

Series **MGG**

# Auto Switch Specifications

## Cylinder Bore Size and Applicable Auto Switches



Type	Switch mounting screw direction					Electrical entry		
	In-line				Perpendicular			
	ø20, ø25	ø32	ø40	ø50, ø63	ø80, ø100		ø20 to ø63	
Reed switch	C76				—	B76	Grommet	
	C73				—	B73		
	(B53)		B53		—	—		
	(B54)		B54		—	—		
	(B64)		B64		—	—		
	C80				—	B80	Connector	
	C73C				—	B73C		
	C80C				—	B80C		
Solid state switch	(B59W)	B59W			—	—	Grommet (2 color indicator)	
	H7A1, (G59)		H7A1, G59		G59	G79	Grommet	
	H7A2, (G5P)		H7A2, G5P		G5P	—		
	H7B, (K59)		H7B, K59		K59	K79		
	H7C				—	K79C	Connector	
	H7NW, (G59W)		H7NW, G59W		G59W	—	Grommet (2 color indicator)	
	H7PW, (G5PW)		H7PW, G5PW		G5PW	—		
	H7BW, (K59W)		H7BW, K59W		K59W	—		
	H7BA, (G5BA)		H7BA, G5BA		G5BA	—	Grommet (2 color indicator, water resistant)	
	(G5NT)		G5NT			—	—	Grommet (with timer)
	H7NF, (G59F)			H7NF, G59F	G59F	—	Grommet (2 color indicator, with diagnostic output)	
H7LF				—	—			

**⚠ Caution** When using auto switches shown inside ( ), stroke end detection may not be possible depending on the One-touch fitting or speed controller model. Contact P/A in this case.

### ⚠ Specific Product Precautions

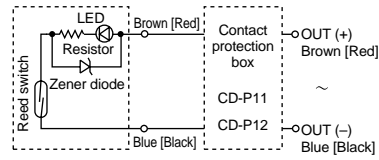
Be sure to read before handling.  
Refer to pages 53 through 55 for auto switch precautions.

## Auto Switch Internal Circuits

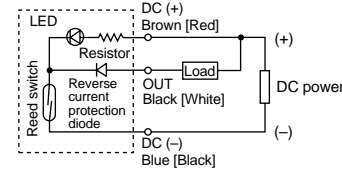
Lead wire colors inside [ ] are those prior to conformity with IEC standards.

