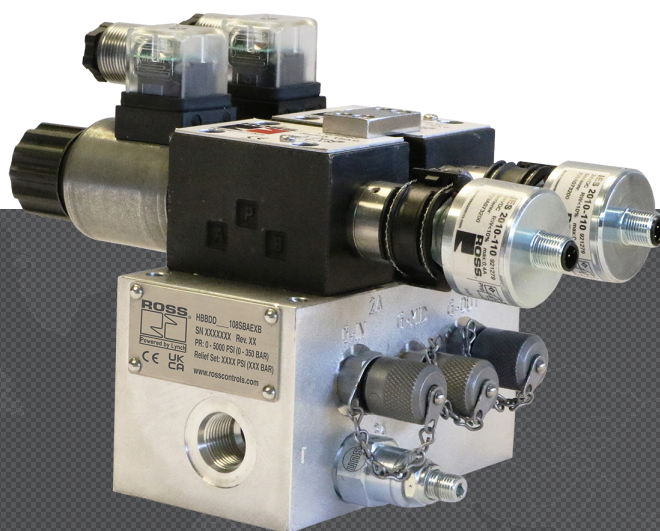




HYDRAULIC BLOCK & BLEED VALVE SYSTEMS

HBB SERIES

PRODUCT CATALOG



HBB Series Hydraulic Block & Bleed Redundant Valve Systems for External Monitoring

Block & Bleed Safety Function

Blocks hydraulic supply pressure and bleeds downstream pressure back to tank.

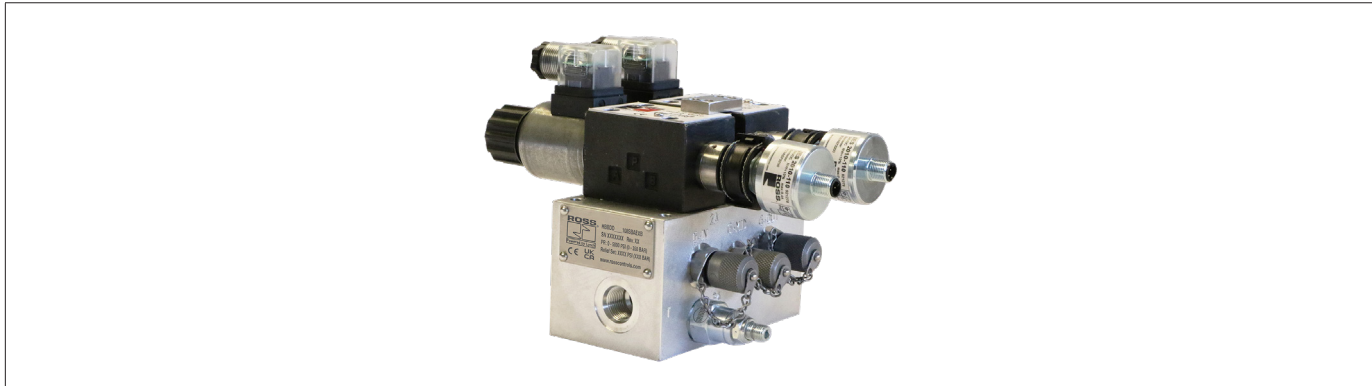


Illustration example.

The HBB Series valves are redundant 3/2 valve systems designed to meet the needs and requirements of safe hydraulic block and bleed applications. These valve systems are equipped with inductive position switches for external monitoring by an electrical safety control system.

NOTE: Block and Bleed functions are intended to permit flow when switched on and to block supply and to bleed off downstream hydraulic energy when switched off or in a faulted state. It is important to note that the ability to bleed may be affected by other components downstream of the HBB valve. PO checks, counterbalance, and closed-center valves are designed to block flow under certain conditions. Depending on the application, these devices may be detrimental or they may be beneficial to complete the needed safety function. Careful consideration of the required safety function and how to achieve that goal is absolutely necessary.

