

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

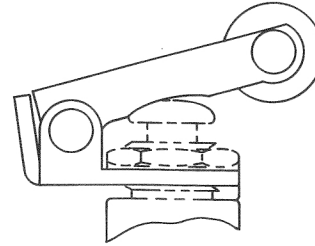
TAC valves can be mounted in any position in most environments within the parameters stated in the specifications. If located near water, oil, or extremely dusty conditions, contaminants may enter via valve exhaust ports causing malfunction or may interfere with movement of button, toggle, or air pilot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

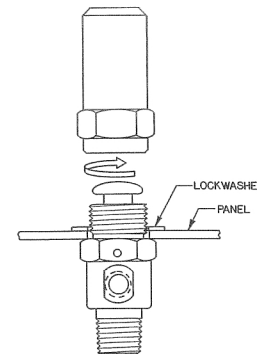
Manual or mechanical actuators should be adapted to valves/mounting while ensuring adequate stroke of actuator.



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.

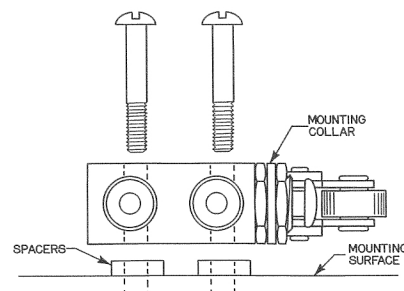
PILOT ACTUATORS

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.

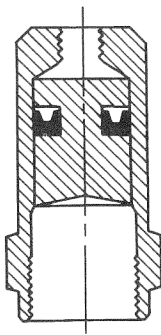


TAC AIR PILOT OPERATORS

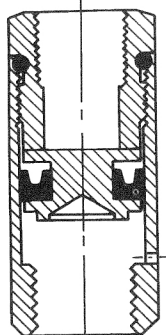
Air pilot operators thread directly onto the collars of push-button valves and the Model ESB Electric Switch Bracket.

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.



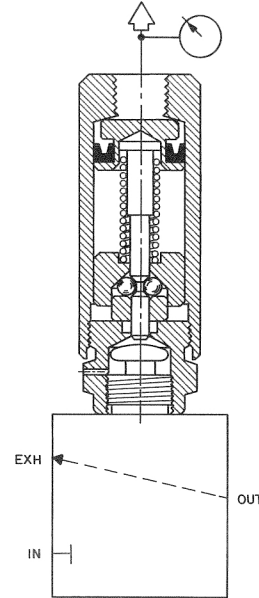
34A



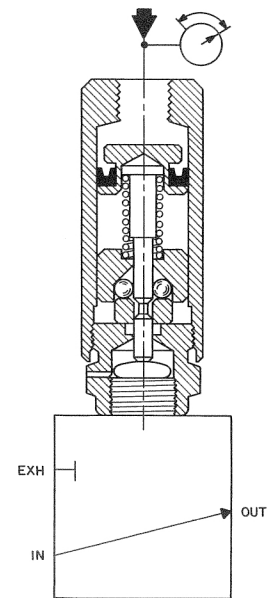
341A

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

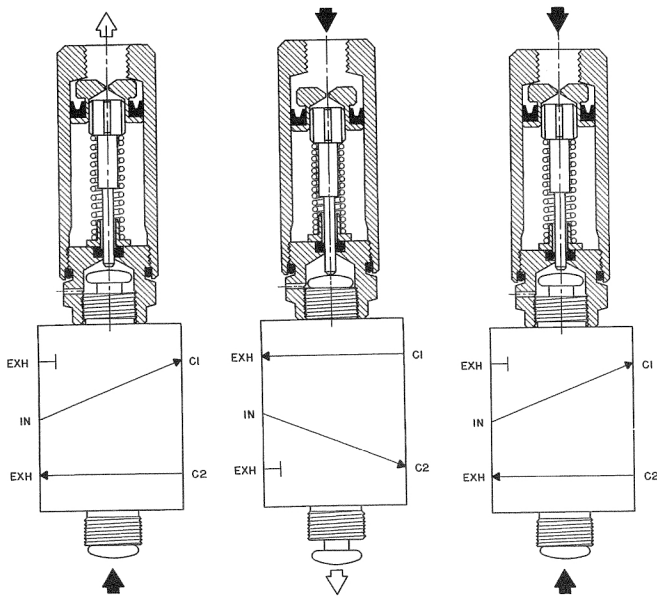


Models 34AR, 341AR

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.



