e-Rodless Actuator
Series *E-MY2C* CE

Cam Follower Guide Type/Nominal Size: 16, 25

How to Order

Integrated control type	E-MY2C 16 – 100 TA N ☐ M9B ☐
Remote control type	E-MY2C 16 – 100 TA N ☐ M M9B ☐ ☐

Nominal size

16	
25	

Stroke
Refer to "Standard Stroke" table.

Motor placement

TA	On the top, Standard
DA	On the bottom, Standard
TB	On the top, Symmetric
DB	On the bottom, Symmetric

Motor
Controller

TA
TB
DA
DB

*Arrow mark shows handling side on controller.

Output type

N	NPN
P	PNP

Number of stoppable positioning points

Nil	3-point stoppable type
A	5-point stoppable type

Cable length

M	1 m
L	3 m
Z	5 m

* The remote control type can be selected by adding the above symbols.

CE compliant

Nil	—
Q	CE marked

* No need to add a suffix for the integrated control type. It is provided with a CE compliant product.
* Noise filter is provided but not attached for the "Q" spec.

Number of auto switches

Nil	2 pcs.
S	1 pc.
n	n

Auto switch

Nil	Without auto switch

* Refer to the table below for auto switch model numbers.
* Auto switch is provided but not mounted at the time of shipment.

Standard Stroke

Nominal size	Standard stroke (mm)
16, 25	100, 200, 300, 400, 500, 600, 700, 800, 900, 1000

* Strokes are manufacturable in increments of 1 mm, up to 1000 strokes.
* When exceeding a 1000 strokes, refer to "Made to Order" on page 26.

Applicable Auto Switches/For detailed auto switch specifications, refer to page 21 through to 25.

Type	Special function	Electrical entry	Indicator light	Wiring (Output)	Load voltage DC	Load voltage AC	Auto switch model Perpendicular	Auto switch model In-line	Lead wire length (m) * 0.5 (Nil)	3 (L)	5 (Z)	Pre-wired connector	Applicable load
Reed switch	—	Grommet	Yes	3-wire (NPN equiv.)	—	5 V	—	A96V	A96	●	●	—	—	IC circuit	—
				2-wire	24 V	12 V	100 V	A93V	A93	●	●	—	—	—	Relay PLC
	—			2-wire		5 V, 12 V	100 V or less	A90V	A90	●	●	—	—	IC circuit	
Solid state switch	—	Grommet	Yes	3-wire (NPN)	24 V	5 V 12 V	—	M9NV	M9N	●	●	○	○	IC circuit	Relay PLC
				3-wire (PNP)				M9PV	M9P	●	●	○	○		
				2-wire		12 V		M9BV	M9B	●	●	○	○	—	
	Diagnostic indication (2-color display)			3-wire (NPN)		5 V 12 V		F9NWV	F9NW	●	●	○	○	IC circuit	
				3-wire (PNP)				F9PWV	F9PW	●	●	○	○		
				2-wire		12 V		F9BWV	F9BW	●	●	○	○	—	

* Lead wire length symbols: 0.5 m ·········· Nil (Example) M9N
　　　　　　　　　　　3 m ·········· L　　　　　　M9NL
　　　　　　　　　　　5 m ·········· Z　　　　　　M9NZ
* Solid state switches marked "○" are produced upon receipt of order.

SMC

Made to Order
(For details, refer to page 26.)

Symbol	Specifications
-X168	Helical insert thread specifications

Weight

Actuator Part
Unit: kg

Nominal size	Basic weight	50 mm stroke per additional weight
16	2.00	0.14
25	3.71	0.21

Remote Controller Part
Unit: kg

Controller body	Cable length		
	1 m	3 m	5 m
0.24	0.09	0.24	0.39

How to calculate/Example: **E-MY2C25-300TANM**

Actuator part
Basic weight .... 3.71 kg
Additional weight .... 0.21/50 st
Actuator stroke .... 300 st
3.71 + 0.21 x 300 ÷ 50 = 4.97 kg
Remote controller part
Controller body .... 0.24 kg
Cable length (3 m) .... 0.24 kg
0.24 + 0.24 = 0.48 kg

∗ For an integrated control type, add 0.24 kg (controller body) to the basic weight.

Replacement Parts

Drive Unit Replacement Part No.

Nominal size / Model	E-MY2C
16	E-MY2BH16- Stroke ∗
25	E-MY2BH25- Stroke ∗

∗ Specify the motor position and output style in ∗ parts.
For a remote control type, enter the symbol for cable length.
Example) E-MY2BH16-300TAN

Option/Mounting Bracket

Description	Part no.
L-bracket	MYE-LB
DIN rail bracket	MYE-DB

Specifications

Model		E-MY2C	
Nominal size		**16**	**25**
Maximum load weight Note)		5 kg	10 kg
Transfer speed set range		100 to 1000 mm/s (By selection. Please refer to the table below.)	
Transfer speed acceleration set range		0.49 to 4.90 m/s² (By selection. Please refer to the table below.)	
Acceleration and deceleration method		Trapezoidal drive	
Moving direction		Horizontal direction	
Positioning points	3-point stoppable type	Both ends (mechanical stoppers), 1 intermediate position	
	5-point stoppable type	Both ends (mechanical stoppers), 3 intermediate positions	
Repeated positioning stopping precision	Both ends	± 0.01 mm	
	Intermediate stopping position	± 0.1 mm	
Intermediate stopping point positioning method		Direct teaching, JOG teaching	
Positioning setting spot		Controller body	
Display		LED for power supply, LED for alarming, LED for positioning completion	
Input signal		Actuation command signal, Emergency stop input signal	
Output signal		Positioning completion signal, Emergency detection signal, Ready signal	

Note) The maximum load weight shows the motor ability. Please consider it together with the guide load factor when selecting a model.

Electrical Specifications

Driving voltage	Power supply voltage	24 VDC ± 10%
	Current consumption	Rated current 2.5 A (Max. 5 A: 2 s or less) at 24 VDC
Current consumption	Power supply voltage	24 VDC ± 10%
	Current consumption	30 mA at 24 VDC and Output load capacity
Input signal capacity		6 mA or less at 24 VDC/1 circuit (Photo coupler input)
Output signal capacity		30 VDC or less, 20 mA or less/1 circuit (Open drain output)
Emergency detection items		Emergency stop, Output deviation, Power supply deviation, Driving deviation, Temperature deviation Stroke deviation, Motor deviation, Controller deviation

General Specifications

Operating temperature range	Integrated control type		5 to 40°C
	Remote control type	Actuator part	5 to 50°C
		Remote controller part	5 to 40°C
Operating humidity range			35 to 85%RH (with no condensation)
Storage temperature range			−10 to 60°C (with no condensation and freezing)
Storage humidity range			35 to 85%RH (no condensation)
Withstand voltage			Between all of external terminals and the case: 1000 VAC for 1 minute
Insulation resistance			Between all of external terminals and the case: 50 MΩ (500 VDC)
Noise resistance			1000 Vp-p Pulse width 1 μs, Rise time 1 ns
CE marking	Integrated control type		Standard
	Remote control type		Available with -Q suffixed products only

Speed/Acceleration

Speed setting switch no.	Speed [mm/s]
1	100
2	200
3	300
4	400
5	500
6	600
7	700
8	800
9	900
10	1000

Note) The factory default setting for the switch is No.1 (100 mm/s).

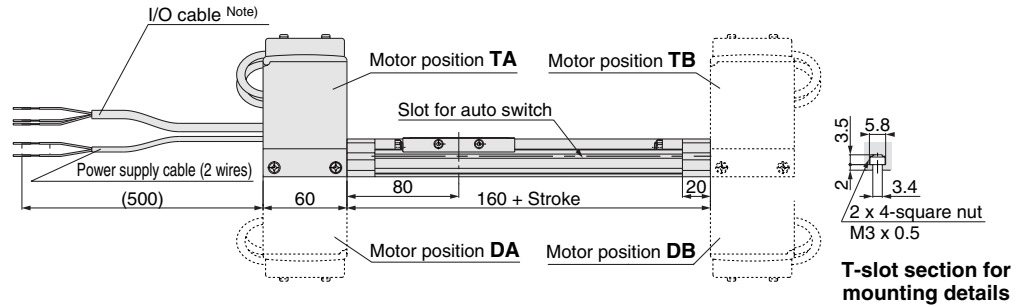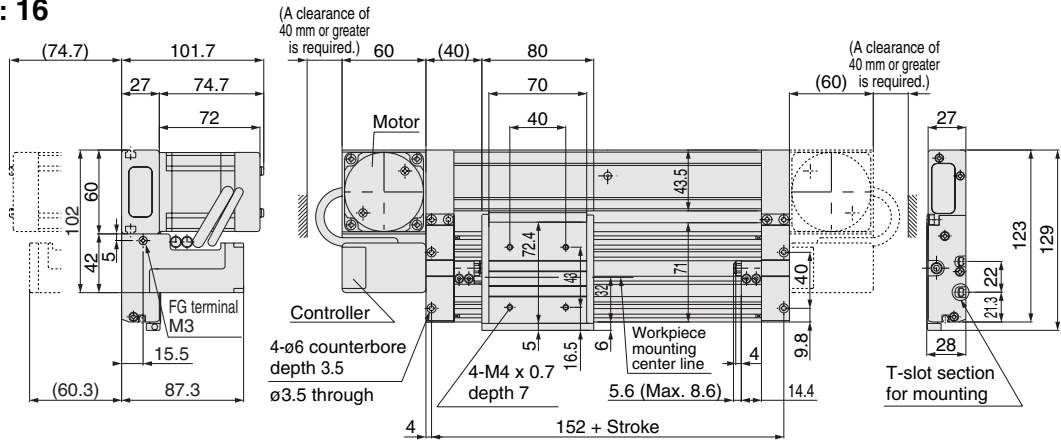| Acceleration setting switch no.	Acceleration [m/s²]
1	0.49
2	0.74
3	0.98
4	1.23
5	1.47
6	1.96
7	2.45
8	2.94
9	3.92
10	4.90

Note) The factory default setting for the switch is No.1 (0.49 m/s²).
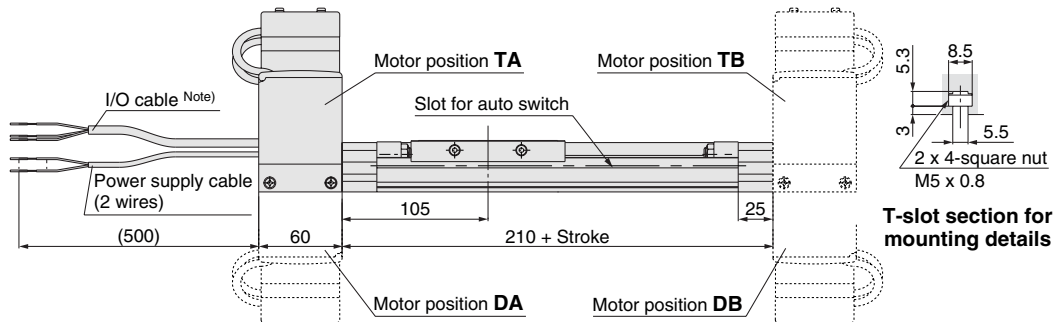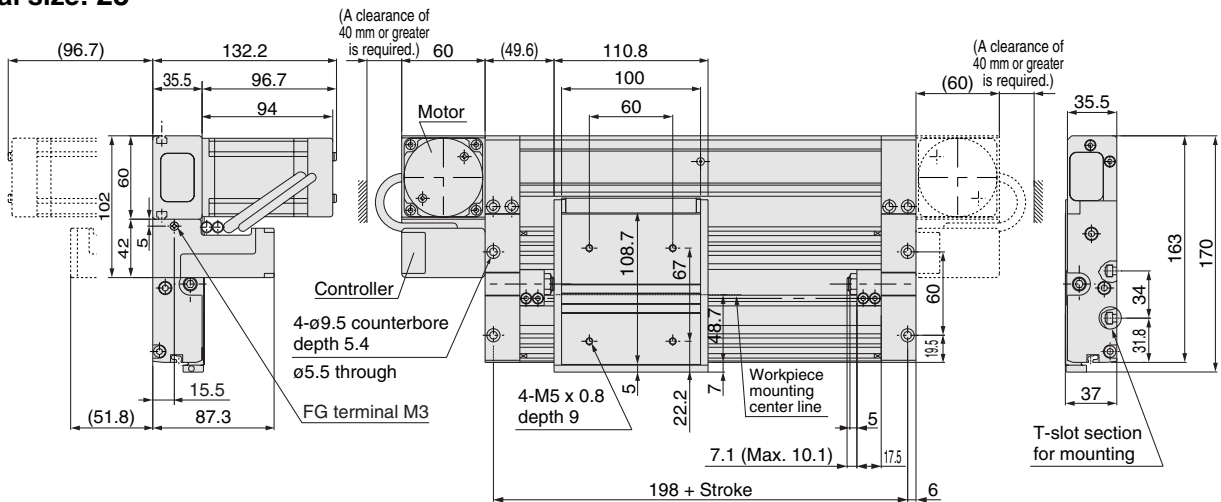
Series *E-MY2C*

