

**KOGANEI**

Air Valve

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# **TAC AIR VALVES**

**INSTRUCTION MANUAL** Ver.1.0

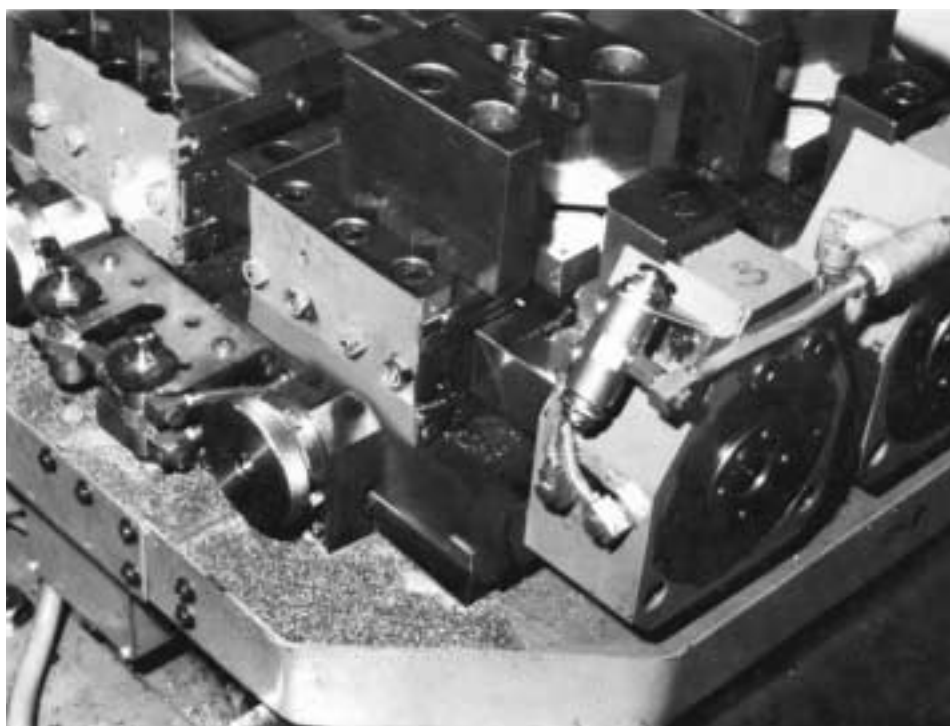
# For Simple Automation Devices, Choose TAC.



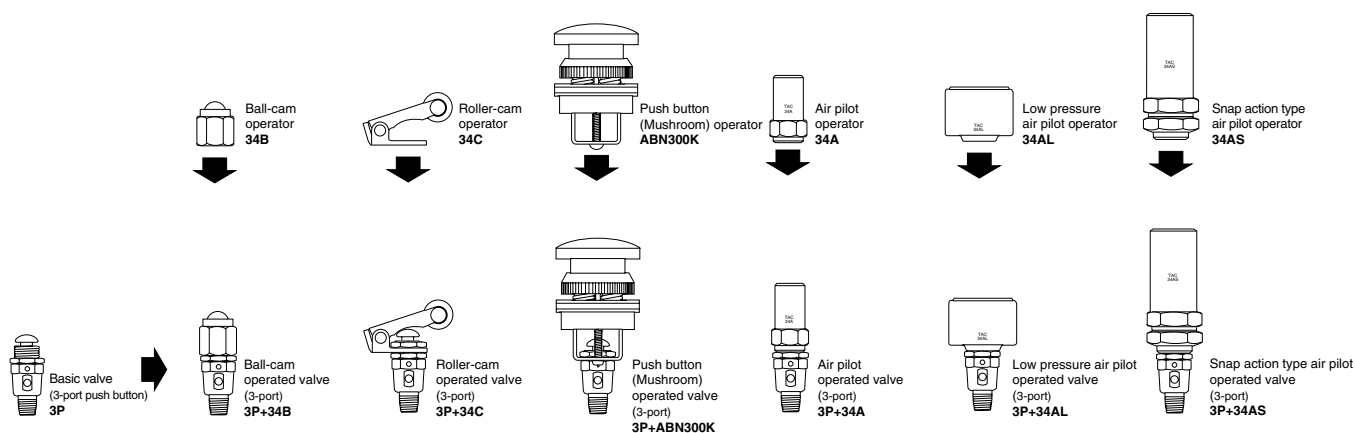
TAC, a compact device for total pneumatic control, derives its acronym from the expression Tiny Air Components for Total Air Control.

The TAC series offers compact valves, virtually all of the necessary peripheral devices for the operation of small air cylinders and the easy configuration of simple pneumatic circuits.

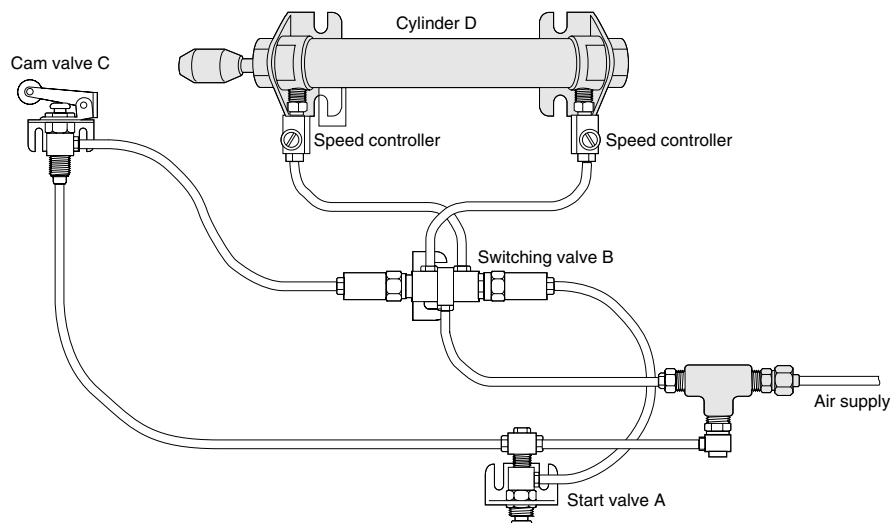
## Application examples



## Combination examples (Combination of basic valves and operators for valves)



## Circuit example



### Explanation of operation

Actuation of valve A (3P) extends the rod of cylinder D, which then retracts and stops. It is often used for reliable reciprocating operation.

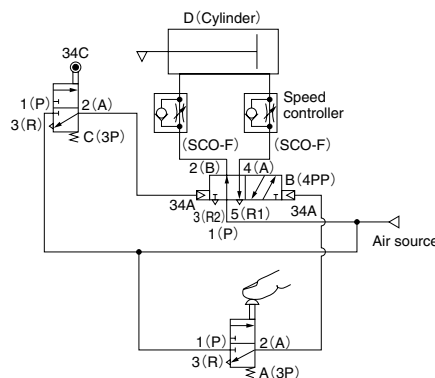
[Detailed explanation of operations]

- Pressing valve A supplies air to the pilot operator (34A) on the right portion of valve B (4PP), which then switches valve B.
- As a result, the air previously filled in the rod side (left side) of the cylinder is exhausted from R<sub>2</sub> of valve B. At the same time, air entering the cylinder head side (right side), extends the cylinder rod forward.
- At this time, when the air passes through the speed controller (SCO-F) to enter the cylinder, it opens the check valve inside the SCO-F and quickly fills in. For exhaust, however, the air is choked and the cylinder rod extends while decelerating.
- When the cylinder rod extends to push against valve C, air is applied to the air pilot operator (34A) on the left portion of valve B, restoring valve B to its normal position, and then return the cylinder rod back.

