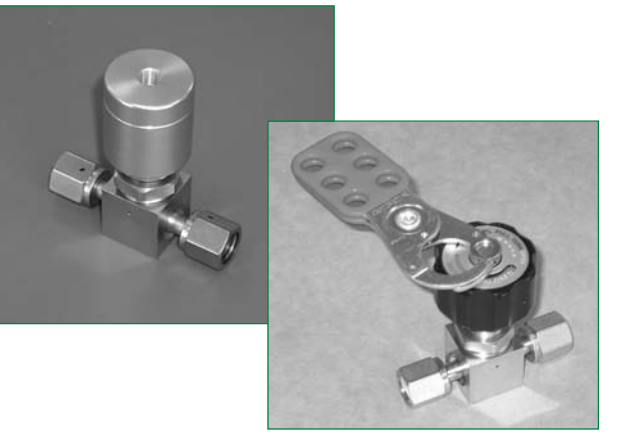
APTech
ADVANCED PRESSURE TECHNOLOGY



# SERIES AP 45 & 46

## 3/8 INCH DIAPHRAGM VALVE

Springless – manual and pneumatic (NC & NO)

- Stainless steel 316L VAR secondary remelt or Hastelloy® C-22® construction
- Replaceable seat
- Operating pressure from 125 psig (9 bar) to 250 psig (17 bar)
- LOTO and indicating switch options
- Surface finish 15 Ra max/10 Ra avg (10, 7 & 5 Ra max options)
- Flow capacity 0.5 $C_V$
- Manual valves 1/4 turn to multi-turn
- Designed for UHP specialty and bulk gas applications
- Multi-port options available (refer to page 4)
- Installation and operating instructions available at www.aptech-online.com in the Tech Briefs section

### Manual valves

| | PSIG / BAR 250 / 17 |
|---|---|
| **AP 4600** | ● |
| – Round knob, multi-turn | |
| **AP 4625** | ● |
| – Lever valve, 1/4 turn | |
| – LOTO, PL 225 optional | |
| – Lever position indicates valve status | |
| **AP 4650** | ● |
| – Round knob, 1/4 turn | |
| – Open/closed status indication window | |
| – Switch option for remote monitoring | |
| **AP 4652** | ● |
| – Round knob, 1/4 turn | |
| – Open/closed status indication window | |
| – Unique design combines scalloped round knob with raised rectangular section | |
| **AP 4657** | ● |
| – Round knob, 1/4 turn | |
| – Pull, then turn to open – operational safety feature | |
| – Open/closed status indication window | |
| – LOTO – integral standard feature | |

### Pneumatic valves, normally closed (NC)

| | PSIG / BAR 125 / 9 | 250 / 17 |
|---|---|---|
| **AP 4540** | ● | |
| **AP 4542** | ● | |
| **AP 4550** | | ● |
| – Switch option for remote monitoring | | |

### Pneumatic valve, normally open (NO)

| | PSIG / BAR 250 / 17 |
|---|---|
| **AP 4580** | ● |
| – Switch option for remote monitoring | |

All specifications subject to change without notice.
Hastelloy® C-22® Haynes Corporation

ENGINEERING DATA — SERIES AP 45 & 46 3/8 INCH VALVE ARRAY

## Engineering Data — Manual valves

| | | |
|---|---|---|
| Operating pressure | AP 4600, 4625, 4650, 4652, AP 4657 | Vacuum to 250 psig (17 bar) |
| Flow coefficient ($C_V$) | AP 4600, 4625, 4650, 4652, AP 4657 | 0.5 ($X_T$ = 0.6) |

## Engineering Data — Pneumatic valves

| | | |
|---|---|---|
| Operating pressure | AP 4540, 4542<br>AP 4550, 4580 | Vacuum to 125 psig (9 bar)<br>Vacuum to 250 psig (17 bar) |
| Flow coefficient ($C_V$) | AP 4540, 4542, 4550, 4580 | 0.5 ($X_T$ = 0.6) |
| Status | AP 4540, 4542, 4550<br>AP 4580 | Normally closed (NC)<br>Normally open (NO) |
| Actuation pressure | AP 4540, 4550, 4580<br>AP 4542 | 70 to 110 psig (5 to 8 bar)<br>60 to 110 psig (4 to 8 bar) |
| Actuation port | AP 4540, 4580<br>AP 4542<br>AP 4550 | 1/8 NPT, top port<br>M5, top port<br>10–32 inch, side port |

