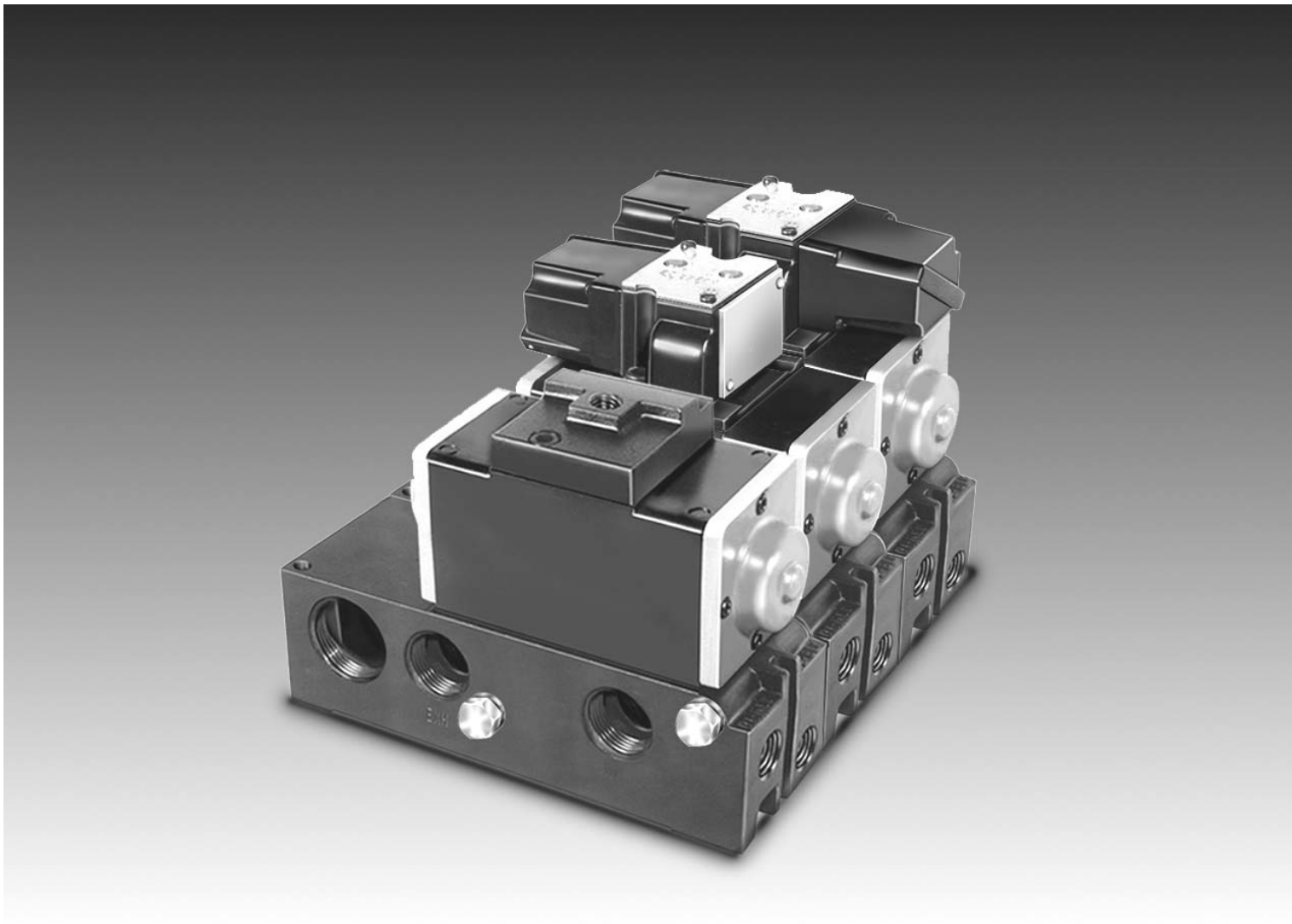
Parker
Pneumatic

"HHB" Series

Air Control Valves

4-Way, 4-Port, 2-Position

Catalog 0665-E/USA
April 2004



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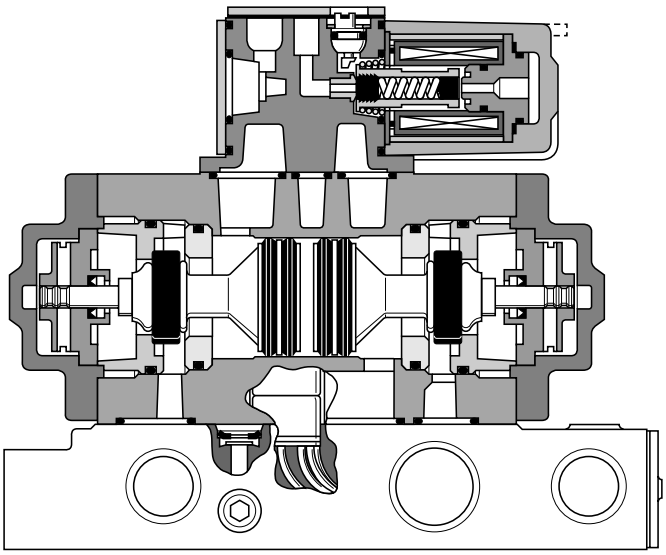
- Basic body size: 1/2 inch.
- Subbase or manifold base mounted.
- Valve body can be removed without breaking plumbing or wiring connections. Two mounting bolts attach body to base.
- Nylon encapsulated coil seals out moisture, preventing corrosion of windings.
- Low power consumption coil, 7.2 watts, is continuous duty rated.
- Short stroke piston poppet gives extremely fast and consistent response.
- Molded polyester poppet gives long operating life.
- Suitable for non-lube service.
- Shur-shift chamber "accumulator" assures positive shifting even at low pressure.
- Corner sealing poppet assures long life, low wear, dirt tolerance, positive sealing with or without lubrication.
- HHB valves can be installed on former 1/2 inch size HH subbases or Add-A-Fold bases.
- Valves are furnished with internal pilot exhaust standard.
- **U.L.** & **CSA** Listed.



HHB200 Series Single Solenoid

Basic Series	Function	Base	Ports	Voltage	Options
HHB	20	0	50	01	B

Function	
10	Single Air Pilot
19	Double Air Pilot
20	Single Solenoid
40	Double Solenoid
49	Double Solenoid and Sequence Operator

Base	
0	Subbase
8	Manifold
V	Without Base

Porting	
37	3/8" NPT (Base Option 0 Only)
50	1/2" NPT
75	3/4" NPT
83	3/8" BSP (Base Option 0 Only)
85	1/2" BSP
87	3/4" BSP
XX	Solenoid Valve Without Base
XX	Air Pilot Valve Without Base NPT
XB	Air Pilot Valve Without Base BSP

Voltage / Frequency			
Suffix	**60Hz.**	**50Hz.**	**DC**
01	**120V**	**110V**	**—**
02	**240V**	**220V**	**—**
15	**—**	**—**	**48V**
20	**24V**	**22V**	**—**
21	**—**	**—**	**12V**
22	**—**	**—**	**24V**
23	**—**	**—**	**125V**
34	**150V**	**—**	**—**
54	**—**	**—**	**185V**
58	**—**	**—**	**250V**
59	**—**	**120V**	**—**
XX	**Use with Air Pilot Valves**		

* Manual Overrides	
A	Non-Locking
B	Locking
C	Non-Locking Knob Type
D	Locking Knob Type

** Pilot Supply	
***F**	External Supply

Other	
J	Sandwich Regulator (With liquid filled gauge installed)
R	Sandwich Regulator (INcludes gauge)
V	Vacuum Service (Not available for functions 40 & 49)

Electrical	
†**H**	5-Pin Connector (In conduit port for base opt. "0") (In base elect. cover for base opt. "8")
L	Indicator Light (Available for voltage option 01, 02, & 22 only)
†**M**	Both "H" & "L"
†**N**	3-Pin Connector (In conduit port for base opt. "0") (In base elect. cover for base opt. "8") (Available for function 20 only)
†**P**	Both "L" & "N" (Available for function 20 only)
†**S**	4-Pin Connector (In conduit port for base opt. "0") (In base elect. cover for base opt. "8")
†**T**	Both "L" & "S"

* Locking Override is standard with Function 20; Non-locking is standard with Function 40. *These need not be specified as options.*

** Internal Pilot Supply is standard. *No option specification required.* (Note: Internal Pilot Exhaust is standard for Function 20 & 40 - Not available for Function 49)

*** Available for Functions 19 and 20 only.

† Available for Base Option "0" and "8" only.

Note: Manifolds are available as separate kits.

Note: Shaded options have been discontinued. Refer to back of Catalog for Cross Reference Information.