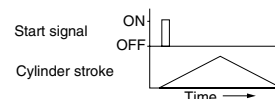
### Precautions on circuit structure

- Cylinder speed is generally determined by the bore size, and the size of the valves, speed controllers, and piping. If large cylinders are used, the valves, speed controllers, and piping must also be correspondingly large, or higher speed will not be obtained.
- Normally, use the cylinder at a speed of 500mm/s [19.7in./sec.] or less. In addition, a stopper is required when the cylinder does not have a built-in cushion, or when the load is large.
- Cylinder thrust is determined by air pressure and bore size. For details, see the separate "Air Cylinder Engineering Documents."
- Keep the piping as short as possible to ensure good response. Avoid use of tubes that have been throttled in between fittings, or tubes that are too large.
- Since valve B(4PP) is a holding type, a pulse signal is sufficient to switch it. In this circuit, it is required to press valve A (3P) and then release it. If pressed continuously without releasing, valve B will not return, and the cylinder will not be able to retract.
- Follow the directions in this catalog when connecting tubes to valve ports, etc.
- The speed controller is normally used with choking exhaust to achieve a stable speed in regard to load changes. In addition, mount it as close as possible to the cylinder's exhaust port.
- Use air through a filter, and use clean air that does not contain dust, collected liquid, degraded compressor oil, etc.
- Use Turbine Oil Class 1(ISO VG32) or the equivalent, and ensure that the lubrication oil reaches the ends of the equipment. In particular, since lubrication is often insufficient for the operation of small-bore cylinders, take care in selecting the lubricator installing position.

### Circuit diagrams



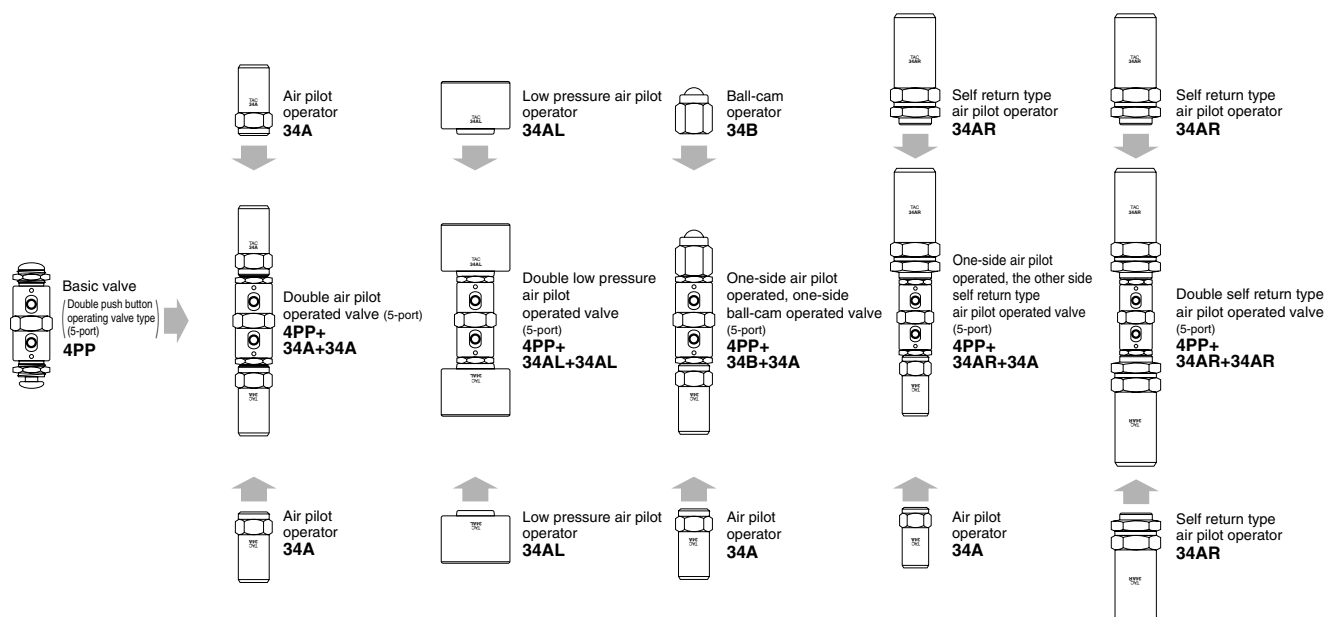
### Time chart



### Device list

Parts	Model	Quantities
Switching valve (3-port, push button type)	3P	2
Switching valve (5-port, holding push button type)	4PP	1
Air pilot operator	34A	2
Roller-cam operator	34C	1
Speed controller	SCO-F	2
Barbed fitting	BF5	14
Bushing (Rc1/8-M5×0.8)	RBF	4
Universal tee fitting	UTF	1
Elbow fitting	EF	1
Bracket (angle type)	8-600	3
Cylinder	φ 20×100	1
Nylon tube (φ 5×φ 3)	N5	1.1 m
Cylinder end dog		1

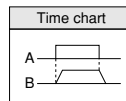
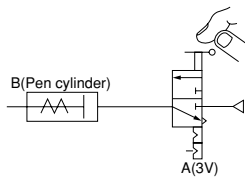
**Caution:** For speed controllers and fittings, see the General Catalog of Air Treatment, Auxiliary, Vacuum.



### (Examples of pneumatic control by the TAC air valve)

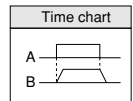
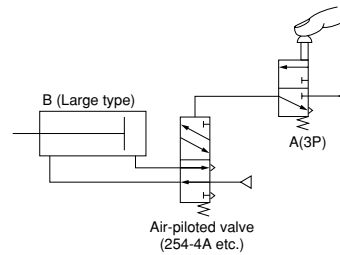
#### 1. Operation of single acting air cylinder (Direct operation of compact single acting air cylinder)

Actuating valve A extends cylinder B's rod, and unactuating it retracts the rod.



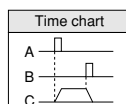
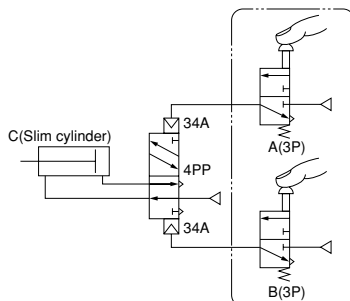
#### 2. Operation of large air cylinder (Indirect operation by a large valve)

Actuating valve A extends cylinder B's rod, and unactuating it retracts the rod.



#### 3. Operation of double acting air cylinder (Operating compact air cylinder by momentary air signal)

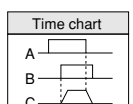
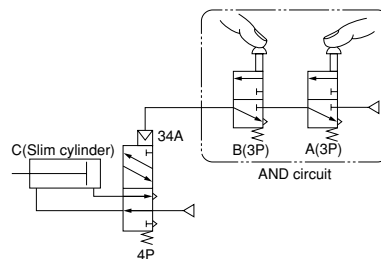
Actuating valve A extends cylinder C's rod, while actuating valve B retracts the rod. Since the valve (4PP) operating the cylinder is a holding type, only a momentary air signal from valve A or B is required.



#### 4. AND circuit (Operation of double acting air cylinder)

Actuating both valves A and B extends cylinder C's rod, and unactuating either A or B retracts the rod.

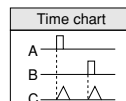
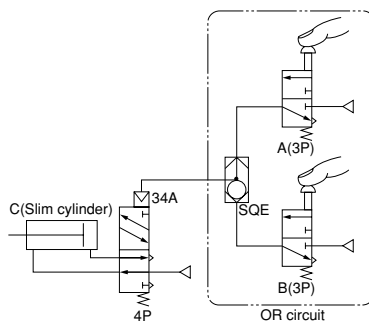
It is used in a safe operation circuit of press machines or in a checking circuit for proceeding to the next step after checking at least 2 actions.



