

Radial Piston Motor (Multi-Stroke) MCR5

Data sheet

Series 3X
Size 380 to 820
Differential pressure up to 450 bar
Torque output up to 4900 Nm
Speed up to 570 rpm
Open and closed circuits



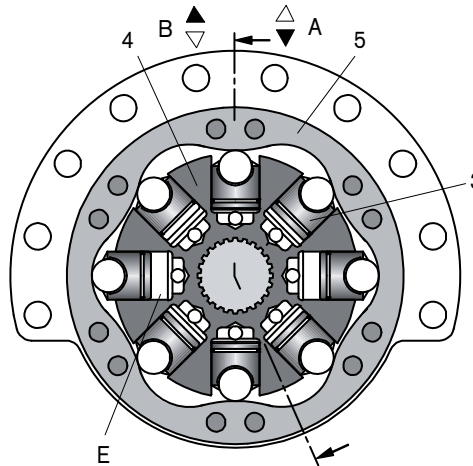
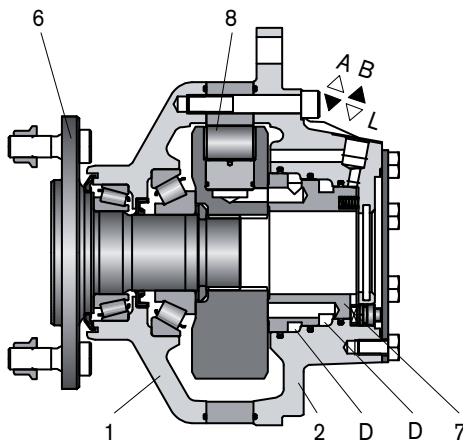
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Features

- 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.

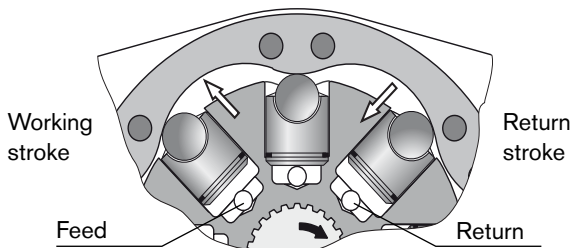
Construction

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



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 $p_{\text{charge}} - p_{\text{case}} = 25 \text{ bar}$)

Ordering code	Flow	($\pm 1 \text{ l/min}$)
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).

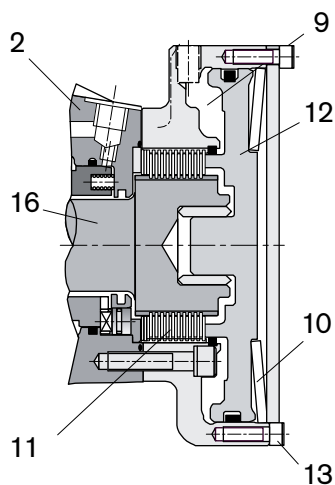
Brake application

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).

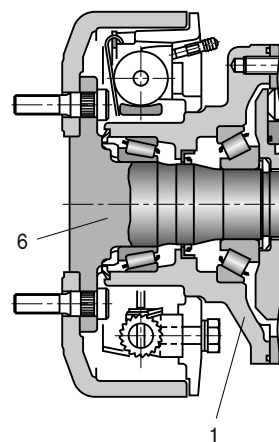


Dynamic brake

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)

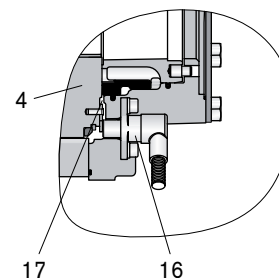


Speed sensor

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

Radial piston motor

01		MCR
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Frame size

02	Frame size 5	5
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Housing Type

03	Front case flanged	A
	Front case flanged, SAE 4 metric holes	D
	Rear case flanged, compact	C
	Rear case flanged	F
	Hydrobase (half motor)	H

Nominal size, displacement V in cm³/rev

			380	470	520	565	620	680	750	820
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")	A60
	Parallel keyed shaft Ø50 mm (only available with housing type "D" – maximum torque 3000 Nm)	L50
	With flange Ø180 mm (only available with housing type "C" and "F")	F180
	Without drive shaft (only available with housing type "H")	Z

Through shaft

06	Without through shaft	Z
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Series

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

08	Without brake	A0
	Hydraulic release spring applied multi-disc holding brake 2200 Nm	B2
	Hydraulic release spring applied multi-disc holding brake 4400 Nm	B4
	Dynamic brake (drum brake) for right hand side of vehicle (see figure page 16)	C4R
	Dynamic brake (drum brake) for left hand side of vehicle (see figure page 16)	C4L

Seals

09	NBR (nitrile rubber) (except dynamic brake – see page 16)	M
	FKM (fluoroelastomer/Viton) (except dynamic brake – see page 16)	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
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Studs

12	Without studs (no code)	
	With wheel studs and nuts (Studs only fitted to motors with housing type "C" and "F"; 5 studs on "C" type, 10 studs on "F" type)	S
	With twice normal number of wheel studs and nuts (only available with housing type "C")	SS

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

Special order

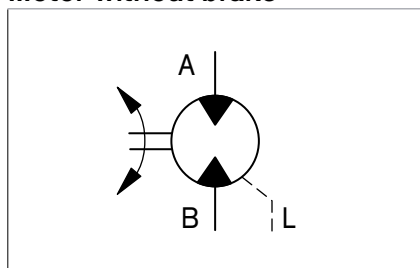
15	Special feature	SOXXX
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Other

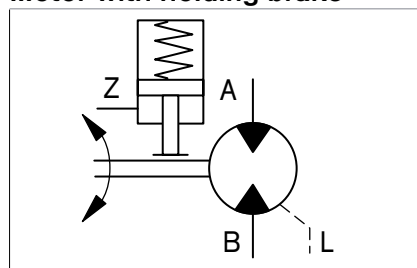
16	Mark in text here	*
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Schematic diagrams

