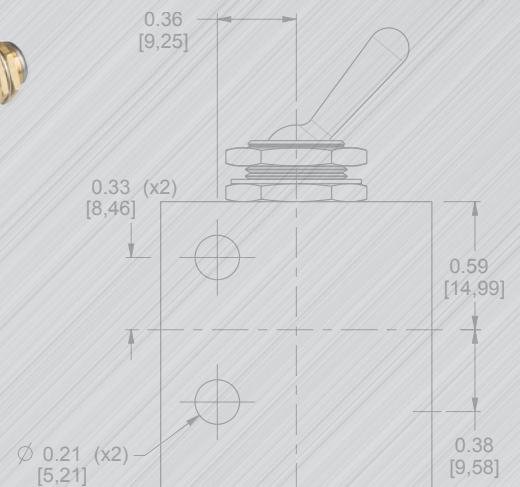
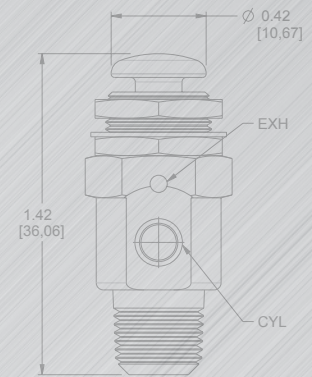
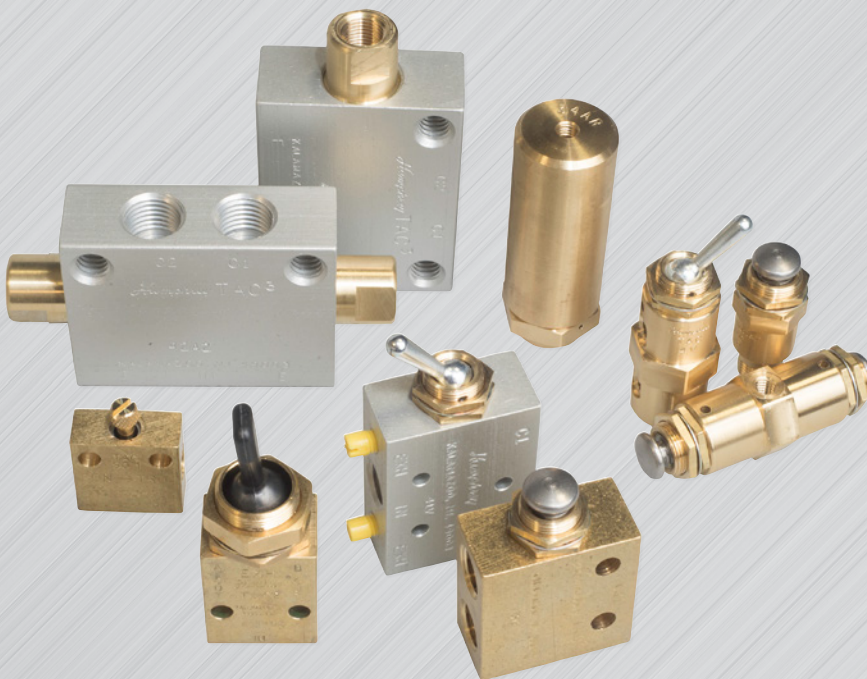


Pneumatic Logic – TAC System

Miniature Valves, Valve Operators and Auxiliary Components



Humphrey TAC System of Miniature Valves, Valve Operators, Auxiliary Components, Miniature Fittings and Accessories combine to create the industry's most productive line up of pneumatic logic control components.

MADE IN USA



Pneumatic Logic – TAC System



The Humphrey TAC “total air control” System of miniature pneumatic valves, valve operators and auxiliary components comprise a comprehensive line up to achieve rugged and reliable industrial automation solutions. The series features compact and attractive 2-, 3- and 4-way directional control valves of exceptional versatility.

Applied individually, TAC valves are ideal for use as inline mounted, on dashboards, or in control panels for applications requiring basic on-off or directional control air switching. Applied collectively, the TAC System of valves and their related components form a complete line-up for basic pneumatic logic control, and featuring a variety of specialty air operators to accomplish logic functions such as AND, OR, Reset, and Delay, etc.

TAC miniature push-button valves are highlighted in the offering. These valves may be directly operated manually or mechanically, or coupled with air pilot, manual and mechanical operators shown on the following pages. Operators attach easily to the valve’s threaded collar.

A key feature of every TAC push-button valve is an attractive, work-hardened stainless steel button plunger, which bottoms-out on the collar preventing over-stroke and internal damage to the valve. Toggle, push-pull and rocker actuators are also available.

TAC auxiliary components and accessories include check and shuttle and quick exhaust valves, pressure regulators, speed controllers, fittings, mounting brackets and other system components to form a complete line up of air logic control.

TABLE OF CONTENTS

Features, Benefits, Product Line	3
Technical Information.....	4-7
How They Work: Push-Button / Push-Pull Valves	8-9
How They Work: Air Pilot Operators.....	10-11
TAC Valves, Components & Fittings	
TAC, TAC2 Push-Button / Push-Pull Valves	12-13
TAC3 Air-Piloted Valves	14
Air Pilot Valve Operators	15
Manual / Mechanical Push-Button Valve Operators.....	16-17
Toggle / 3-Position Manual Valves.....	18-19
Auxiliary Components	20
Mounting Brackets / Adaptors	21
Miniature Fittings.....	22
How to Order.....	23
Humphrey Engineered Solutions	24

FEATURES

- Complete line-up of pneumatic and air logic components.
- Valve line up of 2-, 3- and 4-way types in spring return or detented functions.
- Valve design highlighted by push button and threaded collar design to accept a variety valve operators.
- Manual and Mechanical valve operators mount easily to push-button valve.
- Air Pilot operator line up accomplishes RESET, DELAY, AND, OR logic functions.
- Attractive, work-hardened stainless steel push-button operator.
- Rugged construction for industrial applications

BENEFITS

- One-stop shop for air logic system design and solutions.
- Operator design prevents any valve overstroke and internal damage.
- Easy to panel mount leaves pneumatic below and attractive, rugged button above.
- Extremely resistant to wear.
- Simplified circuitry. Reduced number of components and plumbing costs. Easy assembly.

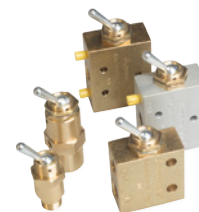
TAC 2-, 3- AND 4-WAY VALVES



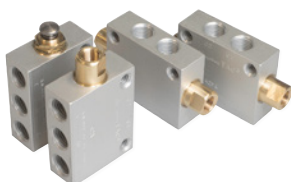
Push Button
10-32 UNF through
1/4 PIPE ports



Push Pull
10-32 UNF and
1/8 PIPE ports



Toggle
10-32 UNF and
1/8 PIPE ports



TAC3 Manual and Air-Piloted
1/4 PIPE ports
4-way, 5-port



3-Position, Manual
1/8 PIPE ports
4-way, 3-position

PUSH-BUTTON VALVE OPERATORS



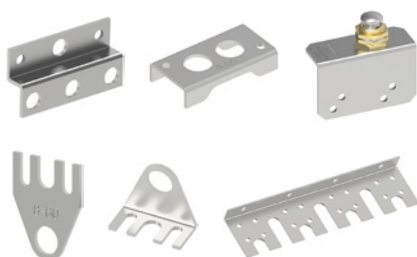
Manual, Mechanical

AUXILIARY COMPONENTS



**Pressure Regulator, Flow Controller,
Check, Shuttle and Quick Exhaust Valves**
10-32 UNF and 1/8 PIPE ports

MOUNTING BRACKETS, ADAPTORS



MINIATURE FITTINGS



10-32 UNF through
1/4 PIPE thread

Technical Information

DESCRIPTION AND PRECAUTIONS

Description

- TAC valves** The original and smallest components of the TAC series, with 2-, 3- and 4-way models having #10-32 ports.
- TAC2 valves** Larger size and higher flow. An expansion of TAC series. These 3- 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.

