PATRIOT

Low Speed High Torque Motors

PHDMM SERIES

Driven by Innovation

Power Precision Performance

734-479-9641 patriothyd.com

PATRIOT HYDRAULICS

TABLE OF CONTENTS

PATRIOT

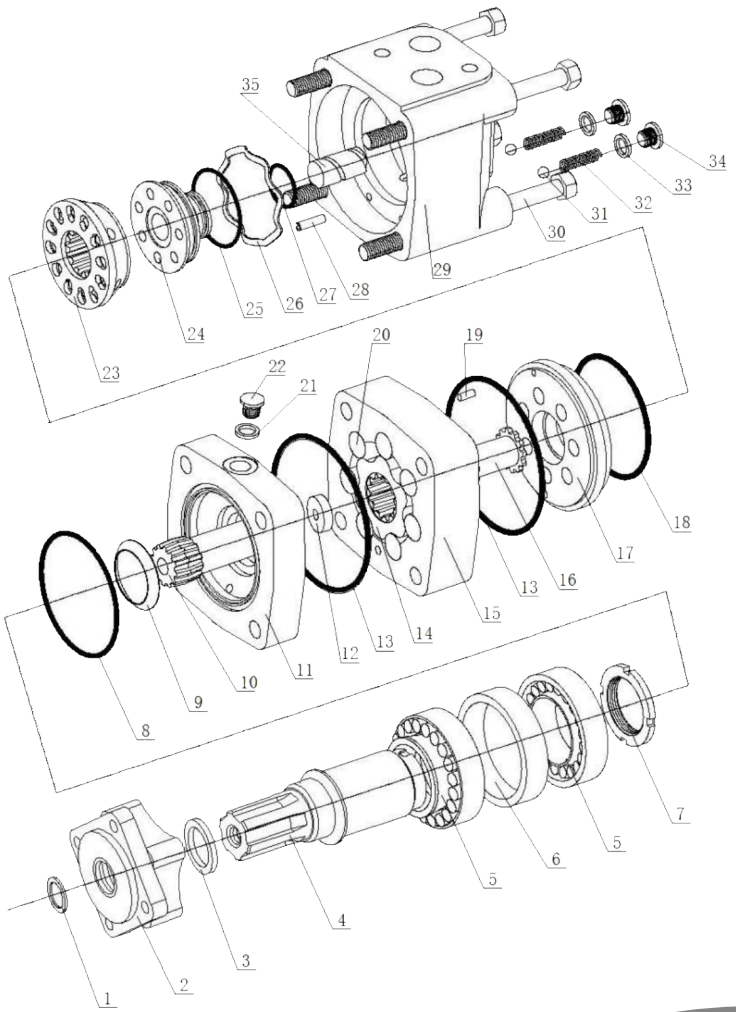
PHDMM SERIES

PHDMM MOTOR CROSS REFERENCE GUIDE

Brand	Series
Eaton Char-Lynn	J (129)
Danfoss	OMM
White	WM (125/126)

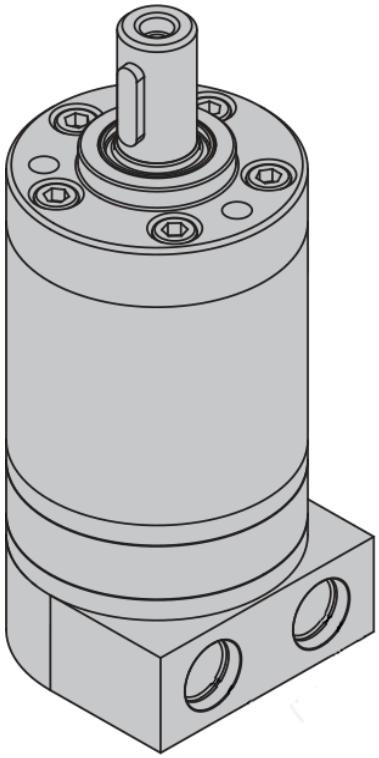
Brand	Series
M+S	MLHM, MM
Brevini - Sam	BGM

PHDMM



DESCRIPTION

PHDMM



Introducing the PHDMM hydraulic motor - the perfect solution for your heavy-duty power needs. Our motor is designed with advanced technology and high-quality materials to deliver superior performance in even the toughest applications. Check out some of the features and benefits of the PHDMM motor: • Maximum durability: The PHDMM motor is built to last, with a rugged design that can withstand even the most demanding environments.

• High efficiency: With its advanced technology, the PHDMM motor provides smooth and efficient

Applications

• Powerful performance: Whether you're powering heavy machinery or industrial equipment, the PHDMM motor provides the power and precision you need to get the job done right.

• Superior quality: Our motor is crafted with the highest quality materials and rigorous manufacturing standards, ensuring a long-lasting and reliable solution for your power needs.

Order now and experience the superior quality and performance of the PHDMM motor for yourself.