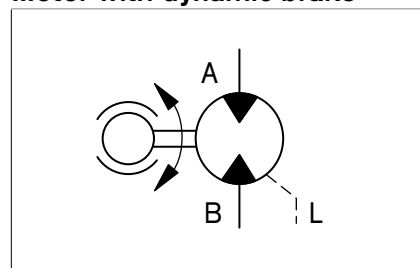
Motor without brake



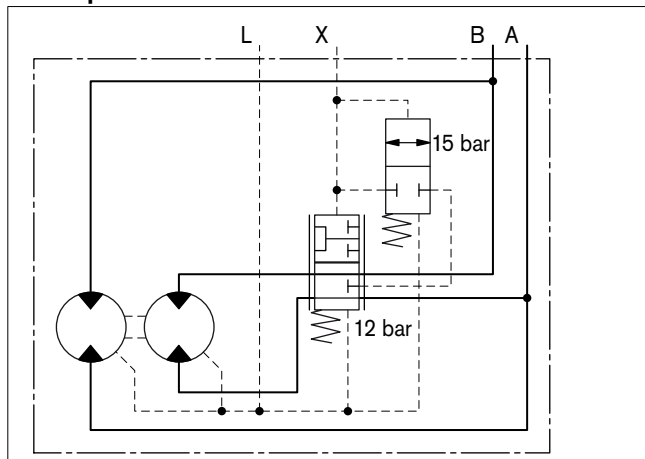
Motor with holding brake



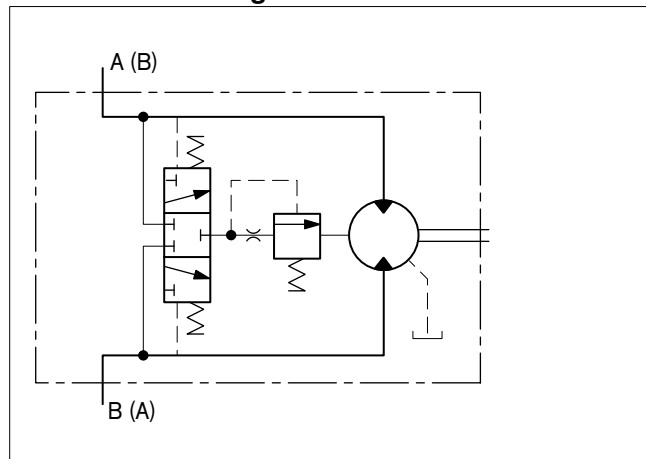
Motor with dynamic brake



Two-speed motor

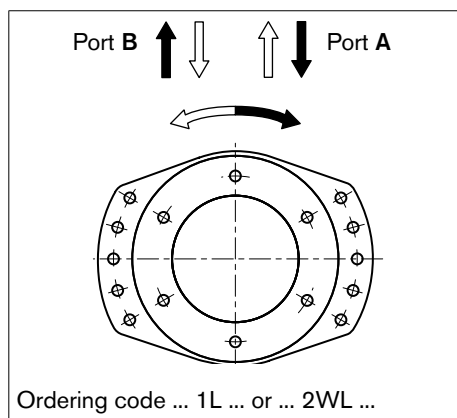


Motor with flushing valve



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			MCR5							
Type of mounting			Flange mounting; face mounting							
Pipe connections ¹⁾²⁾			Threaded per SAE J514							
Shaft loading			see page 9							
Displacement	V _g	cm ³ /rev	380	470	520	565	620	680	750	820
Output torque										
Specific torque (at Δp = 250 bar)		Nm	1360	1680	1860	2020	2220	2440	2690	2940
Maximum torque ³⁾⁴⁾	T _{max}	Nm	2450	3030	3350	3640	3550	3900	4300	4700
Output speed										
Minimum speed for smooth running ⁵⁾	n _{min}	rpm	5	5	5	5	0.5	0.5	0.5	0.5
Maximum speed (1L) ^{6) 7) 8)}	n _{max}	rpm	475	385	350	320	290	265	240	220
Maximum speed (2WL) ^{6) 7)}	n _{max}	rpm	570	465	420	385	350	320	290	265
Output power										
Nominal power ⁹⁾	P	kW	29	29	29	29	35	35	35	35
Weight	m	kg	see unit dimensions on pages 10-17							
Moment of inertia	J _m	kgm ²	see unit dimensions on pages 10-17							
Hydraulic										
Pressure ¹⁰⁾										
Nominal pressure ⁹⁾	p _{nom}	bar	250	250	250	250	250	250	250	250
Maximum differential pressure ³⁾	Δp _{max}	bar	450	450	450	450	400	400	400	400
Maximum pressure at port "A" or "B" ³⁾	p _{max}	bar	470	470	470	470	420	420	420	420
Maximum case drain pressure	p _{case max}	bar	10	10	10	10	10	10	10	10
Hydraulic fluid ^{11) 12)}			Mineral oils (HLP) to DIN 51 524							
Hydraulic fluid temperature range ¹³⁾			-20 to +85							
Viscosity Range			10 to 2000							
Fluid cleanliness			ISO 4406, Class 20/18/15							
Brake										
Holding brake (disc brake)			B2				B4			
Minimum holding torque	T _{min}	Nm	2200				4400			
Release pressure (min/max)	p _{rel}	bar	11/15				11/15			
Maximum pressure at brake port "Z"			40				40			
Oil volume to operate brake	V _{rel}	cm ³	23				46			
Dynamic brake (drum brake)			see information on page 16							

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 3000 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 DP 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 (1L) motors are available by special order with a 20 % increase in the stated maximum speed.

9) When operating motors in series, please consult Rexroth Engineering Department in Glenrothes.

10) Nominal values are guide values for continuous operation.

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

Extension of the allowable temperature range may be possible depending on specification.

13) Please consult Rexroth Engineering Department in Glenrothes for further details.

Technical data (Mean values, measured at $v = 46 \text{ mm}^2/\text{s}$ and $t = 45 \text{ }^\circ\text{C}$)

- All torques apply to run-in motors
- For reduced displacement operating mode multiply the torques by ratio of reduced displacement

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

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

MCR5 . 380								
Pressure Diff. Δp (bar)	Speed n	rpm	0	25	50	100	150	200
100	T	Nm	314	538	544	542	540	537
	q_v	l/min	0.55	10.05	19.55	38.55	57.55	76.55
	q_{vL}	l/min	0.09	0.09	0.09	0.09	0.09	0.09
200	T	Nm	726	1101	1113	1109	1104	1099
	q_v	l/min	1.10	10.60	20.10	39.10	58.10	77.10
	q_{vL}	l/min	0.18	0.18	0.18	0.18	0.18	0.18
300	T	Nm	1161	1669	1687	1682	1674	
	q_v	l/min	1.65	11.15	20.65	39.65	58.65	
	q_{vL}	l/min	0.27	0.27	0.27	0.27	0.27	
400	T	Nm	1645	2153	2177	2177		
	q_v	l/min	2.20	11.70	21.20	40.20		
	q_{vL}	l/min	0.35	0.35	0.35	0.35		
Min. charge pressure	p	bar	1	4	4	6	9	14

