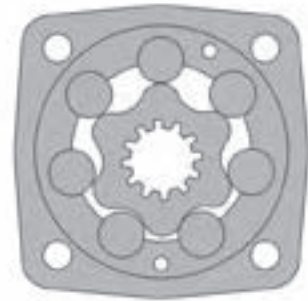


HYDRAULIC MOTORS MLHSY



APPLICATION

- » Conveyors
- » Metal working machines
- » Machines for agriculture
- » Road building machines
- » Mining machinery
- » Food industries



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OPTIONS

- » Model- Disc valve, roll-gerotor
- » Flange and wheel mount
- » Short motor
- » Speed sensing
- » Side and rear ports
- » Shafts- straight, splined and tapered
- » SAE, Metric and BSPP ports

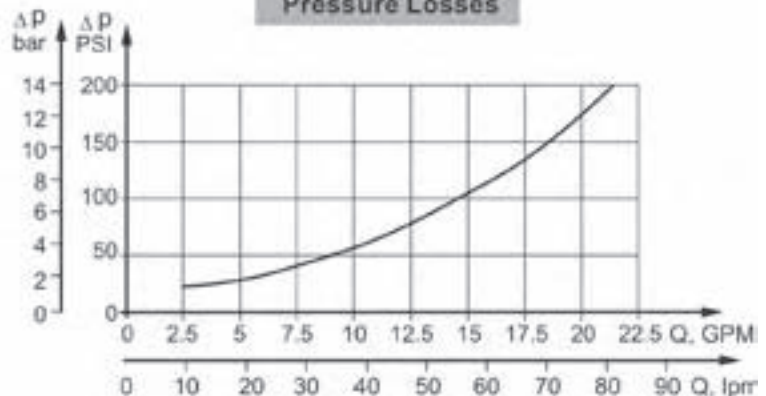
GENERAL

Displacement,	in ³ /rev [cm ³ /rev.]	12.2+24.2 [200+397]
Max. Speed,	[RPM]	185+375
Max. Torque,	in-lb [daNm]	5010+7965 [56,6+90]
Max. Output,	HP [kW]	14.7+24.3 [11+18,1]
Max. Pressure Drop,	PSI [bar]	2320+2900 [160+200]
Max. Oil Flow,	GPM [lpm]	20 [75]
Min. Speed,	[RPM]	5+6
Permissible Shaft Loads	lbs [daN]	P _a =1125 [500]
Pressure fluid	Mineral based- HLP(DIN 51524) or HM(ISO 6743/4)	
Temperature range,	°F [°C]	-22+194 [-30+90]
Optimal Viscosity range, SUS [mm ² /s]	98+347 [20+75]	
Filtration	ISO code 20/16 (Min. recommended fluid filtration of 25 micron)	

Oil flow in drain line

Pressure drop PSI [bar]	Viscosity SUS [mm ² /s]	Oil flow in drain line GPM [lpm]
2030 [140]	98 [20]	.396 [1,5]
	164 [35]	.264 [1]
3045 [210]	98 [20]	.793 [3]
	164 [35]	.528 [2]

