

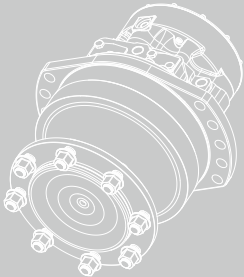
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HRP18 series

Radial piston hydraulic motor

The HRP18 series radial piston hydraulic motor, is a kind of low speed high torque hydraulic motor, disc valve structure, with high pressure, good stability at low speed, high volumetric efficiency and mechanical efficiency.



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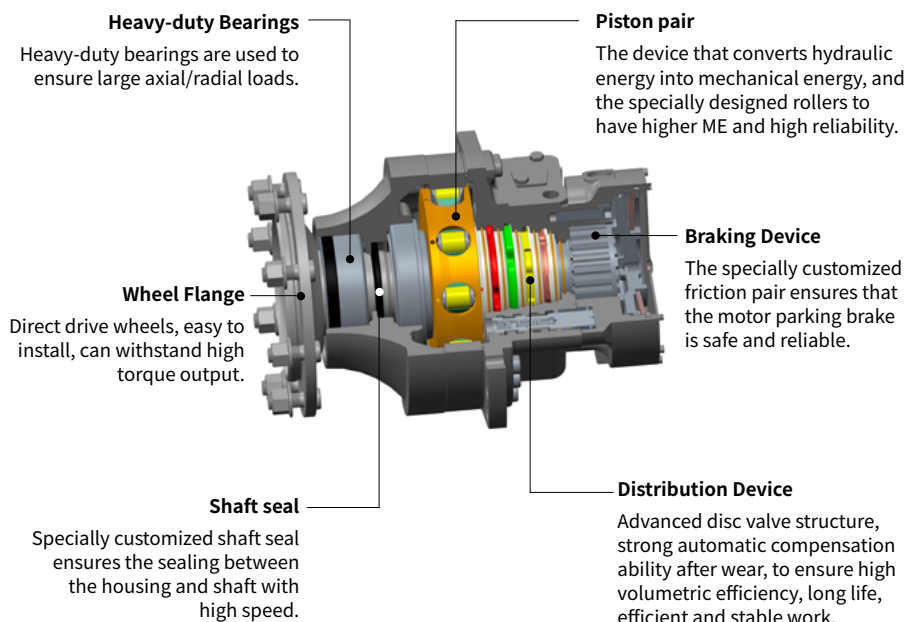
Overview

The HRP18 series radial piston hydraulic motor, is a kind of low speed high torque hydraulic motor, disc valve structure, with high pressure, good stability at low speed, high volumetric efficiency and mechanical efficiency, the motor can be equipped with a variety of functional modules.

Advantages

- Using tapered roller bearing structure, can support larger radial load.
- Advanced disc valve structure, radial large-diameter piston, high torque, high volumetric efficiency.
- More options including parking brake, speed sensor, etc.
- Smoothly 2-speeds changed.

Standard structure



Specification

Series			HRP18					
Motor performance								
Displacement		cm³/rev.	1392	1747	1862	2099	2560	2812
Max.torque		N·m	9800	12180	13000	15016	16280	17884
Min.stable speed		rpm	5					
Max.speed	Displacement	rpm	155	125	100	100	85	75
	Variable displacement	rpm	160	150	125	125	100	90
Pressure	Max.differential pressure	bar	450				400	
Brake								
Static braking torque		N·m	18600					
Release pressure		bar	12 ~ 30					
Maximum pressure at brake port Z		bar	30					
Oil volume to operate brake		cm³	70					

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- Make sure the motor is full of oil before use.
- The maximum torque is only available for small operating conditions.
- During motor running-in(at least 20 hours), it should not be operated without load at greater than 100rpm.
- 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 85° C.

Ordering information

HRP18	2	22	M8	W1	N	F1	A	AA
①	②	③	④	⑤	⑥	⑦	⑧	⑨

Radial Piston Series

①	Incurve multiple-action radial piston motor	HRP18
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Single and Two Speed

	Single speed	1
②	Two speed, gear ratio 2:1	2
	Two speed, gear ratio 2.28:1	3

Displacement cm³/rev.

