OMRON

Mapping Sensor

F3M-S

Increased 13-stage/25-stage batch mapping throughput. Stability detection of SIC dummy wafer contributes to cost reduction.

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Features

Detects Transparent Glass Wafers with a Trans-parency

The F3M-S allows the mapping of cassettes that have both silicon wafers and glass wafers. Furthermore, the F3M-S accurately detects inexpensive opaque dummy wafers used for process checks, thus contributing to cost reductions.

Note: Operating conditions are restricted for the detection of transparent wafers. Contact your OMRON representatives for details.

Automatic Teaching Saves Setting Time Remote Teaching Available

The F3M-S has an automatic teaching function that ensures easy output adjustments within a minimal time.
Furthermore, the F3M-S has a remote teaching function that ensures easy output readjustments.

Answerback function during setup and self-diagnostic function during operation issue warnings when errors occur!

These alarms contribute to the minimization of system downtime.

Note: The self-diagnostic output function is not incorporated by the F3M-S826/-S626.

Prevents Sensor Malfunction and Damage by

OMRON's original optical system, including an emitter and receiver, is built into the F3M-S. This system prevents Sensor malfunction and damage by protecting the Sensor from static electricity that may be charged on semiconductor wafers at the time of mapping.

Ordering Information

Applicable wafer size	No. of tiers	Functions	Model
6 inches (5 inches) (4.76-mm pitch)	25	Self diagnostic	F3M-S625
	26	---	F3M-S626
8 inches (6.35-mm pitch)	25	Self diagnostic	F3M-S825
	26	---	F3M-S826
12 inches (10-mm pitch)	13	Self diagnostic	F3M-S1213
	25	Self diagnostic	F3M-S1225

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Rating/performance

Item	Model	F3M-S625	F3M-S626	F3M-S825	F3M-S826	F3M-S1213	F3M-S1225
No. of tiers		25	26	25	26	13	25
Optical axis pitch		4.76 mm		6.35 mm		10 mm	
Optical axis width		1.5 mm					
Sensing object		6-inch (5-inch) silicon semiconductor wafer, transparent wafer (work having 92% or less transparency) *		8-inch silicon semiconductor wafer, transparent wafer (work having 92% or less transparency) *		12-inch silicon semiconductor wafer, 12-inch sic wafer (work having 30% or less transparency)	
Light source (wave length)		Infrared LED (940 nm)					
Power supply voltage		12 to 24 VDC ±10%, ripple (p-p) : 10% max.					
Current consumption		120 mA max.					
Output	Control output	Load power supply voltage: 30 VDC or less; Load current: 20 mA or less (residual voltage 1 V or less); Input current: 20 mA; All-channel parallel output, NPN open collector output; DARK: ON					
	Answer-back output	When remote teaching is ON, pin 28 will be used for this function.					
	Self-diagnostic output	Load power supply voltage: 30 V DC or less; Load current: 20 mA or less (residual voltage 1 V or less); Input current: 20 mA; NPN open collector output	---	Load power supply voltage: 30 V DC or less; Load current: 20 mA or less (residual voltage 1 V or less); Input current: 20 mA; NPN open collector output	---	Load power supply voltage: 30 VDC or less; Load current: 20 mA or less (residual voltage 1 V or less); Input current: 20 mA; NPN open collector output	
Indicator lamp	P indicator	When power is turned on: Illuminates (green)					
	Warning	Illuminates (red) during teaching, when there is no work, when there is insufficient light, and when other problems occur.					
Response time		10 ms max.					
Control output interrupt		When all outputs are stopped: shorts GND and control output stop input (0-V short current: 1 mA or less) When output stop is canceled: opens GND and control output stop input (open or 9 V or higher, less than or equal to power supply voltage used)					
Remote teaching input		When ON: shorts GND and remote input (0-V short current: 1 mA or less) When OFF: opens GND and remote input (open or 9 V or higher, less than or equal to power supply voltage used)					
Teaching test function		Indicator lamp (orange)					
Ambient illuminance		Fluorescent lamp: 1,500 lux max.					
Ambient temperature		Operating: 0 to +40°C, Storage: -25°C to +60°C (with no icing or condensation)				Operating: 0° to +55°C, Storage: -25 to +60°C (with no icing or condensation)	
Ambient humidity		Operating/Storage: 35% to 85% RH (with no condensation)					
Noise resistance		Power supply line: ±480 V (using normal mode and noise simulator)					
		Static electrical noise: No malfunction or destruction at ±8 kV					
Vibration resistance		Destruction: 10 to 55 Hz, 0.5-mm double amplitude for 2 hrs each in X, Y, and Z directions					
Shock resistance		300 m/s^2, 3 times each in X, Y, and Z directions					
Protective structure		IEC60529 IP40					
Connection method		Pull-out cable with connector (standard cable length: 100 mm)				Connector	
Weight (packed state)		Approx. 110 g				Approx. 200 g	Approx. 300 g
Material	Optical axis	Polycarbonate					
	Case	ABS				ABS, aluminum (Alumite coating, clear finish)	
	Cable	Vinyl-insulated, bending type				---	
Accessories		Spacer and instruction manual				Instruction manual	

