

TIDAL FLUID POWER

AXIAL PISTON MOTOR SERIES 20



General Description

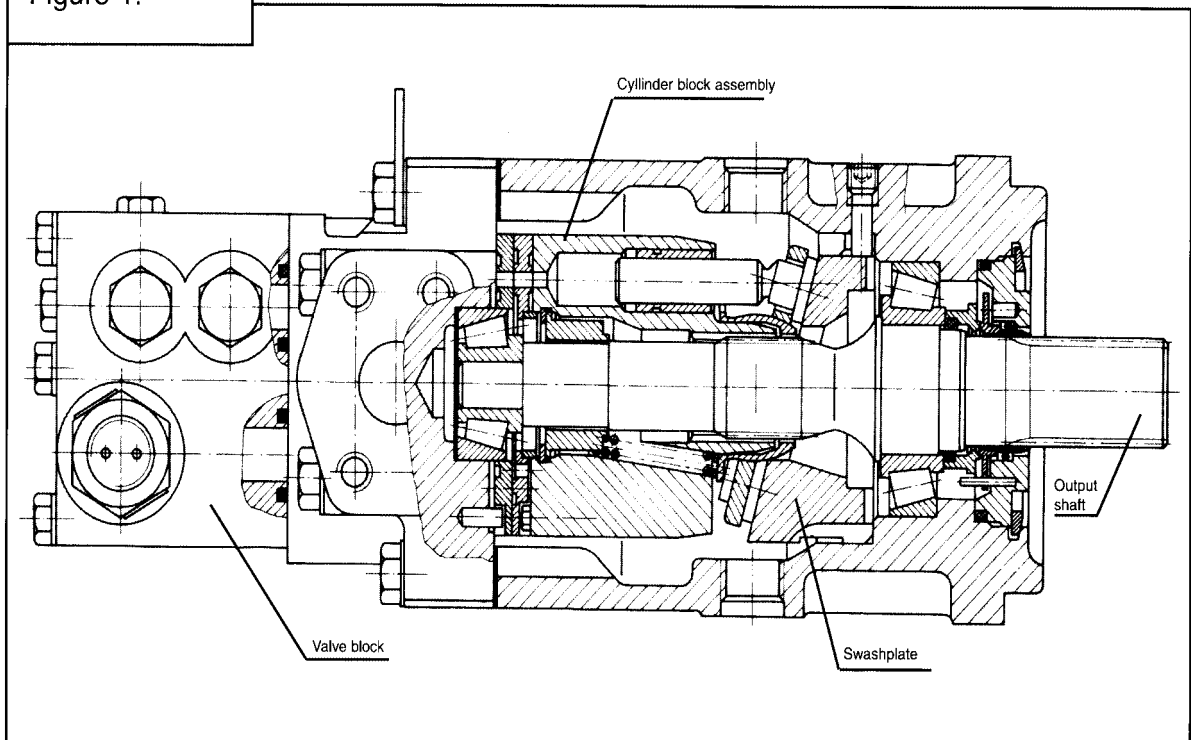
Axial piston fixed displacement motors, Series 20, are of swashplate construction with preset displacement, and are intended for closed circuit operation.

The output speed is proportional to the flow rate of the input fluid.

The output torque is proportional to the differential between high and low pressure sides of the fluid circuit.

The direction of motor (output) shaft rotation depends upon which port the fluid enters the motor.

Figure 1:



Features

Axial piston fixed displacement motors, Series 20, are well-engineered and easy to handle.

The full-length shaft with a highly efficient tapered roller bearing arrangement offers a high loading capacity for external radial forces.

High case pressures can be achieved without leakage even at the lowest temperatures by using suitable shaft seals.

The modular construction of the units simplifies the production of a wide variety of model options while limiting the number of different components involved.

Light weight, short versions available on request.