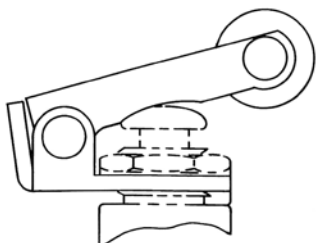
Mounting/Assembly of Actuators

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

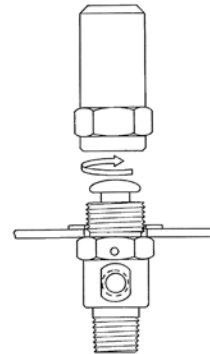
Manual or mechanical actuators should be adapted to valves/ mounting while ensuring adequate stroke of actuator.

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.



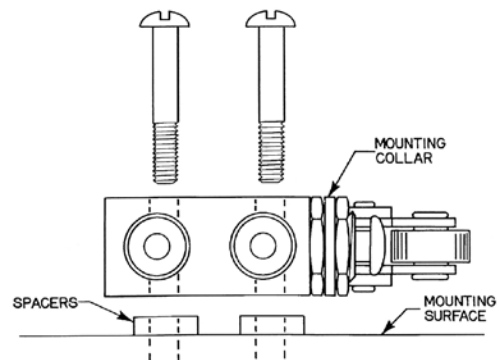
PILOT ACTUATORS

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 and 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; 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 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 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 PSI (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- 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" 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 overtighten 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.

TECHNICAL INFORMATION

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.

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

Flow Rates/Cv

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 Cv as a comparison standard.

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

Model C,	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.

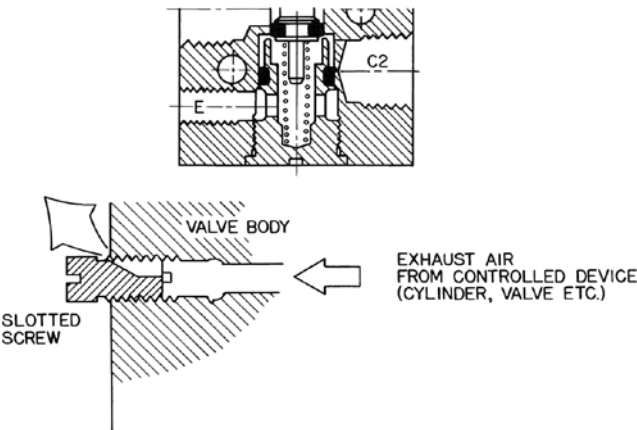
Time to Exhaust 4 cubic inches
= 40% of .250 sec. for 10 cubic inches = 0.100 sec.

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.

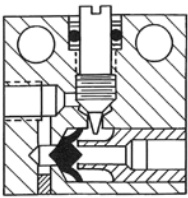
FLOW CONTROL

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.



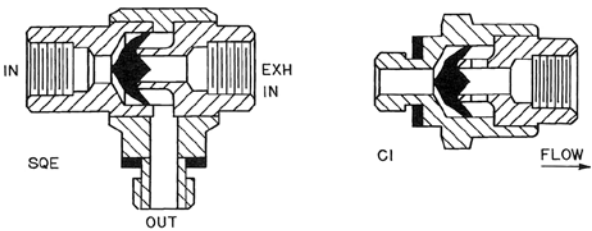
Increased engagement of screw reduces orifice of slot and meters exhausting air.

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 and model SQE shuttle and quick exhaust valve also employ Humphrey's unique molded quick exhaust shuttle.



PACKAGING

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

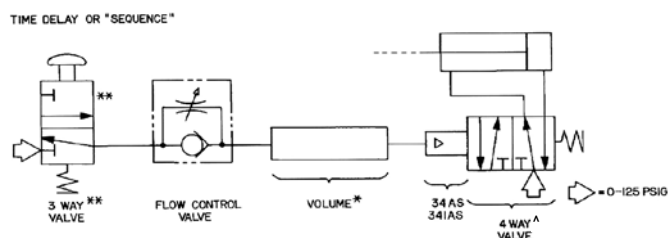
TYPICAL LOGIC CIRCUITS

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.

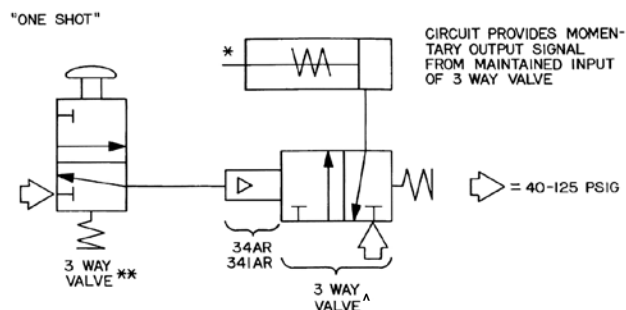


- * One cubic inch of volume equals approximately two seconds delay.
- ** Valve used can be any 3-way or from one side of any 4-way.
- ^ Valve used with 34AS or 341AS actuator must be TAC Series but can be either 2-, 3- or 4-way depending on work function (Double-Acting Cylinder shown).

"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.

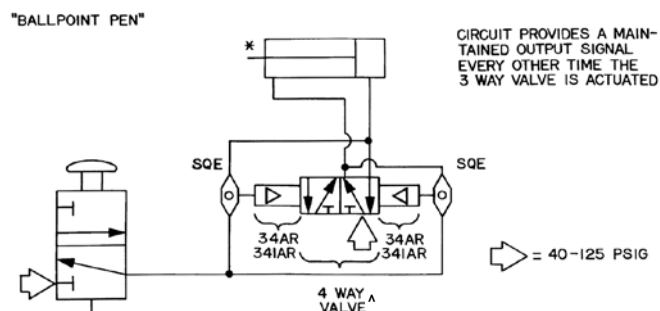


- * Single-acting cylinder shown.
- ** Valve used can be any 3-way or from one side of any 4-way.
- ^ Valve used with 34AR or 341AR operator must be TAC Series, but can be 2-, 3- or 4-way depending on work function.

"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.



- * Double-acting cylinder shown. Single acting cylinder can be used.
- ** Valve used can be any 3-way or from one side of any 4-way.
- ^ Valve used with 34AR or 341AR operator must be TAC Series 4-way model: 4PP, 41PP or 42PP.

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.

- Ensure presence of pressure; blocked or defective fittings are frequent causes of circuit start-up problems.
- Insure adequate duration of pilot signal to air pilot operators.
- Insure proper stroke of manual, mechanical, or air pilot operators. See specific model description.
- Ensure 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.

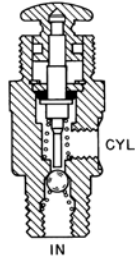
WARRANTY

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: Push-Button / Push-Pull Valves

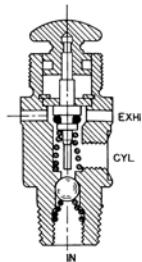
TAC 2P 2-way, 2-position, spring return

Supply pressure enters IN port and holds ball in seat. Ball is spring biased to ensure 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.



TAC 3P 3-way, 2-position, spring return

Supply pressure enters IN port and holds ball in seat. Ball is spring biased to ensure 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.



TAC2 31P 3-way, 2-position, spring return, universal valve*

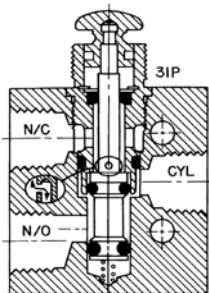
Normally Closed, with supply connections to NC port:

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.

Normally Open, with air supply connected to NO port:

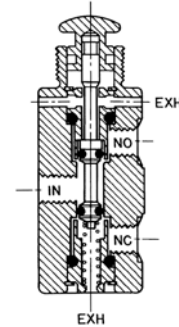
Supply pressure does not hold stem in position due to equal/balanced areas. Spring bias ensures closing. Actuation moves valve stem and causes exhaust via the NC port which serves as the exhaust port. De-actuation permits spring to re-establish normally open position.

* Can be used NC, NO or as a selector or diverter.



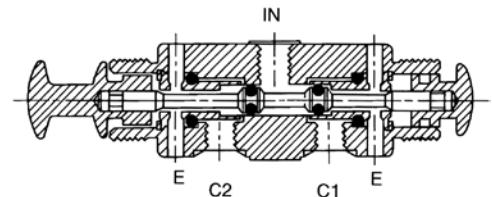
TAC 4P 4-way, NC/NO, 5-port, 2-position, spring return

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.



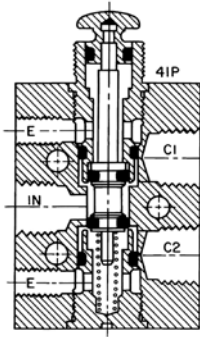
TAC 4PP 4-way, NC/NO, 5-port, 2-position, detented

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.