### Reed switches

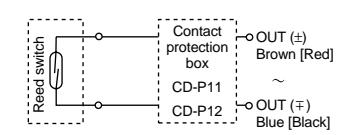
**D-C73, D-B73**



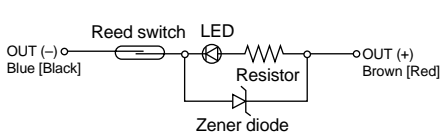
**D-C76, D-B76**



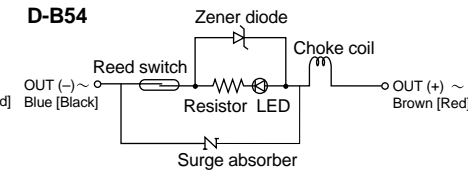
**D-C80, D-B80, D-C80C, D-B80C**



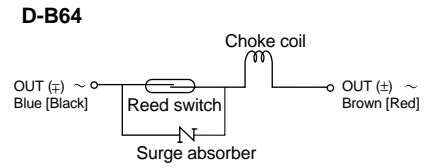
**D-B53**



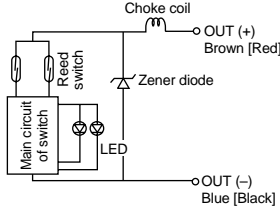
**D-B54**



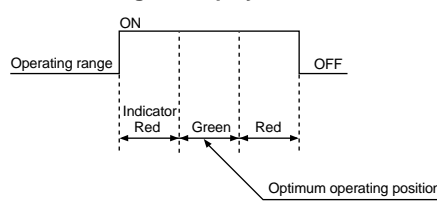
**D-B64**



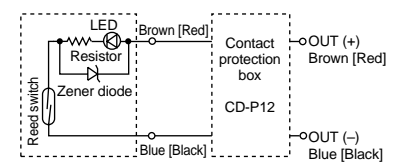
**D-B59W**



**Indicator lights/Display method**

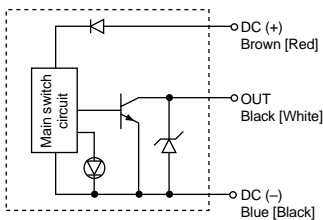


**D-C73C, D-B73C**

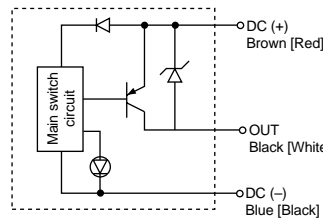


### Solid state switches

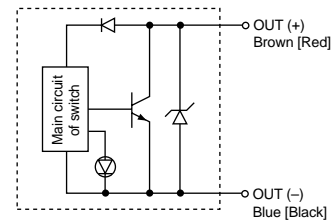
**D-H7A1, D-G59, D-G79**



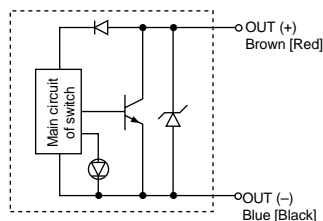
**D-H7A2, D-G5P**



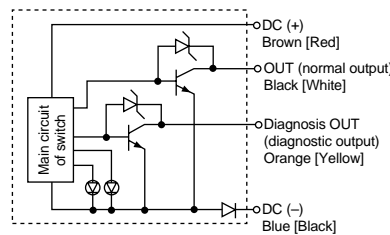
**D-H7B, D-K59, D-K79**



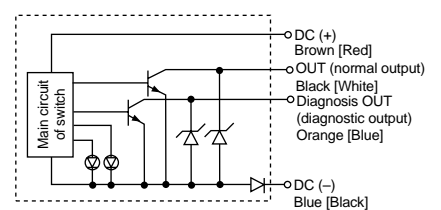
**D-H7C, D-K79C**



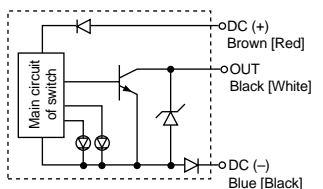
**D-H7NF, D-G59F**



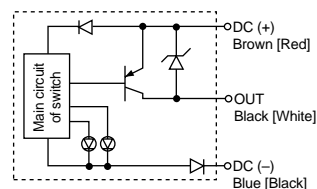
**D-H7LF**



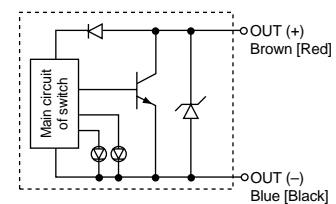
**D-Y7NW, D-G59W**



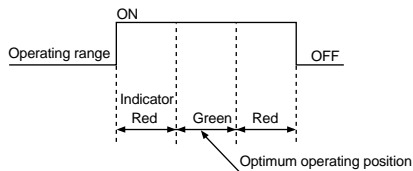
**D-H7PW, D-G5PW**



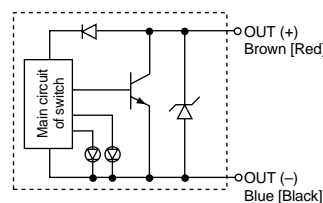
**D-H7BW, D-K59W**



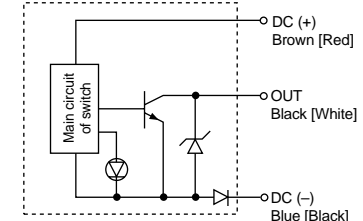
**Indicator lights/Display method**



**D-H7BAL, D-G5BAL**



**D-G5NTL**

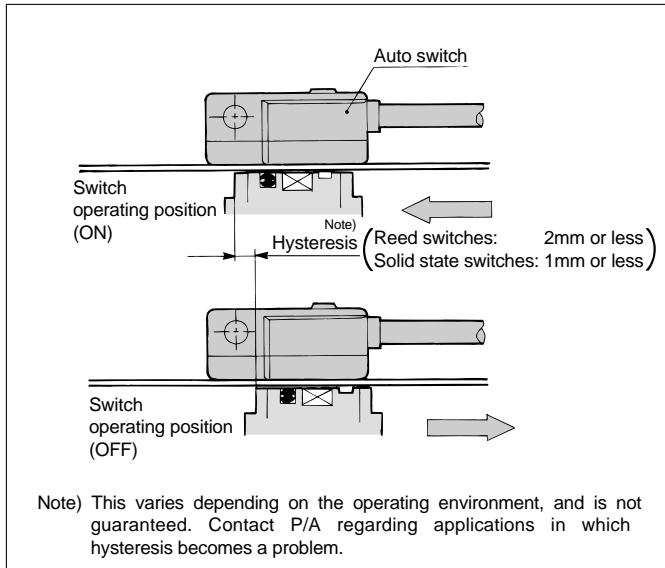


# Series MGG

# Auto Switch Specifications

## Auto Switch Hysteresis

Hysteresis is the distance from the position at which piston movement turns an auto switch ON, to the position at which reverse movement turns the switch OFF. This hysteresis is included in part of the operating range (on one side).



## Contact Protection Boxes/CD-P11, CD-P12

1

### <Applicable switch models>

D-C7/C8, D-C73C/C80C, D-B7/B8, D-B73C/B80C

The above auto switches do not have built-in contact protection circuits.