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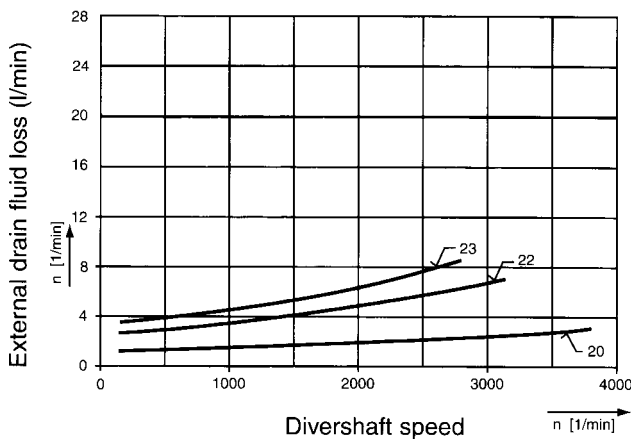


Technical Data
Table 1:

	Dimension	Frame Size		
		20	22	23
Max. displacement per revolution of the motor	cm ³	33,3	69,8	89,0
Max. pressure	MPa	35		
Nominal pressure	MPa	21		
Charging pressure	MPa	0,8-2,0		
Max. pressure in a case	MPa	maximum constant 0,25, intermittent 0,5		
Torque at 35 MPa	Nm	176	369	471
Maximum speed +	min ⁻¹	3590	2810	2590
Minimum speed	min ⁻¹		500	
Nominal speed	min ⁻¹		1500	
Kinematic viscosity range of working fluid - starting - operating - optimum	mm ² s ⁻¹		1000 12-600 25-35	
Kind of working fluid			mineral oil	
Operating temperature	°C (K)	- 40 to + 50 (233 - 323)		
Max. temperature of working in tank	°C (K)		80 (353)	
Purity of working fluid	µm		10	
Sense of rotation of the shaft		reversible		
Maximum swashplate angle	Degrees		± 18°	
Weight	kg	30	40	47

+ For higher speeds contact our Application department.

Figure 3 External drain fluid loss for frame sizes 20 - 23



$$Q_e = \frac{V_g \cdot n \cdot \eta_v}{1000} \text{ [l/min]} \quad (\text{Motor input flow})$$

$$M_o = \frac{15,9 \cdot V_g \cdot \Delta_p \cdot \eta_{mh}}{100} \text{ [Nm]} \quad (\text{Output torque})$$

$$P_e = \frac{M_o \cdot n}{9550} = \frac{Q_e \cdot \Delta_p \cdot \eta_t}{600} \text{ [kW]} \quad (\text{Output power})$$

V_g - Displacement [cm³] per revolution

Δ_p - High pressure minus low pressure [MPa]

n - Speed [1/min]

η_v - Volumetric efficiency

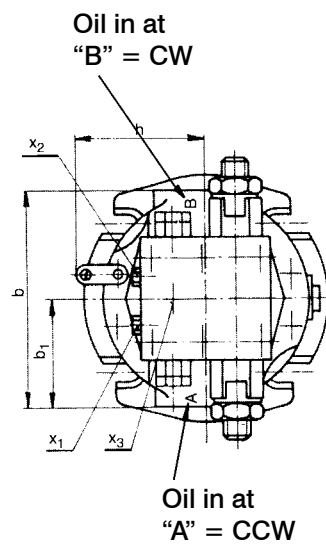
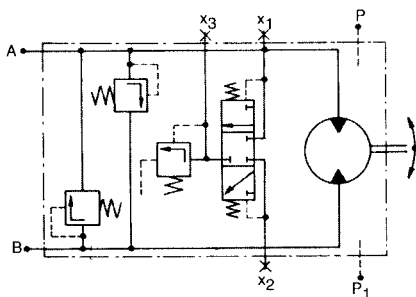
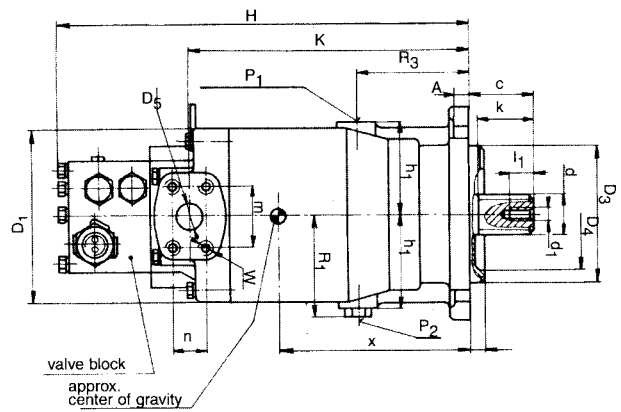
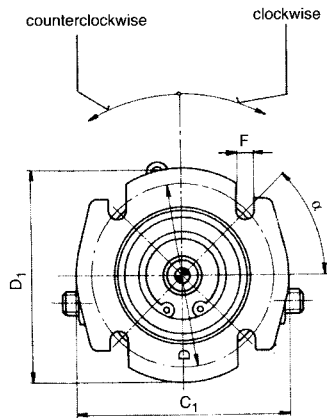
η_{mh} - Mechanical - hydraulic efficiency