		Single speed: 1	Two speed: 2	Two speed: 3	Code
③	1392/696, Standard piston	●	●		22
	1747/874, Standard piston	●	●		26
	1862/816, Standard piston			●	28
	2812/1406, Step piston	●	●		30
	2099/1050, Standard piston	●	●		31
	2560/1280, Step piston	●	●		33

Port Connection

		Single speed: 1	Two speed: 2	Two speed: 3	Code
④	ISO6162 Ø18.5(A, B), M22×1.5(L, F)	●			M6
	ISO6162 Ø18.5(A, B), M22×1.5(L, F), M22×1.5(X)		●	●	M8/M5
	ISO6162 Ø18.5, connection hole 8×M10(A, B), M22×1.5(L, F)	●			M4/M3
	ISO6162 Ø18.5, connection hole 8×M10(A, B), ISO 1179-1 G1/2-14 (L), M22×1.5(F), G3/8 19 ISO 1179-1(X)		●	●	MB

Output Shaft

		M6	M8/M4	M5	M3/MB	Code
⑤	Wheel pilot Ø220.7×10, threaded holes Ø275 distribution circle 16×M20×1.5	●	●			W1
	Wheel pilot Ø220.7×18, hub bolt Ø275 distribution circle 8×M20×1.5	●	●			W2
	Wheel pilot Ø220×25, threaded holes Ø254 distribution circle 3×6×M16×1.5, compact model	●		●		W5
	Wheel pilot Ø175.7×13, through the holes 10×Ø24(Hub bolts Ø225 distribution circle 10×M22×1.5)	●	●			W4
	Wheel pilot Ø220.7×15, through the holes 16×Ø22(Hub bolts Ø275 distribution circle 16×M20×1.5)	●	●			W6
	28T Spline DIN5480-W90×3×28×7H/8f				●	S5

Ordering information

Paint Option

⑥	No Paint	N
	Black	B
	Hengli blue	C
	Yellow	Y

Brake

⑦	No brakes	AA
	Static braking torque 18600N·m, port Z M16x1.5, thin back cover	F1
	Static braking torque 18600N·m, port Z M16x1.5, brake without flushing, thick back cover	F3
	Static braking torque 18600N·m, port Z M16x1.5, brake with flushing, thick back cover	F2
	Static braking torque 18600N·m, port Z M16x1.5	F4
	Static braking torque 18600N·m, port Z G3/8-19 ISO 1179-1, thin back cover	F6
	Parking brake port Z M18×1.5, driving brake port ZD M14×1.5, static braking torque 12000N, dynamic braking torque 6000N·m	F7
	Static braking torque 8000Nm, port Z M16×1.5, copper-based friction discs	F8

Flushing Valve

⑧	No flushing valve	A
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Special Features

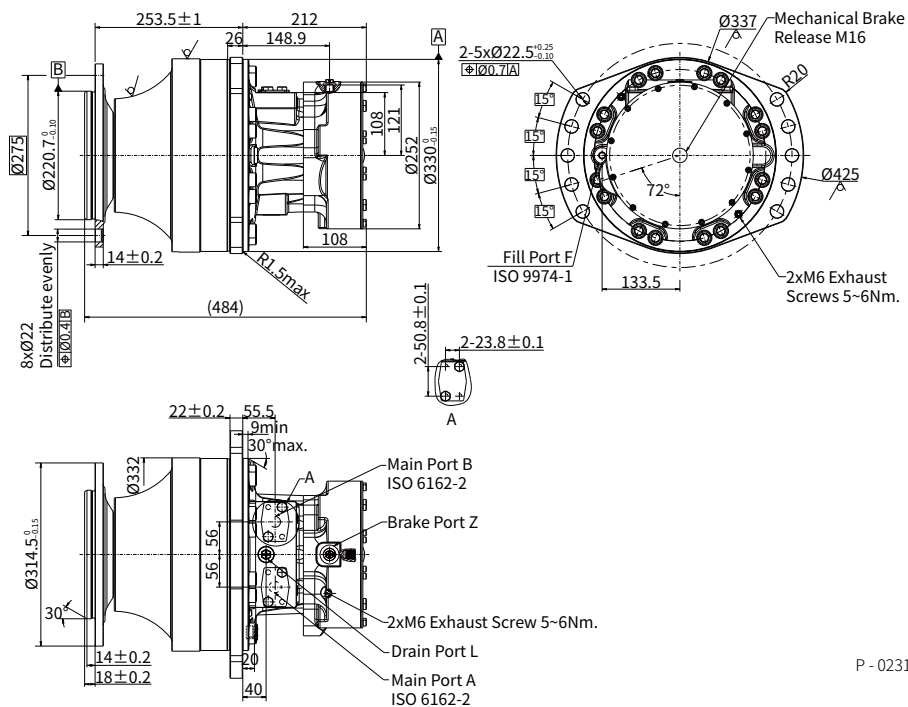
⑨		M5/M6/M8	M3/M4/MB	Code
	Standard	●	●	AA
	Speed sensor cavity	●		S1
	High speed, +30%	●	●	HS
	S6+HS	●	●	AB
	Wheel side axle without hub bolts	●	●	AC
	Wheel side axle with hub bolts only, without nuts	●	●	AD
	Speed sensor(with direction judgement)	●		S6
	S1+HS	●	●	S8

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Note: ● =Available; For the other types of port forms, output forms and brake port orientations, please contact Hengli's application engineer for consultation.

