

DIGITAL FIBER SENSOR

**New**

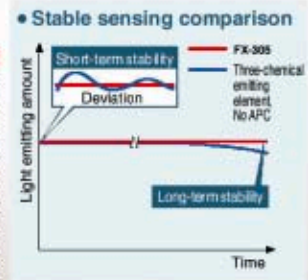
# FX-305



## Highest level of stability and sensing performance!

### Stable sensing over long and short periods

In addition to a 'four-chemical emitting element' which suppresses changes in the light-emitting element over time so that a stable level of light emission can be maintained over long periods, a new 'Auto Power Control (APC) circuit' has also been adopted. Because fluctuations over short periods of time have also been suppressed, stable sensing is possible very quickly once the power is turned back on after setup changes.



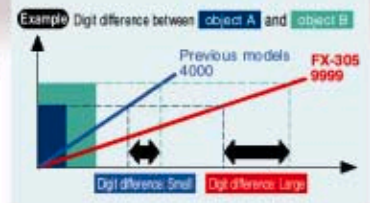
### Industry's largest display 9999

2.5 times previous models

Industry's largest display with 4 digits (9999). With a greater difference in digit value than previous models, threshold values can be set in units of 1 digit up to maximum 9999. Threshold setting can now be done more easily and accurately.

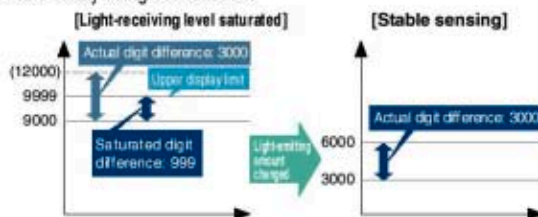


### Digit difference comparison



### Industry first! Light-emitting amount selection function

If the light-receiving level becomes saturated during close-range sensing or when sensing transparent or ultra-small objects, you can adjust the light-emitting amount of the sensor to stabilize sensing without needing to change the response time. Sensing that previously required the response time or fibers to be changed can now be set much more easily using this function.



### Comparison of saturation remedies

| [Conventional models]  | [FX-305]   |
|--|--|
| Response time: Mode selection<br>→ Affects positioning precision                                     | Variable light amount function<br>Makes steps such as those at left unnecessary. |
| Changing fiber: Change to thinner fiber to reduce light amount<br>→ Man-hour and cost inefficiencies |  |
| Changing setting position: Increase sensing range<br>→ Space and man-hour inefficiencies             |  |

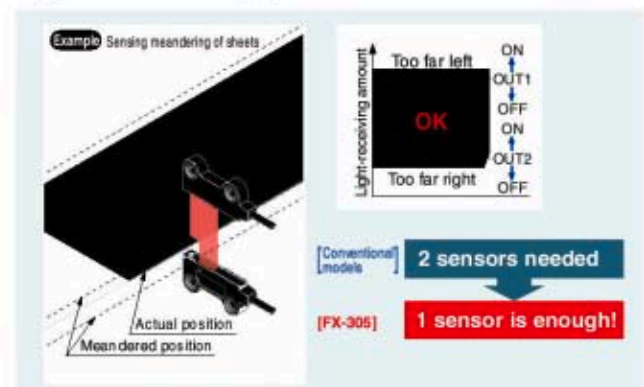
### High-speed response 65 μs

Twice as fast as before

High-speed response that is about twice as fast as before has been achieved. Even small objects moving at high speeds can be sensed. In addition, interference between two units is prevented in high-speed mode (H-SP).

### Independent dual outputs

Two independent output channels are provided, so that one sensor can be used for control tasks that previously required two sensors. In addition, the second output channel can be used for simple self-diagnosis and alarm output, so that ease of maintenance is improved.



### Largest number in the industry! Automatic interference prevention of up to 16 units

Can be used even in places where fibers need to be installed close together.

