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Ing. D. Breitenbach GmbH

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Ing. D. Breitenbach GmbH

"*Our motors are characterised
by optimal efficiency,
long service life
and little noise emission.
From the smallest
until up to the largest.*"

Dieter and Jens Breitenbach

Ing. D. Breitenbach GmbH
Friesstr. 1 – 60388 Frankfurt – Tel. 069/9420150

MICHEL-AXIALKOLBENMOTOR

TYP	M6/1
SER.-NR.	20584
DRUCK	125BAR / 100%ED

Fig. M 6/1, actual size

Breitenbach
Axial piston units

• Large speed range
  from 1 up to 4500 rpm

• Output range from 0.01 up to 9.65 kW

• Compact construction with end and
  side connections

• Diameter from 55 up to 110 mm

• Length until face
  79 up to 181 mm

• **Powerful**
• **Compact and quiet**

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www.breitenbach-hydraulik.de

NEW! Slow running from 1rpm

Breitenbach, team of experts since 1974

Breitenbach Hydraulik-Automation (hydraulics automation) has a great deal of experience in the field of hydraulics, system and power unit construction. Together with their staff, the engineers Dieter and Jens Breitenbach are well known for their in-depth knowledge and their service ideas in this particular field.

We have completed more than thousands of different projects to the full satisfaction of our clients.

Breitenbach is always up to date with the latest developments thanks in particular to the continuous training of our staff at noted manufacturers of hydraulic systems and the utilisation of professional training programmes.

The fields of application

Our main clients are companies in the fields of industrial hydraulics and users of hydraulic machines such as slaughterhouses, foodstuff facilities and candle manufacturing, in forest and agriculture machinery, construction equipment, machine tools, stamping machines and presses, in nautical hydraulic equipment and in the chemical industry, in recycling systems and many other applications.

Our mobile workshops are in the field on a daily basis. Both in Germany as well as in Europe.

The workshop vehicles are equipped with the latest measurement instruments for pressure, volume flow, temperature and oil service. All common threaded assemblies, measurement connections, replacement filters and valves are on board. This enables the professional execution of troubleshooting and preventative maintenance and reduces the standstill times of equipment to a minimum.

Planning

The project planning and the construction of drive units for new systems as well as the optimisation of existing systems, serial production and individual systems with specific requirements such as ATEX.

Comprehensive programme

Consulting, project planning, service teams, repairs, sale of components, spare parts, accessories, oil service, storage service, hose service.

Large spare parts store of noted manufacturers and of our own production.

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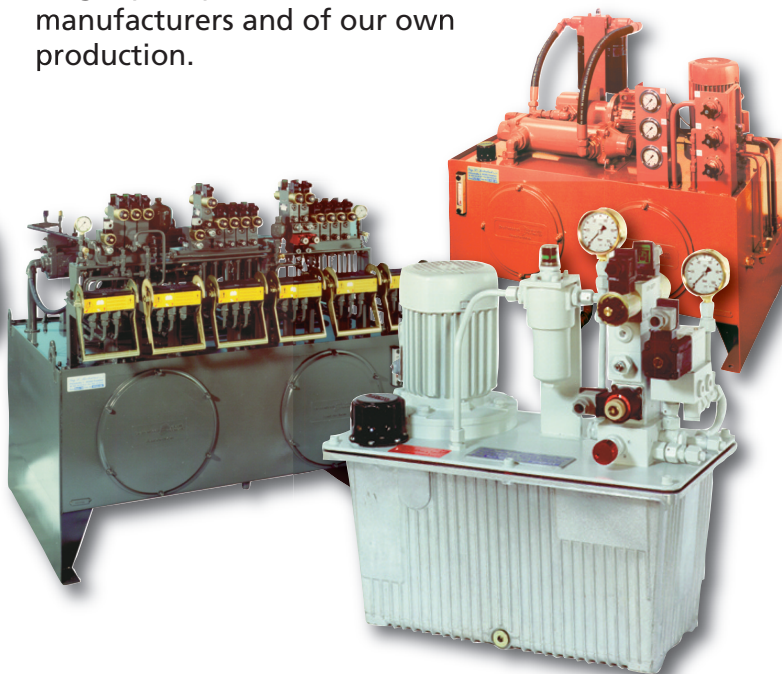
Test bench for Michel-Motors

Our company has optimised the quality management following the takeover of the product range of Michel-Motors.

