DYNEX
High Pressure Hydraulics

ENGINEERING SPECIFICATIONS

D08 Directional Control Valves

D08 SERIES
40 gpm (151 L/min) Nominal
90 gpm (341 L/min) Max
5000 psi (350 bar) Rated Pressure

D08 valves are available with a full range of spools and actuators, including lever operated models.

An optional spool stroke adjustment controls the limit of spool travel. This provides manual control of the valve's metering characteristics. See page 8.

For a description of spools, operators, and application information, refer to page 2.

Mounting

Subplate, NFPA D08, NG25, ISO 4401-08.

Actuator Options

6100 Series: Lever Operated.
6600 Series: Solenoid Operated.
6800 Series: Hydraulic Piloted.
6900 Series: Air Piloted.

Rated Flow

Nominal: 40 U.S. gpm (151 L/min).
Maximum: 90 U.S. gpm (341 L/min).

Rated Pressure

5000 psi (350 bar).

Tank Port Pressure (Maximum)

Standard External Drain:
5000 psi (350 bar).

Internal Drain ("ID" Option):
Lever models,
500 psi (35 bar).
Solenoid and Air Piloted models,
3000 psi (210 bar).
Hydraulic Piloted models,
5000 psi (350 bar).

Response Time (Full Stroke)

Spring Centered models:
Solenoid Energized, 40-45 ms.
Spring Returned, 40 ms.

Spring Returned models:
Solenoid Energized, 50 ms.
Spring Returned, 75 ms.

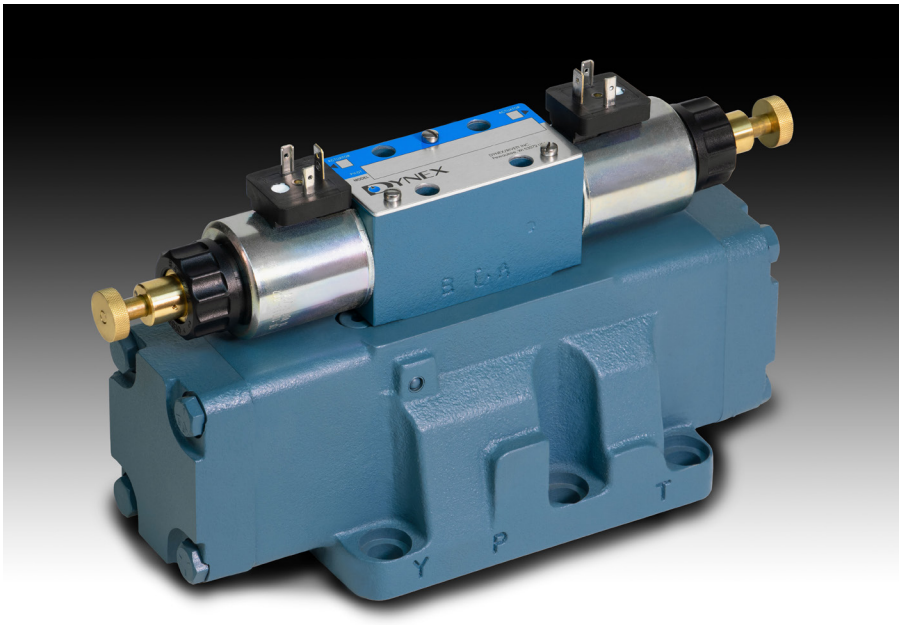


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Standard Seals

All valves use Fluorocarbon (Viton®, Fluorel®, or equivalent) o-rings, providing greater fluid compatibility and increased temperature range performance. EPR seals can be provided as an option.

Fluid Recommendations

50 to 1500 SUS (7 to 323 cSt) viscosity; -20° to 200° F (-29° to 93° C) temperature range.

Recommended Filtration

Use filtration to provide fluid which meets these ISO Code 4406 cleanliness values: 19/17/14.

INTERNAL OPERATORS

The table shows available internal operators and the most common spools. Refer to *Typical Model Code* on page 9 to specify valve model. Contact the Dynex Sales department for availability of spool options not shown.

The function symbols in the table show solenoid or lever actuated models as reference. Air and hydraulic actuators are also available.

Flow pattern in the center position or during crossover is determined by the selected spool. Refer to *Spool Descriptions* below.

Flow Patterns

Actuator "A" opens flow path (P→A). Actuator "B" opens flow path (P→B).

Spring Centered and Spring Offset models are spring positioned unless actuated.

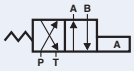
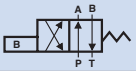
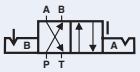
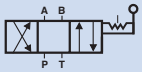
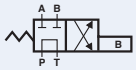
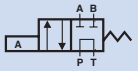
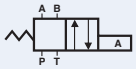
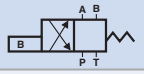
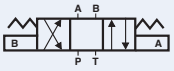
Detented Models (Solenoid Operated)

Code 3 operators (two position detented) hold the spool in the last actuated position. These valves can be actuated momentarily (minimum electrical signal duration, 50 ms) to shift and hold the spool in that position.