MCR5 . 470					
0	25	50	100	150	200
389	666	673	669	666	658
0.55	12.30	24.05	47.55	71.05	94.55
0.09	0.09	0.09	0.09	0.09	0.09
898	1361	1376	1369	1361	
1.10	12.85	24.60	48.10	71.60	
0.18	0.18	0.18	0.18	0.18	
1436	2065	2087	2076		
1.65	13.40	25.15	48.65		
0.27	0.27	0.27	0.27		
2035	2663	2693			
2.20	13.95	25.70			
0.35	0.35	0.35			
1	5	5	7	10	16

MCR5 . 520								
Pressure Diff. Δp (bar)	Speed n	rpm	0	25	50	100	150	200
100	T	Nm	430	737	745	740	734	725
	q_v	l/min	0.55	13.55	26.55	52.55	78.55	104.55
	q_{vL}	l/min	0.09	0.09	0.09	0.09	0.09	0.09
200	T	Nm	993	1506	1523	1513	1504	
	q_v	l/min	1.10	14.10	27.10	53.10	79.10	
	q_{vL}	l/min	0.18	0.18	0.18	0.18	0.18	
300	T	Nm	1589	2284	2309	2294		
	q_v	l/min	1.65	14.65	27.65	53.65		
	q_{vL}	l/min	0.27	0.27	0.27	0.27		
400	T	Nm	2251	2946	2979			
	q_v	l/min	2.20	15.20	28.20			
	q_{vL}	l/min	0.35	0.35	0.35			
Min. charge pressure	p	bar	1	6	6	7	11	17

MCR5 . 565					
0	25	50	100	150	200
468	791	809	800	782	773
0.55	14.68	28.80	57.05	85.30	113.55
0.09	0.09	0.09	0.09	0.09	0.09
1079	800	809	818	827	
1.10	15.23	29.35	57.60	85.85	
0.18	0.18	0.18	0.18	0.18	
1727	2374	2428	2482		
1.65	15.78	29.90	58.15		
0.27	0.27	0.27	0.27		
2446	3093	3165			
2.20	16.33	30.45			
0.35	0.35	0.35			
1	6	6	8	12	18

Technical data (Mean values, measured at $v = 46 \text{ mm}^2/\text{s}$ and $t = 45 \text{ }^\circ\text{C}$)

MCR5 . 620								
Pressure Diff. Δp (bar)	Speed n	rpm	0	25	50	100	150	200
100	T	Nm	513	878	888	878	868	845
	q_v	l/min	0.55	16.05	31.55	62.55	9.55	124.55
	q_{vL}	l/min	0.09	0.09	0.09	0.09	0.09	0.09
200	T	Nm	1184	1796	1816	1796	1776	
	q_v	l/min	1.10	16.60	32.10	63.10	94.10	
	q_{vL}	l/min	0.18	0.18	0.18	0.18	0.18	
300	T	Nm	1895	2723	2753	2738		
	q_v	l/min	1.65	17.15	32.65	63.65		
	q_{vL}	l/min	0.27	0.27	0.27	0.27		
400	T	Nm	2684	3513	3552			
	q_v	l/min	2.20	17.70	33.20			
	q_{vL}	l/min	0.35	0.35	0.35			
Min. charge pressure	p	bar	1	2	3	7	12	23

MCR5 . 680					
0	25	50	100	150	200
563	963	974	963	942	920
0.55	17.55	34.55	68.55	102.55	136.55
0.09	0.09	0.09	0.09	0.09	0.09
1299	1970	1991	1970	1948	
1.10	18.10	35.10	69.10	103.10	
0.18	0.18	0.18	0.18	0.18	
2078	2987	3019	3003		
1.65	18.65	35.65	69.65		
0.27	0.27	0.27	0.27		
2944	3853	3896			
2.20	19.20	36.20			
0.35	0.35	0.35			
1	3	4	9	15	25

			MCR5 . 750				
Pressure Diff. Δp (bar)	Speed n	rpm	0	25	50	100	150
100	T	Nm	621	1062	1074	1056	1033
	q _v	l/min	0.55	19.30	38.05	75.55	113.05
	q _{vL}	l/min	0.09	0.09	0.09	0.09	0.09
200	T	Nm	1432	2172	2196	2172	2149
	q _v	l/min	1.10	19.85	38.60	76.10	113.60
	q _{vL}	l/min	0.18	0.18	0.18	0,18	0.18
300	T	Nm	2292	3295	3330	3312	
	q _v	l/min	1.65	20.40	39.15	76.65	
	q _{vL}	l/min	0.27	0.27	0.27	0.27	
400	T	Nm	3247	4249	4297		
	q _v	l/min	2.20	20,95	39.70		
	q _{vL}	l/min	0.35	0.35	0.35		
Min. charge pressure	p	bar	1	3	4	9	15

MCR5 . 820				
0	25	50	100	150
679	1162	1175	1148	1135
0.55	21.05	41.55	82.55	123.55
0.09	0.09	0.09	0.09	0.09
1566	2375	2401	2375	2349
1.10	19.85	38.60	76.10	113.60
0.18	0.18	0.18	0.18	0.18
2506	3602	3641	3622	
1.65	20.40	39.15	76.65	
0.27	0.27	0.27	0.27	
3550	4646	4698		
2.20	20.95	39.70		
0.35	0.35	0.35		
1	4	6	11	19

Permitted loading on drive shaft

(Speed $n = 50$ rpm, pressure differential $\Delta p = 250$ bar, 2000 hrs L10 life at 50°C)

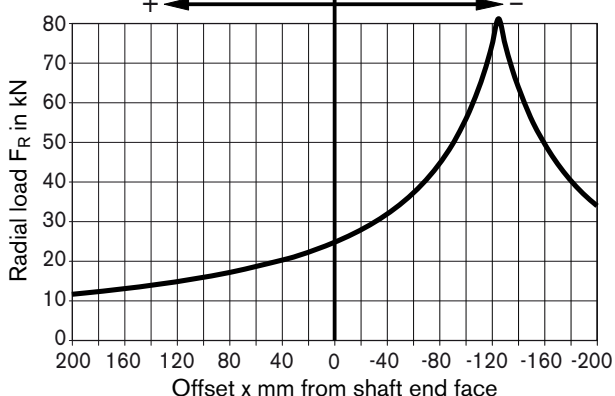
Drive shaft ...A60...

Housing type ...A...

