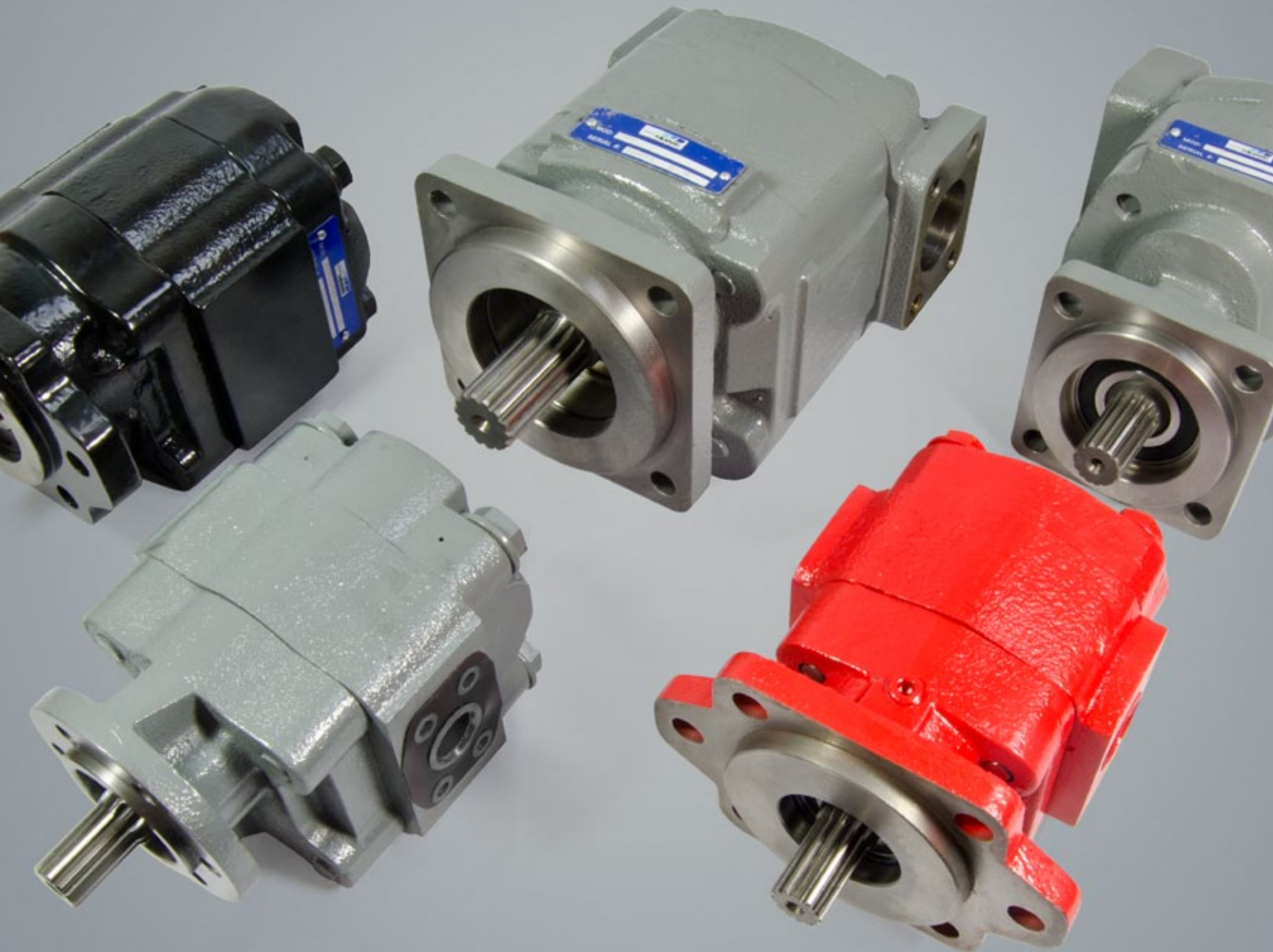


Genuine Metaris Gear Product Technical Catalog

Pumps & Components - MH Series Bearing & Bushing Style



MH330 Series Bushing Pump

Features

Metaris Bushing Pumps & Motors are available in 4 models with many of the same available options as Metaris Bearing Pumps. With ductile iron housings, these pumps offer pressure ratings as high as 3500 psi for the most demanding of applications.