Installation size

- Single speed wheel output: Take HRP18133M6W1BF2AS1 for example



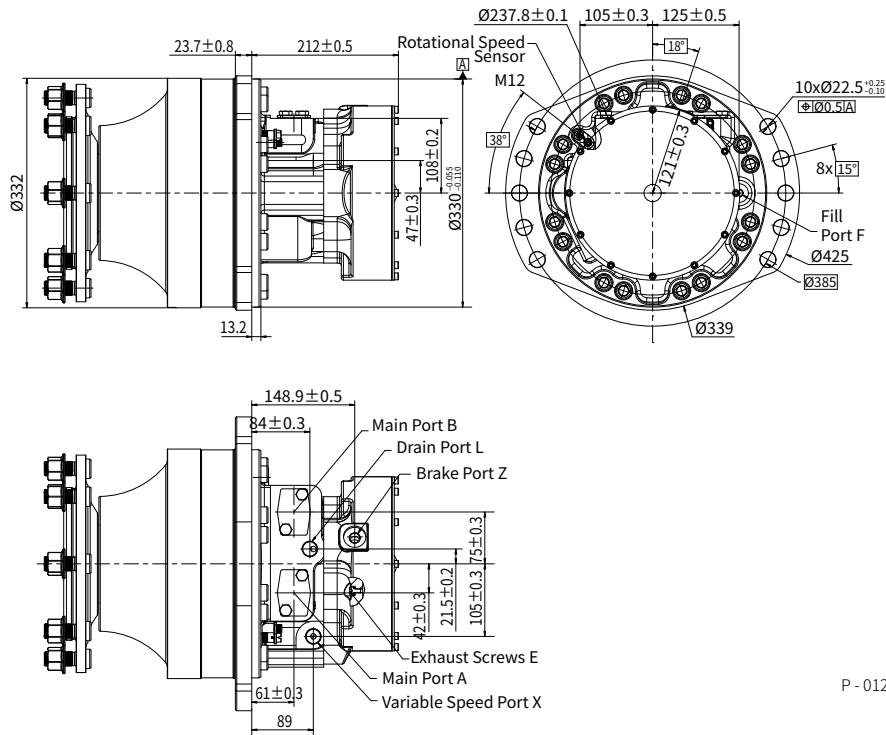
Note: The weight of the connection shown in the figure is 161.1kg.

Name	Port Function	M6/M4
A, B	Main Port	Ø18.5
L	Drain Port	M22×1.5
F	Fill Port	M22×1.5
Z	Brake Port	M16×1.5

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Installation size

·Two speed wheel output: Take HRP18222M8W2BF1AAB for example



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Note: The weight of the connection shown in the figure is 167.1kg.

Name	Port Function	M8
A, B	Main Port	$\varnothing 18.5$
L	Drain Port	$M22 \times 1.5$
F	Fill Port	$M22 \times 1.5$
X	Variable Speed Port	$M22 \times 1.5$
Z	Brake Port	$M16 \times 1.5$

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- Two speed wheel output: Take HRP18230M5W5BF3AS8 for example



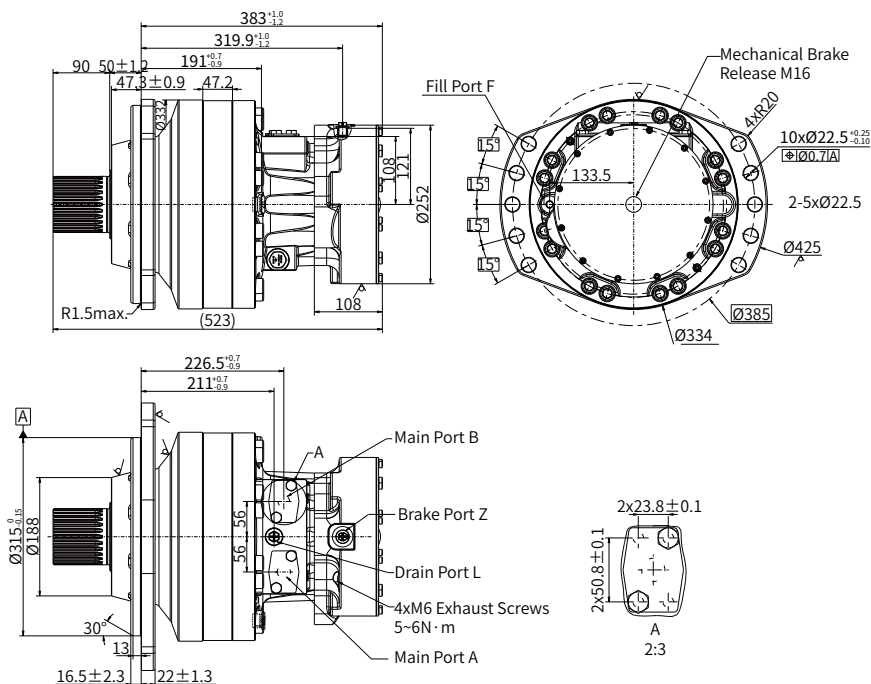
Note: The weight of the connection shown in the figure is 151.7kg.