* Operating conditions are restricted for the detection of transparent wafers. Contact your OMRON representatives for details.

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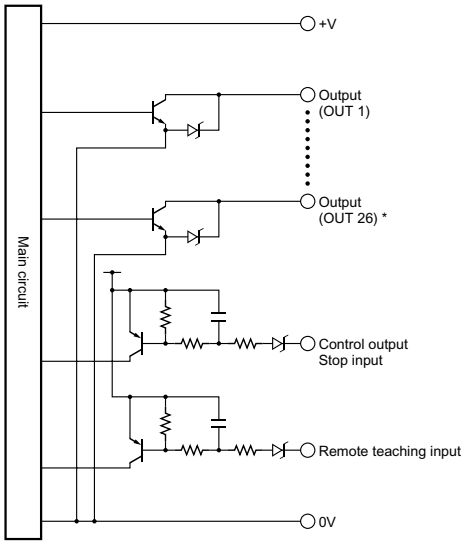
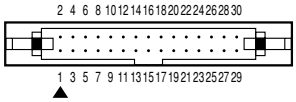
Output Circuit Diagram



* With remote teaching input, output becomes answerback output.
And output becomes self diagnostic output except of F3M-S626/F3M-S826.
F3M-S626 and F3M-S826 are outputted from OUT 26.

Input/output wiring schematic



Pin assignment

Pin No.	Assignment	Pin No.	Assignment	Pin No.	Assignment
1	GND(0V)	11	OUT9	21	OUT19
2	Vcc (12 to 24 V)	12	OUT10	22	OUT20
3	OUT1	13	OUT11	23	OUT21
4	OUT2	14	OUT12	24	OUT22
5	OUT3	15	OUT13	25	OUT23
6	OUT4	16	OUT14	26	OUT24
7	OUT5	17	OUT15	27	OUT25
8	OUT6	18	OUT16	28	Self-diagnostic output/ OUT26 *
9	OUT7	19	OUT17	29	Control output interrupt
10	OUT8	20	OUT18	30	Remote teaching input

* Pin 28 only functions as an answerback output during remote teaching input. At all other times it functions as a self-diagnostic output, except on the F3M-S626 and F3M-S826 where it functions as the output of OUT26.
Note: For the F3M-S1213, terminals for pins 16 to 27 are not used.

Precautions

Correct Use

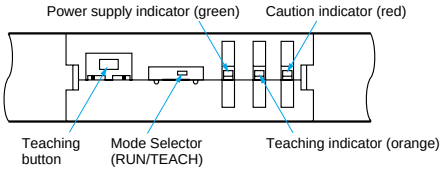
Wiring Considerations

About connection and mounting

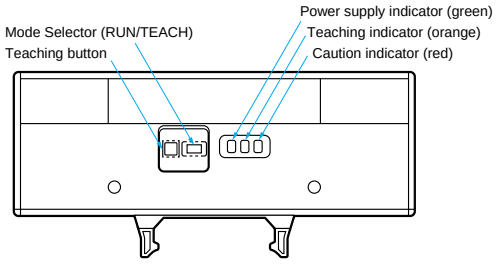
The maximum power supply voltage is 24 V DC+10%. Verify that the power supply voltage does not exceed the maximum voltage before turning on the power. Use a power supply in which the secondary circuit is separated by an isolating transformer.

● For adjustment

F3M-S6 □ and F3M-S8 □



F3M-S12 □



The remote or manual automatic teaching of the F3M-S is possible with the following two sensitivity settings:

Max. Sensitivity Setting: Detects semiconductor silicon wafers, semi-transparent dummy wafers, and SIC wafers.

Teaching with No Sensing Object: Detects transparent wafers (except F3M-S12 □).

