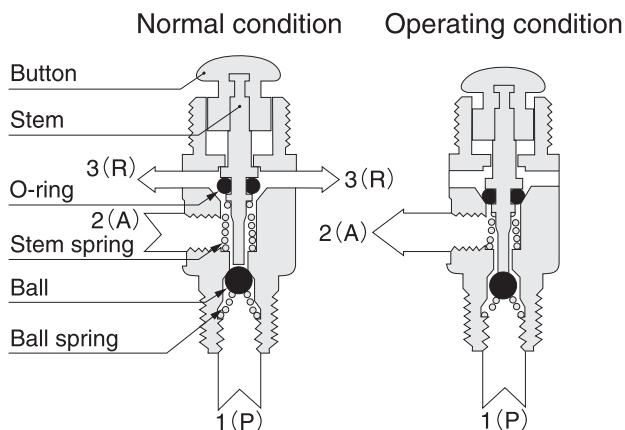


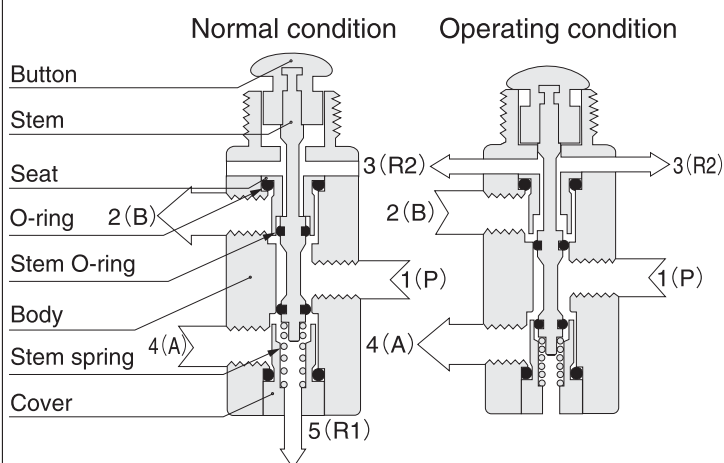
## Basic Valves (Mini Series TAC Valves)

### Operating principles

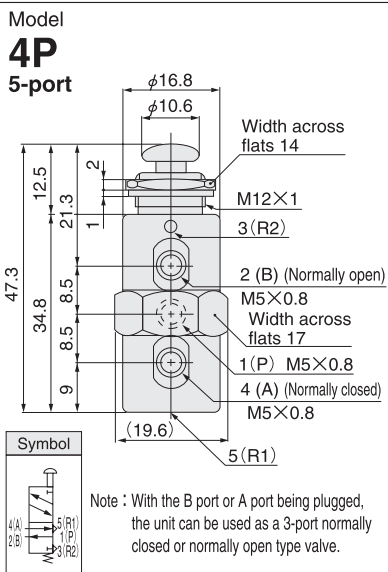
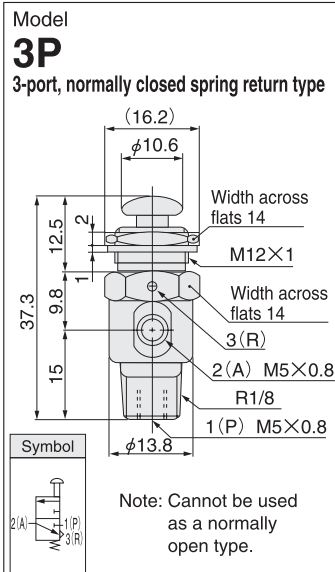
#### 3-port (3P)



#### 5-port (4P)



### Dimensions (mm)



### Specifications

Item	Model	3P	4P
Operation type		Push button spring return	
Number of ports		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] (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.]	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	

