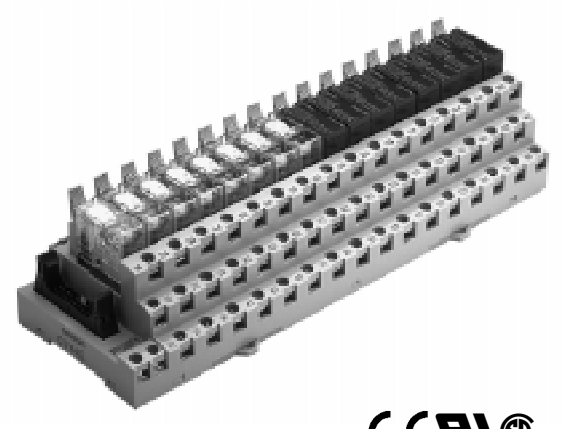
OMRON

Relay I/O Block Base

G70A

Reduces Wiring while Providing I/O Flexibility



- Standard Relays and SSRs can be mounted together in the same base
- Terminal block incorporates finger-touch protection from electric shock, conforming to VDE 0106
- Connects to PLCs and SBCs easily with a connector
- Mounts on DIN rail track
- SPDT (Form C) switching provided when G2R output relays are installed
- G70A I/O Blocks are UL, CSA, IEC, VDE, SEV, SEMKO, DEMKO, and SET1 approved when filled with G2R relays and G3R SSRs

Ordering Information

■ RELAY TERMINAL BLOCK BASE

Relays not included. Order below.

Classification	Internal I/O circuit common	Rated voltage	Part number
Output	NPN (+ common)	24 VDC	**G70A-ZOC16-3 DC24V**
	PNP (– common)	24 VDC	**G70A-ZOC16-4 DC24V**
Input	NPN/PNP (to the relay)	110 VDC max., 240 VAC max. (See Note)	**G70A-ZIM16-5 DC24V**

Note: Each relay to be mounted must incorporate a coil that has proper specifications within the maximum rated voltage range.

■ PCB/SSR RELAYS FOR USE WITH G70A

Classification	I/O Block Base	PCB Relay	Solid State Relay
Output	**NPN: G70A-ZOC16-3 DC24V** **PNP: G70A-ZOC16-4 DC24V**	**G2R-1-SND DC24** **G2R-1-SND DC12**	**G3R-OA202SZN DC5-24** **G3R-ODX02SN DC5-24** **G3R-OD201SN DC5-24**
Input	**G70A-ZIM16-5 DC24V**	**G2R-1A3-SND DC24V** **G2R-13-SND DC24V**	**G3R-IAZR1SN AC100-240** **G3R-IDZR1SN DC12-24** **G3R-IDZR1SN DC5**

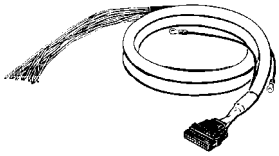
Note: G2R-13-SN has twin cross-bar contacts.

■ CONNECTING SOCKETS FOR SINGLE POINT RELAY CONNECTION

Number of poles	Part number
1 pole (G2R input relays are SPST-NO)	**P2RF-05-E**
2 poles (G2R output relays are SPDT)	**P2RF-08-E**

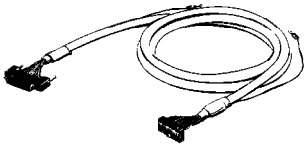
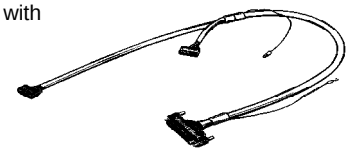
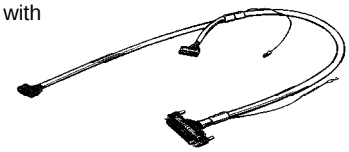
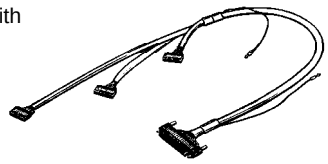
■ GENERAL-PURPOSE CABLES

The following cables can be connected to I/O boards and PLC modules from any manufacturer.

Item	Length	Part number
Connecting cable with crimp hook terminals 	1 m (3.28 ft)	**G79-Y100C**
	1.5 m (4.92 ft)	**G79-Y150C**
	2 m (6.56 ft)	**G79-Y200C**
	3 m (9.84 ft)	**G79-Y300C**
	5 m (16.40 ft)	**G79-Y500C**
Connecting cable with loose wires 	2 m (6.56 ft)	**G79-A200C**
	5 m (16.40 ft)	**G79-A500C**

■ DEDICATED CONNECTING CABLES FOR OMRON PLC MODULES

The following cables are designed to connect directly to Omron PLC modules and have dedicated connectors for specific models.

