

Air Cylinder/Double Rod Series MBW

ø32, ø40, ø50, ø63, ø80, ø100, ø125

How to Order

Standard

MBW L 32 150

With auto switch

MDBW L 32 150 Y7BW

Built-in magnet

Mounting

B	Basic/Without bracket
L	Foot
F	Flange
T	Center trunnion

Bore size

32	32mm
40	40mm
50	50mm
63	63mm
80	80mm
100	100mm
125	125mm

Port thread type

Symbol	Type
—	Rc
TN	NPT
TF	G

Stroke (mm)

Refer to page 14 for standard stroke table.

Number of auto switches

—	2
S	1
3	3
n	n

Auto switch

—	Without auto switch
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* Refer to table below for selection of applicable auto switch.
* The auto switches for D-Z7□, Z80, Y59□, Y69□, Y7□□ are included but unmounted.
(Only the switch mounting brackets for the above models are mounted.)

Rod boot/Cushion

Rod boot	—	None
	J	Nylon tarpaulin (one end)
	JJ	Nylon tarpaulin (both ends)
	K	Heat resistant tarpaulin (one end)
Cushion	KK	Heat resistant tarpaulin (both ends)
	—	Both ends
	N Note 1)	None

Note1) Model without air cushion is designed to include rubber bumpers. The overall length is longer than the cylinder with air cushions because the bumpers are attached to the both sides of the piston as follows.
ø32, ø40: +6mm, ø50, ø63: +8mm, ø80, ø100: +10mm, ø125: +12mm

Applicable Auto Switches/ For detailed specifications, please refer to Best Pneumatics vol.2 page 5.3-2.

Style	Special function	Electrical entry	Indicator	Wiring (Output)	Load voltage		Auto switch model		Lead wire length*(m)			Pre-wired connector	Applicable load		
					DC	AC	Tie rod mounting	Band mounting	0.5 (—)	3 (L)	5 (Z)				
Reed switch	—	Grommet	Yes	3-wire (Equiv. to NPN)	24V	5V	—	Z76	●	●	—	—	IC circuit		
								2-wire	100V	Z73	●	●	●	—	Relay PLC
									100V,200V	A54	●	●	●	—	PLC
									—	A33	—	—	—	—	Relay PLC
									100V,200V	A34	—	—	—	—	
Diagnostic indication (2-color display)	Grommet	—	A44	—	—	—	—	—							
Solid state switch	—	Grommet	Yes	3-wire (NPN)	24V	5V,12V	—	Y59A	●	●	○	○	IC circuit		
				3-wire (PNP)				Y7P	●	●	○	○	—		
				2-wire				J51	●	●	○	○			
				Terminal conduit				2-wire	Y59B	●	●	○	○	IC circuit	
								3-wire (NPN)	—	—	—	—	—		
				Grommet				2-wire	—	—	—	—	—	—	—
		Yes	3-wire (NPN)		24V	5V,12V	—	Y7NW	●	●	○	○	IC circuit		
			3-wire (PNP)					Y7PW	●	●	○	○	—		
			2-wire					Y7BW	●	●	○	○			
			Water resistance (2-color display)					—	—	—	—	—	—	IC circuit	
			Diagnostic output (2-color display)					—	—	—	—	—	—		
			Latch type diagnostic output (2-color display)	—				—	—	—	—	—	—		
Strong magnetic field resistance	—	—	—	—	—	—	—	—							

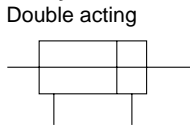
* Lead wire length 0.5mm — (Example): A54
3m L (Example): A54L
5m Z (Example): A54Z

** Solid state switches marked with a "○" are produced upon receipt of order.

Besides the above models, there are some other auto switches that are applicable. For detailed information, please refer to page 11.



JIS Symbol



Made to Order

Refer to page 38 for made to order products of series MBW.

