



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

<p>Performance Level Per ISO 13849-1:2015</p> 	<p>Safety Integrity Level Per IEC 2061:2001</p> 	<p>DGUV</p> 	<p>Declaration of Conformity</p>  	
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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		
		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

HBB **D** **D** **11** **108S** **B** **A** **E** **X** **B***

Series
Valve Type
 Double
Material Type
 Ductile Iron

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.

Revision Level
Communication
 None
Monitoring
 External
Voltage
 24 V DC
Seal Type
 Buna-N

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.

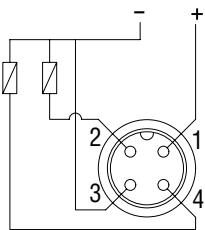
Model Number examples: HBBDD11108SBAEXB, HBBDD28212SBAEXB

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

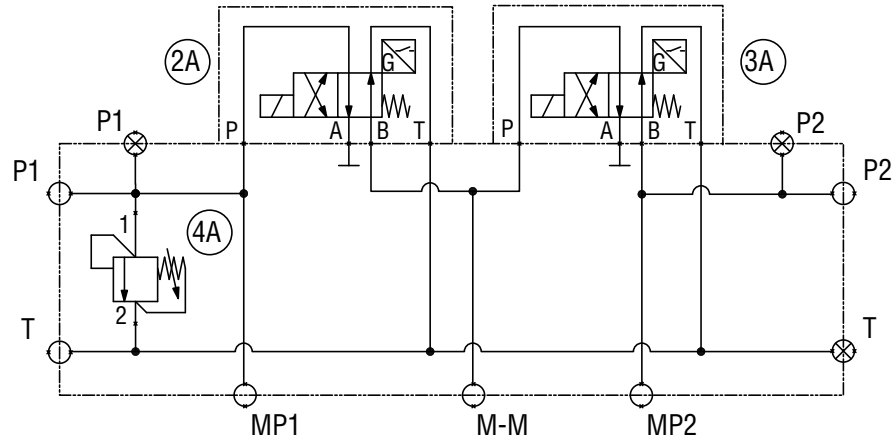
Size D07
 1 = Supply +24 volts DC
 2 = Output Signal NO
 3 = Ground
 4 = Output Signal NC

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

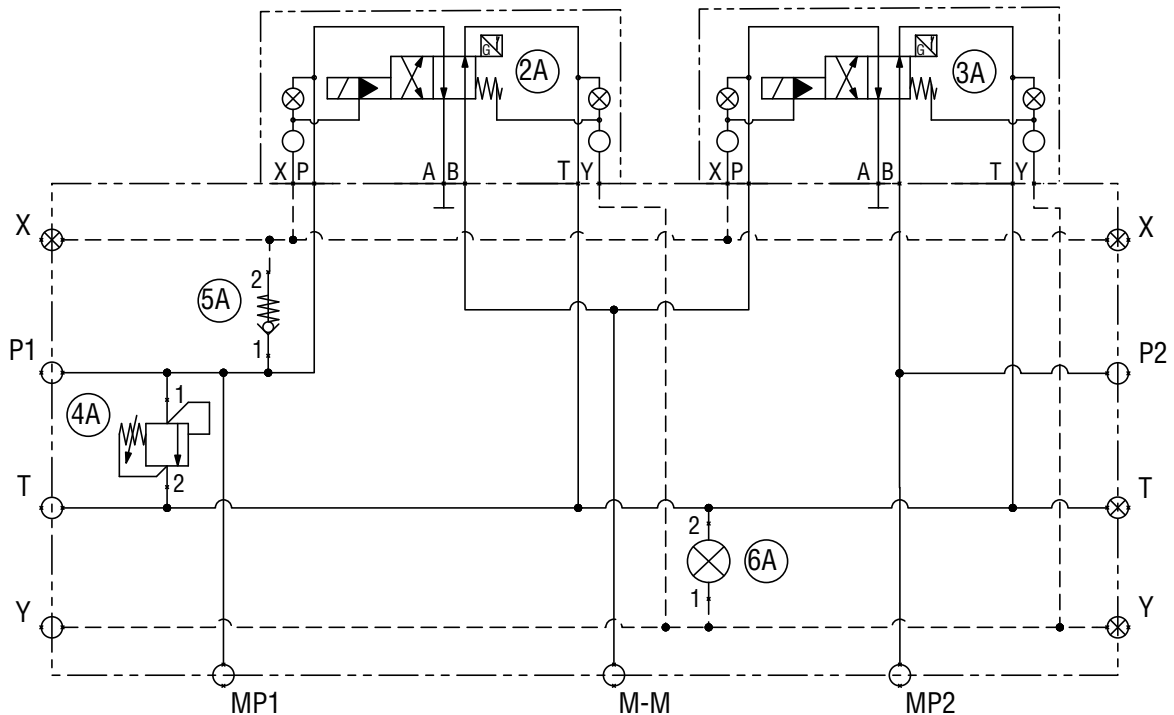
Please note that the function of the switch varies depending on valve size. As a result, in the normal valve off condition, the D03 & D05 valves utilize pin 2 of the switches as NC outputs and pin 4 as NO outputs. On the D07 size valves pin 4 is used as the NC output and pin 2 is used as the NO output.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