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

$F_{ax\ max} = 49000\ \text{N} \leftarrow +$

$F_{ax\ max} = 35400\ \text{N} \rightarrow -$



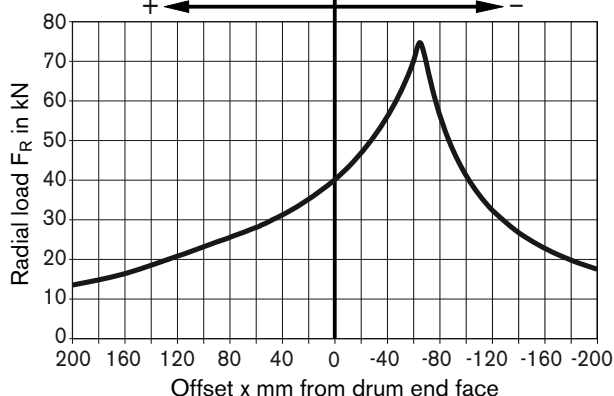
Drive shaft ...F180... (10 studs M18) C4 Brake

Housing type ...F...C4

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

$F_{ax\ max} = 50000\ \text{N} \leftarrow +$

$F_{ax\ max} = 39000\ \text{N} \rightarrow -$



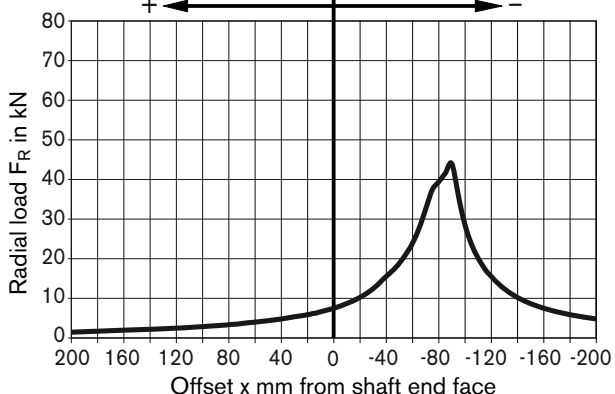
Drive shaft ...L50...

Housing type ...D...

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

$F_{ax\ max} = 50000\ \text{N} \leftarrow +$

$F_{ax\ max} = 32000\ \text{N} \rightarrow -$



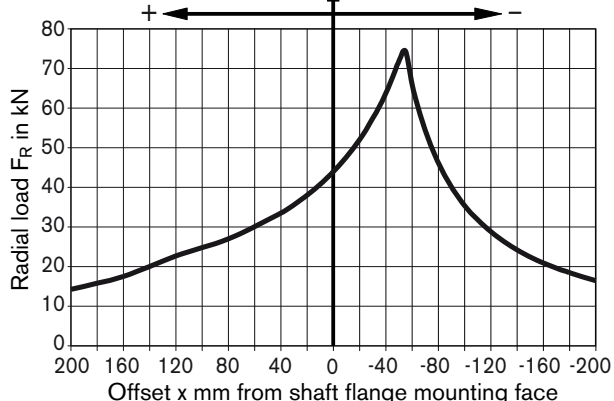
Drive shaft ...F180... (10 studs M14)

Housing type ...F...

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

$F_{ax\ max} = 50000\ \text{N} \leftarrow +$

$F_{ax\ max} = 39000\ \text{N} \rightarrow -$



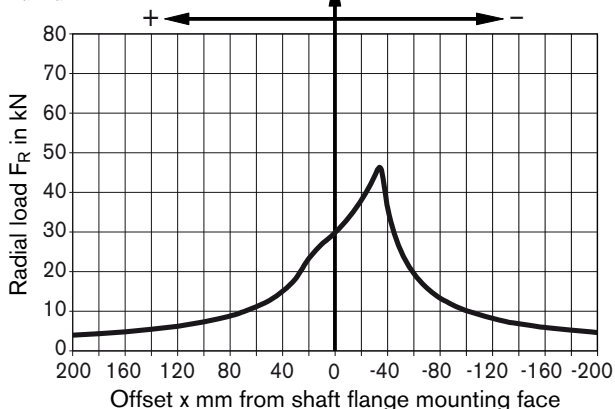
Drive shaft ...F180... (5 studs M14)

Housing type ...C...

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

$F_{ax\ max} = 50000\ \text{N} \leftarrow +$

$F_{ax\ max} = 27000\ \text{N} \rightarrow -$



Note:

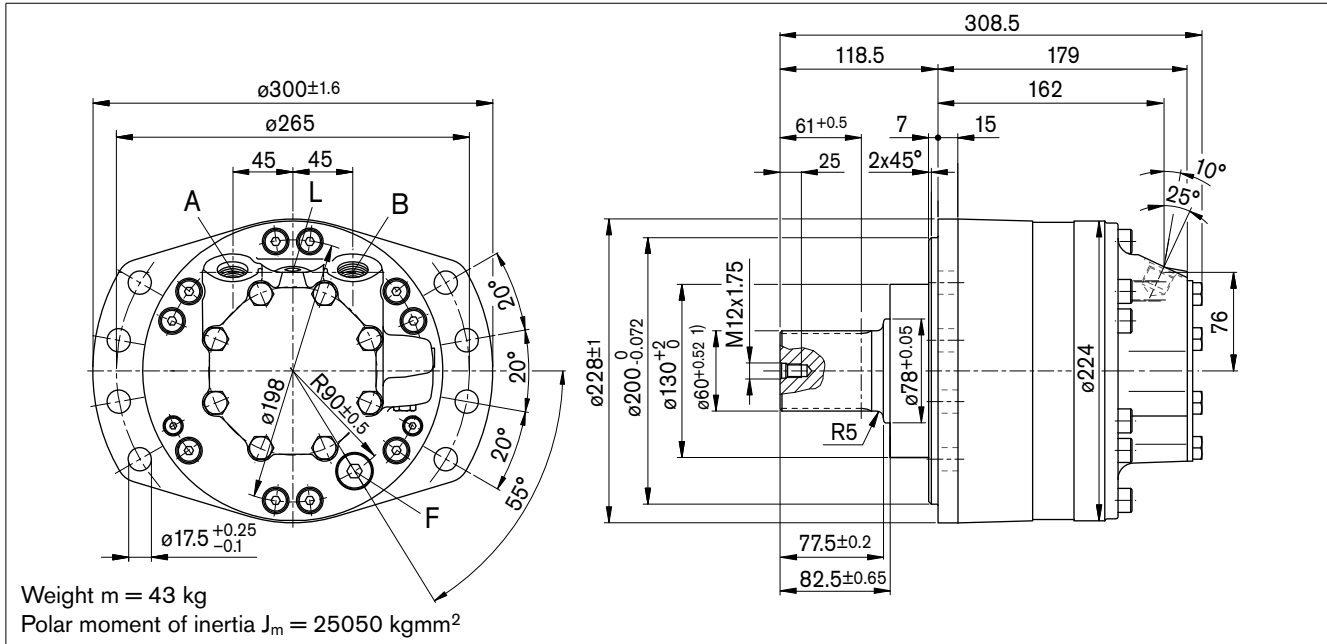
These values and graphs are for initial guidance only.
For actual motor life calculations under typical or specified duty cycles, contact Rexroth Engineering Department in Glenrothes.