## SPECIFICATIONS

| Item   | Type  | NPN output  | PNP output |
|--|---|---|------------|
|  | Model No.   | FX-305  | FX-305P    |
| Sensing range (mm)   | Thru-beam type (FT-B8): 1,700 (U-LG), 1,100 (LONG), 730 (STD), 530 (STD), 400 (FAST), 200 (H-SP)<br>Reflective type (FD-B8): 600 (U-LG), 480 (LONG), 280 (STD), 220 (STD), 160 (FAST), 85 (H-SP)  |   |            |
| Supply voltage   | 12 to 24 V DC $\pm$ 10% Ripple P-P 10% or less  |   |            |
| Power consumption  | Normal operation: 960 mW or less (Current consumption: 40 mA or less at 24 V supply voltage)<br>ECO mode: 600 mW or less (Current consumption: 25 mA or less at 24 V supply voltage)  |   |            |
| Output (Output 1, Output 2)                                  | NPN open-collector transistor<br>• Maximum sink current: each 50 mA (Note 1)<br>• Applied voltage: 30 V DC or less (between output and 0 V)<br>• Residual voltage: 1.5 V or less (at each 50 mA (Note 1) sink current)  | PNP open-collector transistor<br>• Maximum source current: each 50 mA (Note 1)<br>• Applied voltage: 30 V DC or less (between output and +V)<br>• Residual voltage: 1.5 V or less (at each 50 mA (Note 1) source current) |            |
|  | Output operation  | Selectable either Light-ON or Dark-ON, with jog switch  |            |
| Short-circuit protection                                     | Incorporated  |   |            |
| Response time (Note 2)                                       | H-SP: 85 $\mu$ s or less, FAST: 150 $\mu$ s or less, STD: 250 $\mu$ s or less, STD-F: 700 $\mu$ s or less, LONG: 2.5 ms or less, U-LG: 4.5 ms or less (selectable with jog switch)  |   |            |
| Digital display  | 4-digit red LED display   |   |            |
| Sensitivity setting  | Normal mode: 2-level teaching / Limit teaching / Full-auto teaching / Max. sensitivity teaching / Manual adjustment<br>Window comparator mode: Teaching (1-level / 2-level / 3-level) / Manual adjustment   |   |            |
| Fire sensitivity adjustment function                         | Incorporated  |   |            |
| Timer function   | Incorporated with variable ON-delay / OFF-delay / ONE-SHOT / ON-delay-OFF-delay / ON-delay-ONE-SHOT timer, switchable either effective or ineffective (Timer period: Output 1: 0.5 ms, 1 to 9999 ms, Output 2: 0.5 ms, 1 to 500 ms)                                     |   |            |
| Automatic interference prevention function (Note 2) (Note 3) | Incorporated (Up to 4 sets of fiber heads can be mounted close together (However, U-LG mode is 8 sets, H-SP mode is 2 sets.))   |   |            |
| Ambient temperature  | -10 to +55 °C +14 to +131 °F<br>(If 4 to 7 units are connected in cascade: -10 to +50 °C +14 to +122 °F,<br>If 8 to 16 units are connected in cascade: -10 to +45 °C +14 to +113 °F)<br>(No dew condensation or icing allowed).<br>Storage: -20 to +70 °C -4 to +158 °F |   |            |
| Ambient humidity   | 35 to 85 % RH, Storage: 35 to 85 % RH   |   |            |
| Emitting element   | Red LED (modulated)   |   |            |
| Material   | Enclosure: Heat-resistant ABS, Transparent cover: Polycarbonate<br>Press switches: Acrylic, Jog switch: Heat-resistant ABS  |   |            |
| Connecting method  | Connector (Note 4)  |   |            |
| Cable extension  | Extension up to total 100 m 328.084 ft is possible with 0.3 mm <sup>2</sup> , or more, cable.   |   |            |
| Weight   | 20 g approx.  |   |            |

- Notes: 1) 50 mA per output. 25 mA if five, or more, amplifiers are connected in cascade.  
2) When the interference prevention function 'P-2' is set, the number of mountable fibers becomes double. Furthermore, take care that the response time also becomes double.  
3) When the power supply is switched on, the light emission timing is automatically set for interference prevention.  
4) The cable for amplifier connection is not supplied as an accessory. Make sure to use the optional quick-connection cables given below.  
Main cable (4-core): CN-74-C1 (cable length 1 m 3.281 ft), CN-74-C2 (cable length 2 m 6.562 ft), CN-74-C5 (cable length 5 m 16.404 ft)  
Sub cable (2-core): CN-72-C1 (cable length 1 m 3.281 ft), CN-72-C2 (cable length 2 m 6.562 ft), CN-72-C5 (cable length 5 m 16.404 ft)  
CN-73-C□ and CN-71-C□ cannot be used.