- Heavy Duty Sleeve Bushing Design
- Dowelled and Rugged Cast Iron Construction
- Pressure Balanced Wear Plates
- Working Pressure up to 3500 psi
- Multiple Bearing Carrier Options
- NPT & SAE Port Options
- High Strength Steel Gear & Shaft Sets



Specifications

MH330		DISPLACEMENT		MAX PRESSURE	
GEAR WIDTH		IN ³ /REV	(CM ³ /REV)	PSI	BAR
.05	1/2"	.99	(16.1)	3500	(241)
.07	3/4"	1.48	(24.2)	3500	(241)
1.00	1"	1.97	(32.3)	3500	(241)
1.25	1-1/4"	2.46	(40.4)	3500	(241)
1.50	1-1/2"	2.96	(48.4)	3500	(241)
1.75	1-3/4"	3.45	(56.5)	3250	(224)
2.00	2"	3.94	(64.6)	3000	(207)

MH330 Series Bushing Pump

Pump Performance Data

SPEED RPM	GEAR WIDTH (GPM/LPM)						
	1/2"	3/4"	1"	1-1/4"	1-1/2"	1-3/4"	2"
900	3.2 / 12	5.1 / 19	7 / 26	8.8 / 33	10.6 / 40	12.4 / 47	14.3 / 54
1200	4.5 / 17	7 / 26	9.5 / 36	12 / 45	14.5 / 55	16.9 / 64	19.4 / 73
1500	5.8 / 22	8.9 / 34	12.1 / 46	15.2 / 57	18.3 / 69	21.4 / 81	24.5 / 93
1800	7.1 / 27	10.8 / 41	14.7 / 55	18.4 / 70	22.1 / 84	25.9 / 98	29.6 / 112
2100	8.4 / 32	12.7 / 48	17.2 / 65	21.6 / 82	26 / 98	30.3 / 115	34.7 / 131
2400	9.6 / 36	14.7 / 55	19.8 / 75	24.8 / 94	29.8 / 113	34.8 / 132	39.8 / 151
3000	12.2 / 46	18.55 / 70	24.9 / 94	31.2 / 118	37.5 / 142	43.8 / 166	50.1 / 190

Motor Performance Data

SPEED RPM	GEAR WIDTH									
	1" (3500 PSI)		1-1/4" (3500 PSI)		1-1/2" (3500 PSI)		1-3/4" (3250 PSI)		2" (3000 PSI)	
	INPUT FLOW (GPM/LPM)	OUTPUT TORQUE (IN/LBS / NM)	INPUT FLOW (GPM/LPM)	OUTPUT TORQUE (IN/LBS / NM)	INPUT FLOW (GPM/LPM)	OUTPUT TORQUE (IN/LBS / NM)	INPUT FLOW (GPM/LPM)	OUTPUT TORQUE (IN/LBS / NM)	INPUT FLOW (GPM/LPM)	OUTPUT TORQUE (IN/LBS / NM)
900	10.1 / 38	1010 / 114.1	12.3 / 47	1270 / 143.5	14.5 / 55	1530 / 172.9	16.7 / 63	1665 / 188.1	19 / 72	1770 / 200
1200	12.8 / 49	1005 / 113.6	15.7 / 59	1265 / 142.9	18.6 / 70	1525 / 172.3	21.4 / 81	1660 / 187.6	24.3 / 92	1760 / 198.9
1500	15.6 / 59	1000 / 113	19.1 / 72	1255 / 141.8	22.6 / 85	1515 / 171.2	26.1 / 99	1650 / 186.4	29.6 / 112	1750 / 197.7
1800	18.4 / 69	995 / 112.4	22.5 / 85	1250 / 141.2	26.6 / 101	1505 / 170	30.8 / 116	1640 / 185.3	34.9 / 132	1740 / 196.6
2100	21.1 / 80	990 / 111.9	25.9 / 98	1240 / 140.1	30.7 / 116	1495 / 168.9	35.4 / 134	1625 / 183.6	40.2 / 152	1720 / 194.3
2400	23.9 / 90	985 / 111.3	29.3 / 111	1235 / 139.5	34.7 / 131	1480 / 167.2	40.1 / 152	1605 / 181.3	45.5 / 172	1695 / 191.5
3000	29.2 / 110	980 / 110.7	35.9 / 136	1230 / 139	42.6 / 161	1475 / 166.7	49.3 / 186	1595 / 180.2	56 / 212	1685 / 190.4

Note: Input Flow @ 2500psi | Output Torque @ 175 bar

MH330 PL Chart

SHAFT STYLE	INTEGRAL	TWO PIECE
SAE "BB" Spline	13,000	6,250
SAE "BB" Keyed	9,300	6,250
SAE "B" Spline	8,450	6,250
SAE "B" Keyed	6,250	6,250
SAE "C" Spline	*	6,250
SAE "C" Keyed	*	6,250
Connecting Shaft		6,250

Values based on using anti-wear type petroleum oil 150 SUS at 100° F (ISO rating of 32 cSt at 38° C) and 0 psi inlet pressure.