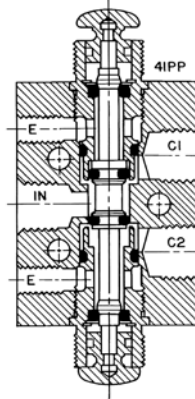
TAC2 41P 4-way, NC/NO,
5-port, 2-position, spring return

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.



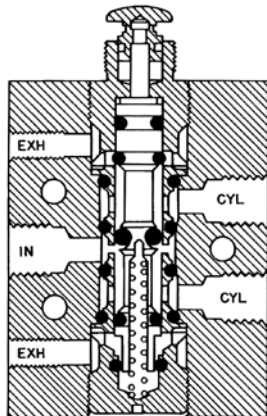
TAC2 41PP 4-way, NC/NO,
5-port, 2-position, detented

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 reestablishes original condition.



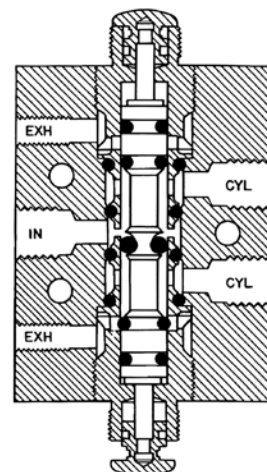
TAC3 42P 4-way, NC/NO,
5-port, spring return

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.



TAC3 42PP 4-way, NC/NO,
5-port, detented

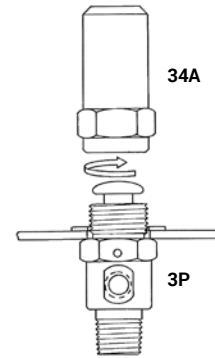
Supply pressure flows from IN to C1; C2 is exhausted via exhaust port opposite valve actuator last actuated. Stem is balanced without "air spring." Actuation moves valve stem allowing flow from IN to C2 port while C1 port is exhausted via other exhaust port. Actuation of valve's opposite actuator re-establishes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



How They Work: Air Pilot Operators

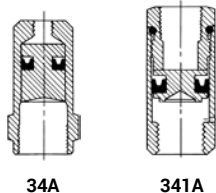
TAC AIR PILOT OPERATORS

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



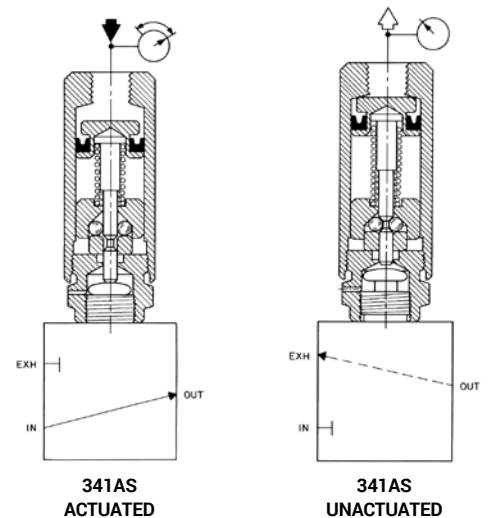
MODELS 34A, 341A

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.



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 PSI $\pm$ 5 PSI. At this pressure, the operator piston snaps forward to actuate valve and remains shifted until pilot pressure is exhausted.

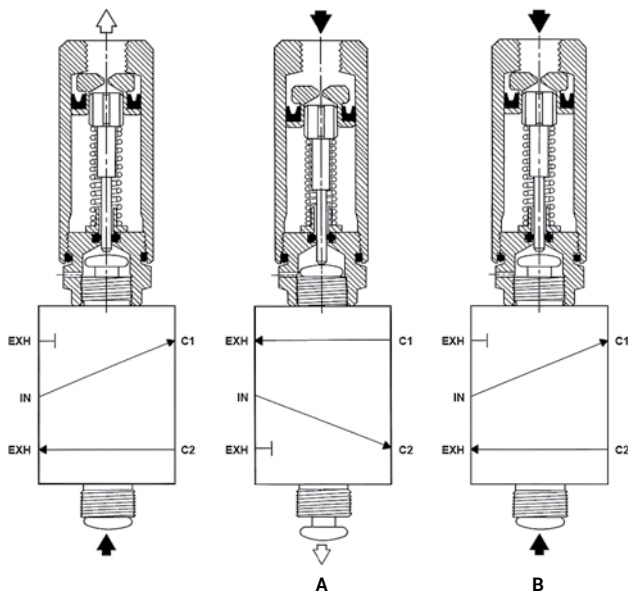


MODELS 34AR, 341AR

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. (A) 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. (B) This reset occurs within 0.3 seconds at 40 PSI within 0.5 seconds at 100 PSI and within 0.7 seconds when used with 4PP, 41PP or 42PP valves. Maximum cycle life is obtained at 40-65 PSI maximum.

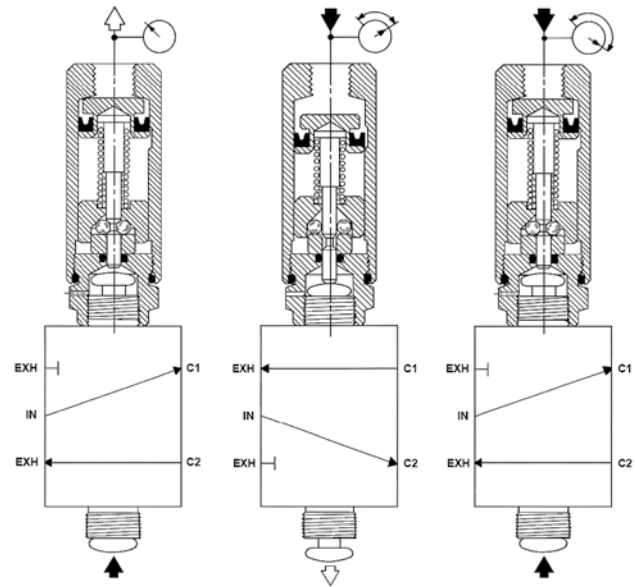
Any erratic action of the operators is often caused by small diameter or long pilot lines, restricted fittings, low flow pilot valves, slow building, or exhausting pilot signals, or excessive moisture or space between operator and valve body and can be eliminated by correcting these conditions.

**341AR****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 PSI $\pm$ 5 PSI, 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.

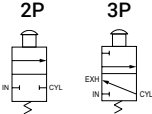
Spring then creates unbalance and returns piston and piston rod to original position resulting in only a momentary actuation of valve, even though air pressure remains applied to pilot port. After snap action, the piston resets within approximately 0.3 seconds at 40 PSI, within 0.5 seconds at 100 PSI,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

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

**341ASR**

TAC, TAC2 Push-Button / Push-Pull Valves

Model TAC and TAC2 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 NPT



2P/3P 2-, 3-way, NC, 2-position, spring return

Valve can trap downstream pressure if the supply pressure is maintained and not exceeded.

IN and CYL port threads are #10-32 female. EXH port is not threaded. Alternate IN port is 1/8 NPT male.

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



4P 4-way, NC/NO, 5-port, 2-position, spring return

IN and CYL port threads are #10-32 female. EXH ports are not threaded.



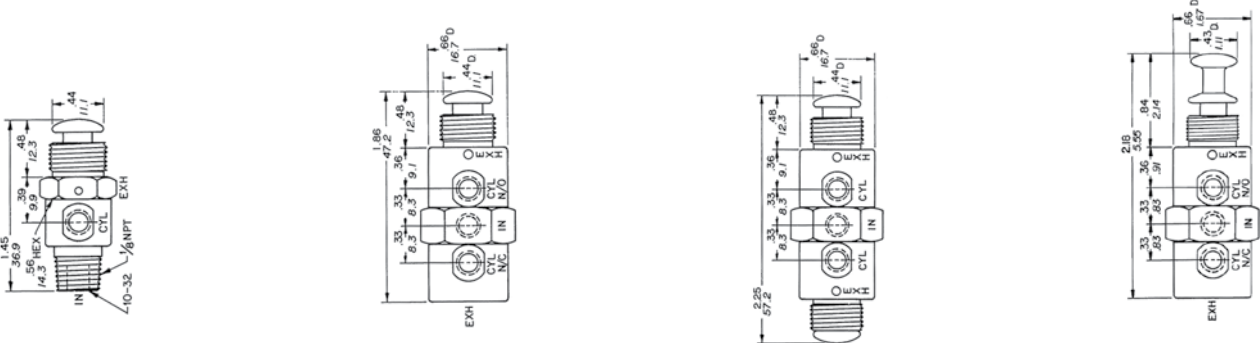
4PP 4-way, NC/NO, 5-port, 2-position, detented

Detented version of TAC 4P with 2 push buttons. IN and CYL port threads are #10-32 female. EXH ports are not threaded.



