

# MICRO EJECTORS

## ME12, ME25, ME60



### Specifications

#### ● Micro ejectors

Item	Model	ME12	ME25	ME60
Media		Air		
Operating pressure range	MPa [psi.]	0.1~0.6 [15~87]		
Operating temperature range	°C [°F]	0 ~ 50 [32~122] (No freezing)		
Nozzle diameter	mm [in.]	0.7 [0.028]	1.0 [0.039]	1.5 [0.059]
Vacuum <sup>Note</sup>	kPa [in.Hg]	-92 [-27.2]		
Vacuum flow rate <sup>Note</sup>	ℓ/min [ft. <sup>3</sup> /min.] (ANR)	12.5 [0.441]	25 [0.88]	58 [2.05]
Compressed air consumption <sup>Note</sup>	ℓ/min [ft. <sup>3</sup> /min.] (ANR)	23 [0.81]	46 [1.62]	107 [3.78]
Lubrication		Prohibited		
Filtration	μm	30		
Port size		Rc1/8	Rc1/4	

Note: Value is measured at air pressure of 0.5MPa [73psi.].

#### ● Vacuum switches

Item	Operation	When NO	When NC
Setting vacuum	kPa [in.Hg]	-26.7~-80 [-7.89~-23.6]	
Response differential	kPa [in.Hg]	-5.3~-13.3 [-1.57~-3.94]	
Color of connected lead wire		Black, white	Black, red
Electric rating		5A/AC250V, 5A/DC24V (resistance load)	

Remark: For the internal switch, JIS-S2H1PO1 or equivalent is used.

#### ● Single and twin solenoid valves

Item	Basic model	For ME12		For ME25, ME60				
		Single solenoid valve		Single solenoid valve		Twin solenoid valves <sup>Note</sup>		
		ME12E1		125EE1		125EE2		
Operation type		Direct operating		Direct operating				
Number of ports		2 ports (NC, NO)		2 ports (NC)				
Port size		Rc1/8		Rc1/4				
Proof pressure	MPa [psi.]	1.03 [149]		1.03 [149]				
Effective area	mm <sup>2</sup> [Cv]	1.5 [0.08]		3 [0.16]				
Maximum operating frequency	Hz	5		5				
Mounting direction		Any		Any				
Voltage type		AC100V (Lead wire: yellow) AC200V (Lead wire: white) DC24V (Lead wire: red, black)		AC100V (Lead wire: yellow, black) AC200V (Lead wire: white, black) DC24V (Lead wire: red, black)				
Operating voltage range	AC100V	90~110V (100V±10%)		90~110V (100V±10%)				
	AC200V	180~220V (200V±10%)		180~220V (200V±10%)				
	DC24V	21.6~26.4V (24V±10%)		21.6~26.4V (24V±10%)				
Current	mA	Frequency	50Hz	60Hz	50Hz	60Hz	50Hz	60Hz
		AC100V	40	32	96	95	96	95
		AC200V	23	17	48	46	48	46
		DC24V	125		412		412	
Insulation resistance	MΩ	100 or more		100 or more				
Wiring		Grammet type (Lead wire length 300mm)		Grammet type (Lead wire length 300mm)				
Manual override		Locking and non-locking type		Locking type				
Surge suppression		Flywheel diode (only DC)						