Dimensions:Integrated Control Type

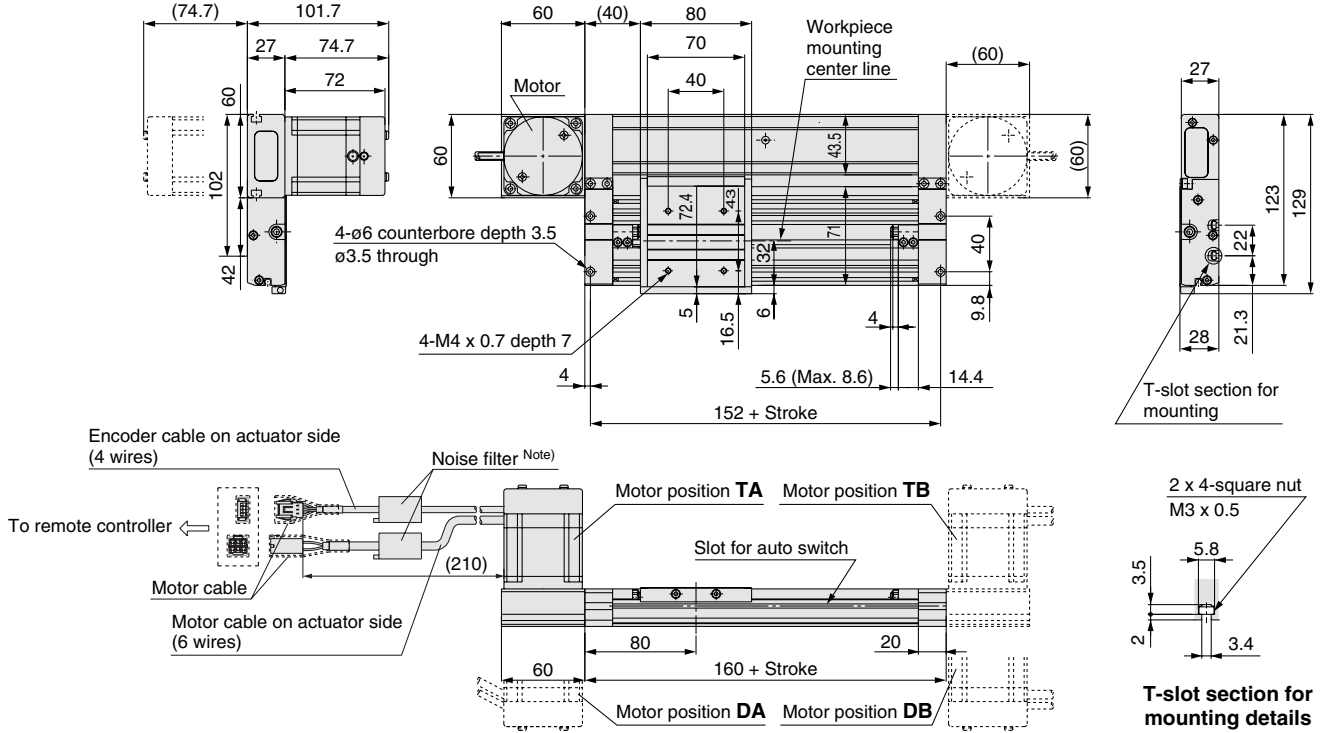**E-MY2C** | Nominal size | — | Stroke |

Nominal size: 16

Nominal size: 25

Note) For the 3-point stoppable type, the I/O cable is a 9 core type and for the 5-point stoppable type, an 11 core type is used.
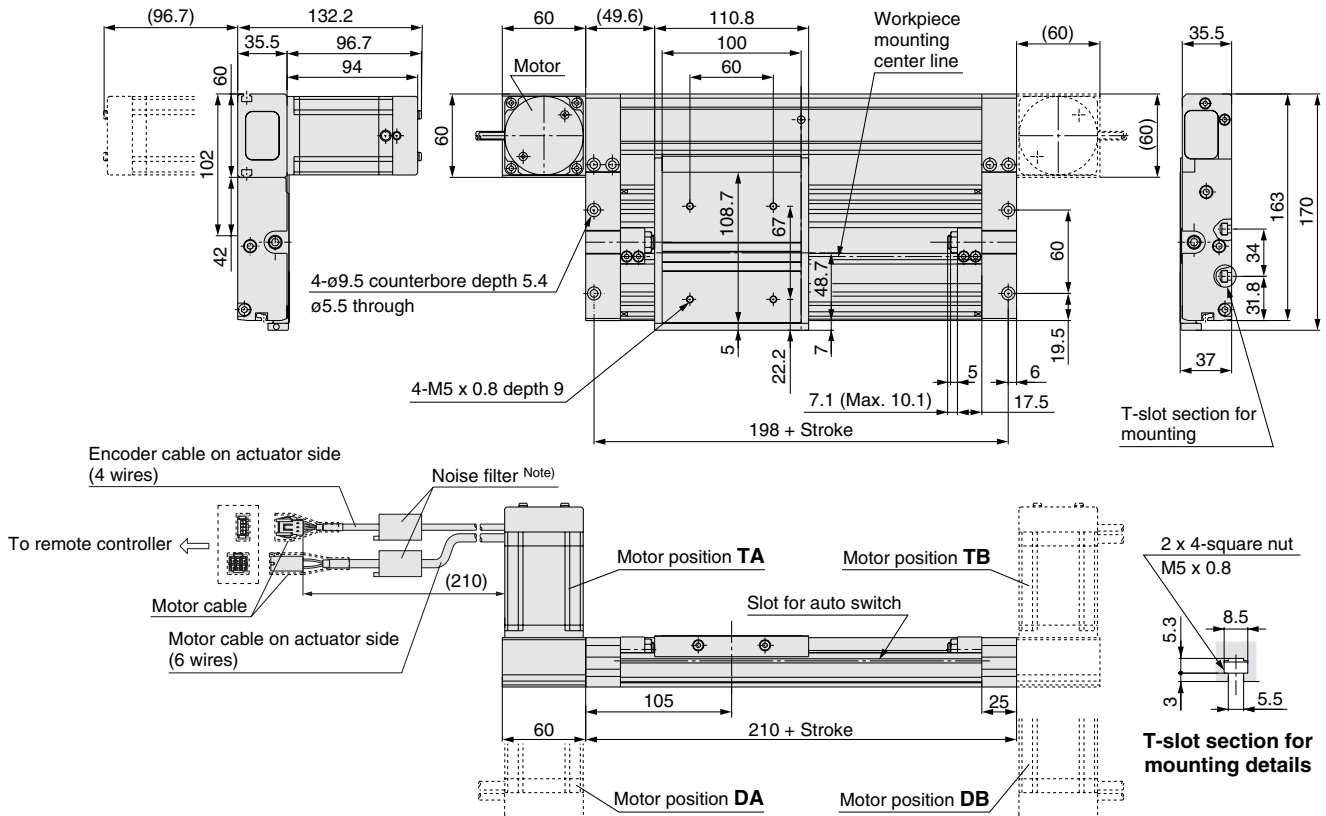
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Dimensions:Remote Control Type (Actuator part)

E-MY2C | Nominal size | — | Stroke | | | **M L Z**

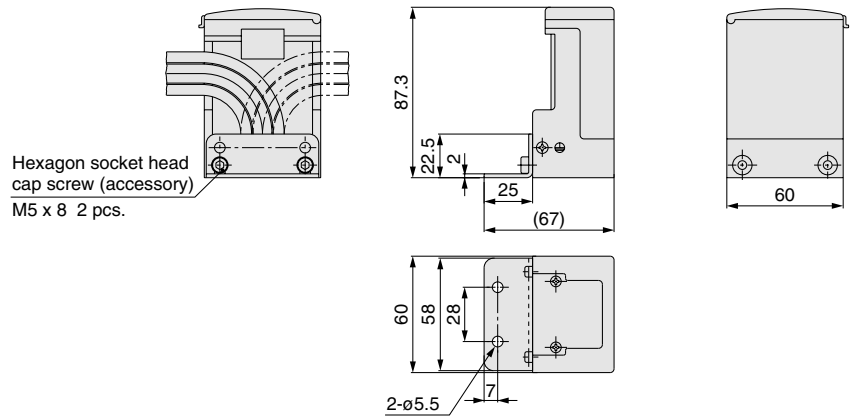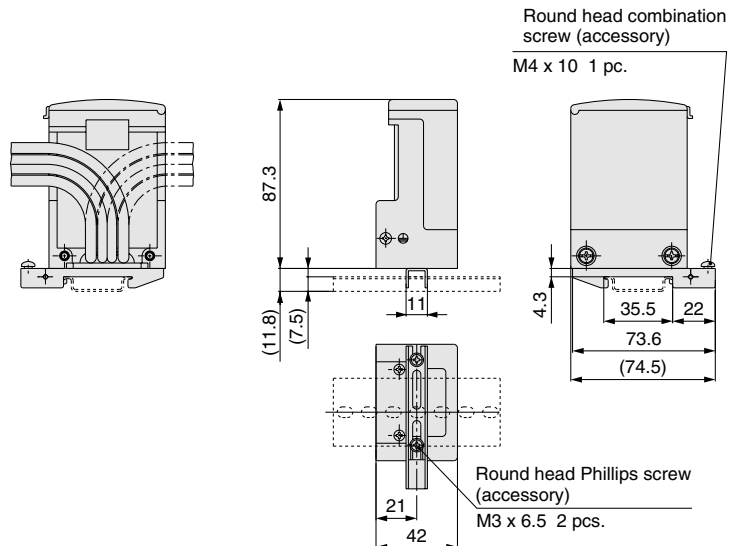∗ Refer to page 11 for dimensions of remote controller.

