Liquid Level Switch selection guide

HB Products

24V AC/DC Level Switches

	24V AC/DC		LIQUID IN GAS			OIL IN AMMONIA OR WATER
Liquid temperature Recommended liquid temperature and IP class. Specified temperature range is typically wider	**PAO oil** **Mineral oil** **POE oil** High temperature	**POE oil** Low temperature **PAG oil**	**R744 CO2** **R600 Butane** **R600a Isobutane** **R290 Propane**	**R507, R410a, R407c R404a, R22, R32, R134a, R1234yf, R1234ze** **Other HFC/HFO/CFC**	**R717 NH3** **Water** **Alcohols**	**Oil (All types)**
Cold and cold ambient conditions IP65	**HBSO1-LT** Ex -30°C to 40°C (-22°F to 104°F)	**HBSO2-LT** Ex -30°C to 40°C (-22°F to 104°F)	**HBSC2-SSR-1/IP** -50°C to 30°C (-58°F to 86°F)	**HBSR-HFC-SSR-1/IP** -55°C to 30°C (-67°F to 86°F)	**HBSR-SSR-1/IP** -55°C to 30°C (-67°F to 86°F)	**HBOR/C-U** -60°C to 80°C (-76°F to 176°F)
Normal dry conditions IP54	**HBSO1** Ex 0°C to 60°C (32°F to 140°F)	**HBSO2** Ex 0°C to 60°C (32°F to 140°F)	**HBSC2** Ex -40°C to 50°C (-40°F to 122°F)	**HBSR-HFC** Ex -40°C to 50°C (-40°F to 122°F)	**HBSR** Ex -40°C to 50°C (-40°F to 122°F)	**HBOR & HBOR/C** -60°C to 80°C (-76°F to 176°F)
Normal but wet and condensing applications IP65	**On request**	**On request**	**HBSC2-U** Ex -40°C to 50°C (-40°F to 122°F)	**HBSR-HFC-U** Ex -40°C to 50°C (-40°F to 122°F)	**HBSR-U** Ex -40°C to 50°C (-40°F to 122°F)	**HBOR/C-U** -60°C to 80°C (-76°F to 176°F)
Hot IP54	**HBSO1-SSR-1-HT** 90°C- to 145°C (194°F to 293°F)	**HBSO2-SSR-1-HT** 90°C- to 145°C (194°F to 293°F)	**On request**	**On request**	**On request**	**N.A**

Ex Indicate if the switch is available in a special ATEX/IECEx version.

90-240V AC Level Switches

	90-240V AC		LIQUID		
Liquid temperature Recommended liquid temperature and IP class. Specified temperature range is typically wider	PAO oil Mineral oil POE oil High temperature	POE oil Low temperature PAG oil	R744 CO2 R600 Butane R600a Isobutane R290 Propane	R507, R410a, R407c R404a, R22, R32, R134a, R1234yf, R1234ze Other HFC/HFO/CFC	R717 NH3 R718 Water Alcohols
Cold and cold ambient conditions IP65	**HBSO1-SSR-2-LT** -30°C to 40°C (-22°F to 104°F)	**HBSO2-SSR-2-LT** -30°C to 40°C (-22°F to 104°F)	**HBSC2-U-SSR2** -55°C to 80°C (-67°F to 176°F)	**HBSR2-U-SSR2** -55°C- to 80°C (-67°F to 176°F)	**HBSR2-U-SSR2** -55°C to 80°C (-67°F to 176°F)
Normal and warm dry conditions IP54	**HBSO1-SSR-2** 0°C to 60°C (32°F to 140°F)	**HBSO2-SSR-2** 0°C to 60°C (32°F to 140°F)	**HBSC2-SSR-2** -30°C to 80 °C (-22°F to 176°F)	**HBSR-SSR-2** -30°C to 80°C (-22°F to 176°F)	**HBSR-SSR-2** -30°C to 80°C (-22°F to 176°F)

IP class:

IP54 is suited for indoor use with limited condensation and no water jet cleaning.

IP65 is suited for outdoor use where condensation occur. If high-pressure water cleaning with aggressive cleaning agents is used the sensor need further protection.

