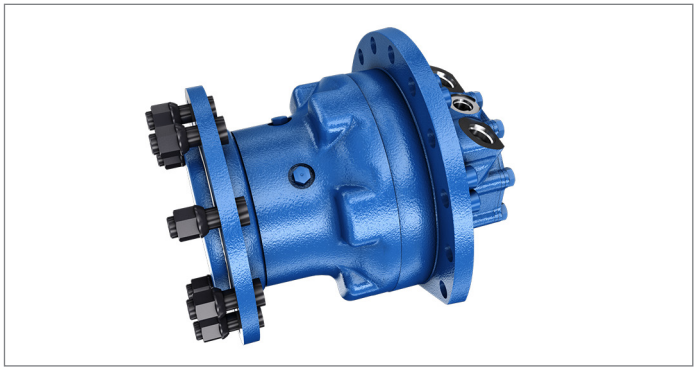
RE 15200/2023-05-26
Replaces: 2021-11-22

rexroth
A Bosch Company

Radial piston motor for heavy duty wheel drives MCR-W



- Frame size MCR3, MCR5, MCR6, MCR10, MCR20
- Displacement 160 cc to 1395 cc
- Differential pressure up to 450 bar
- Torque output up to 9991 Nm
- Speed up to 875 rpm
- Open and closed circuits

Features

- Compact robust construction
- High volumetric and mechanical efficiencies
- Rear case mount
- Wheel flange with wheel studs
- High reliability
- Low maintenance
- Smooth running at very low speeds
- Low noise
- Bi-directional
- Sealed tapered roller bearings
- High radial forces permitted on drive shaft
- Freewheeling possible
- Available with:
  - Holding brake (multi-disc), Dynamic (caliper disc) brake
  - Bi-directional two speed
  - Integrated flushing valve
  - Speed sensor

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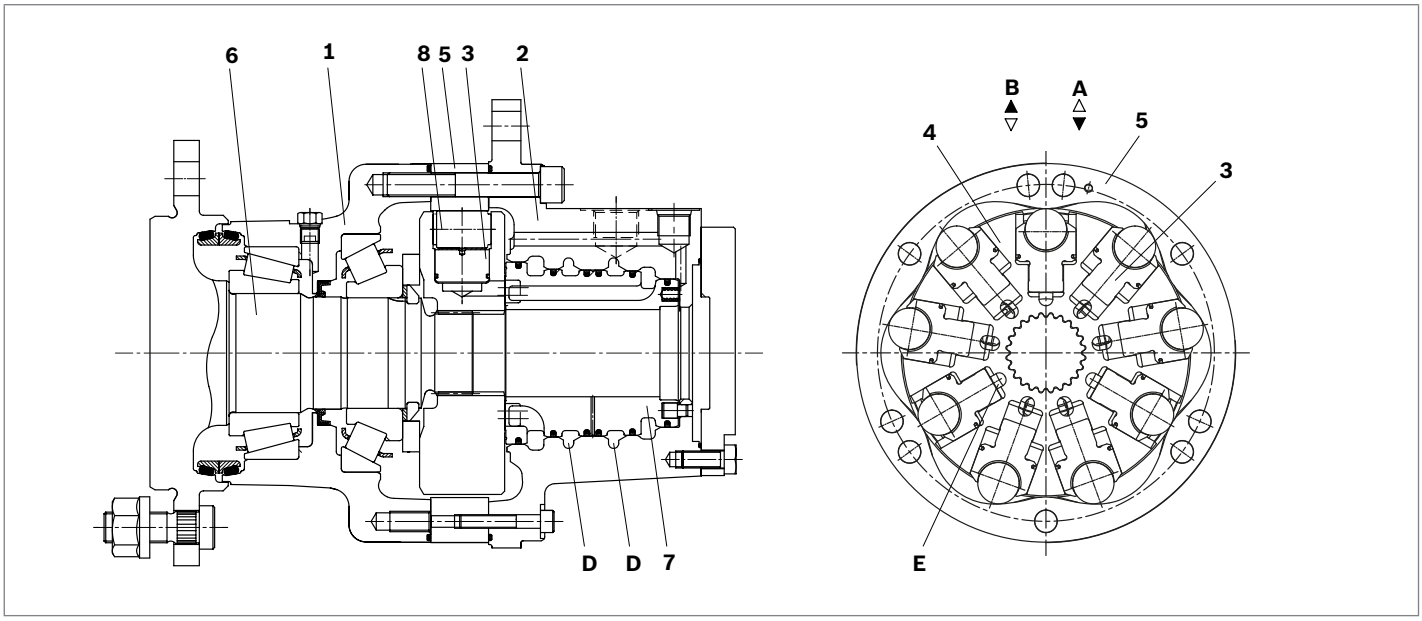
Functional description



Hydraulic motors of the type MCR-W are radial piston motors with rear case mounting and wheel flange shaft. The MCR-W motors are intended for wheel drives in open or closed circuits. They are specially designed to withstand the most demanding conditions in different applications such as; Fork lift trucks, agricultural and forestry machines. Fitted with stronger shaft and bearings, the MCR-W provides up to 60 percent increase in radial load capacity compared to standard radial piston motors. The integrated wheel flange with studs allows easy installation of standard wheel rims.

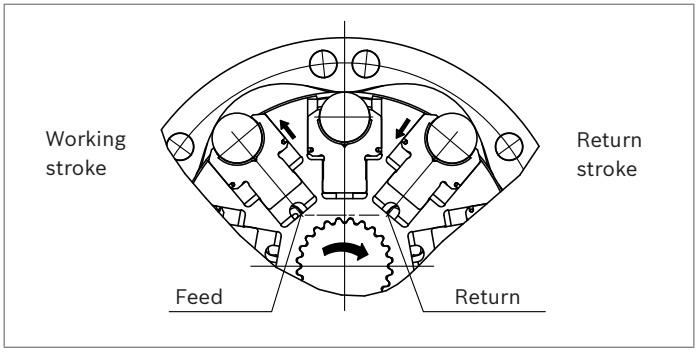
Construction

Two part housing (**1**, **2**), rotary group (**3**, **4, 8**), 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 multiplied by number of pistons in the cylinder block.

Flow paths

The ports **A** and **B**, which are located in the rear case, carry oil through the distributor to the cylinder chambers (**E**).

Bearings

Tapered roller bearings capable of transmitting high axial and radial forces are fitted as standard.

Freewheeling

Certain applications may require the motor to freewheel. This may be achieved by connecting ports A and B to zero pressure and simultaneously applying low pressure to the housing through port L. In this condition the pistons are held within the cylinder block, thus ensuring constant clearance with the cam and allowing the free rotation of the shaft. More information is available in the Freewheeling Data Sheet (RE15225-02).

Two speed operation (2W)

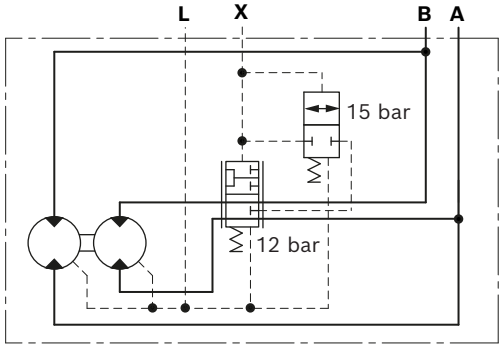
In mobile applications where vehicles are required to operate at high speed with low motor loads, the motor can be switched to a low-torque and high-speed mode. This is achieved by operating an integrated valve which directs hydraulic fluid to only one half of the motor‘s rotary group. This “reduced 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.

Bosch 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.

For more information refer to MCR 2-speed soft-shift data sheet (RE 15225-03).

Standard two speed operates with a reduced displacement which is half full displacement. In some cases it is possible to offer a motor with a reduced displacement that is not 50% (e.g. 60% of full displacement). For further information contact Bosch Rexroth Engineering Dept, Glenrothes.”

▼ **Schematic**



Flushing

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 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. 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.

There are three main characteristic that determine the performance of the flushing.