## Engineering Data — Other parameters all valves

| | |
|---|---|
| Inlet and outlet connectors | 1/4, 3/8 and 1/2 inch face seal or tube weld |
| Internal volume | 0.12 $in^3$ (1.94 $cm^3$) |
| Operating temperature | -40° to +160° F (-40° to 71° C) |
| Surface finish | 15 µin. Ra max / 10 µin. Ra avg. (0.4/0.25 µm) standard;<br>10 µin (0.25 µm); 7 µin (0.18 µm); and 5 µin (0.13 µm) Ra max optional |
| Proof pressure | 1.5 times operating pressure |
| Burst pressure | 3 times operating pressure |
| Inboard leakage | 2 x $10^{-10}$ sccs |
| Outboard leakage | 2 x $10^{-9}$ sccs He |
| Leakage across seat | 4 x $10^{-8}$ sccs He |

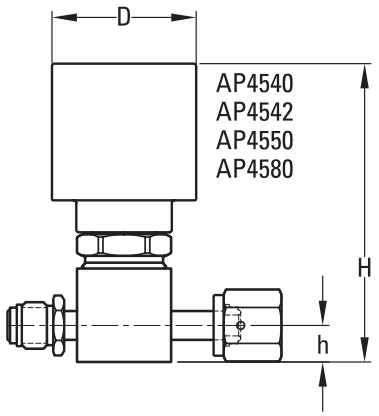
## Engineering Data — Wetted materials all valves

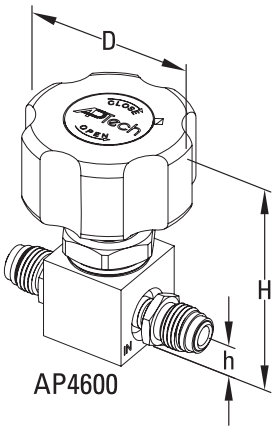
| | S | H |
|---|---|---|
| Body | SS 316L secondary remelt | Hastelloy® C-22® |
| Finish | Electropolished and passivated | Electropolished |
| Diaphragm | Elgiloy® | Elgiloy |
| Seat | PCTFE (Vespel® optional) | PCTFE |

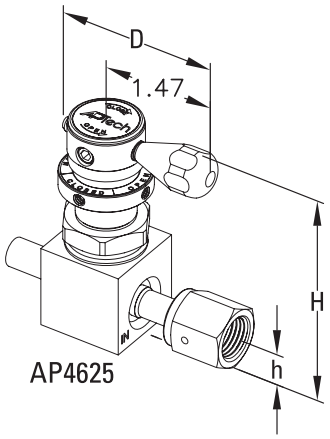
All specifications subject to change without notice.

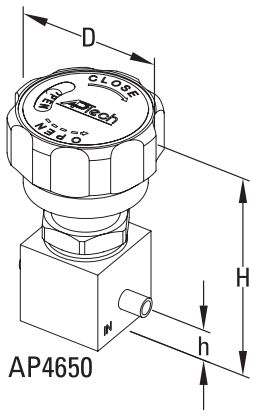
Vespel® DuPont

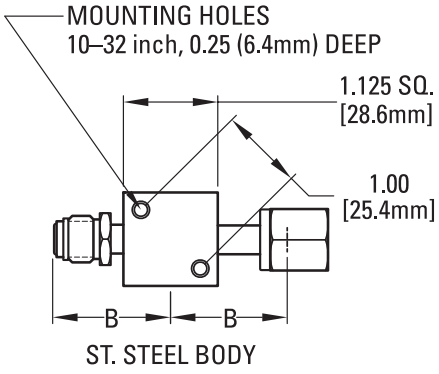
Elgiloy® Elgiloy Corporation
Hastelloy® C-22® Haynes Corporation

