

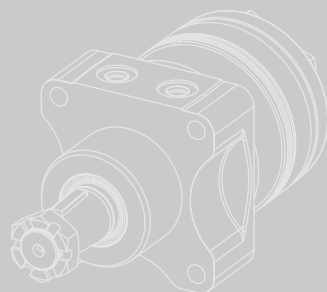
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Hengli®

HCW series

Orbital hydraulic motor

The HCW series orbital hydraulic motor, which boasts superior mass-to-power ratio, has been extensively used in all kinds of mobile and rotary conditions, particularly for low flow and large torque load starting conditions.



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Overview

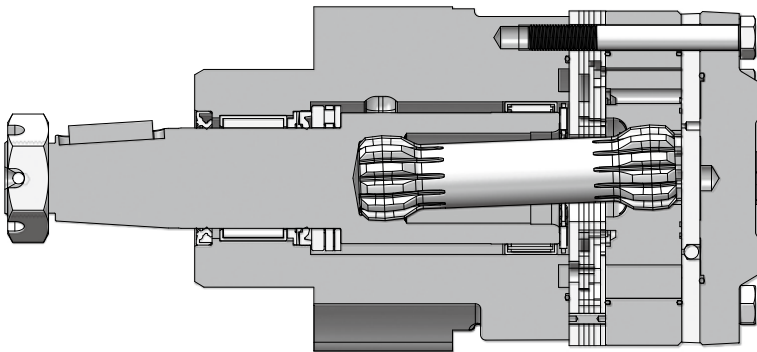
The HCW series orbital hydraulic motor, which boasts superior mass-to-power ratio, has been extensively used in all kinds of mobile and rotary conditions, particularly for lowflow and large torque load starting conditions.

During the working process, the unique balance plate design bends to the rotor under the effect of oil pressure, greatly reducing the end clearance of the fixed rotor and realizing higher volume efficiency; when the oil pressure reaches the working pressure, the deflection and oil pressure of the balance plate will achieve a dynamic balance, allowing for easy, mechanically-efficient rotor operation. This perfect exchange of efficiency maximizes the steady performance of the system and enables the whole machine to consume less energy.

Advantages

- The optimized high-pressure combined seal design ensures excellent sealing performance and reliability.
- The needle roller bearing structure makes it bear axial and radial loads better.
- The unique balance plate design ensures stable operation at low speeds and high pressures.
- The full flow cooling treatment of its linkage mechanism prolongs its service life.
- The advanced flow distribution system design greatly improves efficiency and makes the motor more compact.
- A variety of flange connection sizes are provided, facilitating installation.

Standard structure



P-0001

Specification

Type		120	160	200	230	260	300	350	375	400	470	540	620
Displacement (cm ³ /rev.)		116.8	157	198	225	253	291	328	363	400	451	542	618
Max.speed (rpm)	Continuous	360	374	337	294	292	278	241	203	167	162	140	120
	Intermittent	488	466	409	358	349	316	269	241	200	196	170	142
Max.flow (L/min)	Continuous	45	61	68	68	76	83	83	76	76	76	76	76
	Intermittent	61	76	83	83	91	95	95	91	91	91	91	91
Max.torque (Nm)	Continuous	378	480	559	658	726	827	929	1017	1008	1099	997	1014
	Intermittent	387	552	637	726	808	950	1061	1175	1275	1281	1251	1293
Max.pressure drop (bar)	Continuous	207	207	207	207	207	207	207	207	207	173	138	121
	Intermittent	241	241	241	241	241	241	241	241	241	207	173	155
	Peak	276	276	276	276	276	276	276	276	276	241	207	173
Max.no-load starting pressure (bar)		7	8	8	10	10	10	10	10	10	12	12	14
Min.starting torque (Nm)	Max.continuous	295	383	483	549	617	710	800	885	976	919	881	881
	Max.Intermittent	344	446	562	639	718	826	931	1031	1136	1100	1105	1129

T - 0001

- Intermittent working condition: The working time should be less than 6 seconds per minute under the intermittent working condition.
- Peak differential pressure: At peak differential pressure, the operating time is less than 0.6 seconds per minute.
- It is not recommended for the motor to work at simultaneous maximum torque and maximum speed.
- The filtration standard of ISO 4406 cleaning standard 20/18/15 is recommended.
- High quality anti-wear hydraulic fluids are recommended.
- When the temperature is 50°, the minimum viscosity of the oil is recommended to be 20mm²/s.
- The recommended maximum operating temperature is 82°C .
- To assure best motor life, run motor 10-15 minutes in low speed high torque mode at approximately 50% of continuous pressure and 50% of continuous flow.

