2.1

HSD series

Orbital hydraulic motor

The HSD series orbital hydraulic motor, it is a low-speed and high-torque hydraulic motor, the end face distribution makes it to have characteristics of high working pressure, low starting pressure, high efficiency and high reliability.

Contents

Bearingless motor

Standard mount

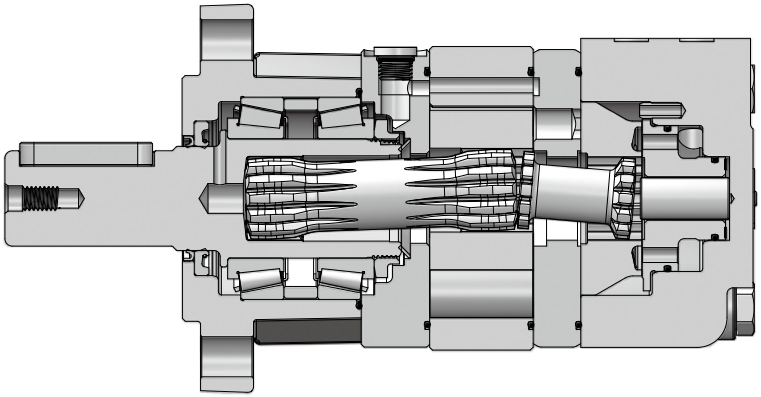
Overview

The HSD series orbital hydraulic motor, it is a low-speed and high-torque hydraulic motor, the end face distribution makes it to have characteristics of high working pressure, low starting pressure, high efficiency and high reliability. Customised product can be developed by different application requirement.

Advantages

- Using tapered roller bearing structure, can support larger axial and radial load.
- Advanced disc valve structure, high distribution accuracy, strong automatic compensation ability after wear, to ensure high volumetric efficiency, long life, efficient and stable work.
- Various displacements and installation dimensions are available.

Standard structure



P-0029

Specification

Type		80	100	125	160	200	230	250	315	400	500
Displacement (cm^3/rev.)		80.2	99.6	124.9	159.2	199.4	232.1	249.3	314.0	391.9	488.3
Max.speed (rpm)	Continuous	773	739	592	465	372	318	298	236	188	153
	Intermittent	982	892	714	562	447	385	359	284	229	187
Max.torque (N·m)	Continuous	241	297	370	473	610	658	676	874	897	847
	Intermittent	316	390	485	580	727	812	855	987	1056	986
Max.output (kW)	Continuous	15.5	18.0	18.0	16.5	16.5	13.8	14.5	15.0	11.0	9
	Intermittent	19.5	22.5	22.5	23.0	22.0	17.2	18.0	17.0	12.5	10.5
Max.differential pressure (bar)	Continuous	210	210	210	210	210	200	200	200	160	120
	Intermittent	275	275	275	260	250	250	250	240	190	140
	Peak	295	295	295	280	270	270	270	260	210	160
Max.flow (L/min)	Continuous	65	75	75	75	75	75	75	75	75	75
	Intermittent	80	90	90	90	90	90	90	90	90	90
Max.no-load starting pressure (bar)		12	10	10	8	8	8	8	8	8	8
Min.starting torque (N·m)	Max.continuous differential pressure	145	215	283	359	460	530	554	734	796	781
	Max.Intermittent differential pressure	188	281	371	440	557	633	697	858	925	925
Weight (kg)	Bearingless	8.2	8.4	8.7	9	9.5	9.9	10.1	11.1	11.6	11.8
	Standard	9.9	10.1	10.4	10.7	11.2	11.6	11.8	12.8	13.3	13.5

T - 0041

- 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 $20mm^2/s$.
- 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.

Ordering information

HSD	080	A3	H	S1	A	N	A
①	②	③	④	⑤	⑥	⑦	⑧

Orbital Hydraulic Series

①	Orbital Hydraulic Motor	HSD

Type

②	Type	080	100	125	160	200	230	250	315	400	500

Mount

③	SAE Type A 2×Ø13.5 mount Ø106.4, pilot Ø82.5×6.1	A3
	SAE Type A 4×Ø13.5 mount Ø106.4, pilot Ø82.5×6.1	A2
	SAE Type B 2×Ø14.3 mount Ø106.4, pilot Ø101.6×9.4	B2
	6×Ø13.5 Magneto mount Ø106.4, pilot Ø82.5×2.6	M0
	4×Ø11.55 Square mount Ø106.4, pilot Ø82.5×6.1	F1
	4×Ø11 Round mount Ø125, pilot Ø100×6, bearingless motor	B0
	4×Ø13.5 Square mount Ø127, pilot Ø101.6×6.3, bearingless motor	F0
	SAE Type A 2×Ø13.5 mount Ø106.4, pilot Ø82.5×6.1 with O-rings	A4
	4×Ø13.5 Magneto mount Ø106.4, pilot Ø82.5(-0.05/-0.1)×2.6	M2
	4×Ø13.5 Square mount 90*90, pilot Ø100×8	F5
	SAE Type A 4×Ø13.5 mount Ø106.4, pilot 82.5(-0.05/-0.1)×6.1	A6

Port

④	Port G1/2, drain port G1/4	H
	Port 7/8-14UNF, drain port 7/16-20UNF	2
	Port M22×1.5, drain port M14×1.5	3
	Port A unthreaded hole Ø12.7, port B unthreaded hole Ø15.88，3×3/8-16UNC	7
	Port G1/2, drain port M14×1.5	B
	Rear oil port, port M22×1.5(ISO 6149), drain port M14×1.5	C
	Rear oil port, port 7/8-14UNF, drain port 7/16-20UNF	D
	Port M22×1.5(ISO 6149), drain port M14×1.5	M
	Port 9/16-18UNF, drain port 7/16-20UNF, without oil port countersink	T