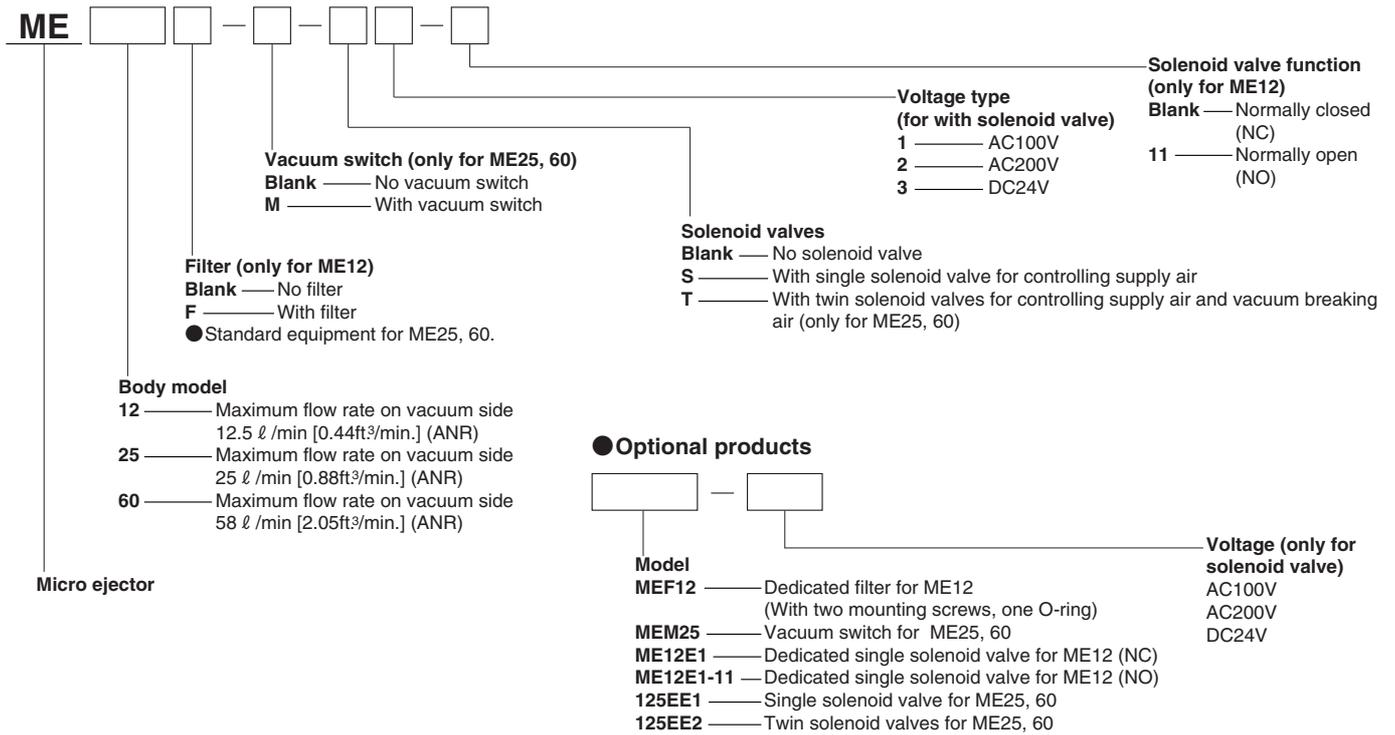
Note: While there are two solenoids in the twin solenoid valves, for vacuum generation use and vacuum breaking use, the configuration prevents power from being sent to both of them at the same time.

### Mass

Model	Item	Body mass	Additional mass			
			With filter	With vacuum switch	With single solenoid valve	With twin solenoid valves
ME12		40 [1.41]	25 [0.88]	—	80 [2.82]	—
ME25, 60		335 [11.82]	—	160 [5.64]	90 [3.17]	230 [8.11]

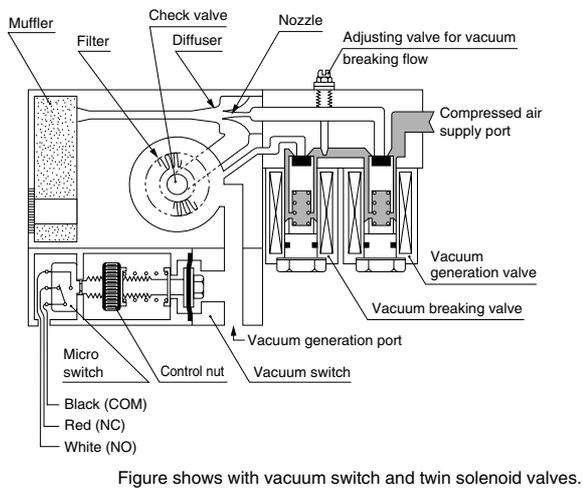
Calculation example: Mass of ME25 with a vacuum switch and twin solenoid valves is 335+160+230 = 725g [25.57oz.]