Dimensions

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

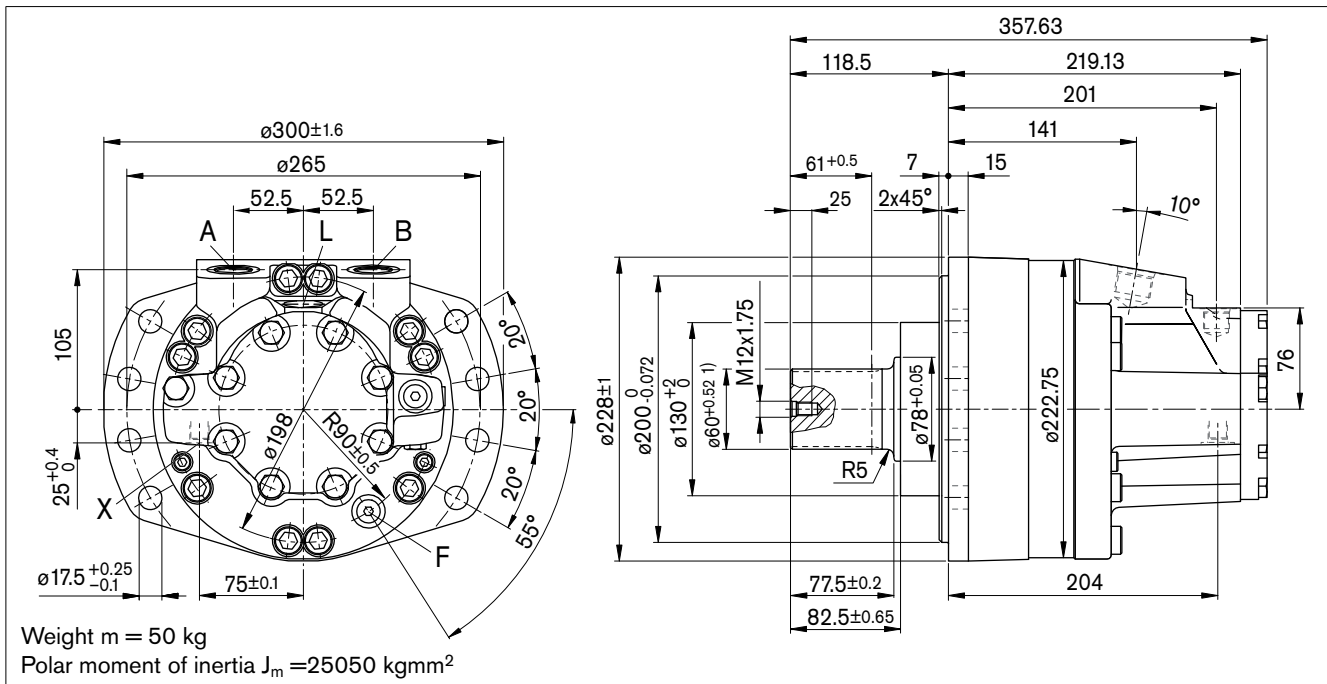
Flanged front housing, splined drive shaft, single speed (1)

Ordering code: "MCR5A...A60Z-32/A0.1L/12./..."



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

Ordering code: "MCR5A...A60Z-32/A0.2WL/12./..."



Ports

Designation	Port function	Code 12	Size	Peak pressure [bar]	State
A, B	Inlet, outlet	SAE J514	1 1/16 in - 12 UNF	470/420 ²⁾	O
L	Case drain	SAE J514	3/4 in - 16 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 59.26 mm, No. of teeth 56

2) depends on nominal size

O = Must be connected (plugged on delivery)

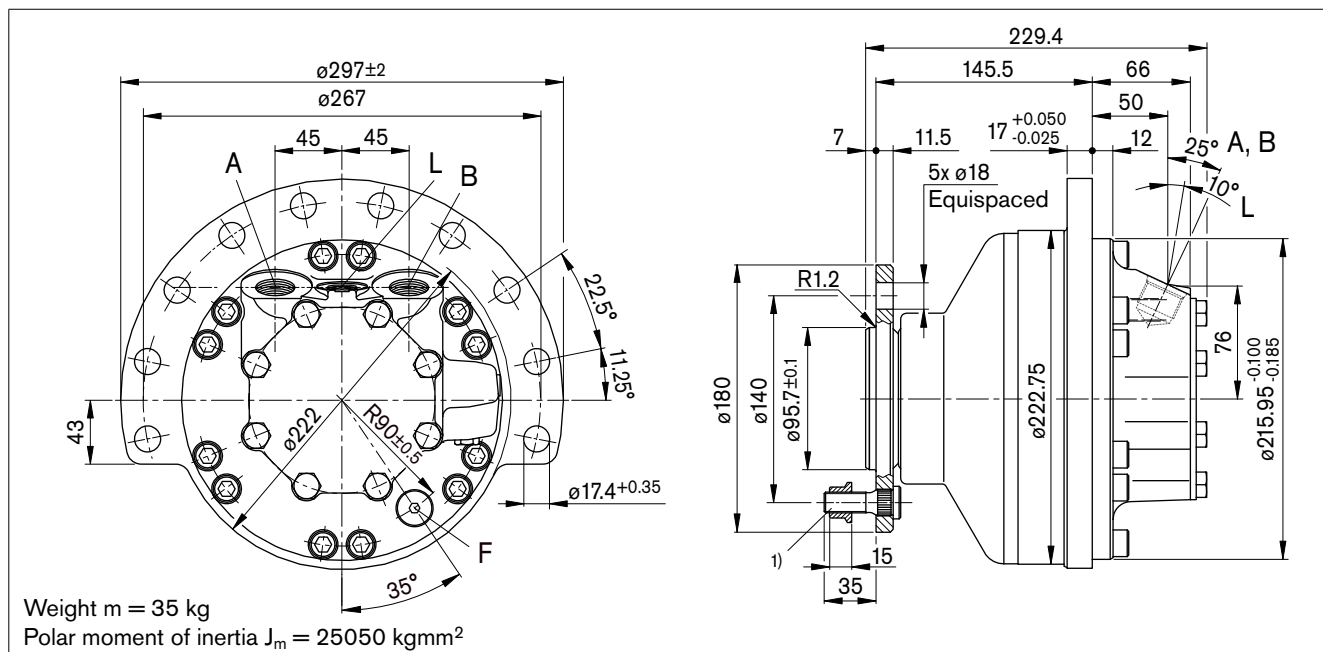
X = Plugged (in normal operation)