Nominal size: 16

- 4-ø6 counterbore depth 3.5 ø3.5 through
- 4-M4 x 0.7 depth 7
- Workpiece mounting center line
- 152 + Stroke
- T-slot section for mounting

Encoder cable on actuator side (4 wires)
Noise filter Note)
To remote controller
Motor cable
Motor cable on actuator side (6 wires)

Motor position **TA** Motor position **TB**
Slot for auto switch
160 + Stroke
Motor position **DA** Motor position **DB**

2 x 4-square nut M3 x 0.5

T-slot section for mounting details

Nominal size: 25

- 4-ø9.5 counterbore depth 5.4 ø5.5 through
- 4-M5 x 0.8 depth 9
- Workpiece mounting center line
- 198 + Stroke
- T-slot section for mounting

Motor position **TA** Motor position **TB**
Slot for auto switch
210 + Stroke
Motor position **DA** Motor position **DB**

2 x 4-square nut M5 x 0.8

T-slot section for mounting details

Note) When the CE compliant model is selected, a noise filter is provided but not attached.
The cable for the CE compliant models uses the dedicated shielding. Even if a noise filter is attached to a non CE marked products, the products cannot be changed to a CE compliant product.

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Series *E-MY2C*

Dimensions:Remote Control Type (Remote controller part)

Controller

Motor cable on controller side (6 wires)

Encoder cable on controller side (4 wires)

Noise filter Note 3)

200 or less

To actuator ⇐

Power supply cable (2 wires)

I/O cable Note 1)

FG terminal M3

2 x M5 depth 8 Note 2)

2 x for M4 thread Note 2) (accessory)

Extention cable	A dimension
M	1000
L	3000
Z	5000

Note 1) For the 3-point stoppable type, the I/O cable is a 9 core type and for the 5-point stoppable type, a 11 core type is used.
Note 2) When mounting the separated type controller, use the included M4 screw or use the M5 tap located on one side of the controller.
Note 3) When the CE compliant model is selected, a noise filter is included but not attached. The cable for the CE compliant models uses the dedicated shielding. Even if a noise filter is attached to a non CE marked product, the products cannot be changed to a CE compliant product.

L-bracket/MYE-LB (Option)

Hexagon socket head cap screw (accessory) M5 x 8 2 pcs.

2-ø5.5

DIN rail bracket/MYE-DB (Option)

Round head combination screw (accessory) M4 x 10 1 pc.

Round head Phillips screw (accessory) M3 x 6.5 2 pcs.

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e-Rodless Actuator
Series E-MY2H CE

High Precision Guide Type/Nominal Size: 16, 25

How to Order

| Integrated control type | E-MY2H | 16 | 100 | TA | N | | | M9B | |
| Remote control type | E-MY2H | 16 | 100 | TA | N | | M | M9B | |

Nominal size

| 16 |
| 25 |

Stroke
Refer to "Standard Stroke" table.

Motor placement

TA	On the top, Standard
DA	On the bottom, Standard
TB	On the top, Symmetric
DB	On the bottom, Symmetric

Output type

| N | NPN |
| P | PNP |

Number of stoppable points for positioning

| Nil | 3-point stoppable type |
| A | 5-point stoppable type |

Cable length

M	1 m
L	3 m
Z	5 m

∗ The remote control type can be selected by adding the above symbols.

∗ Arrow mark shows handling side on controller.

CE compliant

| Nil | — |
| Q | CE marked |

∗ No need to add a suffix for the integrated control type. It is provided with a CE compliant product.
∗ Noise filter is provided but not attached for the "Q" spec.

Number of auto switches

Nil	2 pcs.
S	1 pc.
n	n

Auto switch

| Nil | Without auto switch |

∗ Refer to the table below for auto switch model numbers.
∗ Auto switch is provided but not mounted at the time of shipment.

Standard Stroke

Nominal size	Standard stroke (mm)	Made to Order Long stroke (-XB11) Stroke range (mm)
16, 25	50, 100, 150, 200, 250, 300, 350, 400, 450, 500, 550, 600	601 to 1000

∗ Strokes are manufacturable in increments of 1 mm, up to 1000 strokes.
   However, when a stroke out of the standard 51 to 599 is required, add "-XB10" at the end of the model no.
   When stroke exceeds 600 mm, add "-XB11" at the end of model no. Refer to "Made to Order" on page 26.
∗ When exceeding a 1000 strokes, refer to "Made to Order" on page 26.

Applicable Auto Switches/For detailed auto switch specifications, refer to page 21 through to 25.

Type	Special function	Electrical entry	Indicator light	Wiring (Output)	Load voltage DC	Load voltage AC	Auto switch model Perpendicular	Auto switch model In-line	Lead wire length (m) 0.5 (Nil)	3 (L)	5 (Z)	Pre-wired connector	Applicable load
Reed switch	—	Grommet	Yes	3-wire (NPN equiv.)	5 V	—	A96V	A96	●	●	—	—	IC circuit
	—			2-wire	24 V	12 V	100 V	A93V	A93	●	●	—	—	—	Relay PLC
	—			2-wire	5 V, 12 V	100 V or less	A90V	A90	●	●	—	—	IC circuit
Solid state switch	—	Grommet	Yes	3-wire (NPN)	5 V 12 V		M9NV	M9N	●	●	○	○	IC circuit	Relay PLC
				3-wire (PNP)	5 V 12 V		M9PV	M9P	●	●	○	○	IC circuit
				2-wire	12 V		M9BV	M9B	●	●	○	○	—
	Diagnostic indication (2-color display)			3-wire (NPN)	24 V	5 V 12 V		F9NWV	F9NW	●	●	○	○	IC circuit
				3-wire (PNP)	5 V 12 V		F9PWV	F9PW	●	●	○	○	IC circuit
				2-wire	12 V		F9BWV	F9BW	●	●	○	○	—

∗ Lead wire length symbols: 0.5 m ·········· Nil (Example) M9N
                          3 m ·········· L   M9NL
                          5 m ·········· Z   M9NZ
∗ Solid state switches marked "○" are produced upon receipt of order.

Series *E-MY2H*

Symbol	Specifications
-XB10	Intermediate stroke
-XB11	Long stroke
-X168	Helical insert thread specifications

Weight

Actuator Part
Unit: kg

Nominal size	Basic weight	50 mm stroke per additional weight
16	1.87	0.14
25	3.37	0.23

Remote Controller Part
Unit: kg

Controller body	Cable length		
	1 m	3 m	5 m
0.24	0.09	0.24	0.39

How to calculate/Example: **E-MY2H25-300TANM**

Actuator part

Basic weight ································· 3.37 kg
Additional weight ························· 0.23/50 st
Actuator stroke ···························· 300 st
3.37 + 0.23 x 300 ÷ 50 = 4.75 kg

Remote controller part

Controller body ···························· 0.24 kg
Cable length (3 m) ······················· 0.24 kg
0.24 + 0.24 = 0.48 kg

∗ For an integrated control type, add 0.24 kg (controller body) to the basic weight.

Replacement Parts

Drive Unit Replacement Part No.

Model Nominal size	**E-MY2H**
16	E-MY2BH16- Stroke ∗
25	E-MY2BH25- Stroke ∗

∗ Specify the motor position and output style in ∗ parts.
For a remote control type, enter the symbol for cable length.
Example) E-MY2BH16-300TAN

Option/Mounting Bracket

Description	Part no.
L-bracket	MYE-LB
DIN rail bracket	MYE-DB

Specifications

Model		E-MY2H	
Nominal size		**16**	**25**
Maximum load weight Note)		5 kg	10 kg
Transfer speed set range		100 to 1000 mm/s (By selection. Please refer to the table below.)	
Transfer speed acceleration set range		0.49 to 4.90 m/s² (By selection. Please refer to the table below.)	
Acceleration and deceleration method		Trapezoidal drive	
Moving direction		Horizontal direction	
Positioning points	3-point stoppable type	Both ends (mechanical stoppers), 1 intermediate position	
	5-point stoppable type	Both ends (mechanical stoppers), 3 intermediate positions	
Repeated positioning stopping precision	**Both ends**	± 0.01 mm	
	Intermediate stopping position	± 0.1 mm	
Intermediate stopping point positioning method		Direct teaching, JOG teaching	
Positioning setting spot		Controller body	
Display		LED for power supply, LED for alarming, LED for positioning completion	
Input signal		Actuation command signal, Emergency stop input signal	
Output signal		Positioning completion signal, Emergency detection signal, Ready signal	

Note) The maximum load weight shows the motor ability. Please consider it together with the guide load factor when selecting a model.

Electrical Specifications

Driving voltage	**Power supply voltage**	24 VDC ± 10%
	Current consumption	Rated current 2.5 A (Max. 5 A: 2 s or less) at 24 VDC
Current consumption	**Power supply voltage**	24 VDC ± 10%
	Current consumption	30 mA at 24 VDC and Output load capacity
Input signal capacity		6 mA or less at 24 VDC/1 circuit (Photo coupler input)
Output signal capacity		30 VDC or less, 20 mA or less/1 circuit (Open drain output)
Emergency detection items		Emergency stop, Output deviation, Power supply deviation, Driving deviation, Temperature deviation Stroke deviation, Motor deviation, Controller deviation

General Specifications

Operating temperature range	**Integrated controller type**		5 to 40°C
	Remote control type	**Actuator part**	5 to 50°C
		Remote controller part	5 to 40°C
Operating humidity range			35 to 85%RH (with no condensation)
Storage temperature range			−10 to 60°C (with no condensation and freezing)
Storage humidity range			35 to 85%RH (no condensation)
Withstand voltage			Between all of external terminals and the case: 1000 VAC for 1 minute
Insulation resistance			Between all of external terminals and the case: 50 MΩ (500 VDC)
Noise resistance			1000 Vp-p Pulse width 1 μs, Rise time 1 ns
CE marking	**Integrated control type**		Standard
	Remote control type		Available for suffix -Q only

Speed/Acceleration

Speed setting switch no.	Speed [mm/s]
1	100
2	200
3	300
4	400
5	500
6	600
7	700
8	800
9	900
10	1000

Note) The factory default setting for the switch is No.1 (100 mm/s).

Acceleration setting switch no.	Acceleration [m/s²]
1	0.49
2	0.74
3	0.98
4	1.23
5	1.47
6	1.96
7	2.45
8	2.94
9	3.92
10	4.90

Note) The factory default setting for the switch is No.1 (0.49 m/s²).