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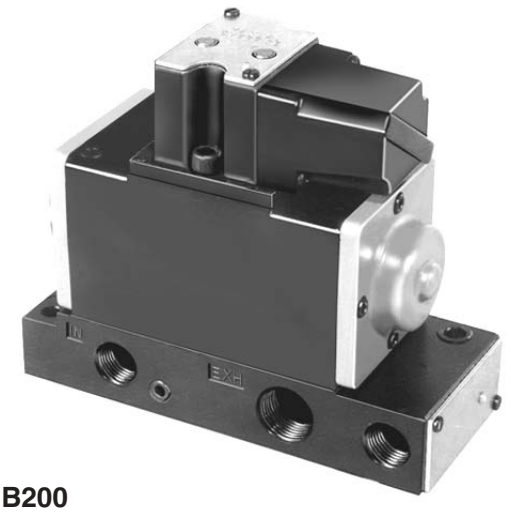


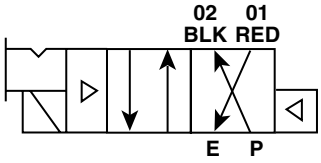
HHB200
Subbase Mounted

Application
These valves are used to operate double acting cylinders. Valves are actuated by a maintained electrical signal.

Mounting
These valves are designed for side ported subbase mounting.

Operation
De-energized position – 3-Way, normally open pilot pressurizes area between pistons. Pressure at inlet port P connected to outlet port 02. Outlet port 01 connected to exhaust port E.

Energized position – Pilot exhausts area between pistons. Pressure at inlet port P connected to outlet port 01. Outlet port 02 connected to exhaust port E.



Model Selection Information
For single pressure applications with internal pilot supply, 120V/60Hz.

Port Size	Valve/Subbase	Model Number
1/2" NPTF	Subbase Mounted	**HHB2005001**
3/4" NPTF	Subbase Mounted	**HHB2007501**
	Valve Only (Includes Gaskets & Bolts)	**HHB20VXX01**

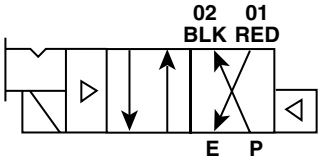
HHB208
Manifold Mounted

Application
These valves are used to operate double acting cylinders. Valves are actuated by a maintained electrical signal.

Mounting
These valves are designed for side ported Add-A-Fold (manifold) base.

Operation
De-energized position – 3-Way, normally open pilot pressurizes area between pistons. Pressure at inlet port P connected to outlet port 02. Outlet port 01 connected to exhaust port E.

Energized position – Pilot exhausts area between pistons. Pressure at inlet port P connected to outlet port 01. Outlet port 02 connected to exhaust port E.



Model Selection Information
For single pressure applications with internal pilot supply, 120V/60Hz.

Port Size	Valve	Model Number
1/2" NPTF	Manifold Mounted	**HHB2085001**
3/4" NPTF	Manifold Mounted	**HHB2087501**

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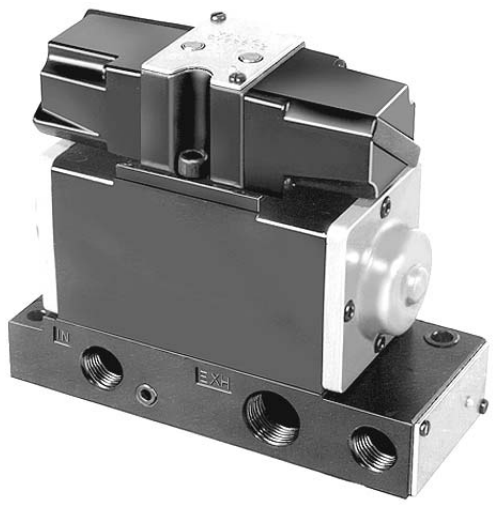


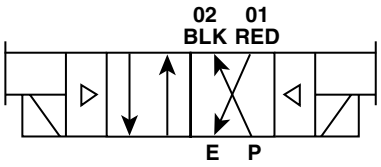
HHB400
Subbase Mounted

Application
These valves are used to operate double acting cylinders. Valves are actuated by a momentary electrical signal alternating on each of the two solenoids.

Mounting
These valves are designed for side ported subbase mounting.

Operation
Black solenoid energized – Pilot pressurizes area between pistons. Pressure at inlet port P connected to outlet port 02. Outlet port 01 connected to exhaust port E. Make-up bleed from outlet port 02 maintains system pressure in area between pistons.

Red solenoid energized – Pilot exhausts area between pistons. Pressure at inlet port P connected to outlet port 01. Outlet port 02 connected to exhaust port E.



Model Selection Information
For single pressure applications with internal pilot supply, 120V/60Hz.

Port Size	Valve/Subbase	Model Number
1/2" NPTF	Subbase Mounted	**HHB4005001**
3/4" NPTF	Subbase Mounted	**HHB4007501**
	Valve Only (Includes Gaskets & Bolts)	**HHB40VXX01**

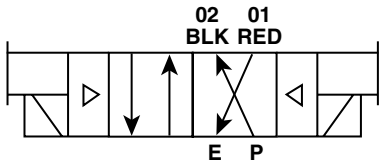
HHB408
Manifold Mounted

Application
These valves are used to operate double acting cylinders. Valves are actuated by a momentary electrical signal alternating on each of the two solenoids.

Mounting
These valves are designed for end ported Add-A-Fold (manifold) base.

Operation
Black solenoid energized – Pilot pressurizes area between pistons. Pressure at inlet port P connected to outlet port 02. Outlet port 01 connected to exhaust port E. Make-up bleed from outlet port 02 maintains system pressure in area between pistons.

Red solenoid energized – Pilot exhausts area between pistons. Pressure at inlet port P connected to outlet port 01. Outlet port 02 connected to exhaust port E.



Model Selection Information
For single pressure applications with internal pilot supply, 120V/60Hz.

Port Size	Valve	Model Number
1/2" NPTF	Manifold Mounted	**HHB4085001**
3/4" NPTF	Manifold Mounted	**HHB4087501**

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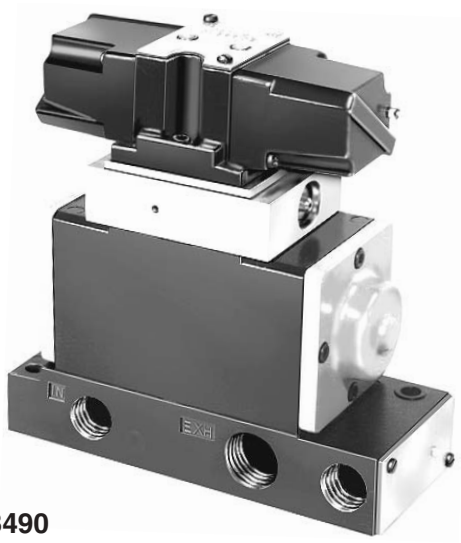


HHB490
Subbase Mounted

HHB498
Manifold Mounted

Application

These valves are used to operate double acting cylinders. Valves are actuated by a momentary electrical signal alternating on each of the two solenoids. The built-in sequence operator assures that the valve's last shifted position is maintained even after a power down condition.

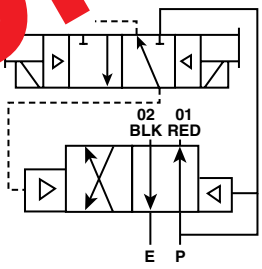
Mounting

These valves are designed for side ported subbase mounting.

Operation

Black solenoid energized – Sequence spool shifted to pressurize area between pistons. Pressure at inlet port P connected to outlet port 02. Outlet port 01 connected to exhaust port E.

Red solenoid energized – Sequence spool shifted to pressurize area between pistons. Pressure at inlet port P connected to outlet port 01. Outlet port 02 connected to exhaust port E.



Model Selection Information

For single pressure applications with internal pilot supply, 120V/60Hz.

Port Size	Valve/Subbase	Model Number
3/8" NPTF	Subbase Mounted	**HHB4903701**
1/2" NPTF	Subbase Mounted	**HHB4905001**
3/4" NPTF	Subbase Mounted	**HHB4907501**

Application

These valves are used to operate double acting cylinders. Valves are actuated by a momentary electrical signal alternating on each of the two solenoids. The built-in sequence operator assures that the valve's last shifted position is maintained even after a power down condition.

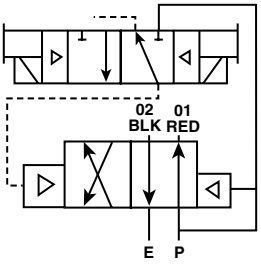
Mounting

These valves are designed for end ported Add-A-Fold (manifold) bases.

Operation

Black solenoid energized – Sequence spool shifted to pressurize area between pistons. Pressure at inlet port P connected to outlet port 02. Outlet port 01 connected to exhaust port E.

