

Model Code for HMA -02 Series - Fixed Displacement Motor

Position 1 2 3 4 5 6 7 8 9
HMA
HMA 280 P C10 N 30 I E F 260

Example:

FRAME SIZE		
165	210	280
●	-	-
-	●	-
-	-	●

1 DISPLACEMENT

165 - 165.0 cc/r (10.06 cir)
 210 - 210.0 cc/r (12.81 cir)
 280 - 280.0 cc/r (17.08 cir)

●	●	●
○	○	○

2 PTO

X - Non-PTO motor
 P - PTO Motor design

○	○	○
○	○	○
○	○	○
○	○	○
○	○	○
○	○	○
○	○	○

3 FLUSHING RELIEF

C05 - Closed Loop, 5 bar (73 psi), 10 lpm flushing only.
 C10 - Closed Loop, 10 bar (145 psi), 10 or 30 lpm flushing.
 C14 - Closed Loop, 14 bar (203 psi), 10 or 30 lpm flushing.
 C20 - Closed Loop, 20 bar (290 psi), 10 lpm flushing only.
 C25 - Closed Loop, 25 bar (263 psi), 10 lpm flushing only.
 O05 - Open Loop, 5 bar (73 psi), 4 lpm flushing only.
 BXX - Blocked purge valve cartridge

●	●	●
○	○	○
○	○	○

4 SHUTTLE

N - Standard
 B - Blocked
 D - Dampened shuttle

○	○	○
●	●	●
○	○	○
○	○	○

5 FLUSHING CHARACTERISTICS

04 - 4 lpm (1 gpm). Open loop only.
 10 - 10 lpm (2.6 gpm). Closed loop only.
 30 - 30 lpm (8 gpm). Closed loop only.
 X - None (Applies when "B - Blocked" is selected in Pos. 4)

●	●	●
---	---	---

6 PORTING

I - Metric Straight Thread with O-Ring Seal (ISO 6149)
 NOTE: High Pressure Work Ports "A" and "B" are SAE Code 62 with Metric Threads (ISO 6162)

●	●	-
-	-	●

7 MOUNTING

D - SAE D, 2-Bolt
 E - SAE E, 2-Bolt

●	-	-
-	●	●
○	○	-
-	-	○

8 SHAFT

D - SAE D 13T, 8/16 dP
 F - SAE F 15T, 8/16 dP
 M - ANSI 27T, 16/32 dP
 N - ANSI 33T, 16/32 dP
 Shafts are manufactured to ANSI B92.1 specifications

●	●	●
○	○	○

9 DISPLACEMENT SETTING

X - Standard Setting (Unit Not Destroyed)
 ___ - Specify Setting in cc/rev (1 cc/rev = 0.061 cir)

- = Standard
- = Option
- c = Special, Consult Factory
- = Not Available
- * = With Restriction(s)
- ▲ = In Development. Consult Factory.

Model Code for HMA -02 Series - Fixed Displacement Motor

10

11

12

13

14

S = _____

(Only when "S" is selected in pos. 14. Specify requirement(s)). Otherwise omit "S ="

X

A

X

2

X

14 SPECIALS

X - None
S - Call out requirement(s) in clear text or use specified code from factory.

13 PRODUCTION LEVEL

2 - Assigned at Factory

12 ADDITIONS

X - None
P - Speed Pick-Up

11 PORT ORIENTATION

A - Radial (Side)

10 CROSS OVER RELIEF

X - Without Crossover Relief
R ___ - High Pressure Crossover Relief Valve
Specify setting in BAR. (1 bar = 14.5 psi)

FRAME SIZE		
165	210	280
●	●	●
c	c	c

●	●	●
---	---	---

●	●	●
c	c	c

●	●	●
---	---	---

●	●	●
○	○	○

Model Code for HMF -02 Series - Fixed Displacement Motor

10 11 12 13
A **X** **2** **X** S = _____

(Only when "S" is selected in pos. 13. Specify requirement(s)). Otherwise omit "S ="

13 SPECIALS

X - None
 S - Call out requirement(s) in clear text or use specified code from factory.

FRAME SIZE							
28	35	50	55	63	75	105	135
●	●	●	-	●	●	●	●
c	c	c	●	c	c	c	c

12 PRODUCTION LEVEL

2 - Assigned at Factory

●	●	●	●	●	●	●	●
---	---	---	---	---	---	---	---

11 ADDITIONS

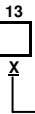
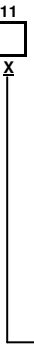
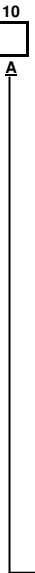
X - None
 H - Hoist Counter Balance Valve
 P - Speed Pick-Up
 T - Counter Balance/Deceleration Valve (Track)
 W - Counter Balance/Deceleration Valve (Wheel)
 V - Integrated VW14 Valve (Priority Swing)
 VW18 Valve (Priority Swing)

●	●	●	-	●	●	●	●
-	-	-	-	c	c	c	c
c	c	c	-	c	c	c	c
-	-	-	-	○	○	○	○
-	-	-	-	○	○	○	○
c	c	-	c	-	-	-	-
-	-	-	-	-	c	c	-

10 PORT ORIENTATION

A - Radial (Side)
 B - Axial (Rear)

●	●	●	●	●	●	●	●
-	-	-	-	-	○*	○*	-



Model Code for HMR -02 Series - Infinitely Variable Displacement Motor

Position
HMR 1 2 3 4 5 6 7 8 9 10 11

Example: **HMR**

210 P E1 M 2 H I E M X 065

FRAME SIZE				
55	75	105	135	165
●	-	-	-	-
-	●	-	-	-
-	-	●	-	-
-	-	-	●	-
-	-	-	-	●

1 DISPLACEMENT

055 - 54.8 cc/r (3.35 cir)
 075 - 75.9 cc/r (4.63 cir)
 105 - 105 cc/r (6.41 cir)
 135 - 135.6 cc/r (8.27 cir)
 165 - 165 cc/r (10.07 cir)