1. The operated load is an induction load.
2. The length of wiring to the load is 5m or more.
3. The load voltage is 100 or 200VAC.

**Use a contact protection box in any of the above situations.**

Otherwise, the life of the contacts may be reduced. (They may stay on continuously.)

2

Furthermore, even in the case of a type having a built-in contact protection circuit (D-B54, B64, D-B59W), if the length of the wiring to the load is extremely long (30m or more) and a PLC having a large rush current is used, confirm with P/A whether a contact protection box may be necessary.

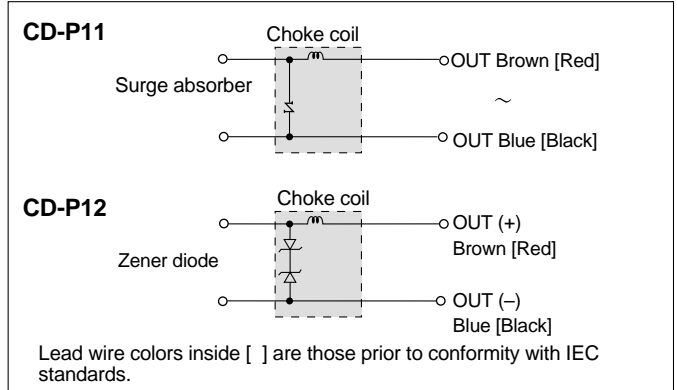
### Contact protection box specifications

Part number	CD-P11		CD-P12
Load voltage	100VAC or less	200VAC	24VDC
Maximum load current	25mA	12.5mA	50mA

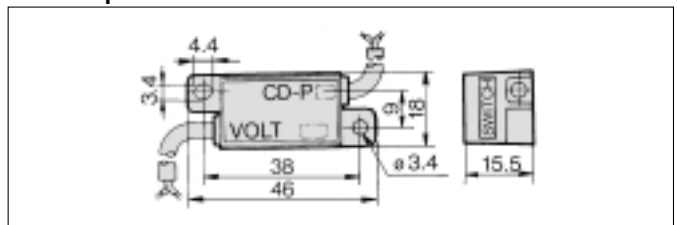
\* Lead wire length ..... Switch connection side 0.5m  
Load connection side 0.5m



### Contact protection box internal circuits



### Contact protection box dimensions

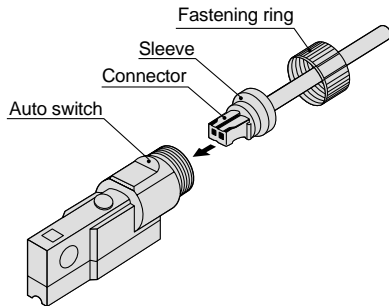


### Contact protection box connection

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 1 meter.

## How to Insert the Connector

D-C73C/C80C, D-H7C  
D-B73C/B80C, D-K79C



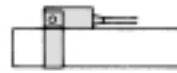
Keeping the protruding section of the connector on top, insert it all the way until the sleeve contacts the auto switch, and then tighten the fastening ring.

(Do not tighten it with pliers or other tools.)

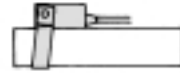
## Auto Switch Mounting

### ⚠ Caution

1. Do not tighten with more than the recommended tightening torque.
2. Mount so that the band does not run on a diagonal.



Correct mounting



Incorrect mounting

### Auto switch mounting bracket part no. (Including band and screw)

Auto switch model	Bore size (mm)							
	20	25	32	40	50	63	80	100
D-C7/C8	BMA2	BMA2	BMA2	BMA2	BMA2	BMA2	—	—
D-H7	-020	-025	-032	-040	-050	-063	—	—
D-B5/B6	BA	BA	BA	BA	BA	BA	BA	BA
D-G5/K5	-01	-02	-32	-04	-05	-06	-08	-10
D-B7/B8	BM1	BM1	BM1	BM1	BM1	BM1	—	—
D-G7/K7	-01	-02	-32	-04	-05	-06	—	—

### <Stainless steel mounting screw kit>

The following stainless steel mounting screw kits (including set screws) are available for use depending on the operating environment. (Order the mounting band separately, as it is not included.)

**BBA3:** For types D-B5/B6/G5/K5

**BBA4:** For types D-C7/C8/H7

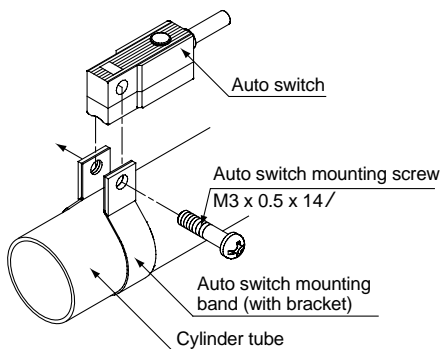
When D-G5BAL and H7BAL type switches are mounted on a cylinder at the factory, the above stainless steel screws are used. When switches are shipped separately, **BBA3** and **BBA4** are included.