Product ordering codes and thread connections

HBSR-PNP/NC-1

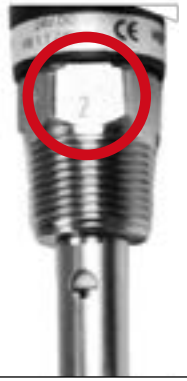
Main product code	Output type PNP or NPN	Switching type Normally closed or normally open	Thread code

Other commonly used codes

U:	Union connection instead of V track with set screws (standard)
L:	Long version
IP:	Ice proof (low temperature version)
LT:	Low temperature version
HT:	High temperature version
HP:	Heat pump version
HFC:	Suited for HFC, HFO, CFC and other synthetic refrigerants
/C:	Built in controller for modulating valve
/S:	Built in controller for stepper motor valve
/PWM:	Built in controller for pulse width modulating valve
SSR-1:	Solid state relay output for 24 V DC/AC supply
SSR-2:	Solid state relay output for 90-240 V AC supply

Thread codes

(stamped on the sensor)



1 = ½" NPT	**9 = 1" NPT**
2 = ¾" NPT	**10 = 1 ¼" BSPP**
3 = ½" BSPT	**11 = 1 ½" BSPP**
4 = ¾" BSPT	**12 = 1 ½" NPT**
5 = ½" BSPP	**13 = ¼" BSPP**
6 = ¾" BSPP	**14 = ¼" NPT**
7 = 1 1/8" UNEF	**15 = 3/8" NPT**
8 = 1" BSPP	**16 = 1 ¼" UNF**

NPT (National Pipe Taper)
BSPT (British Standard Pipe Taper ("R"))
BSPP (British Standard Pipe Parallel ("G"))
UNEF (Unified National Extra Fine)
UNF (Unified National Fine)

Product ordering codes and thread connections

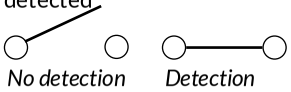
NO/NC what is the difference?

You can order the sensor as NO or NC and it is a question about what fits your system. A NO switch provides no output until liquid is detected. A NC switch provide an output until liquid is detected.

NC is common for fail safe systems where you like to get an indication if the wire is broken.

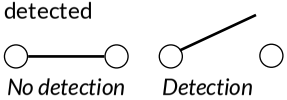
NO

Contact is normally open and closes when liquid is detected



NC

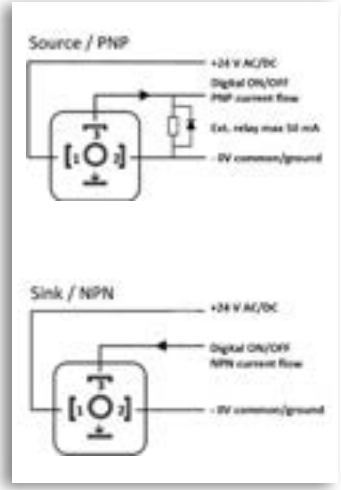
Contact is normally closed and opens when liquid is detected



24V - NPN or PNP output ISO 4400/DIN 43650 plug

A PNP switch is common in Europe and provide a positive signal on pin 3 when switching.

A NPN switch is common in America and provide a ground signal on pin 3 when switching.

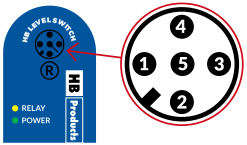


Solid state relay (SSR) IEC 61076-2-101 M12 plug

The large electronic units has a potential free relay output.

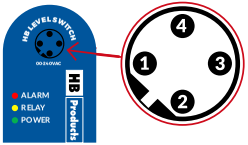
When switching there will be connection between pin 3 and pin 4.

24V versions



1: +24 V DC or 24V AC
2: - common or 24V AC
3: Output potential free
4: Output potential free
5: Communication

90-240V versions

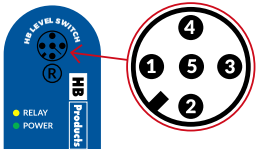


1: 90-240V AC
2: 90-240V AC
3: Output potential free
4: Output potential free

ATEX/IECEx approved switches with IEC 61076-2-101 M12 plug

All the 24V switches are available in an ATEX/IECEx approved version. The switch has a two-wire analog output which will be either 4 or 20 mA. The switch can be changed between NO and NC when connecting it to the HB Tool.

The sensor is used together with a barrier to comply with ATEX/IECEx requirements.



1: +24V DC
2: Not used
3: Not used
4: Analog output
5: Not used