

Safety Relay Unit (I/O Unit Type)

CQM1-SF200/CS1W-SF200

*Same Dimensions as I/O Unit
Less Installation Space and
Wiring Required*

- Safety Relay Unit that can be used as an I/O Unit for OMRON's CQM1H and CS1-series PLCs.
- Requires less installation space and wiring.
- Monitors power supply, output, and internal relays for safety circuits.
- Equipped with four general-purpose input terminals.
- Conforms to EN standards. (TÜV approval)



Ordering Information

I/O Unit Type Emergency-stop Unit

Main contact	Rated voltage	Auxiliary contact	Number of input channels	Number of general-purpose inputs	Model
DPST-NO	24 VDC	None	1 channel or 2 channels possible	4 inputs	CQM1-SF200 CS1W-SF200

Model Number Legend:

CQM1-□□□□□
1 2 3 4

CQM1: CQM1 I/O Unit Type

CS1W-□□□□□
1 2 3 4

CS1W: CS1 I/O Unit Type

1. Function

SF: I/O Unit Type Emergency-stop Unit

2. Contact Configuration (Safety Output)

2: DPST-NO

3. Contact Configuration (OFF-delay Output)

0: None

4. Contact Configuration (Auxiliary Output)

0: None

Specifications

Ratings

Safety Circuit Block

Power Input

Item	CQM1-SF200	CS1W-SF200
Power supply voltage	24 VDC	
Operating voltage range	85% to 110% of rated power supply voltage	
Power consumption	24 VDC: 1.7 W max.	

Inputs

Item	CQM1-SF200	CS1W-SF200
Input current	75 mA max.	

Contacts

Item	CQM1-SF200	CS1W-SF200
	Resistive load (cos ϕ =1)	
Rated load	250 VAC, 5 A	
Rated carry current	5 A	

General-purpose Input Block

Item	CQM1-SF200	CS1W-SF200
Power supply voltage	24 VDC	
Operating voltage range	85% to 110% of rated power supply voltage	
Input impedance	4.0 k Ω	3.3 k Ω
Input current	6 mA (typical) at 24 VDC	7 mA (typical) at 24 VDC
Must-operate voltage/current	14.4 VDC min./3 mA min.	
Reset voltage/current	5 VDC max./1 mA max.	
ON/OFF response time	8 ms max. (Settable in the range 1 to 128 ms in the PLC Setup.)	8 ms max. (Settable in the range 0 to 32 ms in the PLC Setup.)
Number of circuits	4 inputs, 1 common	
Simultaneous ON points	All points	
Internal current consumption	50 mA max.	100 mA max.

Characteristics

Item		CQM1-SF200	CS1W-SF200
Contact resistance (see note 1)		100 mΩ	
Operating time		300 ms max. (not including bounce time)	
Response time (see note 2)		10 ms max. (not including bounce time)	
Insulation resistance (see note 3)		Between safety circuits and safety output: 20 MΩ min. (at 500 VDC) Between general-purpose inputs and safety output: 20 MΩ min. (at 500 VDC) Between different poles of safety output: 20 MΩ min. (at 500 VDC) Between safety circuits and general-purpose inputs: 20 MΩ min. (at 500 VDC)	
Dielectric strength (see note 3)		Between safety circuits and safety output: 2,500 VAC, 50/60 Hz for 1 min Between general-purpose inputs and safety output: 2,500 VAC, 50/60 Hz for 1 min Between different poles of safety output: 2,500 VAC, 50/60 Hz for 1 min Between safety circuits and general-purpose inputs: 500 VAC, 50/60 Hz for 1 min	
Vibration resistance (see note 3)		10 to 57 Hz at 0.075-mm single amplitude, 57 to 150 Hz at 9.8 m/s ² for 80 minutes each in X, Y, and Z directions (sweep time 8 minutes x 10 = 80 minutes) Conforms to JIS C0911.	10 to 57 Hz at 0.075-mm single amplitude, 57 to 150 Hz at 9.8 m/s ² for 80 minutes each in X, Y, and Z directions (sweep time 8 minutes x 10 = 80 minutes) (when mounted on DIN track: 2 to 55 Hz, 2.94 m/s ² for 20 minutes each in X, Y, and Z directions) Conforms to JIS C0041.
Shock resistance (see note 3)		147 m/s ² , 3 times each in X, Y, and Z directions, Conforms to JIS C0912.	147 m/s ² , 3 times each in X, Y, and Z directions, Conforms to JIS C0041.
Life expectancy	Mechanical	5,000,000 operations min. (at approx. 7,200 operations/hr)	
	Electrical	100,000 operations min. (at approx. 1,800 operations/hr)	
Error rate (P-level) (reference value)		5 VDC, 1 mA	
Ambient operating temperature (see note 3)		0 to 55°C	
Ambient operating humidity (see note 3)		10% to 90% (with no condensation)	
Ambient operating environment (see note 3)		No corrosive gases	
Ambient storage temperature (see note 3)		-20 to 75°C	
Structure		Built into panel	
Approved standards		EN954-1, EN60204-1, UL508, CSA C22.2 No. 14	
EMC		EMI: EN55011 group 1 class A EMS: EN50082-2	
Weight		Approx. 260 g	Approx. 300 g