Item	Length	Part number
Connecting cable with one connector for high-density I/O modules 	1 m (3.28 ft)	**G79-100C**
	1.5 m (4.92 ft)	**G79-150C**
	2 m (6.56 ft)	**G79-200C**
	3 m (9.84 ft)	**G79-300C**
	5 m (16.40 ft)	**G79-500C**
Connecting cable with two connectors for high-density input modules 	1 m (3.28 ft) + 0.75 m (2.46 ft)	**G79-I100C-75**
	1.5 m (4.92 ft) + 1.25 m (4.10 ft)	**G79-I150C-125**
	2 m (6.56 ft) + 1.75 m (5.74 ft)	**G79-I200C-175**
	3 m (9.84 ft) + 2.75 m (9.02 ft)	**G79-I300C-275**
	5 m (16.40 ft) + 4.75 m (15.58 ft)	**G79-I500C-475**
Connecting cable with two connectors for high-density output modules 	1 m (3.28 ft) + 0.75 m (2.46 ft)	**G79-O100C-75**
	1.5 m (4.92 ft) + 1.25 m (4.10 ft)	**G79-O150C-125**
	2 m (6.56 ft) + 1.75 m (5.74 ft)	**G79-O200C-175**
	3 m (9.84 ft) + 2.75 m (9.02 ft)	**G79-O300C-275**
	5 m (16.40 ft) + 4.75 m (15.58 ft)	**G79-O500C-475**
Connecting cable with three connectors for CS1 high-density I/O modules 	1.5 m (4.92 ft) + 1.25 m (4.10 ft) + 1 m (3.28 ft)	**G79-150C-125-100**
	2 m (6.56 ft) + 1.75 m (5.74 ft) + 1.5 m (4.92 ft)	**G79-200C-175-150**
	3 m (9.84 ft) + 2.75 m (9.02 ft) + 2.5 m (8.20 ft)	**G79-300C-275-250**

Specifications

■ RELAY BLOCK BASE

Item	G70A-ZOC16-3	G70A-ZOC16-4	G70A-ZIM16-5
Contact resistance	10 mΩ (excluding the resistance of the relay to be used)		
Permissible current	10 A		100 mA
Max. operating voltage	380 VAC, 125 VDC		30 VDC
Dielectric strength	4,000 VAC, 50/60 Hz for 1 min between connector and output terminals 2,000 VAC, 50/60 Hz for 1 min between output terminals 250 VAC, 50/60 Hz for 1 min between connectors		
Insulation resistance	100 MΩ (at 500 V)		
Vibration resistance	Malfunction: 10 to 61.2 Hz, 0.2-mm double amplitude; 61.2 to 150 Hz, 1.5G		
Shock resistance	Malfunction: 200 m/s^2 (approx. 20G)		
Noise immunity	Noise level: 2.0 kV; pulse width: 100 ns to 1 μs		
Ambient temperature	Operating: 0°C to 55°C (32°F to 131°F) with no icing		
Ambient humidity	Operating: 35% to 85%		
Coil surge absorption element	Diode: 1 A, 400 V		Varistor (See Note)
Protection diode for inverse connection	Diode (2 A, withstand inverse voltage: 40 V)		
Tightening torque	6 kgf • cm (0.59 N • m)		

Note: If coil surge protection on input is needed, use a DC relay with a built-in diode.

■ PCB RELAYS G2R-1-S AND G2R-1-SN

Coil Ratings

Rated voltage		24 VDC
Rated current (50/60 Hz)		21.8 mA
Coil resistance		1,100 Ω
Coil inductance (H) (ref. value)	**Armature OFF**	4.27
	Armature ON	8.55
Must operate voltage		70% min. of rated voltage
Must release voltage		15% min. of rated voltage
Max. voltage		110% of rated voltage
Power consumption		Approx. 0.53 W

Contact Ratings

Number of poles	1 pole	
Load	Resistive load (p.f. = 1)	Inductive load (p.f. = 0.4; L/R = 7 ms)
Rated load	10 A at 250 VAC; 10 A at 30 VDC	7.5 A at 250 VAC; 5 A at 30 VDC
Rated carry current	10 A	
Max. operating voltage	380 VAC, 125 VDC	
Max. operating current	10 A	
Max. switching capacity	2,500 VA, 300 W	1,875 VA, 150 W
Min. permissible load	100 mA at 5 VDC	

■ PCB RELAYS G2R-1A3-SND AND G2R-13-SN (SND)

Coil Ratings

Rated voltage		230 VAC	12 VDC	24 VDC
Rated current	**50 Hz**	3.7 mA	43.6 mA	21.8 mA
	60 Hz	3.1 mA		
Coil resistance		30,000 Ω	275 Ω	1,100 Ω
Must operate voltage		80% max. of rated voltage	70% max. of rated voltage	
Must release voltage		30% min. of rated voltage	15% min. of rated voltage	
Max. voltage		110% of rated voltage		
Power consumption		Approx. 0.7 W (60 Hz)	Approx. 0.53 W	

Note: 1. The rated current and coil resistance are measured at a coil temperature of 23°C with a tolerance of $^{+15\%}/_{-20\%}$ (AC rated current) or +10% (DC coil resistance).

