DOERING

Valves and Pumps for Extreme Environments

Undersea to Outer Space Doering Valves, Pumps and Accessories Exceed the Most Critical Performance Requirements

Valves

Pumps

Housing

Assemblies

Precision Valves, Pumps, Housing and Accessories

Doering's innovative valves, pumps, housings and accessories are precision engineered to exceed the most demanding performance characteristics. Constructed of corrosion-resistant materials, many of our products are used for high-pressure and low-leak applications. Our experienced team of engineers, technical sales representatives and distributors are available to discuss your requirements. High-quality Doering products are manufactured in the USA using state-of-the-art equipment with lead times of one week or less. To provide the longest operating life and maximum durability, we follow stringent quality control processes and are committed to continual improvement.

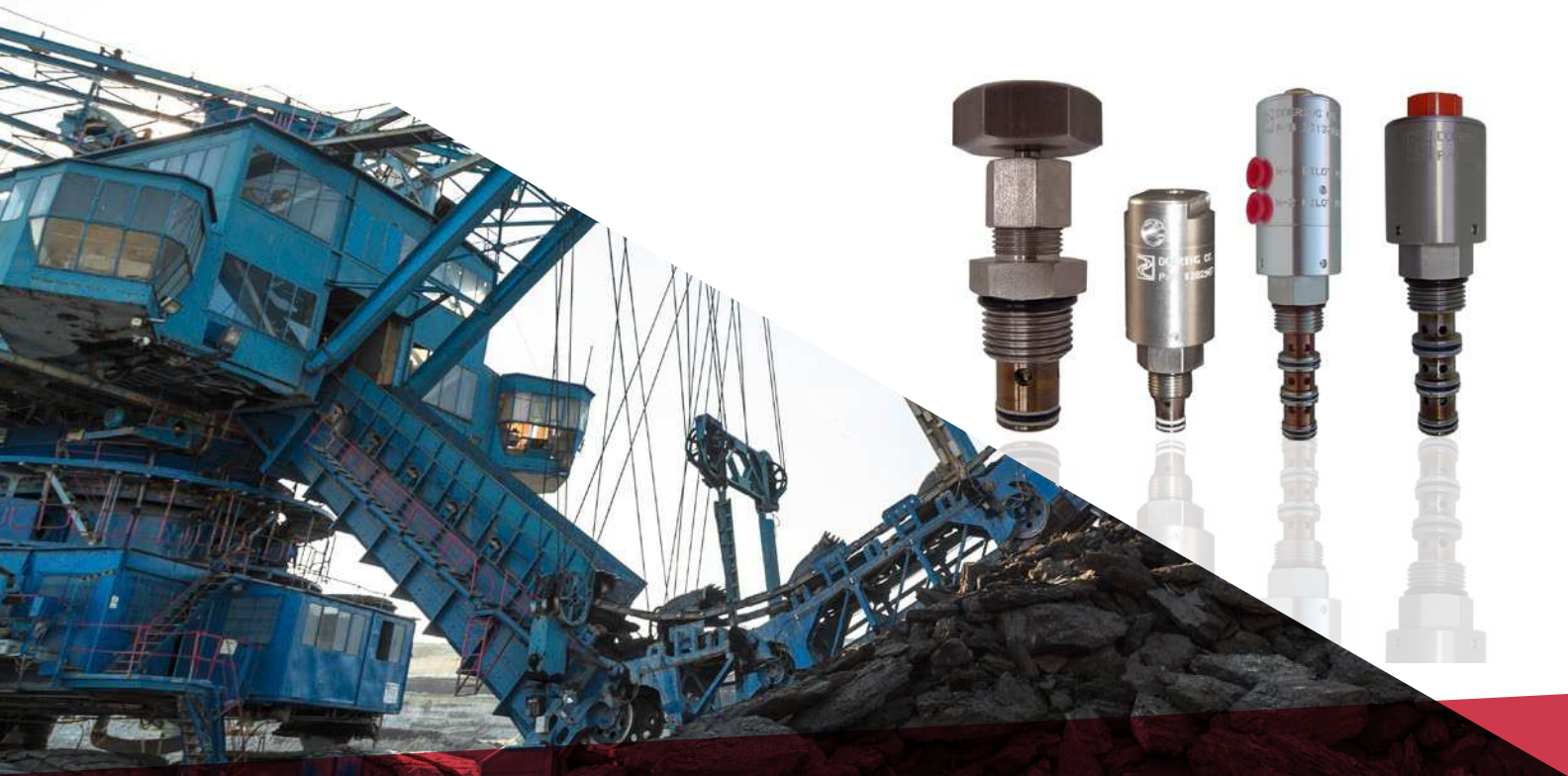
Applications

- Aerospace
- Chemicals
- Heavy-duty equipment
- Hydrostatic testing
- Industrial automation
- Industrial lifts
- Marine cranes and lifts
- Military vehicles and equipment
- Mining equipment
- Offshore and onshore oil and gas
- Rescue boats and lifts
- Unmanned underwater vehicles

Valves

Doering valves are precision engineered and manufactured using stainless steel and a variety of other materials. Our comprehensive line of valves includes:

- Air pilot operated
- Check
- Decompression
- Detent latching
- Directional control
- Flow control
- Manually operated
- Multifunction
- Needle
- Orifice restrictor
- Pilot air valves (PAV)
- Pilot-operated check (POC)
- Poppet
- Pressure-compensated
- Pressure-control
- Pressure relief
- Solenoid pilot operated
- Spool
- Subsea
- Water miser



Pumps

Doering offers reliable hydraulic cartridge-style hand pumps for the toughest, most demanding industrial applications. Pumps have a compact screw-in cartridge design and are manufactured to meet the highest quality control requirements.

- Pressure production from 1,500 psi/103 bar to 10,000 psi/689 bar
- Removable latching handles
- Stainless steel components on all pump styles

Housings and Manifolds

Manufactured with high-consistency using aluminum or corrosion-resistant stainless steel, Doering manifolds have industry-standard cavities.

- Line-mount housings
- Panel-mount manifolds
- Custom designs to fit your Doering product

Assemblies

Doering provides custom assemblies based on your specifications. Our assemblies meet strict quality control and consistency standards. Doering assemblies are offered with no minimum order quantity requirement.

Experienced application engineers and knowledgeable fluid-power distributor representatives are available to help you select the best product for your application.

Made in USA

Since 1969

NATIONAL FLUID POWER ASSOCIATION NFPA

MEMBER

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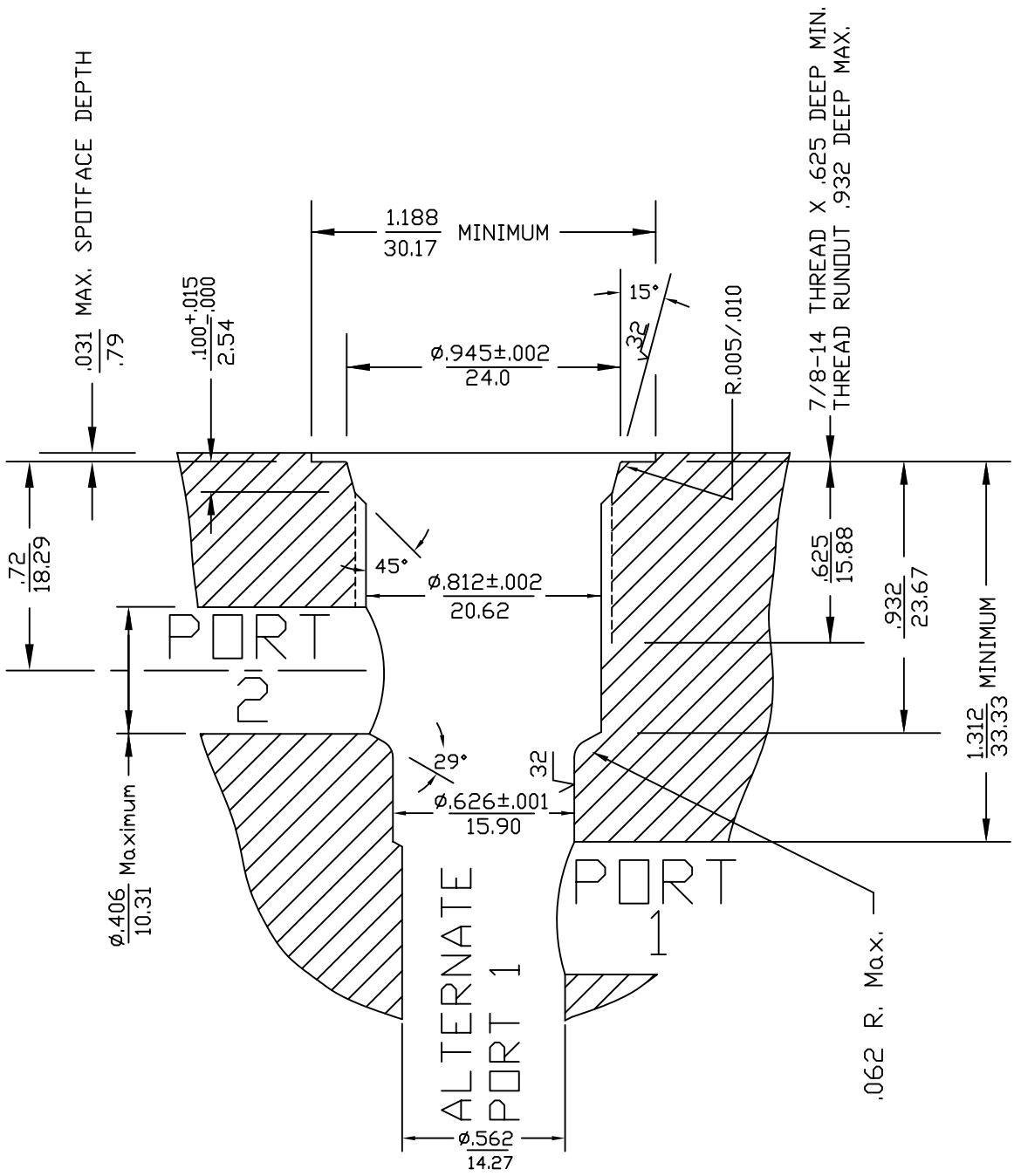

CAVITY C-8542 (10-2)

USE FORM TOOL FT-8542

Also see page two.

INCH
MILLIMETER

Form Tooling FT-8542

To purchase form tools, we recommend you contact our vendor.

Order directly from Form Relief Tool Co. or
a quality form tool manufacturer of your choice.

Doering Company's primary form tool supplier is:

Form Relief Tool Co., Inc.
Davis Junction, IL
www.formrelief.com
T: 815-393-4263
F: 815-393-3143

Additional Vendor information:

Standard and special tools.
Average lead time 3-4 weeks.
Mr. Jim Marx, President

Order Information:

Form tools are generally available in 1" Straight Shank or Morse Taper 3 (MT3).

Form tools are available in HG (High Speed Steel) or TG (Tungsten Carbide Tipped).

Roughing drills are available in HG only. It is recommended to use a roughing drill.

Always verify cavity dimensions and specifications.

FT-8542 Tooling for Doering Cavity C-8542, Industry Standard 10-2:

Description:	Form Relief Part Number and Shank selection:
Roughing Drill, HG	CT10-2R□-HG
Form Cutting, HG	CT10-2F□-HG
Form Cutting, TG	CT10-2F□-TG

In addition to Form Relief Part Number, also specify 3/4" Straight Shank or Morse Taper 3 (MT3) Shank.

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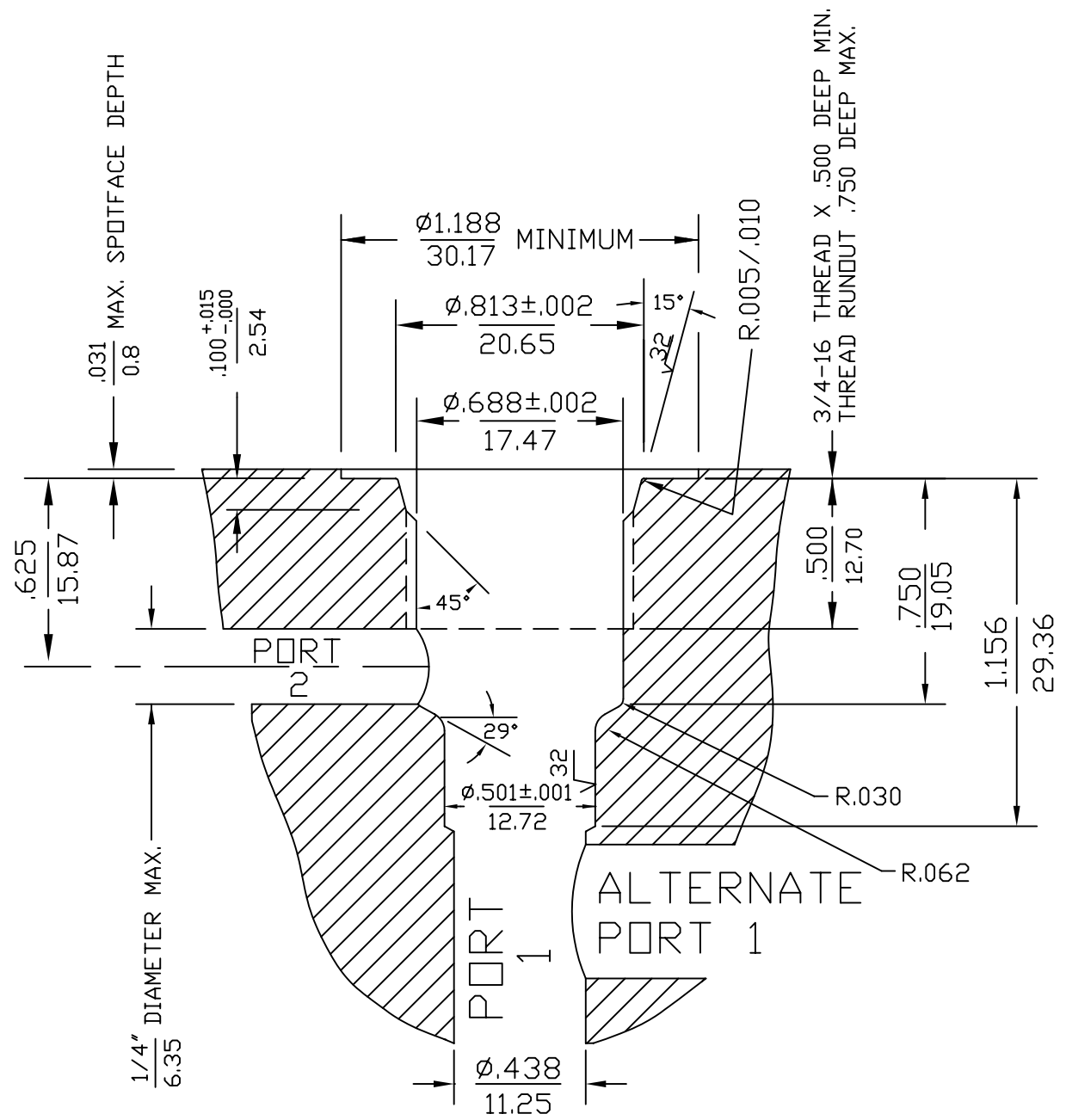

CAVITY C-8502 (8-2)

INCH
MILLIMETER

USE FORM TOOL FT-8502

Also see page two.

Form Tooling FT-8502

To purchase form tools, we recommend you contact our vendor.

Order directly from Form Relief Tool Co. or
a quality form tool manufacturer of your choice.

Doering Company's primary form tool supplier is:

Form Relief Tool Co., Inc.
Davis Junction, IL
www.formrelief.com
T: 815-393-4263
F: 815-393-3143

Additional Vendor information:

Standard and special tools.
Average lead time 3-4 weeks.
Mr. Jim Marx, President

Order Information:

Form tools are generally available in 1" Straight Shank or Morse Taper 3 (MT3).

Form tools are available in HG (High Speed Steel) or TG (Tungsten Carbide Tipped).

Roughing drills are available in HG only. It is recommended to use a roughing drill.

Always verify cavity dimensions and specifications.

FT-8502 Tooling for Doering Cavity C-8502, Industry Standard 8-2:

Description:	Form Relief Part Number and Shank selection:
Roughing Drill, HG	CT08-2R□-HG
Form Cutting, HG	CT08-2F□-HG
Form Cutting, TG	CT08-2F□-TG

In addition to Form Relief Part Number, also specify 3/4" Straight Shank or Morse Taper 3 (MT3) Shank.

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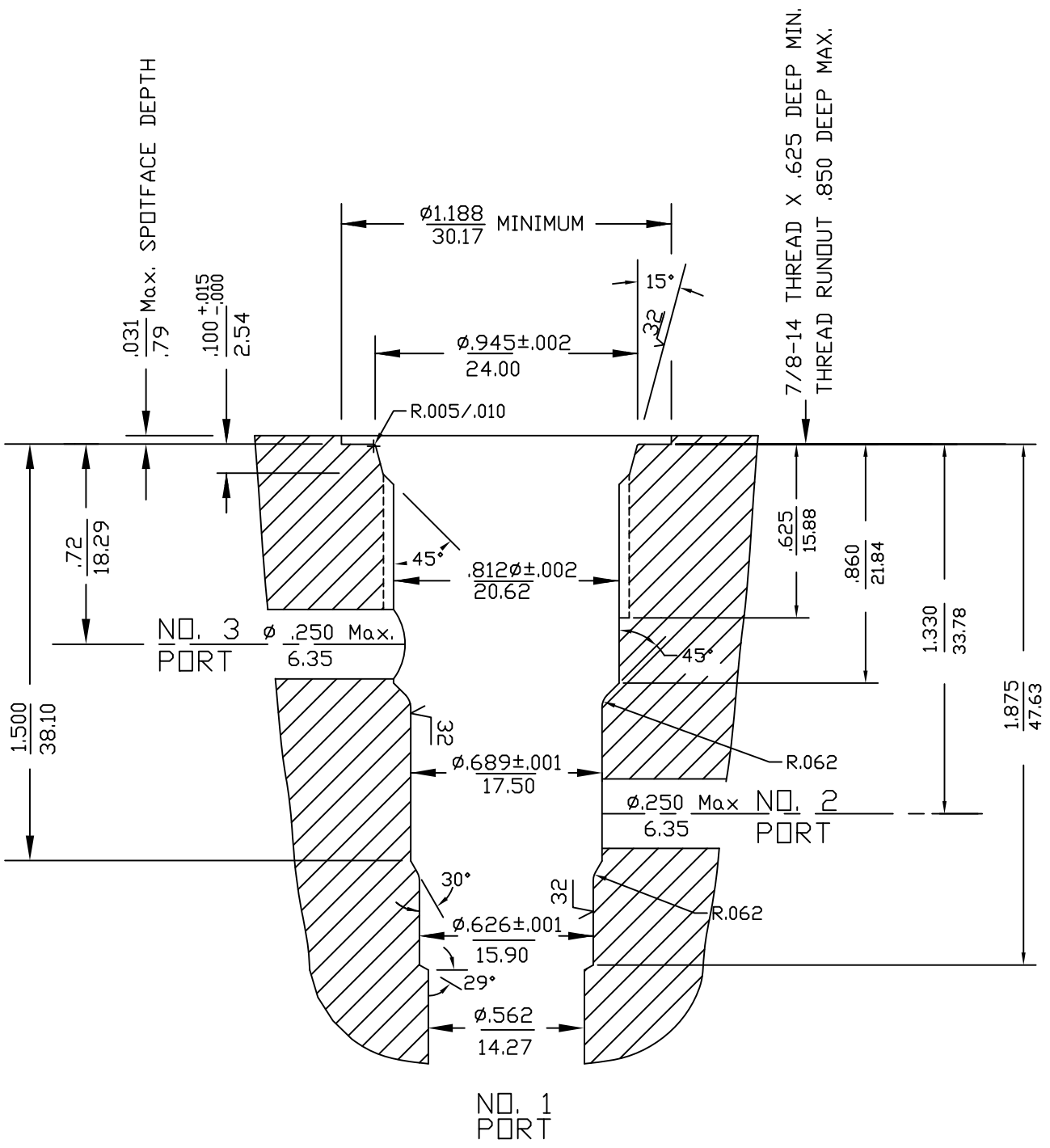

CAVITY C-8543 (10-3)

Form Tooling FT-8543

Also see page two.

INCH
MILLIMETER

Form Tooling FT-8543

To purchase form tools, we recommend you contact our vendor.

Order directly from Form Relief Tool Co. or
a quality form tool manufacturer of your choice.

Doering Company's primary form tool supplier is:

Form Relief Tool Co., Inc.
Davis Junction, IL
www.formrelief.com
T: 815-393-4263
F: 815-393-3143

Additional Vendor information:
Standard and special tools.
Average lead time 3-4 weeks.
Mr. Jim Marx, President

Order Information:

Form tools are generally available in 1" Straight Shank or Morse Taper 3 (MT3).

Form tools are available in HG (High Speed Steel) or TG (Tungsten Carbide Tipped).

Roughing drills are available in HG only. It is recommended to use a roughing drill.

Always verify cavity dimensions and specifications.

FT-8543 Tooling for Doering Cavity C-8543, Industry Standard 10-3:

Description:	Form Relief Part Number and Shank selection:
Roughing Drill, HG	CT10-3R□-HG
Form Cutting, HG	CT10-3F□-HG
Form Cutting, TG	CT10-3F□-TG

In addition to Form Relief Part Number, also specify 3/4" Straight Shank or Morse Taper 3 (MT3) Shank.

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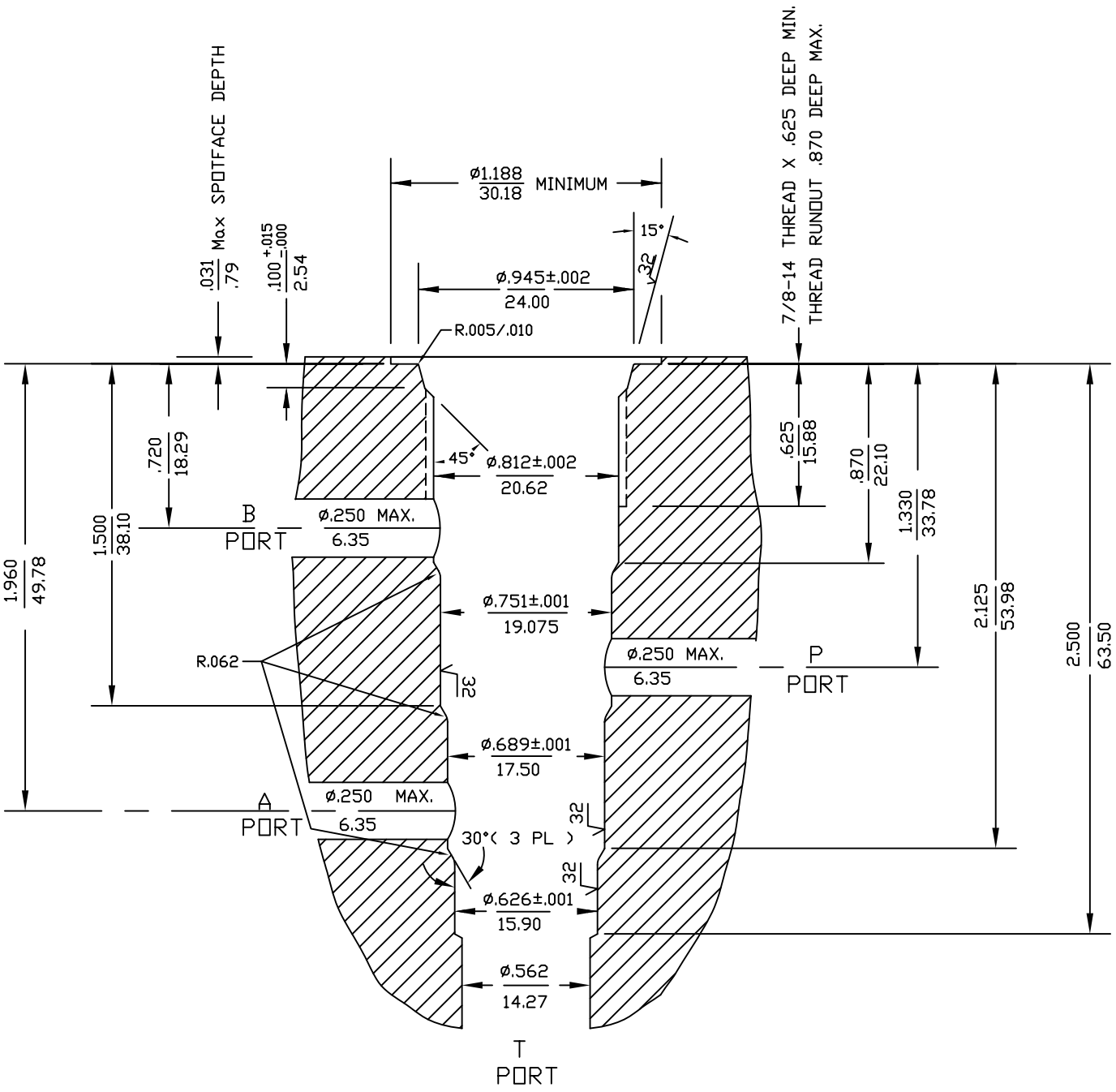

CAVITY C-8544 (10-4)

USE FORM TOOL FT-8544

Also see page two.

INCH
MILLIMETER

Form Tooling FT-8544

To purchase form tools, we recommend you contact our vendor.

Order directly from Form Relief Tool Co. or
a quality form tool manufacturer of your choice.

Doering Company's primary form tool supplier is:

Form Relief Tool Co., Inc.
Davis Junction, IL
www.formrelief.com
T: 815-393-4263
F: 815-393-3143

Additional Vendor information:
Standard and special tools.
Average lead time 3-4 weeks.
Mr. Jim Marx, President

Order Information:

Form tools are generally available in 1" Straight Shank or Morse Taper 3 (MT3).

Form tools are available in HG (High Speed Steel) or TG (Tungsten Carbide Tipped).

Roughing drills are available in HG only. It is recommended to use a roughing drill.

Always verify cavity dimensions and specifications.

FT-8544 Tooling for Doering Cavity C-8544, Industry Standard 10-4:

Description:	Form Relief Part Number and Shank selection:
Roughing Drill, HG	CT10-4R□-HG
Form Cutting, HG	CT10-4F□-HG
Form Cutting, TG	CT10-4F□-TG

In addition to Form Relief Part Number, also specify 3/4" Straight Shank or Morse Taper 3 (MT3) Shank.

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DOERING

CARTRIDGE VALVE

KEY EXPLANATION:

1. Port No. 1, System
2. Port No. 2, System
3. Poppet, Check, Hard Stainless
4. Poppet Check Spring, Stainless Steel
5. O-Ring Seal, Buna N (Also See Options)
6. Filter, 10 Micron, Sintered Bronze
7. Vent (2 Pl.) Optional T Port Locations
8. Filter Retainer
9. Actuator Return Spring, Stainless Steel
10. Piston Guide Ring
11. Piston O-Ring Seal, Buna N (Also See Options)
12. Bonnet O-Ring Seal, Buna N (Also See Options)
13. 3/16" (4.763) Spanner Holes (2 Pl.)
14. 1/8 NPT Pilot Port X (Also See Options)
15. Bonnet, Aluminum material
16. Actuator Body, Aluminum
17. Actuator Piston, Aluminum
18. Push Rod, Hard Stainless Steel
19. Push Rod Seal, Teflon
20. 1/8" (3.175) Spanner Holes (4 or 6 Pl.)
21. Cartridge Seat Retaining Ring
22. Mount O-Ring Seal, Buna N (Also See Options)
23. 7/8-14 Cartridge Mounting Threads, Stainless Steel
24. Cartridge Seat, Hard Stainless
25. Back Up Ring, Teflon
26. O-Ring Seal, Buna N (Also See Options)
27. Spring (Used on valves = "A" Dia. 1-7/8 & 2-1/4")

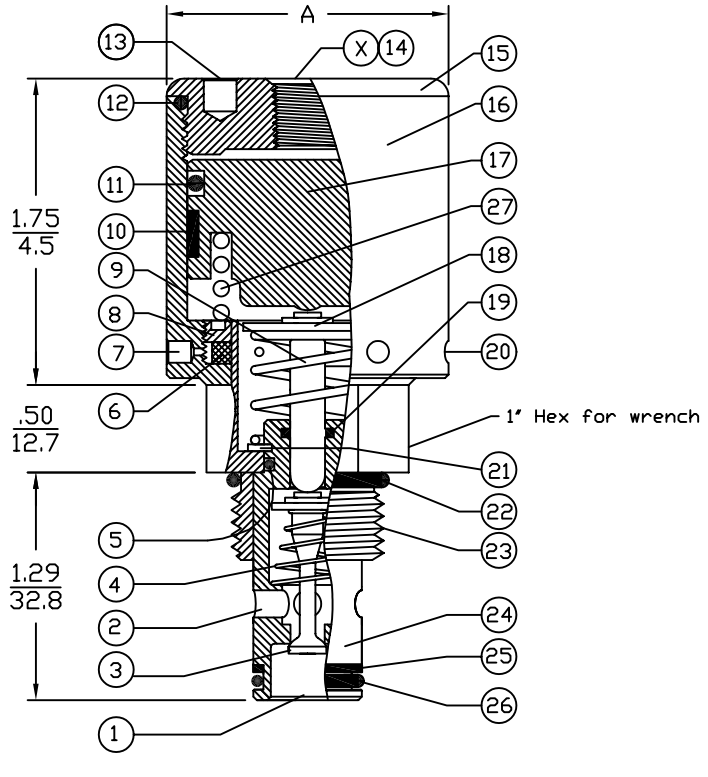
SPECIFICATIONS:

Pilot Operated Check Valve.
Flow is checked from port 1 to port 2.
Add Seat Crack pressure for flow from 2 to 1.
Piloting valve allows free flow in both directions.
Maximum pressure at Ports 1 and 2 is 5,000 PSI.
Pilot Pressure Range, 50 PSI Min. to 150 PSI Max.
Fluid temperature -45°F, (42.7°C) to 200°F, (93.3°C)
Install Cartridge valve using 1" wrench
Valve should screw in freely to the Mount Seal.
Final tightening to 20 foot pounds torque.
Use lubricant on external oil seals and mounting threads.

PILOT RATIO NOTES:

TO CALCULATE THE CORRECT PILOT RATIO VALVE, FOLLOW THESE STEPS:

1. Determine the MAXIMUM possible system pressure. Multiply X 1.1 = SYSTEM
2. Determine MINIMUM possible pilot pressure. Multiply X .9 = PILOT
3. Divide SYSTEM by PILOT = PILOT TO SYSTEM RATIO
4. Round up to standard available ratio.



STANDARD OPTIONS

Pilot Port (Key X) 1/8 NPT. Optional SAE4 Available.
Seals: Buna N, Viton or Teflon. Others please specify.
T Option: 10-32 Ports at Key 7 & 20, Random 360° Pos.

TOOLING

* 1/8 (3.175) Pin Spanner Tool Order No. 471, Ref. Key No. 20
* 3/16 (4.763) Face Spanner Tool Order No. 482, Ref. Key No. 13

Cavity & Housing

Please see Spec. Sheets at www.doering.com

Cavity C-8542 (10-2):
See Spec. Sheet 1200621 Includes Cavity and Cavity Tooling Info.

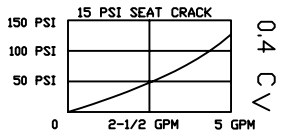
Line Mount Housings:
See Spec. Sheets 1200674 and 1201455

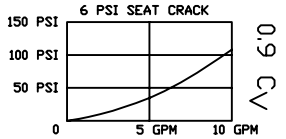
Panel Mount Housings:
See Spec. Sheets 1202982 and 1202990

Two Stage Decompression Housings:
See Spec. Sheets 1201268 and 1203114

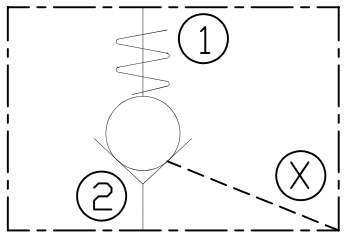
PILOT TO SYSTEM RATIO	" A " DIAMETER		ORDER VALVE NUMBER:
40:1	1-1/2	38,10	94H7204015
49:1	1-5/8	41,28	94H7304915
69:1	1-7/8	47,63	94H7606915
104:1	2-1/4	57,15	94H7710415
19:1	1-1/2	38,10	94H9201906
24:1	1-5/8	41,28	94H9302406
33:1	1-7/8	47,63	94H9603306
50:1	2-1/4	57,15	94H9705006

FLOW AND PRESSURE DROP CHARTS





POC SERIES



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DOERING

CARTRIDGE VALVE

SPECIFICATIONS:

Normally Closed Check Valve
Manual Override to hold Open.

Maximum pressure at Ports 1 and 2 is 5,000 PSI.
Install Cartridge valve using 1" wrench
Final tightening to 20 foot pounds torque.
Use lubricant on external oil seals and mounting threads.
Fluid temperature -45°F (-42.7°C) to 200°F (93.3°C)

MATERIALS & OPTIONS

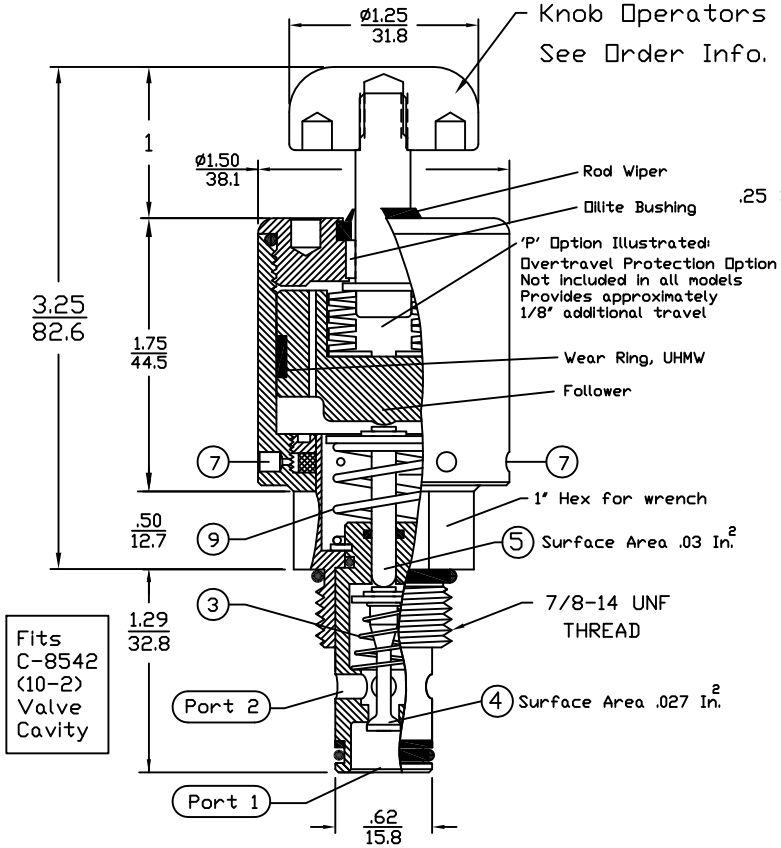
T Option 10-32 vent ports at Key 7 (2 Places)
Seat (Key 4) material is heat treated Stainless.
Seal Materials used are Buna-N and Teflon.
Optional seal and construction materials available.

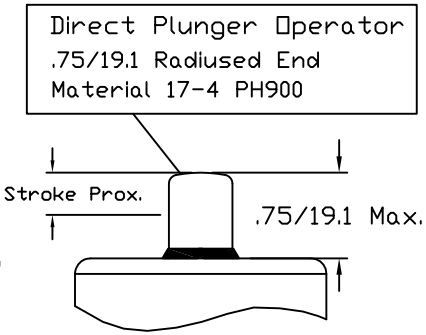
SHIFT FORCE NOTES:

15 Pounds of Force is required to compress springs, Key 3 & 9

To determine the additional operating force imposed by the system pressure, multiply the system pressure X .03 and add the result to the 15 Pound spring force.

Example: 1,000 PSI System
1,000 X .03 = 30#
30 + 15 = 45#
Total Operator Force = 40#
If Tank is Port 2, force is less.





Cavity & Housing

Cavity C-8542 (10-2):
See Spec. Sheet 1200621

Line Mount Housings:
See Spec. Sheets
1200674 and 1201455

Panel Mount Housings:
See Spec. Sheets
1202982 and 1202990

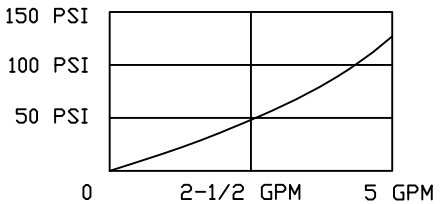
Valve Number: 94H72M##15

- ## = No Overtravel Protection
- P = Overtravel Protection

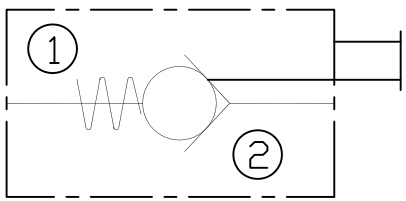
Operators:
- D = Direct Plunger
- K = Knob, Aluminum
- R = Knob, Red Ano.
- S = Knob, Stainless

PRESSURE DROP CHART C_V= 0.4

VALVE ORIFICE DIAMETER = .16"
Add 15 PSI Seat Crack Pressure



POC SERIES



Check Valve with Manual Override to hold open.

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DOERING

SPEC. SHEET NO. 1201527 REV. 005

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DOERING

DCV series

Description

A screw-in, poppet type, cartridge check valve. For use as a blocking or load-holding device.

Operation

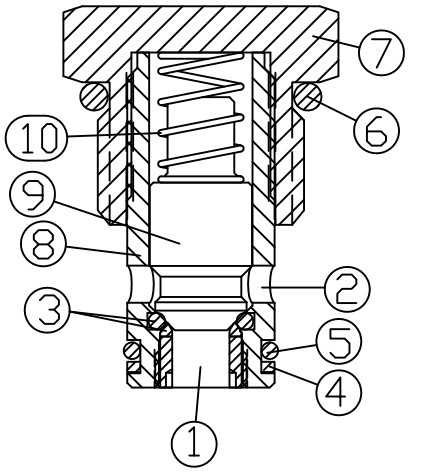
The DCV allows flow passage from port 1 to port 2, while blocking flow in the opposite direction.

Features and Key descriptions:

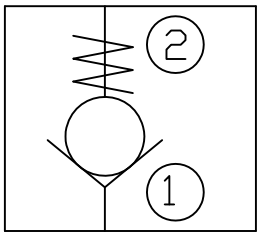
Hardened seat for long life and low leakage.
Optional soft seat added for more perfect seal.
Sold with or without poppet bias spring.
Please call for features or materials not listed.

Key:	Description:
1	Inlet Port
2	Outlet Port
3	Seat Poppet Seal Points (Hard plus optional Soft Seal)
4	Back Up Ring, 014 Teflon (PTFE)
5	Seal, (-014). See Order Information.
6	Seal, -10 SAE (-910). See Order Information.
7	Body Mount, SST., See Order Information.
8	Seat, 17-4 PH SST. Heat Treated
9	Poppet, 17-4 PH SST. Heat Treated
10	Poppet Bias Spring. See Order Information.

Optional Bias Spring (Key 10) to introduce back-pressure.



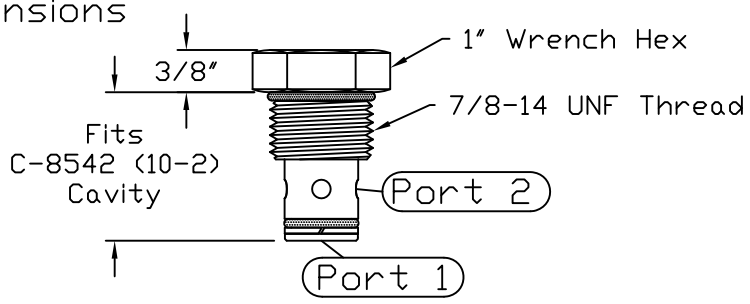
Functional Symbol:



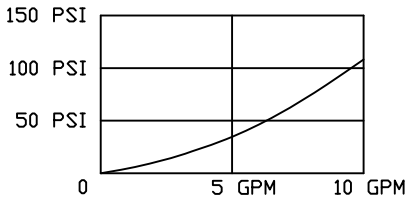
Installation and Ratings:

Operating Pressure: 5,000 PSI (345 bar)
Proof Pressure: 7,500 PSI (518 bar)
Temperature: -40 to 250°f (-40 to 120°c)
Mediums: Gas or Liquid
Installation: Torque - 25 ft-lbs

Dimensions



FLOW AND PRESSURE DROP CHART. C_V=0.9



Order Information

DCV- ___ -10- _ ___ - ___

Seat to Poppet Seal (Key 3)

Hard Seat, Hydraulic Test	H
Soft Seats, Bubble Tested	
Buna-N (Nitrile NBR)	N
Viton (Fluorocarbon FKM)	V
Kel-F (PCTFE)	K

Seals, External (Keys 5 & 6)

Buna-N (Nitrile NBR)	N
Viton (Fluorocarbon FKM)	V
Teflon (PTFE)	E

Material, Body Mount (Key 7):

Blank	303/304 SST.
316	316 SST.

Poppet Bias Spring, Key 10, Crack Pressure

00	0 PSI (0.0 bar) No Spring
03	3 PSI (.2 bar) ±50%
25	25 PSI (1.7 bar) ±20%

CARTRIDGE VALVE

KEY EXPLANATION:

1. Port No. 1, Working
2. Port No. 2, Working
3. Poppet, Check, Hard Stainless
4. Poppet Check Spring, Stainless Steel
5. O-Ring Seals, Teflon
6. Filter, 10 Micron, Sintered Bronze
7. Vent (2 Pl.) Optional T Port Locations
8. Filter Retainer
9. Actuator Return Springs, Stainless Steel
10. Actuator Piston
11. Piston O-Ring Seal, Buna N (Also See Options)
12. Bonnet Stainless Steel
13. 1" Wrench Flats for Installation
14. Pilot Port X (Specify in Part Number)
15. Piston Sleeve, Stainless Steel
16. Push Rod, Hard Stainless Steel (17-4)
17. Cartridge Seat Retaining Ring
18. Mount O-Ring, -910, Buna-N (Also see Options)
19. 7/8-14 Cartridge Mounting Threads, Stainless Steel
20. Cartridge Seat, Hard Stainless
21. Back Up Ring, -014, Teflon
22. O-Ring Seal, -014, Buna N (Also See Options)

FUNCTION

Pilot Operated Check Valve.
Normally closed. Pilot to Open.
In the non-energized (non-piloted) condition:
Flow is checked from 1 to 2.
Flow will occur from 2 to 1 with 15 PSI Crack.
In the energized (Piloted) condition:
Flow will occur in either direction.

Pilot area (X) is isolated from working ports 1 & 2.

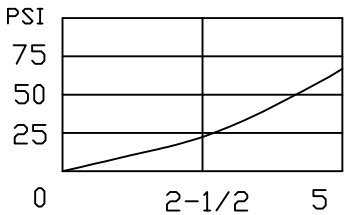
14:1 PILOT RATIO:

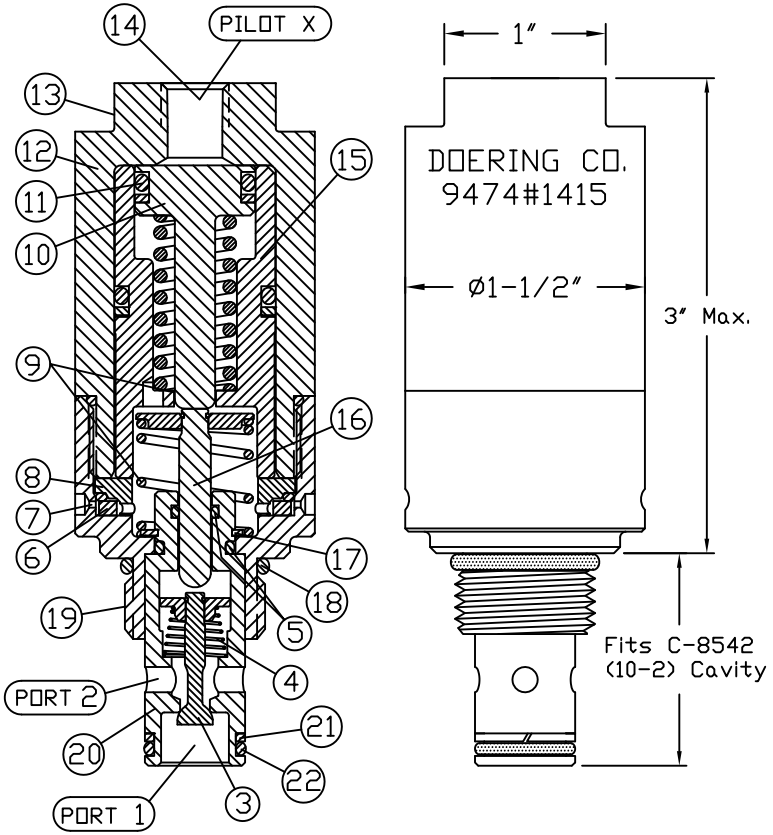
The Pilot Ratio is a comparison between the seat seal area (key 3) poppet and the Actuator Pilot Piston (key 10).
To determine pilot pressure required, divide the maximum working pressure by the pilot ratio of 14 and add 100 PSI for springs (key 9).
The result represents the absolute minimum pilot pressure required to actuate the valve. Add a comfortable margin of pressure to assure reliable operation. Stay within the pressure limit of the pilot area (5,000 PSI).

PERFORMANCE (cartridge only)

Pressure Drop (PSI)
Compared to Flow (GPM)

Valve Orifice Diameter = .160"
Check Bias Spring Crack = 15 PSI





Order P/N 9474#1415

SPECIFY PILOT PORT X

1	=	1/8 NPT
2	=	1/4 NPT
4	=	SAE4
G4	=	G 1/4-19 BSPP
6	=	SAE6
G6	=	G 3/8-19 BSPP

Cavity & Housing

Cavity Drawing C-8542 (10-2):
1200621 Spec. Sheet

Line Mount Housings:
1200674 and 1201455
Spec. Sheets

Panel Mount Housings:
1202982 and 1202990
Spec. Sheets

SPECIFICATIONS

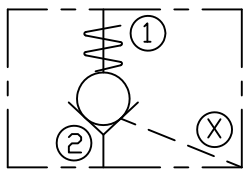
Hydraulic or Gas Pilot Operated Check Valve.
Pilot (X) Hydraulic or Gas mediums.
Pilot Pressure Range, 100 PSI Min. to 5000 PSI Max.
See 14:1 Pilot Ratio: notes for more information.
Working Ports (1 and 2) Rated to 5,000 PSI.

Fluid temperatures -40°F (-40°C) to 200°F (93.3°C)
Install Cartridge valve using 1" wrench
Valve should screw in freely to the Mount Seal.
Final tightening 20 to 30 foot pounds torque.
Use lubricant on external oil seals and mounting threads.

OPTIONS

All Stainless Steel option, add -SS to Part Number.
Standard seals are Buna-N with Teflon back up rings.
Optional seals include EP, Viton, Teflon and others.
Key 7, Vents to atmosphere (2 Places 180° apart).
T Option provides 10-32 Threaded ports at these locations. With T option, Key 6, Sintered Bronze filter, is omitted from the assembly.

FUNCTIONAL SYMBOL



POC SERIES

Pilot Operated Check Valve
Normally Closed. Pilot to Open.

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DOERING

CARTRIDGE VALVE

SPECIFICATIONS:

Pilot operated cartridge check valve. Normally open. Pilot to close passage between ports one and two.

Valve will also function as a Pilot Operated Relief valve. See notes regarding pilot pressure.

Maximum recommended system pressure (ports one and two) 5,000 PSI.

Pilot Pressure Range, 50 PSI Min. to 5000 PSI Max.
Pilot minimum may be lower if valve is used as a pilot operated relief valve.

Fluid temperature -45°F, (42.7°C) to 200°F, (93.3°C)
Install Cartridge valve using 1" wrench
Valve should screw in freely to the Mount Seal.
Final tightening to 20 foot pounds torque.
Use lubricant on external oil seals and mounting threads.

Features

KEY

1. No. 1 working port
2. No. 2 working port
3. Seat, Heat Treated Stainless
   Also see Seat Options.
4. Poppet, Heat Treated Stainless
5. Poppet Spring, Stainless Steel
6. Seat Saver Piston Assembly
7. Vent Port (2 Places)

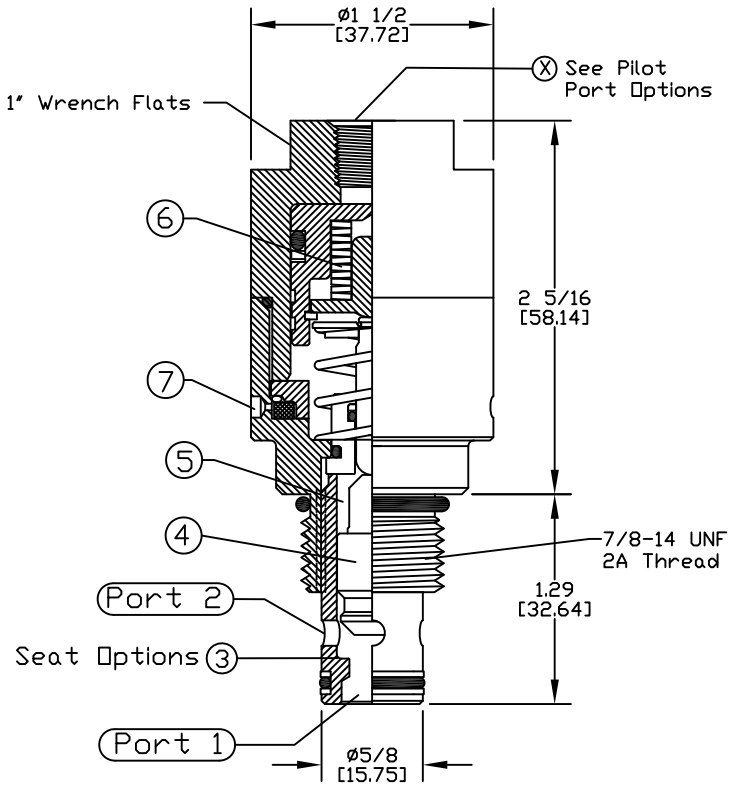
13:1 PILOT RATIO:

Area of pilot piston is 13 X larger than seat area.

To determine Minimum Pilot pressure required, follow these steps:

(1) Multiply the maximum possible system pressure X 1.1 = SM (System Max.)
(2) Divide SM by 13 = MP (Min. Pilot)

Note: MP is minimum pilot pressure needed for normally open / pilot to close valve function. If pilot pressure falls below MP, the valve will function as a pilot operated relief valve.



CAVITY

Cavity C-8542 (Industry 10-2)
Form Tool: FT-8542
Call for source information.

Cavity Drawing Spec. Sheet No. 1200621

Visit www.Doering.com and enter Spec. sheet 1200621. in 'document search' box.

HOUSING

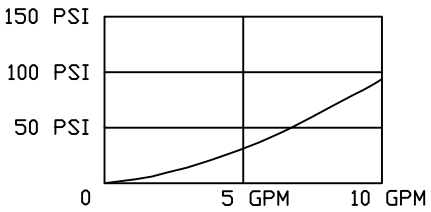
Line Mount Housings:
Spec. Sheets 1200674 and 1201455.

Visit www.Doering.com and enter Spec. sheet number in 'document search' box.

Doering Company also offers:
Custom Housings and Manifolds.
Materials include:
Aluminum, 304 SST., 316 SST.

Pressure Drop/Flow Chart.

Orifice Ø.28 (Cv 1.0)



CARTRIDGE VALVE ORDERING INFORMATION:

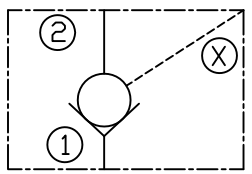
Valve Number: 904#95#13##

SEAT OPTIONS, Ref. Key 3
Blank = Hard Seat, Standard Hydraulic Test
K = Kel-F Soft Seat, Bubble Tested

X PILOT PORT OPTIONS
1 = 1/8 NPT
2 = 1/4 NPT
4 = SAE 4
6 = SAE 6

SPRING OPTIONS, POPPET BIAS Value in PSI Crack, Ref. Key 5
00 = NO SPRING
03 = STAINLESS STEEL
25 = STAINLESS STEEL

POC SERIES



Check Valve, Normally Open, Pilot to Close

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DOERING

DCVF series

Description

A screw-in, poppet type, cartridge check valve. For use as a blocking or load-holding device.

Operation

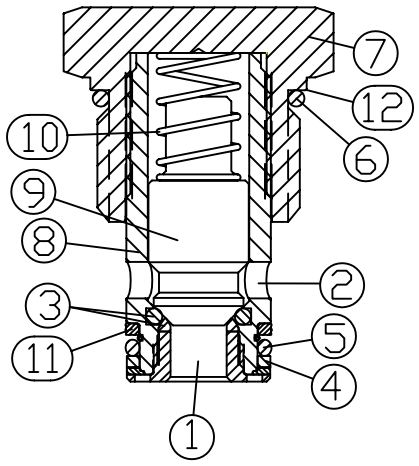
The DCVF allows flow passage from port 1 to port 2, while blocking flow in the opposite direction.

Features and Key descriptions:

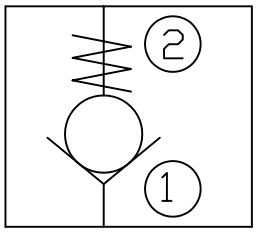
Fire Resistant Design, protects against catastrophic failure to 1200°f (649°c) for a limited time.
Keys 11 and 12 provide metal back up seals.
Designed for one time exposure to high temperatures.

Key:	Description:
1	Inlet Port
2	Outlet Port
3	Seat Poppet Seal Points (Hard plus optional Soft Seal)
4	Back Up Ring, 014 Teflon (PTFE)
5	Seal, (-014). See Order Information.
6	Seal, -10 SAE (-910). See Order Information.
7	Body Mount, SST., See Order Information.
8	Seat, 17-4 PH SST. Heat Treated
9	Poppet, 17-4 PH SST. Heat Treated
10	Poppet Bias Spring. See Order Information.
11	Metal Fire Seal (-014 SST.)
12	Metal Fire Seal, integral with Body Mount (Key 7)

Optional Bias Spring (Key 10) to introduce back-pressure.



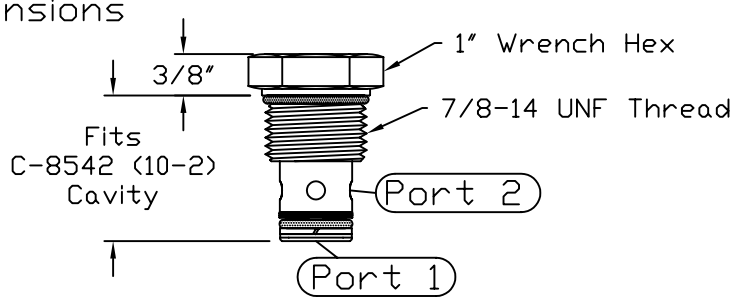
Functional Symbol:



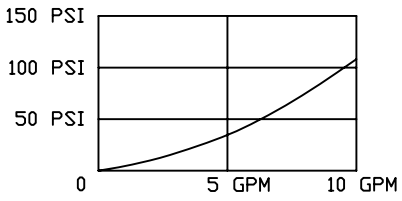
Installation and Ratings:

Operating Pressure: 5,000 PSI (345 bar)
Proof Pressure: 7,500 PSI (518 bar)
Temperature: -40 to 250°f (-40 to 120°c)
Mediums: Gas or Liquid
Installation: Torque - 25 ft-lbs

Dimensions



FLOW AND PRESSURE DROP CHART. C_V=0.9



Order Information

DCVF- -10- - -

Seat to Poppet Seal (Key 3)

Hard Seat, Hydraulic Test	H
Soft Seats, Bubble Tested	
Buna-N (Nitrile NBR)	N
Viton (Fluorocarbon FKM)	V
Kel-F (PCTFE)	K

Seals, External (Keys 5 & 6)

Buna-N (Nitrile NBR)	N
Viton (Fluorocarbon FKM)	V
Teflon (PTFE)	E

Material, Body Mount (Key 7):

Blank	303/304 SST.
316	316 SST.

Poppet Bias Spring, Key 10, Crack Pressure

00	0 PSI (0.0 bar) No Spring
03	3 PSI (.2 bar) ±50%
25	25 PSI (1.7 bar) ±20%

CARTRIDGE VALVE

SPECIFICATIONS:

Pilot to Close Check Valve:
This valve only flows from 1 to 2.
In the steady state (non-piloted), valve will flow from 1 to 2. The poppet spring will determine the poppet crack pressure. When the pilot is energized, the poppet is held closed and flow is blocked.
See Pilot Ratio Notes to determine pilot ratio.

Valve will also function as a Normally Open, Pilot to Close 2-Way valve provided flow is only required from 1 to 2.

Working Pressure: 5,000 PSI Ports 1 and 2.
Pilot Pressure Range, 50 PSI Min. to 150 PSI Max.
Pilot Pressure may be less if used as P.O. Relief.

Pilot medium is to be Air Only!

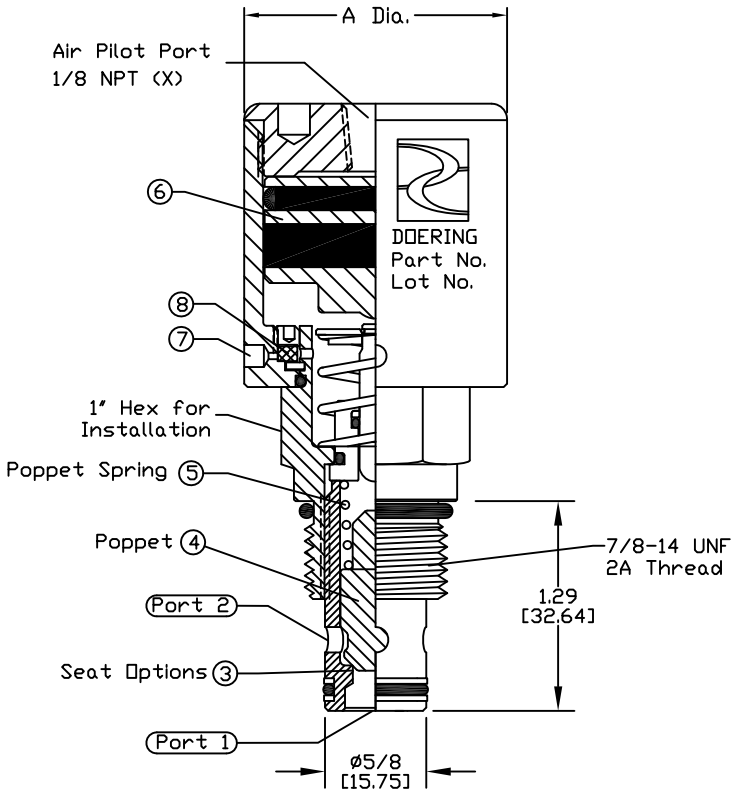
Fluid temperature -45°F, (42.7°C) to 200°F, (93.3°C)
Install Cartridge valve using 1" wrench
Valve should screw in freely to the Mount Seal.
Final tightening to 20 foot pounds torque.
Use lubricant on external oil seals and mounting threads.

Features

KEY
1. No. 1 working port
2. No. 2 working port
3. Seat, Heat Treated Stainless
   Also see Seat Options.
4. Poppet, Heat Treated Stainless
5. Poppet Bias Spring, Stainless Steel
   Also see Spring Options.
6. Piston Assembly
7. Vent Port (2 Places)
8. Internal Sintered Filter, 10 Micron

Pilot Ratio Notes:

Indicated pilot ratio refers to the area of the pilot piston as compared to the seat area, Port 1. Add an additional 15 psi to compensate for spring force. Please call for any assistance or clarification.



CAVITY

Cavity C-8542 (Industry 10-2)
Form Tool: FT-8542
Call for source information.

Cavity Drawing Spec. Sheet No. 1200621

Visit www.Doering.com and enter Spec. sheet 1200621. in 'document search' box.

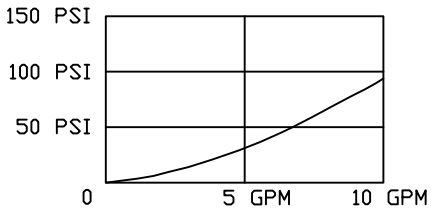
HOUSING

Line Mount Housings:
Spec. Sheets 1200674 and 1201455.

Visit www.Doering.com and enter Spec. sheet number in 'document search' box.

Doering Company also offers:
Custom Housings and Manifolds.
Materials include:
Aluminum, 304 SST., 316 SST.

