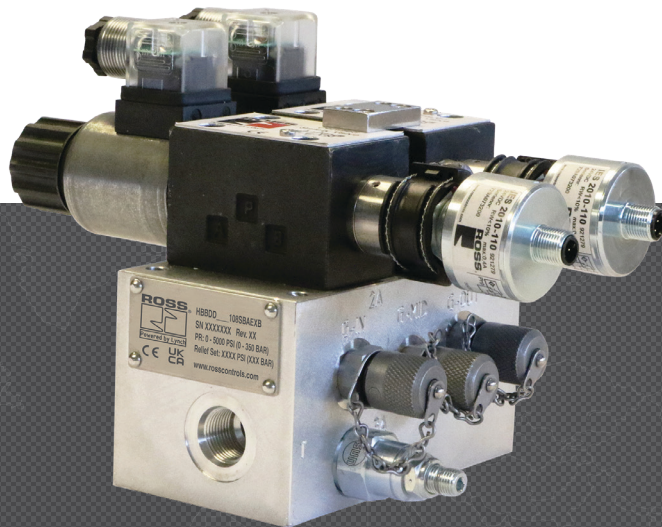




HYDRAULIC BLOCK & BLEED VALVE SYSTEMS HBB SERIES

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.

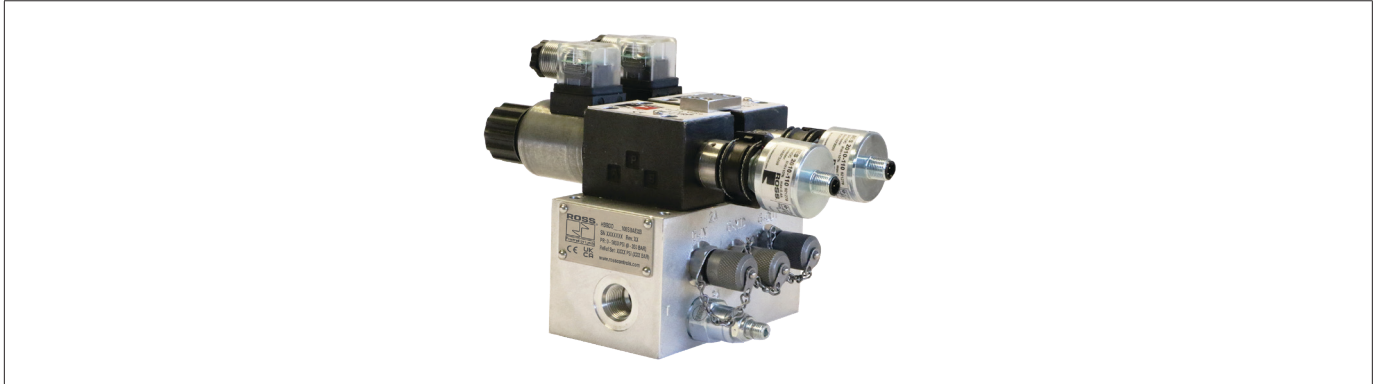


Illustration example.

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.

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

PRODUCT CREDENTIALS

Safety Category	DGUV (German Social Accident Insurance)	Declaration of Conformity	
		CE 	UKCA 

