

# 3-Port Solenoid Valve Modular Type/Residual Pressure Release Valve VP346E/546E/746E/946E Series

Flow rate characteristics  $c_c$  [dm<sup>3</sup>/(s·bar)]

VP346E: 4.2

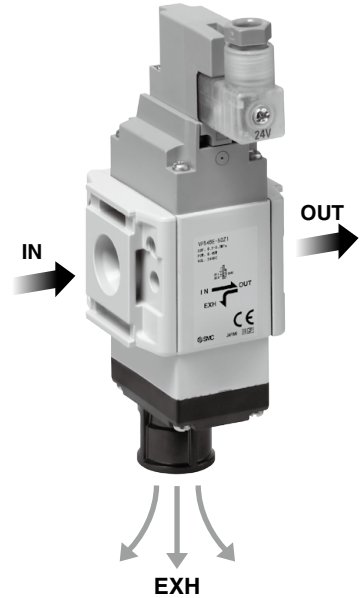
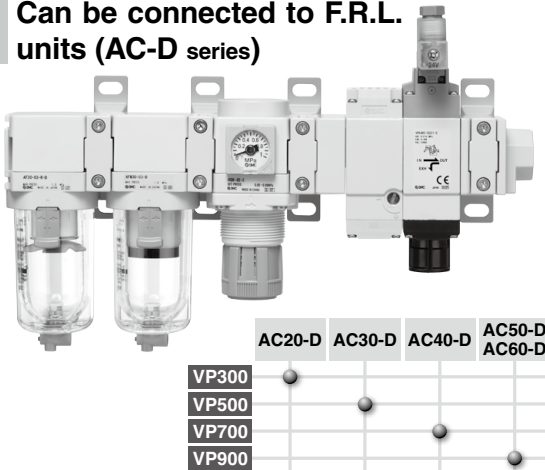
VP546E: 7.5

VP746E: 12.6

Effective area mm<sup>2</sup>

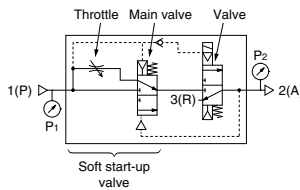
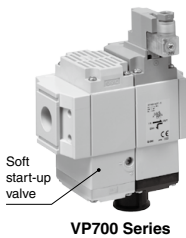
VP946E: 234

Can be connected to F.R.L. units (AC-D series)

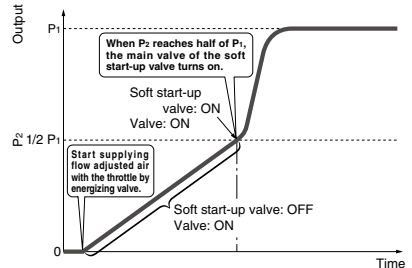


Allows for space saving and reduced piping labor.

A model with a soft start-up function is also available.



Output Pressure (P<sub>2</sub>) vs Time Graph



Power consumption: **0.35 W** (Without light)

Features a check valve built into the pilot flow path

(Supports pilot pressure drops caused by pressure fluctuations on the inlet side)

# VP346E/546E/746E/946E Series

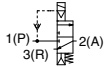


## How to Order

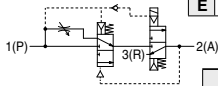
**Modular Type** VP **5** 46 E **5** DZ **1** - R - **1**

### Symbol

Residual pressure relief 3-port solenoid valve



With soft start-up function



**Series**

3	VP300
5	VP500
7	VP700
9	VP900

### Solenoid valve type

E	Residual pressure relief 3-port solenoid valve
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### Pressure specifications

		Series			
		VP300	VP500	VP700	VP900
Nil	Standard (0.7 MPa)	●	●	●	●
K	High pressure (1.0 MPa)	-	●	●	-

### Rated voltage

DC
5 24 VDC

### Electrical entry

DIN terminal		DIN (EN 175301-803C) terminal		M12 connector
	<b>D:</b> With connector		<b>DO:</b> Without connector	
	<b>DZ:</b> With connector/ With light/surge voltage suppressor		<b>YZ:</b> With connector/ With light/surge voltage suppressor	
	<b>KOZ:</b> Without connector			

\* DIN terminal type "Y" which conforms to EN-175301-803C (former DIN4365C) is also available. For details, refer to the **Web Catalog**.

### Soft start-up function

Nil	None
S	With soft start-up function

### Flow direction

Nil	Left to right
R	Right to left

### Manual override

		Series			
		VP300	VP500	VP700	VP900
Nil	Non-locking push type	●	●	●	●
A	Non-locking push type (Manual)*1	-	●	●	-
E	Push-turn locking type (Manual)	●	●	●	●

\*1 Type A is only available for the VP500 and VP700.

## ⚠ Caution

- When using the surge voltage suppressor type, residual voltage will remain. For details, refer to the **Web Catalog**.
- Connection threads are not available for the residual pressure relief 3-port solenoid valve. Order a piping adapter and spacer with bracket separately.

## Simple Specials System

For modular connection units (shipped assembled), the simple specials system can be used.