Pressure Drop/Flow Chart.
Orifice ø.28 (Cv 1.0)



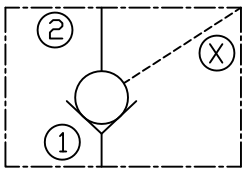
CARTRIDGE VALVE ORDERING INFORMATION:

Ratio	A Diameter	Valve Number
19:1	1-1/2" [38,10]	904H#92019##
24:1	1-5/8" [41.28]	904H#93024##
33:1	1-7/8" [47,63]	904H#96033##
50:1	2-1/4" [57.15]	904H#97050##

SEAT OPTIONS, Ref. Key 3
Blank = Hard Seat, Standard Hydraulic Test
K = Kel-F Soft Seat, Bubble Tested

SPRING OPTIONS, POPPET BIAS Value in PSI Crack, Ref. Key 5
00 = NO SPRING
03 = STAINLESS STEEL
25 = STAINLESS STEEL

POC SERIES



Check Valve, Normally Open:
Air Pilot to Close:
Can Control Fluid or Gas, Ports 1 & 2:
See Ratio Notes:

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SPEC. SHEET NO. 1202970 REV. 12

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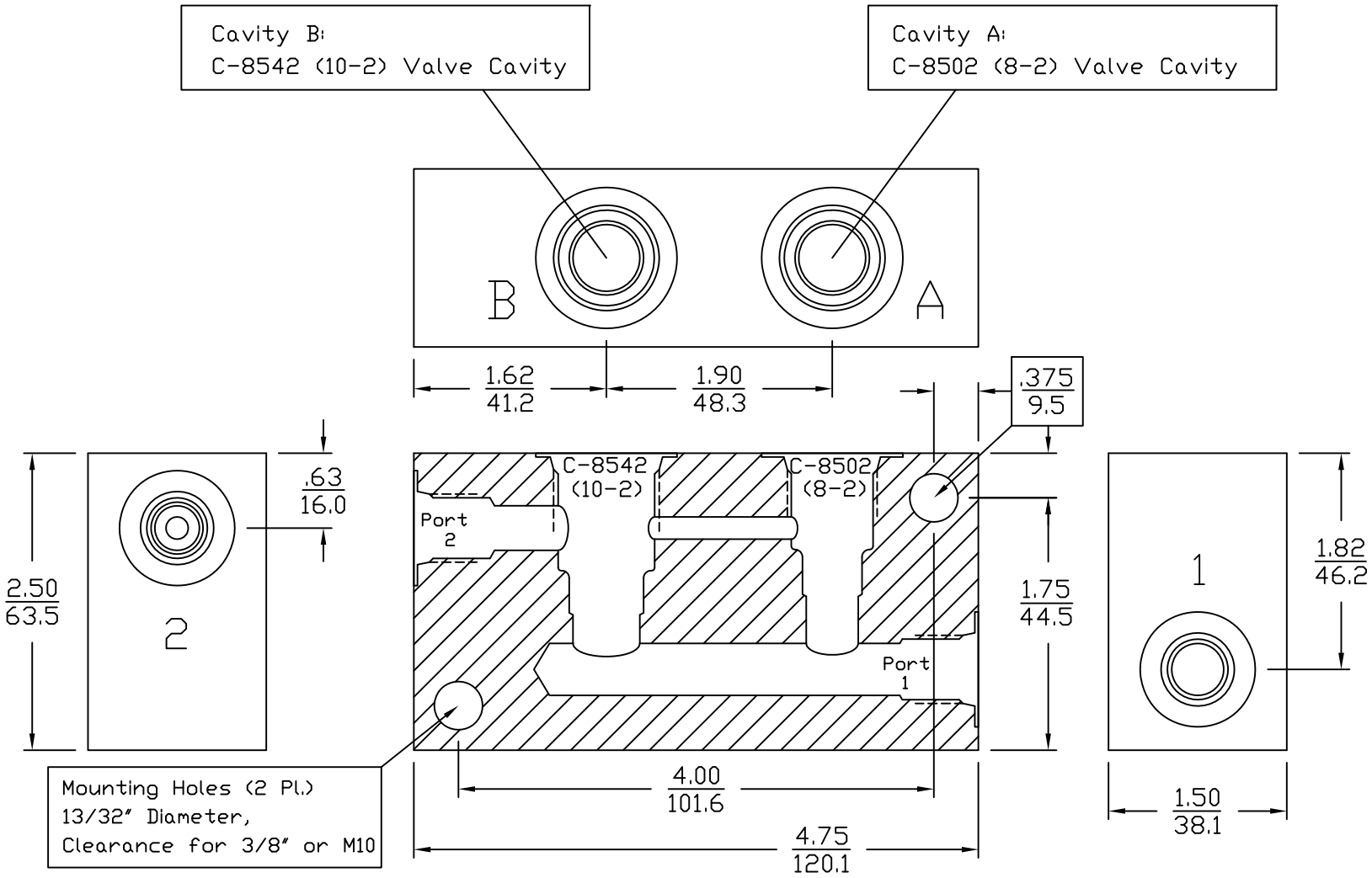

ORDER INFORMATION:

SD2- ___ ___

Ports 1 & 2

1	(1/8 NPT)
2	(1/4 NPT)
3	(3/8 NPT)
4	(SAE4, ORB)
5	(1/2 NPT)
6	(SAE6, ORB)
8	(SAE8, ORB)

Material Option, Pressure Rating

Pressure Note: Double pressure rating for Port 1 only.
Applies to Port Sizes -1, -2, -3, -4 and -6

Blank	(6061 Aluminum)	3,000 PSIG
S	(304 Stainless)	5,000 PSIG
S316	(316 Stainless)	5,000 PSIG

INCH
METRIC

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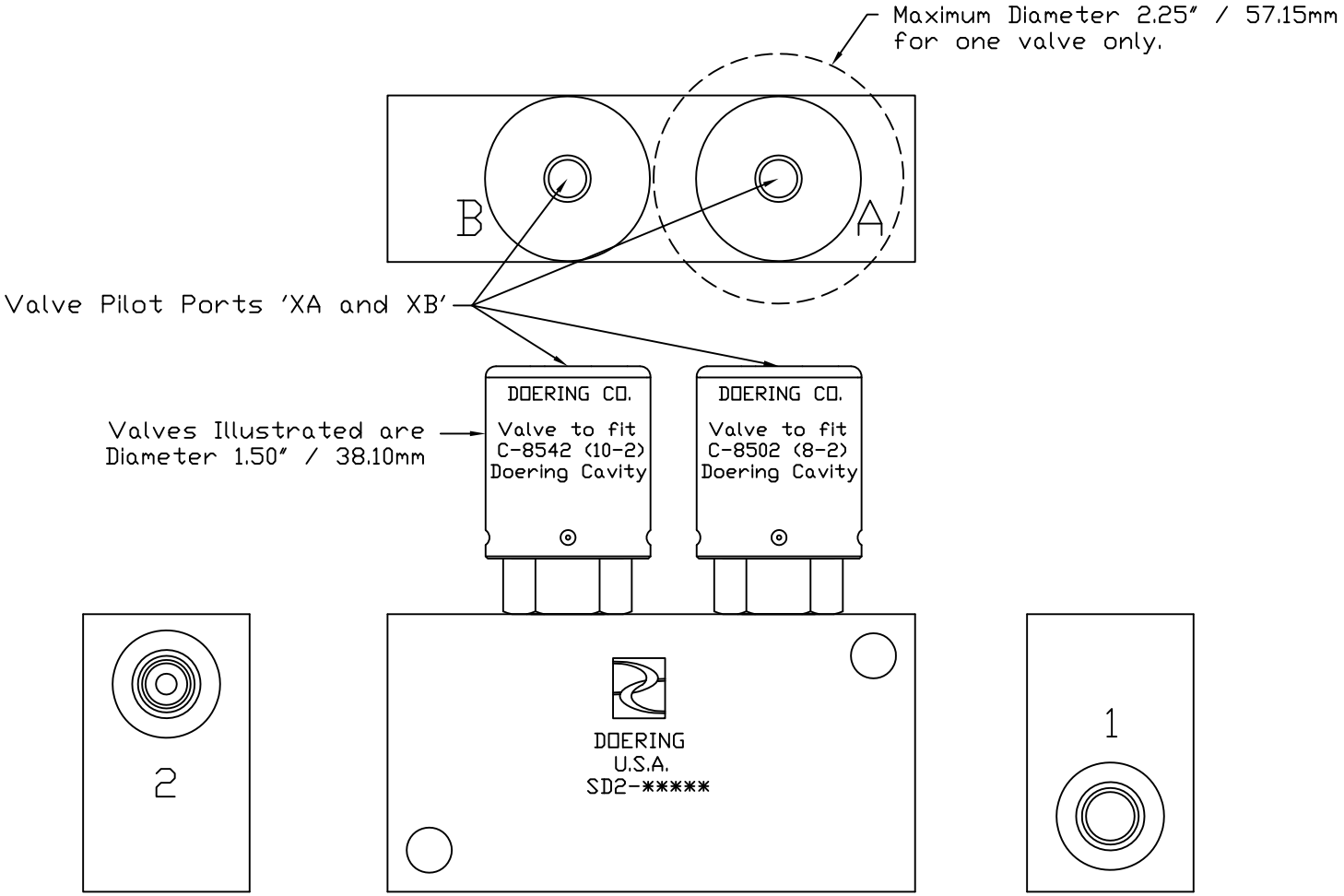


Operational Specifications:

Use No. 1 port for pressure inlet.
Use No. 2 port for return (Tank).
Assembly may be mounted in any position.
Change pilot pressure of valve B to change system pressure when valve B opens to Tank.

Function and Valve installation information:

Pilot Both Valves Simultaneously.
Cavity A: Install valve for Stage 1 Decompression.
Stage 1 Valve opens first due to the high ratio.
Stage 1 Valve installed in Cavity A has the smallest orifice and provides the decompression function.
Cavity B: Install valve for Stage 2, Higher Flow
Stage 2 Valve opens when system pressure drops to a point determined by the pilot ratio. Pilot pressure times the ratio determines the approximate system pressure, opening point of this valve.

Please call our applications engineering department for additional assistance.

The SD2-***** is the part number for housing only. In addition, specify the valves.

Housing Specifications:

Use No. 1 port for pressure inlet.
Use No. 2 port for pressure outlet.
Pressure on port 1 must be greater than pressure on port 2.

Mounting holes: .39ø (Clearance for 3/8ø)

Material: Stainless Steel

Function and Valve installation information:

Pilot Both Valves Simultaneously.

Cavity A: Install valve for Stage 1 Decompression.

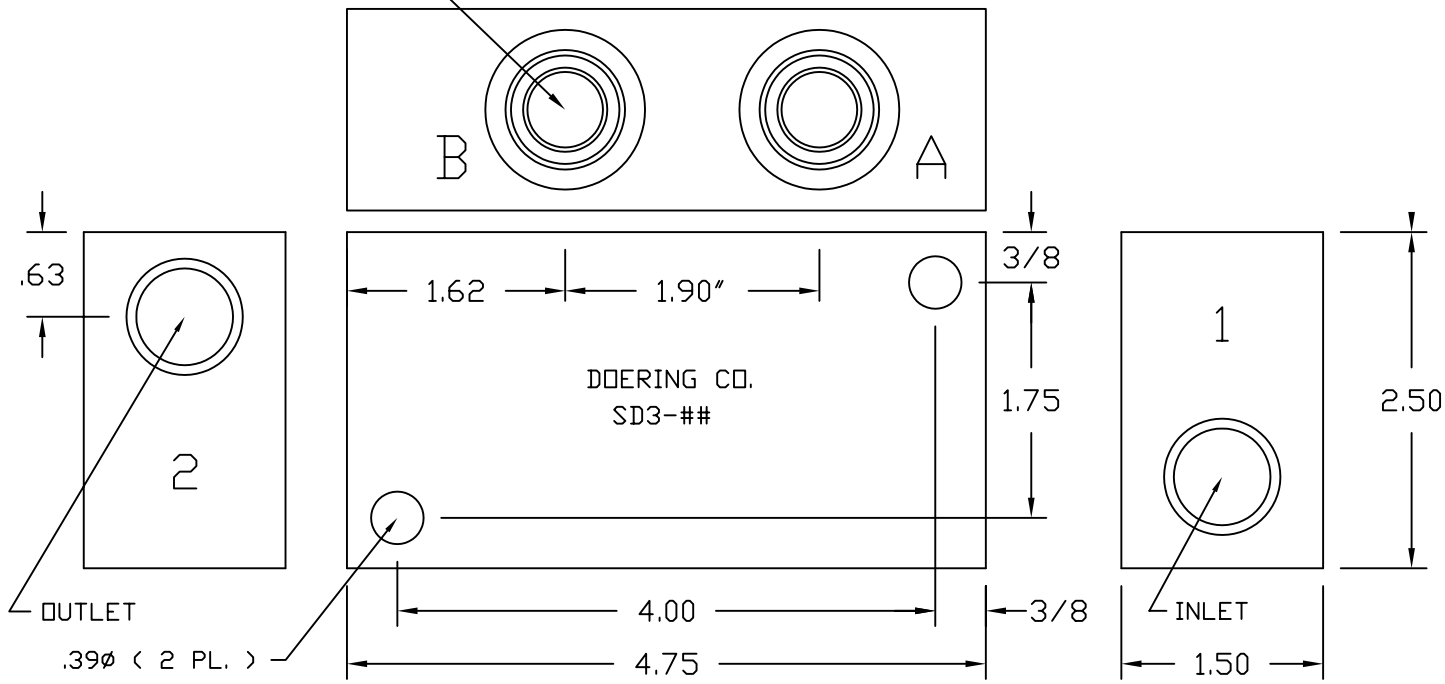
Stage 1 Valve opens first due to the high ratio.

Stage 1 Valve installed in Cavity A has the smallest orifice and provides the decompression function.

Cavity B: Install valve for Stage 2, Higher Flow

Stage 2 Valve opens when system pressure drops to a point determined by the pilot ratio. Pilot pressure times the ratio determines the approximate system pressure, opening point of this valve.

C-8542 Valve Cavity (10-2)
Includes Cavities A & B



STAINLESS ORDER NO:	ALUMINUM ORDER NO:	INLET AND OUTLET PORTS
SD3-2S	SD3-2	1/4 NPT
SD3-3S	SD3-3	3/8 NPT
SD3-5S	SD3-5	1/2 NPT
SD3-6S	SD3-6	SAE6 (O-RING PORTS)
SD3-8S	SD3-8	SAE8 (O-RING PORTS)

NOTE: CARTRIDGE VALVES ORDERED SEPARATELY
SELECT APPROPRIATE VALVES BASED ON RATIO REQUIRED

HOUSING FOR TWO STAGE DECOMPRESSION FUNCTION

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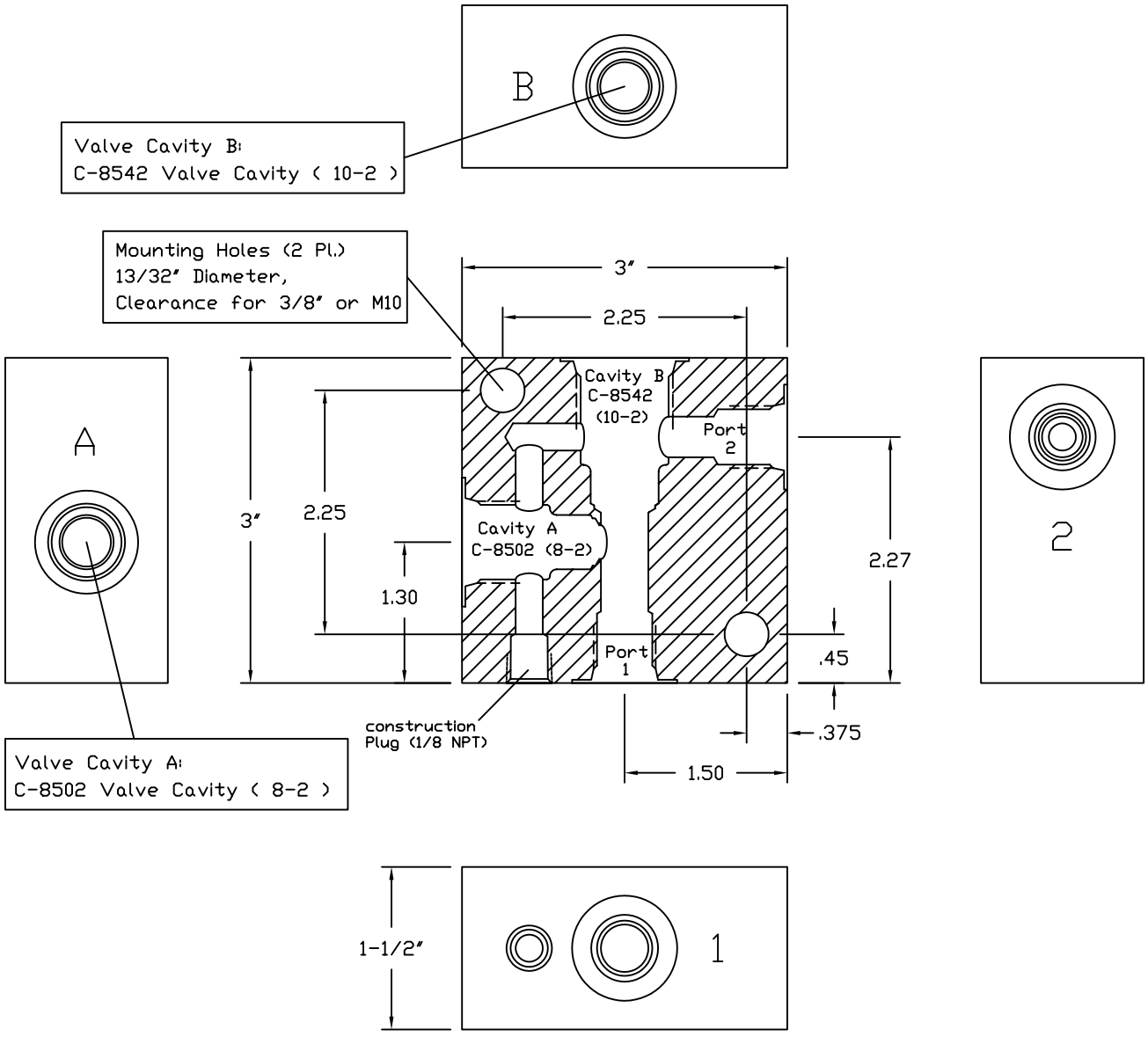

ORDER INFORMATION:

SD842- ___ ___

Ports 1 & 2

1 (1/8 NPT)
2 (1/4 NPT)
3 (3/8 NPT)
4 (SAE4, ORB)
5 (1/2 NPT)
6 (SAE6, ORB)
8 (SAE8, ORB)

Material Option, Pressure Rating

Pressure Note: Double pressure rating for Port 1 only.
Applies to Port Sizes -1, -2, -3, -4 and -6

Blank	(6061 Aluminum)	3,000 PSIG
S	(304 Stainless)	5,000 PSIG
S316	(316 Stainless)	5,000 PSIG

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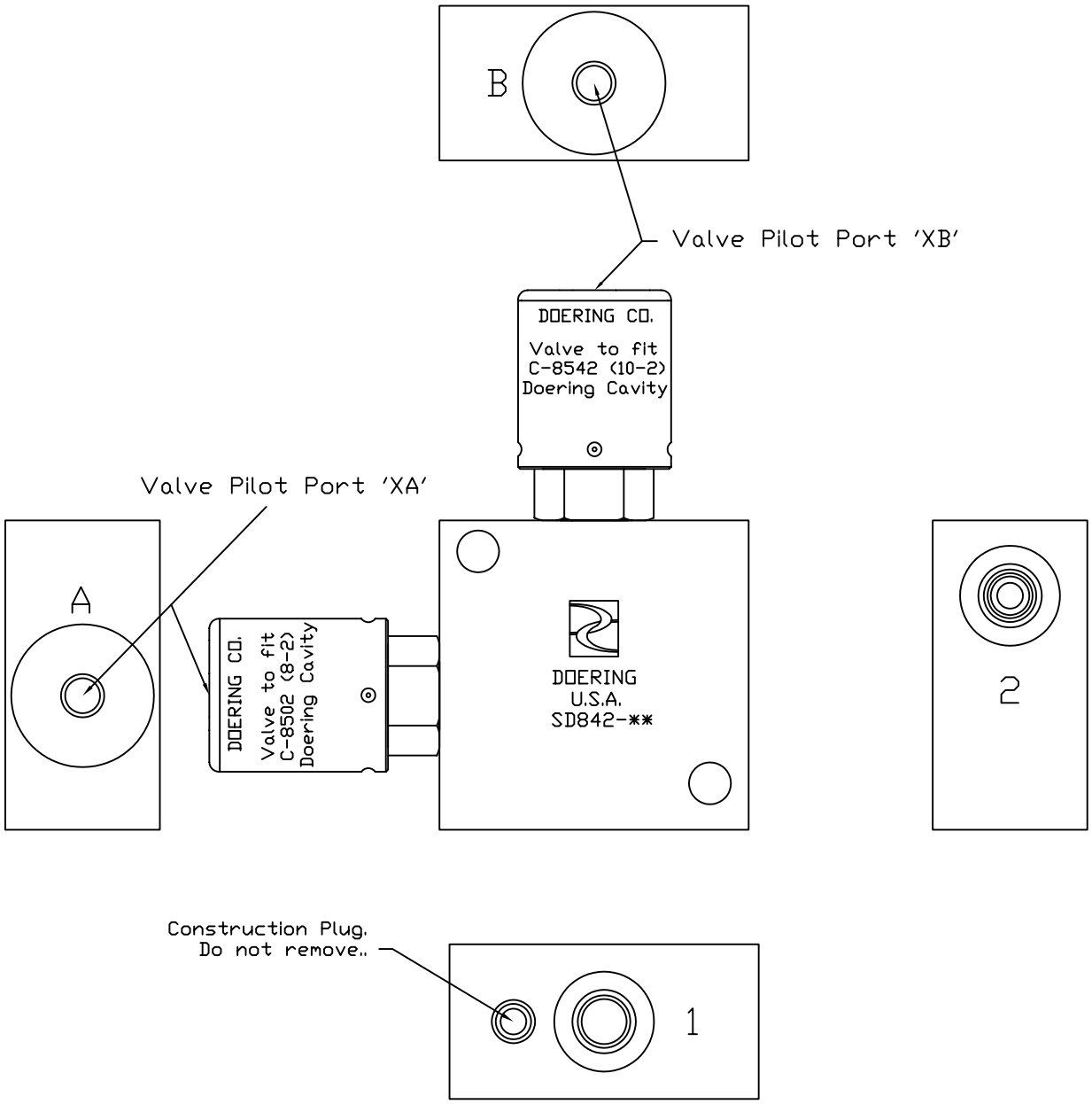

Example of Complete Assembly.

Assembly may be mounted in any position.
Please call our applications engineering department for additional assistance.

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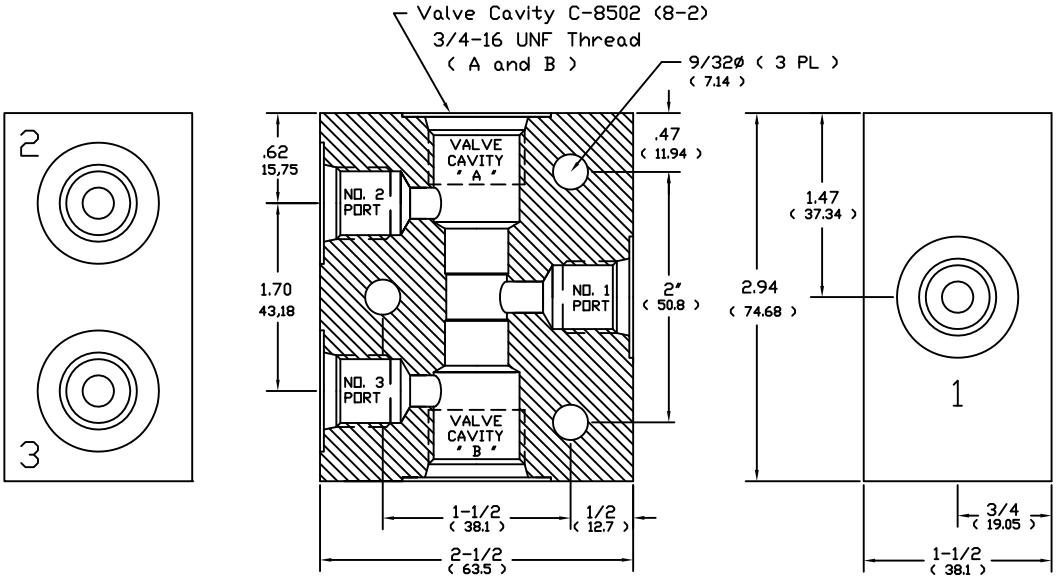


ORDER INFORMATION:

Housing Only.
Order Valves Separately.
based on FS (Functional Symbol).

S3M08-__ ____

Ports 1, 2 & 3

1	(1/8 NPT)
2	(1/4 NPT)
3	(3/8 NPT)
4	(SAE4, ORB)
6	(SAE6, ORB)

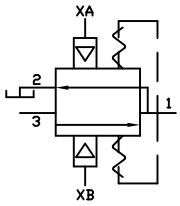
Material Option, Pressure Rating

Blank	(6061 Aluminum)	3,000 PSIG
S	(304 Stainless)	5,000 PSIG
S316	(316 Stainless)	5,000 PSIG

Control Options using S3M08 Housing and DOERING 2PB Valves.

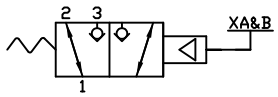
Use 2PB N/O Pressure Relief Valve in Cavity A.
Use 2PB N/C Pressure Reducing Valve in Cavity B.
Use Common pilot signal to valves A & B.
Typical connections: 1 to Cyl., 2 to T, and 3 to P.
(Regulated Pressure 1, Tank 2, Pressure Inlet 3)

FS-1



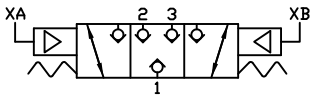
Use Normally Open, 2 Way valve cavity A.
Use Normally Closed 2 Way valve in B.
Use Common pilot signal to valves A & B.

FS-2



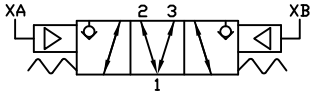
Use Normally Closed, 2 Way valves in cavities A & B. Use separate pilot signals.

FS-3



Use Normally Open, 2 Way valves in cavities A & B. Use separate pilot signals.

FS-4



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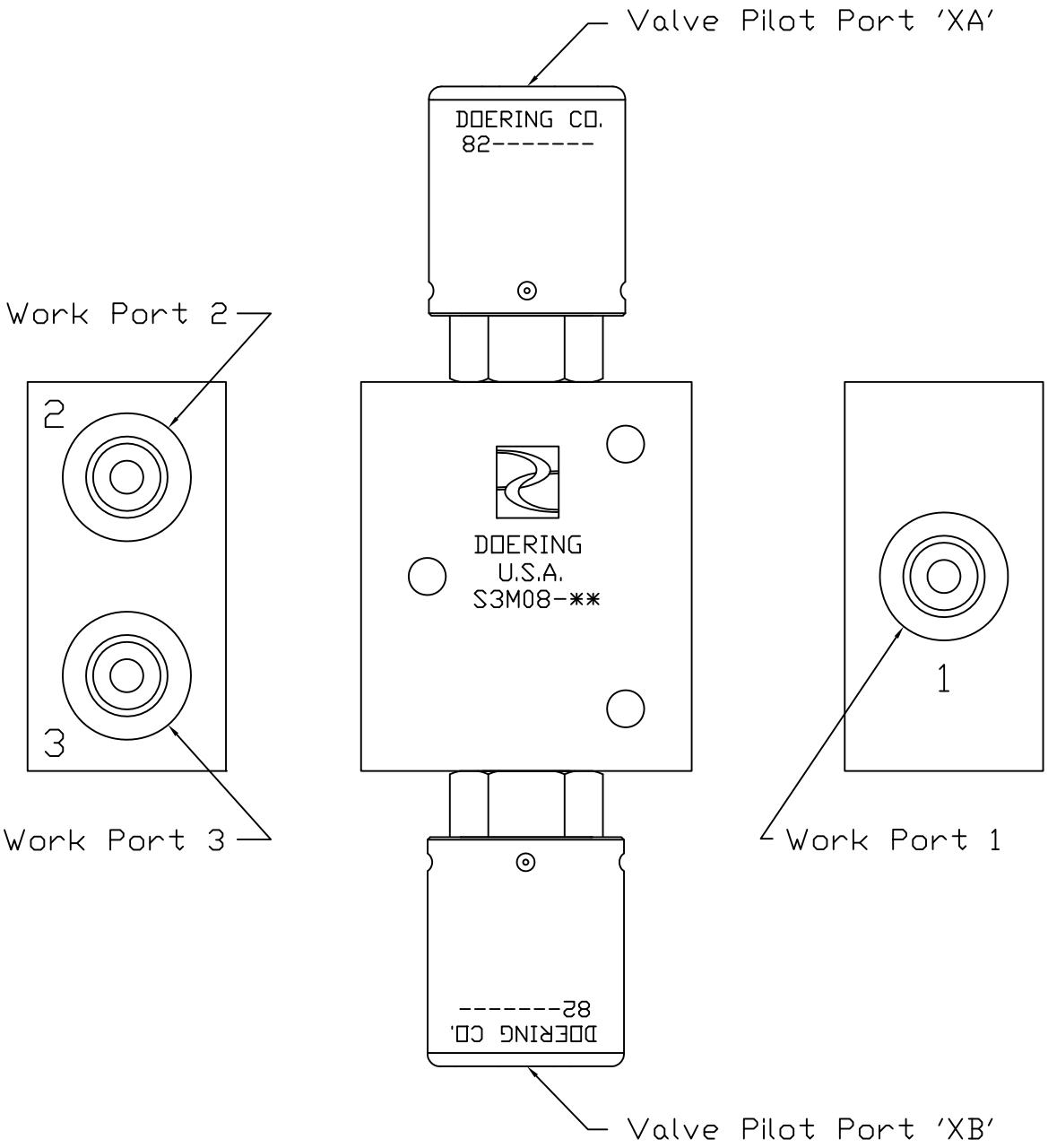

Example of Complete Assembly.

Assembly may be mounted in any position.
Please call our applications engineering department for additional assistance.

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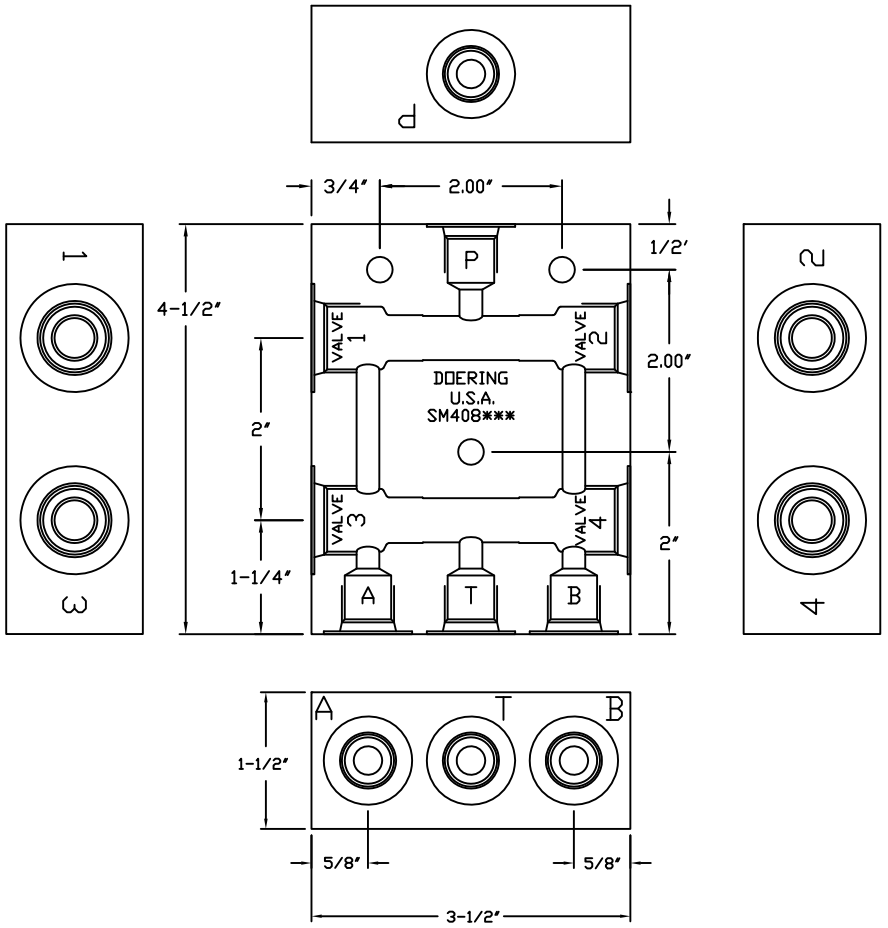
DOERING

4 WAY POPPET FUNCTIONS
USING FOUR, 2 WAY POPPET VALVES



ORDER INFORMATION:

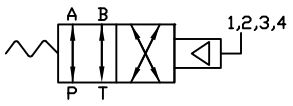
Housing Only. Order 4 Cartridge Valves Separately, based on Functional Symbol (FS-#).

SM408-___ ___

Ports 1, 2 & 3	Material Option, Pressure Rating		
1 (1/8 NPT)	Blank	(6061 Aluminum)	3,000 PSIG
2 (1/4 NPT)	S	(304 Stainless)	5,000 PSIG
3 (3/8 NPT)	S316	(316 Stainless)	5,000 PSIG
4 (SAE4, ORB)			
G4 (G 1/4-19 BSPP)			
6 (SAE6, ORB)			
G6 (G 3/8-19 BSPP)			

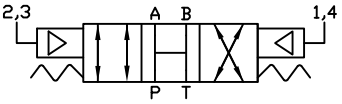
CONTROL OPTIONS (FUNCTIONAL SYMBOLS)
VALVE POSITIONS AND TYPES USED.
N/C = NORMALLY CLOSED
N/O = NORMALLY OPEN
Proper Valve Selection and Assembly is required to achieve functionality corresponding Functional Symbol (FS) required for the application.
FS-# (Select Functional Symbol)

FS-1



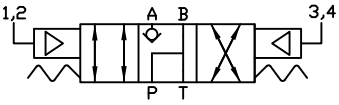
1 AND 4 N/O. 2 AND 3 N/C.

FS-2



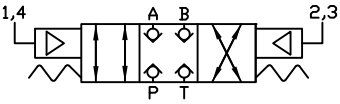
1, 2, 3, AND 4 N/O.

FS-3



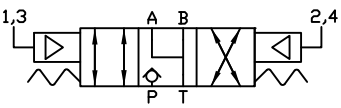
1 AND 3 N/C. 2 AND 4 N/O.

FS-4



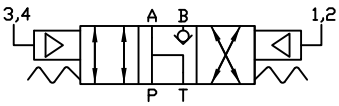
1, 2, 3, AND 4 N/C.

FS-5



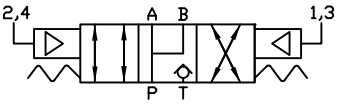
1 AND 2 N/C. 3 AND 4 N/O.

FS-6



1 AND 3 N/O. 2 AND 4 N/C.

FS-7



1 AND 2 N/O. 3 AND 4 N/C.

PILOT VALVE SELECTION:

IN MAKING RATIO SELECTION NOTE VALVES 1 AND 2 ARE AFFECTED BY P (INLET PRESSURE). VALVES 3 AND 4 MAY SEE FULL PRESSURE ON THE SIDE PORT AND TANK PRESSURE ON THE BOTTOM PORT. VALVES 3 AND 4 MAY BE A LOWER PILOT RATIO.

NOTE THE 2" CENTER DISTANCE ALLOWANCE FOR "A" DIAMETERS OF CARTRIDGE VALVES.

SEE SPECIFICATION SHEETS 2PB N/C AND 2PB N/O FOR ADDITIONAL VALVE ORDERING INFORMATION.

THE SM408*** HOUSINGS REQUIRE VALVES TO FIT C-8502 CAVITIES.

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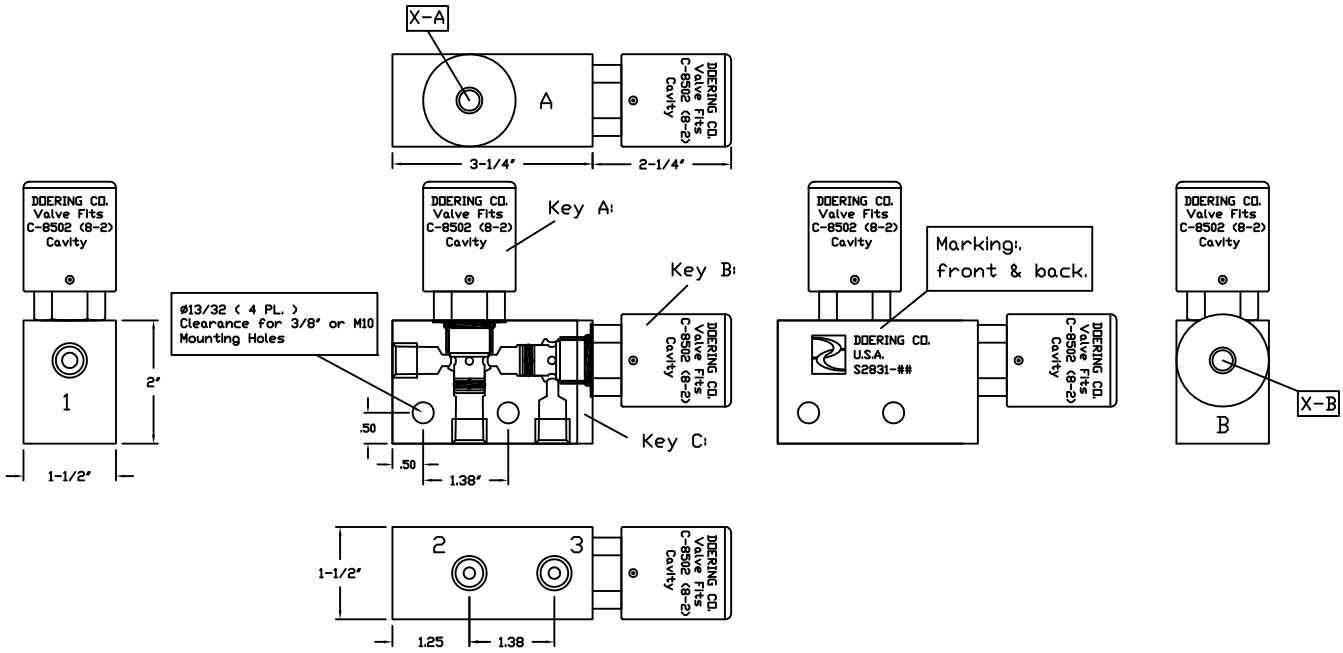
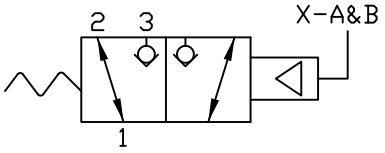
mailbox@doering.com ▪ www.doering.com

DOERING

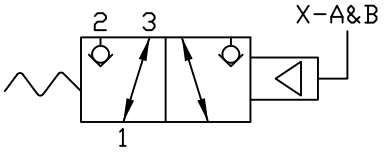


Key A: Illustrates Valve in housing cavity A, Doering Cavity C-8502 (8-2).
Key B: Illustrates Valve in housing cavity B, Doering Cavity C-8502 (8-2).
If another manufacturers cavity drawing or tooling is used, verify dimensions based on the Doering Company C-8502 (8-2) Cavity specifications, 1200630.
Key C: S2831-## Housing
X: Indicates Pilot Signal followed by A and/or B indicating which valve to pilot.
Abbreviation Explanation: N/C (Normally Closed), N/O (Normally Open)
Valves shown mounted in housing for illustration purposes only.
Valves ordered separately.

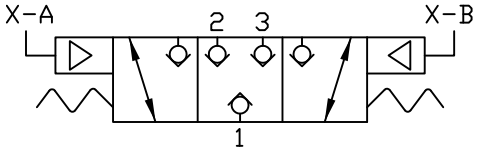
Please contact an application engineer for assistance in valve selection. or to discuss other housing options or applications.



FS-1
Use N/O in A, N/C in B.



FS-2
Use N/C in A, N/O in B.



FS-3
Use N/C in A and B.

Housing Catalog Numbers:

Valves ordered separately.

HOUSING ORDER INFORMATION:

S2831-___ ___

Ports 1, 2 & 3	
1	(1/8 NPT)
2	(1/4 NPT)
3	(3/8 NPT)
4	(SAE4, ORB)
6	(SAE6, ORB)

Material Option, Pressure Rating		
Blank	(6061 Aluminum)	3,000 PSI
S	(304 Stainless)	5,000 PSI
S316	(316 Stainless)	5,000 PSI

Caution: Pressure Ratings apply to housings only. Valve ratings may vary.

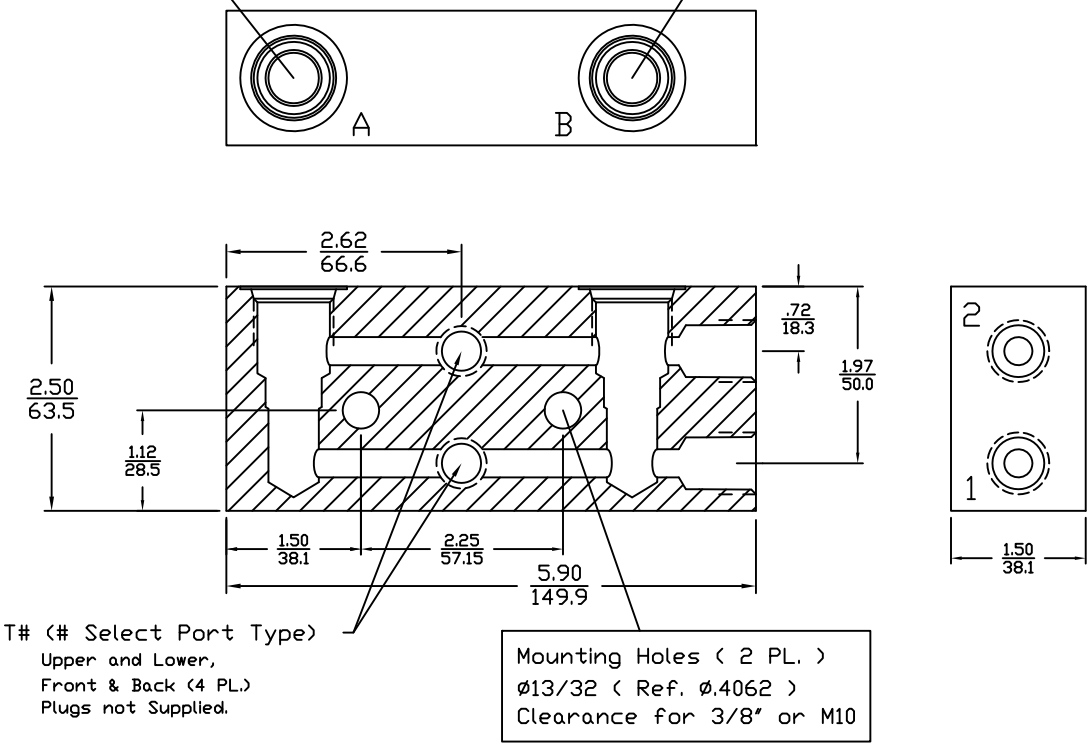
Features and Precautions:
Provides 3 Way Poppet function
Functional Symbols FS-1, FS-2 and FS-3 are illustrated using bi-directional 2 Way poppet Valves. If unidirectional valves are used the functional symbols are void. Valves must be installed in proper cavity (A or B) to assure proper functionality.

S2831 Series Housings

INCH
METRIC

Pump or Valve
Cavity 'A'
Doering C-8542
Industry 10-2
Spec. Sheet 1200621

Pump or Valve
Cavity 'B'
Doering C-8542
Industry 10-2
Spec. Sheet 1200621



T# (# Select Port Type)
Upper and Lower,
Front & Back (4 PL.)
Plugs not Supplied.

Mounting Holes (2 PL.)
ø13/32 (Ref. ø.4062)
Clearance for 3/8" or M10

ORDER INFORMATION:

S2962 - _ _ _

Gauge Port Options:

Blank No Gauge Ports
T# Gauge Ports
Upper and Lower Location.
Select Gauge Porting:
T1 (1/8 NPT)
T2 (1/4 NPT)
T4 (SAE4, ORB)

Ports 1 & 2

1 (1/8 NPT)
2 (1/4 NPT)
3 (3/8 NPT)
4 (SAE4, ORB)
6 (SAE6, ORB)

Material Option, Pressure Rating

Pressure Note: Double pressure rating for Port 1 only.

Blank	(6061 Aluminum)	3,000 PSIG
S	(304 Stainless)	5,000 PSIG
S316	(316 Stainless)	5,000 PSIG

S2962 Series Housing
Designed for use with
222-S, 241-S or 242-S Series
Doering Cartridge Hand Pump

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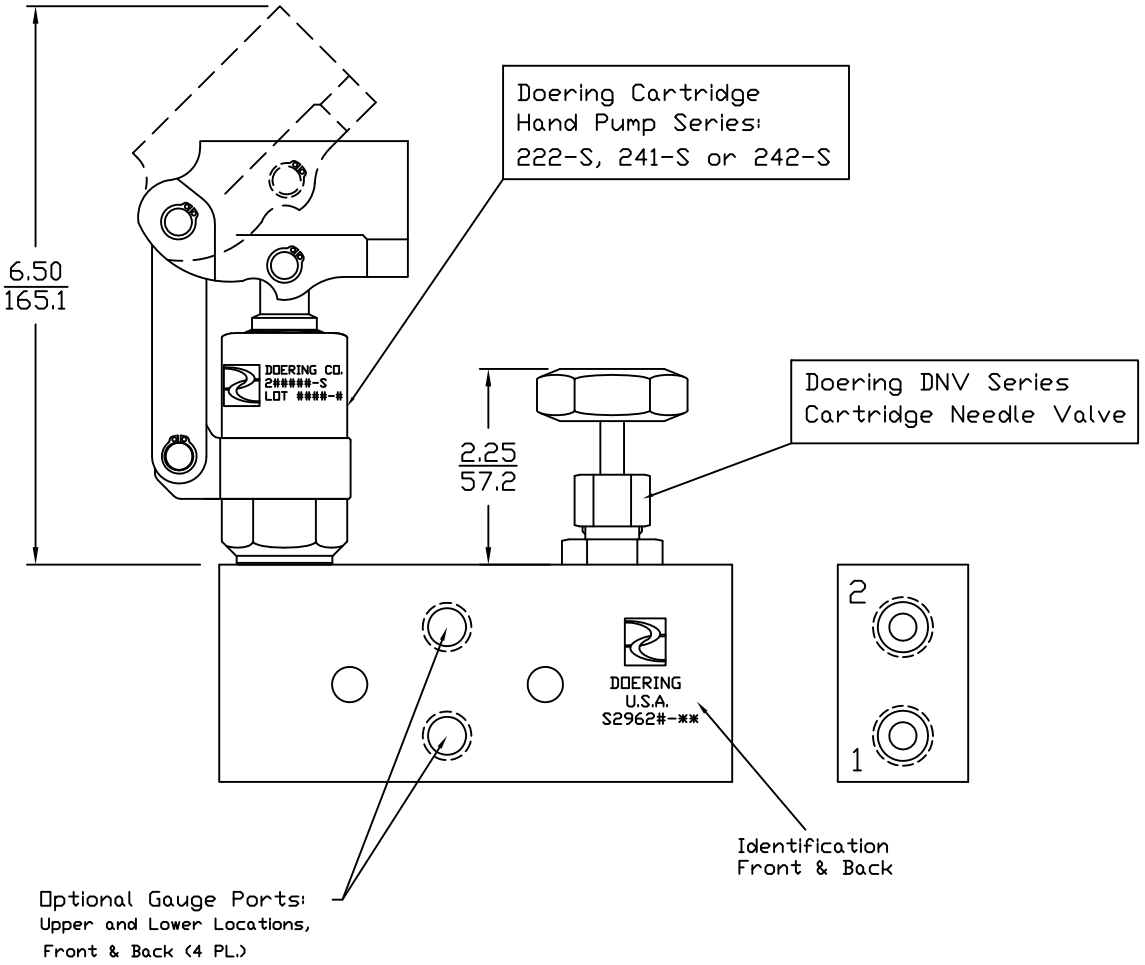
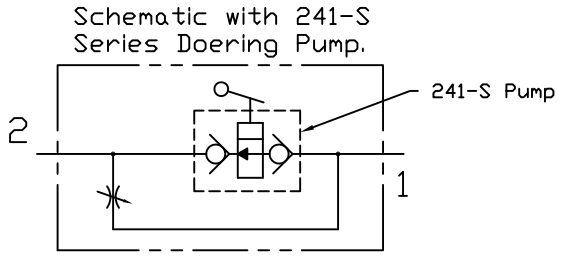
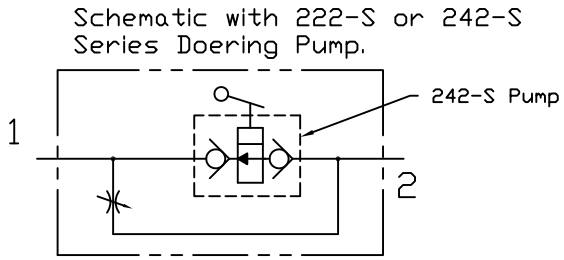
INCH
METRIC







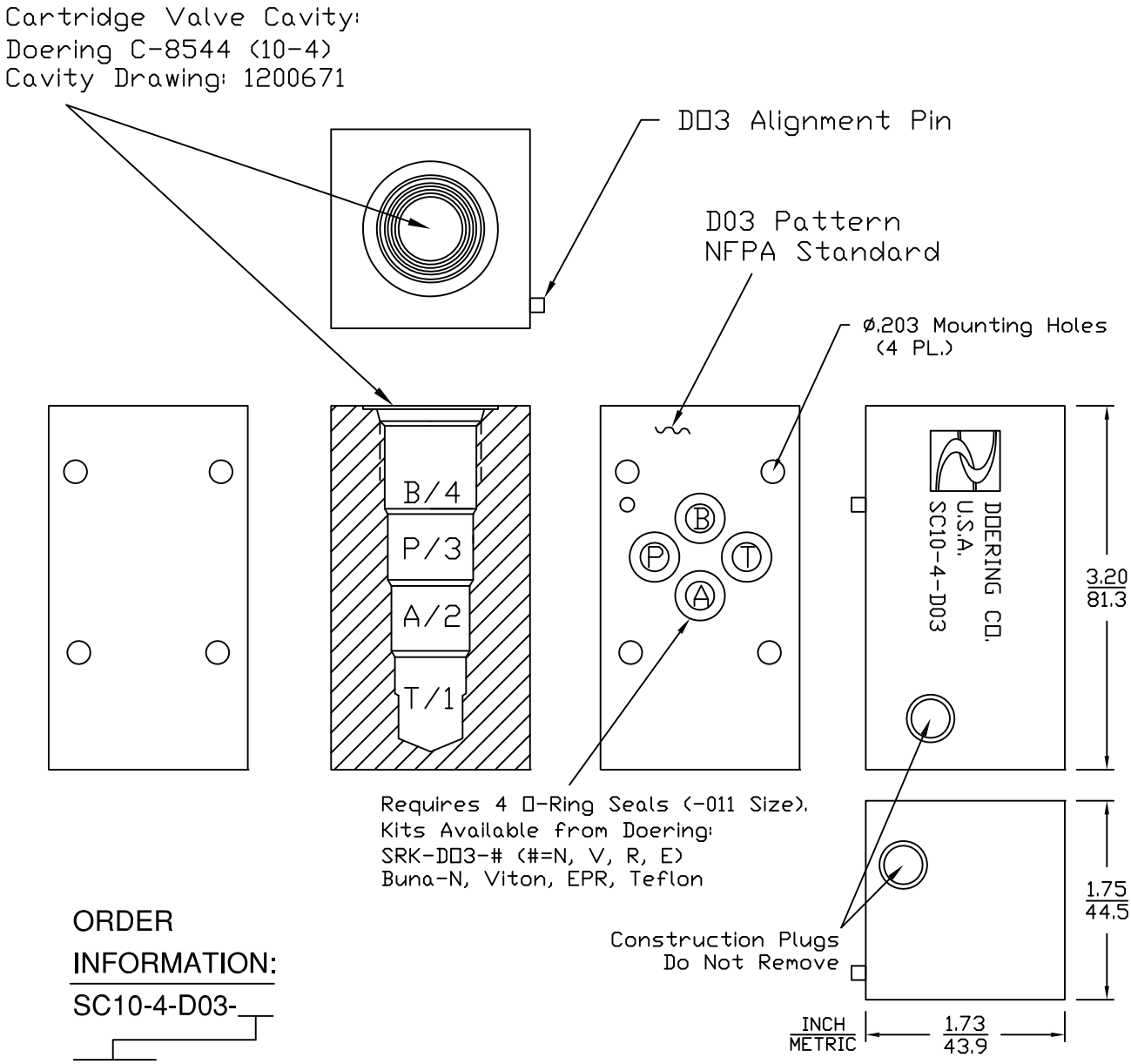
Example Assembly:
Order Components Separately.

S2962#-## Doering Housing. See Page 1 for Part Number Detail.
222###-S Doering Cartridge Pump, Ref. Spec. Sheet 1202250
241###-S Doering Cartridge Pump, Ref. Spec. Sheet 1202251
242###-S Doering Cartridge Pump, Ref. Spec. Sheet 1202252
DNV-K-10-#-###-### Doering Needle Valve, Spec Sheet 1201273
Gauge, Not Available through Doering at this time.

S2962 Series Housing Illustrated with Doering Cartridge Pump and Needle Valve

DOERING

DO3 to 10-4 Adapter



ORDER INFORMATION:

SC10-4-D03-___

ENTER: For Material □ption, Pressure Rating

Blank	(6061 Aluminum Body, Brass Construction Plugs)	3,000 PSIG
S	(304 Stainless Body, SST. Construction Plugs)	5,000 PSIG
S316	(316 Stainless Body, SST. Construction Plugs)	5,000 PSIG

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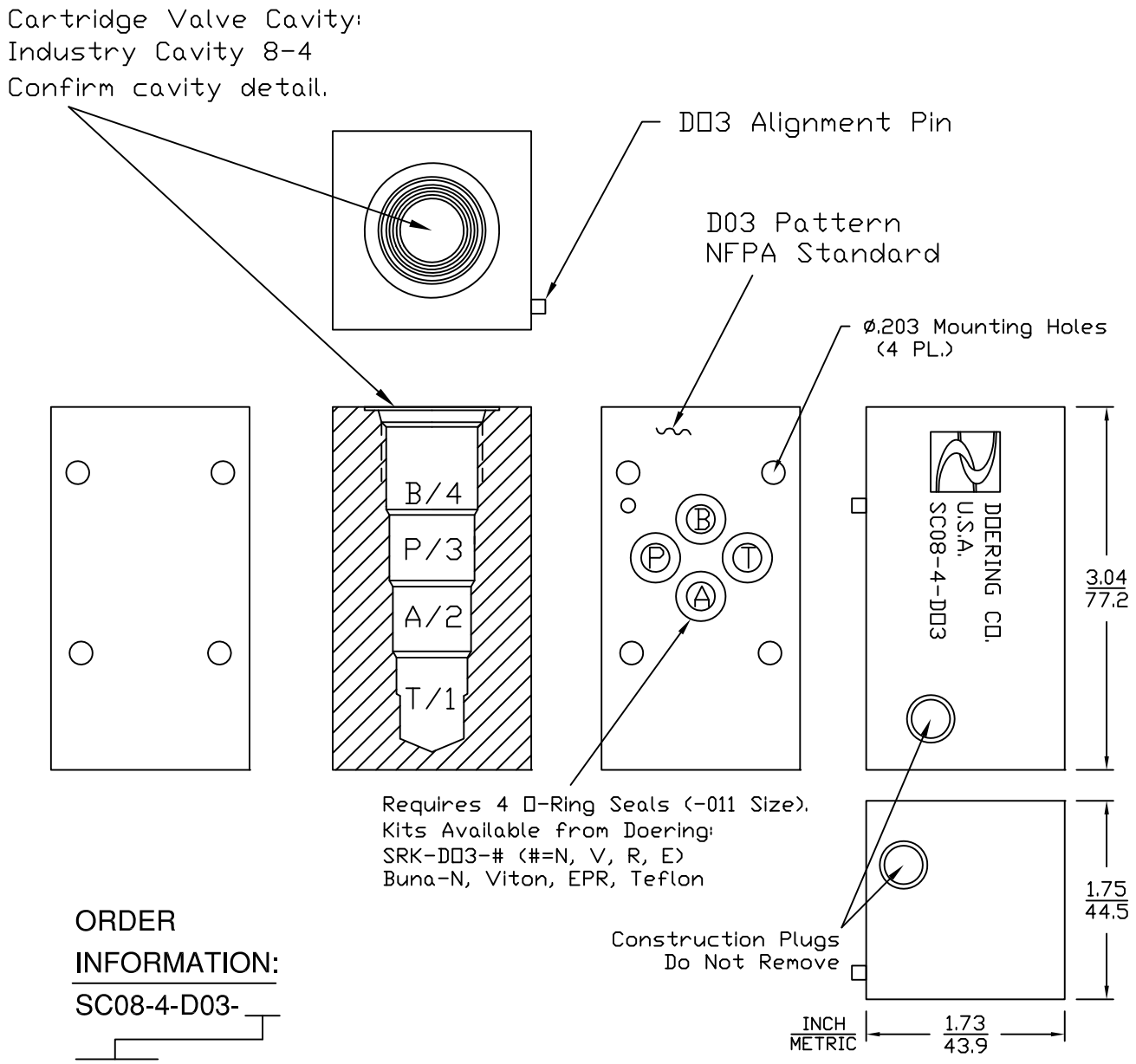
DO3 to 8-4 Adapter



ORDER INFORMATION:

SC08-4-D03-___

ENTER: For Material □ption, Pressure Rating

Blank	(6061 Aluminum Body, Brass Construction Plugs)	3,000 PSIG
S	(304 Stainless Body, SST. Construction Plugs)	5,000 PSIG
S316	(316 Stainless Body, SST. Construction Plugs)	5,000 PSIG

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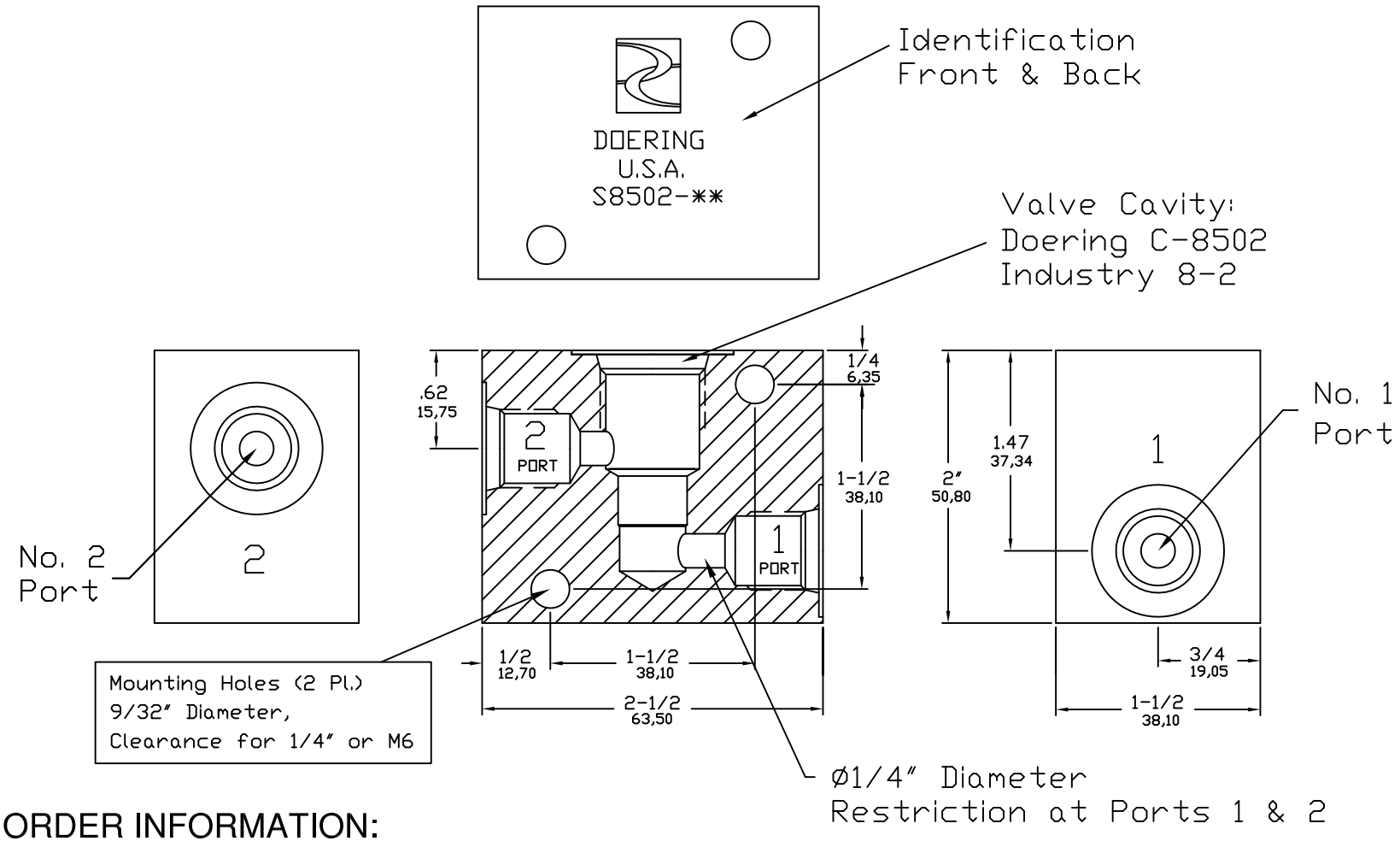

ORDER INFORMATION:

S8502- ____ ____

Ports 1 & 2

1	(1/8 NPT)
2	(1/4 NPT)
3	(3/8 NPT)
4	(SAE4, ORB)
G4	(G 1/4-19 BSPP)
6	(SAE6, ORB)
G6	(G 3/8-19 BSPP)

Material Option, Pressure Rating

Pressure Note: Double pressure rating for Port 1 only.