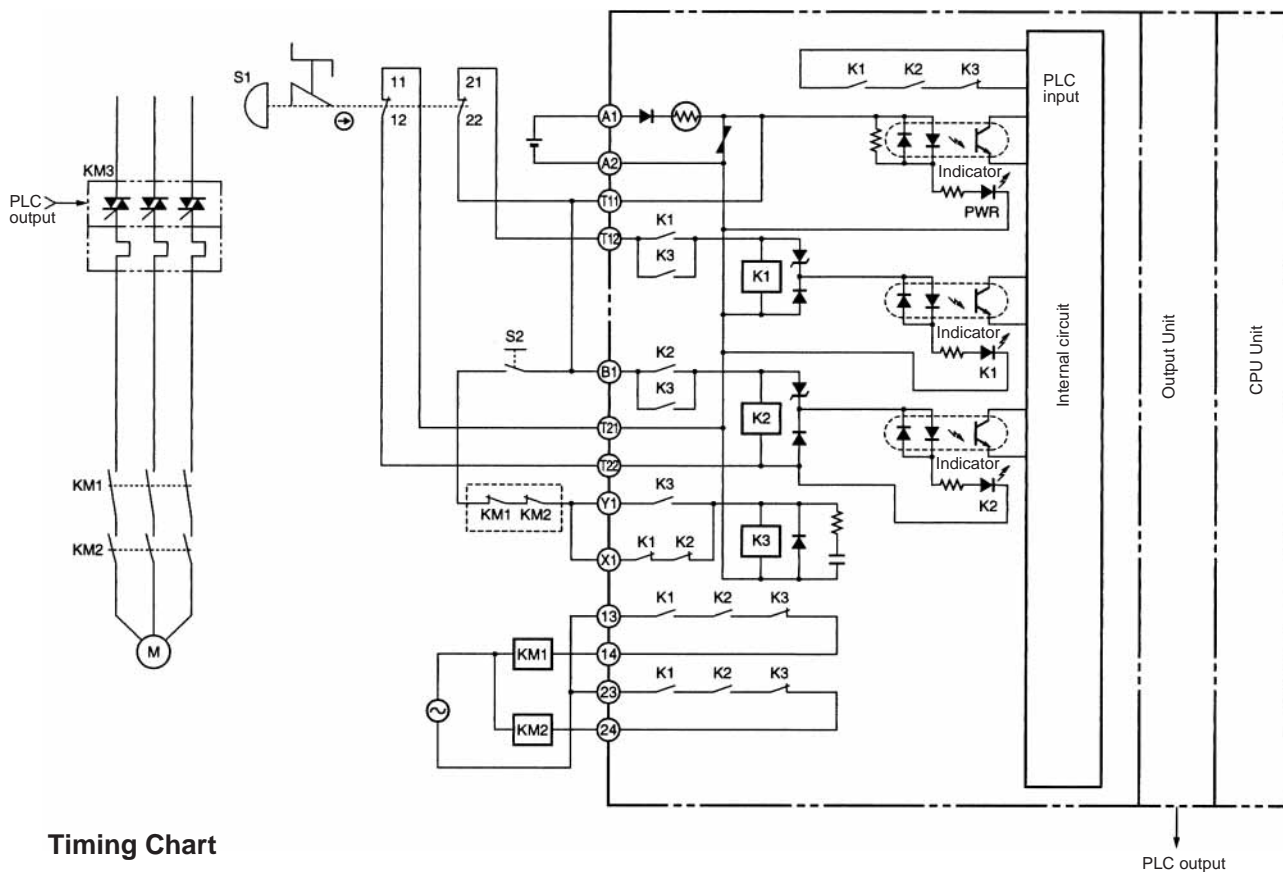
Note: 1. The contact resistance was measured with 1 A at 5 VDC using the voltage-drop method.

