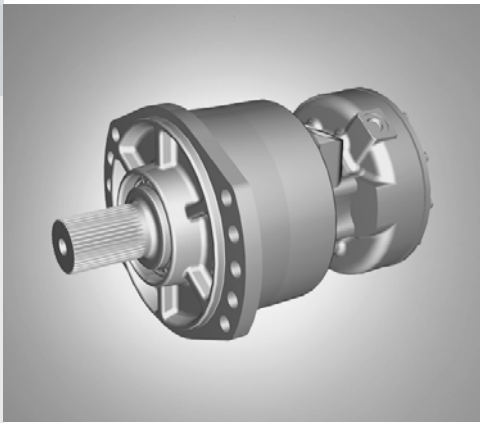
Rexroth
Bosch Group

Radial Piston Motor (Multi-Stroke) MCR3

RE 15205/06.09 **1**/18
Replaces: 02.98

Data sheet



Series 3X
Size 160 to 400
Differential pressure up to 450 bar
Torque output up to 2300 Nm
Speed up to 875 rpm
Open and closed circuits

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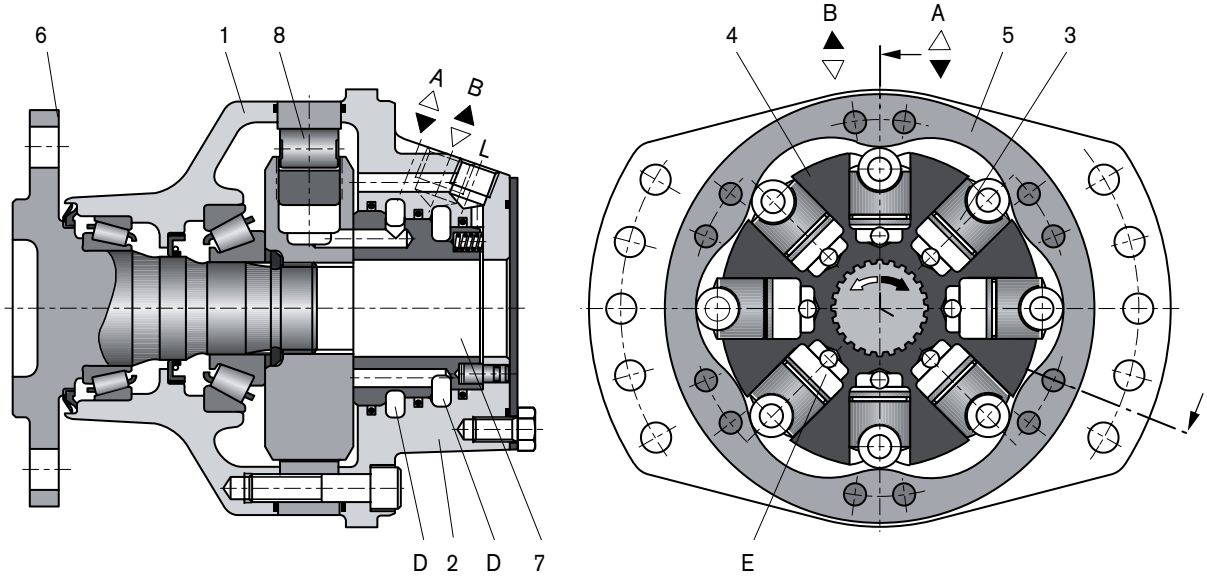
Features

- Compact robust construction
- High volumetric and mechanical efficiencies
- High pressure rating
- High reliability
- Low maintenance
- Smooth running at very low speeds
- Low noise
- Reversible
- Sealed tapered roller bearings
- High radial forces permitted on drive shaft
- Freewheeling possible
- Available with optional holding brake (multi-disc) or dynamic (drum) brake
- Available with:
  - Bi-directional two speed
  - Integrated flushing valve
  - Speed sensor

Functional description

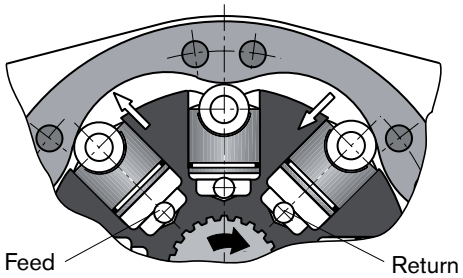


Hydraulic motors type MCR are radial piston motors with a rotating shaft.

Construction
Two part housing (1, 2), rotary group (3, 4), cam (5), drive shaft (6) and flow distributor (7)

Transmission
The cylinder block (4) is connected to the shaft (6) by means of splines. The pistons (3) are arranged radially in the cylinder block (4) and make contact with the cam (5) via rollers (8).

Torque Generation



Working stroke Idle stroke

The number of working and return strokes corresponds to the number of lobes on the cam x number of pistons (8).

Flow paths
The cylinder chambers (E) are connected to ports A and B via the axial bores and the annular passages (D).

Bearings
Tapered roller bearings capable of transmitting high axial and radial forces are fitted as standard, except on Hydrobase motors.

Freewheeling
In certain applications there may be a requirement to freewheel the motor. This may be achieved by connecting ports A and B to zero pressure and simultaneously applying a pressure of 2 bar to the housing through port L. In this condition, the pistons are forced into the cylinder block which forces the rollers to lose contact with the cam thus allowing free rotation of the shaft.

Two speed operation (2W)

In mobile applications where vehicles are required to operate at high speed with low motor loads, the motor can be switched to a low-torque and high-speed mode. This is achieved by operating an integrated valve which directs hydraulic fluid to only one half of the motor while continuously re-circulating the fluid in the other half. This “reduced displacement” mode reduces the flow required for a given speed and gives the potential for cost and efficiency improvements. The motor maximum speed remains unchanged.

Rexroth has developed a special spool valve to allow smooth switching to reduced displacement whilst on the move. This is known as “soft-shift” and is a standard feature of 2W motors. The spool valve requires either an additional sequence valve or electro-proportional control to operate in “soft-shift” mode.

Flushing valve

In a closed circuit, the same hydraulic fluid continuously flows between the pump and the motor. This could therefore lead to overheating of the hydraulic fluid.

The function of the flushing valve option is to replace hydraulic fluid in the closed circuit with that from the reservoir. When the hydraulic motor is operated under load, either in the clockwise or anti-clockwise direction, the flushing valve opens and takes a fixed flow of fluid through an orifice from the low pressure side of the circuit. This flow is then fed to the motor housing and back to the reservoir normally via a cooler. In order to charge the low pressure side of the circuit, cool fluid is drawn from the reservoir by the boost pump and is fed to the pump inlet through the check valve. Thus the flushing valve ensures a continuous renewal and cooling of the hydraulic fluid. The flushing feature incorporates a relief valve which is used to maintain a minimum boost pressure and operates at a standard setting of 14 bar (other options available on request).

Different orifice sizes may be used to select varying flows of flushing fluid. The following table gives flushing rate values based on a boost / charge pressure of 25 bar.

Functional Description

Flushing flow rates (for $p_{charge} - p_{case} = 25$ bar)

Ordering code	Flow	(±1 l/min)
F1	3	l/min
F2	5	l/min
F7	7	l/min
F4	10	l/min
F8	12.5	l/min
F6	13.5	l/min

Holding brake (multi-disc brake)

Mounting

By way of rear housing (2) and brake shaft (16).

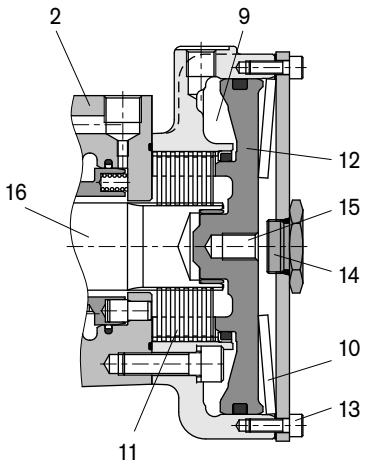
Brake application

As a safety requirement in mobile applications a parking brake may be provided to ensure that the motor cannot turn when the machine is not in use. The parking brake provides holding torque by means of discs (11) that are compressed by a disc spring (10). The brake is released when oil pressure is applied to brake port “Z” and the pressure in the annular area (9) compresses the disc spring allowing the brake discs to turn independently.

Note: This brake is provided solely for static use - not to be used dynamically.

Manual release of holding brake

The brake may also be released manually by loosening screws (13), or by removing plug (14) and inserting a puller into the tapped hole on the brake piston (15)



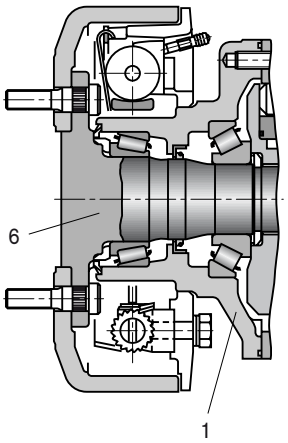
Dynamic brake

Where mechanical dynamic braking is required, a drum brake may be specified. The drum brake is mounted directly onto the drive shaft (6) and front housing (1). Braking torque is provided by brake shoes acting on the inside of the drum.

Operation of brake

– hydraulic brake fluid (special order required for mineral oil operation)

– mechanical brake cable (not supplied)

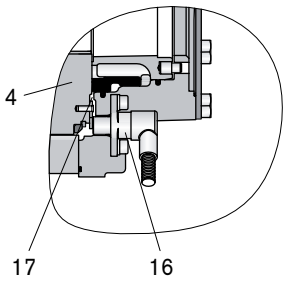


Speed sensor

A Hall-effect speed sensor (16) may be fitted as an option, giving a two-channel output of phase-displaced square waves, and enabling detection of speed and direction. A toothed target disc (17) is fitted to the motor cylinder block (4), and the sensor, fitted to a port in the rear case, produces a pulse on each channel as each tooth passes in front of it. The frequency of the pulses is proportional to the rotational speed.

Versions are available for use with regulated supplies (Code P1) and for direct connection to a 12 V or 24 V unregulated supply (Code P2).