Blank	(6061 Aluminum)	3,000 PSIG
S	(304 Stainless)	5,000 PSIG
S316	(316 Stainless)	5,000 PSIG

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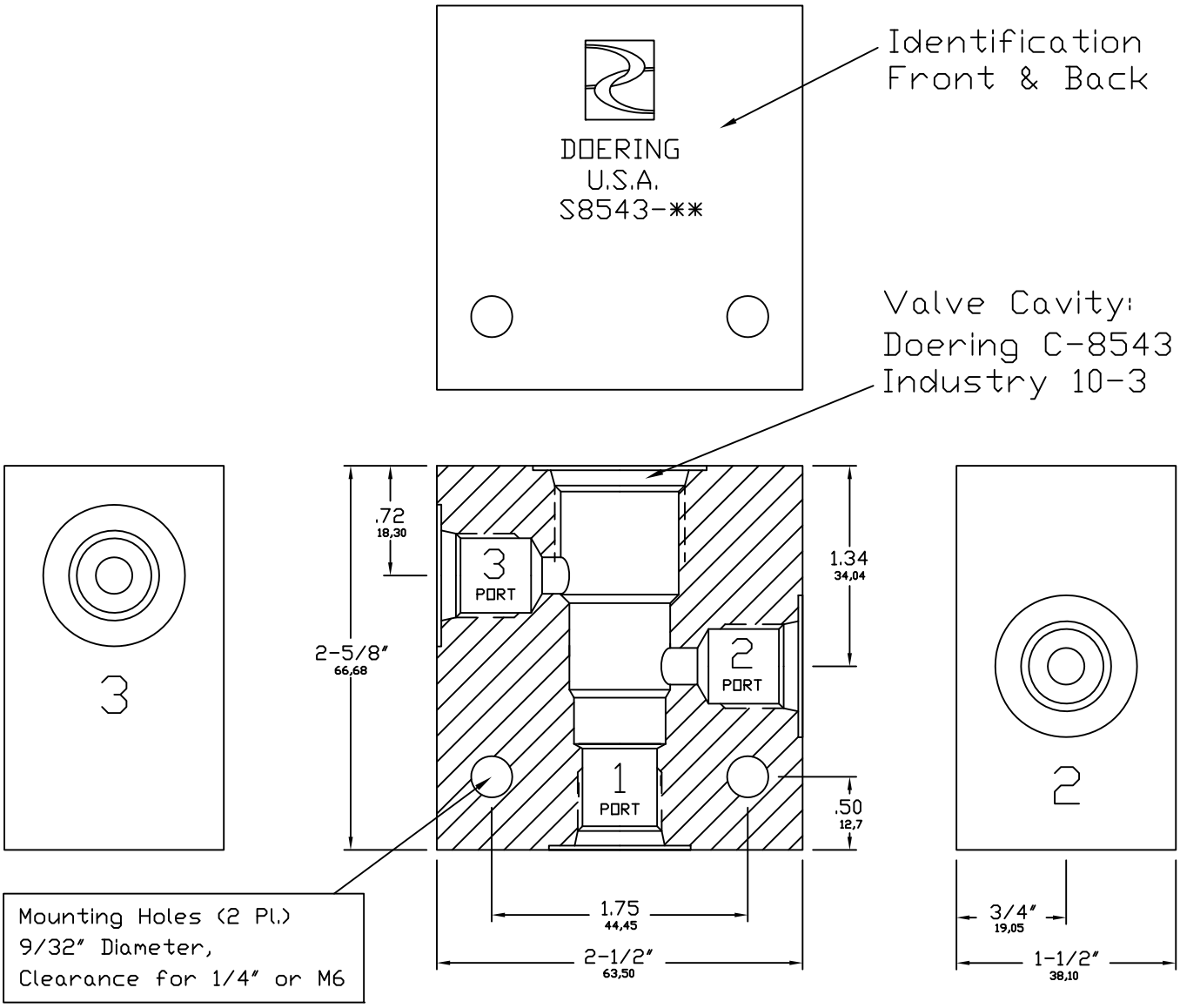

ORDER INFORMATION:

S8543- ___ ___

Ports 1, 2 & 3

1	(1/8 NPT)
2	(1/4 NPT)
3	(3/8 NPT)
4	(SAE4, ORB)
G4	(G 1/4-19 BSPP)
6	(SAE6, ORB)
G6	(G 3/8-19 BSPP)

Material Option, Pressure Rating

Blank	(6061 Aluminum)	3,000 PSIG
S	(304 Stainless)	5,000 PSIG
S316	(316 Stainless)	5,000 PSIG

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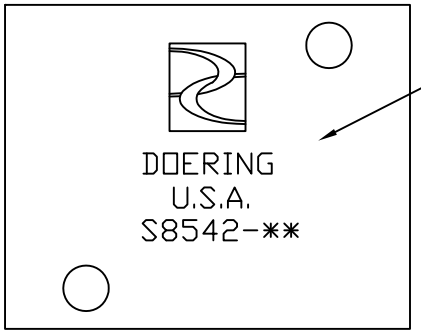
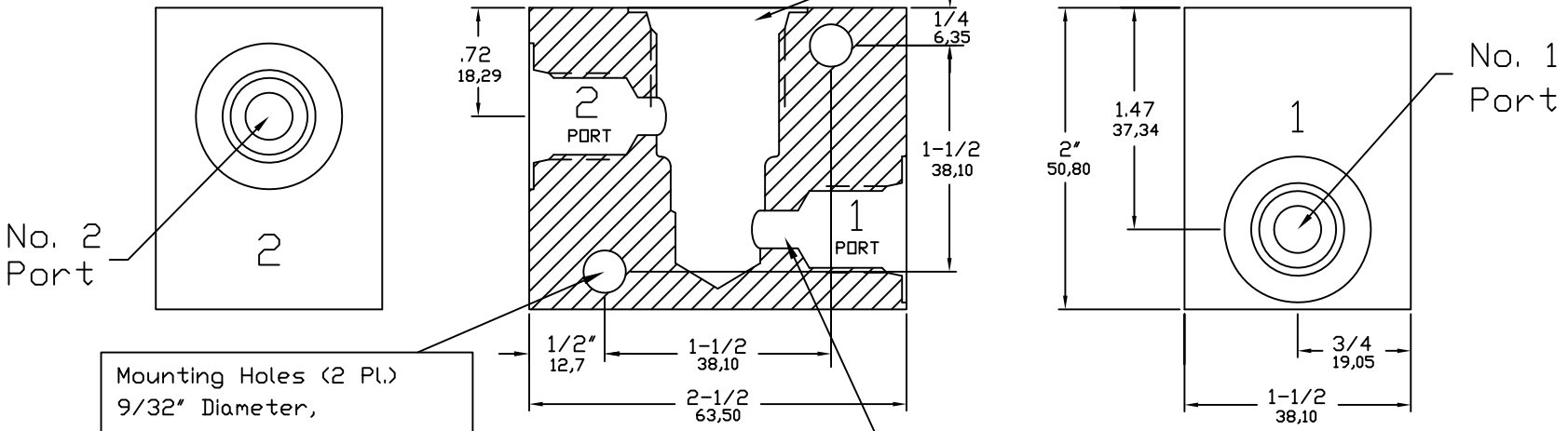


Identification
Front & Back

Valve Cavity:
Doering C-8542
Industry 10-2



Mounting Holes (2 Pl.)
9/32" Diameter,
Clearance for 1/4" or M6

Ø5/16" (7.94mm) Diameter
Restriction at Ports 1 & 2

ORDER INFORMATION:

S8542- ___ ___

Ports 1 & 2

1	(1/8 NPT)
2	(1/4 NPT)
3	(3/8 NPT)
4	(SAE4, ORB)
6	(SAE6, ORB)
G6	(G 3/8-19 BSPP)

Material Option, Pressure Rating

Pressure Note: Double pressure rating for Port 1 only.

Blank	(6061 Aluminum)	3,000 PSIG
S	(304 Stainless)	5,000 PSIG
S316	(316 Stainless)	5,000 PSIG

Doering Line Mount Housing for Cartridge Valve.

Also see Spec. Sheet No. 1201455 for wider Line Mount body style.

Also see Spec. Sheet No. 1202982 for Panel Mount Housing.

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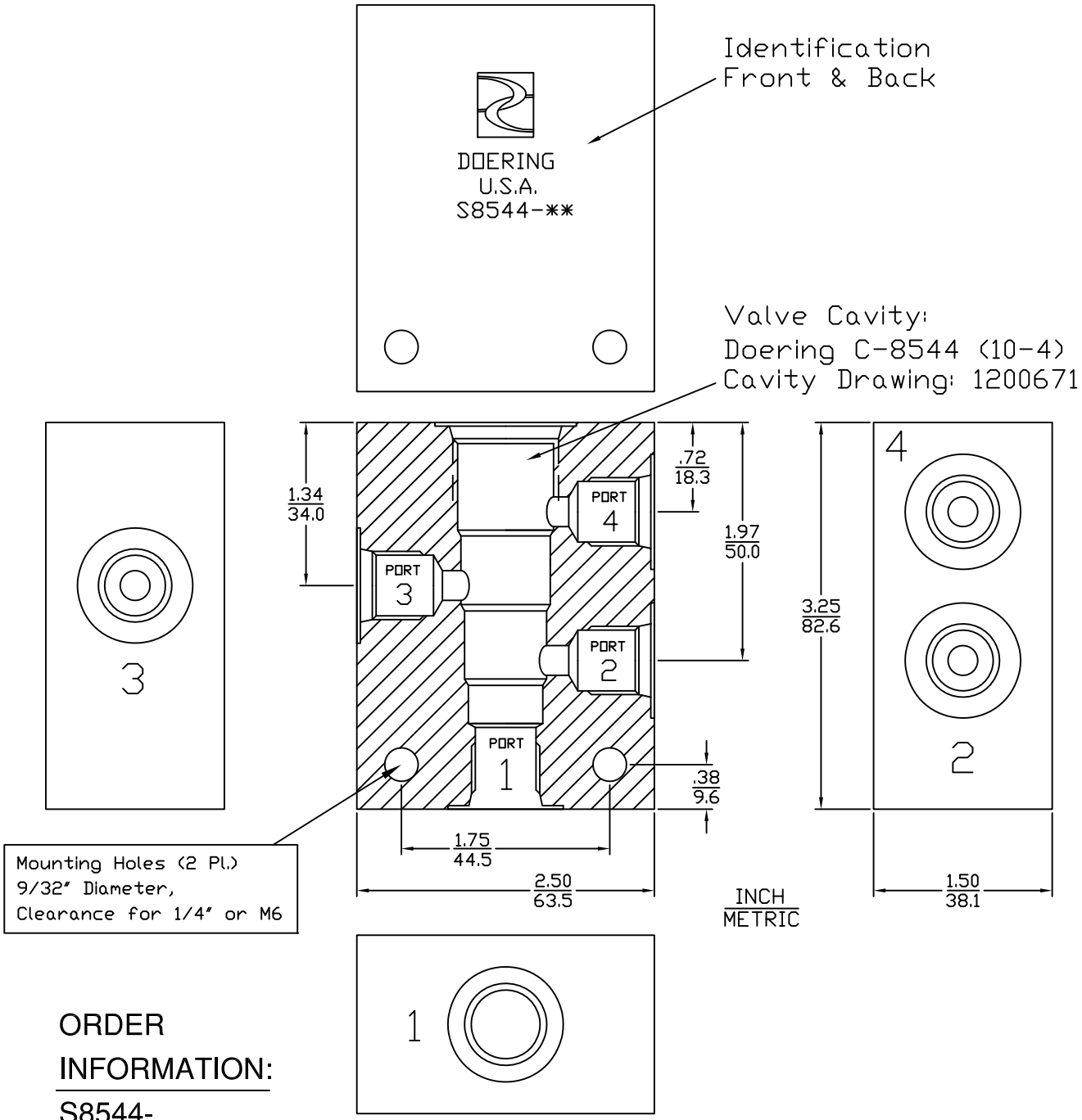

ORDER INFORMATION:

S8544- ___ ___

Ports 1, 2, 3 & 4

- 1 (1/8 NPT)
- 2 (1/4 NPT)
- 3 (3/8 NPT)
- 4 (SAE4, ORB)
- G4 (G 1/4-19 BSPP)
- 6 (SAE6, ORB)
- G6 (G 3/8-19 BSPP)

Material Option, Pressure Rating

Blank	(6061 Aluminum)	3,000 PSIG
S	(304 Stainless)	5,000 PSIG
S316	(316 Stainless)	5,000 PSIG

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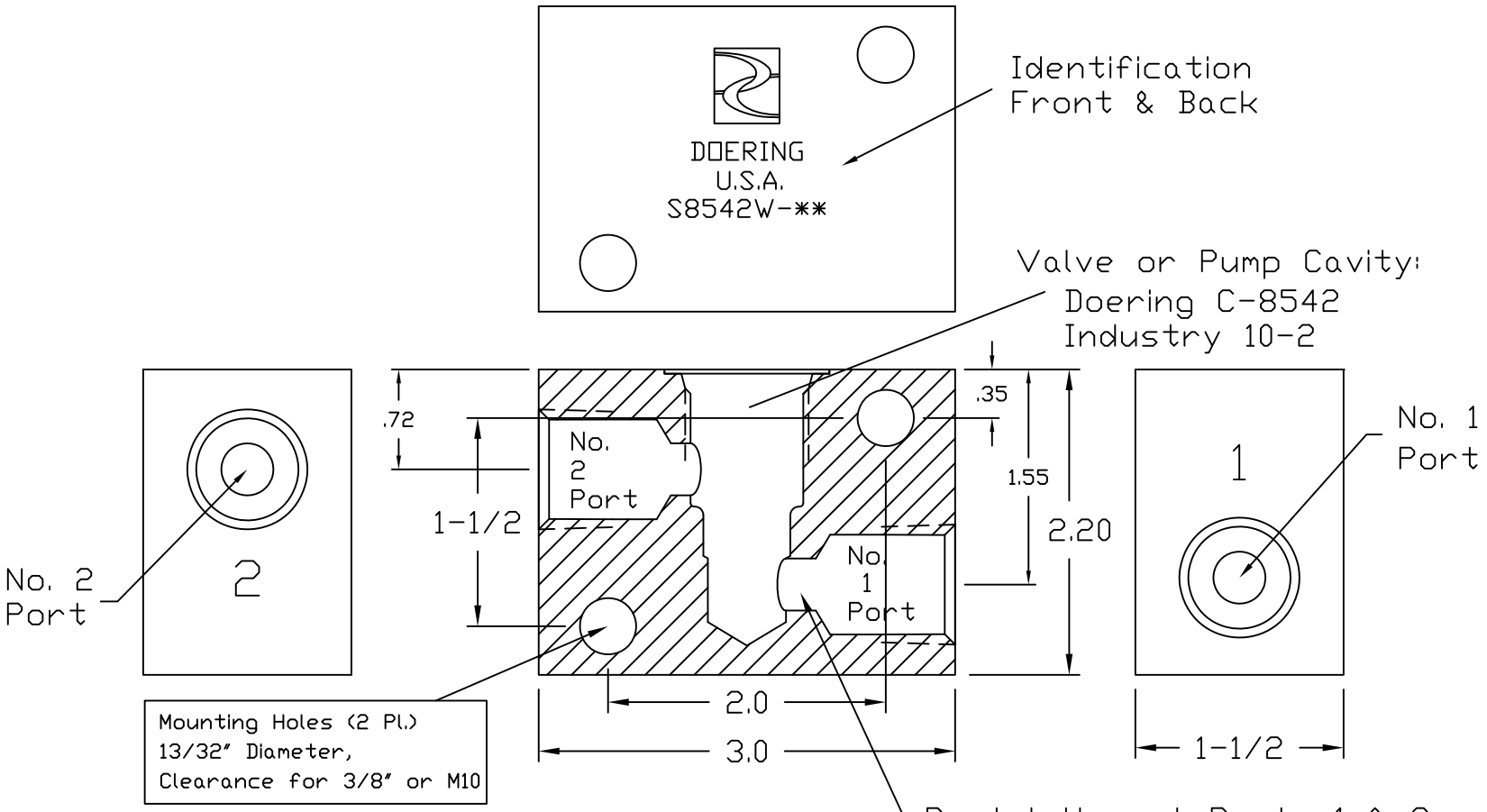

ORDER INFORMATION:

S8542W- ___ ___

Ports 1 & 2

1	(1/8 NPT)
2	(1/4 NPT)
3	(3/8 NPT)
4	(SAE4, ORB)
G4	(G 1/4-19 BSPP)
5	(1/2 NPT)
6	(SAE6, ORB)
G6	(G 3/8-19 BSPP)
8	(SAE8, ORB)

Material Option, Pressure Rating

Pressure Note: Double pressure rating for Port 1 only.
Applies to Port Sizes -1, -2, -3, -4 and -6

Blank	(6061 Aluminum)	3,000 PSIG
S	(304 Stainless)	5,000 PSIG
S316	(316 Stainless)	5,000 PSIG

Doering Line Mount Housing for Valve or Pump, Wide Body Style.

For Smaller Line Mount Body Style, see 1200674 Spec. Sheet.

For Panel Mount Housing System, see 1202982 and 1203290 Spec. Sheets.

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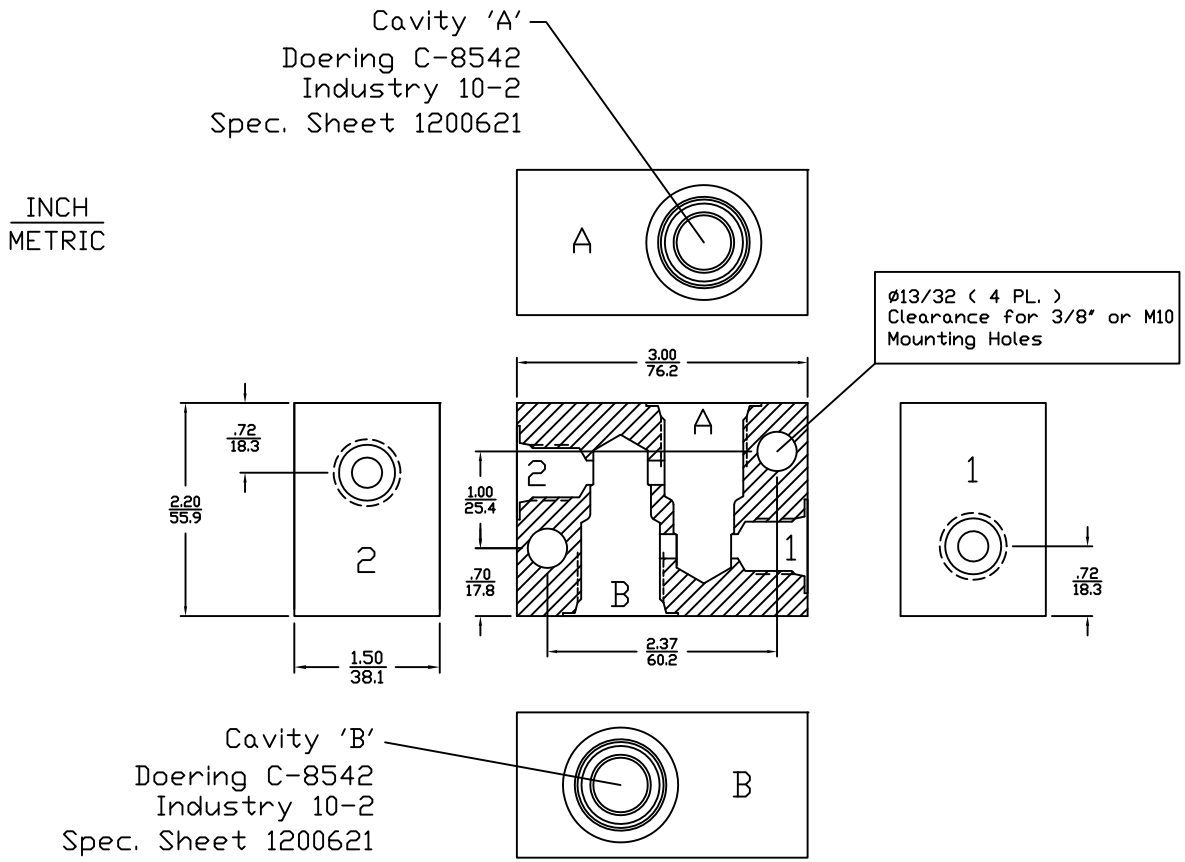

S1552 Series Housing
Order Information:

S1552-

Ports 1 & 2
1 (1/8 NPT)
2 (1/4 NPT)
3 (3/8 NPT)
4 (SAE4, ORB)
6 (SAE6, ORB)

Material Option, Working Pressure
Proof Pressure 2X Working PSIG.

Blank	(6061 Aluminum)	3,000 PSIG
S	(304 Stainless)	5,000 PSIG
S316	(316 Stainless)	5,000 PSIG

App Pages Follow
Order Housing and Valves Separately

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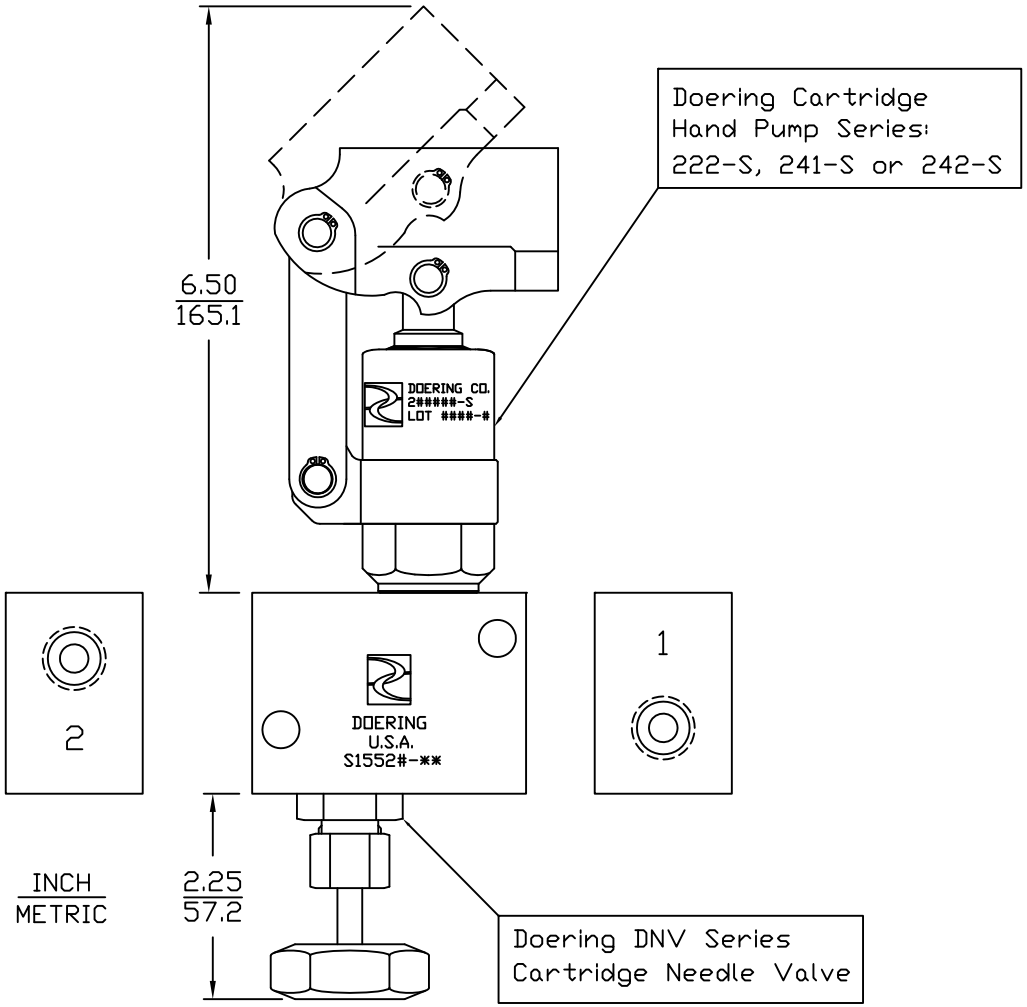

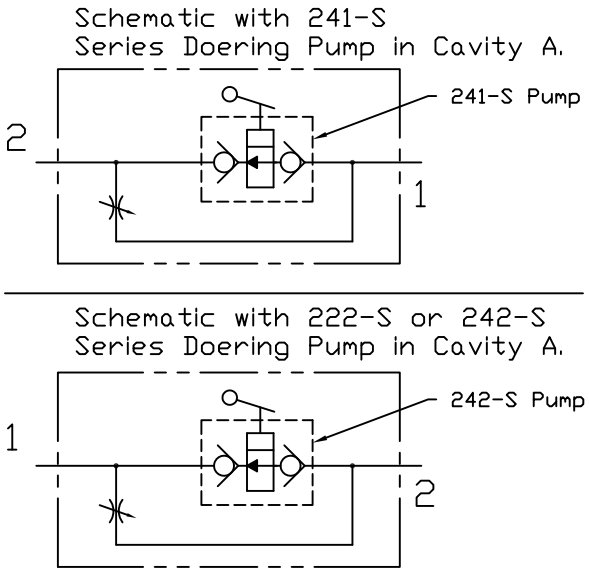

Assembly may be orientated in any position.
Example Assembly:
Order Components Separately.

S1552#-## Doering Housing. See Page 1 for Part Number Detail.
222###-S Doering Cartridge Pump, Ref. Spec. Sheet 222##
241###-S Doering Cartridge Pump, Ref. Spec. Sheet 241##
242###-S Doering Cartridge Pump, Ref. Spec. Sheet 242##
DNV-K-10-#-###-### Doering Needle Valve, Spec Sheet 1201273

S1552 Series Housing Illustrated with Doering Cartridge Pump and Needle Valve

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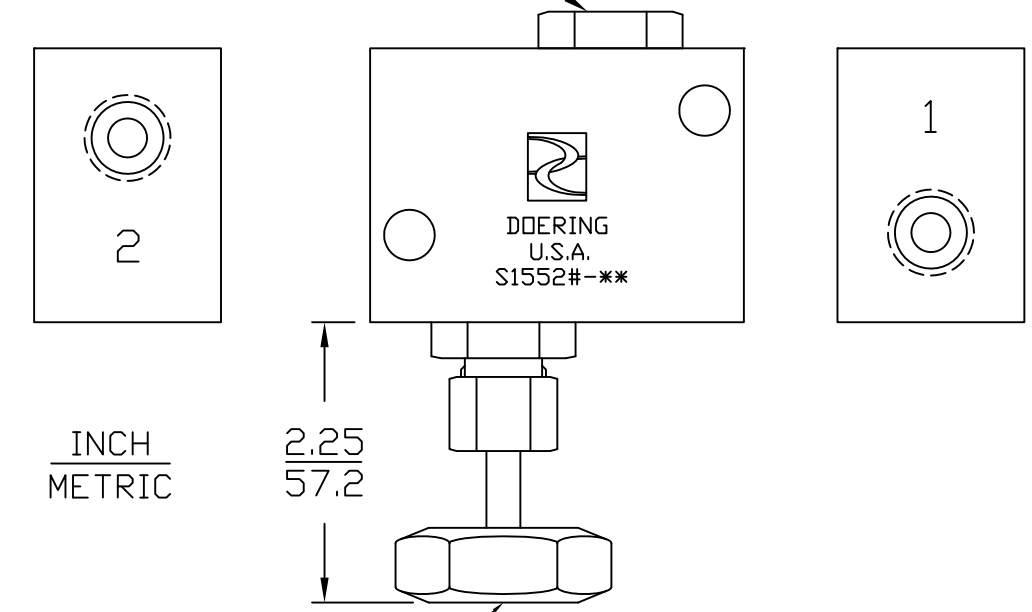
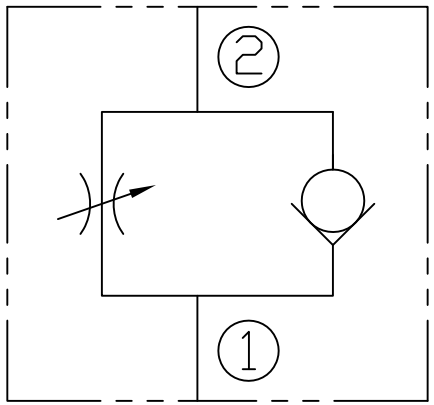
Doering DCV Series
Cartridge Check Valve



Doering DNV Series
Cartridge Needle Valve

Graphic Symbol:
Flow Control and Check Valve
Spec. Sheets 1201273, 1201552, 1202025, 1202937
Order Housing and Valves Separately.



Assembly may be orientated in any position.

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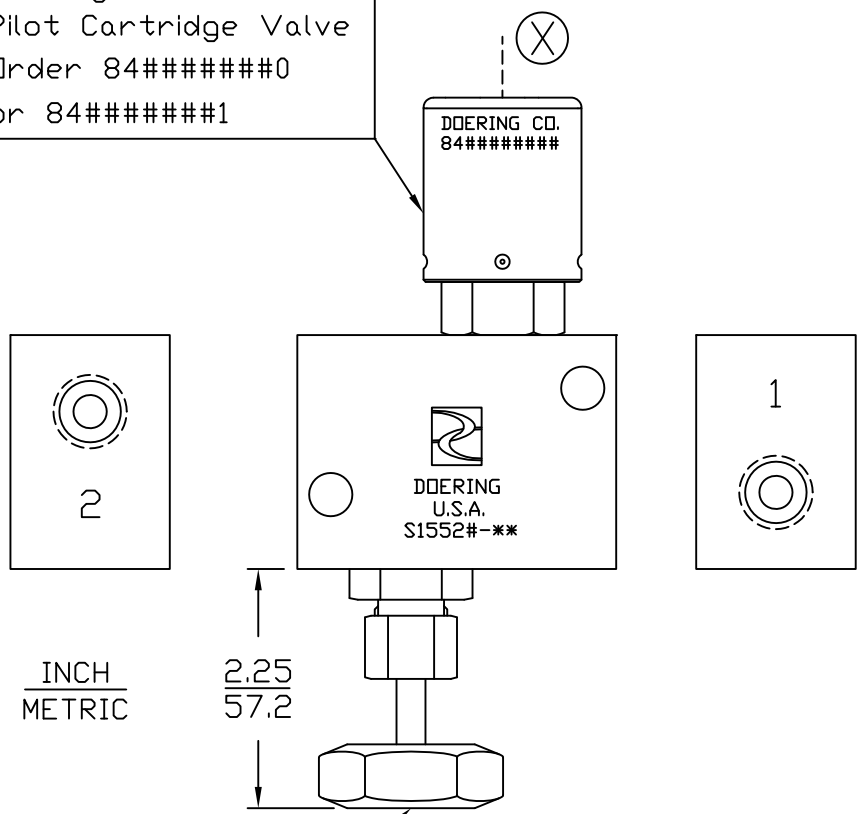
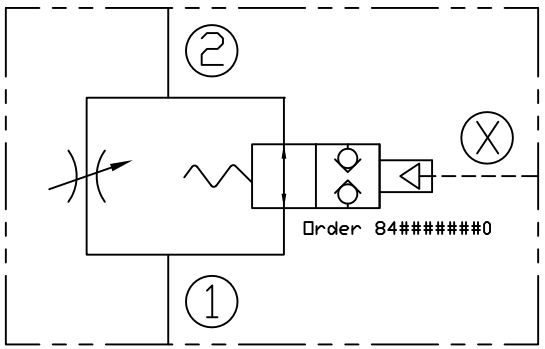
Doering 2PB Series
Pilot Cartridge Valve
Order 84########0
or 84########1

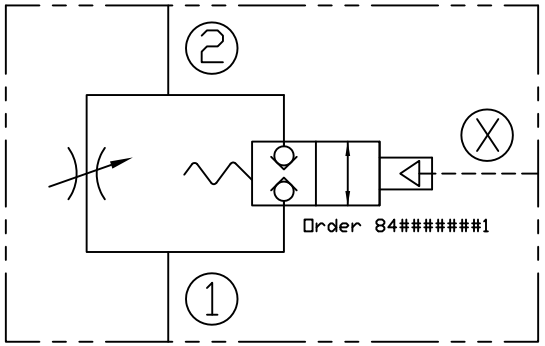


Doering DNV Series
Cartridge Needle Valve

Graphic Symbol:
Flow Control and Normally Open Pilot to Close Valve
Spec. Sheets 1200755, 1201076, 1201273, 1201317, 1201552
Order Housing and Valves Separately.



Graphic Symbol:
Flow Control and Normally Closed Pilot to Open Valve
Spec. Sheets 1200754, 1201280, 1201273, 1201424, 1201552
Order Housing and Valves Separately.



Assembly may be orientated in any position.

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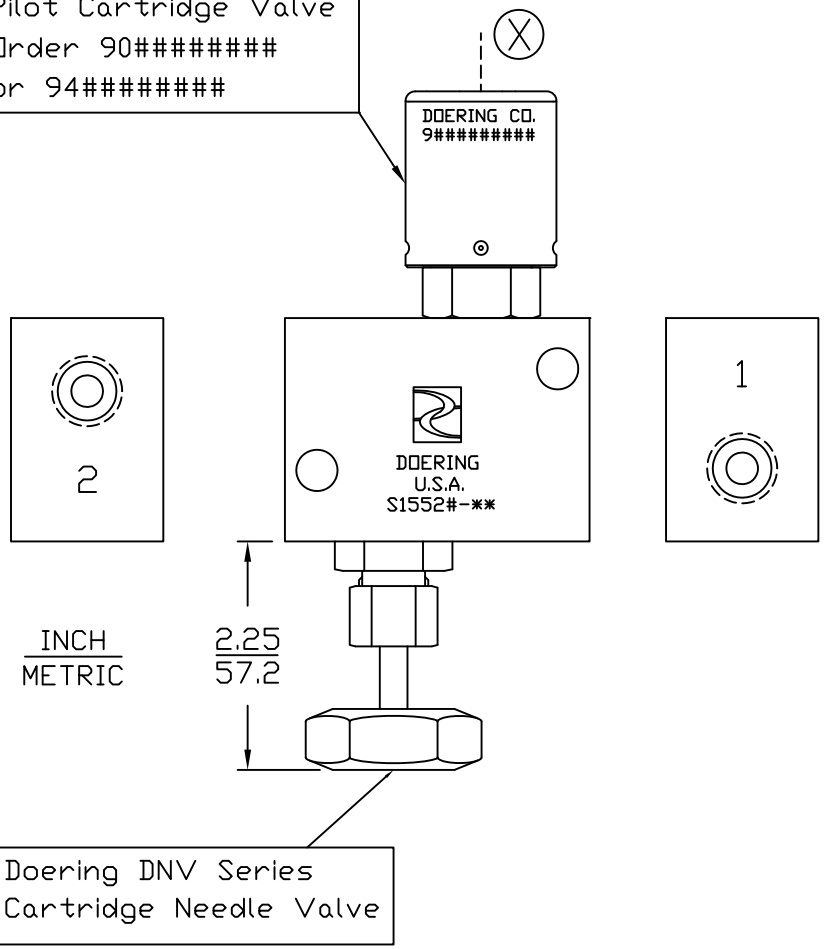
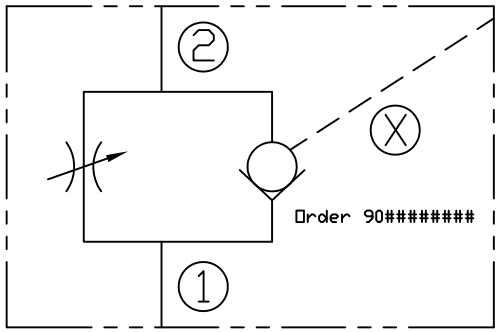
Doering POC Series
Pilot Cartridge Valve
Order 90########
or 94########

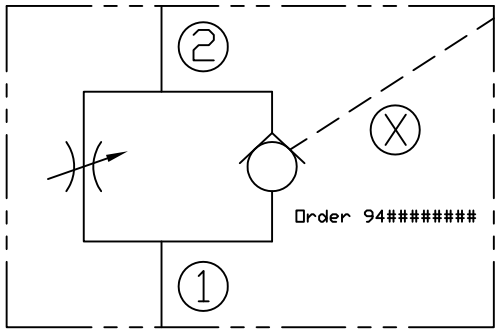


Doering DNV Series
Cartridge Needle Valve

Graphic Symbol:
Flow Control and Pilot to hold Closed Check Valve (POC).
Spec. Sheets 1201273, 1201552 and more under POC.
Order Housing and Valves Separately.



Graphic Symbol:
Flow Control and Pilot to hold Open Check Valve (POC).
Spec. Sheets 1201273, 1201552 and more under POC.
Order Housing and Valves Separately.



Assembly may be orientated in any position.

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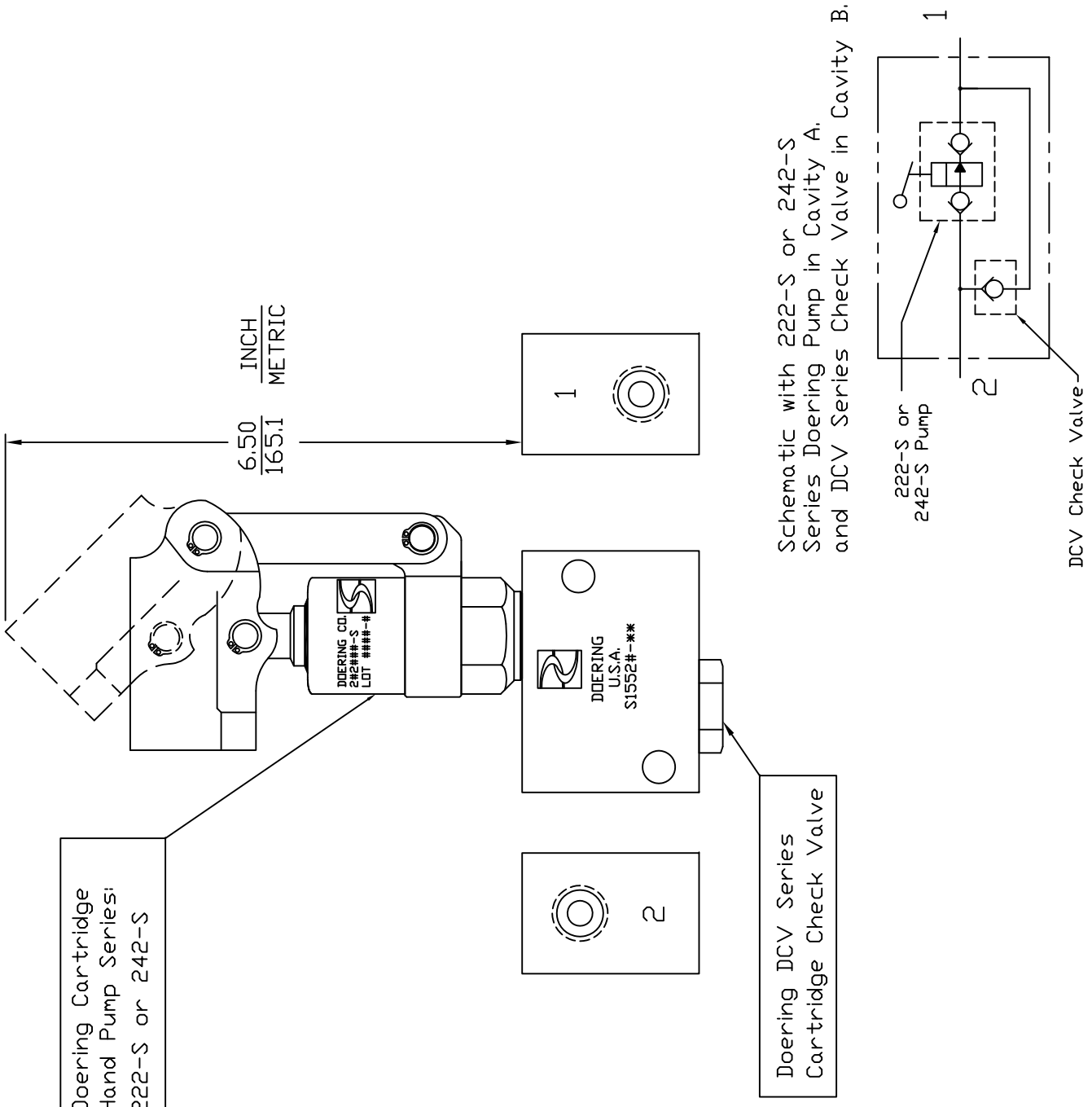

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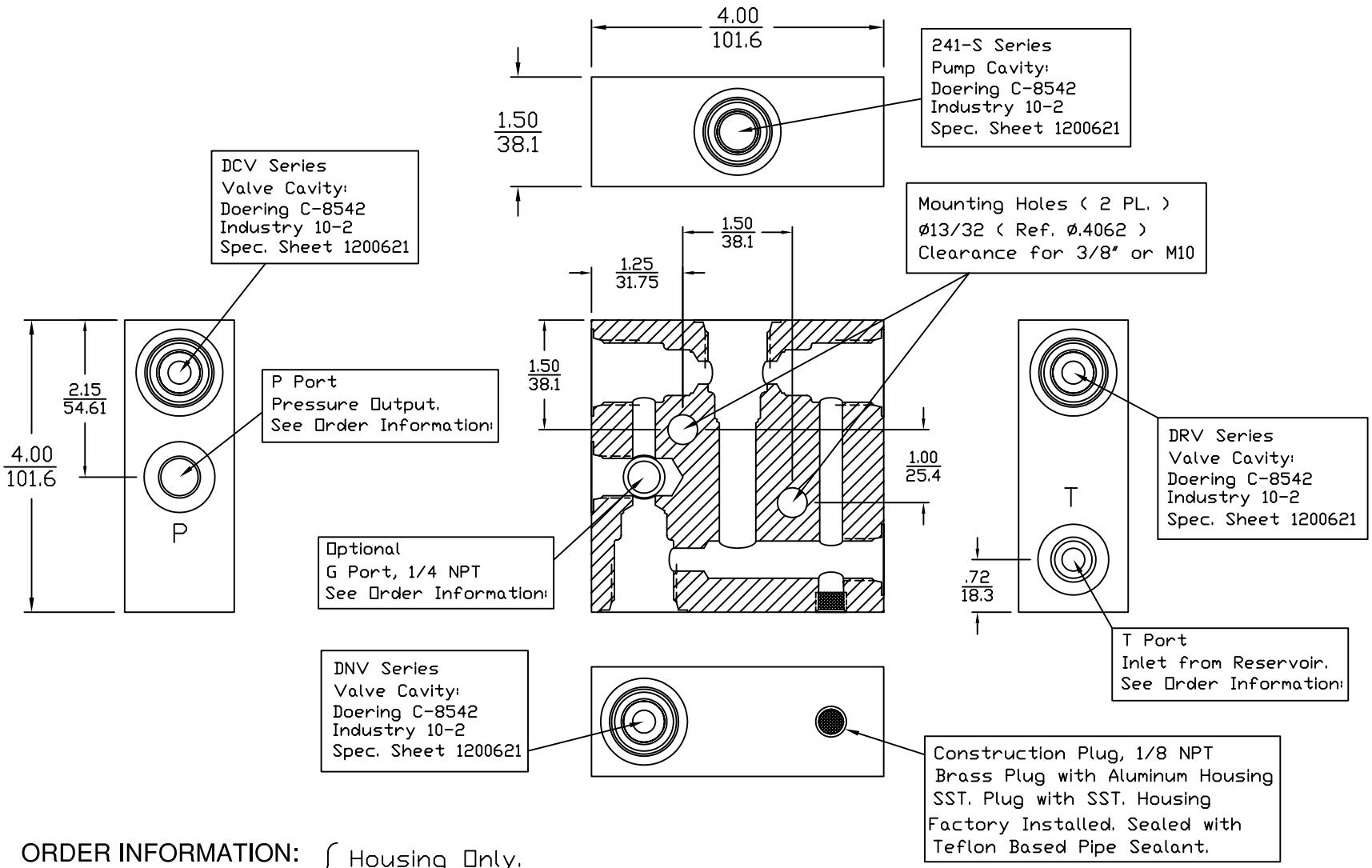

ORDER INFORMATION:

S1554#-

Housing Only.
Order Pump and Valves Separately.

Optional Gauge Port

G (1/4 NPT)

Ports P & T

1	(1/8 NPT)
2	(1/4 NPT)
3	(3/8 NPT)
4	(SAE4, ORB)
6	(SAE6, ORB)

Material Option, Pressure Rating

Blank	(6061 Aluminum)	3,000 PSIG
S	(304 Stainless)	5,000 PSIG
S316	(316 Stainless)	5,000 PSIG

S1554 Series Housing Designed for use with 241-S Series Doering Cartridge Hand Pump

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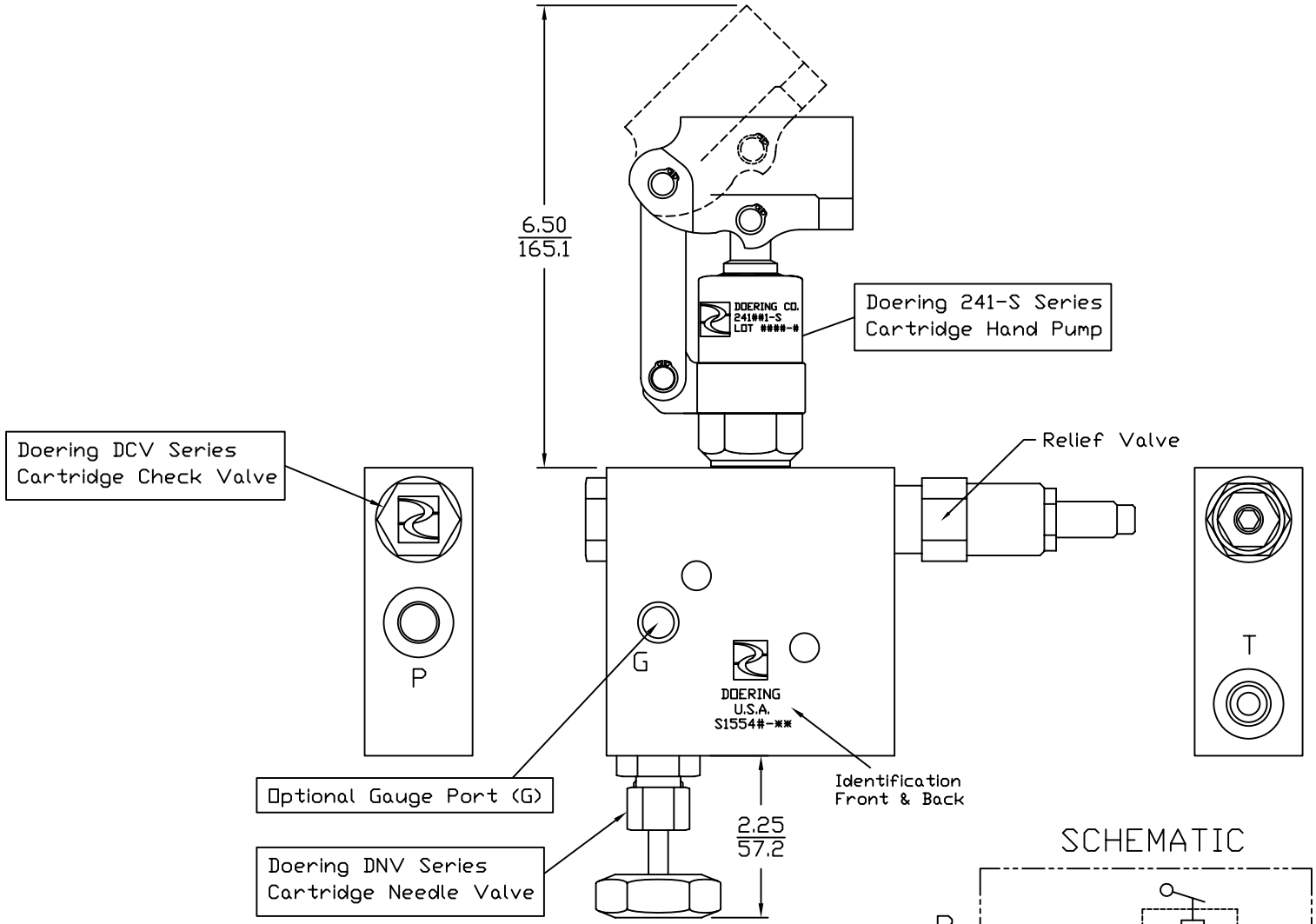
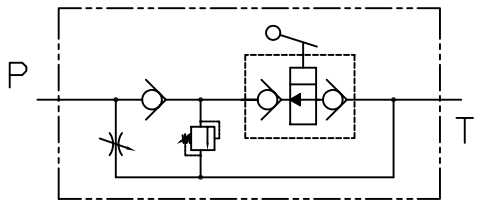


SCHEMATIC



Example Assembly:
Order Components Separately.

S1554#-## Doering Housing
241###-S Doering Cartridge Pump, Ref. Spec. Sheet 1202251
DCV-#-10-#-#-### Doering Check Valve, Spec. Sheet 1202025
DNV-K-10-#-###-### Doering Needle Valve, Spec Sheet 1201273
Relief Valve, Not Available through Doering Company at this time.
Relief Valve must relieve Back to T Port. See Flow path on Page 1.
Gauge, Not Available through Doering at this time.

S1554 Series Housing
Illustrated with
Pump, Check Valve,
Needle Valve & Relief Valve

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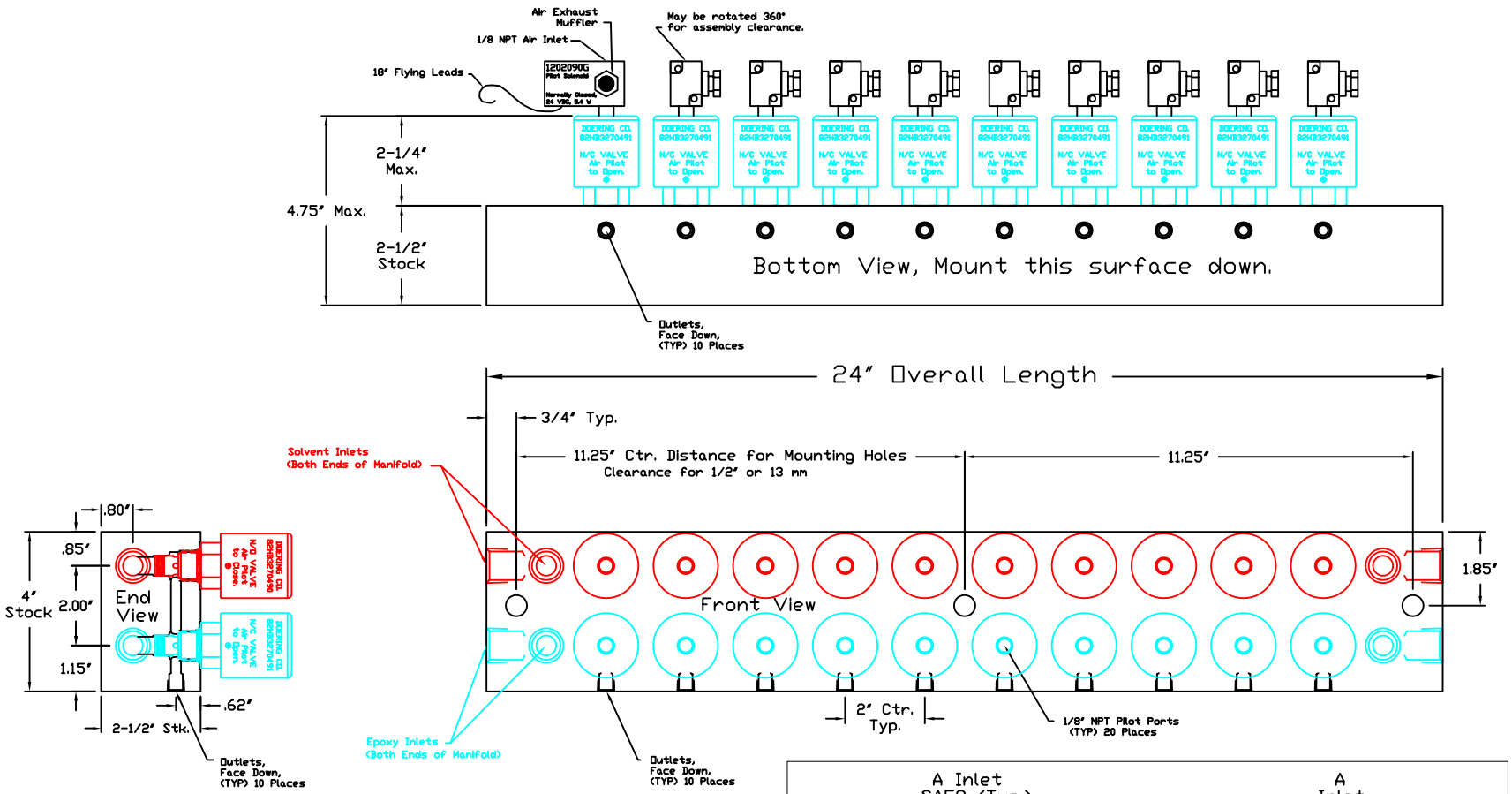

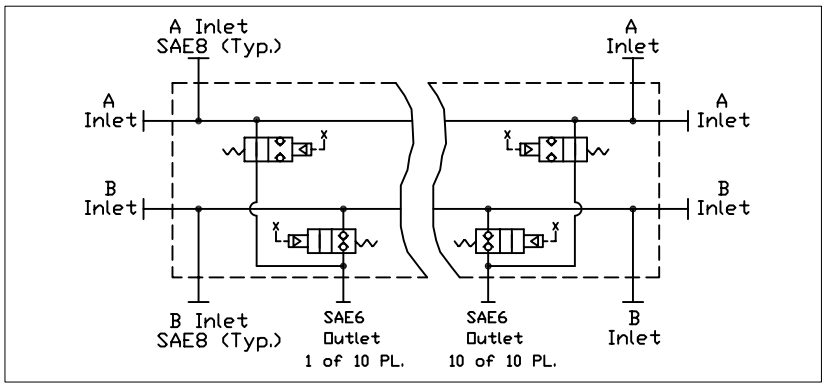

Bill of Material:

Complete assembly P/N 1202761

Each Assembly Includes the following:

1202753 Manifold, 10 Station, 304 SST. (One Each)

82HB3270490 Doering valves, Normally Open (10 Each)

82HB3270491 Doering valves, Normally Closed (10 Each)

1202090G Solenoid Pilot valves, 24 VDC, Normally Closed (20 Each)

Assembly Notes:

Normally Open Valves installed in Row A (Solvent Control)

Normally Closed Valves installed in Row B (Epoxy Controll)

Solenoid Pilot Valves installed as Normally Closed.

DOERING

Spec. Sheet No. 1202753 Rev. 04

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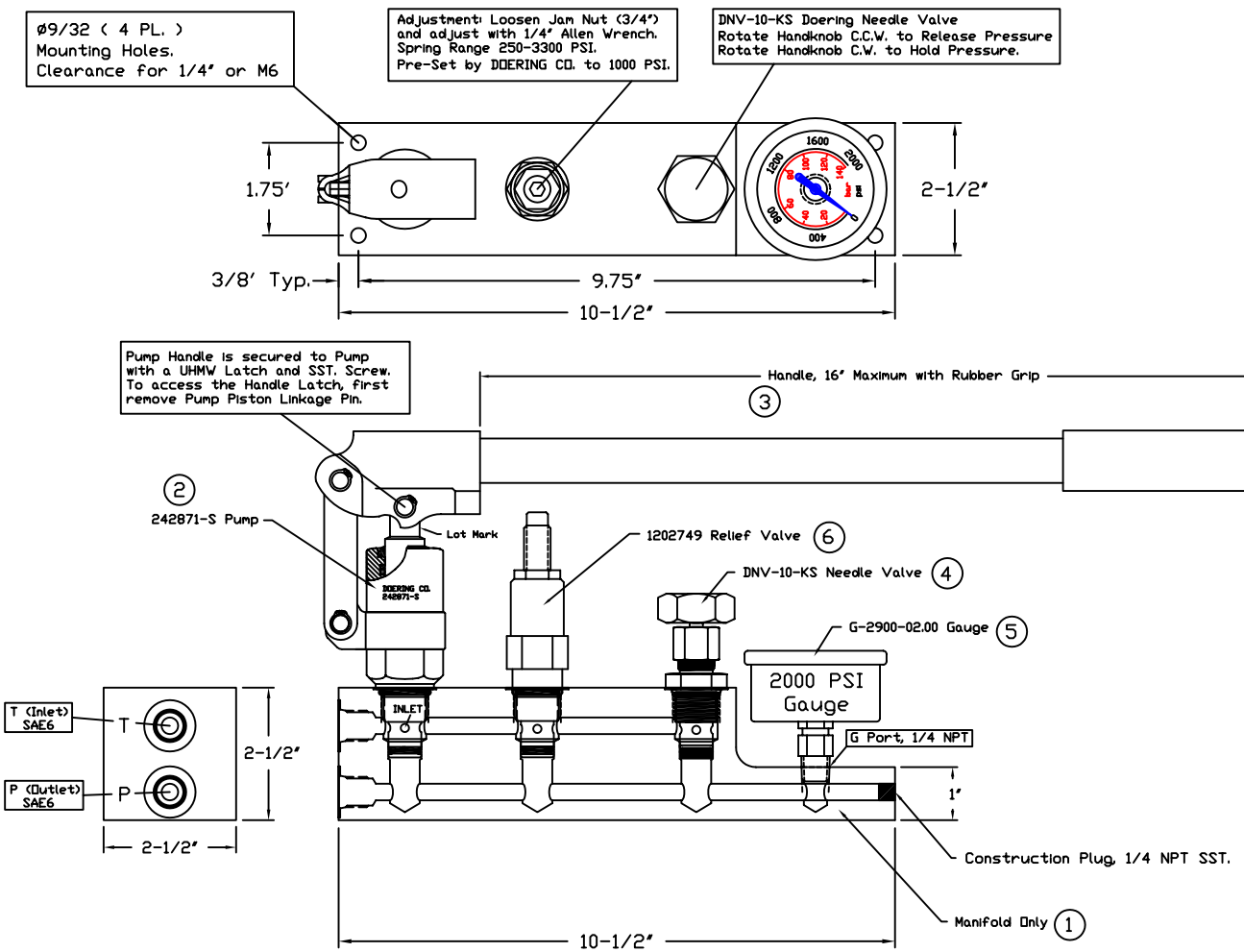
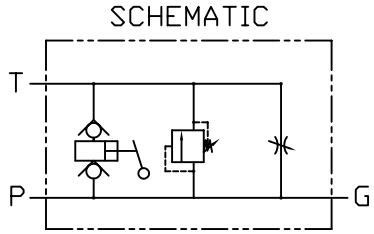


SCHEMATIC



For Complete Assembly, Please order Doering P/N 1202888

Components List / Bill of Material

Key	Doering P/N	Manufacturer	Description
1	1202887	Doering Co.	Manifold, Aluminum, 3500 PSI Rated
2	242871-S	Doering Co.	Pump, Hand Operated, 1000 PSI/ 50# Handle Force
3	1202899	Doering Co.	Handle, SST., Rubber Grip and UHMW Latch
4	DNV-10-KS	Doering Co.	Needle Valve, SST.
5	G2900-02.00	D.F.C.	Gauge, SST. Case, 0-2000 PSI
6	1202749	HYF	Relief Valve (RV-20A-0-N-33) Spring Range 250 to 3300 PSI

1202888 DOERING
Pump Station Assembly

DOERING

SPEC. SHEET NO. 1202888 REV. 01

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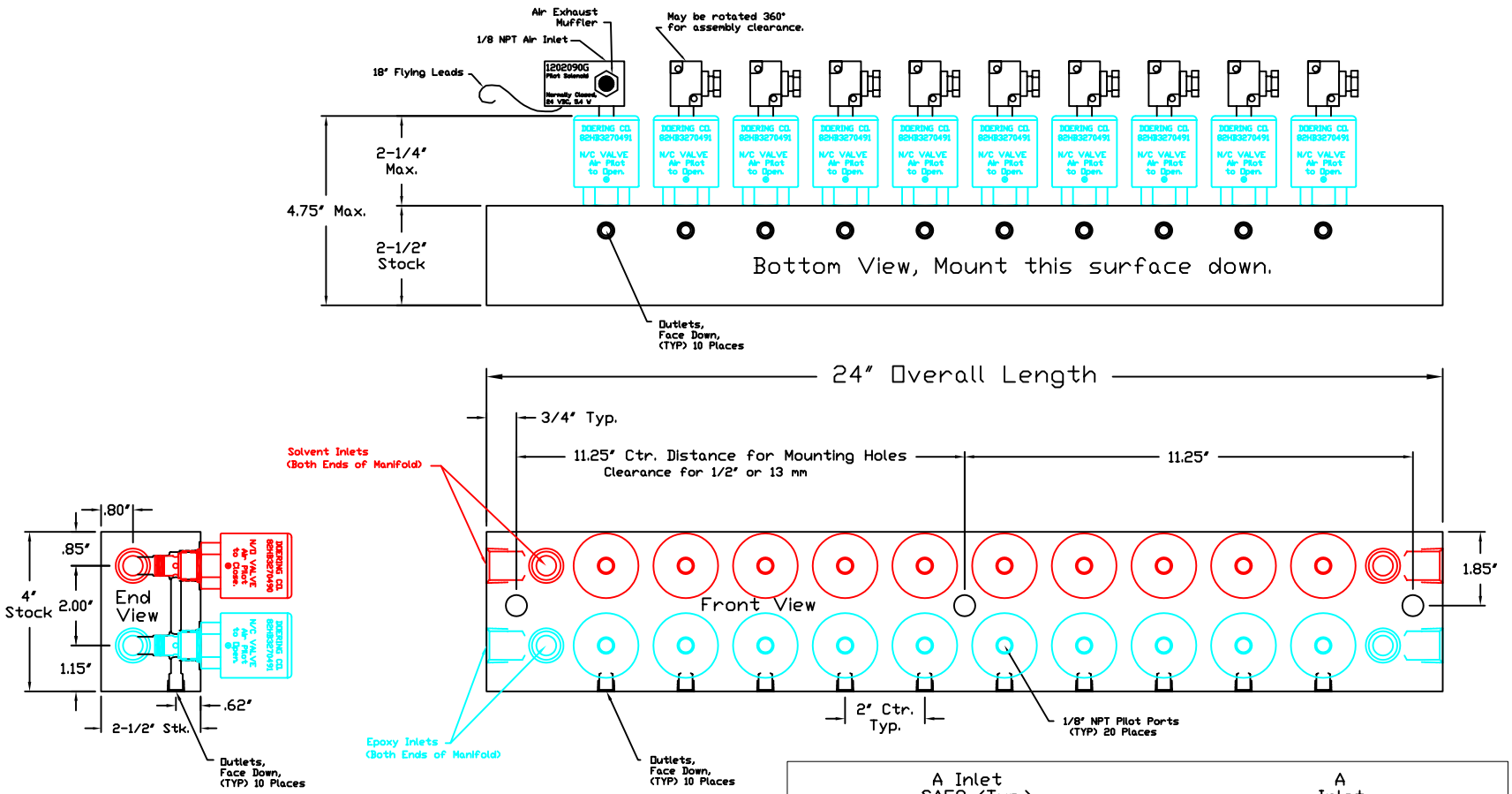

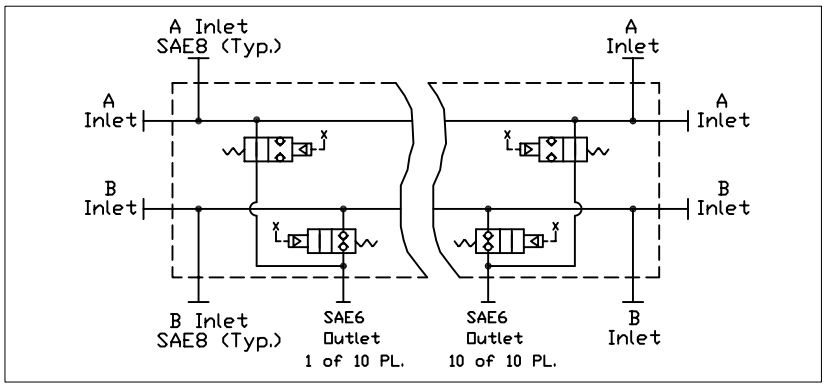

Bill of Material:

Complete assembly P/N 1202761

Each Assembly Includes the following:

1202753 Manifold, 10 Station, 304 SST. (One Each)

82HB3270490 Doering valves, Normally Open (10 Each)

82HB3270491 Doering valves, Normally Closed (10 Each)

1202090G Solenoid Pilot valves, 24 VDC, Normally Closed (20 Each)

Assembly Notes:

Normally Open Valves installed in Row A (Solvent Control)

Normally Closed Valves installed in Row B (Epoxy Controll)

Solenoid Pilot Valves installed as Normally Closed.