Pressure Losses



SPECIFICATION DATA

Type		MLHSY 200	MLHSY 250	MLHSY 315	MLHSY 400
Displacement, in. ³ /rev. [cm. ³ /rev.]		12.2 [200]	15.3 [250]	19.2 [314,9]	24.2 [397]
Max. Speed, [RPM]	cont.	375	300	240	185
	Int.*	450	360	285	225
Max. Torque in- lb [daNm]	cont.	5010 [56,6]	6270 [70,8]	7965 [90,0]	7965 [90,0]
	Int.*	5710 [64,5]	7135 [80,6]	8500 [96,0]	8585 [97,0]
	peak**	5755 [65]	7135 [80,6]	9560 [108]	9735 [110]
Max. Output HP [kW]	cont.	24.3 [18,1]	24.1 [18,0]	22.8 [17]	14.7 [11,0]
	Int.*	32.2 [24,0]	31.9 [23,8]	27.1 [20,2]	16.1 [12]
Max. Pressure Drop PSI [bar]	cont.	2900 [200]	2900 [200]	2900 [200]	2320 [160]
	Int.*	3270 [225]	3270 [225]	3270 [225]	2540 [175]
	peak**	3270 [225]	3270 [225]	3270 [225]	2900 [200]
Max. Oil Flow GPM [lpm]	cont.	20 [75]	20 [75]	20[75]	20[75]
	Int.*	24 [90]	24 [90]	24 [90]	24 [90]
Max. Inlet Pressure PSI [bar]	cont.	3045 [210]	3045 [210]	3045 [210]	3045 [210]
	Int.*	3625 [250]	3625 [250]	3625 [250]	3625 [250]
	peak**	4350 [300]	4350 [300]	4350 [300]	4350 [300]
Max. Return Pressure without Drain Line or Max. Pressure in Drain Line ,PSI [bar]	cont. 0-100 RPM	1450 [100]	1450 [100]	1450 [100]	1450 [100]
	cont. 100-300 RPM	725 [50]	725 [50]	725 [50]	725 [50]
	cont. >300 RPM	290 [20]	-	-	-
Max. Return Pressure with Drain Line PSI [bar]	Int.* 0-max. RPM	1450 [100]	1450 [100]	1450 [100]	1450 [100]
	cont.	2030 [140]	2030 [140]	2030 [140]	2030 [140]
	Int.*	2540 [175]	2540 [175]	2540 [175]	2540 [175]
Max. Starting Pressure with Unloaded Shaft, PSI [bar]	peak**	3045 [210]	3045 [210]	3045 [210]	3045 [210]
	cont.	115 [8]	115 [8]	115 [8]	115 [8]
Min. Starting Torque in- lb [daNm]	at max. press. drop cont.	4090 [46,2]	5135 [58,0]	6530 [73,8]	6370 [72,0]
	at max. press. drop Int.*	4490 [50,7]	5630 [63,6]	7010 [79,2]	6965 [78,7]
Min. Speed***, [RPM]		6	6	5	5
Weight, lb [kg] For Rear Ports + .88[0,40]	MLHSY (F,A)	24.7 [11,2]	25.8 [11,7]	27.3 [12,4]	29.3 [13,3]
	MLHSYW(E)	25.6 [11,6]	26.7 [12,1]	28.2 [12,8]	30.2 [13,7]
	MLHSYB	25.8 [11,7]	26.9 [12,2]	28.4 [12,9]	30.4 [13,8]
	MLHSYS	24.9 [11,3]	26.0 [11,8]	27.6 [12,5]	29.5 [13,4]
	MLHSYV	15.9 [7,2]	17.0 [7,7]	18.5 [8,4]	20.5 [9,3]

* Intermittent operation: the permissible values may occur for max. 10% of every minute.

** Peak load: the permissible values may occur for max. 1% of every minute.

*** For speeds of 5 RPM lower than given, consult factory or your regional manager.

1. Intermittent speed and intermittent pressure must not occur simultaneously.
2. Recommended filtration is per ISO cleanliness code 20/16. A nominal filtration of 25 micron or better.
3. Recommend using a premium quality, anti-wear type mineral based hydraulic oil HLP(DIN51524) or HM (ISO 6743/4).
If using synthetic fluids consult the factory for alternative seal materials.
4. Recommended minimum oil viscosity 70 SUS[13mm²/s] at 122°F [50°C].
5. Recommended maximum system operating temperature is 180°F [82°C].
6. To assure optimum motor life fill with fluid prior to loading and run at moderate load and speed for 10-15 minutes.

SPECIFICATION DATA for MLHSY...LSV

Low Speed Valve (LSV) LSV Series hydraulic motors have been designed to operate with normal pressure drop and to ensure smooth run at low speed (up to 200 RPM), as the best security for operation is guaranteed at frequency of rotation 20 + 50 RPM . They have an increased starting pressure drop and are not recommended for using at pressure less than 580 PSI [40 bars].

Look at specification data for hydraulic motors standard version. The modification concerns only the following parameters : maximum speed , maximum output, maximum Oil flow and maximum starting pressure.