Displacement performance

		Pressure(bar)						Max.Cont	Max.Inter
120		17	35	69	104	138	173	207	241
116.8 cm ³ /rev.		Torque(Nm), Speed(rpm)							
Flow (L/min)	2	18	52	96	139				
		14	14	10	7				
	4	23	53	111	163	226			
		25	24	25	21	14			
	8		55	120	178	228	272	303	344
			56	55	53	46	41	36	28
	15		53	115	187	244	378	337	361
			110	105	98	94	89	87	81
	23		51	114	186	237	277	336	359
			176	165	155	150	143	140	137
30			111	168	224	281	326	386	
			245	213	206	198	197	189	
38			103	167	220	276	323	384	
			293	282	271	265	252	241	
Max.Cont 45			101	163	216	275	320	387	
			360	346	330	325	320	306	
53			89	156	210	269	336		
			413	414	400	393	367		
Max.Inter 61			85	147	210	273	326		
			488	477	456	448	426		

Overall Efficiency: 70-100% 40-69% 0-39%

T - 0002

Torque (Nm):273
Speed (rpm):448

Displacement performance

		Pressure(bar)						Max.Cont	Max.Inter
		17	35	69	104	138	173	207	241
160									
157 cm ³ /rev.		Torque(Nm), Speed(rpm)							
Flow (L/min)	2	37	77	149	223	310	349		
		7	3	3	3	2	1		
	4	31	80	164	243	325	379	443	
		22	18	17	15	15	14	10	
	8	37	81	160	242	317	380	480	552
		46	44	40	39	38	36	31	29
	15	41	77	173	254	320	379	453	518
		94	92	88	85	81	80	78	74
	23		72	157	237	318	380	453	515
			139	133	133	128	123	123	117
	30		69	164	235	314	387	456	513
			188	182	178	175	172	167	163
	38		73	147	232	306	377	454	523
			233	228	227	219	221	212	208
45		67	143	225	303	368	441	499	
		279	278	271	269	263	256	249	
53			136	229	312	373	459	542	
			327	324	319	309	306	300	
Max.Cont 61			124	215	295	368	433	486	
			373	374	361	361	355	334	
68			108	200	284	362	420		
			419	418	417	407	402		
Max.Inter 76			105	190	278	350	454		
			466	460	460	454	444		

Overall Efficiency: 70-100% 40-69% 0-39%

T - 0003

Displacement performance

		Pressure(bar)						Max.Cont	Max.Inter	
		17	35	69	104	138	173	207	241	
200		198 cm ³ /rev.							Torque(Nm), Speed(rpm)	
Flow (L/min)	2	39	91	133	294	375				
		6	4	4	4	3				
	4	43	85	200	276	373	441	525		
		16	13	12	11	10	8	5		
	8	44	94	196	300	375	462	540	615	
		34	32	30	28	28	26	21	19	
	15	40	95	197	307	402	479	545	630	
		73	70	68	65	61	60	56	52	
	23		84	192	285	391	464	555	637	
			113	110	108	105	101	101	91	
	30		80	188	287	403	460	545	631	
			148	145	143	137	136	132	126	
	38		69	182	277	402	459	536	616	
			188	183	177	173	171	161	197	
	45			162	260	364	451	537	618	
				218	213	212	208	200	196	
53			151	271	369	449	559	603		
			258	254	248	244	242	236		
61			136	254	337	436	523	600		
			298	293	286	278	272	271		
Max.Cont 68			124	231	340	418	511	594		
			337	329	328	322	312	303		
76			111	207	309	401	501			
			373	373	366	357	346			
Max.Inter 83				193	282	371	468			
				409	400	389	370			