Name	Port Function	M5
A, B	Main Port	Ø18.5
L	Drain Port	M22×1.5
F	Fill Port	M22×1.5
X	Variable Speed Port	M22×1.5
Z	Brake Port	M16×1.5

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Installation size

- Single speed shaft output: Take HRP18131M3S5BF8AAA for example



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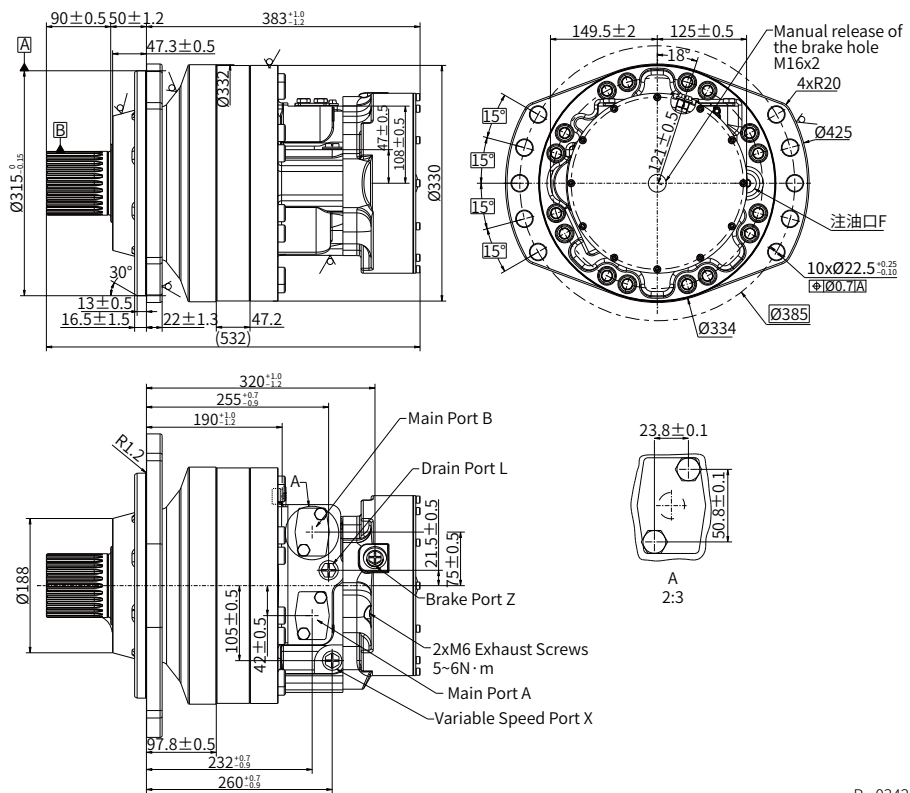
Note: The weight of the connection shown in the figure is 151.7kg.

Name	Port Function	M3
A, B	Main Port	Ø18.5
L	Drain Port	M22×1.5
F	Fill Port	M22×1.5
Z	Brake Port	M16×1.5

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Installation size

·Two speed shaft output: Take HRP18230MBS5BF6AHS for example



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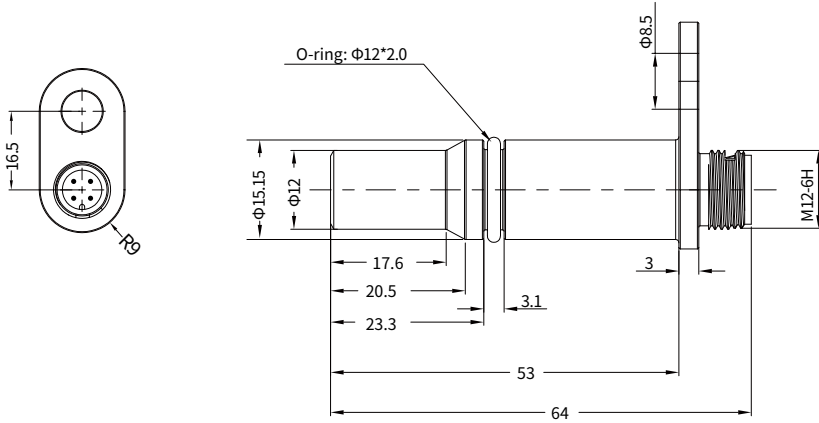
Note: The weight of the connection shown in the figure is 163.8kg.