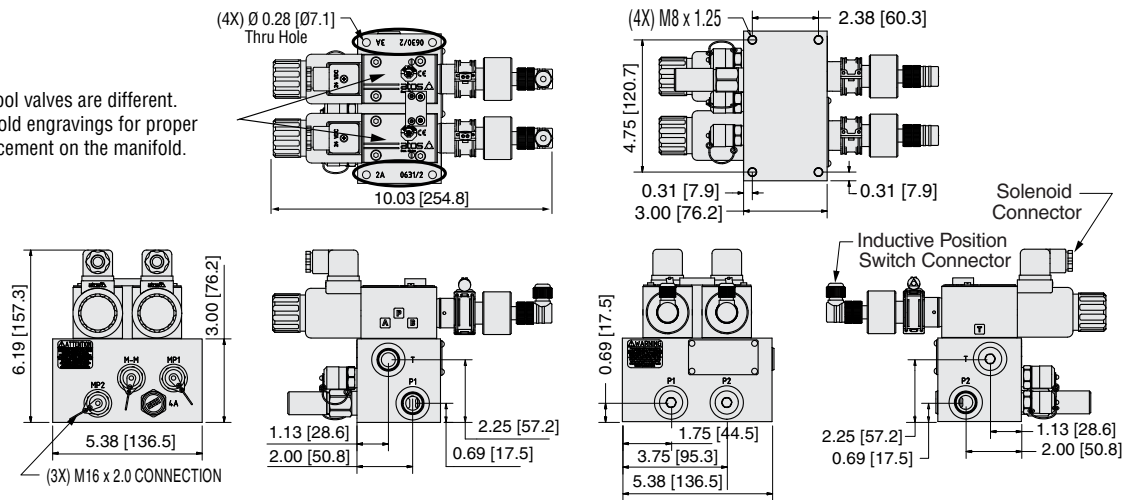
Inches (mm)

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.

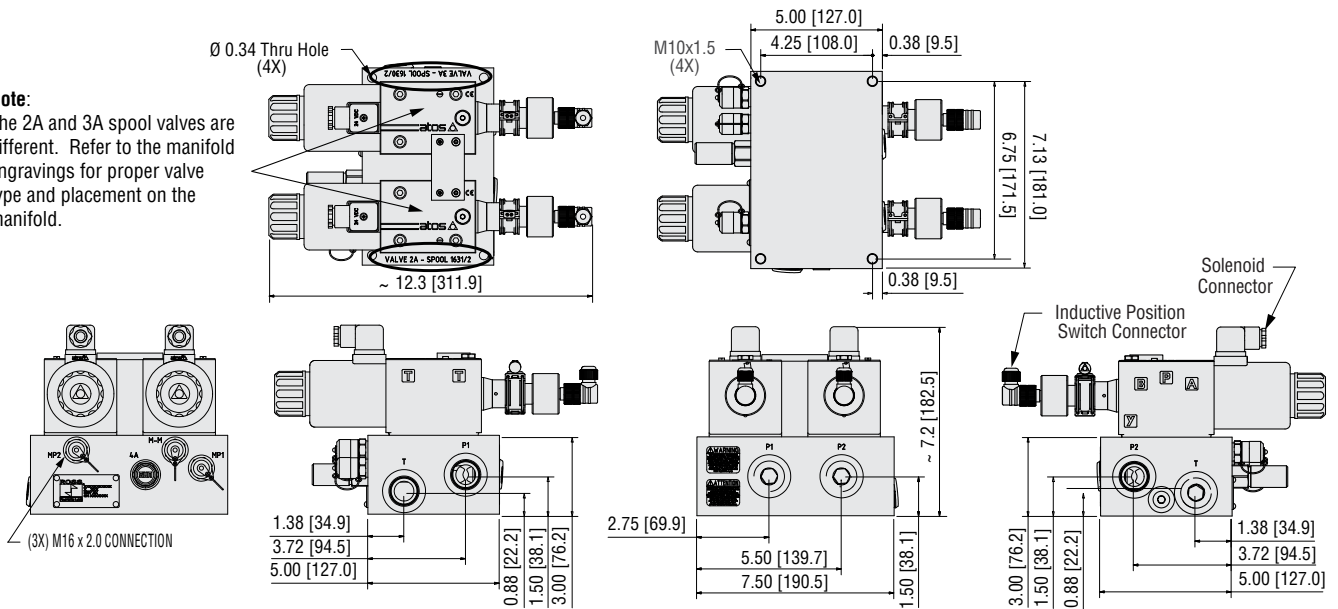
DIMENSIONS

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

DIMENSIONS

Inches (mm)