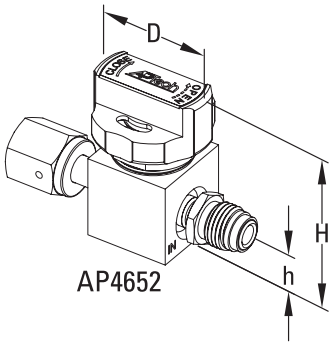


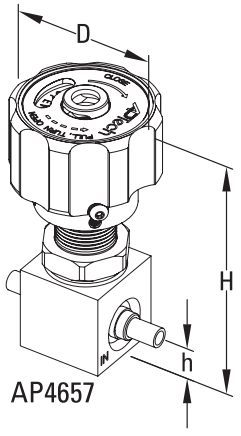



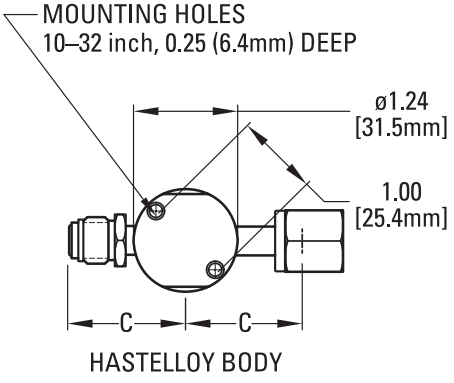




- Metric dimensions are for reference only.
- Height of the valve (H) is an approximate value.
- All specifications subject to change without notice.
- All manual valves are shown in open position.

| VALVE | D | | H | |
|---|---|---|---|---|
| | inch | mm | inch | mm |
| **AP4540** | ø1.46 | 37.1 | 3.49 | 89 |
| **AP4542** | ø1.57 | 40.0 | 2.24 | 57 |
| **AP4550** | ø1.37 | 34.8 | 3.28 | 83 |
| **AP4580** | ø1.46 | 37.1 | 3.17 | 81 |
| **AP4600** | ø2.12 | 53.8 | 3.00 | 76 |
| **AP4625** | 2.04 | 51.8 | 2.94 | 75 |
| **AP4650** | ø1.87 | 47.5 | 3.02 | 77 |
| **AP4652** | ø1.50 | 38.0 | 2.17 | 55 |
| **AP4657** | ø1.87 | 47.5 | 3.60 | 91 |

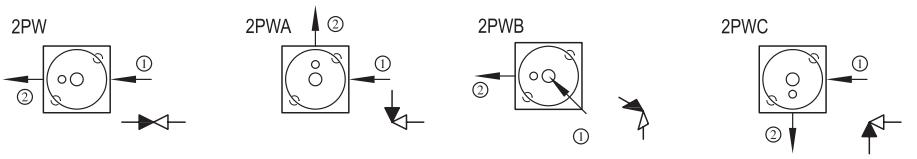
| STAINLESS STEEL BODY | | | | |
|---|---|---|---|---|
| CONNECTION | B | | h | |
| | inch | mm | inch | mm |
| **FV4, MV4** | 1.390 ±.010 | 35.3 | 0.44 | 11.2 |
| **TW4** | 1.060 ±.010 | 26.9 | 0.44 | 11.2 |
| **FV6, MV6** | 1.930 ±.010 | 49.0 | 0.44 | 11.2 |
| **TW6** | 1.325 ±.010 | 33.7 | 0.44 | 11.2 |

| HASTELLOY C–22 BODY | | | | |
|---|---|---|---|---|
| CONNECTION | C | | h | |
| | inch | mm | inch | mm |
| **FV4, MV4** | 1.450 ±.010 | 36.8 | 0.44 | 11.2 |
| **TW4** | 1.080 ±.010 | 27.4 | 0.44 | 11.2 |
| **FV6, MV6** | 1.930 ±.010 | 49.0 | 0.44 | 11.2 |
| **TW6** | 1.325 ±.010 | 33.7 | 0.44 | 11.2 |