### Major parts and materials

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

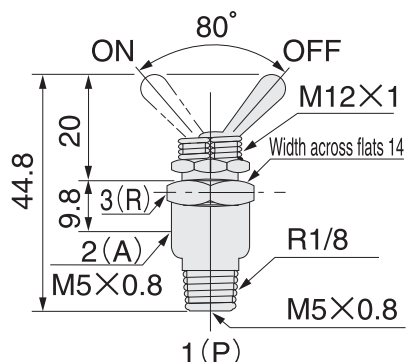
### Minimum operating force of push button

Type	N [lbf]		
	Air pressure MPa	0.2 [29psi.]	0.4 [58psi.] 0.7 [102psi.]
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]

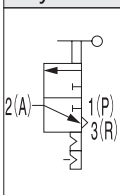
Notes: 1. Figures in parentheses ( ) are for when the 2(A) port is open to the atmosphere.  
2. For the operating force while used in combination with operators, see the pages of each operator.

### Dimensions (mm)

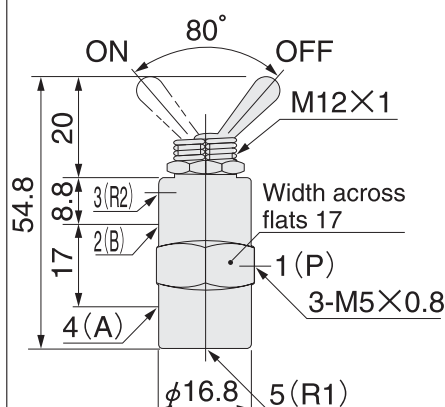
Model

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

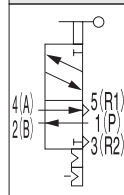
Symbol



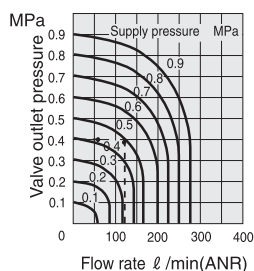
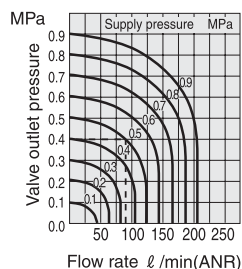
Model

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

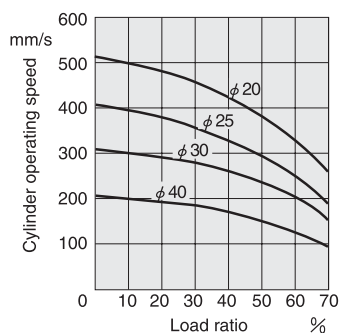
Symbol



### Flow rate

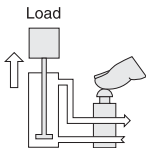
**3-port****5-port**

### 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.].

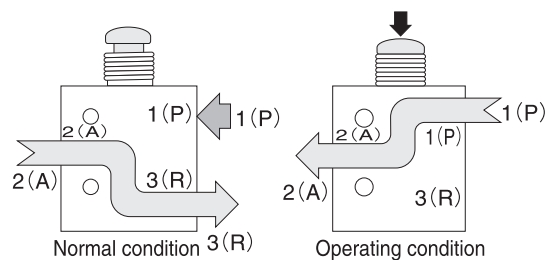
### Specifications

Item	Model	3V	4V
Operation type	Pinned lever	Holding type	
		Holding type	
Number of ports		3	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 {Pre-stroke 0.8 [0.031] Main stroke 0.8 [0.031] Over stroke 0.8 [0.031]} [0.094]	
Lubrication		Required (Turbine Oil Class 1 [ISO VG32] or equivalent)	
Mass	g [oz.]	30 [1.06]	66 [2.33]
Standard accessories	Lock nut (110-21A) Lock washer (100-35)	1 pc. each	

### Operating principles

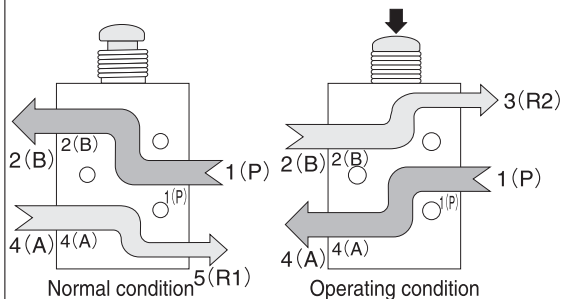
All ports can be used to allow flows in the reverse direction.