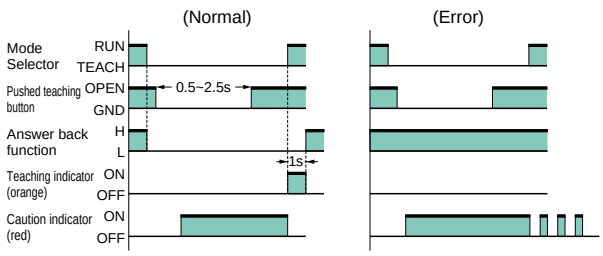
The sensitivity is set to maximum before shipping. Refer to the Instruction Manual when setting the sensitivity of the F3M-S.

Answer-back Function and Self-diagnostic

This sensor has a answerback function that warns you of problems during setup and a self-diagnostic function (on models other than the F3M-S626 and F3M-S826) that warns you of errors during operation.

- Answer-back Function: Normal or error teaching output turns
- Self-diagnostic Function: Warning output turns ON for a decrease in optical input.

Time chart for manual setup (when teaching without work)



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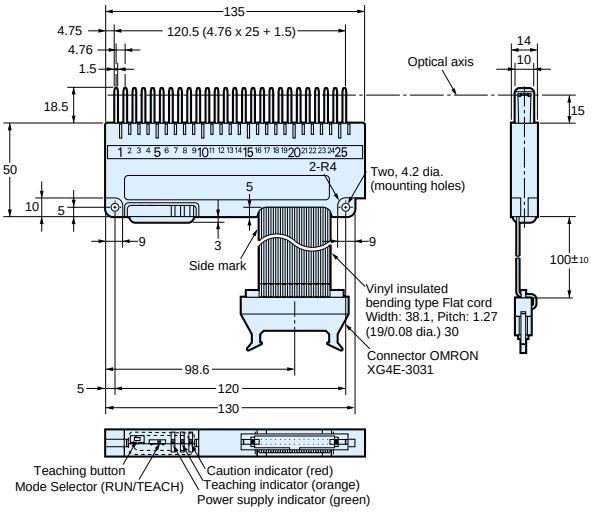
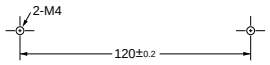
Dimensions (Unit: mm)