Reverse "R" Option (Internal Operator Code 4 Only)

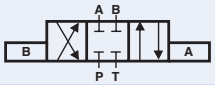
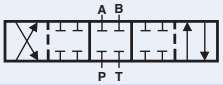
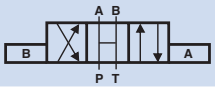
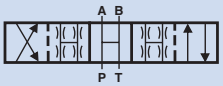
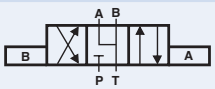
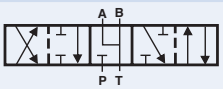
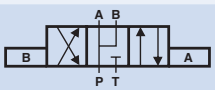
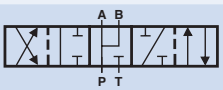
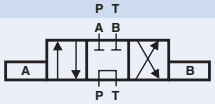
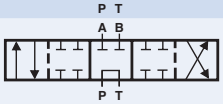
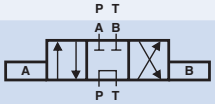
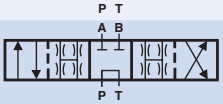
Flow pattern can be altered with "R" (Reverse Assembly) option. Refer to *Internal Operator Descriptions* table for flow pattern details.

Internal Operator Descriptions①

Internal Operator Code	Actuator, Operation	Spool Type	Operator Functions		
			Non-Actuated	Actuated	Function Symbol
1	Lever + Single Actuator, Two Position	5 or 6	P→B	P→A	
2	Lever + Single Actuator, Two Position	5 or 6	P→A	P→B	
3	Double Actuator, Two Position	5 or 6	Detented in Actuated Positions	P→A or P→B	
	Lever Actuator, Three Position	All Spools	Detented in Actuated Positions	P→A or P→B	
4	Single Actuator, Two Position	56 or 58	Spring Centered	P→B	
		56 or 58 Reverse	Spring Centered	P→A	
		5, 6, 8 or 9	Spring Centered	P→A	
		5, 6, 8 or 9 Reverse	Spring Centered	P→B	
5	Lever + Double Actuator, Three Position	All Spools	Spring Centered	P→A or P→B	

① *A & B represent the actuator(s), which can be Air, Hydraulic, or Solenoid.*

Spool Descriptions①

Spool Type	Spool Symbol	Crossover Function	Description of Spool Function
5			Closed center spool. All ports blocked in center position.
6			Open center spool. All ports connected in center position. Allows fluid motors or cylinders to move when de-energized. Minimum shock during crossover.
8			Pressure port blocked in center position. Both A and B ports connected to tank.
9			A and B ports pressurized in center position, tank port blocked. Used for a differential circuit with single rod cylinder. Prevents motor cavitating when decelerating. Reduces crossover shock.
56			Tandem center spool, with closed crossover.
58			Tandem center spool, as noted for Type 56 spools, but with open crossover.

① *A & B represent the actuator(s), which can be Air, Hydraulic, or Solenoid.*



Represents the actuators.



Represents the work ports of the valve.

VALVE EFFICIENCY

D08 valves provide exceptionally low pressure drop, as shown in the performance curves.

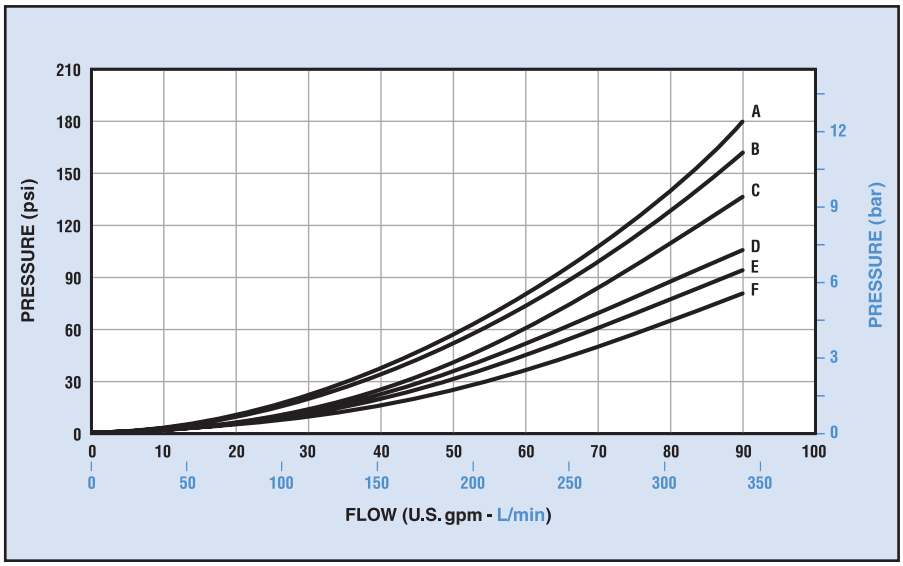
Determining Pressure Drop

The *Pressure Drop (ΔP) Curves* show typical resistance to flow for various spool types. The *Flow Curve Reference* table identifies the typical pressure drop curve for desired spool and flow path.