Ordering information

Output Shaft

		A3/A2/B2/M0/F1/A4/M2/F5/A6	B0/F0	Code
⑤	Ø25.4 Straight, parallel key 6.35×6.35×31.75	●		S1
	Ø31.75 Straight, parallel key 7.96×7.96×31.75	●		S5
	Ø32 Straight, parallel key 10×8×45	●		S3
	Ø22 Spline 13-DP16/32	●		R2
	Ø25.4 Shaft, spline SAE 6B, center hole 1/4-20UNC	●		R1
	Ø31.75 Spline 14-DP12/24, center hole 3/8-16UNC	●		R4
	Ø31.75 Spline 14-DP12/24, center hole M8	●		R5
	Ø31.75Tapered, parallel key 7.96×7.96×31.75	●		T2
	Ø25 Straight, parallel key 8×7×32, center hole M8	●		S2
	Ø31.75 Spline 14-DP12/24, center hole 3/8-16UNC, with unloading groove	●		RA
	Ø30 6B Spline, 30×26×6, with ring groove	●		R9
	Ø31.75 Tapered, parallel key 7.96×7.96×22.6, with dust cover	●		TB
	Ø25.4 Tapered, parallel key 7.96×7.96×31.75, shaft extension 12mm	●		T4
	Ø25.4 Straight, parallel key 6.35×6.35×31.75, center hole 1/4-20UNC	●		SB
	Ø25(-0.01/-0.03) Straight, parallel 8×7×32, center hole M8	●		SA
	Cardan		●	C1

Rotation Direction

⑥	CW	A
	CCW	R

Paint Option

⑦	No Paint	N
	Black	B
	Hengli blue	C

Ordering information

Special Features

		A3/A2/B2/M0/F1/A4/ M2/F5/A6	M0	Code
⑧	Standard	●	●	A
	Free running	●	●	F
	High temperature	●	●	V
	Low temperature	●	●	S
	Speed sensor, DT04-4P connector	●	●	S2
	Dust cover	○	●	D

T - 0067

Note: ● =Available; ○ =Available on request;

1) The B0, F0 options are bearingless motor,and the shaft option is C1.

2) 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.

Displacement performance

		Pressure(bar)					Max.Cont			Max.Inter
80		30	70	105	140	175	210	225	250	275
80.2 cm³/rev.	Torque(N·m), **Speed(rpm)**									
Flow (L/min)	5	26	59	92	117	147				
		60	**57**	**54**	**52**	**51**				
	10	33	72	110	146	183	218	233	254	
		121	**118**	**115**	**111**	**105**	**98**	**93**	**86**	
	20	33	74	116	155	195	236	259	278	304
		243	**239**	**235**	**231**	**225**	**217**	**204**	**203**	**186**
	30	29	76	118	159	199	241	268	287	316
		367	**362**	**357**	**352**	**345**	**335**	**330**	**319**	**303**
	40	25	72	113	154	195	235	262	280	311
		489	**483**	**479**	**473**	**465**	**455**	**434**	**438**	**421**
	50		67	108	150	190	232	260		
			608	**602**	**595**	**586**	**574**	**550**		
Max.Cont	65		66	105	146	189	230	259		
			773	**766**	**758**	**747**	**733**	**696**		
Max.Inter	80		62	102	143	185				
			982	**974**	**964**	**953**				

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

T - 0047

		Pressure(bar)					Max.Cont			Max.Inter
100		35	70	105	140	175	210	225	250	275
99.6 cm³/rev.	Torque(N·m), **Speed(rpm)**									
Flow (L/min)	5	36	80	121	159	197	232	257		
		48	**47**	**46**	**44**	**42**	**38**	**34**		
	10	37	82	125	166	227	257	276	306	337
		97	**95**	**93**	**91**	**85**	**84**	**82**	**74**	**69**
	20	39	90	139	187	235	280	299	326	352
		196	**194**	**191**	**189**	**185**	**180**	**176**	**168**	**157**
	30	41	93	143	193	244	292	316	352	383
		295	**292**	**288**	**284**	**280**	**276**	**269**	**260**	**249**
	40	41	92	143	193	245	297	320	356	390
		393	**390**	**386**	**382**	**376**	**369**	**366**	**355**	**342**
	50	37	88	140	192	241	293	316		
		494	**488**	**485**	**481**	**474**	**466**	**463**		
	60	33	80	133	185	235	288	310		
		592	**588**	**584**	**577**	**571**	**562**	**556**		
Max.Cont	75	30	78	130	180	230	283	304		
		739	**731**	**725**	**719**	**709**	**697**	**690**		
Max.Inter	90		71	123	172	223				
			892	**885**	**876**	**867**				

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

T - 0048

Displacement performance

	Pressure(bar)					Max.Cont			Max.Inter
125	35	70	105	140	175	210	225	250	275
124.9cm³/rev.	Torque(N·m), **Speed(rpm)**								
5	51	109	166	226	281	333			
	39	**38**	**38**	**36**	**35**	**34**			
10	57	120	182	244	301	353	373	405	
	78	**77**	**76**	**74**	**73**	**69**	**67**	**62**	
20	54	119	179	244	306	367	395	437	473
	158	**156**	**155**	**153**	**150**	**145**	**143**	**135**	**123**
30	50	115	177	243	306	370	396	441	483
	237	**235**	**234**	**231**	**214**	**209**	**206**	**198**	**189**
40	44	109	174	238	303	367	395	441	485
	318	**315**	**313**	**310**	**305**	**299**	**296**	**288**	**277**
50	41	106	170	234	298	364	392		
	394	**396**	**392**	**389**	**384**	**377**	**373**		
60	38	96	168	232	297	363	390		
	480	**476**	**472**	**468**	**463**	**454**	**452**		
Max.Cont 75	29	96	161	227	291	355	383		
	592	**592**	**588**	**583**	**578**	**570**	**564**		
Max.Inter 90		91	156	221	286				
		714	**709**	**703**	**694**				

Flow (L/min)

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

T - 0049

	Pressure(bar)						Max.Cont		Max.Inter
160	35	70	105	140	160	175	210	225	260
159.2cm³/rev.	Torque(N·m), **Speed(rpm)**								
5	63	131	200	291	332	358			
	31	**29**	**28**	**28**	**28**	**27**			
10	70	151	229	306	343	368	437	466	
	61	**60**	**59**	**58**	**56**	**57**	**56**	**54**	
20	67	145	226	308	355	388	467	498	
	123	**122**	**120**	**119**	**118**	**117**	**113**	**109**	
30	65	147	229	311	357	391	473	506	580
	185	**184**	**182**	**180**	**179**	**178**	**173**	**171**	**169**
40	61	143	224	306	353	386	467	501	579
	247	**245**	**243**	**241**	**240**	**238**	**233**	**229**	**219**
50	52	136	218	298	345	379	461	496	
	310	**307**	**305**	**302**	**301**	**299**	**293**	**289**	
60	46	127	208	289	335	369	450	486	
	373	**370**	**367**	**347**	**361**	**359**	**353**	**347**	
Max.Cont 75	39	113	193	275	321	356	439	473	
	465	**458**	**455**	**451**	**448**	**446**	**438**	**433**	
Max.Inter 90	26	103	183	265	312				
	560	**562**	**558**	**552**	**549**				