Dimensions

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

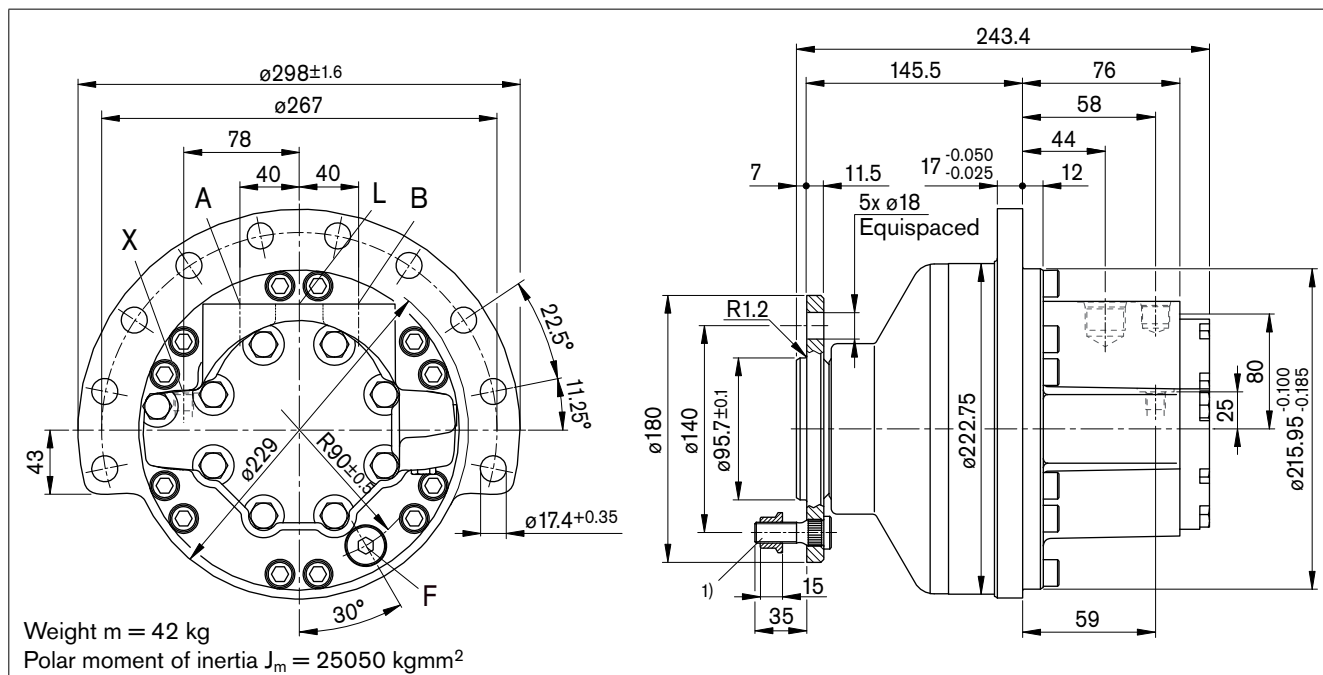
Flanged rear housing, flanged drive shaft, compact front housing, single speed (1)

Ordering code: "MCR5C...F180Z-32/A0.1L/12./..."



Flanged rear housing, flanged drive shaft, compact front housing, two speed (2W)

Ordering code: "MCR5C...F180Z-32/A0.2WL/12./..."



Ports

Designation	Port function	Code 12	Size	Peak pressure [bar]	State
A, B	Inlet, outlet	SAE J514	1 1/16 in - 12 UNF	470/420 ²⁾	O
L	Case drain	SAE J514	3/4 in - 16 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)

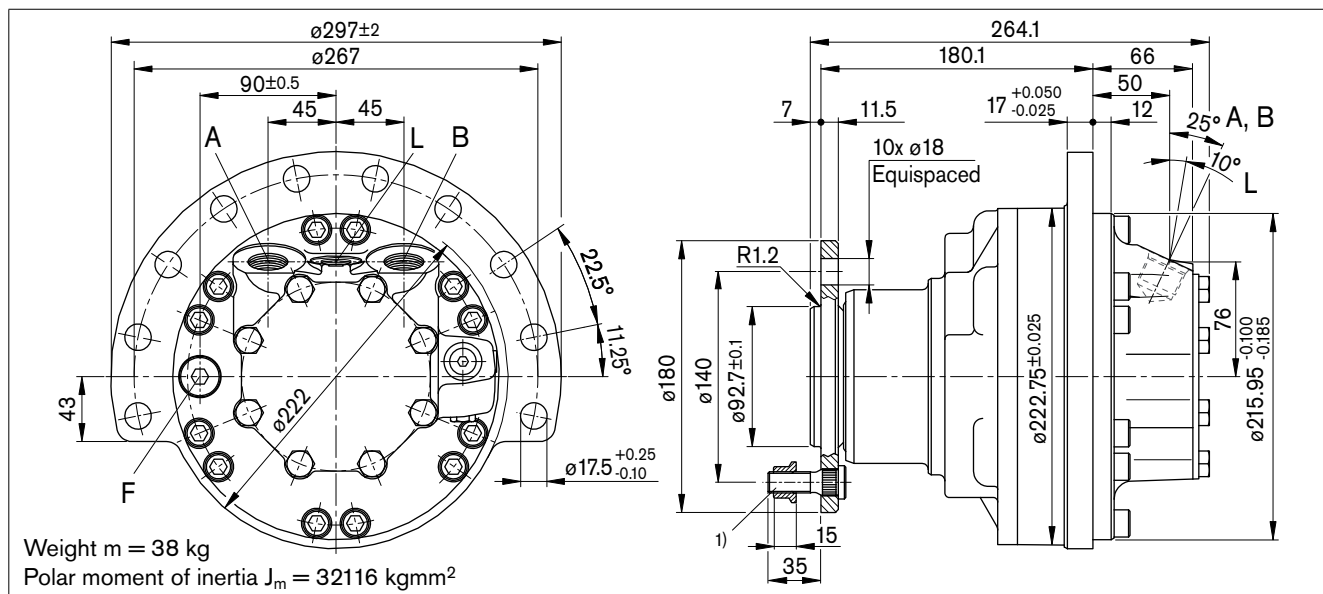
X = Plugged (in normal operation)