#### 3-port 31P



※ When used as a 3-port normally closed type

#### 5-port 41P

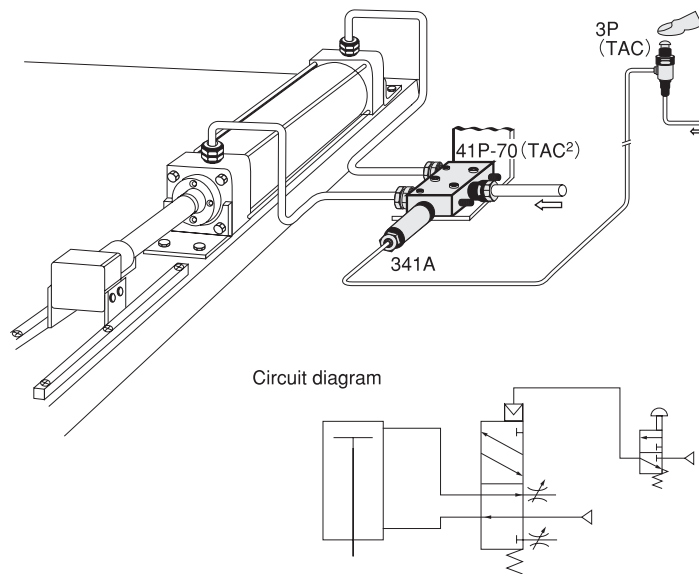


● When used as a 5-port valve

### Specifications

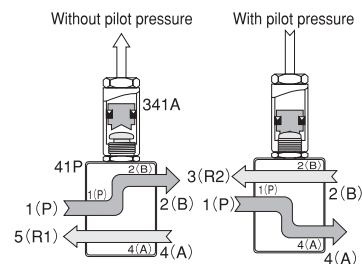
Media		Air
Operating pressure range	MPa {kgf/cm <sup>2</sup> } [psi.]	0.05~0.9 {0.5~9.2} [7~31] (For pilot pressure, see the numeric values of each operator)
Proof pressure	MPa {kgf/cm <sup>2</sup> } [psi.]	1.35 {13.8} [196]
Effective area	mm <sup>2</sup>	5.5
Flow coefficient	Cv	0.27
Air flow rate (at 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)
	Stem	(Stem of 31V, 41V : Stainless steel)
	O-ring	Synthetic rubber

### Application example



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

#### 41P



## Basic Valves (Mini Series TAC Valves)

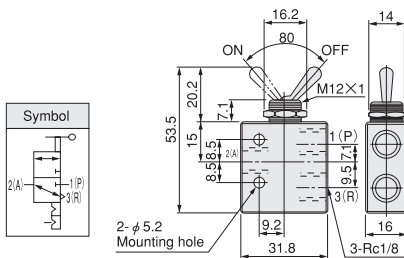
Model

### 31V

Pinned lever, holding type  
3-port, for both NC and NO

As with the 31P type, various usage is possible depending on the used piping.

■ Mass 55g [1.94oz.]



Model

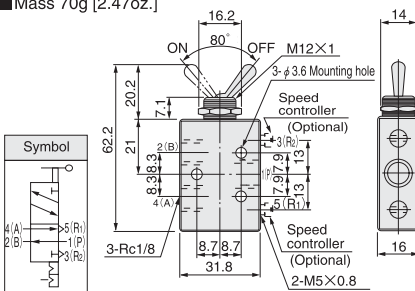
### 41V

Pinned lever, holding type

● 5-port

● Speed controller can be built-in. (Order code **41V-70**)  
[The speed controller can be removed to attach a muffler (Model **150-30A**, to be ordered separately) in its place.]

■ Mass 70g [2.47oz.]