Type		MLHSY 200	MLHSY 250	MLHSY 315	MLHSY 400
Max. Speed, [RPM]	Cont.	200	200	200	185
	Int.*	250	250	250	225
Max. Output HP [kW]	Cont.	10,7 [8,0]	11,8 [8,8]	14,2 [10,6]	12,7 [9,5]
	Int.*	16,6 [12,4]	18 [13,4]	20 [15,0]	17,1 [12,8]
Max. Oil Flow GPM [lpm]	Cont.	10,5 [40]	13 [50]	17 [65]	20 [75]
	Int.*	13 [50]	16,5 [62,5]	21 [80]	24 [90]
Max. Starting Pressure with Unloaded Shaft, PSI [bar]		215 [15]	215 [15]	215 [15]	215 [15]

SPECIFICATION DATA for MLHSY...LL

Low Leakage (LL) LL Series hydraulic motors have been designed to operate at the whole standard range of working conditions (pressure drop and frequency of rotation) , but with considerable decreased volumetric losses in the drainage ports. Their main purpose is to operate as series-connected motors in hydraulic systems.

For this version is permissible decreasing of the maximal torque with up to 5% (at middle speed) and up to 10% (at high speed) in comparison to the standard versions of motors.

Look at specification data for hydraulic motors standard version. The modification concerns only the parameters: maximum torque, maximum output, minimum starting torque.

Type		MLHSY 200	MLHSY 250	MLHSY 315	MLHSY 400
Max. Torque in-lb [daNm]	Cont.	4880 [55,1]	6090 [68,8]	7750 [87,6]	7565 [85,5]
	Int.*	5425 [61,3]	6780 [76,6]	8070 [91,2]	8160 [92,2]
Max. Output HP [kW]	Cont.	23,6 [17,6]	22,4 [16,7]	19,7 [14,7]	13,4 [10,0]
	Int.*	29,2 [21,8]	27,8 [20,7]	21,2 [15,8]	14,6 [10,9]
Min. Starting Torque in-lb [daNm]	Cont.	3990 [45,1]	4990 [56,4]	6355 [71,8]	8210 [70,2]
	Int.*	4400 [49,7]	5490 [62,0]	6540 [73,9]	6610 [74,7]

Performance Data MLHSY 200

	Pressure (Δ PSI)									Max. Cont.	Max. Int.	Speed (theor.)
	500	750	1000	1250	1500	1750	2050	2540	2900	3260		
Flow [GPM]	1	787	1260	1705	2100	2515	2990	3462	4266	4768	-	19
		19	18	17	16	15	13	12	9	7.5	-	
	2	817	1293	1728	2136	2557	3048	3540	4374	4844	5482	38
		38	37	36	35	34	33	32	27.5	25	23	
	4	817	1296	1769	2207	2651	3137	3610	4462	4948	5573	76
		75	73	72	70	69	67	66	61	56	47	
	6	817	1300	1776	2196	2657	3148	3645	4528	5018	5669	114
		113	112	111	110	109	107	105	101	89.5	80.5	
	8	799	1296	1769	2196	2657	3143	3622	4522	5044	5710	151
		150	149	148	147	146	144	142	137	124	113	
10	769	1245	1728	2178	2604	3095	3600	4486	5022	5732	182	
	187	186	185	183	181	179	177	172	164	152		
12	722	1190	1705	2118	2551	3075	3552	4456	4972	5661	227	
	226	225	223	221	219	217	215	210	201	190		
14	698	1170	1651	2083	2515	3055	3522	4410	4905	5596	265	
	264	262	260	258	256	254	252	246	239	228		
17	609	1095	1585	2012	2438	2948	3432	4321	4796	5516	322	
	320	317	314	311	309	306	303	296	294	281		
Max. Cont.	20	515	1006	1479	1923	2355	2840	3344	4232	4734	5410	379
		377	375	373	371	369	366	363	356	343	333	
Max. Int.	24	385	888	1355	1787	2207	2682	3196	3997	4568	5268	454
		452	450	448	446	444	442	440	428	418	402	
Torque (theor.) in-lb. [daNm]		971	1457	1938	2428	2912	3399	3982	4934	5632	6333	
		[10.97]	[16.46]	[21.9]	[27.43]	[32.9]	[38.4]	[44.99]	[55.75]	[63.63]	[71.55]	

12.2 in³/rev. [200 cm³/rev.]