Dimensions

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

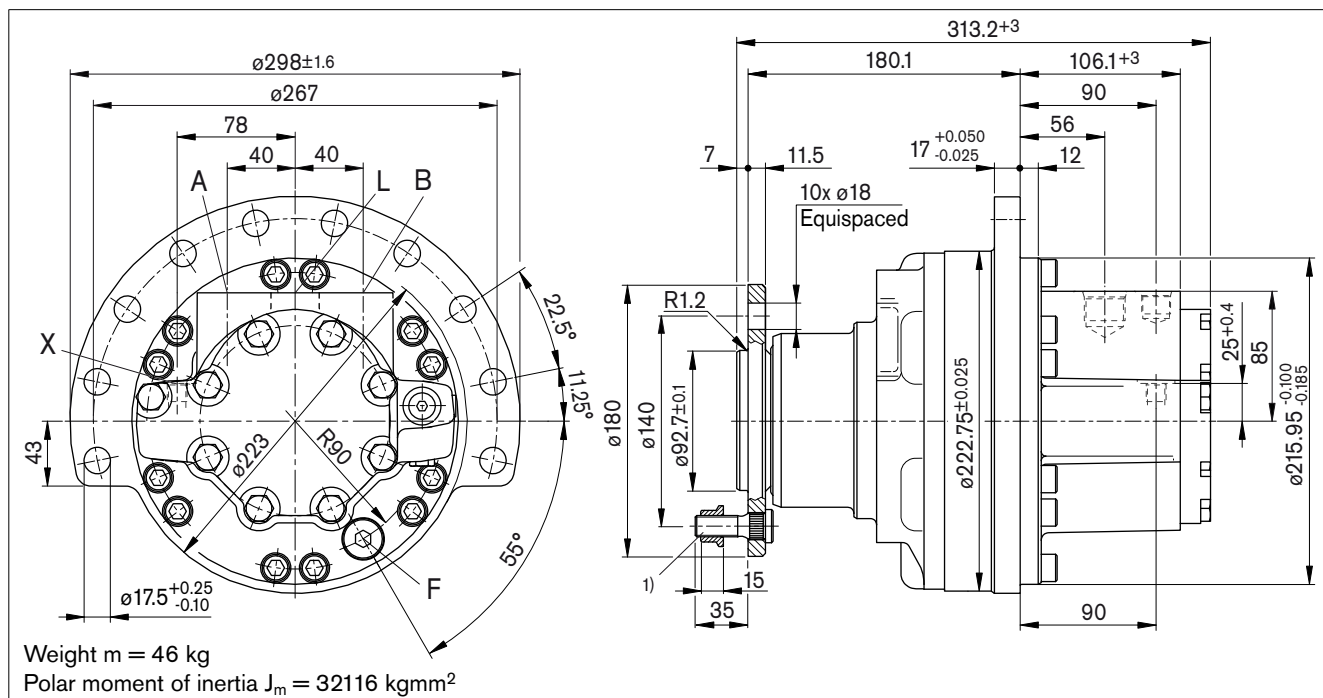
Flanged rear housing, flanged drive shaft, single speed (1)

Ordering code: "MCR5F...F180Z-32/A0.1L/12./..."



Flanged rear housing, flanged drive shaft, two speed (2W)

Ordering code: "MCR5F...F180Z-32/A0.2WL/12./..."



Ports

Designation	Port function	Code 12	Size	Peak pressure [bar]	State
A, B	Inlet, outlet	SAE J514	1 1/16 in - 12 UNF	470/420 ²⁾	O
L	Case drain	SAE J514	3/4 in - 16 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) 10x 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

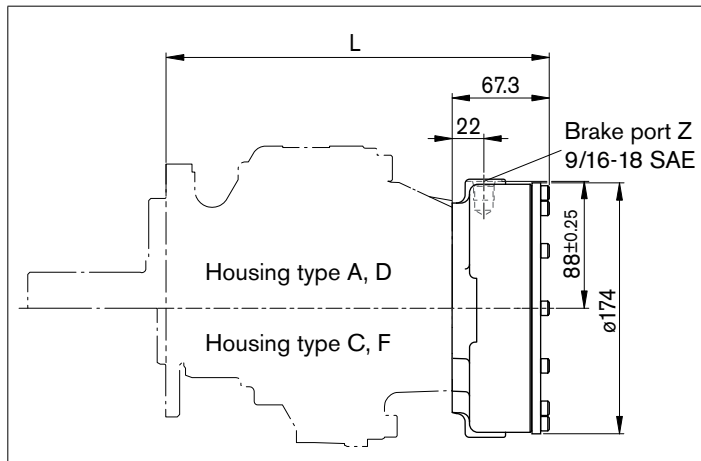
O = Must be connected (plugged on delivery)

X = Plugged (in normal operation)

Dimensions

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

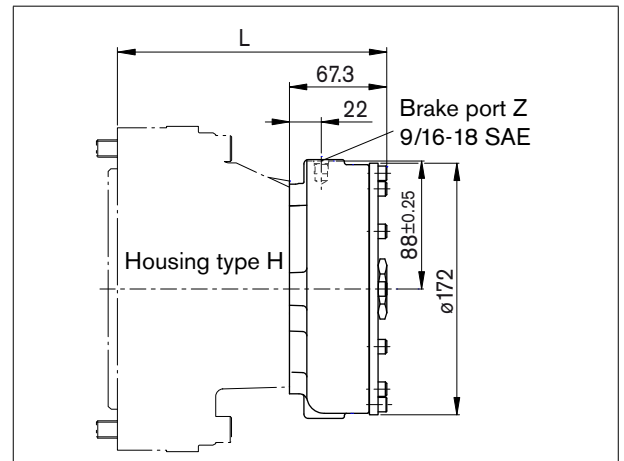
Holding Brake (multi-disc brake): ordering code "B2"



Housing type	Single speed (1) L	Two speed (2W) L
A	246.3	286.6
C	278.8	288.8
D	264.3	274.3
F	313.4	353.5