2. LEDs are used for the built-in operation indicator. For models equipped with these indications, the VAC rated current must be increased by approximately 1 mA; the VDC rated current, by approximately 4 mA.

Contact Ratings

Refer to Ratings/Characteristics of G70A-ZIM16-5.

■ SSR RELAYS

Ratings for G3R I/O Relays

Coil Ratings for Input Relay

Part number	Rated voltage	Operating voltage	Input current	Voltage level	
				Must operate voltage	Must release voltage
G3R-IAZR1SN AC100-240	100 to 240 VAC	60 to 264 VAC	15 mA max.	60 VAC max.	20 VAC min.
G3R-IDZR1SN DC5	5 VDC	4 to 6 VDC	8 mA max.	4 VDC max.	1 VDC min.
G3R-IDZR1SN DC12-24	12 to 24 VDC	6.6 to 32 VDC		6.6 VDC max.	3.6 VDC min.

Contact Ratings for Input Relay

Part number	Logic supply voltage	Logic supply current
G3R-IAZR1SN	4 to 32 VDC	0.1 to 100 mA
G3R-IDZR1SN		

Contact Ratings For Output Relay

Part number	Applicable load		
	Load voltage	Load current	Inrush current
G3R-OA202SZN DC5-24	75 to 264 VAC	0.05 to 2 A	30 A (60 Hz, 1 cycle)
G3R-OA202SLN DC24			
G3R-ODX02N DC5-24	4 to 60 VDC	0.01 to 2 A	8 A (10 ms)
G3R-OD201SN DC5-24	40 to 200 VDC	0.01 to 1.5 A	8 A (10 ms)

Characteristics for G3R I/O Relay

Input Relay

Item	G3R-IAZR1SN	G3R-IDZR1SN	G3R-IDZR1SN-1
Operate time	20 ms max.	0.1 ms max.	20 ms max.
Release time			
Response frequency	10 Hz	1 kHz	10 Hz
Output ON voltage drop	1.6 V max.		
Leakage current	5 μA max.		
Insulation resistance	100 MΩ min. at 500 VDC		
Dielectric strength	4,000 VAC, 50/60 Hz for 1 min		
Vibration resistance	10 to 55 Hz, 1.5-mm double amplitude		
Shock resistance	1,000 m/s^2 (approx. 100G)		
Ambient temperature	Operating: −30°C to 80°C (−22°F to 176°F) Storage: −30°C to 100°C (−22°F to 212°F)		
Ambient humidity	Operating: 45% to 85%		
Weight	Approx. 18 g		

Output Relay

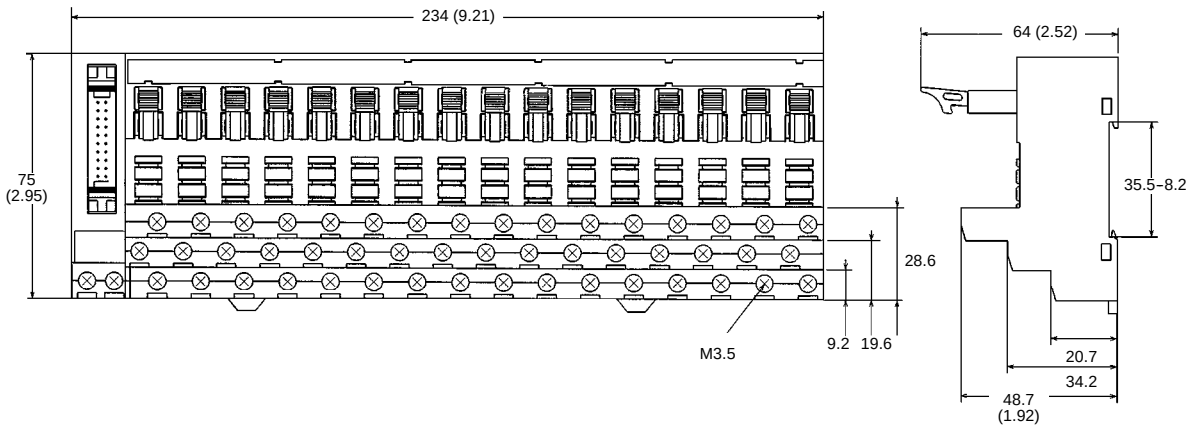
Item	G3R-OA202SZN	G3R-OA202SLN	G3R-ODX02SN	G3R-OD201SN
Operate time	1/2 of load power supply cycle + 1 ms max.		1 ms max.	
Release time			2 ms max.	
Response frequency	20 Hz		100 Hz	
Output ON voltage drop	1.6 V max.			2.5 V max.
Leakage current	1.5 mA max.		1 mA max.	
Insulation resistance	100 MΩ min. at 500 VDC			
Dielectric strength	4,000 VAC, 50/60 Hz for 1 min			
Vibration resistance	10 to 55 Hz, 1.5-mm double amplitude			
Shock resistance	1,000 m/s^2 (approx. 100G)			
Ambient temperature	Operating: −30°C to 80°C (−22°F to 176°F) Storage: −30°C to 100°C (−22°F to 212°F)			
Ambient humidity	Operating: 45% to 85%			
Weight	Approx. 18 g			