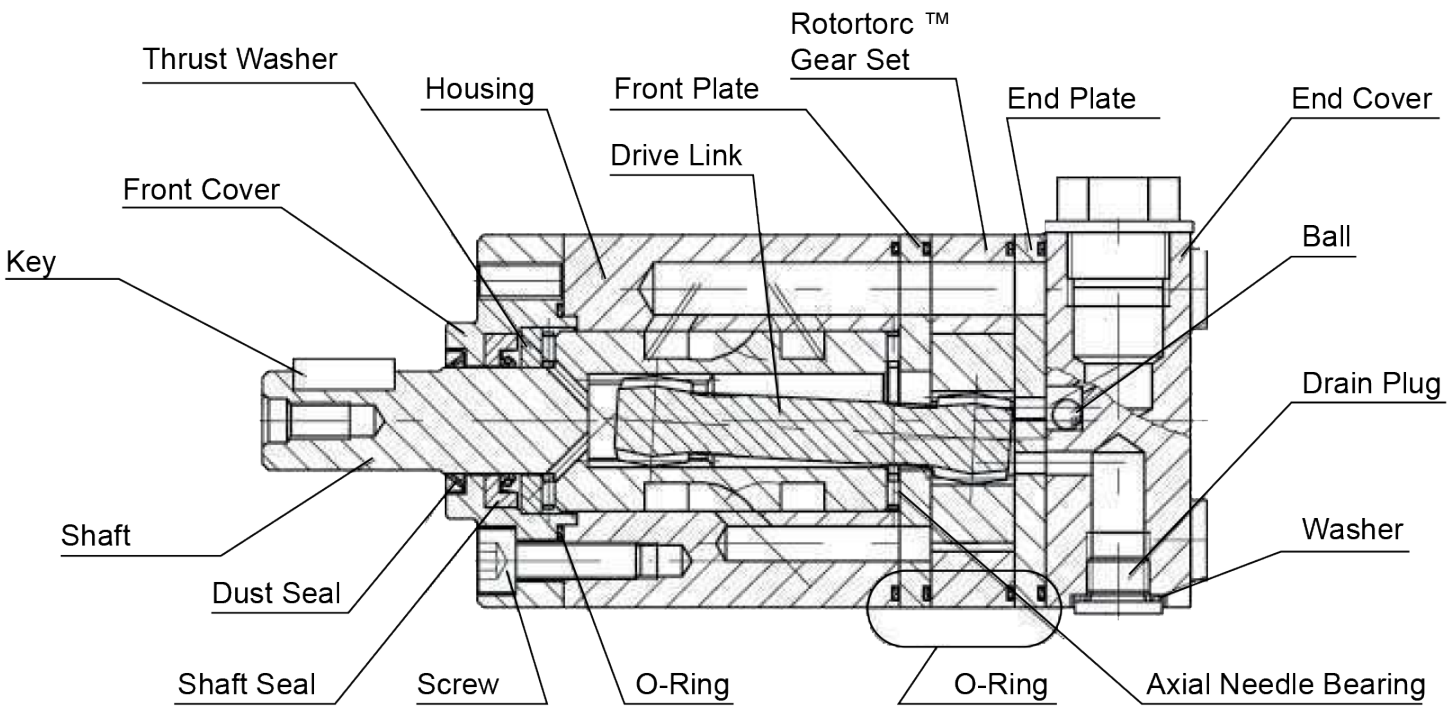
PHDMM MOTOR ORDERING CODE

1		2	3	4	5	6	7
PHDMM	—						

2	3		4		5			6		7	
Disp	Shaft Options		Mounting Flange		Ports	A&B	Drain	Special		Rotation	
8	P1	16MM Straight Keyed [5]x[5]x[16]	C	3-M6 Flange, Polot [31.5MM]	End Ports			OMIT	Standard	L	Standard
12.5	P2	5/8" Straight Keyed [.19]x[.19]x[.75]	C1	3 - 1/4-28 UNF Flange, Pilot [1.24"]	Y1	G 3/8	G 1/8			R	Reveresed
20	K1	16.5MM Involute Splined B17 X 14 DIN5482	A2	2 - 9MM Oval Flange, Pilot [63MM]	Y2	9/16-18 UNF	3/8-24 UNF				
32					Side Ports						
40					S1	G 3/8	G 1/8				
50					S2	9/16-18 UNF	3/8-24 UNF				