Name	Port Function	MB
A, B	Main Port	$\varnothing 18.5$
L	Drain Port	G1/2-14
F	Fill Port	M22×1.5
X	Variable Speed Port	G1/2-14
Z	Brake Port	G3/8-19

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Speed sensor

·Speed sensor: S6



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Dimensions	Ø12 /L=53mm
Voltage	8-32VDC
Input Current	<20mA
Sensing distance	0.2~1.15mm
Output circuitry	Push-Pull
Output overcurrent protection (Y/N)	Yes
Maximum output current	≤ 200mA
Voltage drop	≤ 3.5VDC
Working frequency	0-15KHz
Output signal	A, B
Operating temperature	-40°C ~+125°C
Protection	IP67
Shell material	Copper/plastic
Pressure resistance of measuring surface	10bar
Connector	M12
Weight	55g
Installation depth	53mm
Reverse polarity protection	Yes
Dielectric strength	500VDC

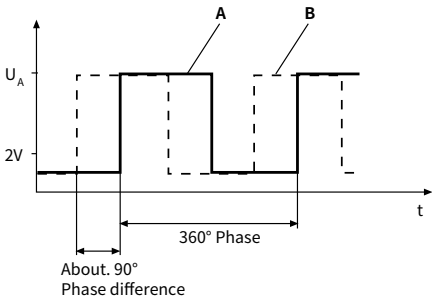
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Speed sensor

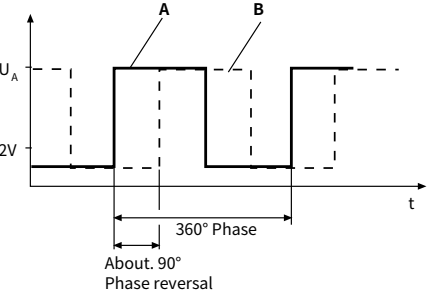
·Speed sensor: S6

■ OUTPUT SIGNAL

⌚ The measured gear rotates clockwise

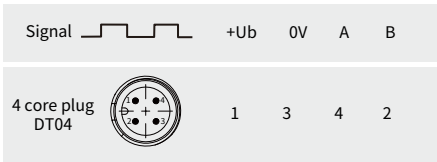


⌚ The measured gear rotates counterclockwise



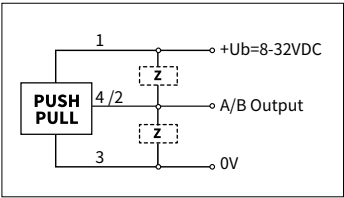
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■ TERMINAL ASSIGNMENT



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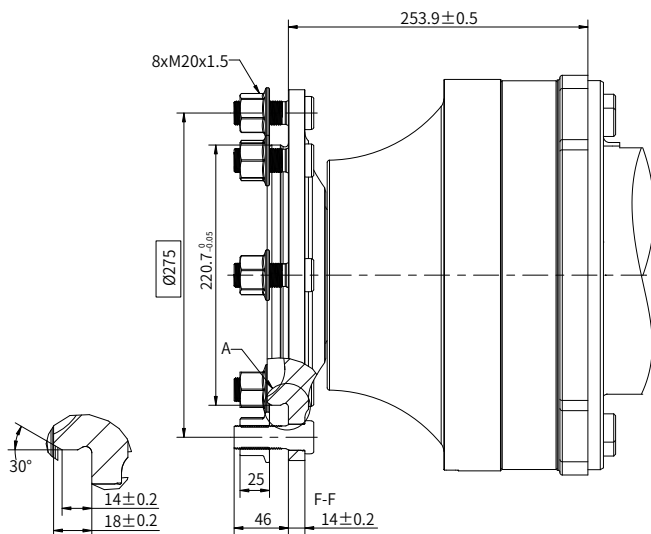
■ WIRING DIAGRAM