Overall Efficiency: 70-100% 40-69% 0-39%

T - 0004

Displacement performance

		Pressure(bar)					Max.Cont	Max.Inter
		17	35	69	104	138	173	207
230								
225 cm ³ /rev.		Torque(Nm), Speed(rpm)						
Flow (L/min)	2	43	91	184	292	373		
		6	4	3	1	1		
	4	51	105	223	315	416	491	565
		14	14	11	11	9	7	4
	8	55	108	217	335	436	527	615
		31	28	27	26	24	22	17
	15	46	111	211	329	439	542	658
		66	62	56	55	55	50	43
	23		107	214	338	427	535	627
			95	91	86	84	79	73
	30		92	210	318	427	524	639
			129	123	122	118	113	105
	38		82	198	314	438	528	617
			164	158	154	149	145	142
	45			193	297	425	514	604
				194	186	179	170	173
53			180	295	388	498	591	
			226	218	214	209	208	
61			155	278	401	487	582	
			259	257	251	247	241	
Max.Cont 68			145	269	356	500	570	
			294	287	282	279	272	
76			127	238	253	452	574	
			324	320	316	309	302	
Max.Inter 83				216	344	460	553	
				358	353	344	340	

Overall Efficiency: 70-100% 40-69% 0-39%

T - 0005

Displacement performance

		Pressure(bar)						Max.Cont	Max.Inter	
		17	35	69	104	138	173	207	241	
260		253 cm ³ /rev.							Torque(Nm), Speed(rpm)	
Flow (L/min)	2	51 4	114 2							
	4	55 11	116 11	244 12	365 9	482 9	578 7	352 6		
	8	57 29	113 27	144 25	365 23	490 22	598 21	708 18		
	15	53 61	117 57	266 52	370 53	492 50	597 48	703 43	805 39	
	23	47 88	127 86	244 82	369 81	504 77	595 72	726 68	806 66	
	30		98 116	232 110	353 109	481 106	595 100	698 98	799 90	
	38		86 143	234 142	344 141	474 137	588 135	689 128	800 119	
	45		82 175	222 174	345 171	474 168	570 161	677 154	808 144	
	53		70 205	203 204	332 202	451 197	572 184	673 184	770 176	
	61			185 230	301 229	454 223	555 218	656 215	754 207	
	68			163 261	310 262	419 255	551 248	646 243	744 232	
	Max.Cont	76		139 292	283 290	396 286	526 279	640 273	738 265	
		83		138 323	263 317	378 318	513 311	618 301		
	Max.Inter	91		86 349	230 348	366 347	501 343			

Overall Efficiency: 70-100% 40-69% 0-39%

T - 0006

Displacement performance

300		Pressure(bar)					Max.Cont	Max.Inter
		17	35	69	104	138	173	207
291 cm ³ /rev.		Torque(Nm), Speed(rpm)						
Flow (L/min)	2	51 3	95 1					
	4	64 12	146 11	302 9	434 9	510 7	626 3	
	8	62 22	158 20	309 20	438 20	572 17	680 14	830 8
	15	67 49	144 46	315 44	430 43	556 37	682 35	907 26
	23	60 77	138 73	291 73	423 68	547 66	691 58	909 48
	30	47 101	127 99	307 101	389 94	572 88	697 79	929 72
	38		112 126	283 125	410 122	505 117	684 107	796 100
	45		94 152	260 149	390 150	475 146	643 135	784 123
	53		76 175	246 176	394 178	530 173	662 164	809 151
	61		64 202	223 200	368 201	506 190	632 186	799 176
	68			202 226	340 226	468 223	667 212	803 198
	76			174 253	328 252	477 244	609 238	743 230
	83			145 278	323 278	467 270	575 263	733 255
	91			121 304	282 302	433 298	558 290	702 279
	Max.Inter	95		106 316	261 313	433 310	554 308	708 295

Overall Efficiency: 70-100% 40-69% 0-39%

T - 0007

Displacement performance

350

328 cm³/rev.

Flow (L/min)

Pressure(bar)						Max.Cont	Max.Inter
17	35	69	104	138	173	207	241

Torque(Nm), Speed(rpm)

2	64	133	272	399			
	4	3	3	2			
4	65	134	297	436			
	11	9	9	7			
8	68	145	313	461	599	742	856
	20	20	20	17	17	17	15
15	72	152	314	471	631	773	889
	43	42	41	39	38	36	34
23	62	148	314	474	631	767	925
	64	62	61	60	58	53	51
30	55	137	309	460	625	769	929
	88	83	86	83	78	76	70
38		114	298	433	602	743	912
		109	108	110	103	98	95
45		98	264	446	581	740	890
		130	128	129	125	117	108
53		87	253	423	571	726	882
		153	152	151	148	142	134
61		64	236	409	549	720	849
		174	174	172	170	163	154
68			220	393	570	695	837
			195	193	189	189	173
76			207	376	516	686	836
			216	217	217	216	196
Max.Cont 83			181	351	551	686	815
			241	238	235	234	223
91			173	360	534	666	
			262	261	260	256	
Max.Inter 95				367	528	648	
				269	269	266	