Flow (L/min)

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

T - 0050

Displacement performance

	Pressure(bar)						Max.Cont		Max.Inter
200	35	70	105	140	160	175	210	225	250
199.4cm³/rev.	Torque(N·m), **Speed(rpm)**								
5	71	163	257	368					
	24	**24**	**23**	**23**					
10	78	178	276	371	432	469	573		
	49	**49**	**48**	**47**	**47**	**46**	**43**		
20	85	188	291	396	459	501	604	646	713
	98	**96**	**95**	**93**	**90**	**89**	**82**	**76**	**68**
30	88	192	297	401	462	505	610	656	727
	147	**146**	**144**	**142**	**140**	**139**	**133**	**129**	**111**
40	75	181	285	390	451	494	600	644	716
	197	**194**	**192**	**190**	**188**	**187**	**181**	**176**	**169**
50	65	170	273	379	438	484	588	633	
	246	**244**	**242**	**240**	**238**	**236**	**230**	**226**	
60	53	159	262	368	426	472	576	622	
	297	**294**	**291**	**289**	**287**	**285**	**279**	**276**	
Max.Cont 75	44	150	254	359	420	464	569	612	
	372	**369**	**366**	**363**	**361**	**359**	**353**	**349**	
Max.Inter 90		138	254	343	401				
		447	**442**	**438**	**435**				

Flow (L/min)

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

T - 0051

	Pressure(bar)							Max.Cont		Max.Inter
230	35	70	95	125	140	155	175	200	225	250
232.1cm³/rev.	Torque(N·m), **Speed(rpm)**									
5	88	187	258							
	21	**20**	**18**							
10	101	215	303	397	441	491				
	42	**41**	**40**	**38**	**37**	**35**				
20	102	219	305	407	450	509	577	658	736	812
	84	**82**	**80**	**79**	**79**	**77**	**76**	**74**	**71**	**66**
30	104	225	334	415	459	519	588	675	744	
	127	**125**	**119**	**123**	**122**	**121**	**120**	**118**	**114**	
40	102	226	333	413	459	518	588	648	732	
	169	**167**	**159**	**165**	**165**	**164**	**162**	**160**	**157**	
50	100	217	324	408	451	512	581			
	212	**211**	**200**	**208**	**207**	**206**	**205**			
60	85	205	310	395	439	499	568			
	255	**253**	**241**	**251**	**250**	**248**	**247**			
Max.Cont 75	76	197	300	387	430	488	498			
	256	**318**	**302**	**315**	**314**	**312**	**310**			
Max.Inter 90		185	289	391	425					
		385	**365**	**364**	**372**					

Flow (L/min)

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

T - 0052

Displacement performance

	Pressure(bar)							Max.Cont		Max.Inter
250	35	70	95	125	140	155	175	200	225	250
249.3 cm^3/rev.	Torque(N·m), **Speed(rpm)**									
5	87									
	20									
10	101	208	288	364	421	506				
	39	**37**	**36**	**33**	**30**	**28**				
20	103	229	315	417	463	513				
	78	**76**	**74**	**73**	**72**	**70**				
30	95	223	313	421	473	538	603	675	749	855
	118	**116**	**115**	**113**	**112**	**111**	**108**	**91**	**85**	**70**
40	83	213	304	414	467	538	608	676	760	
	157	**155**	**154**	**152**	**151**	**149**	**147**	**142**	**135**	
50	68	199	290	401	460	541	613			
	197	**195**	**194**	**192**	**191**	**189**	**187**			
60	51	180	273	384	439	529	600			
	238	**235**	**234**	**232**	**230**	**229**	**226**			
Max.Cont 75	21	150	241	353	408	519				
	298	**296**	**294**	**295**	**290**	**288**				
Max.Inter 90		110	203	321	369					
		359	**356**	**358**	**350**					

Flow (L/min)

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

T - 0053

	Pressure(bar)							Max.Cont		Max.Inter
315	35	70	100	120	140	160	175	200	225	240
314.0cm^3/rev	Torque(N·m), **Speed(rpm)**									
5	127	254	339							
	15	**14**	**14**							
10	133	272	393	465	547	609				
	31	**30**	**28**	**26**	**24**	**22**				
20	141	305	441	528	613	669				
	62	**61**	**59**	**58**	**55**	**50**				
30	144	310	453	545	635	721	783	874	969	987
	93	**92**	**91**	**89**	**87**	**81**	**74**	**66**	**53**	**50**
40	134	297	440	535	627	719	785	873	949	
	125	**123**	**122**	**121**	**119**	**116**	**113**	**102**	**95**	
50	129	291	434	529	623	717	784			
	156	**155**	**153**	**152**	**151**	**148**	**145**			
60	108	272	414	509	604	697	767			
	188	**186**	**185**	**184**	**182**	**180**	**177**			
Max.Cont 75	85	254	395	490	585	679				
	236	**234**	**232**	**231**	**229**	**226**				
Max.Inter 90	60	228	370	464	559					
	284	**283**	**281**	**279**	**277**					

Flow (L/min)

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

T - 0054

Displacement performance

	Pressure(bar)						Max.Cont	Max.Inter
400	30	60	80	105	120	140	160	175	190
391.9cm³/rev.	Torque(N·m), **Speed(rpm)**								
5	142	293							
	11	**10**							
10	153	306	414	558					
	25	**24**	**23**	**22**					
20	152	328	448	590	677	791	897	979	
	50	**49**	**48**	**47**	**46**	**45**	**39**	**36**	
30	163	342	460	608	697	815	931	997	1056
	75	**74**	**73**	**72**	**71**	**70**	**68**	**65**	**60**
40	153	331	451	599	688	810	923	978	
	100	**99**	**98**	**97**	**96**	**95**	**93**	**91**	
50	136	330	454	590	688	776			
	125	**124**	**123**	**122**	**121**	**121**			
60	123	298	417	566	657	775			
	150	**150**	**149**	**148**	**147**	**145**			
Max.Cont 75	96	278	399	544	635				
	188	**188**	**187**	**185**	**185**				
Max.Inter 90	68	248	367	517					
	225	**229**	**227**	**224**					

Flow (L/min)