The motor can also be supplied fitted with a target disc and with a speed sensor port machined, but covered and sealed with a blanking plate (Code P0). These “sensor-ready” motors may be fitted with a sensor at a later date.



Ordering code

MCR	3				Z	–	3X				12					
01	02	03	04	05	06		07	08	09	10	11	12	13	14	15	16

Radial piston motor

01		**MCR**

Frame size

02	Frame size 3	**3**

Housing Type

03	Front case flanged	**A**
	Front case flanged, SAE 4 metric holes	**D**
	Rear case flanged	**F**
	High radial load bearings fitted, rear case mounting flange	**W**
	Hydrobase (half motor)	**H**

Nominal size, displacement V in cm³/rev

			160	225	255	280	325	365	400
04	Low Displacement: motors use standard cylindrical pistons	**LD**	●	●	●	●	–	–	–
	High Displacement: motors use stepped pistons	**HD**	–	–	–	–	●	●	●

Drive shaft

05	Splined shaft ANSI B92.1 (only available with housing type “A”)	**A45**
	Parallel keyed shaft Ø40 mm (only available with housing type “D” – maximum torque 1500 Nm)	**L40**
	With flange Ø180 mm (only available with housing type “F” and “W”)	**F180**
	Without drive shaft (only available with housing type “H”)	**Z**

Through shaft

06	Without through shaft	**Z**

Series

07	Series 30 to 39 (series 30 to 39 are dimensionally interchangeable)	**3X**

Brake

08	Without brake	**A0**
	Hydraulic release spring applied multi-disc holding brake 2200 Nm	**B2**
	Dynamic brake (drum brake) for right hand side of vehicle (see figure page 17)	**C2R**
	Dynamic brake (drum brake) for left hand side of vehicle (see figure page 17)	**C2L**

Seals

09	NBR (nitrile rubber) (except dynamic brake – see page 17)	**M**
	FKM (fluoroelastomer/Viton) (except dynamic brake – see page 17)	**V**

Single / Two-speed operation

10	Single speed, standard direction of rotation	**1L**
	Bi-directional two speed, standard direction of rotation	**2WL**

Ports

11	Tapped with UNF thread (SAE J514)	**12**

Studs

12	Without studs (no code)	
	With wheel studs and nuts (5 studs fitted only to motors with housing types “F” and “W”)	**S**

Speed sensor

13	Without sensor (no code)	
	Sensor ready	**P0**
	Sensor without regulator	**P1**
	Sensor with regulator	**P2**

Flushing

14	Without flushing (no code)	
	With flushing (see table on page 3)	**F1 to F8**

● = available – = not available

Ordering code

MCR	3				Z	–	3X				12					
01	02	03	04	05	06		07	08	09	10	11	12	13	14	15	16

Special order

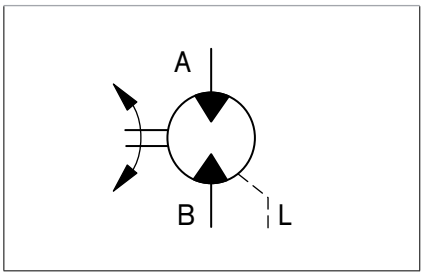
15	Special feature	SOXXX

Other

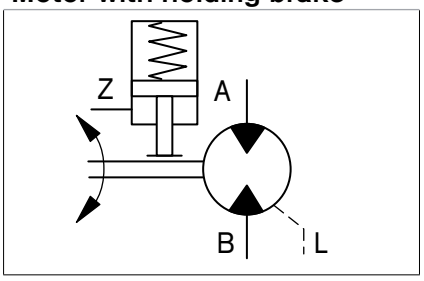
16	Mark in text here	*

Schematic diagrams

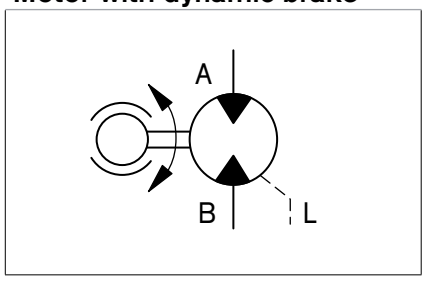
Motor without brake



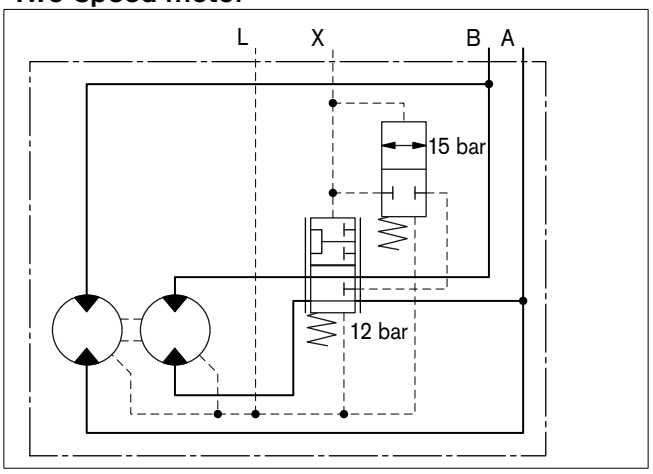
Motor with holding brake



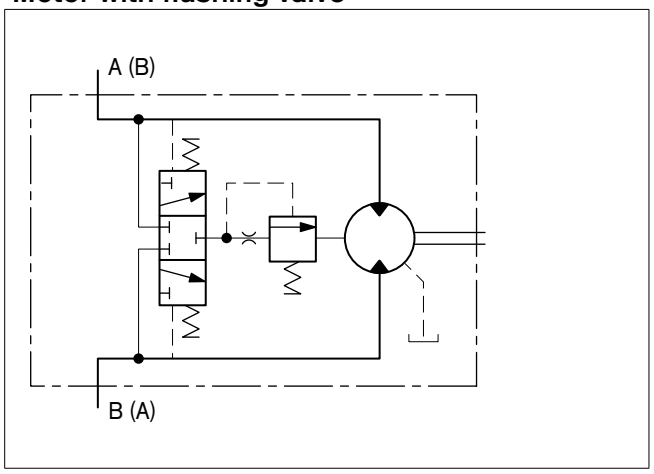
Motor with dynamic brake



Two-speed motor

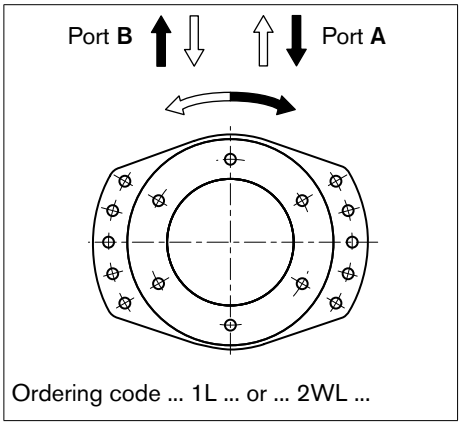


Motor with flushing valve



Direction of rotation

Direction of shaft rotation with flow (viewed from drive shaft)



Technical data

(For operation outside of these parameters, please consult Rexroth)

Description			Radial-piston type, low-speed, high-torque motor						
Frame size			MCR3						
Type of mounting			Flange mounting; face mounting						
Pipe connections[1)2)]			Threaded per SAE J514						
Shaft loading			see page 10						
Displacement	V_g	cm^3/rev	160	225	255	280	325	365	400
Output torque									
Specific torque (at $\Delta p = 250$ bar)		Nm	570	810	910	1000	1160	1310	1430
Maximum torque[3)4)]	T_{max}	Nm	1030	1450	1640	1800	1860	2090	2290
Output speed									
Minimum speed for smooth running[5)]	n_{min}	rpm	0.5						
Maximum speed (1L)[6) 7) 8)]	n_{max}	rpm	670	475	420	385	330	295	270
Maximum speed (2WL)[6) 7)]	n_{max}	rpm	875	620	550	500	430	385	350
Output power									
Nominal power[9)]	P	kW	18	18	18	18	22	22	22
Weight	m	kg	see unit dimensions on pages 11-17						
Moment of inertia	J_m	kgm^2	see unit dimensions on pages 11-17						
Hydraulic									
Pressure[10)]									
Nominal pressure[9)]	p_{nom}	bar	250	250	250	250	250	250	250
Maximum differential pressure[3)]	Δp_{max}	bar	450	450	450	450	400	400	400
Maximum pressure at port "A" or "B"[3)]	p_{max}	bar	470	470	470	470	420	420	420
Maximum case drain pressure	$p_{case\ max}$	bar	10	10	10	10	10	10	10
Hydraulic fluid [11) 12)]			Mineral oils (HLP) to DIN 51 524						
Hydraulic fluid temperature range[13)]	$t_{min/max}$	°C	-20 to +85						
Viscosity Range	$\nu_{min/max}$	mm^2/s	10 to 2000						
Fluid cleanliness			ISO 4406, Class 20/18/15						
Brake									
Holding brake (disc brake)			B2						
Minimum holding torque	T_{min}	Nm	2200						
Release pressure (min/max)	p_{rel}	bar	11/15						
Maximum pressure at brake port "Z"		bar	40						
Oil volume to operate brake	V_{rel}	cm^3	23						
Dynamic brake (drum brake)			see information on page 17						

1) Ensure motor case is filled with oil prior to start-up. See operating manual RE 15215-B.
2) For installation and maintenance details, please see operating manual RE 15215-B.
3) Maximum values should only be applied for a small portion of the duty cycle. Please consult Rexroth Engineering Department in Glenrothes for motor life calculations based on particular operating cases.
4) For motors with housing type D, maximum torque is 1500 Nm, which restricts maximum pressure accordingly.
5) For continuous operation at speeds < 5 rpm please consult Rexroth Engineering Department in Glenrothes.
6) Based on nominal no-load Δp of 20 bar in full-displacement mode.
7) Warning! During the running in period of the motor (min. 20 hrs) it should not be run unloaded at > 100 rpm.
8) Single-speed (1 L) motors are available by special order with a 30 % increase in the stated maximum speed.
9) Nominal values are guide values for continuous operation.
10) When operating motors in series, please consult Rexroth Engineering Department in Glenrothes.
11) For use with environmentally acceptable fluids HEES, HEPG, HETG, Viton seals must be specified. For further information, please refer to RE 90221.
12) For use with HF hydraulic fluids please refer to RE 90229.
13) Extension of the allowable temperature range may be possible depending on specification. Please consult Rexroth Engineering Department in Glenrothes for further details.