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Dimensions: Integrated Control Type

E-MY2H | Nominal size | — | Stroke |
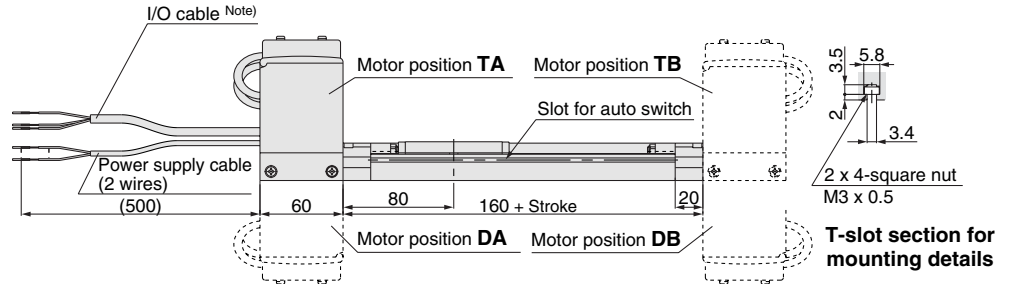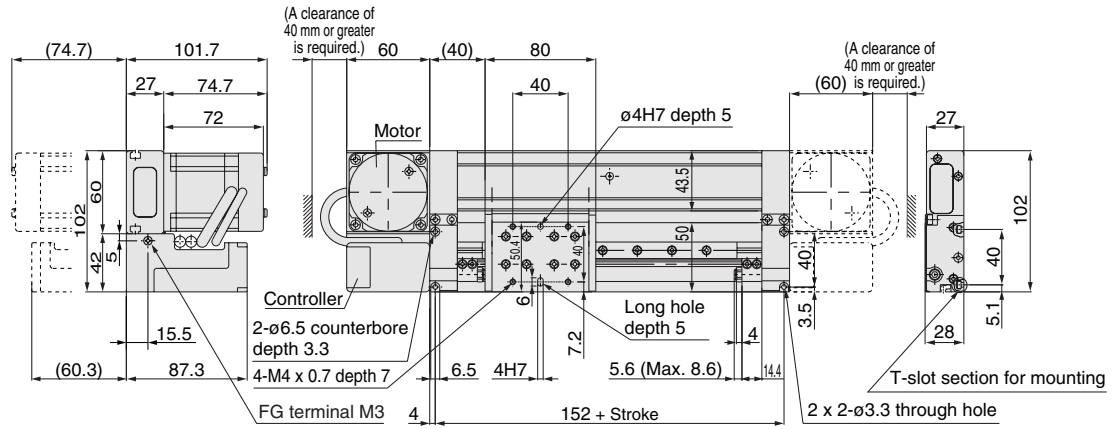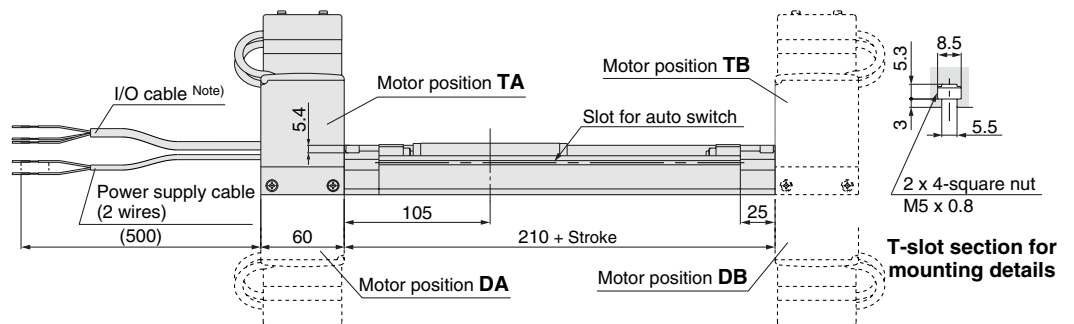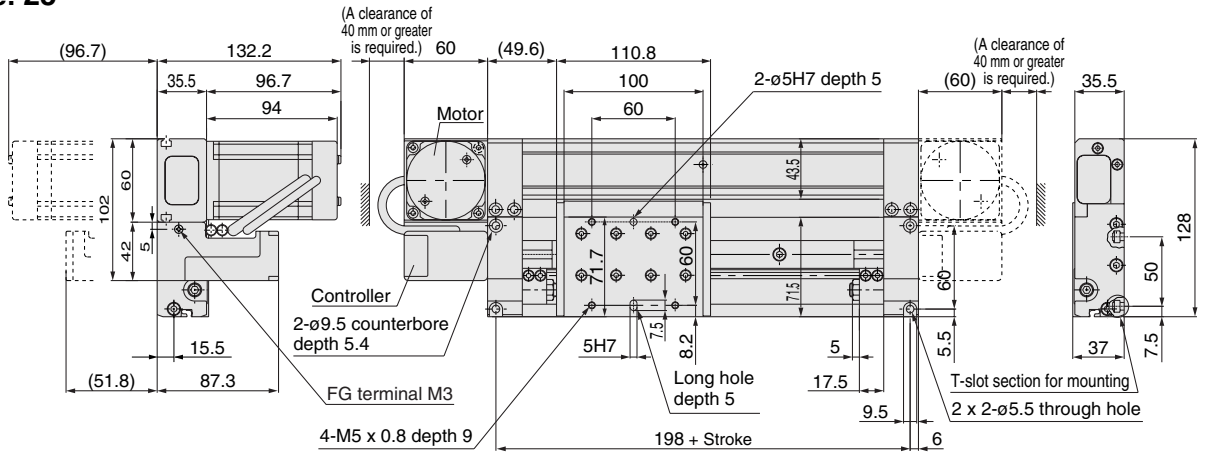
Nominal size: 16

Nominal size: 25

Note) For the 3-point stoppable type, the I/O cable is a 9 core type and for the 5-point stoppable type, a 11 core type is used.
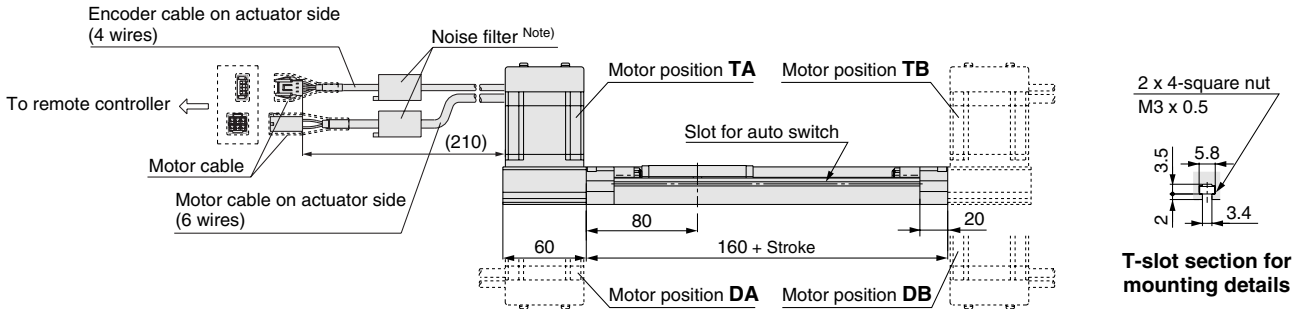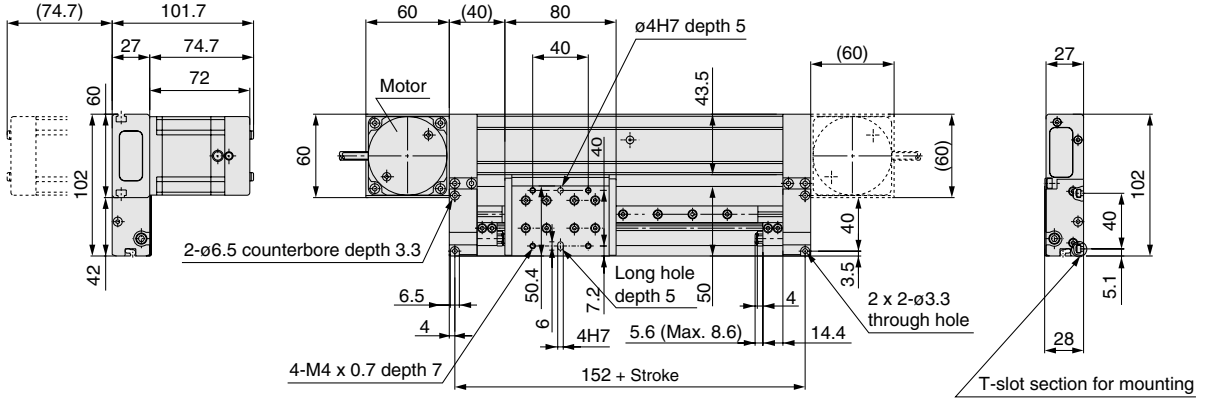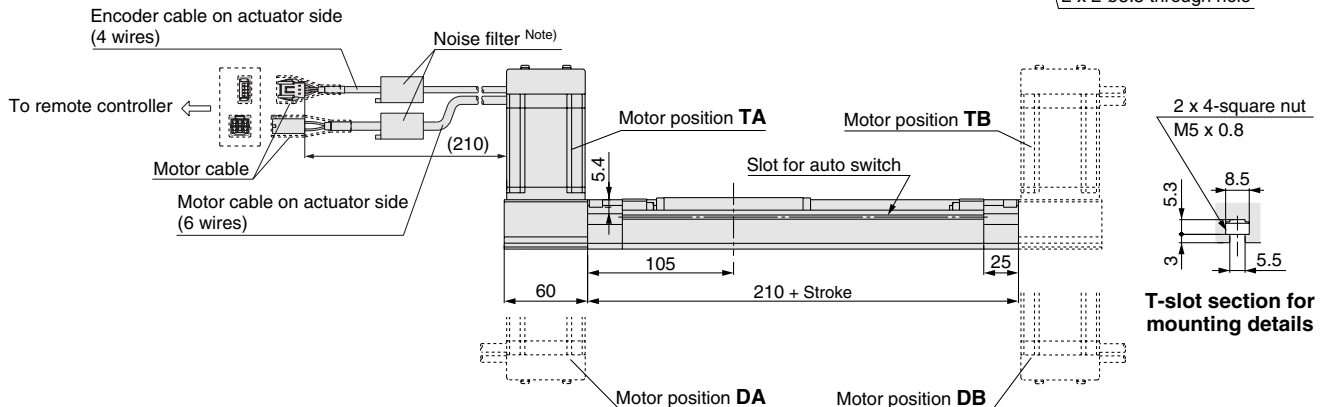
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Dimensions:Remote Control Type (Actuator part)

E-MY2H | Nominal size | — | Stroke | | | **M L Z**

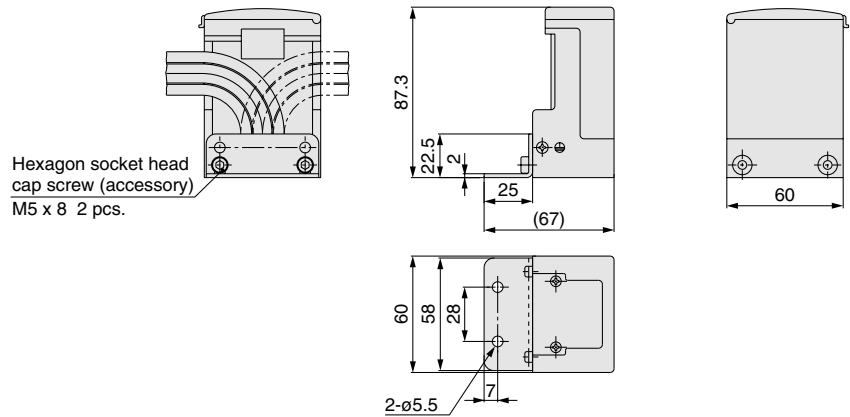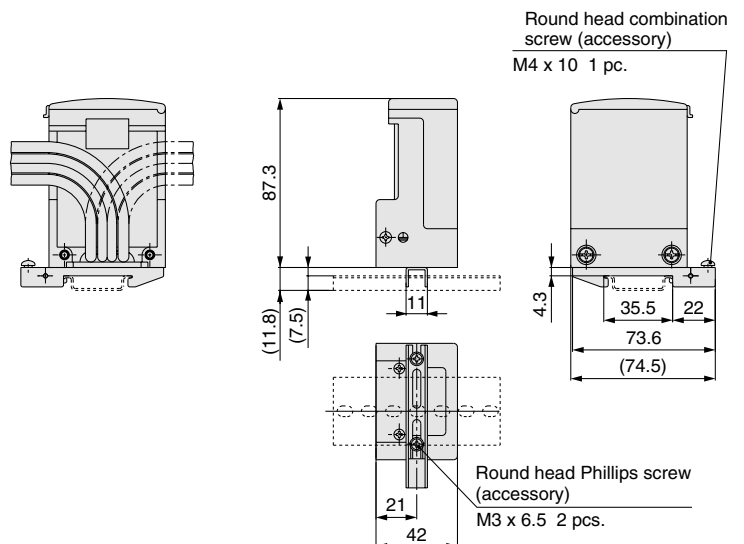∗ Refer to page 16 for dimensions of remote controller.