## PRECAUTIONS FOR PROPER USE

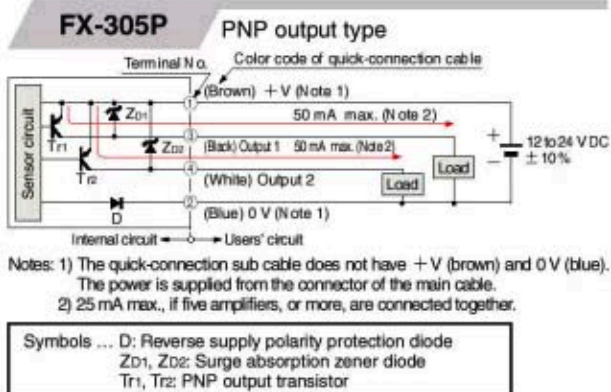
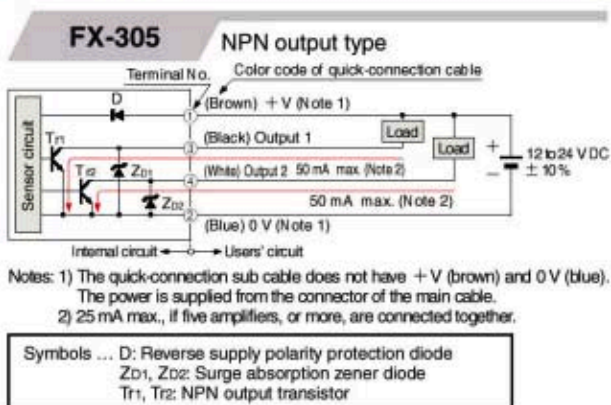


This product is not a safety sensor. Its use is not intended or designed to protect life and prevent body injury or property damage from dangerous parts of machinery. It is a normal object detection sensor.

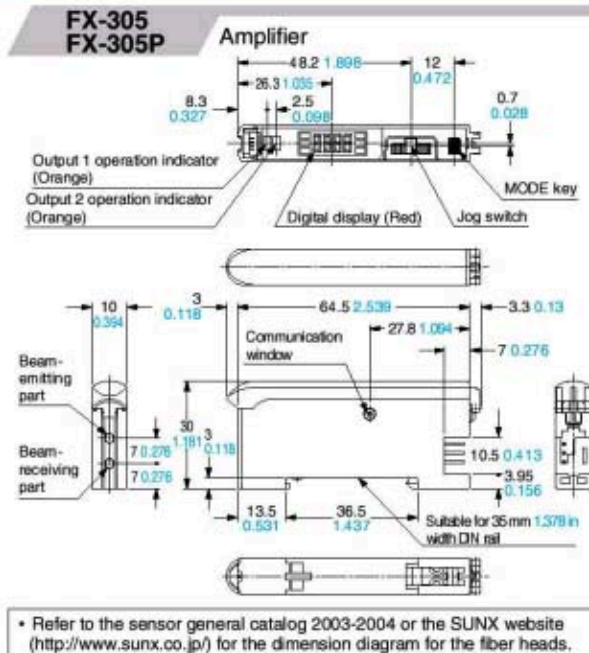
All information is subject to change without prior notice.

**SUNX**  
Sensing the Future

## I/O CIRCUIT



## DIMENSIONS (Unit: mm in)



**RAMCO Innovations**  
Excellence in Automation Solutions  
1207 Maple Street  
West Des Moines, IA USA 50265  
800-280-6933  
[www.ramcoinnovations.com](http://www.ramcoinnovations.com)