Technical data (Mean values, measured at $\nu = 46\ mm^2/s$ and $t = 45\ °C$)

– All torques apply to run-in motors

– For reduced displacement operating mode multiply the torques by ratio of reduced displacement

Note

– Case pressure must be added to minimum charge pressures quoted. Quoted pressures are guide values but can be circuit-dependant. Please contact Bosch Rexroth Engineering Department in Glenrothes for further advice. Figures quoted in technical data tables below are average values.

– Where flushing is used, q_{VL} will increase by the flushing flow rate. Mean case leakage values are average values for single speed motors

T = Torque in Nm

q_V = Input flow in l/min

q_{VL} = Mean case leakage in l/min

p = Minimum charge pressure in pump mode in bar

			MCR3 . 160											
Pressure Diff. Δp (bar)	**Speed n**	rpm	0	25	50	100	150	200	250	300	350	400	500	600
100	T	Nm	132	227	232	232	229	227	224	219	206	196	220	208
	q_V	l/min	0.32	4.32	8.32	16.32	24.32	32.32	40.32	48.32	56.32	64.32	80.32	96.32
	q_{VL}	l/min	0.09	0.09	0.09	0.09	0.09	0.09	0.09	0.09	0.09	0.09	0.09	0.09
200	T	Nm	306	463	469	469	463	467						
	q_V	l/min	0.65	4.65	8.65	16.65	24.65	32.65						
	q_{VL}	l/min	0.18	0.18	0.18	0.18	0.18	0.18						
300	T	Nm	489	703	710	710	710							
	q_V	l/min	0.97	4.97	8.97	16.97	24.97							
	q_{VL}	l/min	0.27	0.27	0.27	0.27	0.27							
400	T	Nm	693	907	917	920								
	q_V	l/min	1.29	5.29	9.29	17.29								
	q_{VL}	l/min	0.35	0.35	0.35	0.35								
Min. charge pressure	p	bar	1	3	3	4	5	6	6	7	8	8	10	12

			MCR3 . 225										
Pressure Diff. Δp (bar)	**Speed n**	rpm	0	25	50	100	150	200	250	300	350	400	450
100	T	Nm	186	319	326	326	322	319	315	308	290	276	286
	q_V	l/min	0.32	5.95	11.57	22.82	34.07	45.32	56.57	67.82	79.07	90.32	101.57
	q_{VL}	l/min	0.09	0.09	0.09	0.09	0.09	0.09	0.09	0.09	0.09	0.09	0.09
200	T	Nm	430	652	659	659	652	650					
	q_V	l/min	0.65	6.27	11.90	23.15	34.40	45.65					
	q_{VL}	l/min	0.18	0.18	0.18	0.18	0.18	0.18					
300	T	Nm	688	988	999	999	1047						
	q_V	l/min	0.97	6.60	12.22	23.47	34.72						
	q_{VL}	l/min	0.27	0.27	0.27	0.27	0.27						
400	T	Nm	974	1275	1289	1261							
	q_V	l/min	1.29	6.92	12.54	23.79							
	q_{VL}	l/min	0.35	0.35	0.35	0.35							
Min. charge pressure	p	bar	1	3	3	4	5	6	8	9	10	11	13

Technical data (Mean values, measured at $\nu = 46\ mm^2/s$ and $t = 45\ °C$)

			MCR3 . 255									
Pressure Diff. Δp (bar)	Speed n	rpm	0	25	50	100	150	200	250	300	350	400
100	T	Nm	211	361	369	369	365	361	357	349	329	313
	q_V	l/min	0.32	6.70	13.07	25.82	38.57	51.32	64.07	76.82	89.57	102,32
	q_{VL}	l/min	0.09	0.09	0.09	0.09	0.09	0.09	0.09	0.09	0.09	0,09
200	T	Nm	487	739	747	747	739					
	q_V	l/min	0.65	7.02	13.40	26.15	38.90					
	q_{VL}	l/min	0.08	0.18	0.08	0.18	0.08					
300	T	Nm	779	1120	1132	1132						
	q_V	l/min	0.97	7.35	13.72	26.47						
	q_{VL}	l/min	0.27	0.27	0.27	0.27						
400	T	Nm	1104	1445	1461							
	q_V	l/min	1.29	7.67	14.04							
	q_{VL}	l/min	0.35	0.35	0.35							
Min. charge pressure	p	bar	1	3	3	5	6	7	8	10	11	13

			MCR3 . 280								
Pressure Diff. Δp (bar)	**Speed n**	rpm	0	25	50	100	150	200	250	300	350
100	T	Nm	232	397	406	406	401	397	392	383	361
	q_V	l/min	0.32	7.32	14.32	28.32	42.32	56.32	70.32	84.32	98.32
	q_{VL}	l/min	0.09	0.09	0.09	0.09	0.09	0.09	0.09	0.09	0.09
200	T	Nm	267	406	410	410	406				
	q_V	l/min	0.65	7.65	14.65	28.65	42.65				
	q_{VL}	l/min	0.18	0.18	0.18	0.18	0.18				
300	T	Nm	856	1230	1243	1243					
	q_V	l/min	0.97	7.97	14.97	28.97					
	q_{VL}	l/min	0.27	0.27	0.27	0.27					
400	T	Nm	1212	1586	1604						
	q_V	l/min	1.29	8.29	15.29						
	q_{VL}	l/min	0.35	0.35	0.35						
Min. charge pressure	p	bar	1	3	3	5	6	8	9	10	12

			MCR3 . 325							
Pressure Diff. Δp (bar)	Speed n	rpm	0	25	50	100	150	200	250	300
100	T	Nm	269	460	471	471	463	455	434	409
	q_V	l/min	0.32	8.45	16.57	32.82	49.07	65.32	81.57	97.82
	q_{VL}	l/min	0.09	0.09	0.09	0.09	0.09	0.09	0.09	0.09
200	T	Nm	621	941	952	952	941			
	q_V	l/min	0.65	8.77	16.90	33.15	49.40			
	q_{VL}	l/min	0.18	0.18	0.18	0.18	0.18			
300	T	Nm	993	1428	1443	1443				
	q_V	l/min	0.97	9.10	17.22	33.47				
	q_{VL}	l/min	0.27	0.27	0.27	0.27				
400	T	Nm	1407	1841	1862					
	q_V	l/min	1.29	9.42	17.54					
	q_{VL}	l/min	0.35	0.35	0.35					
Min. charge pressure	p	bar	1	3	4	5	7	8	10	12

Technical data (Mean values, measured at $\nu = 46\ mm^2/s$ and $t = 45\ °C$)

			MCR3 . 365						
Pressure Diff. Δp (bar)	Speed n	rpm	0	25	50	100	150	200	250
100	T	Nm	302	517	529	529	520	511	488
	q_V	l/min	0.32	9.45	18.57	36.82	55.07	73.32	91.57
	q_{VL}	l/min	0.09	0.09	0.09	0.09	0.09	0.09	0.09
200	T	Nm	697	1057	1069	1069	1057		
	q_V	l/min	0.65	9.77	18.90	37.15	55.40		
	q_{VL}	l/min	0.18	0.18	0.18	0.18	0.18		
300	T	Nm	1115	1603	1621	1621			
	q_V	l/min	0.97	10.10	19.22	37.47			
	q_{VL}	l/min	0.27	0.27	0.27	0.27			
400	T	Nm	1580	2068	2091				
	q_V	l/min	1.29	10.42	19.54				
	q_{VL}	l/min	0.35	0,35	0.35				
Min. charge pressure	p	bar	1	3	4	6	7	9	11

			MCR3 . 400						
Pressure Diff. Δp (bar)	**Speed n**	rpm	0	25	50	100	150	200	250
100	T	Nm	331	567	579	579	567	547	522
	q_V	l/min	0.32	10.32	20.32	40.32	60.32	80.32	100.32
	q_{VL}	l/min	0.09	0.09	0.09	0.09	0.09	0.09	0.09
200	T	Nm	764	1159	1171	1171	1159		
	q_V	l/min	0.65	10.65	20.65	40.65	60.65		
	q_{VL}	l/min	0.18	0.18	0.18	0.18	0.18		
300	T	Nm	1222	1757	1776	1776			
	q_V	l/min	0.97	10.97	20.97	40.97			
	q_{VL}	l/min	0.27	0.27	0.27	0.27			
400	T	Nm	1732	2266	2292				
	q_V	l/min	1.29	11.29	21.29				
	q_{VL}	l/min	0.35	0.35	0.35				
Min. charge pressure	p	bar	1	3	4	6	8	10	13

Permitted loading on drive shaft

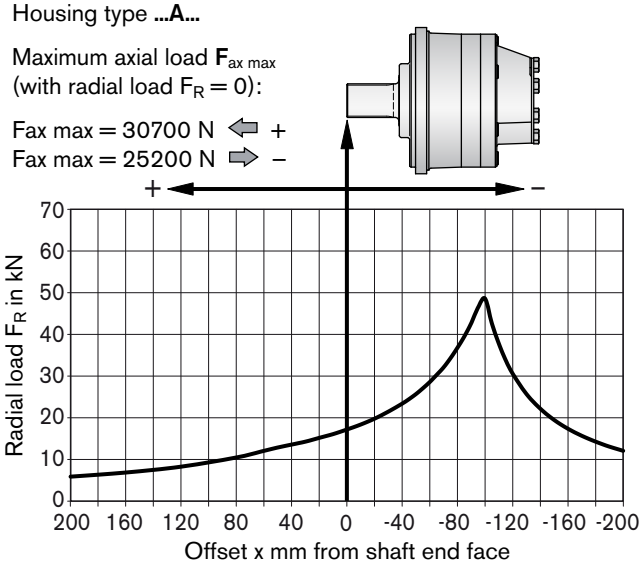
(Speed n = 50 rpm, pressure differential Δp = 250 bar, 2000 hrs L10 life at 50 °C)

Drive shaft ...A45...