NOTE: HBB valves are intended to be used only for tasks that are routine, repetitive, and integral to production. Maintenance tasks require following full lock-out/tag-out procedures to relieve hazardous energy and prevent unexpected startup.

VALVE SYSTEM FEATURES

External Monitoring	Each main valve in the HBB Series system is equipped with an inductive position switch. Monitoring of these switches is to be done by an electrical safety control system.
Spool Type Design	Redundant spool type valve system
Relief Valve	Tamper-evident relief valve available on inlet
Tamper Resistant	Special tool required for disassembly
Mounting	Inline with SAE threaded ports on D03 & D05 sizes. Flange ports on D07 size (flanges sold separately).
Flexible Piping	Redundant Inlets, Outlets, and Tank ports provide piping options to help fit the application. (Plugs for unused ports included.)

These valves are not designed for controlling clutch/brake mechanisms on mechanical power presses.

PRODUCT CREDENTIALS

Performance Level Per ISO 13849-1:2015 Cat. 4 PL e	Safety Integrity Level Per IEC 2061:2001 SIL 3 Functional Safety	DGUV DGUV Test HSM 220187 Sicherheit geprüft tested safety	Declaration of Conformity CE
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Specifications

STANDARD SPECIFICATIONS					
GENERAL	Function		Block & Bleed		
	Construction Design		Redundant valve system, Spool		
	Actuation	Electrical	Solenoid- 2 per system		
			One solenoid per valve element Both to be operated synchronously		
			Size D03, D05	Direct solenoid operated, spring return	
			Size D07	Solenoid pilot operated, spring return	
	Mounting	Type	In-line with SAE threaded ports on D03 & D05 sizes. Flange ports on D07 (flanges sold separately).		
		Flexible Piping	Redundant Inlets, Outlets, and Tank ports provide piping options to help fit the application. (Plugs for unused ports included.)		
		Orientation	Any, preferably horizontal		
	Connection (hydraulic)		Size D03, D05	SAE	
Size D07			Code 62 Flange (P1 & P2), Code 61 Flange (T), SAE (X, Y, MP1, M-M, MP2)		
Monitoring		Dynamic, cyclical, external with customer supplied equipment. Monitoring should check state of both valve position switches with any and all changes in state of valve control signals. See Integration Guide.			
Minimum Operation Frequency		Once per month, to ensure proper function			
OPERATING CONDITIONS	Temperature	Ambient	-22° to 158°F (-30° to 70°C)		
		Media	-4° to 176°F (-20° to 80°C)		
	Flow Media	Hydraulic Fluids	Mineral Oil HLP, HL-DIN 51524		
			Vegetable Oil HETG - VDMA 24568		
	Max Fluid Contamination Level		ISO 4406 class 20/18/15 NAS 1638 class 9		
	Flow	Size D03		10 gpm	
		Size D05		20 gpm	
		Size D07		50 gpm	
	Operating Pressure	Size D03, D05		5000 psi (350 bar) maximum	
		Size D07		116 psi to 5000 psi (8 bar to 350 bar)	
ELECTRICAL DATA	Solenoids		Current Flow	Operating Voltage	Power Consumption (each solenoid)
			DC	24 volts	30 watts
			Rated for continuous duty		
			Design according to VDE 0580		
	Enclosure Rating		DIN EN 60529 IP 65		
	Electrical Connection		DIN EN 175301-803 Form A		
	Power Consumption (each solenoid)	Size D03, D07		30 watts	
		Size D05		36 watts	
	Inductive Position Switch (2 per system)		PNP (M12, 4-pin, A-coded, male); works with both 4-pin & 5-pin female cord sets		
	Maximum Current (each switch)		400mA maximum		
CONSTRUCTION MATERIAL	Valve Body		Cast Steel		
	Manifold		Ductile Iron		
	Spool		Steel		
	Seals		Buna-N		

IMPORTANT NOTE: Please read carefully and thoroughly all of the CAUTIONS, WARNINGS on the inside back cover.