#### 5. OR circuit (Operation of double acting air cylinder)

Actuating either valve A or B extends cylinder C's rod, and unactuating both retracts the rod.

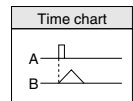
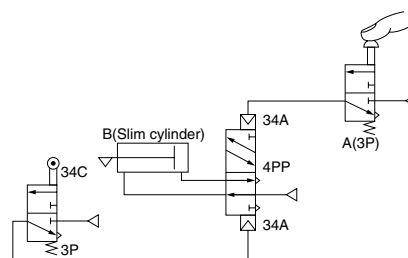
Used when needing any of 2 or more signals to actuate.



#### 6. One reciprocating operation of air cylinder (Reliable operation)

Actuating valve A extends cylinder B's rod, then retracts and stops.

Often used as a method for a secure single reciprocating operation.

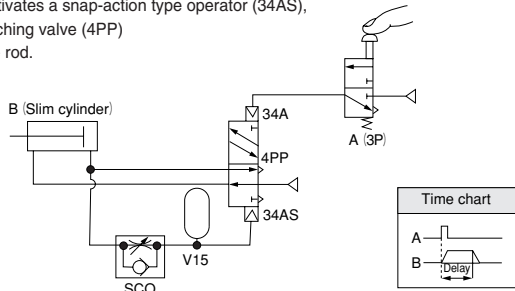


## 7. One reciprocating operation of air cylinder (Timing operation)

Actuating valve A extends cylinder B's rod, pauses it for a moment, then retracts it and stops. Often used for simple single reciprocating operations when reliable operation is not so required.

### [Detailed explanation of operation]

The air pushing the cylinder passes at the same time through a throttle valve (SCO) into a volume tank (V15) where it gradually builds up pressure. Once it exceeds a certain level, the air activates a snap-action type operator (34AS), actuates a switching valve (4PP) and retracts the rod.

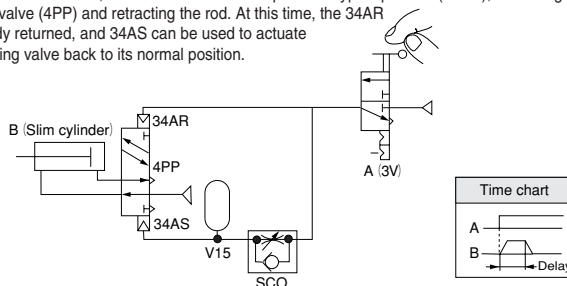


## 8. One reciprocating operation of air cylinder (Timing operation)

Actuating valve A extends cylinder B's rod, then retracts it after a set period and stops. While this method is accurate for delay time settings than the circuit mentioned in 7, it is often used as a method for simple single reciprocating operation that does not require that much reliability.

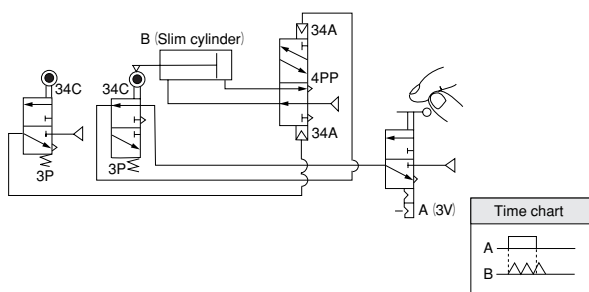
### [Detailed explanation of operation]

The air exhausted from valve A(3V) activates a self-return type operator (34AR) to actuate the switching valve (4PP) and push the cylinder rod. At the same time, the air passes through a throttle valve (SCO) into a volume tank (V15), where air is gradually accumulated. Once it exceeds a certain level, the air activates a snap-action type operator (34AS), actuating a switching valve (4PP) and retracting the rod. At this time, the 34AR has already returned, and 34AS can be used to actuate the switching valve back to its normal position.



## 9. Continuous reciprocating operation of air cylinder

Actuating valve A starts continuous operation of cylinder B. Unactuating it stops the cylinder rod at its retracted position.

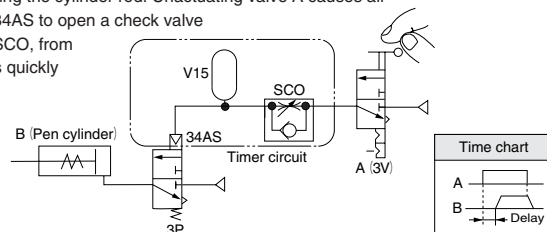


## 10. Delay circuit (On delay timer circuit)

Actuating valve A extends cylinder B's rod after a certain delay time. Unactuating it immediately retracts the rod. Used when a not particularly precise "delay time" ranging from about 0 to 10 seconds is required.

### [Detailed explanation of operation]

Air exhausted from valve A(3V) is passed through a throttle valve (SCO) into a volume tank (V15), where it gradually builds up pressure. Once it exceeds a certain level, the air activates a snap-action type operator, actuating a switching valve (3P) and extending the cylinder rod. Unactuating valve A causes air inside the 34AS to open a check valve inside the SCO, from where air is quickly exhausted.

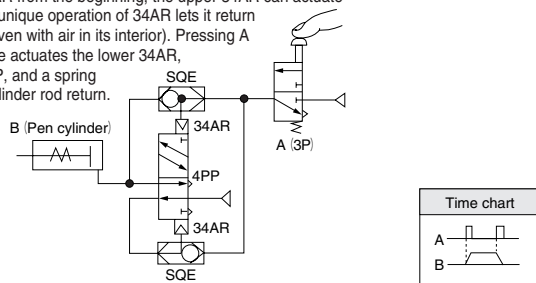


## 11. Step operation circuit (Binary counter circuit)

Actuating valve A one time extends cylinder B's rod, while actuating A one more time retracts the rod. Used when a separate, single action is required once in every several actions.

### [Detailed explanation of operation]

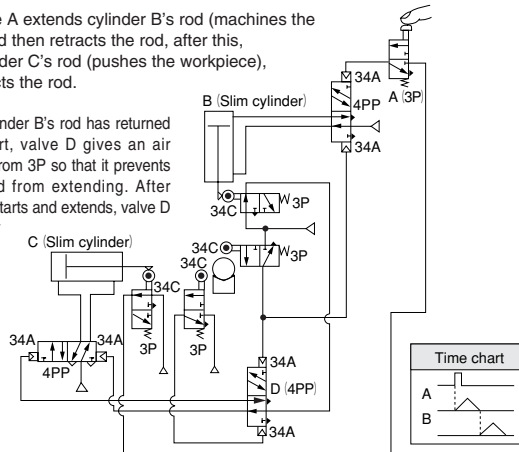
Pressing valve A(3P)(press and release), supply air through the upper shuttle valve (SQE) which activates the upper self-return type operator (34AR), actuating the holding type switching valve (4PP) and extending the cylinder rod. At this time, while air has been in the lower 34AR from the beginning, the upper 34AR can actuate the 4PP (the unique operation of 34AR lets it return the plunger even with air in its interior). Pressing A one more time actuates the lower 34AR, actuating 4PP, and a spring makes the cylinder rod return.



## 12. Sequential operation of 2 air cylinders

Actuating valve A extends cylinder B's rod (machines the workpiece), and then retracts the rod, after this, it extends cylinder C's rod (pushes the workpiece), and then retracts the rod.

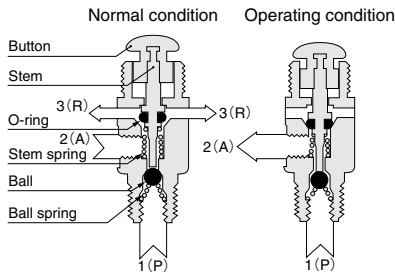
Note—When cylinder B's rod has returned prior to the start, valve D gives an air pressure signal from 3P so that it prevents cylinder C's rod from extending. After cylinder B's rod starts and extends, valve D has been already switched and it can extend cylinder C's rod.



