

KOGANEI

VALVES GENERAL CATALOG

SOLENOID VALVES H050 SERIES INDEX

SOLENOID VALVES 050 SERIES



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Caution

Before use, be sure to read the "Safety Precautions" on p. 31.

The standard for square and direct acting types

SOLENOID VALVES H050 SERIES






Offers reliable control of $\phi 6$ [0.236in.] $\sim \phi 25$ [0.984in.] bore size air cylinders. Standard direct acting solenoid valve offers a refined inner construction and versatility with excellent reliability and durability, responding with ease of use and flexibility to its “reliable operation” feature.

Standard Type

- The poppet type sealing method is used. Almost no problem with sticking due to collected liquid, etc. for assured operation.
- An overspring construction prevents excessive force being applied to the O-ring. Demonstrates excellent durability.
- A flywheel diode is standard equipment for the AC solenoid (optional for the DC24V). Eliminates solenoid burning and humming.
- A wide selection of options responds to diversified requirements. Units with LED indicators are now available.



H050 Series Basic Models and Configuration

Single unit				
Standard type				
2-, 3-port		5-port		
Normally closed (NC)	Normally open (NO)	Single solenoid	2-position Double solenoid	Normally closed (NC)
				
H050E1	H050E1-11	H050-4E1	H050-4E2	H050LE1

Manifold

- Allows combination mounting of 2-, 3- or 5-port valves, with single or double solenoids.



SOLENOID VALVES 050 SERIES

Low current type



- Power consumption is only half of the standard type. Demonstrates its features through reduced initial costs and running costs.
- Basic structure is identical to the standard type. Achieves excellent reliability and durability.
- Direct drive via IC or sequencer is also available.

Low current type

2-, 3-port

5-port

Normally open (NO)

2-position

Single solenoid



H050LE1-11



H050-4LE1

Manifold

Standard type, low current type

Manifold for combination mounting of 2-, 3-, 5-port valves



HSM □

SOLENOID VALVES

H050 SERIES

Basic Models and Functions

Item	Basic model	Standard type			Low current type	
		H050E1	H050-4E1	H050-4E2	H050LE1	H050-4LE1
Number of positions		2 positions			2 positions	
Number of ports		2, 3 ports	5 ports		2, 3 ports	5 ports
Valve function		Normally closed (NC, standard) or Normally open (NO, optional)	Single solenoid	Double solenoid	Normally closed (NC, standard) or Normally open (NO, optional)	Single solenoid

Remark: For optional specifications and order codes, see p.137 ~ 138.

Specifications

Item	Basic model	Standard type			Low current type	
		H050E1	H050-4E1	H050-4E2	H050LE1	H050-4LE1
Media		Air			Air	
Operation type		Direct acting type			Direct acting type	
Effective area [Cv]	mm ²	1.5 [0.08]	1.2 [0.07]		1.5 [0.08]	1.2 [0.07]
Port size ^{Note 1}		10-32 UNF			10-32 UNF	
Lubrication		Not required			Not required	
Operating pressure range	MPa {kgf/cm ² } [psi.]	0~0.7 {0~7.1} [0~102]		0.15~0.7 {1.5~7.1} [22~102]	0~0.7 {0~7.1} [0~102]	
Proof pressure	MPa {kgf/cm ² } [psi.]	1.05 {10.7} [152]			1.05 {10.7} [152]	
Response time ^{Note 2}	ms	DC24V	20/20 or below		20 or below	30/30 or below
ON/OFF		AC100V, AC200V	25/25 or below		20 or below	—
Maximum operating frequency	Hz	5			5	
Minimum time to energize for self holding	ms	—			50	—
Operating temperature range (atmosphere and media)	°C [°F]	0~50 [32~122]			0~50 [32~122]	
Shock resistance m/s ² {G}	Lateral direction	1373.0 {140.0}			1373.0 {140.0}	
	Axial direction	294.2 {30.0}		147.1 {15.0}	294.2 {30.0}	
Mounting direction		Any			Any	

Notes: 1. For details, see the port size on p.136.

2. Values when air pressure is 0.5MPa {5.1 kgf/cm²} [73 psi.]. Values of the double solenoid valve are switching time from the opposite position.