Red solenoid energized – Sequence spool shifted to pressurize area between pistons. Pressure at inlet port P connected to outlet port 01. Outlet port 02 connected to exhaust port E.



Model Selection Information

For single pressure applications with internal pilot supply, 120V/60Hz.

Port Size	Valve	Model Number
1/2" NPTF	Manifold Mounted	**HHB4985001**
3/4" NPTF	Manifold Mounted	**HHB4957501**

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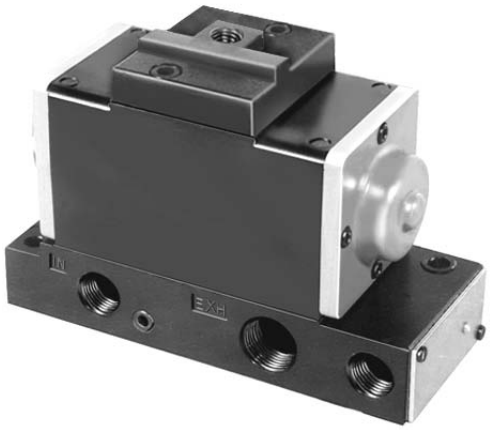


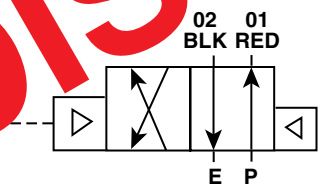
HHB100
Subbase Mounted

Application
These valves are used to operate double acting cylinders. Valves are actuated by a maintained pressure signal.

Mounting
These valves are designed for side ported subbase mounting.

Operation
No Control Signal – piston area exhausted. Flow is P to 01 - 02 to E.

Control Signal On – piston area pressurized. Flow is P to 02 - 01 to E.



Model Selection Information

Port Size	Valve/Subbase	Model Number
3/8" NPTF	Subbase Mounted	**HHB10037**
1/2" NPTF	Subbase Mounted	**HHB10050**
3/4" NPTF	Subbase Mounted	**HHB10075**
	Valve Only (Includes Gaskets & Bolts)	**HHB10VXX**

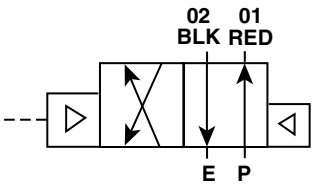
HHB108
Manifold Mounted

Application
These valves are used to operate double acting cylinders. Valves are actuated by a maintained pressure signal.

Mounting
These valves are designed for side ported Add-A-Fold (manifold) bases.

Operation
No Control Signal – piston area exhausted. Flow is P to 01 - 02 to E.

Control Signal On – piston area pressurized. Flow is P to 02 - 01 to E.



Model Selection Information

Port Size	Valve	Model Number
1/2" NPTF	Manifold Mounted	**HHB10850**
3/4" NPTF	Manifold Mounted	**HHB10875**
	Valve Only (Includes Gaskets & Bolts)	**HHB10VXX**

HHB190
Subbase Mounted

Application

These valves are used to operate double acting cylinders. Valves are actuated by momentary pressure signals alternating on each of the two pilot ports. The built-in sequence operator assures that the valve's last shifted position is maintained even after a power down condition.

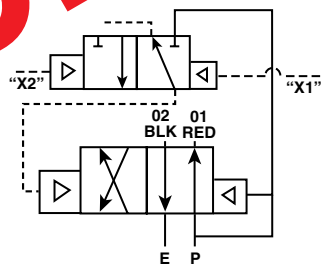
Mounting

These valves are designed for side ported subbase mounting.

Operation

X_2 Pressurized – Sequence spool shifted to pressurize area between pistons. Pressure at inlet port P connected to outlet port 02. Outlet port 01 connected to exhaust port E.

X_1 Pressurized – Sequence spool shifted to pressurize area between pistons. Pressure at inlet port P connected to outlet port 01. Outlet port 02 connected to exhaust port E.



Model Selection Information

Port Size	Valve/Subbase	Model Number
3/8" NPTF	Subbase Mounted	**HHB19037**
1/2" NPTF	Subbase Mounted	**HHB19050**
3/4" NPTF	Subbase Mounted	**HHB19075**

HHB198
Manifold Mounted

Application

These valves are used to operate double acting cylinders. Valves are actuated by momentary pressure signals alternating on each of the two pilot ports. The built-in sequence operator assures that the valve's last shifted position is maintained even after a power down condition.

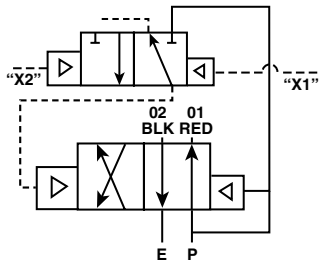
Mounting

These valves are designed for end ported Add-A-Fold (manifold) base

Operation

X_2 Pressurized – Sequence spool shifted to pressurize area between pistons. Pressure at inlet port P connected to outlet port 02. Outlet port 01 connected to exhaust port E.

X_1 Pressurized – Sequence spool shifted to pressurize area between pistons. Pressure at inlet port P connected to outlet port 01. Outlet port 02 connected to exhaust port E.



Model Selection Information

Port Size	Valve	Model Number
1/2" NPTF	Manifold Mounted	**HHB19850**
3/4" NPTF	Manifold Mounted	**HHB19875**

Features

- One base accepts all HHB valves.
- Any function can be changed at any time.
- Valve and base can be added or removed at any time.
- One pressure connection to one or more valves saves time, labor and material.
- One common exhaust allows exhaust to be piped away; one muffler for several valves.
- One electrical conduit connection to install.
- All plumbing and wiring connections to manifold base. Any valve body can be removed without disturbing any other valve, plumbing or wiring.
- Plug-in electrical connections are included on all manifold bases.
- Each base contains junction box with gasket, chained cover, and ground screw.
- Sandwich Pressure Regulator Kit, HHR1, can be applied with new valves or installed in valves in the field. Regulators control pressure from manifold to valve inlet port.

When Ordering Add-A-Fold Assemblies

1. List valves by complete model number in order from left to right viewing the cylinder port 01 Red and 02 Black with assembly. Consult individual valve specification sheet for complete model number.
2. Include proper Add-A-Fold Assembly Kit number AAHHB** (this includes assembling the stack in the order listed with one Side Plate Kit). Place the number of stations in place of the asterisks such as: 2 Station Add-A-Fold – AAHHB02; 4 Station Add-A-Fold –AAHHB04, etc.
3. Any combination of single solenoid, double solenoid, single air operated or double air operated valves can be ordered in the Add-A-Fold assembly.

Note: When valves are ordered separately on manifold bases, all necessary assembly and replacement hardware is included. Side plate kits must be ordered separately.

AA HHB 02

- 02 — Two Station Add-A-Fold (Customer to specify number of valves in assembly)
- HHB — HHB Series Valve
- AA — Add-A-Fold Assembly

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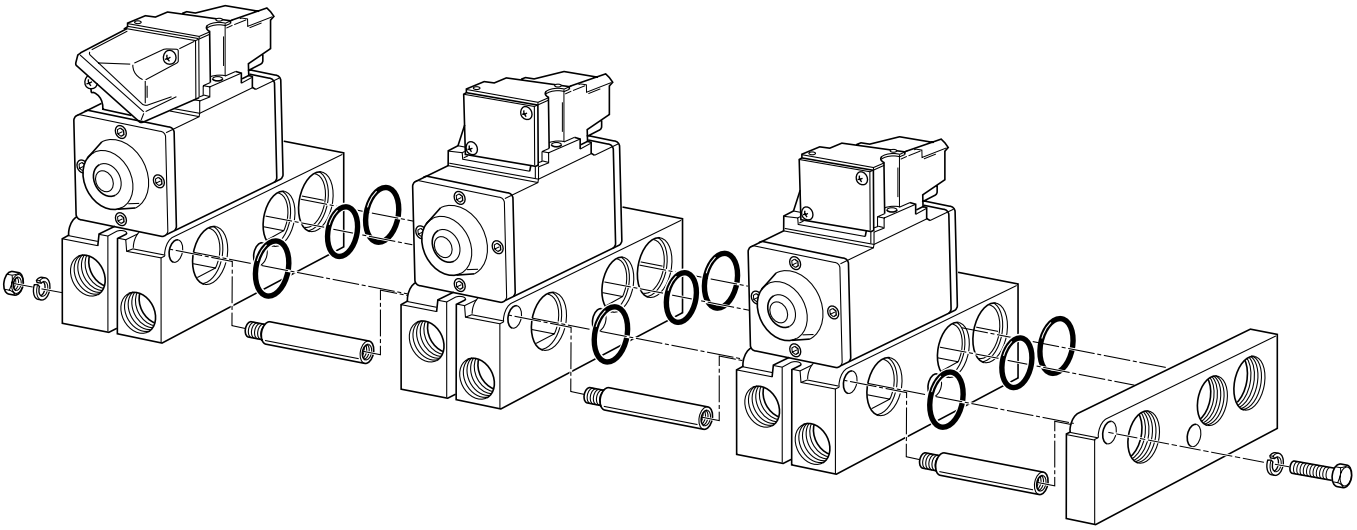
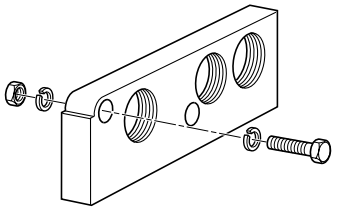
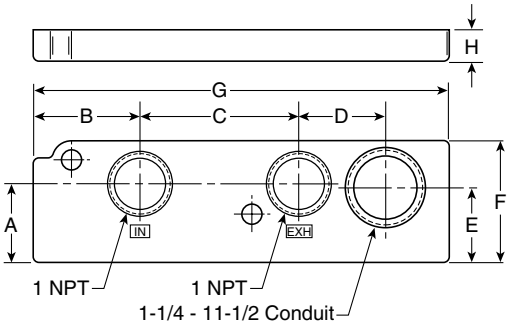