4PPX 4-way, NC/NO, 5-port, 2-position, detented

Features a push-pull actuator with positive stop. Actuator has a short stroke of 0.093 inch.

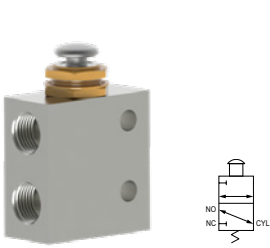


Specifications

MEDIA: Compressed Air (Consult factory for others)	OPERATING SPEEDS: TAC & TAC²: to 900 CPM
PRESSURE RANGE: 0 to 125 psig (0 to 8.6 bars)	MATERIALS: Brass, Stainless Steel, Delrin, Buna N
TEMPERATURE RANGE: -20 to 180°F (-28.9 to 82.2°C)	LUBRICATION Recommended FILTRATION Recommended, 40 Microns Minimum

Air Flow to Atmosphere

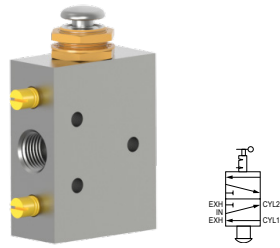
MODEL	25 PSIG CFM	(1.7 BARS) LPM	125 PSIG CFM	(8.6 BARS) LPM
2P, 3P	0.2	6.8	7.0	198.1
4P, 4PP, 4PPX	0.6	16.9	9.0	254.7
31P, 41P, 41PP, 41PPX	4.0	113.2	20.0	566.0



31P 3-way, NC/NO, 2-position, spring return

Multi-purpose valve. Pressure may be applied at any port. The 31P can be used as a 3-way, NC/NO valve, as a divertor or dual-pressure valve, or as a 2-way valve with the unused NC or NO port plugged.

Valve can be mounted with two #10 screws or panel mounted with body threads.

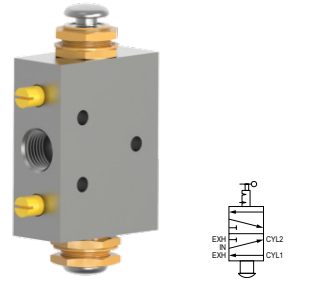


41P 4-way, NC/NO, 5-port, 2-position, spring return

IN and CYL port threads are 1/8 NPT. Exhaust ports are #10-32 female.

Supplied with two #97-21 metering screws for exhaust port flow controls.

Valve can be mounted with three #6 screws or panel mounted with body threads.

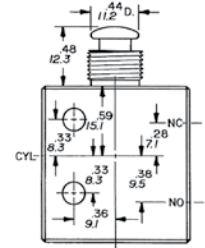


41PP 4-way, NC/NO, 5-port, 2-position, detented

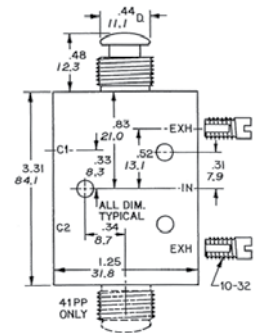
Detented version of 41P with two push-buttons. IN and CYL port threads are 1/8 NPT. Exhaust ports are #10-32 female.

Supplied with two #97-21 metering screws for exhaust port flow controls.

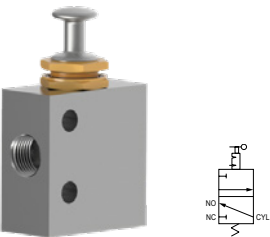
Valve can be mounted with three #6 screws or panel mounted with body threads.



31P

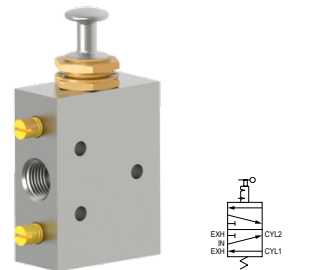


41P, 41PP



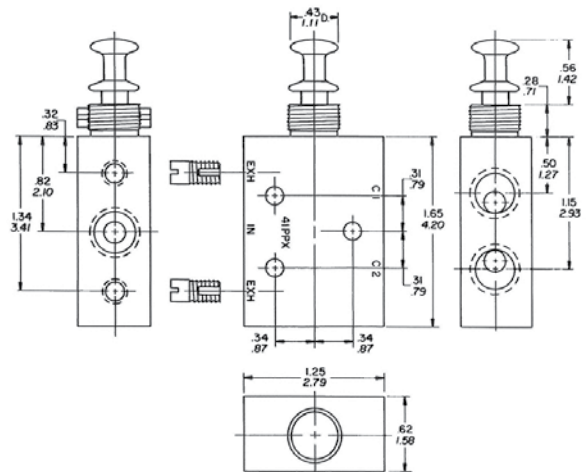
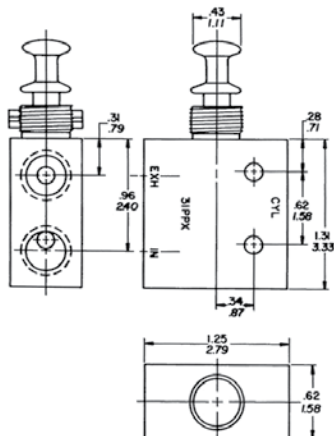
31PPX 3-way, NC/NO, 2-position, detented, universal valve

Detented version of 31P. Features a push-pull actuator with positive stop. Actuator has a short stroke of 0.093 inch.



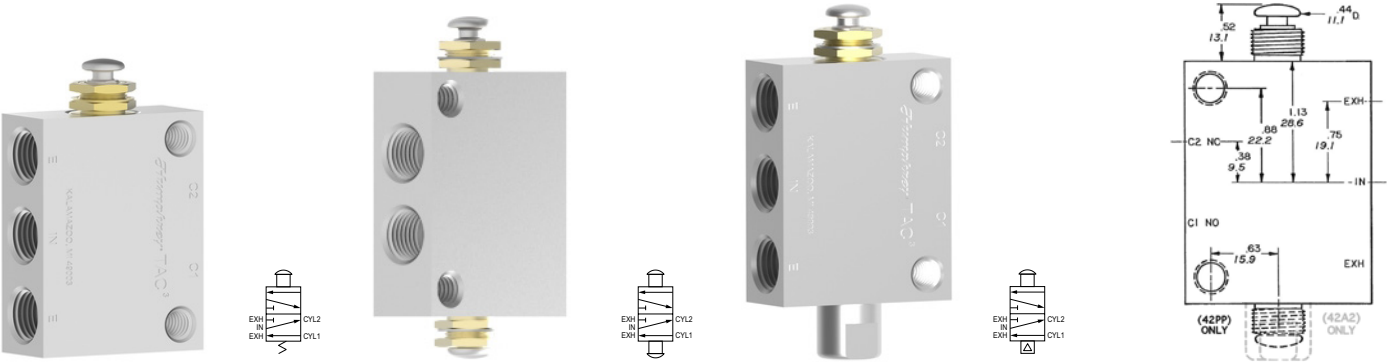
41PPX 4-way, NC/NO, 5-port, 2-position, detented

Detented version of 41P. It features a push-pull actuator with positive stop. Actuator has a short stroke at 0.093 inch.



TAC3 Air Piloted Valves

Humphrey TAC3 large air-piloted valves feature Delrin sleeve construction to reduce friction for smooth performance and long service life. Single air-pilot models employ a mechanical spring and a patented air spring to return the main stem. Double air-pilot models maintain the last position automatically, preventing equipment damage when pressure is interrupted. TAC3 valves have a common inlet and separate exhausts. Cylinder port 1 is normally open and cylinder port 2 is normally closed. Valves can be mounted in any position with two 1/4" screws or directly in-line. Port size: 1/4 PIPE



42P 4-way, NC/NO, 5-port, single push-button, spring-return

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.