2. The response time is the time it takes for the main contact to turn OFF after the input is turned OFF.

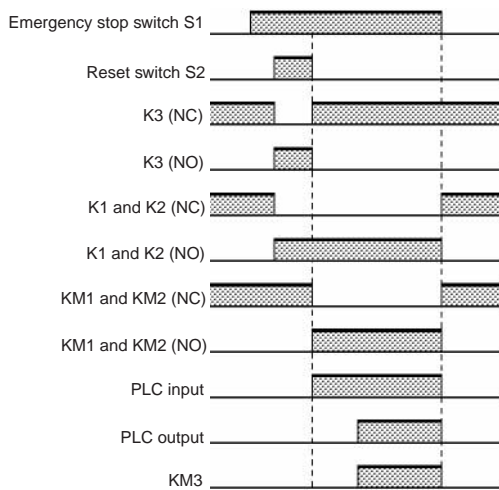
3. Measured with the Unit mounted to the PLC.

Application Examples

Two Channels of Emergency Stop Switch Input (Common to CQM1-SF200 and CS1W-SF200)



Timing Chart



- S1: Emergency stop switch ⊖
- S2: Reset switch (momentary operation switch)
- KM1 and KM2: Magnetic Contactor
- KM3: G3J Solid-state Contactor
- M: 3-phase motor

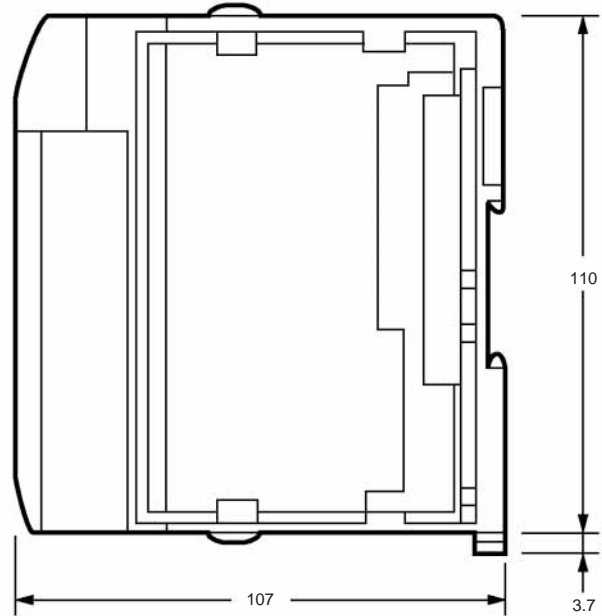
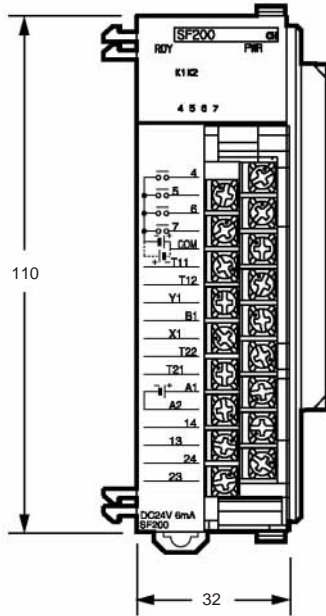
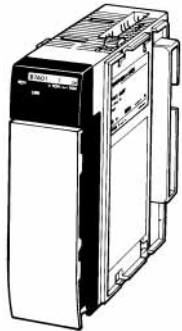
Note: The above circuit example falls under category 4.

