

Troubleshooting manual for HBSO

The HBSO1, HBSO2, HBSO1-MT and HBSO2-MT are physically identical sensors all able to work in oil up to 100°C (212°F) and pressures up to 150 bars. The four versions have different switch points optimal for different oil types and systems.

HBSO1 is the general type suited for most applications and if it operates satisfactory you should keep using it. An example is that the HBSO1 performs well with the Bitzer BSE 85K oil in CO2 systems on compressors and oil separators. For systems where the switch does not operate correctly, we have other versions with a different switching point.

HBSO2 is suited for PAG oils and some POE oils at low temperatures. This sensor is less sensitive and should be used if the HBSO1 triggers without oil is present.

The HBSO1-MT and HBSO2-MT has switch points designed for ammonia heat pumps and other applications with oil temperatures in the range 40 - 80°C. These switches are used in systems where the normal HBSO1 and HBSO2 are too sensitive and indicate oil when oil no longer covers the sensor.

The HBSO-SSR /HT has the same mechanical unit but a different electronic unit. It is designed for oil temperatures above 80°C and the switch points can be adjusted to fit the application. This sensor can be used for all oil types and all temperatures from 0°C (32°F) up to 145°C (293°F)

LED Indication:

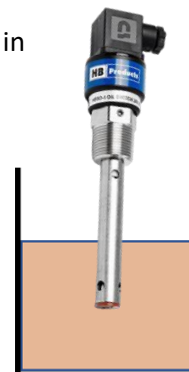
- Red LEDs on: The sensor has detected oil
- Green LEDs flashing: The sensor is active but level not detected.
- Red LEDs flashing: Measurement error

Functional test – electronic unit and switch point

To test the functionality of the electronic unit and the switch point you can use a spare mechanical unit, to avoid removing the one in the system, a power supply and oil at the operating temperature.

Mount the spare mechanical part, connect power, and submerge the tip of the sensor in a pot of oil. The switch must trigger when dipped approximately 50% into the oil.

If a HBSO1 triggers when dipped less than 20% into the oil, you should consider using another version. If the sensor switches and will not stop switching when removed from the oil, you must choose a less sensitive version – please consult HB product for advice

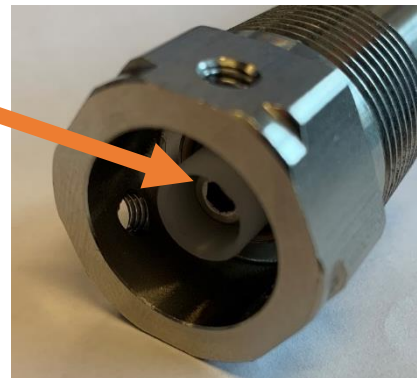


Test of mechanical part

If the electronic part seems to be correctly calibrated investigate if the mechanical part is contaminated. Contaminated oil or large metal shavings can get stuck in the sensor causing false measurements.

Contaminants can be identified before dismounting the sensor by isolation test: at 1000V you can measure the resistance across the screw and ground. You must measure above 1GΩ. Please use caution when using a megger on live equipment. HOT PROBE must go to the inner screw. The switch must be dry when tested.

Hot probe



If contaminants has been found you can clean the sensor by wiping down with a cloth and rinsing the sensor in any liquid like water, cerosene, low viscosity oil.

Contaminents will cause on of two behaviours:

- If lightly contaminated the sensor will likely indicate oil and fail to release when oil is no longer present.
- If strongly contaminated the sensor will likely not be able to detect oil when oil I present.

For high pressure compressors the HBSO1/MT is suggested. If and HBSO1 is intalled and the sensor is indicating oil. Try to deenergize the senosr. If the sensor reads correctly after being reenergized this suggests that the sensor is seeing and offset due to high density