η_t - Total efficiency

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Figure 4 Outline drawing motor configuration with valve block



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Table 2: Dimensions /mm/

Frame size	A	C	C1	D	D1	D2	D3	D4	D5	F	H
20	15,7±1,5	56	190	162	146	140	127-0,05	108	25,4	15 +0,8 -0,3	340
22	15,7±1,5	56	194	162	194	161	127-0,05	108	25,4	15 +0,8 -0,3	380
23	17,2±1,5	56	194	162	194	180	127-0,05	108	25,4	15 +0,8 -0,3	395

Frame size	H1	H2	H3	H4	H5	H6	K	P1,P2,P3	R	R1	R2	U
20	36	252	315	277	11	25	214		88,7	96	18	19
22	36	291	382	315	12	30	255,3	7/8 -14 UNF -2B	108	103	18	19
23	36	306	400	331	6	44	272,3		117	112	18	19

Frame size	U1	W	b	b1	d	d1	h	h1	k
20			162	82,5	34,5-0,17	M10		71	48
22	7/8 -14 UNF -2B	3/8 -16 UNC -2B	172	86	34,5-0,17	M10	100,6	87	48
23			192	96	37,68-0,18	M10	115	96	48

Frame size	l	l1	x	z	α	m	n	x1,x2,xn
20	12,5±0,2	min.20	156		45°	52,4	26,2	
22	12,5±0,2	min.20	165	7/8 -14 UNF -2B	45°	52,4	26,2	7/16 -20 UNF -2B
23	12,5±0,2	min.20	170		45°	52,4	26,2	

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TYPE DESIGNATION AND ORDER CODE:

MF **XX** **XX** **X** **X** **X** **X** **X** **X** **X** **X**
1 **2** **3** **4** **5** **6** **7** **8** **9** **10**

1. Type: MF - Axial Piston Fixed Displacement Motor

for hydrostatic transmissions with closed loop circuit, Serie 20

2. Size: Frame Size

20

22

23

Displacement per revolution

33,3 cm³

51,6 cm³

68,9 cm³

89,0 cm³

3. Shaft End:

A = 14 teeth, 12/24 pitch, ϕ 31,2

B = 19 teeth, 16/32 pitch, ϕ 31,75

C = 21 teeth, 16/32 pitch, ϕ 34,5

D = 23 teeth, 16/32 pitch, ϕ 37,68

K = cone 1: 8, SAE J 501, ϕ 31,75

L = cylindrical ϕ 34,925 spring - valid for size 20, 21, 22

M = cylindrical ϕ 44,45 , spring - valid for size 23

4. Pressure and Inlet Ports "A", "B", "C":

A: SAE J 518, 1", 6 000 PSI

B: SAE J 518, 1", 5 000 PSI

C: ISO 6162, 1", 40 Mpa, metric

5 Pressure and Inlet Ports "A", "B":

A - with bypass valve

B - without bypass valve

6. Identification for charge pressure ΔP_p :

12 - 1,2 Mpa

13 - 1,3 Mpa

14 - 1,4 Mpa

16 - 1,6 Mpa

00 - without purge relief valve

7. Identification for required relief valve setting on side A

11 - 11 Mpa

14 - 14 Mpa

21 - 21 Mpa

28 - 28 Mpa

35 - 35 Mpa

42 - 42 Mpa

00 - without high pressure relief valve

8. Identification for required relief valve setting on side B

11 - 11 Mpa

14 - 14 Mpa

21 - 21 Mpa

28 - 28 Mpa

35 - 35 Mpa

42 - 42 Mpa

00 - without high pressure relief valve

10. No. of special modification:

Determined in factory according to the special requirement of the client.