- Cracking pressure
- Flow rate
- Differential pressure to activate flushing

Cracking pressure

(Size of shim fitted to the poppet)

The flushing relief valve closes off the flushing flow if boost/charge pressure falls below the cracking pressure. This protects other functions e.g. park brake or pump charge. Due to variation in different types of applications a choice of different cracking pressures exists. Selection should be made based on boost/charge pressure available and the minimum required for the other functions. The standard cracking pressure is 14.4 ±3 bar. The letter in the code signifies the cracking pressure required. See table below.

Flow rate

(Size of orifice in poppet)

A range of flow rates exists for different applications. The first number of the code represents the orifice size. At present the options shown in the table below are available.

Differential pressure to activate flushing

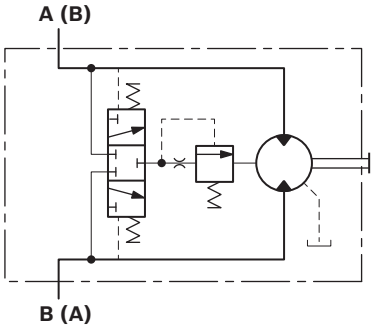
(Spring used in the flushing spool assembly)

The flushing spool selects the low pressure side of the circuit to flush from, preventing flushing with high pressure oil with the associated heating and efficiency losses. The flushing spool requires either a 6 or 8 bar Δp between the A and B ports to shift it. The MCR3, MCR5, and MCR6 are fitted with Δp 6 bar as standard. MCR10 and MCR20 are fitted with Δp 8 bar as standard. The second number in the code represents the shift spool pressure according to the table below.

Notice

- The motor case pressure is applied to the relief outlet. The lift off pressure is therefore the sum of cracking pressure and motor case pressure.
- The hydraulic system, including the flushing relief setting, must be designed to prevent unwanted shifting of the two-speed spool.

▼ **Schematic**



Flushing flow rates

Cracking pressure code	Cracking pressure (bar)[2]	Flow (l/min) at 25 bar[3]									
		_1_ (Ø1 mm)[1]		_2_ (Ø1.5 mm)[1]		_7_ (Ø1.7 mm)[1]		_4_ (Ø2 mm)[1]		_6_ (Ø2.3 mm)[1]	
		min	max	min	max	min	max	min	max	min	max
N_ _	11.2	2.2	2.7	5.0	6.1	6.5	7.8	8.7	10.7	11.5	14.0
F_ _	14.4	2.2	2.7	5.0	6.1	6.4	7.8	8.2	10.7	8.8	11.4
A_ _	18.2	2.2	2.7	5.0	6.1	6.3	7.8	6.5	9.5	5.7	8.6
B_ _	21.4	1.9	2.7	3.5	5.4	4.3	6.5	4.4	7.0	4.4	7.1
C_ _	24.6	1.6	2.7	2.1	4.3	2.3	4.9	3.3	4.5	3.7	6.0

Pressure code	Spool shift pressure (bar)	Standard motor size
_ _2	6	MCR3, MCR5, MCR6
_ _6	8	MCR10, MCR20

Holding brake (multi-disc brake)

Mounting

By way of rear housing and brake shaft.

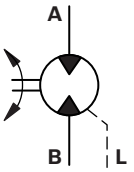
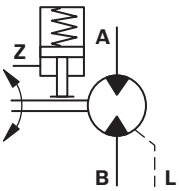
Brake application

An optional parking brake is available to ensure that the motor cannot turn when the machine is not in use. This works on the principle of a Spring Applied Hydraulic Release (SAHR) Brake and is released when oil pressure is applied to brake port ‘Z’. In the event of a loss of hydraulics, the brake can be released manually. Refer to the operating manual RE15215-01-B for more information.

Notice

- The brakes are intended only for static use. Use of the brakes in a dynamic case will cause damage to the motor!
- Holding brake torques account for tolerances and are based on the use of standard mineral oil (HLP/HLVP to DIN 51524). Brake torque may be significantly lower when using fluids other than mineral oil. Brake hold performance must be confirmed on an application specific basis when using alternative fluids.

Schematic diagrams

Motor without brake	Motor with holding brake
	

1) Code (orifice size)
2) Tolerance ±3 bar
3) For other pressures please contact Bosch Rexroth Engineering Dept, Glenrothes.

Dynamic brake - caliper disc brake
Caliper brakes are available for MCR3W motors.
For further information contact Engineering department at Bosch Rexroth, Glenrothes.

Speed sensor
A Hall-effect speed sensor may be fitted as an option. The sensors operate on the Hall-effect principle which detects a change in magnetic field flux across an airgap when a ferromagnetic gear tooth passes the sensor surface. Sensors can then be connected to a controller such as the Rexroth BODAS controller, in order to give information about the motor's speed and direction. Additionally, the latest speed sensors contain an NTC thermistor, enabling temperature measurement at the sensor location.

The sensor is located in a port in the motor's rear case and combined with a toothed target disk fitted to the motor's cylinder block.

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 PA). These "sensor-ready" motors may be fitted with a sensor later. The speed sensors available to use with the MCR motors are as follows:

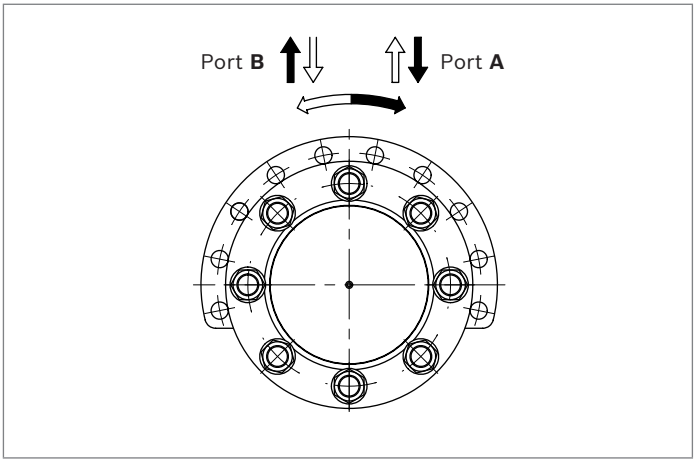
- DST series 10 (Code PB), datasheet RE95131
- DSA1 series 20 (Code PC), datasheet RE95126
- DSA2 series 20 (Code PD), datasheet RE95126.

Please refer to the respective datasheets for more detailed information.

Target Discs
The following table lists the resolutions of target disc available for each MCR-W size.

Motor size	Teeth number (Standard)	Teeth number (Upon request)
MCR3	50	96
MCR5/MCR6	60	100
MCR10	72	100
MCR20	100	–

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



High flow
Certain applications require motors to run at higher speeds than are achievable using our standard motors. In such cases high flow motors can be used which have better flow characteristics which leads to lower power losses, especially at high speed. This allows higher motor speeds to be achieved for a given engine power.
This option is available with single speed MCR 5 motors.
For further information contact Bosch Rexroth Engineering Dept, Glenrothes.

Ordering code

01	02	03	04	05	06		07	08	09	10	11	12	13	14	15
MCR		**W**			**Z**	**/**	**33**								

Radial piston motor

01	Radial-piston type, low-speed, high-torque motor	**MCR**

Frame size

02	Frame size	3	**3**
		5	**5**
		6	**6**
		10	**10**
		20	**20**

Housing type

03	High radial load bearings fitted, rear case mounting flange	**W**

Nominal size, displacement V_g in cm³/rev

04	Frame size 3		**160**	**225**	**255**	**280**	**325**	**365**	**400**	
	Low displacement: motors use standard cylindrical pistons	LD	●	●	●	●	–	–	–	
	High displacement: motors use stepped pistons	HD	–	–	–	–	●	●	●	
	Frame size 5		**380**	**470**	**520**	**565**	**620**	**680**	**750**	**820**
	Low displacement: motors use standard cylindrical pistons	LD	●	●	●	●	–	–	–	–
	High displacement: motors use stepped pistons	HD	–	–	–	–	●	●	●	●
	Frame size 6		**820**	**920**						
	Low displacement: motors use standard cylindrical pistons	LD	–	–						
	High displacement: motors use stepped pistons	HD	●	●						
	Frame size 10		**785**	**865**	**940**	**1140**	**1250**	**1365**		
	Low displacement: motors use standard cylindrical pistons	LD	●	●	●	–	–	–		
	High displacement: motors use stepped pistons	HD	–	–	–	●	●	●		
	Frame size 20[1)]		**1395**							
	Low displacement: motors use standard cylindrical pistons	LD	●							
	High displacement: motors use stepped pistons	HD	–							

Drive shaft		**MCR3**	**MCR5**	**MCR6**	**MCR10**	**MCR20**	
05	With flange ø180 mm	●	–	–	–	–	**F180**
	With flange ø250 mm	–	●	●	–	–	**F250**
	With flange ø280 mm	–	–	–	●	●	**F280**

Rear shaft

06	Without rear shaft	**Z**

Series

07	Serie 33	**33**

● = Available – = Not available

1) For more displacement options on the MCR20 size, please contact Engineering Department at Bosch Rexroth, Glenrothes.