### Short lead times

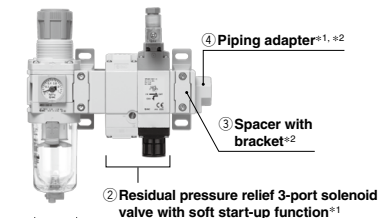
This system enables us to respond to your special needs (accessory assembly or the designing of a modular unit) as quickly as standard products.

Please contact your local sales representative for more details.

### Repeat orders

Once we receive a simple special part number from one of your previous orders, we will process the order, manufacture the product, and deliver it to you as quickly as possible.

## Simple Specials Combination Example



① Filter regulator

② Residual pressure relief 3-port solenoid valve with soft start-up function\*1

\*1 Connection threads are not available for the residual pressure relief 3-port solenoid valve. Select a piping adapter.  
\*2 Refer to page 1098 for details on the spacer with bracket and piping adapter.

- ① Filter regulator AW30-03E-D ..... 1 pc.
- ② Residual pressure relief 3-port solenoid valve with soft start-up function VP546E-5DZ1-S ..... 1 pc.
- ③ Spacer with bracket Y300T-D ..... 2 pcs.
- ④ Piping adapter E300-03-D ..... 1 pc.

### Applicable Combinations/

Attachment Combinations (Refer to page 1098.)

# 3-Port Solenoid Valve Modular Type/ Residual Pressure Release Valve **VP346E/546E/746E/946E Series**

## Specifications

Fluid	Air	
Type of actuation	N.C.	
Pressure specifications	Standard	High pressure
Internal pilot operating pressure range [MPa]	0.2 to 0.7	0.2 to 1.0 (VP546EK/VP746EK)
Operating and ambient temperatures [°C]	-10 to 50 (No freezing)	
Max. operating frequency <sup>*1</sup> [Hz]	5 Hz: VP346E, VP546E, VP746E 1 Hz: VP946E	
Manual override <sup>*2</sup>	Non-locking push type Non-locking push type (Manual) Push-turn locking type (Manual)	
Pilot exhaust	Individual exhaust	
Lubrication	Not required	
Mounting orientation	Unrestricted	
Impact/Vibration resistance <sup>*3</sup> [m/s <sup>2</sup> ]	150/30	
Enclosure	IP65	

\*1 Excludes the type with a soft start-up function

\*2 The non-locking push type (manual) is only compatible with the VP546E and VP746E.

\*3 Impact resistance: No malfunction occurred when it is tested in the axial direction and at the right angles to the main valve and armature in both energized and de-energized states every once for each condition. (Values at the initial period)

Vibration resistance: No malfunction occurred in a one-sweep test between 45 and 2000 Hz. The test was performed at both energized and de-energized states in the axial direction and at the right angles to the main valve and armature. (Values at the initial period)

\* This valve is a large flow rate pilot-operated solenoid valve. If the operating pressure falls below 0.2 MPa due to a pressure drop caused by insufficient air supply, it may not be able to switch properly.

## Solenoid Specifications

Electrical entry	DIN terminal (D)	M12 connector
	DIN terminal (Y) (EN175301-803C)	
	D, Y	K
Coil rated voltage [V]	DC	24
Allowable voltage fluctuation	±10% of the rated voltage	
Power consumption [W]	0.35 (With light: 0.45)	With light: 0.4
Surge voltage suppressor	Varistor	Diode
Indicator light	LED	

## Response Time/Weight

Model	Pressure specifications	Response time [ms] (at 0.5 MPa) <sup>*1</sup>			Weight [g]
		DIN terminal		M12 connector	
		Without light/surge voltage suppressor	With light/surge voltage suppressor	With light/surge voltage suppressor	
VP346E	Standard (0.2 to 0.7 MPa)	23	23	32	210 (With soft start-up function: 310)
	High pressure (0.2 to 1.0 MPa)	38	38	43	340 (With soft start-up function: 590)
VP546E	Standard (0.2 to 0.7 MPa)	56	56	60	680 (With soft start-up function: 1,200)
	High pressure (0.2 to 1.0 MPa)	80	80	86	1,410 (With soft start-up function: 2,300)
VP746E	Standard (0.2 to 0.7 MPa)	154	154	164	
	High pressure (0.2 to 1.0 MPa)				

\*1 Based on dynamic performance test, JIS B 8419-2010 (Coil temperature: 20°C, at rated voltage)

## Flow Rate Characteristics

Model	Port size EXH.	Flow rate characteristics							
		1 → 2 (P → A)				2 → 3 (A → R)			
		C [dm <sup>3</sup> /(s·bar)]	b	Cv	Effective area [mm <sup>2</sup> ]	C [dm <sup>3</sup> /(s·bar)]	b	Cv	Effective area [mm <sup>2</sup> ]
VP346E	G1/4	4.3	0.23	1.1	—	4.2	0.19	1.0	—
VP346E-S	G1/4	3.2	0.18	0.8	—	4.2	0.19	1.0	—
VP546E(K)	G3/8	8.8	0.14	2.0	—	7.5	0.13	1.7	—
VP546E(K)-S	G3/8	6.6	0.07	1.5	—	7.5	0.13	1.7	—
VP746E(K)	G1/2	13.8	0.11	2.9	—	12.6	0.18	2.9	—
VP746E(K)-S	G1/2	10.5	0.12	2.3	—	12.6	0.18	2.9	—
VP946E	G1	—	—	—	282	—	—	—	234
VP946E-S	G1	—	—	—	212	—	—	—	234