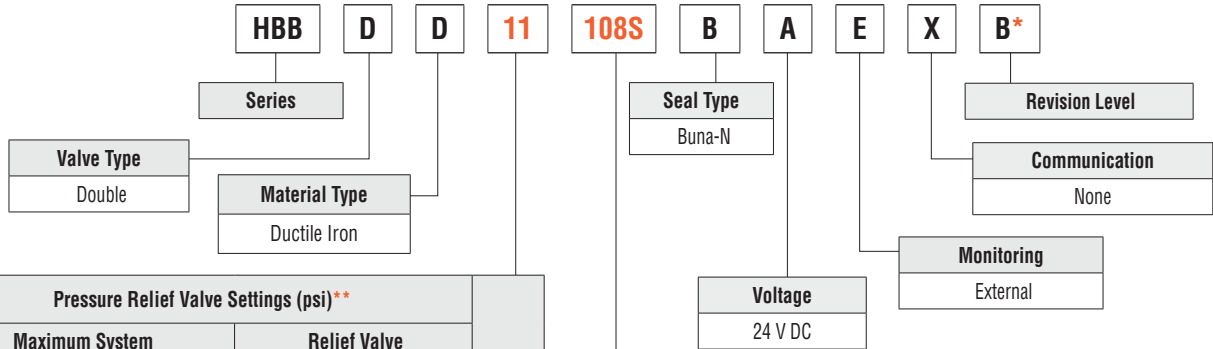
STANDARD SPECIFICATIONS

GENERAL	Function		Block & Bleed		
	Construction Design		Redundant valve system, Spool		
	Actuation (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		
		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	Operating Voltage		Power Consumption (each solenoid)	
		24 volts DC		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.

Size	Flow Rate	Port Size	Port Thread/Type	
D03	0 to 10 gpm	SAE-8	SAE	108S
D05	0 to 20 gpm	SAE-12	SAE	212S
D07	0 to 50 gpm	1¼	Code 62 Flange (P1 & P2) Code 61 Flange (T)	372F

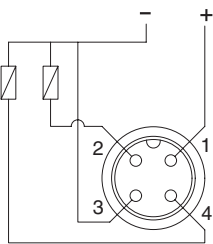
*Subject to change.

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

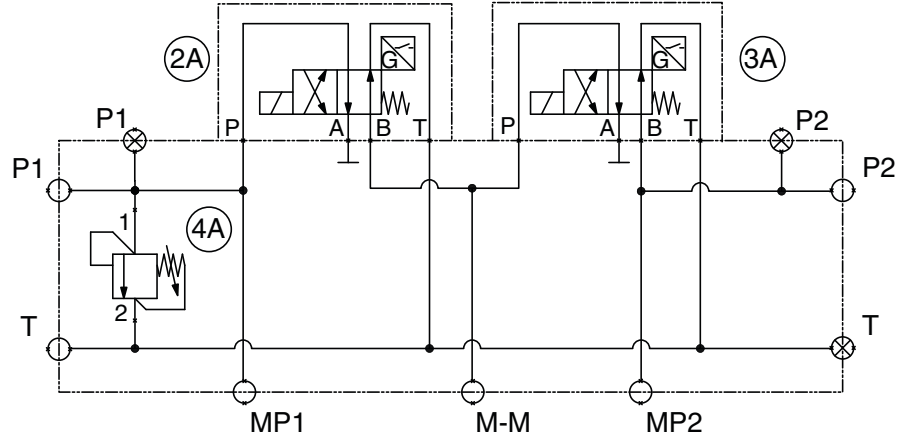
NOTE: PNP (M12, 4-pin, A-coded, male); works with both 4-pin & 5-pin female cord sets.

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.