Housing type **...A...**

Maximum axial load $F_{ax\ max}$ (with radial load $F_R = 0$):

Fax max = 30700 N ⇦ +
Fax max = 25200 N ⇨ –

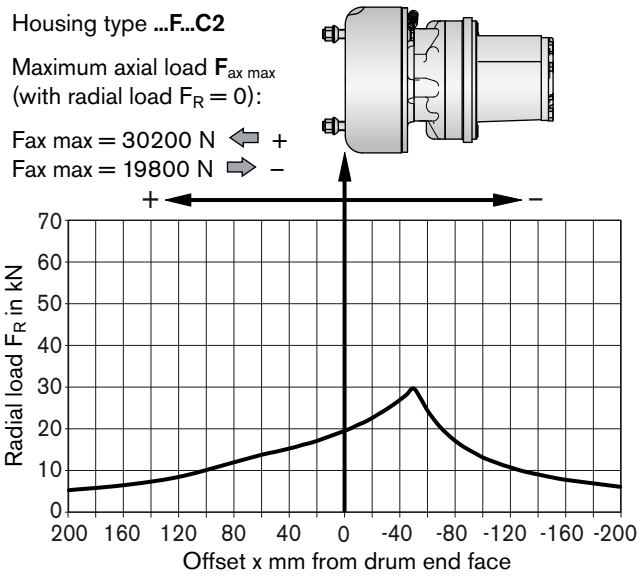


Drive shaft ...F180... (5 studs M14)

Housing type **...F...C2**

Maximum axial load $F_{ax\ max}$ (with radial load $F_R = 0$):

Fax max = 30200 N ⇦ +
Fax max = 19800 N ⇨ –

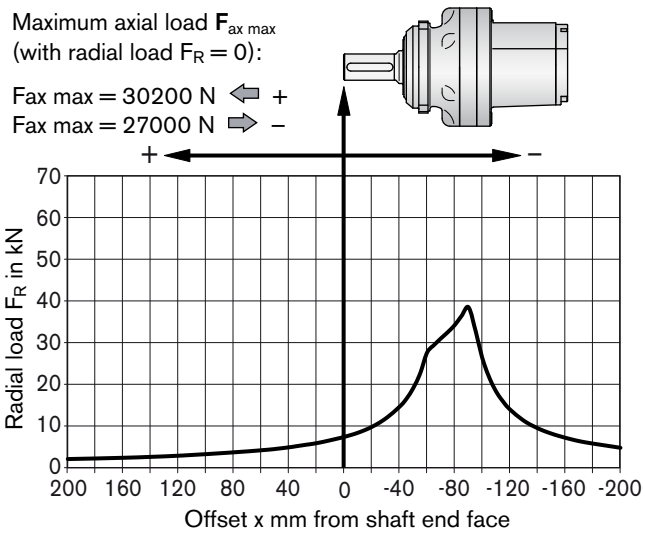


Drive shaft ...L40...

Housing type **...D...**

Maximum axial load $F_{ax\ max}$ (with radial load $F_R = 0$):

Fax max = 30200 N ⇦ +
Fax max = 27000 N ⇨ –

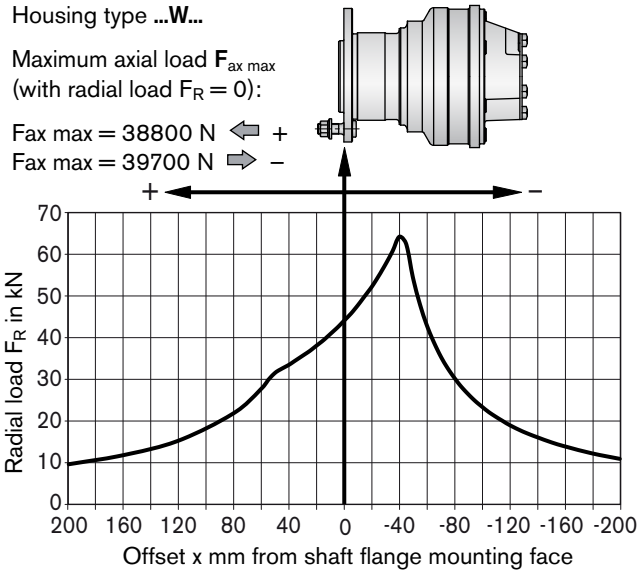


Drive shaft ...F180... (5 studs M14)

Housing type **...W...**

Maximum axial load $F_{ax\ max}$ (with radial load $F_R = 0$):

Fax max = 38800 N ⇦ +
Fax max = 39700 N ⇨ –

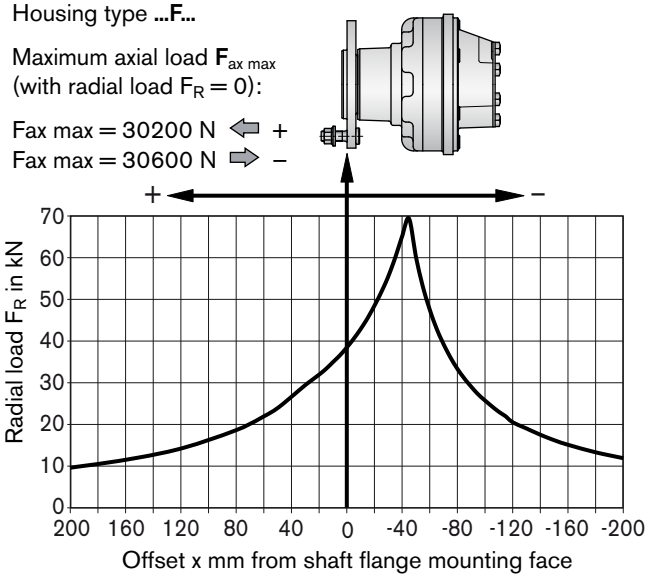


Drive shaft ...F180... (5 studs M14)

Housing type **...F...**

Maximum axial load $F_{ax\ max}$ (with radial load $F_R = 0$):

Fax max = 30200 N ⇦ +
Fax max = 30600 N ⇨ –



Note:

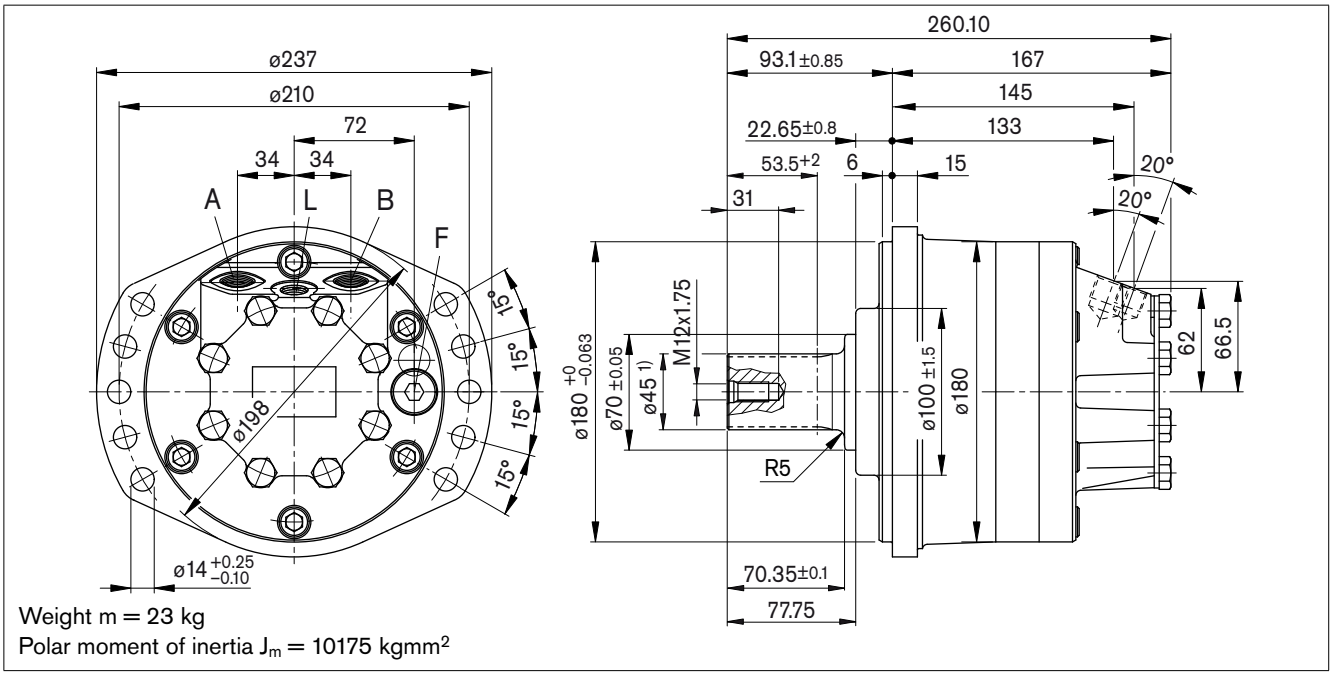
These values and graphs are for initial guidance only.
For actual motor life calculations under typical or specified duty cycles, contact Rexroth Engineering Department in Glenrothes.

Dimensions

Before finalizing your design, request a binding installation drawing. Dimensions in mm.