Ordering Information

MODEL NUMBER CONFIGURATOR

Pressure Relief Valve Settings (psi)**		
Maximum System Operating Pressure	Relief Valve Factory Preset	
1000	1100	11
1500	1700	17
2000	2200	22
2500	2800	28
3000	3300	33
3500	3900	39
4000	4400	44
4500	5000	50
5000	5500	55
No Pressure Relief Valve		XX

For system parameters outside of this range, please contact ROSS.

Series: HBB

Valve Type: Double

Material Type: Ductile Iron

Revision Level: B*

Communication: None

Monitoring: External

Voltage: 24 V DC

Seal Type: Buna-N

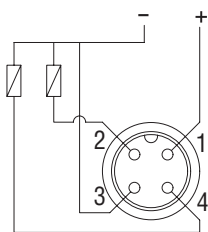
Configuration Code: 1108SBAXE

Model Number examples: HBBDD11108SBAEXB, HBBDD28212SBAEXB

Custom configurations available, consult ROSS.

Size	Weight lb (kg)
D03	22.7 (10.3)
D05	53.4 (24.2)
D07	131.9 (59.8)

Wiring Diagram – Inductive Position Switch Connector



Size D03 & D05

1 = Supply +24 volts DC
2 = Output Signal NC
3 = Ground
4 = Output Signal NO

Size D07

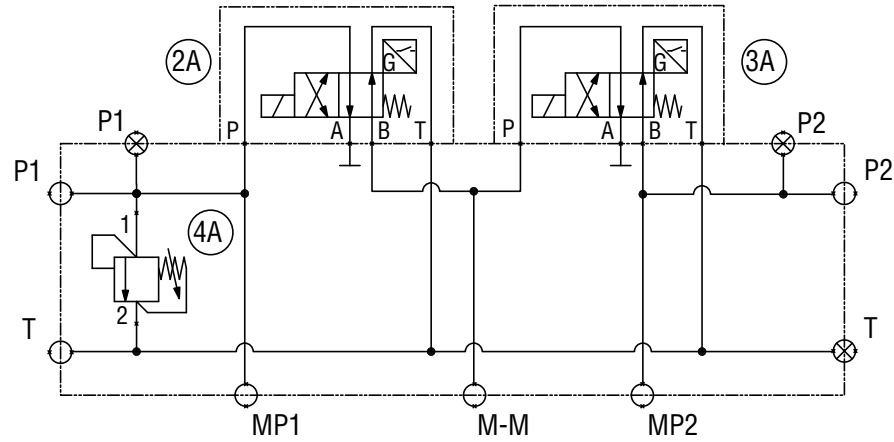
1 = Supply +24 volts DC
2 = Output Signal NO
3 = Ground
4 = Output Signal NC

NOTE: PNP (M12, 4-pin, A-coded, male); works with both 4-pin & 5-pin female cord sets.