## Mounting and Moving Auto Switches

### <Applicable auto switches>

Reed switches ..... D-C73, D-C76, D-C80  
D-C73C, D-C80C

Solid state switches ... D-H7A1, D-H7A2  
D-H7B, D-H7BAL  
D-H7C  
D-H7NF, D-H7LF  
D-H7NW, D-H7PW  
D-H7BW

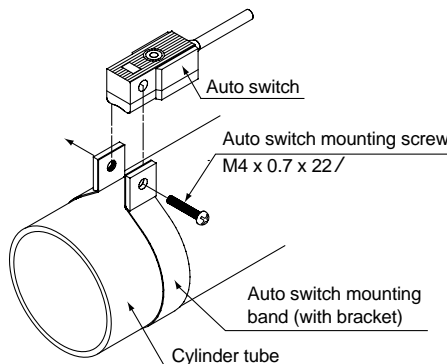


1. Wrap the mounting band around the cylinder tube, and place it in the approximate auto switch mounting position.
2. Insert the mounting section of the auto switch between the band's holding brackets, and align its mounting hole with the holes in the mounting brackets.
3. Pass the mounting screw through the mounting hole and gently screw it into the threaded section of the band's bracket.
4. After sliding the entire assembly to the detection position, secure the auto switch by tightening the mounting screw. (The tightening torque for the M3 screw should be 0.8 to 1N·m.)
5. Make changes to the detection position under the same conditions as in step 3.

### <Applicable auto switches>

Reed switches ..... D-B53, D-B54, D-B64  
D-B59W

Solid state switches ... D-G59, D-G5P  
D-K59, D-G5BAL  
D-G59W, D-G5PW  
D-K59W  
D-G59F  
D-G5NTL

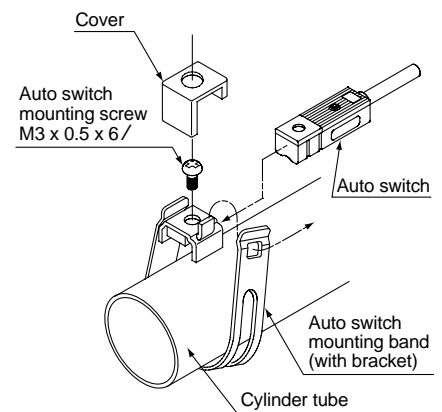


1. Wrap the mounting band around the cylinder tube, and place it in the approximate auto switch mounting position.
2. Insert the mounting section of the auto switch between the band's holding brackets, and align its mounting hole with the holes in the mounting brackets.
3. Pass the mounting screw through the mounting hole and gently screw it into the threaded section of the band's bracket.
4. After reconfirming the detection position, secure the auto switch by tightening the mounting screw. (The tightening torque for the M4 screw should be 1 to 1.2N·m.)
5. Make changes to the detection position under the same conditions as in step 3.

### <Applicable auto switches>

Reed switches ..... D-B73, D-B76, D-B80  
D-B73C, D-B80C

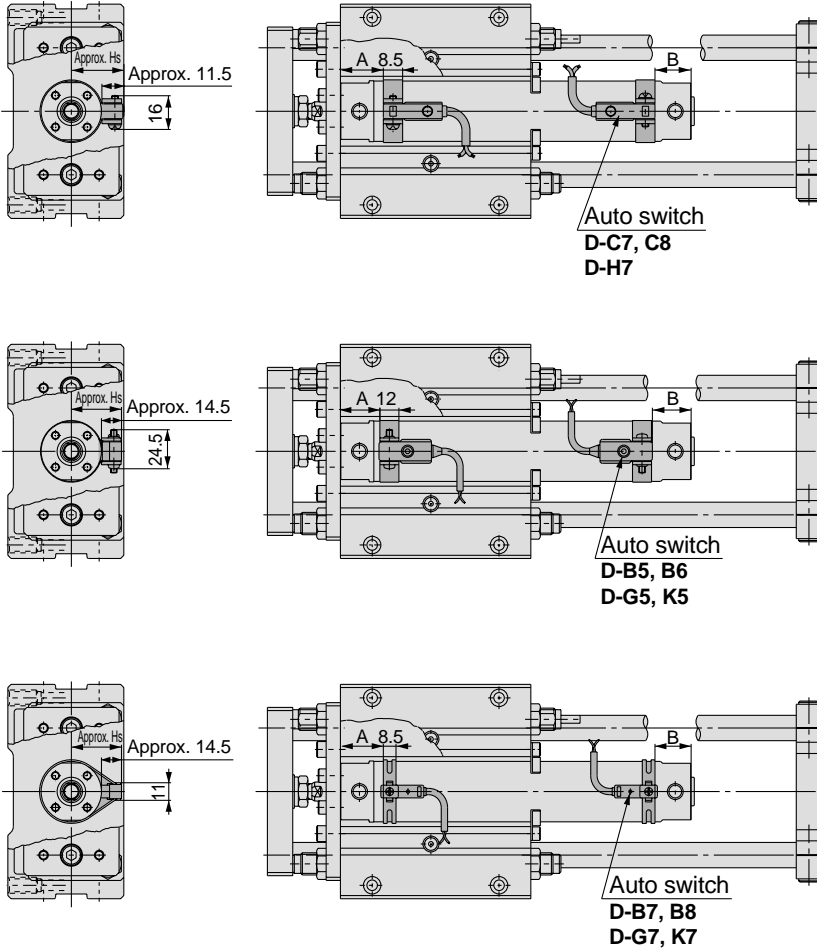
Solid state switches ... D-G79, D-K79,  
D-K79C