Solenoid Specifications

Item	Rated voltage	Standard type				Low current type	
		DC24V	AC100V		AC200V		DC24V
Type		DC type	Flywheel type				DC type
Operating voltage range	V	21.6~26.4 (24 ± 10%)	90~110 (100 ± 10%)		180~220 (200 ± 10%)		21.6~26.4 (24 ± 10%)
Current ^{Note 1} (when rated voltage is applied)	Frequency	Hz	—	50	60	50	60
	Energizing ^{Note 2}	mA(r.m.s)	240 (5.8W) [252 (6.0W)]	74 [83]	71 [79]	48 [50]	46 [48]
Maximum allowable leakage current	mA	20	10		5		10
Insulation resistance	MΩ	10				10	
Wiring type and lead wire length	Standard	Grommet type: 300mm [11.8in.]				Grommet type: 300mm [11.8in.]	
	Optional	With DIN connector				With DIN connector	
Color of lead wire		Red [Red(+), Blue(-)] ^{Note 1} Red(+), Black(-) ^{Note 3}	Yellow, Black		White, Black		Red [Red(+), Blue(-)] ^{Note 1} Red(+), Black(-) ^{Note 3}
Color of LED indicator (optional)		Red	Yellow		Green		Red
Surge suppression	Standard	—				Flywheel diode	
	Optional	Flywheel diode		—		Flywheel diode	

Notes: 1. Figures in brackets [] are for solenoids with LED indicators.

2. Since the AC types have built-in flywheel diodes, the starting current value is virtually the same as the energizing current value.

3. For solenoids with surge suppression, and solenoids with surge suppression and LED indicators.

Solenoid Valve Port Size

Basic model	Port specification	Port size
H050E1 ^{Note} , H050-4E1 H050-4E2 H050LE1 ^{Note} , H050-4LE1	Standard	Female thread 10-32 UNF
	Optional	Female thread 1(P), 4(A), 2(B) port: NPT1/8 3(R2), 5(R1) port: 10-32 UNF

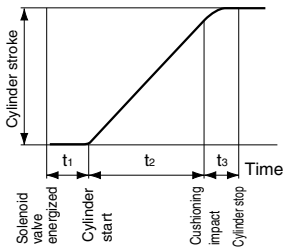
Note: The output ports of H050E1 and H050LE1 are the (2A) port.

Manifold Port Size

Manifold model	Port	Location of piping port	Port size
HSM□	1(P)	Manifold	NPT 1/8
	4(A), 2(B)	Valve	10-32 UNF ^{Note}
	3, 5(R)	Manifold	NPT 1/8

Note: For standard specification valves. In the case of optional ports -01: NPT1/8.

Cylinder Operating Speed

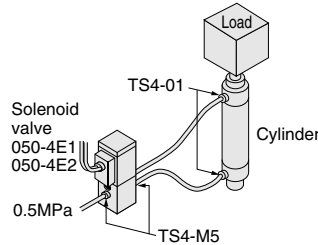


To obtain the time required for the cylinder to complete 1 stroke, add the cylinder's delay time t_1 (time between energizing of the solenoid valve and actual starting of the cylinder), to the cylinder's max. speed operating time t_2 . When a cushion is used, add the cushioning time t_3 , to the above calculations. The standard cushioning time t_3 is approximately 0.2 seconds.

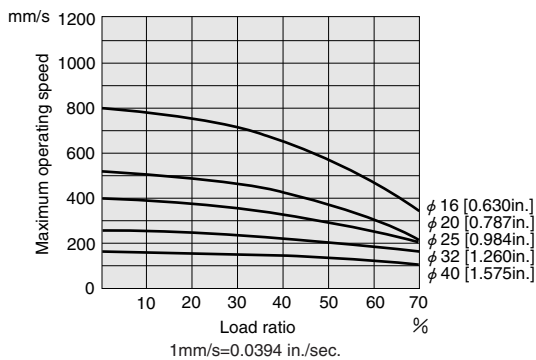
050-4E1, 050-4E2

Measurement conditions

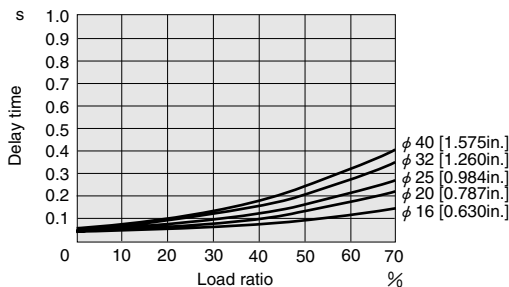
- Air pressure: 0.5MPa {5.1kgf/cm²} [73 psi.]
- Piping inner diameter and length: $\phi 2.5 \times 1000$ mm
- Fitting: Quick fitting TS4-M5, TS4-01
- Load ratio = $\frac{\text{Load}}{\text{Cylinder theoretical thrust}}$ (%)
- Cylinder stroke: 100mm [3.9 in.]