Overall Efficiency: 70-100% 40-69% 0-39%

T - 0008

Displacement performance

		Pressure(bar)					Max.Cont	Max.Inter	
		17	35	69	104	138	173	207	241
375		Torque(Nm), Speed(rpm)							
Flow (L/min)	2	75							
		3							
	4	85	164	325	492	643	758		
		7	7	7	6	5	4		
	8	85	173	364	536	688	841	949	
		17	17	16	16	15	13	10	
	15	75	161	363	539	701	862	985	1115
		38	38	37	37	33	29	26	22
	23	68	155	355	531	698	867	1017	1175
		60	59	57	56	53	49	42	39
	30	59	148	343	514	699	845	1012	1163
		80	79	79	78	73	67	62	52
	38		132	325	498	685	835	1012	1155
			99	99	98	94	88	80	73
	45		118	303	482	642	812	983	1145
			120	120	119	115	106	97	95
	53		95	283	478	628	797	947	1125
			141	141	139	135	130	122	107
61		76	264	432	607	775	939	1094	
		160	160	160	154	153	142	132	
68			238	436	599	773	908	1085	
			182	181	178	169	163	154	
Max.Cont 76			212	386	562	740	876	1025	
			203	201	199	193	185	171	
83			176	372	532	699	843		
			221	220	219	215	207		
Max.Inter 91			143	323	514	665			
			241	241	240	231			

Overall Efficiency: 70-100% 40-69% 0-39%

T - 0009

Displacement performance

		Pressure(bar)						Max.Cont	Max.Inter	
		17	35	69	104	138	173	207	241	
400		Torque(Nm), Speed(rpm)								
Flow (L/min)	2	73	167	336	497	647				
		5	4	4	3	3				
	4	85	184	367	532	703	865			
		8	8	8	9	9	8			
	8	96	196	381	551	716	907	1046		
		19	20	19	19	19	18	17		
	15	89	201	370	558	722	882	1083	1249	
		37	36	38	36	36	35	31	26	
	23	83	193	381	549	740	931	1098	1222	
		56	56	56	57	55	54	52	49	
	30	70	177	375	546	728	923	1075	1186	
		75	74	71	73	72	69	68	66	
	38	55	159	358	530	713	905	1080	1167	
		92	95	92	93	91	88	86	85	
	45	42	144	336	512	684	879	1077	1158	
		110	112	111	111	109	105	101	100	
	53	19	121	321	492	665	864	1050	1135	
		131	132	131	130	128	125	121	118	
61		89	290	470	651	842	1028	1122		
		154	152	150	147	144	140	138		
68		61	262	447	623	804	975	1091		
		173	171	168	166	162	158	164		
Max.Cont 76		30	230	419	594	784	955	1063		
		193	191	188	185	182	177	187		
Max.Inter 83			195	389	564	738	919			
			210	207	204	201	196			
91			171	368	541	721	900			
			228	225	222	219	214			

Overall Efficiency: 70-100% 40-69% 0-39%

T - 0010

Displacement performance

		Pressure(bar)					Max.Cont	Max.Inter
		17	35	69	104	138	173	207
470								
451 cm ³ /rev.		Torque(Nm), Speed(rpm)						
Flow (L/min)	2	93 2	185 1					
	4	98 8	204 6	409 5	610 5	815 4		
	8	98 15	208 13	435 13	658 12	855 12	1025 11	1196 9
	15	93 30	200 30	445 29	660 29	887 27	1067 24	1250 21
	23	86 48	194 48	438 44	673 44	874 43	1073 37	1259 33
	30	74 65	180 64	426 62	664 61	858 58	1099 51	1281 45
	38	54 83	164 80	408 79	627 78	851 75	1068 69	1275 60
	45		142 98	379 94	629 94	833 91	1069 85	1271 74
	53		113 112	351 113	580 111	804 110	1015 104	1223 95
	61		84 131	322 129	546 128	797 124	968 122	1192 115
	68		56 146	274 144	525 144	738 143	958 140	1167 129
	Max.Cont	76		235 162	479 161	705 157	918 155	1124 145
		83		203 180	461 179	669 176	885 172	
	Max.Inter	91		158 196	386 195	621 191	842 185	