# VP346E/546E/746E/946E Series

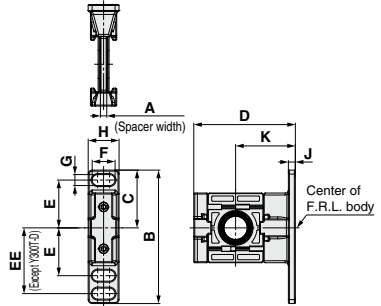
## Spacer with Bracket

Y 300 T - D

①      ②



Spacer with bracket  
(Y□T-D)



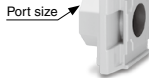
	Symbol	Description	①				
			Body size [Applicable AC size]				
			200 [AC20]	300 [AC30]	400 [AC40]	600 [AC50/AC60]	
②	Bracket	T	Spacer with bracket	●	●	●	●

Model	A	B	C	D	E	EE	F	G	H	J	K	L	Applicable size
Y200T-D	3.2	67	29	51	24	33	11.5	5.5	15.5	3.5	30	2	AC20-D
Y300T-D	4.2	85	42.5	67.5	35	—	14	7	20	6	41	3	AC30-D
Y400T-D	5.2	115	50	85.5	40	55	18	9	26	7	50	3	AC40-D
Y600T-D	6.2	140	60	115	50	70	20	11	31.2	8	70	4	AC50-D AC60-D

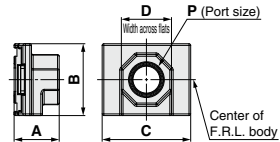
## Piping Adapter

E 300 -    03 - D

①      ②      ③



	Symbol	Description	①				
			Body size [Applicable AC size]				
			200 [AC20]	300 [AC30]	400 [AC40]	600 [AC50, AC60]	
②	Pipe thread type	Nil N F +	Rc NPT G	●	●	●	●
③	Port size	01	1/8	●	—	—	—
		02	1/4	●	●	●	—
		03	3/8	●	●	●	—
		04	1/2	—	●	●	●
		06	3/4	—	—	●	●
		10	1	—	—	●	●
		12	1 1/4	—	—	—	●
		14	1 1/2	—	—	—	●



Model	P	A	B	C	D	Applicable AC size
E200-D	1/8, 1/4, 3/8	24	35	42	24	AC20-D
E300-D	1/4, 3/8, 1/2	27	43	53	30	AC30-D
E400-D	1/4, 3/8, 1/2, 3/4	30	51	71	36	AC40-D
E600-D	1 1/4, 1 1/2	42	64	90	63	AC50-D AC60-D

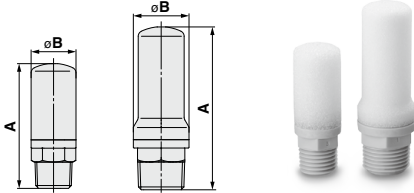
# 3-Port Solenoid Valve Modular Type/ Residual Pressure Release Valve **VP346E/546E/746E/946E Series**