Maximum operating speed



Delay time



Solenoid Valve Mass

g [oz.]

Basic model	Mass
H050E1	190 [6.70] (185 [6.53])
H050-4E1	190 [6.70] (185 [6.53])
H050-4E2	400 [14.11]
H050LE1	295 [10.41] (290 [10.23])
H050-4LE1	295 [10.41] (290 [10.23])

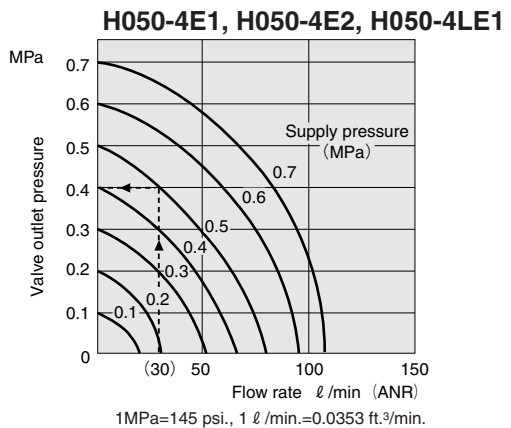
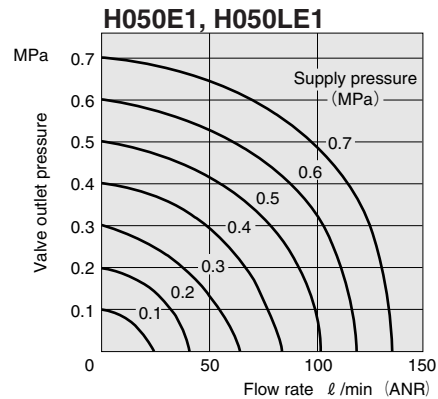
Remark: Figures in parentheses () are for port size NPT1/8: -01.

Manifold Mass

g [oz.]

Manifold model	Mass calculation of each unit (n= number of units)	Block-off plate
HSM□	$(47 \times n) + 30$ [(1.66 \times n) + 1.06]	20 [0.71]

Flow Rate



How to read the graph

When the supply pressure is 0.5MPa [73 psi.] and flow rate is 30 l/min [1.06ft³/min.] (ANR), the valve outlet pressure becomes 0.4 MPa [58 psi.].

H050 Series Solenoid Valve Order Codes (Standard Type, Low Current Type)

Port size	2-, 3-port valve Number of ports	2-, 3-port valve Valve function	Mounting base	Wiring type	Speed controller	LED indicator	Flywheel diode				
Blank : 10-32 UNF -01 : NPT1/8	3-port	Normally closed (NC)	Without mounting base	Grommet type	Without speed controller	Without LED indicator	Without flywheel diode	Basic model			
	2-port	Normally open (NO)	With mounting base	DIN connector	With speed controller	For standard type	With flywheel diode				
						For low current type		Voltage			
Standard type	2-, 3-port single solenoid	H050E1	-01	-2	-11	-21	-39	-70	-LF	-SR	DC24V AC100V AC200V
	5-port single solenoid	H050-4E1									
	5-port double solenoid	H050-4E2									
Low current type	2-, 3-port single solenoid	H050LE1	-01	-2	-11	-21	-39	-70	-L	-SR	DC24V
	5-port single solenoid	H050-4LE1									

● Not available with DIN connector

● For DC24V only.
Equipped for AC100V and AC200V as standard.

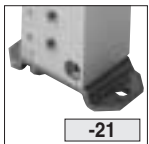
H050 Series Manifold Order Codes (Standard Type, Low Current Type)

		Port size	2-, 3-port valve Number of ports	2-, 3-port valve Valve function	Wiring type	LED indicator	Flywheel diode			
		Blank : 10-32 UNF -01 : NPT1/8	3-port Blank	Normally closed (NC) Blank	Grommet type 	Without LED indicator 	Without flywheel diode 			
			2-port -2	Normally open (NO) -11	DIN connector 	For standard type 	With Flywheel diode 			
						For low current type 				
		Manifold model Number of units	Station	Basic model				Voltage		
Standard type	HSM	2 ⋮ 10	stn. <input type="checkbox"/> ⋮ stn. <input type="checkbox"/>	H050E1		-2	-11			DC24V AC100V AC200V
				H050-4E1	-01					
				H050-4E2						
Low current type				H050LE1		-2	-11			DC24V
				H050-4LE1	-01					

● Valve mounting location from the left-hand side when facing the 4(A), 2(B) ports.
 ● Not available with DIN connector.
 ● For DC24V only. For AC100V, and AC200V, equipped as standard.
 ● Specify the valve type for each station.
 ● Enter -BP when closing a station with a block-off plate without mounting a valve.