MH330 Series Bushing Pump

Model Code Breakdown

Repeat for Tandem Units

1 2 3 4 5 6 7 8 9 6 7 10
MHP - 330 - A - 1 - 78 - AL - AB - 10 - 98 - AU - * - * - *

Type ¹

MHP = Pump
MHM = Motor

Unit ²

A = Single Unit
B = Tandem Unit
C = Single or Tandem Unit w/ a Continental Shaft
L = Unit w/ Extended Studs

Shaft End Cover ³

1 = Pump w/o Shaft Bearing (Clockwise Rotation)
2 = Pump w/o Shaft Bearing (Counter-clockwise Rotation)
4 = Pump w/ Shaft Bearing (Clockwise Rotation)
5 = Pump w/ Shaft Bearing (Counter-clockwise Rotation)
8 = Motor w/ Shaft Bearing (Bi-Rotational)
9 = Motor w/o Shaft Bearing (Bi-Rotational)

Shaft End Cover ⁴

42 = SAE 4-Bolt "B" Mount
46 = SAE 2/4-Bolt "B" Mount
78 = SAE 4-Bolt "C" Mount
97 = SAE 2-Bolt "B" Mount

Port End Cover ⁵

Unported

		Port Size	
		In	Out
BI		None	None

Side Ported - NPT Codes

CW	CCW	Port Size	
		In	Out
AJ	JA	1-1/4"	1"
AK	KA	1-1/4"	3/4"
AL	LA	1"	1"
AM	MA	1"	3/4"
AR	RA	3/4"	3/4"

Orientation is viewed from the shaft end

Motor - Side Ported - NPT

		Port Size	
		In	Out
DN		1"	1"
DM		1-1/4"	1-1/4"
DQ		1-1/2"	1-1/2"

Side Ported - SAE O-ring

CW	CCW	Port Size	
		In	Out
FJ	JF	1-1/4"	1"
FL	LF	1"	1"
BG	GB	1-1/4"	None
BJ	JB	1"	None
BN	NB	None	1"

Orientation is viewed from the shaft end

Motor - Side Ported - SAE O-ring

		Port Size	
		In	Out
VN		1"	1"
VR		3/4"	3/4"
VC		1-1/4"	1-1/4"

Side Ported - SAE Split Flange

CW	CCW	Port Size	
		In	Out
EJ	JE	1-1/2"	1-1/4"
EK	KE	1-1/2"	1"
EL	LE	1-1/4"	1-1/4"
EM	ME	1-1/4"	1"
EN	NE	1"	1"
OF	FO	1-1/2"	None
OG	GO	1-1/4"	None
OJ	JO	1"	None
OM	MO	None	1-1/4"
ON	NO	None	1"

Orientation is viewed from the shaft end

Motor - Side Ported - SAE Split Flange

		Port Size	
		In	Out
CS		1-1/4"	1-1/4"
CT		1"	1"
CV		3/4"	3/4"

Connecting Shaft ¹⁰

For connecting tandem units
1 = Connecting Shaft - Multiple Units

Bearing Carriers ⁹

See following page for Bearing Carrier options

Shaft Type ⁸

7 = SAE "C" 14 Tooth Spline 1.250" Dia. (Cont. Only)
25 = SAE "B" 13 Tooth Spline .88" Dia.
30 = SAE "B" Keyed .88" Dia. 1/4" x 3/8" x 1" Key
43 = SAE "BB" Keyed 1" Dia. 1/4" x 3/8" x 1-1/4" Key
98 = SAE "BB" 15 Tooth Spline 1" Dia.

Gear Size ⁷

Code / Displacement (in³/r)

05 (.99)	07 (1.48)	10 (1.97)	12 (2.46)	15 (2.96)	17 (3.45)	20 (3.94)
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Gear Housing ⁶

Code	Port Size		
	In	Out	
AB	None	None	Pump
EB	None	None	Motor

MH330 Series Bushing Pump

Model Code Breakdown Cont.