## Order Codes

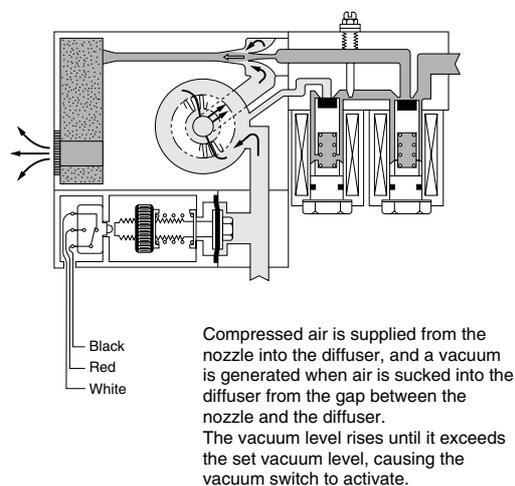


## Operation Principle and Major Parts

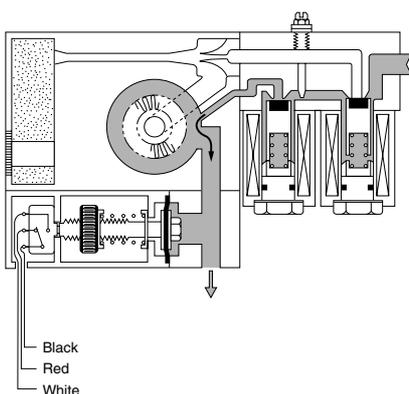
### ● Not in operation



### ● When vacuum generation valve is ON

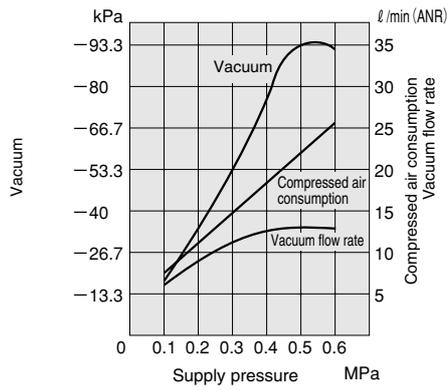


### ● When vacuum breaking valve is operating

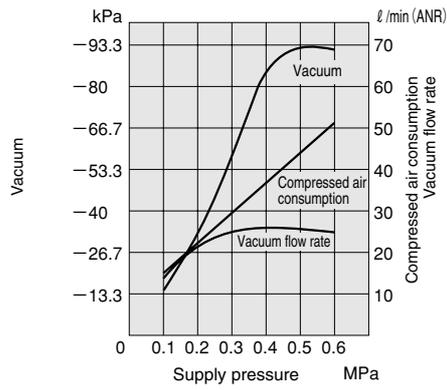


# Air Consumption, Vacuum and Vacuum Flow Rate

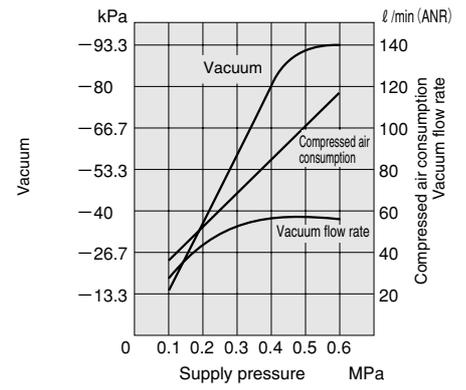
## ME12



## ME25



## ME60

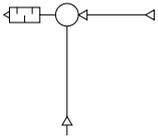


1MPa = 145psi. 1kPa = 0.145psi. -100kPa = -29.54in.Hg 1 l/min = 0.0353ft<sup>3</sup>/min.

## Symbols

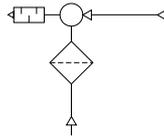
### Single unit

ME12



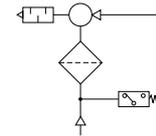
### With filter

ME12F ME25 ME60



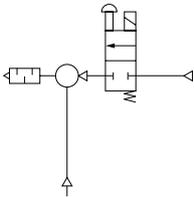
### With vacuum switch and filter

ME25-M ME60-M



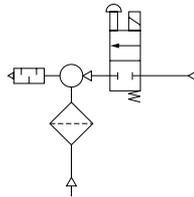
### With single solenoid valve

ME12-S



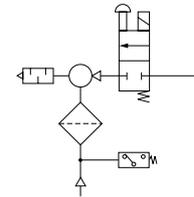
### With single solenoid valve and filter

ME12F-S ME25-S ME60-S



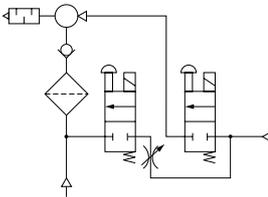
### With vacuum switch, single solenoid valve, and filter