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Shaft end dimensions

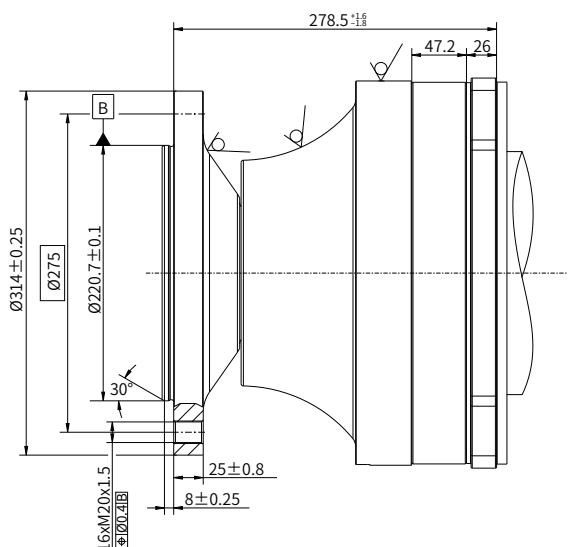
W2 Wheel pilot $\varnothing 220.7 \times 18$, hub bolt $\varnothing 275$ distribution circle $8 \times M20 \times 1.5$



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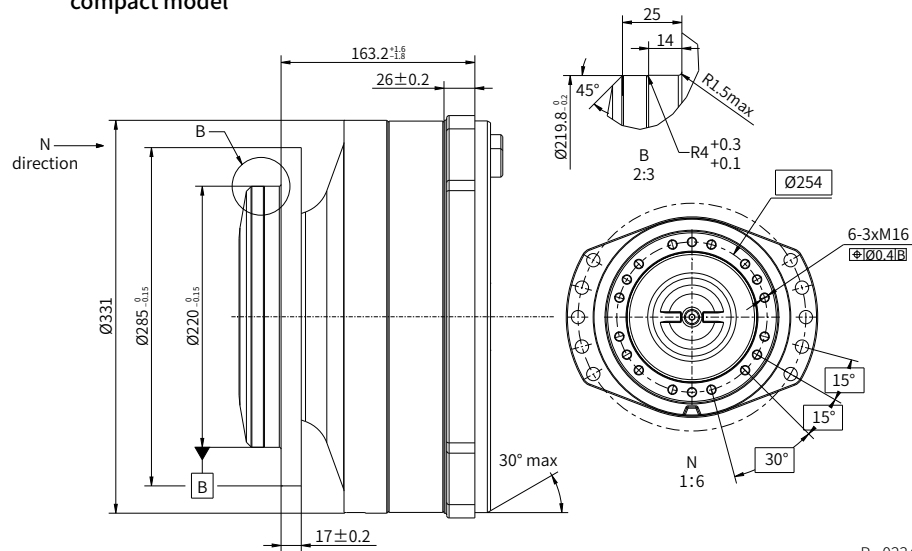
W1 Wheel pilot $\varnothing 220.7 \times 10$, threaded holes $\varnothing 275$ distribution circle $16 \times M20 \times 1.5$



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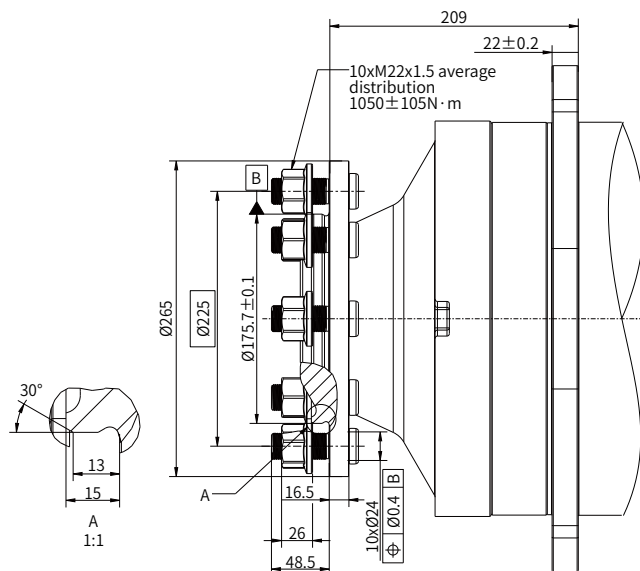
Shaft end dimensions

W5 Wheel pilot $\varnothing 220 \times 25$, threaded holes $\varnothing 254$ distribution circle $3 \times 6 \times M16 \times 1.5$, compact model