Bearing Carriers ⁹

Dual Outlet Pumps

SAE Split Flange

CW	CCW	Port Size		
		In	Out	Out
AM	MA	2"	1-1/4"	1-1/4"
AN	NA	2"	1-1/4"	1"
AP	PA	2"	1"	1"
AT	TA	1-1/2"	1-1/4"	1-1/4"
AU	UA	1-1/2"	1-1/4"	1"
AV	VA	1-1/2"	1"	1"
AW	WA	1-1/4"	1-1/4"	1-1/4"
AX	XA	1-1/4"	1-1/4"	1"
AY	YA	1-1/4"	1"	1"
AZ	ZA	1"	1"	1"

Orientation is viewed from the shaft end

Dual Outlet Pumps

SAE O-ring

CW	CCW	Port Size		
		In	Out	Out
GV	VG	1-1/2"	1"	1"
GY	YG	1-1/4"	1"	1"
GZ	ZG	1"	1"	1"

Orientation is viewed from the shaft end

Single Outlet Pumps

SAE Split Flange

CW	CCW	Port Size	
		In	Out
HB	BH	2"	1-1/2"
HC	CH	2"	1-1/4"
HF	FH	2"	1"
HL	LH	1-1/2"	1-1/2"
HM	MH	1-1/2"	1-1/4"
HN	NH	1-1/2"	1"
HO	OH	1-1/4"	1-1/4"

Orientation is viewed from the shaft end

Single Outlet Pumps

SAE O-ring

CW	CCW	Port Size	
		In	Out
KM	MK	1-1/2"	1-1/4"
KN	NK	1-1/2"	1"
KO	OK	1-1/4"	1-1/4"
KP	PK	1-1/4"	1"
KQ	QK	1"	1"

Orientation is viewed from the shaft end

Combined Outlet Pumps

SAE Split Flange

CW	CCW	Port Size	
		In	Out
UN	NU	2"	1-1/2"
UO	OU	2"	1-1/4"
UP	PU	1-1/2"	1-1/2"
UQ	QU	1-1/2"	1-1/4"
UR	RU	1-1/4"	1-1/4"

Orientation is viewed from the shaft end

Combined Outlet Motors

SAE Split Flange

		Port Size	
		In	Out
BB		1-1/2"	1-1/2"
CC		1-1/4"	1-1/4"
EE		1"	1"
FF		3/4"	3/4"

Orientation is viewed from the shaft end

Combined Outlet Pumps

SAE O-ring

CW	CCW	Port Size	
		In	Out
PQ	QP	1-1/2"	1-1/4"
PR	RP	1-1/4"	1-1/4"