Dimensions

Unit: mm (inch)

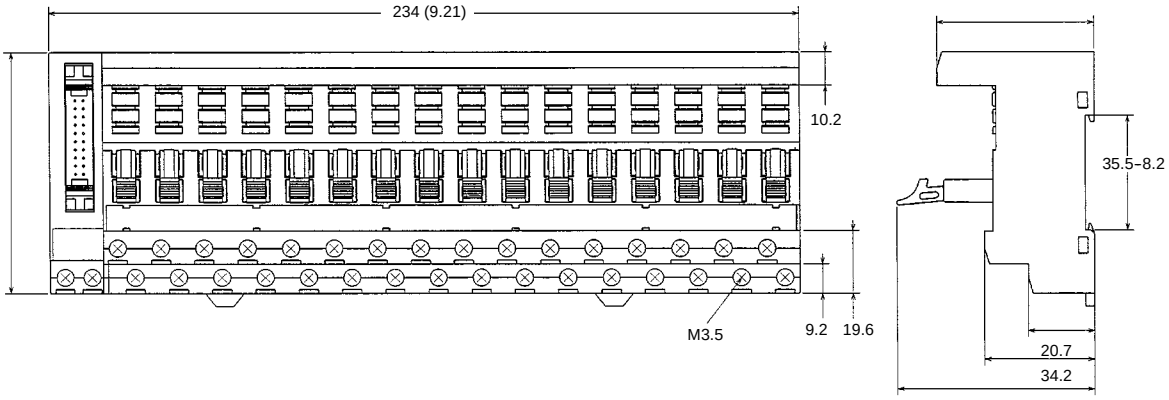
■ G70A

G70A-ZOC16 (Output)



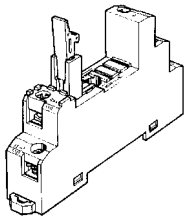
Unit: mm (inch)

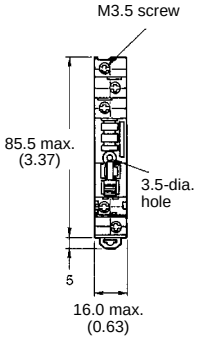
G70A-ZIM16 (Input)

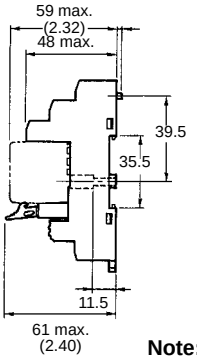


■ P2RF

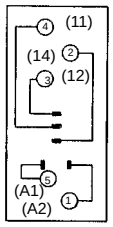
P2RF-05-E



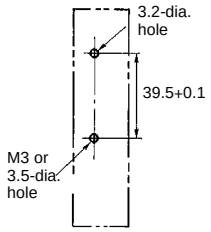




Terminal Arrangement (Top View)

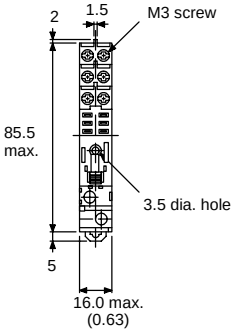


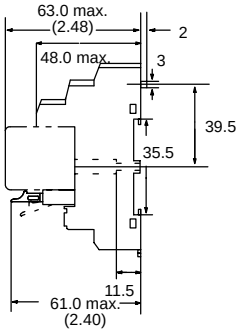
Mounting Holes (for Surface Mounting)



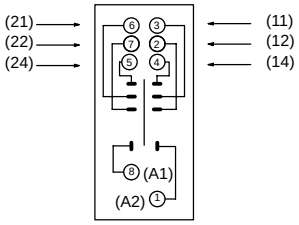
Note: Pin numbers in parentheses apply to DIN standard.

P2RF-08-E

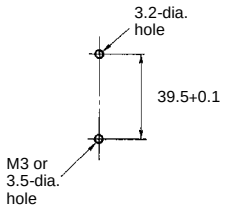




Terminal Arrangement (Top View)



Mounting Holes (for Surface Mounting)



■ COMBINATIONS OF G70A BLOCKS, PLC I/O MODULES AND G79 CABLES

CQM1 I/O Modules

I/O Module (points)	G70A-ZIM16-5	G70A-ZOC16-3	G70A-ZOC16-4
CQM1-ID213 (32)	G79-I□C-□	---	---
CQM1-OD213 (32)	---	G79-O□C-□	---
CQM1-ID212 (16)	G79-Y□C/G79-A□C	---	---
CQM1-OD212 (16)	---	G79-Y□C/G79-A□C	---
CQM1-OD214 (16 PNP)	---	---	G79-Y□C/G79-A□C

Note: Data in parentheses represents the number of total points, the number of connectors, or the number of I/O points per connector. PNP or NPN description is required between the parentheses attached to Output Card model numbers.

