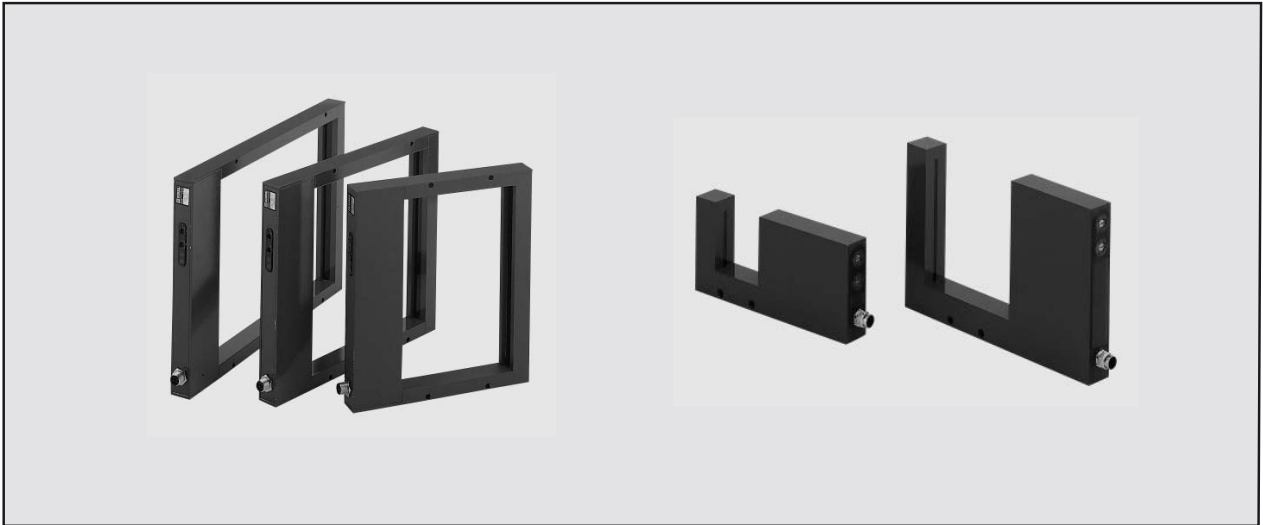


## FRAME SENSORS

# FRM Series

## Frame Sensor to Detect Random Parts



### Three different detectable object sizes

The FRM series is offered with models that can detect a  $\varnothing 2$  mm,  $\varnothing 4$  mm or  $\varnothing 10$  mm object. Select the model that best fits your application.

### NPN and PNP outputs

Both NPN and PNP outputs are standard on the unit.

### Quick connect standard

An M12 connector is standard on the FRM 120/180/250 sensors. The FRM 030/060/061 has an M8 connector.

### Potentiometer adjustment

A potentiometer is built-in to make adjustments to the sensitivity.

### CE/UL approval

Conforms to Europe's EMC Directive and has UL recognition for use in the U.S.

### Dynamic compensation for dust

The sensors incorporate a circuit to automatically compensate for dust or dirt buildup. This makes it possible to maintain the same sensitivity without changing the setting.

### Selectable output operation

The output operation of the sensor can be selected to operate as either Light-On or Dark-On by changing the wiring.

### Adjustable timer

There is an adjustable Off delay timer built-in standard. The timer is adjustable from 0 to 5 seconds. This is useful for short duration output pulses

### Dirty optics indicator

The sensor has a dirty optics indicator and output. This will signal when the lens should be cleaned.