01	02	03	04	05	06		07	08	09	10	11	12	13	14	15
MCR		**W**			**Z**	**/**	**33**								

Brake

			MCR3	MCR5	MCR6	MCR10	MCR20	
08	Without brake		●	●	●	●	●	**A0**
	Hydraulic release spring applied multi-disc holding brake	2200 Nm	●	●	●	–	–	**B2**
		4400 Nm	–	●	●	–	–	**B4**
		4400 Nm	–	–	–	●	–	**B5**
		7000 Nm	–	–	–	●	–	**B7**
		17500 Nm	–	–	–	–	●	**B19**

Seals

09	NBR (nitrile rubber)	**M**
	FKM (fluoroelastomer / Viton)	**V**

Single/two-speed operation

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

Ports

		MCR3	MCR5	MCR6	MCR10	MCR20	
11	Tapped with BSP thread (ISO 228-1)	●	●	●	–	–	**01**
	Tapped with BSP thread (ISO 228-1)	–	–	–	●	●	**11**
	Tapped with UNF thread (ISO 11926-1)	●	●	●	–	–	**12**
	Tapped with UNF thread (ISO 11926-1) A and B ports split flange metric bolt holes (SAE J518C)	–	–	–	●	●	**42**

Studs[1)]

12	Without studs (no code)	
	With wheel studs	**W**

Flushing

13	Without flushing (no code)	
	Cracking Pressure code (see table on page 4)	***_ _**
	Orifice Size code (see table on page 4)	**_ *_**
	Spool shift pressure code (see table on page 4)	**_ _ ***

Speed sensor

14	Without sensor (no code)	
	Speed sensor ready (DST series 10, DSA series 20)	**PA**
	DST series 10	**PB**
	DSA1 series 20	**PC**
	DSA2 series 20	**PD**

Special order

15	Special feature	******

● = Available – = Not available

1) Range of wheel nuts can be offered as a separate order upon request from Bosch Rexroth Engineering Dept, Glenrothes

Technical data

Frame size			**MCR3**	**MCR5**	**MCR6**	**MCR10**	**MCR20**		
Type of mounting			Front case flange mounting						
Pipe connections[1)2)]			Threaded per ISO 11926-1 and ISO228-1; Flanged per SAE J518-2						
Shaft loading			see page 9						
Weight									
Single speed (1L)	m	kg	28	53	–	65	–		
Two speed (2WL)	m	kg	30	58	62.2	–	192.91		
Hydraulic fluid[3)]			Mineral oil type HLP/HLVP to DIN 51524						
Fluid cleaniness			ISO 4406, Class 20/18/15						
Fluid viscosity range	$v_{min/max}$	mm²/s	10 to 2000						
Fluid temperature range[4)]	$\theta_{min/max}$	°C	-20 to +100						
Pressure			Low displacement				High displacement		
Maximum differential pressure[5)6)]	Δp_{max}	bar	450				400		
Maximum pressure at ports **A** or **B**[5)6)]	p_{max}	bar	470				420		
Maximum case drain pressure	$p_{case\ max}$	bar	10				10		
Motor performance MCR3									
Displacement	V_g	cm³/rev	160	225	255	280	325	365	400
Specific torque		Nm/bar	3	4	4	4	5	6	6
Maximum torque[5)]	T_{max}	Nm	1146	1611	1826	2005	2069	2324	2546
Minimum speed for smooth running	n_{min}	rpm	0.5	0.5	0.5	0.5	0.5	0.5	0.5
Maximum speed (1L)[7)8)]	n_{max}	rpm	670	475	420	385	330	295	270
Maximum speed (2WL)[7)8)]	n_{max}	rpm	875	620	550	500	430	385	350
Motor performance MCR5									
Displacement	V_g	cm³/rev	380	470	520	565	620	680	750	820
Specific torque		Nm/bar	6	7	8	9	10	11	12	13
Maximum torque[5)]	T_{max}	Nm	2722	3366	3724	4047	3947	4329	4775	5220
Minimum speed for smooth running	n_{min}	rpm	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.5
Maximum speed (1L)[7)8)]	n_{max}	rpm	475	385	350	320	290	265	240	220
High flow motors maximum speed (1L)[7)8)]	n_{max}	rpm	570	465	420	385	350	320	290	265
Maximum speed (2WL)[7)8)]	n_{max}	rpm	570	465	420	385	350	320	290	265
Motor performance MCR6									
Displacement	V_g	cm³/rev					820	920	
Specific torque		Nm/bar					13	15	
Maximum torque[4)]	T_{max}	Nm					5220	5857	
Minimum speed for smooth running	n_{min}	rpm					0.5	0.5	
Maximum speed (1L)[6)7)]	n_{max}	rpm					230	205	
Maximum speed (2WL)[6)7)]	n_{max}	rpm					250	250	
Motor performance MCR10									
Displacement	V_g	cm³/rev	785	865	940		1140	1250	1365
Specific torque		Nm/bar	12	14	15		18	20	21
Maximum torque[5)]	T_{max}	Nm	5622	6195	6732		7257	7958	8690
Minimum speed for smooth running	n_{min}	rpm	0.5	0.5	0.5		0.5	0.5	0.5
Maximum speed (1L and 2WL)[7)8)]	n_{max}	rpm	215	195	178		150	134	125
Motor performance MCR20									
Displacement[9)]	V_g	cm³/rev	1395						
Specific torque		Nm/bar	22						
Maximum torque[5)]	T_{max}	Nm	9991						
Minimum speed for smooth running	n_{min}	rpm	0.5						
Maximum speed (1L and 2WL)[7)8)]	n_{max}	rpm	215						

Footer on page 9

Brake			**MCR3**	**MCR5/MCR6**		**MCR10**		**MCR20**
Holding brake (disc brake)			**B2**	**B2**	**B4**	**B5**	**B7**	**B19**
Minimum holding torque	$t_{min/max}$	Nm	2200	2200	4400	4400	7000	17500
Release pressure (min)	$p_{rel\ min}$	bar	11	11	11	11	11	11
Release pressure (max)	$p_{rel\ max}$	bar	15	15	15	15	15	15
Maximum pressure at brake port „Z“	p_{max}	bar	40	40	40	30	30	40
Oil volume to operate brake	V_{rel}	cm^3	23	23	46	17	36	99

Notice

- Maximum motor torque values are based on theoretical calculations.
- Efficiencies are not taken into consideration for theoretical calculations.

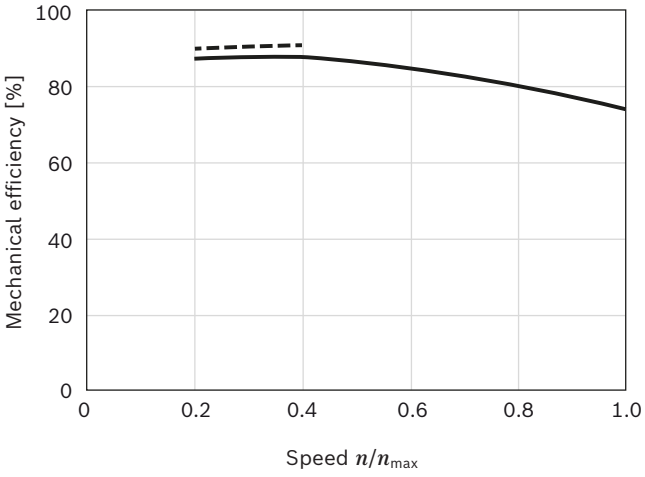
Please refer the related foot notes for more details.