Options

Mounting base



-21

- For direct piping
- Not available with double solenoid

Speed controller



-70

- For direct piping
- Not available with 3-port

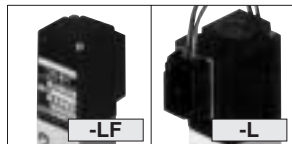
DIN connector



-39

- Cannot be used with -LF and -L

With built-in LED indicator

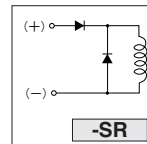


-LF

-L

- For standard type
- For low current type

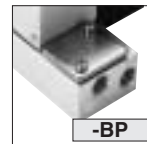
With built-in flywheel diode



-SR

- For DC24V only

Block-off plate

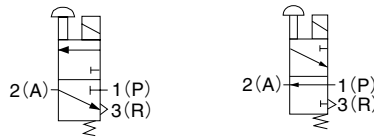


-BP

Operating Principles and Symbols

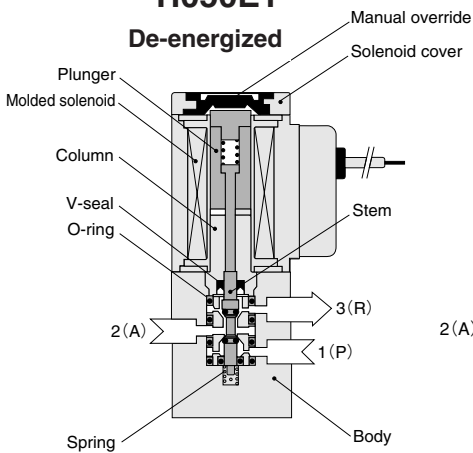
3-port

Normally closed (NC) Normally open (NO)



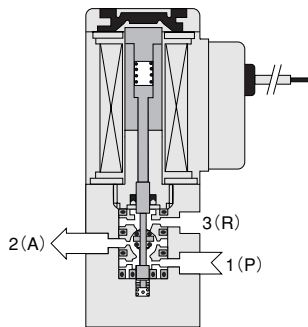
H050E1

De-energized



H050E1-11

De-energized



Major Parts and Materials

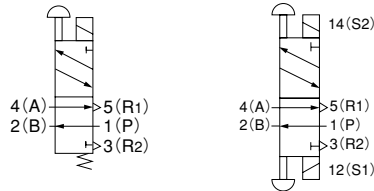
	Parts	Materials
Valve	Body	Aluminum alloy (anodized)
	Stem	Brass
	V-seal, O-ring	Synthetic rubber
	Mounting base	Mild steel (zinc plated)
	Spring	Piano wire
	Plunger	Magnetic stainless steel
Manifold	Column	Magnetic steel
	Body	Aluminum alloy (anodized)
	Block-off plate	Mild steel (zinc plated)
	Seal	Synthetic rubber
	Mounting bracket	Steel (zinc plated)

Remark: Materials that generate copper ions are not used for the non-ion specification.

