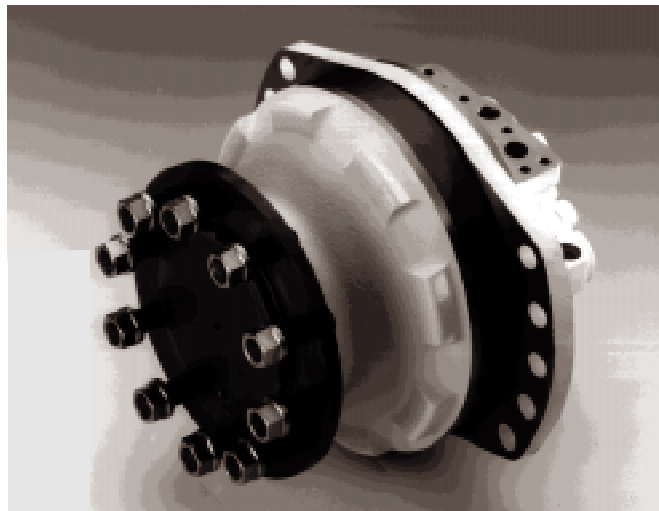


MANNESMANN REXROTH	Hydraulic Motor (Radial Piston Multiple Stroke) Type MCR 20, Series 3X				RE 15 209/03.95 Replaces: 15 217
	Size 1750 to 3000	to 450 bar	to 3000 cm ³	to 17043 Nm	

Characteristics:

- compact, sturdy construction
- smooth running even at very low speeds
- low noise
- reversible
- sealed tapered roller bearing
- high radial forces permitted on output shaft
- shaft seal up to 10 bar
- optional integral holding brake (multi-disc brake)
- switchable
 - freewheeling
 - half displacement
- for open and closed circuits



H/A 2387
Type MCR 20 C...

Contents

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Technical data	5
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Functional description (open and closed circuits)**Closed circuit**

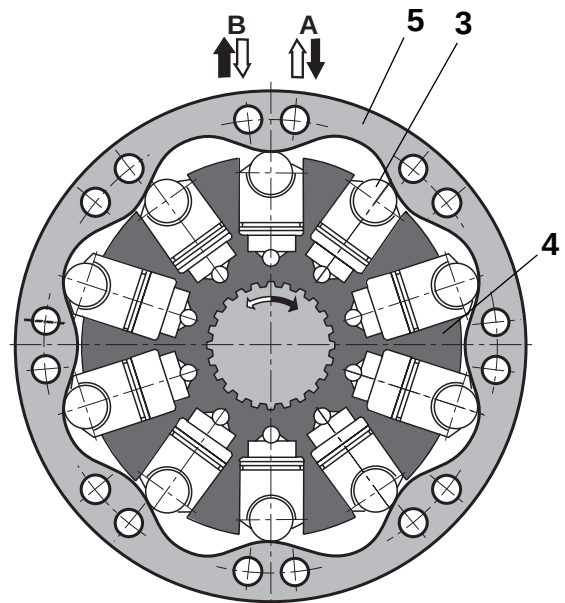
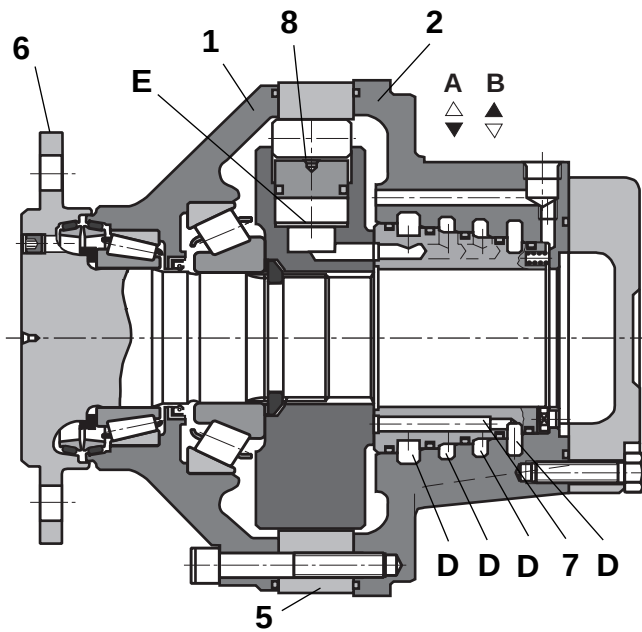
Minimum inlet pressure must be adapted to suit operating conditions; the following must be taken into consideration: idling pressure, flow resistances, pump operation. Minimum flow of the feed pump must be adapted to suit operating conditions.