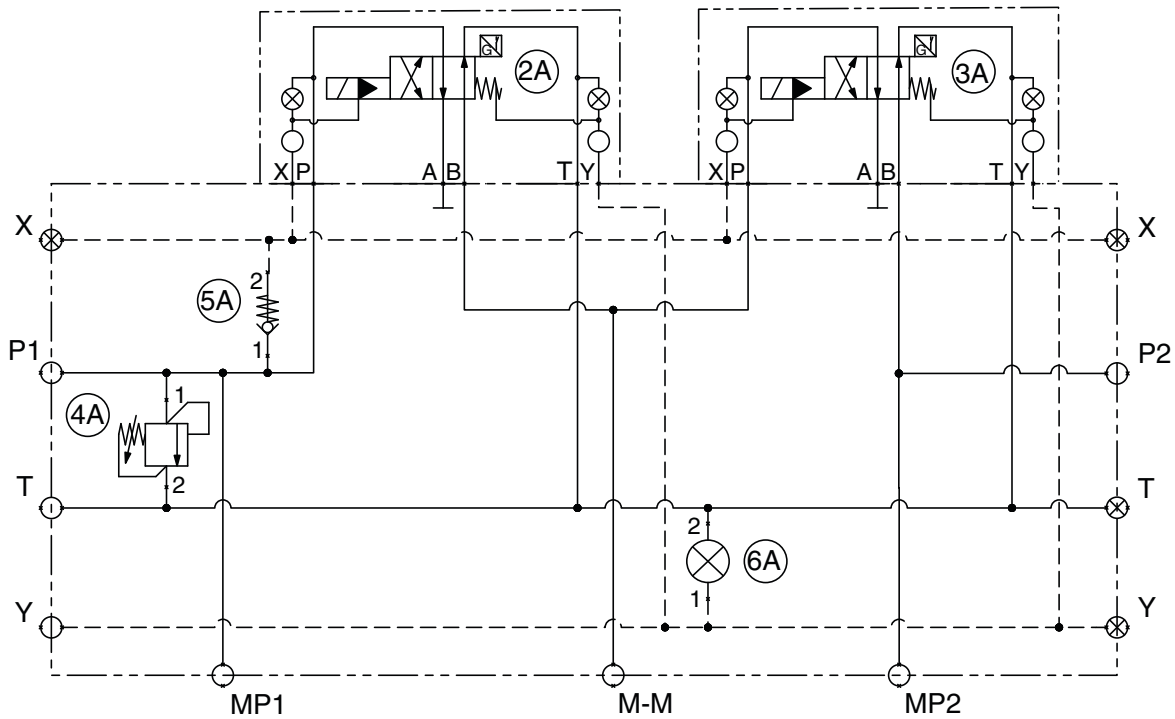
An Integration Guide for HBB Series valve systems is available from ROSS to provide information such as operation, monitoring, and integration into users control circuits. Please visit www.rosscontrols.com.