If the valve has simultaneous flow through it in more than one direction, then the "Loop" pressure drop should be determined to estimate total pressure drop (ΔP) through the valve.

To determine total "Loop" drop, the individual pressure drops for both flow paths (for example: P→A + B→T) must be added together.

Pressure Drop (ΔP)



Flow Curve Reference

Flow Path	Spool Type①					
	5	6	8	9	56	58
P→A	D	E	D	D	D	D
P→B	D	E	D	D	D	D
A→T	F	F	F	F	D	D
B→T	C	C	C	C	B	B
P→T	–	E	–	–	A	A

① *See "Spool Descriptions" table on page 2 to determine which spool to select for valve application.*

Typical Pressure Drop (ΔP Example)

To determine the pressure drop (ΔP) for Spool Type "0"

From *Flow Curve Reference* table, cross reference:

Spool Type "5" with the **Flow Path** for P→A function = **(D curve)**

Spool Type "5" with the **Flow Path** for B→T function = **(C curve)**

From *Pressure Drop (ΔP) Curves*:

At 40 gpm: **(D curve)** = approx. **22 psi** (P→A)

At 40 gpm: **(C curve)** = approx. **25 psi** (B→T)

To determine total (for example: P→A + B→T):

Loop Pressure Drop = 22 psi + 25 psi = **47 psi**

VALVE MOUNTING

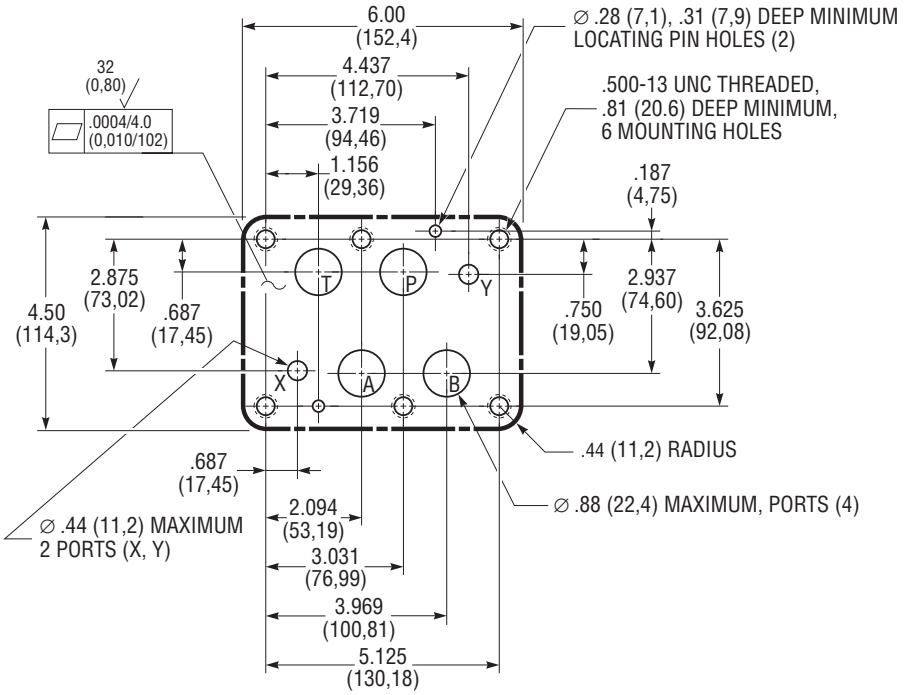
The mounting surface drawing shows the minimum flush or raised surface required for the standard NFPA D08, NG25, ISO 4401-08 pattern.

Port o-rings are included with valves.

Mounting bolts must be ordered separately: .500-13 UNC x 1.25 inch (32 mm), Grade 8 or better, six required. Recommended mounting torque is 55 lb•ft (75 N•m).

P16-BK-20 (Bolt Kit) available.

Note: Installation drawing dimensions are shown in inches (millimeters in parentheses) and are nominal.



