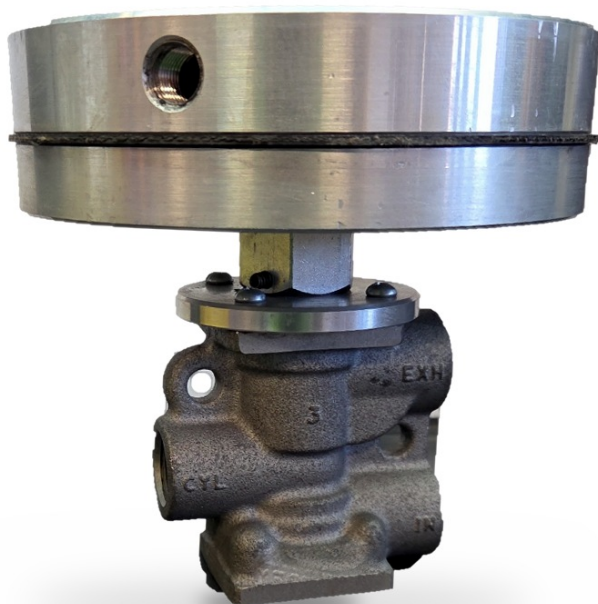


ULPP-501

Ultra Low Pilot Pressure 3-Way Air-Piloted Valve with Diaphragm Actuator

The ULPP-501 shifts a full-flow, 3-way poppet valve with a pilot signal of **less than 5 psig** – even at 125 psig line pressure. A large-area diaphragm actuator mounted directly on the relay valve multiplies a weak or remote pilot signal into the force needed to stroke the poppet, so no booster relay or intermediate pilot valve is required. Flow performance is unchanged from the standard relay body: a full 0.500-inch orifice, straight-line ½ NPTF plumbing and up to 275 scfm.



ULPP-501 complete assembly: relay valve, adapter plate, hex coupling and diaphragm actuator.

< 5 psig

PILOT PRESSURE TO SHIFT

0-125 psig

SUPPLY PRESSURE RANGE

275 scfm

FLOW AT 125 PSIG

0.500 in

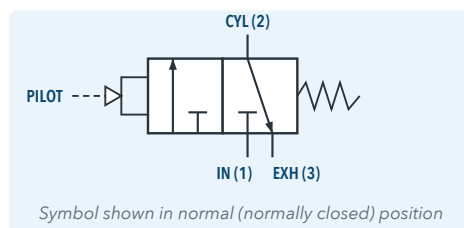
FULL-FLOW ORIFICE

FEATURES

- Shifts on **< 5 psig pilot** at full 125 psig supply
- Full-flow relay body: 0.500 in orifice, 275 scfm
- Four circuits: NC, NO, diverter or selector
- Straight-line ½ NPTF plumbing, ports in one plane
- Direct-coupled diaphragm actuator, ¼ NPTF pilot
- No booster relay or amplifier valve required
- Hard-coated aluminum body, Buna-N seals
- Mounts in any position

HOW IT WORKS

Pilot air at the ¼ NPTF port pressurizes the chamber above the diaphragm. Acting over roughly 21 in² of effective area, a few psig of pilot produces more than 100 lbf of thrust, which the hex coupling transmits to the relay valve's poppet. The valve stays shifted while the pilot signal is held; when the pilot is exhausted, the return spring and line pressure reset it to its normal position. The chamber below the diaphragm vents to atmosphere and must be kept clear.