Nominal size: 16

2-ø6.5 counterbore depth 3.3

4-M4 x 0.7 depth 7

Motor

ø4H7 depth 5

Long hole depth 5

4H7

5.6 (Max. 8.6)

2 x 2-ø3.3 through hole

152 + Stroke

T-slot section for mounting

Encoder cable on actuator side (4 wires)

Noise filter Note)

To remote controller

Motor cable

Motor cable on actuator side (6 wires)

Motor position **TA**   Motor position **TB**

Slot for auto switch

Motor position **DA**   Motor position **DB**

160 + Stroke

2 x 4-square nut M3 x 0.5

T-slot section for mounting details

Nominal size: 25

2-ø9.5 counterbore depth 5.4

4-M5 x 0.8 depth 9

Motor

2-ø5H7 depth 5

5H7

Long hole depth 5

7.1 (Max. 10.1)

198 + Stroke

T-slot section for mounting

2 x 2-ø5.5 through hole

Encoder cable on actuator side (4 wires)

Noise filter Note)

To remote controller

Motor cable

Motor cable on actuator side (6 wires)

Motor position **TA**

Motor position **TB**

Slot for auto switch

Motor position **DA**   Motor position **DB**

210 + Stroke

2 x 4-square nut M5 x 0.8

T-slot section for mounting details

Note) When the CE compliant model is selected, a noise filter is provided but not attached.
The cable for the CE compliant models uses the dedicated shielding. Even if a noise filter is attached to a non CE marked products, the products cannot be changed to a CE compliant product.

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Dimensions:Remote Control Type (Remote controller part)

Controller

Motor cable on controller side (6 wires)

Encoder cable on controller side (4 wires)

Noise filter Note 3)

200 or less

To actuator ⇐

Power supply cable (2 wires)

I/O cable Note 1)

(500)

(A)

60

FG terminal M3

2 x M5 depth 8 Note 2)

15.5 | 5 | 5 | 42

87.1 | 6.5 | 44 | 60

2 x for M4 thread Note 2) (accessory)

Extention cable	A dimension
M	1000
L	3000
Z	5000

Note 1) For the 3-point stoppable type, the I/O cable is a 9 core type and for the 5-point stoppable type, a 11 core type is used.
Note 2) When mounting the separated type controller, use the included M4 screw or use the M5 tap located on one side of the controller.
Note 3) When the CE compliant model is selected, a noise filter is provided but not attached. The cable for the CE compliant models uses the dedicated shielding. Even if a noise filter is attachod to a non CE marked product, the product cannot be changed to a CE compliant product.

L-bracket/MYE-LB (Option)

Hexagon socket head cap screw (accessory) M5 x 8 2 pcs.

87.3 | 22.5 | 2 | 25 | (67) | 60

60 | 58 | 28 | 2-ø5.5 | 7

DIN rail bracket/MYE-DB (Option)

Round head combination screw (accessory) M4 x 10 1 pc.

87.3 | (11.8) | (7.5) | 11 | 4.3 | 35.5 | 22 | 73.6 | (74.5)

21 | 42

Round head Phillips screw (accessory) M3 x 6.5 2 pcs.

SMC

16

Series *E-MY2H*

Auto Switches/Proper Mounting Position at Stroke End Detection
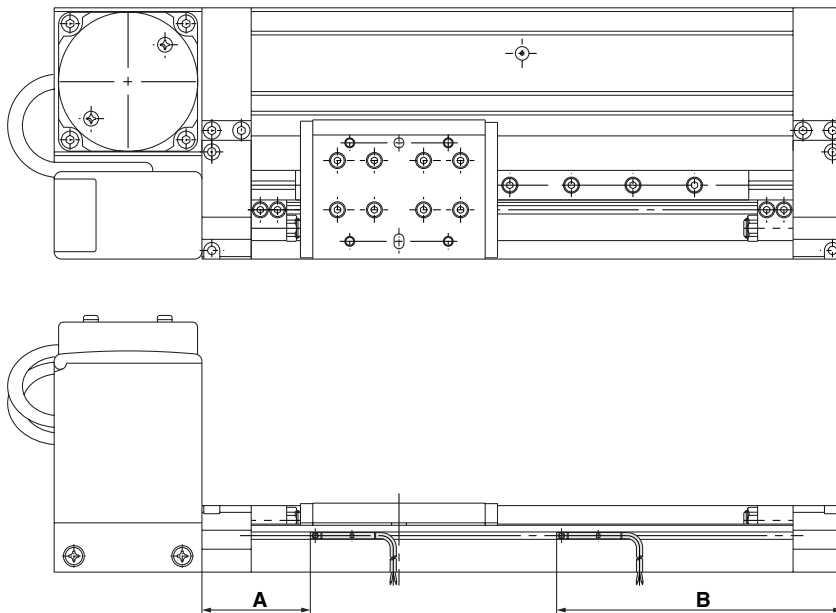
D-A9, D-A9□V
(mm)

Nominal size	A	B	Operating range
16	44	116	8.5
25	54	156	

D-M9, D-M9□V
(mm)

Nominal size	A	B	Operating range
16	48	112	3
25	58	152	4

D-F9□W, D-F9□WV
(mm)

Nominal size	A	B	Operating range
16	48	112	8.5
25	58	152	

Auto Switch Mounting

When mounting the auto switches, they should be inserted into the actuator's switch groove from the direction shown in the drawing on the right. Once in the mounting position, use a flat head watchmakers' screwdriver to tighten the included set screw.

Note) When tightening the set screw, use a watchmakers' screwdriver with a handle diameter of about 5 to 6 mm. The tightening torque should be 0.1 to 0.2 N•m.

SMC
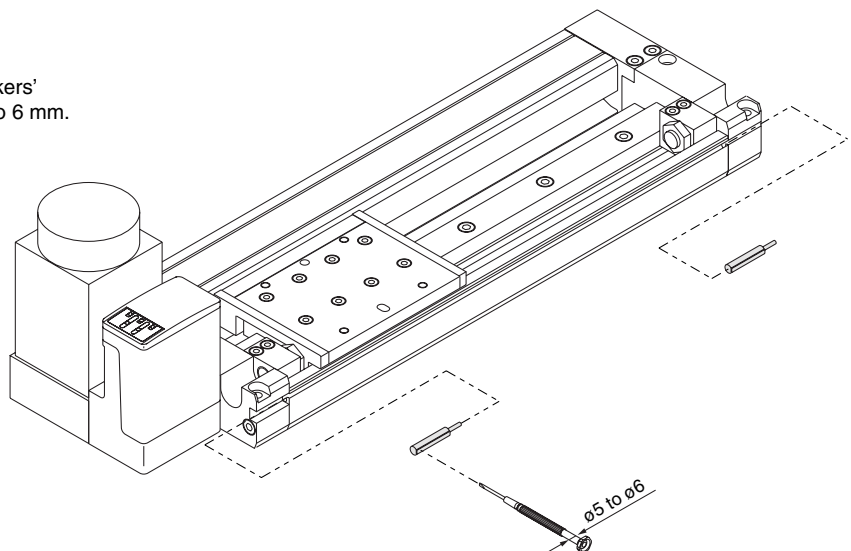
Names and Functions of Individual Part

Integrated control type

Motor
End
I/O cable
Controller
Power supply cable
FG terminal
Motor side end
Slider

Remote control type
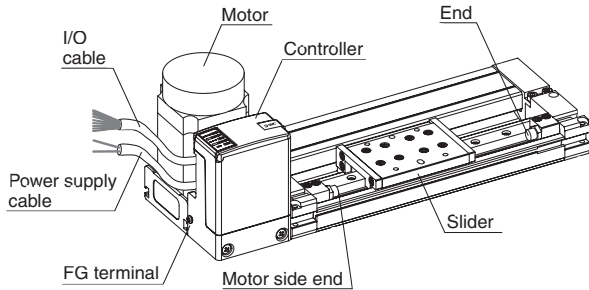
Power supply cable
Encoder cable on actuator side
Encoder cable on controller side
I/O cable
Encoder connector
Motor cable on controller side
Motor connector
Motor cable on actuator side
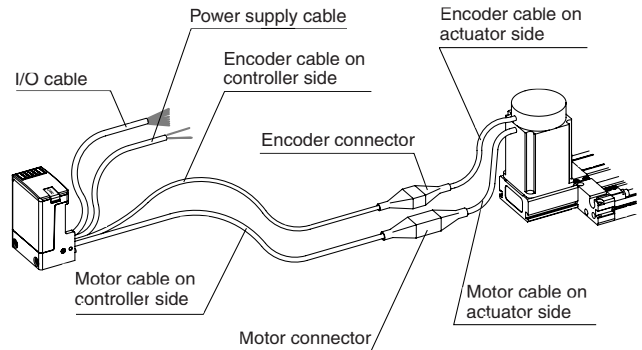
Description	Contents/Functions
Slider	Moving part within the actuator
Motor	Motor activating the actuator
Power supply cable	Power supply cable for providing power to the actuator
I/O cable	I/O cable for transmitting a positioning completion signal and driving instructions
Controller part	The unit part to control and set the actuator, and indicate its status
FG terminal	The terminal to connect the FG cable
Encoder cable on actuator side	Encoder cable for connecting the actuator with the controller
Motor cable on actuator side	Motor cable for connecting the actuator with the controller
Encoder cable on controller side	Encoder cable for separating the controller
Motor cable on controller side	Motor cable for separating the controller

Controller detail

MIDDLE
PWR
MOTOR
ALM
END
STROKE STUDY
SPEED
ACCELERATION
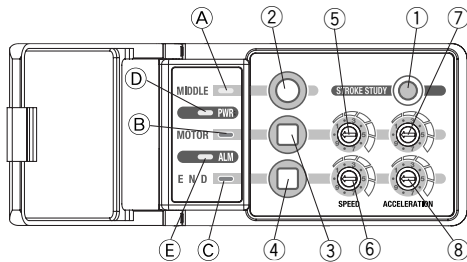
Switch

Description	Contents/Functions
①	Stroke learning switch
② to ④	Switch to move the actuator to intermediate position and set the intermediate position
⑤	Rotary switch to set moving speed to the motor side end
⑥	Rotary switch to set moving speed to the other end
⑦	Rotary switch to set moving acceleration to the motor side end
⑧	Rotary switch to set moving acceleration to the other end

Indicator Light and the Display for the Basic Functions

Symbol	Description	Power supply ON	Actuation instruction					When decelerated and completely stopped [1]	When the alarm is activated
			Motor side	End side	Intermediate 1 [1]	Intermediate 2 [1]	Intermediate 3 [1]		
Ⓐ	MIDDLE Indicator light (Green)	—	—	—	○	○	○	—	[2]
Ⓑ	MOTOR Indicator light (Green)	—	○	—	—	○	—	○	
Ⓒ	END Indicator light (Green)	—	—	○	—	—	○	○	
Ⓓ	PWR Indicator light (Green)	○	○	○	○	○	○	○	○
Ⓔ	ALM Indicator light (Red)	—	—	—	—	—	—	—	○

"○" indicates on status, and — indicates off status.
[1] Displays for the 5-point stoppable type only.
[2] When the alarm is activated, see page 20 for the ALM display.

