

Humphrey TAC Air Valves

TECHNICAL SECTION

GENERAL INFORMATION DESCRIPTION AND PRECAUTIONS

Description

- TAC valves: The original and smallest components of the TAC series, with 2-way, 3-way, and 4-way models having #10-32 ports.
- TAC² valves: Larger size and higher flow. An expansion of TAC series. These 3-way and 4-way models have 1/8 pipe ports.
- TAC³ valves: Largest and highest-flow TAC valves. These 4-way models have 1/4 pipe ports.

Port Identification (Varies by model; see individual model drawing)

- | | |
|--------------|--|
| IN | Pressure supply port. |
| NO | Pressure supply port, normally open (passing). |
| NC | Pressure supply port, normally closed (not passing). |
| CYL or OUT | Delivery port. |
| C1 or CYL NO | Delivery port, normally open (passing). |
| C2 or CYL NC | Delivery port, normally closed (not passing). |
| EXH | Exhaust port. Vent to atmosphere. |

Note: TAC valve drawings show port markings on valve, but some valves are not furnished with such markings.

Installation

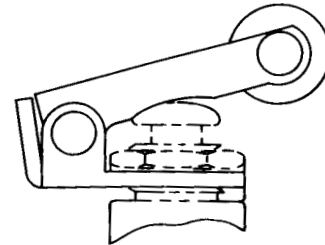
TAC valves can be mounted in any position in most environments within the parameters stated in the specifications. If located near water, oil, or extremely dusty conditions, contaminants may enter via valve exhaust ports causing malfunction or may interfere with movement of button, toggle, or air pilot operator.

Mounting/Assembly of Actuators

Valves can be mounted directly in the supply line, or by using body mounting holes, mounting brackets, or panel mounting nuts. Sometimes actuators can be used to secure actuator and valve to a mounting surface.

MANUAL/MECHANICAL

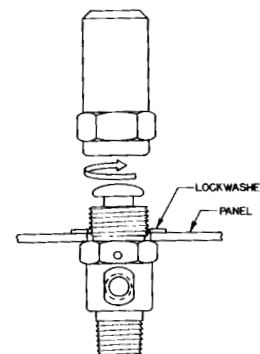
Manual or mechanical actuators should be adapted to valves/mounting while ensuring adequate stroke of actuator.



The mounting surface should not prevent complete actuation of valve. Position actuator on valve and secure with locknuts. Actuator should be positioned to provide adequate stroke of valve, without excessive prestroke of valve or overstroke of actuator (specifically models 34B, 34C, 34CW). Secure actuator with locknut/s.

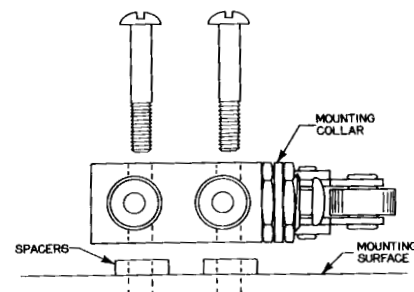
PILOT ACTUATORS

Pilot actuators (34A & 341A) can be adapted to valves/mounting without concern for proper actuator stroke. Pilot actuators (34/341AR, AS, ASR) function best with 3/32" thickness (panel mounting bracket, or locknut and washer) between valve and actuator.



The mounting collar of some actuators is wider than the thickness of certain valves (34C on 31P, or 341AR on 41P, etc.). This requires spacing the valve body away from the mounting surface if body mounting holes are to be used.

Mounting brackets (8-60 & 8-600) have slots that permit mounting adjustment. These brackets can be used to bypass the spacing requirements mentioned above.



Use as 2-Way Valves

TAC

Model 2P and 2V are specifically designed to be 2-way valves. They have no exhaust port, thus they are either vented to atmosphere; or when used to trap downstream pressure, supply pressure must remain on.

Model 3P and 3V can be used as 2-way valves to vent pressure to atmosphere. These valves, however, will not trap downstream pressure. Attempting to plug the unthreaded exhaust port is not recommended because any trapped pressure will vent around the actuator.

TAC²

Model 31P and 31PPX can be used as 2-way valves to vent pressure to atmosphere or to trap downstream pressure. To trap downstream pressure, plug NO port for 2-way, normally closed; plug NC port for 2-way, normally open.

Model 31V can be used as a 2-way valve to vent pressure to atmosphere. The exhaust port can be plugged to trap downstream pressure, however due to the slight deflection of the stem by the toggle actuator, the valve may not be capable of trapping pressure for extended periods of time.

Use as 3-Way Valves

TAC/TAC²/TAC³

All 4-way models can be used as 3-way valves by plugging the C1 or CYL NO port (3-way, normally closed), or the C2 or CYL NC port (3-way, normally open).

Use As A Selector Valve

TAC

Not possible with TAC series valves.

TAC²

Model 31P, 31V, and 31PPX can be used as a selector valve with supply pressures connected to the NO port (normally open, passing to CYL port) and the NC port (normally closed, not passing to CYL port).

Model 41P, 41PP, and 41PPX can be used as a selector valve with supply pressures connected to the C1 port (normally open, passing to IN port) and the C2 port (normally closed, not passing to IN port). The exhaust ports are to be plugged. (Use Humphrey #PF Plug Fittings). Note that Model 41V cannot be used as a selector valve because of the differential (unbalanced) areas within the valve. Models 41T and 41R cannot be used because exhaust ports cannot be plugged.

TAC³

Model 42P and 42PP can be used as a selector valve with supply pressures connected to the C1 port (normally open, passing to IN) and the C2 port (normally closed, not passing to IN).

Use As A Diverter Valve

TAC

Model 4P, 4PP, 4V, and 4PPX can be used as a diverter valve with supply pressure connected to the IN port. Note that unthreaded exhaust ports vent to atmosphere and cannot be plugged.

TAC²

Model 31P, 31V, and 31PPX can be used as a diverter valve with supply pressure connected to the CYL port. With these models, there is no venting to atmosphere.

Model 41P, 41PP, 41V, and 41PPX can be used as a diverter valve with supply pressure connected to the IN port. Exhaust ports vent to atmosphere, or can be

plugged. Note: plugging the exhaust port nearest the actuator of Model 41V may result in the valve maintaining the actuated position due to the differential (unbalanced) areas within the valve.

TAC³

Model 42P, 42PP, 42A, and 42A2 can be used as a diverter valve with supply pressure connected to the IN port. Exhaust ports vent to atmosphere, or can be plugged.

Media/Pressure

TAC, TAC², and TAC³ valves are designed for use with compressed air or inert gases from 0 to 125 psig (8.5 bar). Media should be clean and uncontaminated. When in doubt, install an air filter with filtering capacity of 40 microns. Periodically remove and clean or replace filter element.

Some valves are also capable of functioning with vacuum. Consult factory and provide desired model number, required vacuum range and description of valve function.

Lubrication

All valves are pre-lubricated at assembly and can be operated without air line lubrication depending on condition of compressed air, volume of air passed through valve, and cycle rate.

TAC valves have smaller sealing surface contact areas, thus are less sensitive to the condition of compressed air than TAC² and TAC³. TAC 2-way and 3-way valves are least sensitive to lubrication due to poppet style design.

Lubricating oils used must be compatible with Buna N and be of sufficient viscosity to assure adequate lubrication. Thin or low viscosity oils (spindle oil, machine oil, etc.) do not provide a good residual film of lubrication. Lubrication compatibility problems can sometimes be satisfied with fluoroelastomer seals option. Specify *w/VAI*.

Plumbing

All valves will function with low pressure or restricted volume media supplies.

Air pilot operators may be affected by low pressure, slowly increasing pilot signals, erratic signals, etc. For optimum performance, use 1/8- or 1/4-inch O.D. tubing size and minimum tubing length.

When using a manifold (TAC³) on which more than eight valves will be actuated simultaneously, connect air supply to both ends of manifold. Also exhaust through both ends of manifold. This ensures adequate supply and exhaust capacity. When capturing manifold exhaust, minimize exhaust resistance. Restricted exhaust may cause interference or erratic action of pneumatic devices attached to manifold.

Before connecting fittings and tubing, blow all foreign material from these components. If using a sealant, take extra care that sealant does not enter valve causing malfunction and/or leaks. TAC valve fittings are installed using standard tools. Use of Humphrey Handy Wrench (Model 151-20) is recommended for working with TAC valves, fittings, and accessories. Recommended torque for #10-32 fitting installation is 12-inch pounds (1.3 Newton-meters). *CAUTION: Do not over-tighten beyond 24-inch pounds (2.7 Newton-meters).*

Compressed air is powerful and may be dangerous. Before attempting to remove a component from an air line or system, always disconnect the supply air and thoroughly exhaust the line or system. Never attempt to construct, operate, or service anything utilizing compressed air unless you have been properly trained to do so. Failure to heed this warning could result in SERIOUS, EVEN FATAL, PERSONAL INJURY.

Metric Ports

Although these valves are produced using the inch system, all drawings show the metric equivalent in millimeters (indicated by slanted numbers). Port connections may be available in metric. Consult factory.

Specify metric port threads by using letter *E* as a model number prefix. Example: *E3P* has metric ports.

Humphrey does not offer metric size fittings. Contact your local Humphrey distributor for metric size fittings sources.

Flow Rates/C_v

Humphrey recommends "fill/exhaust times", which are related to various chamber sizes, as the best method for calculating total valve and device (specifically, cylinder) response time. Humphrey recognizes the industry's use of flow coefficient C_v as a comparison standard.

Consequently, Humphrey offers three types of flow data. The National Fluid Power Association's standards for C_v, the scfm flow rate determined by flowing to atmosphere, and Humphrey's preferred "fill/exhaust times".

Model	C _v	SCFM @ 100 PSIG	Fill Time (Seconds) (0 to 90 PSIG) Chamber (cu. in.)			Exhaust Time (Seconds) (100 to 10 PSIG) Chamber (cu. in.)		
			1	10	100	1	10	100
TAC	0.1	6	.049	.490	4.90	.064	.640	6.40
TAC ^{2*}	0.3	18	.018	.180	1.80	.025	.250	2.50
TAC ³	0.4	30	—	.085	0.85	—	.180	1.80

*TAC² Valve Models 41T and 41R have same specifications as TAC valves.

Example of how to calculate fill/exhaust times:

Model 31P One air line (0.125 I.D. x 36-inch long)
100 PSIG supply Air cylinder (1.062-inch bore x 4-inch stroke)

Volume = 0.785 x Diameter squared x stroke or length

Cylinder Volume	=	3.54 cubic inches
Air Line Volume	=	0.43 cubic inches
Total Circuit Volume	=	3.94 or 4 cubic inches

Time to Fill 4 cubic inches
= 40% of .180 sec. for 10 cubic inches = 0.072 sec.

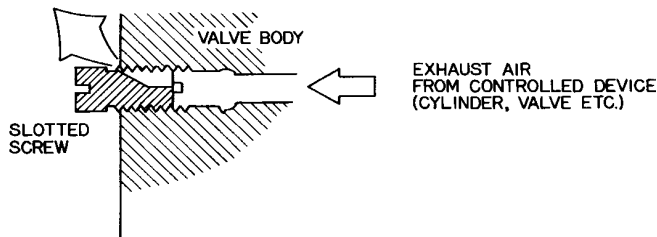
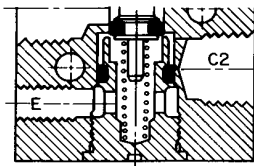
Time to Exhaust 4 cubic inches
= 40% of .250 sec. for 10 cubic inches = 0.100 sec.

Total Cycle Time* = 0.172 sec.

*Although this result is not exact, it is sufficient for most application needs and provides a simple, straight-forward system.

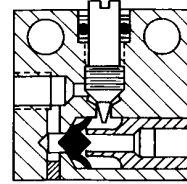
FLOW CONTROL

TAC² 4-way models are furnished (supplied loose) with slotted nylon screws for threading into exhaust ports. This allows metering of exhausting air and provides speed control of device being controlled by valve.



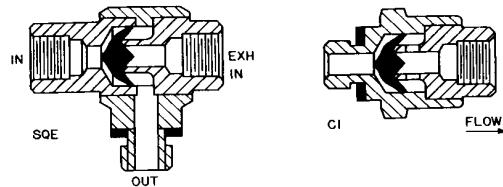
Increased engagement of screw reduces orifice of slot and meters exhausting air.