Add-A-Fold Side Plate Kit PS5419

Each Add-A-Fold Side Plate Kit contains (2) hex head cap screws, (4) flat washers, (2) hex nuts, (1) side plate.





	A	B	C	D	E	F	G	H
inches	1.75	2.31	3.49	1.88	1.69	2.75	9.06	.68
mm	44	59	89	48	43	70	230	17

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Operating Pressure

Single & Double Solenoid:
35 to 150 PSIG (242 to 1035 kPa). Can also be used on low pressure or vacuum (HHB200 Only) with external pilot supply.

Double Solenoid, Double Air Pilot With Sequence Operator:
35 to 150 PSIG (242 to 1035 kPa). Can also be used on low pressure with external pilot supply.

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Temperature

0°F to 140°F (-18°C to 60°C)

Electrical Data: 120V/60Hz - 110V/50Hz

7.2 Watts	.26 Amp Inrush	.14 Amp Holding

Single Solenoid Valve:
Has red wire leads.

Double Solenoid Valve:
Red leads in junction box to red solenoid, black leads to black solenoid.

Valves meet **U.L.** & **CSA** Standards.

Shipping Weight:

Model	Weight
HHB 200	6.8 Lbs.
HHB 208	8.8 Lbs.
HHB 400	7.3 Lbs.
HHB 408	9.5 Lbs.
HHB 490	8.3 Lbs.
HHB 498	10.5 Lbs.

Lubrication

HHB Series Valves suitable for non-lube service.

2-Position Single Solenoid

Average Fill Time: (Seconds)*

Port Size	12 Cu. In. Test Chamber				100 Cu. In. Test Chamber			
	Subbase		Add-A-Fold		Subbase		Add-A-Fold	
	Fill	Exh.	Fill	Exh.	Fill	Exh.	Fill	Exh.
3/8"	.030	.035	NA		.108	.142	NA	
1/2"	.028	.034	.024	.041	.086	.125	.088	.160
3/4"	.028	.034	.025	.043	.077	.123	.084	.149

* With 100 PSIG supply, time required to fill from 0-90 PSIG and exhaust from 100 to 10 PSIG is measured from instant of energizing, or de-energizing 120V/60Hz. Times shown are average. Values for Add-A-Fold mounted valves are for the sixth valve in a bank of six.

2-Position Double Solenoid

Average Fill Time: (Seconds)*

Port Size	12 Cu. In. Test Chamber				100 Cu. In. Test Chamber			
	Subbase		Add-A-Fold		Subbase		Add-A-Fold	
	Fill	Exh.	Fill	Exh.	Fill	Exh.	Fill	Exh.
3/8"	.036	.041	NA		.111	.151	NA	
1/2"	.033	.038	.036	.049	.094	.138	.098	.165
3/4"	.033	.038	.034	.053	.086	.132	.093	.157

* With 100 PSIG supply, time required to fill from 0-90 PSIG and exhaust from 100 to 10 PSIG is measured from instant of energizing, or de-energizing 120V/60Hz. Times shown are average. Values for Add-A-Fold mounted valves are for the sixth valve in a bank of six.

Coil Selection

Voltage Range +10/-15% of Nominal

Class B Coil	60Hz.	50Hz.	DC
01	120VAC	110VAC	—
02	240VAC	220VAC	—
04	—	—	6VDC
21	—	—	12VDC
22	—	—	24VDC
XX	Use For Air Pilot Only		

Flow Rating (C_V)

2-Position:

	-37 (3/8)	-50 (1/2)	-75 (3/4)
Subbase Mtd. C_V* Average	4.5	5.1	5.3
Free Flow – SCFM (dmn ^{3}/sec)	265 (125)	350 (165)	387 (182)
Add-A-Fold Mtd. C_V* Average	NA	4.9	5.1
Free Flow – SCFM (dmn ^{3}/sec)	NA	300 (141)	320 (150)

* C_V value is for sixth valve in a bank of six.

Free Flow is measured at 100 PSIG (690 kPa) inlet.

Options

- Coil indicator lights.
- Non-locking manual override.

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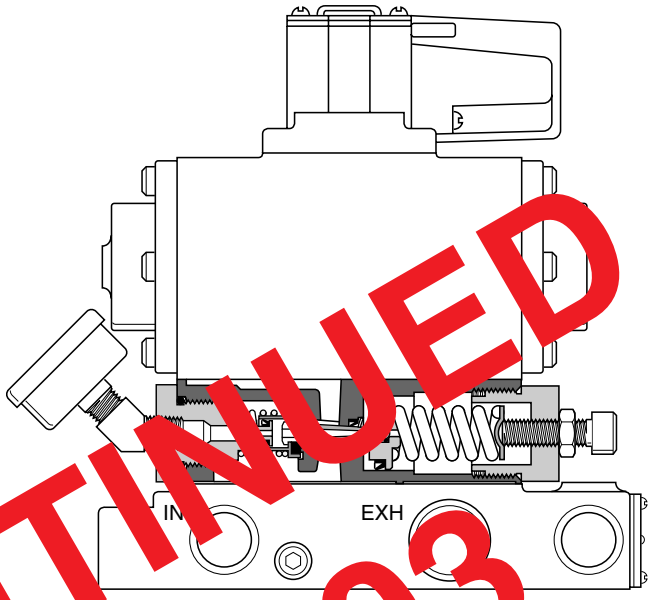
www.parker.com/pneumatic

HHB200
Subbase Mounted

Specifications

- Operating pressure range 30-125 PSI (207 to 863 kPa).
- Flow:
  Free flow – 100 PSI inlet to valve.
  80 PSI reduced setting 115 SCFM.
  40 PSI reduced setting 90 SCFM.
- Sandwich Regulator electrically plugs into bases and contains electrical receptacle for valve body.
- Regulated pressure gauge, 0-160 PSI, is provided.
- Solenoid pilot supply from regulated side is standard.



Shown with HHB200 Subbase Mounted Valve

Application

The HHR1 Sandwich type pressure regulator can be used on both HHB200 and HHB400 Series subbase and manifold mounted valves.

Operation

Sandwich Regulator supplies regulated pressure to inlet of valve mounted on it.

An increase of back pressure from the outlet ports above the set pressure will cause regulator to vent excess air into exhaust port of valve.

How To Order

Complete Valve With Sandwich Regulator:

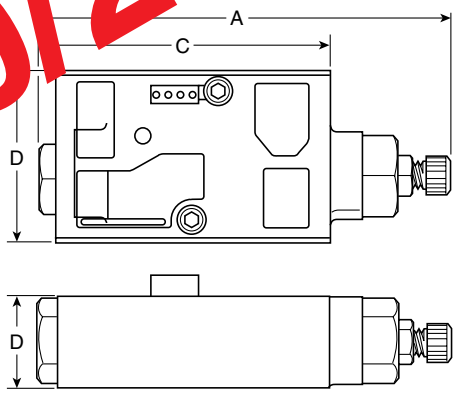
	Single Subbase	Add-A-Fold Manifold Base
Single Solenoid	**HHB200**01R**	**HHB208**01R**
Double Solenoid	**HHB400**01R**	**HHB408**01R**

**Insert desired port size 3/8"-37; 1/2"-50; 3/4"-75.

Note: 3/8" not available in manifold base.

Model numbers shown are for 120V/60Hz.
Other voltages available.

Sandwich Regulator Kit – HHR1
Kit contains regulator, mounting studs, gasket, and gauge.