Series E-MY2

Examples of Internal Circuit and Wiring

3-point Stoppable Type

Power Supply Cable 2 wires AWG20 (20 lines/0.16 mm²)

Symbol	Color	Signal name	Contents
DC1 (+)	Brown	Vcc	Power supply cables for driving the actuator
DC1 (−)	Blue	GND	

I/O Cable 9 wires AWG28 (7 wires/0.127 mm²)

Symbol	Color	Signal name	Contents
DC2 (+)	Brown	Vcc	Power supply cables for signal
DC2 (−)	Blue	GND	
OUT1	Pink	READY output	Signal indicating the controller is operationable
OUT2	Orange	Positioning completion output 1	Signal indicating that positioning is completed
OUT3	Yellow	Positioning completion output 2	
OUT4	Green	Alarm output	Signal indicating an alarm has been generated
IN1	Purple	Actuation instruction input 1	Instruction signal to actuator
IN2	Gray	Actuation instruction input 2	
IN3	White	Emergency stop	Signal providing emergency stop instruction (The emergency stop is activated when contact is opened)

This product can be used without connecting I/O cables, however please use caution and install a power supply switch for the actuator. In case of an emergency, please turn it off.

I/O Cable Signals

Input signal

Command	Symbol	
	IN1	IN2
Motor side actuation instruction	○	—
End side actuation instruction	—	○
Intermediate actuation instruction	○	○

Output signal

Actuator status	Symbol		
	OUT1	OUT2	OUT3
Completion of motor side end positioning	○	○	—
Completion of end positioning	○	—	○
Completion of intermediate positioning	○	○	○

"○" indicates on status, and — indicates off status.

NPN input/output circuit
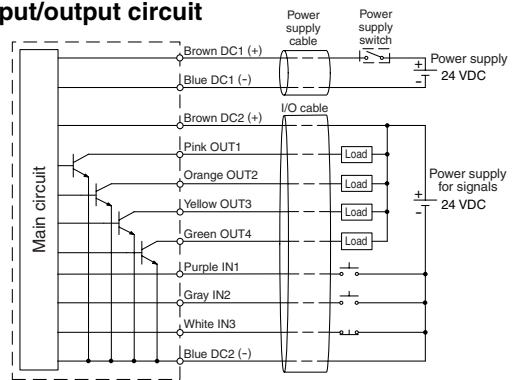
PNP input/output circuit
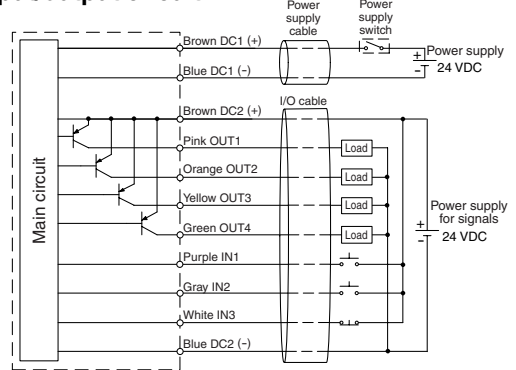
5-point Stoppable Type

Power Supply Cable 2 wires AWG20 (20 lines/0.16 mm²)

Symbol	Color	Signal name	Contents
DC1 (+)	Brown	Vcc	Power supply cables for driving the actuator
DC1 (−)	Blue	GND	

I/O Cable 11 wires AWG28 (7 wires/0.127 mm²)

Symbol	Color	Signal name	Contents
DC2 (+)	Brown	Vcc	Power supply cables for signal
DC2 (−)	Blue	GND	
OUT1	Pink	READY output	Signal indicating the controller is operationable
OUT2	Orange	Positioning completion output 1	Signal indicating that positioning is completed
OUT3	Yellow	Positioning completion output 2	
OUT4	Red	Positioning completion output 3	
OUT5	Green	Alarm output	Signal indicating an alarm has been generated
IN1	Purple	Actuation instruction input 1	Instruction signal to actuator
IN2	Gray	Actuation instruction input 2	
IN3	Black	Actuation instruction input 3	
IN3	White	Emergency stop	Signal providing emergency stop instruction (The emergency stop is activated when contact is opened)

This product can be used without connecting I/O cables, however please use caution and install a power supply switch for the actuator. In case of an emergency, please turn it off.

I/O Cable Signals

Input signal

Command	Symbol		
	IN1	IN2	IN3
Motor side actuation instruction	○	—	—
End side actuation instruction	—	○	—
Intermediate actuation instruction 1	—	—	○
Intermediate actuation instruction 2	○	—	○
Intermediate actuation instruction 3	—	○	○
External input stop instruction	○	○	—

Output signal

Actuator status	Symbol			
	OUT1	OUT2	OUT3	OUT4
Completion of motor side end positioning	○	○	—	—
Completion of end positioning	○	—	○	—
Completion of intermediate 1 positioning	○	—	—	○
Completion of intermediate 2 positioning	○	—	○	○
Completion of intermediate 3 positioning	○	○	○	○
Completion of external input stop	○	○	○	—

"○" indicates on status, and — indicates off status.

NPN input/output circuit

PNP input/output circuit

SMC
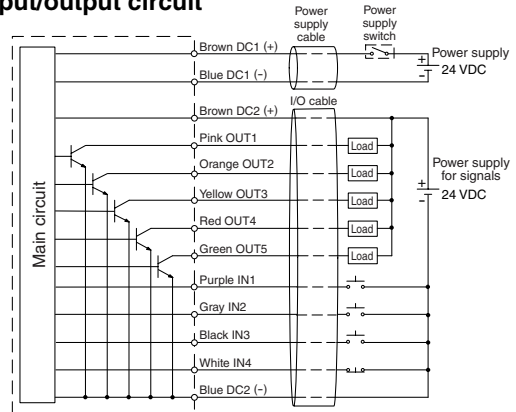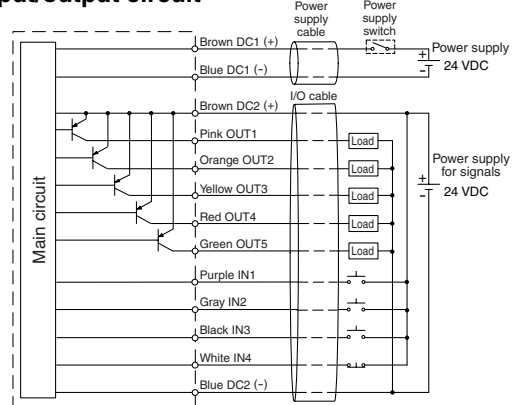
Error Display and Problem Solving

When the error indicator is displayed, refer to the following instructions.

Light ON ▭ Blinks ▭ Light OFF ▭

Item	Display	Contents	Solution
Emergency stop	MIDDLE / PWR / MOTOR / ALM / END	Either the emergency stop input is opened, or the power supply for the signal is cut-off.	Confirm the power supply signal is energized and release the emergency stop input. (Refer to the circuit diagram on page 19.)
Abnormal external output	MIDDLE / PWR / MOTOR / ALM / END	External output is short-circuited. ＊ There is no external output signal.	In case of common power supply, turn off the power supply and check the wiring condition of load. Restart the power supply. (Refer to the circuit diagram on page 19.)
			In case of an independent power supply, turn off the power supply for the signals and check the wiring condition of load. Restart the power supply. (Refer to the circuit diagram on page 19.)
Power supply abnormality	MIDDLE / PWR / MOTOR / ALM / END	The power supply voltage is excessive or lower than the limit for operation.	Check the power supply voltage and adjust it if necessary, then press the MIDDLE button.
Drive abnormality	MIDDLE / PWR / MOTOR / ALM / END	Maximum output is continued for a prolonged period of time.	Check the work weight and confirm that no foreign materials are attached to the actuator. After confirming, press the MIDDLE button.
Temperature abnormality	MIDDLE / PWR / MOTOR / ALM / END	Internal temperature of the controller is high.	Lower the surrounding temperature of the actuator in use, and then press the MIDDLE button.

Item	Display	Contents	Solution
Abnormal stroke	MIDDLE / PWR / MOTOR / ALM / END	The motor is revolving at excessive speed or stops before target is achieved.	If any foreign materials are observed, remove them and then press the MIDDLE button.
			Check to see whether the stroke adjusting unit is loose. If required, readjust the stroke and perform the stroke learning again. Note 1)
			In case of using the remote controller type, please confirm the connection of the connector part between the motor and the controller, after turning off the power supply.
Motor abnormality	MIDDLE / PWR / MOTOR / ALM / END	The motor does not revolve properly or over current is detected.	Press the MIDDLE button.
			In case of using the remote controller type, please confirm the connector part between the motor and the controller after cutting off the power supply.
Controller abnormality	MIDDLE / PWR / MOTOR / ALM / END	The CPU is malfunctioning or the memory content is abnormal.	Turn off the power supply and restart it.
Error of the set value	MIDDLE / PWR / MOTOR / ALM / END	The switch settings for speed and acceleration have been changed while in a locked condition. ＊ There is no external output signal.	Reset the settings for speed and acceleration to the set values while in a locked condition.

Note 1) The product is in the same condition as when the stroke learning process is completed.
Return to the home position is not performed by the initial input
• If the error can not be corrected, turn off the power supply to stop operation, and contact your SMC sales representative.

Alarm reset

There are two types of alarm reset: alarm reset manually (a) and an alarm reset externally (b) by an external signal.

a: Alarm reset manually
In the event of an alarm, simply pushing (2) will revert from the alarm state.
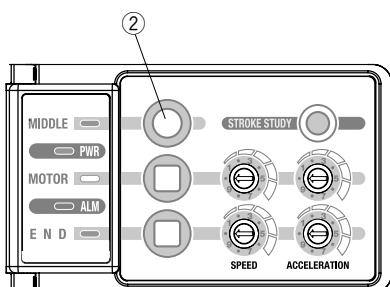
b: Alarm reset externally
In the event of an alarm, simply inputting an external emergency stop signal for 50 ms or longer will return to the state prior to the alarm. The emergency stop output will activate by releasing the input for the emergency stop.

Alarm output		
Emergency stop output	(Releasing)	
READY output	50 ms or longer	
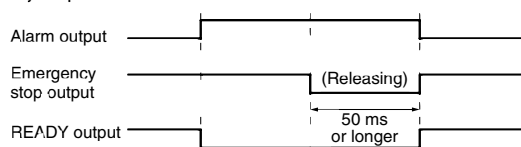
The followings are the reinstated condition.
• The slider will be free until the command for driving is applied
• After being reverted, the next input command for driving makes it start. The initial motion after being reverted is 50 mm/s of a traveling speed.

Auto Switch Specifications

Auto Switch Common Specifications

Type	Reed switch	Solid state switch
Leakage current	None	3-wire: 100 μA or less 2-wire: 0.8 mA or less
Operating time	1.2 ms	1 ms or less
Impact resistance	300 m/s^2	1000 m/s^2
Insulation resistance	50 MΩ or more at 500 VDC Mega (between lead wire and case)	
Withstand voltage	1000 VAC for 1 minute (between lead wire and case)	
Ambient temperature	−10 to 60°C	
Enclosure	IEC529 standard IP67, JIS C 0920 waterproof construction	

Lead Wire Length

Lead wire length indication

(Example)   **D-M9P[L]**

Lead wire length

Nil	0.5 m
L	3 m
Z	5 m

Note 1) Applicable auto switch with 5 m lead wire "Z"
Reed switch: None
Solid state switch: Manufactured upon receipt of order as standard.
Note 2) To designate solid state switches with flexible specifications, add "-61"
after the lead wire length.
∗ Oilproof flexible heavy-duty cable is used for D-M9□ as standard. There is no
need to add the suffix -61 to the end of part number.

(Example) D-F9PWVL- [61]

Flexible specification

Auto Switch Hysteresis

The hysteresis is the difference between the position of the auto switch as
it turns "on" and as it turns "off". A part of operating range (one side)
includes this hysteresis.

