F80R series

Digital display
Fiber optic sensors

- Simple operation and low cost design
- “Long-distance” mode for dramatically increased detecting distance
- “Received light” indication enlarged by about 8 times (compared with conventional Takex product)
- Larger digital display allows for simple adjustment
- Low power consumption achieved

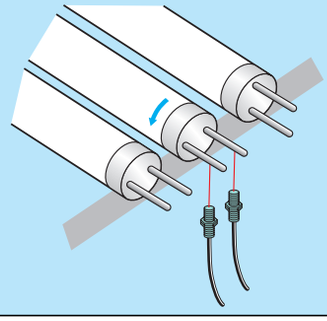
Type

Detection method/detecting distance	Model		Operation mode	Output mode	Light source
	NPN output	PNP output			
Dependent on fiber optic cable	**F80R**	**F80RPN**	Light-ON/Dark-ON selectable	Open collector	Red LED

Applications

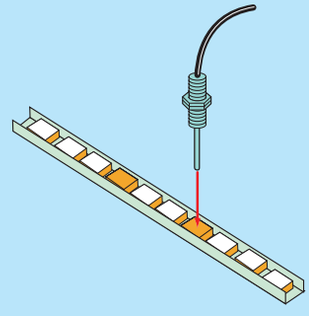
Positioning of fluorescent tubes

Electrodes detected for positioning prior to marking fluorescent tubes.



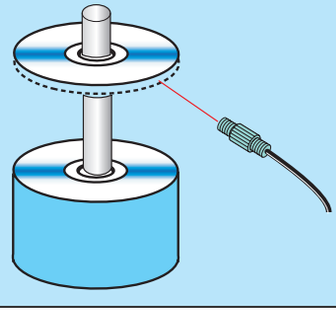
Checking for upside-down electronic components

Sides of electronic components determined on part chute.



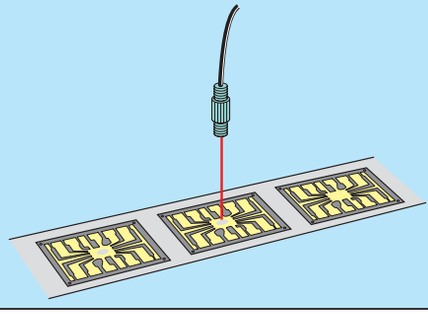
Detection of double feed of CDs

Detected from the side with small spot beam.



Checking of presence of silver paste

Small amount of paste detected with spot of 0.5 mm in diameter.



High-Speed, Long-Distance Capability

Swith selectable mode; between high speed and long distance according to the purpose of detection.

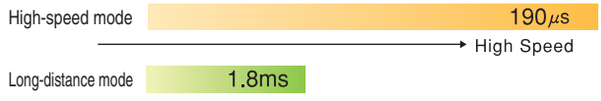
Switching between long-distance and high-speed modes

High-speed mode

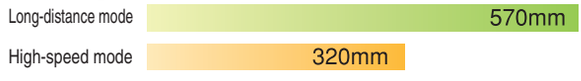
Long-distance mode

Yellow LED in the middle illuminated to indicate long-distance mode

● Response time



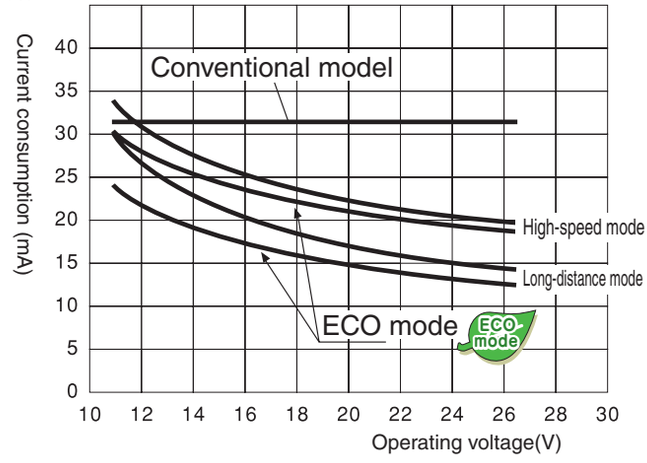
● Detecting distance (when combined with fiber optic cable FR105BC)



Low Power Consumption Achieved through Energy-Saving Design

Power consumption comparison between F80 and conventional model

(Typical example)



- Lower power consumption of less than half of that of a conventional model (by utilizing ECO operation), achieving power consumption of about 15 mA at 24 V (in long-distance mode).
- Dark illumination enabled during normal operation, (when viewing of digital display tends to be less frequent, has reduced power consumption down to about 1/5 of that of illuminated digital display).