## Silencer

### Compact Resin Type

AN20

AN30, AN40

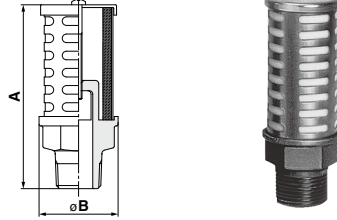


#### Dimensions [mm]

Model	Port size R	A	B
AN20-02	1/4	45	16.5
AN30-03	3/8	58.5	20
AN40-04	1/2	68	24

### Metal Body Type

AN600



#### Dimensions [mm]

Model	Port size R	A	B
AN600-10	1	127	50

### High Noise Reduction Type

AN202 to 402

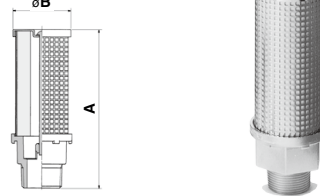


#### Dimensions [mm]

Model	Port size R	A	B
AN202-02	1/4	64	22
AN302-03	3/8	84	28
AN402-04	1/2	95	34

### High Noise Reduction Type

ANA1-10



#### Dimensions [mm]

Model	Port size R	A	B
ANA1-10	1	132	50

### Compatibility Chart for Residual Pressure Relief Valve and Silencers

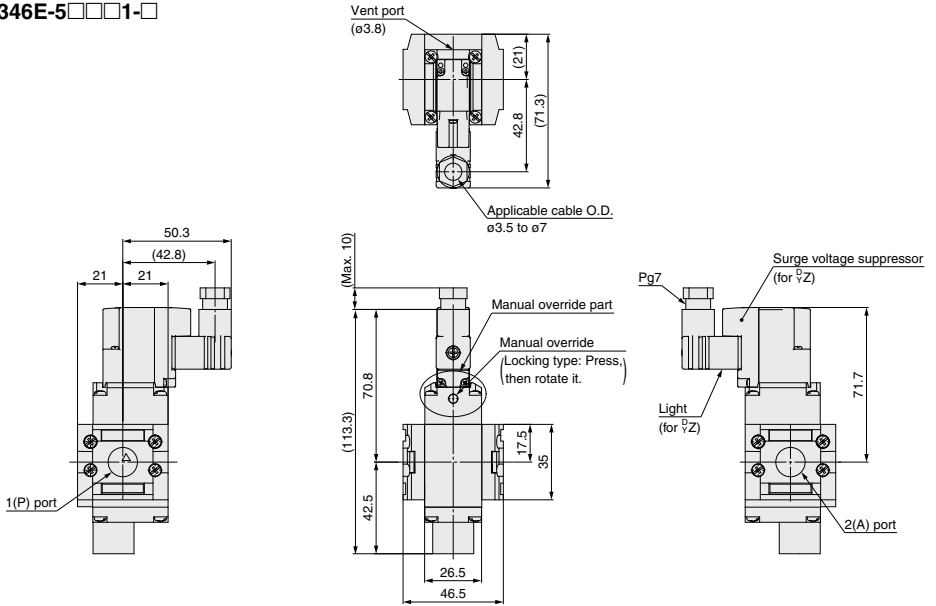
Residual pressure release valve	Silencer	Compact resin type			Metal type	High noise reduction type			
	Model	AN20-02	AN30-03	AN40-04	AN600-10	AN202-02	AN302-03	AN402-04	ANA1-10
	Port size	1/4	3/8	1/2	1	1/4	3/8	1/2	1
VP346E		○	—	—	—	○	—	—	—
VP546E		—	○	—	—	—	○	—	—
VP746E		—	—	○	—	—	—	○	—
VP946E		—	—	—	○	—	—	—	○



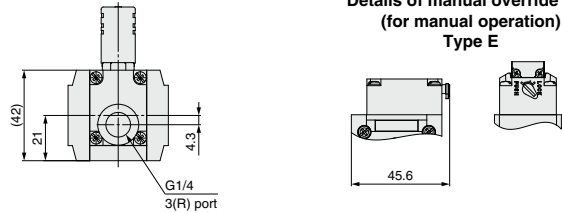
# 3-Port Solenoid Valve Modular Type/ Residual Pressure Release Valve **VP346E/546E/746E/946E Series**

## Dimensions

VP346E-5□□□1-□

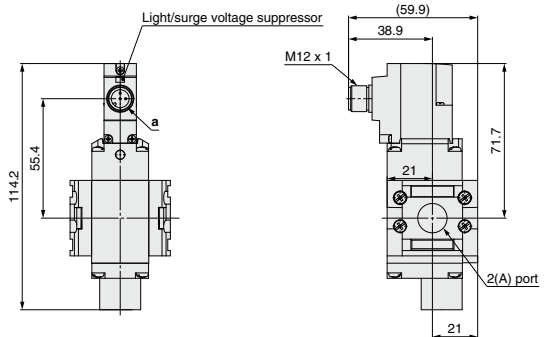
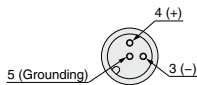


### Details of manual override part (for manual operation) Type E



VP346E-5KOZ1-□

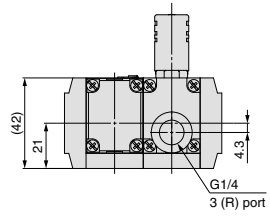
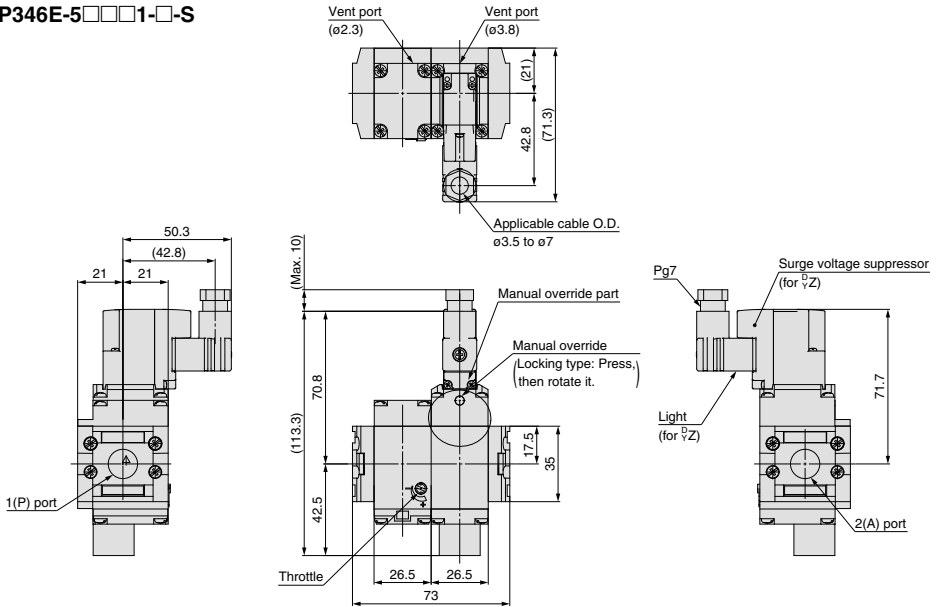
### Detailed figure of a section M12 connector