Footer from page 8

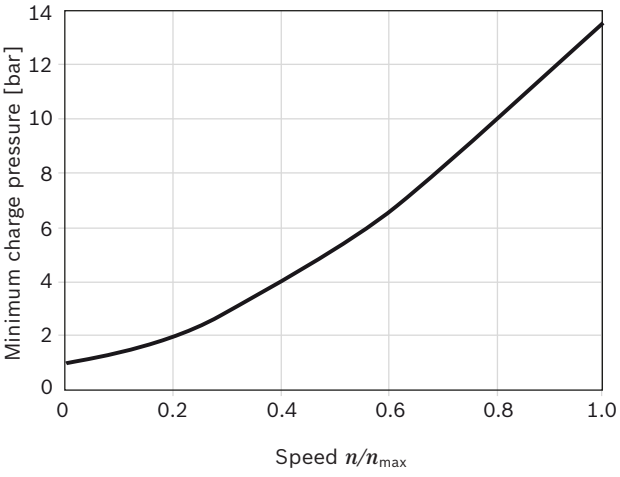
1) Ensure motor case is filled with oil prior to start-up. See instruction manual 15215-B.
2) For installation and maintenance details, please see instruction manual 15215-B.
3) For more information on hydraulic fluids see datasheet 90220.
4) Providing that fluid viscosity limits are adhered to.
5) Maximum values should only be applied for a small portion of the duty cycle. Please consult Bosch Rexroth Engineering. Department in Glenrothes for motor life calculations based on particular operating cases.
6) When operating motors in series, please consult Bosch Rexroth Engineering Department in Glenrothes.
7) Based on nominal no-load Δp of 20 bar in full-displacement mode.
8) Warning! During the running in period of the motor (min. 20 hrs) it should not be run unloaded at >100 rpm.
9) For more displacement options on the 20 size, please contact Engineering Department at Bosch Rexroth, Glenrothes.

Efficiencies

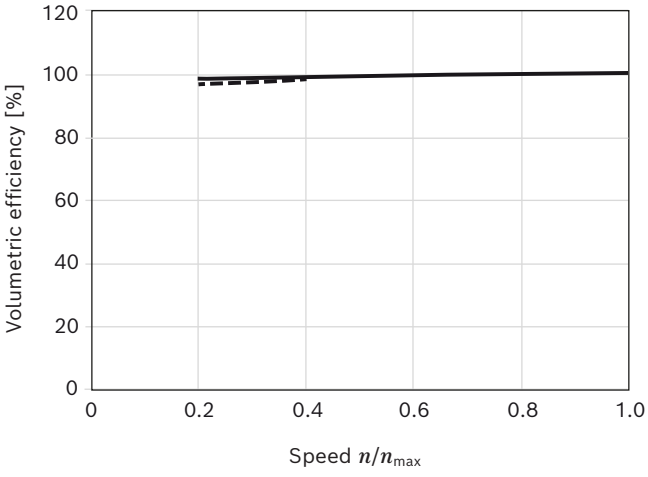
Mechanical efficiency



Charge pressure



Volumetric efficiency



100 bar
300 bar

Note

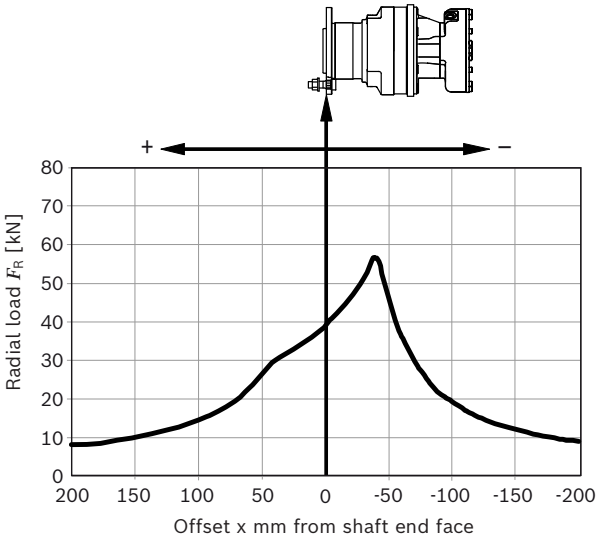
- For specific performance information or operating conditions contact the Engineering Department at Bosch Rexroth, Glenrothes.
- If the correct charge pressure is not maintained and the motor is starved of oil, the motor may go into free wheel mode!

Permitted loading on drive shaft

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

Drive shaft ...3W F180...

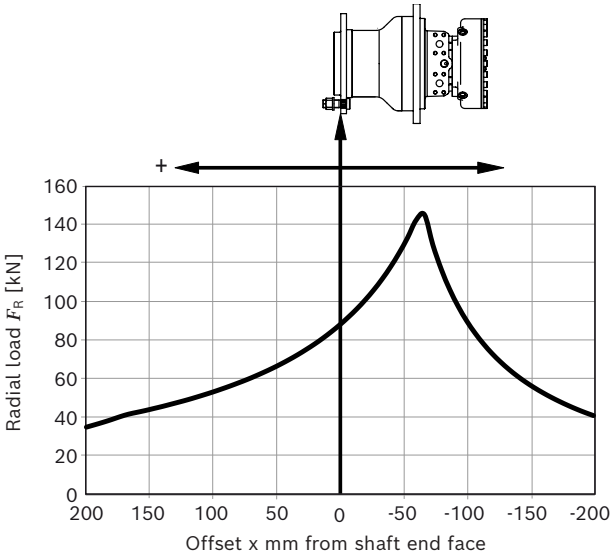
Maximum radial load $F_{R\,max}$ (with axial load F_{ax} = 0)



Maximum axial load $F_{ax\,max}$ (with radial load F_R = 0):
$F_{ax\,max}$ = 43400 N ← +
$F_{ax\,max}$ = 36800 N → –

Drive shaft ...10W F280...

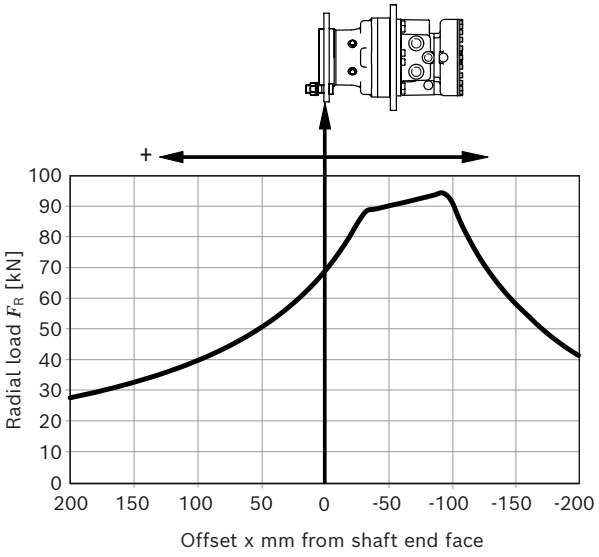
Maximum radial load $F_{R\,max}$ (with axial load F_{ax} = 0)



Maximum axial load $F_{ax\,max}$ (with radial load F_R = 0):
$F_{ax\,max}$ = 108100 N ← +
$F_{ax\,max}$ = 88700 N → –

Drive shaft ...5/6W F250...

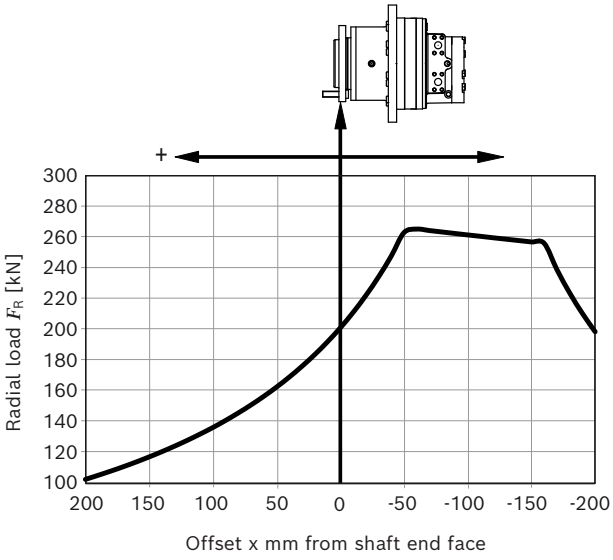
Maximum radial load $F_{R\,max}$ (with axial load F_{ax} = 0)



Maximum axial load $F_{ax\,max}$ (with radial load F_R = 0):
$F_{ax\,max}$ = 85000 N ← +
$F_{ax\,max}$ = 67400 N → –

Drive shaft ...20W F280...