Model SC1 flow control provides more precise control of exhausting air using a combination of precision needle valve adjustment and Humphrey's unique molded quick exhaust valve shuttle as a check valve.



This shuttle provides more consistent control than ball shuttles which are typically used in other miniature flow control designs. Ball shuttles require spring loading. When spring loaded, ball shuttles restrict exhaust flow in flow control valve and may even cause reverse metering. Non-spring loaded ball shuttles are erratic when engaging valve seat in controlled flow. The unique Humphrey molded quick exhaust shuttle does not incur any of these disadvantages.

Model C1 check valve, Model SQE shuttle and Quick Exhaust Valve also employ Humphrey's unique molded quick exhaust shuttle. The merits of this component are discussed immediately above.



PACKAGING/INDIVIDUAL AND BULK QUANTITIES

Individual components are packaged for cleanliness in clear plastic bags. Permits easy identification of model number.

Customers purchasing large quantities may prefer to reduce unpacking cost by ordering in bulk quantities. Bulk packs contain multiple units. Consult factory.

TYPICAL CIRCUITS

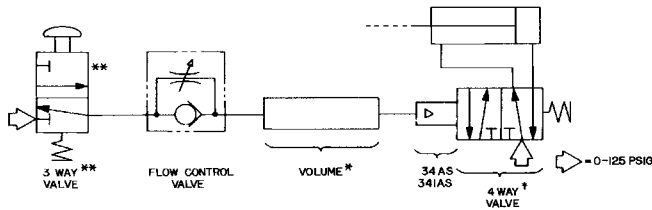
Drawings are presented as examples of methods in which components might typically be used, and are shown for descriptive purposes only. Proper, safe functioning of any system which employs the components as graphically described, or in any other manner, must be ensured by the designer.

“Time Delay” or “Sequence”

Circuit provides delay between functions.

Maintained actuation of 3-way valve supplies pilot pressure through SC1 valve and volume chamber at controlled rate, resulting in slowly building (Time Delay) of pilot pressure upon actuator (34AS). When actuation pressure of actuator is achieved, actuator shifts 4-way valve and extends cylinder. Cylinder remains extended until 3-way valve is released and pilot system is exhausted. Note: Rate of cycling of this circuit may be limited to the time required to exhaust pilot system.

TIME DELAY OR “SEQUENCE”



* One cubic inch of volume equals approximately two seconds delay.

† Valve used with 34AS or 34IAS actuator must be TAC Series but can be either 2-, 3- or 4-way depending on work function (Double Acting Cylinder shown).

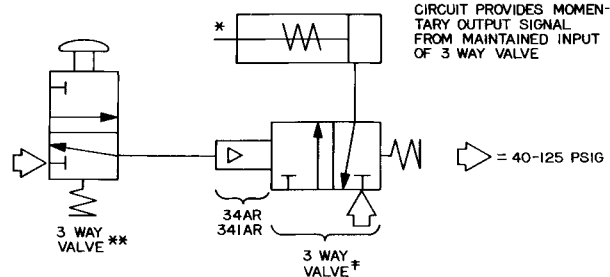
**Valve used can be any 3-way or from one side of any 4-way.

“One Shot”

Circuit provides momentary output signal from maintained input signal of 3-way valve.

Maintained actuation of manual 3-way valve** supplies pilot pressure to actuator (34AR) which actuates 3-way valve† and extends cylinder. Actuator automatically resets and permits valve to de-actuate, even though pressure to actuator is maintained. 3-way valve** must be released and pilot system exhausted before another output can be generated.

“ONE SHOT”



* Single acting cylinder shown.

**Valve used can be any 3-way or from one side of any 4-way.

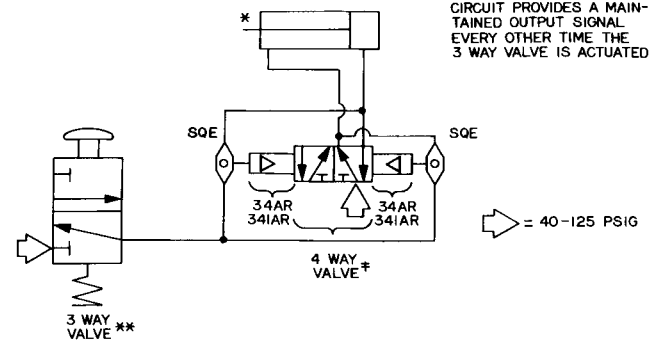
† Valve used with 34AR or 34IAR operator must be TAC Series, but can be 2-, 3-, or 4-way depending on work function.

“Ballpoint Pen”

Circuit provides a maintained output signal every other time the 3-way valve is actuated.

Momentary actuation of 3-way valve supplies pressure to both shuttle valves (SQE). Right-hand shuttle and operator (34AR) will be pressurized and reset due to pressure from 4-way valve. Left-hand shuttle and operator shift 4-way valve to opposite position and extend cylinder. Cylinder remains extended until 3-way valve is released and re-actuated causing circuit to return to position shown.

“BALLPOINT PEN”



* Double acting cylinder shown. Single acting cylinder can be used.

† Valve used with 34AR or 34IAR operator must be TAC Series 4-way model: 4PP, 41PP, or 42PP.

**Valve used can be any 3-way or from one side of any 4-way.

TROUBLESHOOTING

Circuit malfunction problems are normally caused by circuit design errors, insufficient or slow building of pressure, improper lubrication, or contaminated air supplies.

It should be determined conclusively that it is in fact the valve that is causing a malfunction. Often it is other components or factors.

1. Insure presence of pressure; blocked or defective fittings are frequent causes of circuit start-up problems.
2. Insure adequate duration of pilot signal to air pilot operators.
3. Insure proper stroke of manual, mechanical, or air pilot operators. See specific model description.
4. Insure that contamination does not cause improper valve/actuator stroke. **Note:** Model 34/341AR and 34/341ASR can accumulate water under the actuator piston if air system is contaminated with water.

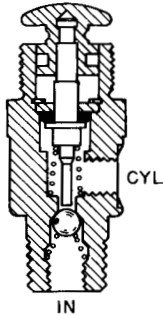
WARRANTY

All valves have a one-year warranty from date of manufacture. This warranty includes repair and/or replacement at no charge should the product be deemed defective due to workmanship and/or material.

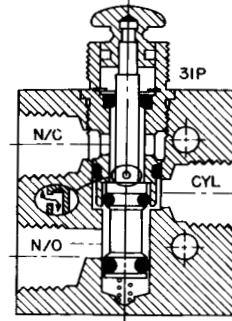
HOW THEY WORK

Model 2P (Basic TAC 2-way, spring return)

2-way, 2-position, spring return. Supply pressure enters IN port and holds ball in seat. Ball is spring biased to insure sealing at low pressure. Actuation causes valve stem to push ball out of seat. This allows flow from IN to CYL port. Being a 2-way, this valve has no exhaust port, thus there is no way for media to exhaust. De-actuation causes the ball to move back into the seat, establishing the original condition.

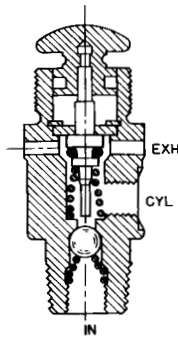


Normally open, with air supply connected to NO port: Supply pressure does not hold stem in position due to equal/balanced areas. Spring bias ensures closing. Actuation moves valve stem and causes exhaust via the NC port which serves as the exhaust port. De-actuation permits spring to re-establish normally open position.



Model 3P (Basic TAC 3-way, spring return)

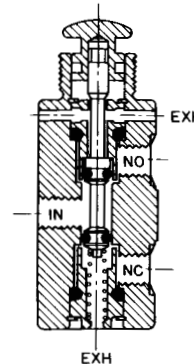
3-way, 2-position, spring return. Supply pressure enters IN port and holds ball in seat. Ball is spring biased to insure sealing at low pressure. Actuation causes valve stem to close EXH with o-ring seal and to push ball out of seat. This allows flow from IN to CYL port. De-actuation causes the ball to move back into the seat, establishing the original condition. At the same time, pressure is exhausted via the twin exhaust ports.



Model 4P (Basic TAC 4-way, spring return)

4-way (NC/NO), 5-port, 2-position, spring return.

Supply pressure flows from IN to NO port; NC port is exhausted. Actuation moves balanced stem allowing flow from IN to NC port; NO port is exhausted. De-actuation permits spring to re-establish original condition.



Model 31P (Basic TAC² 3-way, spring return)

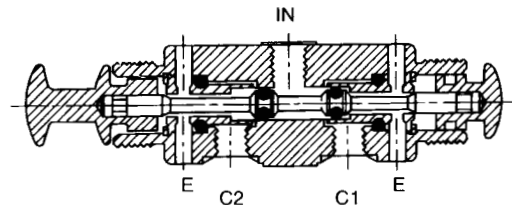
3-way, 2-position, spring return, universal valve. Can be used normally closed, normally open, or as a selector or diverter.

Normally closed, with supply connections to NC port: Supply pressure holds stem in position via "air spring" created by stem orifice which channels supply pressure to bottom of stem. Spring bias ensures closing at low pressure. Actuation moves valve stem allowing flow from NC port. De-actuation permits exhaust via the NO port which serves as the exhaust port.

Model 4P/PPX (Basic TAC 4-way, detented)

4-way (NC/NO), 5-port, 2-position, detented.

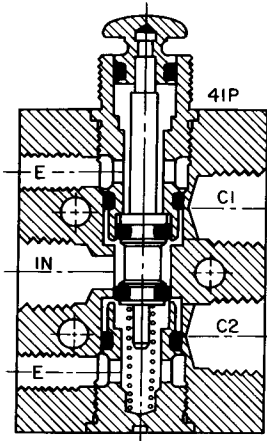
Supply pressure flows from IN to NO port; NC port is exhausted. Actuation moves balanced stem allowing flow from IN to NC port; NO port is exhausted. Actuation of valve's opposite actuator re-establishes original condition.



Model 41P (Basic TAC² 4-way, spring return)

4-way, (NC/NO), 5-port, 2-position, spring return.

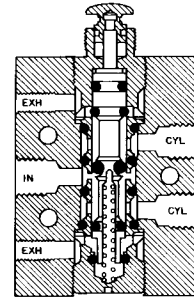
Supply pressure flows from IN to C1 port; C2 port is exhausted via the "bottom" exhaust port (lower of two exhaust ports in drawing). Actuation moves balanced valve stem allowing flow from IN to C2 port; C1 port is exhausted via "top" exhaust port. De-actuation permits spring to re-establish original condition.



Model 42P (Basic TAC³ 4-way, spring return)

4-way (NC/NO), 5-port, spring return.

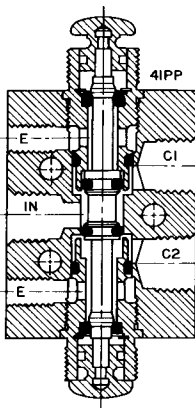
Supply pressure flows from IN to C1; C2 is exhausted via exhaust port nearest actuator. Supply pressure holds stem in position via "air spring" created by stem orifice (under patented floating center o-ring) which channels supply pressure to bottom of stem. Spring bias ensures closing at low pressure. Actuation moves valve stem allowing flow from IN to C2 port while C1 port is exhausted via other exhaust port. De-actuating valve permits spring and air spring to re-establish the original condition.



Model 41PP (Basic TAC² 4-way, detented)

4-way (NC/NO), 5-port, 2-position, detented.

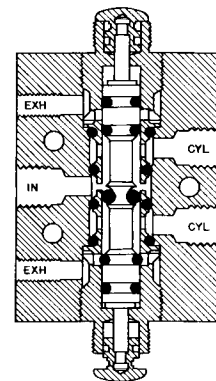
Supply pressure flows from IN to NO port; NC port is exhausted. Actuation moves balanced stem allowing flow from IN to NC port; NO port is exhausted. Actuation of valve's opposite actuator re-establishes original condition.



Model 42PP (Basic TAC³ 4-way, detented)

4-way (NC/NO), 5-port, detented.

Supply pressure flows from IN to C1; C2 is exhausted via exhaust port opposite valve actuator last actuated. Stem is balanced without "air spring." Actuation moves valve stem allowing flow from IN to C2 port while C1 port is exhausted via other exhaust port. Actuation of valve's opposite actuator re-establishes the original condition.