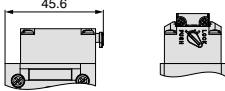
# VP346E/546E/746E/946E Series

## Dimensions

VP346E-5□□□1-□-S

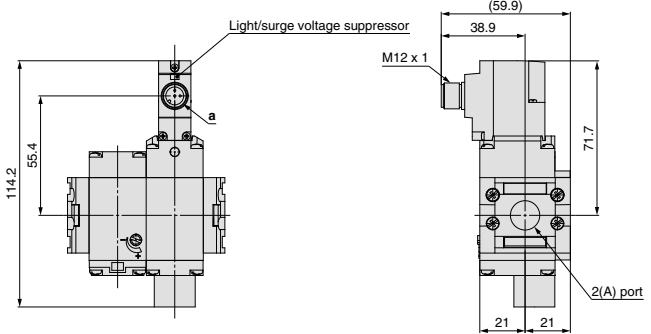
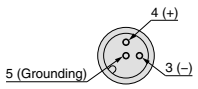


Details of manual override part (for manual operation) Type E



VP346E-5KOZ1-□-S

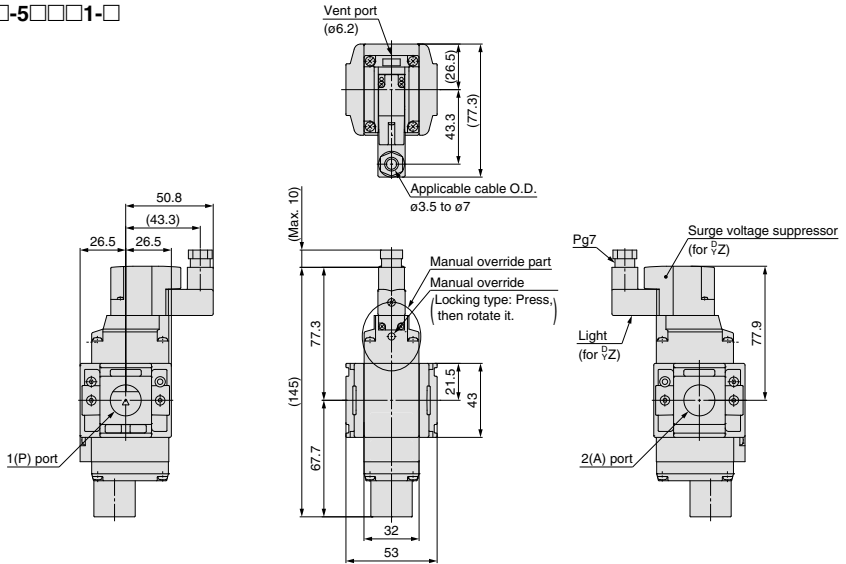
Detailed figure of a section M12 connector