1. Wrap the mounting band around the cylinder in the approximate auto switch mounting position, and hang one side of the band on one of the bracket's hooks.
2. Insert the mounting section of the auto switch (metal plate section) into the band bracket, and align its indented area with the hole in the mounting bracket.
3. Pass the mounting screw through the mounting hole and gently screw it into the threaded section of the band's bracket.
4. After sliding the entire assembly to the detection position, secure the auto switch by tightening the mounting screw. (The tightening torque for the M3 screw should be 0.5 to 0.7N·m.)
5. Attach the cover to the band bracket.
6. Make changes to the detection position under the same conditions as in step 3 (with the cover installed).

# Series MGG

## Proper Auto Switch Mounting Position (Stroke End)



Auto switch mounting position

(mm)

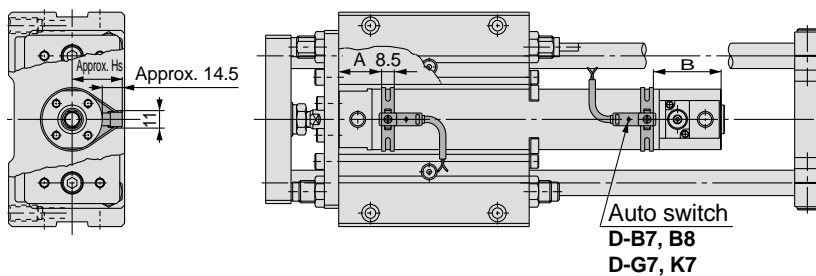
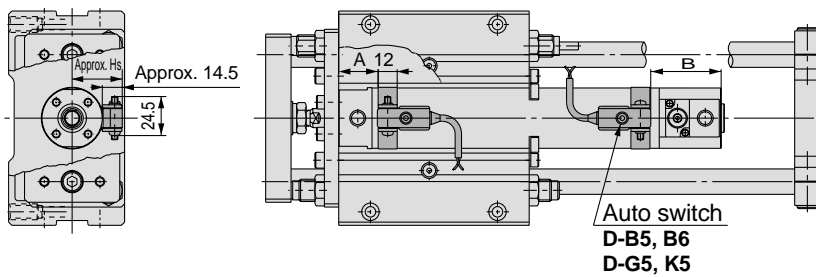
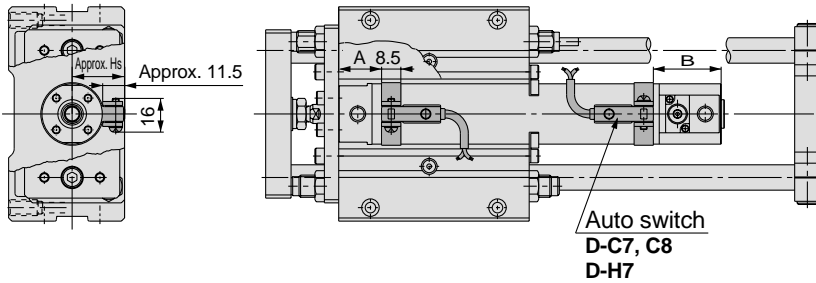
Auto switch mounting height

(mm)