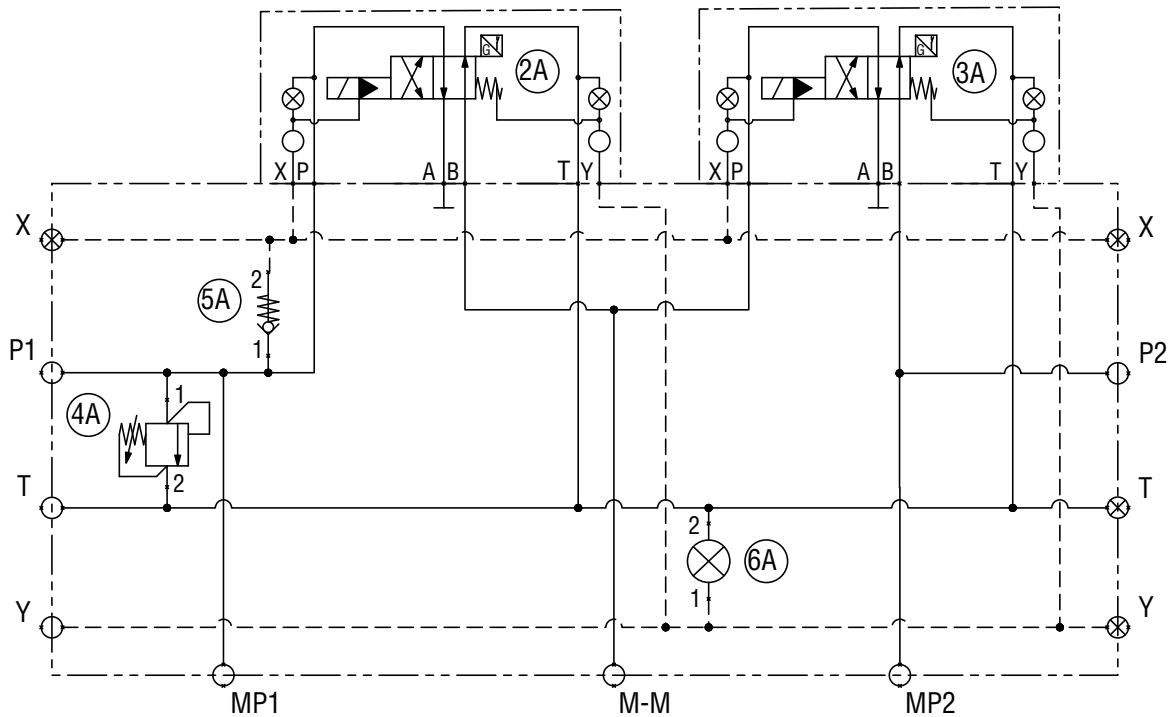
Please note that the function of the switch varies depending on valve size. As a result, in the normal valve off condition, the D03 & D05 valves utilize pin 2 of the switches as NC outputs and pin 4 as NO outputs. On the D07 size valves pin 4 is used as the NC output and pin 2 is used as the NO output. This is due to the fact that in the valve off condition on the size D07, the switches are in the actuated condition when the valve is off.

Valve System Schematics

Size D03, D05 Direct Solenoid Operated with Pressure Relief Valve



Size D07 Solenoid Pilot Operated with Pressure Relief Valve



An Integration Guide for HBB Series valve systems is available from ROSS to provide information such as operation, monitoring, and integration into users control circuits.

Technical Data

DIMENSIONS

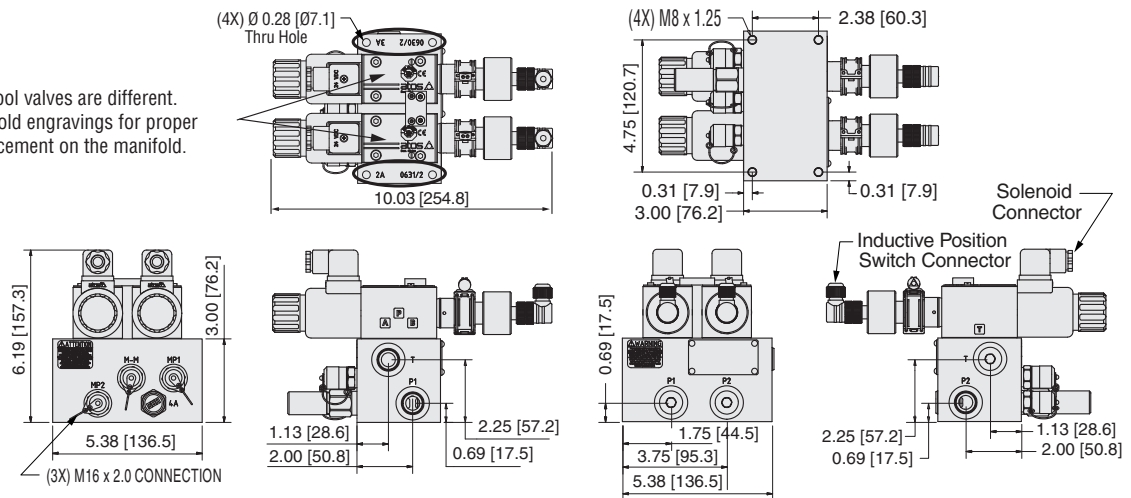
Inches (mm)