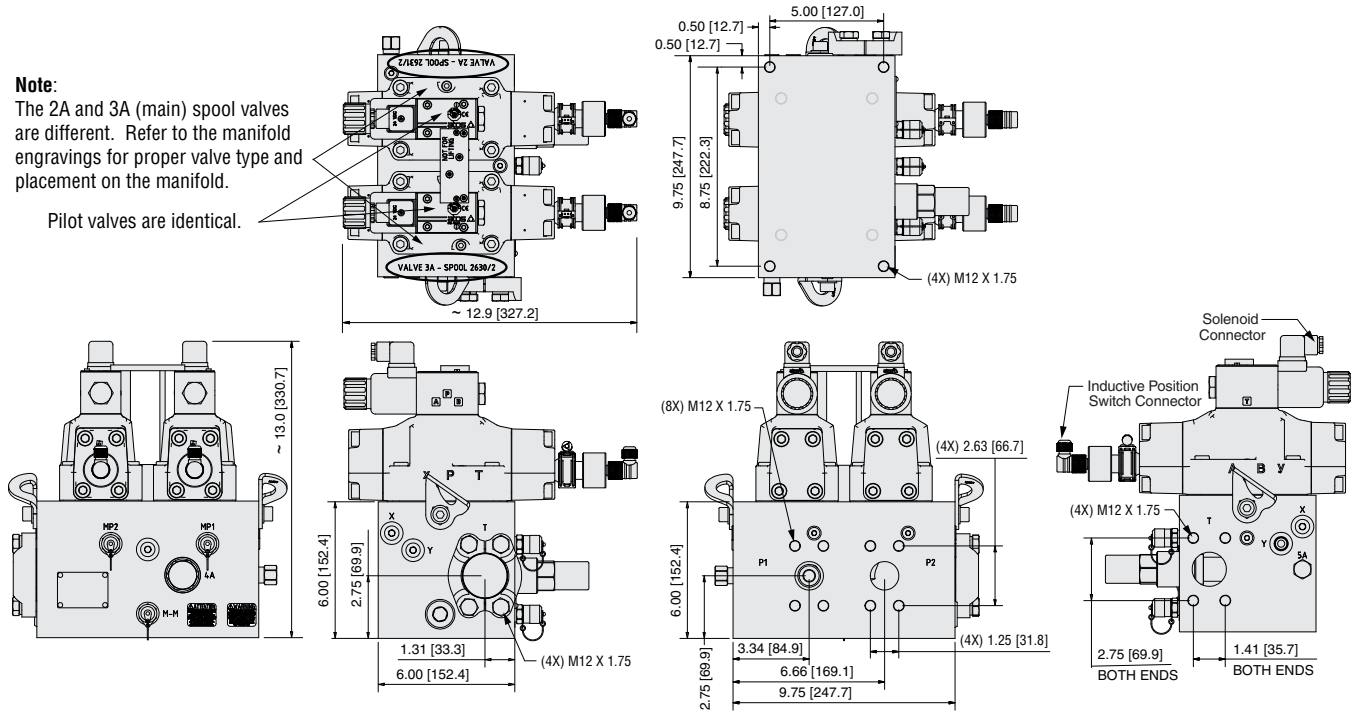
Size D07

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

Note:

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

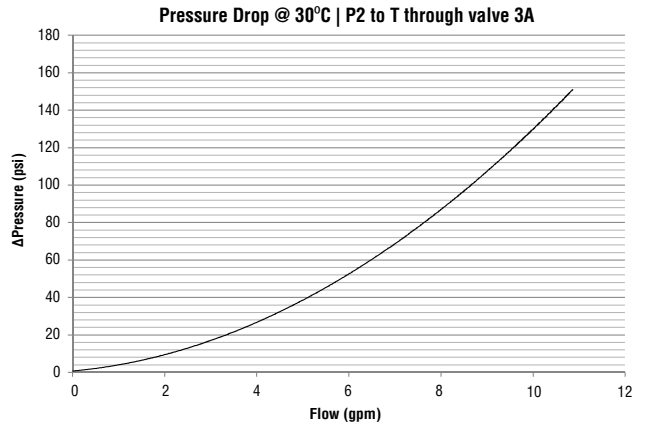
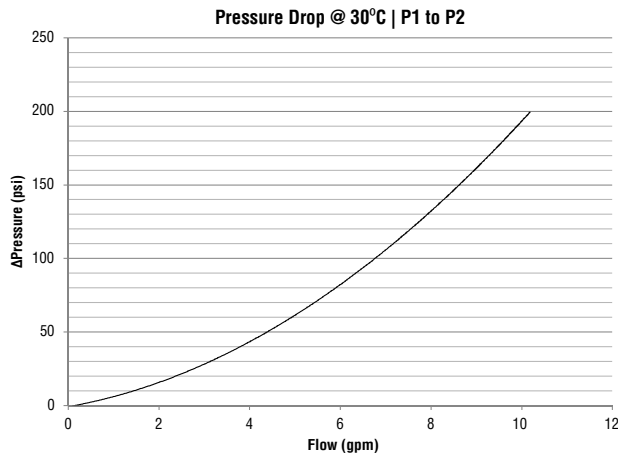
Pilot valves are identical.



