



# BLOCK & BLEED HBB SERIES VALVE SYSTEMS

## PRODUCT CATALOG



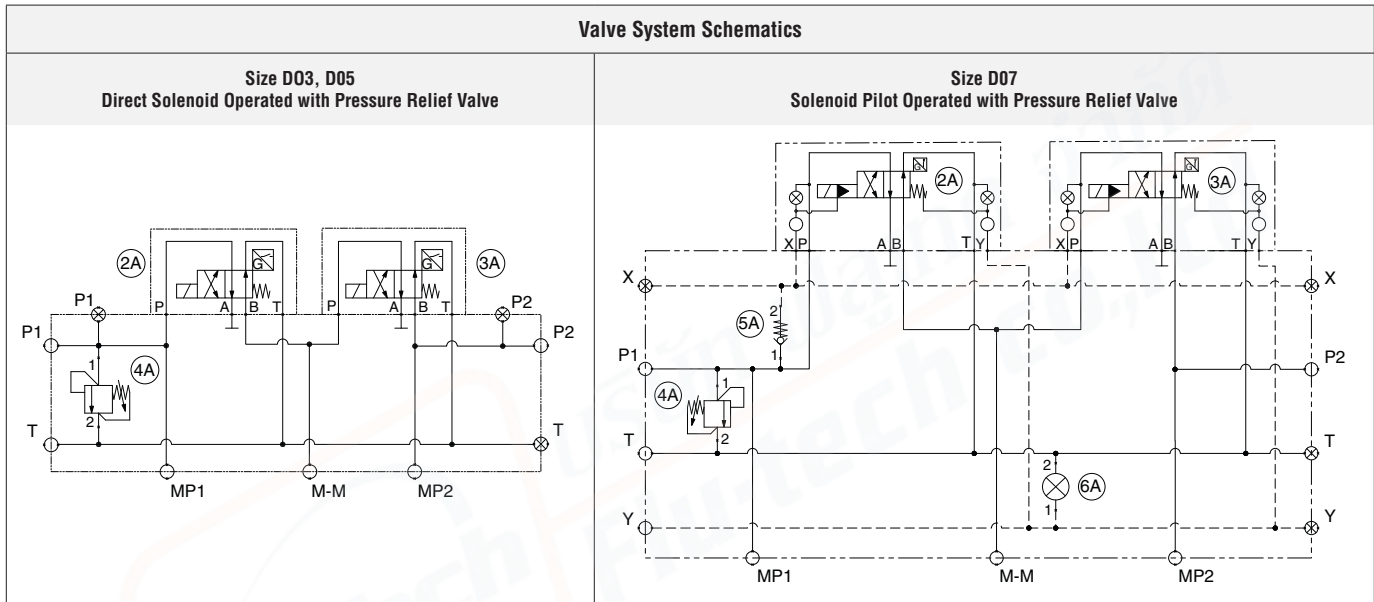
# HBB Series Hydraulic Block & Bleed Redundant Valve Systems for External Monitoring



## Block & Bleed Safety Function

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

### Valve System Schematics



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

<b>External Monitoring</b>	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.
<b>Spool Type Design</b>	Redundant spool type valve system
<b>Relief Valve</b>	Tamper-evident relief valve available on inlet
<b>Tamper Resistant</b>	Special tool required for disassembly
<b>Mounting</b>	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.*

## 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		Version as per VDE 0580; Rated for continuous duty Electrical connection according to EN 175301-803 Form A Enclosure rating according to DIN 400 50 IP 65	
	Operating Voltage		24 volts DC	
	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.

## PRODUCT CREDENTIALS

Safety Category		CE Conformity Declaration	UKCA (UK Conformity Assessed)
(3rd party certification pending)			

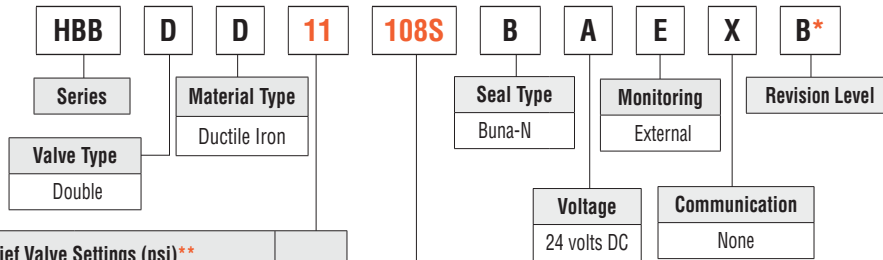


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# Ordering Information

## 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

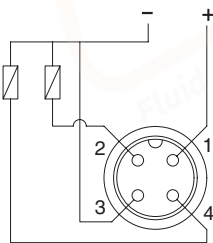
\*Subject to change.