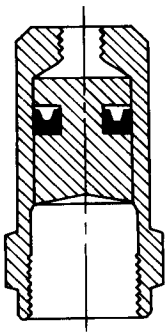


TAC AIR PILOT OPERATORS

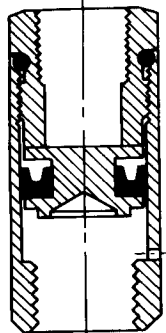
Air pilot operators thread directly onto the collars of push-button valves and the Model ESB Electric Switch Bracket.

Models 34A, 341A

Air pressure applied to pilot port drives a V-cup sealed piston to actuate a valve's push-button. The 341A air pilot operator provides approximately twice the actuation force of the 34A at same pilot pressure. Use for lower pilot pressure requirements or to amplify weak pilot signals, especially to 41PP and 42PP valves with positive detents.



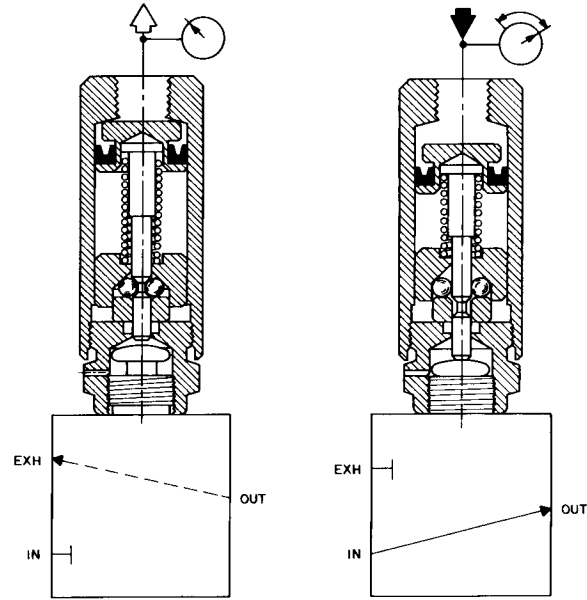
34A



341A

Models 34AS, 341AS

Air pressure applied to pilot port builds upon V-cup sealed piston until pressure against piston area generates sufficient force to overcome ball detents. Used primarily for time-delay or sequence circuits and other slow building pilot pressure applications. Actuation is delayed until pilot pressure reaches 35 PSIG \pm 5 PSIG. At this pressure, the operator piston snaps forward to actuate valve and remains shifted until pilot pressure is exhausted.



341AS

Models 34AR, 341AR

Used primarily for conversion of maintained signal to a momentary actuation. Often referred to as "one-shot." Air pressure applied to pilot port generates force upon V-cup sealed piston which overcomes spring force and extends piston rod to actuate push-button valve. Small orifice in piston and two-piece piston and piston rod permits pressure to equalize and balance piston force.

Spring then creates unbalance and returns piston and piston rod to original position resulting in only a momentary actuation of valve, even though air pressure remains applied to pilot port. This reset occurs within 0.3 seconds at 40 PSIG within 0.5 seconds at 100 PSIG and within 0.7 seconds when used with 4PP, 41PP, or 42PP valves. Maximum cycle life is obtained at 40-65 PSIG maximum.

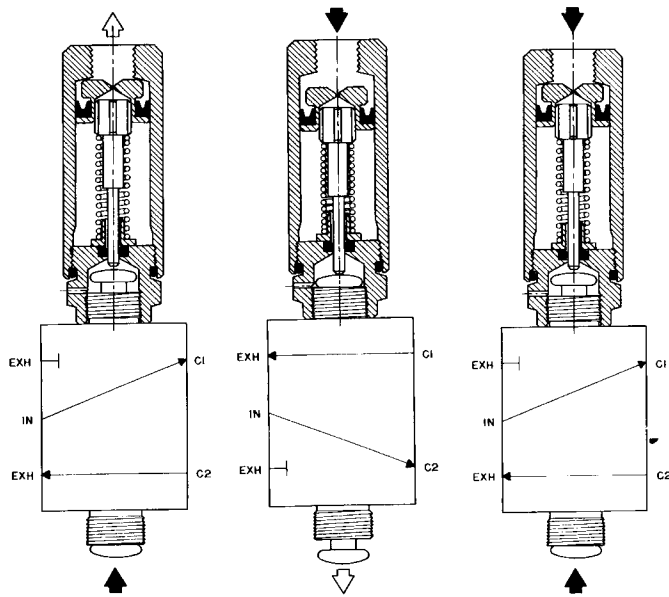
Any erratic action of the operators is often caused by small diameter or long pilot lines, restricted fittings, low flow pilot valves, slow building, or exhausting pilot signals, or excessive moisture or space between operator and valve body and can be eliminated by correcting these conditions.

Models 34ASR, 341ASR

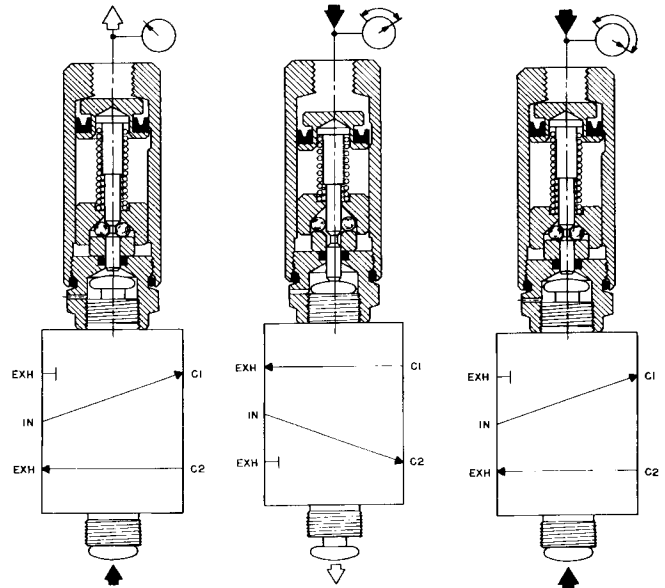
Used to simplify pneumatic circuitry requiring "snap" and "reset" action by providing both functions in a single unit. Air pressure applied to pilot port builds upon V-cup sealed piston until pressure against piston area generates sufficient force to overcome ball detents. Actuation is delayed until pilot pressure reaches 35 PSIG \pm 5 PSIG, and then the operator piston snaps forward to actuate push-button valve. At this point, small groove in cylinder wall permits pressure to equalize and balance piston force.

Spring then creates unbalance and returns piston and piston rod to original position resulting in only a momentary actuation of valve, even though air pressure remains applied to pilot port. After snap action, the piston resets within approximately 0.3 seconds at 40 PSIG, within 0.5 seconds at 100 PSIG, and within 0.7 seconds when used with 4PP, 41PP, or 42PP valves.

NOTE: The recommended maximum pilot pressure is 60 PSIG. If this pressure is exceeded, the operator will recycle snapping and resetting a second time.



341AR



341ASR

Humphrey TAC-TAC²-TAC³ Air Valves

Model TAC, TAC², and TAC³ air valves may be operated by pilot or mechanical operators or manually operated by their push-buttons. Each push-button's shoulder bottoms-out on the valve body to prevent overstroke and valve damage. Operators adapt directly to the threaded button end. The push-button itself is constructed of work-hardening stainless steel. Appropriate locknuts and lockwashers are furnished. Port sizes are as follows: TAC, #10-32; TAC², 1/8"; TAC³, 1/4".



2P
Model 2P is a 2-way, normally closed, spring-return valve that can trap downstream pressure if the supply pressure is maintained and not exceeded. Weight: 1.25 oz. (35.4 gms.).



4P
Model 4P is a 4-way, normally closed/normally open valve with spring-return. IN and CYL port threads are #10-32 female. EXH ports are not threaded. Weight: 2.8 oz. (79.4 gms.).



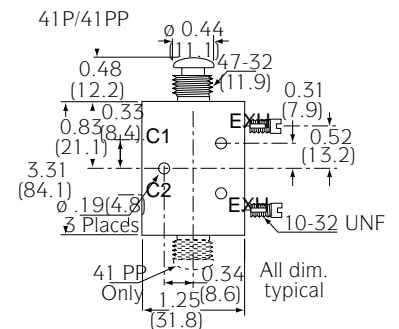
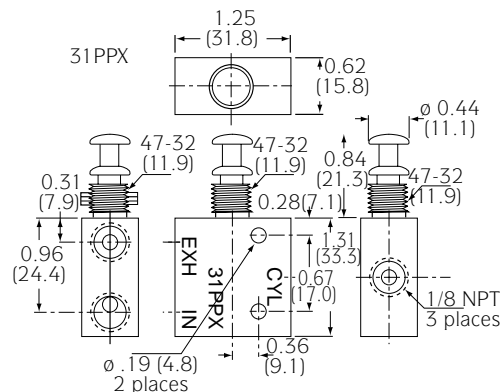
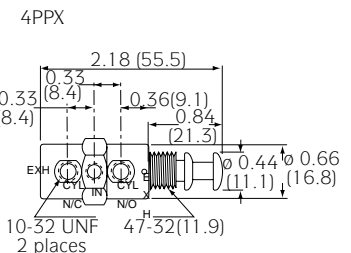
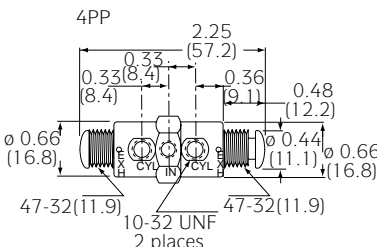
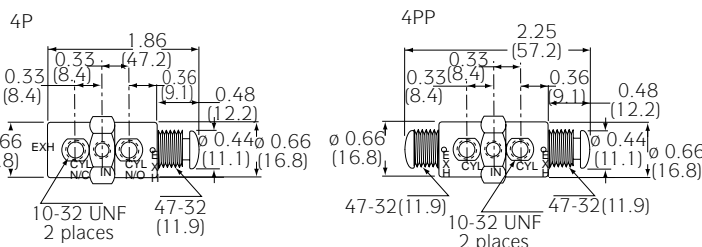
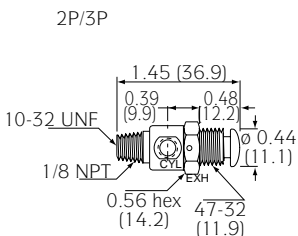
4PP
Model 4PP is a detented 4-way, normally closed/normally open valve with two push-buttons. IN and CYL port threads are #10-32 female. EXH ports are not threaded. Weight: 2.75 oz. (78 gms.).



4PPX
Model 4PPX is a detented version of 4P. It features a push-pull actuator with positive stop. Actuator has a short stroke of 0.093 inch. Weight: 2.8 oz. (67.3 gms.)



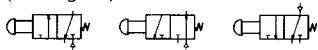
3P
Model 3P is a 3-way, normally closed, spring-return valve. IN and CYL port threads are #10-32 female. EXH port is not threaded. Alternate IN port is 1/8" NPT male. Weight: 1.25 oz. (35.4 gm.).



2P, 4P, 4PPX, 3P, 31P, 31PPX, 41P, 41PP, 41PPX, 43P, 43PP, 43PA
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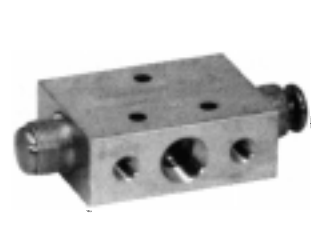
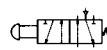
31P
Model 31P is a multi-purpose valve with spring-return. Pressure may be applied at any port. The 31P can be used as a 3-way, normally closed/normally open valve, as a diverter or dual-pressure valve, or as a 2-way valve with the unused NC or NO port plugged. The 31P can be mounted with two #10 screws or panel mounted with body threads. Dimensions: 1.31"H x 1.25"W x 0.63"D. Weight: 4.25 oz. (120.5 gms.).



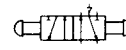
31PPX
Model 31PPX is a detented version of 31P. It features a push-pull actuator with positive stop. Actuator has a short stroke of 0.093 inch. Weight: 4.25 oz. (120.5 gms.)



41P
Model 41P is a 4-way, normally closed/normally open valve with spring-return. IN and CYL port threads are 1/8" NPT. Exhaust ports are #10-32 female. The 41P is supplied with two #97-21 metering screws for exhaust port flow controls. The 41P can be mounted with three #6 screws or with body threads for bracket or panel mounting. Dimensions: 1.65"H x 1.25"W x 0.63"D. Weight: 5.25 oz. (148.8 gms.).