Dimensions:

	A	B	C	D
inches	7.80 7.50	1.68	5.37	3.03
mm	198 191	49	131	77

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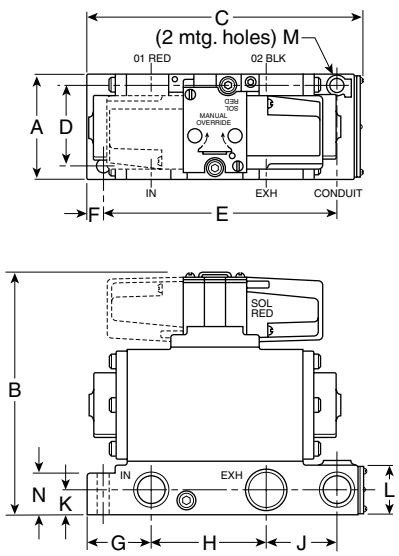
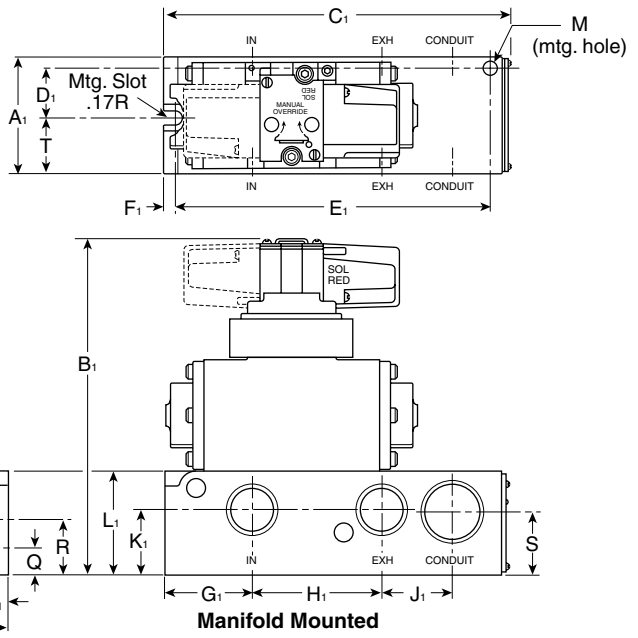
HHB200 — HHB400

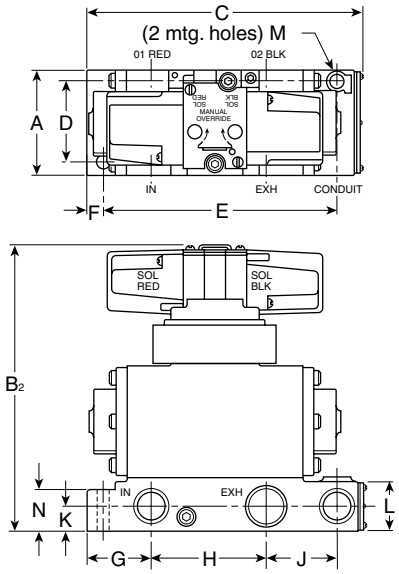


HHB208 — HHB408

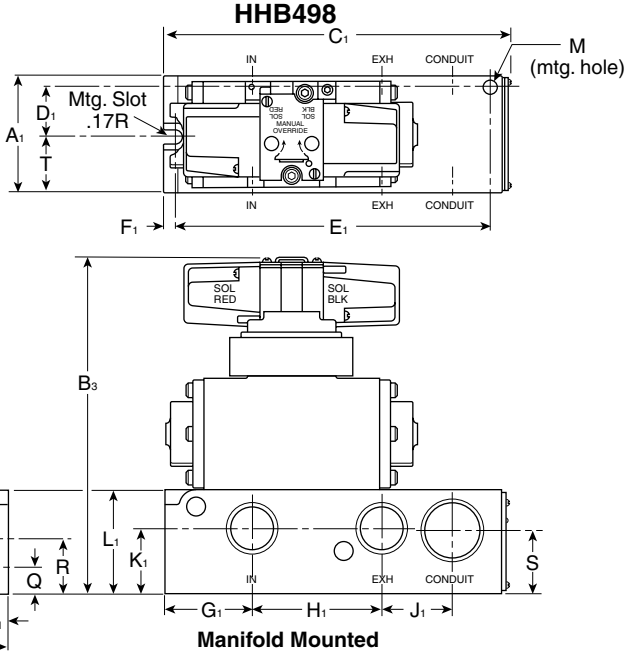


Manifold Mounted

HHB490



HHB498



Manifold Mounted

Dimensions:

	A	A_1	B	B_1	B_2	B_3	C	C_1	D	D_1	E	E_1
inches	2.96	3.16	6.56	7.82	7.78	9.03	7.69	9.25	2.19	1.40	6.50	8.50
mm	75	80	168	199	198	229	195	235	56	36	165	216
	F	F_1	G	G_1	H	H_1	J	J_1	K	K_1	L	L_1
inches	.41	.25	1.91	2.31	3.19	3.49	1.79	1.88	.75	1.75	1.50	2.75
mm	10	6	49	59	81	89	45	48	19	44	38	70
	M	N	N_1	P	Q	R	S	T				
inches	.34 D	1.20	.69	2.25	.66	1.46	1.69	1.47				
mm	8.7 Ø	30	18	57	17	37	43	37				

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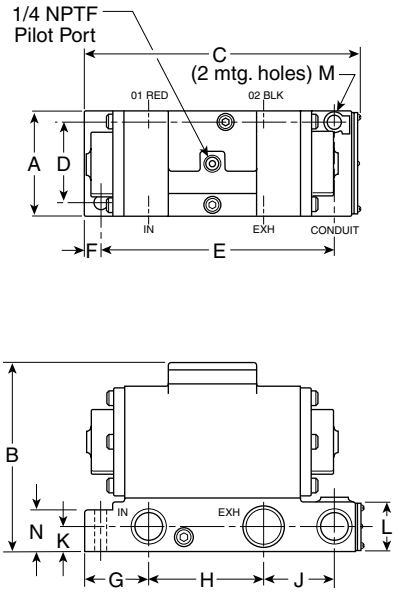
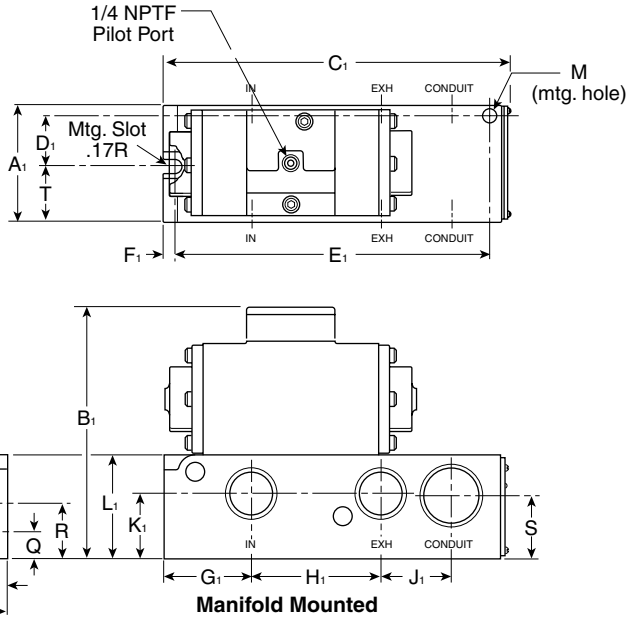
HHB100

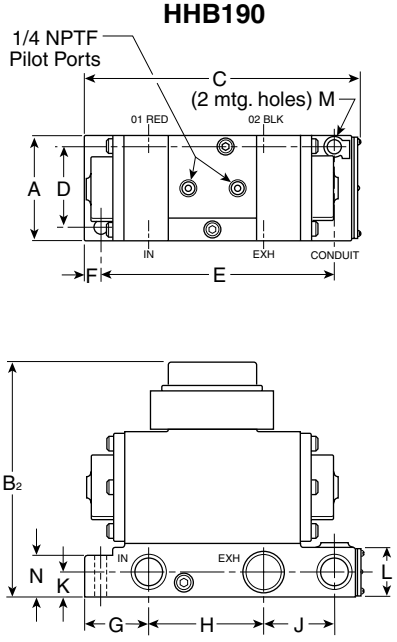


HHB108

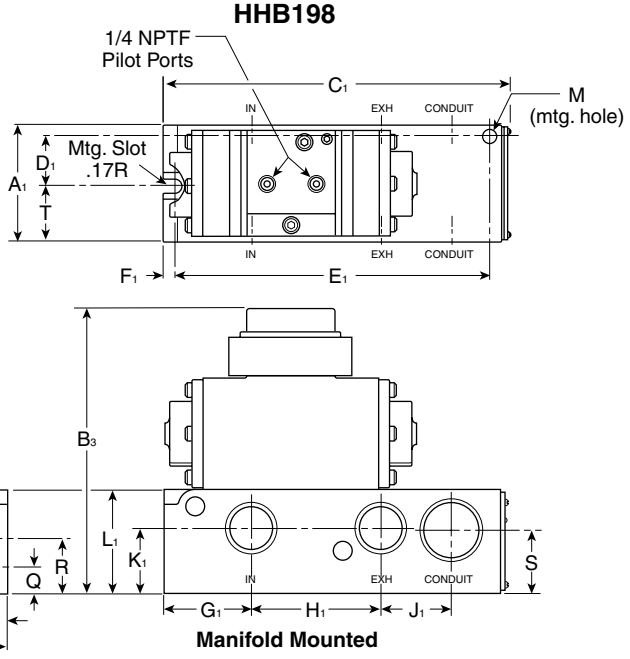


Manifold Mounted

HHB190



HHB198



Manifold Mounted

Dimensions:

	A	A_1	B	B_1	B_2	B_3	C	C_1	D	D_1	E	E_1
inches	2.94	3.16	5.31	6.56	6.50	7.75	7.69	9.25	2.19	1.40	6.50	8.50
mm	75	80	135	167	165	197	195	235	56	36	165	216
	F	**F_1**	**G**	**G_1**	**H**	**H_1**	**J**	**J_1**	**K**	**K_1**	**L**	**L_1**
inches	.41	.25	1.91	2.31	3.19	3.49	1.79	1.88	.75	1.75	1.50	2.75
mm	10	6	49	59	81	89	45	48	19	44	38	70
	M	**N**	**N_1**	**P**	**Q**	**R**	**S**	**T**				
inches	.34 D	1.20	.69	2.25	.66	1.46	1.69	1.47				
mm	8.7 Ø	30	18	57	17	37	43	37				

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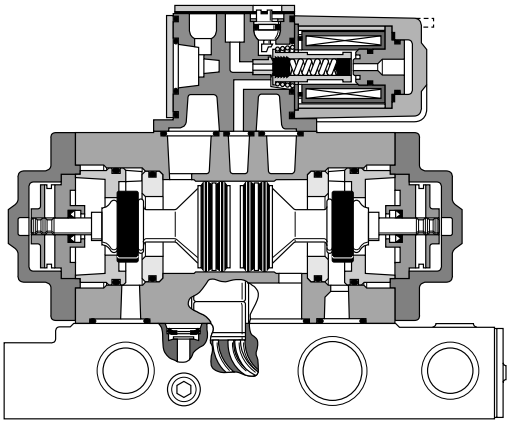
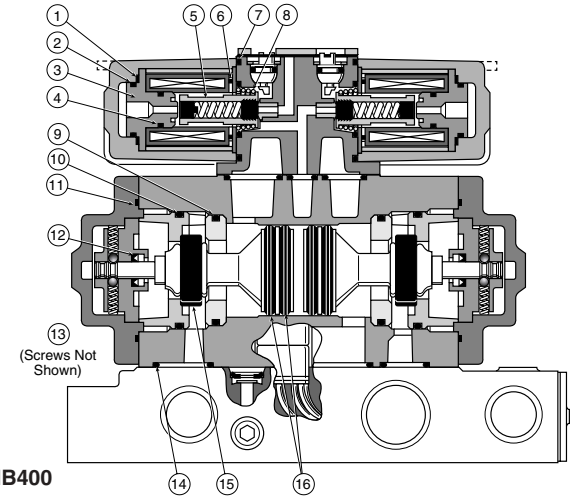
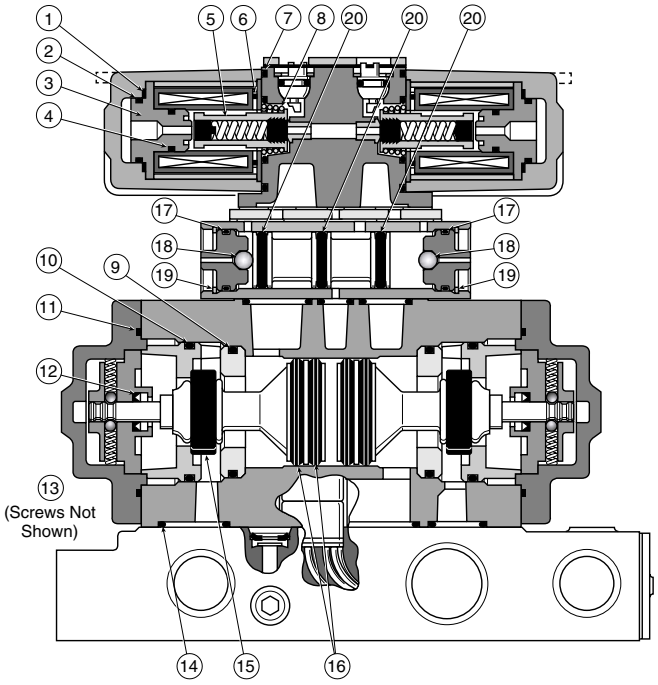


HHB200



HHB400



HHB490

Solenoid Service Kit
(Order Two for Double Solenoid)
Consisting of items: 1, 2, 3, 4, 5, 6, 7 & 8 ..... **PS5171**

Valve Body Service Kit
Consisting of items: 9, 10, 11, 12, 13, 14, 15 & 16 ..... **PS5409**

Solenoid Coil Identification and Specification

Part No.	60 HzAC	50 HzAC	DC
P4615401	120V	110V	–
P4615402	240V	220V	–
P4615404	–	–	6V
P4615421	–	–	12V
P4615422	–	–	24V

Solenoid Service Kit
(Order Two for Double Solenoid)
Consisting of items: 1, 2, 3, 4, 5, 6, 7 & 8 ..... **PS5387**

Valve Body Service Kit
Consisting of items: 9, 10, 11, 12, 13, 14, 15 & 16 ..... **PS5409**

Sequence Head Service Kit
Consisting of items: 17, 18, 19 & 20 ..... **PL5390**

Solenoid Coil Identification and Specification

Part No.	60 HzAC	50 HzAC	DC
P4615401	120V	110V	–
P4615402	240V	220V	–
P4615421	–	–	12V
P4615422	–	–	24V

Cross Reference

Discontinued HHB Valve	Suggested Replacement	Notes	Alternate Replacement	Notes
HHB10VXX	F7FVX000XXA + PS371500P	1	N/A	2
HHB10037	F7F17000XXA AND BUSH TO 3/8"		N/A	2
HHB10050	F7F17000XXA		N/A	2
HHB10075	F7F19000XXA		N/A	2
HHB19VXX	F74VX000XXA + PS371500P	1	N/A	2
HHB19037	F7417000XXA AND BUSH TO 3/8"		N/A	2
HHB19050	F7417000XXA		N/A	2
HHB19075	F7419000XXA		N/A	2
HHB20VXX01D	F7EVXBK023A	1	HHB20VXX01B	3
HHB20VXX01LR	F7EVXPH023A + PS3738166P	1	N/A	2
HHB20VXX02CV		1	N/A	2
HHB20VXX02D	F7EVXBG087A	1	HHB20VXX02B	3
HHB20VXX20C	F7EVXBG012A	1	N/A	2
HHB20VXX21	F7EVXBG015A	1	N/A	2
HHB20VXX22CV		1	N/A	2
HHB20VXX22D	F7EVXBK019A	1	HHB20VXX22B	3
HHB20VXX23	NO CROSS VOLTAGE IS 125VDC	2	N/A	2
HHB20VXX23D	NO CROSS VOLTAGE IS 125VDC	2	N/A	2
HHB20VXX58D	NO CROSS VOLTAGE IS 250VDC	2	N/A	2
HHB2003701	F7E17BHA23A AND BUSH TO 3/8"		HHB2005001 & BUSH TO 3/8"	
HHB2003701A	F7E17BGA23A AND BUSH TO 3/8"		HHB2005001A & BUSH TO 3/8"	
HHB2003701AL	F7E17BGA23A AND BUSH TO 3/8"		HHB2005001AL & BUSH TO 3/8"	
HHB2003701L	F7E17BHA23A AND BUSH TO 3/8"		HHB2005001L & BUSH TO 3/8"	
HHB2003701LR	F7E17BHA23166A AND BUSH TO 3/8"		N/A	2
HHB2003701R	F7E17BHA23166A AND BUSH TO 3/8"		N/A	2
HHB2003702	F7E17BHA87A AND BUSH TO 3/8"		HHB2005002 & BUSH TO 3/8"	
HHB2003721	F7E17BHA15A AND BUSH TO 3/8"		N/A	2
HHB2003722A	F7E17BGA19A AND BUSH TO 3/8"		HHB2005022A & BUSH TO 3/8"	
HHB2005001D	F7E17BKA23A		HHB2005001B	3
HHB2005001R	F7E17BHA23166A		N/A	2
HHB2005021	F7E17BHA15A		N/A	2
HHB2005022AW	F7E17BGB19A		HHB2005001A	4
HHB2005058	NO CROSS VOLTAGE IS 250VDC	2	N/A	2
HHB2005058D	NO CROSS VOLTAGE IS 250VDC	2	N/A	2
HHB2007501D	F7E19BKA23A		HHB2007501B	3
HHB2007501DL	F7E19BKA23A		HHB2007501BL	3
HHB2007501LR	F7E19BHA23166A		N/A	2
HHB2007501R	F7E19BHA23166A		N/A	2
HHB2007502D	F7E19BHA87A		HHB2007502B	3
HHB2007521	F7E19BHA15A		N/A	2
HHB2007522AW	F7E19BGB23A		HHB2007501A	4
HHB2007523	NO CROSS VOLTAGE IS 125VDC	2	N/A	2
HHB2007558	NO CROSS VOLTAGE IS 250VDC	2	N/A	2
HHB2007558D	NO CROSS VOLTAGE IS 250VDC	2	N/A	2
HHB40VXX01BLR	F72VXPG023A + PS3738166P	1	N/A	2
HHB40VXX01D	F72VXBK023A	1	HHB40VXX01B	3