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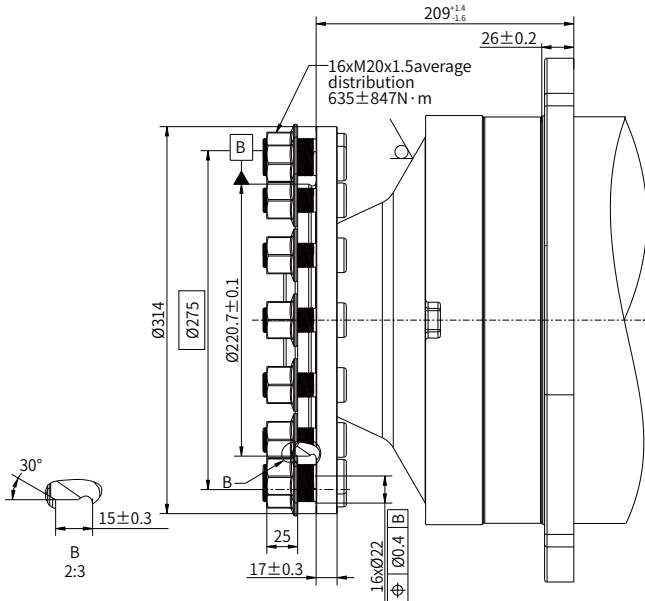
W4 Wheel pilot $\varnothing 175.7 \times 13$, through the holes $10 \times \varnothing 24$ (Hub bolts $\varnothing 225$ distribution circle $10 \times M22 \times 1.5$)



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Shaft end dimensions

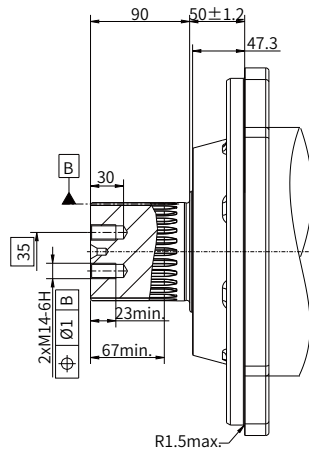
W6 Wheel pilot $\varnothing 220.7 \times 15$, through the holes $16 \times \varnothing 22$ (Hub bolts $\varnothing 275$ distribution circle $16 \times M20 \times 1.5$)



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S5 28T Spline DIN5480-W90×3×28×7H/8f

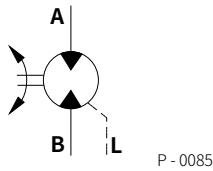
External Spline Parameter List DIN5480		
External Spline DIN5480-W 90x3x28 Flat root Tooth side fit		
Number of teeth	z	28
Spline module	m	3
Pressure angle	α	30°
Pitch dia.	d	Ø84
Tip dia.	d _{a1}	Ø89.4
Root dia.	d _{f1}	Ø83.4
Form dia.	d _{Ff1}	Ø83.92
Max.actual	S _{max}	6.256
Min.actual	S _{min}	6.190
Nominal dimension	Me	95.977
Pin dia.	DM	Ø6
Measurement over pins	M1	95.858-95.977



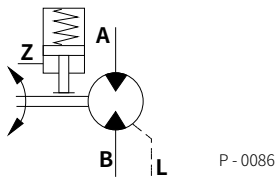
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Hydraulic diagram