# Specifications

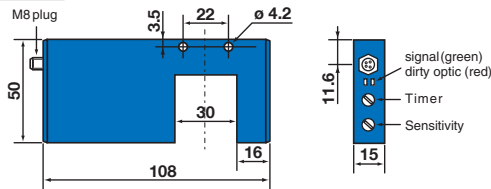
FRAME SENSORS	Small Part Detection		Medium Size Part Detection		Large Size Part Detection	
	Model Number	Frame Size	Model Number	Frame Size	Model Number	Frame Size
	<b>FRM-030-02-DC24</b>	30 x 30 mm	<b>FRM-120-04-DC24</b>	120 x 200 mm	<b>FRM-120-10-DC24</b>	120 x 200 mm
	<b>FRM-060-02-DC24</b>	60 x 60 mm	<b>FRM-180-04-DC24</b>	180 x 200 mm	<b>FRM-180-10-DC24</b>	180 x 200 mm
<b>FRM-061-02-DC24</b>	60 x 100 mm	<b>FRM-250-04-DC24</b>	250 x 200 mm	<b>FRM-250-10-DC24</b>	250 x 200 mm	
Min. Detectable Object	2.0 mm diameter		4.0 mm diameter		10.0 mm diameter	
Object Speed	Min.	100 mm / sec. $\varnothing$ 2.0 mm dia.	100 mm / sec. $\varnothing$ 4.0 mm dia.	100 mm / sec. $\varnothing$ 10.0 mm dia.		
	Max.	15 M / sec. $\varnothing$ 2.0 mm dia.	15 M / sec. $\varnothing$ 4.0 mm dia.	15 M / sec. $\varnothing$ 10.0 mm dia.		
Supply Voltage	18 ~ 30 VDC					
Current Consumption	120 mA		400 mA			
Sensing Outputs	Signal and Dirty optics outputs, both NPN and PNP open collector transistor operating simultaneously					
Output Rating	100 mA					
Output Operation	Light On / Dark On operation selectable by wiring					
Short Circuit Protection	Incorporated					
Response time	1 millisecond - 500 Hz					
Timer	Adjustable Off delay timer - 0 to 5 seconds					
Operation Indicator	Signal (green) and Dirty Optics (red)					
Protection	IP 65					
Ambient Temperature	0 to 60°C					
Housing	Aluminum housing					
Ratings	CE/UL					
Accessories Included	2 meter connection cable					

## DIMENSIONS (Unit: mm)

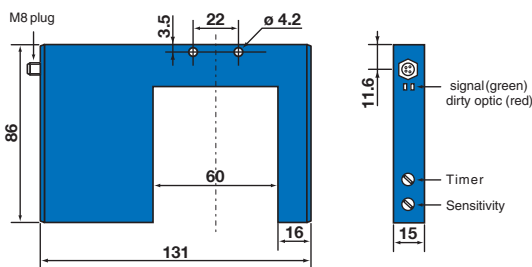
### FRM-0□□-02-DC24

Sensor

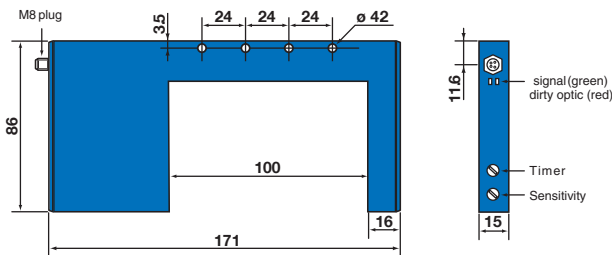
#### FRM-030-02-DC24



#### FRM-060-02-DC24



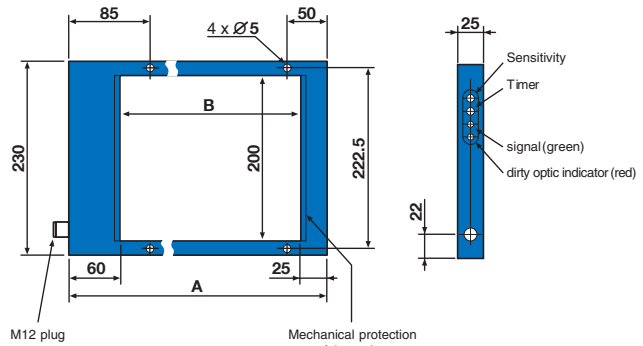
#### FRM-061-02-DC24



- In case of a faulty supply, the red LED flashes.
- In case of a short-circuit on an output, the red and green LED's flash.

### FRM-□□0-□□-DC24

Sensor



- In case of a faulty supply, the red LED flashes.
- In case of a short-circuit on an output, the red and green LED's flash.

TYPE	A (mm)	B (mm) : opening	
FRM-120-□□-DC24	205	120	-DC24
FRM-180-□□-DC24	265	180	-DC24
FRM-250-□□-DC24	335	250	-DC24

### Wiring Connection Diagram