Model

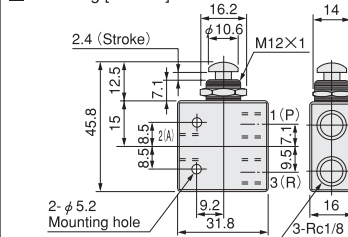
### 31P

Push button spring return type  
3-port, for both NC and NO

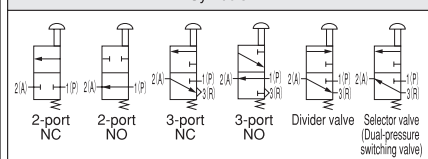
Depending on the piping procedure, the following usage is allowed.

- 2-port, normally closed (3(R) port plugged)
- 2-port, normally open (1(P) port plugged)
- 3-port, normally closed (1(P) port used as IN)
- 3-port, normally open (3(R) port used as IN)
- Divider valve  
[Use the 2(A) port as IN, the 1(P) port and 3(R) port as OUT.]
- Selector valve (Dual-pressure switching valve)  
[Use the 1(P) port and 3(R) port as IN ports with different pressures.]

■ Mass 55g [1.94oz.]



Symbols



Model

### 41P

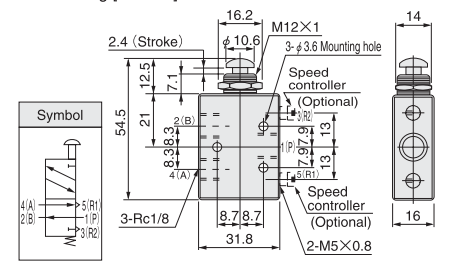
Push button, spring return type

● 5-port

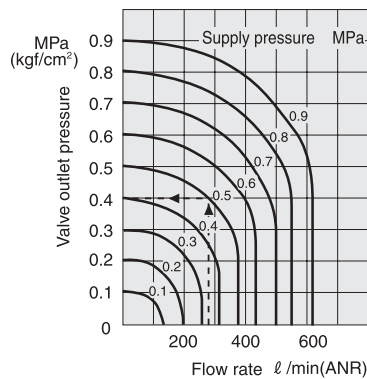
[Plugging the 2(B) port makes a 3-port NC (normally closed) type, while plugging the 4(A) port makes a 3-port NO (normally open) type. Both the 4(A) and 2(B) ports can also be used as IN ports.]

● A speed controller can be built-in. (Order code **41P-70**)  
[The speed controller can be removed to attach a muffler (Model **150-30A**, to be ordered separately) in its place.]

■ Mass 70g [2.47oz.]



### Flow rate

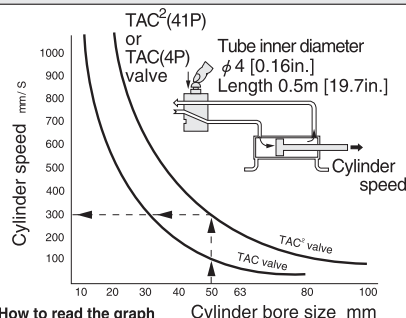


1MPa=145psi., 1 l/min=0.0353ft<sup>3</sup>/min.

### How to read the graph

When the supply pressure is 0.5MPa [73psi.] and the flow rate is 275 l/min [9.71ft<sup>3</sup>/min.] (ANR), the valve outlet pressure becomes 0.4MPa [58psi.].

### Cylinder operating speed



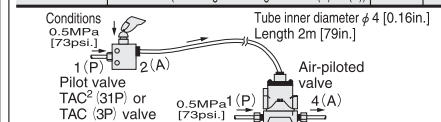
**How to read the graph** Cylinder bore size mm  
When using a TAC<sup>2</sup> valve with a cylinder bore size φ 50 [1.969in.], a speed of about 300mm/s [11.8in./sec.] can be obtained.

### Conditions

Air pressure: 0.4~0.7MPa [58~102psi.], Load: 0~1/3 of cylinder thrust (Speed is virtually constant with pressure of 0.4MPa [58psi.] or more, and/or with load ratio of up to 1/3).