41PP
Model 41PP is a detented 4-way, normally closed/normally open valve with two push-buttons. IN and CYL port threads are 1/8" NPT. Exhaust ports are #10-32 female. The 41PP valve is supplied with two #97-21 metering screws for exhaust port flow controls. It can be mounted with three #6 screws or with body threads for bracket or panel mounting. Dimensions: 1.65"H x 1.25"W x 0.63"D. Weight: 5.63 oz. (159.5 gms.).



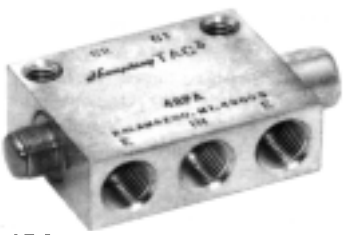
41PPX
Model 41PPX is a detented version of 41P. It features a push-pull actuator with positive stop. Actuator has a short stroke at 0.093 inch. Weight: 5.40 oz. (153.1 gms.)



42P
Model 42P is a 4-way, 5 port, normally closed/normally open, single push-button, spring-return valve. All ports are 1/4" pipe. This valve can be mounted with two 1/4" screws or with body threads for bracket or panel mounting. Dimensions: 2.25"H x 1.75"W x 0.75"D. Weight: 11 oz. (311.9 gms.)



42PP
Model 42PP is a 4-way, 5 port, normally closed/normally open, double push-button, detented valve. All ports are 1/4" pipe. This valve can be mounted with two 1/4" screws or with body threads for bracket or panel mounting. Dimensions: 2.25"H x 1.75"W x 0.75"D. Weight: 11 oz. (311.9 gms.)



42PA
Model 42PA is a 4-way, 5 port, normally closed/normally open, detented valve. One side has push-button; other side has 1/8" air-pilot port. Body ports are 1/4" pipe. This valve can be mounted with two 1/4" screws or with body threads for bracket or panel mounting. Dimensions: 2.25"H x 1.75"W x 0.75"D. Weight: 11 oz. (311.9 gms.) Dimensions of air pilot shown in the TAC³ Air-Piloted Valves section.

Specifications

MEDIA:
Compressed Air (Consult factory for others)

PRESSURE RANGE:
0 to 125 psig (0 to 8.6 bars)

TEMPERATURE RANGE:
-20 to 180°F (-28.9 to 82.2°C)

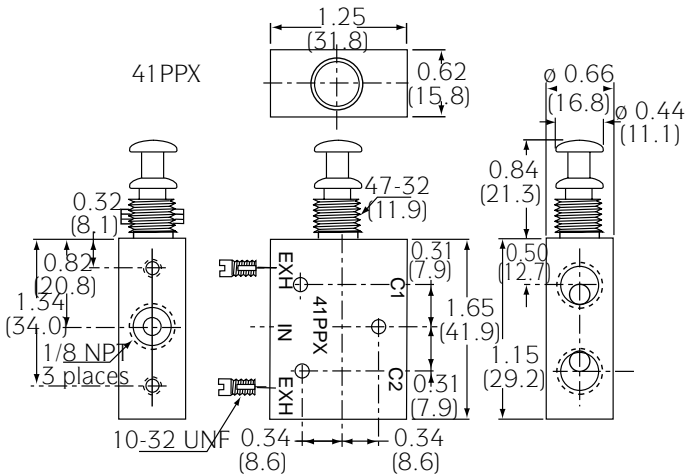
OPERATING SPEEDS:
TAC & TAC²: to 900 CPM
TAC³: to 600 CPM

MATERIALS:
Brass, Stainless Steel, Delrin, Buna N

LUBRICATION Recommended
FILTRATION Recommended,
40 Microns Minimum

Air Flow to Atmosphere

MODEL	25 PSIG CFM	(1.7 BARS) LPM	125 PSIG CFM	(8.6 BARS) LPM
2P, 3P	0.2	6.8	7.0	198.1
4P, 4PP, 4PPX	0.6	16.9	9.0	254.7
31P, 41P, 41PP, 41PPX	4.0	113.2	20.0	566.0
42P, 42PP, M42P, M42PA, M42PP	10.0	283.0	39.0	1103.7



Humphrey TAC Air Valves

TAC & TAC²

#10-32 and 1/8-inch ports 2-way, 3-way

VALVES

	2 WAY	3 WAY	NORM. CLOSED	NORM. OPEN	DETENTED	SPRING RETURN	MOUNT. BASE (see access.)	PANEL MOUNT. NUTS	FKM** Seals	BRASS BODY	BOTTOM INLET
OPTION CODE											VAI
MODEL											
2P	STD	NA	STD	NA	NA	STD	OS	STD	Specify	STD	STD
2V	STD	NA	NA	NA	STD	NA	OS	STD	Specify	STD	STD
2VR	STD	NA	STD	NA	NA	STD	OS	STD	Specify	STD	STD
3P	NA	STD	STD	NA	NA	STD	OS	STD	Specify	STD	STD
3V	NA	STD	NA	NA	STD	NA	OS	STD	Specify	STD	STD
3VR	NA	STD	STD	NA	NA	STD	OS	STD	Specify	STD	STD
31P	*	STD	STD	*	NA	STD	OS	STD	Specify	STD	NA
31PPX	*	STD	NA	NA	STD	NA	OS	STD	Specify	STD	NA
31V	*	STD	STD	NA	STD	NA	OS	STD	Specify	STD	NA
31VR	*	STD	STD	*	NA	STD	OS	STD	Specify	STD	NA

*Plug exhaust port on 31 series for 2-way. For Normally Open, plumb Supply to appropriate port. **Fluoroelastomer
 Order example: 2P
 OS indicates part must be ordered separately.
 REMEMBER: Option Codes marked STD, NA are not used as part of the Model Number when ordering.

TAC & TAC²

#10-32 and 1/8-inch ports 4-way

VALVES

	NORM. CLSD/ NORM. OPEN 2 POS	NORM. CLSD/ NORM. OPEN 3 POS/OPN CTR	DETENTED	SPRING RETURN	3 DETENTED POSITIONS	3 SPRING RETURN POSITIONS	DETENT SPRING CTR'D DETENT	MOUNT. BASE (see access.)	PANEL MOUNT. NUTS	BRASS BODY	FKM* Seals	BOTTOM INLET
OPTION CODE												VAI
MODEL												
4P	STD	NA	NA	STD	NA	NA	NA	OS	STD	STD	Specify	NA
4PP	STD	NA	STD	NA	NA	NA	NA	OS	STD	STD	Specify	NA
4PPX	STD	NA	STD	NA	NA	NA	NA	OS	STD	STD	Specify	NA
4V	STD	NA	STD	NA	NA	NA	NA	OS	STD	STD	Specify	NA
41P	STD	NA	NA	STD	NA	NA	NA	OS	STD	STD	Specify	NA
41PP	STD	NA	STD	NA	NA	NA	NA	OS	STD	STD	Specify	NA
41PPX	STD	NA	STD	NA	NA	NA	NA	OS	STD	STD	Specify	NA
41V	STD	NA	STD	NA	NA	NA	NA	OS	STD	STD	Specify	NA
41TD3	NA	STD	NA	NA	STD	NA	NA	OS	STD	STD	Specify	STD
41TS3	NA	STD	NA	NA	NA	STD	NA	OS	STD	STD	Specify	STD
41TDS3	NA	STD	NA	NA	NA	NA	STD	OS	STD	STD	Specify	STD
41RD3	NA	STD	NA	NA	STD	NA	NA	OS	NA	STD	Specify	STD
41RS3	NA	STD	NA	NA	NA	STD	NA	OS	NA	STD	Specify	STD
41RDS3	NA	STD	NA	NA	NA	NA	STD	OS	NA	STD	Specify	STD

For 42 Series TAC³ Valves, see TAC³ Air Piloted and Push-Button Valves, p. 12 of Humphrey Price List. *Fluoroelastomer
 Order example: 41P-VAI
 OS indicates part must be ordered separately.
 REMEMBER: Option Codes marked STD, NA are not used as part of the Model Number when ordering.

AIR/MANUAL/MECHANICAL OPERATORS

OPERATORS

Air Pilot Operators

	Fluoroelastomer Seals
OPTION CODE	VAI
MODEL	
34A	NA
34AS	Specify
34AR	Specify
34ASR	NA
341A	NA
341AS	Specify
341AR	Specify
341ASR	NA

Order example: 341AR-VAI
 NOTE: Valves and Accessories are shipped detached, ready to be mounted according to specific application requirements.
 REMEMBER: Option Codes marked STD, NA are not used as

Manual & Mechanical Operators

MODEL
34B
34C
34CW
34CH
28-60A
34F
34T

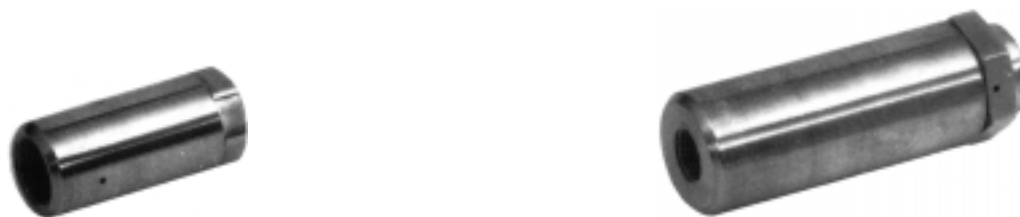
Order example: 34F

2P, 4P, 4PPX, 3P, 31P, 31PPX, 41P, 41PP, 41PPX, 43P, 43PP, 43PA

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Humphrey TAC-TAC²-TAC³ Air Pilot Operators

These air pilot operators are for use with TAC, TAC², and TAC³ push-button valves and the Model ESB Electric Switch Bracket to convert them to air pilot operation. The operators feature snap action for time-delay circuits, automatic "one-shot" reset, or a combination of snap action and automatic reset. Model 34 operators are recommended for use with TAC valves. Model 341 operators are recommended for use with TAC² and TAC³ valves.



34A 341A Air Pilot Operators

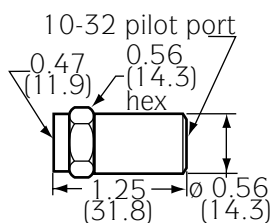
Models 34A and 341A air pilot operators thread directly onto the collars of push-button valves and the Model ESB Electric Switch Bracket. The air pressure applied to the pilot port drives a V-cup sealed piston to actuate the valve's push-button. The 341A

air pilot operator provides approximately twice the actuation force of the 34A at the same pilot pressure and is used for lower pilot pressure requirements or to amplify weak pilot signals, especially to 41PP and 42PP valves with positive detents.
Weight: 34A 1.1 oz. (31.2 gms.)
341A 1.0 oz. (25.3 gms.)

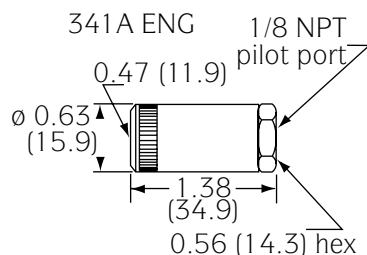
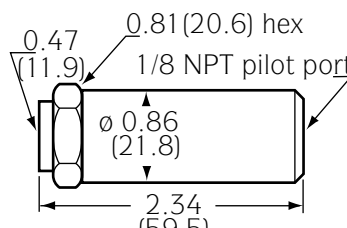
34AS 341AS Air Pilot Operators with Snap Action

Models 34AS and 341AS air pilot operators thread directly onto the collars of push-button valves and the Model ESB Electric Switch Bracket. They are used primarily for time-delay circuits and other slow-building pilot pressure applications. The actuation of the op-

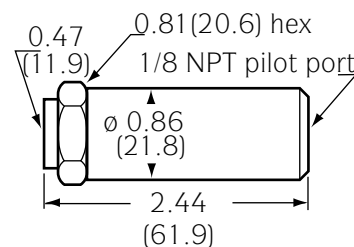
erator is delayed until pilot pressure reaches 35 psig \pm 5 psig. At this pressure, the operator piston snaps forward to actuate valve or switch and remains shifted until pilot pressure is exhausted. Maximum cycle life is obtained at 40-65 psig, 125 psig maximum. Weight: 34AS 3.9 oz. (110.6 gms.)
341AS 4.2 oz. (119.1 gms.)