Size D03

Ports List	
ID	Name
P1	SAE # 8
P2	SAE # 8
T	SAE # 8
MP1	SAE # 6
M-M	SAE # 6
MP2	SAE # 6
MP2	SAE # 6

Note:

The 2A and 3A spool valves are different. Refer to the manifold engravings for proper valve type and placement on the manifold.



Downloadable CAD models available.

DIMENSIONS

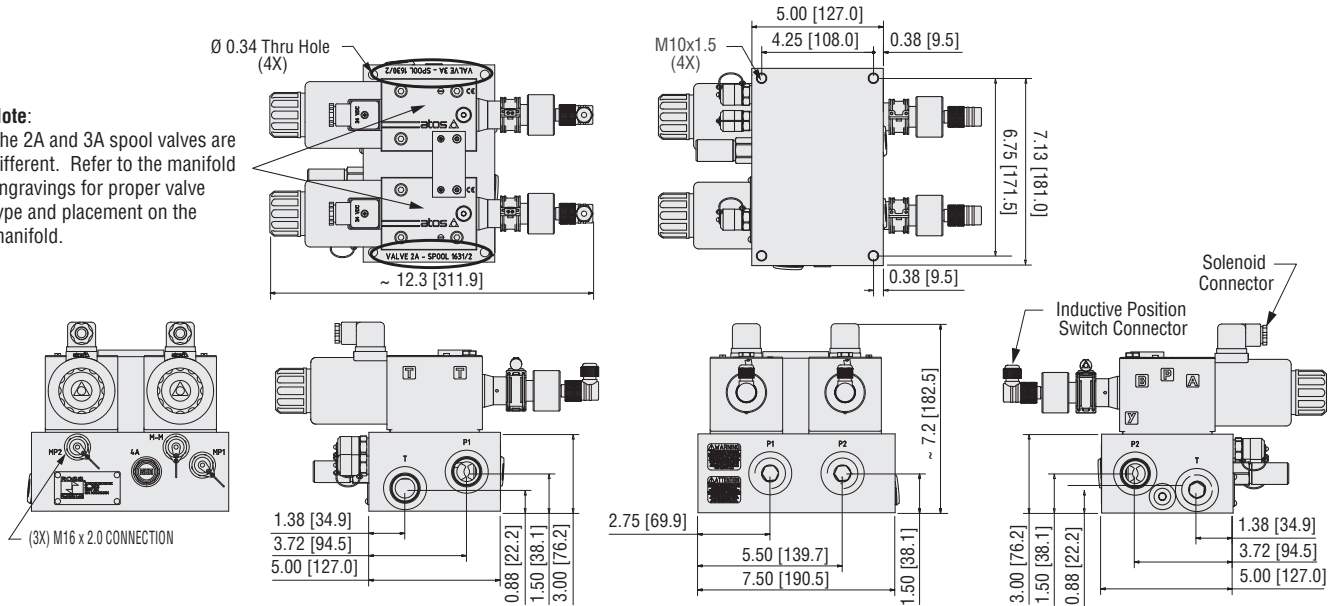
Inches (mm)

Size D05

Ports List	
ID	Name
P1	SAE # 12
P2	SAE # 12
T	SAE # 12
MP1	SAE # 6
M-M	SAE # 6
MP2	SAE # 6
MP2	SAE # 6