ME25-M-S ME60-M-S



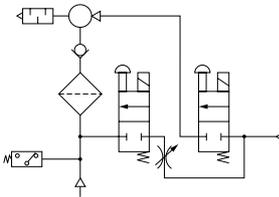
### With twin solenoid valves and filter

ME25-T ME60-T



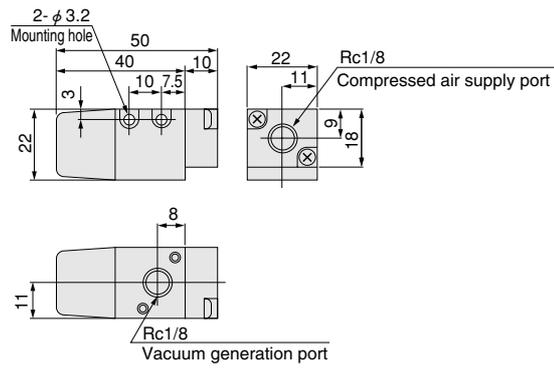
### With vacuum switch, twin solenoid valves, and filter

ME25-M-T ME60-M-T

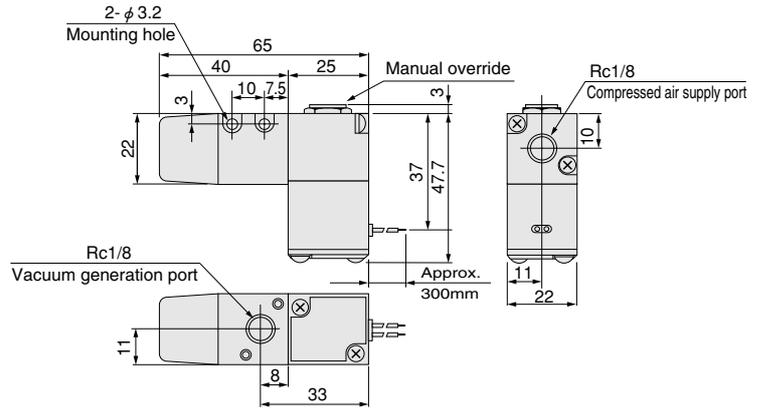


# Dimensions of ME12 (mm)

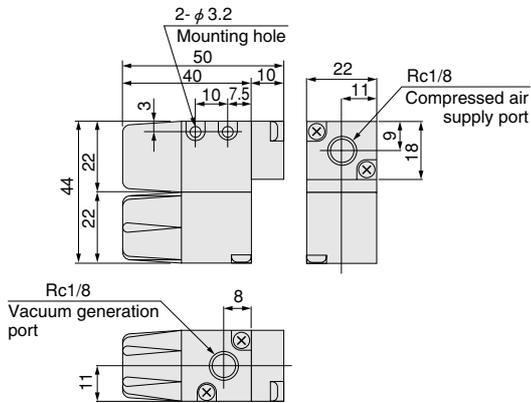
## ●ME12



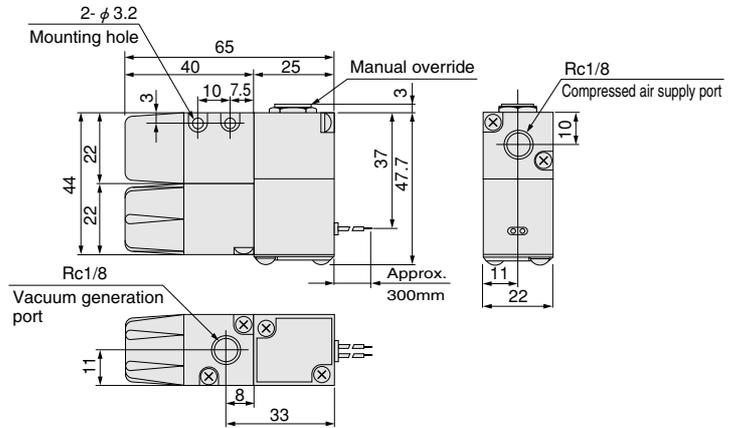
## ●ME12-S□



## ●ME12F

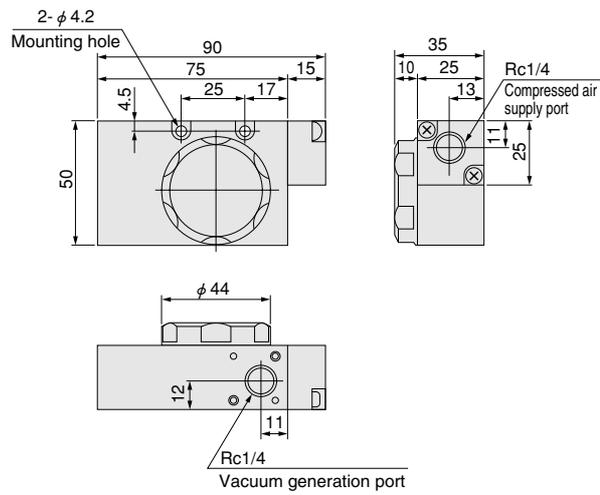


## ●ME12F-S□

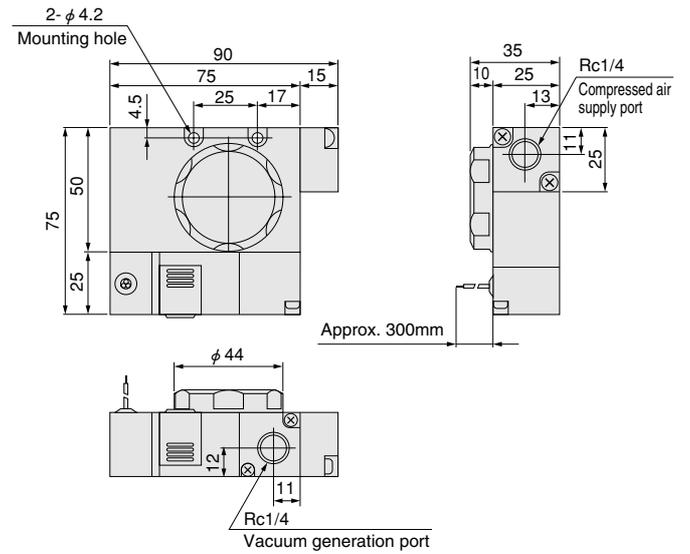


# Dimensions of ME25, ME60 (mm)

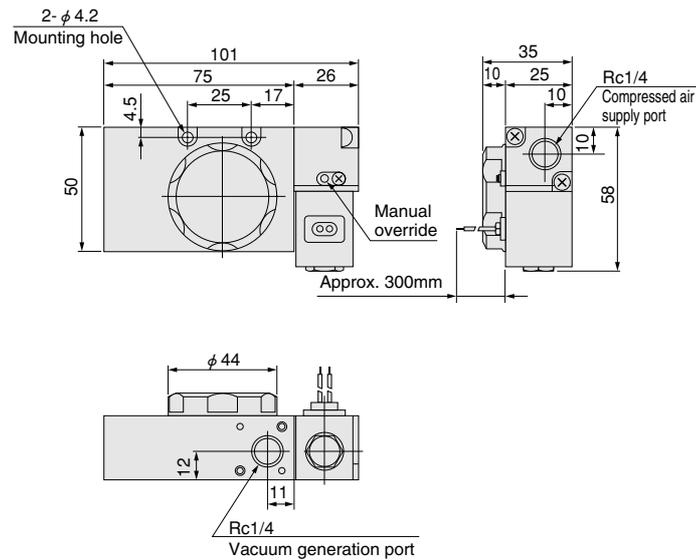
- ME25
- ME60



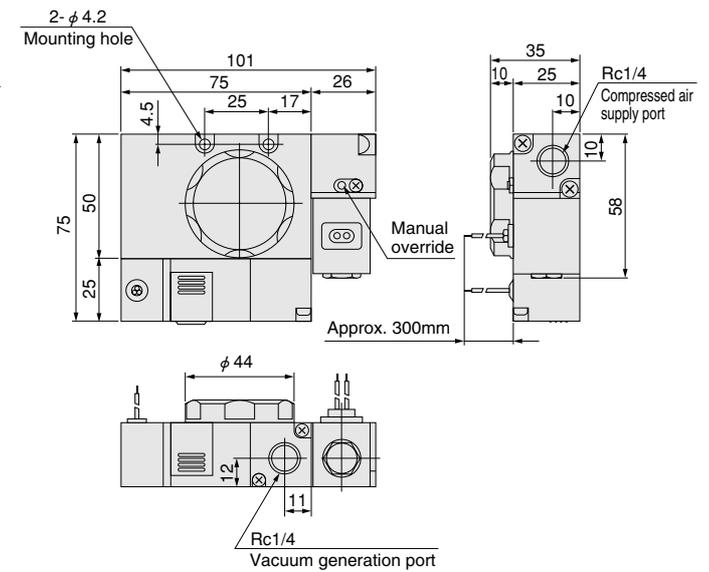
- ME25-M
- ME60-M



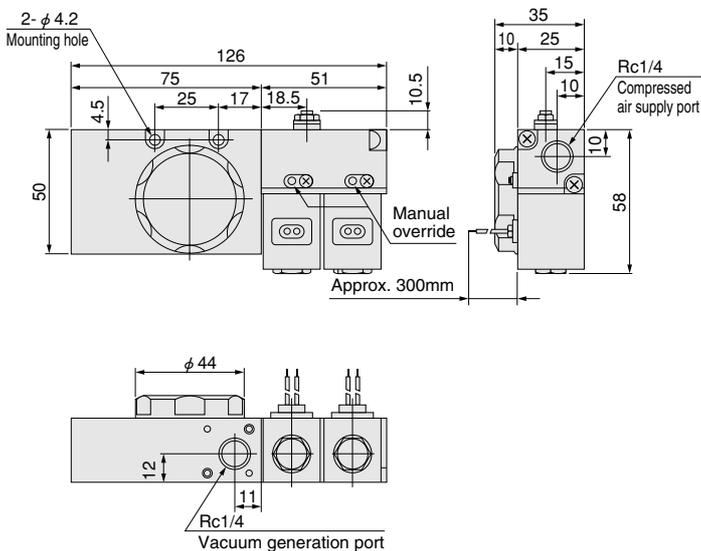
- ME25-S
- ME60-S



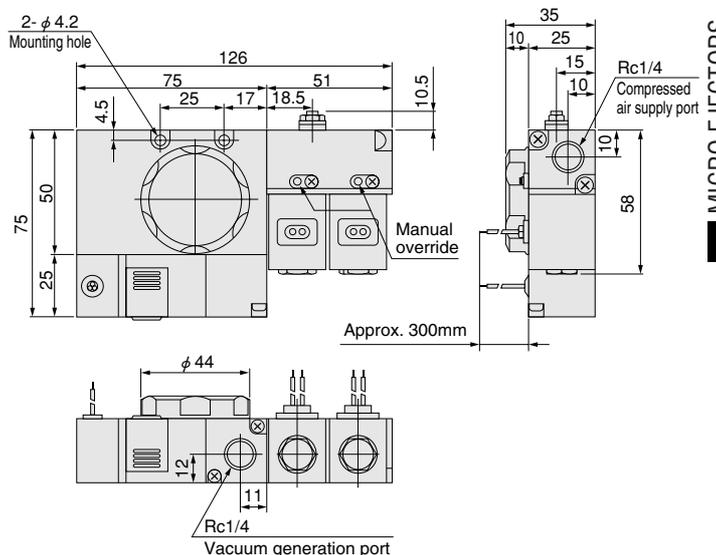
- ME25-M-S
- ME60-M-S