DOERING

Spec. Sheet No. 1202753 Rev. 04

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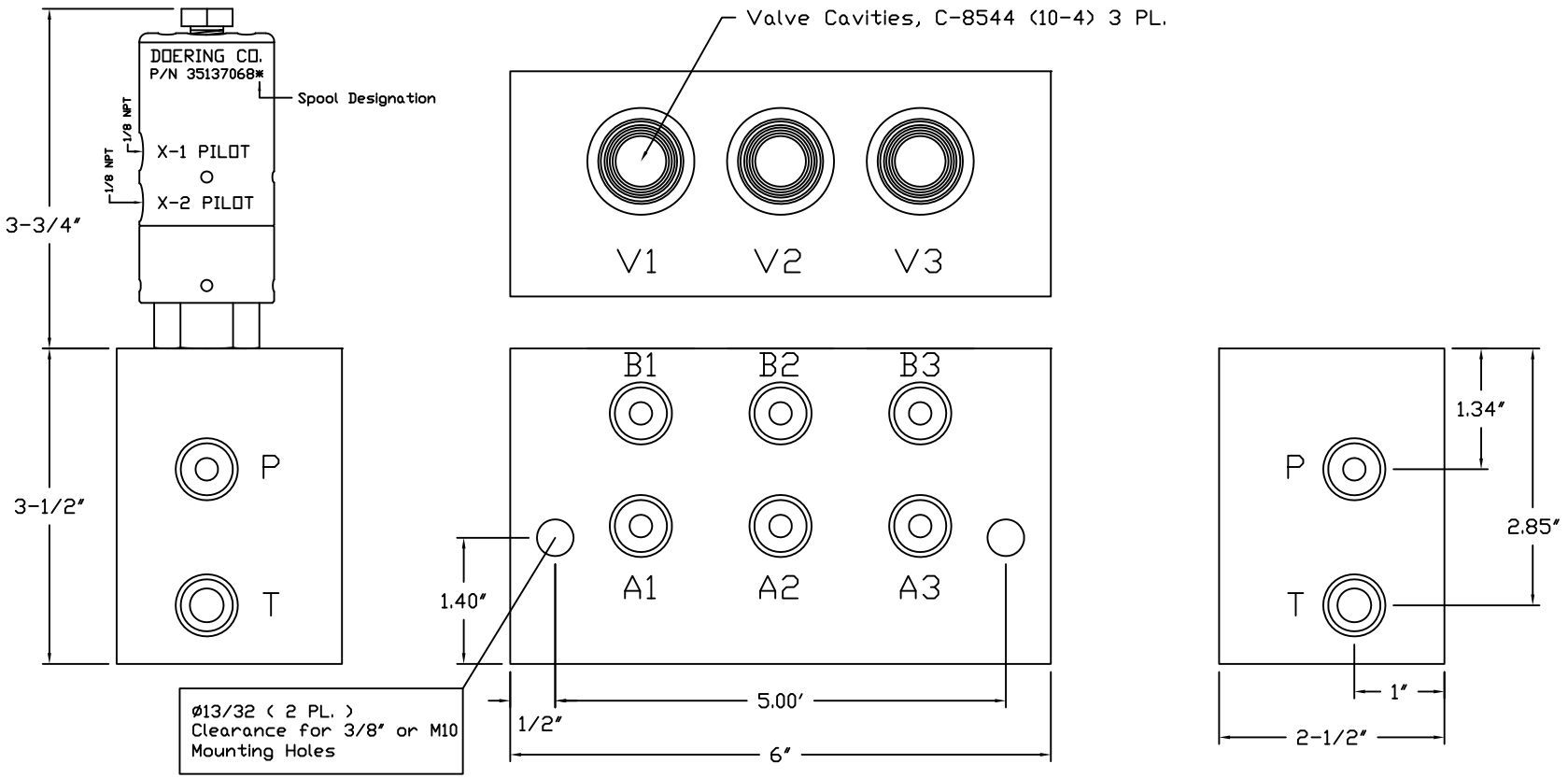

Order Information:

Order Cartridge Valves Separately (One Per Station Required)
Multi Station Housing: S3293-#-#-#. (S3293-3-#-# Illustrated)

Stations

2	(Two Station)
3	(Three Station)
4	(Four Station)
5	(Five Station)
6	(Six Station)

P & T Ports

2	(1/4 NPT)
3	(3/8 NPT)
4	(SAE4, ORB)
6	(SAE6, ORB)

A & B Ports

1	(1/8 NPT)
2	(1/4 NPT)
3	(3/8 NPT)
4	(SAE4, ORB)
6	(SAE6, ORB)

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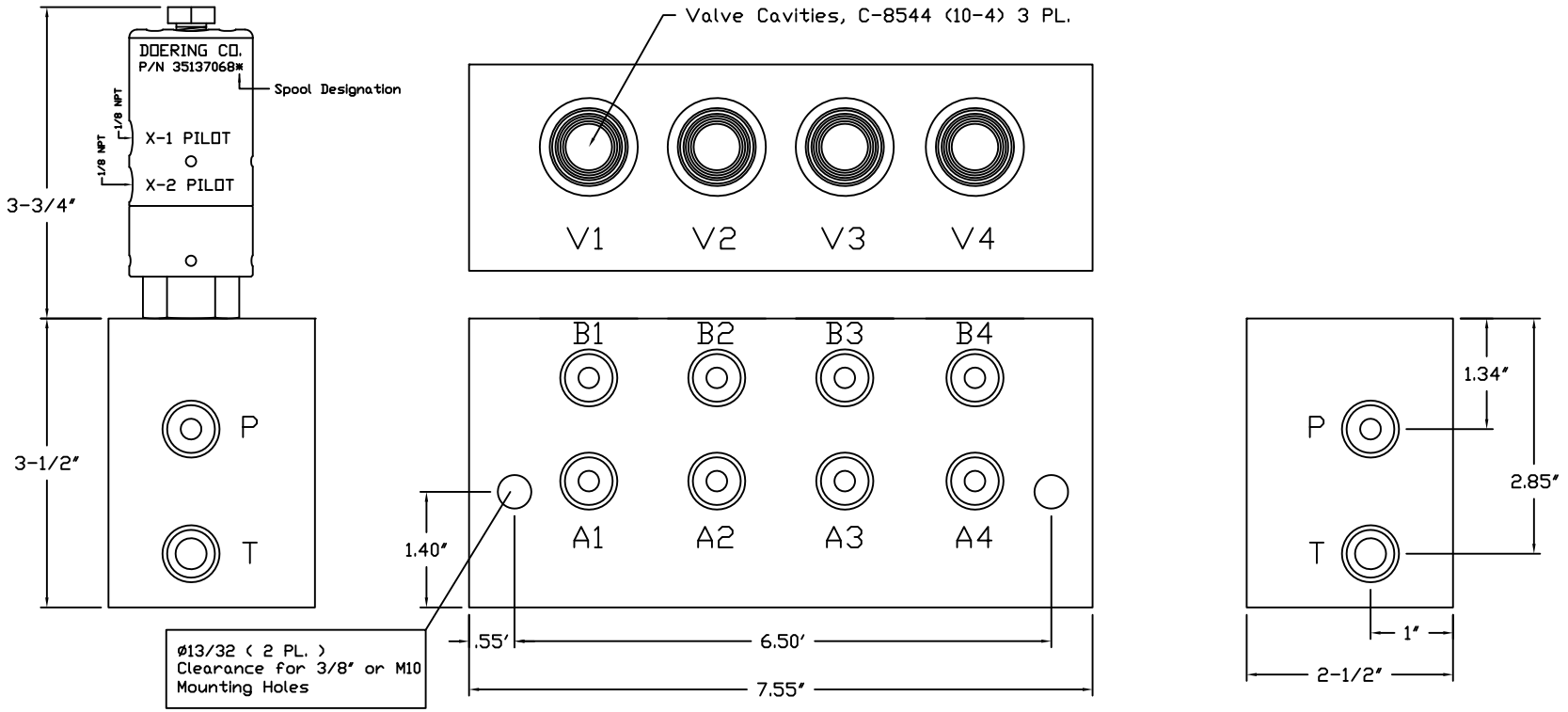

Order Information:

Order Cartridge Valves Separately (One Per Station Required)

Multi Station Housing: S3293-#-#-#. (S3293-4-#-# Illustrated)

Stations

2	(Two Station)
3	(Three Station)
4	(Four Station)
5	(Five Station)
6	(Six Station)

P & T Ports

2	(1/4 NPT)
3	(3/8 NPT)
4	(SAE4, ORB)
6	(SAE6, ORB)

A & B Ports

1	(1/8 NPT)
2	(1/4 NPT)
3	(3/8 NPT)
4	(SAE4, ORB)
6	(SAE6, ORB)

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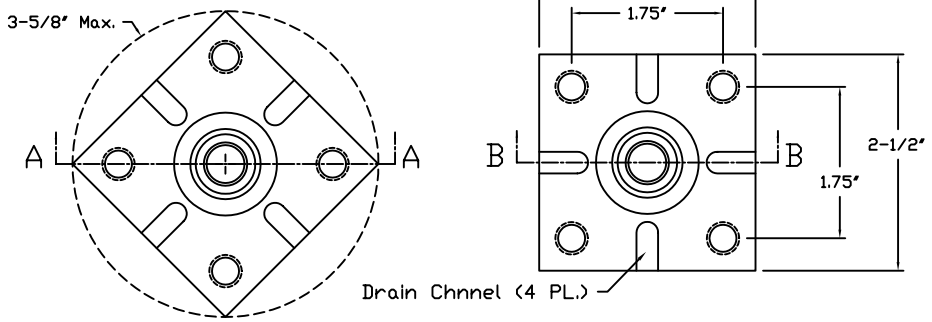
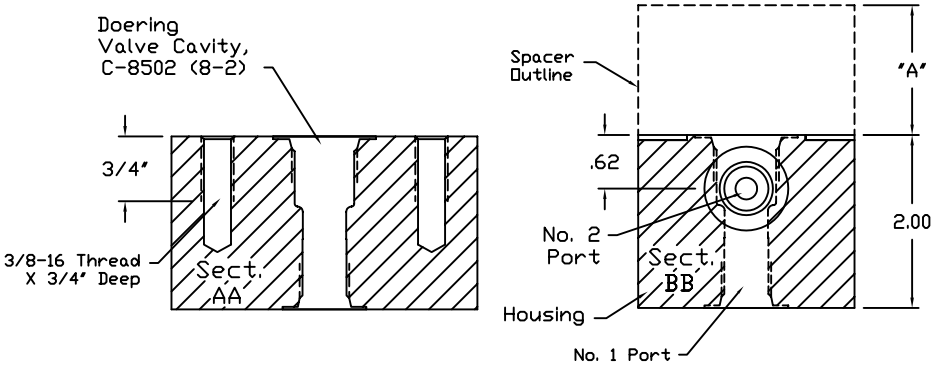
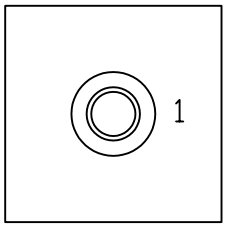
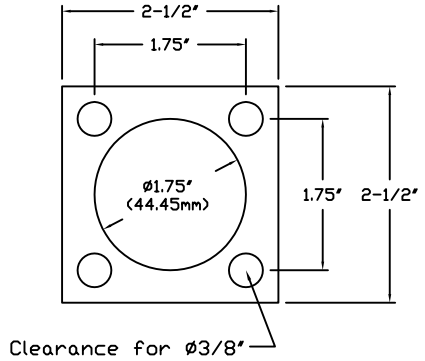
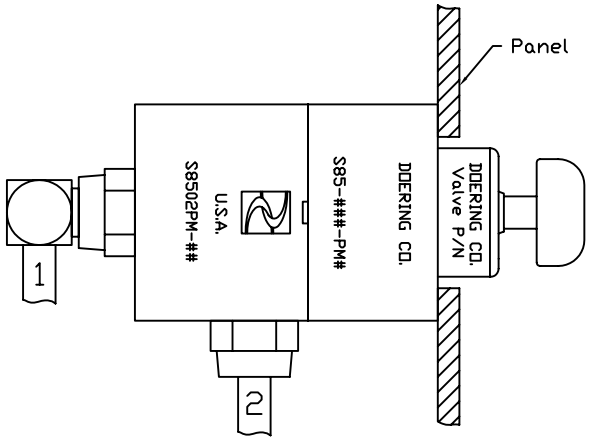








Optional Panel Mount Spacer Sold Separately.
See Spec. Sheet 1202990



ORDER INFORMATION:

S8502PM-____

Ports 1 & 2	
1	(1/8 NPT)
2	(1/4 NPT)
3	(3/8 NPT)
4	(SAE4, ORB)
6	(SAE6, ORB)

Material Option, Pressure Rating	
Blank	(6061 Aluminum)
S	(304 Stainless)
S316	(316 Stainless)

Doering SPM Series

Doering Panel Mount Housing

DOERING

SPEC. SHEET NO. 1202981 REV. 07

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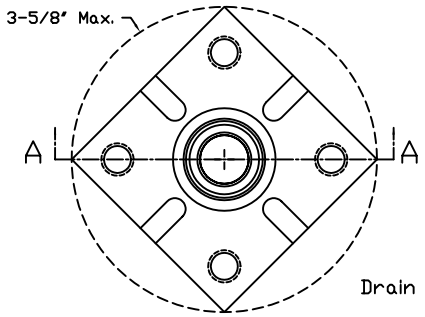
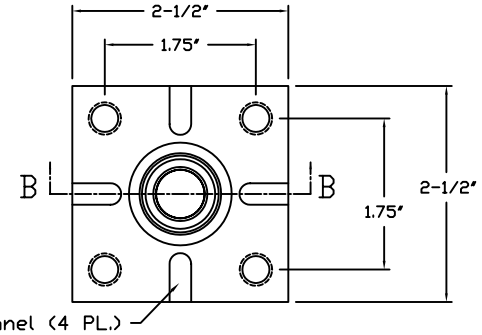
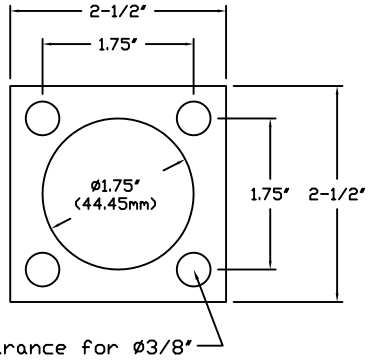
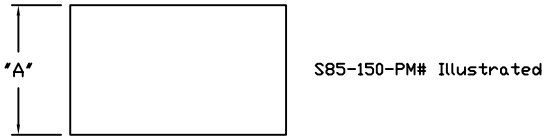
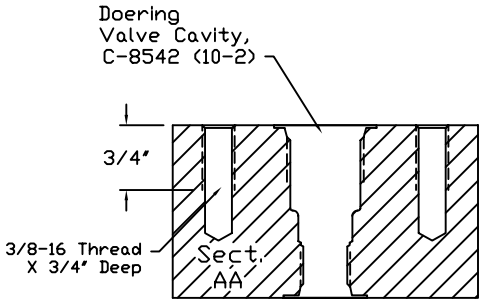


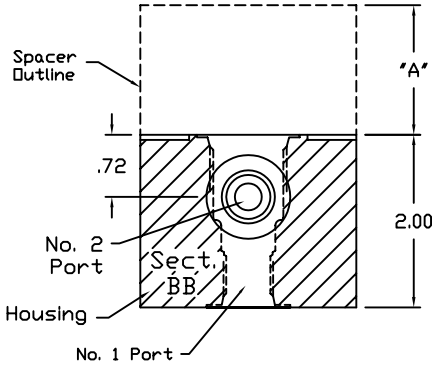


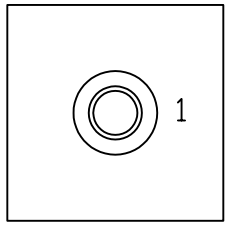


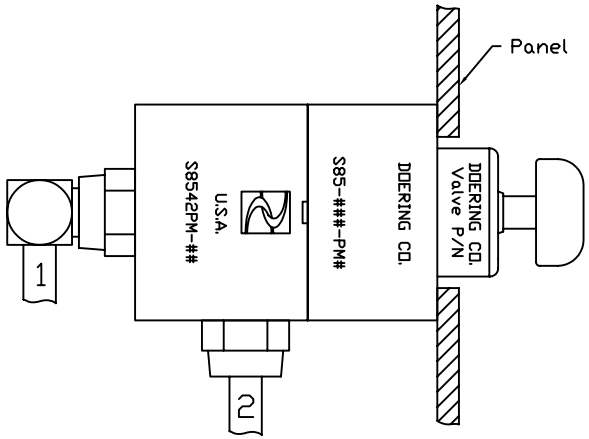


Optional Panel Mount Spacer Sold Separately.
See Spec. Sheet 1202990









ORDER INFORMATION:

S8542PM-

Ports 1 & 2	
1	(1/8 NPT)
2	(1/4 NPT)
3	(3/8 NPT)
4	(SAE4, ORB)
6	(SAE6, ORB)

Material Option, Pressure Rating	
Blank	(6061 Aluminum)
S	(304 Stainless)
S316	(316 Stainless)

Doering SPM Series

Doering Panel Mount Housing

DOERING

SPEC. SHEET NO. 1202982 REV. 07

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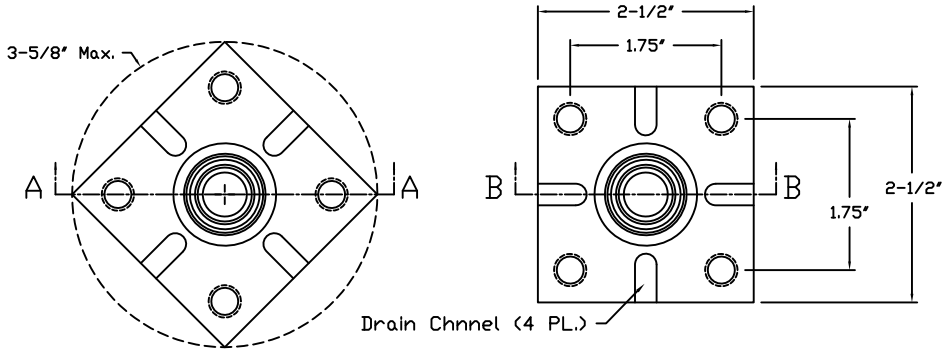
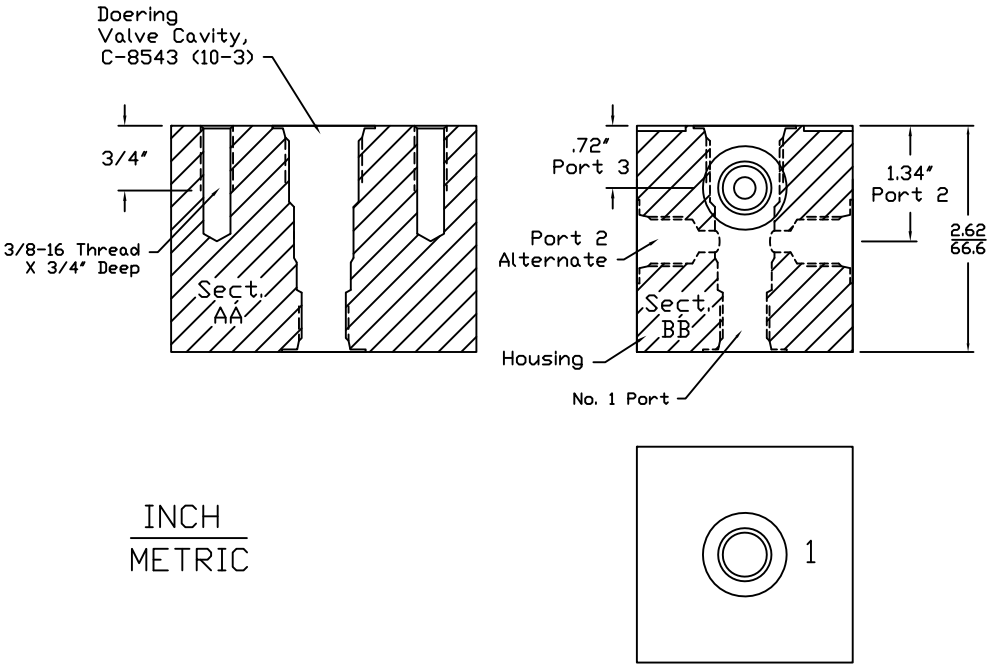
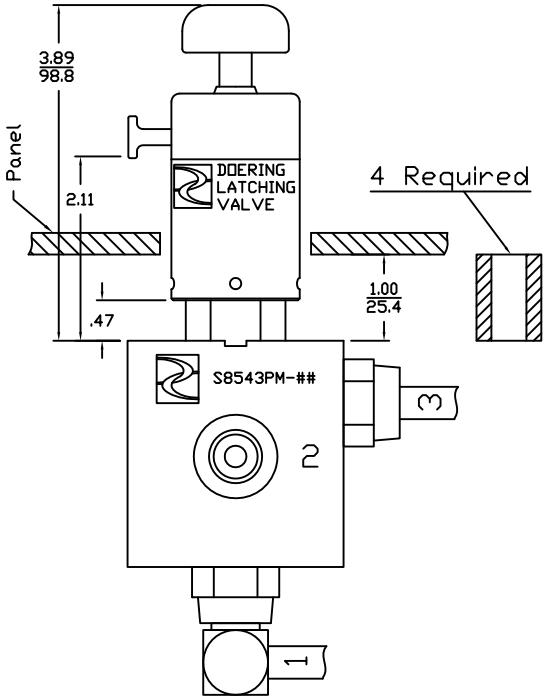




INCH
METRIC

Illustration Assembly scaled with optional 1" Stand Off Spacers between Panel Mount Housing and back side of panel face material.



Panel Mount housings may be mounted directly to the site panel, or Doering SO- Series Stand Off Spacers may be used to improove access to the valve wrench hex area or to control the protrusion of the valve from the panel face. Please see Doering SO- Series Stand Off Spacers on Spec. Sheet 1203290.

ORDER INFORMATION:

S8543PM-___ ___

Ports 1, 2 & 3	
1	(1/8 NPT)
2	(1/4 NPT)
3	(3/8 NPT)
4	(SAE4, ORB)
6	(SAE6, ORB)

Material Option, Pressure Rating		
Blank	(6061 Aluminum)	3,000 PSIG
S	(304 Stainless)	5,000 PSIG
S316	(316 Stainless)	5,000 PSIG

Note: Port 2 Alternate Plug Not Supplied.

Doering SPM Series

Doering Panel Mount Housing

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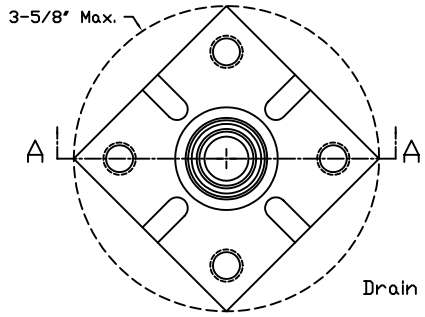
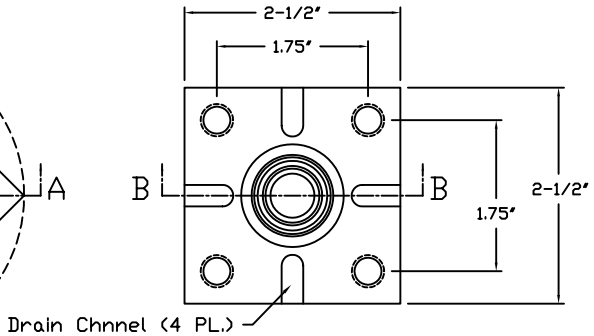
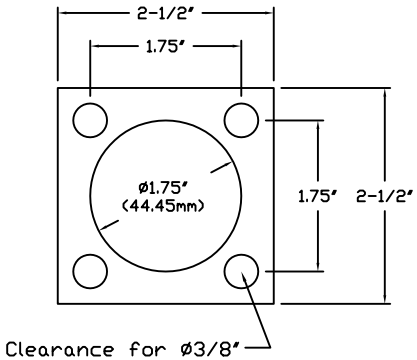
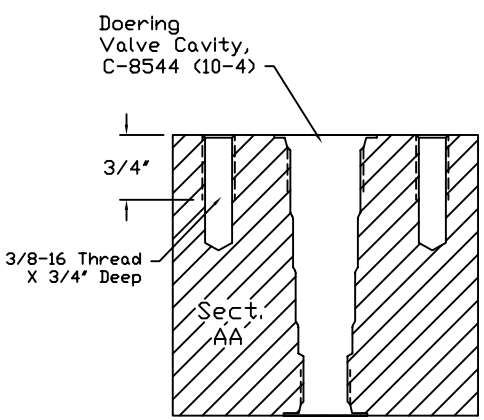
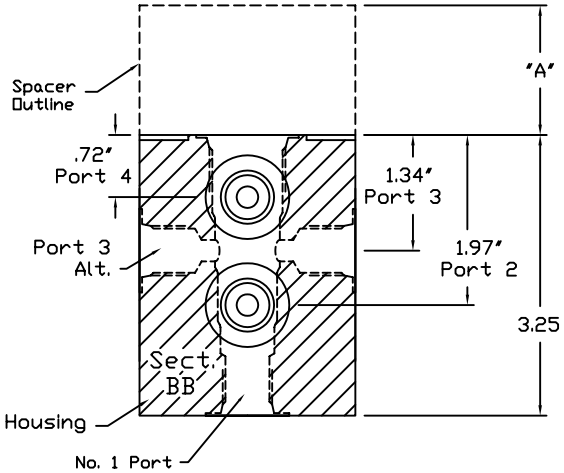


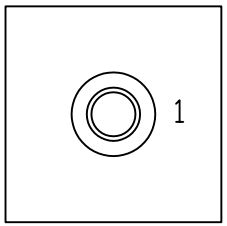


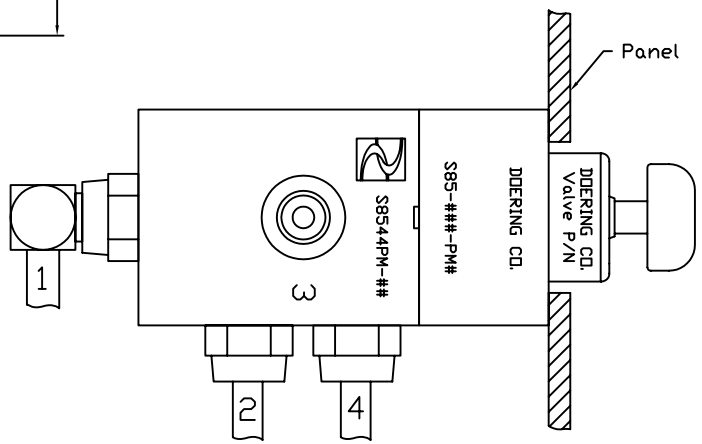


Optional Panel Mount Spacer Sold Separately.
See Spec. Sheet 1202990









ORDER INFORMATION:

S8544PM-___ ___

Ports 1, 2, 3 & 4	
1	(1/8 NPT)
2	(1/4 NPT)
3	(3/8 NPT)
4	(SAE4, ORB)
6	(SAE6, ORB)

Material Option, Pressure Rating		
Blank	(6061 Aluminum)	3,000 PSIG
S	(304 Stainless)	5,000 PSIG
S316	(316 Stainless)	5,000 PSIG

Note: Port 3 Alternate Plug Not Supplied.

Doering SPM Series

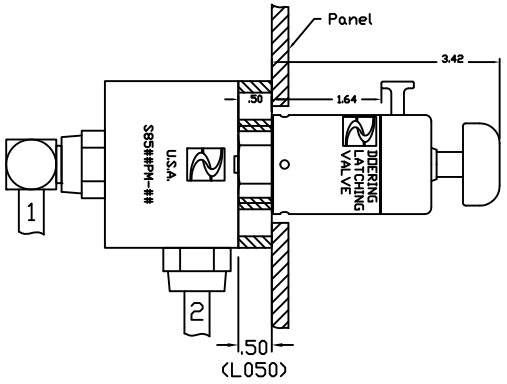
Doering Panel Mount Housing

DOERING

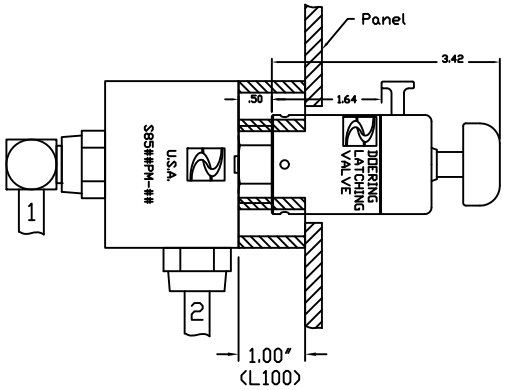
SPEC. SHEET NO. 1202984 REV. 07

Examples of Doering Panel Mount Housing, Latching Valve and Stand Offs.

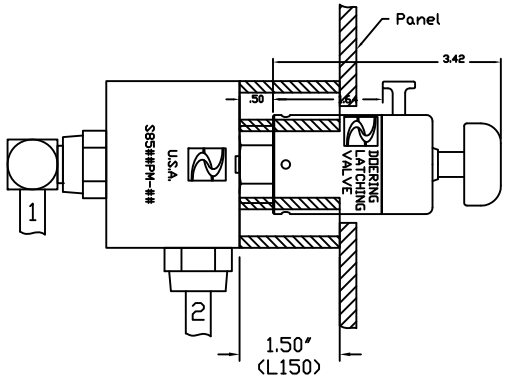
See additional Spec. Sheets for information on Housings and Valves.



Example using:
S85#2PM-## Housing, Panel Mount
SO-375-750-050-#### 1/2" Stand Off
Doering Latching Valve

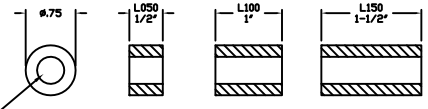


Example using:
S85#2PM-## Housing, Panel Mount
SO-375-750-100-#### 1" Stand Off
Doering Latching Valve



Example using:
S85#2PM-## Housing, Panel Mount
SO-375-750-150-#### 1-1/2" Stand Off
Doering Latching Valve

SO-375-750-L###-#### Stand Off



Clearance for 3/8" or M10

Application:

Application of SO-375-750-L###-####
Optional use of Stand Offs
with Doering Panel Mount Housings
provides improved access to the
valve wrench area and desired
protrusion of the valve from
the panel surface.

For service access, one or two spacers
may temporarily be removed.
Use all 4 Spacers for normal operation.

Order Panel Mount Housing and Valve separately.

Stand Off Order Info., 4 Used Per Housing

SO-375-750-L###-#### Doering Stand Off

L### (Length)			#### (Material)	
L050	= .50"	12.7mm	A	= Aluminum
L100	= 1.00"	25.4mm	S	= Stainless
L150	= 1.50"	38.1mm	S316	= 316 SST.

Doering SO- Series

Stand Off Spacers

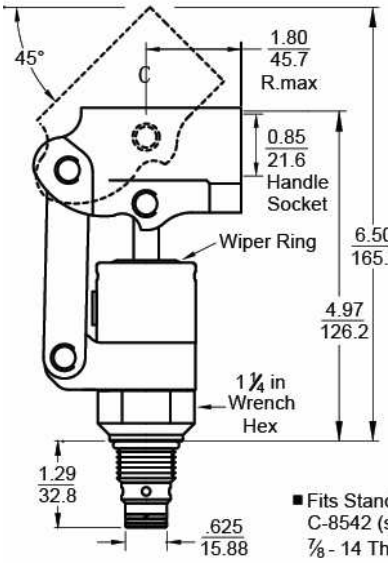
6343 RIVER ROAD SE ▪ CLEAR LAKE, MN 55319 USA
Telephone: 320-743-2276 ▪ Fax: 320-743-3723
mailbox@doering.com ▪ www.doering.com

DOERING

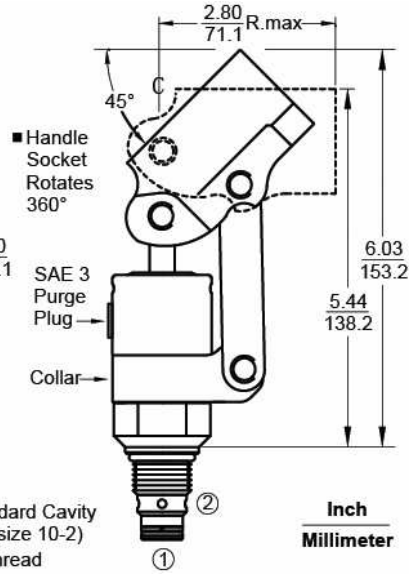
Hydraulic Cartridge Style Hand Pumps

10 K | 222-S Series

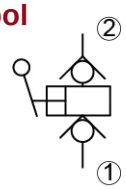
Push Style



Pull Style



Functional Symbol



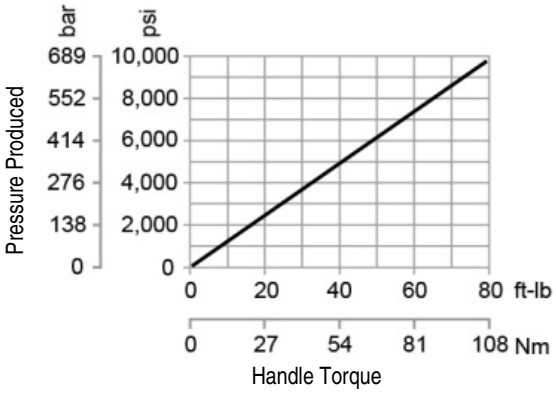
Technical

Operating Pressure	10,000 psi [689 bar]
Proof Pressure	15,000 psi [1,034 bar]
Produced Pressure (80 ft.-lb. handle torque)	10,000 psi [689 bar]
Displacement (Flow per stroke cycle)	0.100 cu. in. [1.6 cc]
Temperature	-40° to 248°F [-40 to 120°C]
Weight	1.8 lbs. [0.82 kg]
Installation Position	No Restrictions
Cavity	C-8542 [size 10-2]
Cavity Form Tooling	FT-8542

Performance and Operation

Maximum Operating Pressure	10,000 psi [689 bar]
Maximum Handle Torque	80 ft. lbs. [108.5 N-m]

Pressure Produced | Handle Torque



Guided Check System

Our guided check system is a special style check for applications demanding exceptional low leak hold. Bubble tested for 0 leaks. Flow direction from ports 2 to 1.

Installation Note

Lubricate seals and install into cavity with a 1-¼ in. wrench. Torque to approximately 50 ft. lbs. [68 N-m].

Order Info

■ Part No. 22237 –

Linkage Style

1 = Push to Pressurize

2 = Pull to Pressurize

Handle Joining Option

(Blank) = No Joining Option

L = Lanyard and Pin

P = Pin with E-clips

Seals

(Blank) = Buna N O-rings

E = Teflon® O-rings

R = EPR/EPDM O-rings

V = Viton® O-rings

Note: All pump back-up rings are Teflon. Wiper ring is polyurethane.

Materials

S = Stainless Steel with Electoless Nickel Plated Carbon Steel – Socket and Collar

SS = All Components Are Stainless Steel

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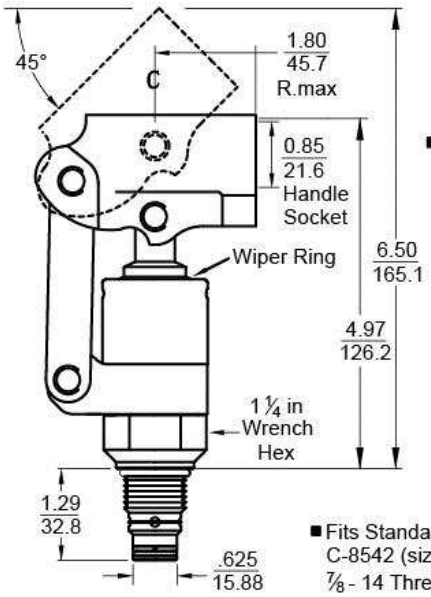
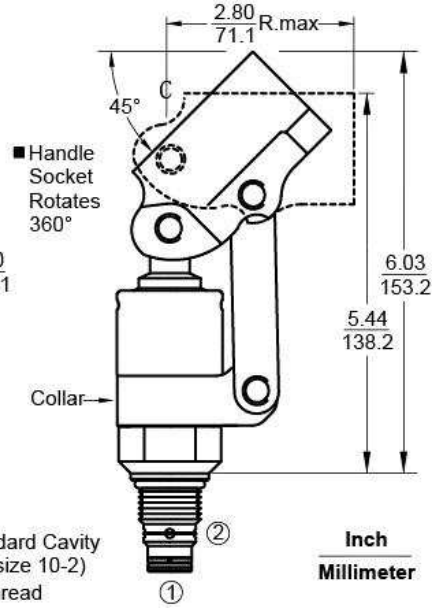
Hydraulic Cartridge Style Hand Pumps

4.9 K | 241-S Series

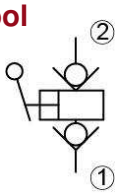
Push Style



Pull Style



Functional Symbol



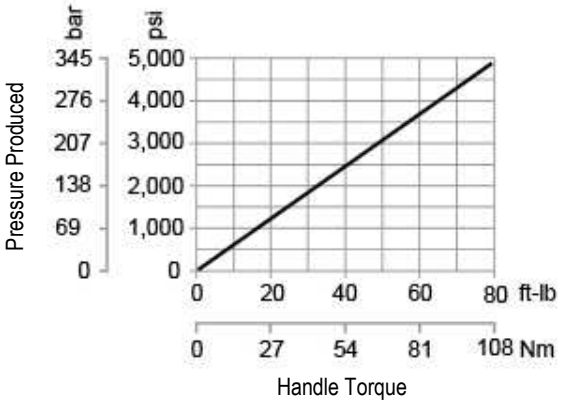
Technical

Operating Pressure	5,000 psi [345 bar]
Proof Pressure	7,500 psi [518 bar]
Produced Pressure (80 ft.-lb. handle torque)	4,900 psi [338 bar]
Displacement (Flow per stroke cycle)	0.196 cu. in. [3.2 cc]
Temperature	-40° to 248°F [-40 to 120°C]
Weight	1.8 lbs. [0.82 kg]
Installation Position	No Restrictions
Cavity	C-8542 [size 10-2]
Cavity Form Tooling	FT-8542

Performance and Operation

Maximum Operating Pressure	5,000 psi [345 bar]
Maximum Handle Torque	80 ft. lbs. [108.5 N-m]

Pressure Produced | Handle Torque



Standard Check System

Our standard check system combines Doering quality with a value price.
Flow direction is from ports 1 to 2.

Installation Note

Lubricate seals and install into cavity with a 1-¼ in. wrench.
Torque to approximately 50 ft. lbs. [68 N-m].

Order Info

■ Part No. 24150 – ____

Linkage Style

1 = Push to Pressurize
2 = Pull to Pressurize

Handle Joining Option

(Blank) = No Joining Option
L = Lanyard and Pin
P = Pin with E-clips

Seals

(Blank) = Buna N O-rings
E = Teflon® O-rings
R = EPR/EPDM O-rings
V = Viton® O-rings

Note: All pump back-up rings are Teflon.
Wiper ring is polyurethane.

Materials

S = Stainless Steel with Electoless Nickel Plated Carbon Steel – Socket and Collar
SS = All Components Are Stainless Steel

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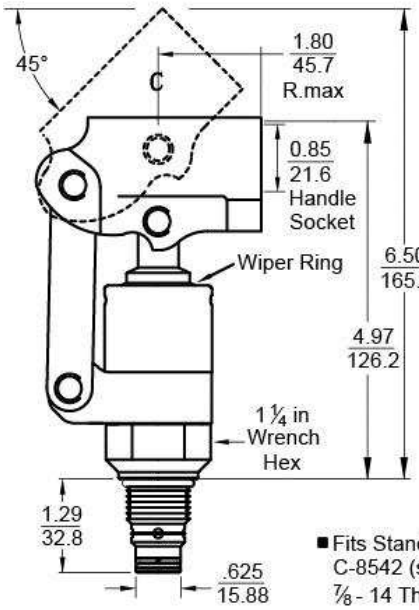
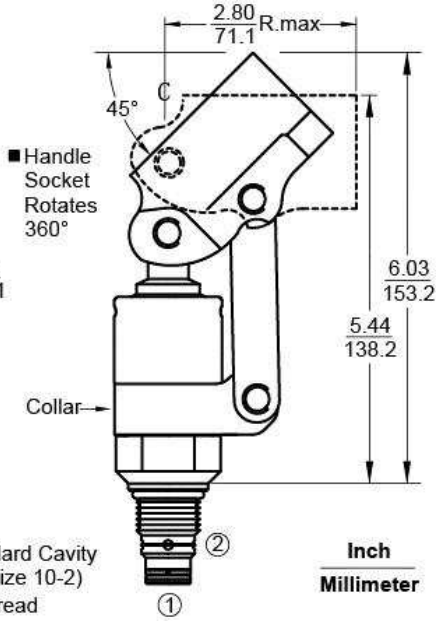
Hydraulic Cartridge Style Hand Pumps

3.8 K | 241-S Series

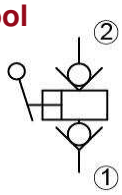
Push Style



Pull Style



Functional Symbol



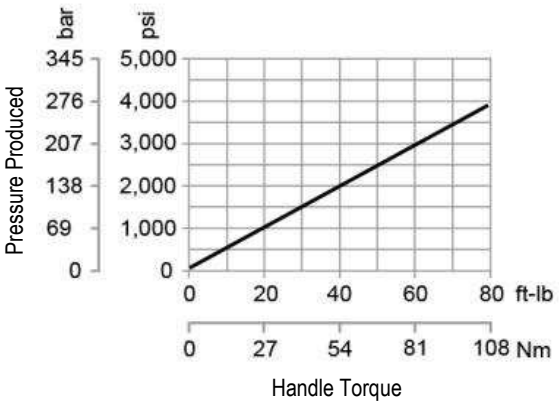
Technical

Operating Pressure	5,000 psi [345 bar]
Proof Pressure	7,500 psi [518 bar]
Produced Pressure (80 ft.-lb. handle torque)	3,800 psi [262 bar]
Displacement (Flow per stroke cycle)	0.249 cu. in. [4.0 cc]
Temperature	-40° to 248°F [-40 to 120°C]
Weight	1.8 lbs. [0.82 kg]
Installation Position	No Restrictions
Cavity	C-8542 [size 10-2]
Cavity Form Tooling	FT-8542

Performance and Operation

Maximum Operating Pressure	5,000 psi [345 bar]
Maximum Handle Torque	80 ft. lbs. [108.5 N-m]

Pressure Produced | Handle Torque



Standard Check System

Our standard check system combines Doering quality with a value price. Flow direction is from ports 1 to 2.

Installation Note

Lubricate seals and install into cavity with a 1-¼ in. wrench. Torque to approximately 50 ft. lbs. [68 N-m].

Order Info

■ Part No. 24156 –

Linkage Style

1 = Push to Pressurize

2 = Pull to Pressurize

Handle Joining Option

(Blank) = No Joining Option

L = Lanyard and Pin

P = Pin with E-clips

Seals

(Blank) = Buna N O-rings

E = Teflon® O-rings

R = EPR/EPDM O-rings

V = Viton® O-rings

Note: All pump back-up rings are Teflon. Wiper ring is polyurethane.

Materials

S = Stainless Steel with Electoless Nickel Plated Carbon Steel – Socket and Collar

SS = All Components Are Stainless Steel

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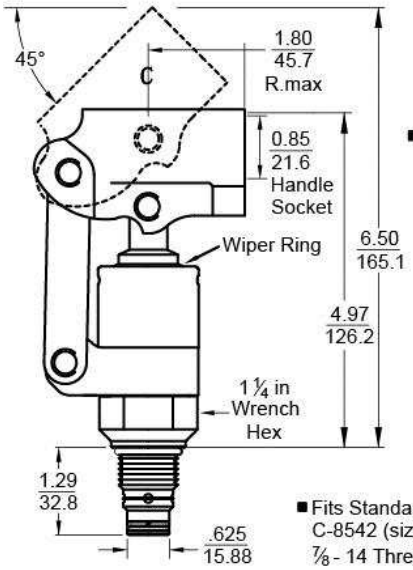
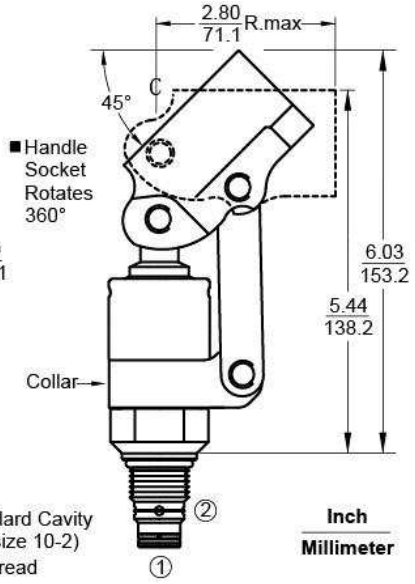
Hydraulic Cartridge Style Hand Pumps

3.1 K | 241-S Series

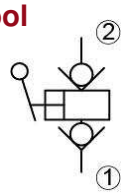
Push Style



Pull Style



Functional Symbol



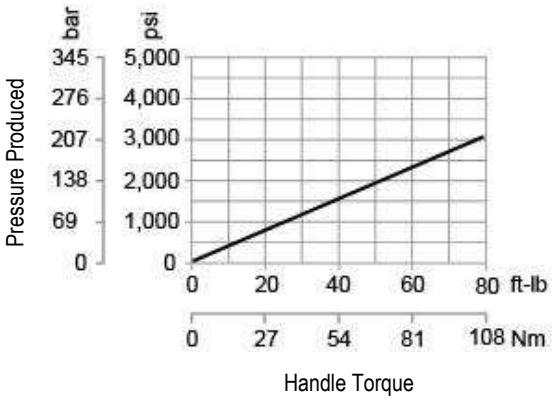
Technical

Operating Pressure	5,000 psi [345 bar]
Proof Pressure	7,500 psi [518 bar]
Produced Pressure (80 ft.-lb. handle torque)	3,100 psi [214 bar]
Displacement (Flow per stroke cycle)	0.307 cu. in. [5.0 cc]
Temperature	-40° to 248°F [-40 to 120°C]
Weight	1.8 lbs. [0.82 kg]
Installation Position	No Restrictions
Cavity	C-8542 [size 10-2]
Cavity Form Tooling	FT-8542

Performance and Operation

Maximum Operating Pressure	5,000 psi [345 bar]
Maximum Handle Torque	80 ft. lbs. [108.5 N-m]

Pressure Produced | Handle Torque



Handle Torque

Standard Check System

Our standard check system combines Doering quality with a value price. Flow direction is from ports 1 to 2.

Installation Note

Lubricate seals and install into cavity with a 1-¼ in. wrench. Torque to approximately 50 ft. lbs. [68 N-m].

Order Info

■ Part No. 24162 – ___ ___ ___ ___

Linkage Style

1 = Push to Pressurize

2 = Pull to Pressurize

Handle Joining Option

(Blank) = No Joining Option

L = Lanyard and Pin

P = Pin with E-clips

Seals

(Blank) = Buna N O-rings

E = Teflon® O-rings

R = EPR/EPDM O-rings

V = Viton® O-rings

Note: All pump back-up rings are Teflon. Wiper ring is polyurethane.

Materials

S = Stainless Steel with Electoless Nickel Plated Carbon Steel – Socket and Collar

SS = All Components Are Stainless Steel

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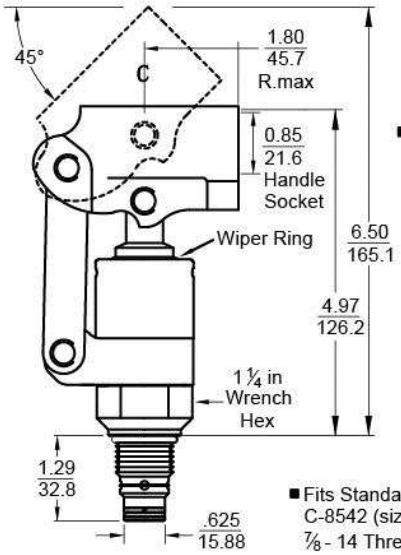
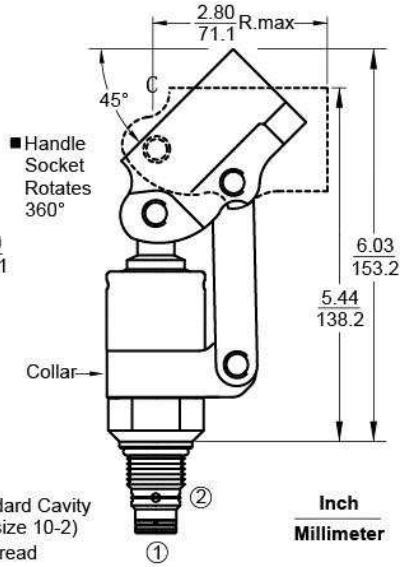
Hydraulic Cartridge Style Hand Pumps

2.1 K | 241-S Series

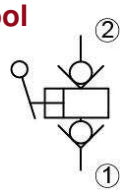
Push Style



Pull Style



Functional Symbol



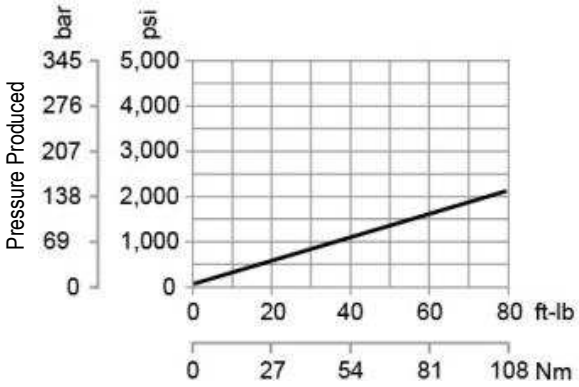
Technical

Operating Pressure	5,000 psi [345 bar]
Proof Pressure	7,500 psi [518 bar]
Produced Pressure (80 ft.-lb. handle torque)	2,100 psi [145 bar]
Displacement (Flow per stroke cycle)	0.442 cu. in. [7.2 cc]
Temperature	-40° to 248°F [-40 to 120°C]
Weight	1.8 lbs. [0.82 kg]
Installation Position	No Restrictions
Cavity	C-8542 [size 10-2]
Cavity Form Tooling	FT-8542

Performance and Operation

Maximum Operating Pressure	5,000 psi [345 bar]
Maximum Handle Torque	80 ft. lbs. [108.5 N-m]

Pressure Produced | Handle Torque



Handle Torque

Standard Check System

Our standard check system combines Doering quality with a value price. Flow direction is from ports 1 to 2.

Installation Note

Lubricate seals and install into cavity with a 1-¼ in. wrench. Torque to approximately 50 ft. lbs. [68 N-m].

Order Info

■ Part No. 24175 – ___ ___ ___

Linkage Style

1 = Push to Pressurize

2 = Pull to Pressurize

Handle Joining Option

(Blank) = No Joining Option

L = Lanyard and Pin

P = Pin with E-clips

Seals

(Blank) = Buna N O-rings

E = Teflon® O-rings

R = EPR/EPDM O-rings

V = Viton® O-rings

Note: All pump back-up rings are Teflon. Wiper ring is polyurethane.

Materials

S = Stainless Steel with Electoless Nickel Plated Carbon Steel – Socket and Collar

SS = All Components Are Stainless Steel

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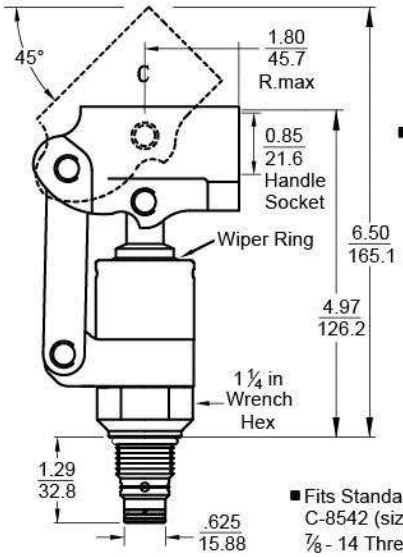
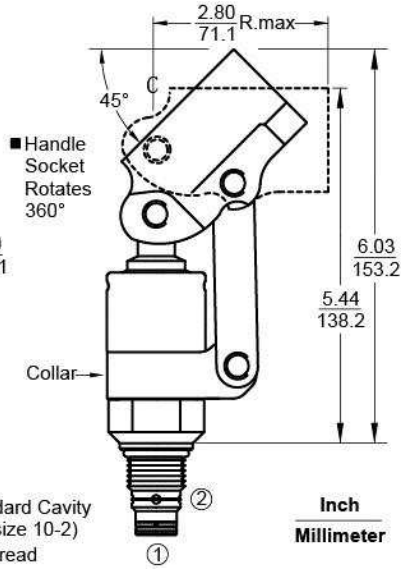
Hydraulic Cartridge Style Hand Pumps

1.5 K | 241-S Series

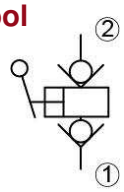
Push Style



Pull Style



Functional Symbol



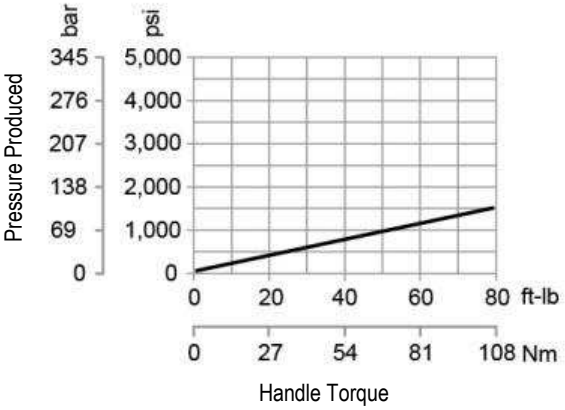
Technical

Operating Pressure	5,000 psi [345 bar]
Proof Pressure	7,500 psi [518 bar]
Produced Pressure (80 ft.-lb. handle torque)	1,500 psi [103 bar]
Displacement (Flow per stroke cycle)	0.601 cu. in. [9.8 cc]
Temperature	-40° to 248°F [-40 to 120°C]
Weight	1.8 lbs. [0.82 kg]
Installation Position	No Restrictions
Cavity	C-8542 [size 10-2]
Cavity Form Tooling	FT-8542

Performance and Operation

Maximum Operating Pressure	5,000 psi [345 bar]
Maximum Handle Torque	80 ft. lbs. [108.5 N-m]

Pressure Produced | Handle Torque



Standard Check System

Our standard check system combines Doering quality with a value price. Flow direction is from ports 1 to 2.

Installation Note

Lubricate seals and install into cavity with a 1-¼ in. wrench. Torque to approximately 50 ft. lbs. [68 N-m].

Order Info

■ Part No. 24187 –

Linkage Style

1 = Push to Pressurize

2 = Pull to Pressurize

Handle Joining Option

(Blank) = No Joining Option

L = Lanyard and Pin

P = Pin with E-clips

Seals

(Blank) = Buna N O-rings

E = Teflon® O-rings

R = EPR/EPDM O-rings

V = Viton® O-rings

Note: All pump back-up rings are Teflon. Wiper ring is polyurethane.