5-port

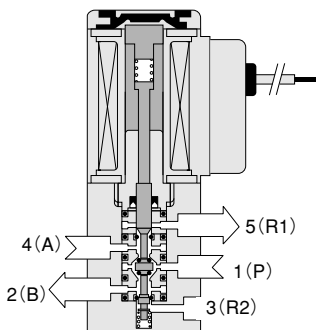
Single solenoid

Double solenoid



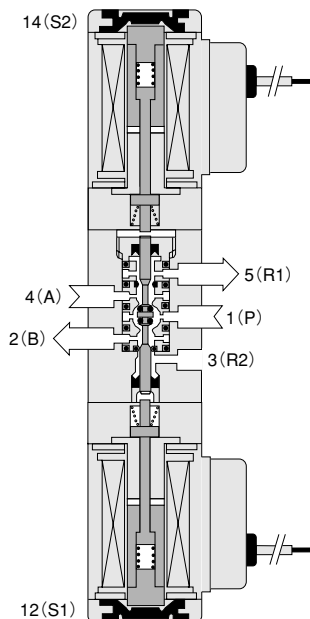
H050-4E1

De-energized



H050-4E2

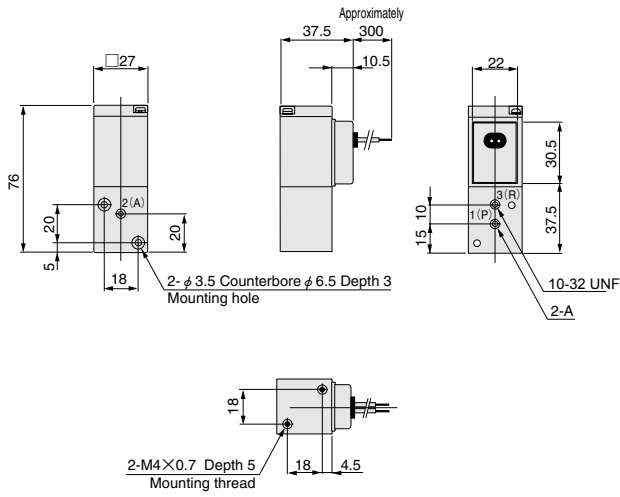
(De-energized condition after energizing solenoid S1)



Dimensions of Standard Type Solenoid Valve (mm)

2-, 3-port

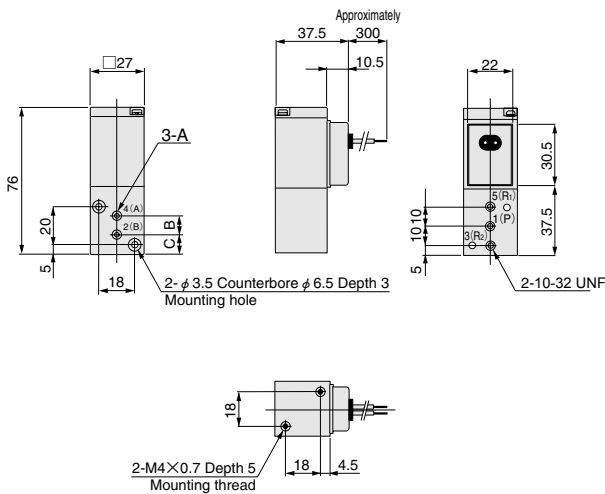
H050E1



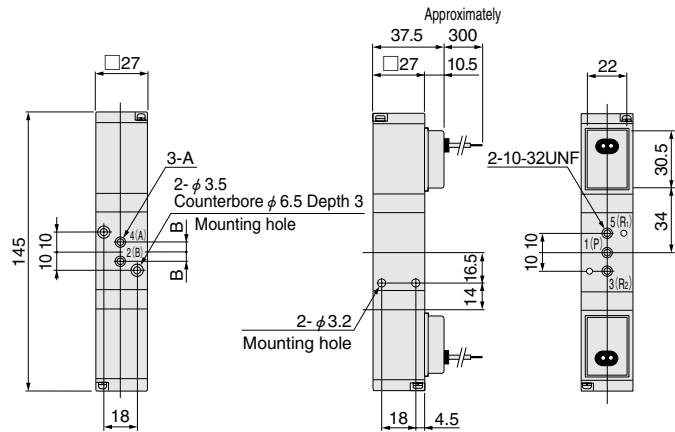
Code		A
Model	H050E1	10-32 UNF
Model	H050E1-01	NPT1/8

5-port

H050-4E1



H050-4E2

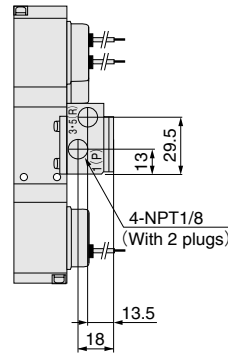
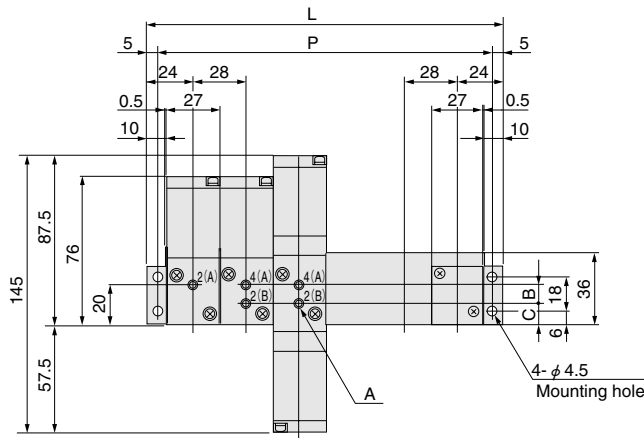