○	●	●	●	●
○	○	○	○	○
○	○	○	○	○
○	○	○	○	○
●	○	○	○	○

2 CONTROL

R - System Pressure Regulating Control
 H - Regulator for Two Position Control (Default to Min, Shift to Max.)
 L - Regulator for Two Position Control (Default to Max, Shift to Min.)
 PR - "R" Control w/ Brake Pressure Shut Off

	E	H	L	M	P	X
BPS Override Option						
Max Displ. Option	E	H	L	M	P	X
"BPS" - Brake Pressure Shut Off	Solenoid	HP Pilot	LP Pilot	Manual	Pneumatic	Blended Oil

●	●	●	●	●
○	○	○	○	○

3 CONTROL OPTION

B - Bi-Directional Regulator Shuttle
 N - None (External Feed to Regulator)

●	●	●	●	●
○	○	○	○	○
○	○	○	○	○
○	○	○	○	○

4 DISPLACEMENT OVERRIDE

E - Electric (Specify Voltage in Pos. 5 & Connector in Pos. 6)
 H - Hydraulic (High Pressure)
 L - Hydraulic (Low Pressure, 20-30 bar (290-435 psi))
 X - Not Applicable

Must Specify w/ Electric Controls				
●	●	●	●	●
●	●	●	●	●
○	○	○	○	○

5 VOLTAGE

1 - 12 Volt DC (E Displacement Override Only, Pos. 4)
 2 - 24 Volt DC (E Displacement Override Only, Pos. 4)
 X - Not Applicable (H, L, or X Displacement Override, Pos. 4)

Must Specify w/ Electric Controls				
○	○	○	○	○
○	○	○	○	○
○	○	○	○	○

6 CONNECTOR TYPE

A - AMP Junior-Timer (E1, E2, E4, & HPE*E* Controls Only)
 H - Hirschmann (E1, E2, E4, & HPE*E* Controls Only)
 X - Not Applicable (H1, H2, H4, or HP** w/o solenoid Controls, Pos. 2)

1 bar = 14.5 psi				
●	●	●	●	●
○	○	○	○	○

7 REGULATION BEGIN

___ - Specify Setting in BAR.
 X - Not Applicable (H or L, Pos. 2. (Preset at 20 bar))

-	●	●	●	-
●	▲	▲	▲	●

8 PORTING

D - Metric Straight Thread Flat Face Seal (DIN 3852)
 I - Metric Straight Thread with O-Ring Seal (ISO 6149)
 NOTE: High Pressure Work Ports "A" and "B" are SAE Code 62 with Metric Threads (ISO 6162)

●	-	-	-	-
-	-	-	●	●
-	-	○	○	-

9 MOUNTING

B - SAE B, 2-Bolt
 C - SAE C, 2-Bolt
 D - SAE D, 2-Bolt
 P - Plug-In

-	○	○	-	-
-	-	-	○	●
-	-	-	-	-
●	-	-	-	-
○	●	-	-	-
-	-	●	-	-
-	-	-	●	▲

10 SHAFT

C - SAE C 14T, 12/24 dP
 D - SAE D 13T, 8/16 dP
 F - SAE F 15T, 8/16 dP
 J - SAE BB 15T, 16/32 dP
 K - ANSI 21T, 16/32 dP
 L - ANSI 23T, 16/32 dP
 M - ANSI 27T, 16/32 dP

Shafts are manufactured to ANSI B92.1 specifications

●	●	●	●	●
○	○	○	○	○

11 MAX DISPLACEMENT

X - Standard Setting (Unit Not Destroyed)
 ___ - Specify Setting in cc/rev (1 cc/rev = 0.061 cir)

Model Code for HMR -02 Series - Infinitely Variable Displacement Motor

12 13 14 15 16 17 18 19 20

C10 N 10 065 X A 2 2 X

S = _____

(Only when "S" is selected in pos. 20. Specify requirement(s)). Otherwise omit "S ="

20 SPECIALS

X - None
S - Call out requirement(s) in clear text or use specified code from factory.

FRAME SIZE				
55	75	105	135	165
●	●	●	●	●
c	c	c	c	c

19 PRODUCTION LEVEL

2 - Assigned at Factory

●	●	●	●	●
---	---	---	---	---

18 ADDITIONS

X - None
P - Speed Pick-Up
T - Counter Balance/Deceleration Valve (Track)
W - Counter Balance/Deceleration Valve (Wheel)

●	●	●	●	●
-	c	c	c	-
-	○	○	○	-

17 PORT ORIENTATION

A - Radial (Side)
B - Axial (Rear)

●	●	●	●	-
-	○*	○*	○*	●

16 RELIEF VALVE

X - Without Crossover Relief
P - Plugged crossover relief cavity
R___ - Specify setting in bar
Specify setting in BAR. (1 bar = 14.5 psi)
(Bolt On Style - Only use Rear Head with Blocked or Plain Purge, pos.14)

Std. Setting for High Pressure Crossover Relief Valve (Adjustment Range: 80 to 420 bar (1160 to 6000 psi))	bar (psi)
	210 (3045)
	230 (3335)
	250 (3625)
	270 (3915)
350 (5075)	
420 (6090)	