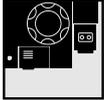
- ME25-T
- ME60-T



- ME25-M-T
- ME60-M-T



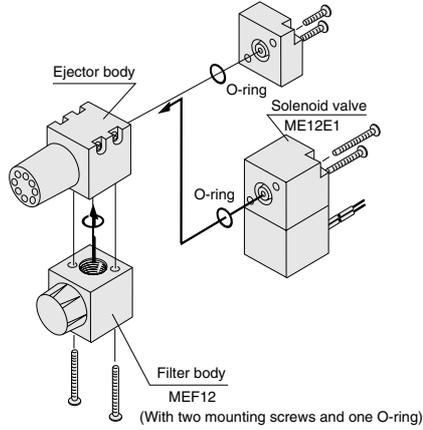
# Handling Instructions and Precautions



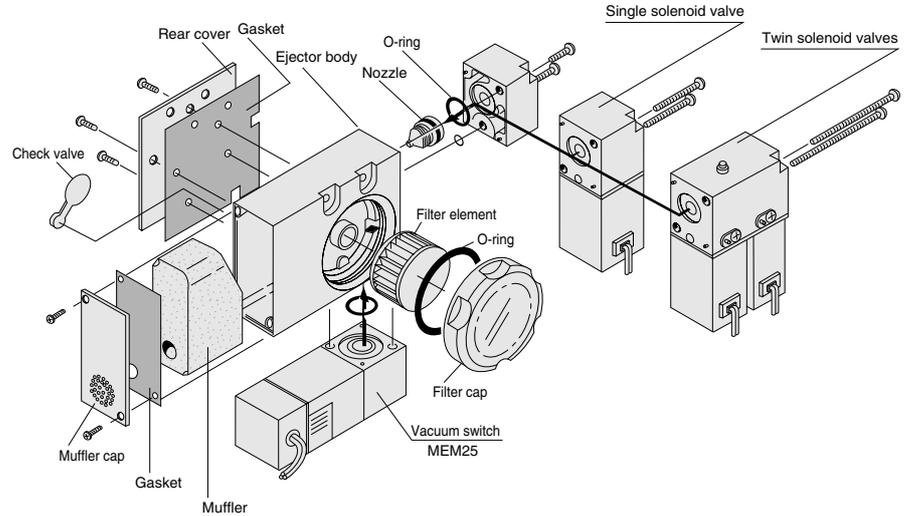
## Micro ejector

### Device configuration

#### ●ME12



#### ●ME25, 60



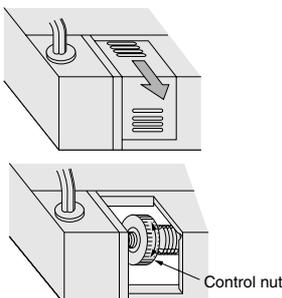
### Piping

1. Connect air supply to the compressed air supply port, and a vacuum pad, etc., to the vacuum generation port.
2. For piping to the micro ejector, use a nylon or urethane tube with inner diameter of  $\phi 4 \sim \phi 6$  [ $\phi 0.157 \sim \phi 0.236$ in.]. For vacuum generation ports, tubes of the following sizes are recommended.  
 ME12  $\cdots \phi 4 \times 2.5 \sim \phi 6 \times 4$   
 ME25  $\cdots \phi 6 \times 4 \sim \phi 8 \times 6$   