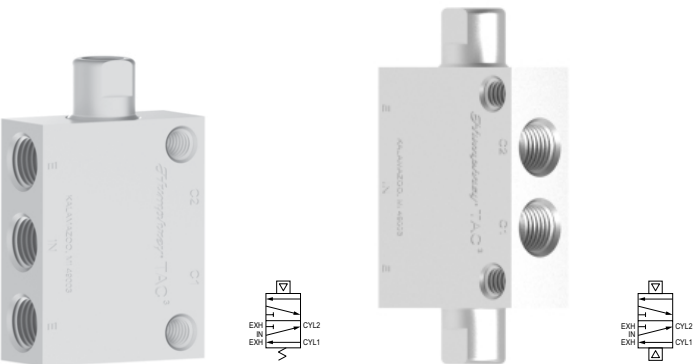
42PP 4-way, NC/NO, 5-port, double push-button, detented

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.

42PA 4-way, NC/NO, 5-port, detented

One side has push-button; other side has 1/8 PIPE 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.

42P, 42PP, 42PA

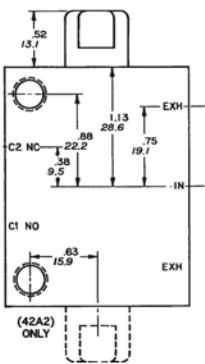


42A 4-way, NC/NO, 5-port, spring-return

Single air-pilot valve with air/spring return. 1/4 PIPE ports; one 1/8 PIPE pilot port.

42A2 4-way, NC/NO, 5-port, detented

Double air-pilot valve that maintains position after a momentary air pilot or if all pressure is removed. 1/4 PIPE ports; two 1/8 PIPE pilot ports.



42A, 42A2

Specifications

MEDIA: Compressed Air (Consult factory for others)	OPERATING SPEEDS: To 600 CPM
PRESSURE RANGE: 0 to 125 psig (0 to 8.6 bars)	MATERIALS: Brass, Stainless Steel, Delrin, Buna N
TEMPERATURE RANGE: -20 to 180°F (-28.9 to 82.2°C)	LUBRICATION Recommended FILTRATION Recommended, 40 Microns Minimum

Air Flow to Atmosphere

Weight

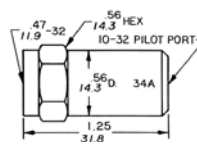
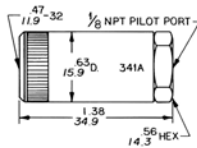
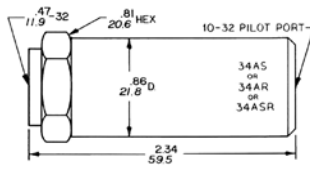
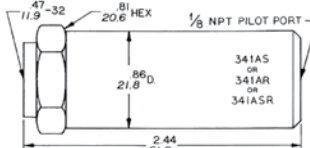
MODEL	25 PSIG CFM	(1.7 BARS) LPM	125 PSIG CFM	(8.6 BARS) LPM	ACTUAL LBS	KGS
All	10.0	283.0	39.0	1103.7	0.65	0.30

VALVED PRESSURE		25 psig	1.7 bars	50 psig	3.5 bars	100 psig	7.0 bars
PILOT PRESSURE							
MODEL	42A	22.6	1.5	26.9	1.8	37.6	2.5
	42A2/PA	6.0	0.4	6.6	0.4	7.6	0.5

Air Pilot Operators

Air pilot operators are for use with TAC, TAC2 and TAC3 push-button valves and the ESB Electric Switch Bracket (p. 21) 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 in a single unit.

Model 34 operators are recommended for use with TAC valves; model 341 operators are recommended for use with TAC2 and TAC3 valves.

		RESET		SNAP ACTION		SNAP ACTION & RESET	
	34A 341A		34AR 341AR		34AS 341AS		34ASR 341ASR
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.		When used on a spring-return valve, these operators provide a momentary "one-shot" output signal (40 PSI/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 PSI, within 0.5 at 100 PSI, and within 0.7 seconds when used with 4PP, 41PP or 42PP valves. Maximum cycle life is obtained at 40-65 PSI, 125 PSI 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.		Primarily used for time-delay circuits and other slow-building pilot pressure applications. The actuation of the operator is delayed until pilot pressure reaches 35 PSI $\pm$ 5 PSI. 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 PSI, 125 PSI maximum.		Actuation is delayed until pilot pressure reaches 35 PSI $\pm$ 5 PSI, 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 PSI, within 0.5 seconds at 100 PSI, and within 0.7 seconds when used with 4PP, 41PP or 42PP valves. NOTE: The recommended maximum pilot pressure is 60 PSI. If this pressure is exceeded, the operator will recycle – snapping and resetting a second time.	
34A  341A 				34AS, 34AR, 34ASR  341AS, 341AR, 341ASR 			

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				

Manual / Mechanical Push-Button Valve Operators

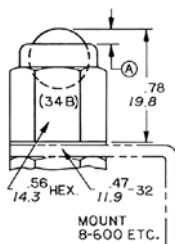
These operators are used to convert TAC, TAC2 and TAC3 push-button valves to manual or mechanical operation. Actuating force varies by valve type and pressure as shown in accompanying charts.



34B Ball Operator

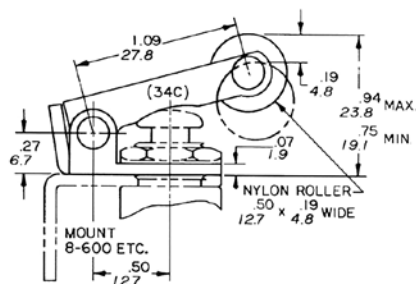
Threads onto the collar of any TAC Series push-button valve. The ball is not retained until threaded onto valve.

The 0.078" thickness of the #8-60 or #8-600 mounting bracket plus the 0.015" thickness of the lockwasher properly spaces the 34B to prevent prestroking of the button. Stroke is 0.093".



34C Cam Operator

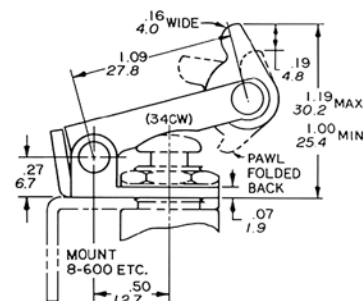
Adjustment of cam roller height is made through the use of a mounting bracket and locknuts. The cam surface should release roller quickly for best valve response.



34CW Cam Operator with One-Way Actuation

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.



Force To Actuate in Ounces/Grams

Model 34B†

VALVED PRESSURE	30 psig	(2.1 bars)	60 psig	(4.2 bars)	100 psig	(7.0 bars)
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				

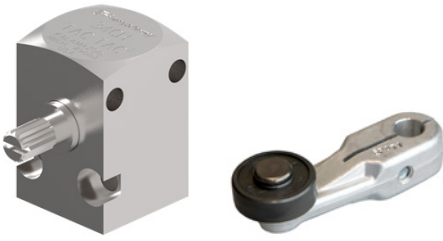
†Same force required to push valve button.

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.



34CH Heavy-Duty Cam Operator

Use with all TAC series valves except TAC3 valves.

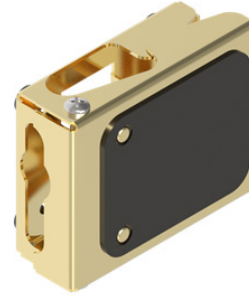
Its spline actuator shaft adapts to Micro Switch 6PA71, Roller Lever Arm and other commercially available actuator styles (Humphrey 28-60A discontinued).

The mean stroke is 15° each for prestroke, fully open and overstroke.



34T Fingertip Operator

Use with any TAC Series push-button valve to provide easier actuation.

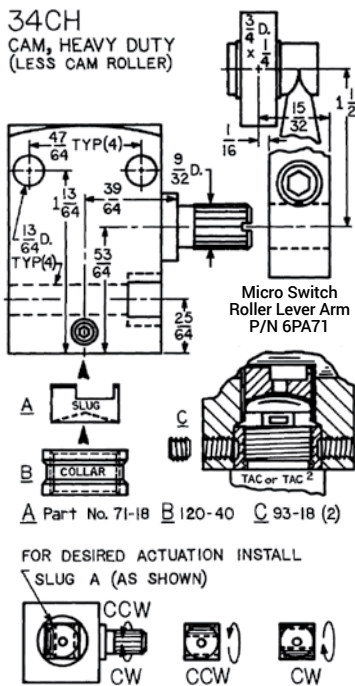


34F Foot, Knee, or Hand Operator

Use with any TAC Series push-button valve except the TAC3.

