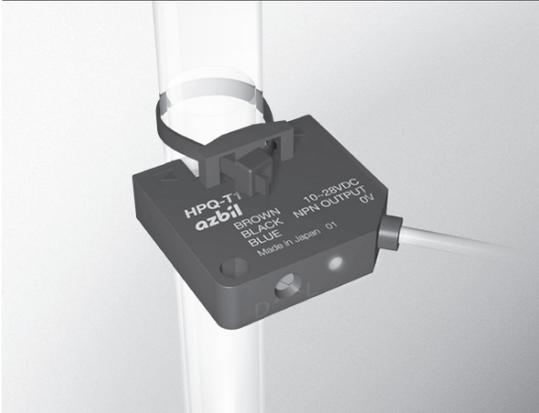


Pipe-Mounted Liquid-Level Switches with Built-in Amplifier CE

HPQ-T Series

Just by mounting the switch on a pipe, the surface of the liquid can be easily detected.



- **Reliable detection**
- **Operation panel is located on the side.**
- **Fits various pipe diameters**
- **The same model can be used for upper or lower limit detection.**

FEATURES

Reliable detection

Refraction-based detection ensures sufficient gain between light-ON and dark-ON light levels.

This switch is also suitable for liquids with poor light transmission (such as photoresist liquid and waste fluids).

Fits various pipe diameters

Switches fit on pipes with diameters of 1/16 inch, 3 to 7 mm, and 8 to 13 mm.

They can be mounted using a cable tie or M3 screw.

Operation panel on the side

Indicator and operation selector switch are located on the side.

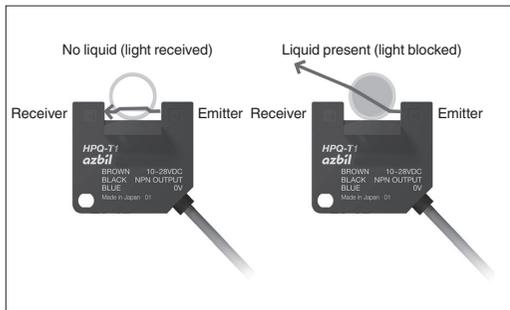
Even when switches are gang-mounted, they can be adjusted while viewing the indicator.

Same model handles upper or lower limit detection

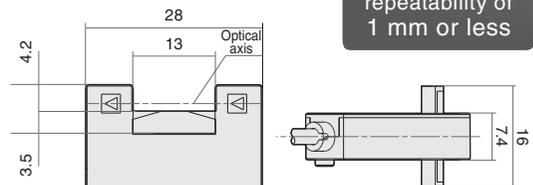
For pipe diameters of 8 mm or less, please contact us.

*Switches with adjustable sensitivity are also available.

DETECTION PRINCIPLE



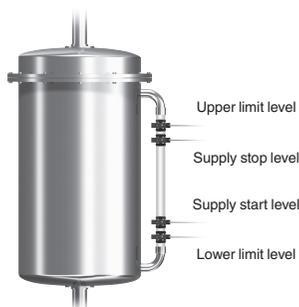
Optical axis position



The slit width is 1 mm, and therefore repetitive detection is possible at an accuracy of that width or less.

*This varies depending on the condition of the liquid.

Example of fail-safe setup



Example of recommended settings

	LO/DO setting	Liquid present	Liquid absent	Abnormal condition	Switch failure "open"
Upper limit	LO	OFF	ON	Liquid present	OFF
Lower limit	DO	ON	OFF	No liquid	OFF

CATALOG LISTINGS AND PRICE LIST

Detection method, shape	Bracket	Mode (LO/DO)	Output mode	Catalog listing
 Thru-scan	φ8 to φ13mm	-	Open collector NPN transistor	HPQ-T1
		-	Open collector PNP transistor	HPQ-T2
		○	Open collector NPN transistor	HPQ-T1-002
		○	Open collector NPN transistor	HPQ-T1-003
	φ3 to φ7mm	-	Open collector NPN transistor	HPQ-T1-004
		-	Open collector PNP transistor	HPQ-T2-005

HPQ-T1/T2 models are also available with a 5 m cable.

For models that fit 1/16-inch diameter pipes, please contact a sales representative.