Valve System Schematics

Size D03, D05
Direct Solenoid Operated with Pressure Relief Valve



Size D07
Solenoid Pilot Operated with Pressure Relief Valve



Technical Data

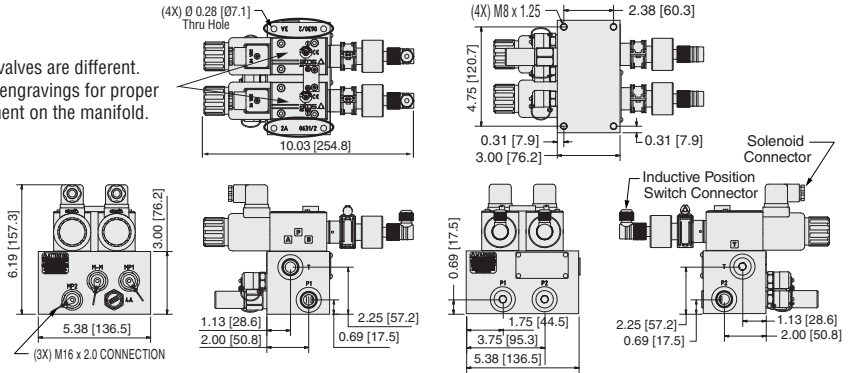
DIMENSIONS

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

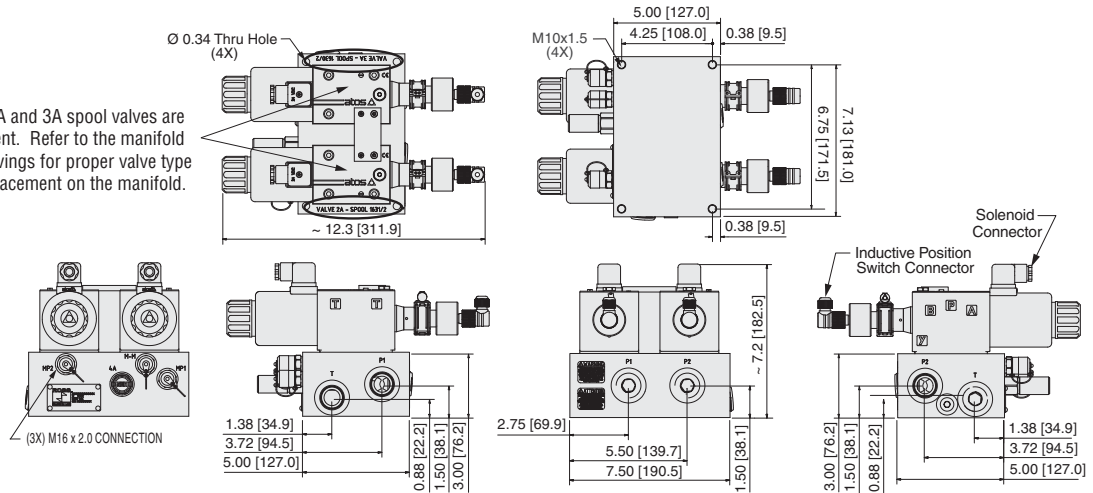
Note:
The 2A and 3A spool valves are different.
Refer to the manifold engravings for proper valve type and placement on the manifold.



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

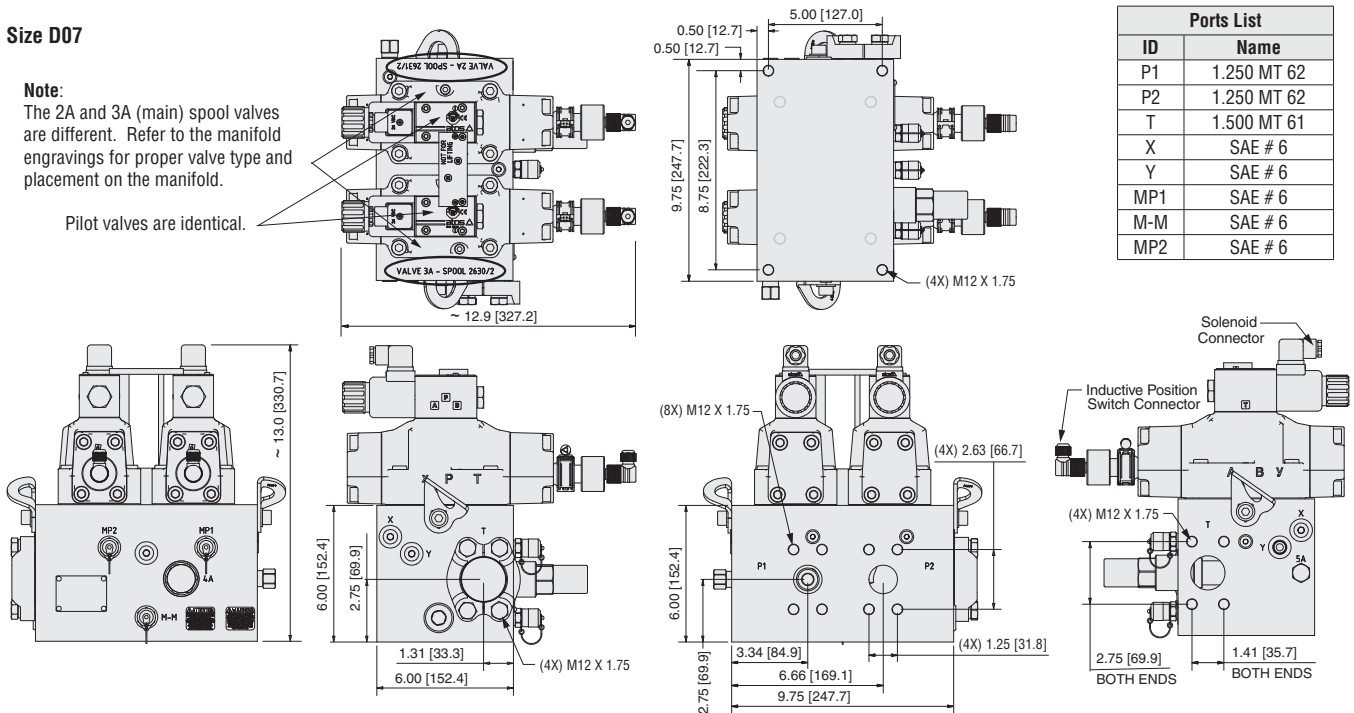
Note:
The 2A and 3A spool valves are different.
Refer to the manifold engravings for proper valve type and placement on the manifold.