34A ENG



341AR ENG



34A, 341A, 34AS, 341AS, 34AR,
341AR, 34ASR, 341ASR

10/22/97



34AR 341AR Air Pilot Operators with Reset

Models 34AR and 341AR air pilot operators thread directly onto the collars of push-button valves and the Model ESB Electric Switch Bracket. When used on a spring-return valve, they provide a momentary "one-shot" output signal (40 psig/min.), which actuates the operator piston immediately. The operator's pressure-balanced piston then resets, even in the presence of a pilot signal. This reset occurs within 0.3 seconds at 40 psig, within 0.5 at 100 psig, and within

0.7 seconds when used with 4PP, 41PP, or 42PP valves. Maximum cycle life is obtained at 40-65 psig, 125 psig maximum.

Any erratic action of the operators is often caused by small diameter or long pilot lines, restricted fittings, low flow pilot valves, slow building or exhausting pilot signals, or excessive moisture or space between operator and valve body and can be eliminated by correcting these conditions. Weight: 34AR 3.9 oz. (110.6 gms.) 341AR 4.1 oz. (116.2 gms.)

34ASR 341ASR Air Pilot Operators with Snap Action and Reset

Models 34ASR and 341ASR air pilot operators provide both snap action and reset features in a single unit and thread directly onto the collars of push-button valves and the Model ESB Electric Switch Bracket. Actuation is delayed until pilot pressure reaches 35 psig ±5 psig, and then the operator piston snaps forward to actuate push-button valve or electric switch. At that point the piston becomes pressure balanced and the spring

resets the operator while removing actuator force from the valve. After snap action, the piston resets within approximately 0.3 seconds at 40 psig, within 0.5 seconds at 100 psig, and with 0.7 seconds when used with 4PP, 41PP, or 42PP valves.

NOTE: The recommended maximum pilot pressure is 60 psig. If this pressure is exceeded, the operator will recycle — snapping and resetting a second time. Weight: 34ASR 3.9 oz. (110.6 gms.) 341ASR 4.1 oz. (116.2 gms.)

Specification

Minimum Pilot Pressure 34A

VALVED PRESSURE		30 psig	2.1 bars	60 psig	4.2 bars	100 psig	7.0 bars
PILOT PRESSURE							
MODEL	2P	22.0	1.5	24.0	1.7	25.0	1.7
	3P	18.0	1.2	19.0	1.3	21.0	1.4
	4P	20.0	1.4	20.0	1.4	20.0	1.4
	4PP	5.0	0.3	5.0	0.3	6.0	0.4
	31P	35.0	2.4	41.0	2.8	51.0	3.5
	41P	42.0	2.9	42.0	2.9	42.0	2.9
	41PP	35.0	2.4	35.0	2.4	35.0	2.4
	42P	55.0	3.8	69.0	4.8	85.0	5.9
	42PP/PA	16.5	1.1	18.0	1.2	20.5	1.4
	ESB	5.0	0.3				

Minimum Pilot Pressure 341A

VALVED PRESSURE		30 psig	2.1 bars	60 psig	4.2 bars	100 psig	7.0 bars
PILOT PRESSURE							
MODEL	2P	11.0	0.8	12.0	0.8	13.0	0.9
	3P	10.0	0.7	10.0	0.7	12.0	0.8
	4P	11.0	0.8	11.0	0.8	11.0	0.8
	4PP	2.5	0.1	2.5	0.1	3.0	0.2
	31P	22.0	1.5	27.0	1.9	32.0	2.2
	41P	22.0	1.5	24.0	1.7	24.0	1.7
	41PP	20.0	1.4	20.0	1.4	20.0	1.4
	42P	34.0	2.3	43.0	3.0	57.0	3.9
	42PP/PA	10.5	0.7	10.5	0.7	12.5	0.8
	ESB	2.5	0.1				

Humphrey TAC Air Valves

TAC & TAC²

#10-32 and 1/8-inch ports 2-way, 3-way

VALVES

	2 WAY	3 WAY	NORM. CLOSED	NORM. OPEN	DETENTED	SPRING RETURN	MOUNT. BASE (see access.)	PANEL MOUNT. NUTS	FKM** Seals	BRASS BODY	BOTTOM INLET
OPTION CODE	VAI										
MODEL	VAI										
2P	STD	NA	STD	NA	NA	STD	OS	STD	Specify	STD	STD
2V	STD	NA	NA	NA	STD	NA	OS	STD	Specify	STD	STD
2VR	STD	NA	STD	NA	NA	STD	OS	STD	Specify	STD	STD
3P	NA	STD	STD	NA	NA	STD	OS	STD	Specify	STD	STD
3V	NA	STD	NA	NA	STD	NA	OS	STD	Specify	STD	STD
3VR	NA	STD	STD	NA	NA	STD	OS	STD	Specify	STD	STD
31P	*	STD	STD	*	NA	STD	OS	STD	Specify	STD	NA
31PPX	*	STD	NA	NA	STD	NA	OS	STD	Specify	STD	NA
31V	*	STD	STD	NA	STD	NA	OS	STD	Specify	STD	NA
31VR	*	STD	STD	*	NA	STD	OS	STD	Specify	STD	NA

*Plug exhaust port on 31 series for 2-way. For Normally Open, plumb Supply to appropriate port. **Fluoroelastomer
 Order example: 2P
 OS indicates part must be ordered separately.
 REMEMBER: Option Codes marked STD, NA are not used as part of the Model Number when ordering.

TAC & TAC²

#10-32 and 1/8-inch ports 4-way

VALVES

	NORM. CLSD/ NORM. OPEN 2 POS	NORM. CLSD/ NORM. OPEN 3 POS/OPN CTR	DETENTED	SPRING RETURN	3 DETENTED POSITIONS	3 SPRING RETURN POSITIONS	DETENT SPRING CTR'D DETENT	MOUNT. BASE (see access.)	PANEL MOUNT. NUTS	BRASS BODY	FKM* Seals	BOTTOM INLET
OPTION CODE	VAI											
MODEL	VAI											
4P	STD	NA	NA	STD	NA	NA	NA	OS	STD	STD	Specify	NA
4PP	STD	NA	STD	NA	NA	NA	NA	OS	STD	STD	Specify	NA
4PPX	STD	NA	STD	NA	NA	NA	NA	OS	STD	STD	Specify	NA
4V	STD	NA	STD	NA	NA	NA	NA	OS	STD	STD	Specify	NA
41P	STD	NA	NA	STD	NA	NA	NA	OS	STD	STD	Specify	NA
41PP	STD	NA	STD	NA	NA	NA	NA	OS	STD	STD	Specify	NA
41PPX	STD	NA	STD	NA	NA	NA	NA	OS	STD	STD	Specify	NA
41V	STD	NA	STD	NA	NA	NA	NA	OS	STD	STD	Specify	NA
41TD3	NA	STD	NA	NA	STD	NA	NA	OS	STD	STD	Specify	STD
41TS3	NA	STD	NA	NA	NA	STD	NA	OS	STD	STD	Specify	STD
41TDS3	NA	STD	NA	NA	NA	NA	STD	OS	STD	STD	Specify	STD
41RD3	NA	STD	NA	NA	STD	NA	NA	OS	NA	STD	Specify	STD
41RS3	NA	STD	NA	NA	NA	STD	NA	OS	NA	STD	Specify	STD
41RDS3	NA	STD	NA	NA	NA	NA	STD	OS	NA	STD	Specify	STD

For 42 Series TAC³ Valves, see TAC³ Air Piloted and Push-Button Valves, p. 12 of Humphrey Price List. *Fluoroelastomer
 Order example: 41P-VAI
 OS indicates part must be ordered separately.
 REMEMBER: Option Codes marked STD, NA are not used as part of the Model Number when ordering.

AIR/MANUAL/MECHANICAL OPERATORS

OPERATORS

Air Pilot Operators

OPTION CODE	Fluoroelastomer Seals
MODEL	VAI
34A	NA
34AS	Specify
34AR	Specify
34ASR	NA
341A	NA
341AS	Specify
341AR	Specify
341ASR	NA

Order example: 341AR-VAI
 NOTE: Valves and Accessories are shipped detached, ready to be mounted according to specific application requirements.
 REMEMBER: Option Codes marked STD, NA are not used as

Manual & Mechanical Operators

MODEL
34B
34C
34CW
34CH
28-60A
34F
34T

Order example: 34F

34A, 341A, 34AS, 341AS, 34AR,
 341AR, 34ASR, 341ASR

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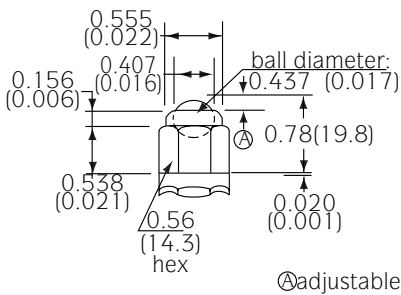
Humphrey TAC-TAC²-TAC³ Manual/Mech. Operators

These operators are used to convert TAC, TAC², and TAC³ push-button valves to manual or mechanical operation.



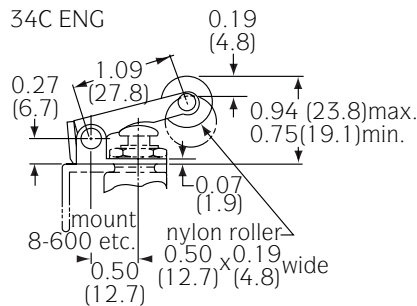
34B Ball Operator

Model 34B ball operator threads onto the collar of any TAC Series push-button valve. The ball is not retained until threaded onto valve. The 0.078-inch thickness of the #8-60 or #8-600 mounting bracket plus the 0.015-inch thickness of the lockwasher properly spaces the 34B to prevent prestroking of the button. Stroke is 0.093-inch. Actuating forces are shown in the accompanying chart. Weight: 0.88 oz. (24.8 gms.).



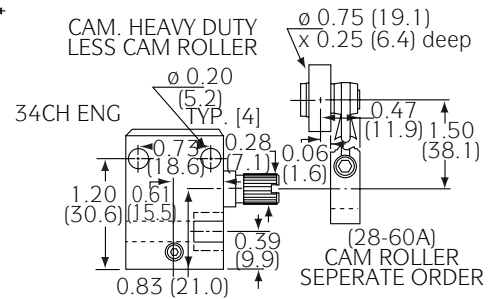
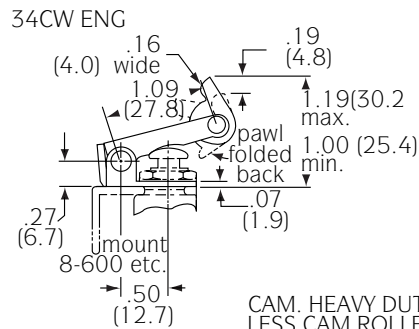
34C Cam Operator

Model 34C operator's actuating force varies by valve type and pressure as shown in the accompanying chart. Adjustment of cam roller height is made through the use of a mounting bracket and locknuts. The cam surface should release roller quickly for best valve response. Weight: 1 oz. (38.4 gms.).



34CW Cam Operator with One-Way Actuation

Model 34CW cam operator actuates valve when the pawl is contacted from lever side. The pawl then folds out of the way in the opposite direction. The spring-loaded Nylatron pawl has high tensile strength and excellent wear characteristics and is self-lubricating. Actuation forces are shown in accompanying chart. Weight: 1 oz. (38.4 gms.).



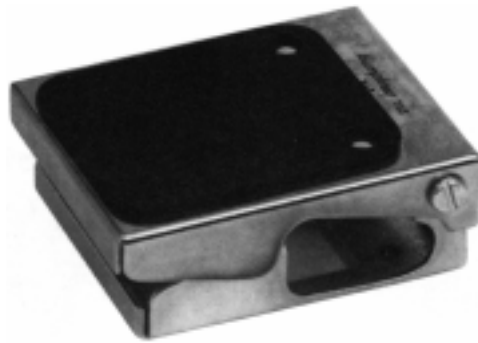
34B. 34C. 34CW. 34CH. 34T, 34F

10/22/97



34T Fingertip Operator

Model 34T fingertip operator may be used with any TAC Series push-button valve to provide easier actuation. Actuation forces are shown in accompanying chart.



34F Foot, Knee, or Hand Operator

Model 34F foot, knee, or hand operator may be used with any TAC Series push-button valve except the TAC³. To install, disassemble the 34F by removing screws. Mount valve shoulder to bracket and retain with locknut

and lockwasher. Back and sides are left open for plumbing. Non-skid rubber pads on both sides. Mount to equipment with two 0.187-inch Dia. holes on 1.625-inch centers, 0.562 inches from back.