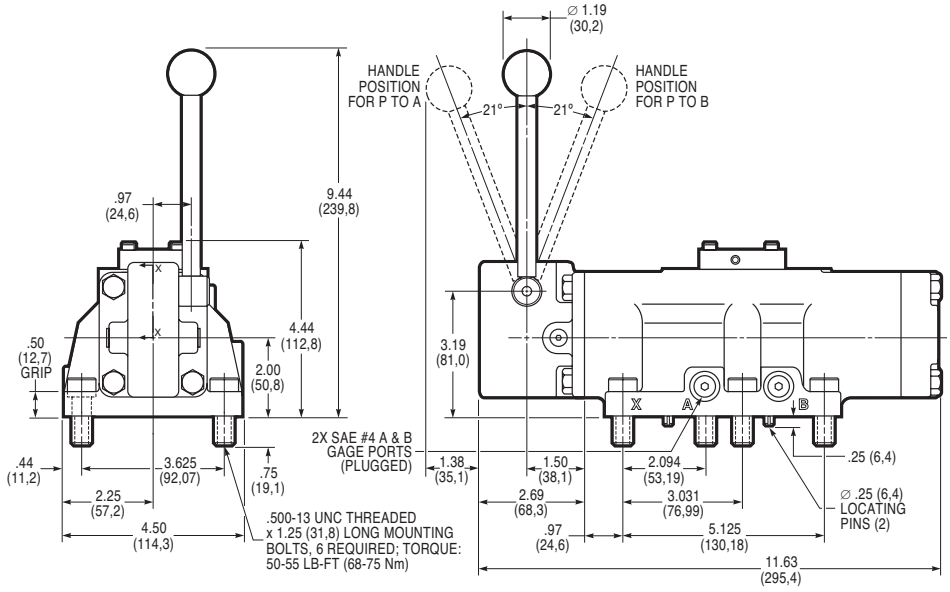
Minimum Mounting Surface

6100 SERIES LEVER OPERATED MODELS

Lever Operated valves are available in two or three position models. Models with Code 3 internal operators provide three position, detented operation. Refer to *Typical Model Code* on page 9.

Weight (Mass):

27.5 lb (12,5 kg).



6100 Series, Lever Operated Models

SOLENOID OPTIONS

These models use a D03 valve as a pilot. Models are available with AC or DC solenoids.

Electrical Connections

Plug-In-Terminal Solenoids fit Deutsch DT04-2P Connector or EN175301-803 / DIN 43650 Form A (Hirschmann Type) Connector.

Standard Solenoids

Solenoids are easily removed without manual wiring or opening the hydraulic system for replacement. Coils can be rotated 360° for flexible installation.

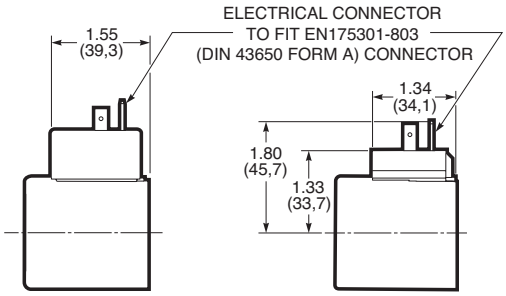
CSA/UL Recognized

c UL us

Solenoid Electrical Data

Solenoid Type	Volts	Coil Resistance (Ohms) at 77°F (25°C)	Power (Watts)
AC	24AC①	19.4 - 21.4	23
	115AC①	444 - 492	23
	230AC①	1823 - 1941	23
DC	12DC	4.56 - 5.04	30
	24DC	18.24 - 20.16	30
Explosion Proof	115AC①	559.0	18.6
	24DC	30.3	19

① *Information shown is for 60Hz models only. At other frequencies the coil characteristics must be revised.*



AC DIN CONNECTOR COIL *DC DIN CONNECTOR COIL*

6600 SERIES SOLENOID OPERATED MODELS

The overall length of a single solenoid model (not shown) is 10.58 inches (268,7 mm).

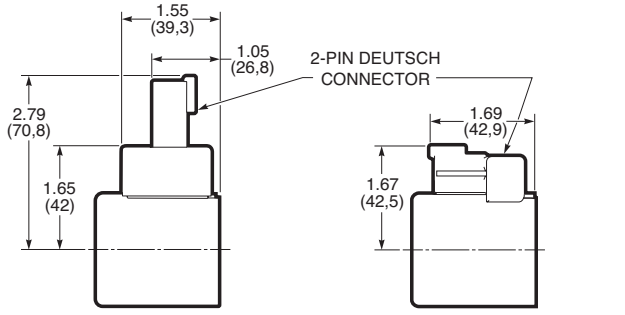
Weight (Mass):

Single Solenoid, 29.5 lb (13,4 kg).