Size D07

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

Pilot valves are identical.

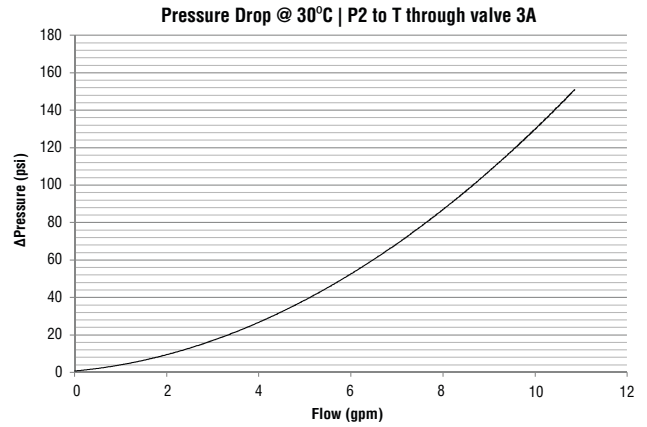
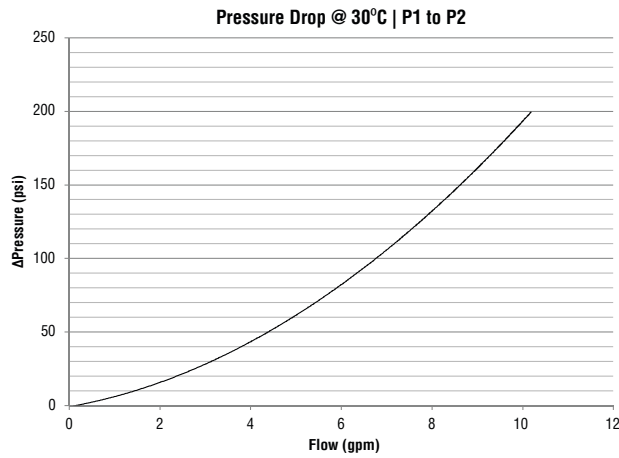


Ports List	
ID	Name
P1	1.250 MT 62
P2	1.250 MT 62
T	1.500 MT 61
X	SAE # 6
Y	SAE # 6
MP1	SAE # 6
M-M	SAE # 6
MP2	SAE # 6