Overall Efficiency: 70-100% 40-69% 0-39%

T - 0011

Displacement performance

		Pressure(bar)				Max.Cont	Max.Inter
		17	35	69	104	138	173
540							
542 cm ³ /rev.		Torque(Nm), Speed(rpm)					
Flow (L/min)	2	104 2	197 2				
	4	127 7	230 5	467 6	699 5	939 5	1150 5
	8	134 13	239 12	500 11	754 11	976 10	1185 10
	15	121 28	232 27	509 25	755 24	997 23	1223 23
	23	99 43	225 42	505 40	783 40	993 38	1226 35
	30	79 57	213 56	485 56	751 55	984 54	1251 48
	38	59 70	189 69	454 68	727 68	958 66	1246 64
	45		176 84	439 84	717 81	946 81	1204 78
	53		140 99	418 97	681 95	952 94	1185 93
	61		108 111	384 110	669 112	900 111	1164 106
	68		83 127	357 127	612 125	870 125	1117 124
	Max.Cont	76		323 140	603 139	828 137	1109 134
		83		299 156	538 154	792 152	
	Max.Inter	91		216 170	492 169	751 169	

Overall Efficiency: 70-100% 40-69% 0-39%

T - 0012

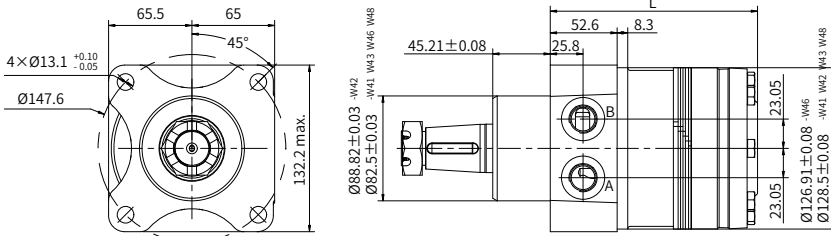
Displacement performance

620		Pressure(bar)				Max.Cont	Max.Inter
		17	35	69	104	121	155
618 cm ³ /rev.		Torque(Nm), Speed(rpm)					
Flow (L/min)	2	120 1	228 1				
	4	137 6	264 5	535 5	796 4	936 4	
	8	143 12	276 11	570 10	853 10	985 9	1256 7
	15	131 23	269 23	581 23	871 23	1009 22	1280 18
	23	112 36	261 36	575 34	883 34	1014 33	1285 29
	30	91 47	249 49	554 45	854 44	999 43	1293 42
	38	68 60	221 59	526 58	883 57	973 57	1269 53
	45		203 71	505 71	816 71	953 69	1240 65
	53		161 84	476 81	779 81	931 80	1226 79
	61		125 96	440 95	753 93	895 92	1187 90
	68		91 107	407 107	704 107	851 104	1148 105
	Max.Cont	76		359 120	675 118	816 118	1100 115
		83		329 132	615 132	759 130	
	Max.Inter	91		246 142	556 142	705 140	

Overall Efficiency: 70-100% 40-69% 0-39%

T - 0013

Installation size



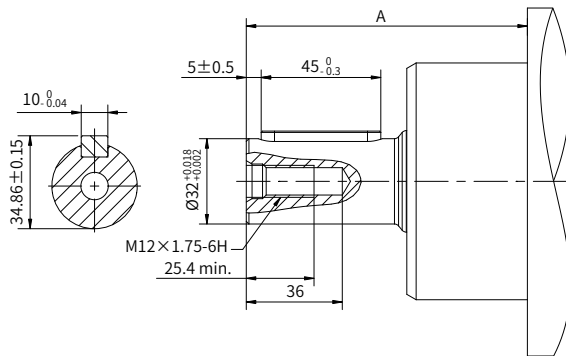
P - 0002

Main Port A, B: W41 W42 7/8-14UNF W43 W46 G1/2 W48 9/16-18UNC

Shaft end dimensions

S5

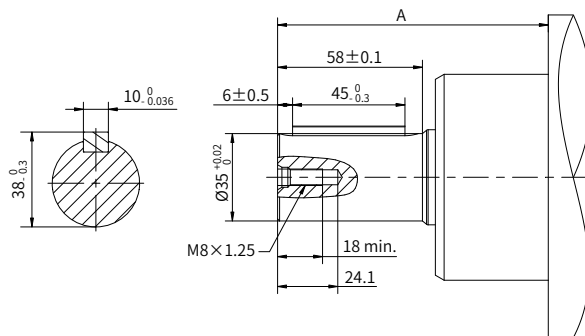
$\varnothing 32$ mm Straight
Parallel key $10 \times 8 \times 45$
Max. Torque: 1200Nm