F3M-S625

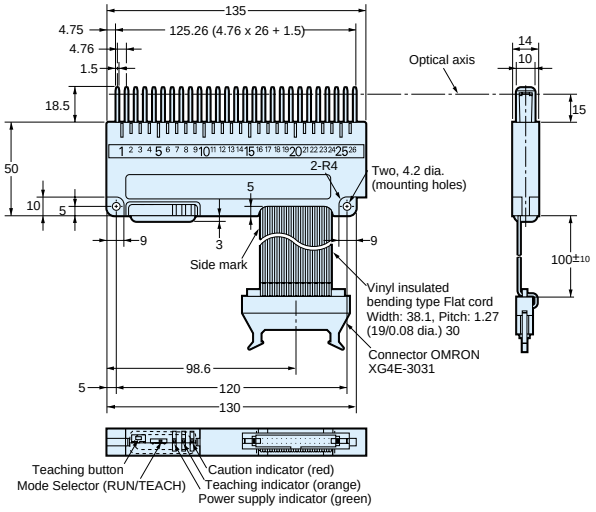


CAD file F3M_03

Mounting Dimensions

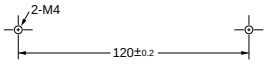


F3M-S626

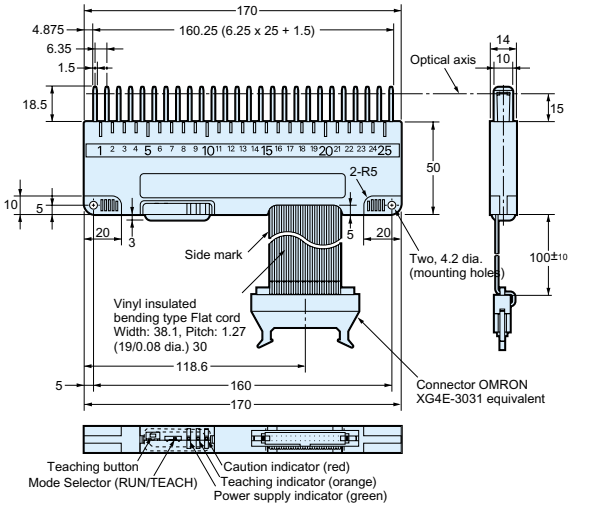


CAD file F3M_04

Mounting Dimensions

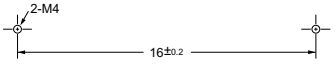


F3M-S825

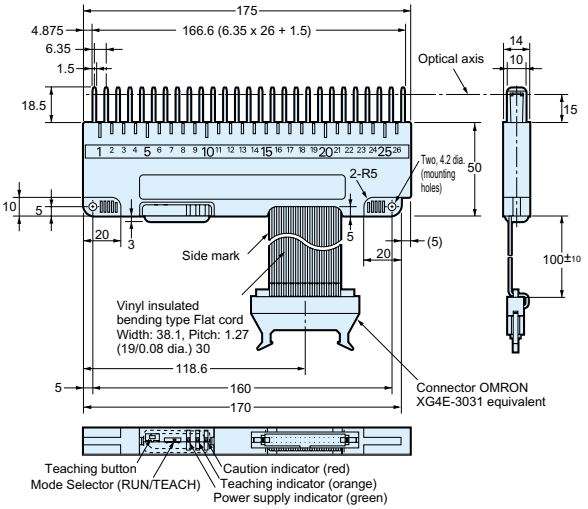


CAD file F3M_01

Mounting Dimensions

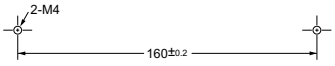


F3M-S826



CAD file F3M_02

Mounting Dimensions



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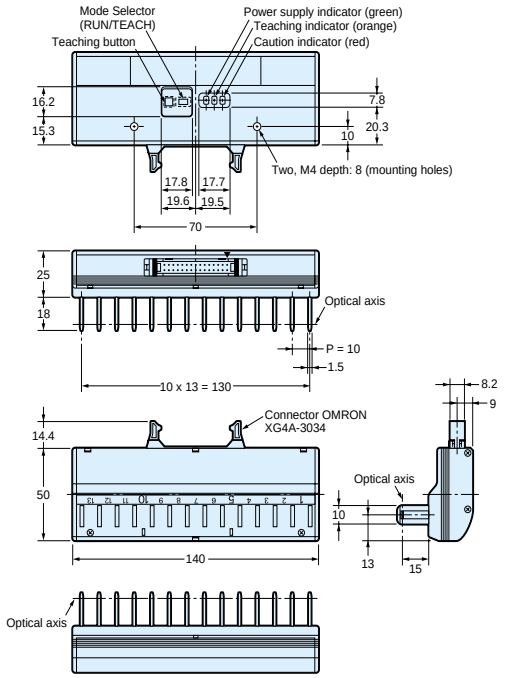
F3M-S1213



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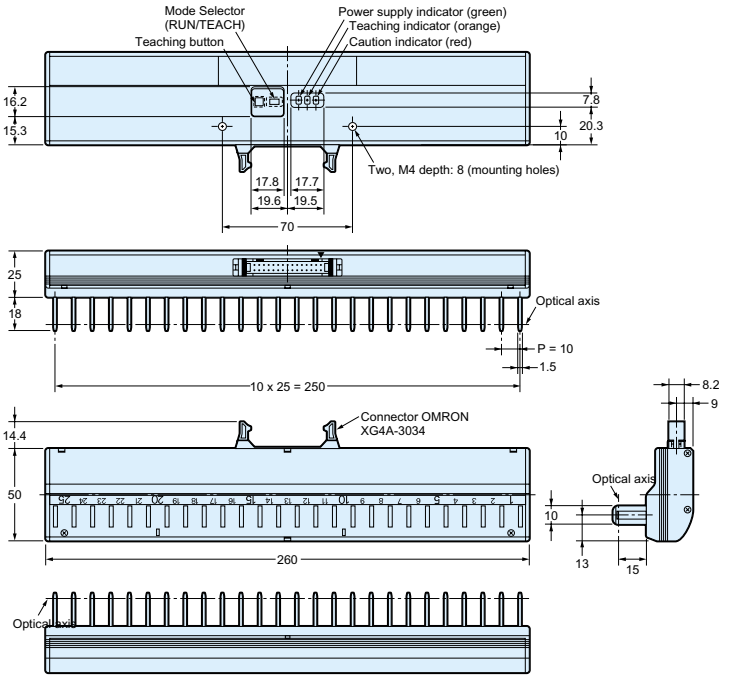
F3M-S1225



CAD file F3M_06

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