Symbol	Specifications/Descriptions
—XB6	Heat resistant cylinder (150°C)
—XB13	Low speed cylinder (5 to 50mm/s)
—XC3	Special port position
—XC4	With heavy duty scraper
—XC5	Heat resistant cylinder (110°C)
—XC6	Piston rod and rod end nut made of stainless steel
—XC7	Tie rod, cushion valve, tie rod nut, etc. made of stainless steel
—XC14	Change of trunnion bracket mounting position
—XC22	Fluorine rubber seals
—XC27	Double clevis pin and double knuckle pin made of stainless steel
—XC29	Double knuckle joint with spring pin
—XC30	Front trunnion
—XC35	With coil scraper

Standard Stroke

Bore size (mm)	Standard stroke (mm)
32	25, 50, 75, 100, 125, 150, 175, 200, 250, 300, 350, 400, 450, 500
40	25, 50, 75, 100, 125, 150, 175, 200, 250, 300, 350, 400, 450, 500
50	25, 50, 75, 100, 125, 150, 175, 200, 250, 300, 350, 400, 450, 500, 600
63	25, 50, 75, 100, 125, 150, 175, 200, 250, 300, 350, 400, 450, 500, 600
80	25, 50, 75, 100, 125, 150, 175, 200, 250, 300, 350, 400, 450, 500, 600, 700, 800
100	25, 50, 75, 100, 125, 150, 175, 200, 250, 300, 350, 400, 450, 500, 600, 700, 800
125	25, 50, 75, 100, 125, 150, 175, 200, 250, 300, 350, 400, 450, 500, 600, 700, 800

Intermediate strokes are available.
(No spacer is used)

Specifications

Bore size (mm)	32	40	50	63	80	100	125
Action	Double acting double rod						
Fluid	Air						
Proof pressure	1.5MPa						
Max. operating pressure	1.0MPa						
Min. operating pressure	0.05MPa						
Ambient and fluid temperature	Without auto switch: -10 to 70°C (No freezing)						
	With auto switch: -10 to 60°C (No freezing)						
Lubrication	Not required (Non-lube)						
Operating piston speed	50 to 1000mm/s						
Allowable stroke tolerance	up to 250: $^{+1.0}_0$, 251 to 750: $^{+1.4}_0$						
Cushion ^{Note 1)}	Both ends (Air cushion)						
Thread tolerance	JIS class 2						
Port size (Rc, NPT, G)	1/8	1/4	1/4	3/8	3/8	1/2	1/2
Mounting	Basic, Foot, Flange, Center trunnion						

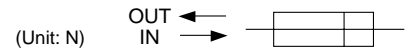
Note 1) Absorbable kinetic energy by cushion mechanism is identical to double acting single rod.

When requesting a cylinder without air cushion, cylinder utilizes rubber bumpers which increases cylinder overall length.

Accessories

Mounting		Basic	Foot	Flange	Center trunnion
Standard	Rod end nut	●	●	●	●
Option	Single knuckle joint	●	●	●	●
	Double knuckle joint (with pin)	●	●	●	●
	Rod boot	●	●	●	●

Theoretical Force



Bore (mm)	Rod dia. (mm)	Operating direction	Piston area (mm ²)	Operating pressure (MPa)								
				0.2	0.3	0.4	0.5	0.6	0.7	0.8	0.9	1.0
32	12	IN/OUT	691	138	207	276	346	415	484	553	622	691
40	16	IN/OUT	1056	211	317	422	528	634	739	845	950	1056
50	20	IN/OUT	1649	330	495	660	825	989	1154	1319	1484	1649
63	20	IN/OUT	2803	561	841	1121	1402	1682	1962	2242	2523	2803
80	25	IN/OUT	4536	907	1361	1814	2268	2722	3175	3629	4082	4536
100	30	IN/OUT	7147	1429	2144	2859	3574	4288	5003	5718	6432	7147
125	32	IN/OUT	11468	2294	3440	4588	5734	6881	8028	9174	10321	11468

Note) Theoretical force (N)=Pressure (MPa) X Piston area (mm²)

Weight/Aluminum Tube

(kg)

Bore size (mm)		32	40	50	63	80	100	125	
Basic weight	Basic	0.56	0.79	1.34	1.65	3.11	4.14	6.48	
	Foot	0.68	0.93	1.56	1.93	3.61	4.8	8.56	
	Flange	0.85	1.16	1.79	2.44	4.56	7.45	10.64	
	Trunnion	0.85	1.15	1.82	2.45	4.66	7.81	9.46	
Additional weight per 50 stroke		All mounting bracket	0.15	0.24	0.34	0.35	0.61	0.84	1.02
Accessories	Single knuckle	0.15	0.23	0.26	0.26	0.60	0.83	1.10	
	Double knuckle (with pin)	0.22	0.37	0.43	0.43	0.87	1.27	0.91	
Square tube	Additional weight to the basic weight*	0.03	0.03	0.05	0.07	0.11	0.13	—	
	Additional weight per 50 stroke	0.20	0.29	0.41	0.45	0.75	1.0	—	

Calculation example: **MBWB32-100** (Basic, ø32, 100st)

- Basic weight 0.56 (Basic, ø32)
 - Additional weight 0.15/50 stroke
 - Cylinder stroke 100 stroke
- 0.56+0.15X100/50=0.86kg

Material of Rod Boot

Symbol	Material	Max. ambient temp.
J	Nylon tarpaulin	70°C
K	Heat resistant tarpaulin	110°C*

* Max. ambient temperature for rod boot itself.