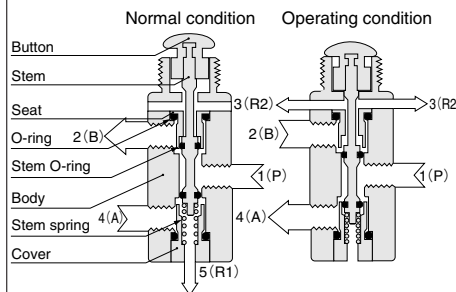
## Basic Valves (Push Button Type Valves)

### Operating principles

#### 3-port (3P)



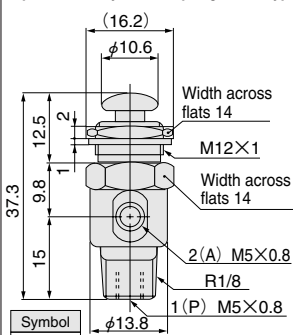
#### 5-port (4P)



### Dimensions (mm)

#### Model 2P

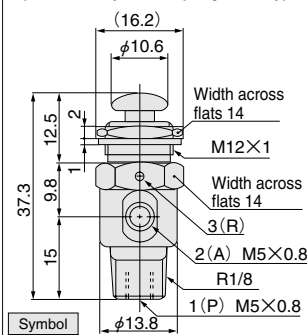
2-port, normally closed spring return type



Note: Cannot be used as a normally open type.

#### Model 3P

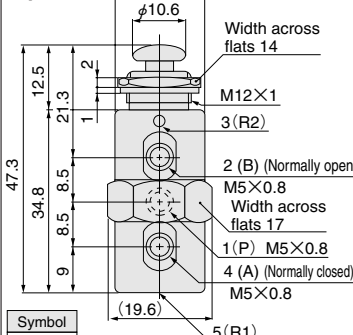
3-port, normally closed spring return type



Note: Cannot be used as a normally open type.

#### Model 4P

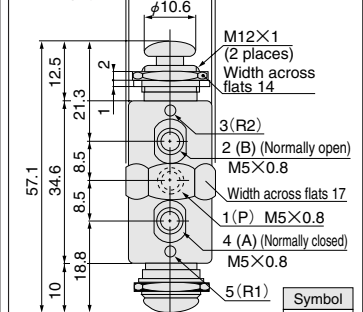
5-port



Note: With the B port or A port being plugged, the unit can be used as a 3-port normally closed or normally open type valve.

#### Model 4PP

5-port holding type



Note: With the B port or A port being plugged, the unit can be used as a 3-port normally closed or normally open type.

### Major parts and materials

Body .....Brass (nickel plated)  
Stem .....Stainless steel  
O-ring .....Synthetic rubber

### Minimum operating force of push button

		N [lbf]		
Type	Air pressure MPa	0.2 [29psi.]	0.4 [58psi.]	0.7 [102psi.]
	MPa [kgf/cm <sup>2</sup> ] [psi.]			
2P	29.4 [6.61] (19.6 [4.41])	44.1 [9.91] (21.6 [4.86])	63.7 [14.32] (23.5 [5.28])	
3P	19.6 [4.41]	24.5 [5.51]	29.4 [6.61]	
4P	19.6 [4.41]	21.6 [4.86]	23.5 [5.28]	
4PP	4.9 [1.10]	5.9 [1.33]	6.9 [1.55]	

Notes: 1. Figures in parentheses ( ) are for when the 2(A) port is open to the atmosphere.  
2. For the operating force while used in combination with operators, see the pages of each operator.

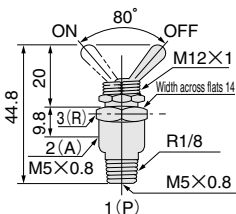
### Specifications

Item	Model	2P	3P	4P	4PP
Operation type		Push button spring return			Double push button holding type
Number of ports		2 (Normally closed)	3 (Normally closed)	5	
Port size		M5×0.8			
Media		Air			
Operating pressure range	MPa [kgf/cm <sup>2</sup> ] [psi.]	0~0.9 {0~9.2} [0~131]			
Proof pressure	MPa [kgf/cm <sup>2</sup> ] [psi.]	1.35 {13.8} [196]			
Operating temperature range (atmosphere and media)	°C [°F]	0~60 [32~140]			
Effective area	mm <sup>2</sup>	1.8		2.5	
Flow coefficient	Cv	0.08		0.12	
Mounting direction		Any			
Maximum operating frequency	Hz	5			
Valve stroke	mm [in.]	2.4 [0.094] $\left( \begin{array}{l} \text{Pre-stroke} \quad 0.8 [0.031] \\ \text{Main stroke} \quad 0.8 [0.031] \\ \text{Over stroke} \quad 0.8 [0.031] \end{array} \right)$			
Lubrication		Required (Turbine Oil Class 1 [ISO VG32] or equivalent)			
Mass	g [oz.]	35 [1.23]	30 [1.06]	66 [2.33]	71 [2.50]
Standard accessories	Lock nut (110-21A) Lock washer (100-35)	1 pc. each			2 pcs. each

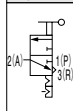
## Manual Valves (Lever Type Valves)

### Dimensions (mm)

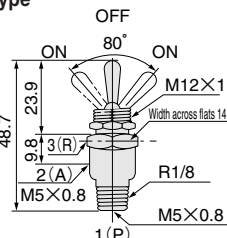
Model  
**3V**  
3-port  
Pinned lever holding type



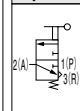
Symbol



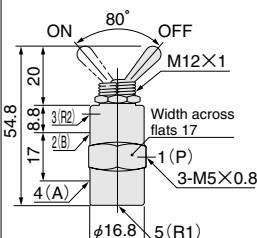
Model  
**3VR**  
3-port  
Pinned lever spring return type



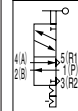
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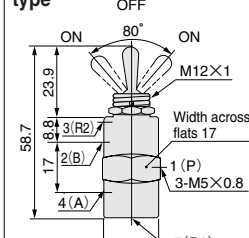
Model  
**4V**  
5-port  
Pinned lever holding type



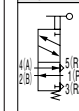
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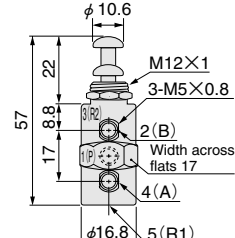
Model  
**4VR**  
5-port  
Pinned lever spring return type



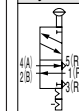
Symbol



Model  
**4PPX**  
5-port  
Push-pull button holding type

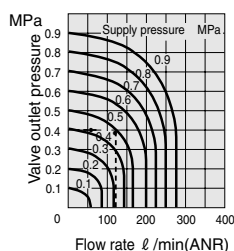


Symbol

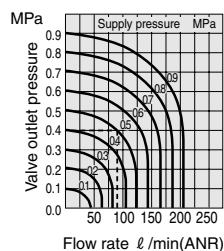


### Flow rate

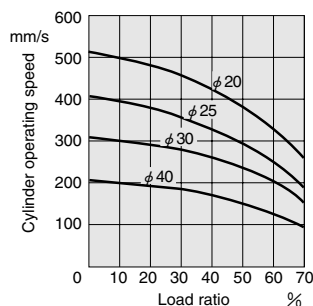
#### 3-port



#### 5-port

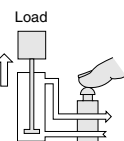


### Cylinder operating speed



### Conditions

1. Applies load from above (vertical direction).
2. Operates using a supply pressure of 0.5MPa [73psi].
3. Uses a tube with an inner diameter of 4mm [0.16in.], and a piping length of 50cm [19.7in.].