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](http://www.rosscontrols.com).



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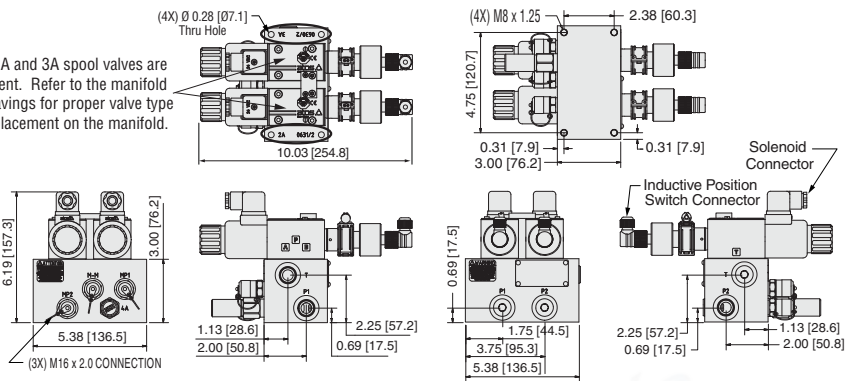
## DIMENSIONS

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

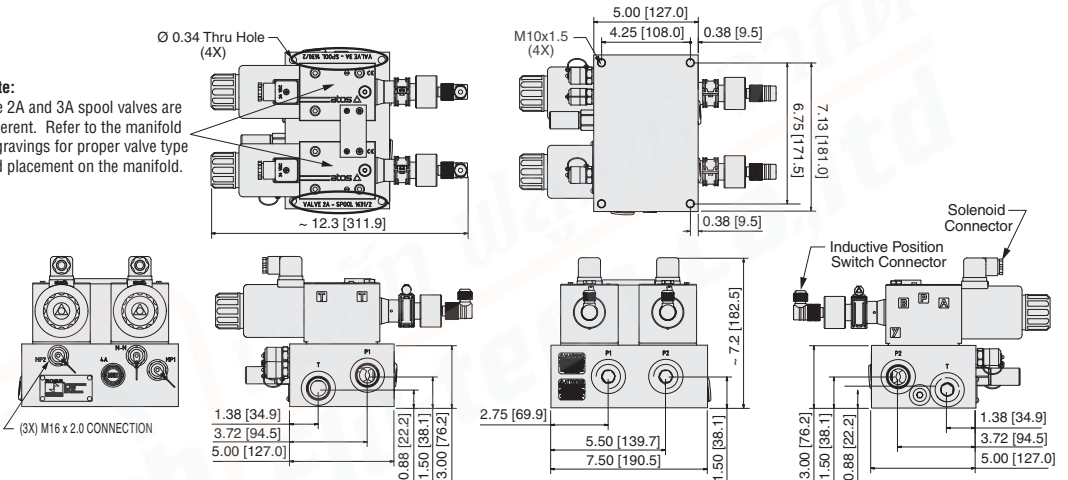
**Note:**  
The 2A and 3A spool valves are different. Refer to the manifold engravings for proper valve type and placement on the manifold.



