Liquid level sensor for mounting pipe (through-beam)

NEW

▣ Features

- Detects liquid in a transparent/semitransparent pipe diameter Ø6 to 13mm, thickness 1mm
- Compact size: W23×H14×L13mm
- Selectable Light ON/Dark ON operation mode by operation mode switching button
- Easy to check operation status by operation mode indicator [green LED (Light ON: ON, Dark ON: OFF)], operation indicator [red LED]
- Built-in reverse polarity and output short-circuit protection circuits
- IP64 of protection structure (IEC standards)

⚠ **Please read "Caution for your safety" in operation manual before using.**

CE

▣ Model

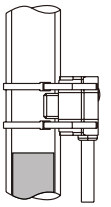
Model	Pipe diameter	Sensing type	Power supply	Control output
BL13-TDT	ø6 to 13mm	Through-beam	12-24VDC ±10%	NPN open collector output
BL13-TDT-P				PNP open collector output

▣ Specifications

Model		NPN output	**BL13-TDT**
		PNP output	**BL13-TDT-P**
Sensing type			Through-beam
Applicable pipe			ø6 to 13mm(thickness: 1mm) transparent pipe (FEP(fluoroplastic) or with equivalent transparency)
Standard sensing target			Liquid in a pipe※1
Response time			Max. 2ms
Power supply			12-24VDC ±10%(Ripple P-P: Max. 10%)
Current consumption			Max. 30mA
Light source			Infrared LED(950nm)
Operation mode			Light ON/Dark ON switching by operation mode switching button
Control output			NPN or PNP open collector output ●Load voltage: Max. 30VDC ●Load current: Max. 100mA ●Residual voltage: Max. 1V
Protection circuit			Reverse polarity protection circuit, output short-circuit protection circuit
Indicator			Operation indicator: Red LED, Operation mode indicator: Green LED
Insulation resistance			Min. 20MΩ(at 500VDC megger)
Noise resistance			±240V the square wave noise(pulse width: 1μs) by the noise simulator
Dielectric strength			1,000VAC 50/60Hz for 1 minute(between all terminals and case)
Vibration			1.5mm amplitude or 300m/s² at frequency of 10 to 55Hz in each of X, Y, Z directions for 2 hours
Shock			500m/s²(approx. 50G) in each of X, Y, Z directions for 3 times
Environment	Ambient illumination		Sunlight/Incandescent lamp: Max. 3,000lx for each(Receiver illumination)
	Ambient temperature		10 to 55℃, storage: -25 to 65℃
	Ambient humidity		35 to 85%RH, storage: 35 to 85%RH
Protection			IP64(IEC standards)
Material			Case: PC
Cable			ø2.5, 3-wire, Length: 1m (AWG28, Core diameter: 0.08mm, Number of cores: 19, Insulator diameter: ø0.9)
Accessory			Binding band 2EA, Anti-slip tube 2EA
Approval			CE
Unit weight			Approx. 30g

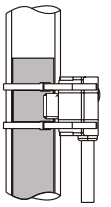
※1: This may not detect the liquid with low transparent, with high viscosity, or with floating matters.
※The temperature or humidity mentioned in Environment indicates a non freezing or condensation environment.

▣ Operation mode



Absent liquid (Light ON)

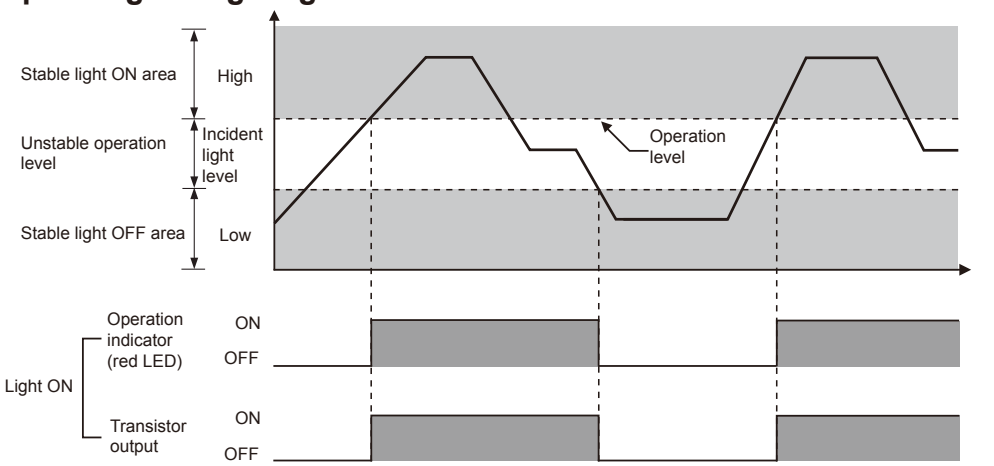
Operation mode	Light ON
Receiver operation	Received light Interrupted light
Operation indicator (red LED)	ON OFF
Transistor output	ON OFF



Present liquid (Dark ON)