Series MBW

Auto Switch Mounting Bracket Part No.

(mm)

Auto switch model	Bore size						
	32	40	50	63	80	100	125
D-A3□/A44 D-G39/K39	BMB2-032	BMB2-040	BMB1-050	BMB1-063	BMB1-080	BMB1-100	BS1-125
D-A5□/A6□ D-A59W D-F5□/J5□ D-F5□W/J59W D-F5□F D-F5BAL D-F5NTL	BT-03	BT-03	BT-05	BT-05	BT-06	BT-06	BT-08
D-P5DWL	BMB3T-040	BMB3T-040	BMB3T-050	BMB3T-050	BMB3T-080	BMB3T-080	BAP2T-080
D-Z7□/Z80 D-Y59□/Y69□ D-Y7P/Y7PV D-Y7□W D-Y7□WV D-Y7BAL	BMB4-032	BMB4-032	BMB4-050	BMB4-050	BA4-063	BA4-063	BA4-080

[A set of stainless steel mounting screws]

A set of following stainless steel mounting screws is attached.

(A mounting bracket itself is not attached. Please order it separately.)

BBA1: D-A5/A6/F5/J5 types

* "D-F5BAL" switch is set on the cylinder with the screws above when shipped.

When a switch only is shipped, "BBA1" screws are attached.

Mounting Bracket Part No.

Bore size (mm)	32	40	50	63	80	100	125
Foot	MB-L03	MB-L04	MB-L05	MB-L06	MB-L08	MB-L10	MB-L12
Flange	MB-F03	MB-F04	MB-F05	MB-F06	MB-F08	MB-F10	MB-F12

* Two foot brackets required for one cylinder.

Water resistant air cylinder

Water resistant air cylinders are also available in Series MB, which are suitable for use on machine tools in an atmosphere with coolant and applicable to food machinery and automobile washing equipment in an environment with water splashes. Please consult SMC for more information.

Copper-free air cylinder

20 - MBW Mounting bracket Bore size Stroke Suffix

↓
Copper-free

Copper material has been replaced with non-copper material to prevent generation of copper ions. This is to eliminate influence of copper ions and fluororesin upon color CRT.

Specifications

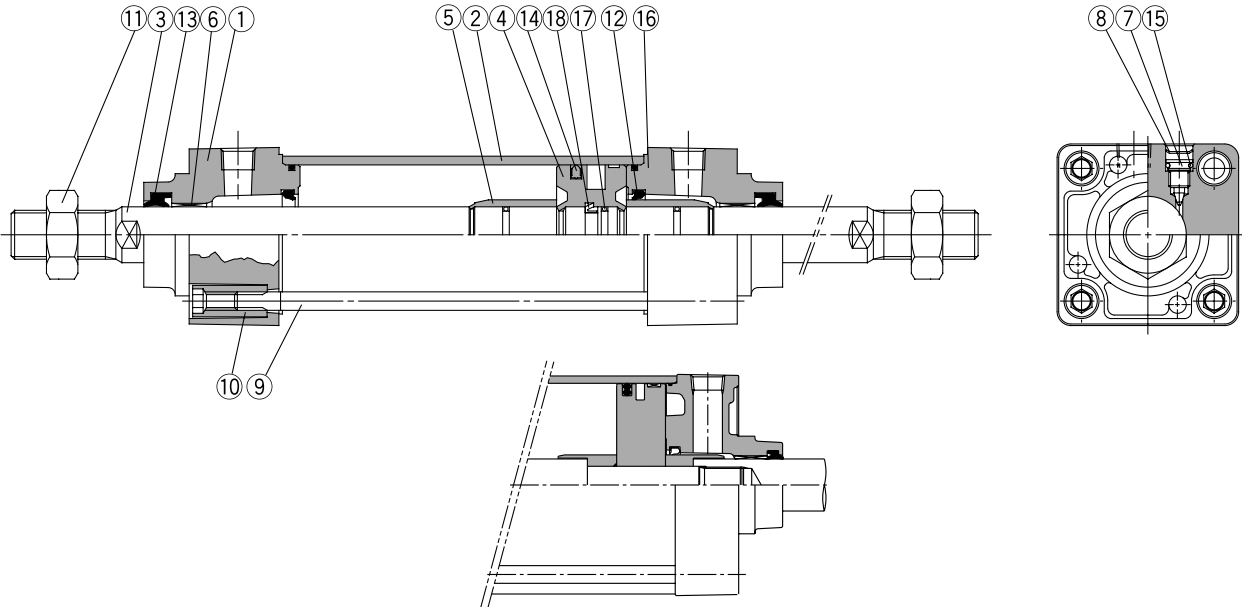
Action	Double acting single rod
Bore size	ø32, ø40, ø50, ø63, ø80, ø100
Max. operating pressure	1MPa
Min. operating pressure	0.05MPa
Cushion	Air cushion ^{Note 1)}
Piping	Screw-in piping
Operating piston speed	50 to 1000mm/s
Mounting bracket	Basic, Axial foot, Front flange, Rear flange, Single clevis, Double clevis, Center trunnion