CS1 and C200H I/O Modules

I/O Module (points)	G70A-ZIM16-5	G70A-ZOC16-3	G70A-ZOC16-4
C200H-ID215 (32)	G79-□C	---	---
C200H-MD215 (16/16)	G79-□C	G79-□C	---
C200H-OD215 (32)	---	G79-□C	---
C200H-ID216 (32)	G79-I□C-□	---	---
C200H-ID217 (64)	G79-I□C-□	---	---
C200H-OD218 (32)	---	G79-O□C-□	---
C200H-OD219 (64)	---	G79-O□C-□	---
C200H-ID212 (16)	G79-Y□C/G79-A□C	---	---
C200H-OD212 (16)	---	G79-Y□C/G79-A□C	---
C200H-OD214 (8 PNP)	---	---	G79-Y□C/G79-A□C
C200H-OD217 (12 PNP)	---	---	G79-Y□C/G79-A□C
CS1W-ID291 (96)	G79-□C-□-□	---	---
CS1W-MD291 (48/48)	G79-□C-□-□	G79-□C-□-□	---
CS1W-OD291 (96)	---	G79-□C-□-□	---
CS1W-MD292 (48/48 PNP)	G79-□C-□-□	---	G79-□C-□-□
CS1W-OD292 (96 PNP)	---	---	G79-□C-□-□

CV/CVM1 I/O Modules

I/O Module (points)	G70A-ZIM16-5	G70A-ZOC16-3	G70A-ZOC16-4
3G2A5-ID218 (32)	G79-Y□C/G79-A□C	---	---
3G2A5-MD211CN (16/16)	G79-□C	G79-□C	---
3G2A5-OD215 (16)	---	G79-Y□C/G79-A□C	---
3G2A5-ID218CN (32)	G79-□C	---	---
3G2A5-OD218 (32)	---	G79-Y□C/G79-A□C	---
3G2A5-ID212 (64)	G79-Y□C/G79-A□C	---	---
3G2A5-OD212 (32 PNP)	---	---	G79-Y□C/G79-A□C
C500-OD219 (16)	G79-I□C-□	---	---
3G2A5-OD213 (64)	---	G79-O□C-□	---

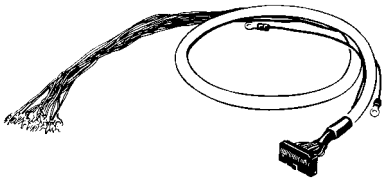
Accessories

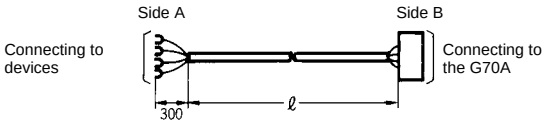
■ G79 CONNECTING CABLES FOR I/O RELAY BLOCKS

With loose wires and crimp terminals		With loose wires		With connector	
Length (*l*)	Model	Length (*l*)	Model	Length (*l*)	Model
1 m 1.5 m 2 m 3 m 5 m	G79-Y100C G79-Y150C G79-Y200C G79-Y300C G79-Y500C	2 m 5 m	G79-A200C G79-A500C	1 m 1.5 m 2 m 3 m 5 m	G79-100C G79-150C G79-200C G79-300C G79-500C

G79-Y□C Cable with Loose Wires and Crimp Terminals

Convenient for connecting screw terminals to I/O Terminal Blocks





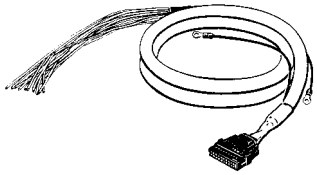
Note: 1. Keep the line capacity to 50 mA per I/O or less. Also, check the capacity of the relay drive element against the power consumption of the I/O relay before output applications.
2. I/O Relay Block connector pin numbers are written on the loose wires.
3. Connector pin numbers correspond to G70A pin numbers.