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



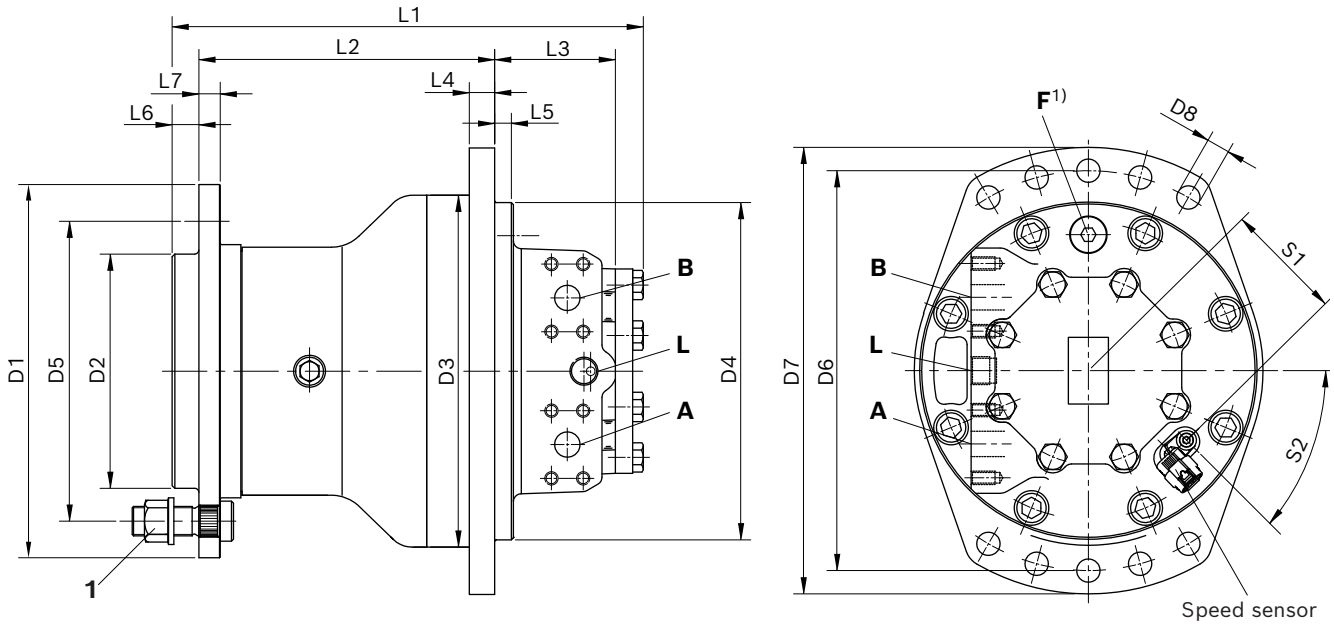
Maximum axial load $F_{ax\,max}$ (with radial load F_R = 0):
$F_{ax\,max}$ = 176300 N ← +
$F_{ax\,max}$ = 179370 N → –

Note:

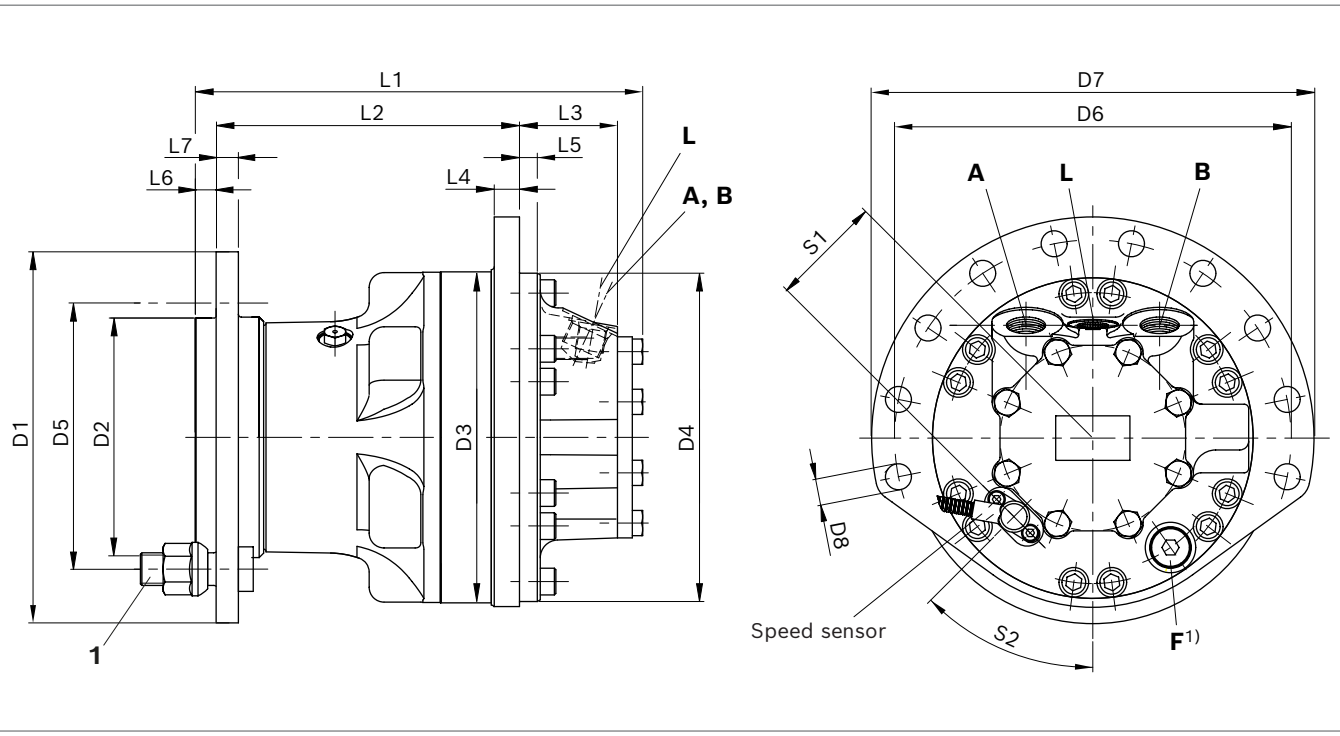
- These values and graphs are for initial guidance only
- For actual motor life calculations under typical or specified duty cycles, contact Bosch Rexroth Engineering Department in Glenrothes

Dimensions

MCR3W and MCR10W single speed (1L)