Torque [in-lb] 5268
 Speed [RPM] 402

Performance Data MLHSY 250

	Pressure (Δ PSI)							Max. Cont.	Max. Int.	Speed (theor.)
	500	750	1000	1400	1800	2200	2900	3260		
Flow [GPM]	1	1196	1735	2330	3014	3990	4870	6062	-	15
		15	14	13	12	10	8	6	-	
	2	1202	1816	2332	3090	4030	4952	6173	6878	30
		30	29	28	27	25	23	16	4	
	4	1185	1740	2336	3154	4088	5052	6280	7008	61
		60	58	57	55	53	45	40	26.5	
	6	1156	1722	2312	3190	4070	5086	6285	7055	91
		90	88	86	84	82	76	58	39.5	
	8	1140	1716	2290	3154	4052	5080	6294	7099	121
		120	118	116	114	112	104	84	58.5	
10	1074	1652	2242	3125	4012	5046	6294	7110	151	
	150	148	146	144	140	132	110	84		
12	1005	1592	2185	3050	3970	4994	625	7099	182	
	180	178	176	174	168	158	140	113		
14	958	1542	2138	2985	3900	4952	6173	7055	212	
	210	208	206	204	198	188	168	148		
17	846	1436	2050	2862	3790	4848	6088	6945	257	
	256	254	252	249	243	233	217	200		
Max. Cont.	20	742	1325	1932	2740	3668	4742	5988	6834	303
		300	298	296	293	287	276	256	240	
Max. Int.	24	584	1168	1792	2546	3504	4520	5842	6724	363
		360	358	356	354	347	330	312	300	
Torque (theor.) in-lb. [daNm]		1214	1821	2425	3399	4372	5346	7036	7913	
		[13.72]	[20.57]	[27.4]	[38.4]	[49.4]	[60.4]	[79.5]	[89.4]	

15.25 in³/rev. [250 cm³/rev.]

Torque [in-lb] 6724
 Speed [RPM] 300

The Performance data was collected at back pressure 72.5+145 PSI [5+10 bar] and oil with viscosity of 150 SUS [32 mm²/s] at 122°F [50° C].

Performance Data MLHSY 315

		Pressure (Δ PSI)									Max. Cont.	Max. Int.	Speed (theor.)
		500	750	1000	1200	1400	1700	2000	2540	2900	3190		
Flow [GPM]	1	1406	2040	2708	3270	3850	4888	5550	-	-	-	12	
		11.5	11.5	11	10.5	10	9	7.5	-	-	-		
	2	1448	2092	2778	3330	3945	4924	5638	6992	-	-	24	
		23	22.5	22	21.5	21	20	17	7	-	-		
	4	1460	2145	2838	3434	4056	4965	5750	7213	7744	8320	48	
		46	45.5	45	44.5	43.5	41	37.5	28	18	10		
	6	1454	2145	2838	3418	4045	4982	5798	7301	7966	8497	72	
		70	69	68	67	66	64	61	46.5	36	25		
	8	1448	2105	2790	3388	4010	4970	5798	7275	8010	8541	96	
		95	94	93	92	90	86	80	64	52	42		
Max. Cont.	10	1390	2040	2730	3364	3974	4924	5762	7293	8030	8585	120	
		119	118	117	116	114	110	105	88	75	64		
	12	1342	1992	2678	3318	3934	4865	5702	7275	7992	8630	144	
		143	142	141	140	138	134	128	111	95	81		
	14	1272	1934	2620	3235	3868	4782	5632	7169	7921	8620	168	
		167	166	165	163	160	156	150	134	120	106		
	17	1155	1800	2498	3135	3750	4665	5498	6903	7788	8496	204	
		203	202	201	200	198	195	191	189	162	146		
	20	996	1682	2368	2990	3658	4572	5370	6859	7700	8408	240	
		240	237	234	231	228	223	217	199	185	169		
Max. Int.	24	808	1488	2210	2838	3470	4366	5133	6638	7434	8231	289	
		288	286	284	282	279	273	264	243	232	218		
Torque (theor.) in-lb. [daNm]		1531	2292	3062	3824	4284	5195	6116	7771	8868	9754		
		[17.3]	[25.9]	[34.6]	[43.2]	[48.4]	[58.7]	[69.1]	[87.8]	[100.2]	[110.2]		

19.2 in³./rev. [314,9 cm³./rev.]