CQM1-SF200/CS1W-SF200

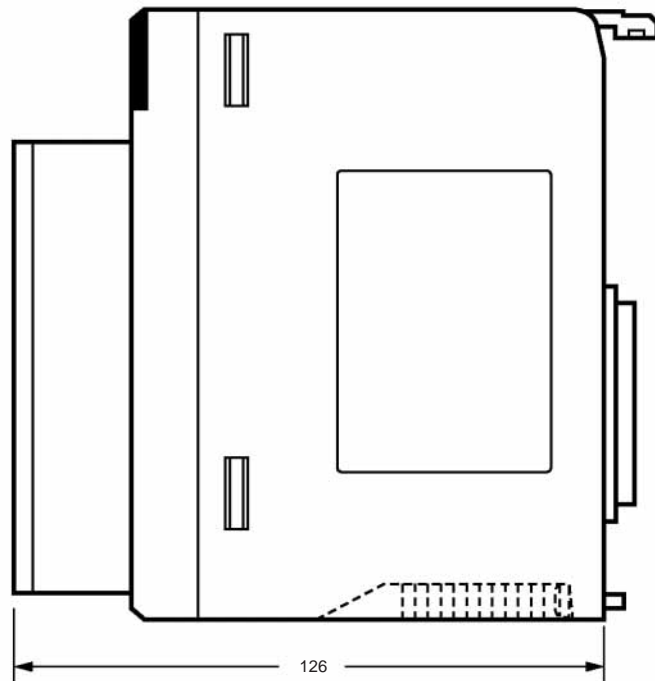
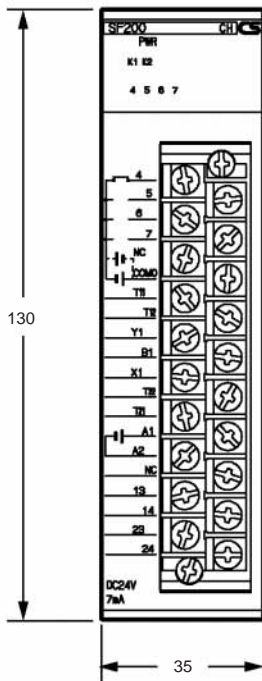
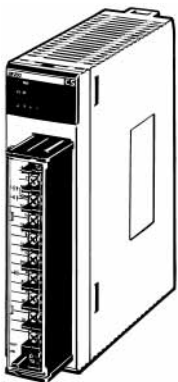
Dimensions

Note: All units are in millimeters unless otherwise indicated.

CQM1-SF200



CS1W-SF200



Address Allocations

CQM1-SF200

Addresses are allocated to Basic I/O Units according to the order in which they are mounted in the CPU Block. Addresses (bits) are allocated in word (16-bit) units starting from the left (the position nearest to the CPU Unit) beginning with word 0000.

Note: The 1 to 16-point Units are allocated 16 bits and 17 to 32-point Units are allocated 32 bits. For example, 8-point DC Input Units are allocated bits 00 to 07. CQM1-SF200 is allocated 16 points.

CS1W-SF200

Addresses are allocated to Basic I/O Units according to the order in which they are mounted on the CPU Block. Addresses (bits) are allocated in word (16-bit) units starting from the left (the position farthest from the CPU Unit) beginning with word 0000.

Note: The 1 to 16-point Units are allocated 16 bits and 17 to 32-point Units are allocated 32 bits. For example, 8-point DC Input Units are allocated bits 00 to 15. CS1W-SF200 is allocated 16 points.