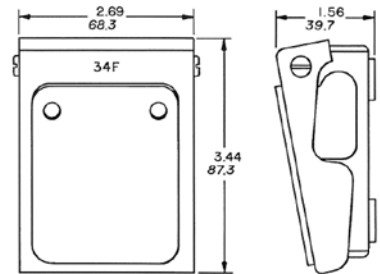
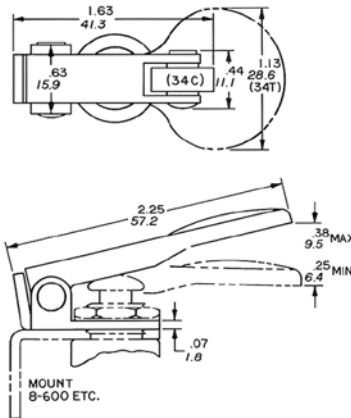
To install, disassemble the 34F by removing screws. Mount valve shoulder to bracket and retain with locknut and lockwasher. Back and sides are left open for plumbing. Non-skid rubber pads on both sides.

Mount to equipment with two 0.187" dia. holes on 1.625" centers, 0.562" from back.



34CH ASSEMBLY INSTRUCTIONS

- Orient supplied square SLUG (A) into 34CH for desired actuation. Slug drill point rests on valve button.
- Thread supplied COLLAR (B) fully onto valve.
- Insert valve / collar behind slug and secure by #8-32 SET SCREWS (C) at 90°.
- Mount 34CH, not valve, to equipment.
- Secure various actuator arms to spline actuator shaft.



Force To Actuate in Ounces/Grams

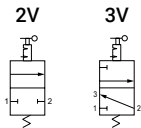
VALVED PRESSURE	30 psig	(2.1 bars)	60 psig	(4.2 bars)	100 psig	(7.0 bars)
2P	10	284	12	340	14	397
3P	14	397	18	510	29	822
4P	16	454	16	454	17	482
4PP	5	142	6	170	7	198
31PP	28	794	32	907	40	1134
41P	32	907	38	1077	50	1418
41PP	19	539	21	595	25	709
42P	35	992	48	1361	69	1956
42PP/PA	10	284	13	369	16	454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

Model 34T

Toggle / 3-Position Manual 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- 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- or 3-position valve.



2V/3V 2-, 3-way, NC, 2-position, detented

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 NPT male.

These valves are furnished with locknuts and lock washers for 15/32-32 x 9/32, toggle collar threads.

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



4V 4-way, NC/NO, 2-position, detented

Convert to 3-way by plugging one CYL port with Humphrey PF fitting. IN and CYL ports are #10-32 female.

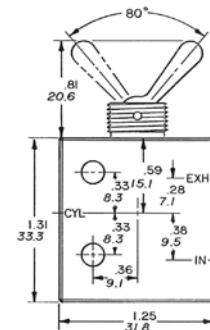
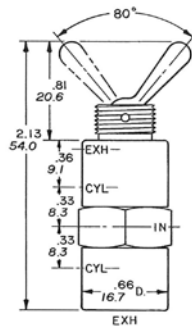
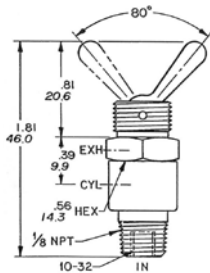
Supplied with locknuts and lockwashers for 15/32-32 x 9/32, toggle collar threads.



31V 3-way, NC, 2-position, detented

Valve can be used as a 2-way valve by plugging the exhaust port. Ports are 1/8 NPT.

The 31V valve can be mounted with two #10 screws or with body threads for bracket or panel mounting.



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



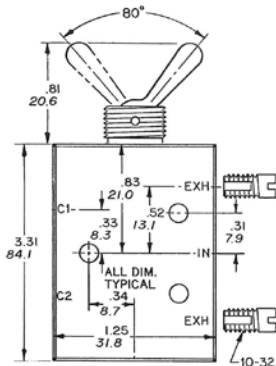
41V 4-way, NC/NO,
2-position, detented

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 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.

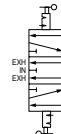


41T

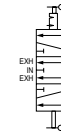


41R

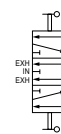
41T/R-D3



41T/R-DS3



41T/R-S3



4-way, 3-position, detented
and/or spring-return

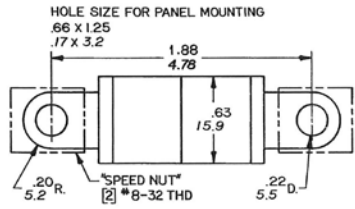
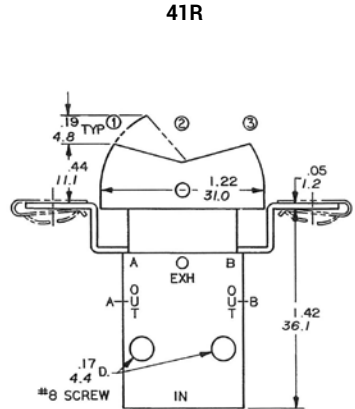
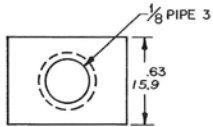
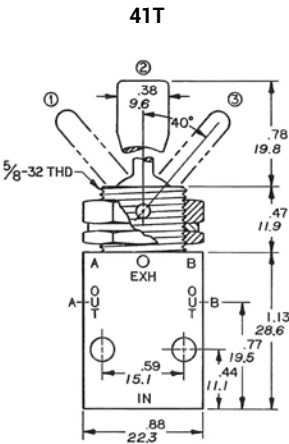
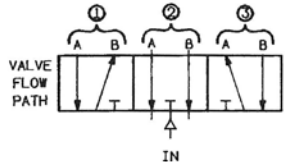
Models 41T (left) and 41R are 3-position, 4-way valves with several functional options. They may be detented or spring-return or both. May use as 2-position valves by bypassing position 2 or as 3-way valves by plugging A or B port.

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" and 0.93" thick) and lockwasher.

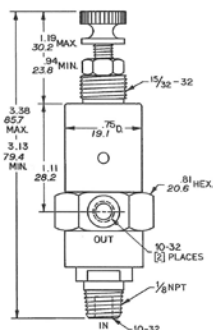
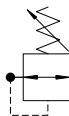
Flow: 7.5 SCFM @ 125 PSI

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



Auxiliary Components

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

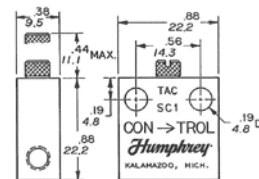


RSR Air Pressure Regulator

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

Flow: 11 SCFM at 100 PSI using #10-32 female IN port.
22 SCFM at 100 PSI using 1/4-inch male IN port.

It 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 lock washers.

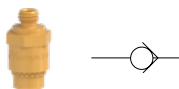


SC1 Speed Control

Provides free flow in one direction and excellent controlled flow in the opposite direction at 3 to 125 PSI.

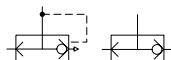
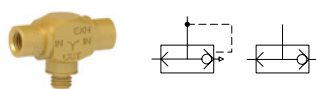
Flow: 6.5 SCFM at 100 PSI, both directions of flow

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" dia. screw holes and #8 screws, or they may be mounted to a Humphrey 8-70 Mounting Bracket with one screw.



C1 Check Valve

Valve has #10-32 male and female ports. Furnished with gasket for male thread.



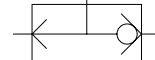
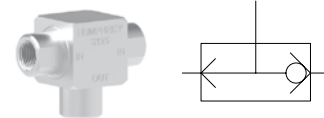
SQE Shuttle and Quick Exhaust Valve

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.



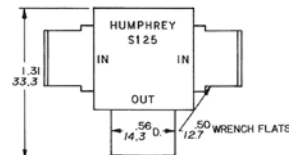
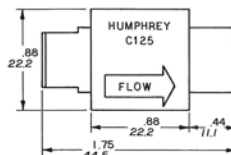
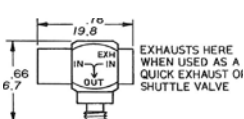
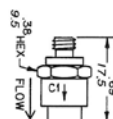
C125 Check Valve

Valve has a spring-loaded shuttle and 1/8 NPT ports.