This includes the test bench developed and built in-house as well as various studies and calculations at the IFAS institute.
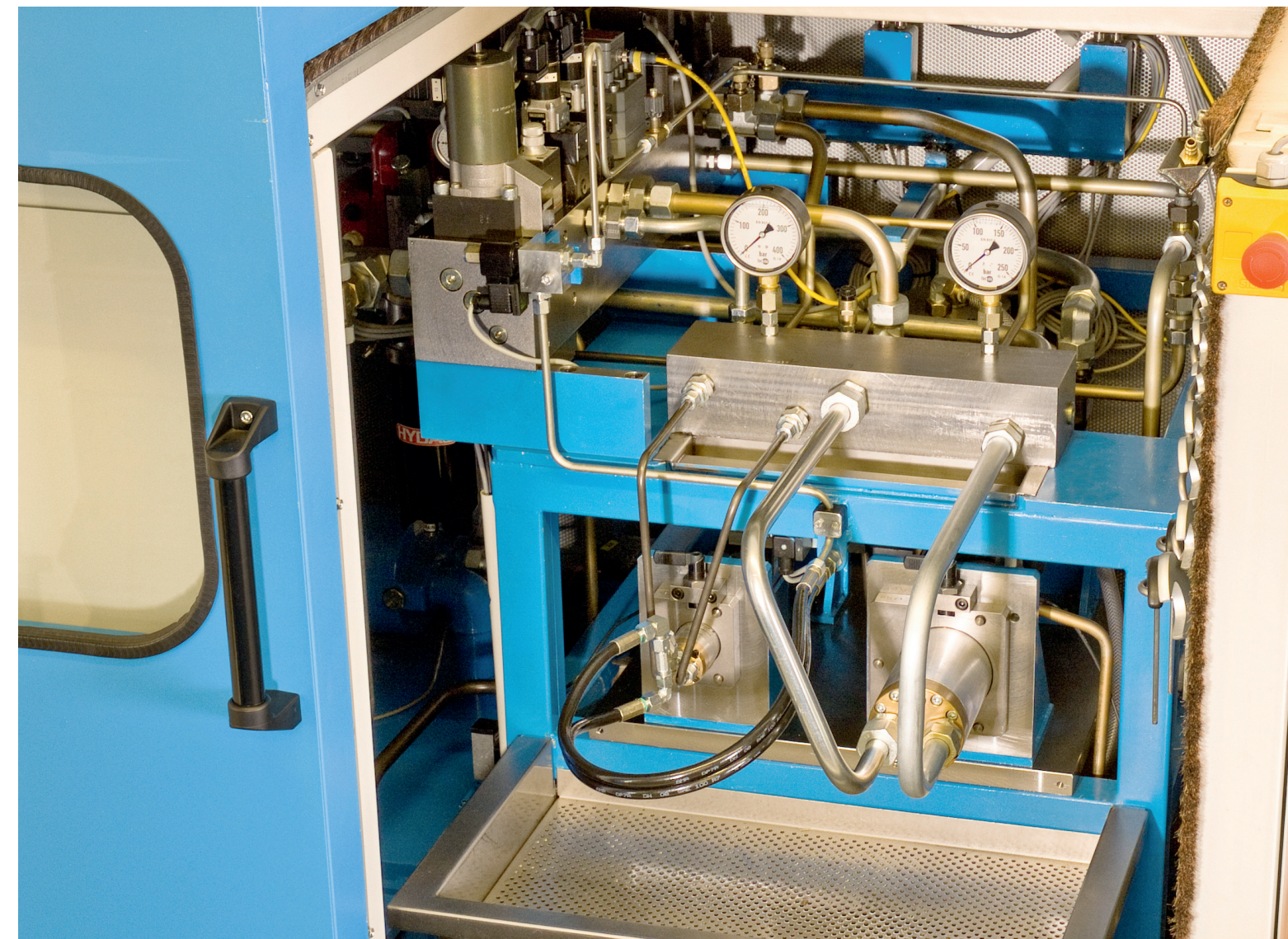
Breitenbach developed a system for leakage oil measurement with which an extremely high degree of precision can be achieved. This has optimised the determination of the degree of efficiency.