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

T - 0055

	Pressure(bar)					Max.Cont	Max.Inter
500	25	50	80	90	105	120	140
488.3cm³/rev.	Torque(N·m), **Speed(rpm)**						
10	160	329					
	20	**20**					
20	152	333	547	616	722		
	41	**40**	**40**	**39**	**34**		
30	160	342	561	633	740	847	986
	57	**57**	**56**	**56**	**56**	**55**	**54**
40	153	337	557	629	736	842	
	81	**81**	**80**	**80**	**79**	**79**	
50	132	316	538	613	723	835	
	102	**101**	**100**	**100**	**100**	**99**	
60	121	304	526	597	708		
	122	**122**	**121**	**121**	**135**		
Max.Cont 75	92	260	478	552	664		
	153	**153**	**152**	**151**	**151**		
Max.Inter 90	56	223	447	518			
	177	**186**	**184**	**184**			

Flow (L/min)

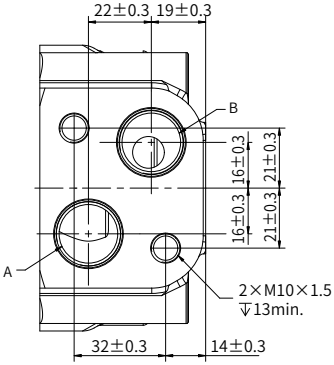
Torque (N·m):835
Speed (rpm):99

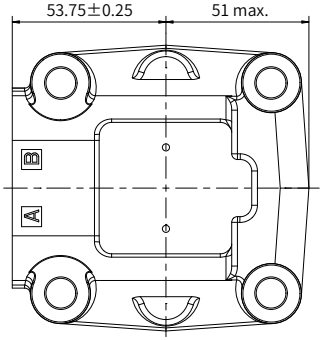
Overall Efficiency: 70-100% 40-69% 0-39%

T - 0056

Installation size

· Port Size



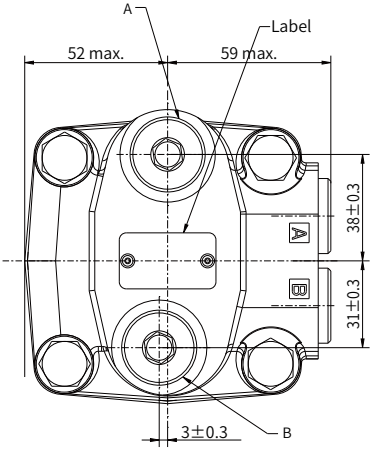


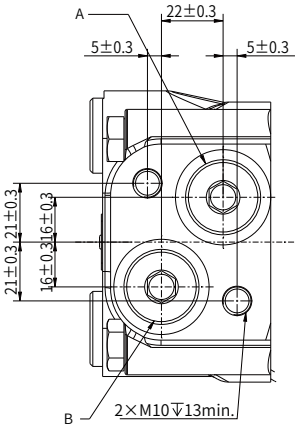
P - 0030

Code	A/B	C
H	G1/2	G1/4
2	7/8-14UNF	7/16-20UNF
3	M22x1.5	M14x1.5
7	Ø12.7/Ø15.88	7/16-20UNF
B	G1/2	M14x1.5
M	M22×1.5（ISO 6149）	M14x1.5
T	9/16-18UNF	7/16-20UNF