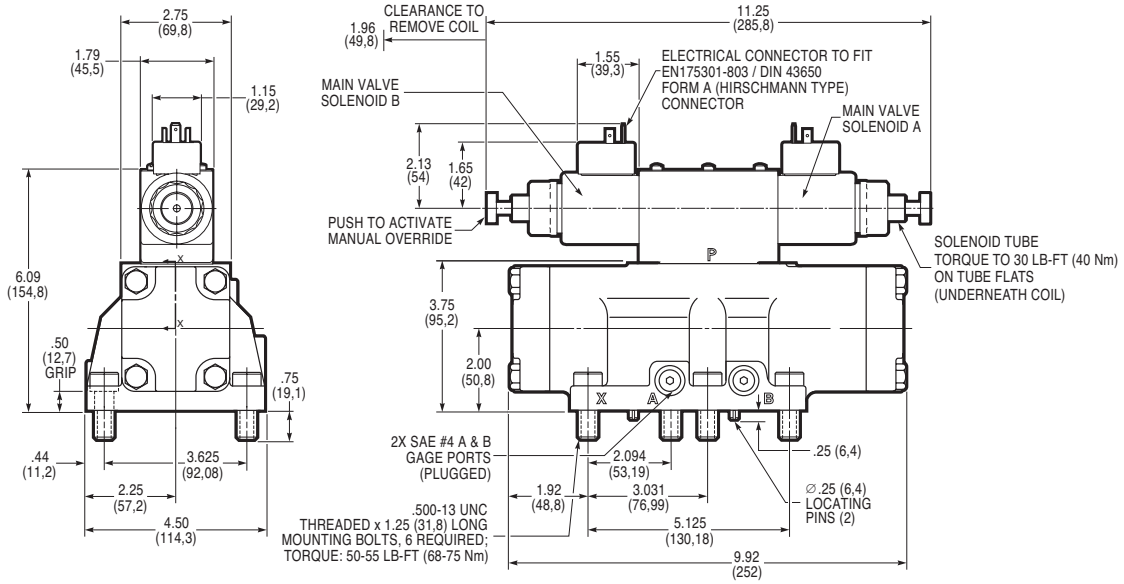
Double Solenoid, 30.5 lb (13,8 kg).

Pilot Pressure:

Minimum, 65 psi (5 bar).
Maximum, 5000 psi (350 bar).



AC DEUTSCH CONNECTOR COIL *DC DEUTSCH CONNECTOR COIL*



6600 Series, Double Solenoid Operated Models

EXPLOSION PROOF SOLENOID OPTIONS

"EP" solenoids with special enclosures are approved by UL and CSA for use in hazardous locations.

See table for Solenoid Ratings.

Weight (Mass):

Single Solenoid, 31.8 lb (14,4 kg).

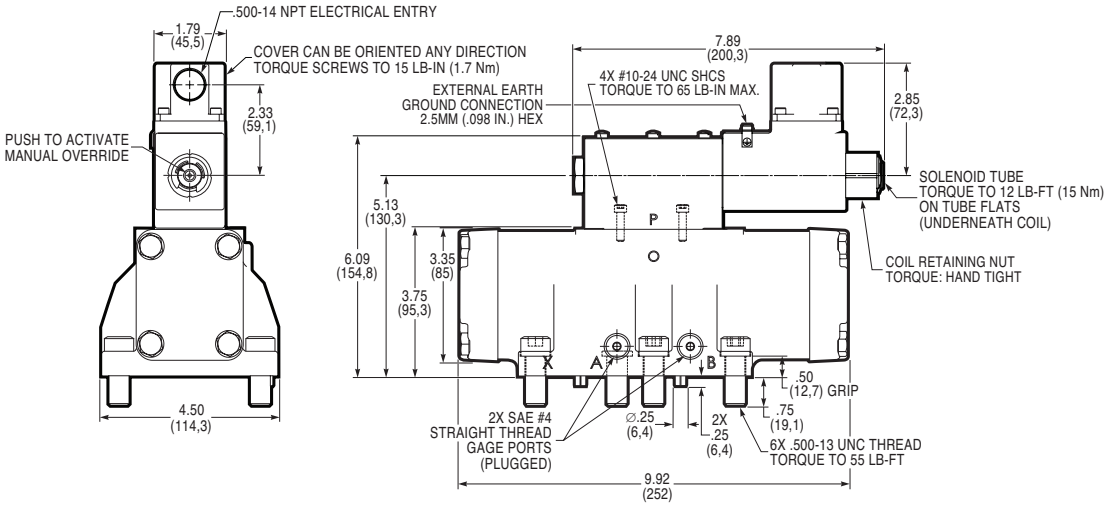
Double Solenoid, 35.1 lb (15,9 kg).

Explosion Proof Solenoid Ratings

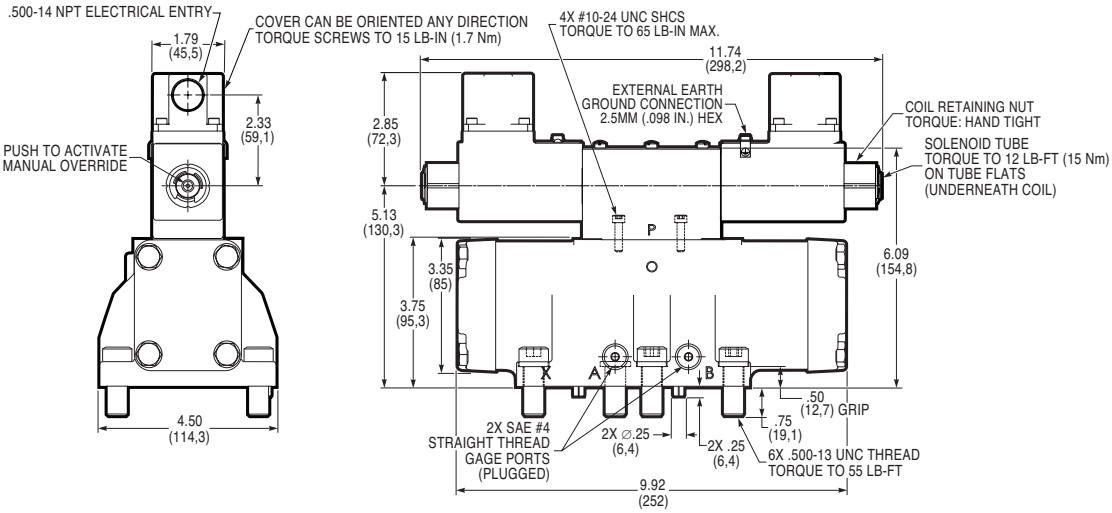
Location	Governing Standard	Dust & Gas Ratings
United States	NEC 500	Class I (Division 1) Group C & D Class II (Division 1) Group E, F, & G
United States	NEC 505 & 506	Class I (Zone 1) AEx db IIC T4 Gb Class I (Zone 21) AEx tb IIIC T135 Db
Canada	CEC/CSA	Ex db IIC T4 Gb (Zone 1)
Europe	ATEX	CЄ2813 II 2GD
International (Excluding Above)	IECEx	Ex db IIC T4 Gb Ex tb IIIC T135 Db