SPECIFICATIONS

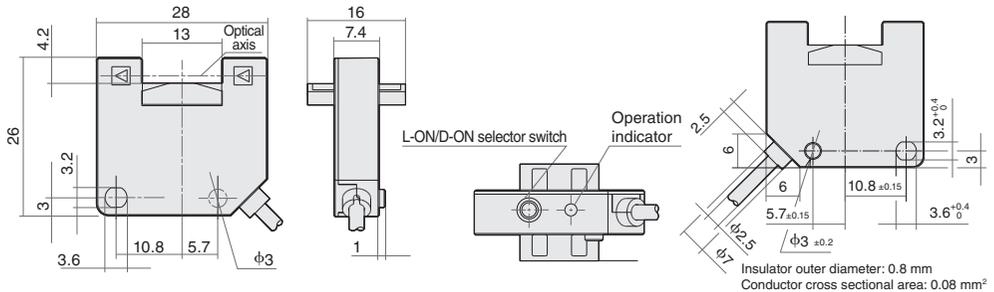
Catalog listing	HPQ-T1	HPQ-T1-002	HPQ-T1-003	HPQ-T1-004	HPQ-T2	HPQ-T2-005	
Detection method	Thru-scan						
Applicable pipe sizes	8 to 13 mm dia. 1 mm thick	○	○	○	-	○	
	3 to 7 mm dia. 0.6 to 1 mm thick	-	-	-	○	-	
Applicable pipe material	Transparent PFA pipe						
Standard target object	Water*						
Repetitive detection positional accuracy	1 mm or less						
Light source	Infrared LED (peak emission wavelength 950 nm)						
Supply power	10 to 28 Vdc (ripple voltage 10 % max.)						
Current consumption	25 mA or less						
Operation mode	Light-on (LO)	-	○	-	-	-	
	Dark-on (DO)	-	-	○	-	-	
	LO/DO switching	○	-	○	○	○	
Output mode	Open collector NPN	○	○	○	-	-	
	Open collector PNP	-	-	-	○	○	
Control output	Switching current	100 mA or less (resistive load)					
	Output withstand voltage	30 Vdc					
	Residual voltage	1 V or less (at 100 mA switching current)					
Response time	2 ms or less (operation and return)						
Sensitivity adjustment	-	○	○	-	-	-	
Indicator	Operation indicator: red (lit when output ON)						
Ambient light immunity	1,000 lux max. (incandescent lamp)						
Operating temperature range	-10 to +55 °C (without freezing)						
Storage temperature range	-25 to +70 °C (without freezing)						
Operating humidity range	30 to 85 % (without condensation)						
Dielectric strength	20 MΩ (at 500 Vdc)						
Withstand voltage	1000 Vac, 50/60 Hz for 1 min between all electrically live metal and case (500 Vac for L-ON/D-ON selector switch and sensitivity adjustment potentiometer)						
Vibration resistance	10 to 55 Hz, 1.5 mm peak-to-peak amplitude, 2 h each in X, Y, and Z directions						
Shock resistance	500 m/s ² 3 times each in X, Y, and Z directions						
Protective structure	IP50 (IEC standard)						
Protection circuits	Built-in reverse connection protection, malfunction prevention at power ON (approx. 20 ms), output short-circuit protection						
Connection method	Prelead, 2 m cable (HPQ-T1/T2 with 5 m cable also available)						
Material	Case: polycarbonate resin. Cable tie: nylon. Tube: silicone						
Mass	Approx. 25 g (main unit only with 2 m cable)						

*Depending on the pipe used, as well as the degree of transparency and the refractive index of the liquid, reliable detection may not be possible. Before use, carefully check switch operation in the actual situation, especially if the pipe type, material or thickness differs from the specification.

EXTERNAL DIMENSIONS

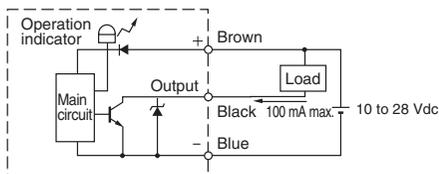
(unit: mm)

HPF-T



OUTPUT CIRCUIT DIAGRAM

HPQ-T1 (NPN type)



HPQ-T2 (PNP type)