Flanged front housing, splined drive shaft, single speed (1L)

Ordering code: "MCR3A…A45Z-32/A0.1L/12./…"

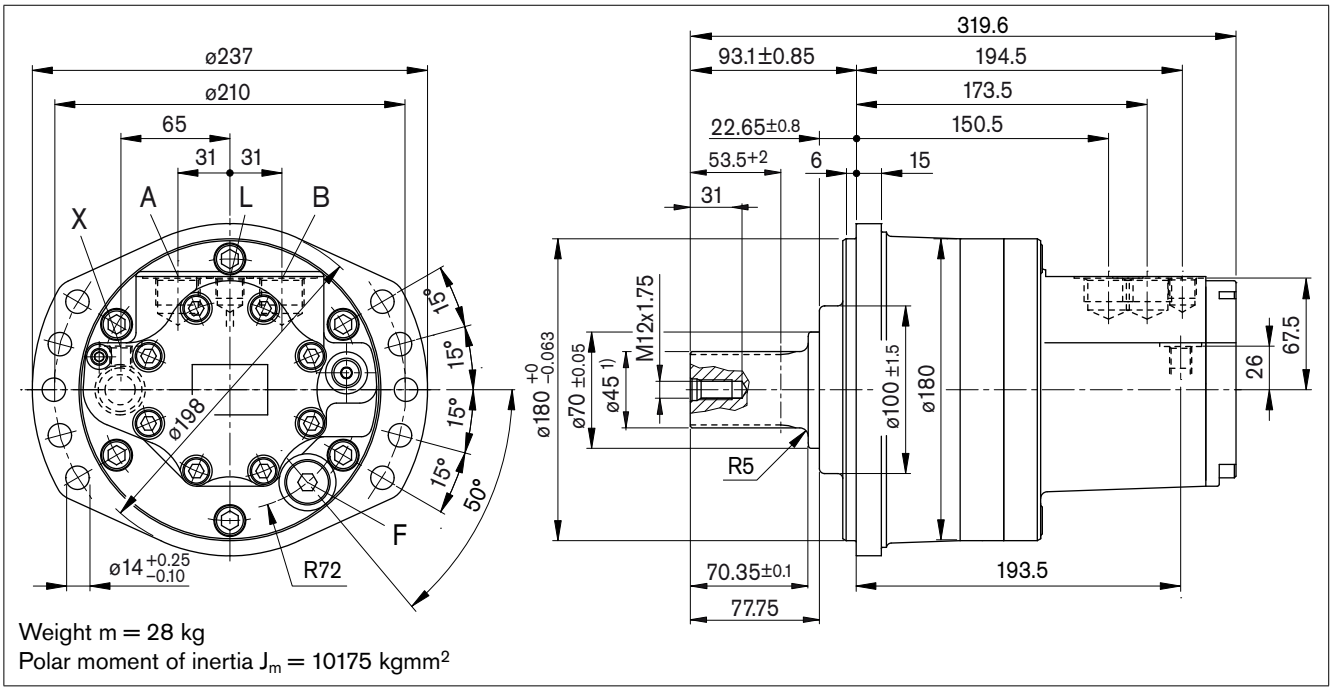


Weight m = 23 kg

Polar moment of inertia J_m = 10175 kgmm²

Flanged front housing, splined drive shaft, two speed (2W)

Ordering code: "MCR3A…A45Z-32/A0.2WL/12./…"



Weight m = 28 kg

Polar moment of inertia J_m = 10175 kgmm²

Ports

Designation	Port function	Code 12	Size	Peak pressure [bar]	State
A, B	Inlet, outlet	SAE J514	7/8 in - 14 UNF	470/420[2)]	O
L	Case drain	SAE J514	9/16 in - 18 UNF	10	O
X	2 speed port	SAE J514	9/16 in - 18 UNF	35	O
F	Filler port	SAE J514	3/4 in - 16 UNF	10	X

1) Spline data: ANSI B92.1-1996 class 5, 30° Pressure angle, Fillet root side fit, Pitch 24/48, PCD 44.45 mm, No. of teeth 42

2) depends on nominal size

O = Must be connected (plugged on delivery)

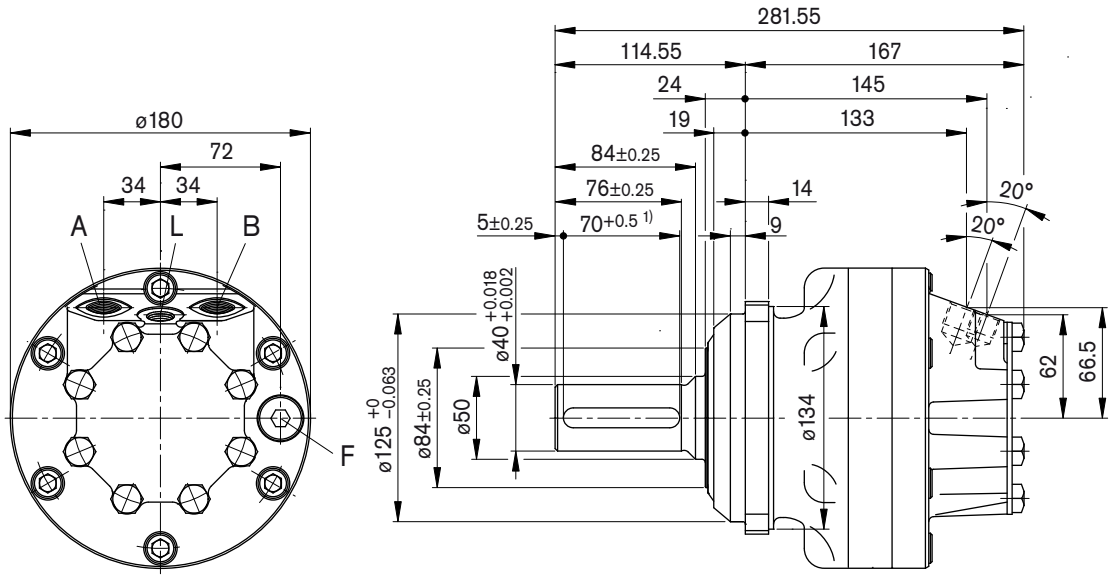
X = Plugged (in normal operation)

Dimensions

Before finalizing your design, request a binding installation drawing. Dimensions in mm.

4 hole SAE flanged front housing, parallel drive shaft, single speed (1L)

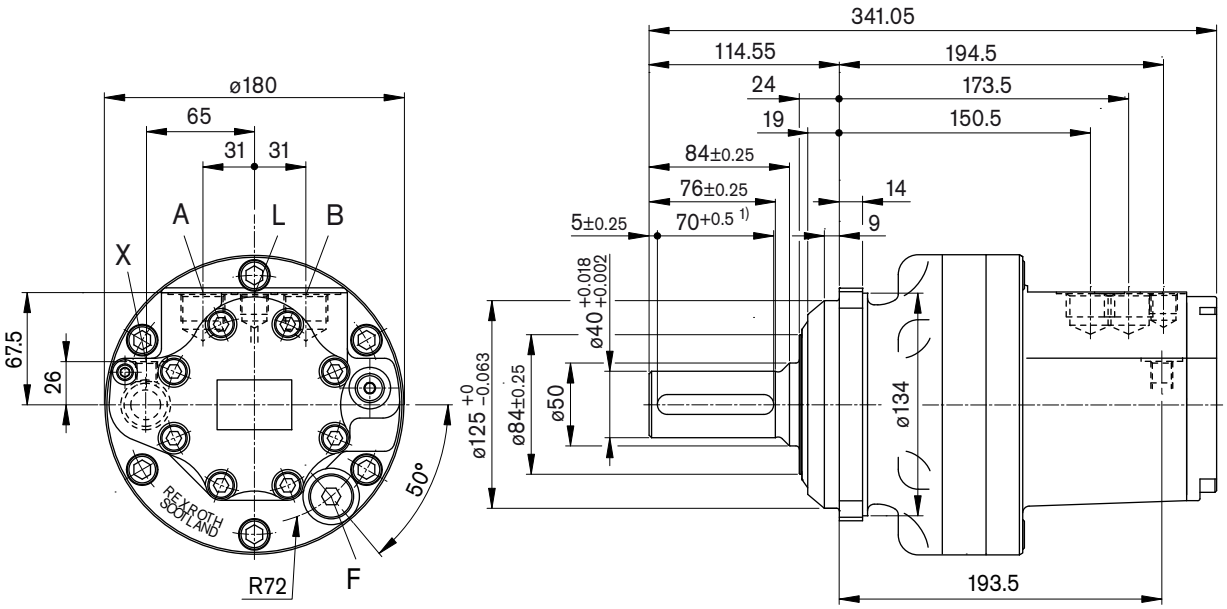
Ordering code: "MCR3D…L40Z-32/A0.1L/12./…"



Weight m = 21 kg
Polar moment of inertia J_m = 10600 kgmm²

4 hole SAE flanged front housing, parallel drive shaft, two speed (2W)

Ordering code: "MCR3D…L40Z-32/A0.2WL/12./…"



Weight m = 26 kg
Polar moment of inertia J_m = 10600 kgmm²

Note: To prevent excessive shaft loading with D-type motors, the mating bore should have F7 or G6 tolerance

Ports

Designation	Port function	Code 12	Size	Peak pressure [bar]	State
A, B	Inlet, outlet	SAE J514	7/8 in - 14 UNF	470/420[2)]	O
L	Case drain	SAE J514	9/16 in - 18 UNF	10	O
X	2 speed port	SAE J514	9/16 in - 18 UNF	35	O
F	Filler port	SAE J514	3/4 in - 16 UNF	10	X