PHDMM

PHDMM Cross Section



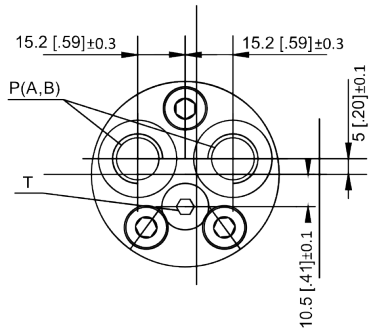
PHDMM

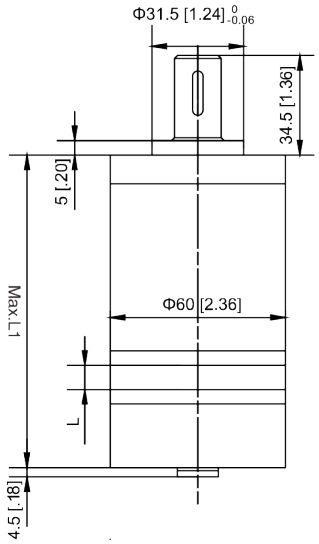
PHDMM Main Specs

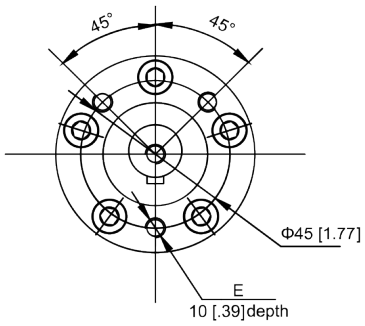
PHDMM		8	12.5	20	32	40	50
Displacement	CC [in³/rev]	8.2 [.50]	12.9 [.79]	19.9 [1.21]	31.6 [1.93]	39.8 [2.43]	50.3 [3.07]
Max Pressure Drop	cont. bar [PSI]	100 [1450]	100 [1450]	100 [1450]	100 [1450]	90 [1305]	70 [1015]
	int. bar [PSI]	140 [2030]	140 [2030]	140 [2030]	140 [2030]	140 [2030]	140 [2030]
	peak. bar [PSI]	200 [2900]	200 [2900]	200 [2900]	160 [2320]	160 [2320]	160 [2320]
Max Torque	cont. bar [PSI]	11 [97]	16 [141]	25 [221]	40 [354]	45 [398]	46 [407]
	int. bar [PSI]	15 [132]	23 [203]	35 [309]	57 [504]	70 [619]	88 [778]
	peak. bar [PSI]	21 [185]	33 [292]	51 [451]	64 [566]	82 [725]	100 [885]
Max Speed	cont. RPM	1950	1550	1005	630	500	395
Max Flow	cont. LPM [GPM]	16 [4.22]	20 [5.28]	20 [5.28]	20 [5.28]	20 [5.28]	20 [5.28]
Weight	Kg [lbs]	1.9 [2.41]	2 [4.40]	2.1 [4.62]	2.2 [4.85]	2.3 [5.07]	2.4 [5.29]
Max Output Power	cont. KW HP	1.8 [2.41]	2.4 [3.21]	2.4 [3.21]	2.4 [3.21]	2.2 [2.95]	1.8 [2.41]

(End Port Y*)

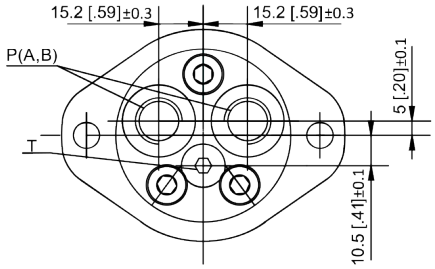
C, C1 Flange

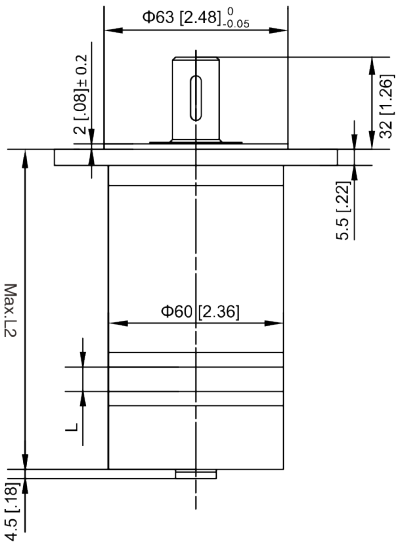


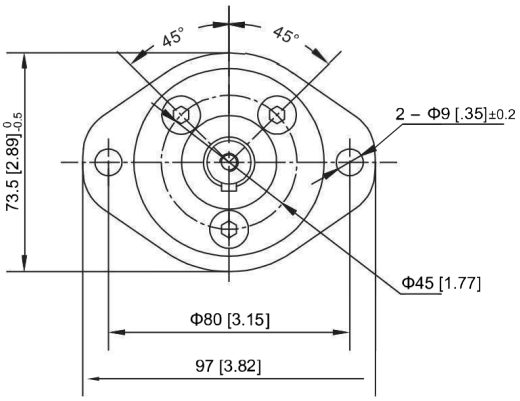




A2 2-Hole Oval Flange





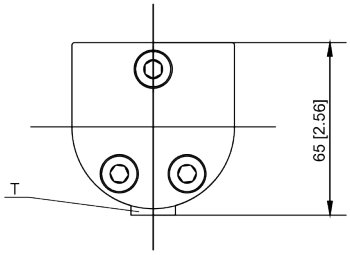


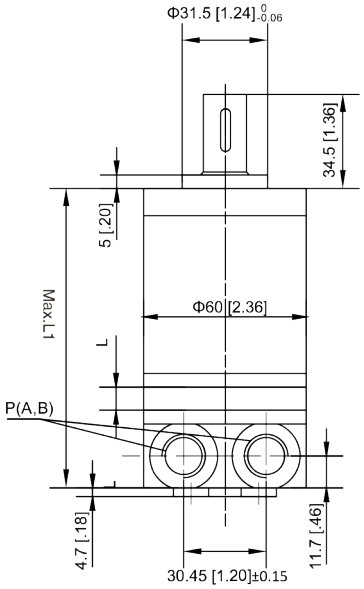
	PHDMM-8	PHDMM-12.5	PHDMM-20	PHDMM-32	PHDMM-40	PHDMM-50
L	3.5MM [0.137"]	5.5MM [0.216"]	8.5MM [0.334"]	13.5MM [0.531"]	17MM [0.669"]	21.5MM [0.846"]
L1	104.5MM [4.114"]	106.5 [4.192"]	109.5MM [4.311"]	114.5MM [4.507"]	118MM [4.645"]	122.5MM [4.822"]
L2	107MM [4.212"]	109MM [4.291"]	112MM [4.409"]	117MM [4.606"]	120.5MM [4.744"]	125MM [4.921"]