* Auto switch capable.

★ The cylinder should be operated within the allowable kinetic energy. (Refer to page 3.)

Note 1) In case of types with no air cushion, a rubber bumper is used.

Construction



MBW125

Component Parts

No.	Description	Material	Note
1	Rod cover	Aluminum die cast	Metallic painted
2	Cylinder tube	Aluminum alloy	Hard anodized
3	Piston rod	Carbon steel	Hard chrome plated
4	Piston	Aluminum alloy	Chromated
5	Cushion ring	Resin	
6	Bushing	Lead bronze cast	
7	Cushion valve	Steel wire	Nickel plated
8	Snap ring	Steel for spring	ø40 to ø100
9	Tie rod	Carbon steel	Uni-chromated
10	Tie rod nut	Carbon steel	Nickel plated
11	Rod end nut	Carbon steel	Nickel plated

No.	Description	Material	Note
12*	Cushion seal	Urethane	
13*	Rod seal	NBR	
14*	Piston seal	NBR	
15	Cushion valve seal	NBR	
16*	Cylinder tube gasket	NBR	
17	Piston gasket	NBR	
18	Piston retainer	Urethane	

Replacement Parts: Seal Kits

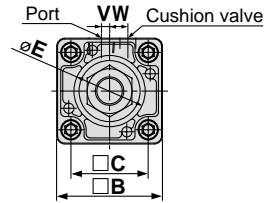
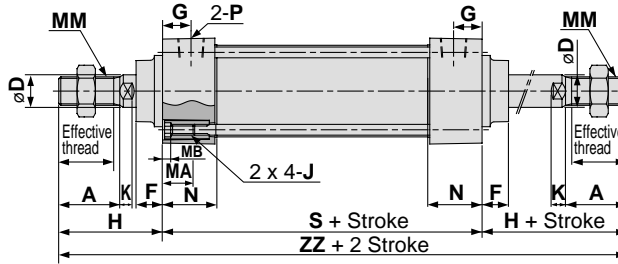
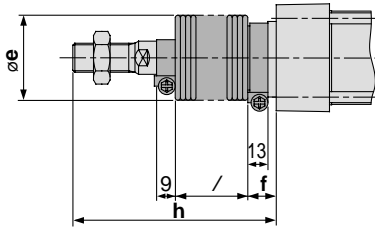
Bore size (mm)	Kit No.	Contents
32	MBW32-PS	Set of the No. 12, 13, 14 and 16.
40	MBW40-PS	
50	MBW50-PS	
63	MBW63-PS	
80	MBW80-PS	
100	MBW100-PS	
125	MBW125-PS	

* Seal kits consist of items 12, 13, 14 and 16, and can be ordered by using the seal kit number corresponding to each bore size.

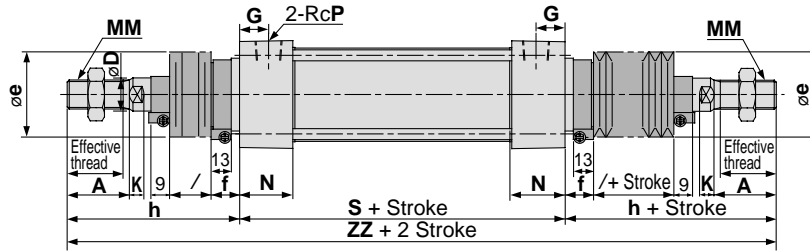
Series MBW

With Mounting Bracket

Basic/(B)