1) Parallel key A12x8x70 – DIN 6885
2) depends on nominal size

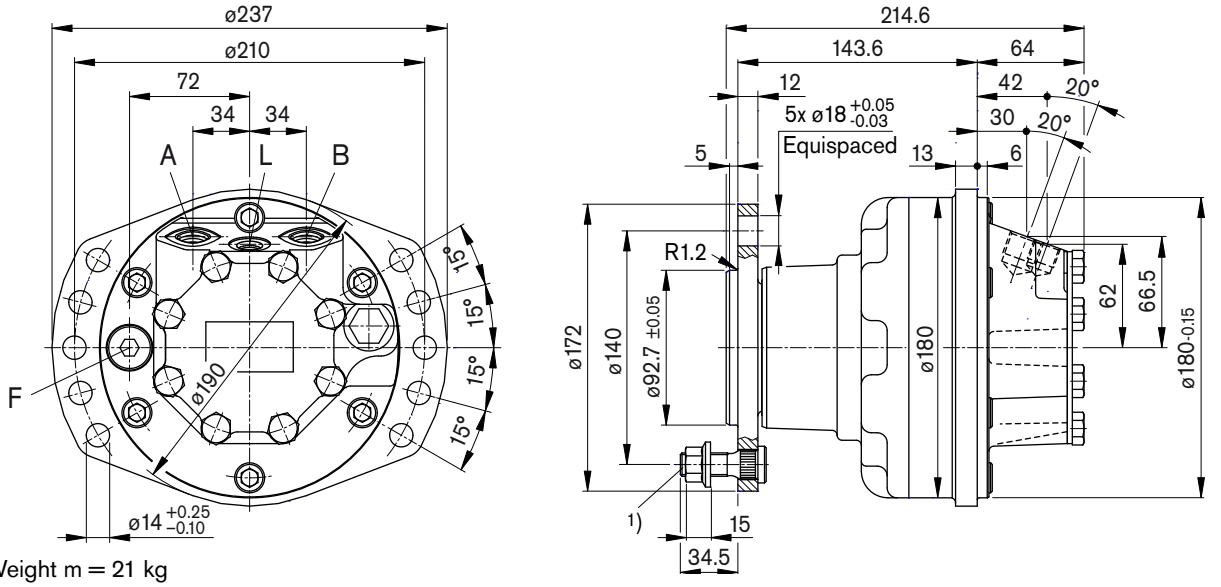
O = Must be connected (plugged on delivery)
X = Plugged (in normal operation)

Dimensions

Before finalizing your design, request a binding installation drawing. Dimensions in mm.

4 hole SAE flanged front housing, flanged drive shaft, single speed (1L)

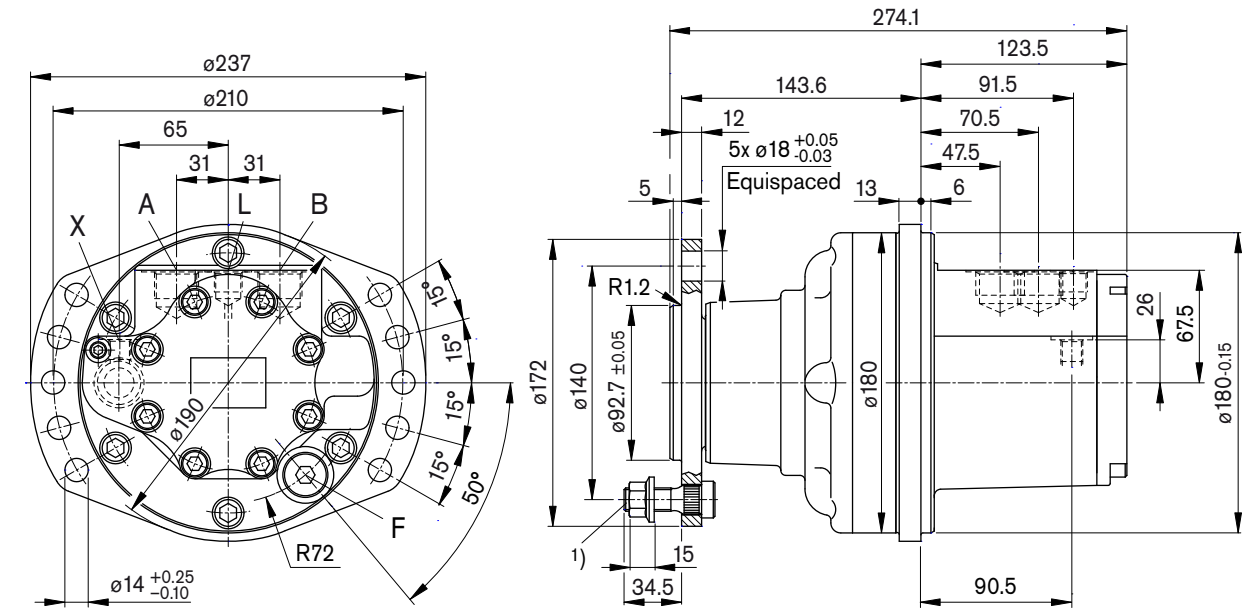
Ordering code: “MCR3F…F180Z-32/A0.1L/12./…”



Weight m = 21 kg
Polar moment of inertia J_m = 17840 kgmm²

4 hole SAE flanged front housing, flanged drive shaft, two speed (2W)

Ordering code: “MCR3F…F180Z-32/A0.2WL/12./…”



Weight m = 26 kg
Polar moment of inertia J_m = 17840 kgmm²

Ports

Designation	Port function	Code 12	Size	Peak pressure [bar]	State
A, B	Inlet, outlet	SAE J514	7/8 in - 14 UNF	470/420[2)]	O
L	Case drain	SAE J514	9/16 in - 18 UNF	10	O
X	2 speed port	SAE J514	9/16 in - 18 UNF	35	O
F	Filler port	SAE J514	3/4 in - 16 UNF	10	X

1) 5x wheel studs M14x1.5 with shouldered hex nut for wheel fixing, clamping length 5 to 20 mm, ordering code S (wheel studs and nuts equally spaced on P.C.D. of 140)

2) depends on nominal size

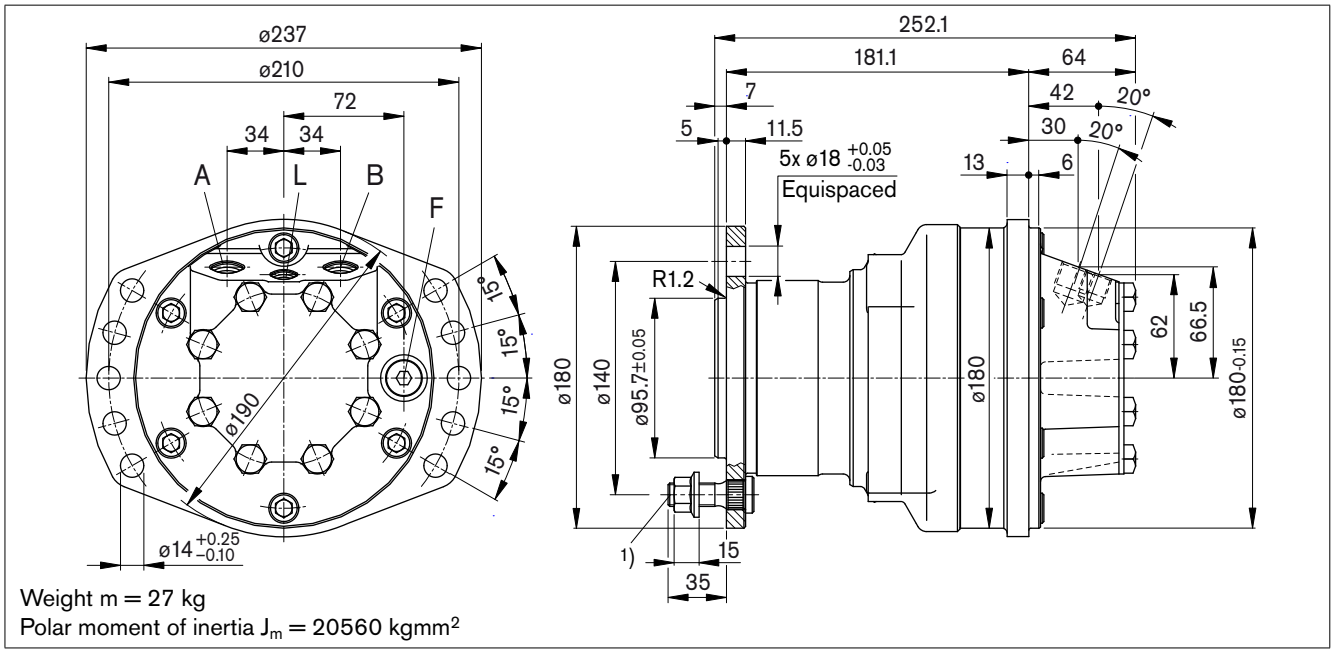
O = Must be connected (plugged on delivery)
X = Plugged (in normal operation)

Dimensions

Before finalizing your design, request a binding installation drawing. Dimensions in mm.

High radial load bearings fitted, rear case mounting flange, single speed (1L)

Ordering code: “MCR3W…F180Z-32/A0.1L/12./…”