Torque [in-lb] 8231
Speed [RPM] 218

Performance Data MLHSY 400

		Pressure (Δ PSI)								Max. Cont.	Max. Int.	Speed (theor.)
		250	500	750	1000	1400	1700	2000	2300	2540		
Flow [GPM]	2	865	1725	2592	3450	4702	5400	6255	-	-	19	
		18.5	18	17.5	17	16.5	15.5	11	-	-		
	4	902	1800	2620	3475	4820	5595	6461	7434	7966	38	
		37	36.5	36	35.5	34.5	33	26	17	8		
	6	918	1825	2700	3540	5035	5820	6611	7700	8231	57	
		56	55	54	53	52	50	40	33	25		
	8	890	1775	2720	3530	4932	5755	6680	7789	8408	76	
		75	74	73	72	71	69	61	47	36.5		
	10	865	1725	2675	3490	4892	5715	6727	7905	8541	95	
		95	94	93	92	90	88	81	66	54.5		
Max. Cont.	12	740	1675	2605	3415	4855	5690	6682	7921	8585	114	
		113	113	112	111	109	107	99	84	71		
	14	650	1612	2525	3322	4735	5560	6638	7877	8580	133	
		133	132	131	130	127	123	118	102	90		
	16	580	1520	2485	3230	4632	5485	6550	7744	8497	153	
		152	151	150	149	147	144	136	121	108		
	18	508	1450	2375	3040	4540	5315	6372	7567	8364	172	
		171	170	169	168	165	162	159	145	131		
	20	424	1240	2125	2955	4465	5230	6195	7390	8187	191	
		190	189	188	185	181	176	172	164	150		
Max. Int.	24	250	992	1885	2730	4260	5210	5930	7036	8568	229	
		228	227	226	225	221	215	210	203	196		
Torque (theor.) in-lb. [daNm]		964	1929	2894	3859	5398	6554	7712	8869	9798		
		[10.89]	[21.8]	[32.7]	[43.6]	[60.99]	[74.05]	[87.13]	[100.2]	[110.7]		

24.21 in³./rev. [397 cm³./rev.]

Metric Conversions

Flow 1 lpm = .2642 GPM
Pressure 1 bar = 14.51 PS
Torque 1 Nm = 8.85 in-lb

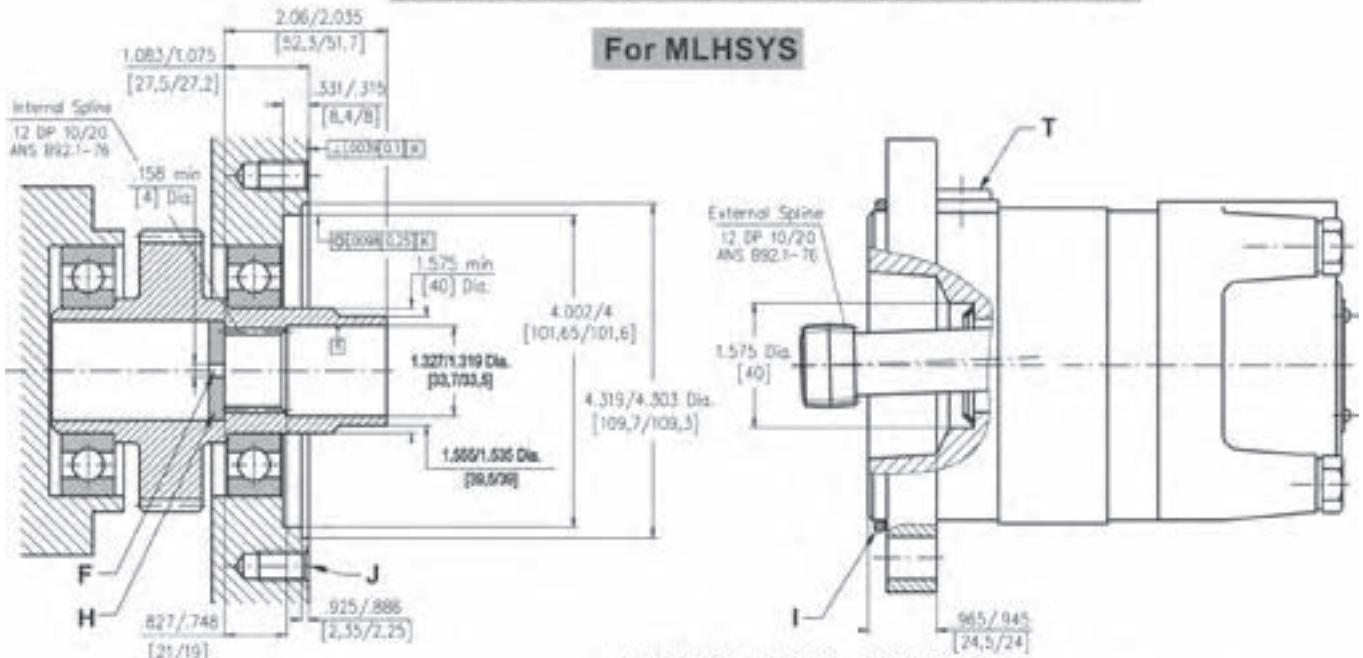
Torque [in-lb] 8568
Speed [RPM] 196

The Performance data was collected at back pressure 72.5+145 PSI [5+10 bar] and oil with viscosity of 150 SUS [32 mm²/s] at 122°F [50° C].