Weight $m = 9.5$ kg

Polar moment of inertia $J_m = 1403$ kgmm²

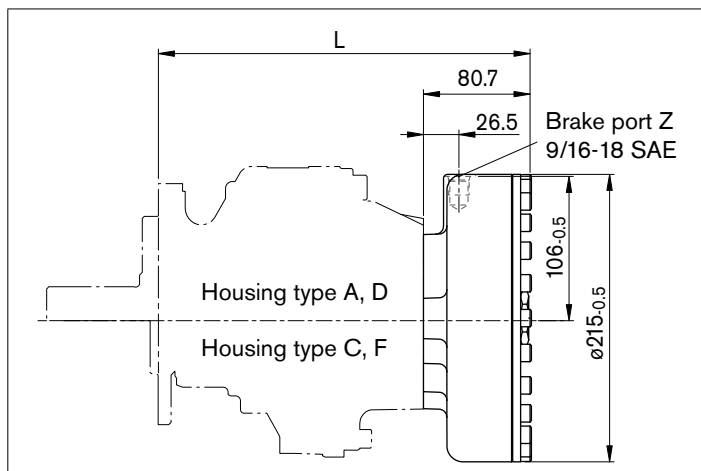


Housing type	Single speed (1) L	Two speed (2W) L
H	186.3	226.4

Weight $m = 9.5$ kg

Polar moment of inertia $J_m = 1403$ kgmm²

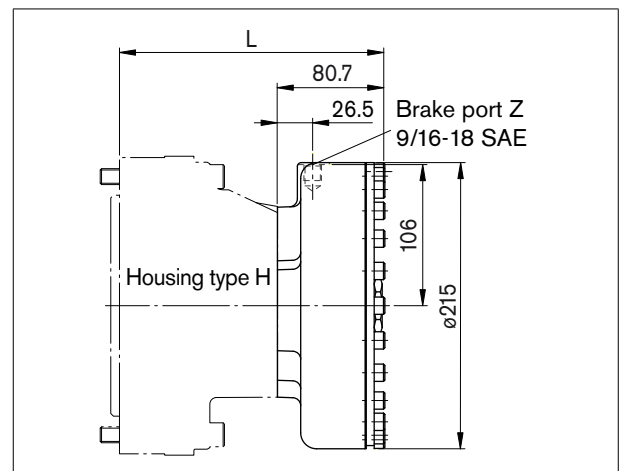
Holding Brake (multi-disc brake): ordering code "B4"



Housing type	Single speed (1) L	Two speed (2W) L
A	259.7	300
C	292.2	302.2
D	277.7	287.7
F	326.8	366.9

Weight $m = 16$ kg

Polar moment of inertia $J_m = 2980$ kgmm²



Housing type	Single speed (1) L	Two speed (2W) L
H	199.7	239.8

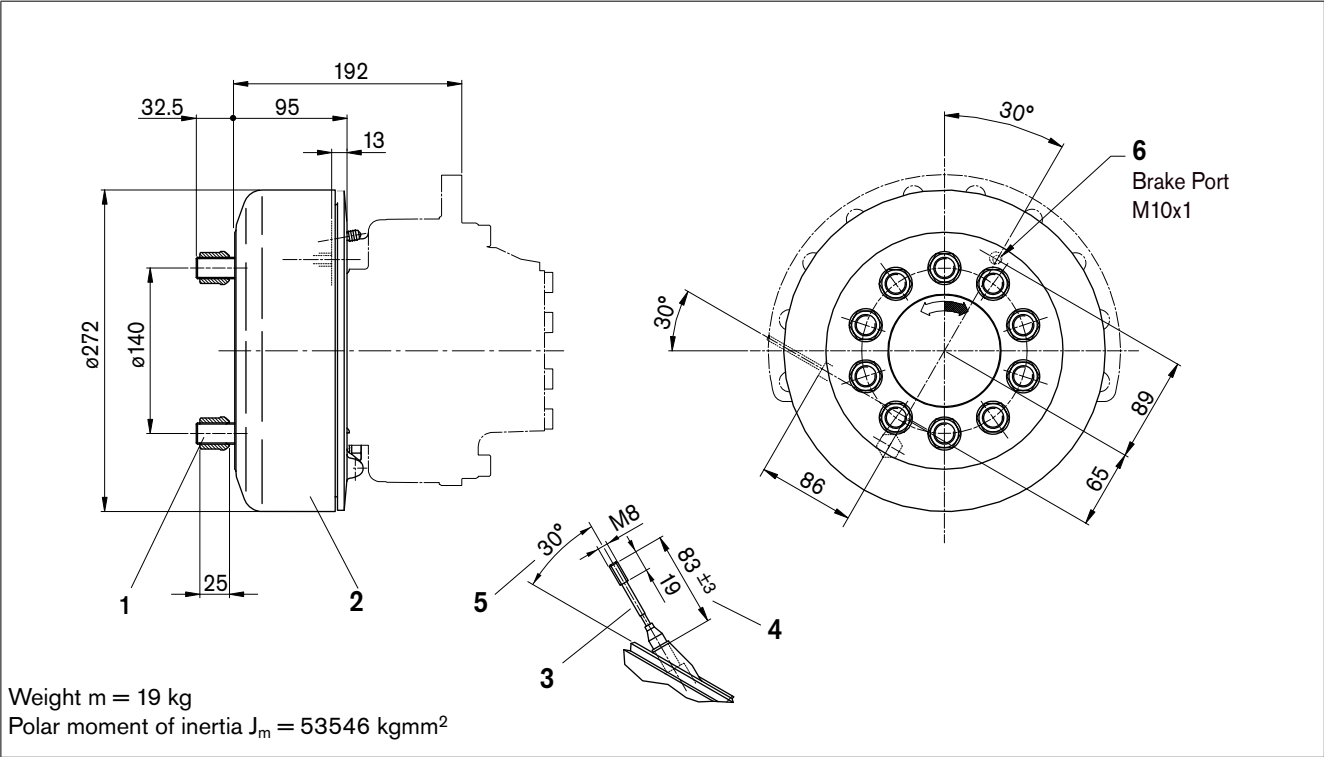
Weight $m = 16$ kg

Polar moment of inertia $J_m = 2980$ kgmm²

Dimensions

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

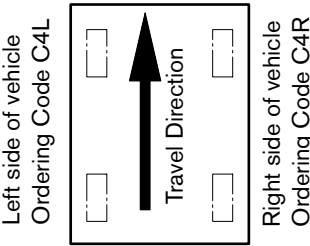
Dynamic brake (drum brake): ordering code “C4R” / “C4L”



- 1 10 Studs M18x1.5 with spherical wheel nuts
- 2 Dynamic brake (drum brake) ordering code C4L/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 $p_{max} = 97\text{ bar}$.
Brake cylinder operating volume $V = 9\text{ cm}^3$.

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.



Brake torque after run-in

Braking torque	Cable tension	Braking torque	Port pressure
3000 Nm	1270 N	3000 Nm	73 bar
4000 Nm	1661 N	4000 Nm	97 bar

Dimensions

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

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