Materials

S = Stainless Steel with Electoless Nickel Plated Carbon Steel – Socket and Collar

SS = All Components Are Stainless Steell

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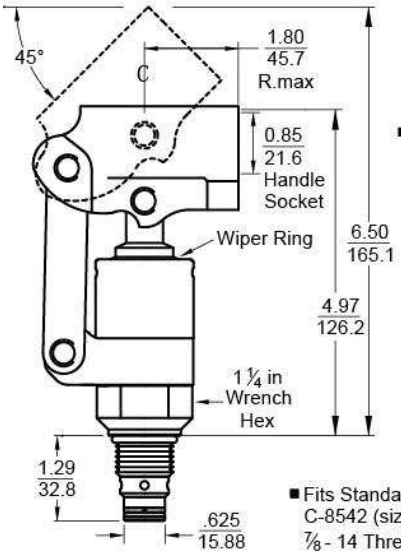
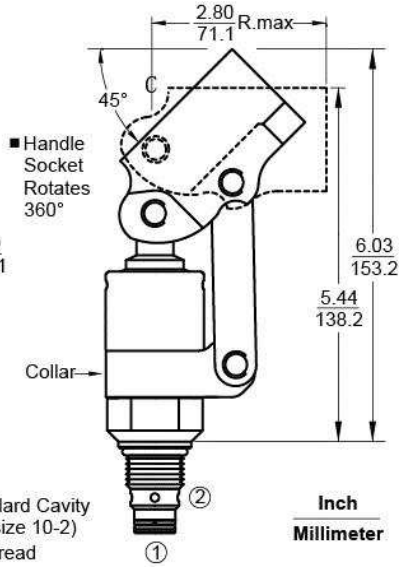
Hydraulic Cartridge Style Hand Pumps

4.9 K | 242-S Series

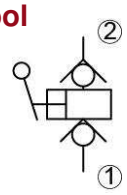
Push Style



Pull Style



Functional Symbol



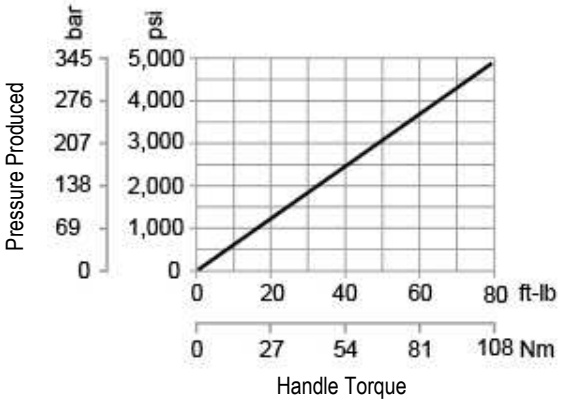
Technical

Operating Pressure	5,000 psi [345 bar]
Proof Pressure	7,500 psi [518 bar]
Produced Pressure (80 ft.-lb. handle torque)	4,900 psi [338 bar]
Displacement (Flow per stroke cycle)	0.196 cu. in. [3.2 cc]
Temperature	-40° to 248°F [-40 to 120°C]
Weight	1.8 lbs. [0.82 kg]
Installation Position	No Restrictions
Cavity	C-8542 [size 10-2]
Cavity Form Tooling	FT-8542

Performance and Operation

Maximum Operating Pressure	5,000 psi [345 bar]
Maximum Handle Torque	80 ft. lbs. [108.5 N-m]

Pressure Produced | Handle Torque



Guided Check System

Our guided check system is a special style check for applications demanding exceptional low leak hold. Bubble tested for 0 leaks. Flow direction from ports 2 to 1.

Installation Note

Lubricate seals and install into cavity with a 1-¼ in. wrench. Torque to approximately 50 ft. lbs. [68 N-m].

Order Info

■ Part No. 24250 –

Linkage Style

1 = Push to Pressurize

2 = Pull to Pressurize

Handle Joining Option

(Blank) = No Joining Option

L = Lanyard and Pin

P = Pin with E-clips

Seals

(Blank) = Buna N O-rings

E = Teflon® O-rings

R = EPR/EPDM O-rings

V = Viton® O-rings

Note: All pump back-up rings are Teflon. Wiper ring is polyurethane.

Materials

S = Stainless Steel with Electoless Nickel Plated Carbon Steel – Socket and Collar

SS = All Components Are Stainless Steel

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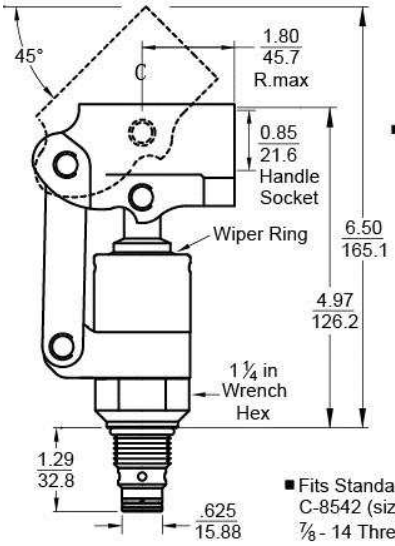
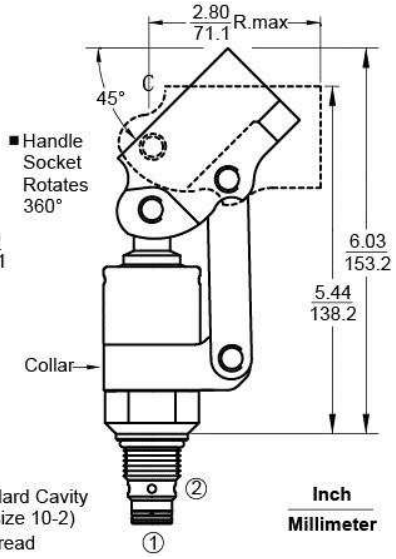
Hydraulic Cartridge Style Hand Pumps

3.8 K | 242-S Series

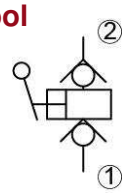
Push Style



Pull Style



Functional Symbol



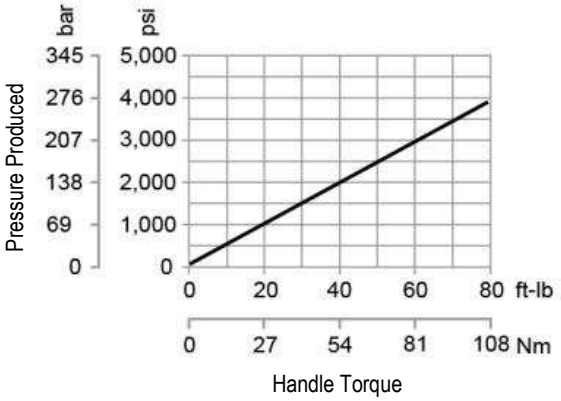
Technical

Operating Pressure	5,000 psi [345 bar]
Proof Pressure	7,500 psi [518 bar]
Produced Pressure (80 ft.-lb. handle torque)	3,800 psi [262 bar]
Displacement (Flow per stroke cycle)	0.249 cu. in. [4.0 cc]
Temperature	-40° to 248°F [-40 to 120°C]
Weight	1.8 lbs. [0.82 kg]
Installation Position	No Restrictions
Cavity	C-8542 [size 10-2]
Cavity Form Tooling	FT-8542

Performance and Operation

Maximum Operating Pressure	5,000 psi [345 bar]
Maximum Handle Torque	80 ft. lbs. [108.5 N-m]

Pressure Produced | Handle Torque



Guided Check System

Our guided check system is a special style check for applications demanding exceptional low leak hold. Bubble tested for 0 leaks. Flow direction from ports 2 to 1.

Installation Note

Lubricate seals and install into cavity with a 1-¼ in. wrench. Torque to approximately 50 ft. lbs. [68 N-m].

Order Info

■ Part No. 24256 –

Linkage Style

1 = Push to Pressurize

2 = Pull to Pressurize

Handle Joining Option

(Blank) = No Joining Option

L = Lanyard and Pin

P = Pin with E-clips

Seals

(Blank) = Buna N O-rings

E = Teflon® O-rings

R = EPR/EPDM O-rings

V = Viton® O-rings

Note: All pump back-up rings are Teflon. Wiper ring is polyurethane.

Materials

S = Stainless Steel with Electoless Nickel Plated Carbon Steel – Socket and Collar

SS = All Components Are Stainless Steel

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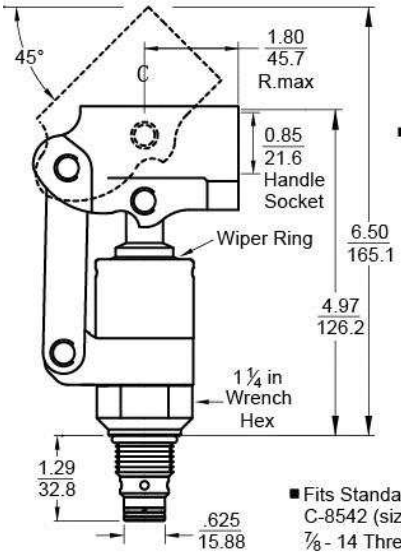
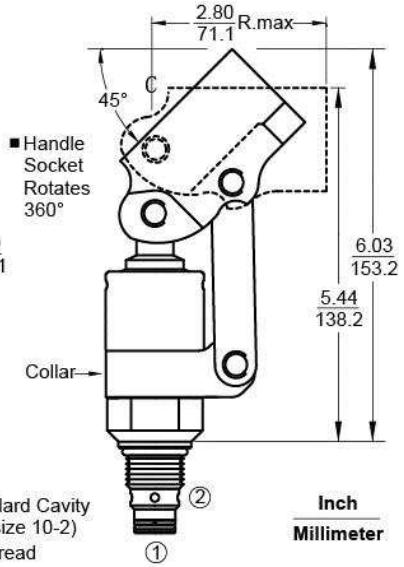
Hydraulic Cartridge Style Hand Pumps

3.1 K | 242-S Series

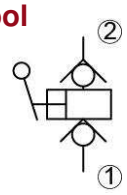
Push Style



Pull Style



Functional Symbol



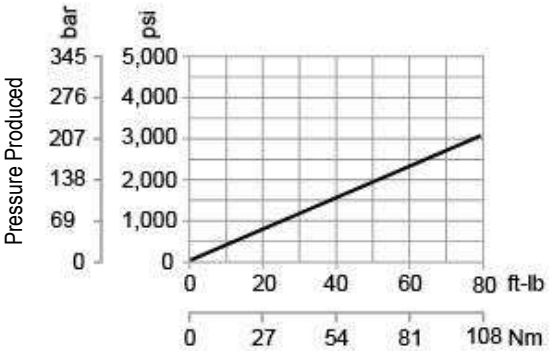
Technical

Operating Pressure	5,000 psi [345 bar]
Proof Pressure	7,500 psi [518 bar]
Produced Pressure (80 ft.-lb. handle torque)	3,100 psi [214 bar]
Displacement (Flow per stroke cycle)	0.307 cu. in. [5.0 cc]
Temperature	-40° to 248°F [-40 to 120°C]
Weight	1.8 lbs. [0.82 kg]
Installation Position	No Restrictions
Cavity	C-8542 [size 10-2]
Cavity Form Tooling	FT-8542

Performance and Operation

Maximum Operating Pressure	5,000 psi [345 bar]
Maximum Handle Torque	80 ft. lbs. [108.5 N-m]

Pressure Produced | Handle Torque



Handle Torque

Guided Check System

Our guided check system is a special style check for applications demanding exceptional low leak hold. Bubble tested for 0 leaks. Flow direction from ports 2 to 1.

Installation Note

Lubricate seals and install into cavity with a 1-¼ in. wrench. Torque to approximately 50 ft. lbs. [68 N-m].

Order Info

■ Part No. 24262 –

Linkage Style

1 = Push to Pressurize

2 = Pull to Pressurize

Handle Joining Option

(Blank) = No Joining Option

L = Lanyard and Pin

P = Pin with E-clips

Seals

(Blank) = Buna N O-rings

E = Teflon® O-rings

R = EPR/EPDM O-rings

V = Viton® O-rings

Note: All pump back-up rings are Teflon. Wiper ring is polyurethane.

Materials

S = Stainless Steel with Electoless Nickel Plated Carbon Steel – Socket and Collar

SS = All Components Are Stainless Steel

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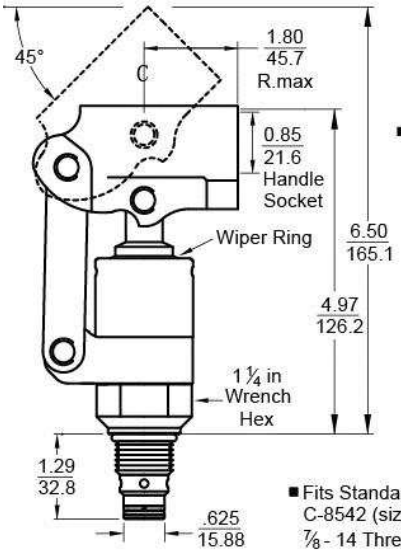
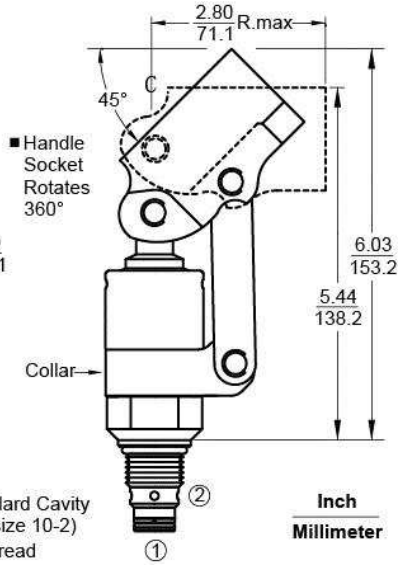
Hydraulic Cartridge Style Hand Pumps

2.1 K | 242-S Series

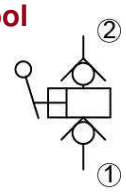
Push Style



Pull Style



Functional Symbol



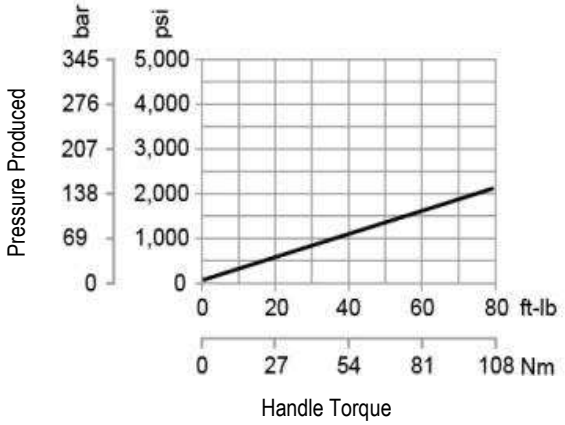
Technical

Operating Pressure	5,000 psi [345 bar]
Proof Pressure	7,500 psi [518 bar]
Produced Pressure (80 ft.-lb. handle torque)	2,100 psi [145 bar]
Displacement (Flow per stroke cycle)	0.442 cu. in. [7.2 cc]
Temperature	-40° to 248°F [-40 to 120°C]
Weight	1.8 lbs. [0.82 kg]
Installation Position	No Restrictions
Cavity	C-8542 [size 10-2]
Cavity Form Tooling	FT-8542

Performance and Operation

Maximum Operating Pressure	5,000 psi [345 bar]
Maximum Handle Torque	80 ft. lbs. [108.5 N-m]

Pressure Produced | Handle Torque



Guided Check System

Our guided check system is a special style check for applications demanding exceptional low leak hold. Bubble tested for 0 leaks. Flow direction from ports 2 to 1.

Installation Note

Lubricate seals and install into cavity with a 1-¼ in. wrench. Torque to approximately 50 ft. lbs. [68 N-m].

Order Info

■ Part No. 24275 – ___ ___ ___

Linkage Style

1 = Push to Pressurize

2 = Pull to Pressurize

Handle Joining Option

(Blank) = No Joining Option

L = Lanyard and Pin

P = Pin with E-clips

Seals

(Blank) = Buna N O-rings

E = Teflon® O-rings

R = EPR/EPDM O-rings

V = Viton® O-rings

Note: All pump back-up rings are Teflon. Wiper ring is polyurethane.

Materials

S = Stainless Steel with Electoless Nickel Plated Carbon Steel – Socket and Collar

SS = All Components Are Stainless Steel

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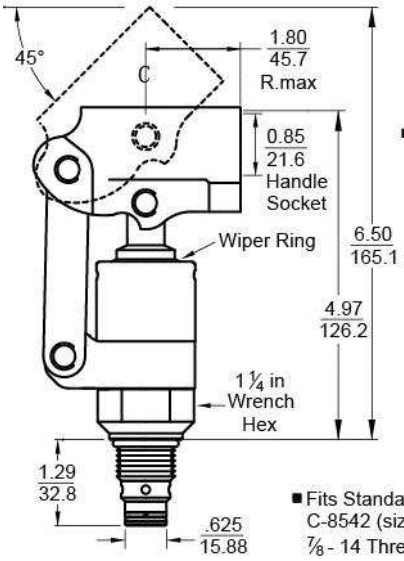
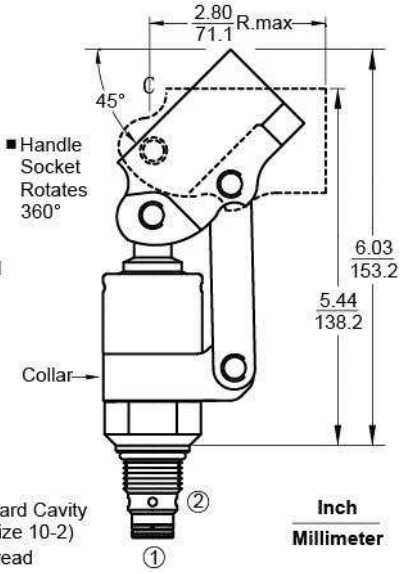
Hydraulic Cartridge Style Hand Pumps

1.5 K | 242-S Series

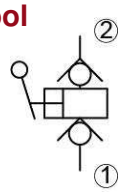
Push Style



Pull Style



Functional Symbol



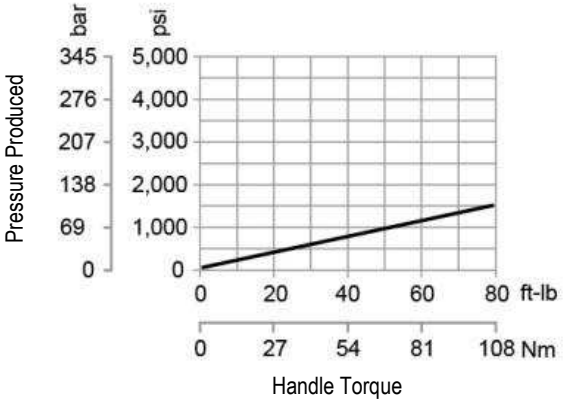
Technical

Operating Pressure	5,000 psi [345 bar]
Proof Pressure	7,500 psi [518 bar]
Produced Pressure (80 ft.-lb. handle torque)	1,500 psi [103 bar]
Displacement (Flow per stroke cycle)	0.601 cu. in. [9.8 cc]
Temperature	-40° to 248°F [-40 to 120°C]
Weight	1.8 lbs. [0.82 kg]
Installation Position	No Restrictions
Cavity	C-8542 [size 10-2]
Cavity Form Tooling	FT-8542

Performance and Operation

Maximum Operating Pressure	5,000 psi [345 bar]
Maximum Handle Torque	80 ft. lbs. [108.5 N-m]

Pressure Produced | Handle Torque



Guided Check System

Our guided check system is a special style check for applications demanding exceptional low leak hold. Bubble tested for 0 leaks. Flow direction from ports 2 to 1.

Installation Note

Lubricate seals and install into cavity with a 1-¼ in. wrench. Torque to approximately 50 ft. lbs. [68 N-m].

Order Info

■ Part No. 24287 –

Linkage Style

1 = Push to Pressurize

2 = Pull to Pressurize

Handle Joining Option

(Blank) = No Joining Option

L = Lanyard and Pin

P = Pin with E-clips

Seals

(Blank) = Buna N O-rings

E = Teflon® O-rings

R = EPR/EPDM O-rings

V = Viton® O-rings

Note: All pump back-up rings are Teflon. Wiper ring is polyurethane.

Materials

S = Stainless Steel with Electoless Nickel Plated Carbon Steel – Socket and Collar

SS = All Components Are Stainless Steel

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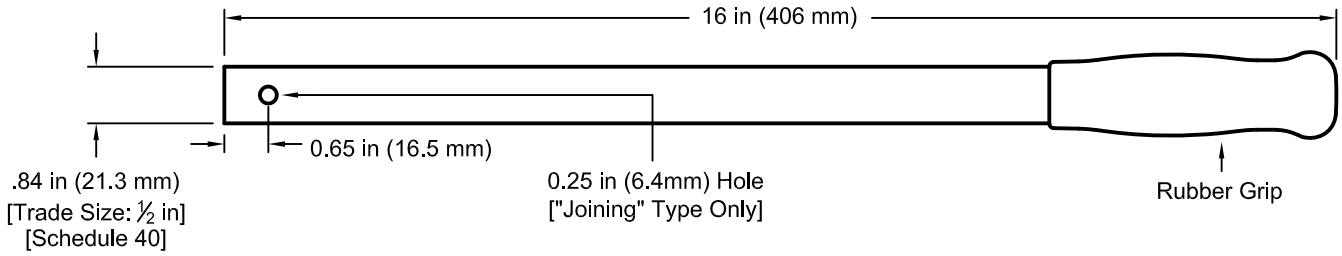
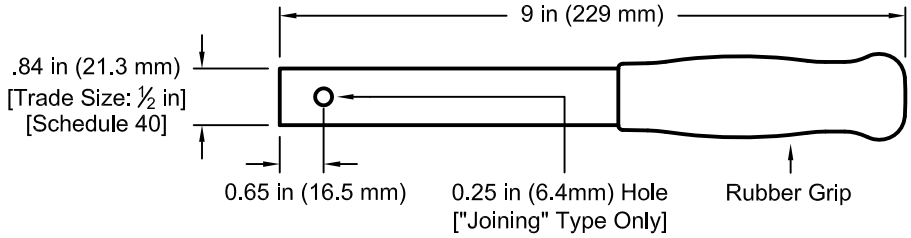
Pump Handles

16 in Handles



9 in Handles



Sizes

- **16 in** (406 mm)
- **9 in** (229 mm)

Types

- **Non-Joining**
  (Handle Slides Freely into Pump Socket.)
- **Joining**
  (Handle is Attached to Pump.)

Materials

- **Zinc Plated Steel**
  (Carbon Steel with Zinc Plating.)
- **Stainless Steel**
  (304 Stainless Steel)

Rubber Grip
- Rubber (Plastisol 750-89)

Order Info

Part No. **2410** __ - __ - __

Size
16 = 16 in (406 mm)
09 = 9 in (229 mm)

Type
(Blank) = Non-Joining
H = Joining

Material
(Blank) = Zinc Plated Steel
S = Stainless Steel

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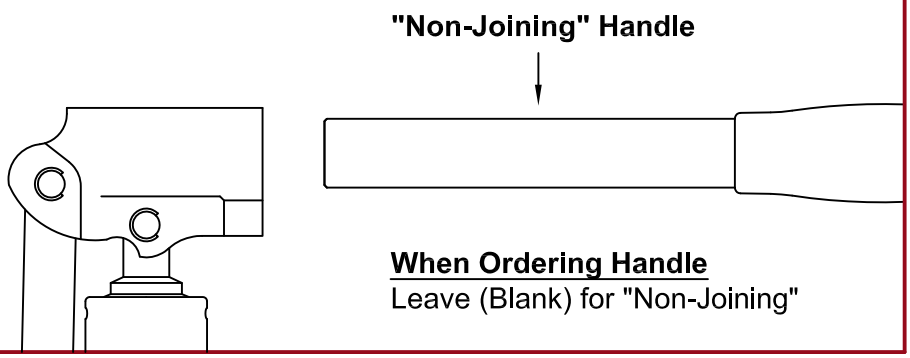
Pump & Handle Joining Options

No Joining Option

- Handle slides freely in and out of Pump Socket.

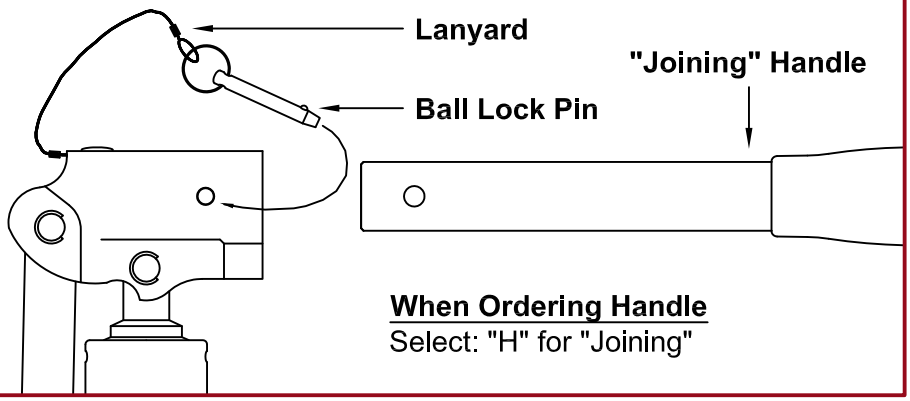


When Ordering Pump
Leave (Blank) for
"No Joining Option"

When Ordering Handle
Leave (Blank) for "Non-Joining"

Lanyard and Pin

- Handle is attached to Pump by means of Ball Lock Pin with Lanyard.

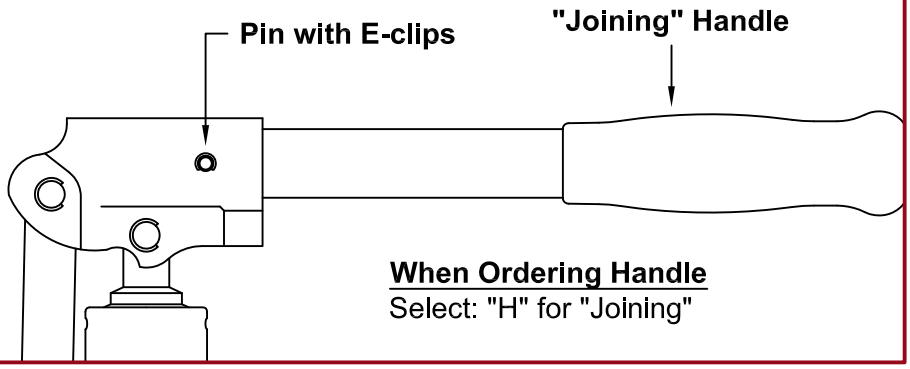


When Ordering Pump
Select: "L" for "Lanyard and Pin"

When Ordering Handle
Select: "H" for "Joining"

Pin with E-clips

- Handle is attached to Pump by means of Pin with E-clips.



When Ordering Pump
Select: "P" for "Pin with E-clips"

When Ordering Handle
Select: "H" for "Joining"

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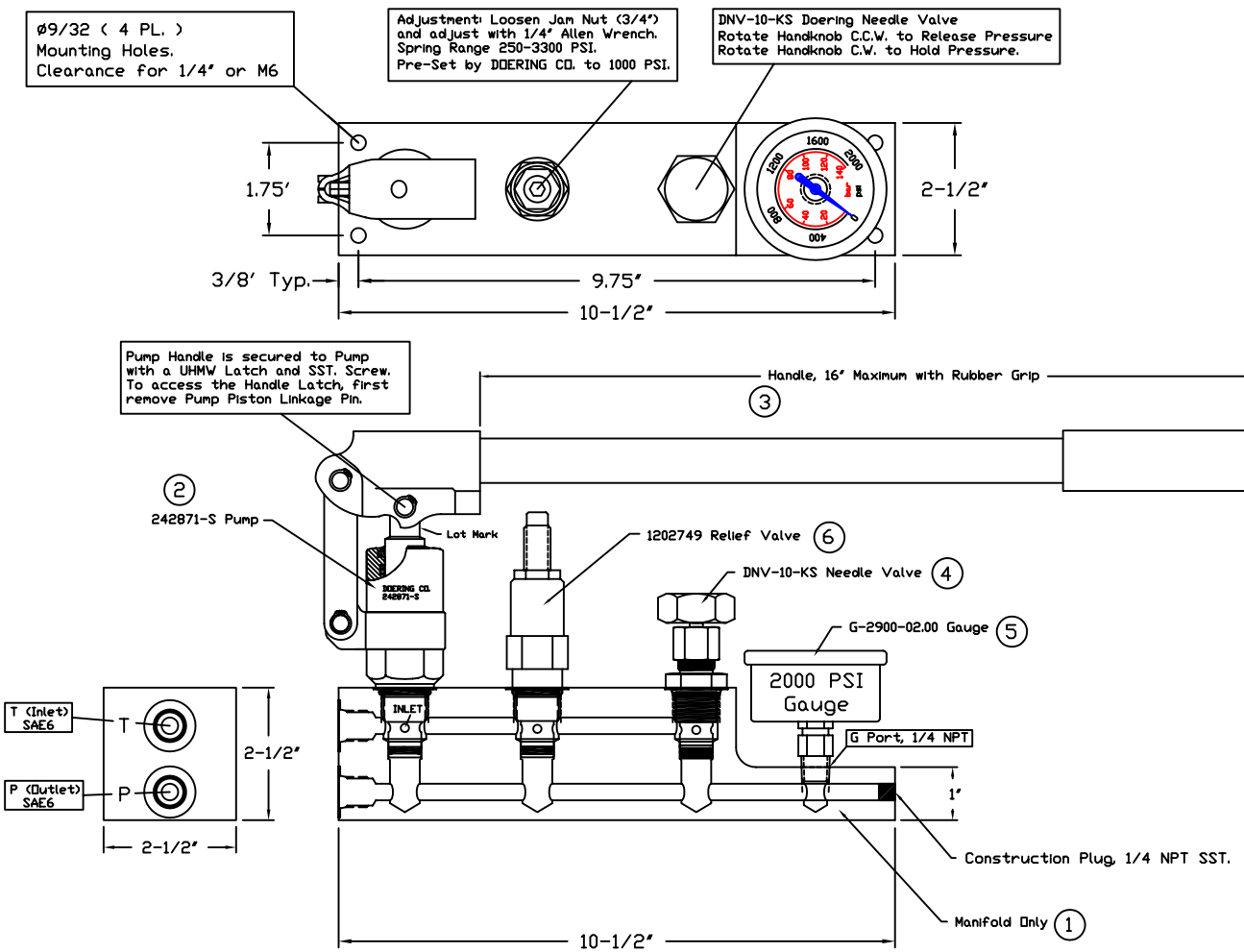
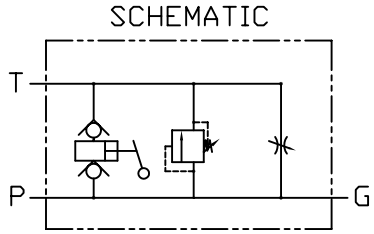


SCHEMATIC



For Complete Assembly, Please order Doering P/N 1202888

Components List / Bill of Material

Key	Doering P/N	Manufacturer	Description
1	1202887	Doering Co.	Manifold, Aluminum, 3500 PSI Rated
2	242871-S	Doering Co.	Pump, Hand Operated, 1000 PSI/ 50# Handle Force
3	1202899	Doering Co.	Handle, SST., Rubber Grip and UHMW Latch
4	DNV-10-KS	Doering Co.	Needle Valve, SST.
5	G2900-02.00	D.F.C.	Gauge, SST. Case, 0-2000 PSI
6	1202749	HYF	Relief Valve (RV-20A-0-N-33) Spring Range 250 to 3300 PSI

1202888 DOERING
Pump Station Assembly

DOERING

SPEC. SHEET NO. 1202888 REV. 01

SPECIFICATIONS:

Manually Operated poppet valve.
Two way, normally closed, push operator to open.
Maximum pressure 5,000 PSI, Cavity C-8502
Cavity C-8542, 5,000 PSI Port 1, 3,500 PSI Port 2
See "SHIFT FORCE NOTES" regarding operating force required to open and hold open the valve.
1/4" Stroke is approximate.
Overtravel Protection is available.
Overstroking will damage the valve.
Use 1" wrench to install valve.
Torque to 20 foot pounds.
Use lubricant on external oil seals and mounting threads.
Fluid temperature -45°F (-42.7°C) to 200°F (93.3°C)

STANDARD OPTIONS

Hand Knob operator shown.
Hand Knob is available in Aluminum or Stainless Steel.
Direct Plunger available for mechanical operation.
T Option 10-32 vent ports at Key 7 (2 Places)
Seat (Key 4) is heat treated Stainless Steel.
K Option: Kel-F Soft Seat with hard seat backup.
Seal Materials used are Buna-N and Teflon.
Optional seal and construction materials available.

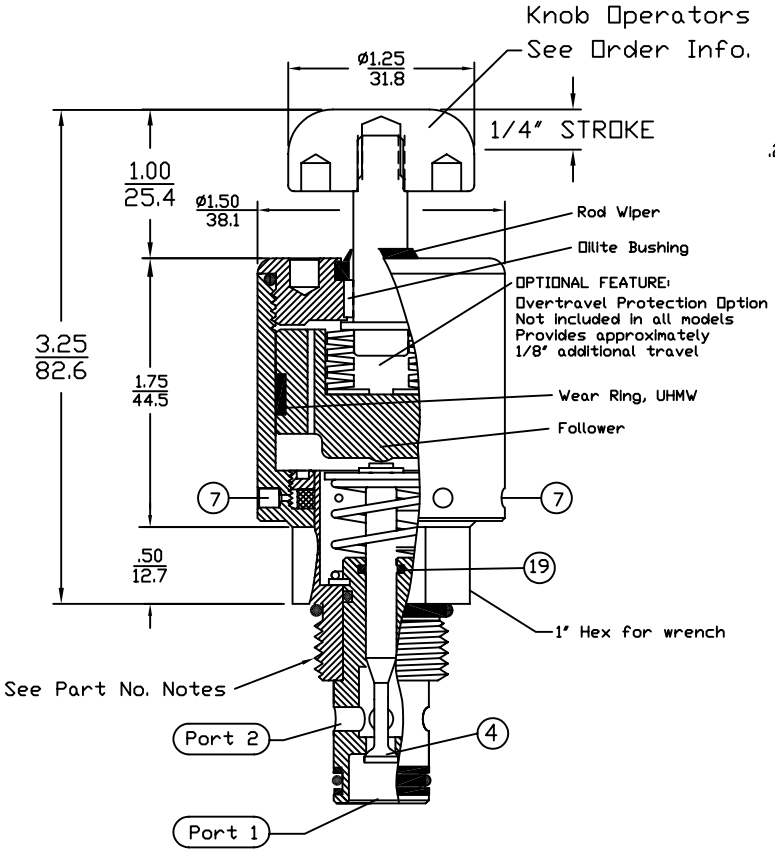
SHIFT FORCE NOTES:

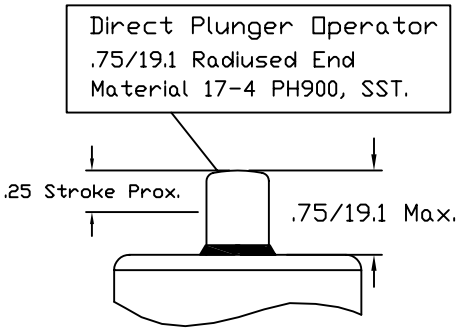
10 to 15 Pounds of Force is required to shift the valve poppet with zero pressure on ports 1 and 2.

To determine the additional operating force imposed by the system pressure, multiply the system pressure X .03 and add the result to the 10 or 15 Pounds.

Example: 3,000 PSI System
3000 X .03 = 90#
90 + 15 = 105#
Total Operator Force = 105#

CARTRIDGE VALVE





Cavity & Housing

For 82H#227M##1 Valve:
Cavity C-8502 (8-2):
See Spec. Sheet 1200630

Line Mount Housings:
See Spec. Sheets
1200672 and 1203123

Panel Mount Housings:
See Spec. Sheets
1202981 and 1202990

For 84H#227M##1 Valve:
Cavity C-8542 (10-2):
See Spec. Sheet 1200621

Line Mount Housings:
See Spec. Sheets
1200674 and 1201455

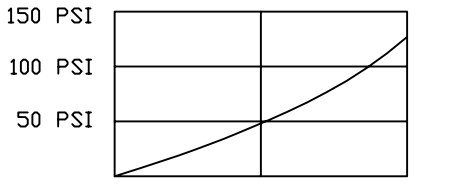
Panel Mount Housings:
See Spec. Sheets
1202982 and 1202990

Valve Number: 8#H#227M##1

- 2 = 3/4-16 Thread Cavity C-8502 (8-2)
- 4 = 7/8-14 Thread Cavity C-8542 (10-2)
- Blank = Standard Hard Seat
- K = Kel-F Soft Seat with Hard Seat backup. Ref. Key 4 Reduces Flow C_V =0.3 Prox.
- Operators:
  - D = Direct Plunger
  - N = No Knob, Threaded
  - K = Knob, Aluminum
  - R = Knob, Red Ano.
  - S = Knob, Stainless
- O = No Overtravel Protection
- P = Overtravel Protection

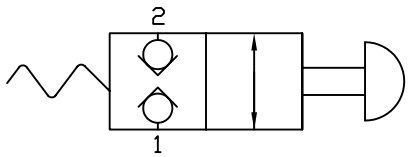
PRESSURE DROP CHART C_V= 0.4
Hard Seat Only.

VALVE ORIFICE DIAMETER = .180"
Smaller Orifice with K Option Seat.



2PB SERIES

Functional Symbol



2PB N/C

2 Way Poppet Valve,
Manually Operated

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DOERING

CARTRIDGE VALVE

SPECIFICATIONS:

Normally Closed Check Valve
Manual Override to hold Open.

Maximum pressure at Ports 1 and 2 is 5,000 PSI.
Install Cartridge valve using 1" wrench
Final tightening to 20 foot pounds torque.
Use lubricant on external oil seals and mounting threads.
Fluid temperature -45°F (-42.7°C) to 200°F (93.3°C)

MATERIALS & OPTIONS

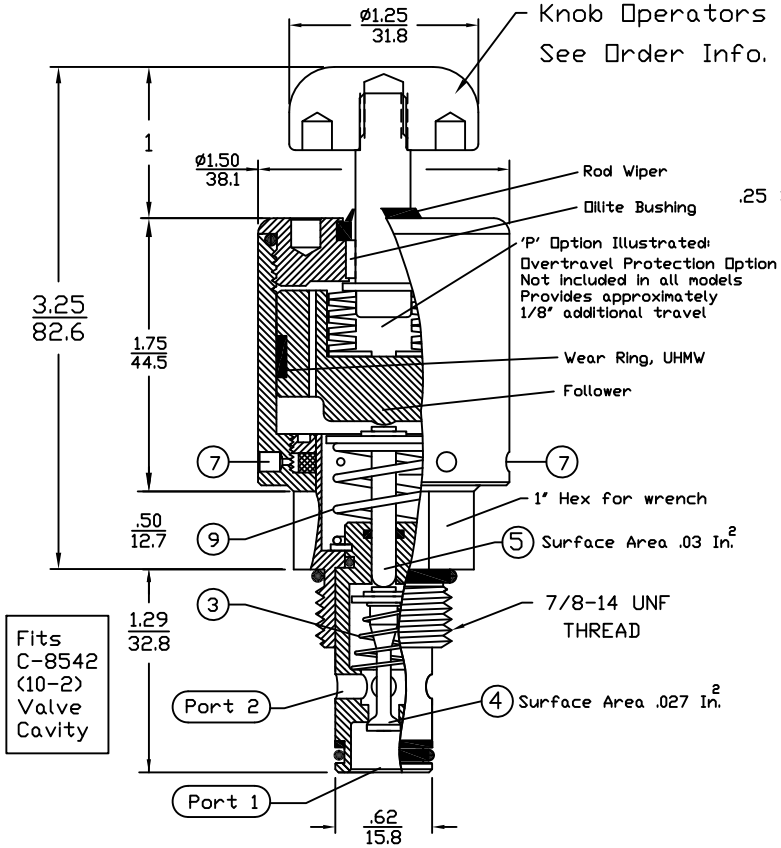
T Option 10-32 vent ports at Key 7 (2 Places)
Seat (Key 4) material is heat treated Stainless.
Seal Materials used are Buna-N and Teflon.
Optional seal and construction materials available.

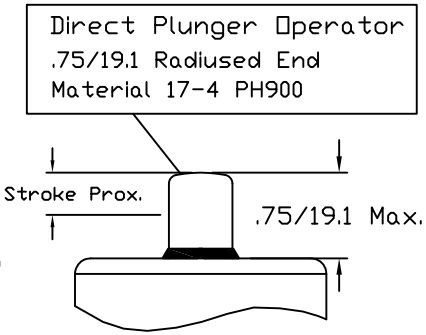
SHIFT FORCE NOTES:

15 Pounds of Force is required to compress springs, Key 3 & 9

To determine the additional operating force imposed by the system pressure, multiply the system pressure X .03 and add the result to the 15 Pound spring force.

Example: 1,000 PSI System
1,000 X .03 = 30#
30 + 15 = 45#
Total Operator Force = 40#
If Tank is Port 2, force is less.





Cavity & Housing

Cavity C-8542 (10-2):
See Spec. Sheet 1200621

Line Mount Housings:
See Spec. Sheets
1200674 and 1201455

Panel Mount Housings:
See Spec. Sheets
1202982 and 1202990

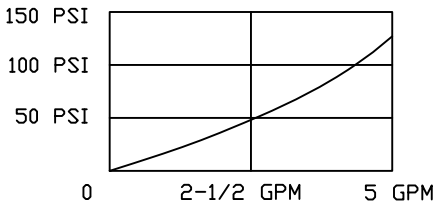
Valve Number: 94H72M##15

- ## = No Overtravel Protection
- P = Overtravel Protection

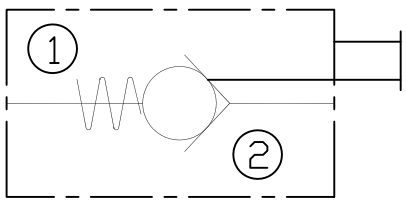
Operators:
- D = Direct Plunger
- K = Knob, Aluminum
- R = Knob, Red Ano.
- S = Knob, Stainless

PRESSURE DROP CHART C_V= 0.4

VALVE ORIFICE DIAMETER = .16"
Add 15 PSI Seat Crack Pressure



POC SERIES



Check Valve with Manual Override to hold open.

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DOERING

SPEC. SHEET NO. 1201527 REV. 005

CARTRIDGE VALVE

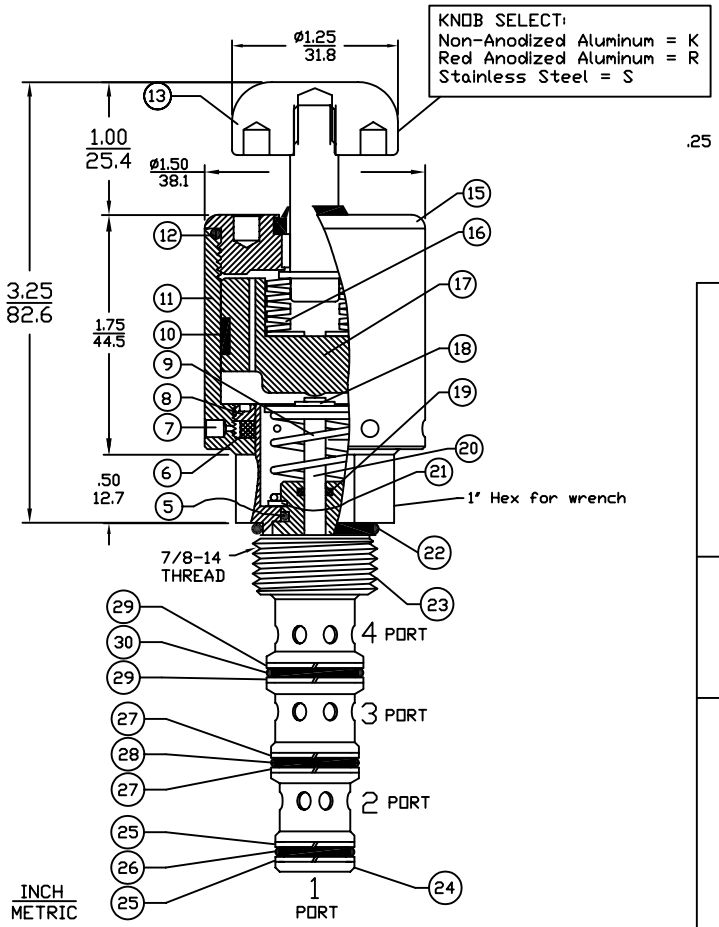
KEY EXPLANATION:

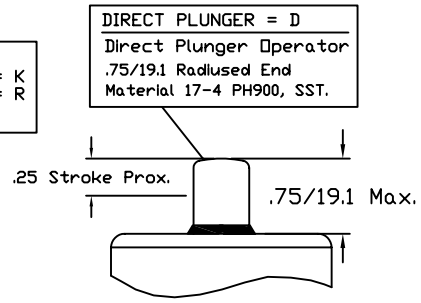
1. Bottom System Port (1)
2. Second from bottom System Port (2)
3. Third from bottom System Port (3)
4. Fourth from bottom System Port (4)
5. Cartridge Seat Seal (Teflon)
6. Filter, 10 Micron Sintered Bronze (optional SST.)
7. Vents to atmosphere (2 Places 180° apart)
8. Filter Retainer, Aluminum (optional SST.)
9. Spool return Spring, Stainless Steel.
10. Piston Wear Ring, UHMW (optional Teflon)
11. Actuator Guide Cylinder, Aluminum (optional SST.)
12. Bonnet O-Ring, Buna-N (also see options)
13. Operator Knob (See part No. designations)
15. Upper Actuator Bonnet, Aluminum (optional SST.)
16. Overtravel Protection Option (Prox. 1/8")
17. Operator Follower Assembly, Aluminum (Optional SST.)
18. Spring Retainer Assembly
19. O-Ring Seal, Teflon
20. Spool Connector Linkage (Stainless Steel)
21. Retaining Ring, Carbon Steel (optional SST.)
22. O-Ring Seal, Buna-N (also see options)
23. Cartridge Mounting Threads (7/8-14)
24. Spool Cage (Heat Treated Stainless)
25. Back Up Rings, Teflon (two used)
26. O-Ring Seal, Buna-N (Also see Options)
27. Back Up Rings, Teflon (two used)
28. O-Ring Seal, Buna-N (Also see Options)
29. Back Up Rings, Teflon (two used)
30. O-Ring Seal, Buna-N (Also see Options)

SHIFT FORCE NOTES:

10 to 15 Pounds of Force is required to shift the valve spool with zero pressure on port no. 1.

Any pressure on Port No. 1 will increase Force Requirement by .012 X Port No. 1 PSI.





Cavity & Housing

Cavity C-8544 (10-4):
See Spec. Sheet 1200671

Line Mount Housings:
See Spec. Sheets
1200675 and 1202930

Panel Mount Housings:
See Spec. Sheets
1202984 and 1202990

OPTIONS

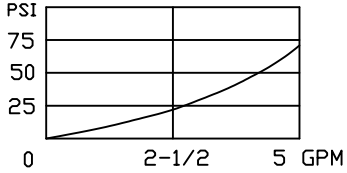
Available with or without Overtravel Protection.
Optional seals include Viton, Teflon and others.

Key 7 vents to atmosphere (2 Places).
T Option provides 10-32 Threaded ports at these locations.

OPERATION

Manually Operated Hydraulic Spool Valve.
Three Way, Directional Control or Selector Valve.
Maximum System Pressure: Ports 1, 2, 3 and 4, 3,000 PSIG. See "SHIFT FORCE NOTES"
Spool Stroke is 1/4" .
Stroke and Over Travel dimensions are approximate.
Fluid temperatures -40°F (-40°C) to 200°F (93.3°C)
Install Cartridge valve using 1" wrench
Valve should screw in freely to the Mount Seal. Final tightening 20 to 30 foot pounds torque. Use lubricant on external oil seals and mounting threads.

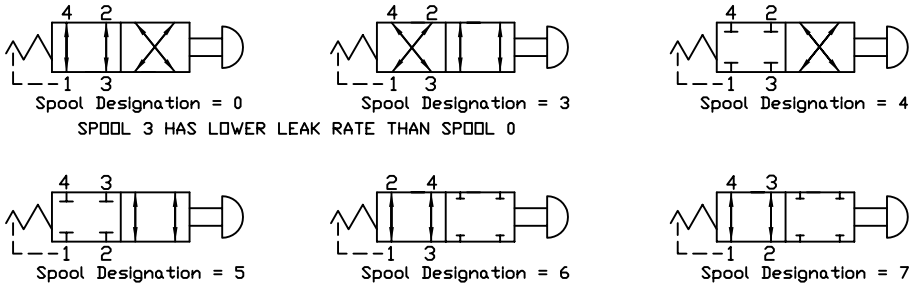
PRESSURE DROP CHART



CARTRIDGE VALVE ORDERING INFORMATION:

Order P/N 44H237M###

No Overtravel Protection = 0
With Overtravel Protection = P
SPOOL DESIGNATION:
KNOB DESIGNATION:



4PS SERIES

4 Way Spool Valve, Manually Operated. Directional Control or Selector Valve.

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DOERING

CARTRIDGE VALVE

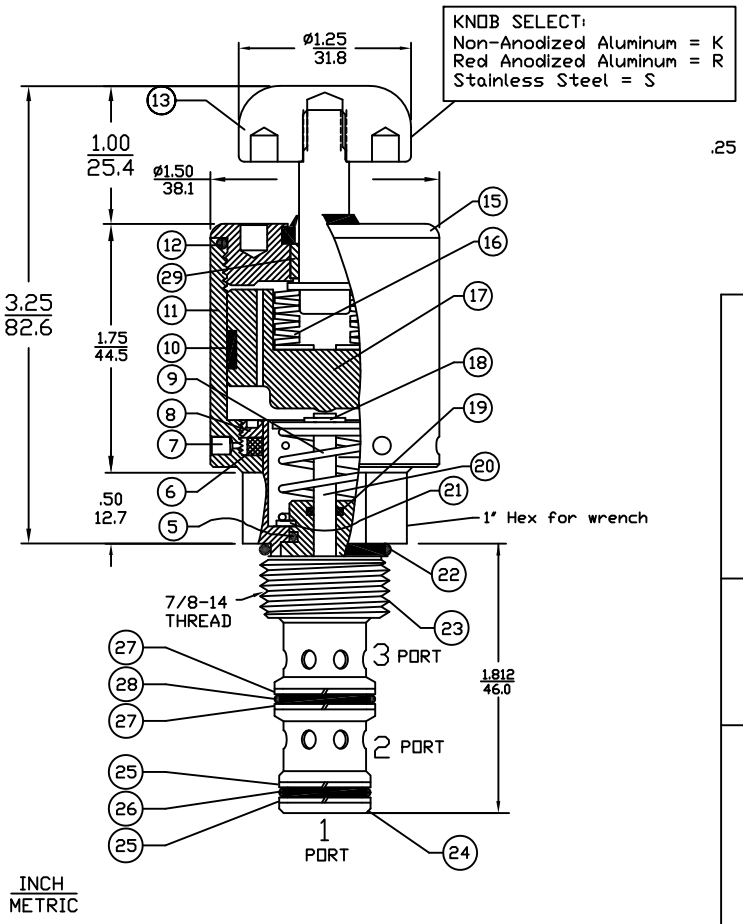
KEY EXPLANATION:

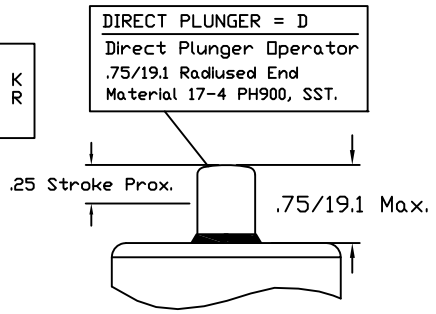
1. Bottom System Port (1)
2. Second from bottom System Port (2)
3. Third from bottom System Port (3)
5. Cartridge Seat Seal (Teflon)
6. Filter, 10 Micron Sintered Bronze (optional SST.)
7. Vents to atmosphere (2 Places 180° apart)
8. Filter Retainer, Aluminum (optional SST.)
9. Spool return Spring, Stainless Steel.
10. Piston Wear Ring, UHMW (optional Teflon)
11. Actuator Guide Cylinder, Aluminum (optional SST.)
12. Bonnet O-Ring, Buna-N (also see options)
13. Operator Knob (See part No. designations)
15. Upper Actuator Bonnet, Aluminum (optional SST.)
16. Overtravel Protection Option (Prox. 1/8")
17. Operator Follower Assembly, Aluminum (Optional SST.)
18. Spring Retainer Assembly
19. O-Ring Seal, Teflon
20. Spool Connector Linkage (17-4PH900 SST.)
21. Retaining Ring, Carbon Steel (optional SST.)
22. O-Ring Seal, Buna-N (also see options)
23. Cartridge Mounting Threads (7/8-14)
24. Spool Cage (Heat Treated Stainless)
25. Back Up Rings, Teflon (two used)
26. O-Ring Seal, Buna-N (Also see Options)
27. Back Up Rings, Teflon (two used)
28. O-Ring Seal, Buna-N (Also see Options)
29. Bronze Bushing

SHIFT FORCE NOTES:

10 to 15 Pounds of Force is required to shift the valve spool with zero pressure on port no. 1.

Any pressure on Port No. 1 will increase Force Requirement by .012 X Port No. 1 PSI.





Cavity & Housing

Cavity C-8543 (10-3):
See Spec. Sheet 1200634

Line Mount Housings:
See Spec. Sheets
1200673 and 1201903

Panel Mount Housings:
See Spec. Sheets
1202983 and 1203290

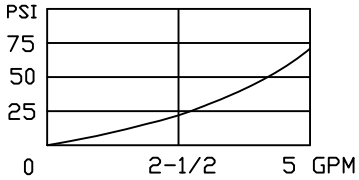
OPTIONS

Available with or without Overtravel Protection.
Optional seals include Viton, Teflon and others.
Key 7 vents to atmosphere (2 Places).
T Option provides 10-32 Threaded ports at these locations.

OPERATION

Manually Operated Hydraulic Spool Valve.
Three Way, Directional Control or Selector Valve.
Maximum System Pressure: Ports
1, 2, and 3) is 3,000 PSIG. See "SHIFT FORCE NOTES"
Spool Stroke is 1/4" .
Stroke and Over Travel dimensions are approximate.
Fluid temperatures -40°F (-40°C) to 200°F (93.3°C)
Install Cartridge valve using 1" wrench
Valve should screw in freely to the Mount Seal.
Final tightening 20 to 30 foot pounds torque.
Use lubricant on external oil seals and mounting threads.

PRESSURE DROP CHART



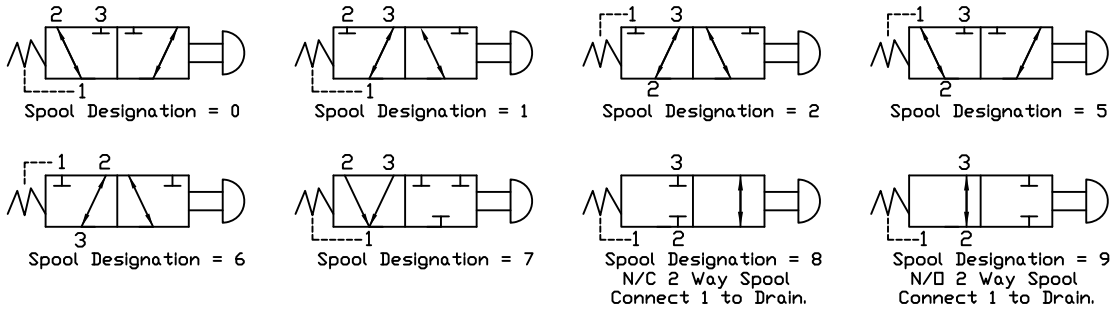
3PS SERIES

3 Way Spool Valve, Manually Operated.
Directional Control or Selector Valve.

CARTRIDGE VALVE ORDERING INFORMATION:

Order P/N 54H237M###

No Overtravel Protection = 0
With Overtravel Protection = P
SPOOL DESIGNATION:
KNOB DESIGNATION:



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DOERING

DESCRIPTION

A 2 or 3-Way, manual, push to shift, latching in the shifted position, spring-return, screw-in, directional hydraulic cartridge valve, spool design.

FEATURES

Actuator mechanism may be rotated 360° for ease of access to Latch Release Pin. Ability to rotate is for access only. Valve does NOT latch by rotating!

Actuator area is isolated from system ports through a 10 Micron sintered filter.

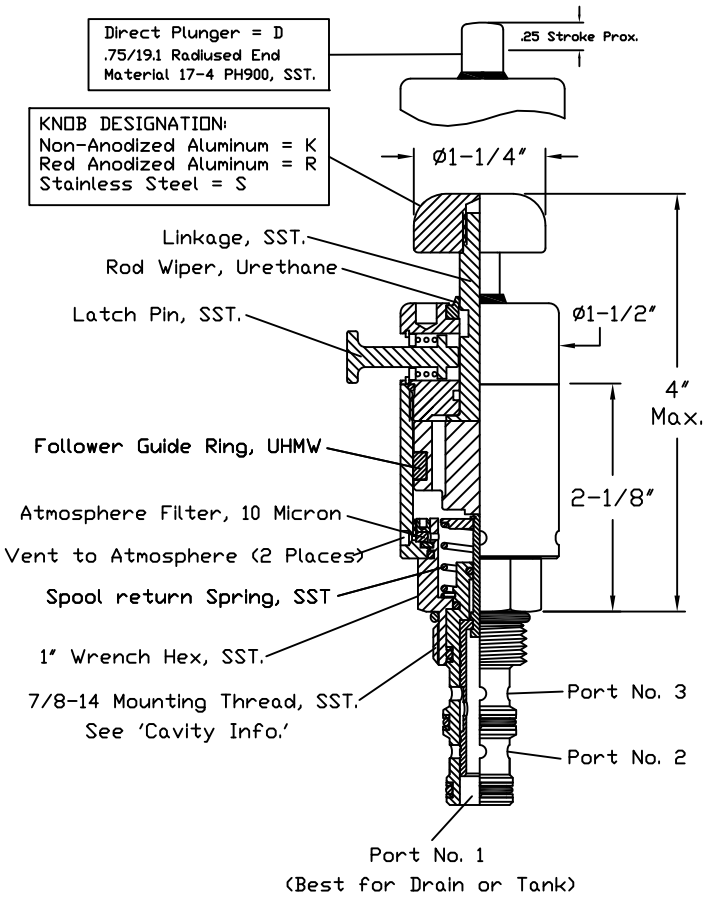
OPERATION

Once the valve is fully actuated, it is held in the actuated position until released by pulling the Latch Release Pin. Upon pulling the latch release pin, the valve spring returns the spool to the normal position as illustrated by the corresponding functional symbol selected. It is ideal to connect the No. 1 Port of the valve to the lowest pressure port, typically the Tank port. Any pressure on No. 1 Port will act upon the spool linkage and is additive to the spring force and effects the shift force required. See "SHIFT FORCE NOTES:".

SHIFT FORCE NOTES:

10 to 15 Pounds of Force is required to shift the valve spool with zero pressure on port no. 1.

Any pressure on Port No. 1 will increase Force Requirement by .012 X PSI at Port No. 1.



Cavity & Housing

Cavity & Tooling C-8543 (10-3):
See Spec. Sheet 1200634

Line Mount Housings:
See Spec. Sheet 1200673 & 1201903

Panel Mount Housings & Spacers:
See Spec. Sheets
1202983 and 1202990

Cavity & Housing information found at www.doering.com Cavities, Housing & Manifolds.

Doering Co. also manufactures multi function and multi station housings and manifolds.

Please call for assistance.

RATINGS

- Pressures to 3,000 PSIG, Ports 2 & 3 Only
- Pressure to 150 PSIG, Port No. 1 Use No. 1 Port for Drain or Tank.
- Caution, Port 1 Pressure effects Shift Force. See "SHIFT FORCE NOTES" for more detail.

Temperature: -40° to 120°C

INSTALLATION

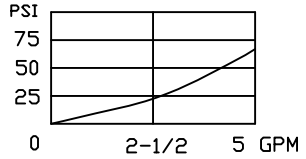
Install Cartridge valve using 1" wrench
Valve should screw in freely to the Mount Seal.
Final tightening 20 to 30 foot pounds torque.
Use lubricant on external oil seals and mounting threads.

OPTIONS

All Stainless Steel option, add -SS to Part Number.
Stainless Steel Wetted Area Only, add -S to Part Number.
Stainless Steel Actuator Area Only, add -PS to Part Number.

Standard seals are Buna-N with Teflon back up rings.
Optional seals include EP, Viton, Teflon and others.
Vents to atmosphere (2 Places 180° apart).
T Option provides 10-32 Threaded ports at these locations. With T option, atmosphere filter is omitted.

PRESSURE DROP / FLOW



3PS SERIES

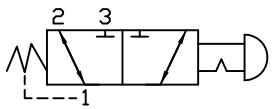
2 and 3 Way Spool, Directional Control, Manually Operated, Latching Valves

DOERING CARTRIDGE VALVE ORDERING INFORMATION:

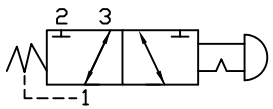
Order P/N 54H237MOL#######

DIRECT PLUNGER OR KNOB DESIGNATION:
SPOOL DESIGNATION:

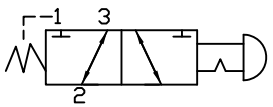
Material: When Blank (includes Brass, Aluminum and Stainless Steel)
SS (includes Brass and Stainless Steel)
SS316 (includes Brass, 17-4 and 316 Stainless Steel)



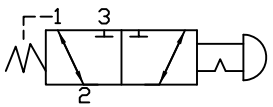
Spool Designation = 0



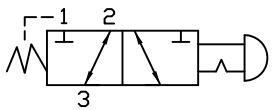
Spool Designation = 1



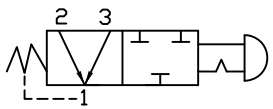
Spool Designation = 2



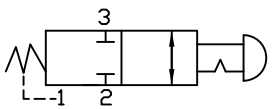
Spool Designation = 5



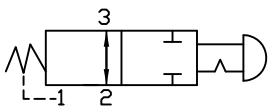
Spool Designation = 6



Spool Designation = 7



Spool Designation = 8
N/C 2 Way Spool
Connect 1 to Drain.