The dimensions, mounting data, shaft extensions and permissible shaft loads are the same as at hydraulic motors type MLHS... except following below.

DIMENSIONS OF THE ATTACHED COMPONENT

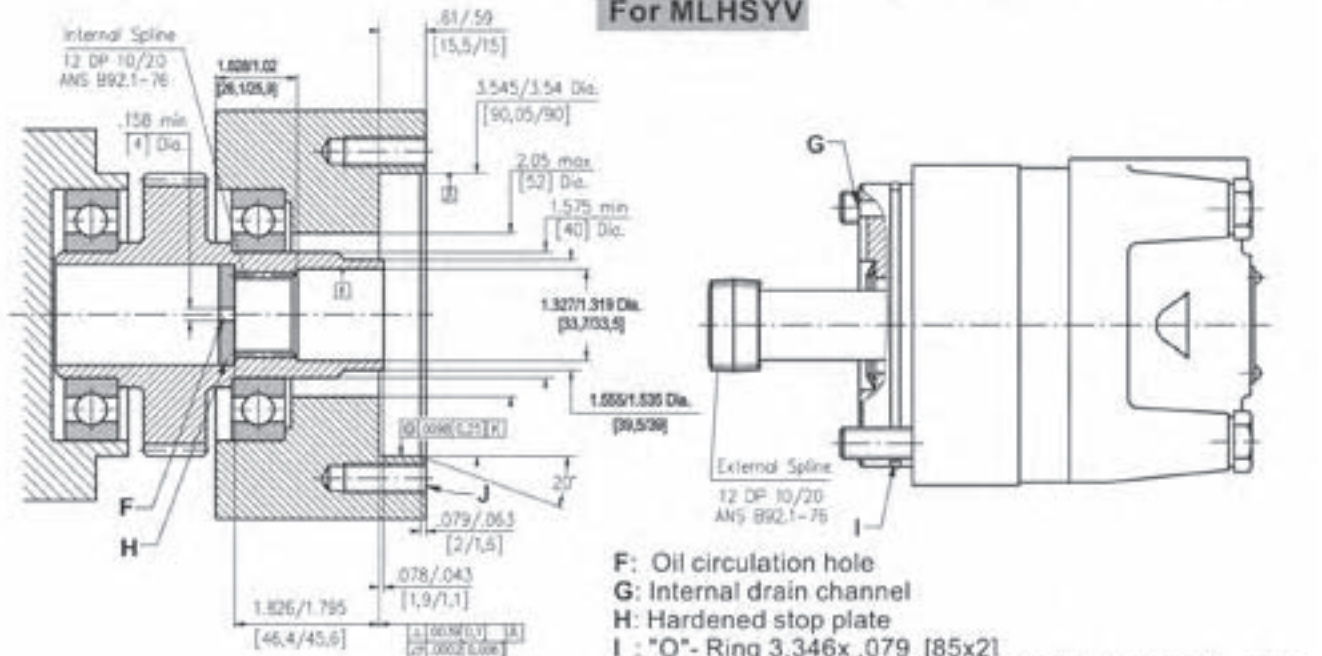
For MLHSYS



F: Oil circulation hole
H: Hardened stop plate

I: "O"- Ring 4.016x .118 [102x3]
J: 4xΩ UN- min .61 [15] Deep, 90°, 5.00[127] Dia. B.C.
T: Drain connection G1/4 or 1/4"-20UNF

For MLHSYV



F: Oil circulation hole
G: Internal drain channel
H: Hardened stop plate
I : "O"- Ring 3.346x .079 [85x2]
J: 4xM10- min 1.024 [26] Deep, 90°, 4.095[104] Dia. B.C.