Simple Operation

F80R series

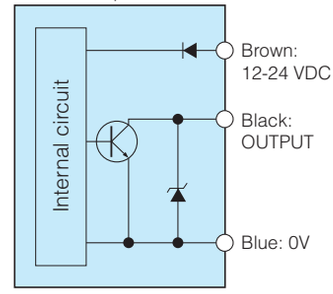
Rating/Performance/Specification

Rating/performance	Type	**NPN**output	**PNP**output
	Model	**F80R**	**F80RPN**
	Power supply	12-24V DC ±10% / Ripple 10% or less	
	Power consumption	650 mW max. (25 mA max. at 24 V)	830 mW max. (32 mA max. at 24 V)
	Output mode	NPN open collector Rating: sink current 100 mA (30 VDC max.) Residual voltage: 1 V or less	PNP open collector Rating: source current 100 mA (30 VDC max.) Residual voltage: 2 V or less
	Operation mode	Light-ON/Dark-ON selectable with sliding switch	
	Timer	Off delay/disabled selectable with sliding switch	
		Delay time: 45 ms fixed	
	Response time (*1)	High-speed mode: 190 µs s or less / Long-distance mode: 1.8 ms or less	
Specification	Light source (wavelength)	Red LED (680 nm)	
	Indicator	Operation indicator: orange LED / Mode indicator: yellow LED / Teaching indicator: green LED	
	Display	Received light level: 4 digits in orange LED (0-8000)	
	Switch	Output mode selector switch x 1 / Timer selector switch: 1 / Teaching and sensitivity adjustment push + 4-direction button switch x 1	
	Sensitivity setting	Full auto teaching / Auto teaching	
	Sensitivity adjustment function	Provided (manual sensitivity adjustment)	
	Protection circuit	Reverse connection protection / Short circuit protection /Serge absorption	
	Material	Polycarbonate	
	Wiring	Permanently attached cord (Outer dimension: dia.3.7) 0.2sq. 3 core 2m length	
	Mass	Approx. 60 g (including 2-m cord and mounting bracket)	
	Accessory	Mounting bracket / Operation manual	

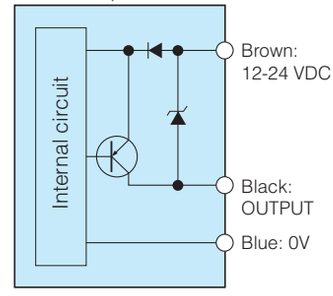
(*1) For initial setting and checking, output operation is disabled for about 1.5 seconds after power-up.
The operation mode factory setting is long-distance mode.

Input/Output Circuit and Connection

● NPN output



● PNP output

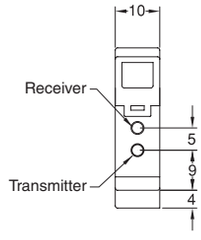


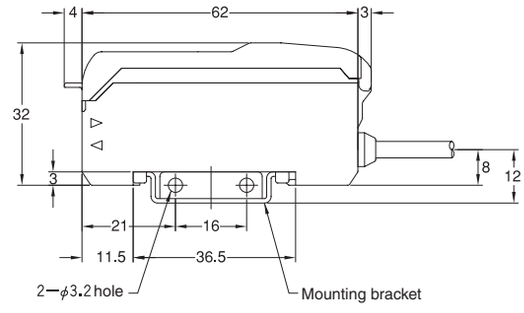
Environmental Specification

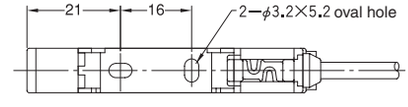
Environment	Ambient light	Illumination on light receiving surface: 3,500 lx (incandescent lamp)
	Ambient temperature	1-5 adjacent units in operation: –25 - +55 °C / Over 5 adjacent units in operation: –25 - +50 °C
		Storage: –40 - +70 °C (non-freezing)
	Ambient humidity	35-85%RH (non-condensing)
	Protective structure	IP40
	Vibration	10-55 Hz / 1.5 mm amplitude / 2 hours each in 3 directions
	Shock	500 m/s² / 3 times each in 3 directions

Dimensions (in mm)

Amplifier
Model: F80 Series
CAD



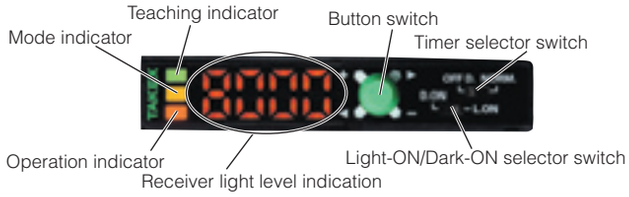




For Correct Use

Be sure to follow the instructions in the operation manual provided for correct use of the product.

●Operation panel



Teaching indicator (green LED) : Flashes/illuminated during teaching.

Mode indicator (yellow LED) : Illuminated when the long-distance mode is selected. Not illuminated in the high-speed mode.

Operation indicator (orange LED) : Illuminated when the output is activated.