### How to read the graph

When the supply pressure is 0.5MPa [73psi.] and the flow rate is 85 l/min [3.0ft<sup>3</sup>/min.] (ANR), the valve outlet pressure becomes 0.4MPa [58psi.].

1MPa=145psi., 1 l/min=0.0353ft<sup>3</sup>/min., 1mm/s=0.0394in./sec.

### Specifications

Item	Model	3V	3VR	4V	4VR	4PPX
Operation type		Pinned lever				Push-pull button
		Holding type	Spring return type	Holding type	Spring return type	holding type
Number of ports		3	3 (Normally closed)	5	5	5
Port size		M5×0.8				
Media		Air				
Operating pressure range	MPa [kgf/cm <sup>2</sup> ] [psi.]	0~0.9 {0~9.2} [0~131]				
Proof pressure	MPa [kgf/cm <sup>2</sup> ] [psi.]	1.35 {13.8} [196]				
Operating temperature range (atmosphere and media)	°C [°F]	0~60 [32~140]				
Effective area	mm <sup>2</sup>	1.8		2.5		
Flow coefficient	Cv	0.08		0.12		
Mounting direction		Any				
Valve stroke	mm [in.]	2.4 [0.094] (Pre-stroke 0.8 [0.031] Main stroke 0.8 [0.031] Over stroke 0.8 [0.031])				
Lubrication		Required (Turbine Oil Class 1 [ISO VG32] or equivalent)				
Mass	g [oz.]	30 [1.06]		66 [2.33]		68 [2.40]
Standard accessories		Lock nut (110-21A) Lock washer (100-35)				
		1 pc. each				



## Operators for Actuating Valves (Manual/Mechanical Operated Valves)

(mm)

**Model 34B**  
**Ball-cam type**

- The stroke is the same as the basic valve stroke.
- When mounting it on the valve, leave appropriate space by using a lock washer(100-35).

**Symbol**

**Materials**

Body	Brass (nickel plated)
Ball	Steel (chrome plated)
Mass	15g [0.53oz.]

**Minimum operating force N [lbf.]**

Air pressure MPa [psi.]	0.2 [29]	0.4 [58]	0.7 [102]
Combined valve			
2P	29.4 [6.61] (19.6 [4.41])	44.1 [9.91] (21.6 [4.86])	63.7 [14.32] (23.5 [5.28])
3P	19.6 [4.41]	24.5 [5.51]	29.4 [6.61]
4P	19.6 [4.41]	21.6 [4.86]	23.5 [5.28]
4PP	4.9 [1.10]	5.9 [1.33]	6.9 [1.55]
ES	4.9 [1.10]		

Note: Figures in parentheses ( ) are for when the 2(A) port is open to the atmosphere.

**Model 34C**  
**Roller-cam type**

- The stroke is double the basic valve stroke.

**Symbol**

**Materials**

Lever	Mild steel (zinc plated)
Roller	Nylon
Mass	15g [0.53oz.]

**Minimum operating force N [lbf.]**

Air pressure MPa [psi.]	0.2 [29]	0.4 [58]	0.7 [102]
Combined valve			
2P	13.7 [3.08] (9.8 [2.20])	19.6 [4.41] (11.8 [2.65])	27.5 [6.18] (14.7 [3.30])
3P	9.8 [2.20]	12.7 [2.85]	14.7 [3.30]
4P	9.8 [2.20]	11.8 [2.65]	13.7 [3.08]
4PP	3.9 [0.88]	4.9 [1.10]	4.9 [1.10]
ES	2.9 [0.65]		

Note: Figures in parentheses ( ) are for when the 2(A) port is open to the atmosphere.

**Model 34F**  
**Foot, elbow, or palm operated type**

- The valve is to be mounted on the inner bracket by using lock nuts and lock washers.
- The valve is to be sold separately.

**Symbol**

**Material** Mild steel (zinc plated)  
**Mass** 300g [10.58oz.]

**Model 34T**  
**Fingertip operated type**

- A lever-type operator used for light fingertip operation.

**Symbol**

**Material** Mild steel (zinc plated)  
**Mass** 17g [0.60oz.]

Model	Parts	Push button type		Selector type	
		Model	Dimensions	Model	Dimensions
<b>ABN</b> <b>Push button type</b>					
<b>ASN</b> <b>Select type</b>					
<ul style="list-style-type: none"> <li>● Electric switch operator type. Use them in combination with any of the basic valves.</li> <li>● The holes for mounting operators on the panel are all <math>\phi 30</math>.</li> <li>● For the selector type, use the lock washer supplied to adjust the valve mounting location.</li> </ul>		<p><b>Flat type ABN100K</b></p> <p>Red, black and green buttons are standard equipment</p> <p>62g [2.19oz.]</p>	<p><b>Mushroom type ABN300K</b></p> <p>Black (standard) (If you need a red button, specify when ordering.)</p> <p>75g [2.65oz.]</p>	<p><b>Selector type ASN300K</b></p> <p>Black</p> <p>76g [2.68oz.]</p>	<p><b>Key selector type ASN3K00K</b></p> <p>Chrome plated</p> <p>117g [4.13oz.]</p>



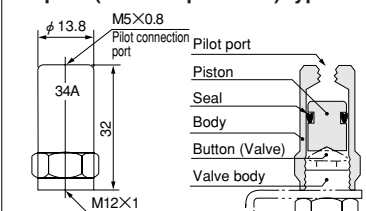
## Operators for Actuating Valves (Air Pilot Type)

(mm)

Model

### 34A

Air pilot (medium pressure) type



● When the pilot port receives a pneumatic signal, it switches the valve.

Symbol	Maximum operating pressure ... 0.9MPa [9.2kgf/cm <sup>2</sup> ] [131psi.]
	Proof pressure ..... 1.35MPa [13.8kgf/cm <sup>2</sup> ] [196psi.]
	Body material ..... Brass (nickel plated)
	Lubrication ..... Required
	Mass ..... 29g [1.02oz.]

#### Minimum pilot pressure MPa [psi.]

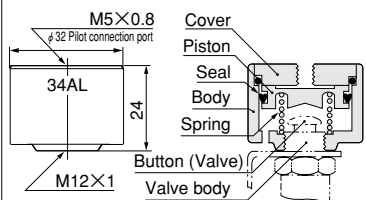
Applicable valve	Air pressure MPa [psi.]	0.2 [29]	0.4 [58]	0.7 [107]
2P	0.4 [58] (0.25 [36])	0.54 [78] (0.26 [38])	0.72 [104] (0.29 [42])	
3P	0.24 [35]	0.26 [38]	0.34 [49]	
4P	0.24 [35]	0.25 [36]	0.25 [36]	
4PP	0.08 [12]	0.08 [12]	0.08 [12]	

Note: Figures in parentheses ( ) are for when the A port is open to the atmosphere.

Model

### 34AL

Air pilot (low pressure) type



● When the pilot port receives a pneumatic signal, it switches the valve.

Symbol	Maximum operating pressure ... 0.9MPa [9.2kgf/cm <sup>2</sup> ] [131psi.]
	Proof pressure ..... 1.35MPa [13.8kgf/cm <sup>2</sup> ] [196psi.]
	Body material ..... Brass (nickel plated)
	Lubrication ..... Required
	Mass ..... 90g [3.17oz.]