### Operating time

		s	
Pilot valve		TAC <sup>2</sup>	TAC
Air-piloted valves			
254-4A	Valve: ON (switching air flowing state to 1(P)→4(A))	0.04	0.06
	Valve: OFF (switching air flowing state to 1(P)→2(B))	0.10	0.15
375-4A	Valve: ON (switching air flowing state to 1(P)→4(A))	0.05	0.07
501-4A	Valve: OFF (switching air flowing state to 1(P)→2(B))	0.12	0.16
750-4A	Valve: ON (switching air flowing state to 1(P)→4(A))	0.06	0.09
	Valve: OFF (switching air flowing state to 1(P)→2(B))	0.13	0.17
1000-4A	Valve: ON (switching air flowing state to 1(P)→4(A))	0.10	0.16
1250-4A	Valve: OFF (switching air flowing state to 1(P)→2(B))	0.20	0.27



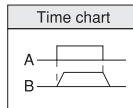
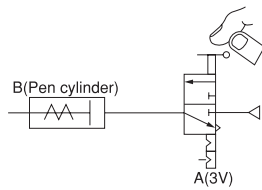
### How to read the table

When used in combination with air-piloted valves 254-4A, switching time is about 0.04 seconds after actuating the TAC<sup>2</sup>, and about 0.10 seconds after closing it.

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

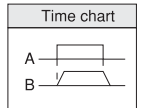
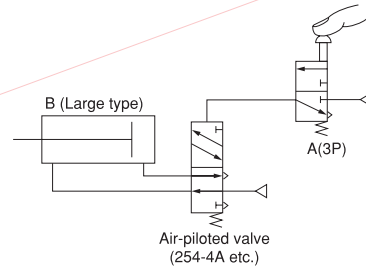
## 1. Operation of single acting air cylinder (Direct operation of compact single acting air cylinder)

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



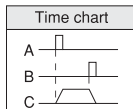
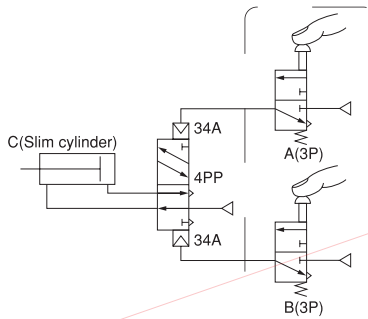
## 2. Operation of large air cylinder (Indirect operation by a large valve)

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)

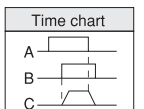
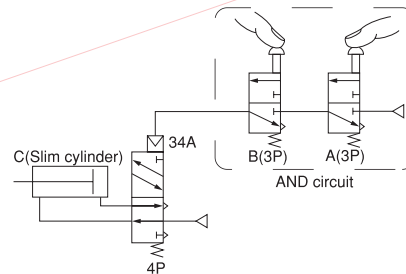
Actuating valve A extends cylinder C's rod, while actuating valve B retracts the rod. Since the valve (4PP) operating the cylinder is a holding type, only a momentary air signal from valve A or B is required.



## 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.

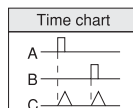
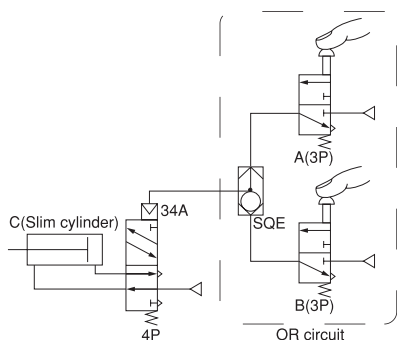
It is used in a safe operation circuit of press machines or in a checking circuit for proceeding to the next step after checking at least 2 actions.