Received light level indication : The received light level is indicated in a 4-digit number between 0 and 8000. The number indication is slow for ease of reading. For instantaneous light reception (or light blocking), even slower indication is given for the level of received light for light reception (or light blocking).
For an application in which the sensor output alternates between on and off consecutively, the levels of received light for light reception and blocking are alternately displayed.

ECO operation : The number indication is illuminated brightly immediately after power-up or during switch operation. When about 7 seconds have passed after power-up or end of switch operation, the number indication is dimmed and the mode enters the ECO operation state requiring less power.

Button switch : Used for teaching or sensitivity adjustment. The button can be pressed downwards and in 4 directions.

Timer selector switch : Switched for selecting the off-delay timer.
OFFD. : Off delay timer enabled
NORM. : Timer disabled

Light-ON/Dark-ON selector switch : Selects an output mode.
L.ON : Light-ON (output activated when light is received)
D.ON : Dark-ON (output activated when light is blocked)
When the mode is switched with the power on, turn off the power once and back on or manually repeat turning on and off.

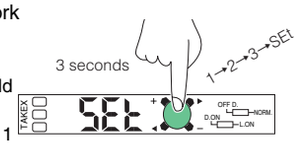
●Sensitivity setting

■The setting condition is displayed after sensitivity setting has been completed:

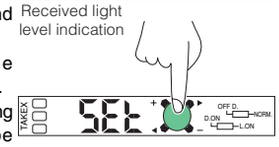
good [Good]	Optimum teaching achieved.
high [High]	Maximum sensitivity set.
HArd [Hard]	The hysteresis is small and the setting is severe. This indication is also given for positioning teaching.
SAtu [Saturated]	The power is too high and the teaching condition is not optimum. Replacing with a thinner fiber optic cable is recommended when a thick cable is used. Use in the high-speed mode is recommended when the long-distance mode is selected.

■Sensitivity setting using stationary work
<auto teaching>
[Reflective type]

①With no work placed, press and hold down the button for 3 seconds.
The indication rotates in the order of 1→2→3→SEt.
When SEt appears, release the button.

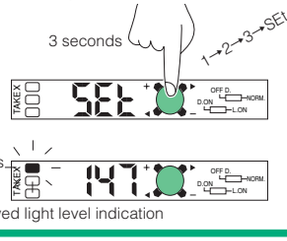


②Place the work in a given position and press the button.
When SEt appears, release the button to complete sensitivity setting.
[Note] The steps in the sensitivity setting process described above may be reversed by pressing the button first with the work placed.

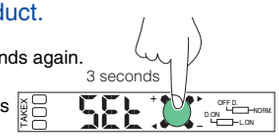


■Sensitivity setting using moving work
<full auto teaching>

①Press and hold down the button for 3 seconds.
The indication rotates in the order of 1→2→3→SEt.
When SEt appears, release the button.



②Press and hold the button for 3 seconds again.



・SEt is shown while the button is held down.
・Release the button when Auto appears.

③The LEDs alternately flash to indicate activation of full auto teaching. Let the work pass in this condition. There is no time limit.

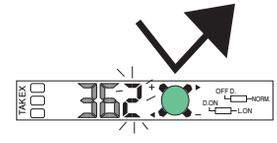
④Press the button to complete sensitivity setting.

■Maximum sensitivity setting
[Through-beam type]
Use a work, etc. to black the light. Set the sensitivity in this condition.
[Reflective type]
Use of a reflective-type fiber optic cable at the maximum sensitivity may cause inadequate light blocking. Be sure to use a work for sensitivity setting.

●Sensitivity adjustment (manual adjustment of activation level)

<The value for the flashing number can be changed by pressing the button.>

①Press the button once.
The current activation level appears, allowing changing of the flashing number.

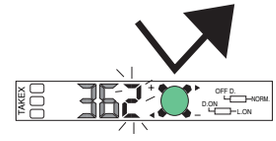


・Pressing in the + direction increases the activation level = SENS DOWN.
・Pressing in the − direction decreases the activation level = SENS UP
[Note] Holding down the button changes the indication faster.
・Pressing the button in the ▲ or ▼ direction shifts the active digit .

②When the adjustment is finished, press the button once to complete sensitivity setting.

●Activation level checking (for finding the current activation level)

①Press the button once.
The number flashes and the activation level is shown.

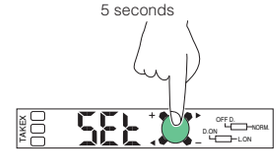


・For Light-ON, the value for the level that activates the output for light reception is displayed.
・For Dark-ON, the value for the level that activates the output for light blocking is displayed.

②Press the button once to complete sensitivity setting.

●Switching between the long-distance and high-speed modes

Press and hold down the button for about 5 seconds.
When Long or H-SP appears on the display, release the button to complete switching.



High-speed mode

Long-distance mode

Yellow LED in the middle illuminated to indicate long-distance mode