Installation Instructions:

1. *Temperature of the fluid flowing through the valve and the solenoid must not exceed ambient temperaturespecified on the nameplate (-65°F to 140°F (-54°C to 60°C)).*
2. *Fasteners securing the terminal box cover shall be M4X0.7-6G X 15mm per ISO-4762 and torqued to 15 LB-IN. Material: A2 - 70 or A4 - 70 of ISO-3506-1*
3. *Solenoid shall be mounted to a valve body/manifold/frame as heat sink ≥ 225 cm² surface area and mass of 1.7 kg of steel.*
4. *Note coil is polarity insensitive.*
5. *Solenoid tube to be torqued to 12 LB-FT min.*



6600 Series, Single "EP" Solenoid Models



6600 Series, Double "EP" Solenoid Models

6800 SERIES HYDRAULIC PILOTED MODELS

Pilot Pressure:

Minimum, 65 psi (5 bar).

Maximum, 5000 psi (345 bar).

Required Volume (to shift spool full stroke): 1.352 in^3 (22,2 cm^3).

Weight (Mass):

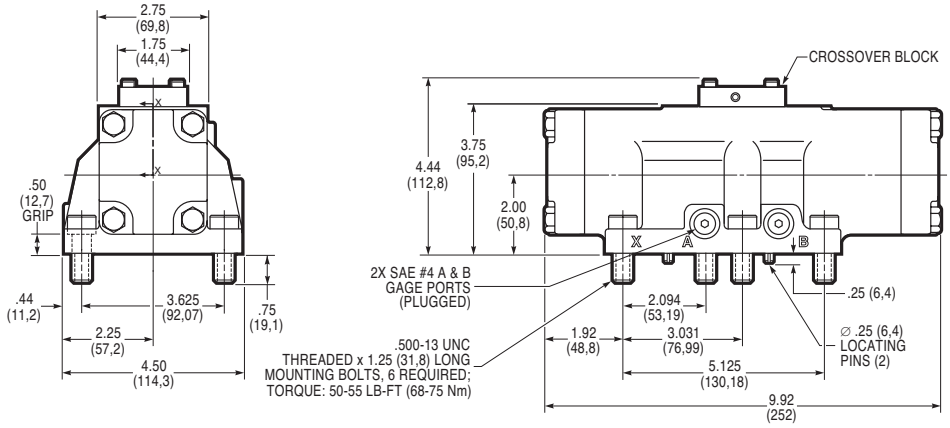
25.7 lb (11,7 kg).

Crossover Block

As shown, these models use a cross-over block to direct pilot pressure from auxiliary ports "X" and "Y".

X" and "Y" Port Function

Model	Port "X"	Port "Y"
681*	Actuator A	External Drain
682*	External Drain	Actuator B
685*	Actuator A	Actuator B



6800 Series, Direct Hydraulic Piloted Models

6900 SERIES AIR PILOTED MODELS

Air Pilot Pressure:

Minimum, 40 psi (3 bar).

Maximum, 200 psi (14 bar).