Spool Designation = 9
N/O 2 Way Spool
Connect 1 to Drain.

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DOERING

CARTRIDGE VALVE

DESCRIPTION

A 2-Way, normally closed, manually operated, push knob to open, latching in the open position, spring-return, screw-in, directional hydraulic cartridge valve, poppet design.

FEATURES

Actuator mechanism may be rotated 360° for ease of access to Latch Release Pin. Ability to rotate is for access only. Valve does NOT latch by rotating!

Actuator area is isolated from system ports through a 10 Micron sintered filter.

Anodized Aluminum Components

OPERATION

Once the valve is fully actuated, it is held in the actuated position until released by pulling the Latch Release Pin. Upon pulling the latch release pin, the valve spring returns the poppet to the closed position as illustrated by the functional symbol.

It is ideal to connect the No. 1 Port of the valve to the lowest pressure port, typically the Tank port.

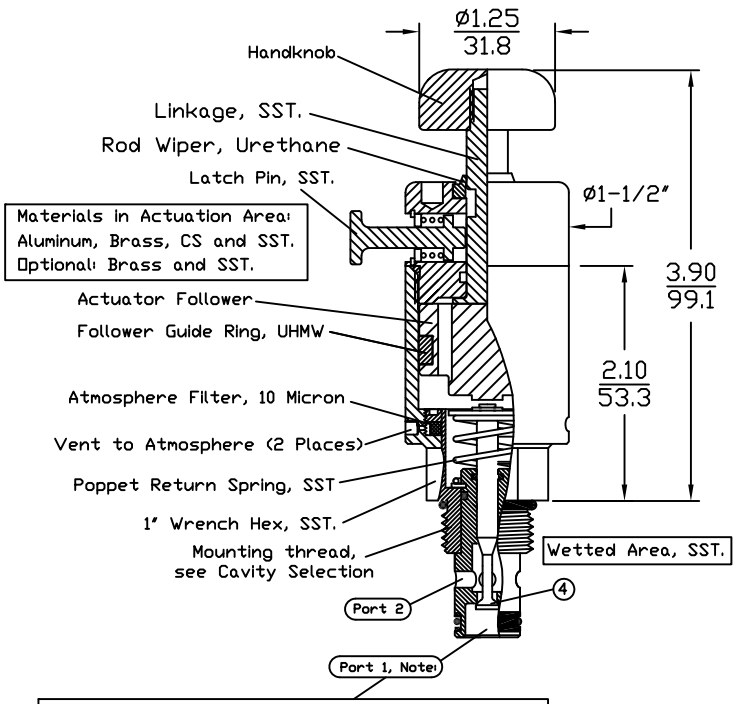
See "SHIFT FORCE NOTES" and Caution Note regarding PSI limitation when Latching feature is engaged.

SHIFT FORCE NOTES:

10 to 15 Pounds of Force is required to shift the valve poppet with zero pressure on ports 1 and 2.

Any pressure on Port No. 1 will increase the Force Requirement by .030 X PSI.

Any pressure on Port No. 2 will increase the Force Requirement by .003 X PSI.



Caution Note:
Note: When Latching feature is engaged, pressure at Port 1 must not exceed 65 PSI.

INCH
METRIC

RATINGS:

Working Pressure:

Port 1, Latched 65 PSI
Cavity C-8502, 5,000 PSI,
Cavity C-8542, 5,000 PSI Port 1
Cavity C-8542, 3,000 PSI Port 2

Fluid temperature:
-45°F, (42.7°C) to 200°F, (93.3°C)

Cavity & Housing

For 82H#227M##1 Valve:

Cavity Drawing:
1200630 Spec. Sheet

Line Mount Housings:
1200672 Spec. sheet

Panel Mount Housings:
1202981 and 1203290
Spec. Sheets

Cavity & Housing

For 84H#227M##1 Valve:

Cavity Drawing:
1200621 Spec. Sheet

Line Mount Housings:
1200674 and 1201455
Spec. Sheets

Panel Mount Housings:
1202982 and 1203290
Spec. Sheets

Valve Number: 8#H#227M□L#1

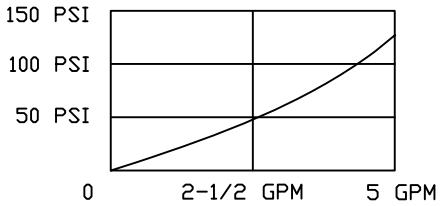
- 2 = 3/4-16 Thread, Cavity C-8502 (8-2)
- 4 = 7/8-14 Thread, Cavity C-8542 (10-2)

Operators:
- K = Knob, Aluminum
- R = Knob, Red Ano.
- S = Knob, Stainless

Blank = Standard Hard Seat
K = Kel-F Soft Seat with Hard Seat backup. Ref. Key 4
Reduces Flow C_V =0.3 Prox.

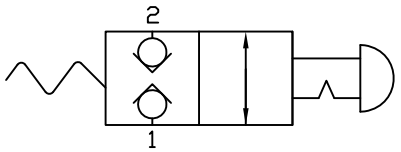
PRESSURE DROP CHART C_V= 0.4
Hard Seat Only.

VALVE ORIFICE DIAMETER = .180"
Smaller Orifice with K Option Seat.



2PB SERIES

Functional Symbol



2PB N/C

2 Way Poppet Valve, Normally Closed
Manually Operated, Latching Valves

6343 RIVER ROAD SE ▪ CLEAR LAKE, MN 55319 USA
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mailbox@doering.com ▪ www.doering.com

DOERING

CARTRIDGE VALVE

SPECIFICATIONS:

Pilot Operated poppet valve with Manual Override.
Two way, normally closed, actuate to open..
Maximum pressure 5,000 PSI, Ports 1 and 2.

See "SHIFT FORCE NOTES" regarding operating force required to open valve.
Full Flow is achieved at .08" Stroke.
Full Travel is at Prox. .16" Stroke.
Do not travel to or past full stroke with positive force.

Use 1" wrench to install valve.
Torque to 20 to 30 foot pounds.

Use lubricant on external oil seals and mounting threads.
Fluid temperature -45°F (-42.7°C) to 200°F (93.3°C)

STANDARD OPTIONS

T Option 10-32 vent ports at Key 7 (2 Places)
Seat (Key 4) is heat treated Stainless Steel.
Seal Materials used are Buna-N and Teflon.

Optional seal and construction materials available.

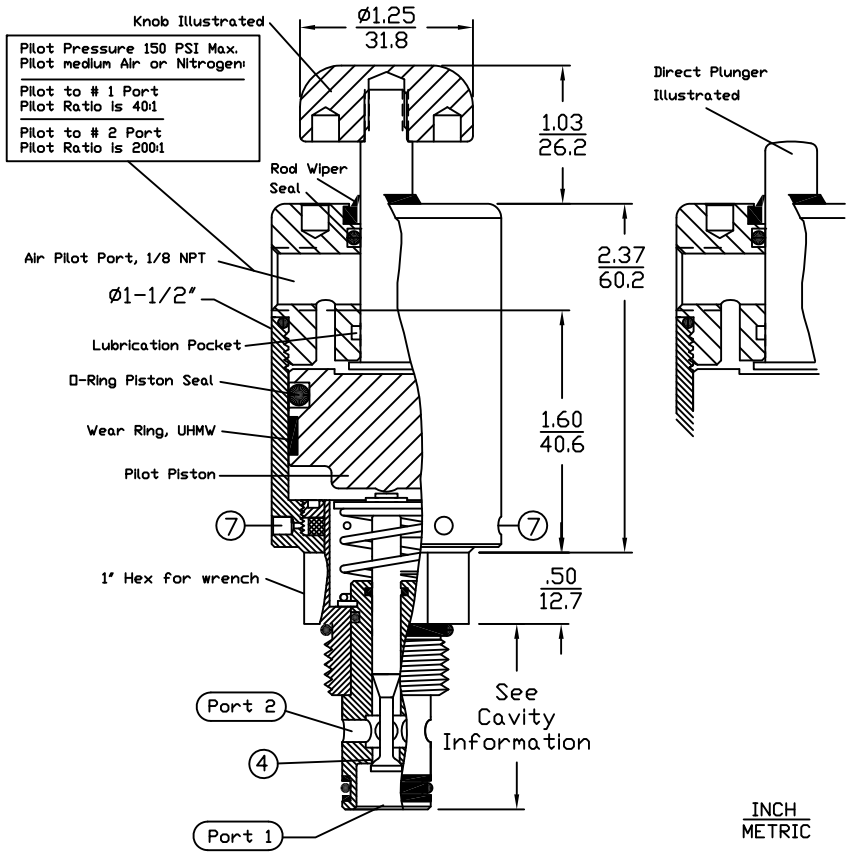
SHIFT FORCE NOTES:

10 to 15 Pounds of Force is required to shift the valve poppet with zero pressure on ports 1 and 2.

Any pressure on port 1 will increase Force requirement by .030 X PSI at No. 1 Port.
Any pressure on port 2 will increase Force requirement by .003 X PSI at No. 2 Port.

For total force requirement, add all 3 results.

Using port 2 as pressure inlet may reduce the force requirement to shift valve.



Cavity & Housing

For 82H#227040M□#1 Valve:

Cavity Drawing:
1200630 Spec. Sheet

Line Mount Housings:
1200672 Spec. sheet

Panel Mount Housings:
1202981 and 1203290
Spec. Sheets

For 84H#227040M□#1 Valve:

Cavity Drawing:
1200621 Spec. Sheet

Line Mount Housings:
1200674 and 1201455
Spec. Sheets

Panel Mount Housings:
1202982 and 1203290
Spec. Sheets

Valve Number: 8#H#227040M□#1

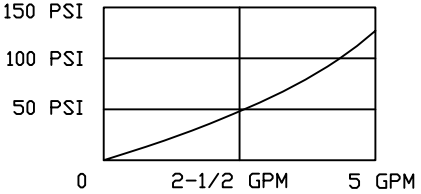
2 = 3/4-16 Thread
Cavity C-8502
(8-2)
4 = 7/8-14 Thread
Cavity C-8542
(10-2)

HANDKNOB DESIGNATION:
D = No Knob Direct Plunger
K = Non-Anodized Aluminum
N = No Knob Threaded Stem
R = Red Anodized Aluminum
S = Stainless Steel

Blank = Standard Hard Seat
K = Kel-F Soft Seat with
Hard Seat backup. Ref. Key 4
Reduces Flow C_V =0.3 Prox.

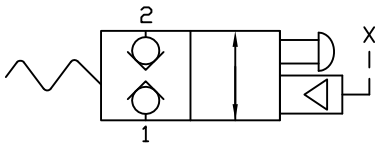
PRESSURE DROP CHART C_V= 0.4

VALVE ORIFICE DIAMETER = .160"



2PB SERIES

Functional Symbol



2PB N/C
2 Way Poppet Valve, Pilot / Manual

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DOERING

DOERING CARTRIDGE VALVE

DESCRIPTION

A 2 or 4-Way, manual, push to shift, latching in the shifted position, spring-return, screw-in, directional hydraulic cartridge valve, spool design.

FEATURES

Actuator mechanism may be rotated 360° for ease of access to Latch Release Pin. Ability to rotate is for access only. Valve does NOT latch by rotating!

Actuator area is isolated from system ports through a 10 Micron sintered filter.

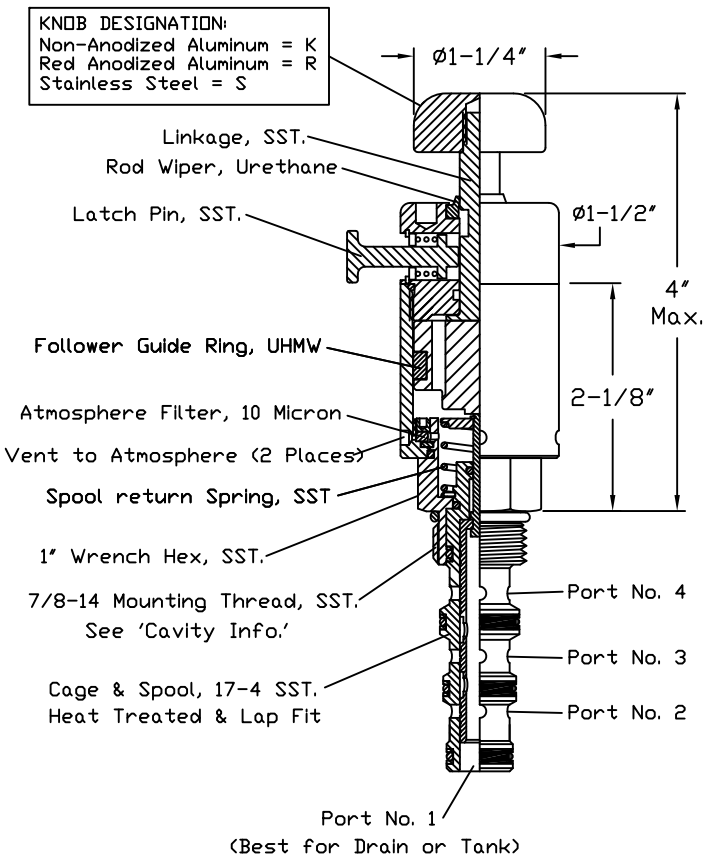
OPERATION

Once the valve is fully actuated, it is held in the actuated position until released by pulling the Latch Release Pin. Upon pulling the latch release pin, the valve spring returns the spool to the normal position as illustrated by the corresponding functional symbol selected. It is ideal to connect the No. 1 Port of the valve to the lowest pressure port, typically the Tank port. Any pressure on No. 1 Port will act upon the spool linkage and is additive to the spring force and effects the shift force required. See "SHIFT FORCE NOTES:".

SHIFT FORCE NOTES:

10 to 15 Pounds of Force is required to shift the valve spool with zero pressure on port no. 1.

Any pressure on Port No. 1 will increase Force Requirement by .012 X PSI at Port No. 1.



CAVITY & HOUSING

Cavity & Tooling C-8544 (10-4):
See Spec. Sheet 1200671

Line Mount Housings:
See Spec. Sheet 1200675 & 1202930

Panel Mount Housings & Spacers:
See Spec. Sheets
1202984 and 1202990

Cavity & Housing information found at www.doering.com Cavities, Housing & Manifolds.

Doering Co. also manufactures multi function and multi station housings and manifolds.

Please call for assistance.

RATINGS

- Pressures to 3,000 PSIG, Ports 2, 3 & 4 Only
- Pressure to 150 PSIG, Port No. 1 Use No. 1 Port for Drain or Tank.
- Caution, Port 1 Pressure effects Shift Force. See "SHIFT FORCE NOTES" for more detail.

Temperature: -40° to 120°C

INSTALLATION

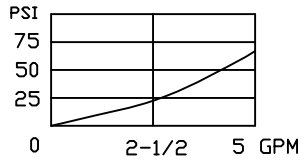
Install Cartridge valve using 1" wrench
Valve should screw in freely to the Mount Seal.
Final tightening 20 to 30 foot pounds torque.
Use lubricant on external oil seals and mounting threads.

OPTIONS

All Stainless Steel option, add -SS to Part Number.
Stainless Steel Wetted Area Only, add -S to Part Number.
Stainless Steel Actuator Area Only, add -PS to Part Number.

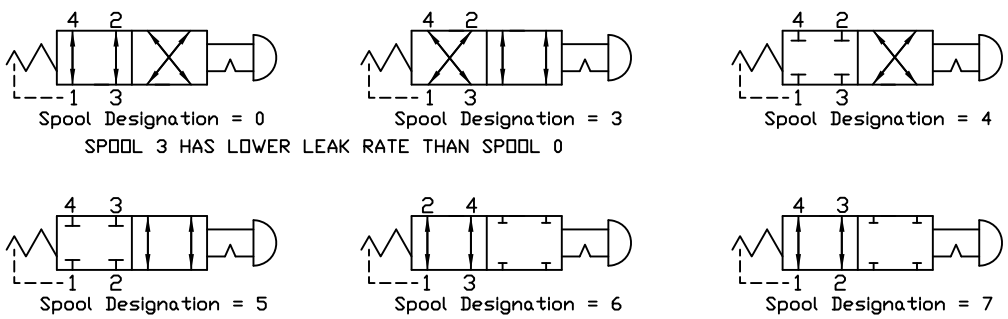
Standard seals are Buna-N with Teflon back up rings.
Optional seals include EP, Viton, Teflon and others.
Vents to atmosphere (2 Places 180° apart).
T Option provides 10-32 Threaded ports at these locations. With T option, atmosphere filter is omitted.

PRESSURE DROP / FLOW



CARTRIDGE VALVE ORDERING INFORMATION:

Order P/N 44H237M0L##
- SPOOL DESIGNATION:
- KNOB DESIGNATION:



4PS SERIES

2 and 4 Way Spool, Directional Control, Manually Operated, Latching Valves

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mailbox@doering.com ■ www.doering.com

DOERING

DESCRIPTION:

- A screw-in cartridge, needle valve.
- Close with clockwise rotation of hand knob.
- Open with counterclockwise rotation of hand knob.
- Fits Doering C-8542 Cavity (10-2)

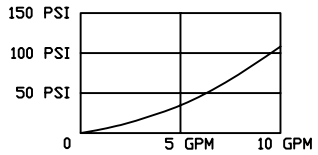
FEATURES:

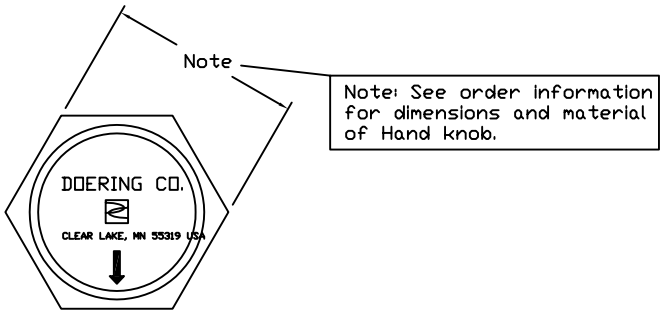
- Stainless Steel Wetted Parts
- Metal Hand Knob (see order info.)
- Adjustments cannot cause parts to back out of valve.
- Positive shut off for gases or liquids.
- Pressures to 5,000 PSIG, Port 1
  Pressures to 3,000 PSIG, Port 2

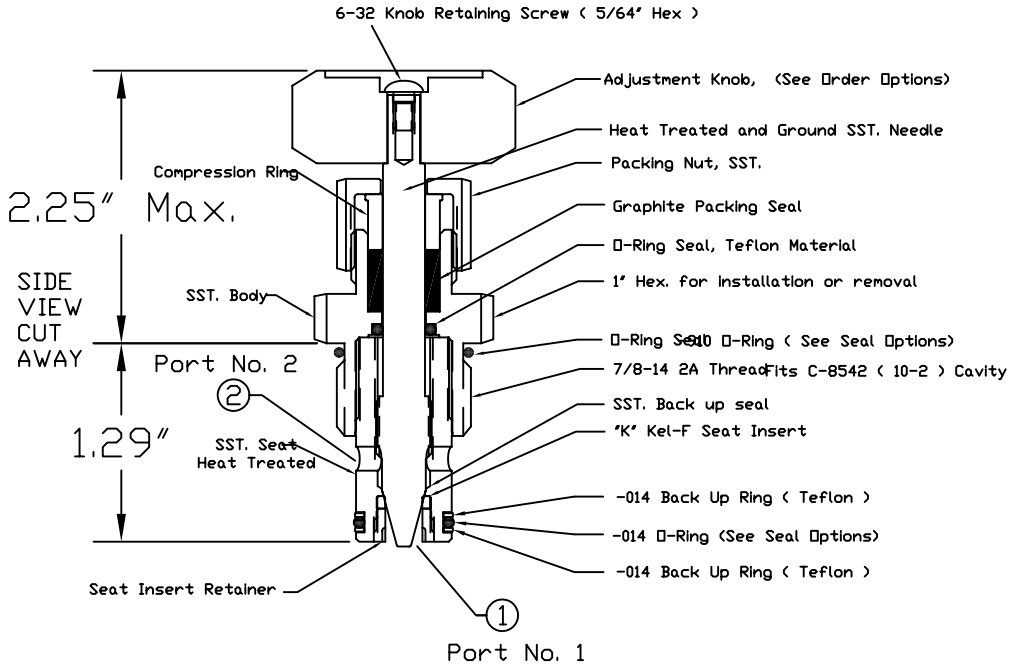
NOTES:

- SST = Stainless Steel material
- Install with 20 to 30 foot pounds torque.
- Lubricate Seals and Threads before installation.

- PRESSURE DROP / FLOW







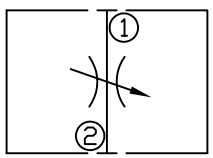
ORDER INFORMATION:

DNVF-K-10-__-___-__

Seal Materials
- N (Buna-N, Nitrile)
- V (Viton, Fluorocarbon)
- E (Teflon)

Material Option, Wetted Area
- Blank (17-4, 303, 304)
- 316 (17-4 & 316)

Knob Selection
- S075 (SST. 0.75" Hex)
- S100 (SST. 1" Hex)
- S125 (SST. 1.25" Hex)
- A150 (Alum. 1.50" Hex)



GRAPHIC SYMBOL

DNVF SERIES
FIRE RESISTANT PRECISION NEEDLE VALVE

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mailbox@doering.com ■ www.doering.com

DOERING

SPEC. SHEET NO. 1201102 REV. 003

DESCRIPTION:

- A screw-in cartridge, needle valve.
- Close with clockwise rotation of hand knob.
- Open with counterclockwise rotation of hand knob.
- Fits Doering C-8542 Cavity (10-2)

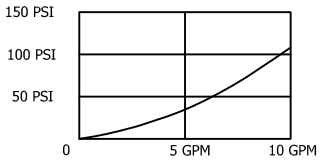
FEATURES:

- Stainless Steel Wetted Parts
- Metal Hand Knob (see order info.)
- Adjustments cannot cause parts to back out of valve.
- Kel-F soft seat (K) with metal back up seat.
- Positive shut off for gases or liquids.
- Working Pressure 5,000 psi (345 bar)
  Proof Pressure 7,500 psi (518 bar)

NOTES:

- SST = Stainless Steel material
- Install with 20 to 30 foot pounds torque.
- Lubricate Seals and Threads before installation.

- PRESSURE DROP / FLOW



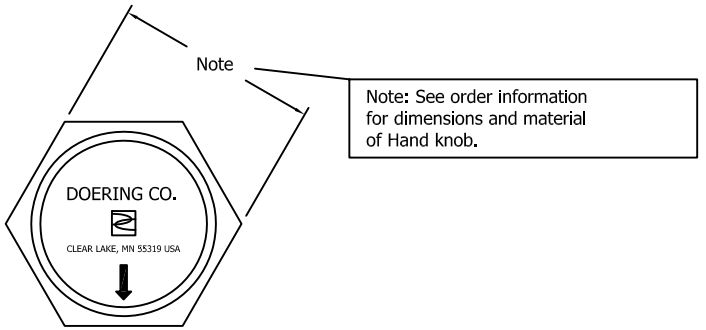
ORDER INFORMATION:

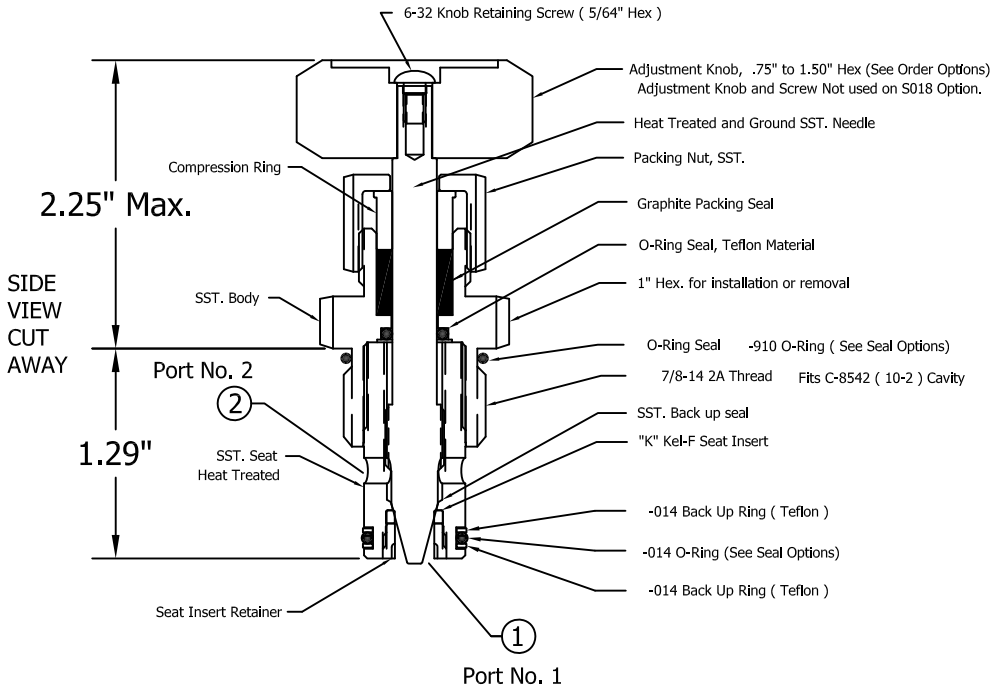
DNV-K-10-__-___-___

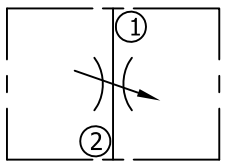
Seal Materials
N (Buna-N, Nitrile)
V (Viton, Fluorocarbon)
E (Teflon)
R (EPR/EPDM)

Knob Selection
S018 (SST. 3/16" Hex) No Knob
S075 (SST. 0.75" Hex)
S100 (SST. 1" Hex)
S125 (SST. 1.25" Hex)
A150 (Alum. 1.50" Hex)

Material Option, Wetted Area
BLANK (17-4, 303, 304)
316 (17-4 & 316)







GRAPHIC SYMBOL

DNV SERIES
PRECISION NEEDLE VALVE

6343 RIVER ROAD SE ■ CLEAR LAKE, MN 55319 USA
Telephone: 320-743-2276 ■ Fax: 320-743-3723
mailbox@doering.com ■ www.doering.com

DOERING

SPEC. SHEET NO. 1201273 REV. 006

KEY EXPLANATION:

1. Port No. 1, System
2. Port No. 2, System
3. Poppet, Hard Stainless Steel
6. Filter, 10 Micron Sintered Bronze. Omitted W/ T option.
9. Poppet and Piston return spring, Stainless
11. Seat Saver Spring group, Stainless Steel.
12. Piston, Seat Saver style.
13. Bonnet, Stainless Steel.
14. 1" Wrench Flats.
15. Pilot Port. See Pilot port options / ordering info.
24. O-Ring Seal, Filter Retainer (Buna-N)
30. Cartridge Seat, Hard Stainless Steel.

SPECIFICATIONS:

Pilot operated two way cartridge valve. Normally open. Pilot to close passage between ports one and two.

Valve will also function as a Pilot Operated Relief valve. See notes regarding pilot pressure.

Maximum pressure 5,000 PSI, Cavity C-8502

Cavity C-8542, 5,000 PSI Port 1, 3,000 PSI Port 2

Pilot Pressure Range, 50 PSI Min. to 5000 PSI Max.
Pilot minimum may be lower if valve is used as a pilot operated relief valve.

Fluid temperature -45°F, (42.7°C) to 200°F, (93.3°C)
Install Cartridge valve using 1" wrench
Valve should screw in freely to the Mount Seal.
Final tightening to 20 foot pounds torque.
Use lubricant on external oil seals and mounting threads.

26:1 PILOT RATIO:

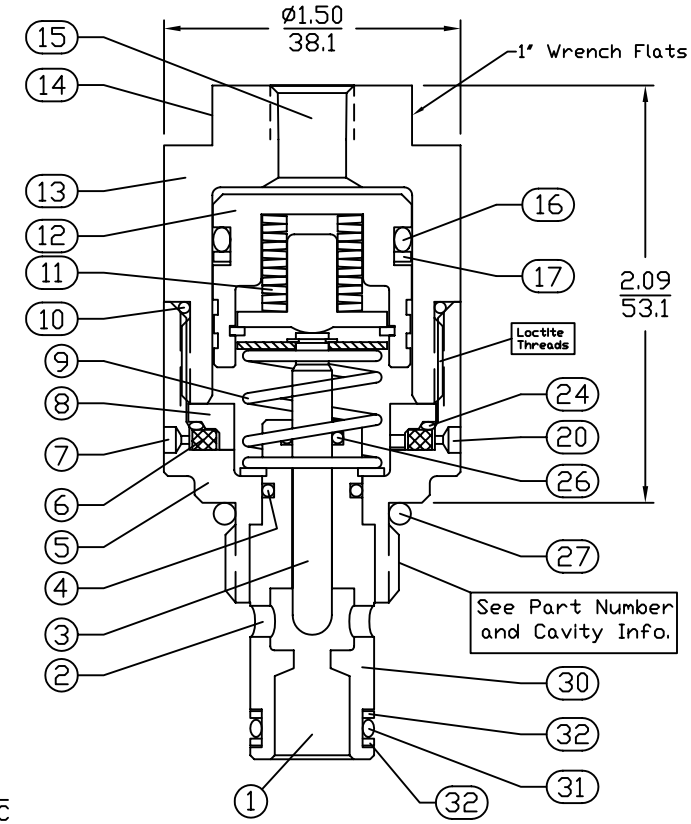
Area of pilot piston is 26 X larger than seat area.

To determine Minimum Pilot pressure required, follow these steps:

(1) Multiply the maximum possible system pressure X 1.1 = SM (System Max.)
(2) Divide SM by 26 = MP (Min. Pilot)

Note: MP is minimum pilot pressure needed for normally open / pilot to close valve function. If pilot pressure falls below MP, the valve will function as a pilot operated relief valve.

CARTRIDGE VALVE



INCH
METRIC

STANDARD OPTIONS

Standard Seals are Buna-N with Teflon Back Up. Call for Options.

T Option: 10-32 Gasket Ports at Key 7 & 20

T Options provides piping connection to piston Vent area.

Cavity & Housing

For 82527#260 Valve:

Cavity C-8502 (8-2):
See Spec. Sheet 1200630

Line Mount Housings:
See Spec. Sheets
1200672 and 1203123

Panel Mount Housings:
See Spec. Sheets
1202981 and 1202990

For 84527#260 Valve:

Cavity C-8542 (10-2):
See Spec. Sheet 1200621

Line Mount Housings:
See Spec. Sheets
1200674 and 1201455

Panel Mount Housings:
See Spec. Sheets
1202982 and 1202990

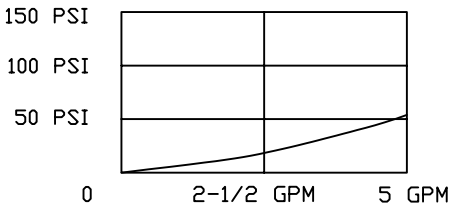
CARTRIDGE VALVE ORDERING INFORMATION:

Valve Number: 8#527#260

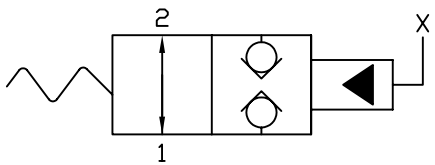
2 = 3/4-16 Thread Cavity C-8502 (8-2)
4 = 7/8-14 Thread Cavity C-8542 (10-2)

Pilot Porting, Key 15
1 = 1/8 NPT
2 = 1/4 NPT
4 = SAE4 (ORB)
6 = SAE6 (ORB)

PRESSURE DROP CHART $C_V = 0.5$



2PB SERIES



2PB N/O

HIGH PRESSURE PILOT RATING.

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DOERING

CARTRIDGE VALVE

KEY EXPLANATION:

1. Port No. 1, System Inlet
2. Port No. 2, System Outlet
3. Poppet, Hard Stainless Steel
4. Seat passage sealing area. Hard Stainless Steel.
5. O-Ring Seal, Buna N (Also See Options)
6. Filter, 10 Micron, Sintered Bronze.
7. Vent (2 Pl.) Optional T Port Locations
8. Filter Retainer
9. Poppet and Actuator Return Spring, Stainless
10. Piston Guide Ring UHMW material
11. Piston O-Ring Seal, Buna N (Also See Options)
12. Bonnet O-Ring Seal, Buna N (Also See Options)
13. 3/16" (4.763) Spanner Holes (2 Pl.)
14. 1/8 NPT Pilot Port X (Also See Options)
15. Bonnet, Aluminum material
16. Actuator Body, Aluminum
17. Actuator Piston, Aluminum
18. Poppet Return Spring Retainer Assembly
19. Poppet Seal, TFE
20. 1/8" (3.175) Spanner Holes (4 or 6 Pl.)
21. Cartridge Seat Retaining Ring
22. Mount O-Ring Seal, Buna N (Also See Options)
23. Cartridge Mounting Threads, Stainless Steel
24. Cartridge Seat, Hard Stainless
25. Back Up Rings, Teflon
26. O-Ring Seal, Buna N (Also See Options)
27. Spring (Used on valves = "A" Dia. 1-7/8 & 2-1/4")
28. Orifice Options, Ø.015 or Ø.031.
    Call for information and restrictions.

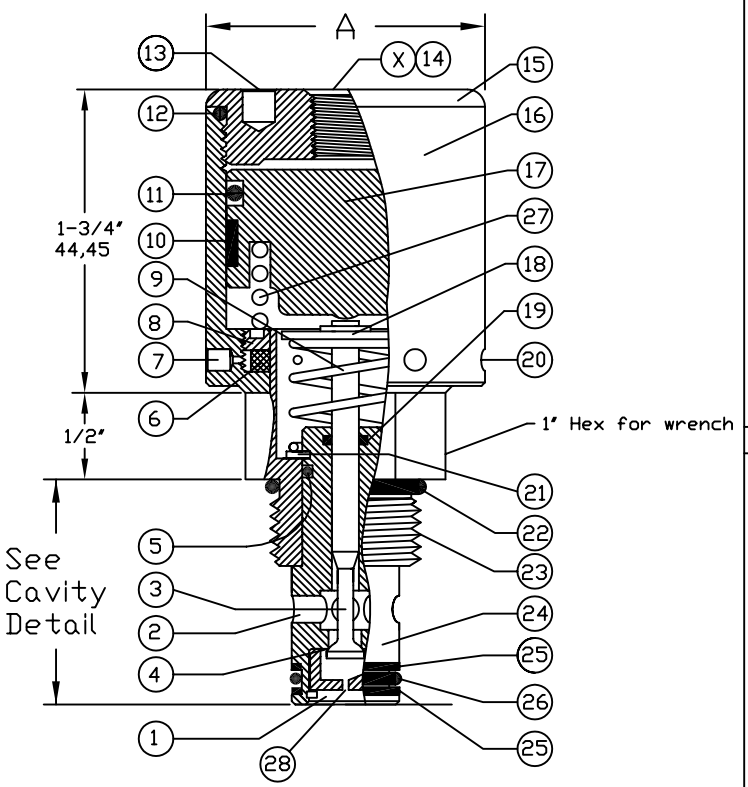
SPECIFICATIONS:

Pilot operated two way cartridge valve. Normally closed. Pilot to open passage between ports one and two.
Use No. 1 port as pressure inlet port.
Port No. 1 pressure rating (8502 Cavity) 7,500 PSIG
Port No. 1 pressure rating (8542 Cavity) 5,000 PSIG
Port 2, Cavity C-8502, Maximum PSI 5,000
Port 2, Cavity C-8542, Maximum PSI 3,000
Pilot Pressure Range, 50 PSI Min. to 150 PSI Max.
Fluid temperature -40°F, (-40°C) to 200°F, (93.3°C)
Install Cartridge Valve using 1" wrench.
Valve should screw in freely to the Mount Seal.
Torque to 20 to 30 foot pounds.
Use lubricant on external oil seals and mounting threads.

PILOT RATIO NOTES:

TO CALCULATE THE CORRECT PILOT RATIO VALVE, FOLLOW THESE STEPS:

1. Determine the MAXIMUM possible system pressure. Multiply X 1.1 = SYSTEM
2. Determine MINIMUM possible pilot pressure. Multiply X .9 = PILOT
3. Divide SYSTEM by PILOT = PILOT TO SYSTEM RATIO
4. Round up to standard available ratio.



STANDARD OPTIONS

Pilot Port (Key X) 1/8 NPT. Optional SAE4 Available.
Seals: Buna N, Viton or Teflon. Others please specify.
T Option: 10-32 Ports at Key 7 & 20, Random 360° Pos.

TOOLING

* Cavity Form Tools: FT+ cavity#
* 1/8 (3.175) Pin Spanner Tool Order No. 471, Ref. Key No. 20
* 3/16 (4.763) Face Spanner Tool Order No. 482, Ref. Key No. 13

Cavity & Housing

For 82H######1 Valve:
Cavity C-8502 (8-2):
See Spec. Sheet 1200630

Line Mount Housings:
See Spec. Sheets
1200672 and 1203123

Panel Mount Housings:
See Spec. Sheets
1202981 and 1202990

For 84H######1 Valve:
Cavity C-8542 (10-2):
See Spec. Sheet 1200621

Line Mount Housings:
See Spec. Sheets
1200674 and 1201455

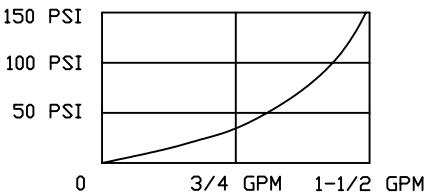
Panel Mount Housings:
See Spec. Sheets
1202982 and 1202990

PILOT TO SYSTEM RATIO	" A " DIAMETER		Order Valve No.	Fits Cavity:
100:1	1-1/2	38,10	82H2041001	C-8502 (8-2)
120:1	1-5/8	41,28	82H3041201	
168:1	1-7/8	47,63	82H6041681	
255:1	2-1/4	57,15	82H7042551	
100:1	1-1/2	38,10	84H2041001	C-8542 (10-2)
120:1	1-5/8	41,28	84H3041201	
168:1	1-7/8	47,63	84H6041681	
255:1	2-1/4	57,15	84H7042551	

FLOW AND PRESSURE DROP CHART.

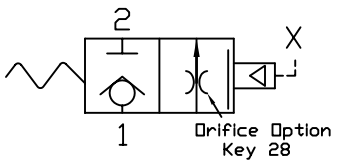
C_V= 0.1 Without Optional Orifice (Key 28).

FLOW and PRESSURE DROP Chart indicates U.S. G.P.M. All flow performance data based on tests using fluid at a specific gravity of .85 and a viscosity of 150 S.U.S. at a temperature of 100°F.



2PB SERIES

Functional Symbol



With optional ORIFICE, flow from Port 2 to Port 1 may damage the valve.

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DOERING

CARTRIDGE VALVE

KEY EXPLANATION:

1. Port No. 1 (System)
2. Port No. 2 (System)
3. Poppet, Hard Stainless Steel
4. Seat to Poppet sealing area, hard seat.
5. O-Ring Seal, Buna N (Also See Options)
6. Filter, 10 Micron, Sintered Bronze.
7. Vent (2 Pl.) Optional T Port Locations
8. Filter Retainer
9. Poppet and Actuator Return Spring, Stainless
10. Piston Guide Ring UHMW material
11. Piston O-Ring Seal, Buna N (Also See Options)
12. Bonnet O-Ring Seal, Buna N (Also See Options)
13. 3/16" (4.763) Spanner Holes (2 Pl.)
14. 1/8 NPT Pilot Port X (Also See Options)
15. Bonnet, Aluminum material
16. Actuator Body, Aluminum
17. Actuator Piston, Aluminum
18. Poppet Return Spring Retainer Assembly
19. Poppet Seal, TFE
20. 1/8" (3.175) Spanner Holes (4 or 6 Pl.)
21. Cartridge Seat Retaining Ring
22. Mount O-Ring Seal, Buna N (Also See Options)
23. Cartridge Mounting Threads, Stainless Steel
24. Cartridge Seat, Hard Stainless
25. Back Up Rings, Teflon
26. O-Ring Seal, Buna N (Also See Options)
27. Spring (Used on valves = "A" Dia. 1-7/8 & 2-1/4")

SPECIFICATIONS:

Pilot operated two way cartridge valve. Normally closed. Pilot to open passage between ports one and two.

No. 1 port is the preferred pressure holding port. Maximum pressure 5,000 PSI, Cavity C-8502
Cavity C-8542, 5,000 PSI Port 1, 3,000 PSI Port 2

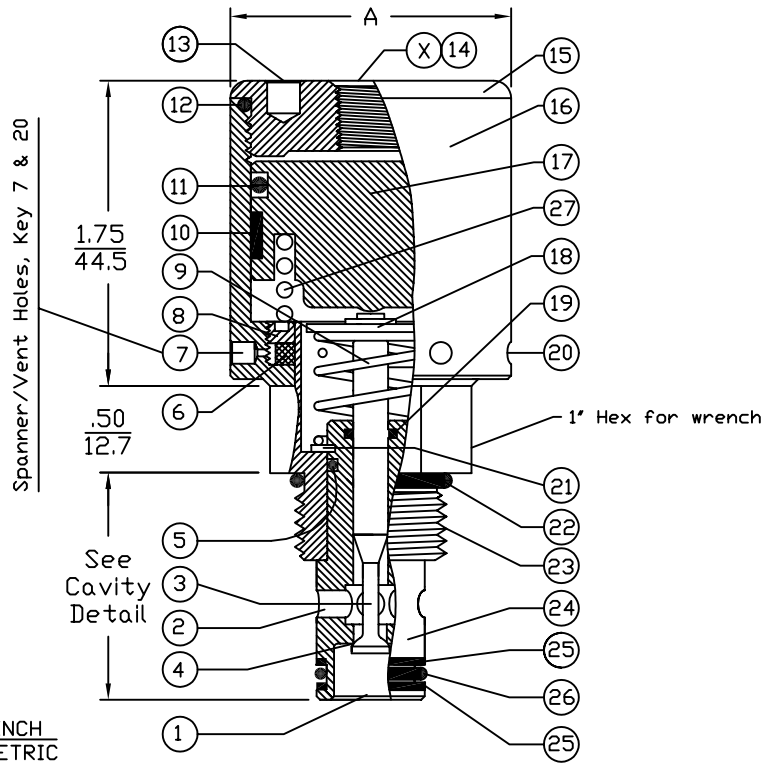
Pilot Pressure Range, 50 PSI Min. to 150 PSI Max.
Fluid temperature -45°F, (42.7°C) to 200°F, (93.3°C)

Install Cartridge Valve using 1" wrench.
Valve should screw in freely to the Mount Seal.
Torque to 20 foot pounds.
Use lubricant on external oil seals and mounting threads.

PILOT RATIO NOTES:

TO CALCULATE THE CORRECT PILOT RATIO VALVE, FOLLOW THESE STEPS:

1. Determine the MAXIMUM possible system pressure. Multiply X 1.1 = SYSTEM
2. Determine MINIMUM possible pilot pressure. Multiply X .9 = PILOT
3. Divide SYSTEM by PILOT = PILOT TO SYSTEM RATIO
4. Round up to standard available ratio.



For Kel-F Soft Seat, modify Part No. IE: 82HK######1

STANDARD OPTIONS

Pilot Port (Key X) 1/8 NPT. Optional SAE4 Available.
Seals: Buna N, Viton or Teflon. Others please specify.
T Option: 10-32 Ports at Key 7 & 20, Random 360° Pos.
Seat (Key 4) Hard Stainless. Optional Soft Available.
Add letter K after H to order Kel-F 81 soft seat.

TOOLING

*1/8 (3.175) Pin Spanner Tool Order No. 471, Ref. Key No. 20
*3/16 (4.763) Face Spanner Tool Order No. 482, Ref. Key No. 13

Cavity & Housing

For 82H######1 Valve:
Cavity C-8502 (8-2):
See Spec. Sheet 1200630

Line Mount Housings:
See Spec. Sheets
1200672 and 1203123

Panel Mount Housings:
See Spec. Sheets
1202981 and 1202990

For 84H######1 Valve:
Cavity C-8542 (10-2):
See Spec. Sheet 1200621

Line Mount Housings:
See Spec. Sheets
1200674 and 1201455

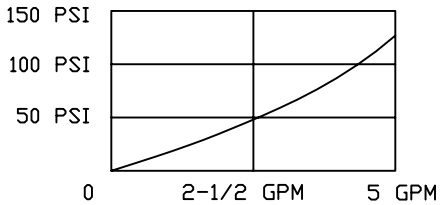
Panel Mount Housings:
See Spec. Sheets
1202982 and 1202990

SYSTEM RATIO	" A " Diameter Inch	Metric	Order Valve No.	Fits Cavity:
40:1	1-1/2	38.10	82H2270401	C-8502 (8-2) 3/4-16 Thd.
49:1	1-5/8	41.28	82H3270491	
69:1	1-7/8	47.63	82H6270691	
104:1	2-1/4	57.15	82H7271041	
40:1	1-1/2	38.10	84H2270401	C-8542 (10-2) 7/8-14 Thd.
49:1	1-5/8	41.28	84H3270491	
69:1	1-7/8	47.63	84H6270691	
104:1	2-1/4	57.15	84H7271041	

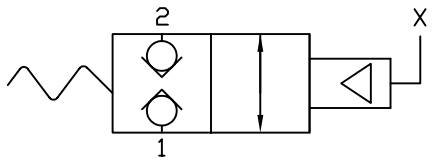
Flow & Pressure Drop.

Reduce Values 50% with K (Soft) Seat.

Hard Seat Effecive Diameter .158"
Hard Seat estimated Cv 0.4



2PB SERIES



2PB N/C

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DOERING

SPEC. SHEET NO. 1201280 REV. 005

CARTRIDGE VALVE

KEY EXPLANATION:

1. Port No. 1 (System)
2. Port No. 2 (System)
3. Poppet, Hard Stainless Steel
4. Seat passage sealing area.
5. O-Ring Seal, Buna N (Also See Options)
6. Filter, 10 Micron, Sintered Bronze.
7. Vent (2 Pl.) Optional T Port Locations
8. Filter Retainer
9. Poppet and Actuator Return Spring, Stainless
10. Piston Guide Ring UHMW material
11. Piston O-Ring Seal, Buna N (Also See Options)
12. Bonnet O-Ring Seal, Buna N (Also See Options)
13. 3/16" (4.763) Spanner Holes (2 Pl.)
14. 1/8 NPT Pilot Port X (Also See Options)
15. Bonnet, Aluminum material
16. Actuator Body, Aluminum
17. Actuator Piston, Aluminum
18. Poppet Return Spring Retainer Assembly
19. Poppet Seal, TFE
20. 1/8" (3.175) Spanner Holes (4 or 6 Pl.)
21. Cartridge Seat Retaining Ring
22. Mount O-Ring Seal, Buna N (Also See Options)
23. Cartridge Mounting Threads, Stainless Steel
24. Cartridge Seat, Hard Stainless
25. Back Up Rings, Teflon
26. O-Ring Seal, Buna N (Also See Options)
27. Spring (Used on valves = "A" Dia. 1-7/8 & 2-1/4")
28. Orifice Options, Ø.015 or Ø.031.
    Orifice includes retaining ring.

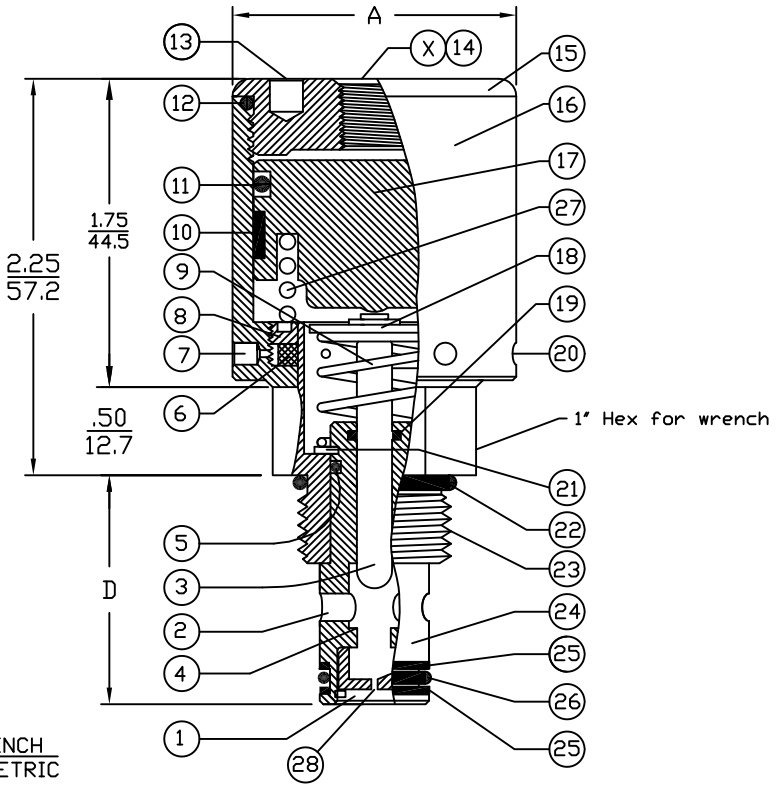
SPECIFICATIONS:

Pilot operated two way cartridge valve. Normally open. Pilot to close passage between ports one and two.
No. 1 port is the preferred pressure holding port.
Working pressure Ratings: Proof Pressure add 50%.
82H--- Valve, 7,500 PSI Port 1, 5,000 PSI Port 2
84H--- Valve, 5,000 PSI Port 1, 3,000 PSI Port 2
Pilot Pressure Range, 50 PSI Min. to 150 PSI Max.
Fluid temperature -45°F, (42.7°C) to 200°F, (93.3°C)
Valve should screw in freely to the Mount Seal.
Torque to 20 foot pounds.
Use lubricant on external oil seals and mounting threads.

PILOT RATIO NOTES:

TO CALCULATE THE CORRECT PILOT RATIO VALVE, FOLLOW THESE STEPS:

1. Determine the MAXIMUM possible system pressure. Multiply X 1.1 = SYSTEM
2. Determine MINIMUM possible pilot pressure. Multiply X .9 = PILOT
3. Divide SYSTEM by PILOT = PILOT TO SYSTEM RATIO
4. Round up to standard available ratio.



STANDARD OPTIONS

Pilot Port (Key X) 1/8 NPT. Optional SAE4 Available.
Standard Seals are Buna-N with Teflon Back Up.
Please call for other seal options.
T Option: 10-32 Ports at Key 7 & 20, Random 360° Pos.

TOOLING

* Cavity Form Tools: FT+ cavity#
* 1/8 (3.175) Pin Spanner Tool Order No. 471, Ref. Key No. 20
* 3/16 (4.763) Face Spanner Tool Order No. 482, Ref. Key No. 13

Cavity & Housing

For 82 Series Valve:
Cavity C-8502 (8-2):
See Spec. Sheet 1200630

Line Mount Housings:
See Spec. Sheets
1200672 and 1203123

Panel Mount Housings:
See Spec. Sheets
1202981 and 1202990

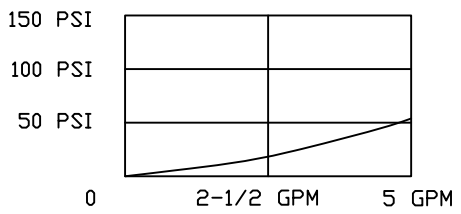
For 84 Series Valve:
Cavity C-8542 (10-2):
See Spec. Sheet 1200621

Line Mount Housings:
See Spec. Sheets
1200674 and 1201455

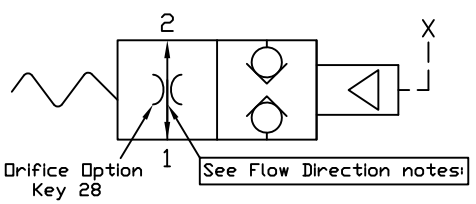
Panel Mount Housings:
See Spec. Sheets
1202982 and 1202990

Order Valve No.	Pilot To System Ratio:	" A " Diameter		Cavity & Housing
82H2270400	40:1	1.50	38.1	See: For 82 Series:
82H3270490	49:1	1.62	41.2	
82H6270690	69:1	1.87	47.5	
82H7271040	104:1	2.25	57.2	
84H2270400	40:1	1.50	38.1	See: For 84 Series:
84H3270490	49:1	1.62	41.2	
84H6270690	69:1	1.87	47.5	
84H7271040	104:1	2.25	57.2	

Pressure Drop Chart Without Orifice Only. $C_V = 0.5$



2PB N/O



Without optional ORIFICE, flow is bi-directional.
With Orifice, flow from Port 1 to Port 2 Only.

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DOERING

SPEC. SHEET NO. 1201317 REV. 005

KEY EXPLANATION:

1. Port No. 1, System
2. Port No. 2, System
3. Poppet, Hard Stainless Steel
4. O-Ring Seal, Buna N (Also see Options)
5. Cartridge Body, Lower Section
6. Filter, 10 Micron Sintered Bronze.Omitted W/ T option.
7. Vent (2 Pl.) Optional T Port Locations
8. Filter Retainer
9. Poppet return Spring, Stainless Steel, 10 psig
10. O-Ring Seal, Buna N (Also see Options)
11. Coil Spring, Stainless Steel, 80 psig
12. Piston
13. Cartridge Body, Upper Section
14. 1" Wrench Flats.
15. Pilot Port. See Pilot port options / ordering info.
16 & 19. O-Ring Seals, Buna N (Also see Options)
17 & 20 Back Up Rings, Teflon
18. Cylinder Sleeve
21. Spring Retainer Assembly
24. O-Ring Seal, Filter Retainer (Buna-N)
26, 27, & 31. O-Ring Seals, Buna N (Also see Options)
30. Cartridge Seat, Hard Stainless Steel.
32. Back Up Rings, Teflon

SPECIFICATIONS:

Pilot operated two way cartridge valve. Normally closed. Pilot to open passage between ports one and two.

No. 1 port is the preferred pressure holding port.

Maximum pressure 5,000 PSI, Cavity C-8502
Cavity C-8542, 5,000 PSI Port 1, 3,000 PSI Port 2
Fluid temperature -45°F, (42.7°C) to 200°F, (93.3°C)

Install Cartridge valve using 1" wrench

Valve should screw in freely to the Mount Seal.
Final tightening to 20 foot pounds torque.
Use lubricant on external oil seals and mounting threads.

14:1 PILOT RATIO:

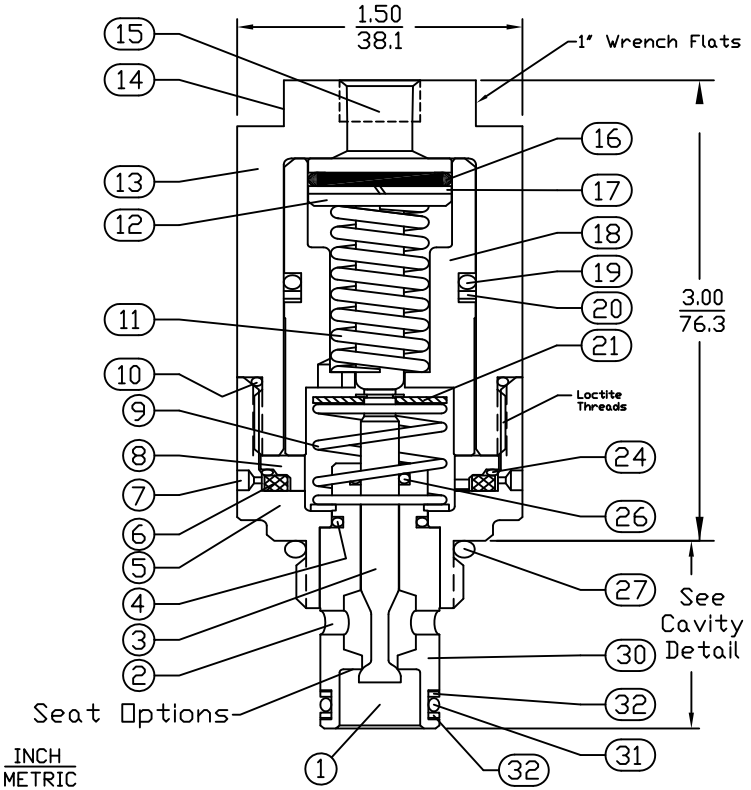
Pilot pressure Range 90 PSI Min. to 5000 PSI Max.
Add pilot pressure to offset working pressure.
Area of pilot piston is 14 X larger than seat area.

To determine Minimum Pilot pressure required, follow these steps:

(1) Multiply the maximum possible system pressure X 1.1 = SM (System Max.)
(2) Divide SM by 14 and add 90 PSI = MP

Note: MP is minimum pilot pressure needed to open this normally closed valve.

CARTRIDGE VALVE



STANDARD OPTIONS

Seals: Buna N, Viton or Teflon. Others please specify.
T Option: 10-32 Ports at Key 7 (Located 2 places)
If T option is used, allow for fitting clearance.

TOOLING

* Cavity Form Tools: FT+ cavity#
* 1" Open End Wrench No. 720
* 1/8 (3.175) Pin Spanner Tool Order No. 471, Ref. Key No. 20

Cavity & Housing

For 82#427#141 Valve:
Cavity C-8502 (8-2):
See Spec. Sheet 1200630

Line Mount Housings:
See Spec. Sheets
1200672 and 1203123

Panel Mount Housings:
See Spec. Sheets
1202981 and 1202990

For 84#427#141 Valve:
Cavity C-8542 (10-2):
See Spec. Sheet 1200621

Line Mount Housings:
See Spec. Sheets
1200674 and 1201455

Panel Mount Housings:
See Spec. Sheets
1202982 and 1202990

Valve Number: 8##427#141

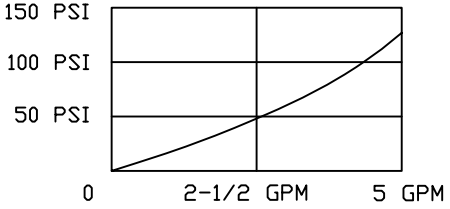
2 = 3/4-16 Thread Cavity C-8502 (8-2)
4 = 7/8-14 Thread Cavity C-8542 (10-2)

Pilot Porting, Key 15
1 = 1/8 NPT
2 = 1/4 NPT
4 = SAE4 (ORB)
6 = SAE6 (ORB)

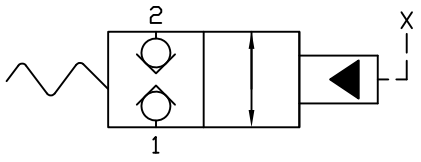
Seat Options:
Blank = Hard Seat
K = Soft Seat (Kel-F with Metal Backup)
10% Flow Restriction with Soft Seat.

PRESSURE DROP CHART C_V= 0.4

VALVE ORIFICE DIAMETER = .180"



2PB SERIES



2PB N/C

HIGH PRESSURE PILOT RATING.

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DOERING

CARTRIDGE VALVE

KEY EXPLANATION:

1. Port No. 1, System
2. Port No. 2, System
3. Poppet, Hard Stainless Steel
4. O-Ring Seal, Buna N (Also see Options)
5. Cartridge Body, Lower Section
6. Filter, 10 Micron Sintered Bronze. Omitted W/ T option.
7. Vent (2 Pl.) Optional T Port Locations
8. Filter Retainer
9. Poppet return Spring, Stainless Steel, 20psig
10. O-Ring Seal, Buna N (Also see Options)
11. Coil Spring, Stainless Steel, 100psig
12. Piston
13. Cartridge Body, Upper Section
14. 1" Wrench Flats.
15. Pilot Port. See Pilot port options / ordering info.
16 & 19. O-Ring Seals, Buna N (Also see Options)
17 & 20 Back Up Rings, Teflon
18. Cylinder Sleeve
21. Spring Retainer Assembly
24. O-Ring Seal, Filter Retainer (Buna-N)
26, 27, & 31. O-Ring Seals, Buna N (Also see Options)
30. Cartridge Seat, Hard Stainless Steel.
32. Back Up Rings, Teflon

SPECIFICATIONS:

Pilot operated two way cartridge valve. Normally closed. Pilot to open passage between ports one and two. Valve will not hold pressure from 2 to 1. Use No. 1 port as pressure inlet port.

Valve is pressure rated to 5,000 PSI working and 7,500 PSI Proof Pressure.

Fluid temperature -45°F, (42.7°C) to 200°F, (93.3°C)
Install Cartridge valve using 1" wrench
Valve should screw in freely to the Mount Seal.
Final tightening to 20 foot pounds torque.
Use lubricant on external oil seals and mounting threads.