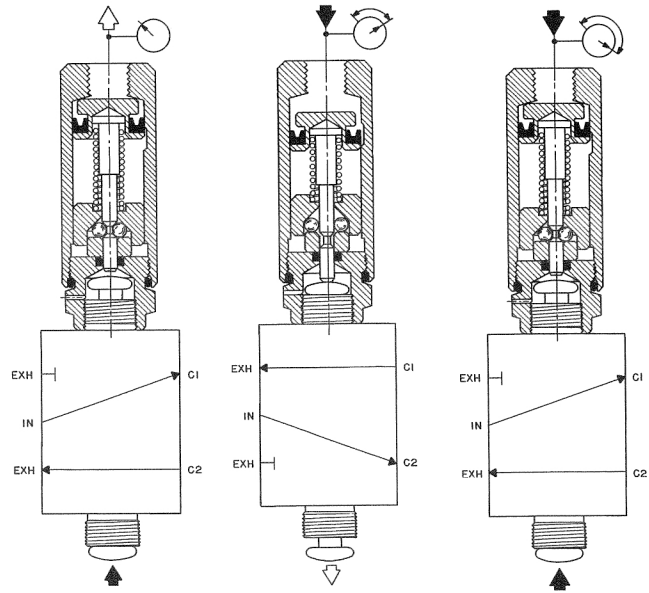
341AR

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 PSIG ± 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.

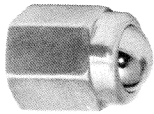
NOTE: The recommended maximum pilot pressure is 60 PSIG. If this pressure is exceeded, the operator will recycle snapping and resetting a second time.



341ASR

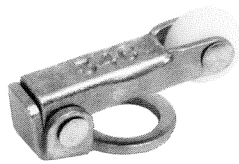
Humphrey TAC-TAC²-TAC³ Manual/Mech. Operators

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.).



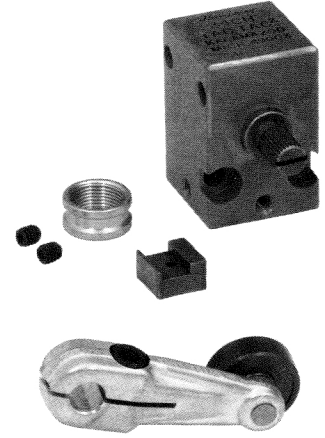
34C Cam Operator

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

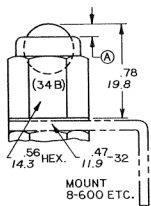
Model 34CW cam operator actuates valve when the pawl is contacted from lever side. The pawl then folds out of the way in the opposite direction. The spring-loaded Nylatron pawl has high tensile strength and excellent wear characteristics and is self-lubricating. Actuation forces are shown in accompanying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



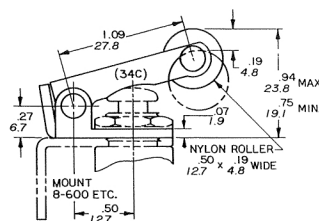
34CH Heavy-Duty Cam Operator

Model 34CH heavy-duty cam operator is for use with all TAC series valves except TAC³ valves. Its spline actuator shaft adapts to Cam Roller 28-60A (Order cam roller separately) and other commercially available actuator styles. The mean stroke is 15° each for prestroke, fully open, and overstroke. Dimensions: 1.5"H x 1"W x 1"D. Weight: 3 oz. (85 gms.).