Notes

1. This is a valve less base. The suggested replacement selected will not attach to the HHB valve base. Review for proper base replacement.
2. Use Repair Kits to Service Valve.
3. Valve has Flush Locking Override instead of Knob Type Locking Override.
4. Valve has 18" Leads instead of 72" Leads.
5. This valve is attached to a Manifold Assembly. No direct replacement is available. Review application of Valve Manifold configuration. The F7 valve listed includes Manifold Base.

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Cross Reference

Discontinued HHB Valve	Suggested Replacement	Notes	Alternate Replacement	Notes
HHB40VXX02D	F72VXBG023A	1	HHB40VXX02B	3
HHB4003701	F7217BGA23A AND BUSH TO 3/8"		HHB4005001 & BUSH TO 3/8"	
HHB4003701B	F7217BHA23A AND BUSH TO 3/8"		HHB4005001B & BUSH TO 3/8"	
HHB4003701BL	F7217BHA23A AND BUSH TO 3/8"		HHB4005001BL & BUSH TO 3/8"	
HHB4003701C	F7217BGA23A AND BUSH TO 3/8"		HHB4005001C & BUSH TO 3/8"	
HHB4003701D	F7217BHA23A AND BUSH TO 3/8"		HHB4005001B & BUSH TO 3/8"	3
HHB4003701L	F7217BGA23A AND BUSH TO 3/8"		HHB4005001L & BUSH TO 3/8"	
HHB4003701LR	F7217BGA23166A AND BUSH TO 3/8"		N/A	2
HHB4003701R	F7217BGA23166A AND BUSH TO 3/8"		N/A	2
HHB4003702	F7217BGA87A AND BUSH TO 3/8"		HHB4005002 & BUSH TO 3/8"	
HHB4003722B	F7E17BHA23A AND BUSH TO 3/8"		HHB4005022B & BUSH TO 3/8"	
HHB4003722L	F7217BGA19A AND BUSH TO 3/8"		HHB4005022L & BUSH TO 3/8"	
HHB4005001D	F7217BHA23A		HHB4005001B	3
HHB4005001DL	F7217BHA23A		HHB4005001BL	3
HHB4005021	F7217BGA15A		N/A	2
HHB4005022D	F7217BHA19A		HHB4005022B	3
HHB4005058	NO CROSS VOLTAGE IS 250VDC	2	N/A	2
HHB4007501D	F7219BHA23A		HHB4007501B	3
HHB4007501DL	F7219BHA23A		HHB4007501BL	3
HHB4007501W	F7219BGB23A		HHB4007501	4
HHB4007502D	F7219BHA87A		HHB4007502B	3
HHB4007522D	F7219BHA19A		HHB4007522B	3
HHB4007523	NO CROSS VOLTAGE IS 125VDC	2	N/A	2
HHB49VXX01C	F72VXBG023A	1	N/A	2
HHB49VXX01CL	F72VXBG023A	1	N/A	2
HHB49VXX01D	F72VXBH023A	1	N/A	2
HHB49VXX02C	F72VXBG087A	1	N/A	2
HHB49VXX22C	F72VXBG019A	1	N/A	2
HHB4903701	F7217BGA23A AND BUSH TO 3/8"		N/A	2
HHB4903701L	F7217BGA23A AND BUSH TO 3/8"		N/A	2
HHB4903758	NO CROSS VOLTAGE IS 250VDC	2	N/A	2
HHB4905001	F7217BGA23A		N/A	2
HHB4907501	F7219BGA23A		N/A	2
HHB4907501L	F7219BGA23A		N/A	2
HHB2085001	F7E57BKA23A	5	HHB20VXX01 + PS5421	
HHB20850001A	F7E57BGA23A	5	HHB20VXX01A + PS5421	
HHB2085001AL	F7E57BGA23A	5	HHB20VXX01AL + PS5421	
HHB2085001DL	F7E75BKA23A	5	HHB20VXX01BL + PS5421	3
HHB2085001L	F7E57BKA23A	5	HHB20VXX01L + PS5421	
HHB2085001R	F7E57BKA23166A	5	N/A	2
HHB2085002	F7E57BGA87A	5	HHB20VXX02 + PS5421	
HHB2085002W	F7E57BGB87A	5	HHB20VXX02 + PS5421	4
HHB2085020	F7E57BGA12A	5	N/A	2
HHB2085021	F7E57BGA15A	5	N/A	2
HHB2085021A	F7E57BGA15A	5	N/A	2
HHB2085022	F7E57BGA19A	5	HHB20VXX22 + PS5421	

Notes

1. This is a valve less base. The suggested replacement selected will not attach to the HHB valve base. Review for proper base replacement.
2. Use Repair Kits to Service Valve.
3. Valve has Flush Locking Override instead of Knob Type Locking Override.
4. Valve has 18" Leads instead of 72" Leads.
5. This valve is attached to a Manifold Assembly. No direct replacement is available. Review application of Valve Manifold configuration. The F7 valve listed includes Manifold Base.

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Cross Reference

Discontinued HHB Valve	Suggested Replacement	Notes	Alternate Replacement	Notes
HHB2085022AW	F7E57BGB19A	5	HHB20VXX22 + PS5421	4
HHB2085022L	F7E57BGA19A	5	HHB20VXX22L + PS5421	
HHB2085022LR	F7E57BGA19166A	5	N/A	2
HHB2085022R	F7E57BGA19166A	5	N/A	2
HHB2087501	F7E59BKA23A	5	HHB20VXX01 + PS5422	
HHB2087501A	F7E59BGA23A	5	HHB20VXX01A + PS5422	
HHB2087501AFL	F7E59LGA23A	5	N/A	2
HHB2087501AL	F7E59BGA23A	5	HHB20VXX01AL + PS5422	
HHB2087501ALR	F7E59BGA23166A	5	N/A	2
HHB2087501D	F7E59BKA23A	5	HHB20VXX01B + PS5422	3
HHB2087501DL	F7E59BKA23A	5	HHB20VXX01BL + PS5422	3
HHB2087501L	F7E59BKA23A	5	HHB20VXX01L + PS5422	
HHB2087501LR	F7E59BKA166A	5	N/A	2
HHB20875LRV	N/A	2	N/A	2
HHB2087501R	F7E59BKA166A	5	N/A	2
HHB2087502	F7E59BGA87A	5	HHB20VXX02 + PS5422	
HHB2087502D	F7E59BGA87A	5	HHB20VXX02B + PS5422	
HHB2087522	F7E59BKA19A	5	HHB20VXX22 + PS5422	
HHB2087522L	F7E59BKA19A	5	HHB20VXX22L + PS5422	
HHB4085001	F7257BKA23A	5	HHB40VXX01 + PS5421	
HHB4085001L	F7257BKA23A	5	HHB40VXX01L + PS5421	
HHB4085001R	F7257BKA23166A	5	N/A	2
HHB4085022	F7257BKA19A	5	HHB40VXX22 + PS5421	
HHB4085022W	F7257BKB19A	5	HHB40VXX22 + PS5421	4
HHB4087501	F7259BKA23A	5	HHB40VXX01 + PS5422	
HHB4087501BL	F7259BGA23A	5	HHB40VXX01BL + PS5422	
HHB4087501D	F7259BKA23A	5	HHB40VXX01B + PS5422	4
HHB4087501DL	F7259BKA23A	5	HHB40VXX01BL + PS5422	4
HHB4087501L	F7259BGA23A	5	HHB40VXX01L + PS5422	
HHB4087501LR	F7259BGA23A	5	N/A	2
HHB4087502D	F7259BGA87A	5	HHB40VXX02B + PS5422	4
HHB4087522L	F7259BGA19A	5	HHB40VXX22L + PS5422	
HHB4987501L	F7259BGA23A	5	N/A	2
HHB4987501LR	F7259BGA23166A	5	N/A	2

Notes

1. This is a valve less base. The suggested replacement selected will not attach to the HHB valve base. Review for proper base replacement.
2. Use Repair Kits to Service Valve.
3. Valve has Flush Locking Override instead of Knob Type Locking Override.
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Notes

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1. Terms and Conditions of Sale: All descriptions, quotations, proposals, offers, acknowledgments, acceptances and sales of Seller's products are subject to and shall be governed exclusively by the terms and conditions stated herein. Buyer's acceptance of any offer to sell is limited to these terms and conditions. Any terms or conditions in addition to, or inconsistent with those stated herein, proposed by Buyer in any acceptance of an offer by Seller, are hereby objected to. No such additional, different or inconsistent terms and conditions shall become part of the contract between Buyer and Seller unless expressly accepted in writing by Seller. Seller's acceptance of any offer to purchase by Buyer is expressly conditional upon Buyer's assent to all the terms and conditions stated herein, including any terms in addition to, or inconsistent with those contained in Buyer's offer. Acceptance of Seller's products shall in all events constitute such assent.