## 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.

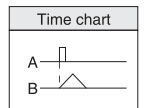
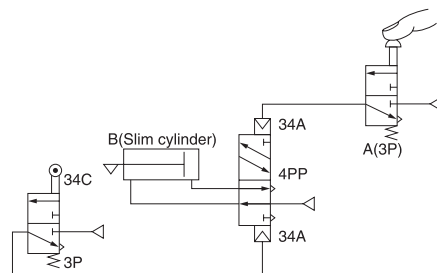
Used when needing any of 2 or more signals to actuate.



## 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.



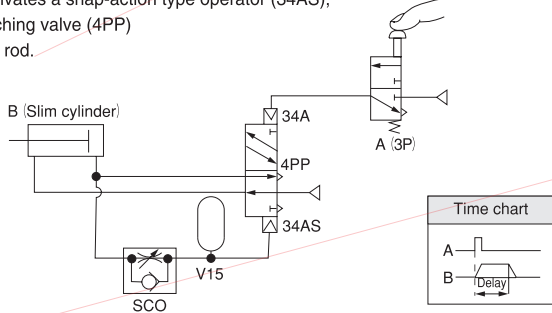
## Basic Valves (Mini Series TAC Valves) Circuit Examples

### 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.

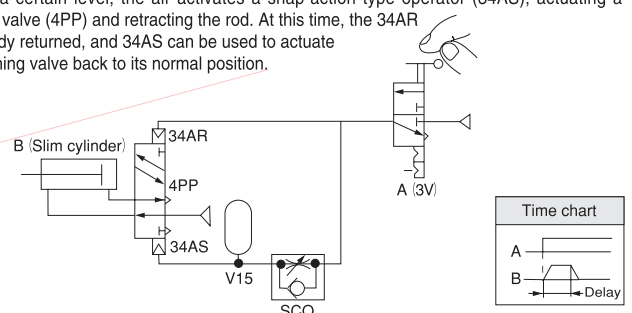


### 8. One reciprocating operation of air cylinder (Timing operation)

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.

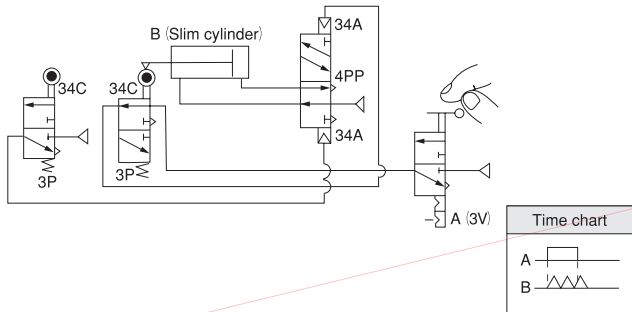
#### [Detailed explanation of operation]

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.



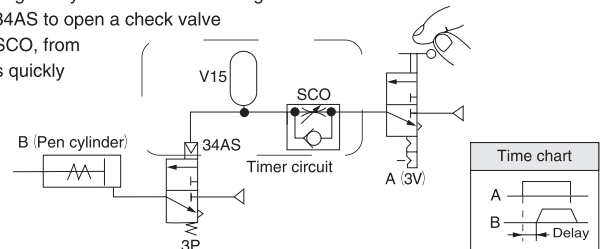
### 10. Delay circuit (On delay timer circuit)

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 where air is quickly exhausted.



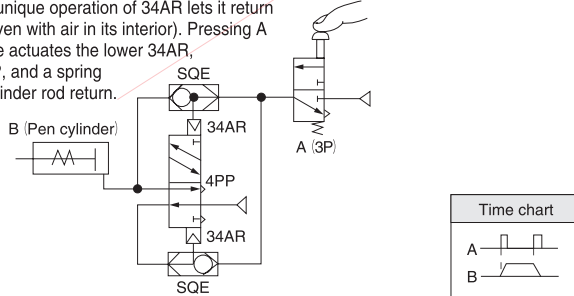
### 11. Step operation circuit (Binary counter circuit)

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]