Specification

Force To Actuate in Ounces/Grams Models 34C & 34CW

VALVED PRESSURE	30 psig	(2.1 bars)	60 psig	(4.2 bars)	100 psig	(7.0 bars)
2P	15	425	16	454	18	510
3P	19	539	27	765	38	1077
4P	22	624	22	624	23	652
4PP	6	170	7	198	8	227
31P	40	1134	44	1247	52	1474
41P	44	1247	52	1474	67	1899
41PP	26	737	28	794	34	964
42P	49	1389	66	1871	94	2665
42PP/PA	14	397	17	482	22	624
ESB	7	198				
34CH*	40	1134 Maximum				

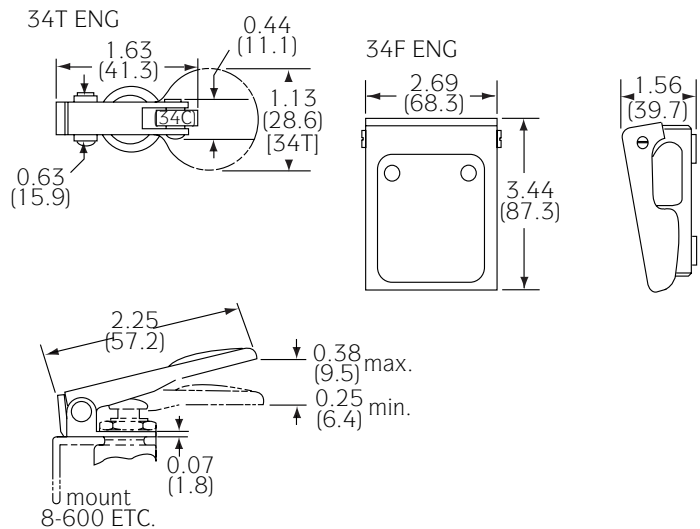
*Use with TAC/TAC² Only.

Force To Actuate in Ounces/Grams Model 34T

VALVED PRESSURE	30 psig	(2.1 bars)	60 psig	(4.2 bars)	100 psig	(7.0 bars)
2P	10	284	12	340	14	397
3P	14	397	18	510	29	822
4P	16	454	16	454	17	482
4PP	5	142	6	170	7	198
31PP	28	794	32	907	40	1134
41P	32	907	38	1077	50	1418
41PP	19	539	21	595	25	709
42P	35	992	48	1361	69	1956
42PP/PA	10	284	13	369	16	454
ESB	5	142				

Force to Actuate in Ounces/Grams Model 34

VALVED PRESSURE	30 psig	(2.1 bars)	60 psig	(4.2 bars)	100 psig	(7.0 bar)
2P	32	907	36	1021	48	1361
3P	38	1077	54	1531	76	2155
4P	44	1247	44	1247	46	1304
4PP	12	340	14	397	16	454
31P	64	1814	72	2041	88	2495
41P	87	2466	104	2948	135	3827
41PP	52	1474	57	1616	67	1899
42P	97	2750	132	3742	189	5358
42PP/PA	26.5	751	34	964	43.5	1233
ESB	13	369				
34CH	40	1134 Maximum				



34B. 34C. 34CW. 34CH. 34T, 34F

10/22/97

Humphrey TAC and TAC² Manual Air Valves

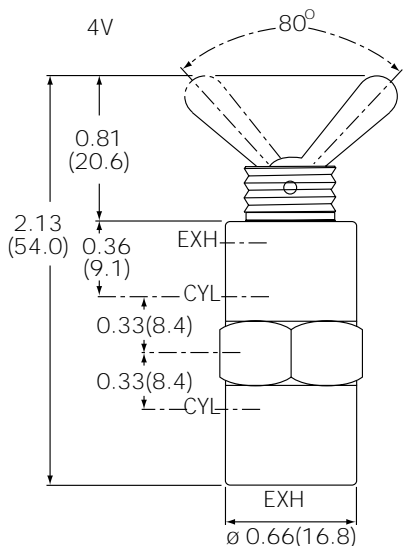
Although these toggle, rocker, and push-pull valves have their primary application in general industrial and instrumentation applications (including control panels), they are also widely used in mobile equipment and adapt well to vehicle dashboards. V and PPX models are 2-position, 3-way and 4-way valves; V models have single-direction throw with pinned lever. 41T and 41R models are rugged, 3-position, 4-way valves which can be used as a 2-position or 3-position valve.



2V 3V

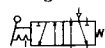
Model 2V is a 2-position, 2-way, normally closed, detented valve, having a single direction throw with pinned lever. The 2V has no exhaust port and will trap downstream pressure if supply pressure is maintained but not exceeded. IN and CYL port threads are #10-32 female. Alternate IN is 1/8-inch NPT male. These valves are furnished with locknuts and lockwashers for 1/32-32 x 3/32 toggle collar threads. Weight: 1.25 oz. (35.2 gms.).

Model 3V is a 3-way version of the 2V valve.



4V

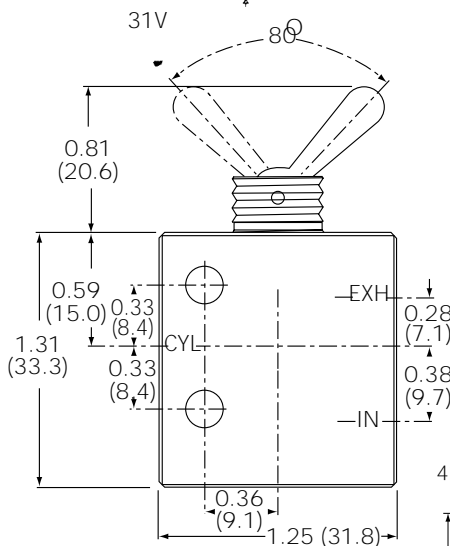
Model 4V is a 2-position, 4-way, normally closed/normally open, detented valve, which can be converted to 3-way by plugging one CYL port with Humphrey PF fitting. IN and CYL ports are #10-32 female. These valves have single-direction throw with pinned lever and are furnished with locknuts and lockwashers for 1/32-32 x 3/32 toggle collar threads. Weight: 2.38 oz. (67.3 gms.).



31V

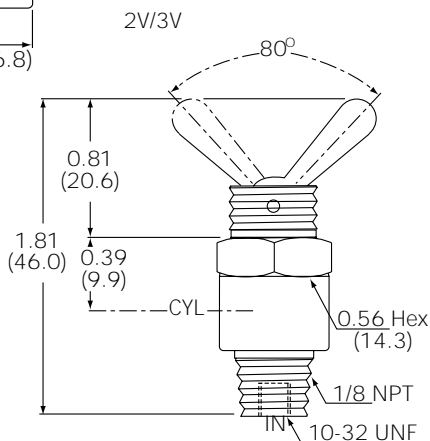
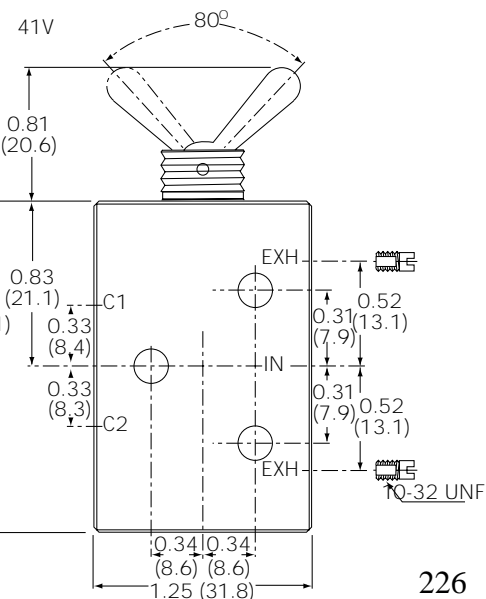
31V

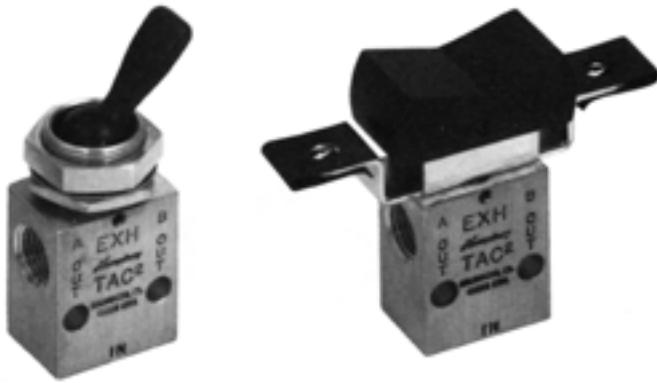
Model 31V is a 2-position, 3-way, normally closed, detented valve with single-direction throw with pinned lever. It can be used as a 2-way valve by plugging the exhaust port. Ports are 1/8-inch NPT. The 31V valve can be mounted with two #10 screws or with body threads for bracket or panel mounting. Dimensions: 1.31"H x 1.25"W x 0.63"D. Weight: 4.25 oz. (120.5 gms.).



41V

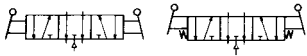
Model 41V is a 2-position, 4-way, normally closed/normally open, detented valve with single-direction throw with pinned lever. Exhaust may be captured by removing port flow controls and using Humphrey BF or BF1 fittings. Exhaust may be muffled with Humphrey 150-30A muffler. Exhaust ports have #10-32 threads; all other ports have 1/8-inch NPT threads. Furnished with exhaust port flow controls. The 41V may be mounted with three #6 screws or with body threads for bracket or panel mounting. Dimensions: 1.65"H x 1.25"W x 0.63"D. Weight: 5.25 oz. (148.8 gms.).



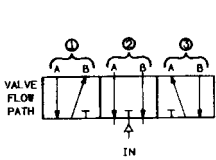
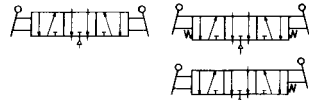


41T 41R

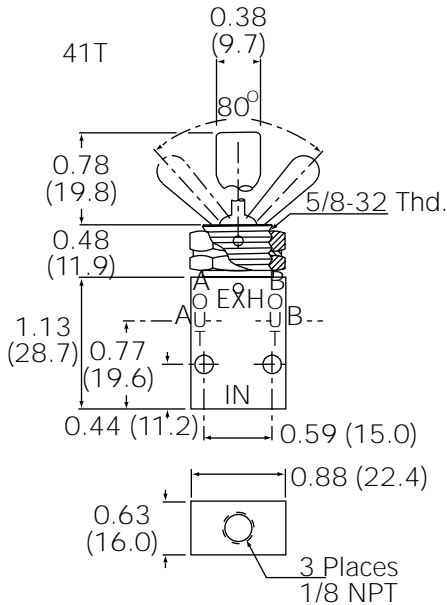
Models 41T and 41R are 3-position, 4-way valves with several functional options. They may be detented or spring-return or both. They can be used as 2-position valves by bypassing position #2. They can be used as 3-way valves by plugging A or B



port. These valves have separate unthreaded exhaust ports at 180° and rugged matte black toggle or rocker actuators. All models may be side mounted. Toggle valves may be panel mounted with two supplied locknuts (0.187-inch and 0.93-inch thick) and lockwasher. Flow is 7.5 scfm at 125 psig. Weight: 3 oz. (85 gms.)