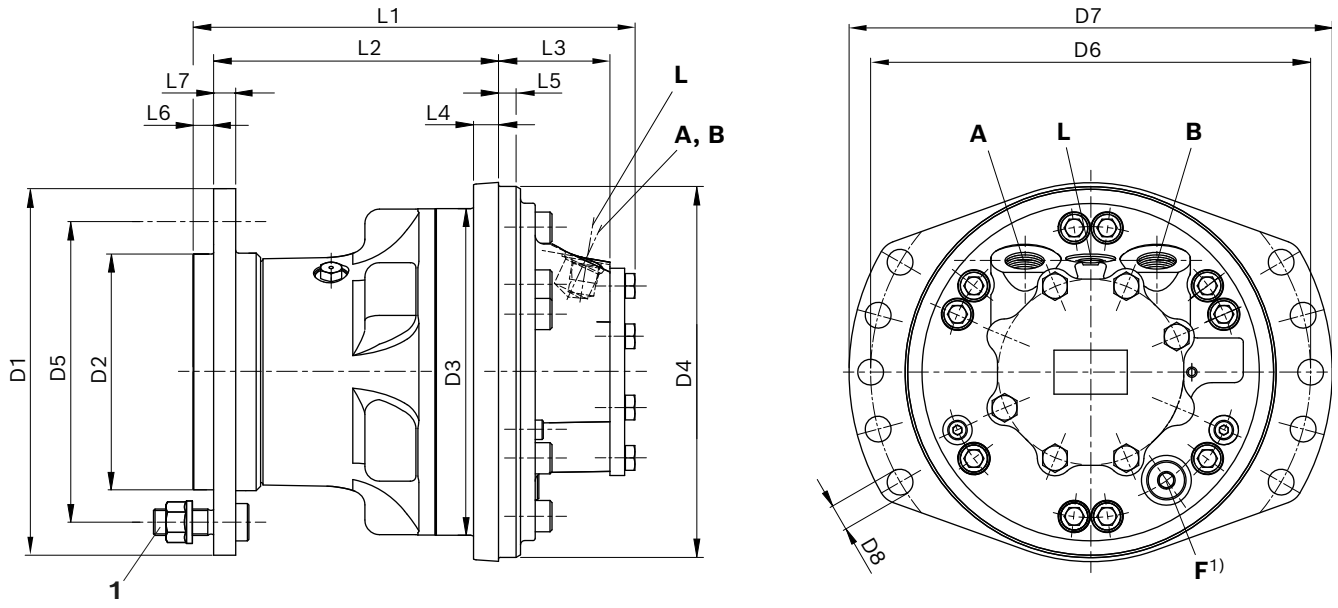
MCR5W single speed (1L)



Before finalising your design, request a specific installation drawing. Dimensions may vary from the data sheet.

1) Filler port can be requested as a special option.

MCR5W single speed (1L) alternative mounting



Motor	D1	D2	D3	D4	D5[2]	D6	D7	D8[3]	1
MCR3	Ø180	Ø92.7	Ø180	Ø180	Ø140	Ø210	Ø237	Ø14	10×M14×1.5
MCR5	Ø250	Ø160.8	Ø223	Ø222	Ø205	Ø267	Ø297	Ø17.4	6×M18×1.5
MCR5 alternative mounting	Ø250	Ø160.8	Ø223	Ø253	Ø205	Ø300	Ø335	Ø17.4	6×M18×1.5
MCR10	Ø280	Ø175.8	Ø264	Ø253	Ø225	Ø300	Ø335	Ø17.5	10×M22×1.5

Motor	L1	L2	L3	L4	L5	L6	L7	S1	S2
MCR3	251.8	181	54	13	6	5	11.5	62.5	30°
MCR5	301.1	204	66	17	12	13.5	15	75	–
MCR5 alternative mounting	301.1	194	76	17	12	13.5	15	–	–
MCR10	351.4	221.9	90.5	19	12.5	18	16	89	45°

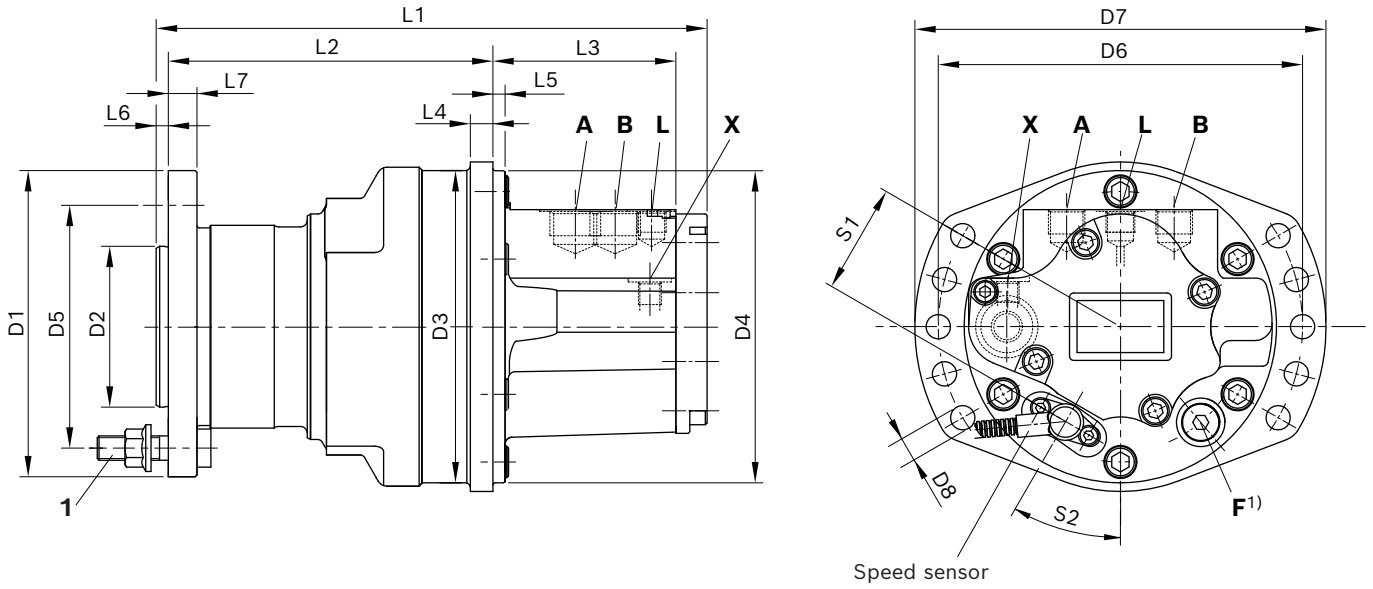
Ports

Motor	Designation	Port function	SAE Ports Standard	Size	BSP Ports Standard	Size	p_{max} [bar]	State[5]
MCR3	**A, B**	Inlet, outlet	ISO 11926-1	7/8-14 UNF	ISO 228-1	1/2 BSP	470/420[4]	O
	L	Case drain	ISO 11926-1	9/16-18 UNF	ISO 228-1	1/2 BSP	10	O
	F	Filler port	ISO 11926-1	3/4-16 UNF	ISO 228-1	1/2 BSP	10	X
MCR5	**A, B**	Inlet, outlet	ISO 11926-1	1 1/16-12 UNF	ISO 228-1	1/2 BSP	470/420[4]	O
	L	Case drain	ISO 11926-1	3/4-16 UNF	ISO 228-1	1/2 BSP	10	O
	F	Filler port	ISO 11926-1	3/4-16 UNF	ISO 228-1	1/2 BSP	10	X
MCR10	**A, B**	Inlet, outlet	SAE J518C	3/4 in	SAE J518C	3/4 in	470/420[4]	O
	L	Case drain	ISO 11926-1	3/4-16 UNF	ISO 228-1	1/2 BSP	10	O
	F	Filler port	ISO 11926-1	3/4-16 UNF	ISO 228-1	1/2 BSP	10	X