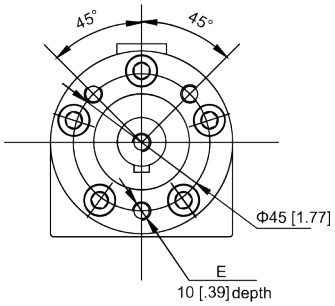
Flange	E
C	3 - M6
C1	3 - 1/4-28 UNF

(Side Port S*)

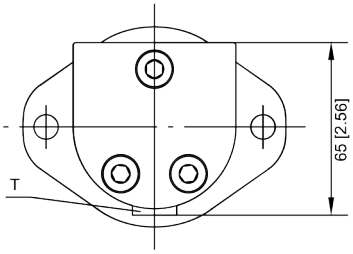
C, C1 Flange

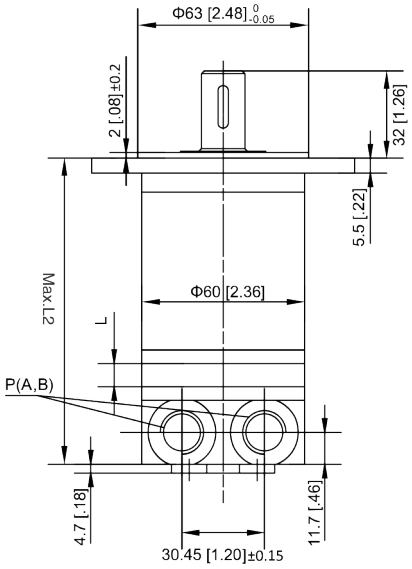


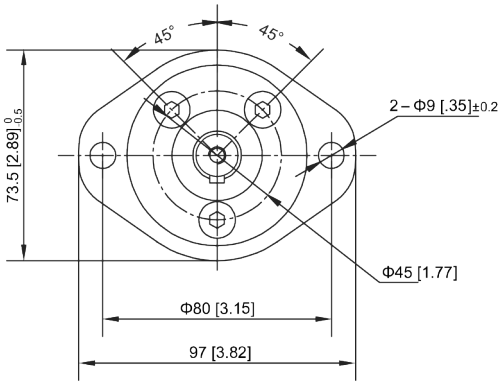




A2 2–Hole Oval Flange







	PHDMM-8	PHDMM-12.5	PHDMM-20	PHDMM-32	PHDMM-40	PHDMM-50
L	3.5MM [0.137"]	5.5MM [0.216"]	8.5MM [0.334"]	13.5MM [0.531"]	17MM [0.669"]	21.5MM [0.846"]
L1	106MM [4.173"]	108MM [4.251"]	111MM [4.370"]	116MM [4.566"]	119.5MM [4.704"]	124MM [4.881"]
L2	108.5MM [4.271"]	110.5MM [4.350"]	113.5MM [4.468"]	118.5MM [4.665"]	122MM [4.803"]	126.5MM [4.980"]

Flange	E
C	3 - M6
C1	3 - 1/4-28 UNF

PHDMM 8 (8.2cc)

[GPM] L/min	[507] 35	[725] 50	[1015] 70	[1450] 100	[1740] 120 (Max cont.)	[2030] 140 (Max int.)	[PSI] BAR
[0.53] 2	[26] **3** 228	[44] **5** 218	[71] **8** 206	[88] **10** 156	[106] **12** 111	[124] **14** 58	
[1.06] 4	[26] **3** 474	[44] **5** 471	[62] **7** 463	[97] **11** 426	[115] **13** 391	[133] **15** 331	TORQUE [LB-IN] **TORQUE N•M** SPEED RPM
[2.11] 8	[26] **3** 953	[44] **5** 946	[62] **7** 926	[97] **11** 884	[115] **13** 855	[133] **15** 816	
[3.17] 12	[18] **2** 1444	[44] **5** 1426	[62] **7** 1402	[88] **10** 1360	[115] **13** 1324	[133] **15** 1288	
[4.23] 16 (Max cont.)		[35] **4** 1912	[62] **7** 1900	[88] **10** 1861	[106] **12** 1833	[124] **14** 1780	Max cont.
[5.28] 20 (Max int.)			[53] **6** 2395	[88] **10** 2350	[97] **11** 2328	[124] **14** 2281	Max int.

Flow

PHDMM 12.5 (12.9cc)

[GPM] L/min	[507] 35	[725] 50	[1015] 70	[1450] 100	[1740] 120 (Max cont.)	[2030] 140 (Max int.)	[PSI] BAR
[0.53] 2	[53] **6** 140	[71] **8** 136	[97] **11** 119	[132] **15** 68	[168] **19** 35		
[1.06] 4	[53] **6** 296	[71] **8** 289	[106] **12** 274	[141] **16** 229	[168] **19** 200	[203] **23** 145	TORQUE [LB-IN] **TORQUE N•M** SPEED RPM
[2.11] 8	[44] **5** 605	[71] **8** 596	[106] **12** 583	[141] **16** 543	[177] **20** 514	[212] **24** 469	
[3.17] 12	[44] **5** 912	[71] **8** 905	[97] **11** 895	[141] **16** 859	[177] **20** 834	[212] **24** 784	
[3.96] 15	[44] **5** 1152	[62] **7** 1144	[97] **11** 1136	[142] **16** 1102	[168] **19** 1078	[203] **23** 1036	
[5.28] 20 (Max cont.)	[27] **3** 1542	[62] **7** 1532	[88] **10** 1521	[133] **15** 1500	[168] **19** 1482	[195] **22** 1437	Max cont.
[6.60] 25 (Max int.)	[18] **2** 1910	[53] **6** 1891	[80] **9** 1878	[124] **14** 1848	[159] **18** 1828	[195] **22** 1788	Max int.