TOGGLE-ROCKER ACTION BY POSITION				
TOGGLE NO.	1	2	3	ROCKER NO.
41T-D3	Detent	Detent	Detent	41R-D3
41T-S3	Spring-Return	Detent	Spring-Return	41R-S3
41T-DS3	Detent	Detent	Spring-Return	41R-DS3



Specifications

MEDIA:
Compressed Air (Consult factory for others)

PRESSURE RANGE:
0 to 125 psig (0 to 8.6 bars)

TEMPERATURE RANGE:
-20 to 180°F (-28.9 to 82.2°C)

OPERATING SPEEDS:
TAC & TAC²: to 900 CPM
TAC³: to 600 CPM

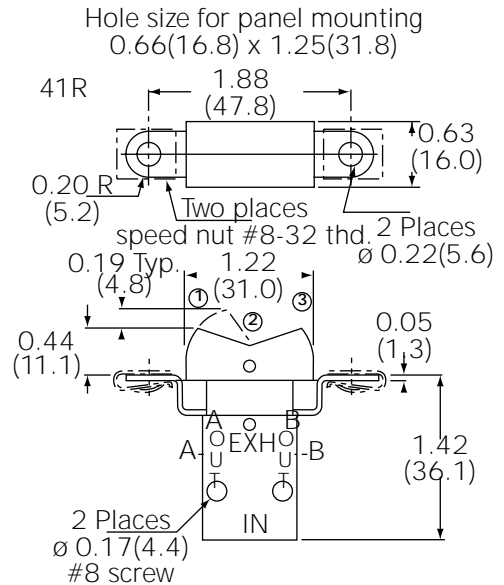
MATERIALS:
Brass, Stainless Steel, Delrin, Buna N

LUBRICATION: Recommended

FILTRATION: Recommended, 40 Microns Minimum

Air Flow to Atmosphere

MODEL	25 PSIG CFM	(1.7 BARS) LPM	125 PSIG CFM	(8.6 BARS) LPM
2V, 3V	0.2	6.8	7.0	198.1
4V	0.6	16.9	9.0	254.7
31V, 41V	4.0	113.2	20.0	566.0
41T 41R	2.0	56.6	7.0	198.1



Humphrey TAC Total Air Control Components

These pressure regulators, speed controls, check valves, shuttle valves, and shuttle/quick exhaust valves have been specifically designed to integrate with the Humphrey TAC Total Air Control system.

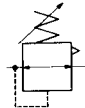


RSR Air Pressure Regulator

This self-relieving air pressure regulator regulates pressure up to 125 psig with maximum supply pressure to IN port of 150 psig.

Flow (scfm to atmosphere):
 11 scfm at 100 psig using #10-32 female IN port.
 22 scfm at 100 psig using 1/8-inch male IN port.

The valve has two #10-32 female OUT ports at 180°. Mounting threads are 15/32" x 32 x 9/32". Furnished with knurled adjusting screw and locknut, plus two mounting locknuts and lockwashers. Weight: 3.25 oz. (92.1 gms.).



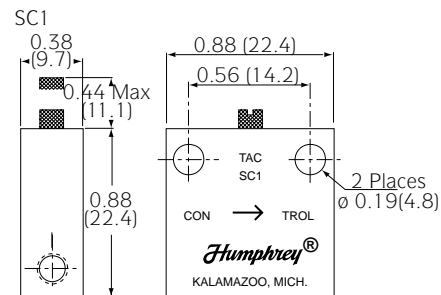
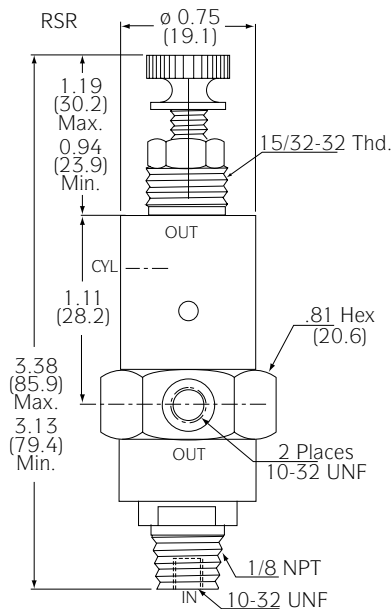
SC1 Speed Control

Model SC1 Speed Control provides free flow in one direction and excellent controlled flow in the opposite direction at 3 to 125 psig.

Flow: 6.5 scfm at 100 psig, both directions of flow.

The SC1 Speed Control maintains accurate setting even under severe vibration. Its knurled

adjusting screw cannot be removed and provides easy finger adjustment. SC1 controls have #10-32 port threads at both ends and may be attached to panels or stacked in multiples with two 0.187-inch Dia. screw holes and #8 screws, or they may be mounted to a Humphrey 8-70 Mounting Bracket with one screw. Weight: 1.1 oz. (31.2 gms.)





C1 Check Valve

Model C1 Check Valve has #10-32 male and female ports. Furnished with gasket for male thread. Weight: 3 oz. (85.1 gms.)



SQE Shuttle and Quick Exhaust Valve

Model SQE Shuttle and Quick exhaust valve has #10-32 male and female ports and always exhausts at EXH/IN port when used as a shuttle. Furnished with gasket for male thread. Weight: 4 oz. (113.5 gms.)



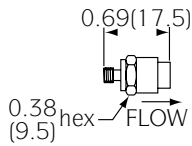
C125 Check Valve

Model C125 Check Valve has a spring loaded shuttle and 1/8-inch NPT ports. Weight: 1.1 oz. (31.2 gms.)



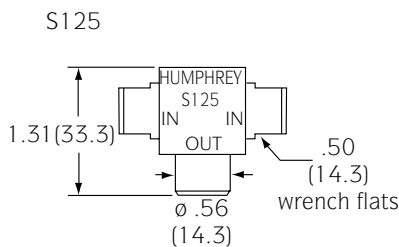
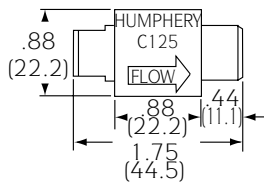
S125 Shuttle Valve

Model S125 Shuttle Valve has a free-floating shuttle to provide fast response, even at low pressure. Ports are 1/8-inch NPT. Weight: 1.2 oz. (34.0 gms.)



C1 Check valve
Model C1 Check valve has #10-32 male and female ports. Furnished with gasket for male thread.

C125 ENG



Specifications

MEDIA: Compressed Air (Consult factory for others)	TEMPERATURE RANGE: 20 TO 150°F 9-7.0 TO 65.6°C
PRESSURE RANGE: *S125, C125: 5 to 125 psig (.03 to 8.6 bars)* *SQE, C1: 3 to 125 psig (.20 to 8.6 bars)* *Bubble tight seal: S125—20 psig (1.4 bars) C125—10 psig (.7 bars) SQE, C1—15 psig (1.0 bars)	MATERIALS: S125, C125: Aluminum, now Delrin, Buna N SQE, C1: Brass, Buna N
LUBRICATION: Not Required	

Air Flow to Atmosphere

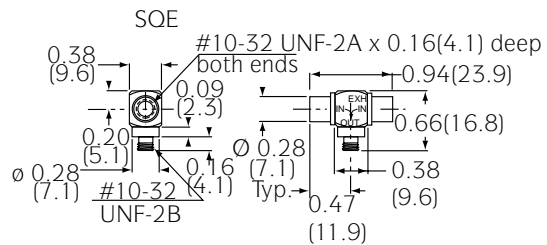
MODEL	30 PSIG CFM	(2.1 BARS) LPM	50 PSIG CFM	(3.5 BARS) LPM	80 PSIG CFM	(5.5 BARS) LPM
C1	3.2	91.0	4.7	133.0	7.0	198.0
SQE	2.7	76.0	4.0	113.0	5.9	167.0
C125	7.0	198.0	10.0	283.0	16.0	453.0
S125	6.0	170.0	9.0	255.0	13.0	368.0

Air Flow to Atmosphere

MODEL	100 PSIG CFM	(7.0 BARS) LPM
C1	8.2	232.0
SQE	7.0	198.0
C125	19.0	538.0
S125	16.0	453.0

Weight

MODEL	ACTUAL OUNCES	GRAMS
C1	.3	8.5
SQE	.4	11.3
C125	1.1	31.2
S125	1.2	34.0



Humphrey TAC-TAC²-TAC³ Brackets/Adaptors

Humphrey TAC mounting brackets provide convenient alternatives to mounting versatile TAC series valves.



8-60 Flat Mounting Bracket 8-600 Angle Mounting Bracket

Slot A (0.343-inch) of these mounting brackets provides clearance for the plumbing outlet. Slot B (0.203-inch) provides for mounting screws and adjustment of bracket position.

8-70 Multi-Mount Bracket

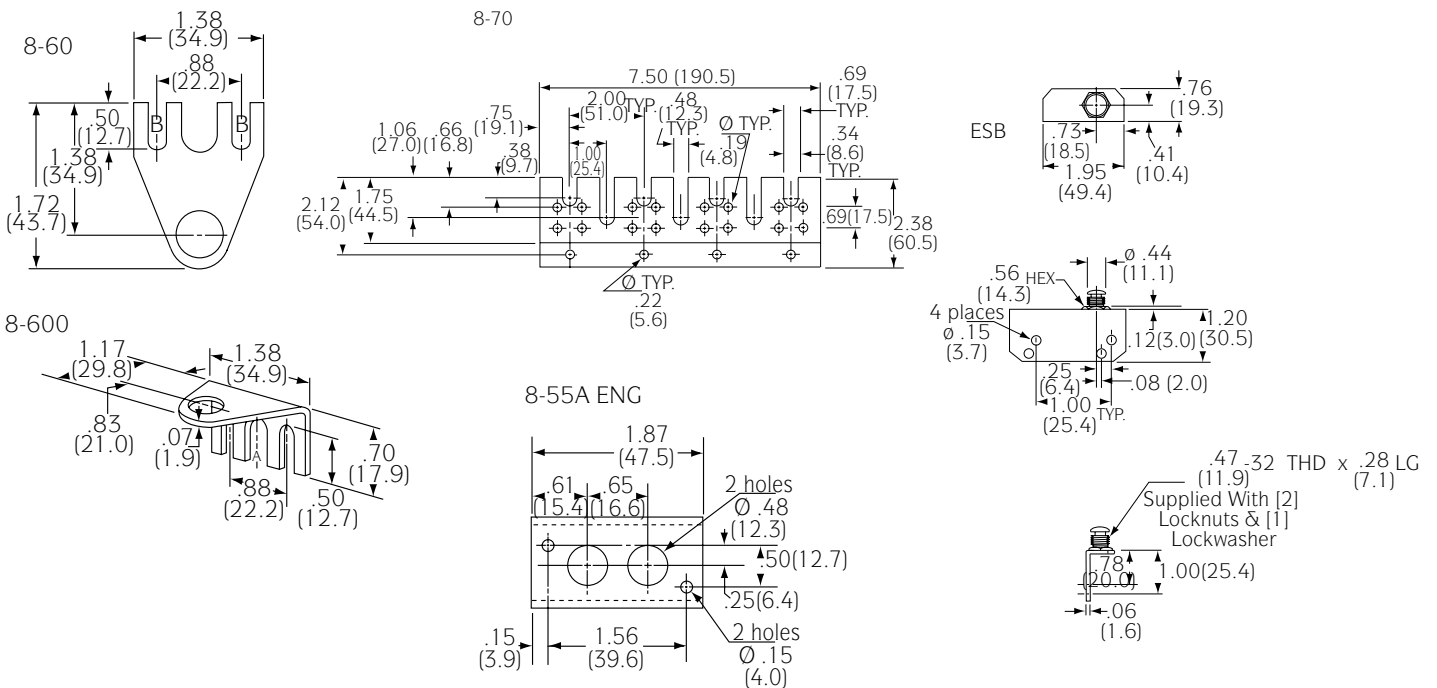
Model 8-70 Multi-Mount Bracket accepts combinations of various TAC Series components, including valves, speed control, regulators, etc., and provides for centralized, compact placement of controls. 7.5"W x 1.875"H.

8-55A Adaptor

Model 8-55A Adaptor is designed to adapt the TAC or TAC² push-button valves to a variety of commercially available electric style actuators. To install, the adapter is mounted to the shoulder of any TAC or TAC² push-button valve (one or two, in any combination). Consult factory for details.

ESB Electric Switch Bracket

Model ESB Electric Switch Bracket is for use with Microswitch #BA-2R-A2 electric switch, available from Humphrey, or with certain other commercially available electric switches. Adapt any TAC or TAC² air pilot or mechanical operator to convert to an electrical signal.




8-60, 8-600, 8-55A, ESB SWITCH


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Humphrey TAC Miniature Fittings


Humphrey TAC miniature fittings are precision machined brass fittings, 1/8-inch NPT and #10-32 threads, for pressures to 125 psig.




BF Hose Barbed Fitting
#10-32 to 1/8-inch O.D. tubing.
Supplied with gasket. Sold as bag of ten.




BF1 Hose Barbed Fitting
Use with 0.125-inch to 0.190-inch I.D. tubing. Supplied with gasket. Sold as bag of ten.




PBF1 Pipe-Barbed Fitting
1/8-inch NPT male to 1/4-inch O.D. tubing.
Use with 0.125-inch to 0.190-inch I.D. tubing. Sold as bag of ten.




TCF Tube Compression Fitting
TCF plated steel #10-32 male to 1/8-inch O.D. tubing (copper, nylon, etc.). Supplied with brass nut, ferrule, and gasket. Sold as bag of ten.