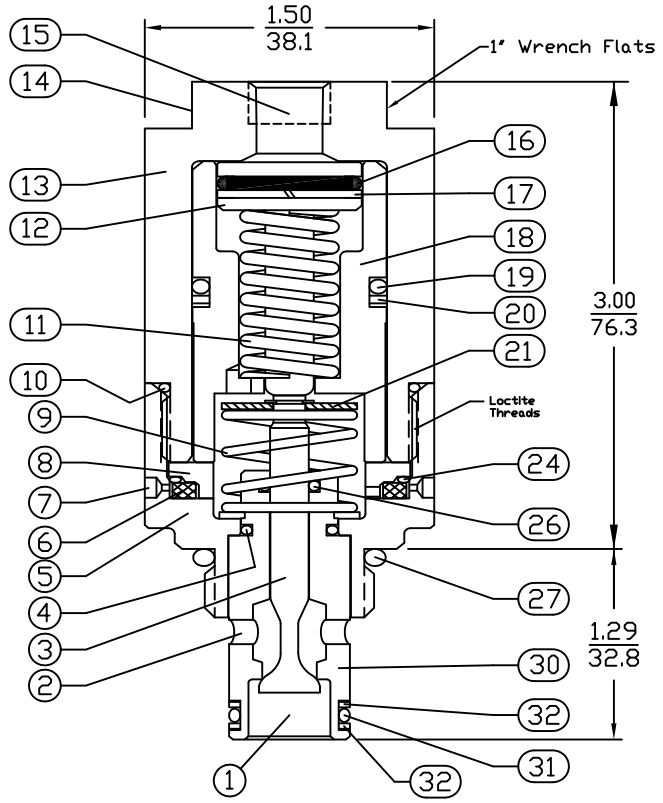
7:1 PILOT RATIO NOTES

Pilot pressure Range 120 PSI Min. to 5000 PSI Max.
Add pilot pressure to offset working pressure.
Area of pilot piston is 7 X larger than seat area.
To determine Minimum Pilot pressure required, follow these steps:

(1) Multiply the maximum possible system pressure X 1.1 = SM (System Max.)

(2) Divide SM by 7 and add 120 PSI = MP

Note: MP is minimum pilot pressure needed to open this normally closed valve.



STANDARD OPTIONS

Seals: Buna N, Viton or Teflon. Others please specify.
T Option: 10-32 Ports at Key 7 (Located 2 places)
If T option is used, allow for fitting clearance.

TOOLING

* Cavity Form Tools: FT+ cavity#
* 1" Open End Wrench No. 720

Cavity & Housing

Please see Spec. Sheets at www.doering.com

Cavity C-8542 (10-2):
See Spec. Sheet 1200621
Includes Cavity and Cavity Tooling Info.

Line Mount Housings:
See Spec. Sheets
1200674 and 1201455

Panel Mount Housings:
See Spec. Sheets
1202982 and 1202990

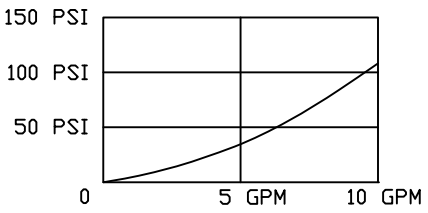
Two Stage Decompression Housings:
See Spec. Sheets
1201268 and 1203114

Valve Number: 84409#071

Pilot Porting, Key 15
1 = 1/8 NPT
2 = 1/4 NPT
4 = SAE4 (ORB)
6 = SAE6 (ORB)

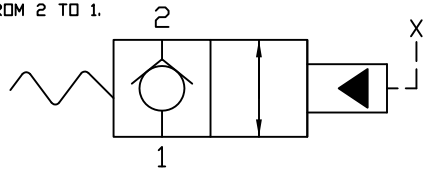
FLOW AND PRESSURE DROP CHART. $C_V = 1.0$

VALVE ORIFICE DIAMETER = .280"



2PB SERIES

IN CLOSED POSITION, VALVE DOES NOT FREE FLOW FROM 2 TO 1.



2PB N/C
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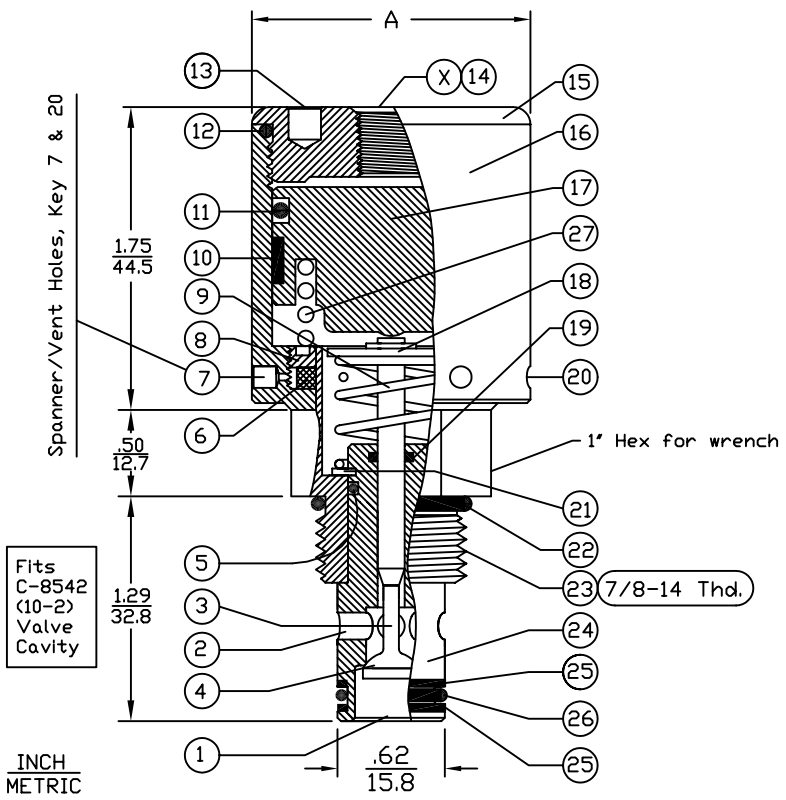
DOERING

CARTRIDGE VALVE

KEY EXPLANATION:

1. Port No. 1, System Inlet
2. Port No. 2, System Outlet
3. Poppet, Hard Stainless Steel
4. Seat passage sealing area. Hard Stainless Steel.
5. O-Ring Seal, Buna N (Also See Options)
6. Filter, 10 Micron, Sintered Bronze.
7. Vent (2 Pl.) Optional T Port Locations
8. Filter Retainer
9. Poppet and Actuator Return Spring, Stainless
10. Piston Guide Ring UHMW material
11. Piston O-Ring Seal, Buna N (Also See Options)
12. Bonnet O-Ring Seal, Buna N (Also See Options)
13. 3/16" (4.763) Spanner Holes (2 Pl.)
14. 1/8 NPT Pilot Port X (Also See Options)
15. Bonnet, Aluminum material
16. Actuator Body, Aluminum
17. Actuator Piston, Aluminum
18. Poppet Return Spring Retainer Assembly
19. Poppet Seal, TFE
20. 1/8" (3.175) Spanner Holes (4 or 6 Pl.)
21. Cartridge Seat Retaining Ring
22. Mount O-Ring Seal, Buna N (Also See Options)
23. Cartridge Mounting Threads, Stainless Steel
24. Cartridge Seat, Hard Stainless
25. Backup Ring, Teflon
26. O-Ring Seal, Buna N (Also See Options)
27. Spring, Stainless Steel

Key 27 Used on valves with 1-7/8 and 2-1/4" "A" Dia.



Cavity & Housing

Cavity C-8542 (10-2):
See Spec. Sheet 1200621

Line Mount Housings:
See Spec. Sheets
1200674 and 1201455

Panel Mount Housings:
See Spec. Sheets
1202982 and 1202990

PILOT RATIO NOTES:

TO CALCULATE THE CORRECT PILOT RATIO VALVE, FOLLOW THESE STEPS:

1. Determine the MAXIMUM possible system pressure. Multiply X 1.1 = SYSTEM
2. Determine MINIMUM possible pilot pressure. Multiply X .9 = PILOT
3. Divide SYSTEM by PILOT = PILOT TO SYSTEM RATIO
4. Round up to standard available ratio.

STANDARD OPTIONS

Pilot Port (Key X) 1/8 NPT. Optional SAE4 Available.
Seals: Buna N, Viton or Teflon. Others please specify.
T Option: 10-32 Ports at Key 7 & 20, Random 360° Pos.
Seat (Key 4) Hard Stainless.

TOOLING

*1/8 (3.175) Pin Spanner Tool Order No. 471, Ref. Key No. 20
*3/16 (4.763) Face Spanner Tool Order No. 482, Ref. Key No. 13

SPECIFICATIONS:

Pilot operated two way cartridge valve. Normally closed. Pilot to open passage between ports one and two. Valve will not hold pressure from 2 to 1. Use No. 1 port as pressure inlet port.

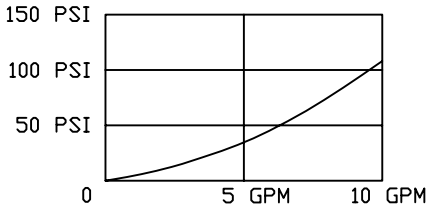
Maximum pressure 5,000 PSI Port 1, 3,000 PSI Port 2

Pilot Pressure Range, 50 PSI Min. to 150 PSI Max.
Fluid temperature -45°F, (42.7°C) to 200°F, (93.3°C)
Install Cartridge valve using 1" wrench
Valve should screw in freely to the Mount Seal.
Final tightening to 20 foot pounds torque.
Use lubricant on external oil seals and mounting threads.

PILOT TO SYSTEM RATIOS:	" A " Diameter Inch	Metric	CARTRIDGE VALVE NO.
19:1	1-1/2	38.10	84H2090191
24:1	1-5/8	41.28	84H3090241
33:1	1-7/8	47.63	84H6090331
50:1	2-1/4	57.15	84H7090501

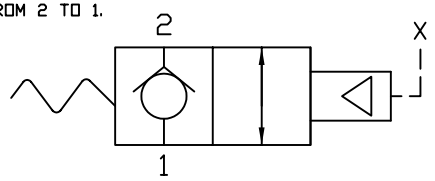
FLOW AND PRESSURE DROP CHART. $C_V = 0.9$

VALVE ORIFICE DIAMETER = .25"



2P SERIES

IN CLOSED POSITION, VALVE DOES NOT FREE FLOW FROM 2 TO 1.



2P N/C

This Valve is not a POC.

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KEY EXPLANATION:

1. Port No. 1, System Inlet
2. Port No. 2, System Outlet
3. Poppet, Hard Stainless Steel
4. O-Ring Seal, Buna N (Also see Options)
5. Cartridge Body, Lower Section
6. Filter, 10 Micron Sintered Bronze.Omitted W/ T option.
7. Vent (2 Pl.) Optional T Port Locations
8. Filter Retainer
9. Poppet return Spring. Stainless Steel (7 PSI).
10. O-Ring Seal, Buna N (Also see Options)
11. Coil Spring, Stainless Steel (90 PSI).
12. Piston
13. Cartridge Body, Upper Section
14. 1" Wrench Flats.
15. Pilot Port. See Pilot port options / ordering info.
16 & 19. O-Ring Seals, Buna N (Also see Options)
17 & 20 Back Up Rings, Teflon
18. Cylinder Sleeve
21. Spring Retainer Assembly
24. O-Ring Seal, Filter Retainer (Buna-N)
26, 27, & 31. O-Ring Seals, Buna N (Also see Options)
30. Cartridge Seat, Hard Stainless Steel
32. Back Up Rings, Teflon

SPECIFICATIONS:

Pilot operated two way cartridge valve. Normally closed. Pilot to open passage between ports one and two.
Use No. 1 port as pressure inlet port.
Port No. 1 pressure rating (8502 Cavity) 7,500 PSIG
Port No. 1 pressure rating (8542 Cavity) 5,000 PSIG
Port 2, Cavity C-8502, Maximum PSI 5,000
Port 2, Cavity C-8542, Maximum PSI 3,000
Pilot Pressure Range, 100 PSI Min. to 5000 PSI Max.
Fluid temperature -40°F, (-40°C) to 200°F, (93.3°C)
Install Cartridge Valve using 1" wrench.
Valve should screw in freely to the Mount Seal.
Torque to 20 to 30 foot pounds.
Use lubricant on external oil seals and mounting threads.

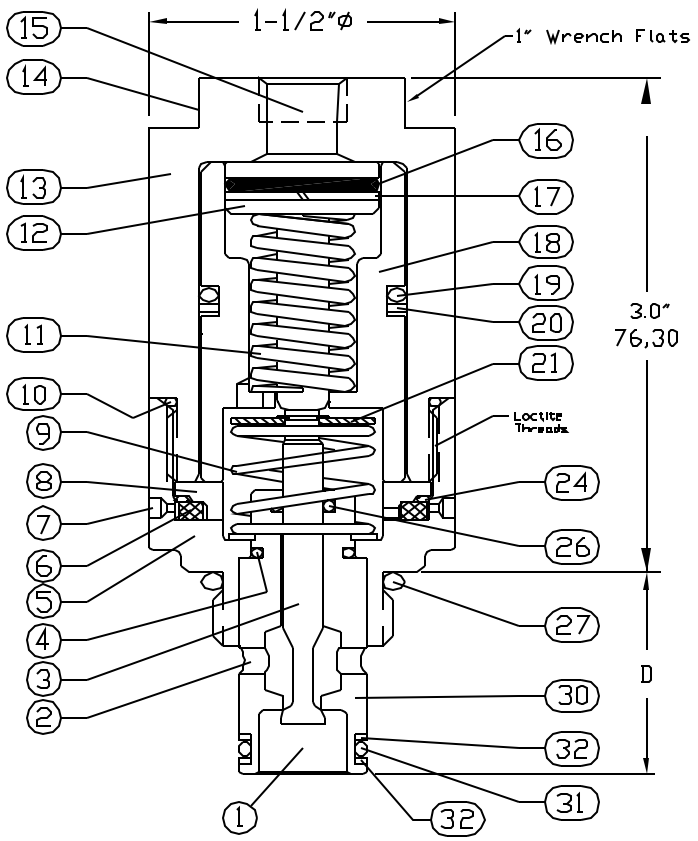
36:1 PILOT RATIO:

Area of pilot piston is 36 X larger than seat area.
To determine Minimum Pilot pressure required, follow these steps:

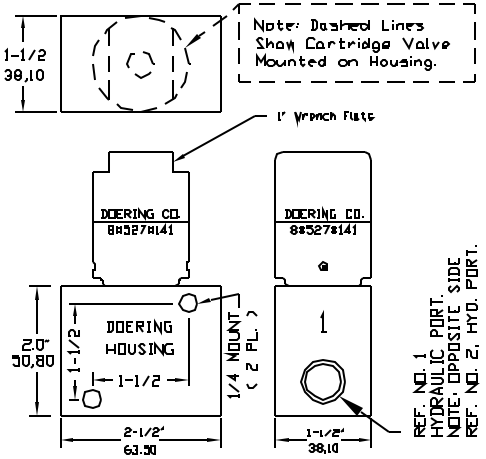
(1) Multiply the maximum possible system pressure X 1.1 = SM (System Max.)
(2) Divide SM by 36 and add 100 PSI = MP

Note: MP is minimum pilot pressure needed to open this normally closed valve.

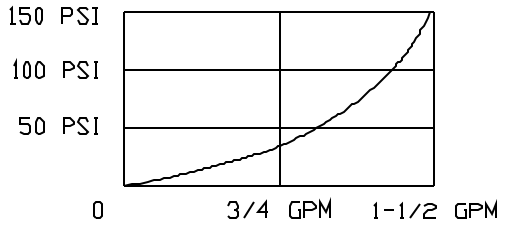
CARTRIDGE VALVE



HOUSING



Standard Housing is 3/8 NPT. -2 is 1/4 NPT. -6 is SAE6
Standard Housing Material is Aluminum.
For Stainless add -S or -2S or -6S to Housing No.



FLOW AND PRESSURE DROP CHART. $C_V = 0.1$

FLOW and PRESSURE DROP Chart indicates U.S. G.P.M. All flow performance data based on tests using fluid of a specific gravity of .85 and a viscosity of 150 S.U.S. at a temperature of 100°F.

STANDARD OPTIONS

Seals: Buna N, Viton or Teflon. Others please specify.
T Option: 10-32 Ports at Key 7 (Located 2 places)
If T option is used, allow for fitting clearance.

TOOLING

* Cavity Form Tools: FT+ cavity#
* 1" Open End Wrench No. 720
* 1/8 (3.175) Pin Spanner Tool Order No. 471. Ref. Key No. 20

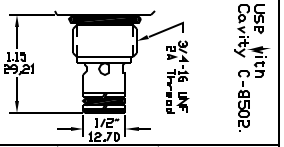
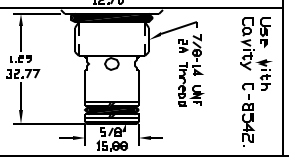
CARTRIDGE VALVE ORDERING INFORMATION:

82404#361
- 3/4-16 UNF Mounting threads

PILOT PORT OPTIONS
1 = 1/8 NPT
2 = 1/4 NPT
4 = SAE4
6 = SAE6

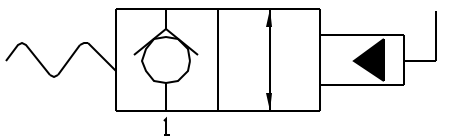
84404#361
- 7/8-14 UNF Mounting Threads

PILOT PORT OPTIONS
1 = 1/8 NPT
2 = 1/4 NPT
4 = SAE4
6 = SAE6

HOUSING NUMBER	" D " SUB SURFACE DETAIL
S8502 - OR - S8502-2 - OR - S8502-6	 Use With Cavity C-8502.
S8542 - OR - S8542-2 - OR - S8542-6	 Use With Cavity C-8542.

2PB SERIES

IN CLOSED POSITION, VALVE DOES NOT FREE FLOW FROM 2 TO 1.



2PB N/C

HIGH PRESSURE PILOT RATING.

DOERING

SPEC. SHEET NO. 1202230 REV. 002

CARTRIDGE VALVE

SPECIFICATIONS:

Pilot operated cartridge check valve. Normally open. Pilot to close passage between ports one and two.

Valve will also function as a Pilot Operated Relief valve. See notes regarding pilot pressure.

Maximum recommended system pressure (ports one and two) 5,000 PSI.

Pilot Pressure Range, 50 PSI Min. to 5000 PSI Max.
Pilot minimum may be lower if valve is used as a pilot operated relief valve.

Fluid temperature -45°F, (42.7°C) to 200°F, (93.3°C)
Install Cartridge valve using 1" wrench
Valve should screw in freely to the Mount Seal.
Final tightening to 20 foot pounds torque.
Use lubricant on external oil seals and mounting threads.

Features

KEY

1. No. 1 working port
2. No. 2 working port
3. Seat, Heat Treated Stainless
   Also see Seat Options.
4. Poppet, Heat Treated Stainless
5. Poppet Spring, Stainless Steel
6. Seat Saver Piston Assembly
7. Vent Port (2 Places)

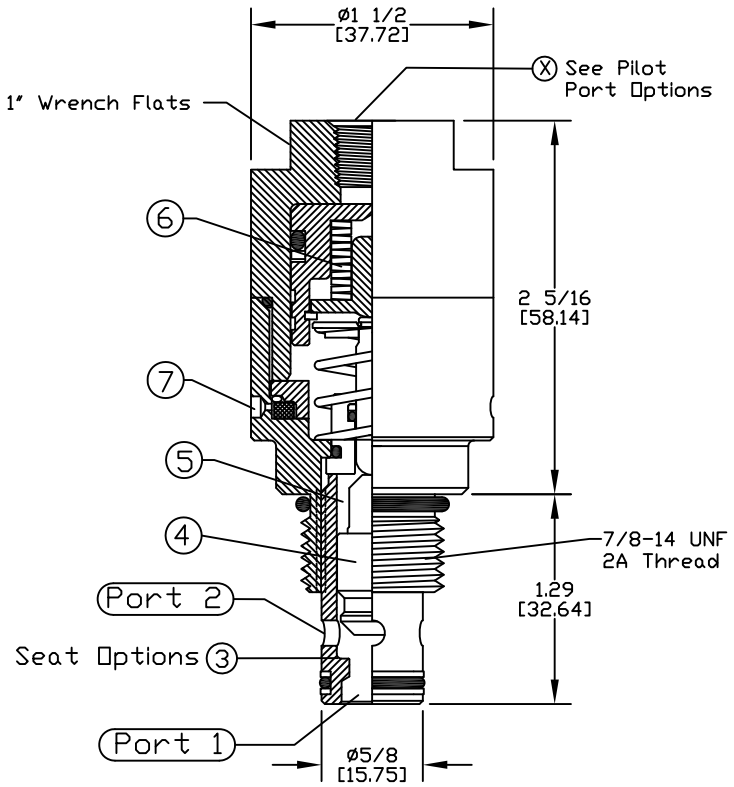
13:1 PILOT RATIO:

Area of pilot piston is 13 X larger than seat area.

To determine Minimum Pilot pressure required, follow these steps:

(1) Multiply the maximum possible system pressure X 1.1 = SM (System Max.)
(2) Divide SM by 13 = MP (Min. Pilot)

Note: MP is minimum pilot pressure needed for normally open / pilot to close valve function. If pilot pressure falls below MP, the valve will function as a pilot operated relief valve.



CAVITY

Cavity C-8542 (Industry 10-2)
Form Tool: FT-8542
Call for source information.

Cavity Drawing Spec. Sheet No. 1200621

Visit www.Doering.com and enter Spec. sheet 1200621. in 'document search' box.

HOUSING

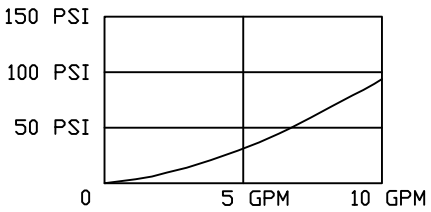
Line Mount Housings:
Spec. Sheets 1200674 and 1201455.

Visit www.Doering.com and enter Spec. sheet number in 'document search' box.

Doering Company also offers:
Custom Housings and Manifolds.
Materials include:
Aluminum, 304 SST., 316 SST.

Pressure Drop/Flow Chart.

Orifice Ø.28 (Cv 1.0)



CARTRIDGE VALVE ORDERING INFORMATION:

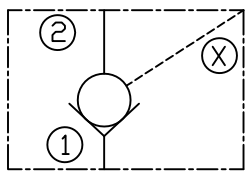
Valve Number: 904#95#13##

SEAT OPTIONS, Ref. Key 3
Blank = Hard Seat, Standard Hydraulic Test
K = Kel-F Soft Seat, Bubble Tested

X PILOT PORT OPTIONS
1 = 1/8 NPT
2 = 1/4 NPT
4 = SAE 4
6 = SAE 6

SPRING OPTIONS, POPPET BIAS Value in PSI Crack, Ref. Key 5
00 = NO SPRING
03 = STAINLESS STEEL
25 = STAINLESS STEEL

POC SERIES



Check Valve, Normally Open, Pilot to Close

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mailbox@doering.com ■ www.doering.com

DOERING

KEY EXPLANATION:

5. Teflon Seal
6. Filter, 10 Micron, Sintered Bronze
7 & 20 Spanner Holes and Vent Holes
9. Spring, Spool Return (SST)
10. Piston Guide Ring, UHMW
11. O-Ring Seal, Piston
14. 1/8 NPT Pilot Port
19. Teflon Seal
27. Spring (Used on valves = "A" Dia. 1-7/8 & 2-1/4")

SPECIFICATIONS:

Air Pilot Operated Hydraulic Spool Valve.
Three Way, Directional Control or Selector Valve.
Maximum System Pressure:
Ports 1, 2, and 3 rated to 3,000 PSI.
Maximum Pilot Pressure (X port) 150 PSI.
Fluid temperature -40°F (-40°C) to 200°F (93.3°C)
Install Cartridge Valve using appropriate tool. Valve should screw in freely to the Mount Seal. Final tightening 15 to 20 foot pounds torque. Use lubricant on external oil seals and mounting threads.

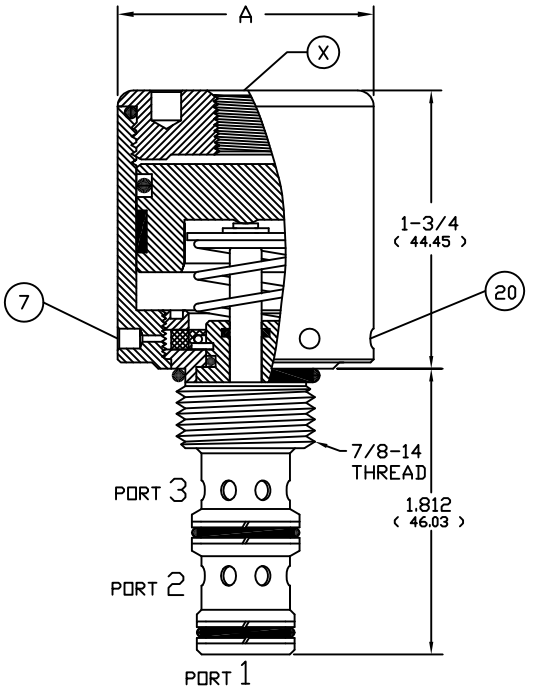
TOOLING

* 1/8 (3.175) Pin Spanner Tool
  Order No. 471, Ref. Key No. 20
* 3/16 (4.763) Face Spanner Tool
  Order No. 482, Ref. Key No. 13

PILOT RATIO NOTES:

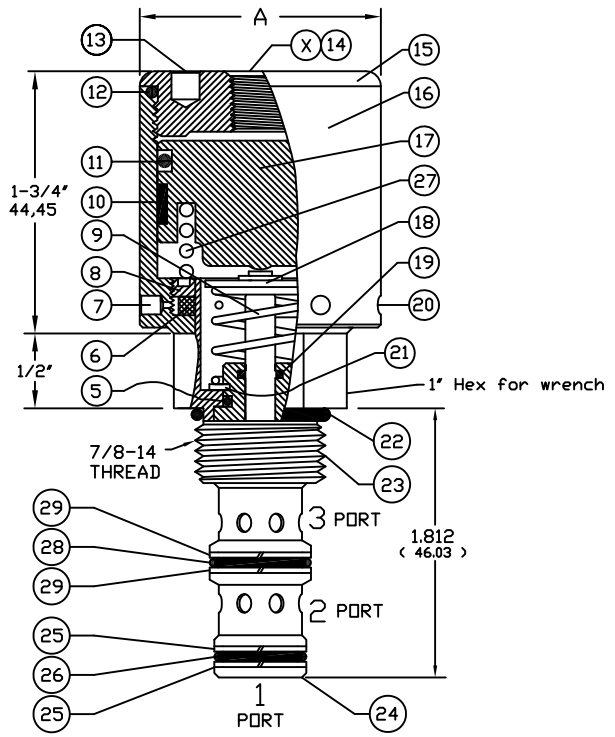
TO CALCULATE THE CORRECT PILOT RATIO VALVE TO ORDER FOLLOW THESE STEPS:

1. Determine the MAXIMUM possible system pressure. Multiply X 1.1 = SYSTEM
2. Determine MINIMUM possible pilot pressure. Multiply X .9 = PILOT
3. Divide SYSTEM by PILOT = PILOT TO SYSTEM RATIO
4. Round up to standard available ratio.



Install Cartridge Valve using No. 471 Spanner Tool.
Reference Spanner holes, Keys 7 & 20.

Cartridge Valve
Tamper Resistant Series
54*37****



Install Cartridge valve using 1" wrench

Cartridge Valve
Hex Wrench Series
54H*37****

PILOT TO SYSTEM RATIO	" A " DIAMETER
108:1	1-1/2 (38.1)
131:1	1-5/8 (41.28)
183:1	1-7/8 (47.63)
277:1	2-1/4 (57.15)
108:1	1-1/2 (38.1)
131:1	1-5/8 (41.28)
183:1	1-7/8 (47.63)
277:1	2-1/4 (57.15)

Cavity & Housing

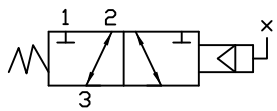
Cavity C-8543 (10-3):
See Spec. Sheet 1200634

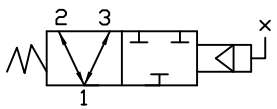
Line Mount Housings:
See Spec. Sheets
1200673 and 1201903

Panel Mount Housings:
See Spec. Sheets
1202983 and 1202990

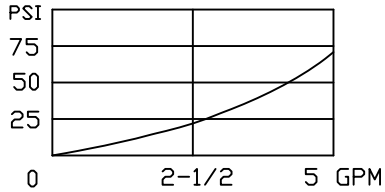
CARTRIDGE VALVE NO.	CARTRIDGE VALVE NO.
542371086	54H2371086
543371316	54H3371316
546371836	54H6371836
547372776	54H7372776
542371087	54H2371087
543371317	54H3371317
546371837	54H6371837
547372777	54H7372777

Functional Symbol





PRESSURE DROP CHART



3PS SERIES

3 Way Spool Valve, Pilot Operated.
Directional Control or Selector Valve.

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DOERING

SPEC. SHEET NO. 1200878 REV. 008

CARTRIDGE VALVE

KEY EXPLANATION:

5. Teflon Seal
6. Filter, 10 Micron, Sintered Bronze
7. Spanner Hole & Vent to Atmosphere
8. Filter Retainer
9. Stainless Steel Spring
10. Piston Guide Ring, UHMW Machined
11. O-Ring, Buna-N
12. O-Ring, Buna-N
13. Bonnet Face Spanner Holes (2)
14. Pilot Port, 1/8 NPT
15. Bonnet
16. Actuator Cylinder
17. Actuator Piston
18. Spring Retaining System
19. Teflon Seal
20. Spanner Hole & Vent to Atmosphere
21. Retaining Ring, Spool Cage Assembly
22. O-Ring, Buna-N
24. Spool Cage, Heat Treated Stainless, Honed
25. Teflon Back Up Ring (2)
26. O-Ring, Buna-N
27. Teflon Back Up Ring (2)
28. O-Ring, Buna-N
29. Booster Spring on 54H6-- & 54H7-- Models only.

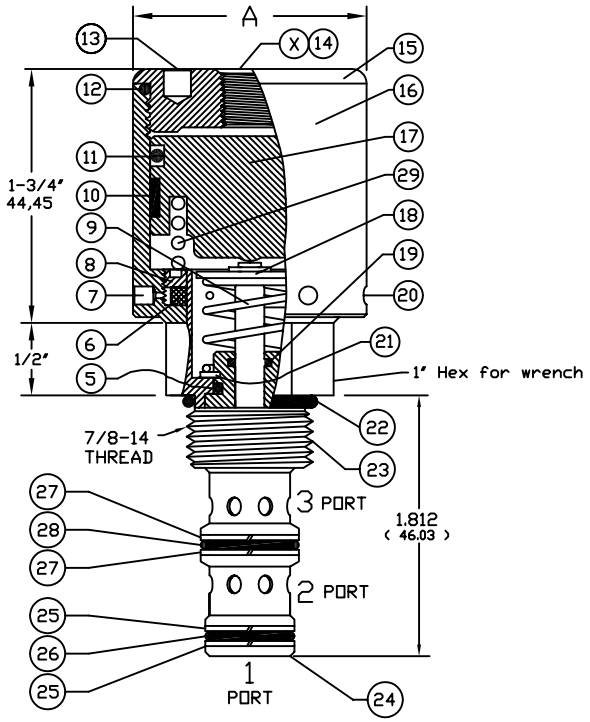
OPTIONS

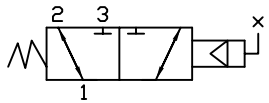
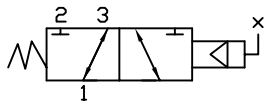
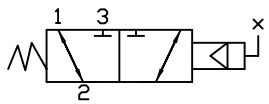
Pilot Port (Key X) is 1/8 NPT.
Optional Pilot Porting includes 1/4 NPT, SAE4, and SAE6.
Standard seals are Buna-N with Teflon back up rings. Optional seals include Viton, Teflon and others.
Keys 7 & 20 are vents to atmosphere.
T Option provides 10-32 Threaded ports at these locations.

PILOT RATIO NOTES:

TO CALCULATE THE CORRECT PILOT RATIO VALVE TO ORDER FOLLOW THESE STEPS:

1. Determine the MAXIMUM possible system pressure. Multiply X 1.1 = SYSTEM
2. Determine MINIMUM possible pilot pressure. Multiply X .9 = PILOT
3. Divide SYSTEM by PILOT = PILOT TO SYSTEM RATIO
4. Round up to standard available ratio.



Pilot to System Ratio applies to Port 1 only.	" A " Diameter	Cartridge Valve Order Number	Functional Symbol Suggested Connections
108:1 131:1 183:1 277:1	1-1/2 (38.1) 1-5/8 (41.28) 1-7/8 (47.63) 2-1/4 (57.15)	54H2371080 54H3371310 54H6371830 54H7372770	 Normally Open: 1=Cyl., 2=P, 3=T
108:1 131:1 183:1 277:1	1-1/2 (38.1) 1-5/8 (41.28) 1-7/8 (47.63) 2-1/4 (57.15)	54H2371081 54H3371311 54H6371831 54H7372771	 Normally Closed: 1=Cyl., 2=P, 3=T
108:1 131:1 183:1 277:1	1-1/2 (38.1) 1-5/8 (41.28) 1-7/8 (47.63) 2-1/4 (57.15)	54H2371085 54H3371315 54H6371835 54H7372775	 Selector: 2=P, 1=C1, 3=C2

Cavity & Housing

Cavity & Tooling C-8543 (10-3):
See Spec. Sheet 1200634

Line Mount Housings:
See Spec. Sheet 1200673 & 1201903

Panel Mount Housings & Spacers:
See Spec. Sheets
1202983 and 1202990

Cavity, Tooling & Housing Info found at www.doering.com Cavities, Housings & Manifolds.

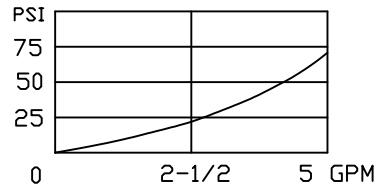
Doering Company also manufactures multi function and multi station Housings & Manifolds.

Please call for assistance.

SPECIFICATIONS:

Air Pilot Operated Hydraulic Spool Valve.
Three Way, Directional Control or Selector Valve.
Maximum System Pressure:
Ports 1, 2, and 3 rated to 3,000 PSI.
Maximum Pilot Pressure (X port) 150 PSI.
Fluid temperature -40°F (-40°C) to 200°F (93.3°C)
Install Cartridge valve using 1" wrench
Valve should screw in freely to the Mount Seal. Final tightening to 20 foot pounds torque. Use lubricant on external oil seals and mounting threads.

PRESSURE DROP CHART



3PS SERIES

3 Way Spool Valve, Pilot Operated.
Directional Control or Selector Valve.

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DOERING

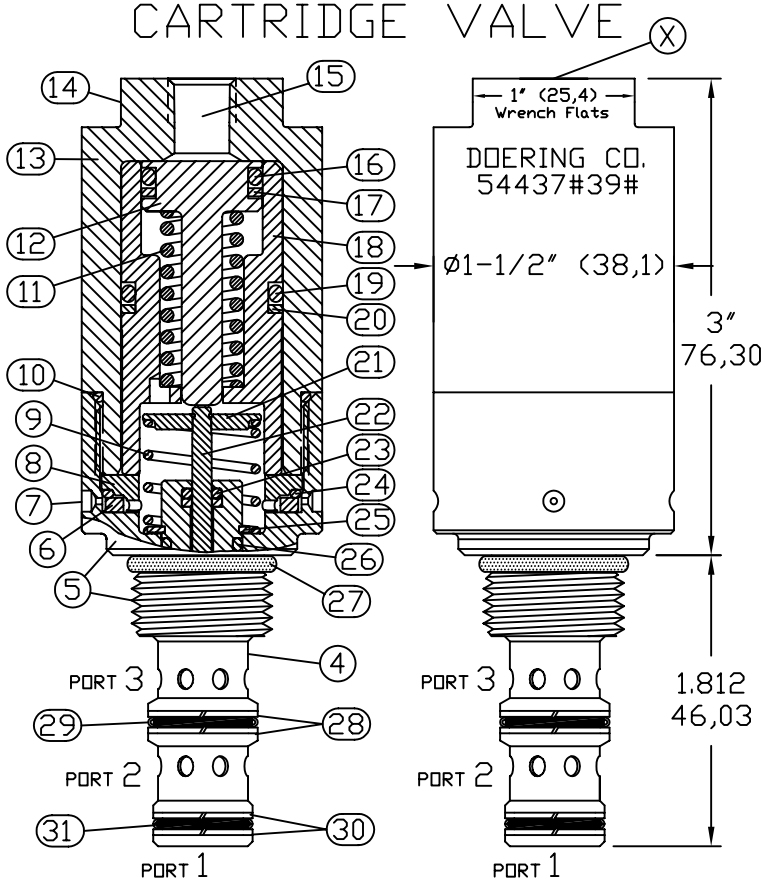
KEY EXPLANATION:

1. Bottom System Port (1)
2. Second from bottom System Port (2)
3. Third from bottom System Port (3)
4. Spool Cage (Heat Treated Stainless)
5. Cartridge Body, Lower, SST., 7/8"-14 Thread
6. Filter, 10 Micron Sintered Bronze. Optional SST.
7. Vents to atmosphere (2 Places 180° apart)
8. Filter Retainer, Aluminum. Optional SST.
9. Spool return Spring, Stainless Steel, 10 PSI.
10. O-Ring Seal, Buna N (Also see Options)
11. Piston return Spring, Stainless Steel, 90 PSI.
12. Piston, Stainless Steel
13. Cartridge Body, Upper, Stainless Steel
14. 1" Wrench Flats
15. Pilot Port. See Ordering Information for choices.
16. O-Ring Seal, Buna N (Also see Options)
17. Back Up Ring, Teflon
18. Cylinder Sleeve, Stainless Steel
19. O-Ring Seal, Buna N (Also see Options)
20. Back Up Ring, Teflon
21. Spring Retainer Assembly, Carbon and Stainless.
22. Spool Connector Linkage (Stainless Steel)
23. O-Ring Seal, Teflon
24. O-Ring Seal, (Buna-N)
25. Retaining Ring, Carbon Steel. Optinal SST.
26. O-Ring Seal, Teflon
27. O-Ring Seal, Buna-N (Also see Options)
28. Back Up Rings, Teflon (two used)
29. O-Ring Seal, Buna-N (Also see Options)
30. Back Up Rings, Teflon (two used)
31. O-Ring Seal, Buna-N (Also see Options)

39:1 PILOT RATIO:

Pilot Ratio applies to the #1 Port only.
The #2 and 3 ports are balanced.
To determine the pilot pressure required, divide the maximum pressure at the #1 Port by the ratio of 39 and add the spring PSI of 100. This represents the theoretical minimum pilot pressure in PSI required to shift the valve. Considering variations in springs and hysteresis it is advisable to add at least 50 PSI to the calculated minimum theoretical pilot pressure to assure full valve shift.

CARTRIDGE VALVE



HOUSING & MANIFOLD INFO.

Single Station Housings (Sub-Plates) illustrated on Spec. Sheet No. 1200706, S8543-** Group.
Also see Web Sheet S8543 at www.doering.com.
Choose from Aluminum or Stainless materials.
Multi Station and Custom Housings or Manifolds also available.

CAVITY INFO.

Cavity C-8543 (Industry 10-3)
Form Tool: FT-8543 Call for source information.
Reference Cavity Spec. Sheet No. 1200023 or
Web Sheet C-8543 at www.doering.com

SPECIFICATIONS

Hydraulic or Gas Pilot Operated Spool Valve.
Three Way, Directional Control or Selector Valve.

Pilot (X) Hydraulic or Gas mediums.
Pilot Pressure Range, 100 PSI Min. to 5000 PSI Max.
See 39:1 Pilot Ratio: notes for more information.

System Ports (1, 2 and 3)
require lubricated fluid. I.E.: Standard Hydraulic Oil.
Ports 1, 2, and 3 rated to 3,000 PSI.

Fluid temperatures -40°F (-40°C) to 200°F (93.3°C)
Install Cartridge valve using 1" wrench
Valve should screw in freely to the Mount Seal. Final tightening 20 to 30 foot pounds torque. Use lubricant on external oil seals and mounting threads.

FEATURES

Pilot area (X) is isolated from system ports (1, 2 and 3) by vent to atmosphere (Key 7).

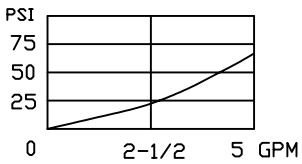
All ports may be pressurized allowing use as directional control or selector valve.

OPTIONS

All Stainless Steel option, add -SS to Part Number.
Stainless Steel Wetted Area Only, add -S to Part Number
Stainless Steel Pilot Area Only, add -PS to Part Number.

Standard seals are Buna-N with Teflon back up rings.
Optional seals include EP, Viton, Teflon and others.
Key 7, Vents to atmosphere (2 Places 180° apart).
T Option provides 10-32 Threaded ports at these locations. With T option, Key 6. Sintered Bronze filter, is omitted from the assembly.

PRESSURE DROP / FLOW



3PS SERIES

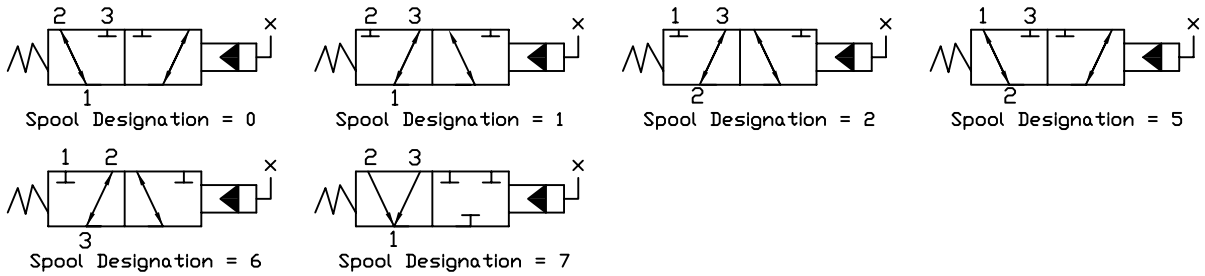
3 Way Spool Valve, Pilot Operated.
Directional Control or Selector Valve.

CARTRIDGE VALVE ORDERING INFORMATION:

Order P/N 54437#39#

PILOT PORT OPTIONS
1 = 1/8 NPT
2 = 1/4 NPT
4 = SAE4
6 = SAE6

SPOOL DESIGNATIONS:
SEE FUNCTIONAL SYMBOL KEY BELOW



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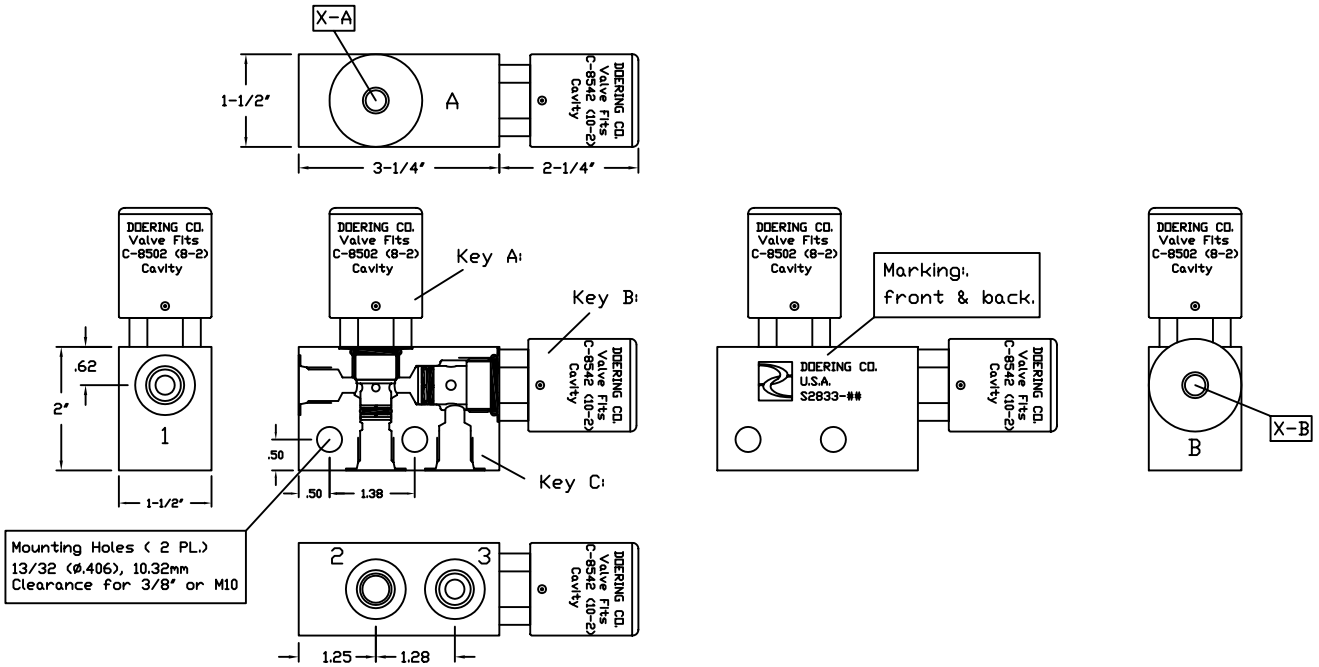
DOERING



Key A: Illustrates Valve in housing cavity A, Doering Cavity C-8502 (8-2).

Key B: Illustrates Valve in housing cavity B, Doering Cavity C-8542 (10-2).

If another manufacturers cavity drawing or tooling is used, verify dimensions based on the Doering Company Cavity specifications for C-8502 or C-8542.

Key C: S2833-## Housing

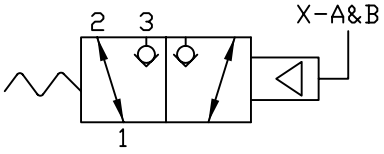
X: Indicates Pilot Signal followed by A and/or B indicating which valve to pilot.

Abbreviation Explanation: N/C (Normally Closed), N/O (Normally Open)

Valves shown mounted in housing for illustration purposes only.

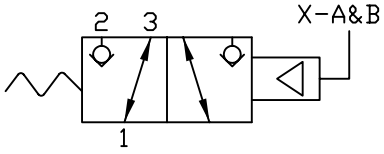
Valves ordered separately.

Please contact an application engineer for assistance in valve selection, or to discuss other housing options or applications.



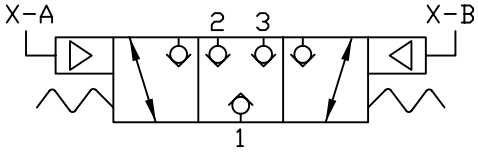
FS-1

Use N/O in A, N/C in B.



FS-2

Use N/C in A, N/O in B.



FS-3

Use N/C in A and B.

Housing Catalog Numbers:

Valves ordered separately.

HOUSING ORDER INFORMATION:

S2833-__ __

Ports 1, 2 & 3	
1	(1/8 NPT)
2	(1/4 NPT)
3	(3/8 NPT)
4	(SAE4, ORB)
6	(SAE6, ORB)

Material Option, Pressure Rating		
Blank	(6061 Aluminum)	3,000 PSI
S	(304 Stainless)	5,000 PSI
S316	(316 Stainless)	5,000 PSI

Caution: Pressure Ratings apply to housings only. Valve ratings may vary.

Features and Precautions:
Provides 3 Way Poppet function

Functional Symbols FS-1, FS-2 and FS-3 are illustrated using bi-directional 2 Way poppet Valves. If uni-directional valves are used the functional symbols are void.

The S2833 Series features two different valve cavities. They are Industry 8-2 and 10-2 Standards. This provides protection from installing a valve in the wrong cavity.

S2833 Series Housings

DESCRIPTION

A 2 or 3-Way, shop air pilot to shift, spring-return, screw-in, directional hydraulic cartridge valve, spool design.

FEATURES

Pilot to System Ratio of 108:1 applies to port No. 1 only. Ports 2 & 3 are balanced. Higher Pilot to System ratios. are available.

Actuator area is isolated from system ports. The isolation area is vented to atmosphere through a 10 Micron sintered filter. There are two small vent holes located within the spanner holes on the perimeter of the valve body.

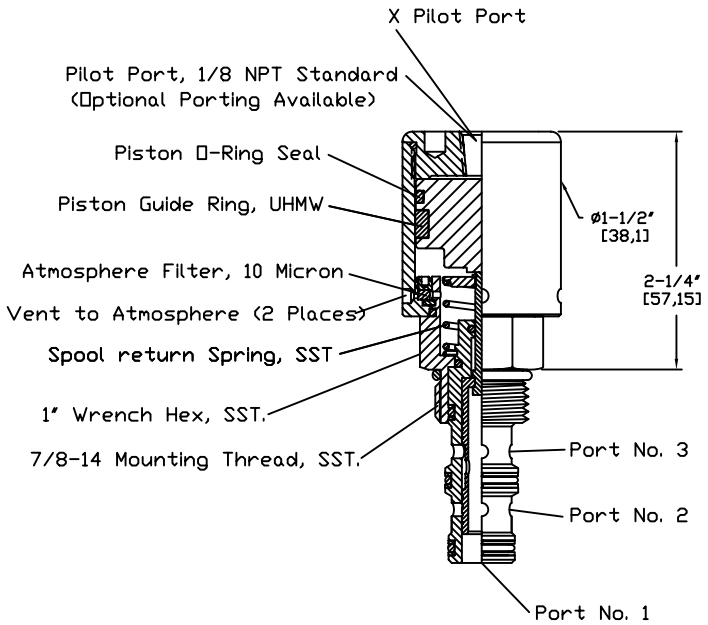
OPERATION

This is a metal to metal (SST.) Spool and cage design. Some leakage across the ports is normal. Valve is designed for Shop Air Pilot (Max. 150 PSI) to control standard Hydraulic Oil at ports 1, 2, and 3 (Max. 3000 PSI).

Pilot Pressure Requirements:

With System pressure of 3000 PSI, Recommended Pilot Pressue is 80 PSI Air. Minimum 50 PSI, Maximum 150 PSI.

DOERING CARTRIDGE VALVE



HOUSING & MANIFOLD INFO.

Single Station Housings (Sub-Plates) Illustrated Reference Housing Spec. Sheet No. 1200673 for Housing Drawing S8543 at www.doering.com.
Choose from Aluminum or Stainless materials.
Multi Station and Custom Housings or Manifolds also available.

CAVITY INFO.

Cavity C-8543 (Industry 10-3)
Reference Cavity Spec. Sheet No. 1200634 for Cavity Drawing C-8543 at www.doering.com
Form Tool: FT-8543 Call for source information.

RATINGS

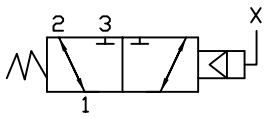
- Pressures to 3,000 PSIG, Ports 1, 2 & 3
- Air Pilot Pressure 50 to 150 PSIG, (X) Pilot Port.

INSTALLATION

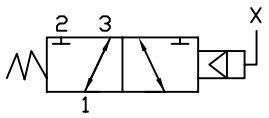
Install Cartridge valve using 1" wrench
Valve should screw in freely to the Mount Seal. Final tightening 20 to 30 foot pounds torque.
Use lubricant on external oil seals and mounting threads.

CARTRIDGE VALVE ORDERING INFORMATION:

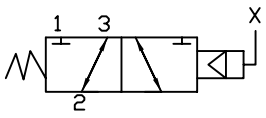
Order P/N 54H237108#
└SPOOL DESIGNATION:



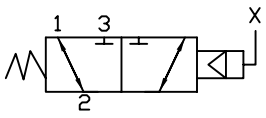
Spool Designation = 0



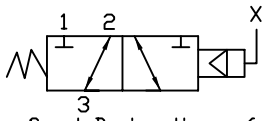
Spool Designation = 1



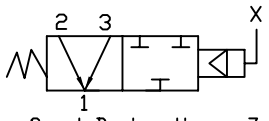
Spool Designation = 2



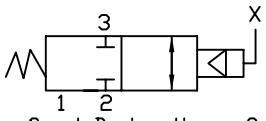
Spool Designation = 5



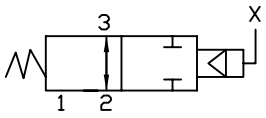
Spool Designation = 6



Spool Designation = 7



Spool Designation = 8
N/C 2 Way Spool
Connect 1 to Drain.



N/O 2 Way Spool
Connect 1 to Drain.

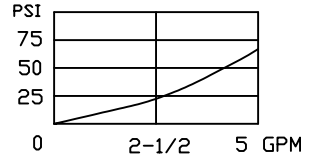
OPTIONS

All Stainless Steel option, add -SS to Part Number.
Stainless Steel Wetted Area Only, add -S to Part Number.
Stainless Steel Actuator Area Only, add -PS to Part Number.

Standard seals are Buna-N with Teflon back up rings.
Optional seals include EP, Viton, Teflon and others.

Vents to atmosphere (2 Places 180° apart).
T Option provides 10-32 Threaded ports at these locations. With T option, Key 6. Sintered Bronze filter, is omitted from the assembly.

PRESSURE DROP / FLOW



3PS SERIES

2 and 3 Way Spool, Directional Control, Air Pilot Operated, Hydraulic Control

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mailbox@doering.com ■ www.doering.com

DOERING

SPEC. SHEET NO. 1202968 REV. 000

DOERING CARTRIDGE VALVE

DESCRIPTION

A Three Way Air Pilot Operated to shift, latching in the shifted position, spring-return, screw-in, directional hydraulic cartridge valve, spool design.

FEATURES

Actuator mechanism may be rotated 360° for ease of access to Latch Release Pin. Ability to rotate is for access only. Valve does NOT latch by rotating!

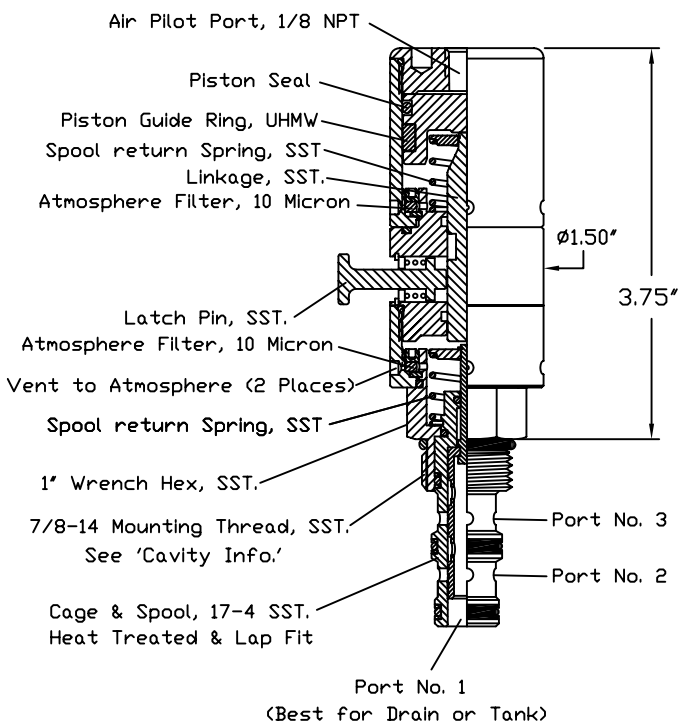
Actuator area is isolated from system ports through a 10 Micron sintered filter.

OPERATION

Once the valve is fully actuated, it is held in the actuated position until released by pulling the Latch Release Pin. Upon pulling the latch release pin, the valve spring returns the spool to the normal position as illustrated by the corresponding functional symbol selected. It is ideal to connect the No. 1 Port of the valve to the lowest pressure port, typically the Tank port. Any pressure on No. 1 Port will act upon the spool linkage and is additive to the spring force and effects the shift force required. See "SHIFT FORCE NOTES:".

PILOT PRESSURE and SHIFT FORCE NOTES:

Spring forces around 20 PSI.
Recommended air pilot pressue 50-100 PSI.
Maximum air pilot pressure 150 PSI.



Cavity & Housing

Cavity & Tooling C-8543 (10-3):
See Spec. Sheet 1200634

Line Mount Housings:
See Spec. Sheet 1200673 & 1201903

Panel Mount Housings & Spacers:
See Spec. Sheets
1202983 and 1202990

Cavity & Housing information found at www.doering.com Cavities, Housing & Manifolds.

Doering Co. also manufactures multi function and multi station housings and manifolds.

Please call for assistance.

RATINGS

- Pressures to 3,000 PSIG, Ports 2 & 3 Only
- Pressure to 150 PSIG, Port No. 1
  Use No. 1 Port for Drain or Tank.
- Caution, Port 1 Pressure effects Shift Force.
  See "SHIFT FORCE NOTES" for more detail.
  Temperature: -40° to 120°C

INSTALLATION

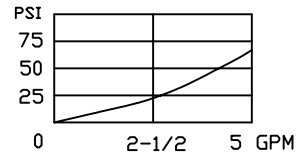
Install Cartridge valve using 1" wrench
Valve should screw in freely to the Mount Seal.
Final tightening 20 to 30 foot pounds torque.
Use lubricant on external oil seals and mounting threads.

OPTIONS

Call for assistance on options ordering.
All Stainless Steel option, add -SS to Part Number.
Stainless Steel Wetted Area Only, add -S to Part Number.
Stainless Steel Actuator Area Only, add -PS to Part Number.

Standard seals ore Buna-N with Teflon back up rings.
Optional seals include EP, Viton, Teflon and others.
Vents to atmosphere (2 Places 180° apart).
T Option provides 10-32 Threaded ports at these locations. With T option, Key 6. Sintered Bronze filter, is omitted from the assembly.

PRESSURE DROP / FLOW



3PS SERIES

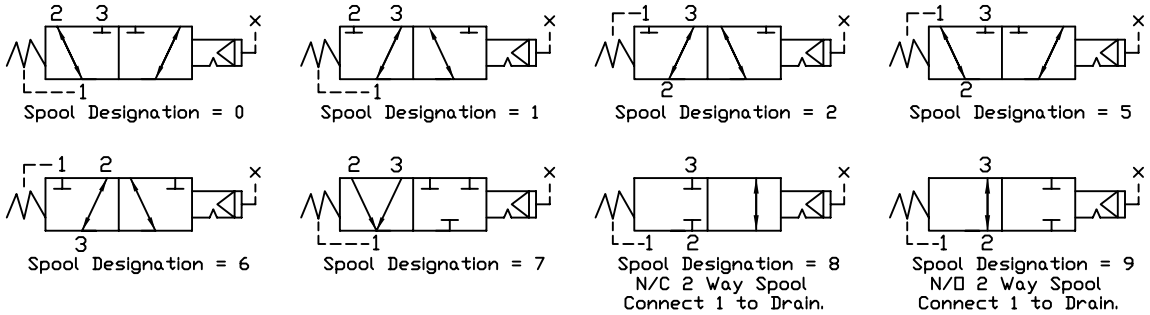
2 and 3 Way Spool, Directional Control, Pilot Operated, Latching Valves

CARTRIDGE VALVE ORDERING INFORMATION:

Order P/N 54LH23108# ##### ###

Call for assistance on options ordering.

SPOOL DESIGNATION: — MATERIAL OPTIONS: — SEAL OPTIONS:



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DOERING

SPECIFICATIONS:

Four Way, Directional Control or Selector Valve.
Dual Air Pilot Operated, Spring Centered,
Hydraulic Spool Valve.

Maximum System Pressure:
Ports 2(A), 3(P), and 4(B) rated to 3,000 PSI.
Port 1(T) rated to 1,500 PSI.
Pilot Pressure Range: 80 PSI Min. to 150 PSI Max.
Pilot to Port 1 (T) Ratio is 68:1
Ports 2, 3 and 4 are pressure balanced.
Fluid temperature -40°F (-40°C) to 200°F (93.3°C)

Install Cartridge valve using 1" wrench
Valve should screw in freely to the Mount Seal.
Final tightening to 20 foot pounds torque.
Use lubricant on external oil seals and mounting threads.
"Actuator Section" may be rotated independent of 1" wrench hex.

OPTIONS

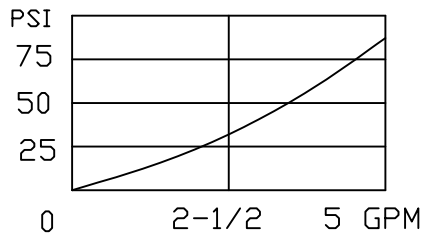
Standard seals are Buna-N and Teflon.
Optional seals materials: EPR, all Teflon, Viton, Kalrez.
Additional optional seal materials available on request.

Vent to Atmosphere Ports and Options:
Keys 14 Vent to atmosphere, sintered bronze.
Keys 7 & 20 are additional vents to atmosphere.
T Option provides 10-32 Threaded ports at Key 7 and Key 20 locations.

Material and Material Options:
Standard material includes Aluminum in pilot area.
Optional all Stainless Materials.