Open circuit

Minimum inlet pressure must be adapted to suit operating conditions; the following must be taken into consideration: idling pressure, flow resistances, pump operation. The outlet pressure must be at least 2 bar greater than the pressure in the housing.

If the motor circuits are in series please consult the manufacturer.

Section, functional description



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

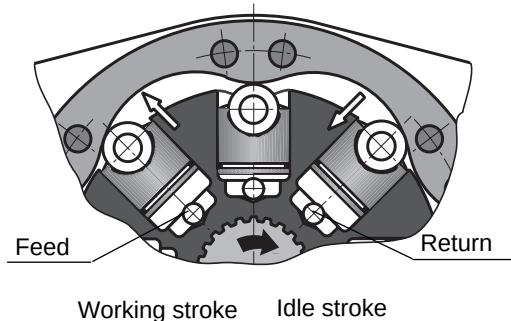
Construction

Two-part housing (1; 2), rotary piston assembly (3; 4) cam (5), output shaft (6) and control section (7)

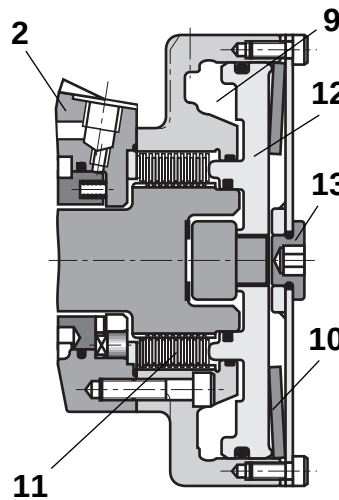
Transmission

The rotor (4) is connected to the shaft (6) by means of splines. The pistons (3) are arranged radially in the rotor (4) and are supported on the cam plate (5) by way of rollers (8).

Torque generation



Holding brake (multi-disc brake)



Mounting:

By way of control housing (2) and through drive.

Brake application

If the pressure in the annular area (9) falls short of a pre-determined level, the Belleville washer (10) will press the disc package (11) together.

Brake release

If the pressure in the annular area (9) exceeds the required level, the brake piston (12) will be pushed against the Belleville washer (10). The load is taken off the disc package (11), and the holding brake released.

The number of working and idle strokes corresponds to the number of cams on the stroke curve.

Open loop control

The cylinder chambers (E) are connected to ports A or B by means of the axial bores and the annular passages (D).

Bearings

Tapered roller bearings capable of transmitting high axial and radial forces.

Freewheeling

If the two ports A and B are connected with no pressure loading and a pressure of 2 bar is simultaneously applied to the housing by way of port "L", the pistons will be forced into the rotary piston assembly. The rollers will no longer be lying against the cam curve and it will be possible for the end of the shaft to be rotated.

Switching to half displacement

On certain models of radial piston motors halving of displacement is possible. This means that at working stroke only half the pistons are supplied with fluid by way of a valve in the control system. The remaining pistons are connected to the outlet side of the motor. When connected the motor will run at twice the speed but at half torque.

Ordering codes

MCR	20	C				Z - 3X /	M /				*
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Further details
in clear text

Studs

no code = without studs
/S = with studs for
wheel mounting

Ports

11 = BSP thread to ISO 228/1
42 = UNF-SAE threads

no code = not switchable,
2W = switchable displacement

Seals

M = NBR seals, suitable for
mineral oil to DIN 51 524 (HL, HLP)

Brake mounting

AO = without brake
B19 = hydraulic holding brake
(spring pressure disc brake)

Sizes/Displacement V

Size 1750	= 1750 cm ³	= 1750
Size 2100	= 2100 cm ³	= 2100
Size 2500	= 2500 cm ³	= 2500
Size 3000	= 3000 cm ³	= 3000

1st shaft end

with flange 280 = **F 280**

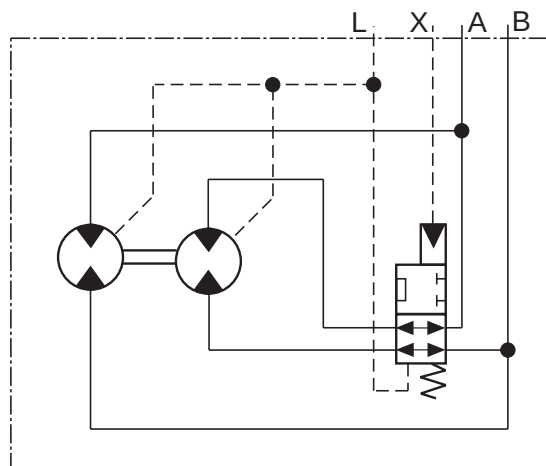
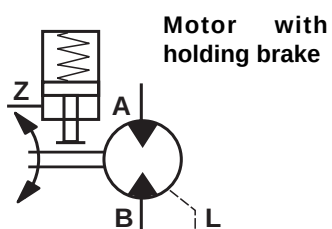
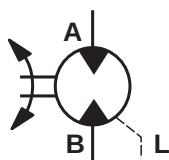
without 2nd shaft end = **Z**