Code		A	B	C
Model	H050-4E1	10-32 UNF	10	10
Model	H050-4E1-01	NPT1/8	16	7

Code		A	B
Model	H050-4E2	10-32 UNF	5
Model	H050-4E2-01	NPT1/8	8

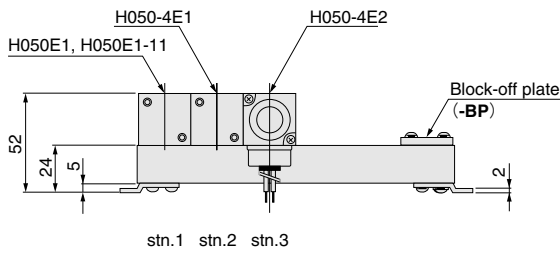
Dimensions of Standard Type Manifold (mm)

HSM□



Unit dimensions

Model	L	P
HSM2	76	66
HSM3	104	94
HSM4	132	122
HSM5	160	150
HSM6	188	178
HSM7	216	206
HSM8	244	234
HSM9	272	262
HSM10	300	290

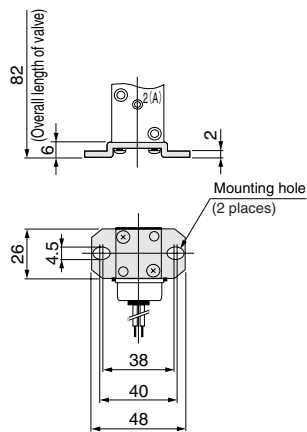


Code	A	B	C
Model			
H050E1	10-32 UNF	—	—
H050E1-01	NPT1/8	—	—
H050-4E□	10-32 UNF	10	10
H050-4E□-01	NPT1/8	16	7

Options (mm)

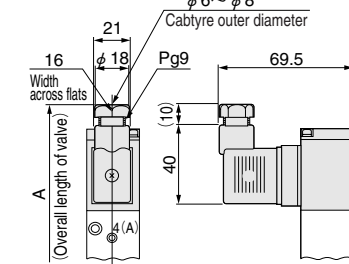
● Mounting base: -21

● For standard type



● Solenoid with DIN connector: -39

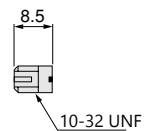
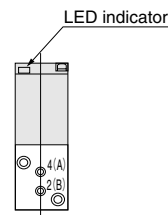
● For standard type



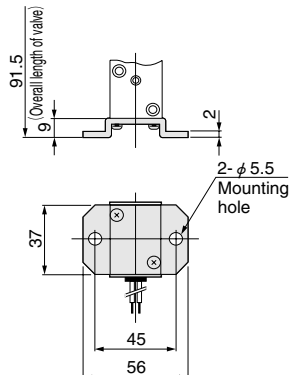
Code	A
Model	
H050E1	87
H050-4E1	
H050-4E2	171