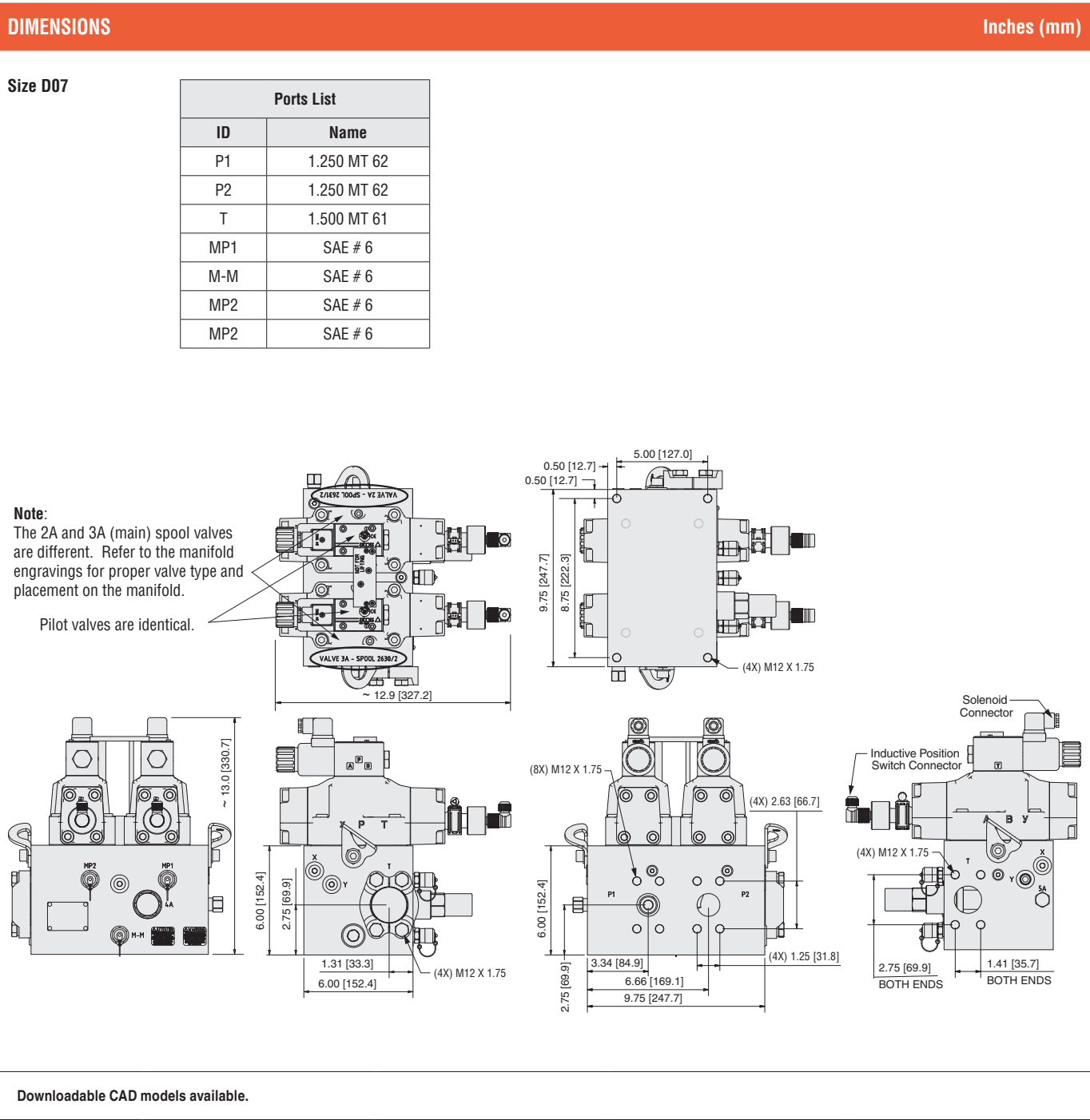
Note:

The 2A and 3A spool valves are different. Refer to the manifold engravings for proper valve type and placement on the manifold.