S125 Shuttle Valve

Valve has a free-floating shuttle to provide fast response, even at low pressure. Ports are 1/8 NPT.



Specifications

MEDIA:
Compressed Air (Consult factory for others)

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)

TEMPERATURE RANGE:
20 to 150°F (-7.0 to 65.6°C)

MATERIALS:
S125, C125: Aluminum, Nylon, 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

ACTUAL OUNCES	GRAMS
.3	8.5
.4	11.3
1.1	31.2
1.2	34.0

Mounting Brackets / Adaptors

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



8-25A Mounting Bracket

Body mounting for TAC3 push-button and air-piloted valves. Includes mounting screws.



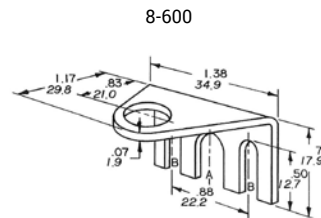
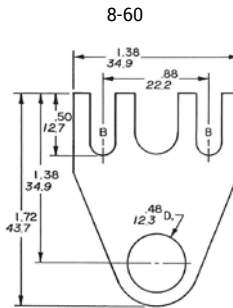
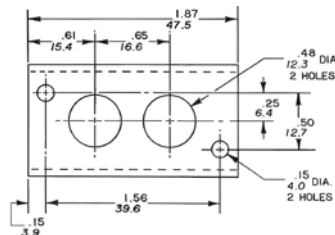
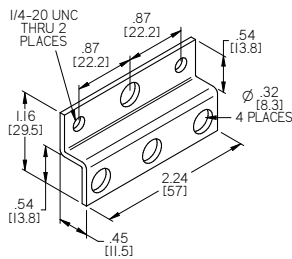
8-55A Adaptor

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 adaptor is mounted to the shoulder of any TAC or TAC2 push-button valve (one or two, in any combination). Consult factory for details.



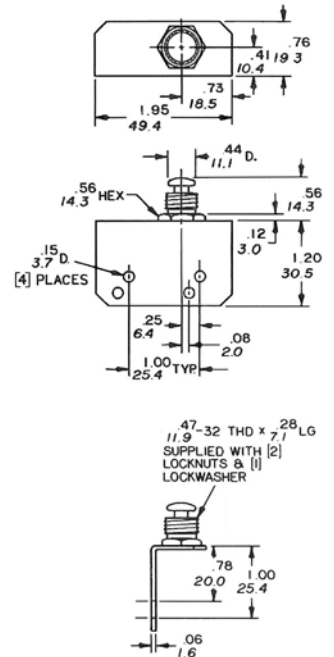
8-60 Mounting Bracket 8-600 Angled Mtg. Bracket

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



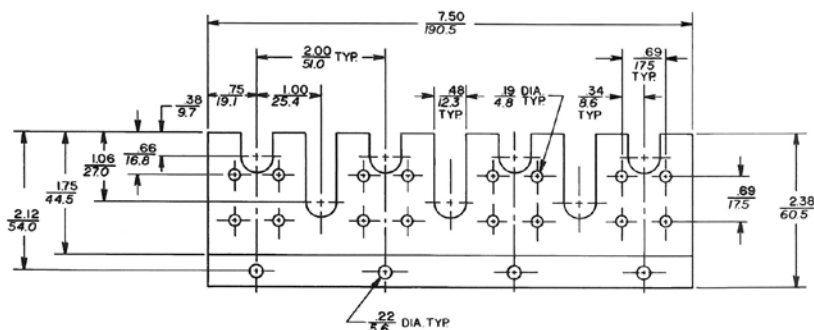
ESB Electric Switch Bracket

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.



8-70 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.



Miniature Fittings

Precision machined brass fittings. 1/8 NPT and 10-32 UNF. Pressures to 125 PSI. All fittings sold as bag of 10, unless otherwise noted.

MODEL PN	DRAWING	DESCRIPTION	MODEL PN	DRAWING	DESCRIPTION
BFBAGOF10		HOSE BARBED FITTING #10-32 to 1/8" O.D. tubing. 1/4" wrench flat. Supplied with gasket.	SEFBAGOF10		STREET ELL FITTING Accepts #10-32 male and female at 90°. Supplied with gasket.
BF1BAGOF10		HOSE BARBED FITTING #10-32 to 1/4" O.D. tubing. Use with 0.125" to 0.190" I.D. tubing. 1/4" wrench flat. Supplied with gasket.	SFBAGOF10		SWIVEL FITTING #10-32 male and female. Excellent for preventing twisting of tubing or tightening of fitting. Not for use as rotary joint. 1/4" wrench flat. Supplied with gasket.
BHFBAGOF10		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". Supplied with locknuts and washers.	TCFBAGOF10		TUBE COMPRESSION FITTING #10-32 male to 1/8" O.D. tubing (copper, nylon, etc.). 3/8" hex nut. Supplied with brass nut, ferrule, and gasket.
CFBAGOF10		COUPLING FITTING #10-32 female thread on both ends. 1/4" wrench flat.	TCF1BAGOF10		TUBE COMPRESSION FITTING 1/8 NPT male to 1/8" O.D. tubing (copper, nylon, etc.). 7/16" wrench flat; 3/8" hex nut. Supplied with nut and ferrule.
EFBAGOF10		ELBOW FITTING Accepts any #10-32 fitting (2 places at 90°).	TFBAGOF10		TEE FITTING Accepts any #10-32 fitting (3 places).
EXFBAGOF10		EXTENSION FITTING #10-32 on both ends, male and female. Used to prevent fitting interference on parallel tees and elbows. 1/4" wrench flat. Supplied with gasket.	UEFBAGOF10		UNIVERSAL ELBOW FITTING Accepts #10-32 male (1 place) and female (2 places). Rotate ell to desired position and tighten hollow screw. 1/4" wrench flat. Supplied with two gaskets.
MBTFBAGOF10		MALE BRANCH TEE FITTING Accepts #10-32 male (1 place) and female (2 places). Supplied with gasket.	UTFBAGOF10		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.
NFBAGOF10		NIPPLE FITTING #10-32 on both ends. 1/4" wrench flat. Supplied with 2 gaskets.	8914BAGOF100		GASKET Buna coated aluminum gasket provides air-tight seal without extruding. Keeps fitting from coming loose. Sold as bag of 100.
PBF1BAGOF10		PIPE-BARBED FITTING 1/8 NPT male to 1/4" O.D. tubing. Use with 0.125" to 0.190" I.D. tubing. 7/16" wrench flat.	9721BAGOF10		METERING SCREW #10-32 split nylon screw. Used to control exhaust of 4-way TAC2 valves.
PFBAGOF10		PLUG FITTING For plugging unused valve ports. 1/4" wrench flat. Supplied with gasket.	10035BAGOF10		LOCK WASHER 15/32" x 19/32" x 1/64"
RBFBAGOF10		REDUCER BUSHING 1/8 NPT male to #10-32 female. 7/16" wrench flat.	11021BAGOF10		LOCKNUT 9/16" hex x 5/64"
RBF1BAGOF10		REDUCER BUSHING 1/4 NPT male to #10-32 female. 9/16" wrench flat.	15030ABAGOF10		MUFFLER #10-32 male thread. Sintered bronze. 5/16" wrench flat. Supplied with gasket.
			15031ABAGOF10		BREATH-MUFFLER 1/4 NPT male thread. 40-micron screen tends to restrict exhaust. 7/16" wrench flat.