● Solenoid with LED indicator: -LF

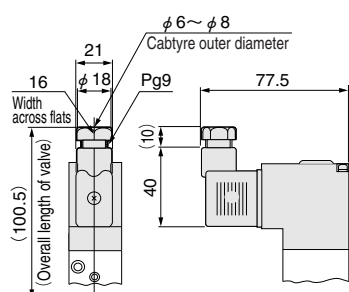
● For standard type



● For low current type

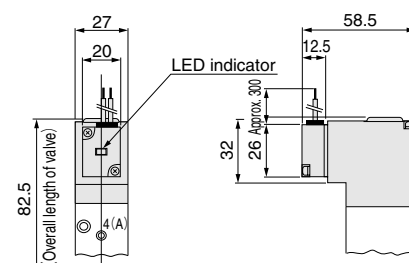


● For low current type



● Solenoid with LED indicator: -L

● For low current type



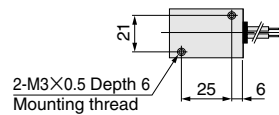
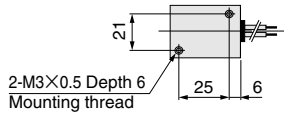
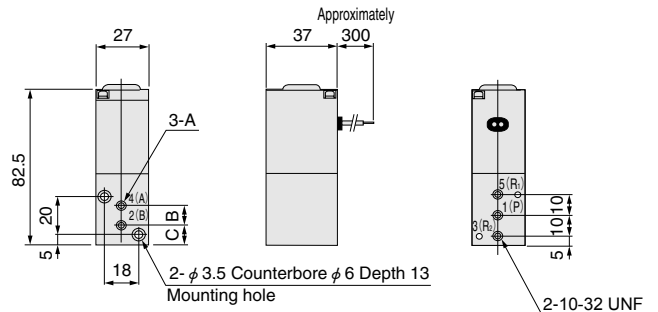
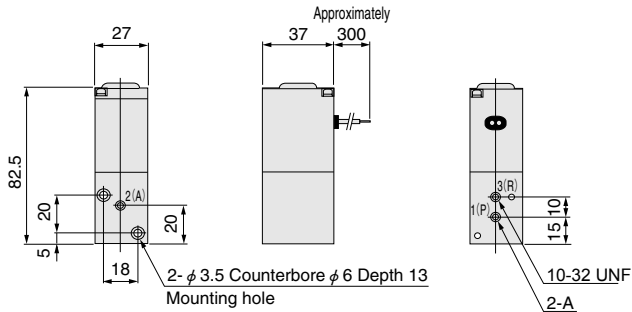
Dimensions of Low Current Type Solenoid Valve (mm)

2-, 3-port

5-port

H050LE1

H050-4LE1

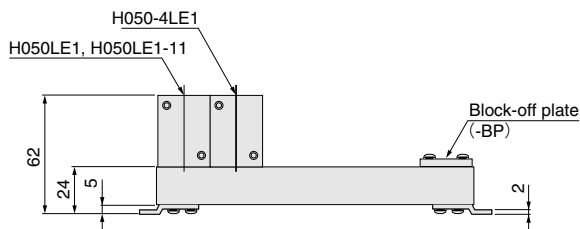
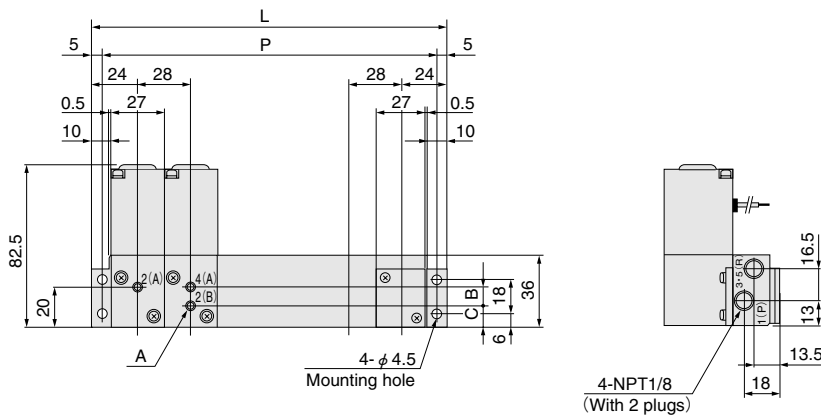


Code	A
H050-4LE1	10-32 UNF
H050-4LE1-01	NPT1/8

Code	A	B	C
H050-4LE1	10-32 UNF	10	10
H050-4LE1-01	NPT1/8	16	7

Dimensions of Low Current Type Manifold (mm)

HSM□



Unit dimensions

Model	L	P
HSM2	76	66
HSM3	104	94
HSM4	132	122
HSM5	160	150
HSM6	188	178
HSM7	216	206
HSM8	244	234
HSM9	272	262
HSM10	300	290

Code	A	B	C
HH050LE1 H050-4LE1	10-32 UNF	10	10
H050LE1-01 H050-4LE-01	NPT1/8	16	7

For options, see p.141.

Handling Instructions and Precautions

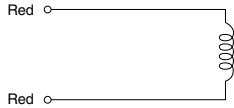


Solenoid

Internal circuit

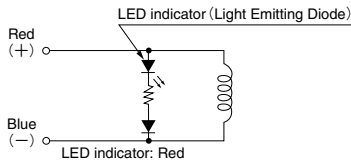
●DC24V

Standard solenoid



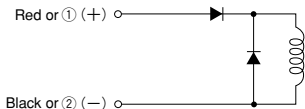
Solenoid with LED indicator

Order code: -LF, -L



Solenoid (Surge suppression)

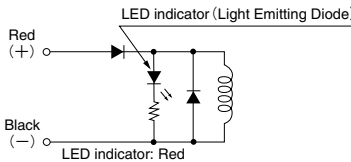
Order code: -SR



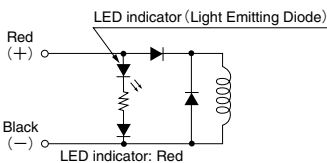
① and ② are for with DIN connector (Order code: -39).