Switch operation
position
(ON)

Hysteresis

Note) Reed switch: 2 mm or less
Solid state switch: 1 mm or less

Switch operation
position
(OFF)

Note) Hysteresis may fluctuate due to the operating environment.
Contact SMC if hysteresis causes an operational problem.
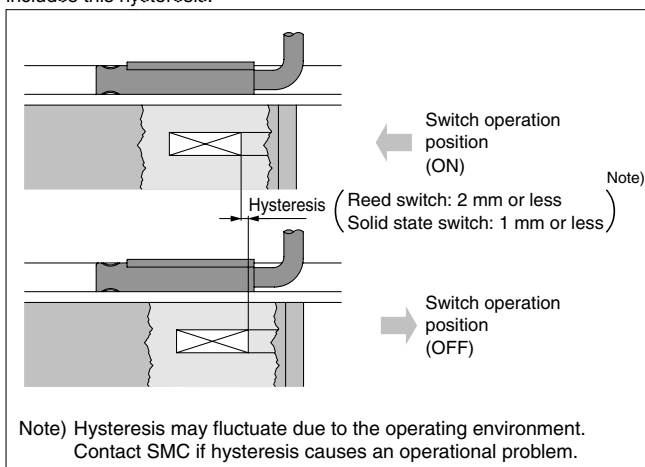
Contact Protection Boxes: CD-P11, CD-P12

<Applicable switch model>
D-A9/A9□V
The auto switches above do not have a built-in contact protection circuit.
Therefore, please use a contact protection box with the switch for any of
the following cases:
① **Where the operation load is an inductive load.**
② **Where the wiring length to load is greater than 5 m.**
③ **Where the load voltage is 100 VAC.**
The contact life may be shortened. (Due to permanent energizing conditions.)

Specifications

Part No.	CD-P11		CD-P12
Load voltage	100 VAC	200 VAC	24 VDC
Maximum load current	25 mA	12.5 mA	50 mA

∗ Lead wire length —— Switch conneciton side 0.5 m
Load connection side   0.5 m

Internal Circuit

CD-P11

Surge absorber

Choke coil

OUT Brown

OUT Blue

CD-P12

Choke coil

Zener diode

OUT (+)
Brown

OUT (−)
Blue
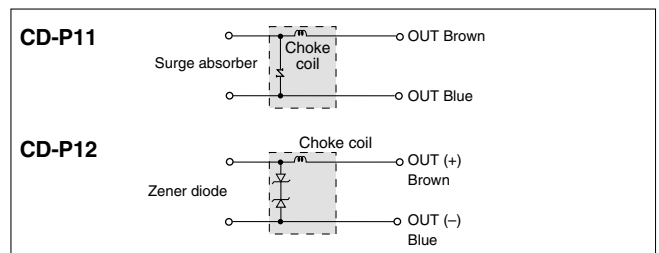
Dimensions
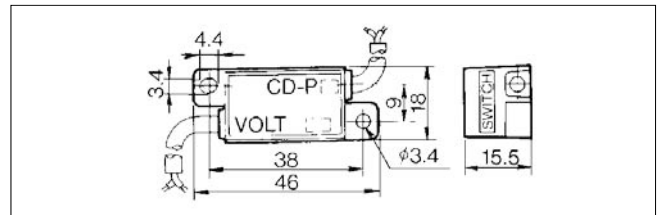
Connection

To connect a switch unit to a contact protection box, connect the lead wire
from the side of the contact protection box marked SWITCH to the lead
wire coming out of the switch unit. Keep the switch as close as possible to
the contact protection box, with a lead wire length of no more than   meter.

SMC

Basic Wiring

Solid state 3-wire, NPN

Switch main circuit — Brown — Load — Black — Blue
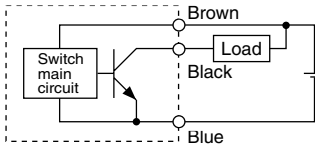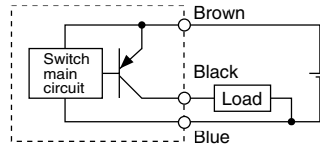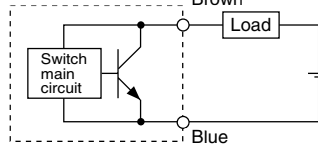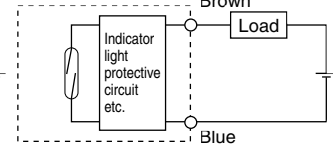
(Power supplies for switch and load are separate.)

Switch main circuit — Brown — Load — Black — Blue

Solid state 3-wire, PNP

Switch main circuit — Brown — Black — Load — Blue

2-wire (Solid state)

Switch main circuit — Brown — Load — Blue

Switch main circuit — Brown — Load — Blue

2-wire (Reed switch)

Indicator light protective circuit etc. — Brown — Load — Blue

Indicator light protective circuit etc. — Brown — Load — Blue
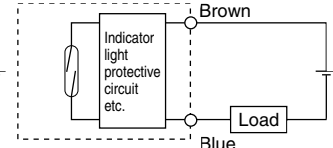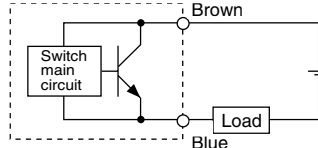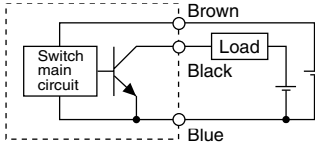
Examples of Connection to PLC (Programmable Logic Controller)

• **Sink input specifications 3-wire, NPN**

Switch — Black — Input — Brown — Blue — COM — PLC internal circuit

2-wire

Switch — Brown — Input — Blue — COM — PLC internal circuit
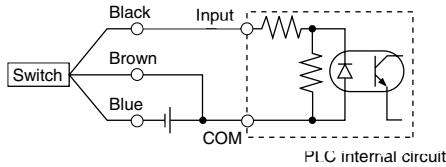
• **Source input specifications 3-wire, PNP**

Switch — Black — Input — Brown — Blue — COM — PLC internal circuit

2-wire

Switch — Blue — Input — Brown — COM — PLC internal circuit
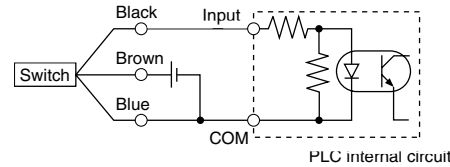
Connect according to the applicable PLC input specifications, since the connection method will vary depending on the PLC input specifications.
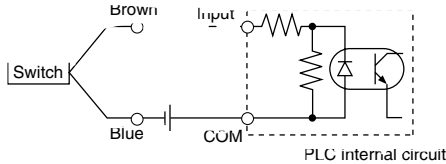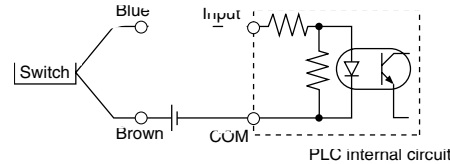
Examples of AND (Serial) and OR (Parallel) Connection

• **3-wire**

AND connection for NPN output (using relays)

Switch 1 — Brown / Black / Blue — Relay
Switch 2 — Brown / Black / Blue — Relay

Load — Relay contact
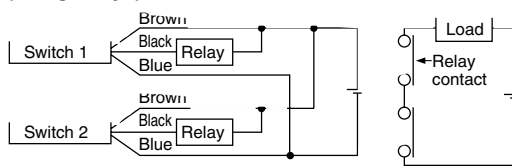
AND connection for NPN output (performed with switches only)

Switch 1 — Brown / Black / Blue — Load
Switch 2 — Brown / Black / Blue
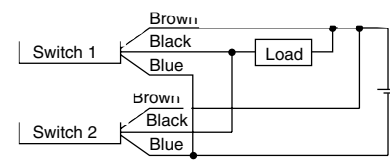
The indicator lights will light up when both switches are turned ON.

OR connection for NPN output

Switch 1 — Brown / Black / Blue — Load
Switch 2 — Brown / Black / Blue

2-wire with 2-switch AND connection

Switch 1 — Brown — Load — Blue
Switch 2 — Brown — Blue
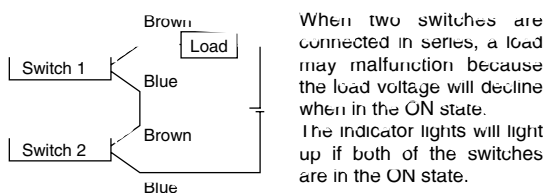
When two switches are connected in series, a load may malfunction because the load voltage will decline when in the ON state.
The indicator lights will light up if both of the switches are in the ON state.

$$\text{Load voltage at ON} = \text{Power supply voltage} - \text{Internal voltage drop} \times 2 \text{ pcs.}$$
$$= 24 \text{ V} - 4 \text{ V} \times 2 \text{ pcs.}$$
$$= 16 \text{ V}$$

Example: Power supply is 24 VDC.
Internal voltage drop in switch is 4 V.

2-wire with 2-switch OR connection

Switch 1 — Brown — Load — Blue
Switch 2 — Brown — Blue
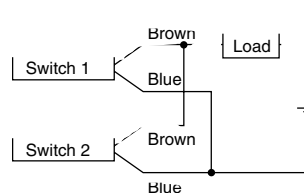
(Solid state)
When two switches are connected in parallel, a malfunction may occur because the load voltage will increase when in the OFF state.

$$\text{Load voltage at OFF} = \text{Leakage current} \times 2 \text{ pcs.} \times \text{Load impedance}$$
$$= \text{mA} \times 2 \text{ pcs.} \times 3 \text{ k}\Omega$$
$$= 6 \text{ V}$$

Example: Load impedance is 3 kΩ.
Leakage current from switch is 1 mA.

(Reed switch)
Because there is no current leakage, the load voltage will not increase when turned OFF. However, depending on the number of switches in the ON state, the indicator lights may sometimes dim or not light because of the dispersion and reduction of the current flowing to the switches.

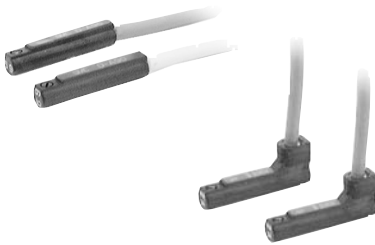# Reed Switch: Direct Mounting Style
D-A90(V)/D-A93(V)/D-A96(V) $C\epsilon$

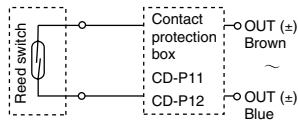## Grommet
Electrical entry direction: In-line

⚠Caution
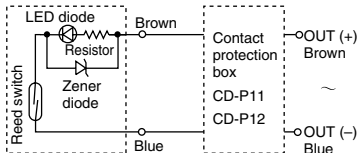### Operating Precautions

Fix the switch with the existing screw installed on the switch body. The switch may be damaged if a screw other than the one supplied, is used.
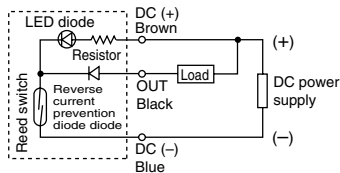
Auto Switch Internal Circuit

D-A90(V)

D-A93(V)

D-A96(V)

Note) ① In a case where the operation load is an inductive load.
② In a case where the wiring load is greater than 5 m.
③ In a case where the load voltage is 100 VAC.

Please use the auto switch with a contact protection box any of the above mentioned cases. (For details about the contact protection box, refer to page 21.)

Auto Switch Specifications

For details about certified products conforming to international standards, visit us at www.smcworld.com.