DRAIN CONNECTION

A drain line ought to be used when pressure in the return line can exceed the permissible pressure. It can be connected:

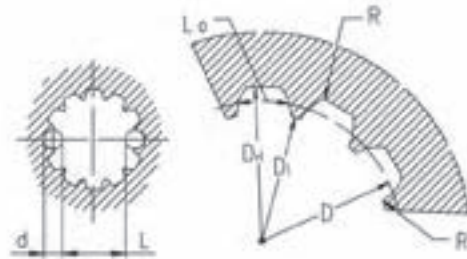
- For MLHSYS at the drain port of the motor;
- For MLHSYV at the drain connection of the attached component. The maximum pressure in the drain line is limited by the attached component and its shaft seal.

The drain line must be possible for oil to flow freely between motor and attached component and must be led to the tank. The maximum pressure in the drain line is limited by the attached component and its seal.

INTERNAL SPLINE DATA FOR THE ATTACHED COMPONENT

Standard 12 DP 10/20 ANSI B92.1-1976, class 5
 [m=2.54; corrected x.m=+0,4]

Fillet Root Side Fit		inch	mm
Number of Teeth	z	12	12
Diametral Pitch	DP	10/20	10/20
Pressure Angle		30°	30°
Pitch Dia.	D	1.2	30,48
Major Dia.	D _{ri}	1.323 + 1.307	33,2 ^{+0,4}
Minor Dia.	D _i	1.098 + 1.094	27,8 ^{+0,1}
Space Width [Circular]	Lo	.178 + .175	4,45 ^{+0,01}
Fillet Radius	R	.008	0,2
Max. Measurement between Pins	L	.901 + .894	22,72 ^{+0,11}
Pin Dia.	d	.19689 + 19681	5±0,001



Hardening Specification:
 HRC 60±2
 HRC 52
 .035-.019 [0,7±0,2] effective case depth
 Material 20 MoCr, DIN 17210 or better

Above are when hardened

ORDER CODE

1	2	3	4	5	6	7	8	9
MLHSY								

Pos.1 - Mounting Flange

- omit - SAE A-4, four holes
- A** - SAE A-2, two holes
- B** - SAE B, two holes
- E** - Wheel mount, 4.25 Pilot Dia.
- F** - Magneto, four holes
- S** - Short
- V** - Very short
- W** - Wheel mount, 5.00 Pilot Dia.

Pos.2 - Displacement code

- 200** - 12.20 [200,0] in.³/rev. [cm.³/rev.]
- 250** - 15.30 [250,0] in.³/rev. [cm.³/rev.]
- 315** - 19.20 [314,9] in.³/rev. [cm.³/rev.]
- 400** - 24.20 [397,0] in.³/rev. [cm.³/rev.]

Pos.3 - Shaft Extensions*[see page 89]

- omit - for **S** and **V** mounting flange
- C** - 1" [31,75] straight, Parallel key
- G** - 1" [31,75] 14T DP 12/24 Splined
- M** - 32 mm straight, Parallel key
- P** - 34,85 mm Splined, p.t.o. DIN 9611 Form 1
- T** - 1" [31,75] J501 Tapered

Pos.4 - Port Size/Type [standard manifold to each]

- 2** - side ports, 2xG1/2, G1/4, BSP thread, ISO 228
- 4** - side ports, 2x7/8-14 UNF, O-ring, 7/16-20 UNF
- 6** - rear ports, 2xG1/2; G1/4; BSP thread, ISO 228
- 7** - rear ports, 2x7/8-14 UNF, O-ring, 7/16-20 UNF

Pos. 5 - Speed Monitoring

- omit - none
- RS-P** - with speed sensor (PNP pull-down resistor)
- RS-N** - with speed sensor (NPN pull-up resistor)

Pos. 6 - Special Features[see Specification data-page 101]

- omit - none
- LL** - Low Leakage
- LSV** - Low Speed Valve

Pos. 7 - Rotation

- omit - Standard Rotation
- R** - Reverse Rotation

Pos. 8 - Option [Paint]**

- omit - no Paint
- P** - Painted
- PC** - Corrosion Protected Paint

Pos. 9 - Design Series

- omit - Factory specified

Notes : * 1. The permissible output torque for shafts must be not exceeded!
 2. The following combinations are not allowed - **E** flange with **G** and **P** shafts.

** Color at customer's request.

The hydraulic motors are mangano phosphatized as standard.