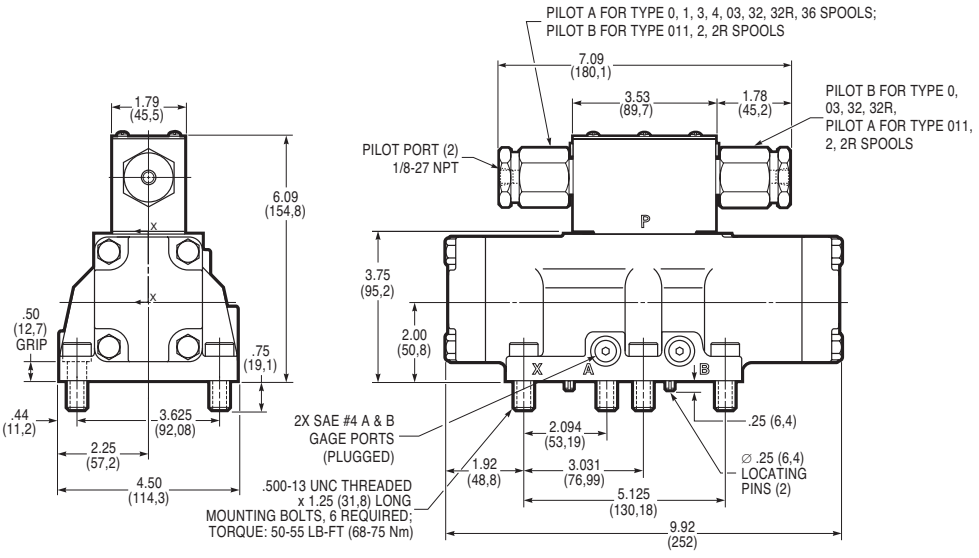
Required Volume (to shift spool full stroke): 0.220 in^3 (3,61 cm^3).

Weight (Mass):

Single Actuator, 28.7 lb (13 kg).

Double Actuator, 29 lb (13,1 kg).

Overall length of single actuator configuration (not shown) is 9.92 inches (252 mm), the same as a double actuator model (determined by the length of the main valve).



6900 Series, Air Piloted Models

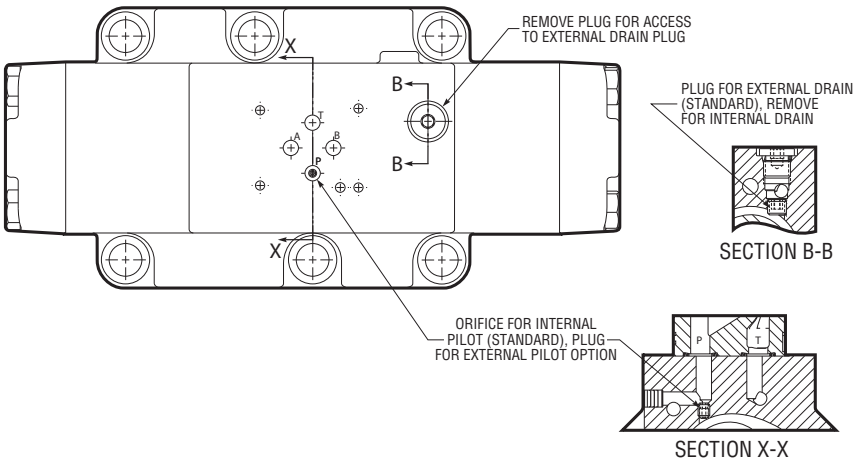
OPTIONS

Pilot and Drain Options

This drawing shows the location of the orifice for the standard internal pilot configuration, and the plug for standard external drain on solenoid and air piloted models.

For conversion to external pilot (XP), replace orifice with solid setscrew, 10-24 UNC x 0.25 inch (6.4) long, (Dynex part 1059.027).

For conversion to Internal Drain (ID), remove plug (as shown in Section B-B illustration).



Pilot and Drain Conversion Solenoid and Air Piloted Models

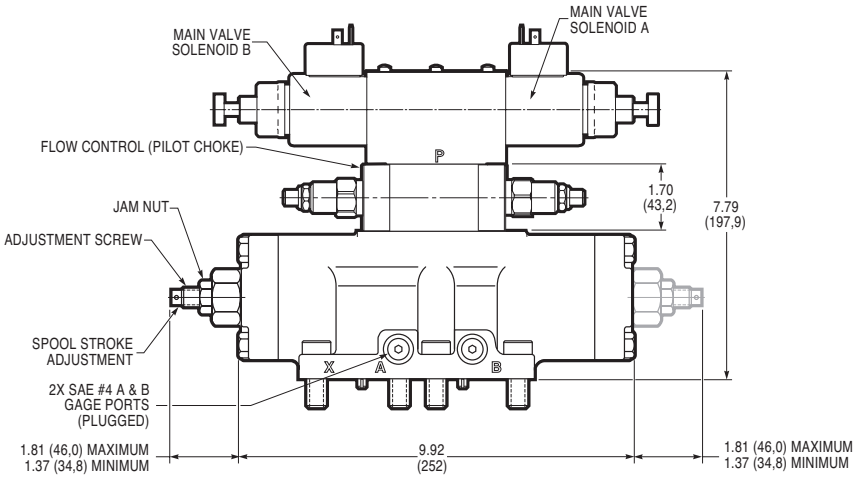
Spool Stroke Adjustment (SSA OPTION)

The main stage spool travel can be limited by using a stroke adjustment. These are available on one or both ends. When the stroke is limited, maximum flow through the valve is reduced (assuming same inlet pressure). To adjust, loosen the jam nut and turn adjusting screw. Once adjustment is achieved, re-tighten jam nut.