 ME60  $\cdots \phi 8 \times 6 \sim \phi 10 \times 8$

- Cautions:**
1. Use a fitting that does not reduce inner diameter. A small inner diameter can result in degradation of performance, including flow rate and pressure shortages, insufficient vacuum, or longer periods of time before the vacuum level is reached.
  2. Avoid using coil tubes and other forms of spiraled piping. Also, avoid use of elbow fittings, etc., between the micro ejector and vacuum pad, and use piping that is as straight as possible.

### Vacuum switch

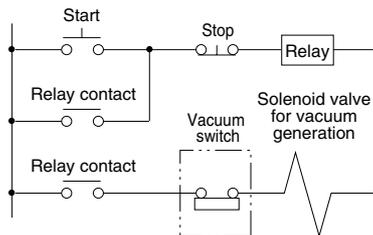
When vacuum reaches the set vacuum level which is adjusted by a control nut, a micro switch operates, and an electrical signal is obtained. Move the cover in the direction of the arrow, and rotate the control nut to adjust the vacuum level. Rotate the control nut in the  $\downarrow$  direction to increase the set vacuum level to rise, and rotate it in the  $\uparrow$  direction to reduce the vacuum level.



### Solenoid valve

The micro ejector includes an optional single solenoid valve for vacuum generation, and optional twin solenoid valves for vacuum generation and vacuum breaking air (twin solenoid valves are for ME25 and 50 only). The twin solenoid valves option uses supply pressurized air to the vacuum side to enable vacuum breaking and blow-off release, and makes use of a breaking flow adjustment valve to allow flexible setting of breaking and release time. In addition, a built-in check valve ensures that the vacuum level setting can be maintained even when the power to the vacuum generation solenoid valve has been switched off, enabling energy savings.

