

Standard switches available from HB-products

Liquid switches

Supply voltage, recommended liquid temperature and IP class Specified temperature range is typically wider	Liquid				
	R744 CO2 R600 Butane R600a Isobutane R290 Propane (In gas)	R507, R410a, R407c R404a, R22, R32, R134a, R1234yf, Other HFC/HFO (in gas and oil)	R717 NH3, Water Alcohols (In gas and oil)	Electronic part design	Settings NO/NC NPN/PNP EX version (different electronic unit)
24 V AC/DC – dry conditions -40-80 °C (-40-176 °F) IP54	HBSC2	HBSR-HFC HBSR	HBSR	V-track connection	Programmable
24 V AC/DC – for wet and condensing applications IP65	HBSC2-U	HBSR-HFC-U HBSR-U	HBSR-U	Treated union	Programmable
90-240 V AC - normal temp -55-80 °C (-67-86 °F) IP54	HBSC2-SSR-2	HBSC-HFC-SSR-2 HBSC-HFC-SSR-2	HBSR-SSR-2		Preset Relay output
24 V AC/DC low ambient temp -55-30 °C (-67-86 °F) IP65	HBSC2-SSR-1/IP	HBSR-HFC-SSR-1/IP HBSR-SSR-1/IP	HBSR-SSR-1/IP		Programmable
Mechanical part design					

Oil Switches

Supply voltage and recommended oil temperature Allowed temperature is typically higher	PAO Mineral POE	POE (low temp.) PAG	Application	Design	Settings NO/NC NPN/PNP Available in special EX version (different electronic unit)
24 V AC/DC low temp -30-40 °C (-22-104 °F)	HBSO1-LT	HBSO1-LT	Refrigeration		Programmable
90-240 V AC - low temp -30-40 °C (-22-104 °F)	HBSO1-SSR-2-LT	HBSO2-SSR-2-LT	Refrigeration		Preset Relay output
24 V AC/DC - normal temp 0-80 °C (32-176 °F)	HBSO1	HBSO2	Refrigeration		Programmable
90-240 V AC - normal temp 0-60 °C (32-140 °F)	HBSO1-SSR-2	HBSO2-SSR-2	Refrigeration		Preset Relay output
24 V AC/DC high or all temp 80-145 °C (176-293 °F) 0-145 °C (32-293 °F) changed settings	HBSO1-SSR-1-HT	HBSO2-SSR-1-HT	Oil separator or universal		Programmable Relay output
24 V AC/DC- Oil return switch -80-80 °C (-22-176 °F)	HBOR		Oil return system NH3		Programmable

Quick guide

Programmable versions from May 2025

All liquid level switches with circular electronic unit HBSC2, HBSR, HBOR & HBSO



HBxC-USB
HBxC-Adapt-DIN/M12

Functionality and labelling:

The switches are used for detecting liquid in gas or air (HBOR detects oil in liquid ammonia). The mechanical elements have different designs because they are optimized to different liquids. The switches use the capacitive measuring principle and react to the difference in dielectric constant between liquid and gas.

The switches have different calibration and parameter settings in the electronic unit, but the unit is the same. The settings can be changed by the user, but they must match the mechanical part.

To change the settings, use the HB Tool that can be downloaded directly from our website together with M12 connector and USB cable. See manual for details

The switches and electronic units are delivered either as universal replacement units or predefined for a specific switch with NO/NC and NPN/PNP setting. The switches setting is printed on the small silver label on the switch together with the type code. On the same label you find a manufacturing date and in the second row a unique production batch number.



Type: HBSO1 configuration:
PNP/NO



Manufacturing date DDMMYY
Production batch number

LED indication (standard setup)

- 4 x red LED's indicate liquid/oil detection.
- 4 x green LED's flashing indicate no detection, but sensor is active.
- 4 x red flashing LED's indicate no connection to mechanical unit.

Irrespective of the output function (NO/NC) LED's are activated when liquid is detected.

Mechanical installation

The switch is installed in a vessel or compressor, using Teflon tape or liquid sealant, for those with NPT thread.

Min. distance to other objects 10 mm for HBSR and HBOR and 3 mm for HBSC2 and HBSO. For all switches make sure liquid can get in and out of the switch.

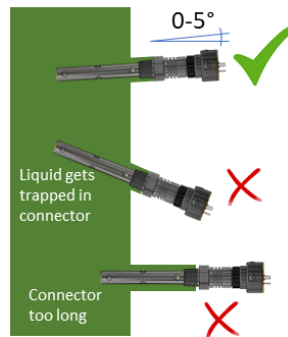
When installing the switch in cold conditions, where the liquid has high viscosity, make sure liquid can drain from the switch. This can be done by sloping the switch 5 degrees downwards.

Long weld adapters should be avoided because gas pockets can build up and disturb the measurement

Switches pointing upwards can collect liquid which disturbs the measurement

Mounting the electronic unit

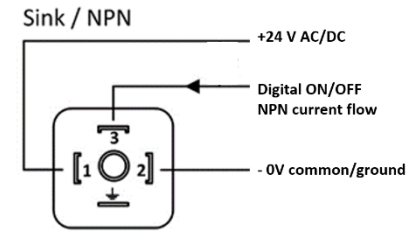
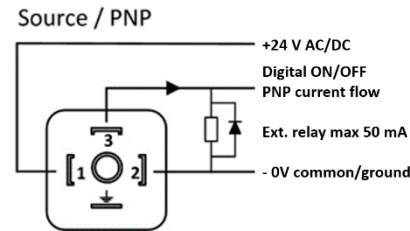
The electronic unit is mounted with either a threaded union or with two set screws in a V-track. The threaded union is mainly used for switches operating in cold conditions. The set screws are tightened with a torque of 5 Nm and the threaded union is tightened firmly by hand or by using pliers to secure a good electrical connection. For cold installations where condensation occur the treaded union should be used to avoid poor contact between electrical contact between mechanical and electrical unit.



Electrical connection

The switch is predefined as NO (normally open) or NC (normally closed) and this refers to the contact in the switch, in dry condition.

The switch is either PNP or NPN type and the connection must be done according to the drawing. Switches can be supplied with AC, but the output will be DC



Switching

All switches except HBOR switch on when liquid is detected. This means a NO switch closes the contact when liquid is detected, and a NC opens the contact when in liquid. HBOR is different: it switches off when oil is detected

Electrical specifications

- Connector: DIN 43650/ISO4400
- Relay current max 50 mA
- Supply AC/DC 24V ± 10 %

More information

For further information please download the instruction manual from our homepage: www.hbproducts.dk.

All switches except HBOR

NO (normally open)
Contact is open when no liquid is detected and closes when liquid is detected

No liq. detection

Liquid detection

NC (normally closed)
Contact is closed when no liquid is detected and opens when liquid is detected

No liq. detection

Liquid detection

HBOR only

NO (normally open)
Contact is open when oil is detected and closes when no oil is detected

Oil detection

No oil detection

NC (normally closed)
Contact is closed when oil is detected and opens when no oil is detected

Oil detection

No oil detection