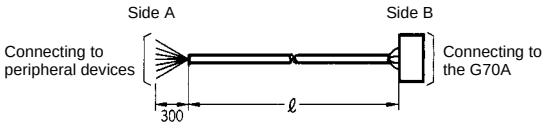
Connections

Tube no.		Wire no.	Color of insulator	Dot mark	Dot color	Connector no.	
Side A	20	1	Light brown	■	Black	1	Side B
	10			■	Red	2	
	19	2	Yellow	■	Black	3	
	9			■	Red	4	
	18	3	Light green	■	Black	5	
	8			■	Red	6	
	17	4	Gray	■	Black	7	
	7			■	Red	8	
	16	5	White	■	Black	9	
	6			■	Red	10	
	15	6	Light brown	■■	Black	11	
	5			■■	Red	12	
	14	7	Yellow	■■	Black	13	
	4			■■	Red	14	
	13	8	Light green	■■	Black	15	
	3			■■	Red	16	
	12	9	Gray	■■	Black	17	
	2			■■	Red	18	
	11	10	White	■■	Black	19	
	1			■■	Red	20	

G79-A□C Cable with Loose Wires

Device connection end provides loose wires.





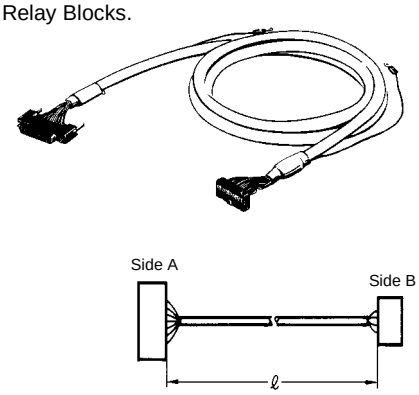
Note: 1. Loose wires are AWG24 (wire diameter: 0.6 mm).
2. Connector pin numbers correspond to G70A pin numbers.

Connections

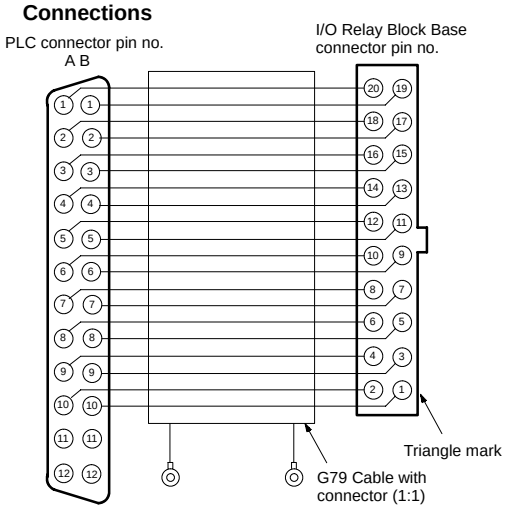
Tube no.	Wire no.	Color of insulator	Dot mark	Dot color	Connector no.	
Side A	1	Light brown	■	Black	20	Side B
			■	Red	19	
	2	Yellow	■	Black	18	
			■	Red	17	
	3	Light green	■	Black	16	
			■	Red	15	
	4	Gray	■	Black	14	
			■	Red	13	
	5	White	■	Black	12	
			■	Red	11	
	6	Light brown	■■	Black	10	
			■■	Red	9	
	7	Yellow	■■	Black	8	
			■■	Red	7	
	8	Light green	■■	Black	6	
			■■	Red	5	
	9	Gray	■■	Black	4	
			■■	Red	3	
	10	White	■■	Black	2	
			■■	Red	1	

G79-□C Cable with Connector (1:1)

Convenient for 1:1 connection of PLC I/O modules to I/O Relay Blocks.



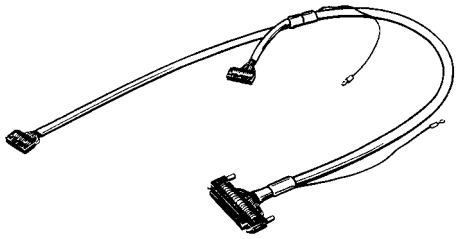
Connections

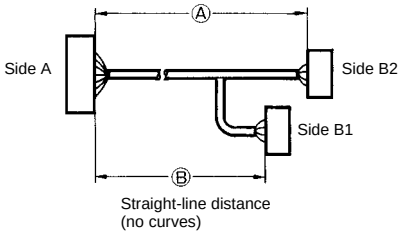


Note: Connector pin numbers correspond to G70A pin numbers.

G79-O□C-□/-I□C-□ Cable with Connectors (1:2)

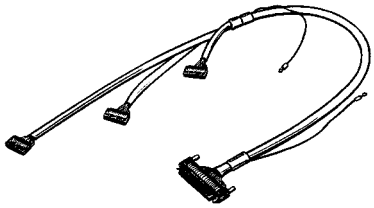
Input and Output Cables are available for Omron PLC modules. (Input: cables are identified with red tape; Output: cables are identified with yellow tape.)