PLC: Programmable Logic Controller

D-A90/D-A90V (Without indicator light)

Auto switch part no.	D-A90/D-A90V		
Applicable load	IC circuit, Relay, PLC		
Load voltage	24 V AC/DC or less	48 V AC/DC or less	100 V AC/DC or less
Maximum load current	50 mA	40 mA	20 mA
Contact protection circuit	None		
Internal resistance	1 Ω or less (including lead wire length of 3 m)		

D-A93/D-A93V/D-A96/D-A96V (With indicator light)

Auto switch part no.	D-A93/D-A93V		D-A96/D-A96V
Applicable load	Relay, PLC		IC circuit
Load voltage	24 VDC	100 VAC	4 to 8 VDC
Load current range and max. load current Note 3)	5 to 40 mA	5 to 20 mA	20 mA
Contact protection circuit	None		
Internal voltage drop	D-A93 — 2.4 V or less (to 20 mA)/3 V or less (to 40 mA) D-A93V — 2.7 V or less		0.8 V or less
Indicator light	Red LED illuminates when ON		

● Lead wires
D-A90(V)/D-A93(V)   Oilproof heavy-duty vinyl cable: ø2.7, 0.18 mm² x 2 cores (Brown, Blue), 0.5 m
D-A96(V) — Oilproof heavy-duty vinyl cable ø2.7 0   5 mm² x 3 cores (Brown, Black, Blue), 0.5 m
Note 1)   Refer to page 21 for reed switch common specifications.
Note 2)   Refer to page 21 for lead wire lengths
Note 3)   In less than 5 mA condition, the indicating light visibility becomes low, and it may be unreadable in less than 2.5 mA. However, as long as the contact ouput is over a   mA condition, there will be no problem.
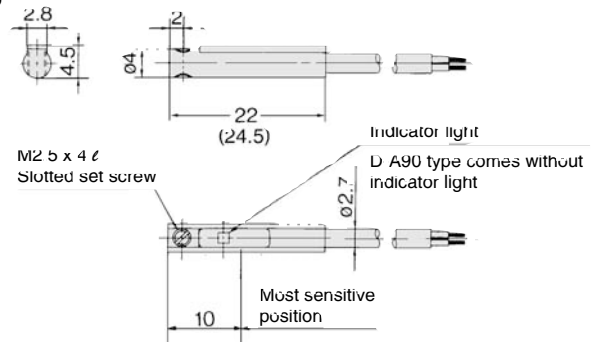
Weight

Unit: g

| Model	D-A90	D-A90V	D-A93	D-A93V	D-A96	D-A96V
Lead wire length: 0.5 m	6	6	6	6	8	8
Lead wire length: 3 m	30	30	30	30	41	41

Dimensions

Unit: mm

D-A90/D-A93/D-A96

D-A90V/D-A93V/D-A96V

SMC
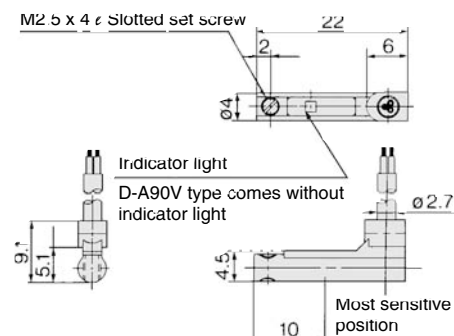
Solid State Switch: Direct Mounting Style
D-M9N(V)/D-M9P(V)/D-M9B(V) $C \epsilon$

For details about certified products conforming to international standards, visit us at www.smcworld.com.

Grommet

- **2-wire load current is reduced (2.5 to 40 mA)**
- **Lead-free**
- **UL certified (style 2844) lead cable is used.**

PLC: Programmable Logic Controller
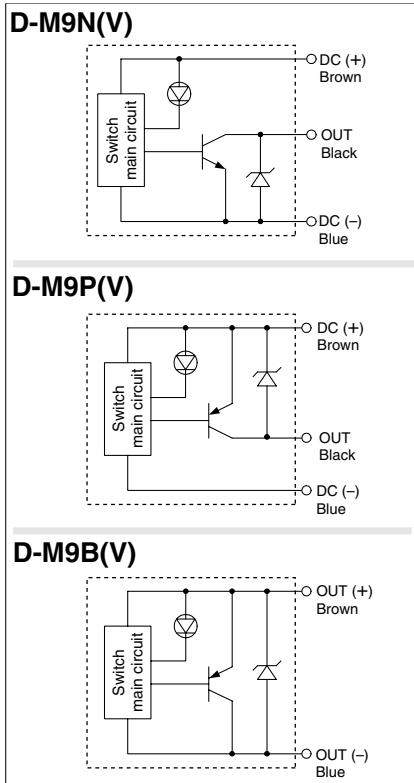
D-M9□/D-M9□V (With indicator light)						
Auto switch part no.	**D-M9N**	**D-M9NV**	**D-M9P**	**D-M9PV**	**D-M9B**	**D-M9BV**
Electrical entry direction	In-line	Perpendicular	In-line	Perpendicular	In-line	Perpendicular
Wiring type	3-wire				2-wire	
Output type	NPN		PNP		—	
Applicable load	IC circuit, Relay, PLC				24 VDC relay, PLC	
Power supply voltage	5, 12, 24 VDC (4.5 to 28 V)				—	
Current consumption	10 mA or less				—	
Load voltage	28 VDC or less		—		24 VDC (10 to 28 VDC)	
Load current	40 mA or less				2.5 to 40 mA	
Internal voltage drop	0.8 V or less				4 V or less	
Leakage current	100 µA or less at 24 VDC				0.8 mA or less	
Indicator light	Red LED illuminates when ON.					

- Lead wires
  Oilproof heavy-duty vinyl cable: ø2.7 x 3.2 ellipse
  D-M9B(V)   0.15 mm² x 2 cores
  D-M9N(V), D-M9P(V)   0.15 mm² x 3 cores
  Note 1)   Refer to page 21 for solid state switch common specifications
 Note 2)   Refer to page 21 for lead wire lengths.

⚠Caution
Operating Precautions

Fix the switch with the existing screw installed on the switch body. The switch may be damaged if a screw other than the one supplied, is used.

Auto Switch Internal Circuit

D-M9N(V)

D-M9P(V)

D-M9B(V)

Weight
Unit: g

Auto switch part no.		**D-M9N(V)**	**D-M9P(V)**	**D-M9B(V)**
Lead wire length (m)	0.5	8	8	7
	3	41	41	38
	5	68	68	63

Dimensions
Unit: mm

D-M9□

D-M9□V
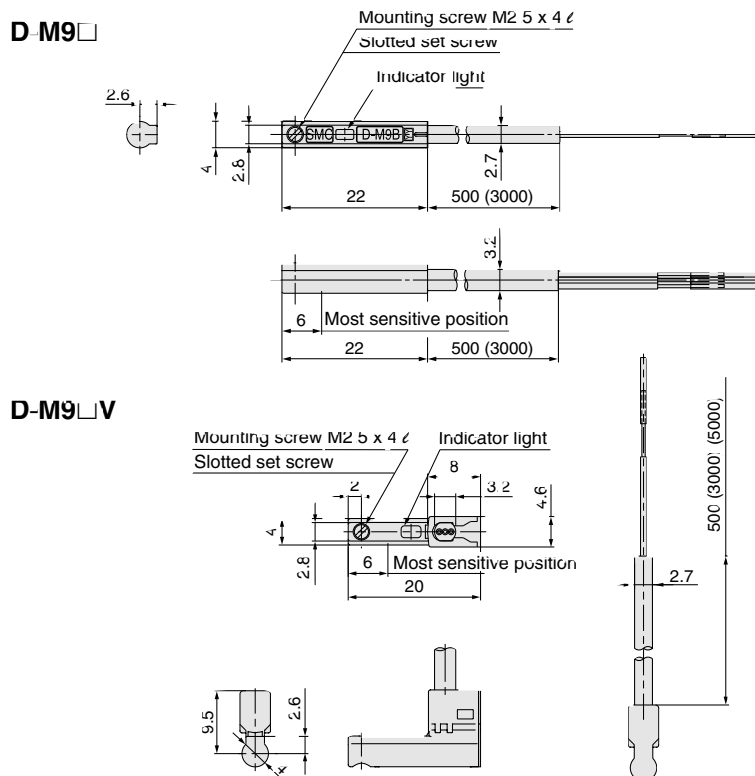
2-color Indication Type, Solid State Switch: Direct Mounting Style

D-F9NW(V)/D-F9PW(V)/D-F9BW(V) $C\epsilon$

Auto Switch Specifications

PLC Programmable Logic Controller

Grommet

⚠Caution

Operating Precautions

Fix the switch with the existing screw installed on the switch body The switch may be damaged if a screw other than the one supplied, is used.

Auto Switch Internal Circuit

D-F9NW(V)

D-F9PW(V)

D-F9BW(V)

Indicator light/Display method

D-F9□W/D-F9□WV (With indicator light)						
Auto switch part no.	**D-F9NW**	**D-F9NWV**	**D-F9PW**	**D-F9PWV**	**D-F9BW**	**D-F9BWV**
Electrical entry direction	In-line	Perpendicular	In-line	Perpendicular	In-line	Perpendicular
Wiring type	3-wire				2-wire	
Output type	NPN		PNP		—	
Applicable load	IC circuit, Relay IC, PLC				24 VDC relay, PLC	
Power supply voltage	5, 12, 24 VDC (4.5 to 28 VDC)				—	
Current consumption	10 mA or less				—	
Load voltage	28 VDC or less		—		24 VDC (10 to 28 VDC)	
Load current	40 mA or less		80 mA or less		5 to 40 mA	
Internal voltage drop	1.5 V or less (0.8 V or less at 10 mA load current)		0.8 V or less		4 V or less	
Leakage current	100 µA or less at 24 VDC				0.8 mA or less	
Indicator light	Operating position ·········· Red LED illuminates. Optimum operating position ·········· Green LED illuminates.					

● Lead wires
　Oilproof heavy-duty vinyl cable: ø2.7, 0.15 mm² x 3 cores (Brown, Black, Blue),
　0.18 mm² x 2 cores (Brown, Blue), 0.5 m
Note 1)　Refer to page 21 for solid state switch common specifications.
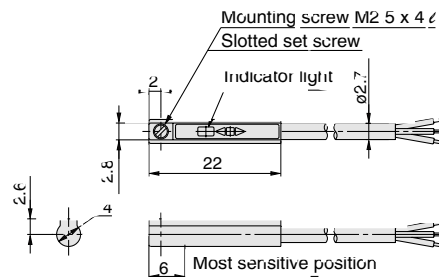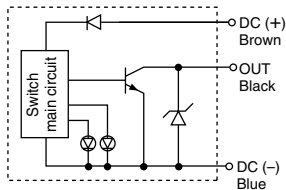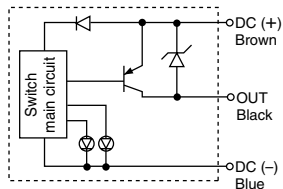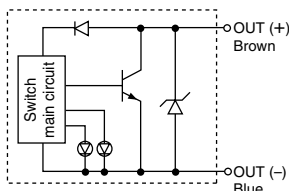Note 2)　Refer to page 21 for lead wire lengths.

Weight

Unit: g

Auto switch part no.		**D-F9NW(V)**	**D-F9PW(V)**	**D-F9BW(V)**
Lead wire length (m)	0.5	7	7	7
	3	34	34	32
	5	56	56	52

Dimensions

Unit: mm

D-F9□W

D-F9□WV

SMC