TCF1 Tube Compression Fitting
1/8-inch NPT male to 1/8-inch O.D. tubing (copper, nylon, etc.). Supplied with nut and ferrule. Sold as bag of ten.




RBF Reducer Bushing
1/8-inch NPT male to #10-32 female. Sold as bag of ten.



RBF1 Reducer Bushing
1/4-inch NPT male to #10-32 female. Sold as bag of ten.




BHF Bulkhead Fitting
Provides connections through control panel to prevent chafed tubing. Accepts any #10-32 fitting (both ends) and accommodates panel thicknesses to 1/4-inch. Supplied with locknuts and washers. Sold as bag of ten.



EF Elbow Fitting
Accepts any #10-32 fitting (2 places at 90°). Sold as bag of ten.



SEF Street Ell Fitting
Accepts #10-32 male and female at 90°. Supplied with gasket. Sold as bag of ten.



TF Tee Fitting
Accepts any #10-32 fitting (3 places). Sold as bag of ten.




MBTF Male Branch Tee Fitting
Accepts #10-32 male (1 place) and female (2 places). Supplied with gasket. Sold as bag of ten.




CF Coupling Fitting
#10-32 female thread on both ends. Sold as bag of ten.




NF Nipple Fitting
#10-32 on both ends. Supplied with 2 gaskets. Sold as bag of ten.




EXF Extention Fitting
#10-32 on both ends, male and female. Used to prevent fitting interference on parallel tees and elbows. Supplied with gasket. Sold as bag of ten.



SF Swivel Fitting
#10-32, male and female. Excellent for preventing twisting of tubing or tightening of fitting. Not for use as rotary joint. Supplied with gasket. Sold as bag of ten.




PF Plug Fitting
For plugging unused valve ports. Supplied with gasket. Sold as bag of ten.




UEF Universal Elbow Fitting
Accepts #10-32 male (1 place) and female (2 places). Rotate ell to desired position and tighten hollow screw. Supplied with two gaskets. Sold as bag of ten.



UTF Universal Tee Fitting
Accepts #10-32 male (1 place) and female (2 places). Rotate tee to desired position and tighten hollow screw. Supplied with two gaskets. Sold as bag of ten.



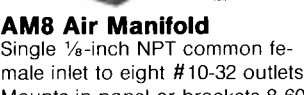
URTF Universal Running Tee Fitting
Accepts #10-32 male (1 place) and female (2 places). Rotate fitting to desired position and tighten hollow screw. Supplied with two gaskets. Sold as bag of ten.




UXF Universal X Fitting
Accepts #10-32 male (1 place) and female (3 places). Rotate fitting to desired position and tighten hollow screw. Supplied with two gaskets. Sold as bag of ten.



AM8 Air Manifold
Single 1/8-inch NPT common female inlet to eight #10-32 outlets. Mounts in panel or brackets 8-60, 8-600, or 8-70. Plug unused ports with PF Fitting.
Note: A single manifold cannot accommodate more than one TCF, SEF, or MBTF fitting per manifold face.




AM8 Air Manifold
Single 1/8-inch NPT common female inlet to eight #10-32 outlets. Mounts in panel or brackets 8-60, 8-600, or 8-70. Plug unused ports with PF Fitting.
Note: A single manifold cannot accommodate more than one TCF, SEF, or MBTF fitting per manifold face.



89-14 Gasket
Buna coated aluminum gasket provides air-tight seal without extruding. Keeps fitting from coming loose. Sold as bag of 100.




110-21 Locknut
9/16-inch hex x 5/64-inch. Sold as bag of ten.




97-21 Metering Screw
#10-32 split nylon screw. Used to control exhaust of 4-way TAC² valves. Sold as bag of ten.



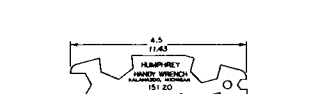
150-31A Breather-Muffler
1/8-inch NPT male thread. 40-micron screen tends to restrict exhaust. Sold as bag of ten.



150-30A Muffler
#10-32 male thread. Sintered bronze. Supplied with gasket. Sold as bag of ten.




40-13 Hose Clamp Sleeve
Use with BF1, PBF1, UTBF1, to clamp tubing firmly to barb. Sold as bag of ten.



40-13 Hose Clamp Sleeve
Use with BF1, PBF1, UTBF1, to clamp tubing firmly to barb. Sold as bag of ten.



151-20 Handy Wrench
Stainless steel. Fits all valves, locknuts, and fittings. Use of 2 is suggested.



100-35 Lockwasher
15/32-inch x 19/32-inch x 1/64-inch. Sold as bag of ten.

Miniature Fittings
10/23/97

Humphrey TAC Air Valves

TAC & TAC²

#10-32 and 1/8-inch ports 2-way, 3-way

VALVES

	2 WAY	3 WAY	NORM. CLOSED	NORM. OPEN	DETENTED	SPRING RETURN	MOUNT. BASE (see access.)	PANEL MOUNT. NUTS	FKM** Seals	BRASS BODY	BOTTOM INLET
OPTION CODE VAI											
MODEL											
2P	STD	NA	STD	NA	NA	STD	OS	STD	Specify	STD	STD
2V	STD	NA	NA	NA	STD	NA	OS	STD	Specify	STD	STD
2VR	STD	NA	STD	NA	NA	STD	OS	STD	Specify	STD	STD
3P	NA	STD	STD	NA	NA	STD	OS	STD	Specify	STD	STD
3V	NA	STD	NA	NA	STD	NA	OS	STD	Specify	STD	STD
3VR	NA	STD	STD	NA	NA	STD	OS	STD	Specify	STD	STD
31P	*	STD	STD	*	NA	STD	OS	STD	Specify	STD	NA
31PPX	*	STD	NA	NA	STD	NA	OS	STD	Specify	STD	NA
31V	*	STD	STD	NA	STD	NA	OS	STD	Specify	STD	NA
31VR	*	STD	STD	*	NA	STD	OS	STD	Specify	STD	NA

*Plug exhaust port on 31 series for 2-way. For Normally Open, plumb Supply to appropriate port. **Fluoroelastomer
 Order example: 2P
 OS indicates part must be ordered separately.
 REMEMBER: Option Codes marked STD, NA are not used as part of the Model Number when ordering.

TAC & TAC²

#10-32 and 1/8-inch ports 4-way

VALVES

	NORM. CLSD/ NORM. OPEN 2 POS	NORM. CLSD/ NORM. OPEN 3 POS/OPN CTR	DETENTED	SPRING RETURN	3 DETENTED POSITIONS	3 SPRING RETURN POSITIONS	DETENT SPRING CTR'D DETENT	MOUNT. BASE (see access.)	PANEL MOUNT. NUTS	BRASS BODY	FKM* Seals	BOTTOM INLET
OPTION CODE VAI												
MODEL												
4P	STD	NA	NA	STD	NA	NA	NA	OS	STD	STD	Specify	NA
4PP	STD	NA	STD	NA	NA	NA	NA	OS	STD	STD	Specify	NA
4PPX	STD	NA	STD	NA	NA	NA	NA	OS	STD	STD	Specify	NA
4V	STD	NA	STD	NA	NA	NA	NA	OS	STD	STD	Specify	NA
41P	STD	NA	NA	STD	NA	NA	NA	OS	STD	STD	Specify	NA
41PP	STD	NA	STD	NA	NA	NA	NA	OS	STD	STD	Specify	NA
41PPX	STD	NA	STD	NA	NA	NA	NA	OS	STD	STD	Specify	NA
41V	STD	NA	STD	NA	NA	NA	NA	OS	STD	STD	Specify	NA
41TD3	NA	STD	NA	NA	STD	NA	NA	OS	STD	STD	Specify	STD
41TS3	NA	STD	NA	NA	NA	STD	NA	OS	STD	STD	Specify	STD
41TDS3	NA	STD	NA	NA	NA	NA	STD	OS	STD	STD	Specify	STD
41RD3	NA	STD	NA	NA	STD	NA	NA	OS	NA	STD	Specify	STD
41RS3	NA	STD	NA	NA	NA	STD	NA	OS	NA	STD	Specify	STD
41RDS3	NA	STD	NA	NA	NA	NA	STD	OS	NA	STD	Specify	STD

For 42 Series TAC³ Valves, see TAC³ Air Piloted and Push-Button Valves, p. 12 of Humphrey Price List. *Fluoroelastomer
 Order example: 41P-VAI
 OS indicates part must be ordered separately.
 REMEMBER: Option Codes marked STD, NA are not used as part of the Model Number when ordering.

AIR/MANUAL/MECHANICAL OPERATORS

OPERATORS

Air Pilot Operators

	Fluoroelastomer Seals
OPTION CODE	VAI
MODEL	
34A	NA
34AS	Specify
34AR	Specify
34ASR	NA
341A	NA
341AS	Specify
341AR	Specify
341ASR	NA

Order example: 341AR-VAI
 NOTE: Valves and Accessories are shipped detached, ready to be mounted according to specific application requirements.
 REMEMBER: Option Codes marked STD, NA are not used as

Manual & Mechanical Operators

MODEL
34B
34C
34CW
34CH
28-60A
34F
34T

Order example: 34F

34B. 34C. 34CW. 34CH. 34T, 34F

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MISCELLANEOUS PRODUCTS

VALVES/MANIFOLD/FLOW CONTROL/REGULATOR

MODEL	Fluoroelastomer Seals	DESCRIPTION
RSR	NA	Self Relieving Regulator.
SC1	NA	Flow Control.
C125	Specify	Check Valve, 1/8-inch ports.
C1	NA	Check Valve, #10-32 ports
S125	Specify	Shuttle Valve, 1/8-inch ports.
AM8	NA	8 Port Air Manifold.

Order example: C125-VAI
REMEMBER: Option Codes marked STD, NA are not used as part of the Model Number when ordering.

ELECTRIC STYLE

MODEL	DESCRIPTION
BA-2R-AR	2-Position Electric Switch (used with ESB)
ESB	Electric Switch Bracket.

TAC, TAC², TAC³ FITTINGS/ACCESSORIES

ACCESSORIES

MODEL	DESCRIPTION
8-60	Bracket-Flat
8-600	Bracket-Angle
8-70	Bracket-Multiple
8-55A	Adapter for Cutler Hammer Electric Actuators

Order example: 8-600

TAC, TAC², TAC³ FITTINGS

MODEL	UNIT	DESCRIPTION
BF*	bag-10	Barbed Fitting 1/8 O.D. Hose
BF1*	bag-10	Barbed Fitting 1/4 O.D. Hose
BHF*	bag-10	Bulkhead Fitting
CF*	bag-10	Coupling Fitting
EF*	bag-10	Elbow Fitting
EXF*	bag-10	Extension Fitting
MBTF*	bag-10	Male Branch Tee Fitting
NF*	bag-10	Nipple Fitting
PF*	bag-10	Plug Fitting
PBF1*	bag-10	1/8 Pipe Barbed Fitting
RBF*	bag-10	Reducer Bush, 1/8 NPT-#10-32
RBF1*	bag-10	Reducer Bush, 1/4 NPT-#10-32
SF*	bag-10	Swivel Fitting
SEF*	bag-10	Street Ell Fitting
TF*	bag-10	Tee Fitting
TCF*	bag-10	Tube Compression Fit. #10-32
TCF1*	bag-10	Tube Compression Fit. 1/8 NPT

*Order by Quantity of Bags Only
Order example: TF

MODEL	UNIT	DESCRIPTION
UEF*	bag-10	Univ. Elbow Fitting
URTF*	bag-10	Univ. Running Tee Fitting
UTF*	bag-10	Univ. Tee Fitting
UXF*	bag-10	Univ. X Fitting
28-60A	ea	Cam Roller (For 34CH)
40-13*	bag-10	Hose Clamp-Sleeve for 1/4" O.D. Hose
71-18	ea	Slug (For 34CH)
89-14*	bag-100	Gasket
93-18	ea	Set Screw (For 34CH)
95-27	ea	Screw, UEF & UTF
97-21*	bag-10	Metering Screw
100-35*	bag-10	Lockwasher
110-21*	bag-10	Locknut
120-40	ea	Collar (For 34CH)
150-30A*	bag-10	Muffler # 10-32
150-31A*	bag-10	Muffler # 1/8 NPT
151-20	ea	Handy Wrench

*Order by Quantity of Bags Only
Order example: 71-18