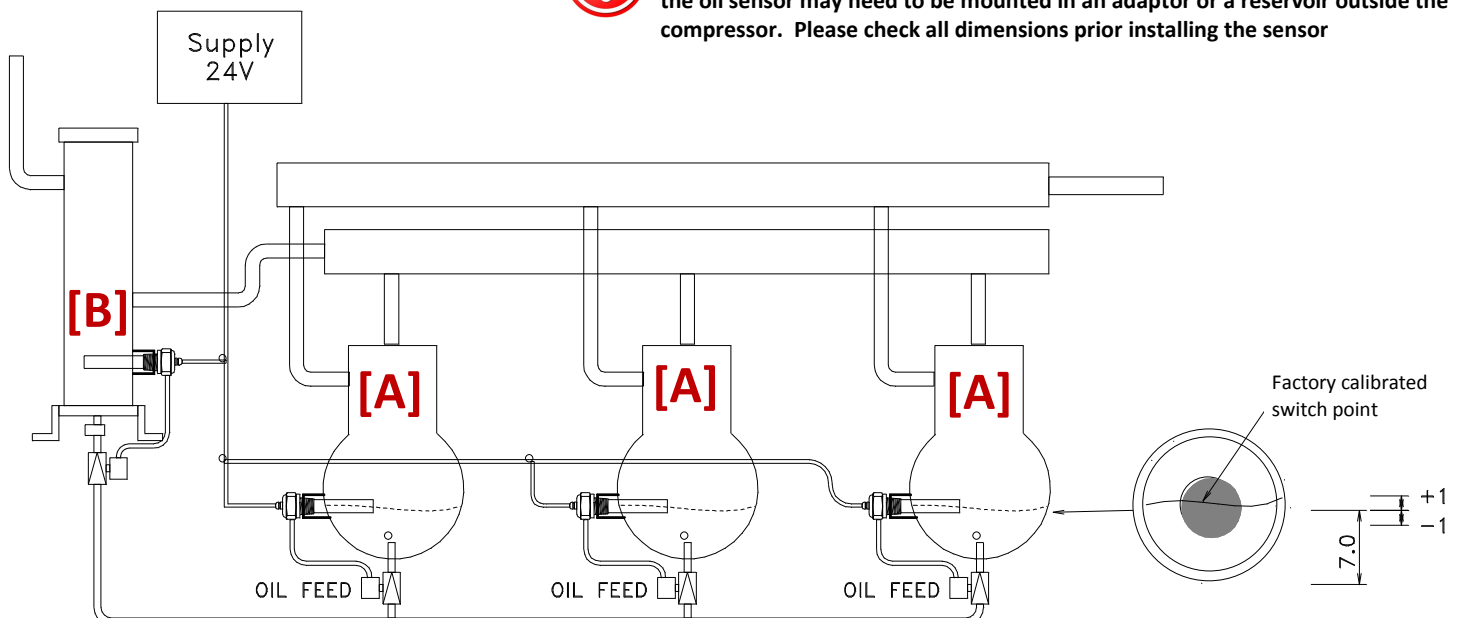
Further the user must be aware of consequences in case of malfunction or wrong setup.

Preset and factory default values are no guarantee for safe operation!



Note:

On small compressors where space inside the compressor housing is limited, the oil sensor may need to be mounted in an adaptor or a reservoir outside the compressor. Please check all dimensions prior installing the sensor



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Set up Oil Management:

All safety and control function are included in the HBOC oil sensor, all default settings can easily be change by using HBOC configuration tool (HBOC-Tool).

General settings	Setting Range	Factory setting
Oil cycle periods/time	1 to 300s	60s
Oil valve open time	1 to 300s	10s
Oil feed, switching hysteresis	Factor 1 to 10 1=1mm/0.04" 5=10mm/0.4"	5 (=10mm/0.4")
Alarm counter (no of oil cycles)	1 to 100 Times	30T
Oil sensor prel delay	1 to 30s	10s
Calibration function	ON or OFF	OFF
Oil cycle function	ON or OFF	ON
A Compressor mode		
Alarm delay (compressor mode)	1 to 3600s	5s
Alarm output signal	Contact function: NO or NC	NC
B Oil separator mode		
Oil separator mode	ON or OFF	OFF
Output signal, oil feed	Contact function: NO or NC	NO
Alarm delay (separator mode)	0 to 10.000min	60min

- The sensor is default set to compressor mode with oil cycle function **[A]**
- If used for oil separator, then select "oil separator mode" in the configuration software **[B]**
- If oil cycle function/timer function not desired, then switch "Oil cycle function" OFF.
- Calibration of switch point is only possible when "calibration function" is ON.