Flow

PHDMM 20 (19.9cc)

[GPM] L/min	[246] 17	[507] 35	[725] 50	[1015] 70	[1450] 100 (Max cont.)	[1740] 120	[2030] 140 (Max int.)	[PSI] BAR
[0.53] 2	[35] **4** 99	[80] **9** 96	[124] **14** 89	[168] **19** 74	[212] **24** 42	[265] **30** 21		
[1.06] 4	[35] **4** 197	[80] **9** 191	[124] **14** 182	[168] **19** 178	[212] **24** 134	[274] **31** 112	[318] **36** 74	TORQUE [LB-IN] **TORQUE N•M** SPEED RPM
[2.11] 8	[35] **4** 398	[80] **9** 395	[115] **13** 391	[168] **19** 377	[221] **25** 340	[274] **31** 319	[318] **36** 288	
[3.17] 12	[27] **3** 596	[71] **8** 594	[115] **13** 588	[159] **18** 579	[221] **25** 545	[274] **31** 523	[327] **37** 493	
[3.96] 15	[27] **3** 745	[71] **8** 741	[106] **12** 738	[150] **17** 728	[221] **25** 695	[265] **30** 684	[318] **36** 660	
[5.28] 20 (Max cont.)	[9] **1** 998	[53] **6** 995	[97] **11** 991	[168] **19** 985	[212] **24** 962	[256] **29** 916	[310] **35** 885	Max cont.
[6.60] 25 (Max int.)		[35] **4** 1247	[80] **9** 1245	[124] **14** 1242	[203] **23** 1189	[248] **28** 1180	[292] **33** 1176	Max int.

Flow

PHDMM 32 (31.6cc)

[GPM] L/min	[290] 20	[507] 35	[725] 50	[1015] 70	[1450] 100 (Max cont.)	[1740] 120	[2030] 140 (Max int.)	[PSI] BAR
[0.53] 2	[62] **7** 61	[133] **15** 57	[186] **21** 52	[248] **28** 47	[345] **39** 16			
[1.06] 4	[62] **7** 126	[133] **15** 121	[186] **21** 114	[256] **29** 106	[354] **40** 82	[424] **48** 67	[504] **57** 49	TORQUE [LB-IN] **TORQUE N•M** SPEED RPM
[2.11] 8	[62] **7** 250	[133] **15** 244	[186] **21** 239	[256] **29** 231	[354] **40** 207	[433] **49** 194	[513] **58** 167	
[3.17] 12	[53] **6** 378	[115] **13** 374	[177] **20** 369	[248] **28** 362	[354] **40** 338	[424] **48** 322	[513] **58** 297	
[3.96] 15	[35] **4** 474	[106] **12** 472	[159] **18** 468	[239] **27** 462	[345] **39** 441	[415] **47** 429	[504] **57** 406	
[5.28] 20 (Max cont.)	[27] **3** 631	[88] **10** 630	[150] **17** 627	[221] **25** 619	[327] **37** 601	[407] **46** 585	[486] **55** 566	Max cont.
[6.60] 25 (Max int.)	[9] **1** 791	[70] **8** 789	[133] **15** 787	[203] **23** 783	[309] **35** 766	[380] **43** 753	[460] **52** 732	Max int.

Flow

PHDMM 40 (39.8cc)

		Max cont.				Max int.	
		[435] 30	[725] 50	[1015] 70	[1305] 90	[1450] 100	[1740] 120	[PSI] BAR
[GPM]	[0.53]	[142] **16** 45	[239] **27** 40	[318] **36** 34	[389] **44** 28	[451] **51** 17		
L/min	2							
	[1.06]	[142] **16** 96	[239] **27** 93	[327] **37** 85	[398] **45** 79	[460] **52** 65	[548] **62** 52	TORQUE [LB-IN]
	4							**TORQUE N•M**
	[2.11]	[133] **15** 197	[230] **26** 195	[319] **36** 182	[398] **45** 176	[460] **52** 166	[557] **63** 154	SPEED RPM
Flow	8							
	[3.17]	[124] **14** 293	[221] **25** 287	[310] **35** 282	[380] **43** 277	[451] **51** 268	[548] **62** 257	
	12							
	[3.96]	[115] **13** 371	[212] **24** 365	[301] **34** 360	[371] **42** 355	[442] **50** 347	[548] **62** 338	
	15							
	[5.28]	[88] **10** 497	[186] **21** 492	[274] **31** 487	[345] **39** 480	[425] **48** 472	[522] **59** 463	Max cont.
Max cont.	20							
	[6.60]	[62] **7** 622	[168] **19** 617	[256] **29** 612	[327] **37** 607	[389] **44** 600	[495] **56** 591	Max int.
Max int.	25							

PHDMM 50(50.3cc)