With rod boot



Bore (mm)	Stroke range	Eff. thread length	Width across flats	With rod boot																	Without air cushion			
				A	B	C	D	Ee11	F	G	H	MA	MB	J	K	MM	N	P	S*	V	W	ZZ**	S	ZZ
32	to 500	19.5	10	22	46	32.5	12	30	13	13	47	16	4	M6 X 1.0	6	M10 X 1.25	27	1/8	84	4	6.5	178	90	184
40	to 500	27	14	30	52	38	16	35	13	14	51	16	4	M6 X 1.0	6	M14 X 1.5	27	1/4	84	4	9	186	90	192
50	to 600	32	18	35	65	46.5	20	40	14	15.5	58	16	5	M8 X 1.25	7	M18 X 1.5	31.5	1/4	94	5	10.5	210	102	218
63	to 600	32	18	35	75	56.5	20	45	14	16.5	58	16	5	M8 X 1.25	7	M18 X 1.5	31.5	3/8	94	9	12	210	102	218
80	to 800	37	22	40	95	72	25	45	20	19	72	16	5	M10 X 1.5	10	M22 X 1.5	38	3/8	114	11.5	14	258	124	268
100	to 800	37	26	40	114	89	30	55	20	19	72	16	5	M10 X 1.5	10	M26 X 1.5	38	1/2	114	17	15	258	124	268
125	to 1000	50	27	54	136	110	32	60	27	19	97	20	6	M12 X 1.75	13	M27 X 2.0	38	1/2	120	17	15	314	132	326

With rod boot

Note) Dimension ZZ is with rod boot. (mm)

Bore (mm)	e	f	h																	ZZ (Note)																		
			1 to 50	51 to 100	101 to 150	151 to 200	201 to 300	301 to 400	401 to 500	501 to 600	601 to 700	701 to 800	801 to 900	901 to 1000	1 to 50	51 to 100	101 to 150	151 to 200	201 to 300	301 to 400	401 to 500	501 to 600	601 to 700	701 to 800	801 to 900	901 to 1000												
32	36	23	12.5	25	37.5	50	75	100	125	—	—	—	—	73	86	98	111	136	161	186	—	—	—	—	230	256	280	306	356	406	456	—	—	—	—			
40	41	23	12.5	25	37.5	50	75	100	125	—	—	—	—	81	94	106	119	144	169	194	—	—	—	—	246	272	296	322	372	422	472	—	—	—	—			
50	51	25	12.5	25	37.5	50	75	100	125	150	—	—	—	89	102	114	127	152	177	202	227	—	—	—	—	272	298	322	348	398	448	498	548	—	—	—	—	
63	51	25	12.5	25	37.5	50	75	100	125	150	—	—	—	89	102	114	127	152	177	202	227	—	—	—	—	272	298	322	348	398	448	498	548	—	—	—	—	
80	56	29	12.5	25	37.5	50	75	100	125	150	175	200	—	101	114	126	139	164	189	214	239	264	289	—	—	316	342	366	392	442	492	542	592	642	692	—	—	
100	61	29	12.5	25	37.5	50	75	100	125	150	175	200	—	101	114	126	139	164	189	214	239	264	289	—	—	316	342	366	392	442	492	542	592	642	692	—	—	
125	75	27	10	20	30	40	60	80	100	120	140	160	180	200	120	130	140	150	170	190	210	230	250	270	290	310	340	360	380	400	440	480	520	560	600	640	680	720

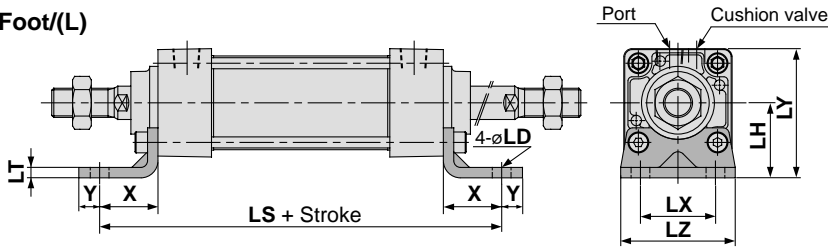
* Model without air cushion is designed to include rubber bumpers. The overall length is longer than the cylinder with air cushion as follows because the bumpers are attached to the both sides of the piston; $\phi 32, \phi 40$: +6mm, $\phi 50, \phi 63$: +8mm, $\phi 80, \phi 100$: +10mm, $\phi 125$: +12mm

** Model without air cushion is designed to include rubber bumpers. The overall length is longer than the cylinder with air cushion as follows because the bumpers are attached to the both sides of the piston; $\phi 32, \phi 40$: +3mm, $\phi 50, \phi 63$: +4mm, $\phi 80, \phi 100$: +5mm, $\phi 125$: +6mm (For trunnion mounting and trunnion bracket)

With Mounting Bracket

* Refer to basic mounting/(B) for other dimensions and with rod boot.