### 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

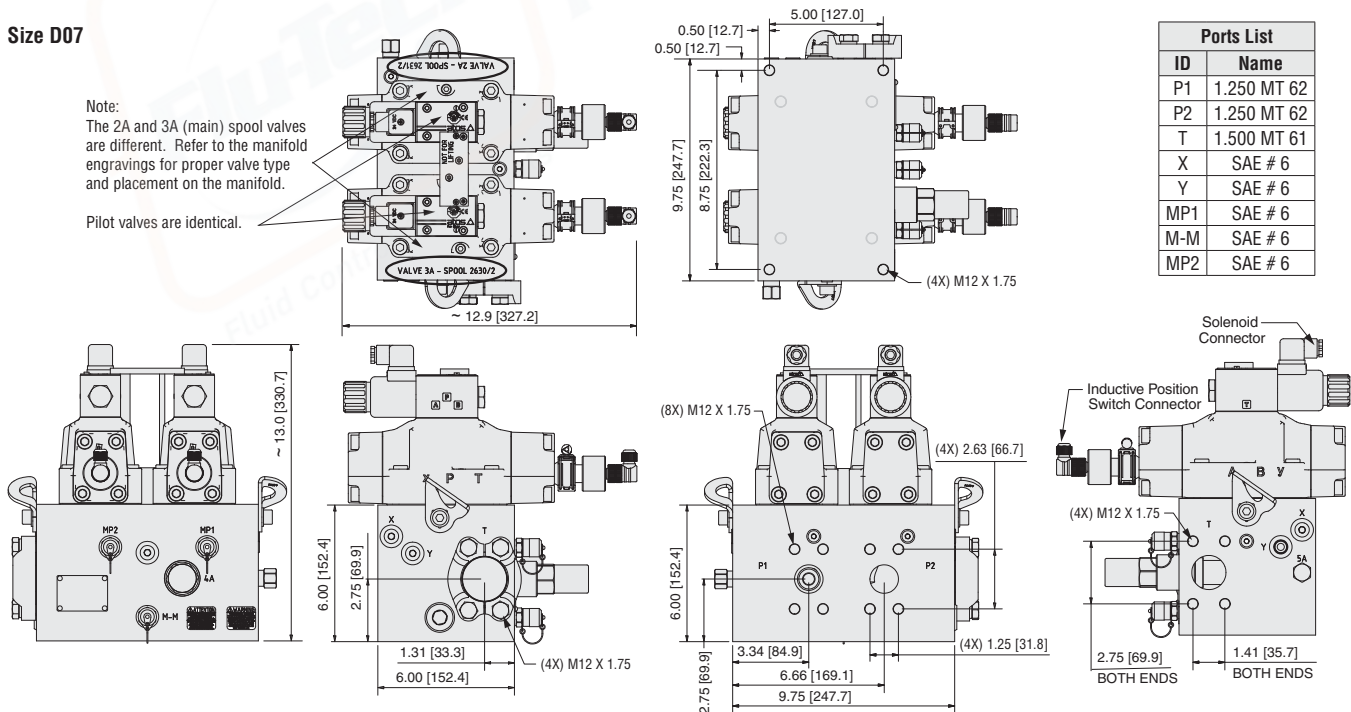
**Note:**  
The 2A and 3A spool valves are different. Refer to the manifold engravings for proper valve type and placement on the manifold.



### 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.

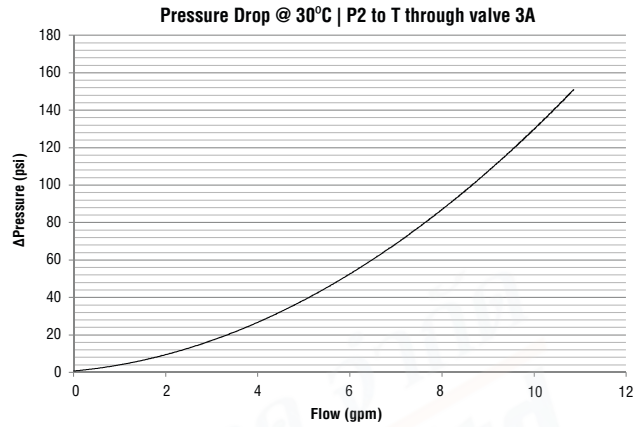
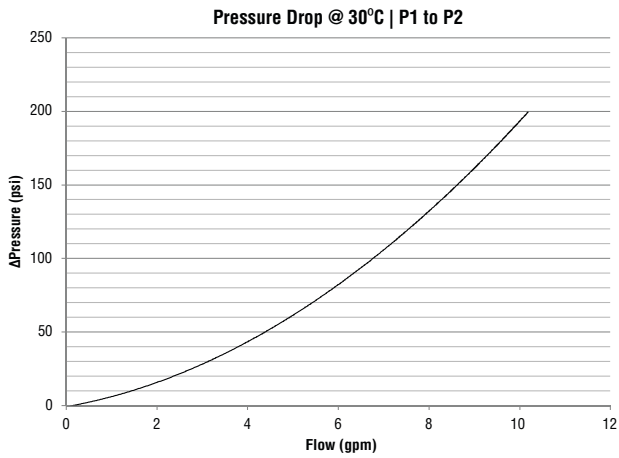


Ports List	
ID	Name
P1	1.250 MT 62
P2	1.250 MT 62
T	1.500 MT 61
X	SAE # 6
Y	SAE # 6
MP1	SAE # 6
M-M	SAE # 6
MP2	SAE # 6