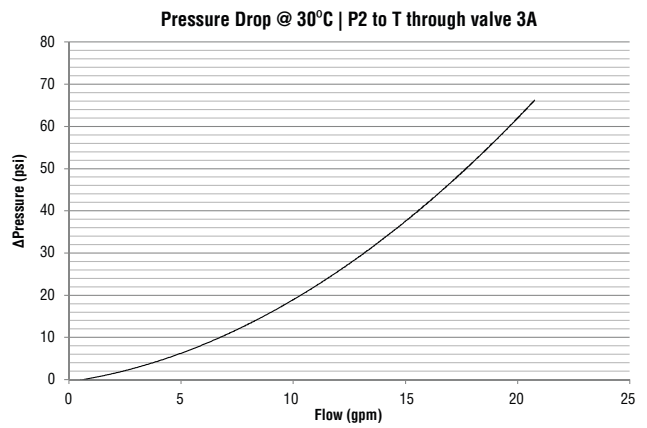
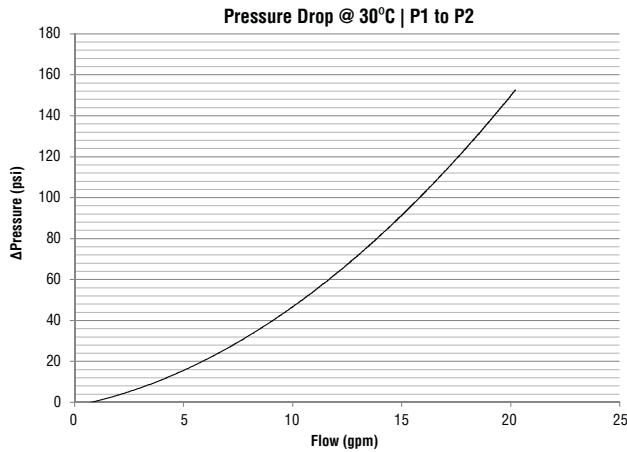
For additional information, and to assist you with piping and connectivity designs, our products are available in downloadable 2D drawings and 3D CAD models in a wide range of options including native formats. Please visit www.rosscontrols.com.

PRESSURE DROP CURVES

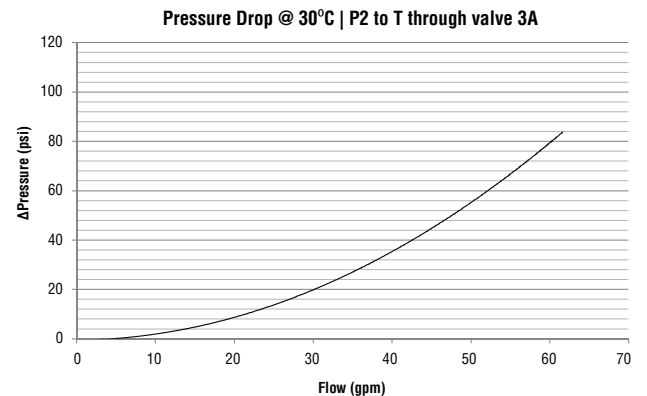
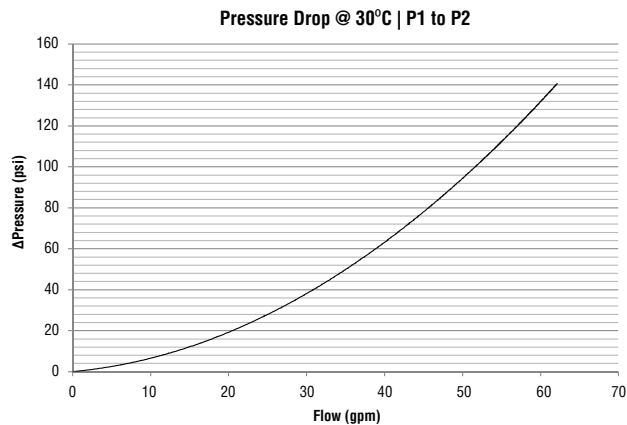
Size D03



Size D05



Size D07



Accessories

PREWIRED ELECTRICAL CONNECTORS

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	
			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

Connectors	Connector					Model Number	
	Type	Connection	Fitting Connection	Quantity Included	Cord Diameter mm	Without Light	Lighted Connector
	24 V DC						
DIN EN 175301-803 Form A	Solenoid		Cable grip	1	8 to 10	937K87	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.

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CAUTIONS, WARNINGS

Additional technical documentation, cautions and warnings information is available at www.rosscontrols.com, Support and Downloads.

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