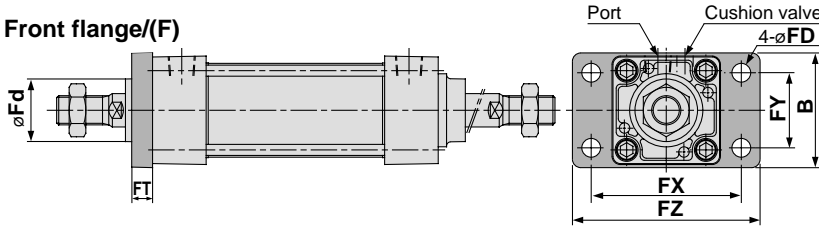
Foot/(L)



Foot

Bore (mm)	Stroke range	X	Y	LD	LH	LS*	LT	LX	LY	LZ
32	to 500	22	9	7	30	128	3.2	32	53	50
40	to 500	24	11	9	33	132	3.2	38	59	55
50	to 600	27	11	9	40	148	3.2	46	72.5	70
63	to 800	27	14	12	45	148	3.6	56	82.5	80
80	to 800	30	14	12	55	174	4.5	72	102.5	100
100	to 800	32	16	14	65	178	4.5	89	122	120
125	to 1000	45	20	14	81	210	8	90	149	136

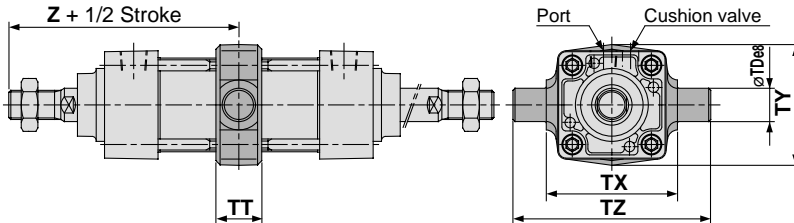
Front flange/(F)



Front flange

Bore (mm)	Stroke range	B	FD	FT	FX	FY	FZ	Fd
32	to 500	50	7	10	64	32	79	25
40	to 500	55	9	10	72	36	90	31
50	to 600	70	9	12	90	45	110	38.5
63	to 600	80	9	12	100	50	120	39.5
80	to 800	100	12	16	126	63	153	45.5
100	to 800	120	14	16	150	75	178	54
125	to 1000	138	14	20	180	102	216	57.5

Center trunnion/(T)



Center trunnion

Bore (mm)	Stroke range	TDe8	TT	TX	TY	TZ	** Z
32	to 500	12	17	50	49	74	89
40	to 500	16	22	63	58	95	93
50	to 600	16	22	75	71	107	105
63	to 600	20	28	90	87	130	105
80	to 800	20	34	110	110	150	129
100	to 800	25	40	132	136	182	129
125	to 1000	25	50	160	160	210	157

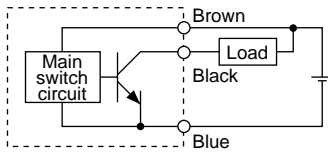
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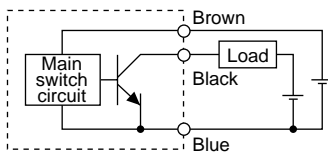
Auto Switch Connections and Examples

Basic Wiring

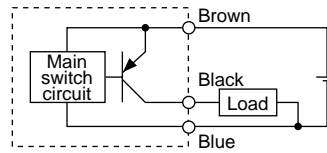
•Solid state switch 3 wire NPN



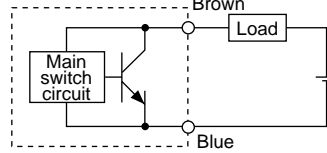
(When power source for switch and load is not common.)