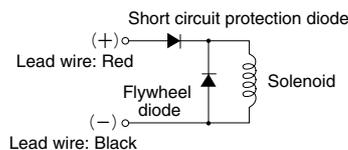
#### ● Energy-saving circuit for maintaining vacuum over long periods



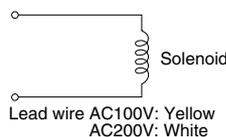
#### ● Solenoid internal circuit

##### ME12

##### DC24V (surge suppression)

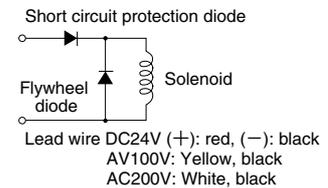


##### AC100V, AC200V (shading type)



#### ME25, ME60

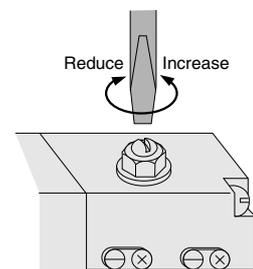
##### For DC and AC (DC surge suppression)



- 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 valve will not operate.
  3. Leakage current inside the circuit could result in failure of the solenoid valve to return, or 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.

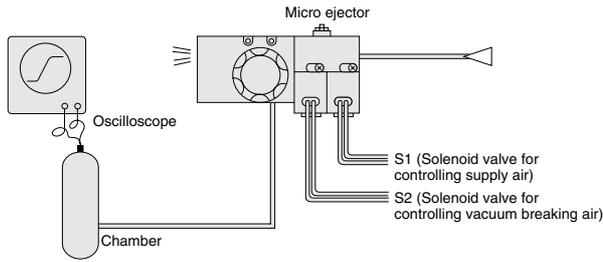
#### ● Adjustment of breaking flow rate

Rotate the adjusting needle for vacuum breaking flow rate in the clockwise direction to reduce the vacuum breaking flow rate and lengthen vacuum breaking time, and in the counterclockwise direction to increase the vacuum breaking flow rate and shorten breaking time.

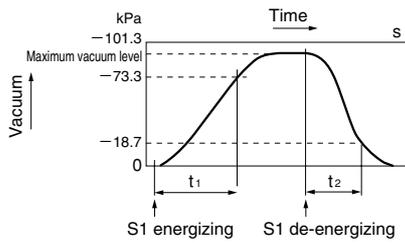


# Time to Reach Vacuum and Vacuum Breaking Time

## ● Measurement circuits and conditions



## ● Measurement method



Air pressure: 0.5MPa [73psi.]  
 t<sub>1</sub>: Time to reach -73.3kPa [-21.65in.Hg] in the chamber after energizing S1.  
 t<sub>2</sub>: Time to reach -18.7kPa [-5.52in.Hg] in the chamber after energizing S2.

## ● Response time

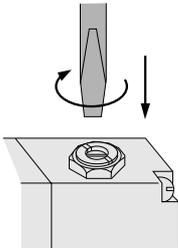
Chamber capacity cm <sup>3</sup> [in. <sup>3</sup> ]	Time s											
	10 [0.610]		50 [3.05]		200 [12.2]		1000 [61.0]		3000 [183]		5000 [305]	
Model	t <sub>1</sub>	t <sub>2</sub>										
ME12	1.5	—	2.0	—	4.0	—	7.5	—	26.0	—	50.0	—
ME25	1.0	0.1	1.3	0.1	2.0	0.2	3.8	0.4	13.0	1.5	23.0	3.0
ME60	0.5	0.1	1.0	0.1	1.5	0.2	3.0	0.4	10.0	1.5	15.0	3.0

Note: Some degree of variation may occur due to piping size and chamber shape.  
 The figures can be viewed as a guide.

## ● Manual operation

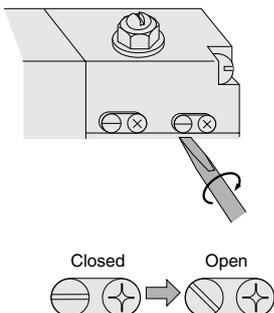
### ME12E1

To lock the manual override, use a small screwdriver to push down the manual override all the way and turn it 45 degrees or more. Either turning direction at this time is acceptable.  
 When locked, turning the manual override from the locking position releases a spring on the manual override, returns it to its original position, and release the lock.



### 125EE1, 125EE2

To lock, use a screwdriver to rotate the manual override 45 degrees and tilt the screw groove 45 degrees. Either turning direction at this time is acceptable.  
 To release the lock, rotate the manual override by 45 degrees, and return the screw groove to horizontal.



**Caution:** Always release the lock on the manual override before commencing normal operation.