Orientation is viewed from the shaft end

Combined Outlet Motors

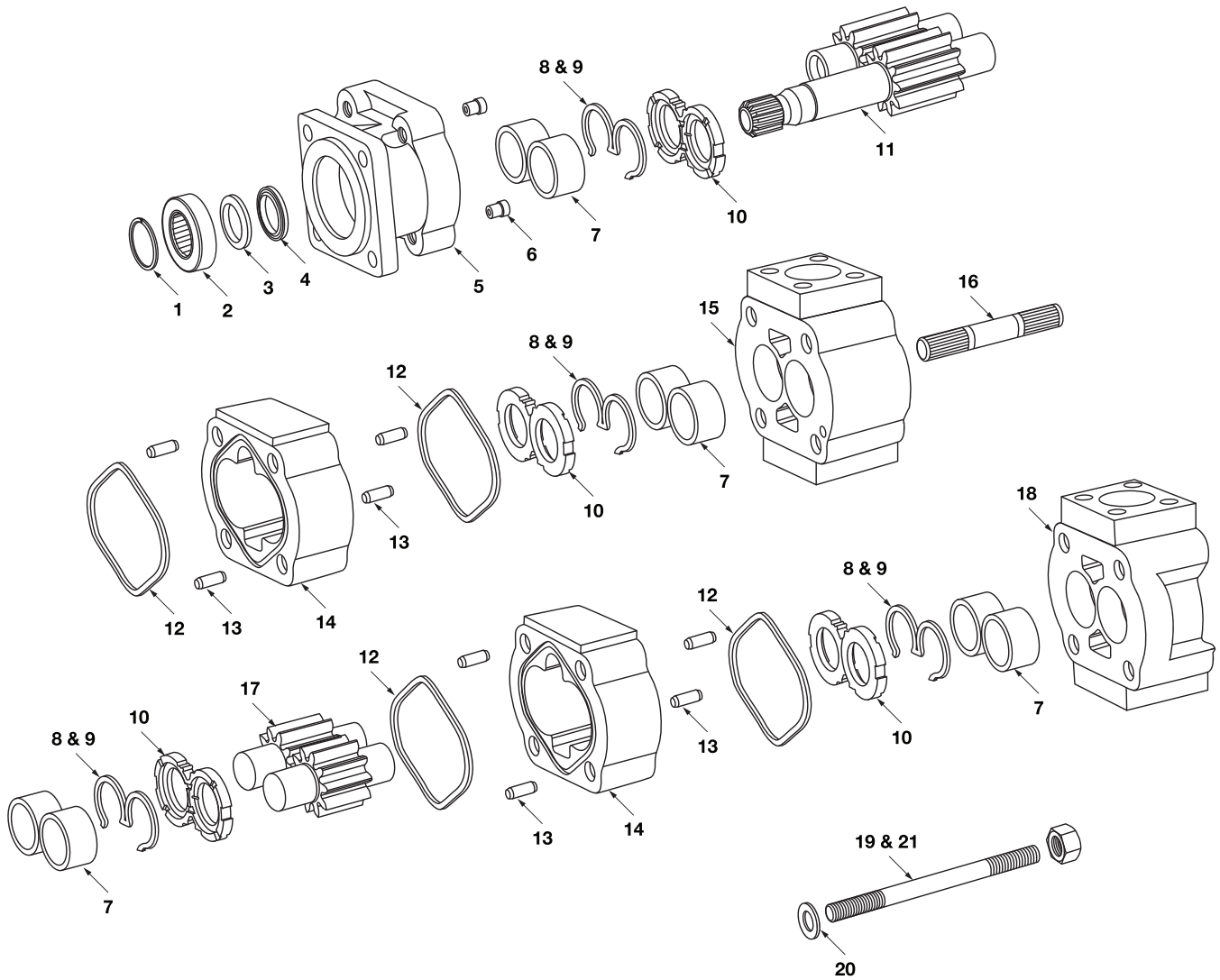
SAE O-ring

		Port Size	
		In	Out
NN		1-1/4"	1-1/4"
QQ		1"	1"
RR		3/4"	3/4"