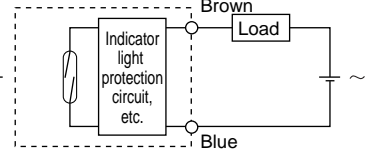
3 wire PNP



2 wire

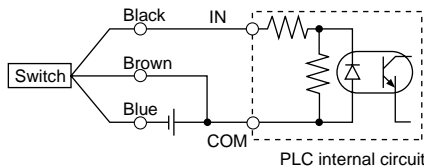


•Reed switch 2 wire

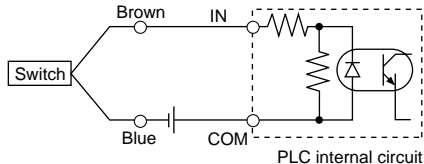


Examples of Connection to PLC

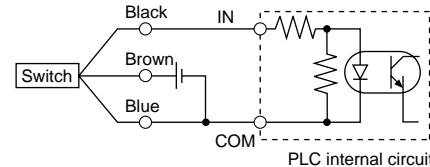
•Sink input specifications 3-wire NPN



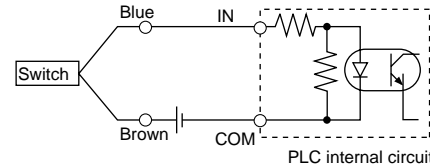
2 wire



•Source input specifications 3-wire PNP



2 wire

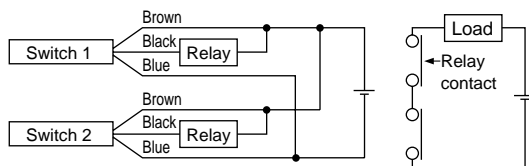


Connect according to the applicable PLC input specifications, as the connection method will vary depending on the PLC input specifications.

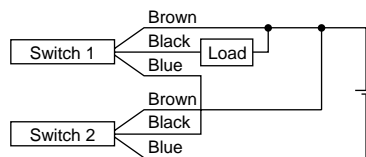
Connection Examples for AND (Serial) and OR (Parallel)

•3-wire

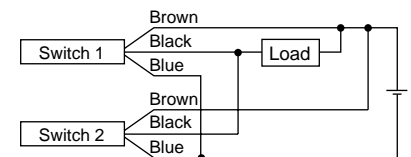
AND connection for NPN output (using relays)



AND connection for NPN output (performed with switches only)

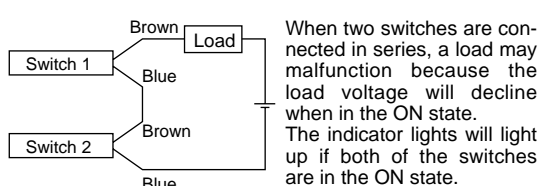


OR connection for NPN output

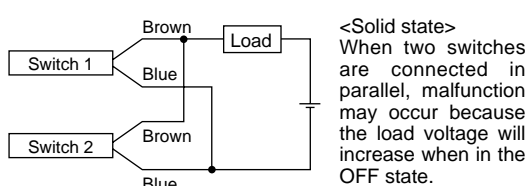


The indicator lights will light up when both switches are turned ON.

2-wire with 2 switch AND connection



2-wire with 2 switch OR connection



<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.

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

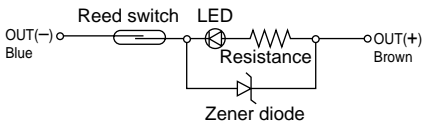
Example: Power supply is 24V DC,
Internal voltage drop in switch is 4V

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

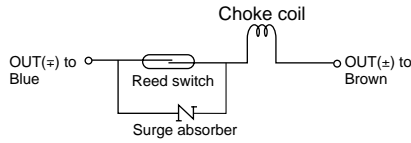
Example: Load impedance is 3kΩ
Leakage current from switch is 1mA