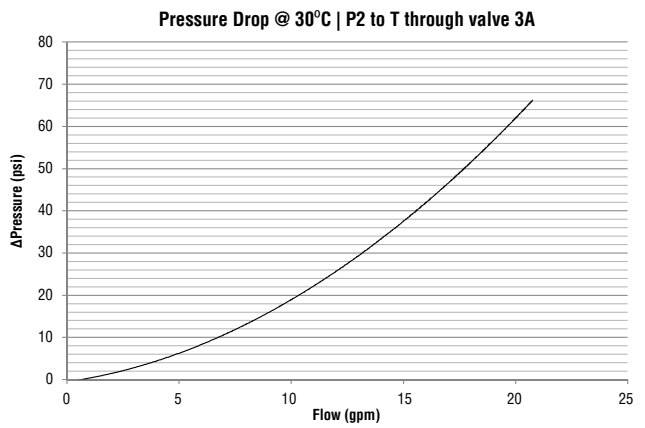
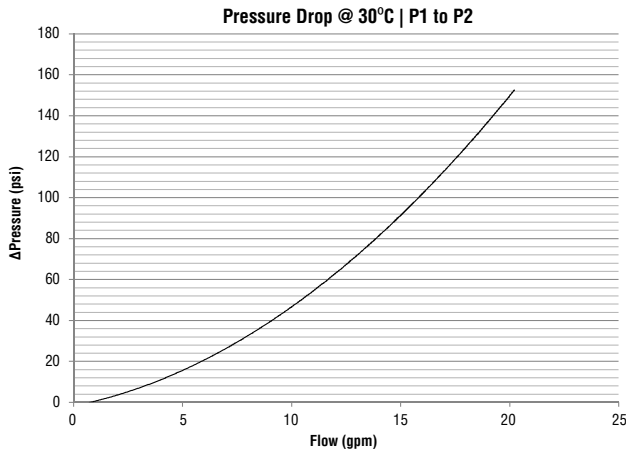
Downloadable CAD models available.

PRESSURE DROP CURVES

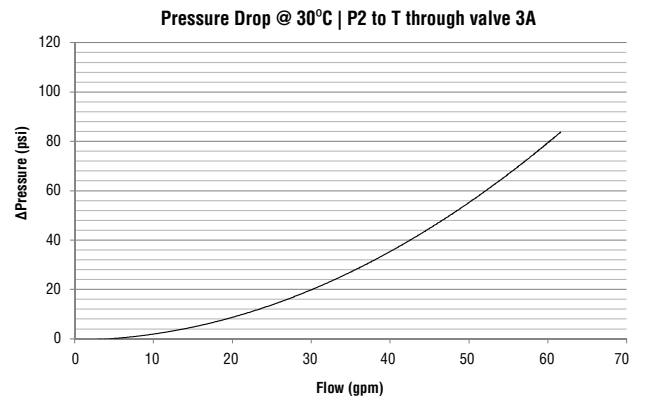
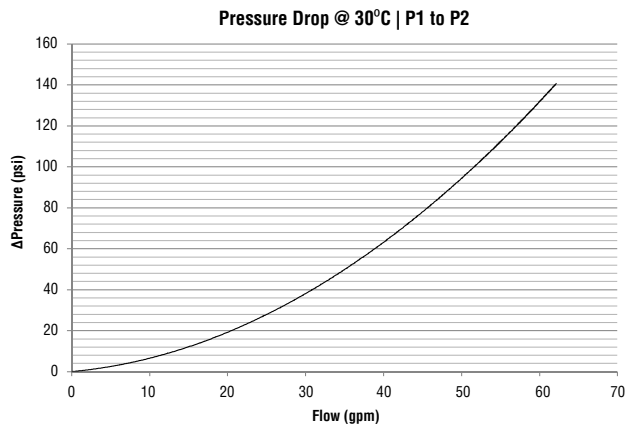
Size D03



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					Without Light
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

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.

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