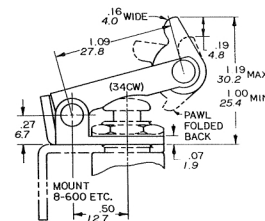
34B



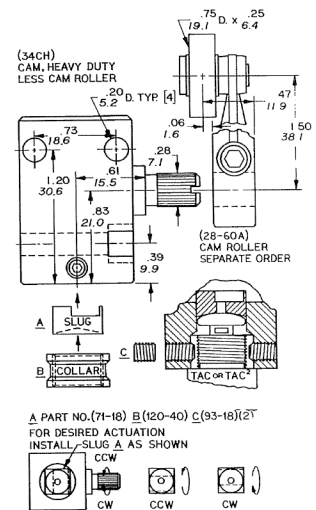
34C



34CW



34CH



34CH Assembly Instructions

- Position square slug into 34CH for desired actuation. The slug drill point rests on valve button.
- Thread collar fully onto valve.
- Insert valve/collar behind slug and secure by tightening #8-32 set screws at 90°.
- Mount 34CH, not valve, to equipment.
- Attach cam roller to spline actuator.



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 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				

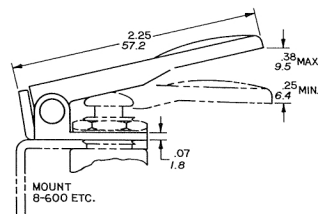
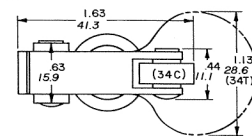
†Same force required to push valve button.

Force To Actuate in Ounces/Grams

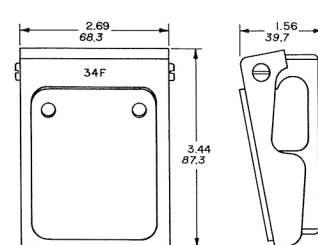
Model 34T

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				

34T



34F



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

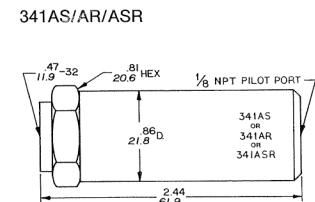
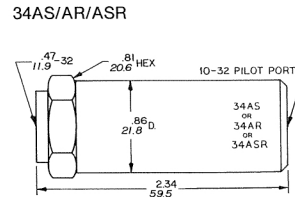
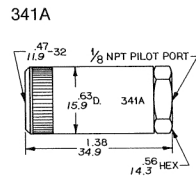
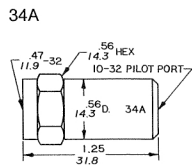
Models 34A and 341A air pilot operators thread directly onto the collars of push-button valves and the Model ESB Electric Switch Bracket. The air pressure applied to the pilot port drives a V-cup sealed piston to actuate the valve's push-button. The 341A

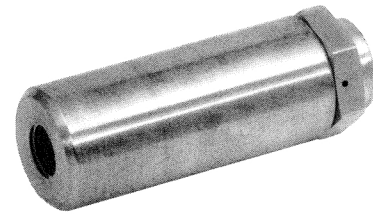
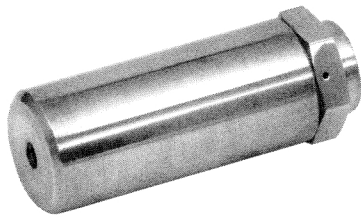
air pilot operator provides approximately twice the actuation force of the 34A at the same pilot pressure and is used for lower pilot pressure requirements or to amplify weak pilot signals, especially to 41PP and 42PP valves with positive detents.
Weight: 34A 1.1 oz. (31.2 gms.)
341A 1.0 oz. (25.3 gms.)

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 ± 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.)





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				