Orientation is viewed from the shaft end

MH330 Series

Parts Breakdown



MH330 Series

Parts Breakdown

DRAWING NO.	DESCRIPTION	METARIS #	ALTERNATE #
1	SHAFT BRG. SNAP RING	X05-03-56200	391-2686-063
2a	INPUT SHAFT BRG.	X03-16-12552	391-0381-040
2b	SPACER IN PLACE OF SHAFT BEARING	A30-92-38520	391-3383-069
3	SEAL RETAINER FOR MOTORS ONLY	A20-60-10000	391-3381-040
4a	PUMP LIP SEAL	X83-11-02708	391-2883-058
4b	MOTOR LIP SEAL	X84-36-02709	391-2883-119
4c	PUMP LIP SEAL FOR CONTINENTAL SHAFT ONLY	X89-11-02508	391-2883-107
4d	MOTOR LIP SEAL FOR CONTINENTAL SHAFT ONLY	X84-36-02509	391-2883-126
5a	4 BOLT B PILOT PUMP S.E.C. WITHOUT BUSHING TYPE 42 (4" or 101.6 mm pilot)	A33-10-21421	324-5033-201
5b	4 BOLT B PILOT PUMP S.E.C. WITH BUSHING TYPE 42 (4" or 101.6 mm pilot)	A33-10-21422	324-5133-201
5c	4 BOLT C PILOT PUMP S.E.C. WITHOUT BUSHING TYPE 78 (5" or 127 mm pilot)	A33-10-21431	324-5033-202
5d	4 BOLT C PILOT PUMP S.E.C. WITH BUSHING TYPE 78 (5" or 127 mm pilot)	A33-10-21432	324-5133-202
5e	2 BOLT B PILOT PUMP S.E.C. WITHOUT BUSHING TYPE 97 (4" or 101.6 mm pilot)	A33-10-21221	324-5023-201
5f	2 BOLT B PILOT PUMP S.E.C. WITH BUSHING TYPE 97 (4" or 101.6 mm pilot)	A33-10-21222	324-5123-201
5g	2 & 4 BOLT B PILOT PUMP S.E.C. WITHOUT BUSHING TYPE 46 (4" or 101.6 mm pilot)	A33-10-21321	324-5053-201
5h	2 & 4 BOLT B PILOT PUMP S.E.C. WITH BUSHING TYPE 46 (4" or 101.6 mm pilot)	A33-10-21322	324-5153-201
5i	4 BOLT B PILOT MOTOR S.E.C. WITHOUT BUSHING TYPE 42 (4" or 101.6 mm pilot)	A33-10-41421	324-5033-401
5j	4 BOLT B PILOT MOTOR S.E.C. WITH BUSHING TYPE 42 (4" or 101.6 mm pilot)	A33-10-41422	324-5133-401
5k	4 BOLT C PILOT MOTOR S.E.C. WITHOUT BUSHING TYPE 78 (5" or 127 mm pilot)	A33-10-41431	324-5033-402
5l	4 BOLT C PILOT MOTOR S.E.C. WITH BUSHING TYPE 78 (5" or 127 mm pilot)	A33-10-41432	324-5133-402
5m	2 BOLT B PILOT MOTOR S.E.C. WITHOUT BUSHING TYPE 97 (4" or 101.6 mm pilot)	A33-10-41221	324-5023-401
5n	2 BOLT B PILOT MOTOR S.E.C. WITH BUSHING TYPE 97 (4" or 101.6 mm pilot)	A33-10-41222	324-5123-401
5o	2 & 4 BOLT B PILOT MOTOR S.E.C. WITHOUT BUSHING TYPE 46 (4" or 101.6 mm pilot)	A33-10-41320	324-5053-401
5p	2 & 4 BOLT B PILOT MOTOR S.E.C. WITH BUSHING TYPE 46 (4" or 101.6 mm pilot)	A33-10-41322	324-5153-401
6a	CHECK VALVE MOTOR	A00-75-11000	391-3681-001
6b	PRESSURE PLUG PUMP (may not be required)	X02-03-32110	391-2286-004
7	BUSHING	X03-00-32730	391-0482-306
8	PUMP BUNA SEAL	A33-82-11030	391-2883-166
9	PUMP NYLON BACKUP SEAL	A33-82-46010	391-2883-167
Not Shown	MOTOR NYLON BACKUP SEAL	A33-82-46030	391-2881-929
Not Shown	MOTOR THRUST PLATE SIDE SEAL	A33-82-14022	391-2881-931
Not Shown	MOTOR THRUST PLATE END SEAL	A33-82-14021	391-2881-930
10a	PUMP THRUST PLATE	A33-70-20000	391-2185-056
10b	MOTOR THRUST PLATE	A33-70-10000	391-2185-065
11a	SHAFT & GEAR SET 13 TOOTH SPLINE 0.858" maj. dia TYPE 25	A33-50-XX225	324-29XX-230
11b	SHAFT & GEAR SET 0.9984" dia. KEYED (1/4" x 3/8" x 1 1/4") TYPE 43	A33-50-XX135	324-29XX-740

MH330 Series

Parts Breakdown

DRAWING NO.	DESCRIPTION	METARIS #	ALTERNATE #
11c	SHAFT & GEAR SET 15 TOOTH SPLINE 0.983" maj. dia TYPE 98	A33-50-XX231	324-29XX-240
12a	PUMP HOUSING GASKET	X85-11-10104	391-2884-050
12b	MOTOR HOUSING GASKET	X85-11-09803	391-2884-076
13	HOUSING DOWEL PIN	A00-94-11025	391-2082-032
14a	PUMP GEAR HOUSING	A33-33-XX000	324-81XX-100
14b	MOTOR GEAR HOUSING	A33-32-XX000	324-82XX-100
15a	330 BEARING CARRIER BLANK WITHOUT BUSHING	A33-40-00000	324-7200-100
15b	330 BEARING CARRIER BLANK WITH BUSHING	A33-40-10000	324-7700-100
15c	330 BEARING CARRIER 1 OUTLET WITHOUT BUSHING	A33-40-21000	324-7100-100
15d	330 BEARING CARRIER 1 OUTLET WITH BUSHING	A33-40-31000	324-7600-100
15e	330 BEARING CARRIER 2 OUTLET WITHOUT BUSHING	A33-40-22000	324-7300-100
15f	330 BEARING CARRIER 2 OUTLET WITH BUSHING	A33-40-32000	324-7800-100
15g	330/315 BEARING CARRIER CW WITHOUT BUSHING	A33-40-23000	324-3050-100
15h	330/315 BEARING CARRIER CW WITH BUSHING	A33-40-33000	324-3150-100
15i	330/315 BEARING CARRIER CCW WITHOUT BUSHING	A33-40-24000	324-3060-100
15j	330/315 BEARING CARRIER CCW WITH BUSHING	A33-40-34000	324-3160-100
16a	CONNECTING SHAFT	A33-50-00500	324-1133-001
16b	PIGGYBACK CONNECTING SHAFT PHASE 2	A81-50-00500	324-1133-004
17	GEAR SET ONLY	A33-50-XX000	324-28XX-000
18a	330 PUMP P.E.C. NO PORTING WITHOUT BUSHING	A33-23-00000	324-3000-100
18b	330 PUMP P.E.C. NO PORTING WITH BUSHING	A33-23-10000	324-3100-100
18c	330 P.E.C. NO PORTING WITHOUT BUSHING CHECK VALVE REQ.	A33-25-00000	324-3000-101
18d	330 P.E.C. NO PORTING WITH BUSHING CHECK VALVE REQ.	A33-25-10000	324-3100-101
18e	330 PUMP P.E.C. PORTING TYPE WITHOUT BUSHING	A33-23-02000	324-3010-100
18f	330 PUMP P.E.C. PORTING TYPE WITH BUSHING	A33-23-12000	324-3110-100
18g	330 MOTOR P.E.C. PORTING TYPE WITHOUT BUSHING	A33-22-02000	324-3020-100
18h	330 MOTOR P.E.C. PORTING TYPE WITH BUSHING	A33-22-12000	324-3120-100
19	BOLTS / STUDS (5/8"-UNC)	See Fasteners Page	
20	FLAT WASHER (5/8")	X45-10-17005	391-3784-028
21	HEX NUT (5/8"-UNC)	X42-11-16000	391-1451-076
Not Shown	CONTINENTAL SHAFT 14 TOOTH SPLINE 1.223" maj. dia. TYPE 7	A33-50-00241	324-1000-500
Not Shown	CONTINENTAL SHAFT 13 TOOTH SPLINE 0.858" maj. dia. TYPE 25	A33-50-00221	324-1000-300