T - 0232

· Rear Port Size





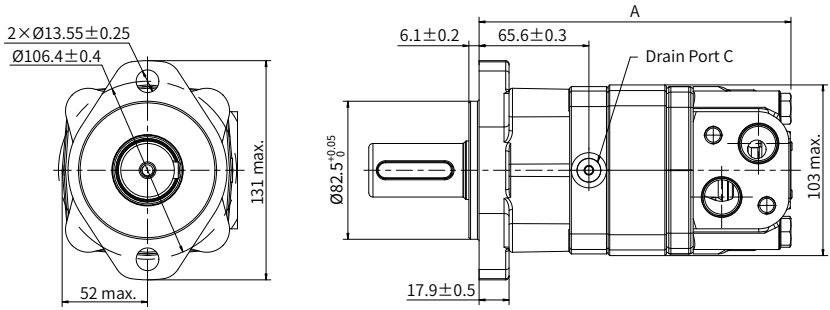
P - 0295

Code	A/B	C
C	M22×1.5（ISO 6149）	M14x1.5
D	7/8-14UNF	7/16-20UNF

T - 0233

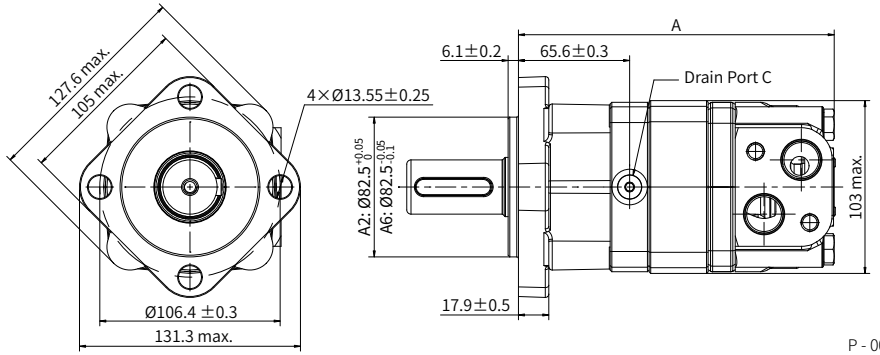
Installation size

A3/A4 2-HOLE, SAE A MOUNT



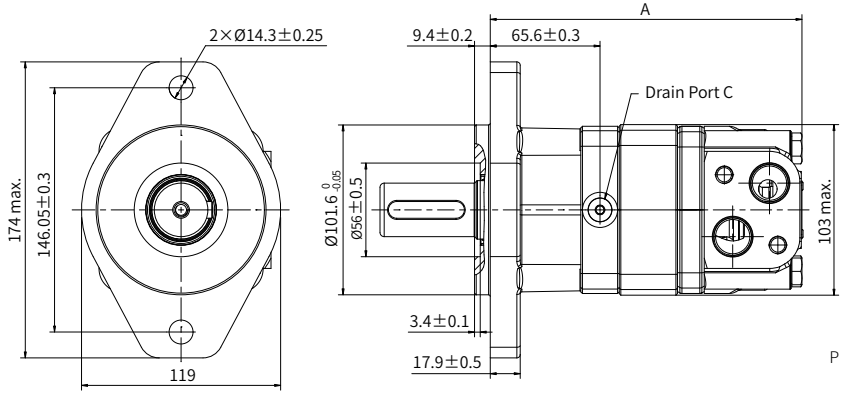
P - 0033

A2/A6 4-HOLE, SAE A MOUNT



P - 0034

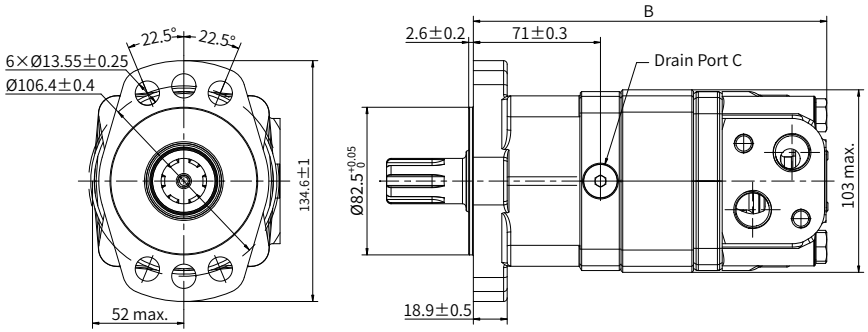
B2 2-HOLE, SAE B MOUNT



P - 0040

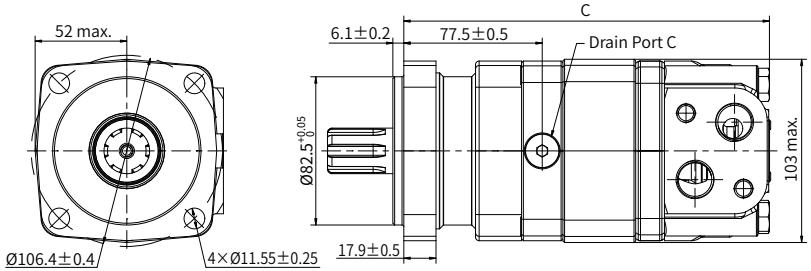
Installation size

M0 6-HOLE, MAGNETO MOUNT



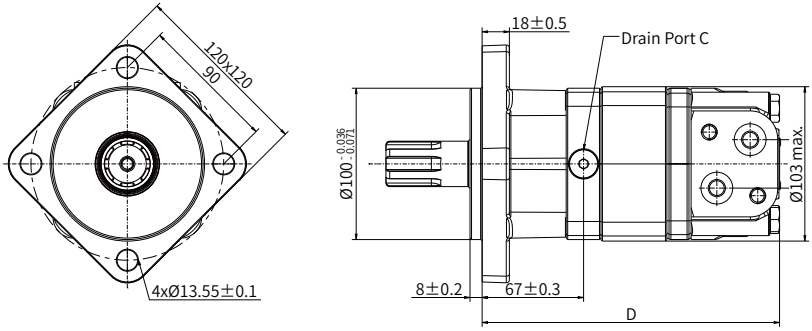
P - 0035

F1 SQUARE MOUNT



P - 0041

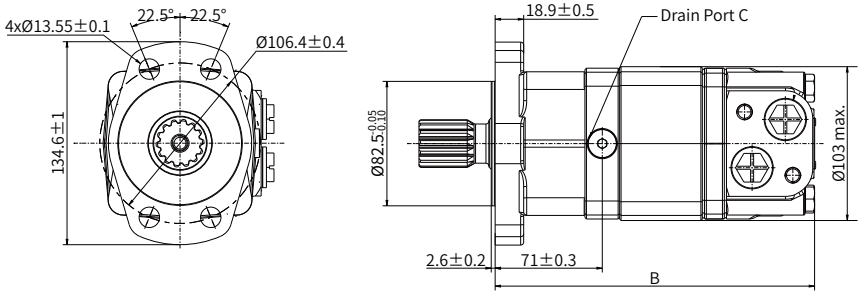
F5 SQUARE MOUNT



P - 0293

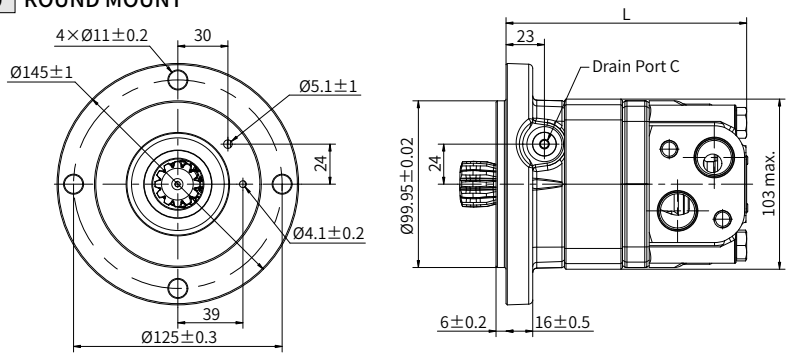
Installation size

M2 4-HOLE, MAGNETO MOUNT



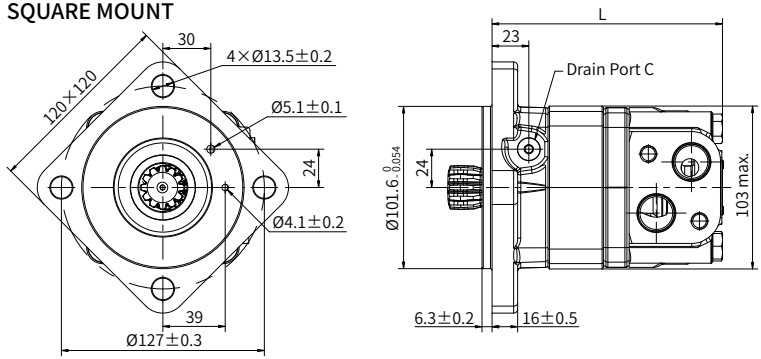
P - 0294

B0 ROUND MOUNT



P - 0031

F0 SQUARE MOUNT



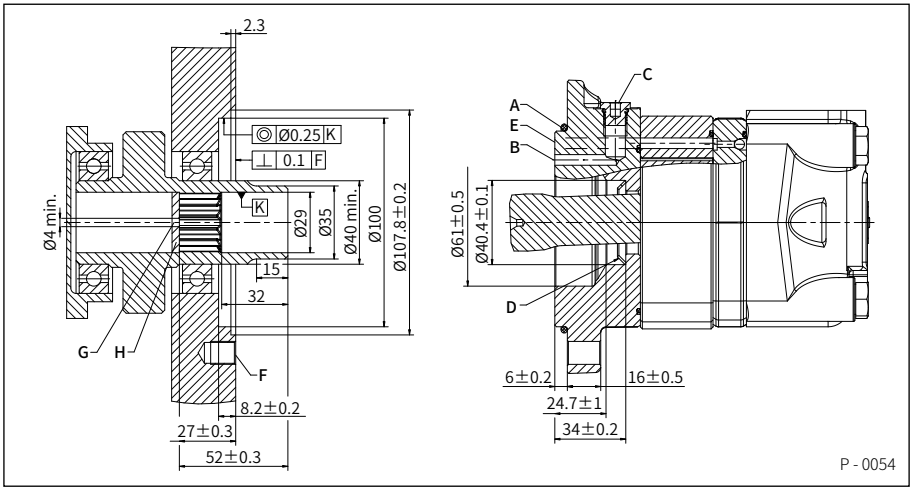
P - 0032

Installation size

Type	L mm	A mm	B mm	C mm	D mm
80	123.4	165.5	170.9	177.4	166.9
100	126.8	168.9	174.3	180.8	170.3
125	131.2	173.3	178.7	185.2	174.7
160	137.2	179.3	184.7	191.2	180.7
200	144.2	186.3	191.7	198.2	187.7
230	149.9	192.0	197.4	203.9	193.4
250	152.9	195.0	200.4	206.9	196.4
315	164.2	206.3	211.7	218.2	207.7
400	177.8	219.9	225.3	231.8	221.3
500	177.8	219.9	225.3	231.8	221.3

T - 0058