		Max cont.				Max int.	
		[217] 15	[435] 30	[725] 50	[1015] 70	[1450] 100	[PSI] BAR
[GPM]	[0.53]	[79] **9** 37	[159] **18** 33	[283] **32** 27	[398] **45** 22		
L/min	2						
	[1.06]	[79] **9** 76	[168] **19** 73	[292] **33** 68	[407] **46** 63	[619] **64** 55	TORQUE [LB-IN]
	4						**TORQUE N•M**
	[2.11]	[79] **9** 157	[168] **19** 154	[292] **33** 149	[407] **46** 145	[566] **64** 137	SPEED RPM
Flow	8						
	[3.17]	[79] **9** 237	[159] **18** 234	[283] **32** 231	[407] **46** 226	[557] **63** 218	
	12						
	[3.96]	[70] **8** 296	[150] **17** 295	[274] **31** 294	[371] **42** 288	[548] **62** 282	
	15						
	[5.28]	[53] **6** 395	[115] **13** 395	[238] **27** 393	[354] **40** 390	[522] **59** 381	Max cont.
Max cont.	20						
	[6.60]	[35] **4** 497	[97] **11** 496	[221] **25** 494	[327] **37** 490	[513] **58** 484	Max int.
Max int.	25						

SHAFTS

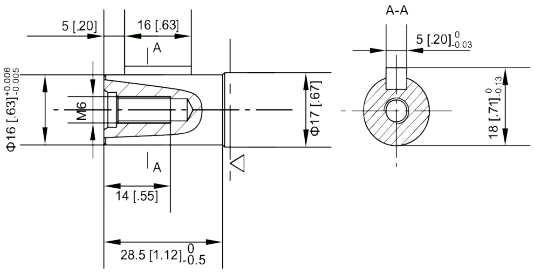
PHD SHAFT P1

16MM Keyed Shaft

Keyway [5]x[5]x[16]

.63” Keyed shaft

Keyway [.20]x[.20]x[.63]



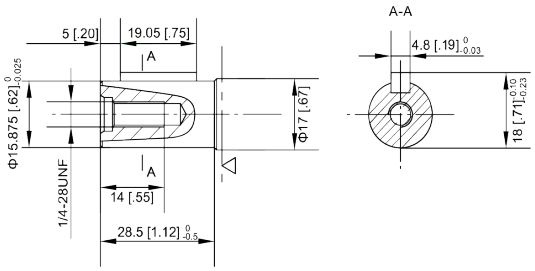
PHD SHAFT P2

15.875MM Keyed Shaft

Keyway [4.8]x[4.8]x[19.05]

.62” Keyed Shaft

Keyway [.18]x[.18]x[.75]