Auto switch model	D-B7, B8 D-B73C D-B80C D-G7, K7 D-K79C		D-C7, C8 D-C73C D-C80C		D-B5, B6 D-G5□W D-K59W D-G5BAL D-G59F		D-B59W		D-H7 D-H7C		D-H7□W D-H7□F D-H7BAL		D-G5 D-K5 D-G5NTL		D-C7, C8 D-H7 D-H7□W D-H7□F D-H7BAL	D-C73C D-C80C	D-B7, B8 D-B73C D-B80C D-G7, K7 D-K79C D-H7C	D-G5, K5 D-G5□W D-K59W D-G5NTL D-B5, B6 D-B59W D-G5BAL D-G59F
	A	B	A	B	A	B	A	B	A	B	A	B	A	B	Hs	Hs	Hs	Hs
20	30.5	21.5 (29.5)	29.5	20.5 (28.5)	24	16 (23)	27	18 (26)	28.5	19.5 (27.5)	27	21 (29)	25.5	17.5 (24.5)	24.5	27	27.5	27.5
25	30.5	21.5 (29.5)	29.5	20.5 (28.5)	24	16 (23)	27	18 (26)	28.5	19.5 (27.5)	27	21 (29)	25.5	17.5 (24.5)	27	29.5	30	30
32	31.5	22.5 (30.5)	30.5	21.5 (29.5)	25	16 (24)	28	19 (27)	29.5	20.5 (28.5)	28	22 (30)	26.5	17.5 (25.5)	30.5	33	33.5	33.5
40	36.5	24.5 (33.5)	35.5	23.5 (32.5)	30	18 (27)	33	21 (30)	34.5	22.5 (31.5)	33	24.5 (33.5)	31.5	19.5 (28.5)	35	37.5	38	38
50	43.5	29.5 (41.5)	42.5	28.5 (40.5)	37	23 (35)	40	26 (38)	41.5	27.5 (39.5)	40	29 (41)	38.5	24.5 (36.5)	40.5	43	43.5	43.5
63	43.5	29.5 (41.5)	42.5	28.5 (40.5)	37	23 (35)	40	26 (38)	41.5	27.5 (39.5)	40	29 (41)	38.5	24.5 (36.5)	47.5	50	50.5	50.5
80	—	—	—	—	47	31 (45)	50	34 (48)	—	—	—	—	48.5	32.5 (46.5)	—	—	—	59
100	—	—	—	—	47	31 (45)	50	34 (48)	—	—	—	—	48.5	32.5 (46.5)	—	—	—	69.5

\* Numbers inside ( ) are for long strokes.

**Proper Auto Switch Mounting Position (Stroke End)/End Lock Type: With Head Side Locking**



**Auto switch mounting position**

(mm)

**Auto switch mounting height**

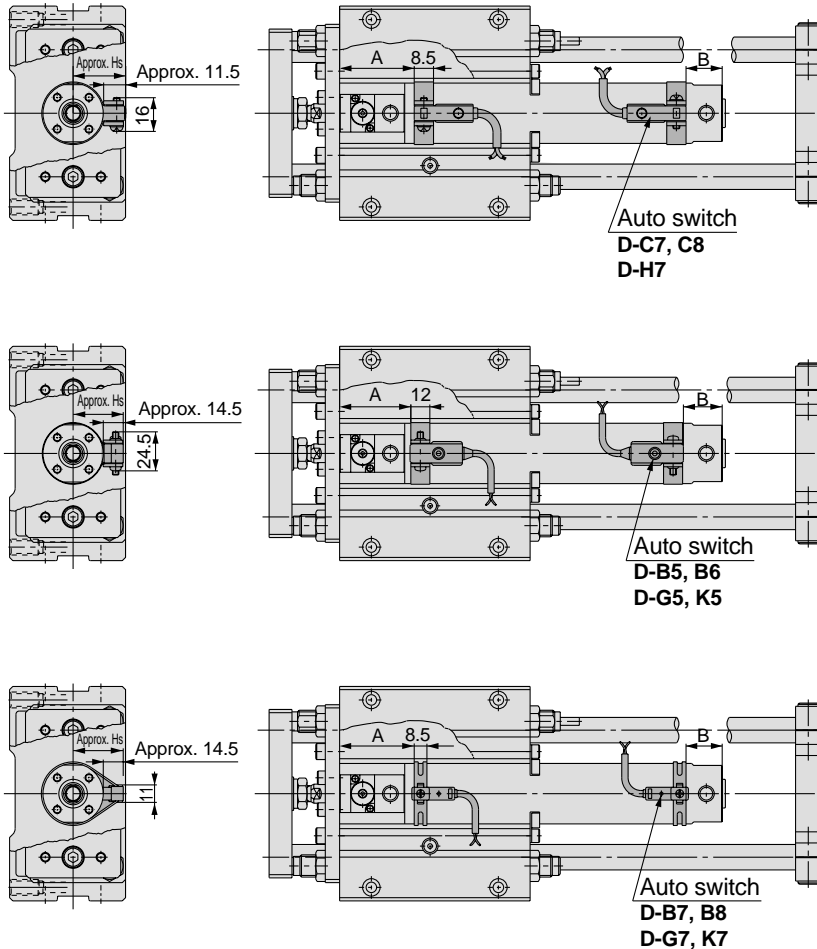
(mm)