Note: Dimensions L, A, B, C, D are the length from the flange mounting surface to the rear end of the motor, and the tolerance is ±0.61mm.



P - 0054

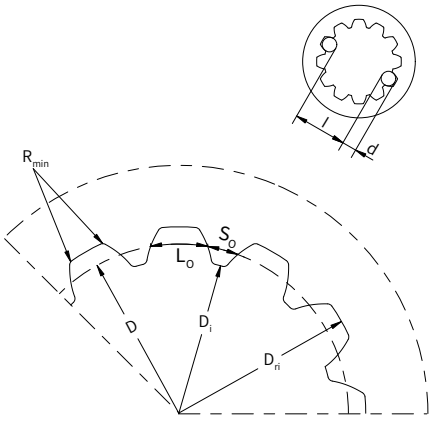
A: O-ring: 100×3
B: External drain channel
C: Drain connection 12mm
D: Conical seal ring
E: Internal drain channel
F: 15 mm deep
G: Oil circulation hole
H: Hardened stop plate

Installation size

Spline parameters

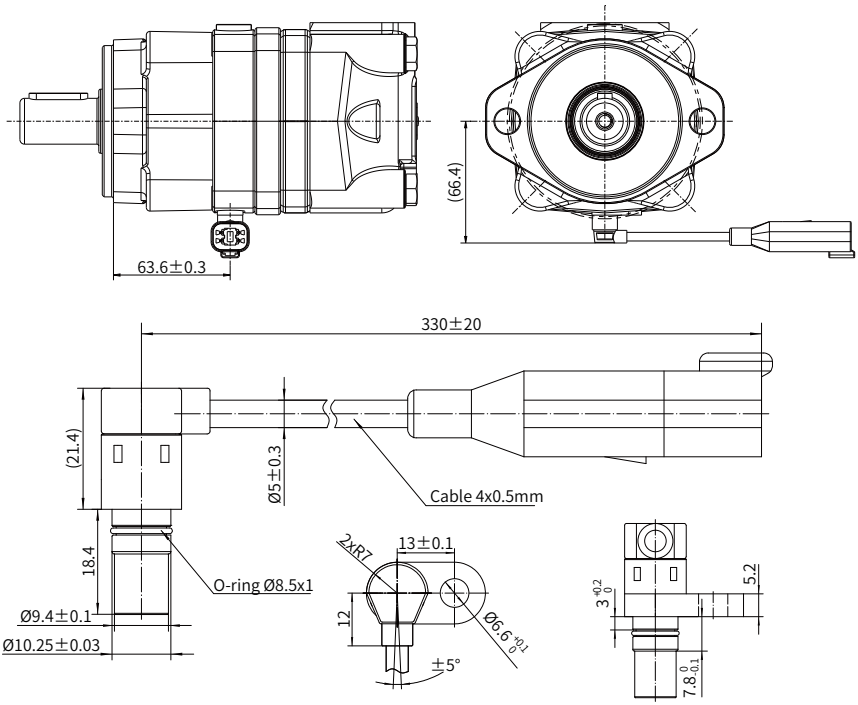
Side Fit		mm
Number of teeth	Z	12
Pitch	DP	12/24
Pressure angle	α_D	30°
Pitch dia	D	Ø25.4
Major dia	D_{ri}	Ø28 $^{0}_{-0.1}$
Minor dia	D_i	Ø23 $^{+0.033}_{0}$
Tip radius	R_{min}	0.2
Tooth thickness	S_O	2.341
Space width	L_O	4.308±0.02
Pin dia	d	4.835±0.001
Dimension between two pins	I	17.62 $^{+0.15}_{0}$

T - 0059



P - 0055

Speed sensor



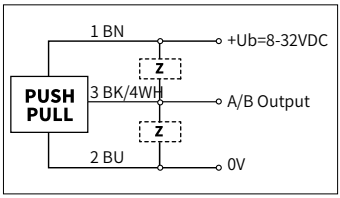
P - 0235

Dimensions	Ø10.25 /L=18.4mm
Voltage	8-32VDC
Input Current	<15mA
Sensing distance	0.2~2mm
Power reverse protection（Y/N）	Yes
Power input overcurrent and overvoltage protection (Y/N)	Yes
Maximum output current	50mA
Voltage drop	⩽ 3VDC
Working frequency	0-20KHz
Output signal	A, B
Operating temperature	-40°C ~ +125°C
Protection	IP69K
Shell material	Copper/plastic
Pressure resistance of measuring surface	10bar
Connector	Cable 0.33m, Injection 4-core DEUTSCH DT04-4P-EP04 plug
PPR	28