●	●	●	●	●
-	○	○	○	○
c	○	○	○	○

15 FLUSHING CHARACTERISTICS

04 - 4 lpm (1 gpm). Open loop only.
10 - 10 lpm (2.6 gpm). Closed loop only.
30 - 30 lpm (8 gpm). Closed loop only.
X - None (Applies when "B - Blocked" is selected in Pos. 14)

○	○	○	○	○
●	●	●	●	○
○	○	○	○	●
○	○	○	○	○

14 SHUTTLE

N - Standard
B - Blocked
D - Dampened shuttle

●	●	●	●	●
○	○	○	○	○
○	○	○	○	○

13 FLUSHING RELIEF

C05 - Closed Loop, 5 bar (73 psi), 10 lpm flushing only.
C10 - Closed Loop, 10 bar (145 psi), 10 or 30 lpm flushing.
C14 - Closed Loop, 14 bar (203 psi), 10 or 30 lpm flushing.
C20 - Closed Loop, 20 bar (290 psi), 10 lpm flushing only.
C25 - Closed Loop, 25 bar (263 psi), 10 lpm flushing only.
O05 - Open Loop, 5 bar (73 psi), 4 lpm flushing only.
BXX - Blocked purge valve cartridge
PXX - Plain, without purge valve

●	○	○	○	○
○	●	●	●	●
○	○	○	○	○
-	○	○	○	○
-	○	○	○	○
○	●	●	●	●
○	○	○	○	○
-	○	○	○	○

12 MIN DISPLACEMENT

___ - Specify Setting in cc/rev
(1 cc/rev = 0.061 cir)

●	●	●	●	●
---	---	---	---	---

- = Standard
- = Option
- c = Special, Consult Factory
- = Not Available
- * = With Restriction(s)
- ▲ = In Development. Consult Factory.

Model Code for HMV -02 Series - Infinitely Variable Displacement Motor

Position
HMV

Example: **HMV**

1 2 3 4 5 6 7 8 9 10

 210 P E1 M 2 H I E M X

FRAME SIZE							
55	75	105	135	135D	165	210	280
●	-	-	-	-	-	-	-
-	●	-	-	-	-	-	-
-	-	●	-	-	-	-	-
-	-	-	●	-	-	-	-
-	-	-	-	●	-	-	-
-	-	-	-	-	●	-	-
-	-	-	-	-	-	●	-
-	-	-	-	-	-	-	●

●	●	●	●	●	●	●	●
-	-	-	-	-	-	-	-

●	●	●	●	●	●	●	●
○	○	○	○	○	○	○	○
○	○	○	○	○	○	○	○
-	-	-	-	-	-	-	-
○	○	○	○	○	○	○	○
○	○	○	○	○	○	○	○
○	○	○	○	○	○	○	○
○	○	○	○	○	○	○	○

NOTE: E1, E2, H1, and H2 require an external servo supply pressure.

○	○	○	○	○	○	○	○
○	○	○	○	○	○	○	○
○	○	○	○	○	○	○	○
○	○	○	○	○	○	○	○
○	○	○	○	○	○	○	○
○	○	○	○	○	○	○	○
○	○	○	○	○	○	○	○
○	○	○	○	○	○	○	○

Must Specify w/ Electric Controls.							
●	●	●	●	●	●	●	●
○	○	○	○	○	○	○	○

Must Specify w/ Electric Controls.							
○	○	○	○	○	○	○	○
○	○	○	○	○	○	○	○

●	●	●	●	-	-	-	-
▲	▲	▲	○	●	●	●	●

●	●	●	-	-	-	-	-
-	-	-	●	●	●	●	●
-	-	-	-	-	-	-	-
-	○	○	○	-	-	-	-

●	●	●	-	-	-	-	-
-	-	-	●	●	●	●	●
-	-	-	-	-	-	-	-
○	○	-	-	-	-	-	-
-	-	○	-	○	○	-	-
-	-	-	○	-	-	-	-
-	-	-	-	-	-	-	-

●	●	●	●	●	●	●	●
○	○	○	○	○	○	○	○

1 DISPLACEMENT

- 055 - 54.8 cc/r (3.35 cir)
- 075 - 75.9 cc/r (4.63 cir)
- 105 - 105 cc/r (6.41 cir)
- 135 - 135.6 cc/r (8.27 cir)
- 135D - 2 x 135.6 cc/r (2 x 8.27 cir)
- 165 - 165 cc/r (10.07 cir)
- 210 - 210 cc/r (12.81 cir)
- 280 - 280 cc/r (17.08 cir)

2 PTO

- X - Non-PTO motor
- P - PTO Motor design

3 CONTROL TYPE

- E1 - Electric Infinitely Variable Control.
- E2 - Electric Two Position Control (2-Speed)
- E4 - Electric Infinitely Variable (E1) w/ Zero Displacement.
- E6 - Electric Infinitely Variable, Shifts from Zero to Max Displ.
- H1 - Hydraulic Infinitely Variable Control.
- H2 - Hydraulic Two Position Control (2-Speed)
- H3 - Hydraulic Infinitely Variable Control (4-16 bar)
- H4 - Hydraulic Infinitely Variable (H1) w/ Zero Displacement
- HP - H1 Control w/ Pressure Override (POR)

BPS Override Option	E	H	L	M	P	X
Max Displ. Option	E	H	L	M	P	X
"BPS" - Brake Pressure Shut Off	Solenoid	HP Pilot	LP Pilot	Manual	Pneumatic	Blanked Off

4 CONTROL RANGE

- J - 3-23 bar (44-334 psi)
- K - 4-10 bar (58-145 psi)
- L - 8-14 bar (116-203 psi)
- M - 10-16 bar (145-232 psi)
- N - 4-16 bar (58-232 psi), [H4 control (4-15 bar)]
- P - 17-23 bar (247-334 psi)
- X - Not Applicable (E2 and H2 Controls, Pos. 2)