Auto switch model	D-B7, B8 D-B73C D-B80C D-G7, K7 D-K79C		D-C7, C8 D-C73C D-C80C		D-B5, B6 D-G5□W D-K59W D-G5BAL D-G59F		D-B59W		D-H7 D-H7C		D-H7□W D-H7□F D-H7BAL		D-G5 D-K5 D-G5NTL	
	A	B	A	B	A	B	A	B	A	B	A	B	A	B
20	30.5	45.5	29.5	44.5	24	40	27	42	28.5	43.5	27	45	25.5	41.5
25	30.5	45.5	29.5	44.5	24	40	27	42	28.5	43.5	27	45	25.5	41.5
32	31.5	46.5	30.5	45.5	25	40	28	43	29.5	44.5	28	46	26.5	41.5
40	36.5	55.5	35.5	54.5	30	49	33	52	34.5	53.5	33	55.5	31.5	50.5
50	43.5	65.5	42.5	64.5	37	59	40	62	41.5	63.5	40	65	38.5	60.5
63	43.5	69.5	42.5	68.5	37	63	40	66	41.5	67.5	40	69	38.5	64.5
80	—	—	—	—	47	82	50	85	—	—	—	—	48.5	83.5
100	—	—	—	—	47	88	50	91	—	—	—	—	48.5	89.5

D-C7, C8 D-H7 D-H7□W D-H7□F D-H7BAL	D-C73C D-C80C	D-B7, B8 D-B73C D-B80C D-G7, K7 D-K79C D-H7C	D-G5, K5 D-G5□W D-K59W D-G5NTL D-B5, B6 D-B59W D-G5BAL D-G59F
Hs	Hs	Hs	Hs
24.5	27	27.5	27.5
27	29.5	30	30
30.5	33	33.5	33.5
35	37.5	38	38
40.5	43	43.5	43.5
47.5	50	50.5	50.5
—	—	—	59
—	—	—	69.5

# Series MGG

## Proper Auto Switch Mounting Position (Stroke End)/End Lock Type: With Rod Side Locking



Auto switch mounting position

(mm)

Auto switch mounting height

(mm)

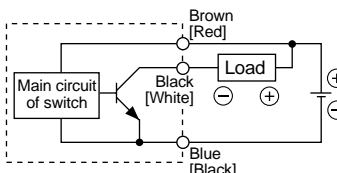
Auto switch model	D-B7, B8 D-B73C D-B80C D-G7, K7 D-K79C		D-C7, C8 D-C73C D-C80C		D-B5, B6 D-G5□W D-K59W D-G5BAL D-G59F		D-B59W		D-H7 D-H7C		D-H7□W D-H7□F D-H7BAL		D-G5 D-K5 D-G5NTL		D-C7, C8 D-H7	D-C73C D-C80C	D-B7, B8 D-B73C D-B80C D-G7, K7 D-K79C D-H7C	D-G5, K5 D-G5□W D-K59W D-G5NTL D-B5, B6 D-B59W D-G5BAL D-G59F
	A	B	A	B	A	B	A	B	A	B	A	B	A	B	Hs	Hs	Hs	Hs
20	57.5	21.5 (29.5)	56.5	20.5 (28.5)	51	16 (23)	54	18 (26)	55.5	19.5 (27.5)	54	21 (29)	52.5	17.5 (24.5)	24.5	27	27.5	27.5
25	57.5	21.5 (29.5)	56.5	20.5 (28.5)	51	16 (23)	54	18 (26)	55.5	19.5 (27.5)	54	21 (29)	52.5	17.5 (24.5)	27	29.5	30	30
32	59.5	22.5 (30.5)	58.5	21.5 (29.5)	53	16 (24)	56	19 (27)	57.5	20.5 (28.5)	56	22 (30)	54.5	17.5 (25.5)	30.5	33	33.5	33.5
40	65.5	24.5 (33.5)	64.5	23.5 (32.5)	59	18 (27)	62	21 (30)	63.5	22.5 (31.5)	62	24.5 (33.5)	60.5	19.5 (28.5)	35	37.5	38	38
50	76.5	29.5 (41.5)	75.5	28.5 (40.5)	70	23 (35)	73	26 (38)	74.5	27.5 (39.5)	73	29 (41)	71.5	24.5 (36.5)	40.5	43	43.5	43.5
63	78.5	29.5 (41.5)	77.5	28.5 (40.5)	72	23 (35)	75	26 (38)	76.5	27.5 (39.5)	75	29 (41)	73.5	24.5 (36.5)	47.5	50	50.5	50.5
80	—	—	—	—	91	31 (45)	94	34 (48)	—	—	—	—	92.5	32.5 (46.5)	—	—	—	59
100	—	—	—	—	96	31 (45)	99	34 (48)	—	—	—	—	97.5	32.5 (46.5)	—	—	—	69.5

\* Numbers inside ( ) are for long strokes.