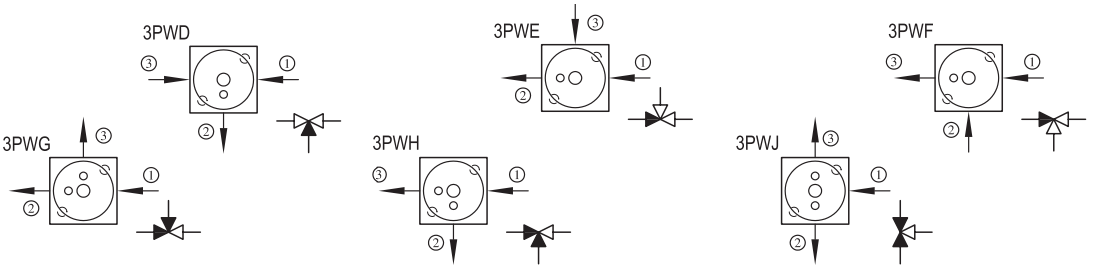
## PORTING CONFIGURATIONS


Top View (Mounting holes on bottom)

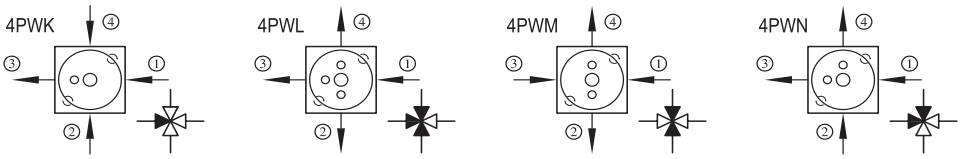
2 PORTS




3 PORTS




4 PORTS




- Valves are illustrated top view looking down through the valve. Mounting holes on the valve bottom are shown for reference.
- INLET (Upstream) is defined as a port connected to the region below the valve seat. It is illustrated with an arrow pointing towards the valve body or an "empty" triangle on the schematic. OUTLET (Downstream) is defined as a port connected to the region above the seat and below the diaphragm. It is illustrated with an arrow pointing away from the valve body or a "filled" triangle on the schematic.
- The traditional flow direction is INLET to OUTLET, but AP Tech valves may be employed in either flow direction.
- End connections are specified in numerical order per the diagram's numbered arrows.

**CAUTION: Product selection is the sole responsibility of the user, regardless of any recommendations or suggestions made by the factory. The user shall make selections based upon their own analysis and testing with regard to function, material compatibility and product ratings. Proper installation, operation and maintenance are also required to assure safe, trouble free performance.**

## ORDERING INFORMATION

**Sample Order Number** — **AP 4652S 2PW MV6 MV6**

| | | |
|---|---|---|
| AP 4652 | **Series** | AP 4540, 4542, 4550<br>AP 4580<br>AP 4600, 4625<br>AP 4650, 4652, 4657 |
| S | **Material** | S = Stainless steel (SS)<br>H = Hastelloy C-22 |
| | **Surface Finish Option** | M = 10 µin. Ra max<br>V = 7 µin. Ra max<br>X = 5 µin. Ra max |
| 2PW | **Ports** | 2PW = 2 ports welded<br>3PW = 3 ports welded<br>4PW = 4 ports welded |
| | **Porting Designation Option** | X = Letter code for available porting option<br>Refer to porting options above. |
| MV6 MV6 | **Connections Inlet / Outlet or ① ② ③ ④** | FV4 = 1/4 inch face seal female<br>MV4 = 1/4 inch face seal male<br>TW4 = 1/4 inch tube stub weld<br>FV6 = 3/8 inch face seal female<br>MV6 = 3/8 inch face seal male<br>TW6 = 3/8 inch tube stub weld |
| | **Options** | 1.75 = 1.75" face to face TW4, TW6<br>VS = Vespel Seat<br>ISC = Indicating switch, NC* (AP 4550 and 4580 only)<br>ISO = Indicating switch, NO* (AP 4550 and 4580 only)<br>ISH = Indicating switch* (AP 4650 only)<br>*Refer to manual for installation information. |