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SOLENOID VALVES
050 SERIES

Basic Models and Functions

Item \ Basic model	Standard type			Low current type	
	050E1	**050-4E1**	**050-4E2**	**050LE1**	**050-4LE1**
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	
		050E1	**050-4E1**	**050-4E2**	**050LE1**	**050-4LE1**
Media		Air			Air	
Operation type		Direct acting type			Direct acting type	
Effective area〔Cv〕	mm²	1.5〔0.08〕	1.2〔0.07〕		1.5〔0.08〕	1.2〔0.07〕
Port size Note 1		M5×0.8			M5×0.8	
Lubrication		Not required			Not required	
Operating pressure range	MPa {kgf/cm²} [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/cm²} [psi.]	1.05 {10.7} [152]			1.05 {10.7} [152]	
Response time Note2 ON/OFF	ms DC24V	20/20 or below		20 or below	30/30 or below	
	ms 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/s²{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〕	100 (2.4W) 〔112 (2.7W)〕
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
050E1[Note], **050-4E1** **050-4E2** **050LE1**[Note], **050-4LE1**	Standard	Female thread	M5×0.8
	Optional	Female thread	1(P), 4(A), 2(B) port: Rc1/8 3(R2), 5(R1) port: M5×0.8

Note: The output ports of 050E1 and 050LE1 are the (2A) port.

Solenoid Valve Mass

g [oz.]

Basic model	Mass
050E1	190 [6.70] (185 [6.53])
050-4E1	190 [6.70] (185 [6.53])
050-4E2	400 [14.11]
050LE1	295 [10.41] (290 [10.23])
050-4LE1	295 [10.41] (290 [10.23])

Remark: Figures in parentheses ( ) are for port size Rc1/8: -01.

Manifold Port Size

Manifold model	Port	Location of piping port	Port size
SM□	1(P)	Manifold	Rc 1/8
	4(A), 2(B)	Valve	M5×0.8[Note]
	3, 5(R)	Manifold	Rc 1/8

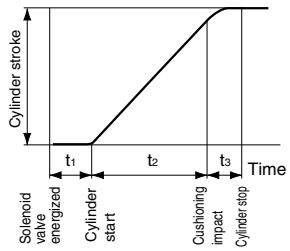
Note: For standard specification valves. In the case of optional ports **-01**: Rc1/8.

Manifold Mass

g [oz.]

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

Cylinder Operating Speed

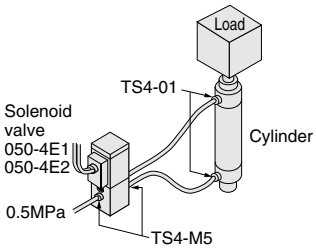


To obtain the time required for the cylinder to complete 1 stroke, add the cylinder's delay time t_1 (time between energizing of the solenoid valve and actual starting of the cylinder), to the cylinder's max. speed operating time t_2. When a cushion is used, add the cushioning time t_3, to the above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

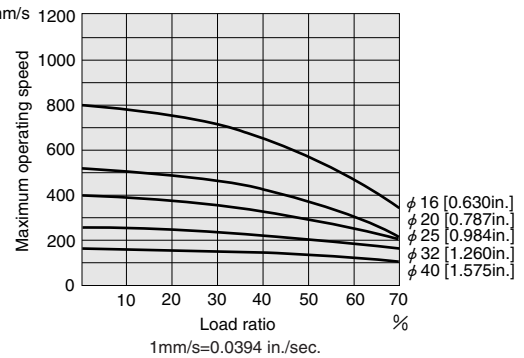
050-4E1, 050-4E2

Measurement conditions

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

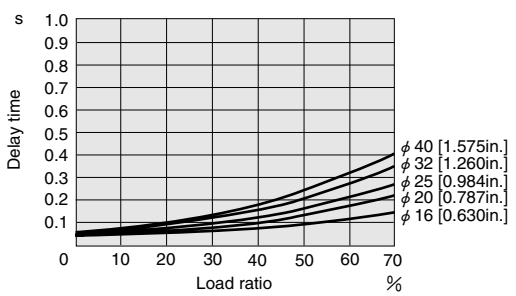


Maximum operating speed



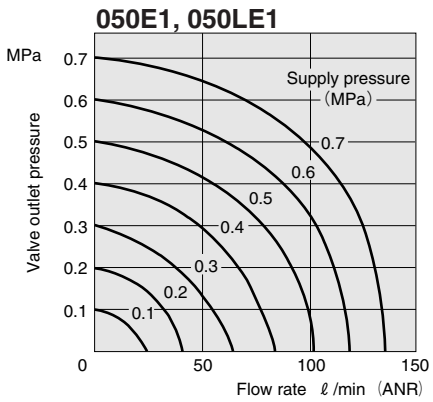
1mm/s=0.0394 in./sec.

Delay time

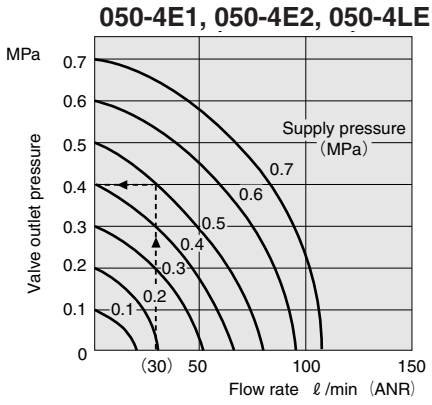


Flow Rate

050E1, 050LE1



050-4E1, 050-4E2, 050-4LE1



1MPa=145 psi., 1 ℓ/min.=0.0353 ft.³/min.

How to read the graph

When the supply pressure is 0.5MPa [73 psi.] and flow rate is 30 ℓ/min [1.06ft.³/min.] (ANR), the valve outlet pressure becomes 0.4 MPa [58 psi.].

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