T - 0192

Speed sensor

■ WIRING DIAGRAM



P - 0236

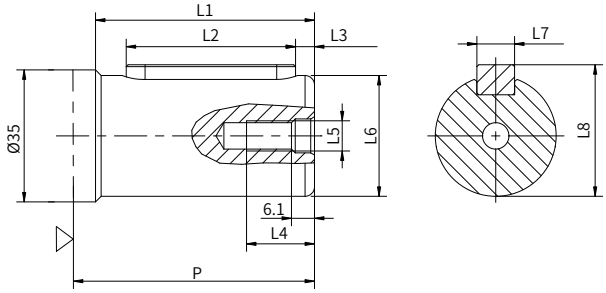
■ TERMINAL ASSIGNMENT

Signal		+Ub	0V	A	B
Color		BN	BU	BK	WH
4 core plug DT04		1	2	3	4

P - 0237

Shaft end dimensions

·Straight Shaft—Paralley Key



P - 0043

Code	L1	L2	L3	L4	L5	L6	L7	L8	Max.torque
S1	43±0.4	$31.75^{\ 0}_{-0.38}$	2.5±0.3	20 min.	3/8-16UNC	$Ø25.4^{\ 0}_{-0.02}$	$6.35^{+0.050}_{\ 0}$	$28.2^{\ 0}_{-0.3}$	655N·m
S2	43±0.3	$32^{-0.30}_{-0.62}$	5±0.3	18	M8	$Ø25^{+0.02}_{\ 0}$	7.94±0.01	27.84±0.1	678N·m
S3	58±0.3	$45^{\ 0}_{-0.3}$				$Ø32^{+0.018}_{+0.02}$	$10^{\ 0}_{-0.04}$	$35^{\ 0}_{-0.3}$	881N·m
S5	48±0.4	$31.75^{\ 0}_{-0.38}$	5±0.3	18	3/8-16UNC	$Ø31.75^{\ 0}_{-0.05}$	$7.96^{\ 0}_{-0.02}$	$35.3^{\ 0}_{-0.3}$	
SA	41.5	$32^{-0.30}_{-0.62}$	5	20 min.	M8	$Ø25^{-0.01}_{-0.03}$	7.94±0.01	27.84±0.1	678N·m
SB	40.8	$31.75^{\ 0}_{-0.38}$	2.5±0.3	20 min.	1/4-20UNC	$Ø25.4^{\ 0}_{-0.02}$	$6.35^{+0.050}_{\ 0}$	$28.2^{\ 0}_{-0.3}$	655N·m

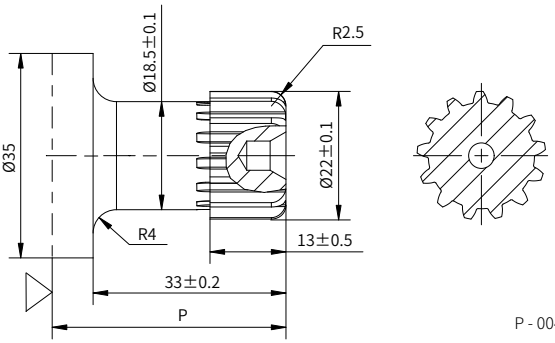
T - 0234

Shaft end dimensions

·13 Teeth Spline

R2

Ø22mm
Spline: 13-DP16/32, ANS B92.1 - 1996
Max. Torque: 170N·m

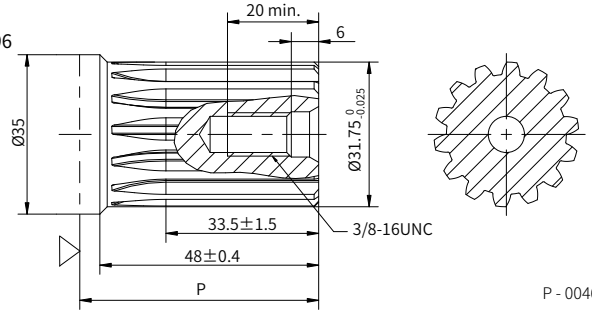


P - 0049

·14 Teeth Spline

R4/RA

Ø31.75mm
Spline: 14-DP12/24, ANS B92.1 - 1996
Max. Torque: 881N·m

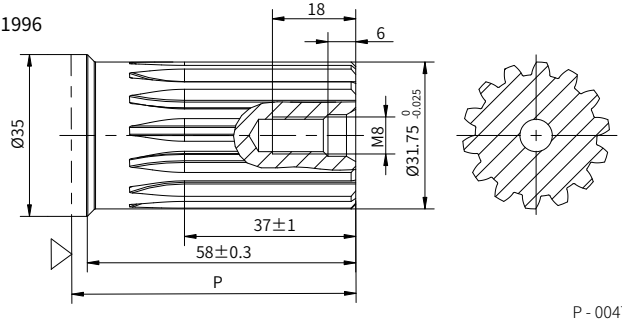


P - 0046

·14 Teeth Spline

R5

Ø31.75mm
Spline: 14-DP12/24, ANS B92.1 - 1996
Max. Torque: 881N·m



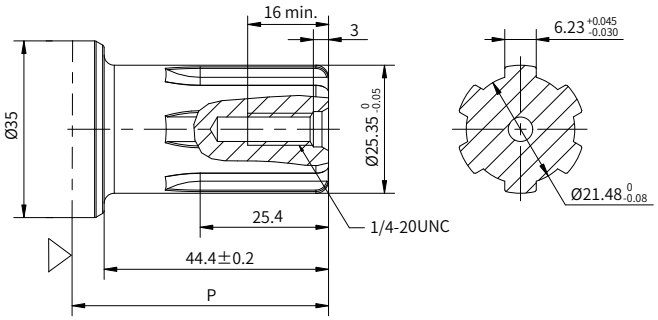
P - 0047

Shaft end dimensions

·SAE 6B Spline

R1

Ø25.4mm
Spline: SAE 6B（B.S.2059)
Max. Torque: 678N·m

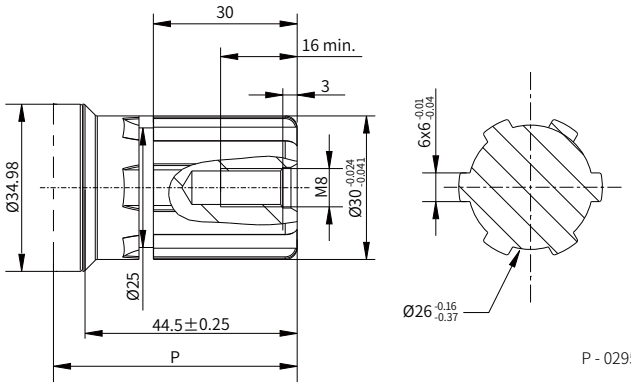


P - 0048

·SAE 6B Spline

R9

Ø30.0mm
Spline: SAE 6B（B.S.2059)
Max. Torque: 768N·m

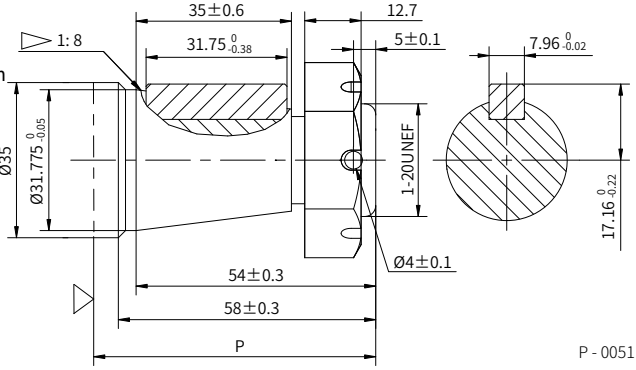


P - 0295

·Tapered Shaft

T2

Ø31.75mm Tapered
Parallel key: 7.96×7.96×31.75
Tightening torque: 200±10N·m
Max. Torque: 881N·m