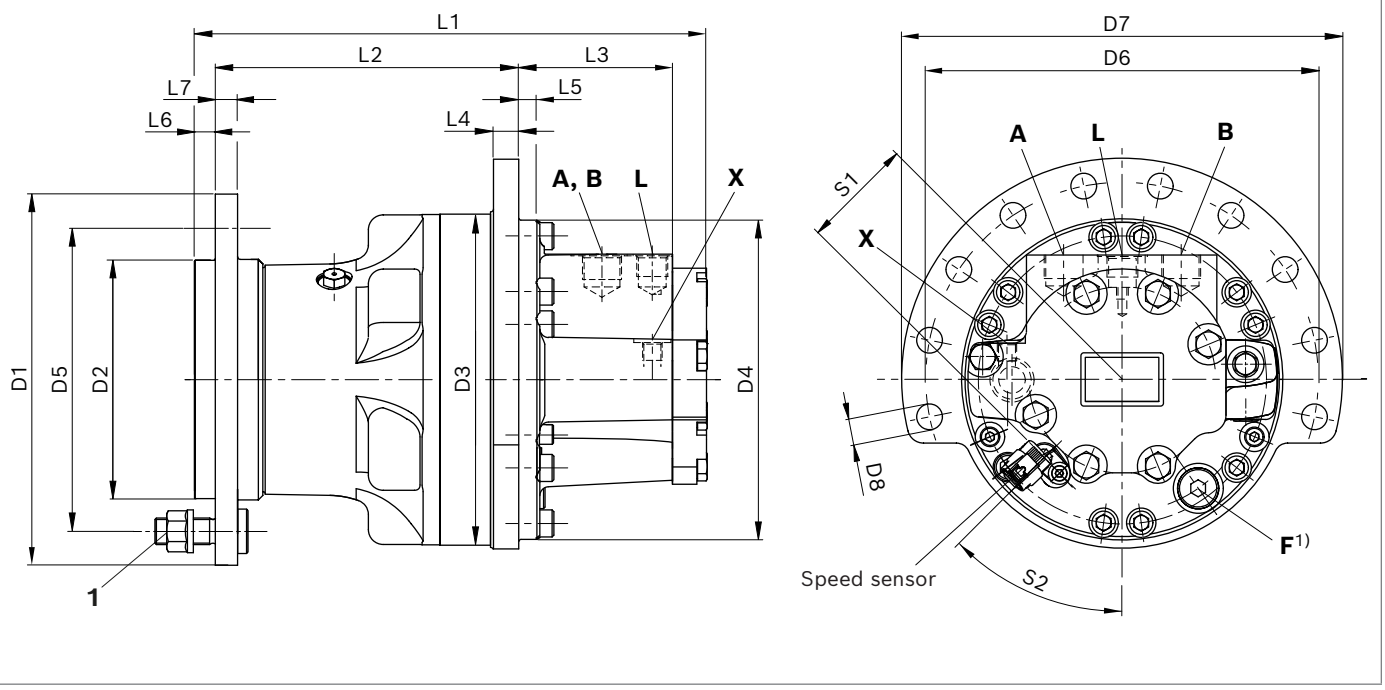
Before finalising your design, request a specific installation drawing. Dimensions may vary from the data sheet.

1) Filler port can be requested as a special option.
2) Wheel stud pitch circle diameter
3) Flange shape may be different for different frame sizes
4) Depends on displacement
5) O = Must be connected (plugged on delivery)
X = Plugged (in normal operation)

MCR3W and MCR10W two speed (2WL)



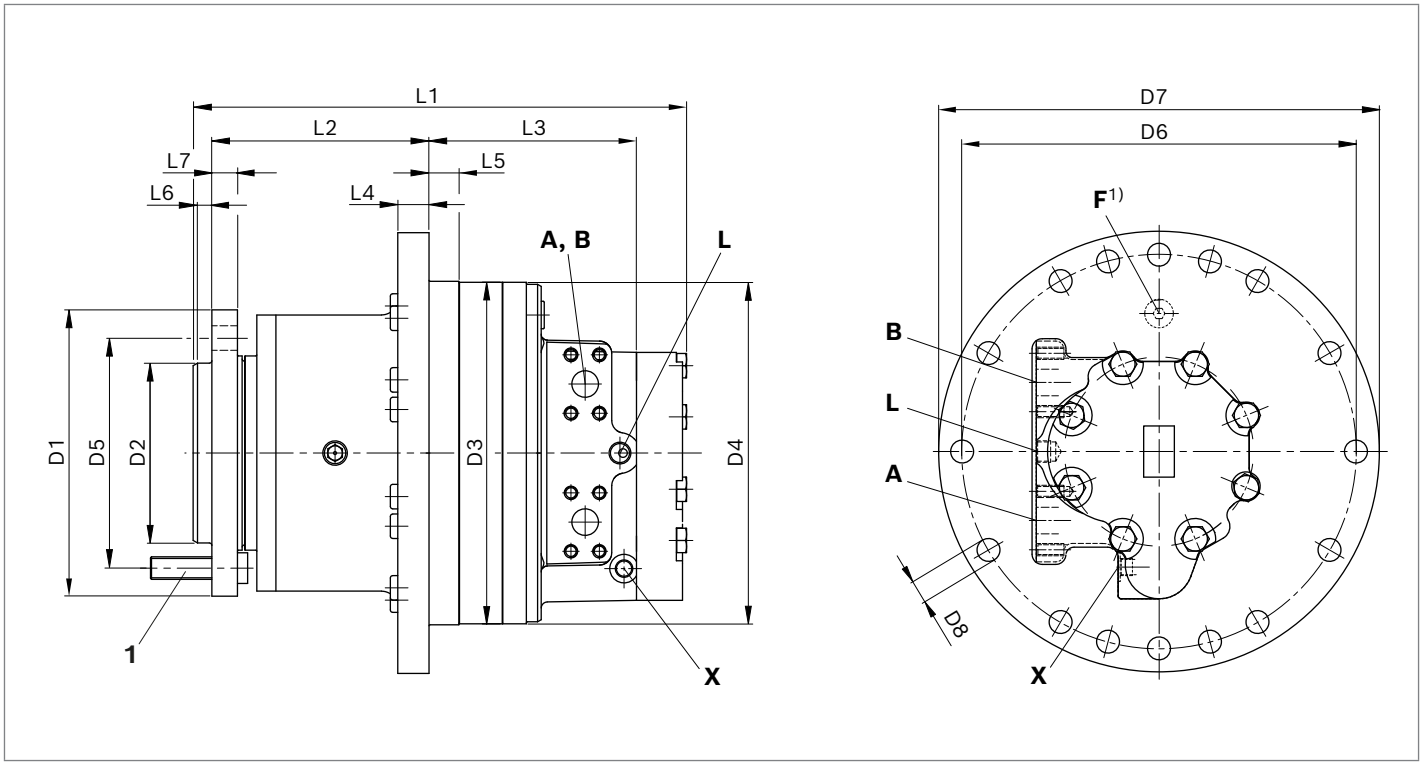
MCR5W and MCR6W two speed (2WL)



Before finalising your design, request a specific installation drawing. Dimensions may vary from the data sheet.

1) Filler port can be requested as a special option.

MCR20W two speed (2WL)



Motor	D1	D2	D3	D4	D5[2)]	D6	D7	D8[3)]	1
MCR3	Ø180	Ø92.7	Ø180	Ø180	Ø140	Ø210	Ø237	Ø14	10×M14×1.5
MCR5	Ø250	Ø160.8	Ø223	Ø222	Ø205	Ø267	Ø298	Ø17.4	6×M18×1.5
MCR6	Ø250	Ø160.8	Ø240	Ø235.9	Ø205	Ø267	Ø298	Ø18.4	6×M18×1.5
MCR10	Ø280	Ø175.8	Ø264	Ø253	Ø225	Ø300	Ø330	Ø17.5	10×M22×1.5
MCR20	Ø280	Ø175.8	Ø335.9	Ø334.3	Ø225	Ø385	Ø431	Ø22.5	10×M22×1.5

Motor	L1	L2	L3	L4	L5	L6	L7	S1	S2
MCR3	311.5	181	123.5	13	6	5	11.5	62.5	30°
MCR5	345.3	204	103.7	17	12	13.5	15	75	45°
MCR6	345.3	204	103.7	17	12	13.5	15	75	45°
MCR10	382.9	221.9	115.5	19	12.5	18	16	89	45°
MCR20	415.15	212.3	202.85	30.5	29.2	14	25	–	–

Before finalising your design, request a specific installation drawing. Dimensions may vary from the data sheet.