A: COMPRESSOR OPERATION:

The oil supply is controlled separately by each sensor, the settings shown above will start oil supply to the compressor **when the compressor run signal is activated/ON the Green power LED flashes.**

Function: by low oil level, the oil feed output activates the oil return valve for 10 second, followed by a pause of 50 second. This control loop runs 30times. If no oil is present the alarm goes ON.

Reset of the alarm can be done locally and/or if the supply voltage is switched OFF and ON

Reset will be done automatically when oil is/becomes present in the compressor (the run signal can not reset the alarm, or alarm counter).

Reset of an alarm: Activate the Push button for about 5sec.



Note:

If there is disturbance in the oil, and the three green LED flashes, then change the oil sensor prel delay to a higher value.

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B: OIL SEPARATOR OPERATION:

When oil is present in the separator the output/run signal is ON (terminal 3 &4).

On stand-alone systems this signal can be used as run input signal on the HBOC oil sensor mounted on the compressor.

Alarm function: if no oil is present in the separator during a periode of 60min. the alarm switches ON. Reset of the alarm can be done locally and/or if the supply voltage is switched OFF and ON

Reset will be done automatically when oil is/becomes present in the compressor (the run signal can not reset the alarm, or alarm counter).

Reset of an alarm: Activate the Push button for about 5sec.



Note:

If there is disturbance in the oil, and the three green LED flashes, then change the oil sensor prel delay to a higher value.

CALIBRATION OF SWITCH POINT:

Calibration can only be performed when **"CALIBRATION IS ON IN THE SETUP MENU"**

The calibration and reset can be done by the push button (R).

When oil is at the desired level, then activate the push button five times.

Oil feed LED lights up when the switch is activated, on the fifth the alarm LED lights up to indicate completed calibration.

SWITCHING HYSTERESIS:

The switching hysteresis can be changed in the setup menu using the below factors:

1=1mm/0.04"

5=10mm/0.4"

10=20mm/0.79"



Solenoid valves sold separately

ACCESSORIES:

High pressure solenoid valves for oil return.

USB/M12 cable for setup on PC: **HBxC-USB.**

Configuration tool (software) comes with the cable

M12 connection cable: **HBxC-M12/5** (5 meters/197")

HBxC-M12/10 (10 meters/394")

Flange adaptors available for most compressor types.

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Setup screen showing the PC configuration tool

Configuration instruction:

- 1) Press 'Search for COM Port' to verify which COM Port already in use.
ONLY THEN
- 2) Connect USB-M12 cable to PC and HBOC sensor.
- 3) Press 'Search for COM Port' again and select the newly added COM Port. Green LEDs indicate connection.
- 4) Choose operation mode: COMPRESSOR(default) or SEPARATOR mode.
- 5) Configure sensor 'Get Configuration' to check current set values. Change relevant parameters and 'Set Configuration' or 'Reset to default'

Set the configuration:

Reset data to default:

COM13 is selected and open.

HBOC Configuration Tool, version 1.4.0

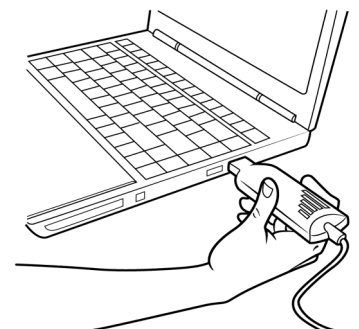
Instruction:

1. Install HBOC configuration tool on the computer.
2. Follow 'configuration instructions'



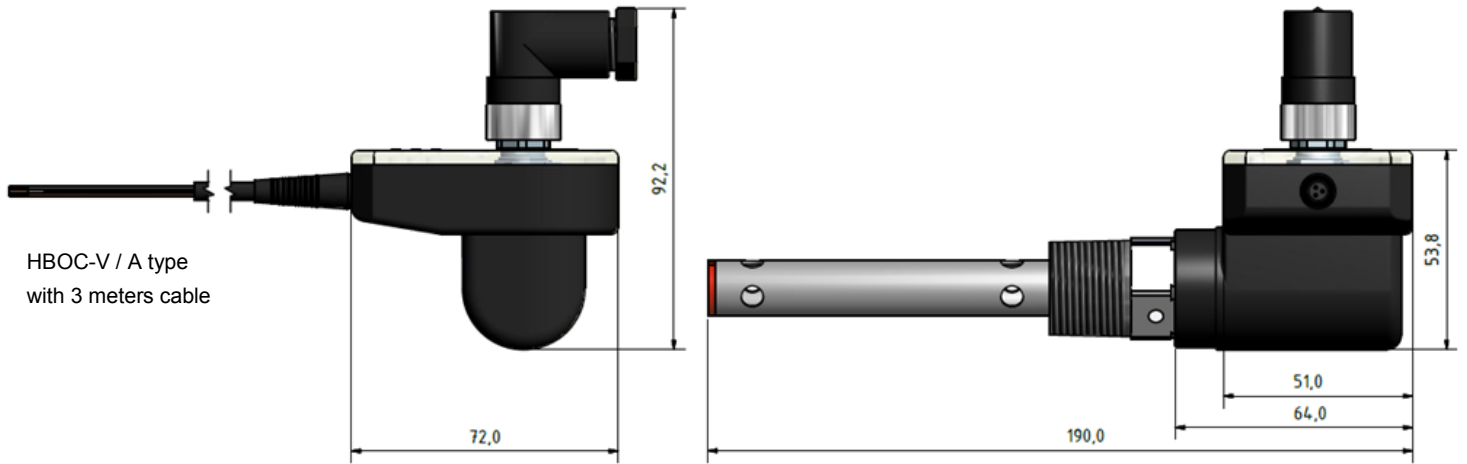
Note:

Connection to the sensor is established when red, yellow and green LED flashes repetitively.



Mechanical size:

HBOC - OIL LEVEL CONTROL SENSOR

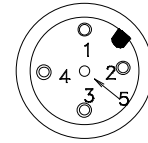
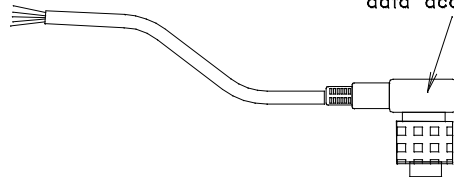


Electrical Connection:

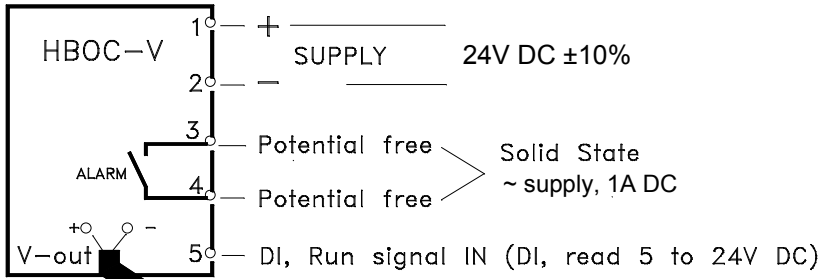
Wire colour

- 1 = Brown
- 2 = White
- 3 = Blue
- 4 = Black
- 5 = Gray

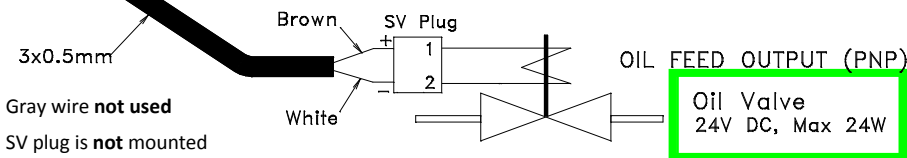
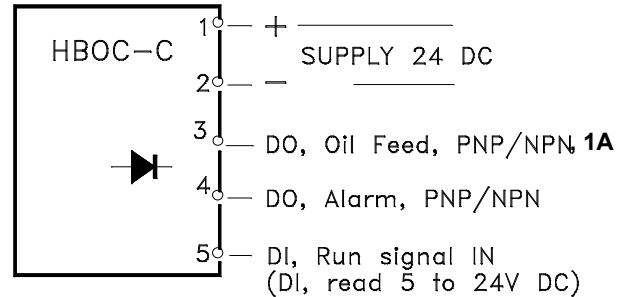
5p M12 plug, IP67 data acc. to DIN. 0627



With Valve Cable



Without Valve Cable



Note:

HBOC-V has a 3meter/118" cable for connection to a 24V DC oil return valve and potential free Alarm output. HBOC-C is with both control & alarm output from the M12 plug, pin 3 = Control, pin 4 = Alarm output.



Note:

- Oil control only starts when DI, run signal IN is ON (PIN 5/gray wire)**
- The Green power LED flashes when run signal is ON.**
- Reset of an alarm: Activate the Push button for about 5sec.**