The drawing shows an end cover with "1SSA" option on the standard port "A" end of valve. The "2SSA" configuration, with adjustments on both ends, is shown printed in gray.

For single adjustment on port "B" end, contact the Dynex Sales department.

1SSA option adds 0.4 lb (0,18).
2SSA option adds 0.8 lb (0,36).



Optional Spool Stroke Adjustment and Flow Control

Flow Control (Pilot Choke) (CH OPTION)

A pilot choke increases the amount of time it takes to shift the main valve from one position to another.

It is designed to allow free flow to one end of the main stage spool but restricts flow out of the opposite end.

The rate of spool travel in either direction can be slowed by loosening a locknut and turning an adjusting screw clockwise. To increase the rate of spool travel, turn the adjusting screws counterclockwise.

When a pilot choke is used, pilot pressure should be taken from a constant pressure source.

The pilot choke is mounted between the pilot valve and the main valve.

CH option adds 3.1 lb (1.4 kg).

Maximum Pressure:

3000 psi (210 bar).
Consult Dynex Sales department for pressures above 3000 psi (210 bar).

TYPICAL MODEL CODE

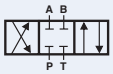
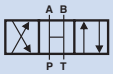
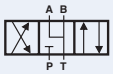
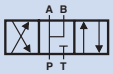
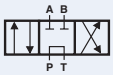
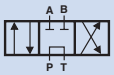
6 1 1 5 – D08–115DA – R – 1SSA – E – 3 0

Valve Type	
6	Subplate Mounted Directional Control

Actuators	
1	Lever Operated
6	Solenoid Operated
8	Hydraulic Piloted
9	Air Piloted

Internal Operators	
1	Two Position: Spring Offset (P→B), Actuated Position (P→A)
2	Two Position: Spring Offset (P→A), Actuated Position (P→B)
3	Two Position: Actuated Position, Detented Three Position: Detented (Lever Operated only)
4	Two Position: Spring Centered, Actuated Position①
5	Three Position: Spring Centered, Actuated Position①

① *For most spools, normal flow is actuated position P→A. For Spool Types 56 or 58, normal flow is actuated position P→B.*

Spool Types	
5	
6	
8	
9	
56①	
58②	

① *Closed Crossover.*
② *Open Crossover.*

Valve Size	
D08	NFPA D08 (NG25, ISO 4401-08) Mounting Pattern

Design Number

Modification Number

Seals	
No Code	Fluorocarbon (Viton® or Fluorel ®)
E	EPR (Ethylene-Propylene Rubber)

General Options	
1SSA	Spool Stroke Adjustment on port "A" end of valve
2SSA	Spool Stroke Adjustment on both ends of valve
CH	Flow Control (Pilot Choke) – 3000 psi (210 bar) maximum pressure①②
ID	Internal Drain①
XP	External Pilot①

① *Not available with Hydraulic Piloted models.*
② *Consult Dynex Sales for pressures over 3000 psi (210 bar).*

Reverse Assembly Option	
R	Used with Internal Operator Code 4 only.

Electrical Options			
*AC Solenoids Deutsch Connector:*①		*DC Solenoids Deutsch Connector:*①	
115DA	115V/60Hz, 110V/50Hz	**12DD**	12VDC
230DA	230V/60Hz, 220/50Hz	**24DD**	24VDC
24DA	24V/60Hz, 24V/50Hz		
*AC Solenoids DIN Connector:*②		*DC Solenoids DIN Connector:*②	
115HA	115V/60Hz, 110V/50Hz	**12HD**	12VDC
230HA	230V/60Hz, 220/50Hz	**24HD**	24VDC
*AC Explosion Proof:*③		*DC Explosion Proof:*③	
115EP	115V/60Hz	**24EP**	24VDC

① *Fits Deutsch DT04-2P Connector.*
② *Fits EN 175301-803 (DIN 43650 Form A) Connector.*
③ *Junction box with 1/2" NPT entry for cable glands.*



USA Headquarters

770 Capitol Drive
Pewaukee, WI 53072
Tel: +1 (262) 691-0300
Fax: +1 (262) 691-0312
sales@dynexhydraulics.com



Power Units & Systems

54 Nickerson Road
Ashland, MA 01721
Tel: +1 (508) 881-5110
ashland@dynexhydraulics.com



European Sales

Unit C5 Steel Close, Little End Road,
Eaton Socon, St Neots,
Cambs. PE19 8TT United Kingdom
Tel: +44 (0) 1480 213980
Fax: +44 (0) 01480 405662
sales@dynexhydraulics.co.uk



Middle East Sales

JAFZA 1, Tower A, 11th Floor
Jebel Ali Freezone
Dubai, UAE
Tel: +971 547422353
UAEsales@dynexhydraulics.com

Specifications shown were in effect when published. Since errors or omissions are possible, contact your Dynex Sales representative or the Dynex Sales department for the most current specifications before ordering. Dynex reserves the right to discontinue products or change designs at any time without incurring any obligation.

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