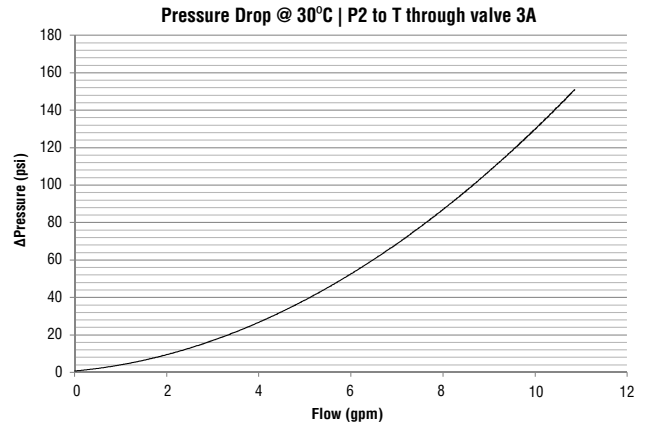
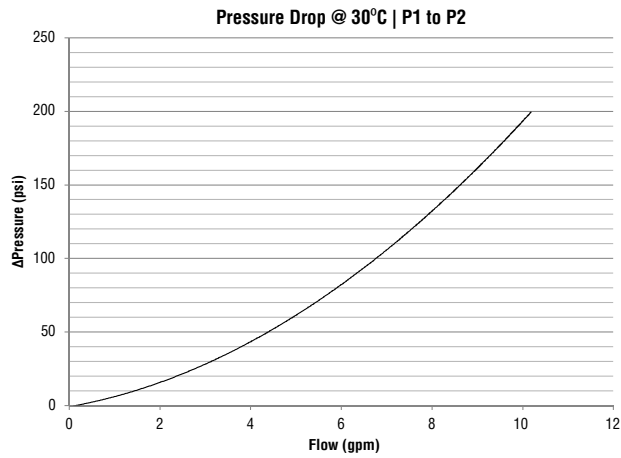
Downloadable CAD models available.

Technical Data

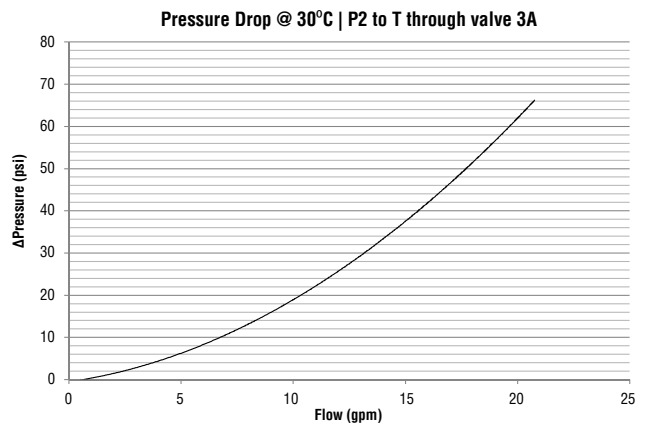
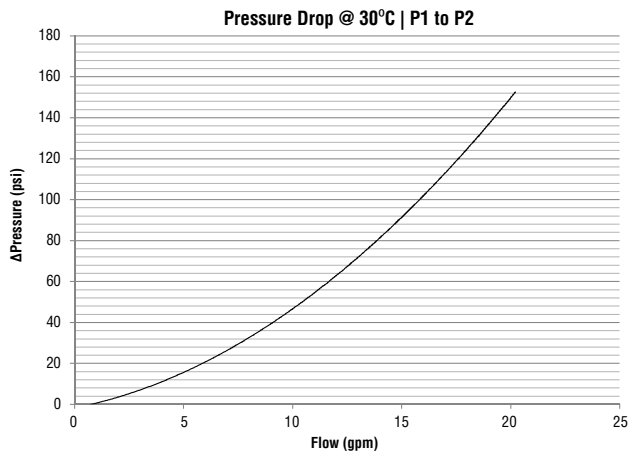