5 VOLTAGE

- 1 - 12 Volt DC (E1, E2, E4, & HPE*E* Controls Only.)
- 2 - 24 Volt DC (E1, E2, E4, & HPE*E* Controls Only.)
- X - Not Applicable (H1, H2, H4, or HP** w/o solenoid Controls, Pos. 2)

6 CONNECTOR TYPE

- A - AMP Junior-Timer (E1, E2, E4, & HPE*E* Controls Only)
- H - Hirschmann (E1, E2, E4, & HPE*E* Controls Only)
- X - Not Applicable (H1, H2, H4, or HP** w/o solenoid Controls, Pos. 2)

7 PORTING

- D - Metric Straight Thread Flat Face Seal (DIN 3852)
 - I - Metric Straight Thread with O-Ring Seal (ISO 6149)
- NOTE: High Pressure Work Ports "A" and "B" are SAE Code 62 with Metric Threads (ISO 6162)

8 MOUNTING

- C - SAE C, 2-Bolt
- D - SAE D, 2-Bolt
- E - SAE E, 2-Bolt
- P - Plug-In

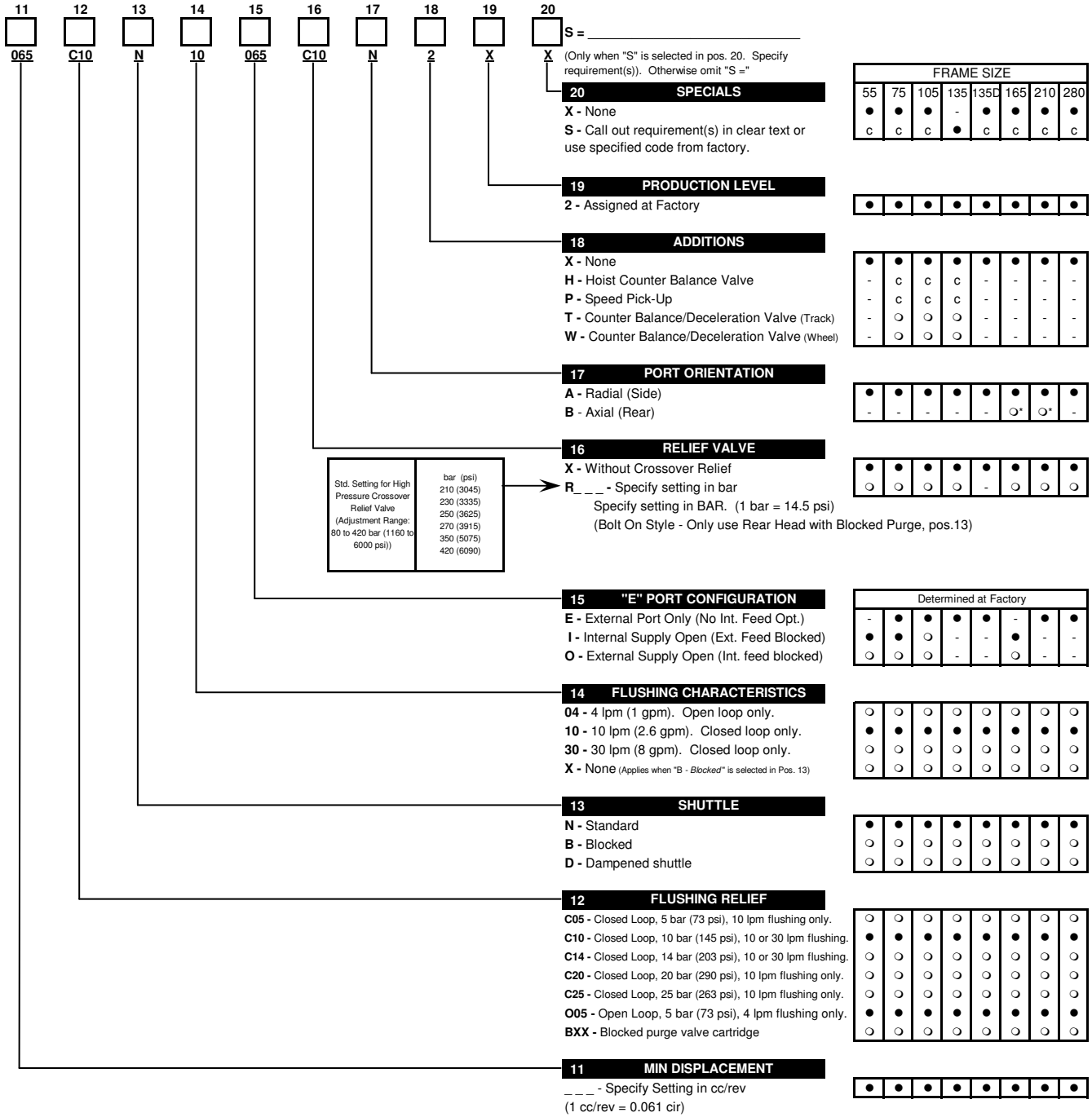
9 SHAFT

- C - SAE C 14T, 12/24 dP
 - D - SAE D 13T, 8/16 dP
 - F - SAE F 15T, 8/16 dP
 - K - ANSI 21T, 16/32 dP
 - L - ANSI 23T, 16/32 dP
 - M - ANSI 27T, 16/32 dP
 - N - ANSI 33T, 16/32 dP
- Shafts are manufactured to ANSI B92.1 specifications

10 MAX DISPLACEMENT

- X - Standard Setting (Unit Not Destroyed)
- ___ - Specify Setting in cc/rev (1 cc/rev = 0.061 cir)

Model Code for HMV -02 Series - Infinitely Variable Displacement Motor



- = Standard
- = Option
- c = Special, Consult Factory
- = Not Available
- * = With Restriction(s)
- ▲ = In Development. Consult Factory.