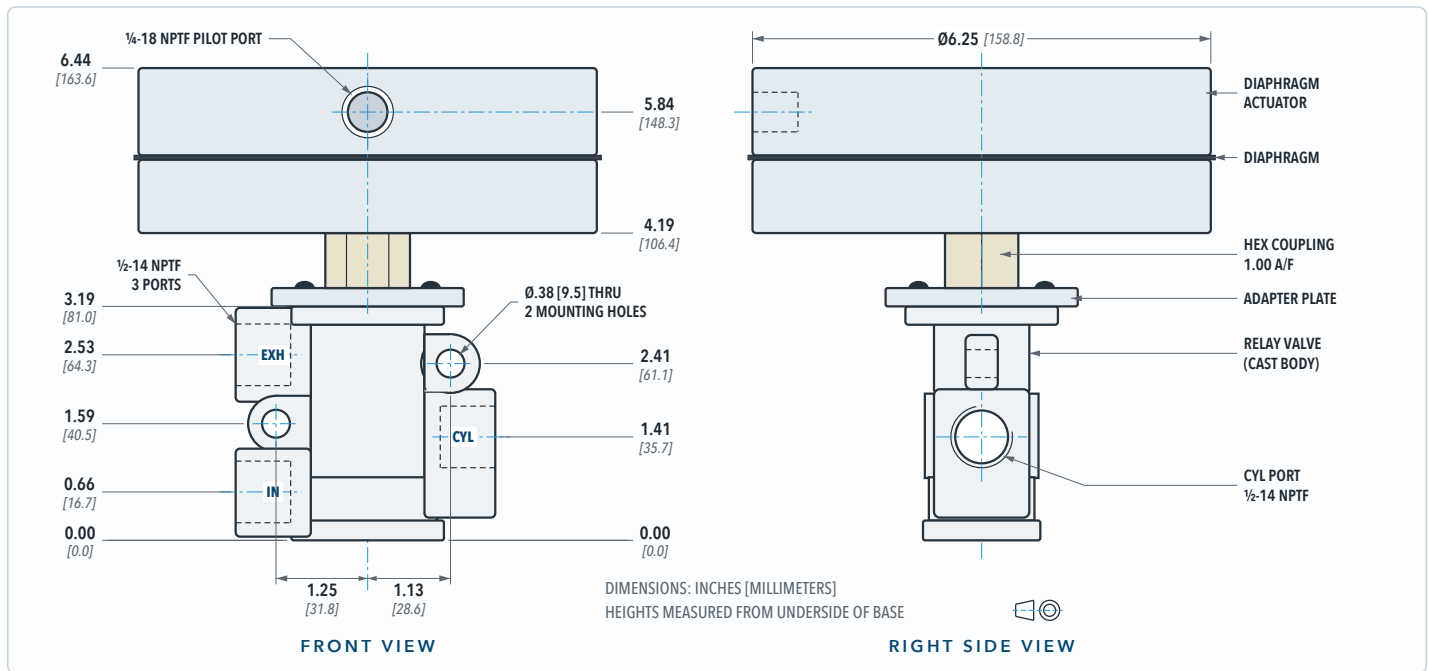


CIRCUIT FUNCTIONS

Function	Port connections	Pilot signal removed	Pilot signal applied
Normally closed	Supply to IN · CYL to work · EXH vents	IN blocked; CYL exhausts through EXH	IN flows to CYL; EXH blocked
Normally open	Supply to EXH · CYL to work · IN vents	Supply flows EXH to CYL	Supply blocked; CYL exhausts through IN
Diverter	Supply to CYL · IN and EXH are outlets	CYL flows to EXH outlet	Flow diverted to IN outlet
Selector (bi-media)	Supply A to EXH · Supply B to IN · CYL is common outlet	CYL receives supply A	CYL receives supply B

TYPICAL APPLICATIONS Low-pressure sensing circuits (tank level, back-pressure and bleed-port sensing) · weak, remote or long-line pilot signals · interfacing low-pressure pneumatic logic and instrument signals with high-flow power circuits.

DIMENSIONS



SPECIFICATIONS

RELAY VALVE

Type	3-way, 2-position poppet, spring return
Media	Compressed air (consult factory for others)
Supply pressure	0 to 125 psig (0 to 8.6 bar)
Ports: IN, CYL, EXH	1/2-14 NPTF
Orifice	0.500 in (12.7 mm)
Temperature range	-30 to 225 °F (-34.4 to 107.2 °C)
Materials	Hard-coated cast aluminum, zinc-plated steel, stainless steel, Buna-N
Mounting	Any position; two Ø0.38 in holes
Lubrication	Recommended
Filtration	Recommended

DIAPHRAGM ACTUATOR

Type	Single-acting diaphragm, direct-coupled
Pilot port	1/4-18 NPTF
Pilot pressure to shift	< 5 psig (0.34 bar) at 0 to 125 psig supply
Maximum pilot pressure	140 psig (9.7 bar)
Effective diaphragm area	≈ 21 in ² (135 cm ²)
Thrust	≈ 21 lbf per psig of pilot (≈ 105 lbf at 5 psig)
Pilot chamber volume	≈ 5 in ³ (82 cm ³)
Housing	Machined aluminum, two-piece
Diaphragm	Fabric-reinforced Buna-N
Coupling / fasteners	Brass hex coupling; black-oxide steel screws

AIR FLOW TO ATMOSPHERE

Model	At 30 psig (2.1 bar)		At 120 psig (8.3 bar)	
	CFM	LPM	CFM	LPM
ULPP-501	72.0	2037.6	267.0	7556.1

WEIGHT

Assembly	lb	kg
Relay valve only	0.9	0.4
ULPP-501 complete	≈ 5.5	≈ 2.5

FILL / EXHAUST TIMES (SECONDS)

Model	50 psig (3.5 bar)				100 psig (7.0 bar)			
	10 in ³ (164 cc)		100 in ³ (1640 cc)		10 in ³ (164 cc)		100 in ³ (1640 cc)	
	Fill	Exhaust	Fill	Exhaust	Fill	Exhaust	Fill	Exhaust
ULPP-501	0.008	0.012	0.082	0.096	0.009	0.015	0.094	0.119

Fill: chamber charged from 0 to 40 psig (50 psig supply) or 0 to 80 psig (100 psig supply). Exhaust: chamber vented from 50 to 10 psig or 100 to 20 psig. Times are for the relay valve and do not include actuator pilot fill time, which depends on pilot line size and length.

ORDERING INFORMATION

ULPP-501

Ultra Low Pilot Pressure 3-way air-piloted valve, complete with diaphragm actuator.
1/2-14 NPTF IN / CYL / EXH ports · 1/4-18 NPTF pilot port · shifts on < 5 psig pilot.