PRESSURE DROP CURVES

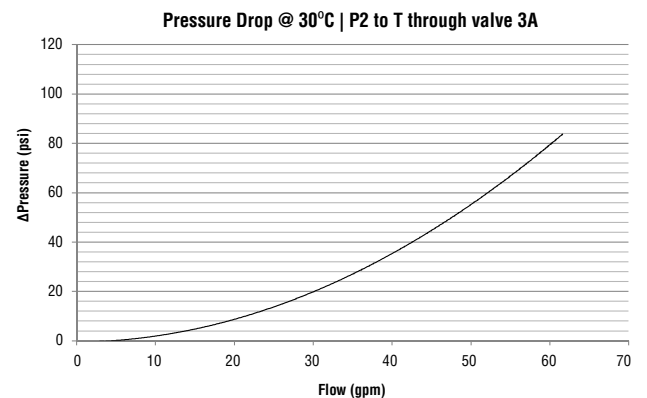
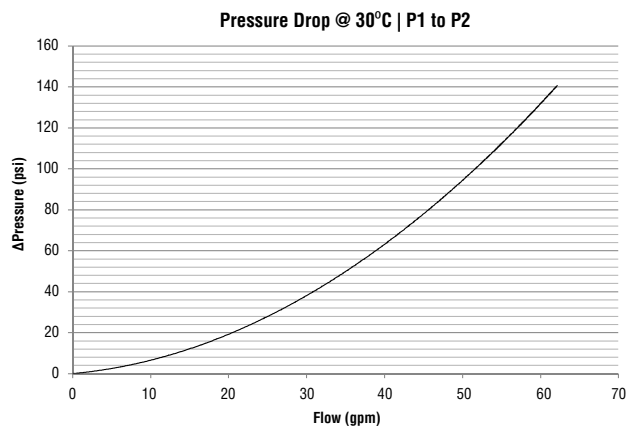
Size D03



Size D05



Size D07



Accessories

PREWIRED ELECTRICAL CONNECTORS



Illustration example.

Prewired Connector Kits	Cable						Kit Number
	End 1	End 2	Length meters (feet)	Connection	Quantity Included	Cord Diameter mm	Without Light
	Connector	Cord /Connector					
	DIN EN 175301-803 Form A	Flying leads	5 (16.4)	Solenoid	2	6	2243H77
			10 (32.8)	Solenoid	2	6	2244H77
	M12 5-pin, Female	Flying leads	5 (16.4)	Sensor	2	6	2644B77
			10 (32.8)	Sensor	2	6	2370B77
		M12 5-pin, Male	5 (16.4)	Sensor	2	6	2645B77
10 (32.8)			Sensor	2	6	2371B77	

Prewired Connectors	Cable						Model Number	
	End 1	End 2	Connection	Quantity Included	Length meters (feet)	Cord Diameter mm	Without Light	Lighted Connector
	Connector	Cord						24 V DC
	DIN EN 175301-803 Form A	Flying leads	Solenoid	1	2 (6.5)	6	721K77	720K77-W
						10	371K77	383K77-W

ELECTRICAL CONNECTORS

with Cable Grip, without Light	with Cable Grip, with Light	1/2" NPT Conduit

Illustration examples.

Connectors	Connector					Model Number	
	Type	Connection	Fitting Connection	Quantity Included	Cord Diameter mm	Without Light	Lighted Connector
	DIN EN 175301-803 Form A	Solenoid	Cable grip	1	8 to 10		936K87-W
			1/2" NPT conduit	1	–	723K77	724K77-W

CAUTIONS: Do not use electrical connectors with surge suppressors, as this may increase valve response time when de-actuating the solenoids.

*Lights in connectors with a translucent housing can be used as indicator lights to show when solenoids are energized.

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CAUTIONS, WARNINGS

Additional technical documentation, cautions and warnings information is available.

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