Model Code for HPR -02 Series - Variable Displacement Open Loop Pumps



Example:

FRAME SIZE						
55	75	105	105D	135	165	210
●	-	-	-	-	-	-
-	●	-	-	-	-	-
-	-	●	-	-	-	-
-	-	-	●	-	-	-
-	-	-	-	●	-	-
-	-	-	-	-	●	-
-	-	-	-	-	-	●

-	●	●	○	●	●	●
●	●	●	●	●	-	-

Viewed from Input Shaft End						
●	●	●	●	●	●	●
●	●	●	●	●	●	●

●	●	●	●	-	-	-
c	*	*	*	●	●	●

●	●	●	●	●	●	●
-	○*	-	-	-	▲	▲
-	○*	-	-	-	▲	▲
●	●	●	●	●	●	●
●	●	●	●	●	●	●
●	●	●	●	●	●	●
c	c	c	c	c	c	c

Must Specify w/ E1L Control						
●	●	●	●	●	●	●
●	●	●	●	●	●	●
○	○	○	○	○	○	○
○	○	○	○	○	○	○

Must Specify w/ Electric Control						
●	●	●	●	●	●	●
○	○	○	○	○	○	○
○	○	○	○	○	○	○

●	●	●	-	-	-	-
-	-	-	-	●	●	-
-	-	-	-	-	-	●
-	-	-	●	○	-	-
-	-	-	-	○	○	-
-	-	-	-	-	-	○
-	-	-	●	○	-	-

●	●	●	-	-	-	-
-	-	○	-	○	-	-
-	-	-	-	●	●	-
-	-	-	-	-	-	●
○	○	-	-	-	-	-
-	-	○	●	-	-	-
-	-	-	-	○	-	-

Must Specify w/ LP or PO Control						
○	○	○	○	○	○	○
○	○	○	○	○	○	○
○	○	○	○	○	○	○
●	●	●	●	●	●	●
●	●	●	●	●	●	●
○	○	○	○	○	○	○

1 DISPLACEMENT

- 055 - 54.8 cc/r (3.35 cir)
- 075 - 75.9 cc/r (4.63 cir)
- 105 - 105 cc/r (6.41 cir)
- 105D - 105(x2) cc/r (12.81 cir)
- 135 - 135.6 cc/r (8.27 cir)
- 165 - 165 cc/r (10.1 cir)
- 210 - 210 cc/r (12.81 cir)

2 SPU

- S - SPU
- X - Without SPU

3 ROTATION

- R - Right (CW)
- L - Left (CCW)

4 PORTING

- D - Metric Straight Thread Flat Face Seal (DIN 3852)
 - I - Metric Straight Thread with O-Ring Seal (ISO 6149)
- NOTE: High Pressure Work Ports "P" and "S" are SAE Code 62 with Metric Threads (ISO 6162)

5 CONTROL TYPE

- LP - Load Sense w/ Pressure Compensation (Specify P.C. setting in Pos. 10)
- E1L - Load Sense w/ Power Mode Valve (Must specify Pos. 6 and 7)
- TL - Load Sense w/ Power Limiter (Specify HP and Speed setting in Pos. 16)
- TL2 - Load Sense w/ Power Limiter (Specify HP and Speed setting in Pos. 16)
- LO - Load Sense Only (Pressure compensator canceled)
- PO - Pressure Compensation Only (Specify P.C. setting in Pos. 10)
- X - Special (Specify in Pos. 16)

6 VOLTAGE

- 1 - 12 Volt DC (E1L control only)
- 2 - 24 Volt DC (E1L control only)
- 3 - No Solenoid (Blanked off for remote control. E1L control only)
- X - Not Applicable

7 CONNECTOR TYPE

- H - Hirschmann
- A - AMP Junior-Timer
- X - Not Applicable

8 MOUNTING

- C - SAE C, 2-Bolt
- D - SAE D, 2-Bolt
- E - SAE E, 4-Bolt
- P - Plug-In
- D3 - SAE D Mount w/ SAE #3 Engine Mount
- E3 - SAE E Mount w/ SAE #3 Engine Mount
- P3 - Plug-In Mount w/ SAE #3 Engine Mount

9 SHAFT

- C - SAE C 14T, 12/24 dP
 - G - SAE C-C 17T, 12/24 dP
 - D - SAE D 13T, 8/16 dP
 - F - SAE F 15T, 8/16 dP
 - K - ANSI 21T, 16/32 dP
 - L - ANSI 23T, 16/32 dP
 - M - ANSI 27T, 16/32 dP
- Shafts are manufactured to ANSI B92.1 specifications

10 COMPENSATOR (PCO)

- Specify Spring Range and Setting in BAR.
- K___ - 80 to <125 bar (1160 - <1800 psi)
 - L___ - 125 to <230 bar (1800 - <3335 psi)
 - M___ - 230 to <350 bar (3335 - <5075 psi)
 - N___ - 350 to 420 bar (5075 - 6090 psi)
 - X - Not using pressure compensated control (LP or PO)

- = Standard
- = Option
- c = Special, Consult Factory
- = Not Available
- * = With Restriction(s)
- ▲ = In Development. Consult Factory.