P - 0008

S7

$\varnothing 35$ mm Straight
Parallel key $10 \times 8 \times 45$
Max. Torque: 1200Nm

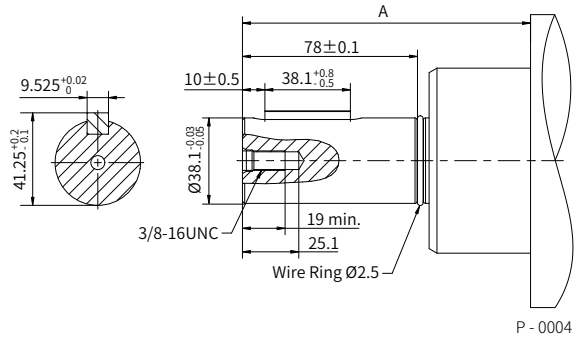


P - 0005

Shaft end dimensions

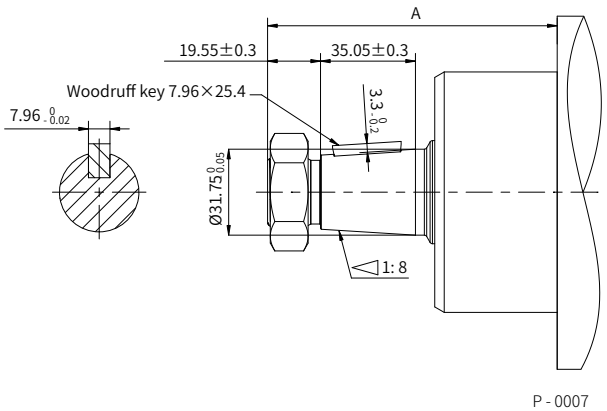
S4

Ø38.1mm Straight
 Parallel key 9.525×9.525×38.1
 Max. Torque: 1200Nm



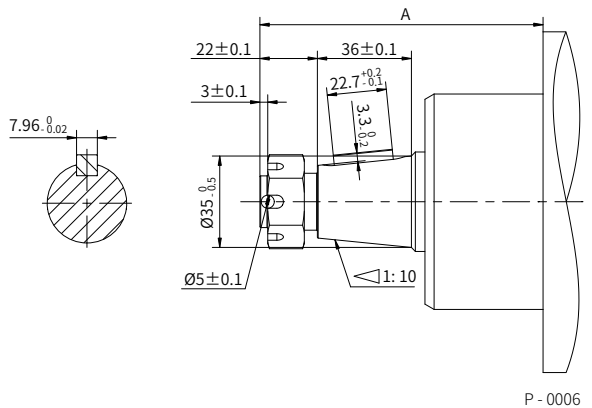
T1

Ø31.75mm Tapered
 Woodruff key 7.96×25.4
 Tightening torque 380Nm
 Max. Torque: 1200Nm



T8

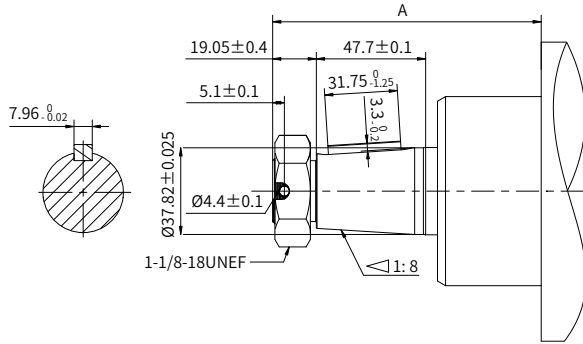
Ø35mm Straight
 Parallel key 7.96×7.96×22.7
 Tightening torque 325Nm
 Max. Torque: 1200Nm



Shaft end dimensions

T7

Ø38.1mm Tapered
 Parallel key 7.96×7×31.75
 Tightening torque 410-540Nm
 Max. Torque: 1200Nm



P - 0003

Shaft depth	A mm
S5	105.2
S7	111.9
S4	129.9
T1	106.8
T8	111.9
T7	116.9

T - 0030

Note: Dimension A is the overall distance from the flange mounting surface to the end of the shaft, and the tolerance is ± 1.03 mm.