#### Minimum pilot pressure MPa [psi.]

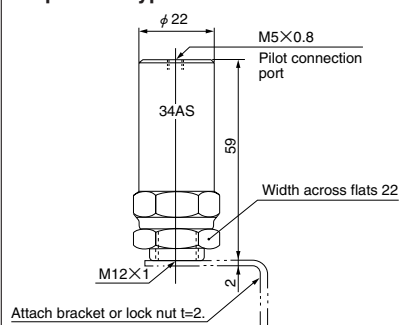
Applicable valve	Air pressure MPa [psi.]	0.2 [29]	0.4 [58]	0.7 [102]
2P	0.07 [10] (0.05 [7])	0.1 [15] (0.05 [7])	0.12 [17] (0.06 [9])	
3P	0.05 [7]	0.05 [7]	0.06 [9]	
4P		0.05 [7]		
4PP		0.03 [4]		
ES		0.03 [4]		

Note: Figures in parentheses ( ) are for when the A port is open to the atmosphere.

Model

### 34AS

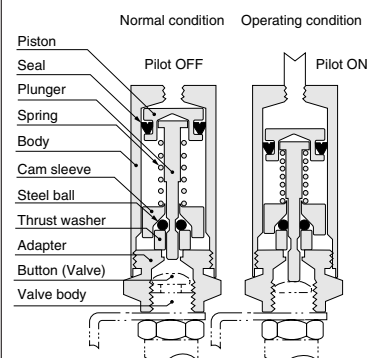
Air pilot snap action type



● When the pneumatic signal applied to this operator builds up pressure to  $0.25 \pm 0.03$ MPa [ $36 \pm 4$ psi.], it immediately activates (snap action), and switches the valve.  
Use in timer circuits, etc., in which pilot pressure in circuits gradually builds up and accumulates.

Symbol	Operating pressure range ... 0.22 ~ 0.9MPa {2.2 ~ 9.2kgf/cm <sup>2</sup> } [32 ~ 131psi.]
	Operating pressure ..... 0.25 ± 0.03MPa {2.5 ± 0.3kgf/cm <sup>2</sup> } [36 ± 4psi.]
	Proof pressure ..... 1.35MPa [13.8kgf/cm <sup>2</sup> ] [196psi.]
	Body material ..... Brass (nickel plated)
	Lubrication ..... Required
	Mass ..... 132g [4.66oz.]

#### Operating principles

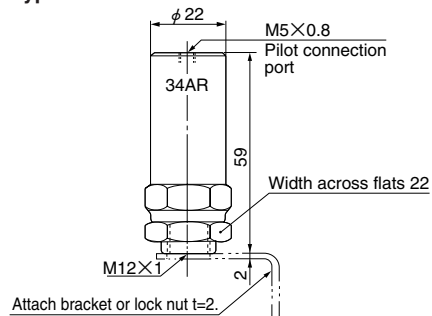


Remark: Application example is on p.849.

Model

### 34AR

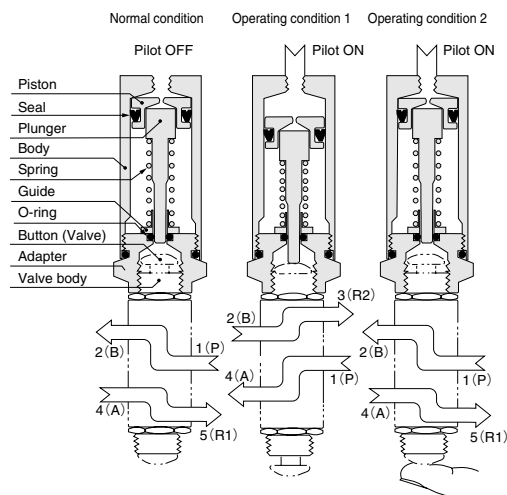
Air pilot self return type



● This operator provides a special function, in that it is immediately activated upon receiving air pilot pressure of at least 0.27MPa [39psi.], and then returns to its original position after about 0.5 seconds, even if the pilot pressure is applied continuously.  
● When combined with a holding type valve(4PP), the valve can return to its original position even if the air pilot is only applied on one side.  
● Mainly used in one-shot circuits, this operator can help to build a simple circuit.  
● Give the air pilot plenty of flow rate margin. It cannot be used by gradually building up the pressure.

Symbol	Operating pressure range ..... 0.27 ~ 0.9MPa {2.8 ~ 9.2kgf/cm <sup>2</sup> } [39 ~ 131psi.]
	Operating pressure ..... 0.27MPa {2.8kgf/cm <sup>2</sup> } [39psi.]
	Proof pressure ..... 1.35MPa [13.8kgf/cm <sup>2</sup> ] [196psi.]
	Body material ..... Brass (nickel plated)
	Lubrication ..... Required
	Mass ..... 122g [4.30oz.]

#### Operating principles



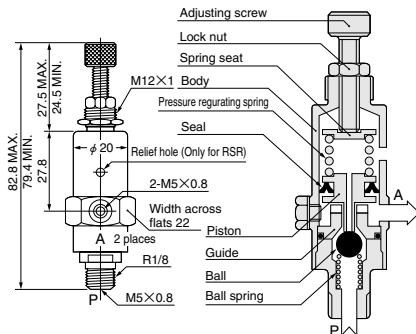
Remark: Application example is on p.849.



## Other Components

Model  
**RSR**  
Regulator (relieving type)

Model  
**RNR** (Semi-standard)  
**Regulator (non-relieving type)**

- Either reduces or maintains pressure to activate pneumatic components in a stable condition.



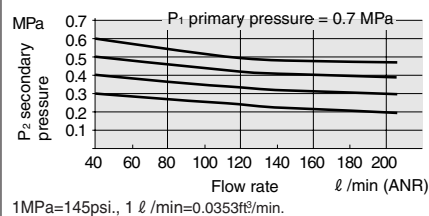
Symbols	
Relieving type	Non-relieving type
 <p><b>RSR</b></p>	 <p><b>RNR</b></p>

## Specifications

Item	Model	RSR	RNR (semi-standard)
Operation type		Relieving type	Non-relieving type
Port size		P: R1/8 (male thread) or M5×0.8 (female thread) A: M5×0.8 (2 places)	
Maximum operating pressure	MPa[kg/cm <sup>2</sup> ] [psi]	0.93 [9.5] [135]	
Operating pressure range	MPa[kg/cm <sup>2</sup> ] [psi]	0.2~0.7 [2.0~7.1] [29~102]	
Mounting direction		Any	
Material	Body	Brass (nickel plated)	
	Seal	Synthetic rubber	
Mass	g [oz.]	108 [3.81]	
Standard equipment	Lock nut(110-21A) Lock washer(100-35)	1 pc. each	

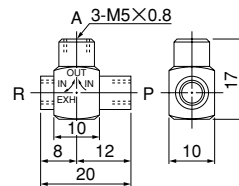
Note: For low-pressure application, consult us.

### Flow rate



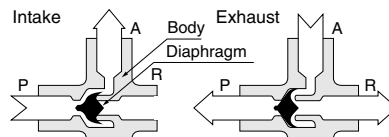
Model	<b>SQE</b> Quick exhaust valve (also used as a shuttle valve)
-------	--

- Can be used for quick exhaust of air from air cylinders, air tanks, or circuits.  
And when used as a shuttle valve, it can be used for changing flows from 2 directions to a single direction.