Series

Series 30 to 39 = **3X**
(30 to 39, externally interchangeable)

Symbols to DIN ISO 1219

Motor for two speeds



Technical data (for applications outside these parameters please consult us)**General**

Type				Piston machine			
Model				Radial piston multi-stroke motor, switchable displacement			
Type code				MCR 20...			
Type of mounting				Flange mounting; face mounting			
Type of connection				Threaded, flange			
Mounting position				Optional			
Shaft load				See page 6			
Direction of rotation				Right / left - reversible			
Frame size				20			
Nominal size				1750	2100	2500	3000
Displacement	V	cm³		1750	2100	2500	3000
Displacement flow at $n = 100$ rev/min/100 bar	Q	L/min		176	211	252	302
Output torque ^{1), 7)}							
– spec. torque (at $\Delta p = 100$ bar)	T	Nm		2785	3342	3979	4775
– max. torque	T	Nm		11 531	13 762	14 244	17 093
Output speed							
– min. speed	n	rev/min		5 to 10 when running smoothly, depending on application			
– max. continious speed	n	rev/min		125	125	115	115
– max. intermitent speed	n	rev/min		160	160	115	115
– freewheeling	n	rev/min		500			
Output power ¹⁾							
Weight							
– continuous power	P	kW		70	70	85	85
– motor	m	kg		110			
– motor with holding brake	m	kg		140			

Hydraulic

Nominal pressure	p	bar	250	
Pressure difference, cont. ^{2), 6), 7)}	Δp			
– with mineral oil (HL, HLP)		bar	250	
Pressure difference, peak ^{3), 6), 7)}	Δp			
– with mineral oil (HL, HLP)		bar	450	400
Inlet pressure port “A” or “B”	p	bar	470	420
Summated pressure ^{4; 6)} port “A” + “B”	p	bar	470	420
Case drain pressure	p	bar	10	
Fluid ⁵⁾	Mineral oil (HL, HLP) to DIN 51 524			
Fluid temperature range	t	°C	– 20 to 80	
Viscosity range	ν	mm ² /s	10 to 2000	
Fluid cleanliness	Max. permissible degree of contamination of the fluid to NAS 1638 class 9. We therefore recommend a filter with a minimum retention rate of $\beta_{10} \geq 75$.			

Brake

Holding brake (multi-disc brake)			
Holding torque	T	Nm	19 000
Brake release pressure, min – max	p	bar	Min. 15 Max. 30

¹⁾ The data given apply after 100 hours running-in time

²⁾ Continuous operation

³⁾ Peak values may occur for a maximum duration of one second within an operating minute.

⁴⁾ In the return line we recommend $p_{\min} = 15 \text{ bar}$

⁵⁾ Environmentally friendly fluids HETG, HEPG, HEE to RE 90 221

⁶⁾ For connection in series, please consult the technical sales department.

⁷⁾ **Warning!** During the running-in time of the motor (min. 20 hours) motors should not be run unloaded at greater than 50% of maximum speed.

Technical data (mean values, measured at $v = 46 \text{ mm}^2/\text{s}$ and $t = 45 \text{ }^\circ\text{C}$)**Notes on the technical data** T = torque in Nm Q = input flow in L/min Q_L = mean case leakage in L/min

– All torques given apply to run-in motors (see page 4, footnote 7)

– For "half displacement" operating mode multiply the torques and Q -values by 0.5.– For maximum case leakage multiply Q_L by 2