Solenoid with LED indicator (Surge suppression)

Standard type Order code: -LF-SR

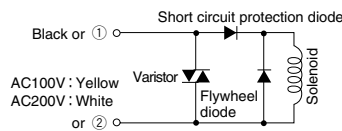


Low current type Order code: -L-SR



●AC100V, AC200V

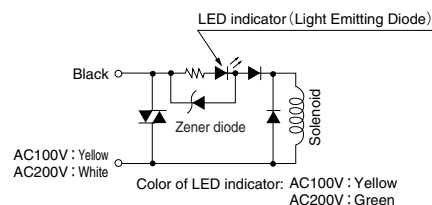
Standard solenoid (Surge suppression)



① and ② are for with DIN connector (Order code: -39).

Solenoid with LED indicator (Surge suppression)

Order code: -LF



Cautions: 1. Do not apply megger between the lead wires.

2. The DC solenoid will not short circuit even if the wrong polarity is applied, but the surge suppression solenoid valve will not operate. In addition, in solenoids with an LED indicator, the LED will not light up.

3. Leakage current inside the circuit could result in failure of the solenoid valve to return, or in other erratic operation. Always use it within the range of the allowable leakage current. If circuit conditions, etc. cause the leakage current to exceed the maximum allowable leakage current, consult us.

4. For a double solenoid valve, avoid energizing both solenoids simultaneously. The valve could fall into the neutral position.

5. Since the AC solenoid uses diodes for the solenoid, always use lead wires of the same color when connecting a number of solenoid units in parallel. The DC24V standard solenoid, however, has no polarity, so either lead wire connection is acceptable.

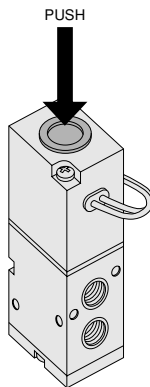


Manual override

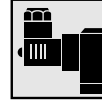
Non-locking type

To operate the manual override, press it all the way down. The valve works the same as when in the energized state as long as the manual override is pushed down, and returns to the rest position upon release.

For the double solenoid, pressing the manual override on the 12(S1) side switches the 12(S1) to the energized state, and the unit remains in that state even after the manual override is released. To return it to the rest position, operate the manual override on the 14(S2) side. This is the same for the solenoid 14(S2).



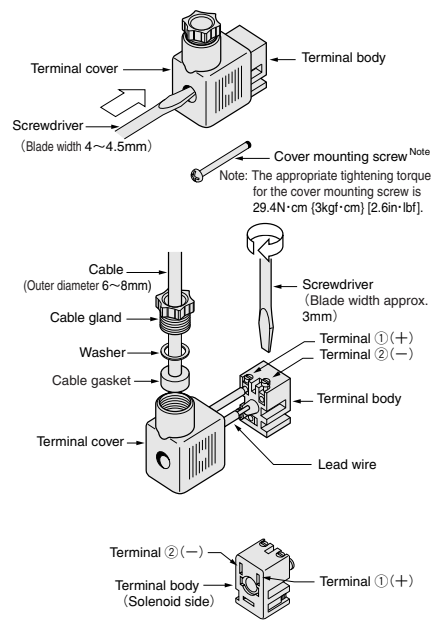
※ Illustration shows the 200 series.



DIN connector

Wiring instructions

Remove the cover mounting screws, and lift the terminal cover off from the solenoid. Use a screwdriver (blade width 4~4.5mm [0.16~0.18in.]), etc. to push strongly against the terminal body through the hole of the terminal cover's mounting screw, and remove the terminal body. Slip a cable gland, washer, and cable gasket over a cable (outer diameter 6~8mm [0.24~0.31in.]), insert the cable into the terminal cover's wiring port, and connect the lead wire to the terminal body (screwdriver blade width of about 3mm [0.12in.]).



※For the DC24V solenoid with surge suppression, connect (+) to Terminal ①, and (-) to Terminal ②.