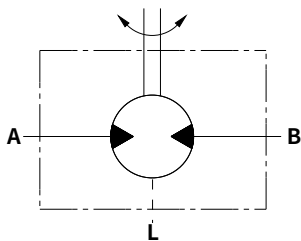
· Motor without brakes



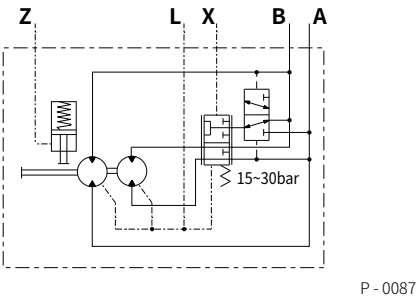
· Motor with parking brake



· Schematic diagram of a single-speed motor



· Schematic diagram of a two-speed motor

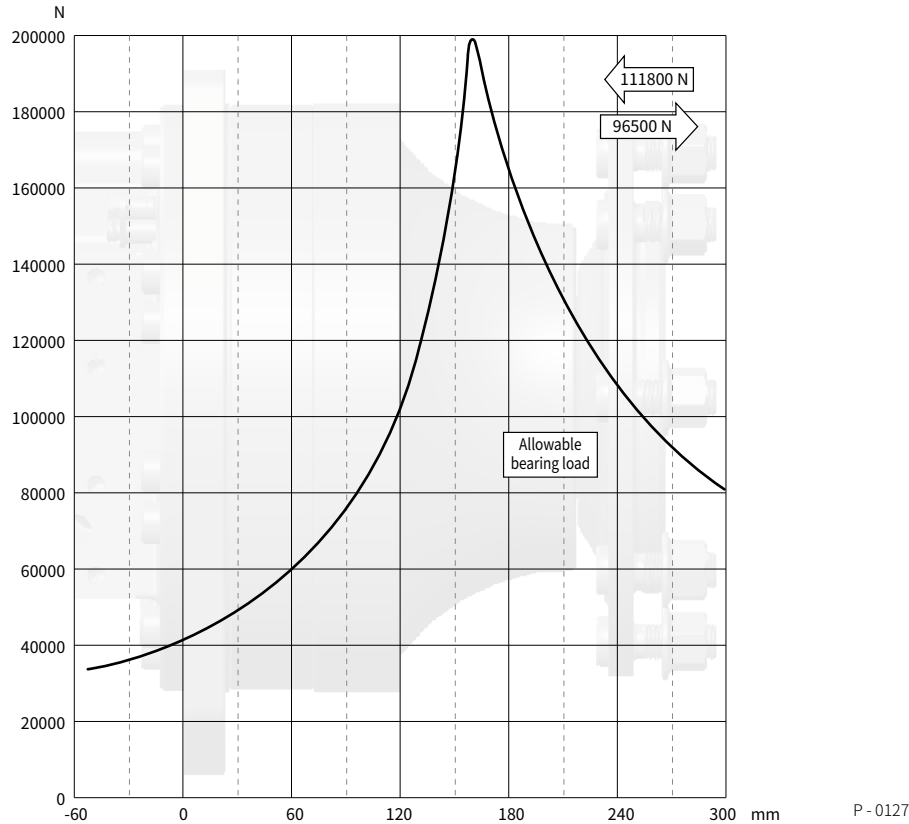


Allowable shaft load/bearing curve

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.

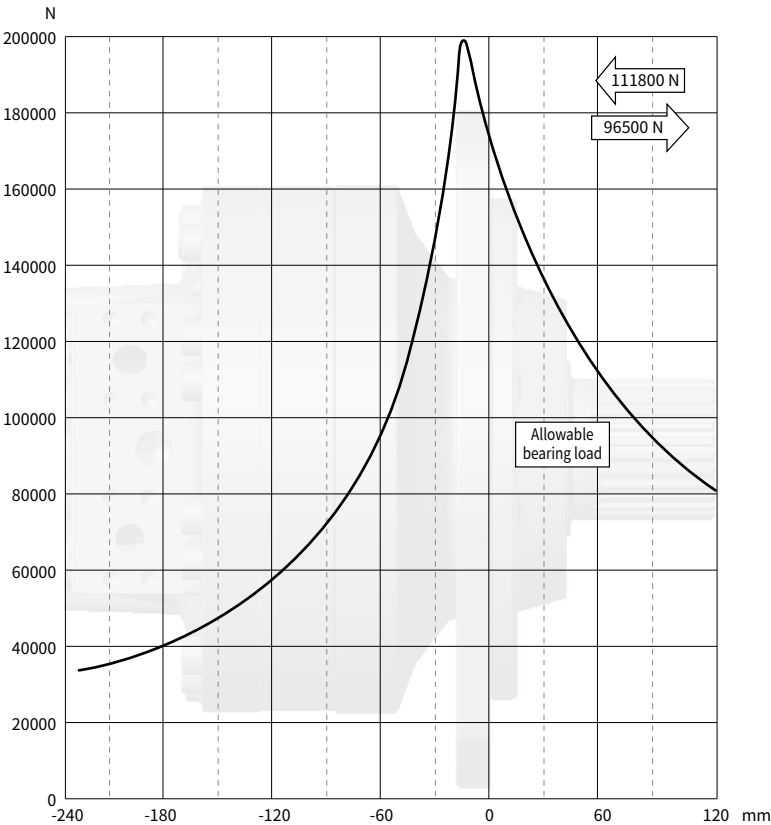
The solid line shows the allowable radial load of the bearing based on life with 2000hrs. Denote use hydraulic fluids containing anti-wear additives, and rated output torque and motor speed of 50rpm, the differential pressure is 250 bar, the operating oil temperature is 50°C .

·Wheel Output Bearing Curve



Allowable shaft load/bearing curve

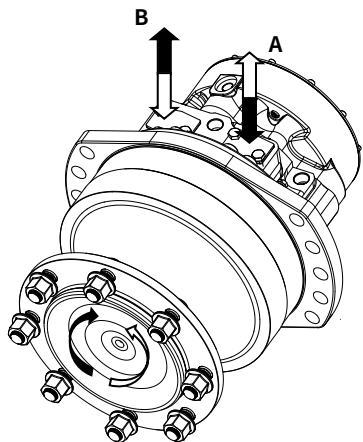
· Shaft Output Bearing Curve



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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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