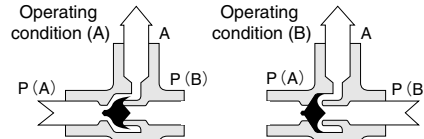


## Operating principles

When used as a quick exhaust valve

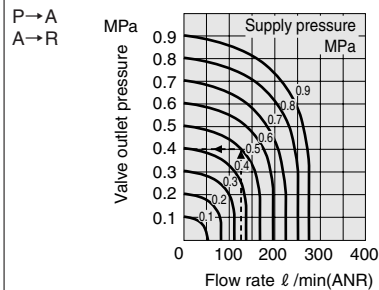


When used as a shuttle valve



Symbol	Specifications	
	Minimum operating pressure	0.03MPa (0.3kgf/cm <sup>2</sup> ) [4psi]
	Effective area	2.5mm <sup>2</sup>
	Flow coefficient	Cv
		0.12
	Material	Brass
	Diaphragm	Synthetic rubber
Mass	g [oz.]	10 [0.35]

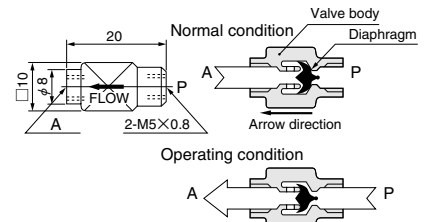
## Flow rate




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

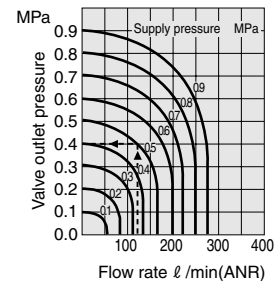
Model  
**C1**  
Check valve

- Enables media to flow in one direction, and prevent it from flowing in the opposite direction.



Symbol	<b>Specifications</b>		
	Minimum operating pressure	0.03MPa (0.3kgf/cm <sup>2</sup> )	[4psi]
	Effective area	2.5mm <sup>2</sup>	
	Flow coefficient	Cv	0.12
	Material	Body	Brass (nickel plated)
		Diaphragm	Synthetic rubber
	Mass	g [oz.]	7 [0.25]

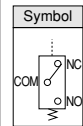
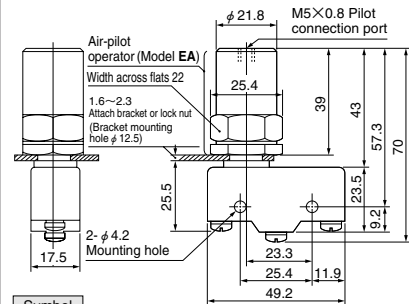
## Flow rate



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

(mm)

Model

**ESA****Pneumatic-electric transducer switch**

This switch is used to transduce pneumatic signals to electrical signals, with a already assembled micro switch and dedicated operator.

● For the timer circuit or for obtaining a pulse signal, use another model **ES**, and use it in combination with the various operators.

● The micro switch (with lock nut) order code is **ESL**, while the order code for its dedicated air pilot operator is **EA** (**ESL+EA=ESA**).

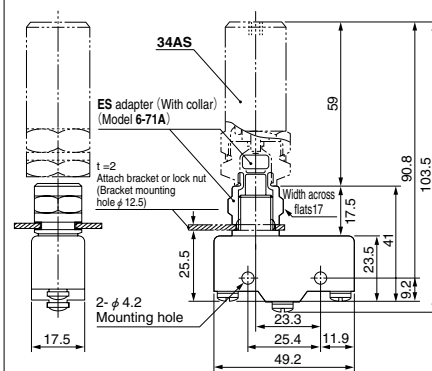
**Specifications**

Operating pressure range (air pilot)	MPa {kgf/cm <sup>2</sup> } {psi.}	0.06~0.9 {0.6~9.2} [9~131]
Maximum operating frequency	Hz	5
Micro switch rating		AC 250V 15A DC 30V 6A
Material		
Operator body		Brass (nickel plated)
Seal		Synthetic rubber
Micro switch body		Plastic
Mass	g [oz.]	120 [4.23]
Standard equipment		1 pc. lock nut (spacer)

Micro switch model	OMRON Z-15GQ-B (standard) (Remove the plunger's stop ring when using)
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Remark: More compact models are available. Consult us.

Model

**ES****Electric switch (with adapter)**

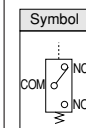
This example is mounting operator 34AS

This switch is used in combination with various operators for transducing pneumatic signals to electrical signals.

● When using in combination with operators, attach the supplied **ES** adapter (Model **6-71A**) as shown in the diagram.

● Cannot be used in combination with **34A**. When using it as a general pneumatic electric transducing switch, use another model **ESA**.

(Since the **34A** does not have a built-in spring, it could occasionally fails to return properly.)



- Maximum operating cycles ..... 5Hz
- Mass ..... 63g [2.22oz.]
- Materials
  - Body ..... Brass (nickel plated)
  - Adapter ..... Brass (nickel plated)
  - Collar ..... Delrin plastic

**Example of the combination of ES and operator**

P/E transducing of low pressure	0.3~2kgf/cm <sup>2</sup> [4~28psi.] G	<b>ES+34AL</b>
Timer circuit		<b>ES+34AS</b>
In the case of receiving pulse signal		<b>ES+34AR</b>
P/E transducing of medium pressure	0.6~9kgf/cm <sup>2</sup> [9~128psi.] G	Specify another model <b>ESA</b>

Remark: The micro switch is the same as the one for **ESA**.

Note: When using in combination with **34AL**, do not use the **ES** adapter's collar.

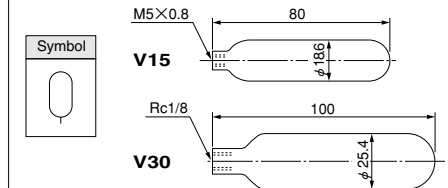
Model

**V15****Volume tank 15cc [0.915in<sup>3</sup>]**

Model

**V30****Volume tank 30cc [1.830in<sup>3</sup>]**

● Used as an air reservoir, etc., for air timers.

**Specifications**

Item	Model	V15	V30
Volume	cc [in <sup>3</sup> ]	15 [0.915]	30 [1.830]
Port size		M5×0.8	Rc 1/8
Proof pressure	MPa (kgf/cm <sup>2</sup> ) {psi.}	1.35 {13.8} [196]	
Materials		Steel sheet (nickel plated on both sides)	
Mass	g [oz.]	44 [1.55]	103 [3.63]

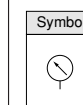
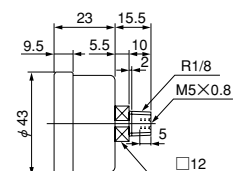
● Maximum setting time when used normally in combination with the speed controller SC0, etc.

V15: approximately 5 seconds, V30: approximately 10 seconds

● If moisture is included in the compressed air, the moisture can accumulate and cause instability in the setting time.

Use dry air. In addition, install the tank in a way not to collect water.

Model

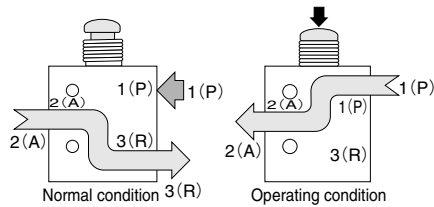
**PG1****Pressure gauge****Specifications**

Maximum operating pressure	0.9MPa [9.2kgf/cm <sup>2</sup> ] [131psi.]
Proof pressure	1.35MPa [13.8kgf/cm <sup>2</sup> ] [196psi.]
Mass	g [oz.] 90 [3.17]

## Operating principles

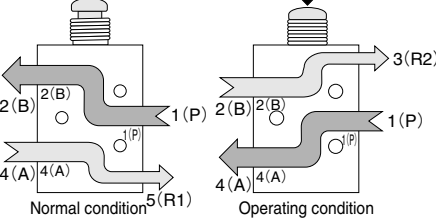
All ports can be used to allow flows in the reverse direction.