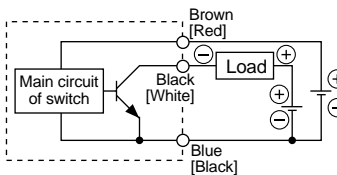
# Auto Switch Connections and Examples

## Basic Wiring

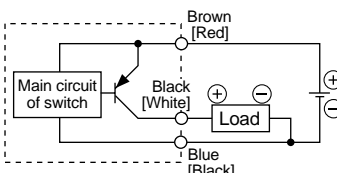
### Solid state 3-wire, NPN



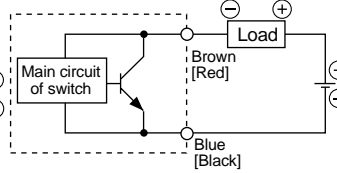
(Power supplies for switch and load are separate.)



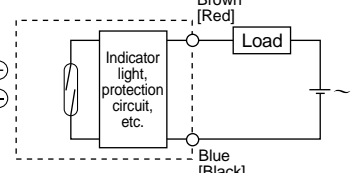
### Solid state 3-wire, PNP



### 2-wire <Solid state>



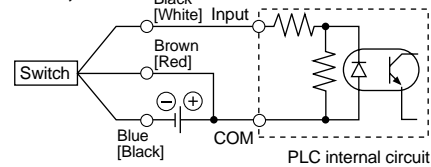
### 2-wire <Reed switch>



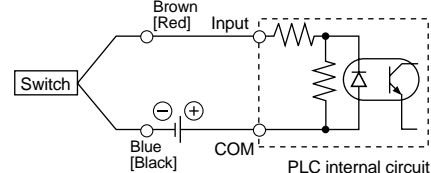
## Examples of Connection to PLC

### Sink input specifications

#### 3-wire, NPN

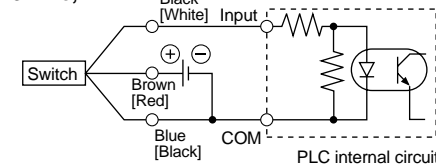


#### 2-wire

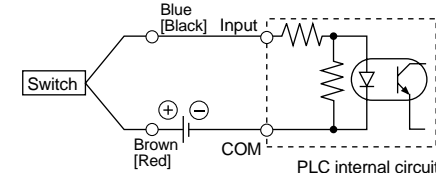


### Source input specifications

#### 3-wire, PNP



#### 2-wire

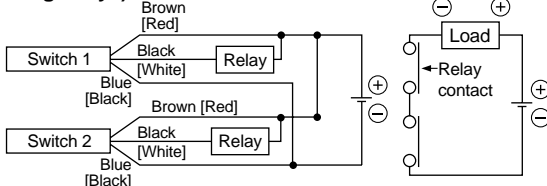


Connect according to the applicable PLC input specifications, as the connection method will vary depending on the PLC input specifications.

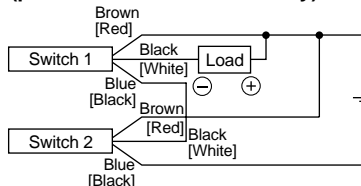
## Connection Examples for AND (Series) and OR (Parallel)

### 3-wire

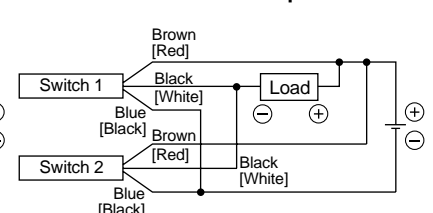
#### AND connection for NPN output (using relays)



#### AND connection for NPN output (performed with switches only)

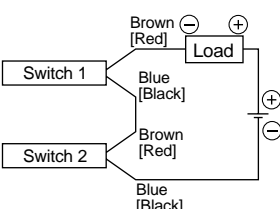


#### OR connection for NPN output



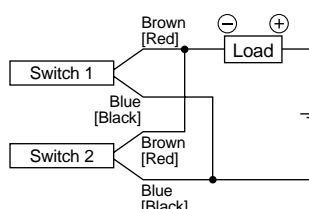
The indicator lights will light up when both switches are turned ON.

#### 2-wire with 2 switch AND connection



When two switches are connected in series, a load may malfunction because the load voltage will drop when in the ON state. The indicator lights will light up if both of the switches are in the ON state.

#### 2-wire with 2 switch OR connection



<Solid state>  
When two switches are connected in parallel, malfunction may occur because the load voltage will increase when in the OFF state.

<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 up, because of dispersion and reduction of the current flowing to the switches.

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

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

$$\begin{aligned} \text{Load voltage at OFF} &= \text{Leakage current} \times 2 \text{ pcs.} \times \text{Load impedance} \\ &= 1\text{mA} \times 2 \text{ pcs.} \times 3\text{k}\Omega \\ &= 6\text{V} \end{aligned}$$

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