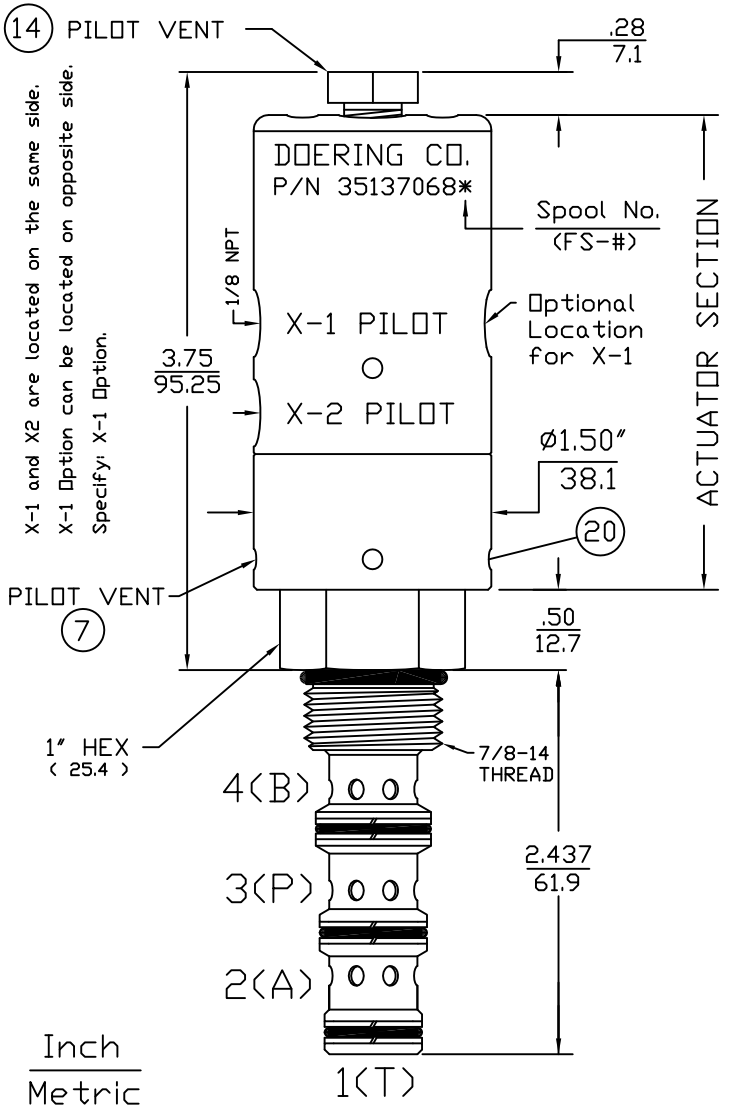
Call for price and delivery on options.

PRESSURE DROP CHART

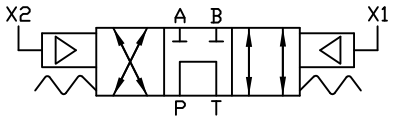


Pilot to Port 1 Ratio: 68:1.
Ports 2, 3 & 4 are balanced.

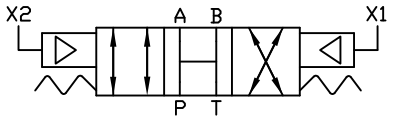
CARTRIDGE VALVE



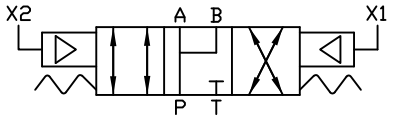
SELECTION



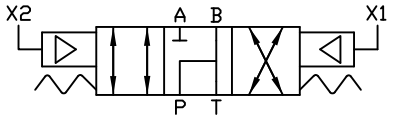
FS-1, Order No. 351370681



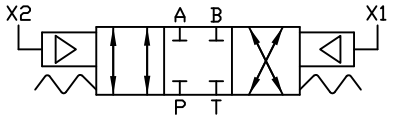
FS-2, Order No. 351370682



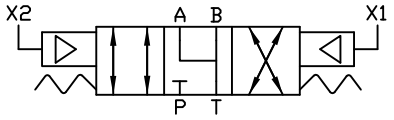
FS-3, Order No. 351370683



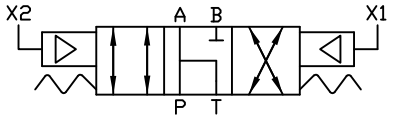
FS-4, Order No. 351370684



FS-5, Order No. 351370685



FS-6, Order No. 351370686



FS-7, Order No. 351370687

Cartridge Valve Part Number:
See Functional Symbol (FS-#)
and Order Number on right column.

Cavity Info.:
C-8544 (10-4)
Data Sheet 1200671

Housings & Line Mount Options:
See Data Sheets: 1200675,
1201385, 1202930 or 1202984.

4PS SERIES

Three Position 4 Way Spool Valve.
Dual Pilot Operated, Spring Centered.
Directional Control or Selector Valve.

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DOERING

SPEC. SHEET NO. 1200864 REV. 008

CARTRIDGE VALVE

KEY EXPLANATION:

5. O-Ring Seal, TFE
6. Filter, 10 Micron, Sintered Bronze
19. Poppet Seal, TFE
27. Spring (Used on valves = "A" Dia. 1-7/8 & 2-1/4")

Air Pilot Operated Hydraulic Spool Valve.

Four Way, Directional Control or Selector Valve.

Maximum System Pressure:
Ports A, B, P, and T rated to 3,000 PSI.

Maximum Pilot Pressure (X port) 150 PSI.

Fluid temperature -40°F (-40°C) to 200°F (93.3°C)

Install Cartridge valve using 1" wrench
Valve should screw in freely to the Mount Seal.
Final tightening to 20 foot pounds torque.
Use lubricant on external oil seals and mounting threads.

OPTIONS

Pilot Port (Key X) is 1/8 NPT.
Optional Pilot Porting includes 1/4 NPT, SAE4, and SAE6.

Standard seals are Buna-N with Teflon back up rings.
Optional seals include Viton, Teflon and others.

Keys 7 & 20 are vents to atmosphere.
T Option provides 10-32 Threaded ports at these locations.

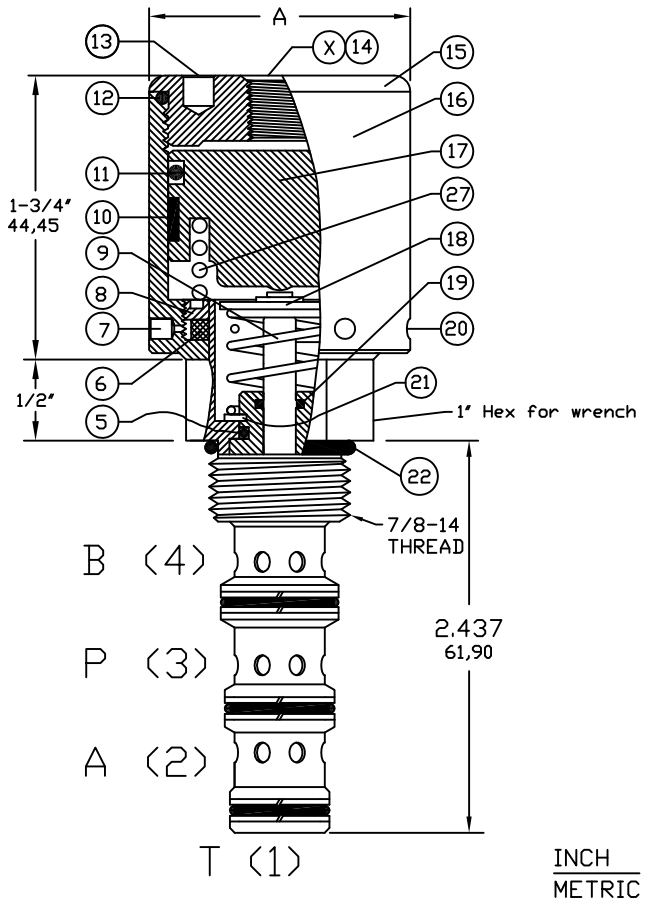
TOOLING

- Cavity Form Tool: FT-8544
- 1/8 (3.175) Pin Spanner Tool Order No. 471
- 3/16 (4.763) Face Spanner Tool Order No. 482

PILOT RATIO NOTES:

TO CALCULATE THE CORRECT PILOT RATIO VALVE TO ORDER FOLLOW THESE STEPS:

1. Determine the MAXIMUM possible system pressure. Multiply X 1.1 = SYSTEM
2. Determine MINIMUM possible pilot pressure. Multiply X .9 = PILOT
3. Divide SYSTEM by PILOT = PILOT TO SYSTEM RATIO
4. Round up to standard available ratio.



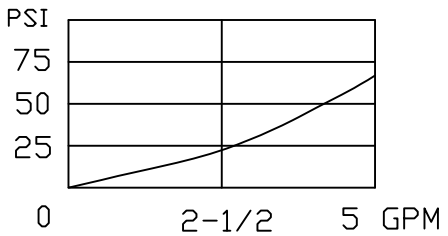
Cavity & Housing

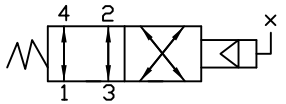
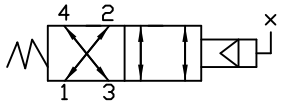
Cavity C-8544 (10-4):
See Spec. Sheet 1200671

Line Mount Housings:
See Spec. Sheets
1200675 and 1202930

Panel Mount Housings:
See Spec. Sheets
1202984 and 1203290

PRESSURE DROP CHART



Pilot to System Ratio applies to Port 1 only.	" A " DIAMETER	Cartridge Valve Order Number	Functional Symbol Suggested Connections
108:1 131:1 183:1 277:1	1-1/2 (38.1) 1-5/8 (41.28) 1-7/8 (47.63) 2-1/4 (57.15)	44H2371080 44H3371310 44H6371830 44H7372770	
108:1 131:1 183:1 277:1	1-1/2 (38.1) 1-5/8 (41.28) 1-7/8 (47.63) 2-1/4 (57.15)	44H2371083 44H3371313 44H6371833 44H7372773	 USE THIS SPOOL FOR LOWEST LEAK RATE.

4PS SERIES

4 Way Spool Valve, Pilot Operated.
Directional Control or Selector Valve.

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DOERING

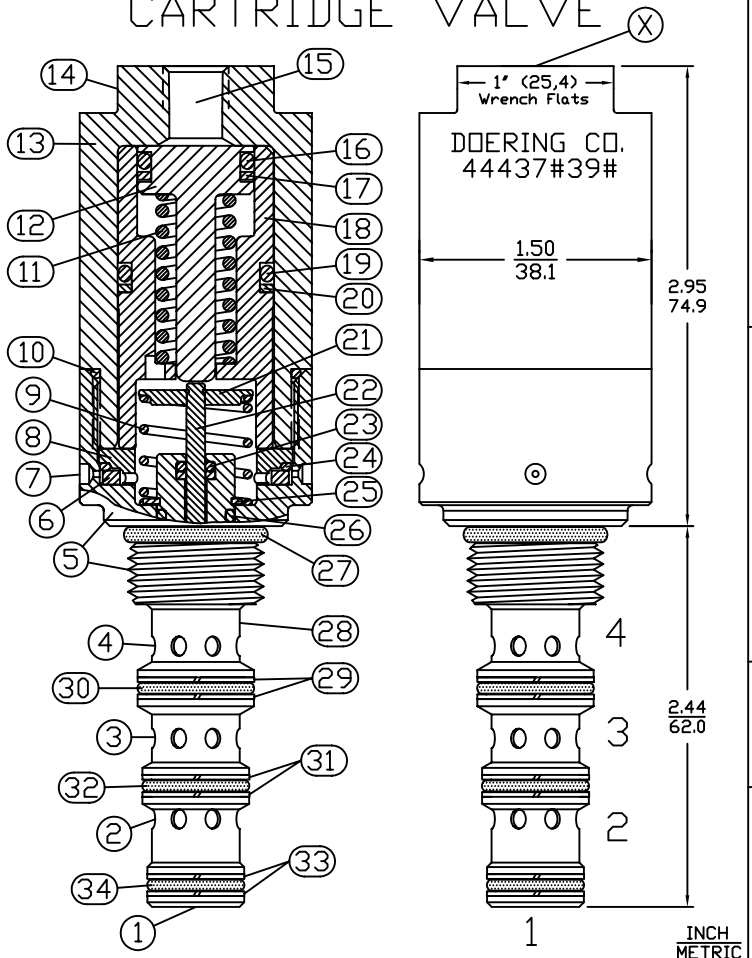
KEY EXPLANATION:

1. Bottom System Port (T)
2. Second from bottom System Port (A)
3. Third from bottom System Port (P)
4. Fourth from bottom System Port (B)
5. Cartridge Body, Lower Section, 7/8"-14 Thread
6. Filter, 10 Micron Sintered Bronze.
7. Vents to atmosphere (2 Places 180° apart)
8. Filter Retainer
9. Spool return Spring, Stainless Steel.
10. O-Ring Seal, Buna N (Also see Options)
11. Coil Spring, Stainless Steel
12. Piston
13. Cartridge Body, Upper Section
14. 1" Wrench Flats
15. Pilot Port. See Ordering Information for choices.
16. O-Ring Seal, Buna N (Also see Options)
17. Back Up Ring, Teflon
18. Cylinder Sleeve
19. O-Ring Seal, Buna N (Also see Options)
20. Back Up Ring, Teflon
21. Spring Retainer Assembly
22. Spool Connector Linkage (Stainless Steel)
23. O-Ring Seal, Teflon
24. O-Ring Seal, (Buna-N)
25. Retaining Ring
26. O-Ring Seal, Teflon
27. O-Ring Seal, Buna-N (Also see Options)
28. Spool Cage (Heat Treated Stainless)
29. Back Up Rings, Teflon (two used)
30. O-Ring Seal, Buna-N (Also see Options)
31. Back Up Rings, Teflon (two used)
32. O-Ring Seal, Buna-N (Also see Options)
33. Back Up Rings, Teflon (two used)
34. O-Ring Seal, Buna-N (Also see Options)

39:1 PILOT RATIO:

Pilot Ratio applies to the T Port only.
The A, B, and P ports are balanced.
To determine the pilot pressure required, divide the maximum pressure at the T Port by the ratio of 39 and add the spring PSI of 100. This represents the theoretical minimum pilot pressure in PSI required to shift the valve. Considering variations in springs and hysteresis it is advisable to add at least 50 PSI to the calculated minimum theoretical pilot pressure to assure full valve shift.

CARTRIDGE VALVE



Cavity & Housing

Cavity & Tooling C-8544 (10-4):
See Spec. Sheet 1200671

Line Mount Housings:
See Spec. Sheet 1200675 & 1202930

Panel Mount Housings & Spacers:
See Spec. Sheets
1202984 and 1202990

Cavity & Housing information found at www.doering.com Products Housings

Doering Co. also manufactures multi function and multi station housings and manifolds.

Specifications

Hydraulic or Gas Pilot Operated Spool Valve.
Four Way, Directional Control or Selector Valve.

Pilot (X) Hydraulic or Gas mediums.
Pilot Pressure Range, 100 PSI Min. to 5000 PSI Max.
See 39:1 Pilot Ratio notes for more information.

System Ports (A, B, P, and T)
require lubricated fluid. I.E.: Standard Hydraulic Oil.
Ports A, B, P, and T rated to 3,000 PSI.

Fluid temperatures -40°F (-40°C) to 200°F (93.3°C)
Install Cartridge valve using 1" wrench
Valve should screw in freely to the Mount Seal. Final tightening 20 to 30 foot pounds torque. Use lubricant on external oil seals and mounting threads.

Features

Pilot area (X) is isolated from system ports (A, B, P, and T) by vent to atmosphere (Key 7).

All ports may be pressurized allowing use as directional control or selector valve.

Options

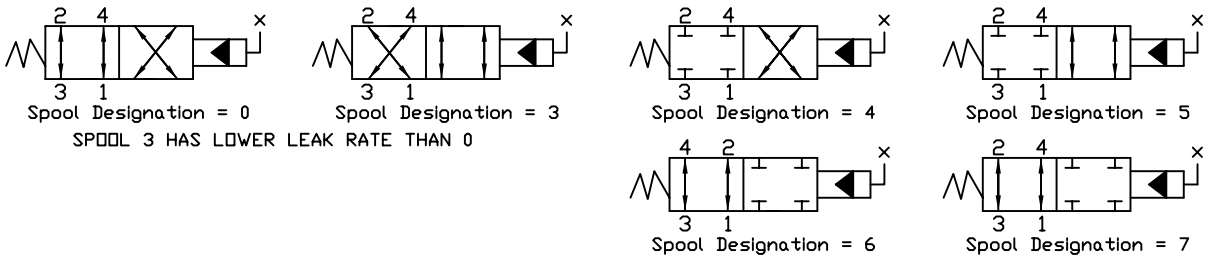
All Stainless Steel option, add -SS to Part Number.
Standard seals are Buna-N with Teflon back up rings.
Optional seals include EP, Viton, Teflon and others.
Key 7, Vents to atmosphere (2 Places 180° apart).
T Option provides 10-32 Threaded ports at these locations. With T option, Key 6. Sintered Bronze filter, is omitted from the assembly.

CARTRIDGE VALVE ORDERING INFORMATION:

Order P/N 44437#39#

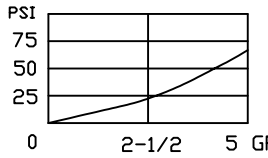
PILOT PORT OPTIONS
1 = 1/8 NPT
2 = 1/4 NPT
4 = SAE4
6 = SAE6

SPOOL DESIGNATIONS:
SEE FUNCTIONAL SYMBOL KEY BELOW



Spool Designation = 0
Spool Designation = 3
SPOOL 3 HAS LOWER LEAK RATE THAN 0
Spool Designation = 4
Spool Designation = 5
Spool Designation = 6
Spool Designation = 7

PRESSURE DROP / FLOW



4PS SERIES

4 Way Spool Valve, Pilot Operated.
Directional Control or Selector Valve.

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DOERING

DOERING CARTRIDGE VALVE

DESCRIPTION

A Four Way Air Piot Operated to shift, latching in the shifted position, spring-return, screw-in, directional hydraulic cartridge valve, spool design.

FEATURES

Actuator mechanism may be rotated 360° for ease of access to Latch Release Pin. Ability to rotate is for access only. Valve does NOT latch by rotating!

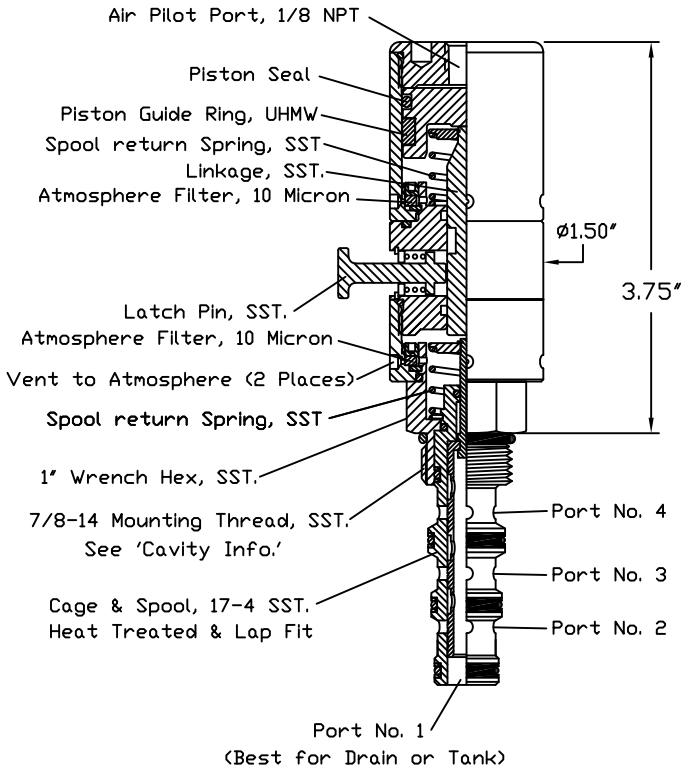
Actuator area is isolated from system ports through a 10 Micron sintered filter.

OPERATION

Once the valve is fully actuated, it is held in the actuated position until released by pulling the Latch Release Pin. Upon pulling the latch release pin, the valve spring returns the spool to the normal position as illustrated by the corresponding functional symbol selected. It is ideal to connect the No. 1 Port of the valve to the lowest pressure port, typically the Tank port. Any pressure on No. 1 Port will act upon the spool linkage and is additive to the spring force and effects the shift force required. See "SHIFT FORCE NOTES:".

PILOT PRESSURE and SHIFT FORCE NOTES:

Spring forces around 20 PSI.
Recommended air pilot pressue 50-100 PSI.
Maximum air pilot pressure 150 PSI.



Cavity & Housing

Cavity & Tooling C-8544 (10-4):
See Spec. Sheet 1200671

Line Mount Housings:
See Spec. Sheet 1200675 & 1202930

Panel Mount Housings & Spacers:
See Spec. Sheets
1202984 and 1202990

Cavity & Housing information found at www.doering.com Cavities, Housing & Manifolds.

Doering Co. also manufactures multi function and multi station housings and manifolds.

Please call for assistance.

RATINGS

- Pressures to 3,000 PSIG, Ports 2, 3 & 4 Only
- Pressure to 150 PSIG, Port No. 1
  Use No. 1 Port for Drain or Tank.
- Caution, Port 1 Pressure effects Shift Force.
  See "SHIFT FORCE NOTES" for more detail.
  Temperature: -40° to 120°C

INSTALLATION

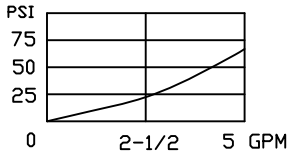
Install Cartridge valve using 1" wrench
Valve should screw in freely to the Mount Seal.
Final tightening 20 to 30 foot pounds torque.
Use lubricant on external oil seals and mounting threads.

OPTIONS

Call for assistance on options ordering.
All Stainless Steel option, add -SS to Part Number.
Stainless Steel Wetted Area Only, add -S to Part Number.
Stainless Steel Actuator Area Only, add -PS to Part Number.

Standard seals are Buna-N with Teflon back up rings.
Optional seals include EP, Viton, Teflon and others.
Vents to atmosphere (2 Places 180° apart).
T Option provides 10-32 Threaded ports at these locations. With T option, Key 6. Sintered Bronze filter, is omitted from the assembly.

PRESSURE DROP / FLOW



4PS SERIES

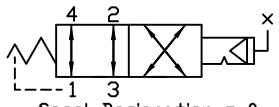
4 Way Spool, Directional Control, Pilot Operated, Latching Valves

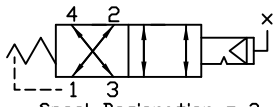
CARTRIDGE VALVE ORDERING INFORMATION:

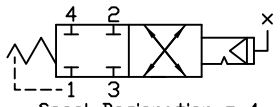
Call for assistance on options ordering.

Order P/N 44LH237108# ##### ###

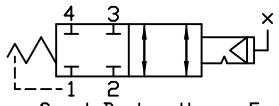
SPOOL DESIGNATION: | MATERIAL OPTIONS: | SEAL OPTONS:

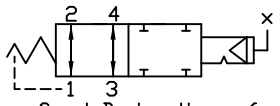


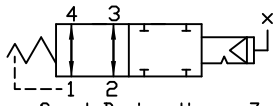




SPOOL 3 HAS LOWER LEAK RATE THAN SPOOL 0







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DOERING

SPEC. SHEET NO. 1203158 REV. 01

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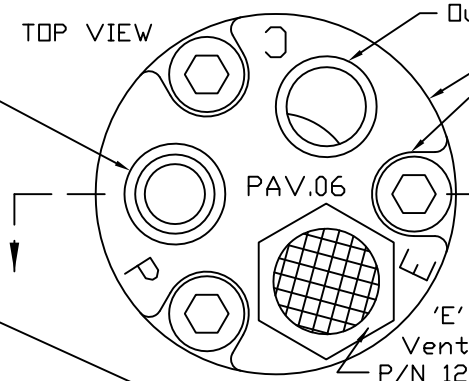
DOERING

'P' Port
Pressure Inlet Port, 1/8 NPT
300 PSI (20 bar) Maximum
Controls Air or Gas.
Verify material compatibility.

Stainless Steel Fasteners
3 Used in Assembly:
P/N 1200984 Bolts, 10-24 X 1-1/2"
(5/32" Socket Hex)
P/N 1200985 Lock Washers, 10-24

TOP VIEW



'C' Port
Outlet Port (Cylinder) 1/8 NPT.
ø1-1/2" (38.1) Diameter, Body
Hole & Counter Bore for Assembly
using 3 Ea. Bolts Lock Washers.

'E' Port
Vent Port
P/N 1200836
1/8 NPT Muffler
Included with Valve.

Pilot may be Hydraulic or Pneumatic.
Pilot seals are Buna-N and Teflon.
Optional seal materials are available.

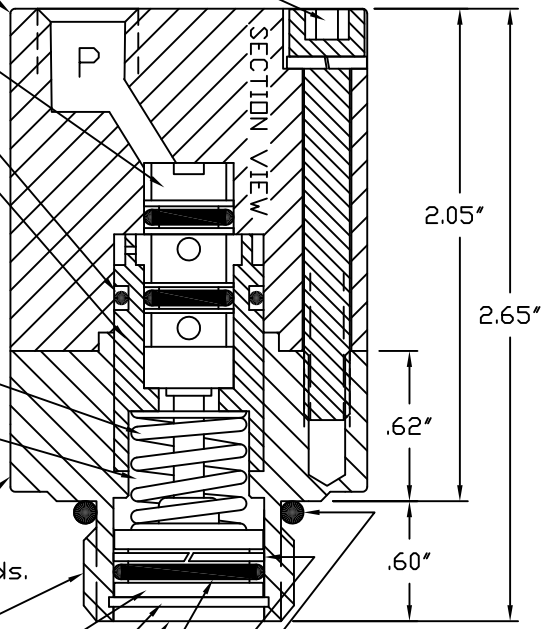
Mount Directly to SAE-10 ORB Port
or adapt to 1/2 NPT.
Optional SAE to NPT Adapter, P/N 1200967
SAE10 (7/8-14) Female to 1/2-14 NPT Male

ø1-1/2" (38.1) Body, Aluminum
Optional: 303 or 316 SST.

Poppet Style Insert Valve.

O-Ring Seal

Sleeve for Insert Valve



Modify Valve Number for PSI.
Valve Shift (crack) Pressure:

11N****##
0050 = 50 PSI Spring
0075 = 75 PSI Spring
0300 = 300 PSI Spring
0350 = 300 PSI Spring
2000 = 2000 PSI Spring
Additional crack pressures
available From 400 to 1,900 PSI.

Note: Spring chamber vents
through E port.

1-1/4" (31.75) Hexagon Mount, SST.
Wrench For Installation @ 20 Foot-Pounds.

Fits ORB Port, SAE-10 (7/8-14 THD.)

Pilot Piston, Stainless Steel
5000 PSI (350 bar) Limit.

Retaining Ring for Pilot Piston, SST.

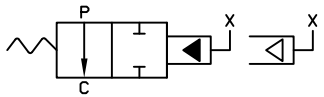
Pilot Port (X)

SAE Port, O-Ring

Pilot Piston Back Up Ring

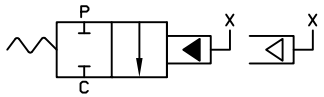
Pilot Piston O-Ring

Order No. 11****20 2W, N/O, Pilot Valve.



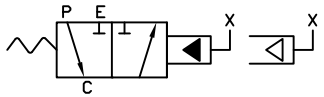
2 Way, Normally Open, Pilot to Close.

Order No. 11****21 2W, N/C, Pilot Valve.



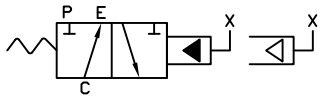
2 Way, Normally Closed, Pilot to Open.

Order No. 11****30 3W, N/O, Pilot Valve.



3 Way, Normally Open, Pilot to Close.

Order No. 11****31 3W, N/C, Pilot Valve.



3 Way, Normally Closed, Pilot to Open.

PAV.06 SERIES

Piloted Air Valve, .06 CV
3.0 scfm @ 50 psig, 6.0 scfm @ 100 psig
Pilot Operated by Hydraulic or Air.

SPEC. SHEET NO. 1200966 REV. 018

CARTRIDGE VALVE

KEY EXPLANATION:

1. Port No. 1, System
2. Port No. 2, System
3. Poppet, Check, Hard Stainless
4. Poppet Check Spring, Stainless Steel
5. O-Ring Seal, Buna N (Also See Options)
6. Filter, 10 Micron, Sintered Bronze
7. Vent (2 Pl.) Optional T Port Locations
8. Filter Retainer
9. Actuator Return Spring, Stainless Steel
10. Piston Guide Ring
11. Piston O-Ring Seal, Buna N (Also See Options)
12. Bonnet O-Ring Seal, Buna N (Also See Options)
13. 3/16" (4.763) Spanner Holes (2 Pl.)
14. 1/8 NPT Pilot Port X (Also See Options)
15. Bonnet, Aluminum material
16. Actuator Body, Aluminum
17. Actuator Piston, Aluminum
18. Push Rod, Hard Stainless Steel
19. Push Rod Seal, Teflon
20. 1/8" (3.175) Spanner Holes (4 or 6 Pl.)
21. Cartridge Seat Retaining Ring
22. Mount O-Ring Seal, Buna N (Also See Options)
23. 7/8-14 Cartridge Mounting Threads, Stainless Steel
24. Cartridge Seat, Hard Stainless
25. Back Up Ring, Teflon
26. O-Ring Seal, Buna N (Also See Options)
27. Spring (Used on valves = "A" Dia. 1-7/8 & 2-1/4")

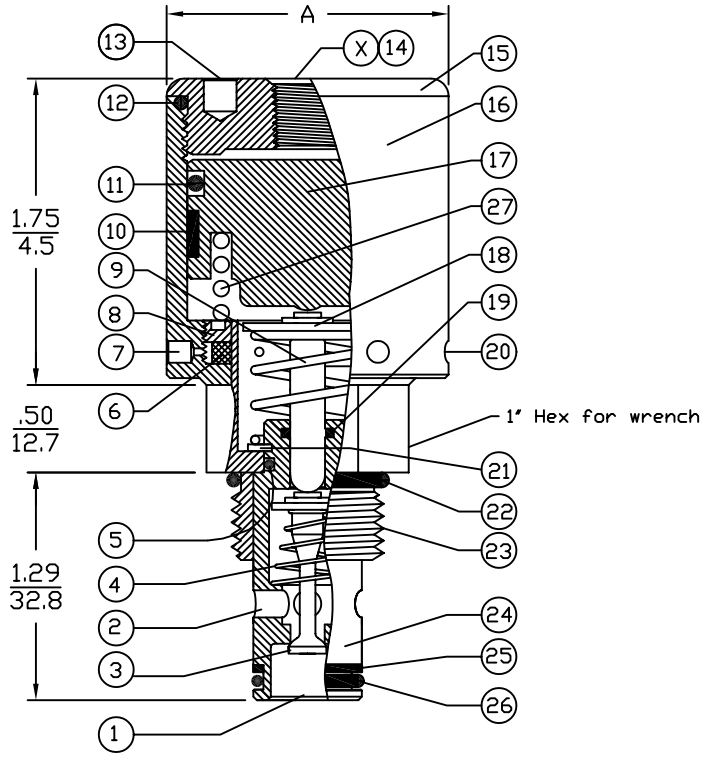
SPECIFICATIONS:

Pilot Operated Check Valve.
Flow is checked from port 1 to port 2.
Add Seat Crack pressure for flow from 2 to 1.
Piloting valve allows free flow in both directions.
Maximum pressure at Ports 1 and 2 is 5,000 PSI.
Pilot Pressure Range, 50 PSI Min. to 150 PSI Max.
Fluid temperature -45°F, (42.7°C) to 200°F, (93.3°C)
Install Cartridge valve using 1" wrench
Valve should screw in freely to the Mount Seal.
Final tightening to 20 foot pounds torque.
Use lubricant on external oil seals and mounting threads.

PILOT RATIO NOTES:

TO CALCULATE THE CORRECT PILOT RATIO VALVE, FOLLOW THESE STEPS:

1. Determine the MAXIMUM possible system pressure. Multiply X 1.1 = SYSTEM
2. Determine MINIMUM possible pilot pressure. Multiply X .9 = PILOT
3. Divide SYSTEM by PILOT = PILOT TO SYSTEM RATIO
4. Round up to standard available ratio.



STANDARD OPTIONS

Pilot Port (Key X) 1/8 NPT. Optional SAE4 Available.
Seals: Buna N, Viton or Teflon. Others please specify.
T Option: 10-32 Ports at Key 7 & 20, Random 360° Pos.

TOOLING

* 1/8 (3.175) Pin Spanner Tool Order No. 471, Ref. Key No. 20
* 3/16 (4.763) Face Spanner Tool Order No. 482, Ref. Key No. 13

Cavity & Housing

Please see Spec. Sheets at www.doering.com

Cavity C-8542 (10-2):
See Spec. Sheet 1200621 Includes Cavity and Cavity Tooling Info.

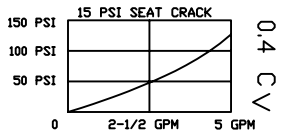
Line Mount Housings:
See Spec. Sheets 1200674 and 1201455

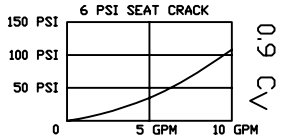
Panel Mount Housings:
See Spec. Sheets 1202982 and 1202990

Two Stage Decompression Housings:
See Spec. Sheets 1201268 and 1203114

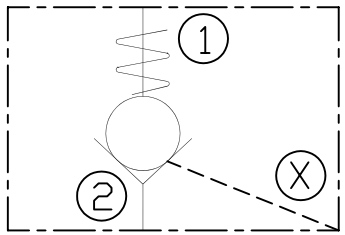
PILOT TO SYSTEM RATIO	" A " DIAMETER		ORDER VALVE NUMBER:
40:1	1-1/2	38,10	94H7204015
49:1	1-5/8	41,28	94H7304915
69:1	1-7/8	47,63	94H7606915
104:1	2-1/4	57,15	94H7710415
19:1	1-1/2	38,10	94H9201906
24:1	1-5/8	41,28	94H9302406
33:1	1-7/8	47,63	94H9603306
50:1	2-1/4	57,15	94H9705006

FLOW AND PRESSURE DROP CHARTS





POC SERIES



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DOERING

CARTRIDGE VALVE

KEY EXPLANATION:

1. Port No. 1, Working
2. Port No. 2, Working
3. Poppet, Check, Hard Stainless
4. Poppet Check Spring, Stainless Steel
5. O-Ring Seals, Teflon
6. Filter, 10 Micron, Sintered Bronze
7. Vent (2 Pl.) Optional T Port Locations
8. Filter Retainer
9. Actuator Return Springs, Stainless Steel
10. Actuator Piston
11. Piston O-Ring Seal, Buna N (Also See Options)
12. Bonnet Stainless Steel
13. 1" Wrench Flats for Installation
14. Pilot Port X (Specify in Part Number)
15. Piston Sleeve, Stainless Steel
16. Push Rod, Hard Stainless Steel (17-4)
17. Cartridge Seat Retaining Ring
18. Mount O-Ring, -910, Buna-N (Also see Options)
19. 7/8-14 Cartridge Mounting Threads, Stainless Steel
20. Cartridge Seat, Hard Stainless
21. Back Up Ring, -014, Teflon
22. O-Ring Seal, -014, Buna N (Also See Options)

FUNCTION

Pilot Operated Check Valve.
Normally closed. Pilot to Open.
In the non-energized (non-piloted) condition:
Flow is checked from 1 to 2.
Flow will occur from 2 to 1 with 15 PSI Crack.
In the energized (Piloted) condition:
Flow will occur in either direction.

Pilot area (X) is isolated from working ports 1 & 2.

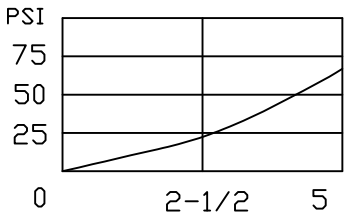
14:1 PILOT RATIO:

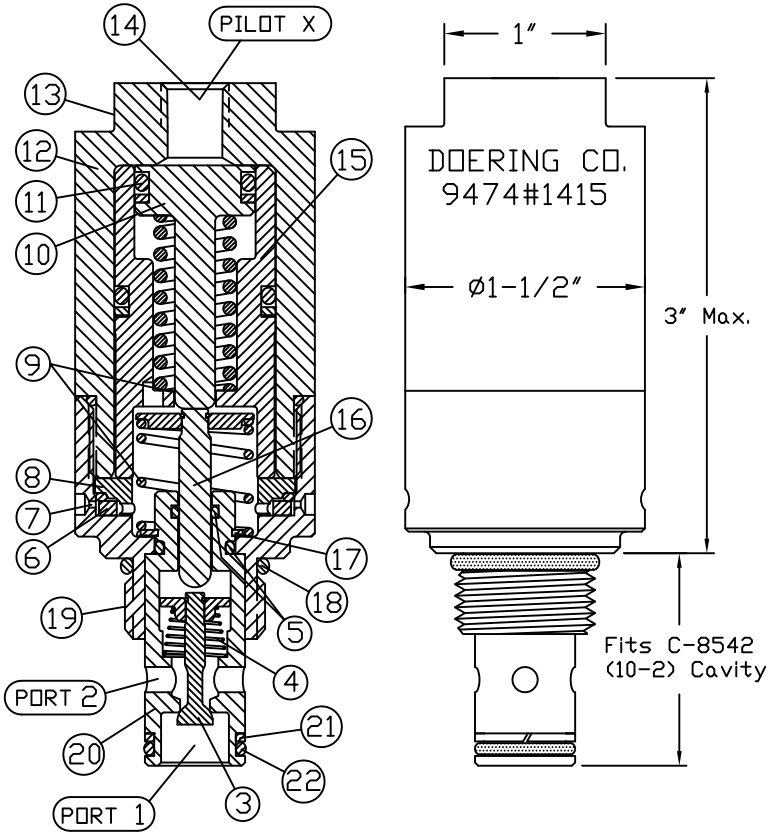
The Pilot Ratio is a comparison between the seat seal area (key 3) poppet and the Actuator Pilot Piston (key 10).
To determine pilot pressure required, divide the maximum working pressure by the pilot ratio of 14 and add 100 PSI for springs (key 9).
The result represents the absolute minimum pilot pressure required to actuate the valve. Add a comfortable margin of pressure to assure reliable operation. Stay within the pressure limit of the pilot area (5,000 PSI).

PERFORMANCE (cartridge only)

Pressure Drop (PSI)
Compared to Flow (GPM)

Valve Orifice Diameter = .160"
Check Bias Spring Crack = 15 PSI





Order P/N 9474#1415

SPECIFY PILOT PORT X

1	=	1/8 NPT
2	=	1/4 NPT
4	=	SAE4
G4	=	G 1/4-19 BSPP
6	=	SAE6
G6	=	G 3/8-19 BSPP

Cavity & Housing

Cavity Drawing C-8542 (10-2):
1200621 Spec. Sheet

Line Mount Housings:
1200674 and 1201455
Spec. Sheets

Panel Mount Housings:
1202982 and 1202990
Spec. Sheets

SPECIFICATIONS

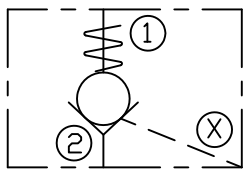
Hydraulic or Gas Pilot Operated Check Valve.
Pilot (X) Hydraulic or Gas mediums.
Pilot Pressure Range, 100 PSI Min. to 5000 PSI Max.
See 14:1 Pilot Ratio: notes for more information.
Working Ports (1 and 2) Rated to 5,000 PSI.

Fluid temperatures -40°F (-40°C) to 200°F (93.3°C)
Install Cartridge valve using 1" wrench
Valve should screw in freely to the Mount Seal.
Final tightening 20 to 30 foot pounds torque.
Use lubricant on external oil seals and mounting threads.

OPTIONS

All Stainless Steel option, add -SS to Part Number.
Standard seals are Buna-N with Teflon back up rings.
Optional seals include EP, Viton, Teflon and others.
Key 7, Vents to atmosphere (2 Places 180° apart).
T Option provides 10-32 Threaded ports at these locations. With T option, Key 6, Sintered Bronze filter, is omitted from the assembly.

FUNCTIONAL SYMBOL



POC SERIES

Pilot Operated Check Valve
Normally Closed. Pilot to Open.

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mailbox@doering.com ▪ www.doering.com

DOERING

CARTRIDGE VALVE

SPECIFICATIONS:

Pilot operated cartridge check valve. Normally open. Pilot to close passage between ports one and two.

Valve will also function as a Pilot Operated Relief valve. See notes regarding pilot pressure.

Maximum recommended system pressure (ports one and two) 5,000 PSI.

Pilot Pressure Range, 50 PSI Min. to 5000 PSI Max.
Pilot minimum may be lower if valve is used as a pilot operated relief valve.

Fluid temperature -45°F, (42.7°C) to 200°F, (93.3°C)
Install Cartridge valve using 1" wrench
Valve should screw in freely to the Mount Seal.
Final tightening to 20 foot pounds torque.
Use lubricant on external oil seals and mounting threads.

Features

KEY

1. No. 1 working port
2. No. 2 working port
3. Seat, Heat Treated Stainless
   Also see Seat Options.
4. Poppet, Heat Treated Stainless
5. Poppet Spring, Stainless Steel
6. Seat Saver Piston Assembly
7. Vent Port (2 Places)

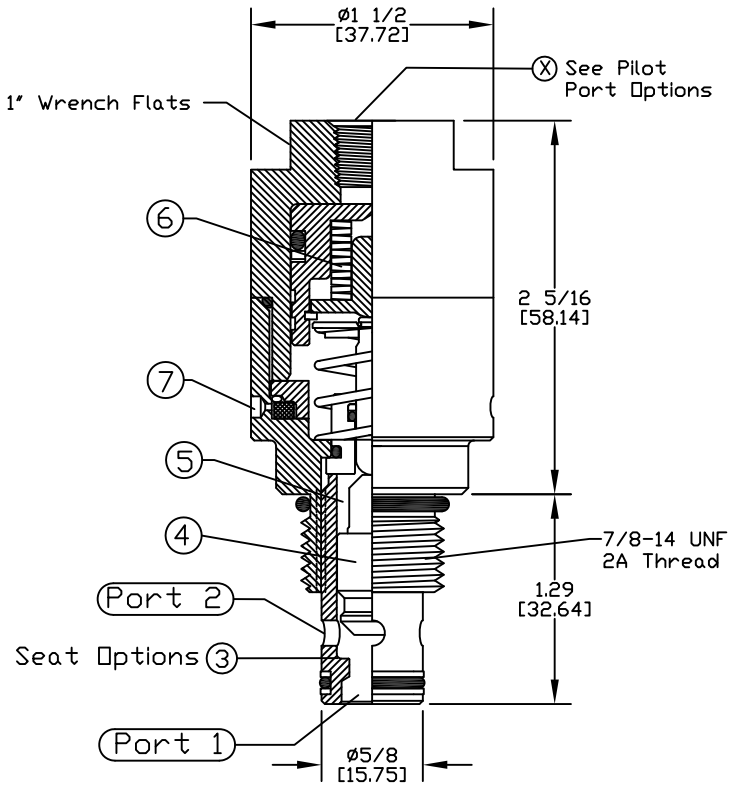
13:1 PILOT RATIO:

Area of pilot piston is 13 X larger than seat area.

To determine Minimum Pilot pressure required, follow these steps:

(1) Multiply the maximum possible system pressure X 1.1 = SM (System Max.)
(2) Divide SM by 13 = MP (Min. Pilot)

Note: MP is minimum pilot pressure needed for normally open / pilot to close valve function. If pilot pressure falls below MP, the valve will function as a pilot operated relief valve.



CAVITY

Cavity C-8542 (Industry 10-2)
Form Tool: FT-8542
Call for source information.

Cavity Drawing Spec. Sheet No. 1200621

Visit www.Doering.com and enter Spec. sheet 1200621. in 'document search' box.

HOUSING

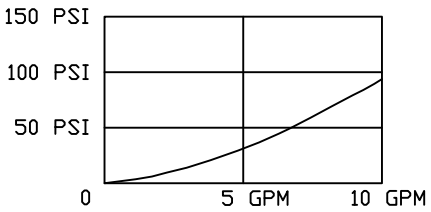
Line Mount Housings:
Spec. Sheets 1200674 and 1201455.

Visit www.Doering.com and enter Spec. sheet number in 'document search' box.

Doering Company also offers:
Custom Housings and Manifolds.
Materials include:
Aluminum, 304 SST., 316 SST.

Pressure Drop/Flow Chart.

Orifice Ø.28 (Cv 1.0)



CARTRIDGE VALVE ORDERING INFORMATION:

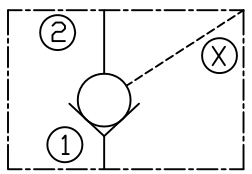
Valve Number: 904#95#13##

SEAT OPTIONS, Ref. Key 3
Blank = Hard Seat, Standard Hydraulic Test
K = Kel-F Soft Seat, Bubble Tested

X PILOT PORT OPTIONS
1 = 1/8 NPT
2 = 1/4 NPT
4 = SAE 4
6 = SAE 6

SPRING OPTIONS, POPPET BIAS Value in PSI Crack, Ref. Key 5
00 = NO SPRING
03 = STAINLESS STEEL
25 = STAINLESS STEEL

POC SERIES



Check Valve, Normally Open, Pilot to Close

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DOERING

CARTRIDGE VALVE

SPECIFICATIONS:

Pilot to Close Check Valve:
This valve only flows from 1 to 2.
In the steady state (non-piloted), valve will flow from 1 to 2. The poppet spring will determine the poppet crack pressure. When the pilot is energized, the poppet is held closed and flow is blocked.
See Pilot Ratio Notes to determine pilot ratio.

Valve will also function as a Normally Open, Pilot to Close 2-Way valve provided flow is only required from 1 to 2.

Working Pressure: 5,000 PSI Ports 1 and 2.
Pilot Pressure Range, 50 PSI Min. to 150 PSI Max.
Pilot Pressure may be less if used as P.O. Relief.

Pilot medium is to be Air Only!

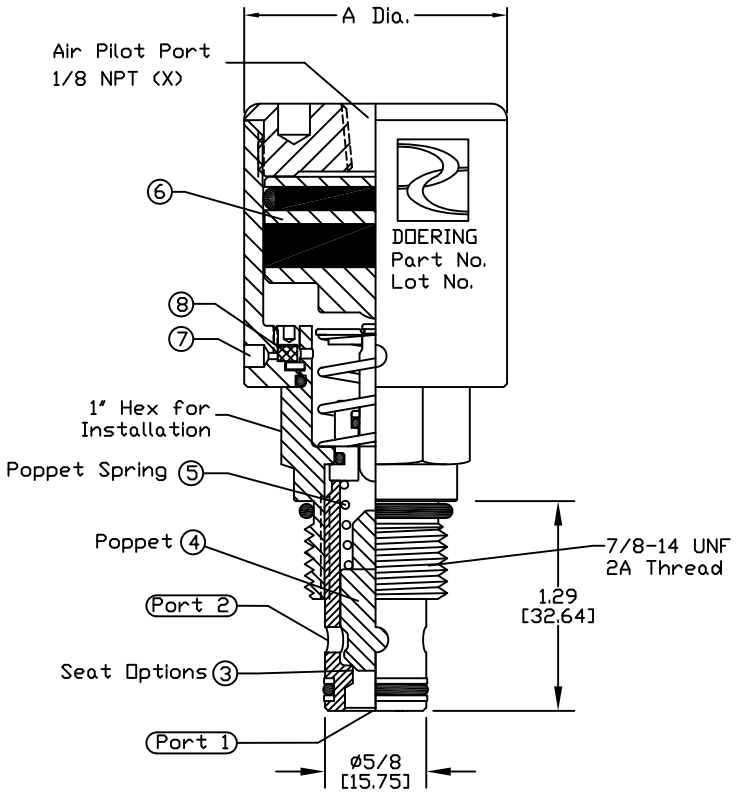
Fluid temperature -45°F, (42.7°C) to 200°F, (93.3°C)
Install Cartridge valve using 1" wrench
Valve should screw in freely to the Mount Seal.
Final tightening to 20 foot pounds torque.
Use lubricant on external oil seals and mounting threads.

Features

KEY
1. No. 1 working port
2. No. 2 working port
3. Seat, Heat Treated Stainless
   Also see Seat Options.
4. Poppet, Heat Treated Stainless
5. Poppet Bias Spring, Stainless Steel
   Also see Spring Options.
6. Piston Assembly
7. Vent Port (2 Places)
8. Internal Sintered Filter, 10 Micron

Pilot Ratio Notes:

Indicated pilot ratio refers to the area of the pilot piston as compared to the seat area, Port 1. Add an additional 15 psi to compensate for spring force. Please call for any assistance or clarification.



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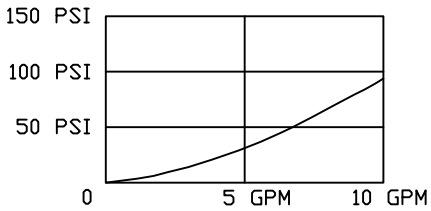
Materials include:
Aluminum, 304 SST., 316 SST.

Pressure Drop/Flow Chart.
Orifice ø.28 (Cv 1.0)



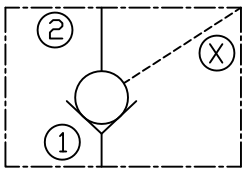
CARTRIDGE VALVE ORDERING INFORMATION:

Ratio	A Diameter	Valve Number
19:1	1-1/2" [38,10]	904H#92019##
24:1	1-5/8" [41.28]	904H#93024##
33:1	1-7/8" [47,63]	904H#96033##
50:1	2-1/4" [57.15]	904H#97050##

SEAT OPTIONS, Ref. Key 3
Blank = Hard Seat, Standard Hydraulic Test
K = Kel-F Soft Seat, Bubble Tested

SPRING OPTIONS, POPPET BIAS Value in PSI Crack, Ref. Key 5
00 = NO SPRING
03 = STAINLESS STEEL
25 = STAINLESS STEEL

POC SERIES



Check Valve, Normally Open:
Air Pilot to Close:
Can Control Fluid or Gas, Ports 1 & 2:
See Ratio Notes:

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DOERING

SPEC. SHEET NO. 1202970 REV. 12

Select DOERING Solenoid Option (*)	Order DOERING P/N Assembled	OR	Order DOERING P/N Open Items (Kit)	Ref. MAC P/N Solenoid Only	Electrical Information	Condition of (P) N/C or N/O	Connect MAC ports
A	1202090A		1202090AB	35A-AAA-DAAA-1BA	110/120VAC 50/60Hz 5.4 Watts	Normally Closed	1 - (P) Air Inlet 2 - (C) Doering Pilot 3 - (E) Exhaust
B	1202090B					Normally Open	1 - (E) Exhaust 2 - (C) Doering Pilot 3 - (P) Air Inlet
C	1202090C		1202090CD	35A-AAA-DACA-1BA	24VAC 50Hz, 7.4W 60Hz, 5.7W	Normally Closed	1 - (P) Air Inlet 2 - (C) Doering Pilot 3 - (E) Exhaust
D	1202090D					Normally Open	1 - (E) Exhaust 2 - (C) Doering Pilot 3 - (P) Air Inlet
G	1202090G		1202090GH	35A-AAA-DDAA-1BA	24VDC 5.4 Watts	Normally Closed	1 - (P) Air Inlet 2 - (C) Doering Pilot 3 - (E) Exhaust
H	1202090H					Normally Open	1 - (E) Exhaust 2 - (C) Doering Pilot 3 - (P) Air Inlet
J	1202090J		1202090JK	35A-AAA-DDBA-1BA	12VDC 5.4 Watts	Normally Closed	1 - (P) Air Inlet 2 - (C) Doering Pilot 3 - (E) Exhaust
K	1202090K					Normally Open	1 - (E) Exhaust 2 - (C) Doering Pilot 3 - (P) Air Inlet

Assembly 1202090* Solenoid Pilot Options
* = Select Voltage and Condition
Exhaust Muffler 1200836 - Assemble without sealant.
1/8" NPT Brass Short Nipple 1202091 - Assemble with sealant.
This series of Solenoid Pilot Valves has 18" Flying Leads.

Solenoid Options & Assembly Guide using MAC brand valves.
PSI Limit is 120 PSI for illustrated MAC valves (P) Air Inlet.

1202090 Series
Solenoid Pilot Options

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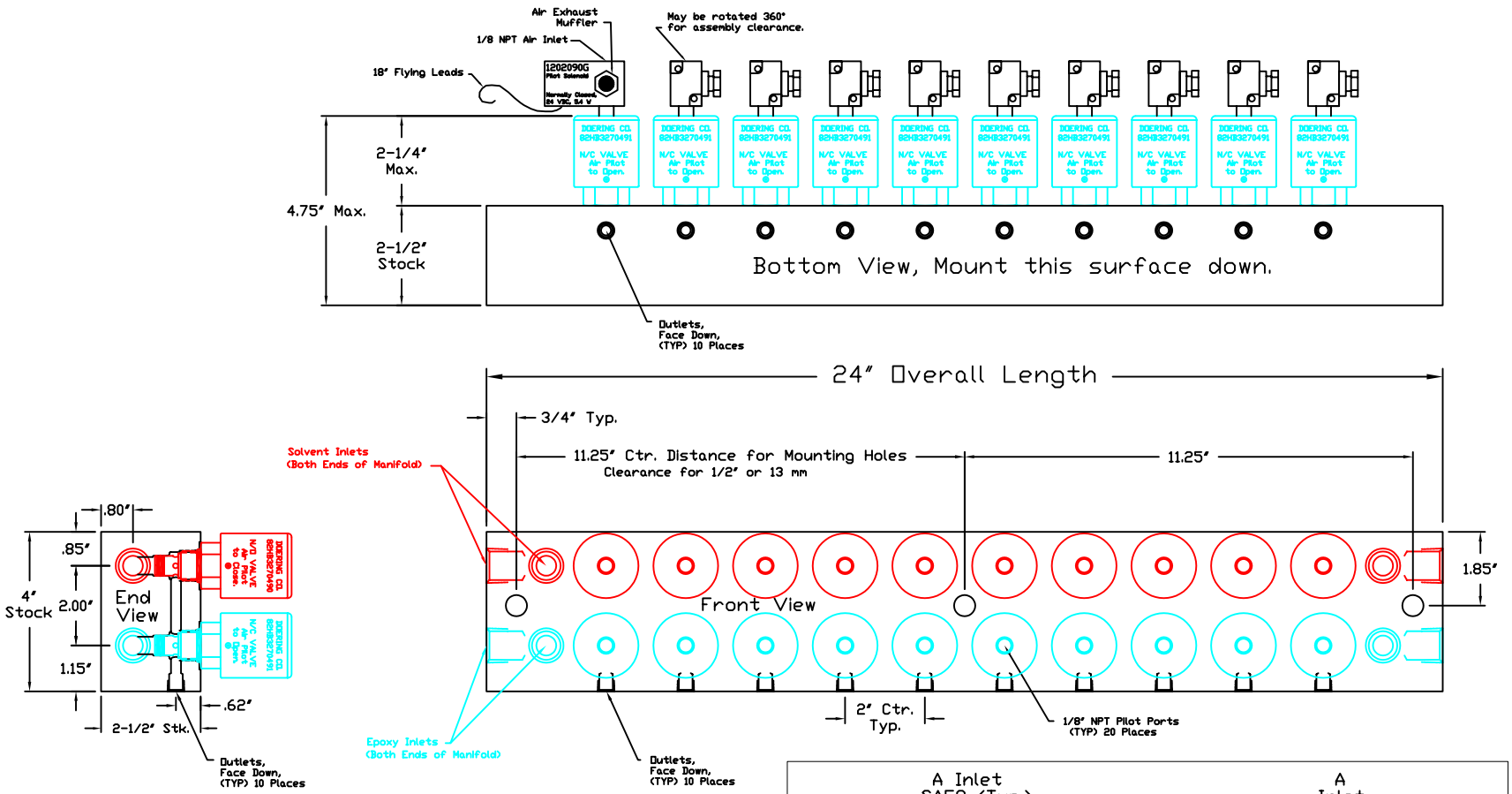
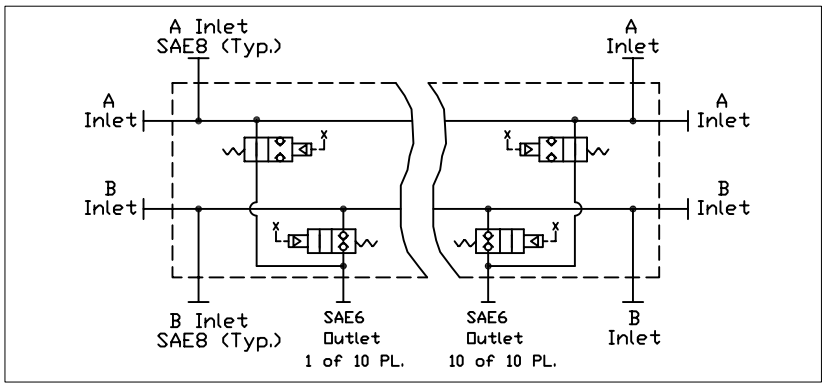




Bill of Material:

Complete assembly P/N 1202761

Each Assembly Includes the following:

1202753 Manifold, 10 Station, 304 SST. (One Each)

82HB3270490 Doering valves, Normally Open (10 Each)

82HB3270491 Doering valves, Normally Closed (10 Each)

1202090G Solenoid Pilot valves, 24 VDC, Normally Closed (20 Each)

Assembly Notes:

Normally Open Valves installed in Row A (Solvent Control)

Normally Closed Valves installed in Row B (Epoxy Controll)

Solenoid Pilot Valves installed as Normally Closed.

DOERING

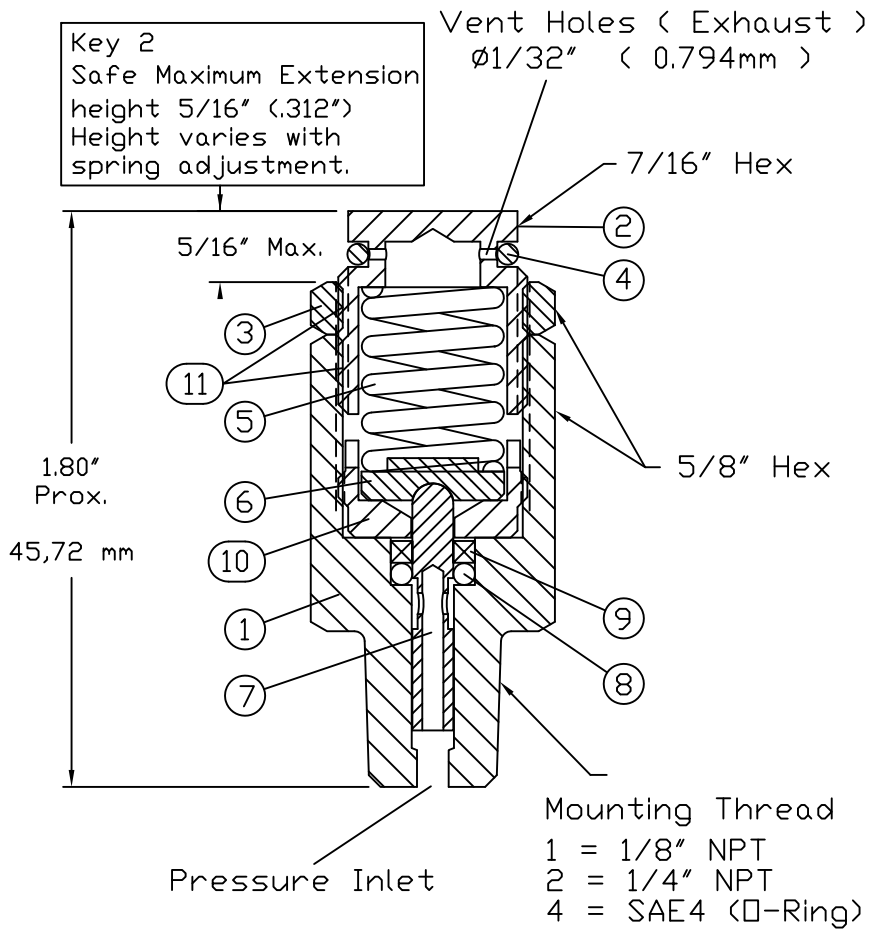
Spec. Sheet No. 1202753 Rev. 04

KEY TABLE:

KEY	DESCRIPTION
1	Body, Stainless Steel (SST)
2	Adjusting Cap, SST.
3	Lock Nut (Jam Nut), SST.
4	O-Ring, -012, Dust Seal Protects inside of valve.
5	Spring, Stainless Steel
6	Spring Follower, SST.
7	Poppet, SST.
8	O-Ring, -006
9	Back Up Ring, -006, Teflon
10	Retainer, SST.
11	Optional Factory Thread Lock, LB or LR Loctite Blue (LB) or Loctite Red (LR)

Features:

* Stainless Steel Construction
* Adjustable Crack Pressure
* Low Hysteresis
* Bubble Tested for Zero Leakage
* Optional Factory Preset
* 100% Seal Leakage Tested



Order Information:

Adjustment Range PSI.	Doering Order No.
Spring (B) 0500 to 1500	2009-*-*-**-****-**
Spring (C) 1500 to 3000	
Spring (D) 3000 to 4000	

Select Mounting Thread: (1), (2), (4)

Select Spring Range (B), (C), (D)

Seals
Specify (NN) Buna-N, (RR) EPR/EPDM,
(K75K) Kalrez 7075 or (VV) Viton.
Additional Seal Materials available on request.
First Letter Specifies Wetted seals Only
Second Letter Specifies Key 4 Dust Seal

Optional: Specify Crack Pressure
in PSI for Factory Preset ±5%
This will be left blank if not
Factory Preset.
Reseal within 10% of Crack Pressure.

Optional: Add Letters LB or LR
Loctite Blue (LB), Loctite Red (LR)
Factory Applied Thread Lock. Key No. 11.
Secures Cap and Nut. Keys 2 and 3.

RVS-18 Series

Relief Valve, Safety Popoff

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