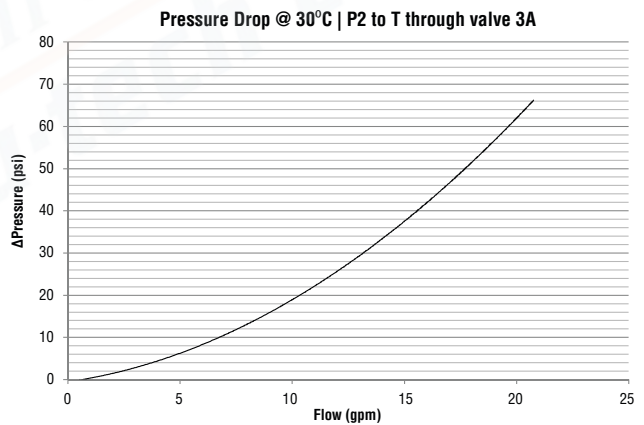
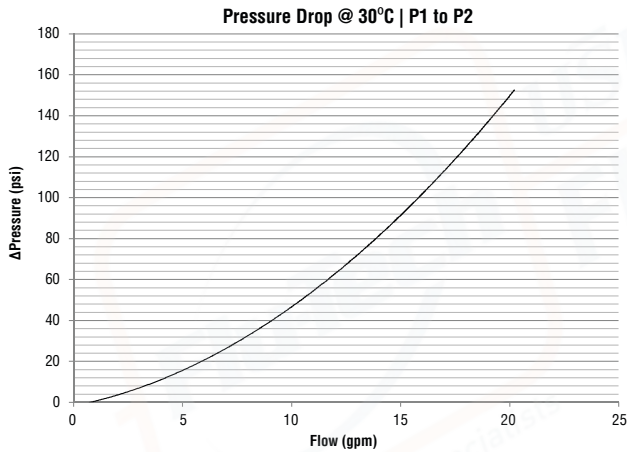
For additional information, and to assist you with piping and connectivity designs, our products are available in downloadable 2D drawings and 3D CAD models in a wide range of options including native formats. Please visit [www.rosscontrols.com](http://www.rosscontrols.com).

## PRESSURE DROP CURVES

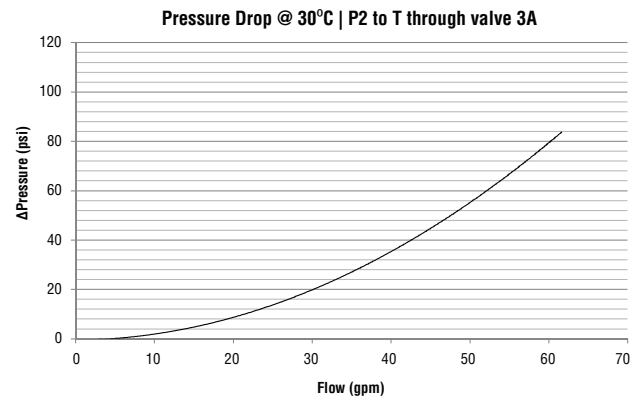
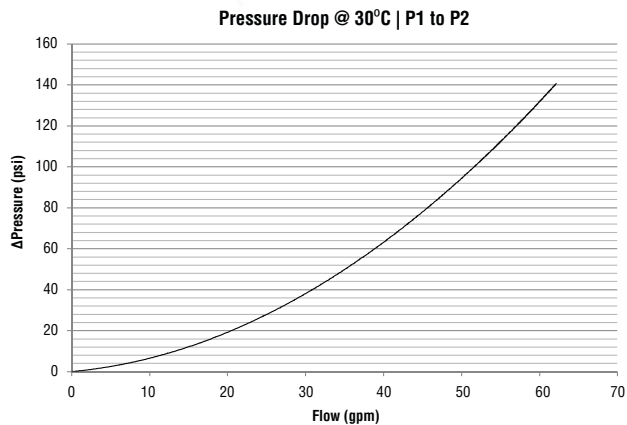
### Size D03



### Size D05



### Size D07



## ELECTRICAL CONNECTORS

	Connection	Connector Type	End 1	End 2	Quantity	Length meters (feet)	Kit Number
							Without Light
Pre-wired Connector Kits	Solenoid	DIN EN 175301-803 Form A	Connector	Flying leads	2	5 (16.4)	2243H77
					2	10 (32.8)	2244H77
	Sensor	M12 5-pin, straight, A-coded	Female	Flying leads	2	5 (16.4)	2644B77
					2	10 (32.8)	2370B77
				Male	2	5 (16.4)	2645B77
					2	10 (32.8)	2371B77

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

	Connection	Connector Type	Fitting Connection	Quantity	Model Number	
					Without Light	Lighted Connector 24 Volts DC
Connectors (no cable)	Solenoid	DIN EN 175301-803 Form A	Cable grip	1	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.