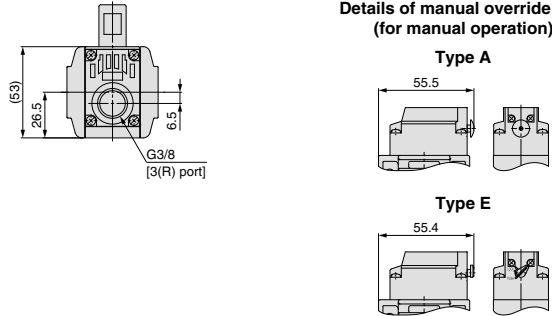


**Dimensions**

VP546E□-5□□□1-□

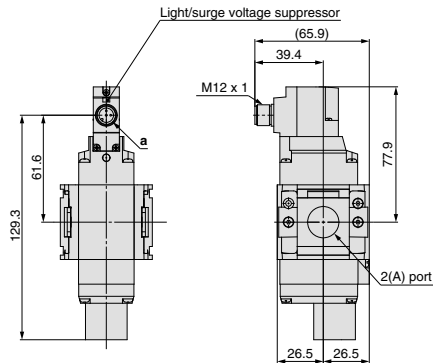


**Details of manual override part  
(for manual operation)**



VP546E-5KOZ1-□

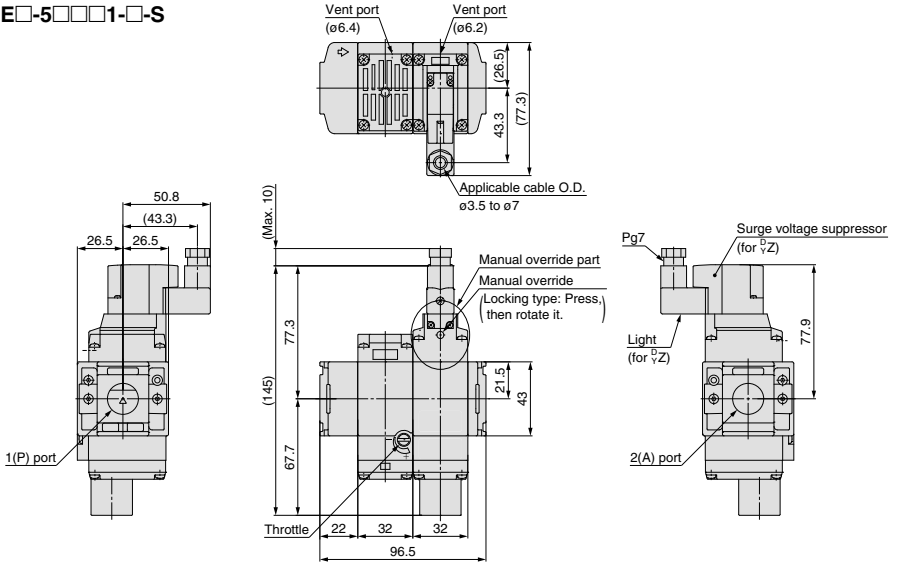
**Detailed figure of a section  
M12 connector**



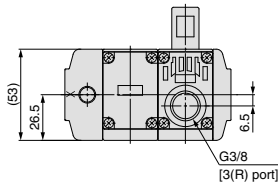
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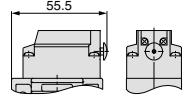
VP546E□-5□□□1-□-S



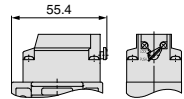
Details of manual override part (for manual operation)



Type A

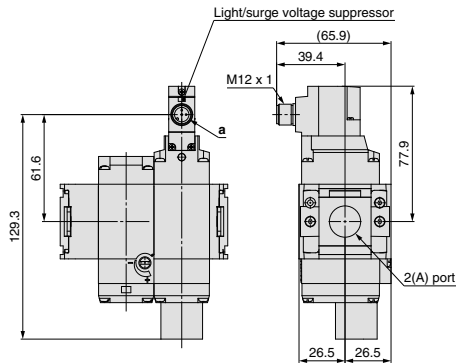
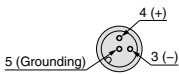


Type E



VP546E-5KOZ1-□-S

Detailed figure of a section M12 connector



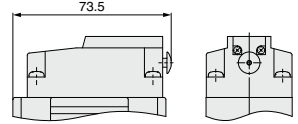
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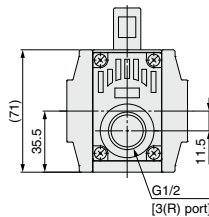
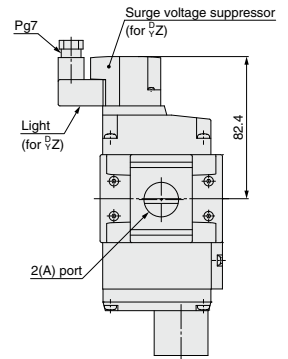
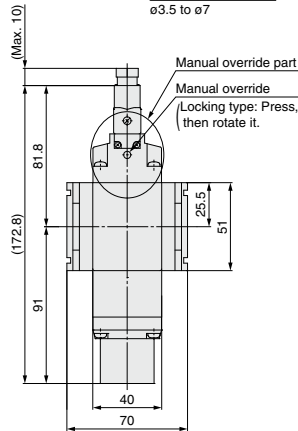
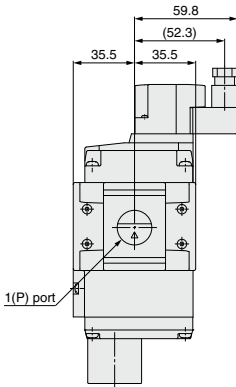
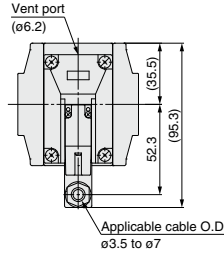
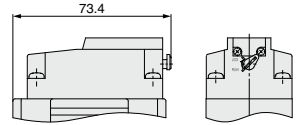
VP746E□-5□□□1-□

Details of manual override part  
(for manual operation)

Type A



Type E

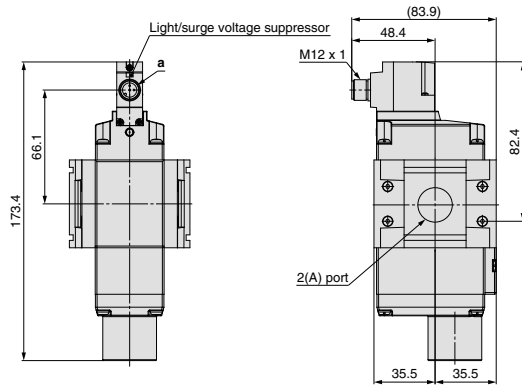
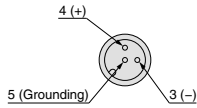