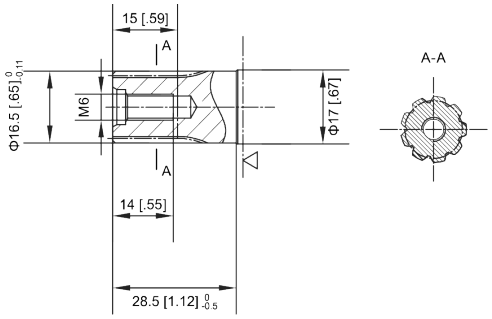
PHD SHAFT K1

16.5MM Involute Splined Shaft

B17 X 14 DIN5482

.649” Involute Splined Shaft

B17 X 14 DIN5482

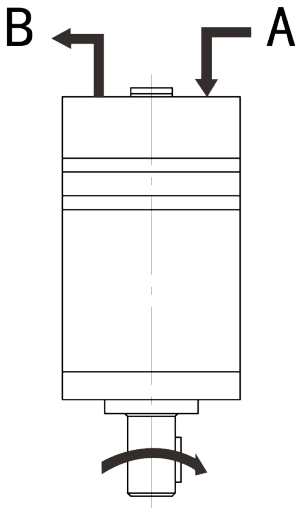


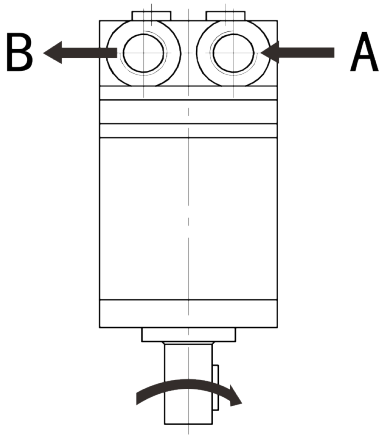
PHDMM

■ PHDMM Direction of Shaft Rotation: Standard

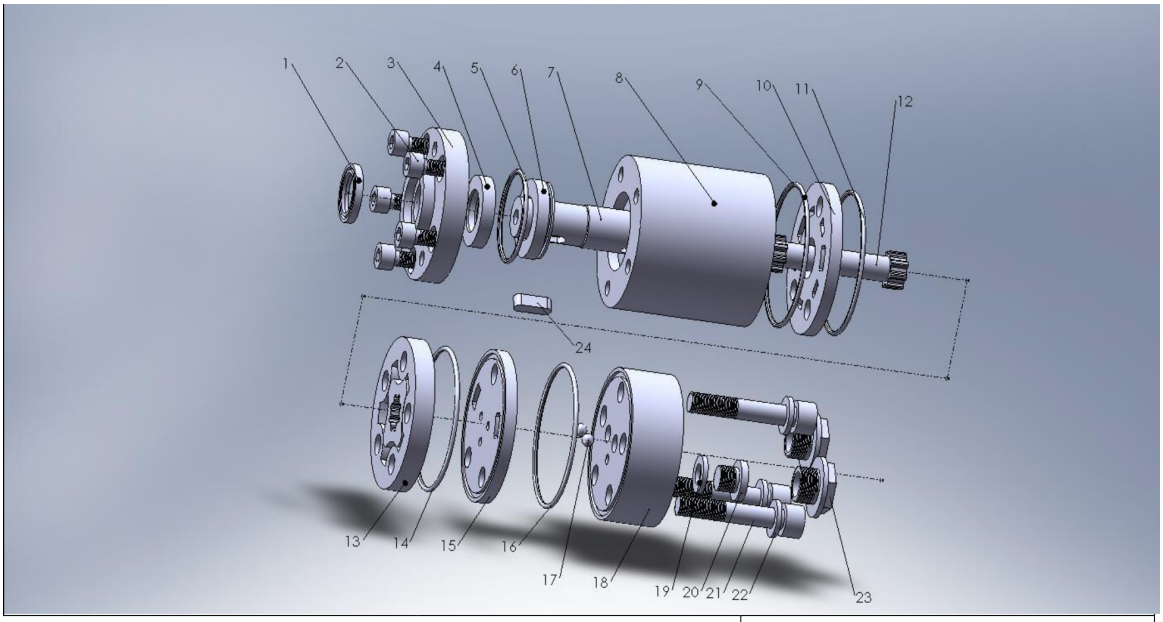
Direction of shaft ration：Standard

When facing shaft end of motor，shaft to rotate：
Clockwise when port “A” is pressurized.
Counter–clockwise port “B” is pressurized.





PHDMM



			Number per motor	
Item	Spare parts	Dimension	Code	PHDMM Flange C/C1
1	Dust seal	17*23*3 mm,NBR		1
2	Screw	M6*14		5
3	Spigot flange		PHDMM-10/C PHDMM-10/C1	1
4	Shaft seal	17*28*5.6 mm HNBR		1
5	O-ring	33.5*1.8 mm,NBR		1
6	Bearing assembly	17.5*31*5 mm 17*30*2 mm	PHDMM-08A1 PHDMM-08A2	1 1
7	Output shaft		PHDMM-01**	1
8	Housing		PHDMM-02	1
9	O-ring	53.7*1.78 mm,NBR		1
10	Distributor plate		PHDMM-03	1
11	O-ring	53.7*1.78 mm,NBR		1
12	Cardan shaft PHDMM-8 PHDMM-12.5 PHDMM-20 PHDMM-32 PHDMM-40 PHDMM-50	L=57.5mm L=59.5mm L=62mm L=67mm L=70.5mm L=75mm	PHDMM-09(8) PHDMM-09(12.5) PHDMM-09(20) PHDMM-09(32) PHDMM-09(40) PHDMM-09(50)	1
13	Gearwheel set PHDMM-8 PHDMM-12.5 PHDMM-20 PHDMM-32	L=3.5mm L=5.5mm L=8.5mm L=13.5mm L=17mm	PHDMM-15G(8) PHDMM-15G(12.5) PHDMM-15G(20) PHDMM-15G(32) PHDMM-15G(40)	1

	PHDMM-40 PHDMM-50	L=21.5mm	PHDMM-15G(50)	
14	O-ring	53.7*1.78 mm,NBR		1
15	End cover		PHDMM-06	1
16	O-ring	53.7*1.78 mm,NBR		1
17	Steel ball			2
18	End cap		PHDMM-07	1
19	Washer			1
20	Drain plug			1
21	Screw PHDMM-8 PHDMM-12.5 PHDMM-20 PHDMM-32 PHDMM-40 PHDMM-50	S* Y* M8*50mm M8*40mm M8*50mm M8*45mm M8*55mm M8*45mm M8*60mm M8*50mm M8*60mm M8*55mm M8*65mm M8*60mm		3
22	Washer			3
23	Plastic plug			2
24	Parallel key			1

Tightening torque

Item	Dimension	Torque(N.m)
2	M6	19-21
20	G1/8 or 3/8-24UNF	13-15
21	M8	28-28.5

Disassambly

Item	Part to remove	Comments
24	Parallel key	
23	Plastic plug	Put the motor in a holding tool, with the output shaft downward.
20,19	Drain plug Washer	Use 5 mm hexagon socket spanner.
21,22	Screws, Washers	Use 6 mm hexagon socket spanner.
18	End cap	Remove end cap sideways.
17	Steel ball	Remove steel ball sideways.
16	O-ring	
15	End cover	Remove end cover sideways.
14	O-ring	
13	Gearwheel set	Keep fingers under the gearwheel set to prevent the parts from falling out.
12	Cardan shaft	
11	O-ring	
10	Distributor plate	Remove distributor plate sideways
9	O-ring	
7	Output shaft	After this, turn the motor.
2	Screws	Use 5 mm hexagon socket spanner.
3	Spigot flange	
5,6	O-ring, Bearing assembly	
4,1	Shaft seal, Dust seal	Knock out the shaft seal with a plastic hammer. Knock out the dust seal with a plastic hammer.

Cleaning

Clean all parts carefully with low aromatic kerosine.

