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	R507, R410a, R407c R404a, R22, R32, R134a, R1234yf, R1234ze Other HFC/HFO	R717 NH3, R718 Water, Alcohols	Electronic part design	Settings NO/NC NPN/PNP EX version (different electronic unit)
24 V AC/DC – dry conditions **-40-50 °C (-40-122 °F) IP54**	HBSC2	HBSR-HFC HBSR	HBSR	V-track connection	Preset Ex
24 V AC/DC – elevated temp. **50-80°C 122-176 °F) IP54**	HBSC2	HBSR-HFC	HBSR-HP	V-track connection	Preset Ex
24 V AC/DC – for wet and condensing applications **IP66**	HBSC2-U	HBSR-HFC-U HBSR-U	HBSR-U	Treaded union	Preset Ex
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) IP66**	HBSC2-SSR-1/IP	HBSR-HFC-SSR-1/IP HBSR-SSR-1/IP	HBSR-SSR-1/IP		Can be changed Ex
Mechanical part design					

Oil Switches

Supply voltage and recommended oil temperature Allowed temperature is typically higher	PAO Mineral	POE 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)	HBSO-LT		Refrigeration		Preset Ex
90-240 V AC - low temp -30-40 °C (-22-104 °F)	HBSO-SSR-2-LT		Refrigeration		Preset Relay output
24 V AC/DC - normal temp 0-60 °C (32-140 °F)	HBSO1	HBSO2	Refrigeration		Preset Ex
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 - medium temp 40-100 °C (104-212 °F)	HBSO1-MT	HBSO2-MT	Heat pump		Preset Ex
24 V AC/DC high or all temp 90-145 °C (194-293 °F) 0-145 °C (32-293 °F) changed settings	HBSO-SSR-1-HT		Oil separator or universal		Can be changed Relay output Ex
24 V AC/DC- Oil return switch -30-80 °C (-22-176 °F)	HBOR		Oil return system NH3		Preset

HB Products WE INCREASE UPTIME, SAFETY AND EFFICIENCY

Quick guide

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

Functionality and labelling:

The switches are used for detecting liquid in gas or air (HBOR detect oil in liquid ammonia). The mechanical elements have different design 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 unit is the same. The settings cannot be changed by the user, and it must match the mechanical part. Switches delivered after September 2020 has a build in heater which will be in operation below 5°C to keep the sensor dry

The switches are delivered as NO/NC and NPN/PNP connection. 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 combined version number and manufacturing date and in second row a unique production number.

Type: HBSO1 configuration: PNP/NO

Version: VU10 date: 080319 DDMMYY
Production no. 400000

LED indication

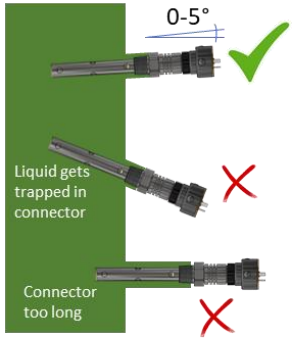
4 x red LED´s indicate liquid/oil detection.
4 x green LED´s flashing indicate no detection, but sensor is active.
4 x red flashing LED´s indicate no connection to mechanical unit.

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.

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 disturb the measurement

Mounting the electronic unit

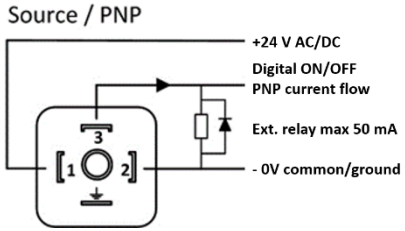
The electronic unit is mounted with either a threaded union or with two set of screws in a V-track. The threaded union is mainly used for switches operating in cold conditions. The set screws are tightened with a torque of 5 Nm and the threaded union is tightened firmly by hand or by using pliers to 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.

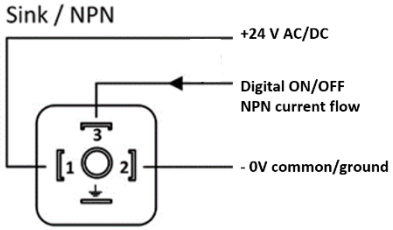
HB Products WE INCREASE UPTIME, SAFETY AND EFFICIENCY

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

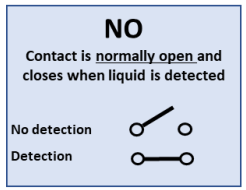


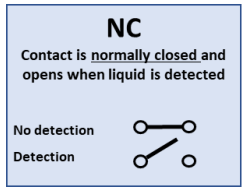


Switching

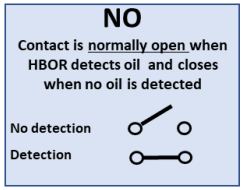
All switches except HBOR switch on when liquid is detected. This means a NO switch close the contact when liquid is detected, and a NC open the contact when in liquid. HBOR is different: it switches off when oil is detected

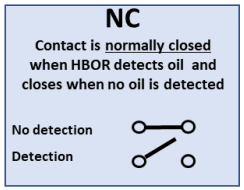
All switches except HBOR





HBOR only





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.