# VP346E/546E/746E/946E Series

## Dimensions

VP746E-5KOZ1-□

Detailed figure of a section  
M12 connector





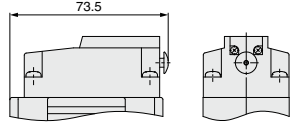
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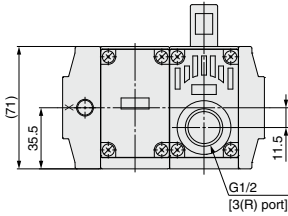
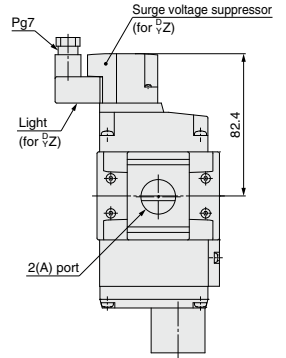
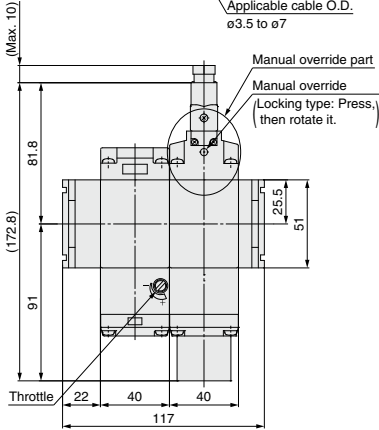
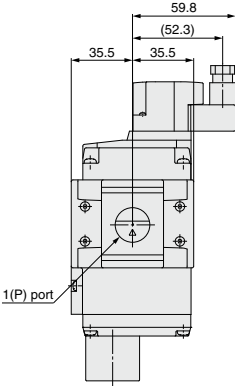
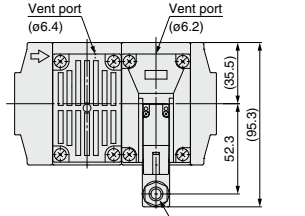
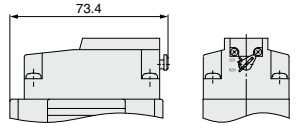
VP746E□-5□□□1-□-S

Details of manual override part  
(for manual operation)

Type A



Type E

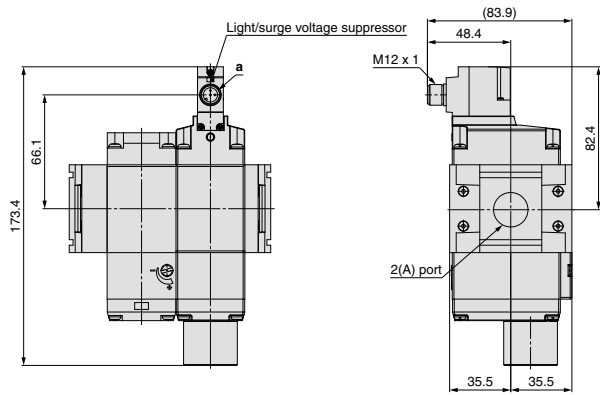
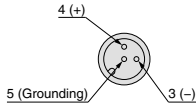


3-Port Solenoid Valve Modular Type/  
Residual Pressure Release Valve **VP346E/546E/746E/946E Series**

**Dimensions**

VP746E-5KOZ1-□-S

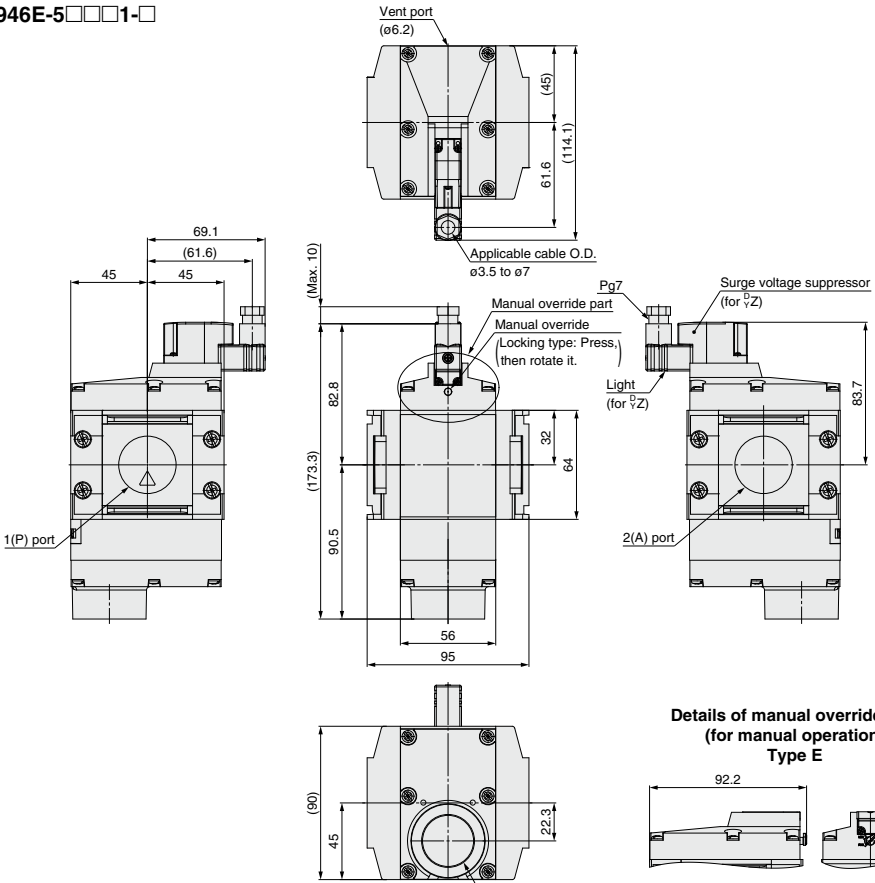
Detailed figure of a section  
M12 connector