Reed switch

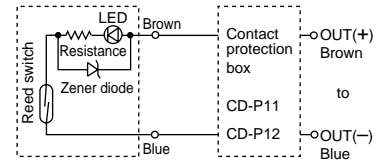
D-A53



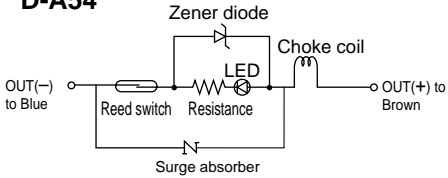
D-A64



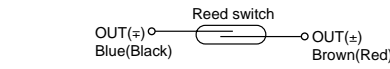
D-Z73



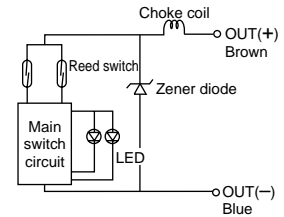
D-A54



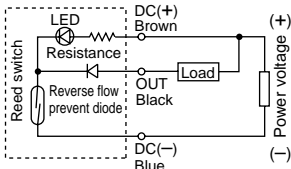
D-A67/Z80



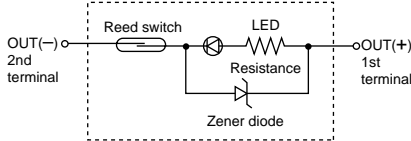
D-A59W



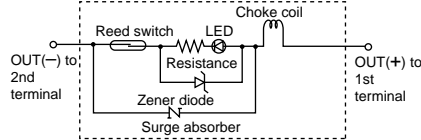
D-A56/Z76



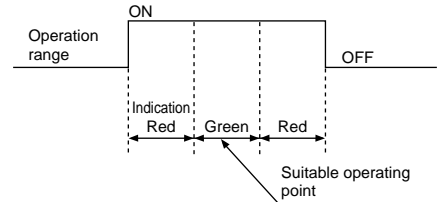
D-A33



D-A34/D-A44

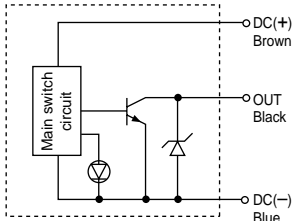


Indicator light/Operation

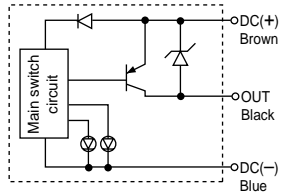


Solid state switch

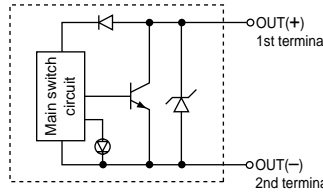
D-F59/Y59A



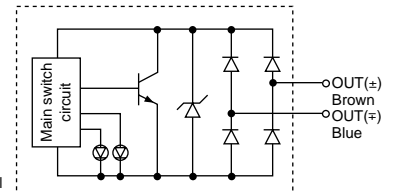
D-F5PW/Y7PW



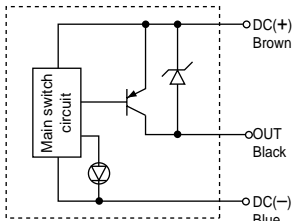
D-K39



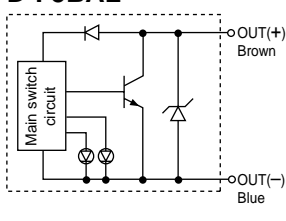
D-P5DWL



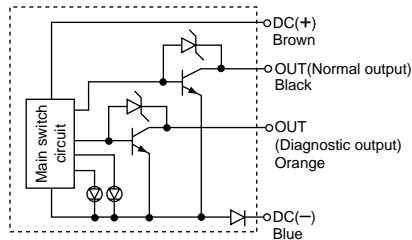
D-F5P/Y7P



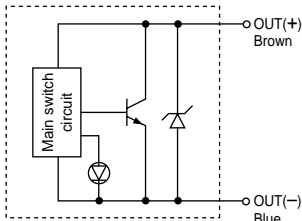
D-J59W/Y7BW/Y7BAL
D-F5BAL



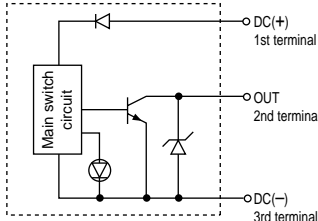
D-F59F



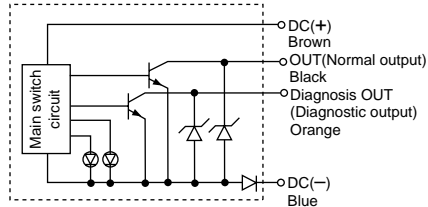
D-J59/Y59B



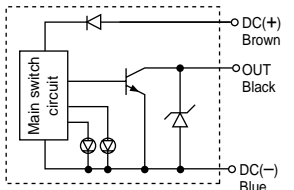
D-G39



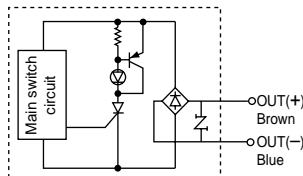
D-F5LF



D-F59W/Y7NW



D-J51



D-F5NTL

