

















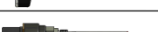






Standard switches available from HB-products

Liquid switches

Supply voltage, recommended liquid temperature and IP class Specified temperature range is typically wider	Liquid				Electronic part design	Settings NO/NC NPN/PNP EX version (different electronic unit)
	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			
24 V AC/DC – dry conditions -40-50 °C (-40-122 °F) IP54	HBSC2	HBSR-HFC HBSR	HBSR		Preset 	
24 V AC/DC – elevated temp. 50-80°C 122-176 °F) IP54	HBSC2	HBSR-HFC	HBSR-HP		Preset 	
24 V AC/DC – for wet and condensing applications IP66	HBSC2-U	HBSR-HFC-U HBSR-U	HBSR-U		Preset 	
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 	
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 
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 
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 
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 
24 V AC/DC - Oil return switch -30-80 °C (-22-176 °F)	HBOR		Oil return system NH3		Preset

Quick guide

All liquid switches with large electronic unit HBSC2-SSR, HBSR-SSR & HBSO-SSR

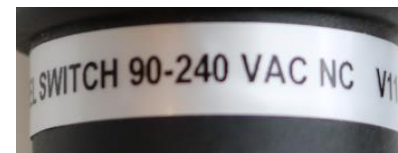


Functionality and labelling:

The switches are used for detecting liquid in gas or air. The mechanical elements are different and optimized to different liquids. The switches use the capacitive measuring principle and react on the difference in dielectric constant between liquid and gas

The switches have different calibration and parameter settings in the electronic unit. The basic electronic unit exist in two versions 24 V and 90-240 V, and it must match the mechanical part.

The switches are delivered as NO/NC. The switch 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



Switch with NC configuration



Version: VU10 date: 080319 DDMMYY
Production no. 40000

LED indication



3 x green LED's indicate liquid detection
Yellow LED "RELAY" indicates closed contact between pin 3 and pin 4
Green LED "POWER" indicate power is connected and switch is active when flashing

Irrespective of the output function NO/NC, the three LEDs are activated when liquid is detected.

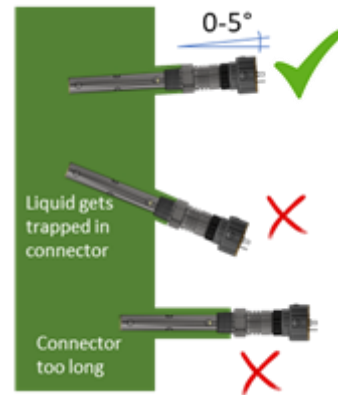
Mechanical installation

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



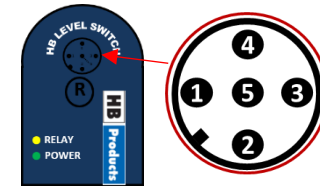
Mounting the electronic unit

The electronic unit is mounted with either a threaded union or with two set 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.

Electrical connection

The switch exists in two versions one supplied with 24V AC/DC and one with 90-240V AC. The switch is delivered as NO (normally open) or NC (normally closed) and this refers to the contact in the switch in dry conditions. The 24 V version switch can be changed between NO and NC – this is described in the full manual. The switch is connected to the power source on pin 1 and pin 2. The contact is potential free relay and it is connected to pin 3 and pin 4

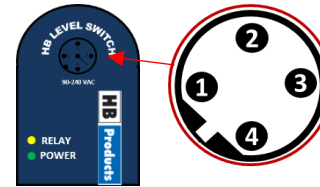
24 V



- | | |
|---------|-----------------------|
| 1 Brown | +24 VDC or 24 V AC |
| 2 White | - common or 24 V AC |
| 3 Blue | Output potential free |
| 4 Black | Output potential free |
| 5 Grey | Communication |

Male M12

90-240 V



- | | |
|---------|-----------------------|
| 1 Brown | 90-240 V AC |
| 2 White | 90-240 V AC |
| 3 Blue | Output potential free |
| 4 Black | Output potential free |

Electrical specifications

Supply AC/DC 24V ± 10 % or 90-240V AC

Connector: M12 IEC 61076-2-101

- 5 pin A type for 24 V
- 4 pin B type for 90-240 V

Relay output

- 24 V current max 1A
- 90-240 V max 40 W

More information

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