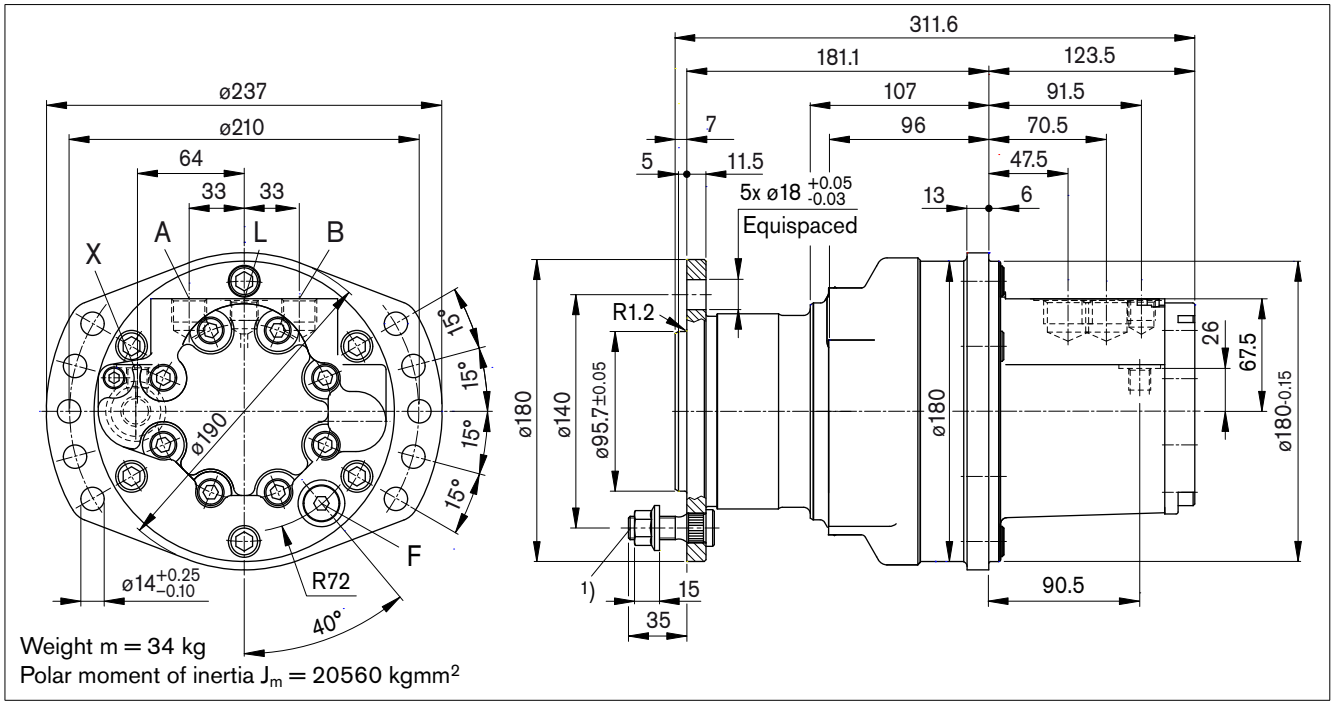


Weight m = 27 kg

Polar moment of inertia J_m = 20560 kgmm²

High radial load bearings fitted, rear case mounting flange, two speed (2W)

Ordering code: “MCR3W…F180Z-32/A0.2WL/12./…”



Weight m = 34 kg

Polar moment of inertia J_m = 20560 kgmm²

Ports

Designation	Port function	Code 12	Size	Peak pressure [bar]	State
A, B	Inlet, outlet	SAE J514	7/8 in - 14 UNF	470/420[2)]	O
L	Case drain	SAE J514	9/16 in - 18 UNF	10	O
X	2 speed port	SAE J514	9/16 in - 18 UNF	35	O
F	Filler port	SAE J514	3/4 in - 16 UNF	10	X

1) 5x wheel studs M14x1.5 with shouldered hex nut for wheel fixing, clamping length 5 to 20 mm, ordering code S (wheel studs and nuts equally spaced on P.C.D. of 140)

2) depends on nominal size

O = Must be connected (plugged on delivery)

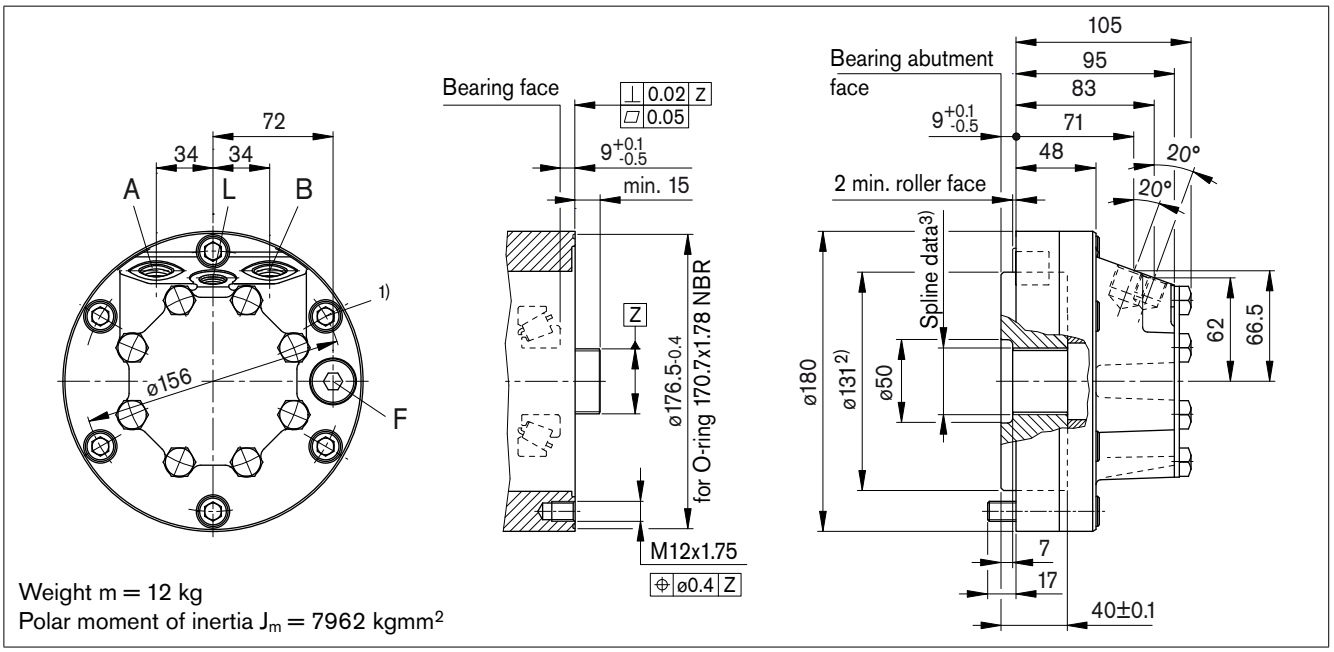
X = Plugged (in normal operation)

Dimensions

Before finalizing your design, request a binding installation drawing. Dimensions in mm.

Hydrobase for mounting on customer´s shaft, single speed (1L)

Ordering code: “MCR3H…ZZ-32/A0.1L/12./…”

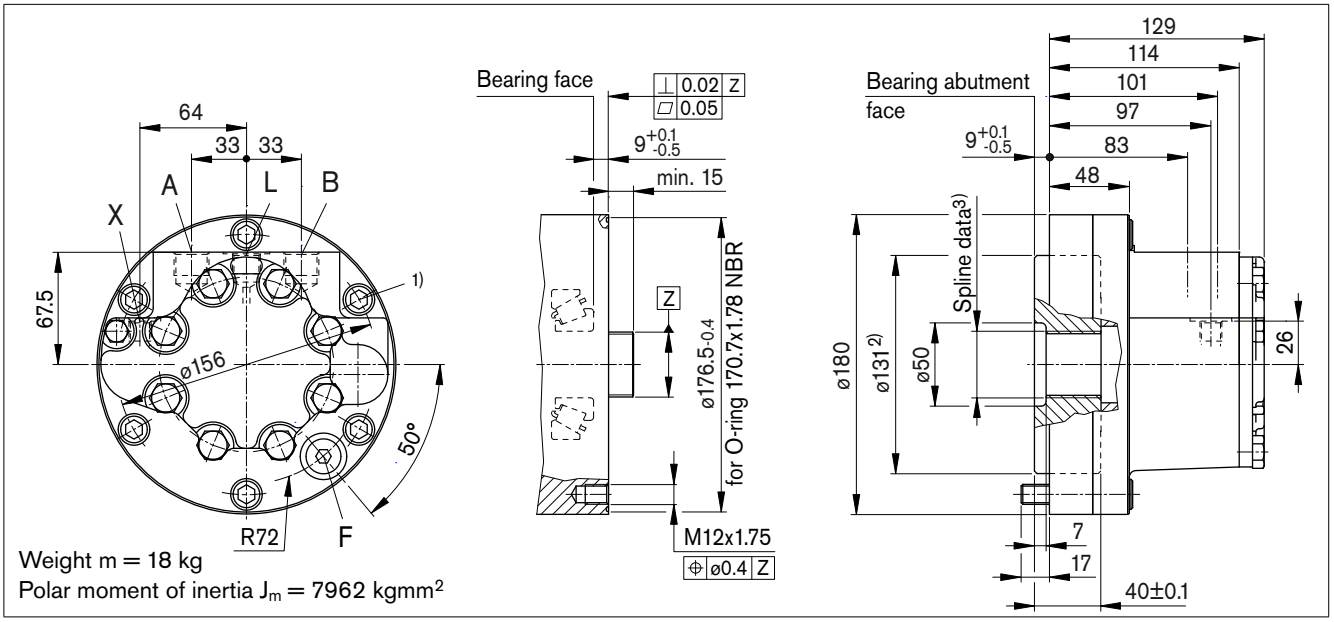


Weight m = 12 kg

Polar moment of inertia J_m = 7962 kgmm²

Hydrobase for mounting on customer´s shaft, two speed (2W)

Ordering code: “MCR3H…ZZ-32/A0.2WL/12./…”



Weight m = 18 kg

Polar moment of inertia J_m = 7962 kgmm²

Ports

Designation	Port function	Code 12	Size	Peak pressure [bar]	State
A, B	Inlet, outlet	SAE J514	7/8 in - 14 UNF	470/420[4]	O
L	Case drain	SAE J514	9/16 in - 18 UNF	10	O
X	2 speed port	SAE J514	9/16 in - 18 UNF	35	O
F	Filler port	SAE J514	3/4 in - 16 UNF	10	X

1) 6x M12x1.75 bolts on a P.C.D of 156

2) Mating part must clear this diameter

3) Spline data: BS3550 class 1, Fillet root side fit, Pitch 24/48, PCD 38.1 mm, No. of spaces 36

4) depends on nominal size

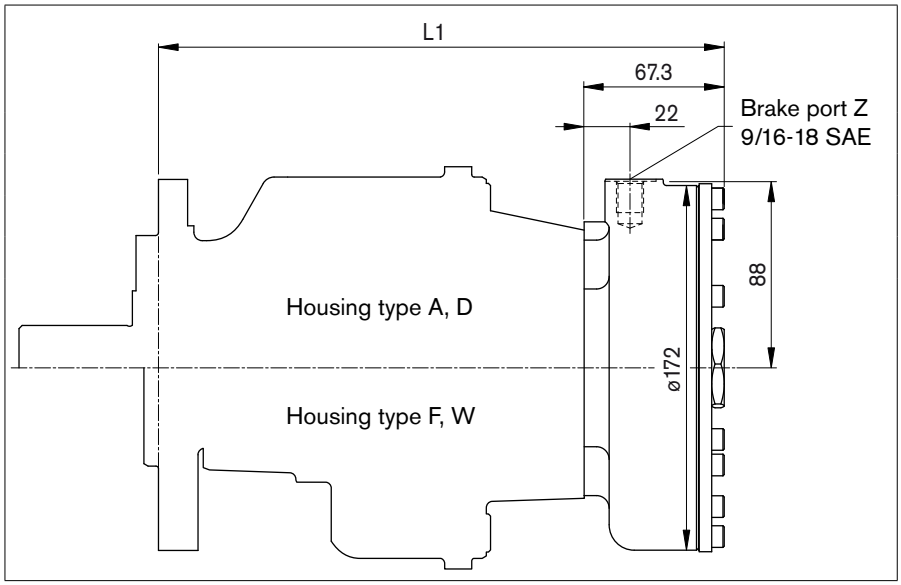
O = Must be connected (plugged on delivery)

X = Plugged (in normal operation)

Dimensions

Before finalizing your design, request a binding installation drawing. Dimensions in mm.