# VP346E/546E/746E/946E Series

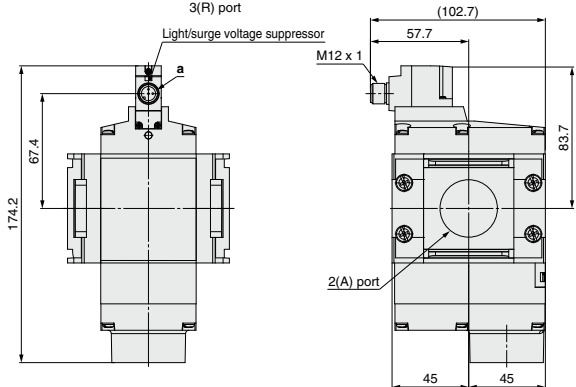
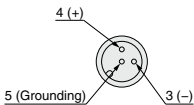
## Dimensions

VP946E-5□□□1-□



VP946E-5KOZ1-□

Detailed figure of a section M12 connector

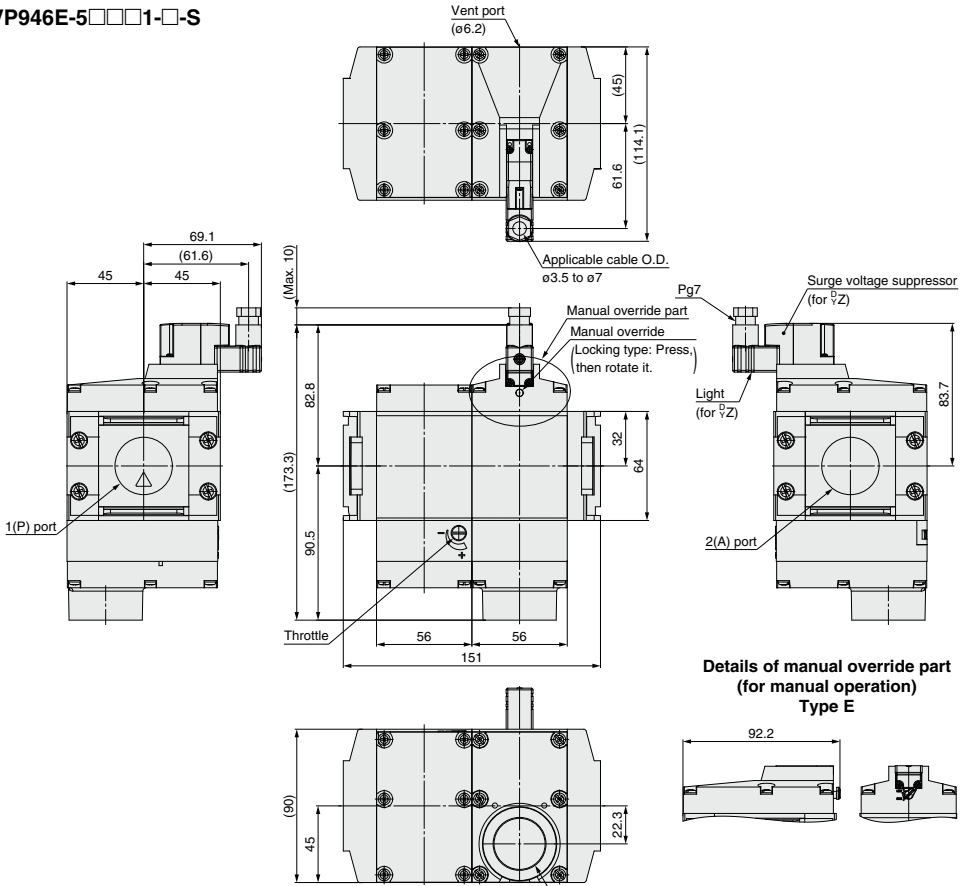




# 3-Port Solenoid Valve Modular Type/ Residual Pressure Release Valve **VP346E/546E/746E/946E Series**

## Dimensions

### VP946E-5□□□1-□-S



### VP946E-5KOZ1-□-S

#### Detailed figure of a section M12 connector