Note: The **XX** shown in the part number is in place of the size - the true value must be placed into the part number when ordering parts.

For example: Gear set no. A33-50-XX000 changes to A33-50-15000 for 1.5" gear size
Housing no. A33-33-XX000 changes to A33-33-15000 for a 1.5" housing size
No porting sizes have been indicated all porting must be specified when ordering parts.

MH330 Series

Parts Breakdown

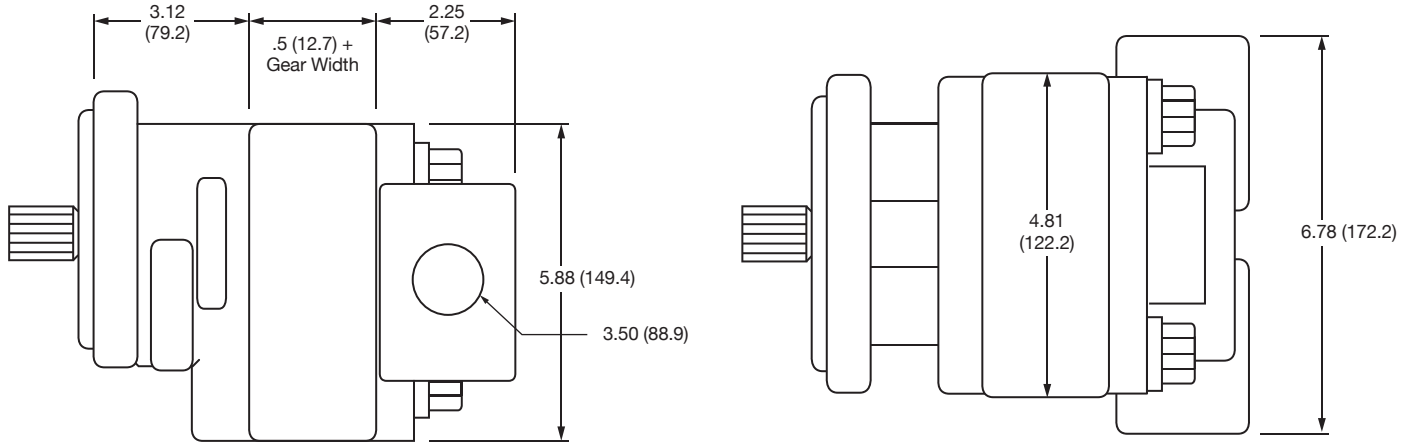
DRAWING NO.	DESCRIPTION	METARIS #	ALTERNATE #
Not Shown	CONTINENTAL SHAFT 0.9984" dia. KEYED (1/4" x 3/8" x 1 1/4") TYPE 43	A33-50-00131	324-1500-400
Not Shown	CONTINENTAL SHAFT 15 TOOTH SPLINE 0.983" maj. dia. TYPE 98	A33-50-00239	324-1200-400
Not Shown	CONTINENTAL SHAFT 0.875" dia. KEYED (1/4" x 3/8" x 1") TYPE 30	A33-50-00121	324-1500-300
Not Shown	DRIVE KEY FOR TYPE 43 SHAFT	X01-02-60632	391-1781-082
Not Shown	DRIVE KEY FOR TYPE 30 SHAFT	X01-02-60625	391-1781-085
Not Shown	CONTINENTAL SHAFT BRG. RETAINER	A20-60-20000	312-0100-002
Not Shown	CONTINENTAL SHAFT BRG. RETAINER SNAP RING	X05-02-28110	391-2685-011