2-POSITION PUSH-BUTTON VALVES

MODEL	OPTIONAL BRASS BODY	FKM SEALS	DESCRIPTION
2P	-	VAI	2-Way, NC, Spring Return, 10-32 UNF
3P	-	VAI	3-Way, NC, Spring Return, 10-32 UNF
4P	-	VAI	4-Way, NC, Spring Return, 10-32 UNF
4PP	-	VAI	4-Way, NC, Detented, 10-32 UNF
4PPX	-	VAI	4-Way, NC, tDetented, 10-32 UNF
31P	BRB	VAI	3-Way, NC or NO, Spring Return, 1/8 PIPE
31PPX	BRB	VAI	3-Way, Detented, 1/8 PIPE
41P	BRB	VAI	4-Way, Spring Return, 1/8 PIPE
41PPX	BRB	VAI	4-Way, Detented, 1/8 PIPE
41PP	BRB	VAI	4-Way, Detented, 1/8 PIPE
42P	NA	VAI	4-Way, Spring Return, 1/4 PIPE
42PP	NA	VAI	4-Way, Detented, 1/4 PIPE
42PA	NA	VAI	4-Way, Detented, 1/4 PIPE (Air Pilot Port - One End)

2-POSITION AIR PILOTED VALVES

MODEL	OPTIONAL BRASS BODY	FKM SEALS	DESCRIPTION
42A	NA	VAI	4-Way, Spring Return, 1/4 PIPE
42A2	NA	VAI	4-Way, Detented, 1/4 PIPE

PUSH-BUTTON VALVE OPERATORS

MODEL	OPTIONAL BRASS BODY	FKM SEALS	DESCRIPTION
34A	STD	VAI	Air Pilot, 10-32 UNF
341A	STD	VAI	Air Pilot, 1/8 PIPE
34AR	STD	VAI	Air Pilot w/Reset, 10-32 UNF
341AR	STD	VAI	Air Pilot w/Reset, 1/8 PIPE
34AS	STD	VAI	Air Pilot w/Air Snap, 10-32 UNF
341AS	STD	VAI	Air Pilot w/Air Snap, 1/8 PIPE
34ASR	STD	VAI	Air Pilot w/Air Snap & Reset, 10-32 UNF
341ASR	STD	VAI	Air Pilot w/Air Snap & Reset, 1/8 PIPE
34B	NA	NA	Roller Ball
34C	NA	NA	Roller Cam
34CW	NA	NA	One-Way Trip Roller Cam
34F	NA	NA	Foot/Knee
34T	NA	NA	Finger Tip
34CH	NA	NA	Heavy Duty

MOUNTING BRACKETS, ADAPTORS, TAC ACCESSORIES

MODEL	DESCRIPTION
ESB	Valve Operator to Electric Switch - Adaptor
8-60	Individual Valve - Flat Type
8-600	Individual Valve - Angle Type
8-70	Multiple Valve - Angle Type
8-55A	Valve to Electric Style Actuator - Adaptor
9721BAGOF10	Metering Screw, 10-32 UNF, Sold in Bag of 10
10035BAGOF10	Lockwasher, Sold in Bag of 10
11021BAGOF10	Locknut, Sold in Bag of 10
8914BAGOF100	Gasket (for 10-32 UNF), Sold in Bag of 100

2-POSITION TOGGLE VALVES

MODEL	OPTIONAL BRASS BODY	FKM SEALS	DESCRIPTION
2V	-	VAI	2-Way, NC, Detented, 10-32 UNF
2VR	-	VAI	3-Way, NC, Spring Return, 10-32 UNF
3V	-	VAI	3-Way, NC, Detented, 10-32 UNF
3VR	-	VAI	3-Way, NC, Spring Return, 10-32 UNF
4V	-	VAI	4-Way, Detented, 10-32 UNF
31V	BRB	VAI	3-Way, Detented, 1/8 PIPE
31VR	BRB	VAI	3-Way, NC, Spring Return, 1/8 PIPE
41V	BRB	VAI	4-Way, Detented, 1/8 PIPE
41VR	BRB	VAI	4-Way, Spring Return, 1/4 PIPE

3-POSITION, 4-WAY MANUAL VALVES, EXHAUST CENTER POSITION

MODEL	OPTIONAL BRASS BODY	FKM SEALS	DESCRIPTION
41RD3	STD	VAI	Detented, 1/8 PIPE, Rocker
41RDS3	STD	VAI	Detented & Spring Return, 1/8 PIPE, Rocker
41RS3	STD	VAI	Spring Return to Center, 1/8 PIPE, Rocker
41TD3	STD	VAI	Detented, 1/8 PIPE, Toggle
41TDS3	STD	VAI	Detented & Spring Return, 1/8 PIPE, Toggle
41TS3	STD	VAI	Spring Return to Center, 1/8 PIPE, Toggle

AUXILIARY VALVES, BRASS FITTINGS & MUFFLERS

MODEL	DESCRIPTION
C1	Check Valve, 10-32 UNF
C125	Check Valve, 1/8 PIPE
SQE	Quick Exhaust & Shuttle Valve, 10-32 UNF
S125	Shuttle Valve, 1/8 PIPE
SC1	Speed Control, 10-32 UNF
RSR	Regulator, Self-Relieving, 10-32 UNF
BFBAGOF10	Hose Barb Fitting, Sold in Bag of 10
BF1BAGOF10	Hose Barb Fitting, Sold in Bag of 10
BHFBAGOF10	Bulkhead Fitting, Sold in Bag of 10
CFBAGOF10	Coupling Fitting, Sold in Bag of 10
EFBAGOF10	Elbow Fitting, Sold in Bag of 10
EXFBAGOF10	Extension Fitting, Sold in Bag of 10
MBTFBAGOF10	Male Branch Tee Fitting, Sold in Bag of 10
NFBAGOF10	Nipple Fitting, Sold in Bag of 10
PFBAGOF10	Plug Fitting, Sold in Bag of 10
PBF1BAGOF10	Piped Barb Fitting, Sold in Bag of 10
RFBAGOF10	Reducer Bushing Fitting, Sold in Bag of 10
RBF1BAGOF10	Reducer Bushing Fitting, Sold in Bag of 10
SFBAGOF10	Street Ell Fitting, Sold in Bag of 10
SEFBAGOF10	Swivel Fitting, Sold in Bag of 10
TFBAGOF10	Tee Fitting, Sold in Bag of 10

ORDER EXAMPLES

2P	31VBRBVAI
9721BAGOF10	41TD3VAI

Engineered Solutions

Custom Valve Solutions featuring Humphrey TAC System Components

Since 1995, the Humphrey Engineered Solutions Group has created many custom product solutions centered around the flexibility and capabilities of the TAC System of miniature valves, valve operators, auxiliary components, miniature fittings, and logic accessories.



CH-BE1

TRANSPORTATION Safety, Reliability

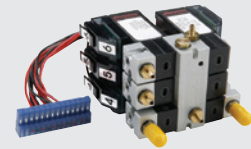
Custom valve manifold assembly improved the safety and reliability of fuel delivery by tanker trucks serving retail gas stations and bulk fuel transfer tanks.



CH-VI1

MEDICAL Emergency Respiratory Care

Humphrey's custom valve assembly allowed the customer to provide critical pressure monitoring when delivering CO₂ - O₂ mixture to patients suffering from toxic gas or smoke inhalation.



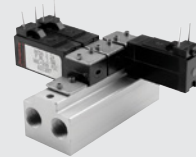
Compact Analytical
Instrument
CH-BK1



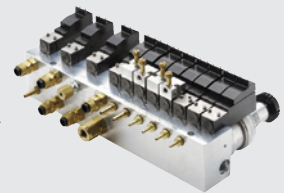
Portable Oxygen
Concentrator
CH-IV1



High Volume
Recycled Glass
Processing System
CH-EC1



Analytical
Instrument for
Medical Laboratory
CH-VN1



Carbon/Sulfur
Determinator
CH-LE1

CUSTOM VALVE SOLUTIONS

Scan the QR code below to learn more and read the case histories highlighted here, as well as the many other custom valve success stories that feature more Humphrey valves.

ENGINEERED SOLUTIONS | Custom Valve Solutions Tailored to Your Needs



Our Engineered Solutions Group offers complete fluid handling and/or pneumatic system design, development and production capabilities to the OEM equipment or device maker. We are uniquely qualified to assist on projects where standard catalog components fall short, and a better valve, or valve system, is required.

Working peer-to-peer basis, our Engineered Solutions Team will concept, design, develop and produce a logical solution to your need. We'll select from and incorporate proven Humphrey

valve technology into the design. We couple our application experience with advanced techniques, design tools and understanding of manufacturing processes to give you a logical and cost effective solution.

Direct more engineering time to leveraging your technology; outsource your fluid handling or pneumatic control to us.

Certified to the ISO 9001:2015 Standard.

HUMPHREY-PRODUCTS.COM

A privately owned US company since 1901.

© 2026 Humphrey Products Company

Printed in U.S.A.

ISBTAC26

Humphrey Products Company

5070 East N Avenue

Kalamazoo, MI 49048 USA

P: 269.381.5500

F: 269.381.4113

Humphrey