Model Code for HPV -02 Series - Variable Displacement Close Loop Pump

Position
HPV 1 2 3 4 5 6 7 8 9 10

Example: HPV 210 R I E1P C 10 A I D H

FRAME SIZE						
55	75	105	135	165	210	280
●	-	-	-	-	-	-
-	●	-	-	-	-	-
-	-	●	-	-	-	-
-	-	-	●	-	-	-
-	-	-	-	●	-	-
-	-	-	-	-	●	-
-	-	-	-	-	-	●

Viewed from Input Shaft End						
●	●	●	●	●	●	●
●	●	●	●	●	●	●

●	●	●	●	-	-	-
▲	●*	●*	●*	●	●	●

●	●	●	●	●	●	●
●	●	●	●	●	●	●
●	●	●	●	●	●	●
●	●	●	●	●	●	●
-	○	○	○	○	○	○
○	○	○	○	○	○	○
●	●	●	●	●	●	●
●	●	●	●	●	●	●
○*	○*	-	-	-	-	-
○	○	▲	▲	▲	▲	▲

●	●	●	●	●	●	●
●	●	●	●	●	●	●
○	○	○	○	○	○	○

Orifice Diameter						
●	●	●	●	●	●	●
○	○	○	○	○	○	○
○	○	○	○	○	○	○
○	○	○	○	○	○	○
○	○	○	○	○	○	○

Must Specify w/ Electric Control						
●	●	●	●	●	●	●
○	○	○	○	○	○	○
○	○	○	○	○	○	○
○	○	○	○	○	○	○

Must Specify w/ Electric Control						
●	●	●	●	●	●	●
●	●	●	●	●	●	●

●	●	●	-	-	-	-
-	-	-	●	●	●	●
-	-	-	-	-	●	●
-	-	-	○	○	○	○

●	●	●	-	-	-	-
-	○	○	○	-	-	-
-	-	-	●	-	-	-
-	-	-	-	●	○	-
○	○	-	-	-	-	-
-	-	○	-	-	-	-
-	-	-	○	●	○	-
-	-	-	-	-	-	●

1 DISPLACEMENT
 055 - 54.8 cc/r (3.35 cir)
 075 - 75.9 cc/r (4.63 cir)
 105 - 105 cc/r (6.41 cir)
 135 - 135.6 cc/r (8.27 cir)
 165 - 165 cc/r (10.07 cir)
 210 - 210 cc/r (12.81 cir)
 280 - 280 cc/r (17.08 cir)

2 ROTATION
 R - Right (CW)
 L - Left (CCW)

3 PORTING
 D - Metric Straight Thread Flat Face Seal (DIN 3852)
 I - Metric Straight Thread with O-Ring Seal (ISO 6149)
 NOTE: High Pressure Work Ports "P*" and "S*" are SAE Code 62 with Metric Threads (ISO 6162)

4 CONTROL TYPE
 E1 - Electro-Hydraulic Control, Non-POR
 E1P - Electro-Hydraulic Control with POR
 E2 - Electro-Hydraulic Control with Third (3rd) Switching Solenoid
 H1 - Hydraulic Control, Non-POR
 H1P - Hydraulic Control with POR
 H2 - Hydraulic Control with Horse Power Module (Must specify HP setting.)
 H2TF - Hydraulic Control with Integrated Horse Power Feedback (Must specify HP setting.)
 M1 - Mechanical-Hydraulic Control, Non-POR (Offset Lever)
 M2P - Mechanical-Hydraulic Control with POR (Flat Lever)
 AP - Automotive Control
 CA - Automotive Control

5 CONTROL RANGE
 A - 2-8 bar (29-116 psi) (Only Available in H or H1P Controls.)
 B - 4-10 bar (58-145 psi)
 C - 4-16 bar (58-232 psi)
 X - Not Applicable (Manual Lever Control, M1 or M2P)

12V Rb: 450 mA, Re: 820 mA	24V Rb: 225 mA, Re: 410 mA
12V Rb: 450 mA, Re: 1200 mA	24V Rb: 225 mA, Re: 600 mA

6 RESPONSE ORIFICES
 08 - 0.8 mm Diameter (Standard for M1, M2P, H1, H1P)
 10 - 1.0 mm Diameter (Standard for E1, E1P, E2) **Additional Option for Orifice Size:**
 12 - 1.2 mm 06 - 0.6 mm 13 - 1.3 mm
 18 - 1.8 mm 07 - 0.7 mm 15 - 1.5 mm
 21 - 2.1 mm 09 - 0.9 mm 16 - 1.6 mm
 N - No Orifices 11 - 1.1 mm 19 - 1.9 mm