MH330 Series

Dimensions

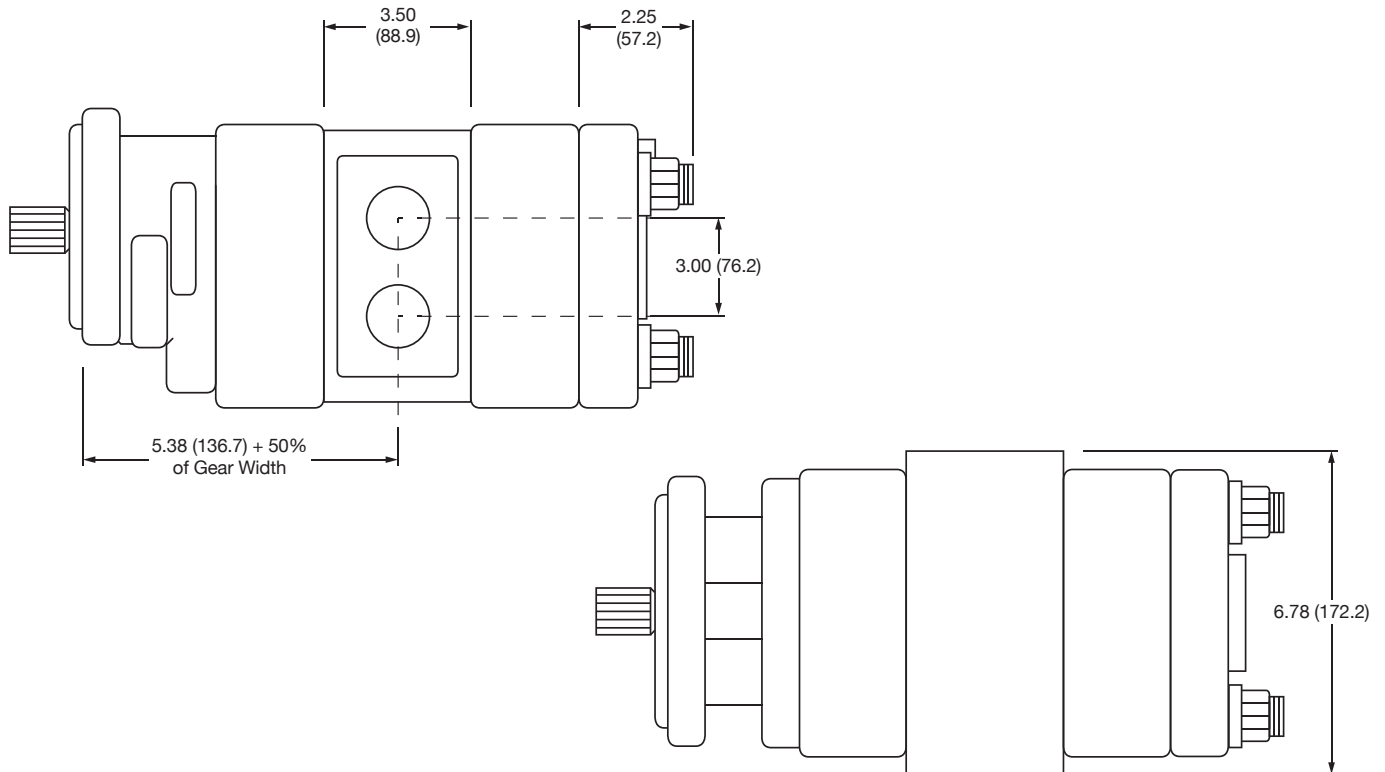
Single Unit

* Shaft dimension will change with the type of shaft used.



Multiple Unit

* Shaft dimension will change with the type of shaft used.



Dimensions are in inches (millimeters).