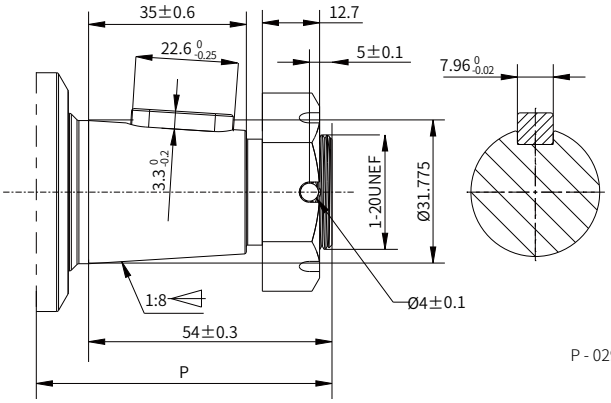
P - 0051

Shaft end dimensions

·Tapered Shaft

TB

Ø31.75mm Tapered
Parallel key: 7.96×7.96×22.6
Tightening torque: 200±10N·m
Max. Torque: 881N·m

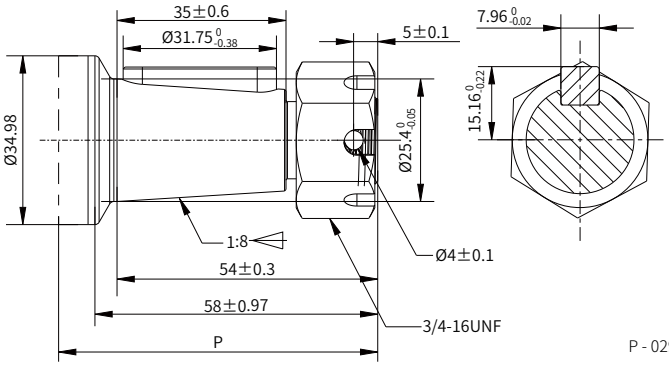


P - 0296

·Tapered Shaft

T4

Ø31.75mm Tapered
Parallel key:
7.96×7.96×22.6
Tightening torque:
200±10N·m
Max. Torque: 881N·m



P - 0297

P mm	SAE Mount	Magneto Mount	F1 Square Mount	F5 Square Mount
S1	51.0	45.6	39.1	50
S5	56.0	50.6	44.1	55
S3	66.0	60.6	54.1	65
R2	41.0	35.6	29.1	40
R1	53.9	48.5	42.0	52.9
R4	56.0	50.6	44.1	55
R5	66.0	60.6	54.1	65
T2	66.0	60.6	54.1	65
S2	51.0	45.6	39.1	50
RA	55.9	50.5	44	54.9
R9	52.62	47.22	40.72	51.62
TB	71	65.6	59.1	70
T4	78	72.6	66.1	77

T - 0064

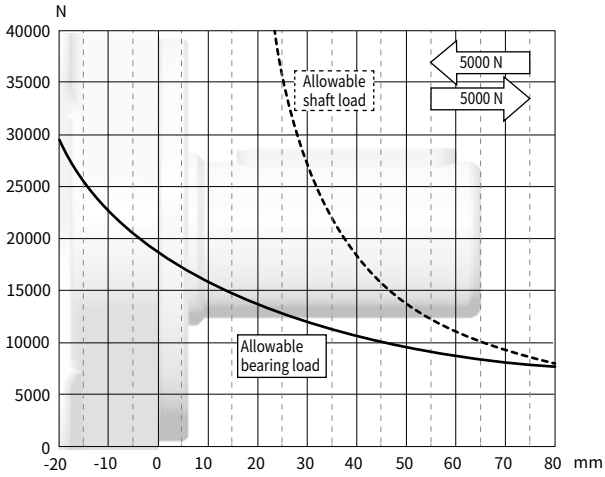
Note: Dimension P is the overall distance from the flange mounting surface to the end of the shaft, and the tolerance is ±0.97mm.

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.

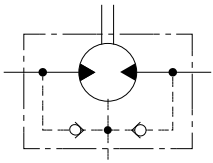
The solid line shows the allowable radial load of the bearing.It is based on L_{10} bearing life 2000 hrs at 100 RPM with rated output torque.

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



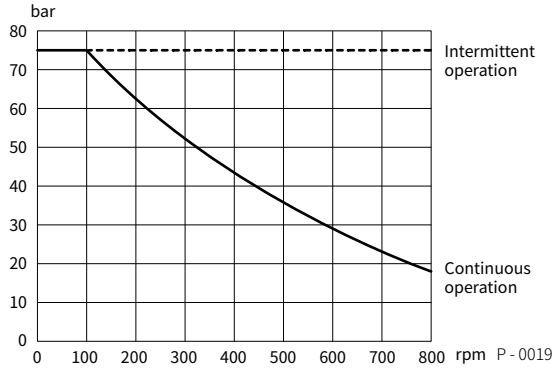
P - 0018

Hydraulic diagram



P - 0020

Standard shaft seal pressure

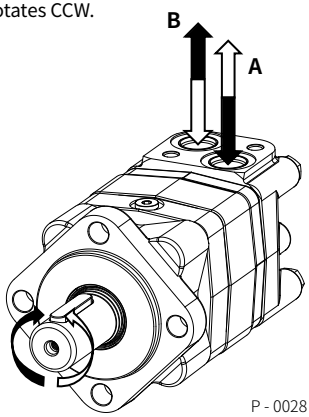


P - 0019

When case drain port is not working, the pressure on the output shaft seal is slightly higher than the pressure in the return line. When using a drain line, the pressure on the shaft seal of the output shaft is the same as the pressure in the drain line.

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.



P - 0028