7 CONNECTOR TYPE
 H - Hirschmann
 A - AMP Junior-Timer
 D - Deutsch
 X - Not Applicable

8 VOLTAGE
 1 - 12 Volt DC
 2 - 24 Volt DC
 X - Not Applicable

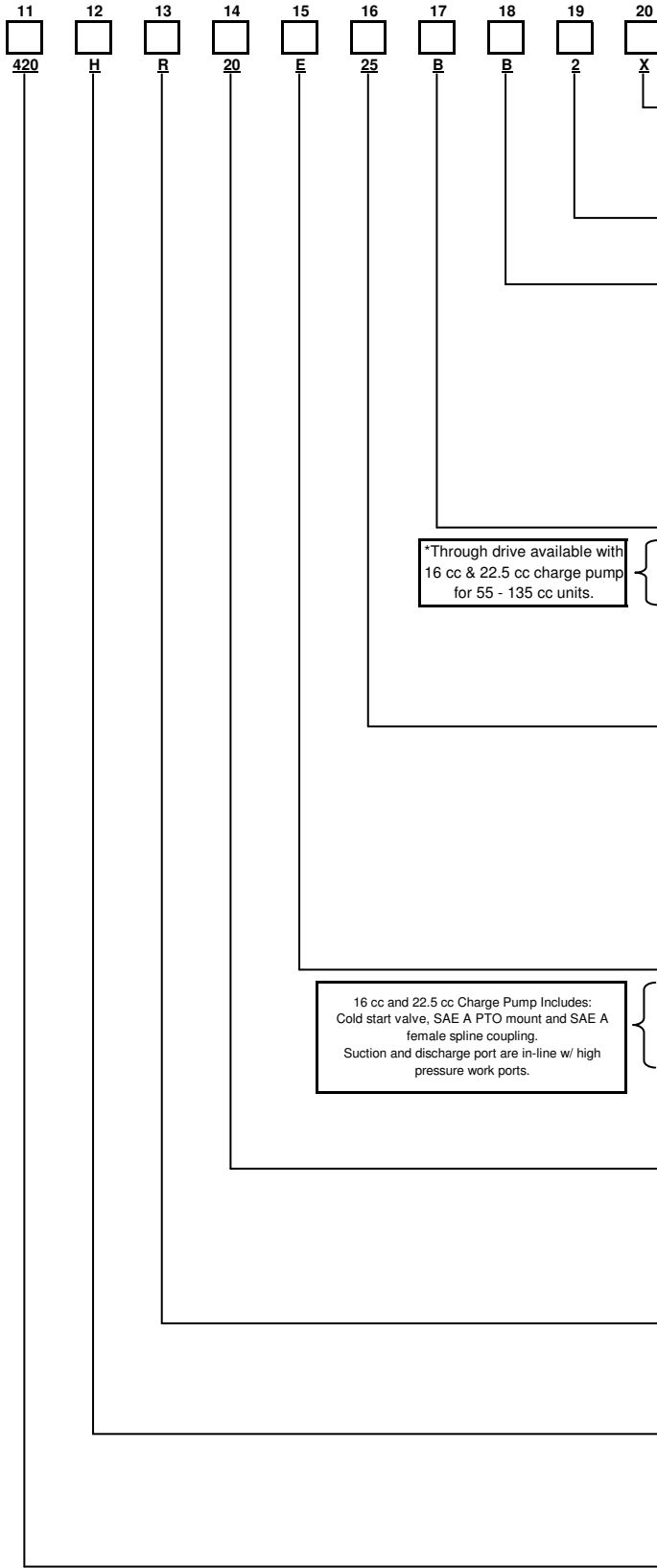
9 MOUNTING
 C - SAE C, 2-Bolt
 D - SAE D, 2-Bolt
 E - SAE E, 4-Bolt
 3 - SAE #3 Engine Mount (base unit with SAE D or E mount)

10 SHAFT
 C - SAE C 14T, 12/24 dP
 G - SAE C-C 17T, 12/24 dP
 D - SAE D 13T, 8/16 dP
 F - SAE F 15T, 8/16 dP
 K - ANSI 21T, 16/32 dP
 L - ANSI 23T, 16/32 dP
 M - ANSI 27T, 16/32 dP
 N - ANSI 33T, 16/32 dP

Shafts are manufactured to ANSI B92.1 specifications

- = Standard
- = Option
- c = Special, Consult Factory
- = Not Available
- * = With Restriction(s)
- ▲ = In Development. Consult Factory.

Model Code for HPV -02 Series - Variable Displacement Close Loop Pump



S = _____

(Only when "S" is selected in pos. 20. Specify requirement(s)). Otherwise omit "S ="

20 SPECIALS

X - None
 S - Call out requirement(s) in clear text or use specified code from factory.

19 PRODUCTION LEVEL

2 - Assigned at Factory

18 COUPLING - THROUGH DRIVE

X - No Coupling
 A - SAE A 9T, 16/32 dP
 B - SAE B 13T, 16/32 dP
 J - SAE B-B 15T, 16/32 dP
 C - SAE C 14T, 12/24 dP
 G - SAE C-C 17T, 12/24 dP
 D - SAE D 13T, 8/16 dP
 F - SAE F 15T, 8/16 dP
 S - Special (Specify in pos. 20)

17 MOUNT - THROUGH DRIVE

*Through drive available with 16 cc & 22.5 cc charge pump for 55 - 135 cc units.

A - SAE A, 2-Bolt mount.*
 B - SAE B, 2-Bolt mount.*
 C - SAE C, 2-Bolt mount.*
 D - SAE D, 2-Bolt mount. (Without charge pump)
 E - SAE E, 4-Bolt mount. (Without charge pump)
 X - Charge pump w/o through drive

* Note: Through drive torque capacity limited when used with charge pump.

16 COLD START RELIEF VALVE

(Integrated into 16 and 22.5 cc/r charge pumps.)

21 - 21 bar (305 psi)
 24 - 24 bar (348 psi)
 25 - 25 bar (363 psi)
 30 - 30 bar (435 psi)
 32 - 32 bar (464 psi)
 36 - 36 bar (522 psi)
 38 - 38 bar (551 psi)
 P - Plugged
 X - Not Applicable ("X - No Charge Pump")

15 CHARGE PUMP

16 cc and 22.5 cc Charge Pump Includes:
 Cold start valve, SAE A PTO mount and SAE A female spline coupling.
 Suction and discharge port are in-line w/ high pressure work ports.