2. Payment: Payment shall be made by Buyer net 30 days from the date of delivery of the items purchased hereunder. Amounts not timely paid shall bear interest at the maximum rate permitted by law for each month or portion thereof that the Buyer is late in making payment. Any claims by Buyer for omissions or shortages in a shipment shall be waived unless Seller receives notice thereof within 30 days after Buyer's receipt of the shipment.

3. Delivery: Unless otherwise provided on the face hereof, delivery shall be made F.O.B. Seller's plant. Regardless of the method of delivery, however, risk of loss shall pass to Buyer upon Seller's delivery to a carrier. Any delivery dates shown are approximate only and Seller shall have no liability for any delays in delivery.

4. Warranty: Seller warrants that the items sold hereunder shall be free from defects in material or workmanship for a period of 18 months from date of shipment from Parker Hannifin Corporation. THIS WARRANTY COMPRISES THE SOLE AND ENTIRE WARRANTY PERTAINING TO ITEMS PROVIDED HEREUNDER. SELLER MAKES NO OTHER WARRANTY, GUARANTEE, OR REPRESENTATION OF ANY KIND WHATSOEVER. ALL OTHER WARRANTIES, INCLUDING BUT NOT LIMITED TO, MERCHANTABILITY AND FITNESS FOR PURPOSE, WHETHER EXPRESS, IMPLIED, OR ARISING BY OPERATION OF LAW, TRADE USAGE, OR COURSE OF DEALING ARE HEREBY DISCLAIMED.

NOTWITHSTANDING THE FOREGOING, THERE ARE NO WARRANTIES WHATSOEVER ON ITEMS BUILT OR ACQUIRED WHOLLY OR PARTIALLY, TO BUYER'S DESIGN OR SPECIFICATIONS.

5. Limitation of Remedy: SELLER'S LIABILITY ARISING FROM OR IN ANY WAY CONNECTED WITH THE ITEMS SOLD OR THIS CONTRACT SHALL BE LIMITED EXCLUSIVELY TO REPAIR OR REPLACEMENT OF THE ITEMS SOLD OR REFUND OF THE PURCHASE PRICE PAID BY BUYER, AT SELLER'S SOLE OPTION. IN NO EVENT SHALL SELLER BE LIABLE FOR ANY INCIDENTAL, CONSEQUENTIAL OR SPECIAL DAMAGES OF ANY KIND OR NATURE WHATSOEVER, INCLUDING BUT NOT LIMITED TO LOST PROFITS ARISING FROM OR IN ANY WAY CONNECTED WITH THIS AGREEMENT OR ITEMS SOLD HEREUNDER, WHETHER ALLEGED TO ARISE FROM BREACH OF CONTRACT, EXPRESS OR IMPLIED WARRANTY, OR IN TORT, INCLUDING WITHOUT LIMITATION, NEGLIGENCE, FAILURE TO WARN OR STRICT LIABILITY.

6. Changes, Reschedules and Cancellations: Buyer may request to modify the designs or specifications for the items sold hereunder as well as the quantities and delivery dates thereof, or may request to cancel all or part of this order, however, no such requested modification or cancellation shall become part of the contract between Buyer and Seller unless accepted by Seller in a written amendment to this Agreement. Acceptance of any such requested modification or cancellation shall be at Seller's discretion, and shall be upon such terms and conditions as Seller may require.

7. Special Tooling: A tooling charge may be imposed for any special tooling, including without limitations, dies, fixtures, molds and patterns, acquired to manufacture items sold pursuant to this contract. Such special tooling shall be and remain Seller's property notwithstanding payment of any charges by Buyer. In no event will Buyer acquire any interest in apparatus belonging to Seller which is utilized in the manufacture of the items sold hereunder, even if such apparatus has been specially converted or adapted for such manufacture and notwithstanding any charges paid by Buyer. Unless otherwise agreed, Seller shall have the right to alter, discard or otherwise dispose of any special tooling or other property in its sole discretion at any time.

8. Buyer's Property: Any designs, tools, patterns, materials, drawings, confidential information or equipment furnished by Buyer, or any other items which become Buyer's property, may be considered obsolete and may be destroyed by Seller after two (2) consecutive years have elapsed without Buyer placing an order for the items which are manufactured using such property. Seller shall not be responsible for any loss or damage to such property while it is in Seller's possession or control.

9. Taxes: Unless otherwise indicated on the face hereof, all prices and charges are exclusive of excise, sales, use, property, occupational or like taxes which may be imposed by any taxing authority upon the manufacture, sale or delivery of the items sold hereunder. If any such taxes must be paid by Seller or if Seller is liable for the collection of such tax, the amount thereof shall be in addition to the amounts for the items sold. Buyer agrees to pay all such taxes or to reimburse Seller therefore upon receipt of its invoice. If Buyer claims exemption from any sales, use or other tax imposed by any taxing authority, Buyer shall save Seller harmless from and against any such tax, together with any interest or penalties thereon which may be assessed if the items are held to be taxable.

10. Indemnity For Infringement of Intellectual Property Rights: Seller shall have no liability for infringement of any patents, trademarks, copyrights, trade dress, trade secrets or similar rights except as provided in this Part 10. Seller will defend and indemnify Buyer against allegations of infringement of U.S. patents, U.S. trademarks, copyrights, trade dress and trade secrets (hereinafter "Intellectual Property Rights"). Seller will defend at its expense and will pay the cost of any settlement or damages awarded in an action brought against Buyer based on an allegation that an item sold pursuant to this contract infringes the Intellectual Property Rights of a third party. Seller's obligation to defend and indemnify Buyer is contingent on Buyer notifying Seller within ten (10) days after Buyer becomes aware of such allegations of infringement, and Seller having sole control over the defense of any allegations or actions including all negotiations for settlement or compromise. If an item sold hereunder is subject to a claim that it infringes the Intellectual Property Rights of a third party, Seller may, at its sole expense and option, procure for Buyer the right to continue using said item, replace or modify said item so as to make it noninfringing, or offer to accept return of said item and return the purchase price less a reasonable allowance for depreciation. Notwithstanding the foregoing, Seller shall have no liability for claims of infringement based on information provided by Buyer, or directed to items delivered hereunder for which the designs are specified in whole or part by Buyer, or infringements resulting from the modification, combination or use in a system of any item sold hereunder. The foregoing provisions of this Part 10 shall constitute Seller's sole and exclusive liability and Buyer's sole and exclusive remedy for infringement of Intellectual Property Rights.

If a claim is based on information provided by Buyer or if the design for an item delivered hereunder is specified in whole or in part by Buyer, Buyer shall defend and indemnify Seller for all costs, expenses or judgements resulting from any claim that such item infringes any patent, trademark, copyright, trade dress, trade secret or any similar right.

11. Force Majeure: Seller does not assume the risk of and shall not be liable for delay or failure to perform any of Seller's obligations by reason of circumstances beyond the reasonable control of Seller (hereinafter "Events of Force Majeure"). Events of Force Majeure shall include without limitation, accidents, acts of God, strikes or labor disputes, acts, laws, rules or regulations of any government or government agency, fires, floods, delays or failures in delivery of carriers or suppliers, shortages of materials and any other cause beyond Seller's control.

12. Entire Agreement/Governing Law: The terms and conditions set forth herein, together with any amendments, modifications and any different terms or conditions expressly accepted by Seller in writing, shall constitute the entire Agreement concerning the items sold, and there are no oral or other representations or agreements which pertain thereto. This Agreement shall be governed in all respects by the law of the State of Ohio. No actions arising out of sale of the items sold hereunder or this Agreement may be brought by either party more than two (2) years after the cause of action accrues.

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