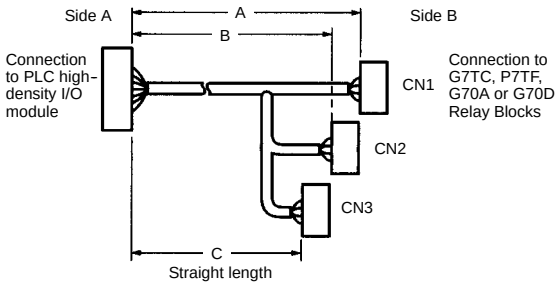




Length		For input	For output
A	B	Model	Model
1 m	0.75 m	G79-I100C-75	G79-O100C-75
1.5 m	1.25 m	G79-I150C-125	G79-O150C-125
2 m	1.75 m	G79-I200C-175	G79-O200C-175
3 m	2.75 m	G79-I300C-275	G79-O300C-275
5 m	4.75 m	G79-I500C-475	G79-O500C-475

G79-□C-□-□ Cable with Connector (1:3)





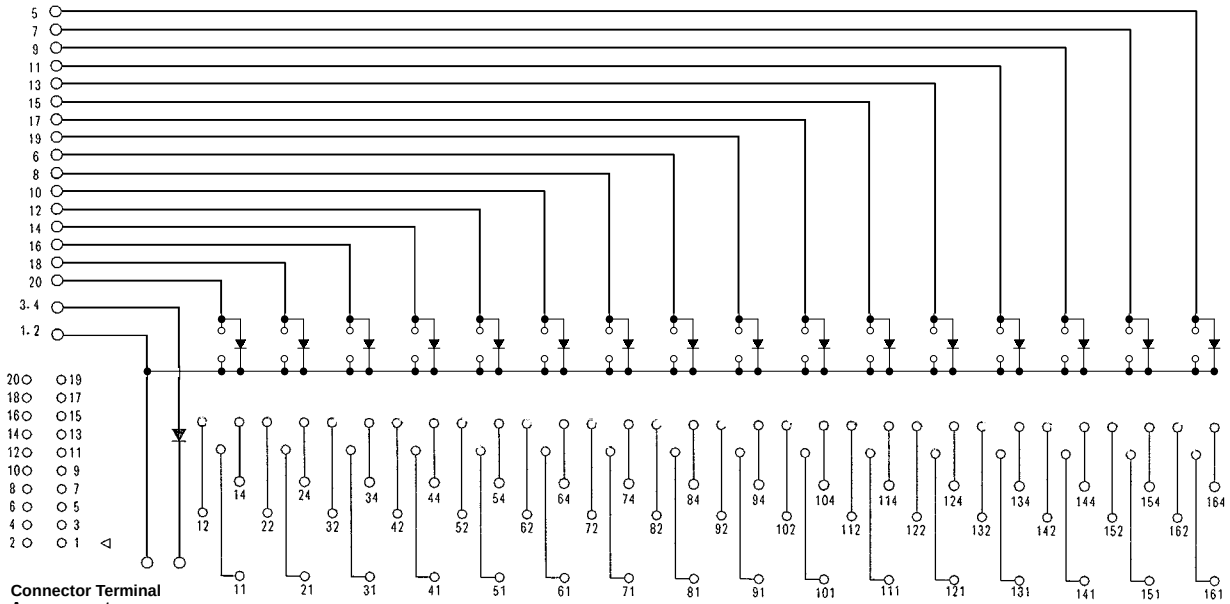
Applicable Omron PLC High-density I/O Modules		Connector Cable for Output Blocks			
		Length (ℓ)			Part number
Part number	No. of output points	A	B	C	
CS1W-ID291 CS1W-OD29□ CS1W-MD29□	96 inputs 96 outputs 48 inputs/48 outputs	1,500 mm (4.92 ft)	1,250 mm (4.10 ft)	1,000 mm (3.28 ft)	G79-150C-125-100
		2,000 mm (6.56 ft)	1,750 mm (5.74 ft)	1,500 mm (4.92 ft)	G79-200C-175-150
		3,000 mm (9.84 ft)	2,750 mm (9.02 ft)	2,500 mm (8.20 ft)	G79-300C-275-250

Note: For cable pin-outs, refer to the *G79 Data Sheet* in the Cables section of this catalog.