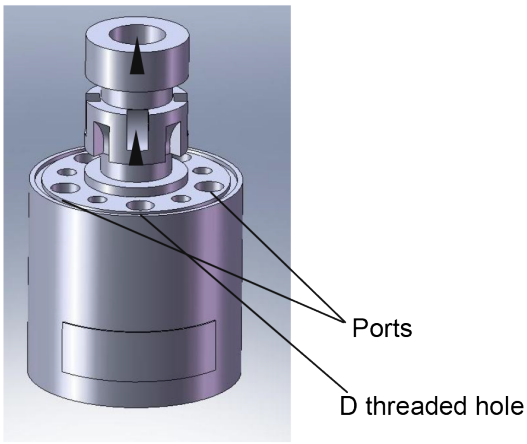
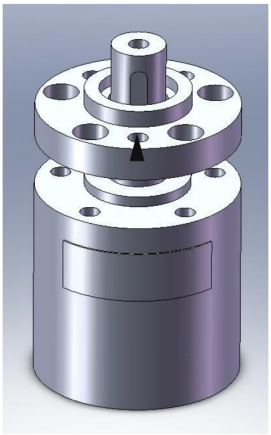
Inspection and replacement

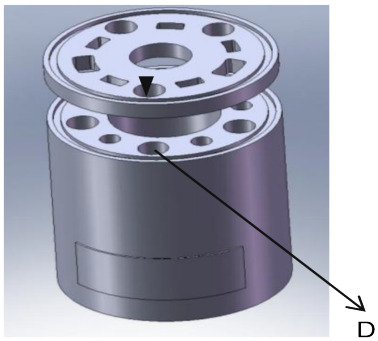
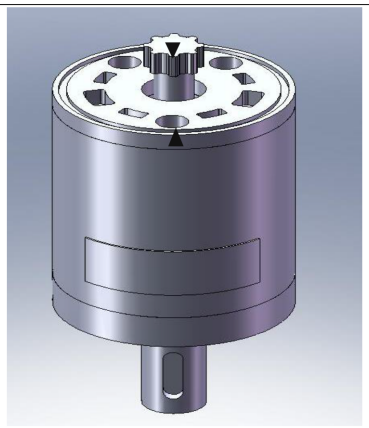
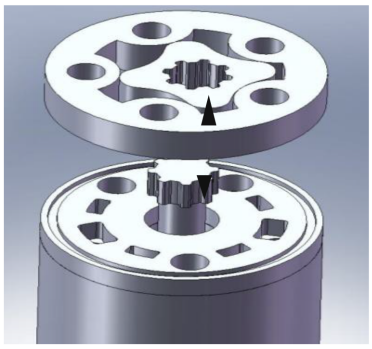
Check all parts carefully and replace if necessary.

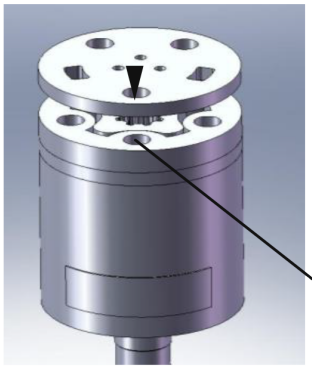
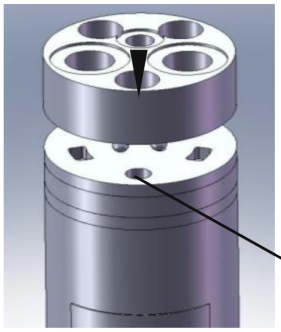
Lubrication

Before assembly, lubricate all parts with hydraulic oil and grease rubber parts with vaseline.

Assambly

Item	Part to remove	Comments
8，7	Housing Output shaft	The output shaft is placed in the housing. Grease the journals with hydraulic oil. The rear shaft end must be marked before fitted. The marks need to be aligned with threaded hole “D”. 
6	Bearing assembly	
1,4,3	Dust seal Shaft seal Spigot flange	The dust seal and the shaft seal are placed in the spigot flange.
5	O-ring	The O-ring is placed in the spigot flange.
2	Screw	Screw the spigot flange and output shaft together. Tightening Torque:19-21N.m Rotate the output shaft to see if it is smooth, then rotate to original position. Position as below picture(the marked threaded hold is aligned with the center of nameplate). 

Item	Part to remove	Comments
9	O-ring	Place the O-ring (greased) in the O-ring grooves of the Housing.
10	Distributor plate	 D threaded hole
11	O-ring	Place the O-ring (greased) in the O-ring grooves of the Distributor plate.
12	Cardan shaft	
13	Gearwheel set	The inner and outer teeth marked in below picture are matched,rotate the Gearwheel set, align with mounting hole. 

Item	Part to remove	Comments
14	O-ring	Place the O-ring (greased) in the O-ring grooves of the End cover.
15	End cover	 Right above the nameplate center (D threaded hole tunnel).
17	Steel ball	 Put the steel ball into the position shown as the marks in the picture.
16	O-ring	Place the O-ring (greased) in the O-ring grooves of the End cap.
18	End cap	 Right above the nameplate center (D threaded hole tunnel).
21 22	Washer, screws	Use 6 mm hexagon socket spanner. Tightening torque: 28-28.5 N.m.
19 20	Washer, drain plug	Use 5 mm hexagon socket spanner. Tightening torque: 13-15N.m
23	Plastic plug	Screw in plastic plugs.
24	Parallel key	To be secured with tape or plastic ring.