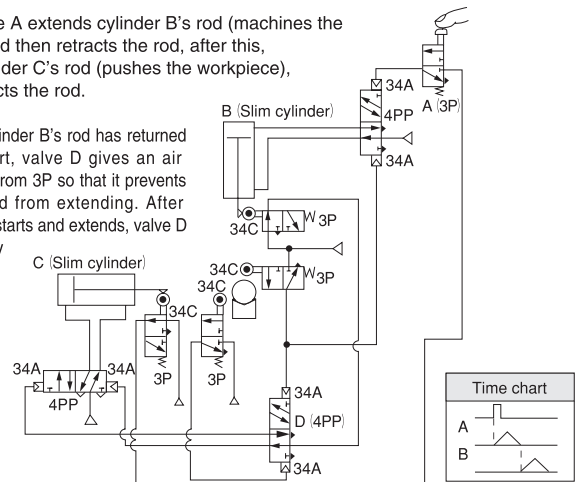
Pressing valve A(3P)(press and release), supply air through the upper shuttle valve (SQE) which activates the upper self-return type operator (34AR), actuating the holding type switching valve (4PP) and extending the cylinder rod. At this time, while air has been in the lower 34AR from the beginning, 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 (Mini Series TAC Valves)

### Circuit Examples


#### 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.]

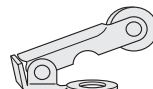
		Basic valve	31P	41P	
Main pressure MPa [psi.]	0.1 [15]	34A	0.30 [44]	0.46 [67]	
		341A	0.18 [26]	0.29 [42]	
		34AL	0.07 [10]	0.09 [13]	
	0.3 [44]	34A	0.34 [49]	0.48 [70]	
		341A	0.20 [29]	0.30 [44]	
		34AL	0.07 [10]	0.10 [15]	
	0.5 [73]	34A	0.35 [51]	0.50 [73]	
		341A	0.22 [32]	0.31 [45]	
		34AL	0.08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

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

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	
Main pressure MPa [psi.]	0.1 [15]	34B	26.5 [5.96]	37.3 [8.39]	
		34C	17.7 [3.98]	26.5 [5.96]	
	0.3 [44]	34B	27.5 [6.18]	38.2 [8.59]	
		34C	18.6 [4.18]	27.5 [6.18]	
	0.5 [73]	34B	29.4 [6.61]	41.2 [9.26]	
		34C	20.6 [4.63]	27.5 [6.18]	
	0.7 [102]	34B	32.4 [7.28]	44.1 [9.91]	
		34C	23.5 [5.28]	29.4 [6.61]	

Note: The following operators cannot be used with the TAC<sup>2</sup>:

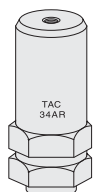
●34AS (snap-action type air pilot operator)

Because of its strong operating force.

●34F (foot, elbow, and hand operated operator)

Because of the piping port location.

Model  
**34AR**  
Self return type  
Air pilot operator



Pilot pressure (minimum)

MPa [psi.]

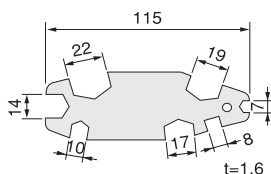
		Basic valve	31P	41P	
Main pressure	0.1 [15]		0.32 [46]	0.33 [48]	
	0.3 [44]		0.34 [49]	0.34 [49]	
	0.5 [73]		0.36 [52]	0.36 [52]	
	0.7 [102]		0.39 [57]	0.39 [57]	

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

#### Hand wrench

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

##### ●151-20

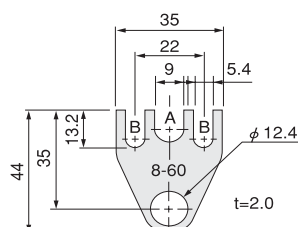


#### Bracket

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

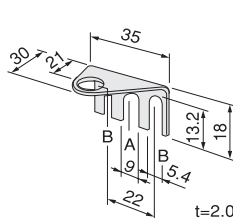
##### ●8-60

Flat



##### ●8-600

Angle



##### ●8-70

Multiple-use