T - (Tandem) 2x16 cc/rev (2x0.976 cir)
 2x22.5 cc/rev (2x1.373 cir)
 E - 16 cc/rev (0.976 cir)
 22.5 cc/rev (1.373 cir)
 38 cc/rev (2.32 cir) (No Through Drive)
 44 cc/rev (2.68 cir) (No Through Drive)
 X - No Charge Pump

14 CHARGE RELIEF VALVE

19 - 19 bar (276 psi)
 20 - 20 bar (290 psi)
 23 - 22.5 bar (327 psi)
 24 - 24 bar (348 psi)
 D1 - D1.0 mm Orifice w/o Relief Valve

13 FILTRATION INLET ORIENTATION

R - Inlet Facing Rear of Pump
 F - Inlet Facing Front of Pump
 X - Not Applicable (Only "0" Option Pos. 12)

12 FILTRATION

F - Filter (Standard).
 H - Filter (Reinforced).
 0 - Filter Elimination Block (FEB), 0 degrees
 9 - Filter Elimination Block (FEB), 90 degrees

11 SYSTEM RELIEF VALVE

150 - 150 bar (2175 psi)
 200 - 200 bar (2900 psi)
 250 - 250 bar (3625 psi)
 285 - 285 bar (4133 psi)
 300 - 300 bar (4350 psi)
 305 - 305 bar (4423 psi)
 350 - 350 bar (5075 psi)
 360 - 360 bar (5220 psi)
 380 - 380 bar (5510 psi)
 400 - 400 bar (5800 psi)
 420 - 420 bar (6090 psi)
 435 - 435 bar (6308 psi)
 445 - 445 bar (6453 psi)

FRAME SIZE						
55	75	105	135	165	210	280
●	●	●	●	●	●	●
c	c	c	c	c	c	c

●	●	●	●	●	●	3	●
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All Splines are ANSI B92.1						
●	●	●	●	●	●	●
○	○	○	○	○	○	○
○	○	○	○	○	○	○
○	○	○	○	○	○	○
○	○	○	○	○	○	○
-	-	-	○	-	-	○
-	-	-	○	○	○	○
-	-	-	-	-	○	○
c	c	c	c	c	c	c

●	●	●	●	●	●	●
○	○	○	○	○	○	○
○	○	○	○	○	○	○
○	○	○	○	○	○	○
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-	-	-	-	-	○	○
○	○	○	○	○	○	○

○	○	○	○	-	-	-
●	●	●	●	-	-	-
○	○	○	○	●	-	-
○	○	○	○	-	-	-
○	○	○	○	-	-	-
○	○	○	○	-	-	-
○	○	○	○	-	-	-
○	○	○	○	-	-	-
○	○	○	○	●	●	●

○	○	○	○	-	-	-
○	○	○	○	-	-	-
○	○	○	○	-	-	-
○	○	○	○	-	-	-
○	○	○	○	-	-	-
○	○	○	○	-	-	-
○	○	○	○	-	-	-
○	○	○	○	-	-	-
○	○	○	○	●	●	●

Specify Setting in BAR. (1 bar = 14.5 psi)						
●	●	●	●	●	●	●
○	○	○	○	○	○	○
○	○	○	○	-	○	○
○	○	○	○	-	-	-
○	○	○	○	-	-	-

Charge / Make-Up Flow Inlet.						
●	●	●	●	●	●	●
○	○	○	○	○	○	○
○	○	○	○	-	-	-

●	●	●	●	●	●	-
○	○	○	○	○	○	●
○	○	○	○	○	○	○
○	○	○	○	○	○	○

Specify Setting in BAR. (1 bar = 14.5 psi)						
○	○	○	-	-	-	-
○	○	○	○	○	○	○
○	○	○	○	○	○	○
-	-	-	-	-	-	-
○	○	○	○	○	○	○
-	○	○	-	-	-	-
○	○	○	○	○	○	○
-	○	○	-	-	-	-
○	○	○	○	○	○	○
○	○	○	○	○	○	○
○	○	○	○	○	○	○
○	○	○	○	○	○	○

Model Code for HPV -02 Series - Variable Displacement Close Loop Pump

FRAME SIZE						
55	75	105	135	165	210	280

●	●	●	●	●	●	●
●	●	●	●	●	●	●
●	●	●	●	●	●	●
○	○	○	○	○	○	○
○	○	○	○	○	○	○

5 CONTROL RANGE

- A - 2-8 bar (29-116 psi) (Only Available in H or H1P Controls.)
 B - 4-10 bar (58-145 psi)

12V	Rb: 450 mA, Re: 820 mA	24V	Rb: 225 mA, Re: 410 mA
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 C - 4-16 bar (58-232 psi)

12V	Rb: 450 mA, Re: 1200 mA	24V	Rb: 225 mA, Re: 600 mA
-----	-------------------------	-----	------------------------

D - 6-12 bar (87-174 psi)
 X - Not Applicable (Manual Lever Control, M1 or M2P)

Must Specify w/ Electric Control						
●	●	●	●	●	●	●
○	○	○	○	○	○	○
○	○	○	○	○	○	○
○	○	○	○	○	○	○

7 CONNECTOR TYPE

- H - Hirschmann
 A - AMP Junior-Timer
D - Deutsch
 X - Not Applicable

●	●	●	-	-	-	-
-	-	-	●	-	-	-
-	-	-	-	-	●	○
-	-	○	○	-	-	-
-	-	-	-	-	-	-
○	○	-	-	-	-	-
-	-	○	-	-	-	-
-	-	-	○	●	○	-
-	-	-	-	-	-	●

10 SHAFT

- C - SAE C 14T, 12/24 dP
 D - SAE D 13T, 8/16 dP
 F - SAE F 15T, 8/16 dP
 G - SAE C-C 17T, 12/24 dP
J - SAE BB 15T, 16/32 dP
K - ANSI 21T, 16/32 dP
L - ANSI 23T, 16/32 dP
M - ANSI 27T, 16/32 dP
N - ANSI 33T, 16/32 dP
 Shafts are manufactured to ANSI B92.1 specifications

Model Code for HPV -02 Series - Variable Displacement Close Loop Pump