Installation

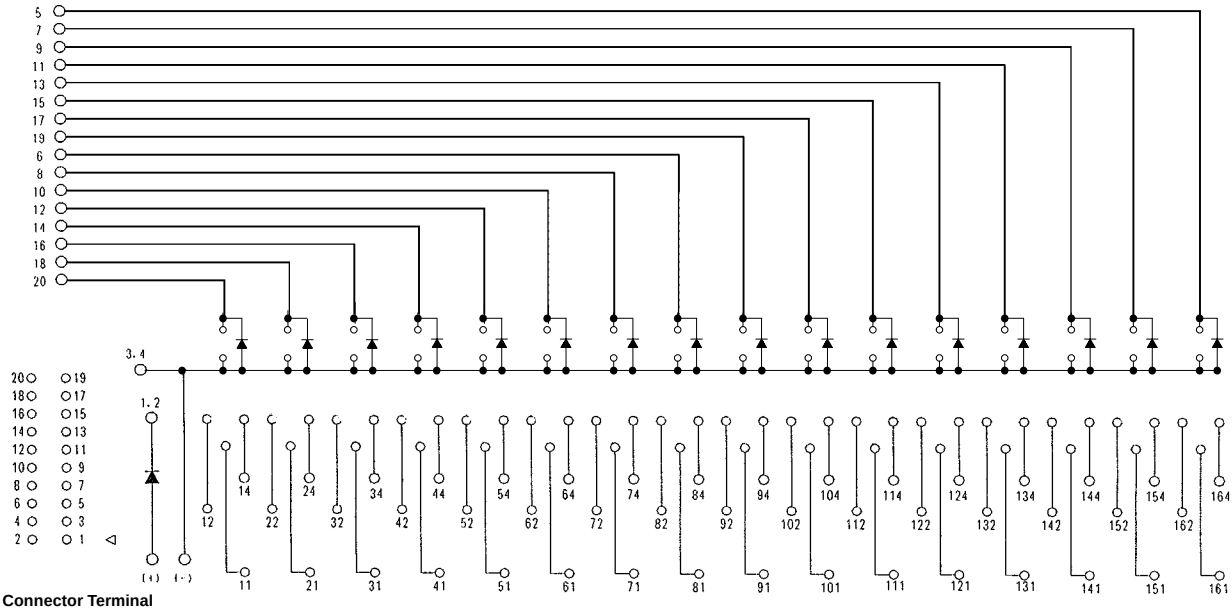
■ TERMINAL ARRANGEMENT/INTERNAL CONNECTION

G70A-ZOC16-3 (NPN)



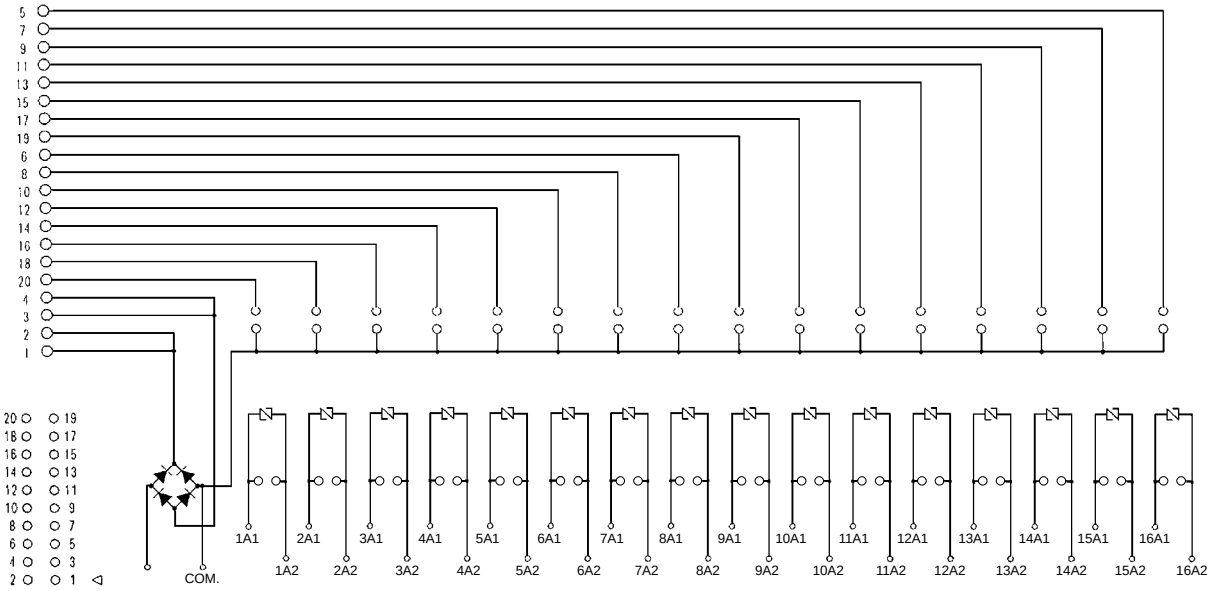
Connector Terminal Arrangement (Top View)

G70A-ZOC16-4 (PNP)



Connector Terminal Arrangement (Top View)

G70A-ZIM16-5 (NPN/PNP)



Connector Terminal Arrangement (Top View)

Note: 1. When G70A-ZIM16-5 is used with C200H-ID216 Input Module and a G79-I□□C cable, the G70A common terminal must be connected to +24 VDC. The C200H-ID216 common pins (A9, B9, A18, B18) are connected to 0 V.

2. When G70A-ZIM16-5 is used with C200H-ID215 Input Module and a G79-C□ cable, the G70A common terminal must be connected to +24 VDC. The C200H-ID215 common pins (A9, B9, A18, B18) are connected to 0 V.

NOTE: DIMENSIONS SHOWN ARE IN MILLIMETERS. To convert millimeters to inches divide by 25.4.

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