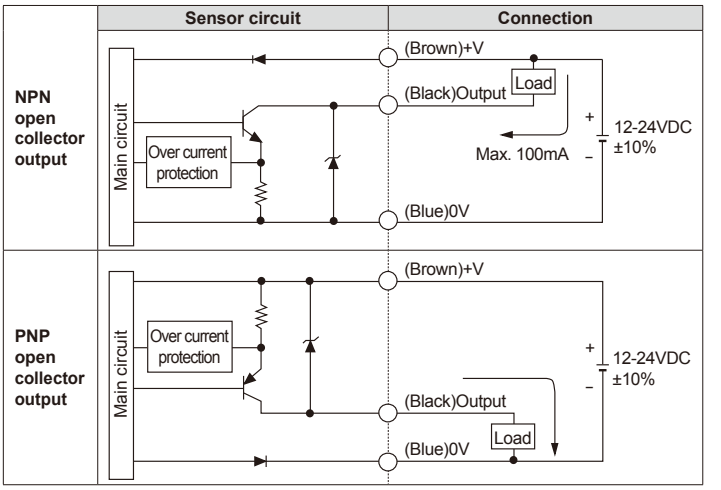
Operation mode	Dark ON
Receiver operation	Received light Interrupted light
Operation indicator (red LED)	ON OFF
Transistor output	ON OFF

▣ Operating timing diagram

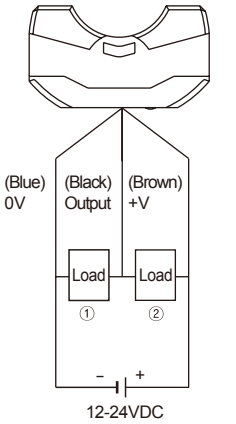


※The waveforms of 'Operation indicator' and 'Transistor output' are for Light ON, it is operated as reverse in Dark ON.

▣ Control output circuit diagram



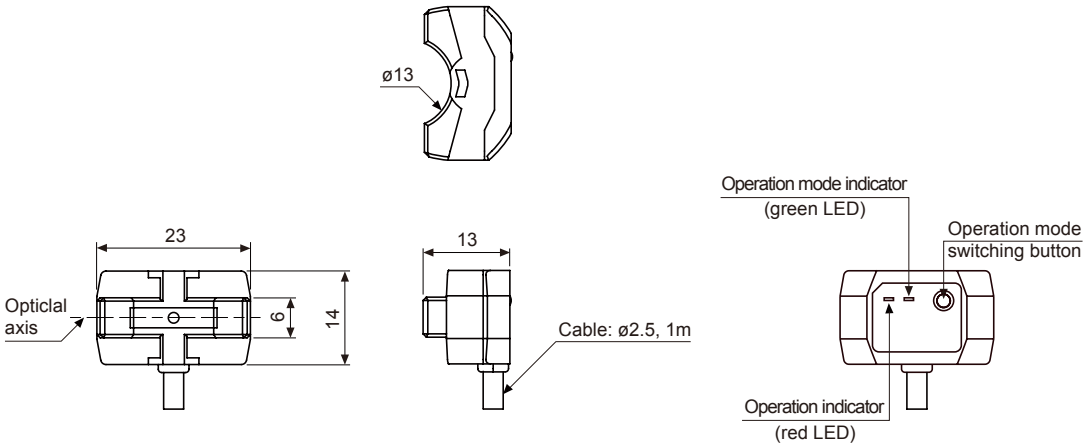
▣ Connection



①Load connection for PNP output
②Load connection for NPN output

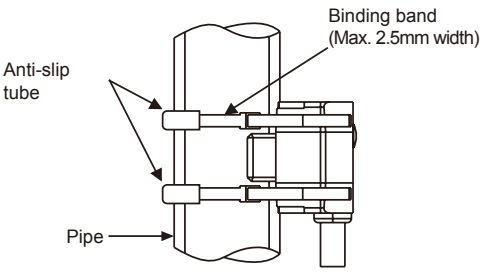
▣ Dimensions

(unit: mm)

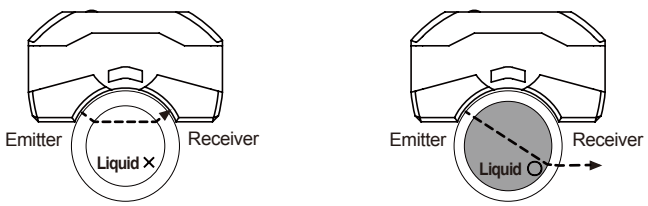


▣ Installation

- If installing this unit at an opaque pipe, it is not possible to detect accurately. Install this unit at the rated pipe.
- Fix a pipe and this sensor tightly with binding bands and anti-slip tubes as the right figure and cut the spare part of binding bands with scissors or a knife.
- When connecting binding bands, be careful not to transform a pipe.

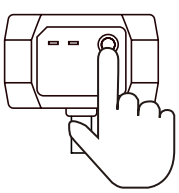


※Principle of operation
It detects whether there is liquid or not in a pipe by refractive index of light.



▣ Functions

● Operation mode switching

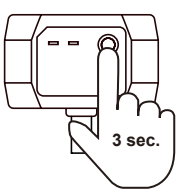


Light ON ← Press operation mode switching button once → Dark ON

Operation mode indicator (green LED) ON

Operation mode indicator (green LED) OFF

● Operation mode lock setting



Lock operation mode ← Press operation mode switching button for over 3 sec. (until operation mode indicator flashes) → Unlock operation mode

※If you press the operation mode switching button(less than 3 sec.) in lock operation status and the operation mode indicator(green LED) flashes 3 times.