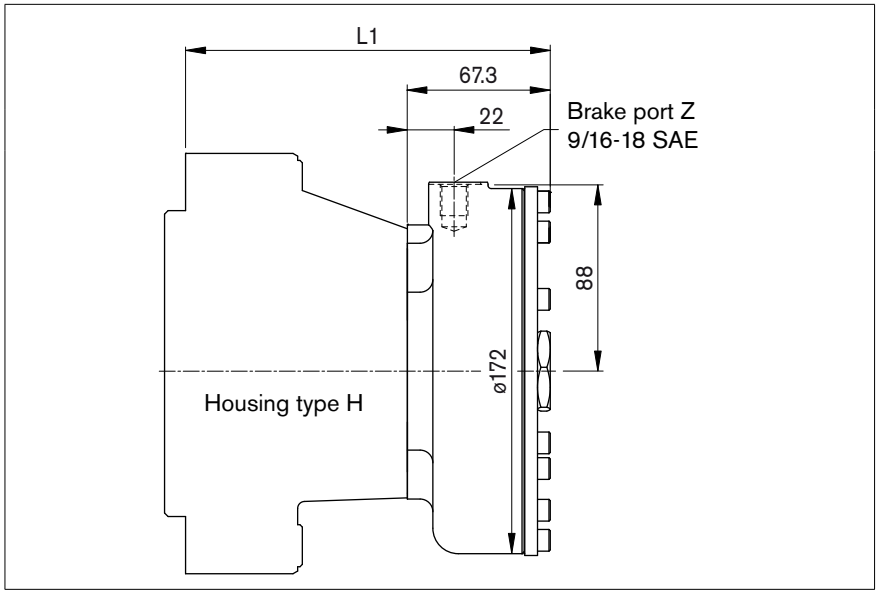
Holding Brake (multi-disc brake): ordering code “B2”



Housing type	Single speed (1L) L1	Two speed (2W) L1
A	224.3	275.8
D	224.3	275.8
F	264.8	316.4
W	302.3	353.8

Weight m = 9 kg
Polar moment of inertia J_m = 520 kgmm^2

Holding Brake (multi-disc brake): ordering code “B2”



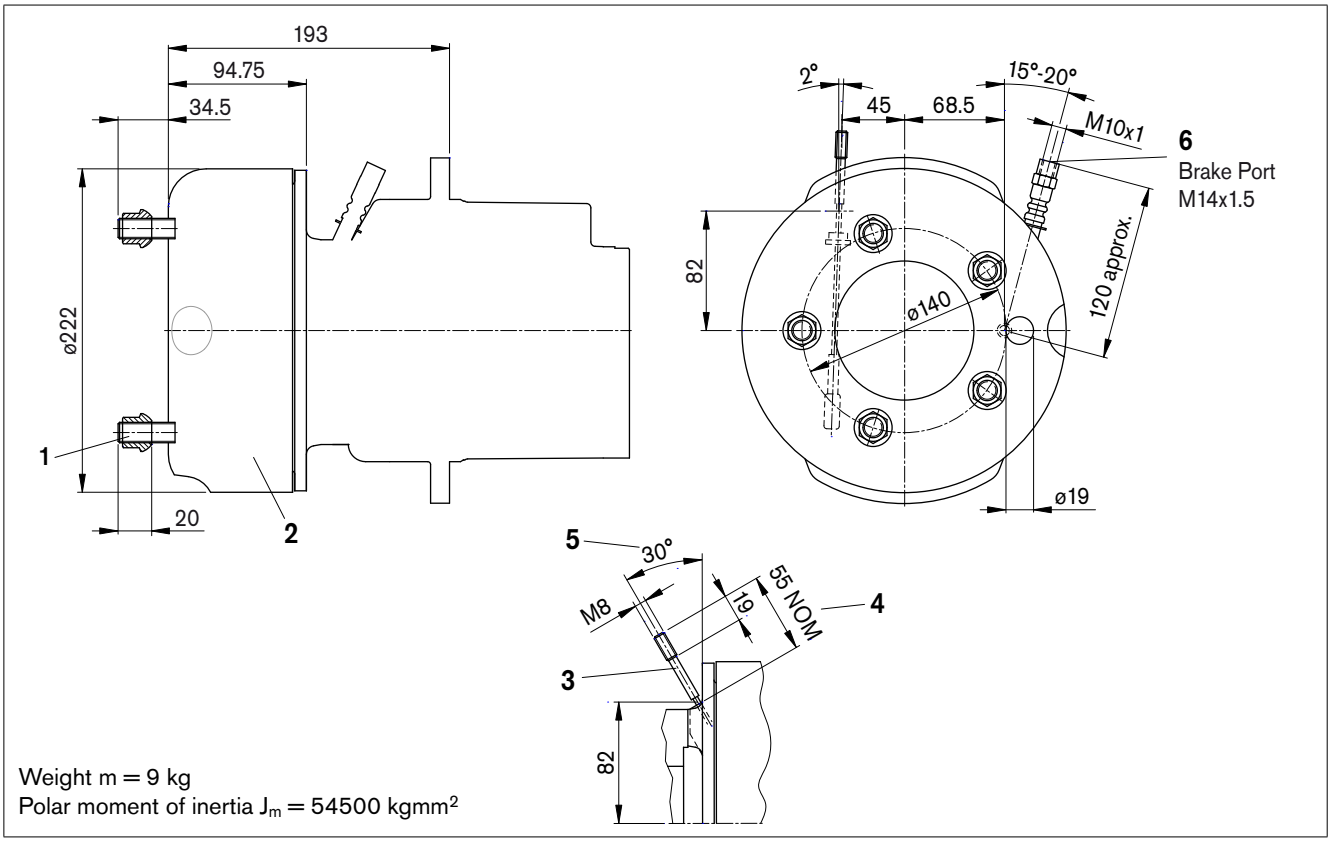
Housing type	Single speed (1L) L1	Two speed (2W) L1
H	162.3	181.3

Weight m = 9 kg
Polar moment of inertia J_m = 520 kgmm^2

Dimensions

Before finalizing your design, request a binding installation drawing. Dimensions in mm.

Dynamic brake (drum brake): ordering code “C2R” / “C2L”



1 5 Studs M14x1.5 with spherical wheel nuts

2 Dynamic brake (drum brake) ordering code C2L/R for use with brake fluid DOT 3+5 or SAE JI 703.
If brake is to be used with mineral oil a special order is to be made.
Please state if seals for mineral oil are required when placing order.

3 Brake cable (Bowden cable).
The brake illustrated is for right side of vehicle. The left is a mirror image of this (see fig. below).

4 Brake cable length.

5 Angular position of brake cable.

6 Brake port p_{max} = 117 bar.
Brake cylinder operating volume V = 7 cm³.

Brake torque after run-in

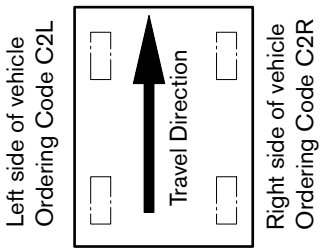
Braking torque	Cable tension	Braking torque	Port pressure
2000 Nm	1000 N	2000 Nm	82 bar
2900 Nm	1440 N	2900 Nm	117 bar

MCR dynamic drum brake run-in procedure

– Brake the machine hard in forward and reverse directions until the brake drum temperature reaches 200 °C.

– Allow the brake to cool.

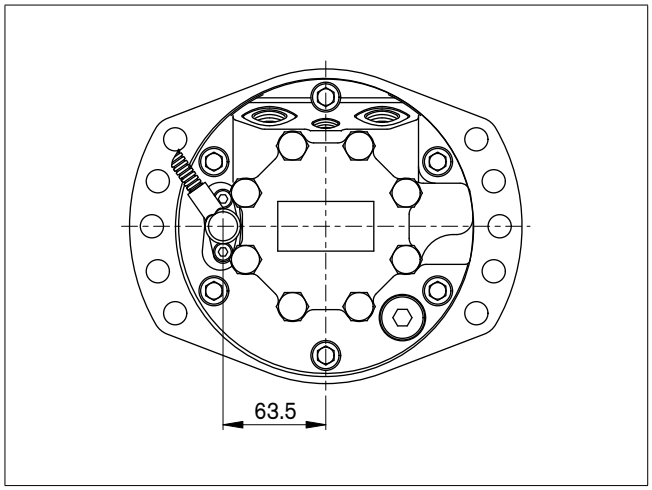
– To remove residue, brake gently 2 times each in the forward and reverse directions.



Dimensions

Before finalizing your design, request a binding installation drawing. Dimensions in mm.

Speed sensor: ordering code “P1” / “P2”



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