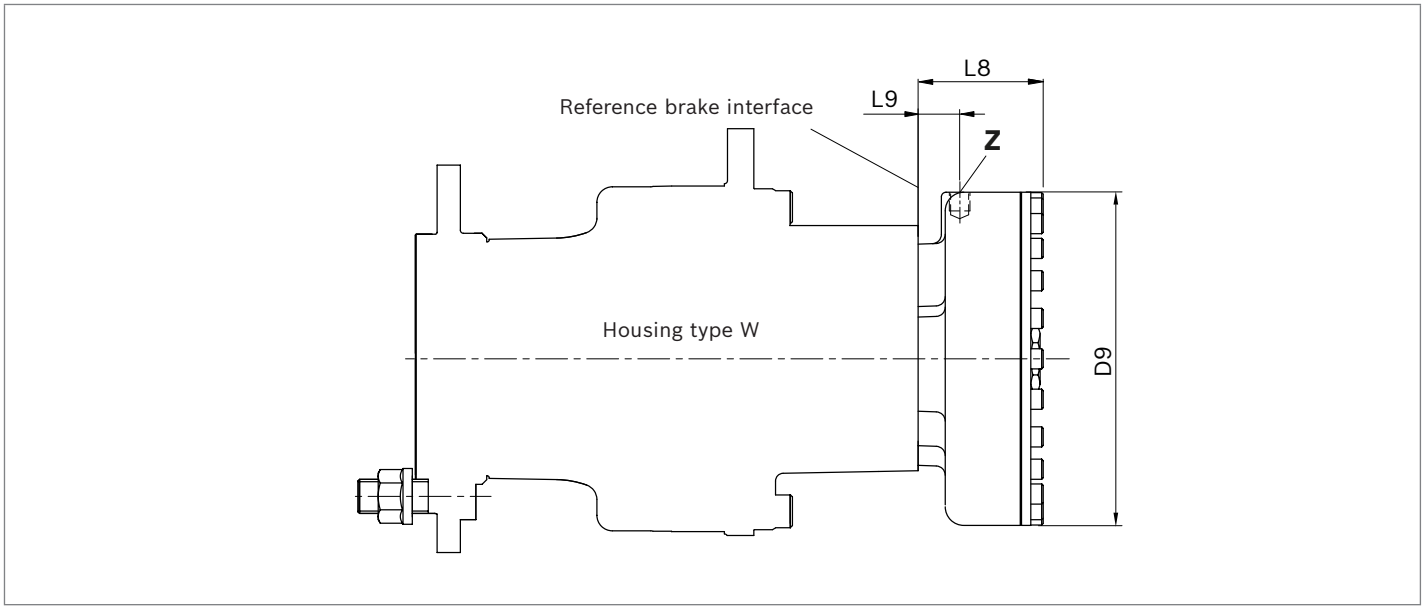
1) Filler port can be requested as a special option.
2) Wheel stud pitch circle diameter
3) Flange shape may be different for different frame sizes

Ports

Motor	Designation	Port function	SAE Ports Standard	Size	BSP Ports Standard	Size	p_{max} [bar]	State[3]
MCR3	**A, B**	Inlet, outlet	ISO 11926-1	1 1/16-12 UNF	ISO 228-1	1/2 BSP	470/420[2]	O
	L	Case drain	ISO 11926-1	9/16-18 UNF	ISO 228-1	3/8 BSP	10	O
	F[1]	Filler port	ISO 11926-1	3/4-16 UNF	ISO 228-1	1/2 BSP	10	X
	X	2 speed port	ISO 11926-1	9/16-18 UNF	ISO 228-1	1/4 BSP	35	O
MCR5	**A, B**	Inlet, outlet	ISO 11926-1	1 1/16-12 UNF	ISO 228-1	3/4 BSP	470/420[2]	O
	L	Case drain	ISO 11926-1	3/4-16 UNF	ISO 228-1	3/8 BSP	10	O
	F[1]	Filler port	ISO 11926-1	3/4-16 UNF	ISO 228-1	1/2 BSP	10	X
	X	2 speed port	ISO 11926-1	9/16-18 UNF	ISO 228-1	1/4 BSP	35	O
MCR6	**A, B**	Inlet, outlet	ISO 11926-1	1 1/16-12 UNF	SAE J518C	3/4 BSP	420	O
	L	Case drain	ISO 11926-1	3/4-16 UNF	ISO 228-1	1/2 BSP	10	O
	F[1]	Filler port	ISO 11926-1	3/4-16 UNF	ISO 228-1	1/2 BSP	10	X
	X	2 speed port	ISO 11926-1	9/16-18 UNF	ISO 228-1	1/4 BSP	35	O
MCR10	**A, B**	Inlet, outlet	ISO 11926-1	3/4 in	SAE J518C	3/4 in	470/420[2]	O
	L	Case drain	ISO 11926-1	3/4-16 UNF	ISO 228-1	1/2 BSP	10	O
	F[1]	Filler port	ISO 11926-1	3/4-16 UNF	ISO 228-1	1/2 BSP	10	X
	X	2 speed port	ISO 11926-1	9/16-18 UNF	ISO 228-1	3/8 BSP	35	O
MCR20	**A, B**	Inlet, outlet	ISO 11926-1	1 in	SAE J518C	1 in	470/420[2]	O
	L	Case drain	ISO 11926-1	3/4-16 UNF	ISO 228-1	1/2 BSP	10	O
	F[1]	Filler port	ISO 11926-1	3/4-16 UNF	ISO 228-1	1/2 BSP	10	X
	X	2 speed port	ISO 11926-1	9/16-18 UNF	ISO 228-1	3/8 BSP	35	O

1) Filler port can be requested as a special option
2) Depends on displacement
3) O = Must be connected (plugged on delivery)
X = Metal plug fitted (in normal operation)

Holding brake (multi-disc brake)



Motor	Brake	L8	L9	D9
MCR3	**B2**	67.3	22	Ø172
MCR5/MCR6	**B2**	67.3	22	Ø172
	B4	80.7	26.5	Ø215
MCR10	**B5**	84.7	26.5	Ø215
	B7	98	29	Ø251
MCR20	**B19**	116.4	32	Ø326

			SAE Ports		BSP Ports			
Motor	**Designation**	**Port function**	**Standard**	**Size**	**Standard**	**Size**	p_{max} **[bar]**	**State**[1)]
MCR3	**Z**	Brake port	ISO 11926-1	9/16-18 UNF	ISO 228-1	1/4 BSP	40	O
MCR5/MCR6	**Z**	Brake port	ISO 11926-1	9/16-18 UNF	ISO 228-1	1/4 BSP	40	O
MCR10	**Z**	Brake port	ISO 11926-1	9/16-18 UNF	ISO 228-1	3/8 BSP	30	O
MCR20	**Z**	Brake port	ISO 11926-1	9/16-18 UNF	ISO 228-1	3/8 BSP	30	O

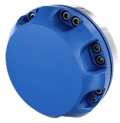
Project Planning Notes

- The project planning, installation and commissioning of the MCR motor should only be carried out by competent personnel.
- Before using the Radial Piston Motor read the MCR Instruction Manual RE15215-01-B.
- Before finalising your machine design request a binding Installation Drawing from the Engineering Department at Bosch Rexroth, Glenrothes.
- The limitations specified in this datasheet must not be exceeded unless authorisation has been given by the Engineering Department at Bosch Rexroth, Glenrothes.
- Unauthorised modification to parts of the MCR may affect the motors integrity & performance and could create a hazard to personnel or property.
- Holding brake torques account for tolerances and are based on the use of standard mineral oil (HLP/HLVP to DIN 51524). Brake torque may be significantly lower when using fluids other than mineral oil. Brake hold performance must be confirmed on an application specific basis when using alternative fluids.

Before finalising your design, request a specific installation drawing. Dimensions may vary from the data sheet.

1) O =Must be connected (plugged on delivery)

Selection guide

Data sheet	Motor type Application		Frame size 3 160 cc to 400 cc	4 260 cc to 470 cc	5 380 cc to 820 cc	6 820 cc to 920 cc	8 1030 cc to 1130 cc	10 780 cc to 1340 cc	15 1130 cc to 2150 cc	20 1750 cc to 3000 cc
15198	**MCR-F** Wheel drives		●	–	●	●	–	●	●	–
15200	**MCR-W** Heavy duty wheel drives		●	–	●	●	–	●	–	●
15197	**MCR-C** Compact drives		–	–	–	–	–	–	–	●
15195	**MCR-A** Frame integrated drives		●	–	●	–	–	●	●	–
15226	**MCR-S** Chain drives		–	●	–	–	–	–	–	–
15221	**MCR-T** Track drives		–	–	●	●	●	●	–	–
15199	**MCR-H** Integrated drives		●	–	●	–	–	●	●	●
15223	**MCR-R Series 41** Hydraulic drive assist		–	–	–	–	–	●	–	–
15196	**MCR-D** Industrial applications		●	–	●	–	–	●	–	–
	MCR-E Industrial applications		–	–	●	–	–	–	–	–

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