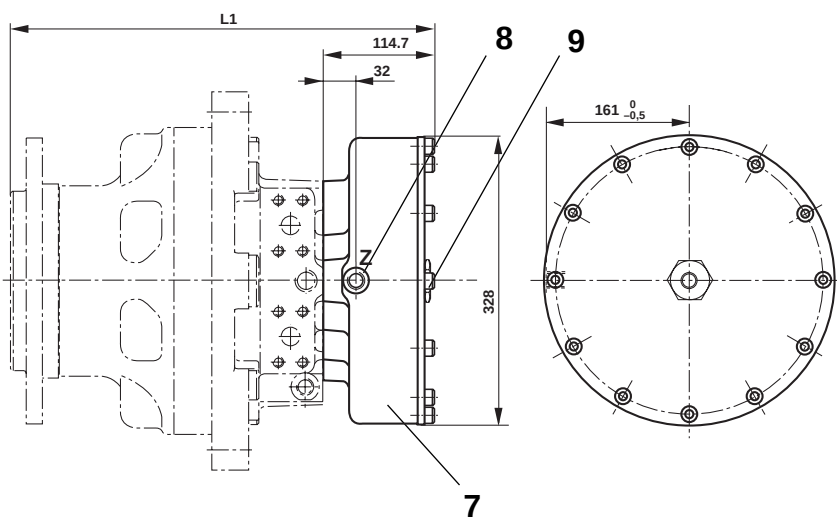
Pressure Differential Δp bar		Speed in RPM					Speed in RPM				
		MCR20. 1750					MCR20. 3000				
		0	25	50	100	125	0	25	50	100	115
100	T Nm	1950	2423	2507	2206	2111	2626	3915	4011	3247	2435
	Q L/min	1.6	45.4	89.3	176.8	221.0	1.6	76.6	151.8	301.8	347.0
	Q_L L/min	0.8	0.8	0.9	0.9	1.1	0.8	0.8	0.9	0.9	1.0
200	T Nm	3899	5013	5124	5013		6207	8212	8403		
	Q L/min	2.4	46.2	90.3	178.0		2.4	77.4	152.8		
	Q_L L/min	1.2	1.2	1.4	1.5		1.2	1.2	1.4		
300	T Nm	5850	7520	7688			10027	126052	12891		
	Q L/min	3.4	47.2	91.3			3.4	78.4	153.8		
	Q_L L/min	1.7	1.7	1.9			1.7	1.7	1.9		
400	T Nm	7799	10028	10251			13751	16998			
	Q L/min	4.4	48.2	92.1			4.4	79.4			
	Q_L L/min	2.2	2.2	2.3			2.2	2.2			
450	T Nm	8774	11281	11531							
	Q L/min	4.8	48.6	92.6							
	Q_L L/min	2.4	2.4	2.6							
		MCR20. 2100									
		0	25	50	100	125					
100	T Nm	2335	2902	3002	2570	2390					
	Q L/min	1.6	54.1	106.8	211.8	269.7					
	Q_L L/min	0.8	0.8	0.9	0.9	1.1					
200	T Nm	4670	6005	6138	6005						
	Q L/min	2.4	54.9	107.8	213						
	Q_L L/min	1.2	1.2	1.4	1.5						
300	T Nm	7006	9007	9207							
	Q L/min	3.4	55.9	108.8							
	Q_L L/min	1.7	1.7	1.9							
400	T Nm	9341	12010	12276							
	Q L/min	4.4	56.9	109.6							
	Q_L L/min	2.2	2.2	2.3							
450	T Nm	10508	13510								
	Q L/min	4.8	57.3								
	Q_L L/min	2.4	2.4								
		MCR20. 2500									
		0	25	50	100	115					
100	T Nm	2188	3263	3342	2706	2594					
	Q L/min	1.6	64.1	126.8	251.8	289.5					
	Q_L L/min	0.8	0.8	0.9	0.9	1.0					
200	T Nm	5173	6844	7003	6605						
	Q L/min	2.4	64.9	127.8	253						
	Q_L L/min	1.2	1.2	1.4	1.5						
300	T Nm	8356	10504	10743							
	Q L/min	3.4	65.9	128.8							
	Q_L L/min	1.7	1.7	1.9							
400	T Nm	11459	14165	14244							
	Q L/min	4.4	66.9	129.6							
	Q_L L/min	2.2	2.2	2.3							

Unit dimensions

(in mm)

Holding brake (multi-disc brake): Ordering code "**B19**"

Flange housing	L1
C	442.35

**7** Holding brake (multi-disc brake)Ordering code "**B19**"**8** Brake release port Z**9** Threaded bore for emergency mechanical release of holding brake

Port	Dimensions of threads	
	Ordering code " /11 "	Ordering code " /12 "
Z	3/8" BSP	9/16-18 SAE
Item 9	M24	M24

Notes

 Mannesmann Rexroth AG D-97813 Lohr am Main Jahnstraße 3–5 • D-97816 Lohr am Main Telefon 0 93 52 / 18-0 • Telefax 0 93 52 / 18-10 40 Telex 6 89 418	Mannesmann Rexroth Ltd., Cromwell Road, St. Neots, Cambridgeshire, PE19 2ES Tel: 01480 223200 Fax: 01480 219052
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