### 3-port 31P



※ When used as a 3-port normally closed type

### 5-port 41P

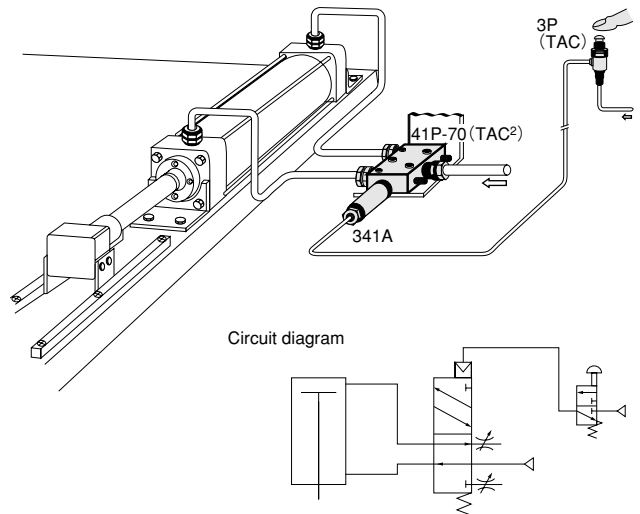


● When used as a 5-port valve

## Specifications

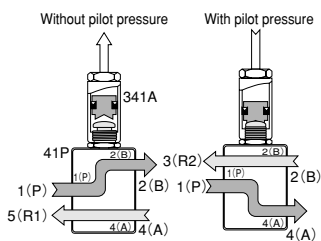
Media		Air
Operating pressure range	MPa [kgf/cm <sup>2</sup> ] [psi.]	0.05~0.9 {0.5~9.2} [7~31] (For pilot pressure, see the numeric values of each operator)
Proof pressure	MPa [kgf/cm <sup>2</sup> ] [psi.]	1.35 {13.8} [196]
Effective area	mm <sup>2</sup>	5.5
Flow coefficient	Cv	0.27
Air flow rate (at 0.7MPa [102psi.])	ℓ /min [ft <sup>3</sup> /min.] (ANR)	Approximately 500 [17.7]
Operating temperature range (atmosphere and media)	°C [°F]	0~60 [32~140]
Maximum operating frequency	Hz	5
Valve stroke	mm [in.]	2.4 [0.094] (Pre-stroke 0.8 [0.031] Main stroke 0.8 [0.031] Over stroke 0.8 [0.031] )
Lubrication	Required (Turbine Oil Class 1 (ISO VG32) or equivalent)	
Port size	Rc1/8 female thread (3(R2), 5(R1) port of 5-port valve: M5×0.8)	
Materials	Body	Aluminum alloy (electroless nickel plating)
	O-ring	Synthetic rubber

## Application example

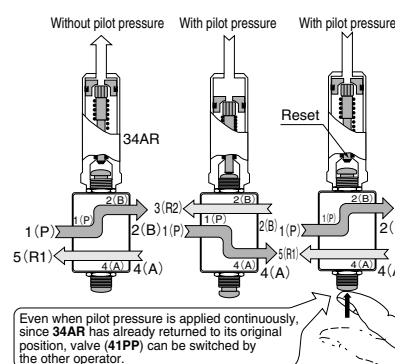


## Example of valve and operator combination, and its operation

### 41P, 341A



### 41PP, 34AR (self return type)



While the **34AR** operates immediately after receiving pilot pressure, it returns to its original position after 0.3~0.5 second.

Note: Ensure that adequately large flow rate of pilot air is applied to **34AR**. (Do not supply flows gradually.)




## Types and operating force of operators (valve operation devices)

Combines with the basic valves to create valves for all kinds of operation types.

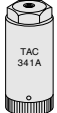
Note: Always insert a spacer of 2~2.5mm [0.079~0.098in.] between the basic valve and the operator. The lock nut (1 pc. nut) supplied with the basic valve can be used as a spacer.

The mounting brackets shared with the one of TAC air valve range can also be used as spacers.


Model  
**34A**  
Air pilot  
operator



Model  
**341A**  
Air pilot  
operator



Model  
**34AL**  
Air pilot operator for  
low pressure

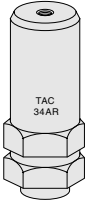


Pilot pressure (minimum)

MPa [psi.]

		Basic valve	31P	41P	41PP
Main pressure MPa [psi.]	0.1 [15]	34A	0.30 [44]	0.46 [67]	0.13 [19]
		341A	0.18 [26]	0.29 [42]	0.09 [13]
		34AL	0.07 [10]	0.09 [13]	0.04 [6]
	0.3 [44]	34A	0.34 [49]	0.48 [70]	0.14 [20]
		341A	0.20 [29]	0.30 [44]	0.11 [16]
		34AL	0.07 [10]	0.10 [15]	0.05 [7]
	0.5 [73]	34A	0.35 [51]	0.50 [73]	0.18 [26]
		341A	0.22 [32]	0.31 [45]	0.13 [19]
		34AL	0.08 [12]	0.10 [15]	0.05 [7]
	0.7 [102]	34A	0.39 [57]	0.52 [75]	0.21 [30]
		341A	0.25 [36]	0.33 [48]	0.15 [22]
		34AL	0.09 [13]	0.11 [16]	0.06 [87]

Note: Use the 34A when a high pilot pressure can be obtained.

Model <b>34AR</b> Self return type Air pilot operator	
	
Pilot pressure (minimum)	
	MPa [psi.]
Main pressure	Basic valve
0.1 [15]	0.32 [46]
0.3 [44]	0.34 [49]
0.5 [73]	0.36 [52]
0.7 [102]	0.39 [57]

This operator actuates immediately after receiving pilot pressure, but then returns immediately after that. When used in combination with 4PP and 41PP, it can also be used with other operators, for separate actuation from the 34AR.  
See p.847 for an explanation.

Model


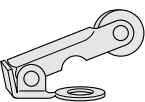
34B

Ball-cam operator

Model

34C

Roller-cam operator

Pre-stroke

1.6mm [0.063in.]

Main stroke

1.6mm [0.063in.]

Over stroke

1.6mm [0.063in.]

Note: Completely switches at a stroke of 3.2mm or larger. Do not use a stroke of 4.8mm or larger.

Operating force (minimum)

N [lbf.]

		Basic valve	31P	41P	41PP
Main pressure MPa [psi.]	0.1 [15]	34B	26.5 [5.96]	37.3 [8.39]	9.8 [2.20]
		34C	17.7 [3.98]	26.5 [5.96]	5.9 [1.33]
	0.3 [44]	34B	27.5 [6.18]	38.2 [8.59]	11.8 [2.65]
		34C	18.6 [4.18]	27.5 [6.18]	6.9 [1.55]
	0.5 [73]	34B	29.4 [6.61]	41.2 [9.26]	12.7 [2.85]
		34C	20.6 [4.63]	27.5 [6.18]	7.8 [1.75]
	0.7 [102]	34B	32.4 [7.28]	44.1 [9.91]	16.7 [3.75]
		34C	23.5 [5.28]	29.4 [6.61]	9.8 [2.20]

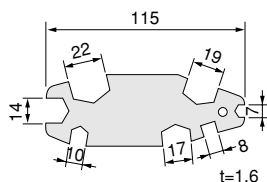
Note: The following operators cannot be used with the TAC2:

- 34AS (snap-action type air pilot operator) — Because of its strong operating force.
- 34F (foot, elbow, and hand operated operator) — Because of the piping port location.

### Hand wrench

Can be used for all fittings, valves, and lock nuts. Use of 2 pieces is convenient and recommended.

●151-20

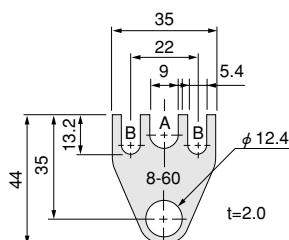


### Bracket

Used for mounting valves and regulators in the TAC air valve series. Slot A is for piping, while Slot B is for mounting screws.

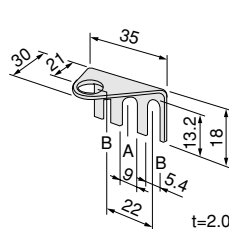
●8-60

Flat



●8-600

Angle



●8-70

Multiple-use