Length and weight

Displacement cm ³ /rev.	L mm	Weight kg
120	151.4	15
160	154.6	15.3
200	158.1	15.7
230	160.5	15.9
260	163.0	16.2
300	166.3	16.4
350	169.5	16.7
375	172.6	17
400	175.8	17.3
470	180.2	17.7
540	188.2	18.4
620	194.8	19.1

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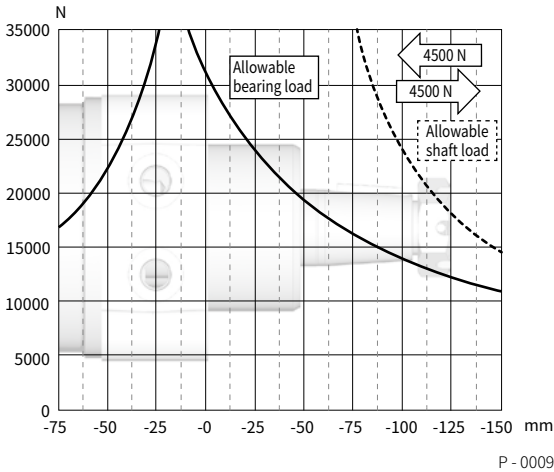
Note: Dimensions L, A, B, C are the length from the flange mounting surface to the rear end of the motor, and the tolerance is ± 0.93 mm.

Allowable shaft load/bearing curve

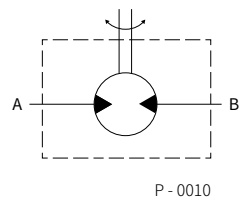
As shown in the figure, when the axial load is 0, the radial allowable load of the output shaft is related to the distance from the flange mounting surface to the load action point.

The solid line shows the allowable radial load of the bearing. It is based on L_{10} bearing life 2000 hrs at 100 RPM with rated output torque.

The dash line shows max radial shaft load. Any shaft load exceeding the values quoted in the curve will involve a risk of failure.

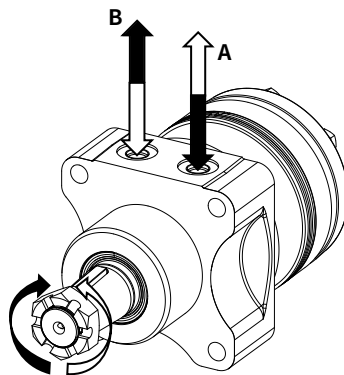


Hydraulic diagram



Rotation direction: CW

When facing the motor shaft extension direction, port A is high pressure oil, the output shaft rotates CW; Otherwise, it rotates CCW.



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Ordering information



Pos.1	2	3	4	5	6	7
Series code	Displacement	Mount, Port	Output shaft	Rotation direction	Paint option	Special features
HCW	120	W41 4×Ø13.1 Wheel mount Ø82.5 pilot, Port 7/8-14UNF, Rear pilot Ø128.5 W42 4×Ø13.1 Wheel mount Ø88.82 pilot, Port 7/8-14UNF, Rear pilot Ø128.5 W43 4×Ø13.1 Wheel mount Ø82.5 pilot, Port G1/2, Rear pilot Ø128.5 W46 4×Ø13.1 Wheel mount Ø82.5 pilot, Port G1/2, Rear pilot Ø126.91 W48 4×Ø13.1 Wheel mount Ø82.5 pilot, Port 9/16-18UNC, Rear pilot Ø128.5	S5 Ø32 Straight, Parallel key 10×8×45	A CW	No Paint	Standard Free running High temperature Low temperature
	160		S7 Ø35 Straight, Parallel key 10×8×45	R CCW	Black	
	200		S4 Ø38.1 Straight, Parallel key 9.525×9.525×38.1		Hengli blue	
	230		T1 Ø31.75 Tapered, woodruff key 7.96×25.4			
	260		T8 Ø35 Tapered, Parallel key 7.96×7.96×22.7			
	300		T7 Ø38.1 Tapered, Parallel key 7.96×7×31.75			
	350					
	375					
400						
470						
540						
620						

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Note: When using the order information, the user can select the motor series, displacement, installation flange, port, shaft and other information. If the selected specification is not in the table or has special requirements, please contact us.