We assigned one of the leading German companies, HBM Hottinger Baltwin, especially for the program control and measurement engineering.

The Michel-Motors, built by Breitenbach from the smallest up to the largest, are subjected to individual testing in all operating points.

The sound testing of the Michel-Motors built by Breitenbach was performed by the renowned IFAS Institute for Fluid Power Drives and Controls of the university Aachen, Germany, on our assignment.

Breitenbach
Axial piston units

Axial piston motors, standard series

Hydraulik Automation

Ing. D. Breitenbach GmbH

Description

The axial piston units with a swashplate construction are constructed for hydraulic drives with either an open or closed circuit.

Our motor construction is characterised by a special selection of materials, bearings and seals with very small space requirements.

This results in advantages due to small dimensions and little weight. The internal type of control allows reverse operation and due to the interior parts, which are rotationally symmetrical, additionally permit very high speeds.

Due to the usage of nine pistons, very little pulsation is achieved even at low speeds. The speed is proportional to the supplied volume flow.

The output torque is proportional to the set pressure difference. Our motors are characterised by optimal efficiency, long service life and low noise emission.

(Drawings of the motors can be requested in all common CAD program formats.)

Examples of usage

• **Tool machines**
(feed and spindle operation)

• **Construction equipment/forklifts**
(traction drives, steering, fan drives and brakes)

• **Ship building**
(rudder systems, sail trimming, anchor winches)

• **Agriculture and forestry**
(cable winches, hoisting equipment, rape cutters)

• **Mining**
(rock drills, conveyor screws)

• **Sawmills**
(wood drilling spindles, saws, fans)

• **Cranes and means of transport**
(drum drive, sweeping units, vacuum cleaners)

• **Printing machines**
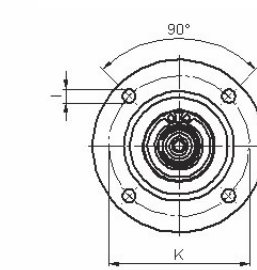(printing roller cleaning)

• **Shuttle drives**

Motor size (S) with side ports	M 6/1(S)	M 8/1(S)	M 10/1(S)	M 12/1(S)	M 14/1(S)	M 16/1(S)
Displacement (cm³)	1.68	3.99	8.02	12.83	20.96	31.93
Maximum pressure differential (bar)			125			
Maximum inlet pressure (bar)			140			
Maximum peak pressure (bar)			210			
Theoretically torque (Nm/bar)	0.025	0.063	0.12	0.21	0.33	0.49
Maximum output speed (rpm)	4500	4500	4000	3500	3500	3000
Minimum output speed (rpm) Standard	2	2	5	25	40	50
Minimum output speed (rpm) Version "L" with at least 10 bar at the outlet port	1*	1*	1*	1*	1*	1*
Minimum volumetric efficiency at 1500 rpm/125 bar pressure differential	0.95	0.95	0.95	0.95	0.95	0.95
Typical volumetric efficiency at 1500 rpm/125 bar pressure differential	0.99	0.99	0.99	0.98	0.98	0.98
Minimum mechanical efficiency at 1500 rpm/125 bar pressure differential	0.80	0.85	0.85	0.85	0.85	0.85
Typical mechanical efficiency at 1500 rpm/125 bar pressure differential	0.89	0.90	0.95	0.93	0.93	0.93
Weight of motors with axial ports [M*/1] (kg)	0.8	1.5	2.5	3.5	5.0	7.0
Weight of motors with side ports [M*/1 S] (kg)	1.0	1.7	2.7	3.8	5.3	7.4
* Lowspeet version "L"						

Motor dimensions

Motor Typ	M 6/1	M 8/1	M 10/1	M 12/1	M 14/1	M 16/1
A	111	136	155	179	203	225
B	55	65	75	85	94	110
C (g6)	10	12	14	16	20	22
D (h6)	35	42	50	54	65	75
F	20	24	27	31	39	45
G	32	38	43	47	56	59
I	M 5	M 6	M 6	M 6	M 6	M 8
K	45	54	64	70	82	94
L	24	30	36	48	56	64
M	G 1/4	G 3/8	G 1/2	G 1/2	G 3/4	G 3/4
N	G 1/8	G 1/8	G 1/4	G 1/4	G 3/8	G 3/8
O	16	20	24	24	34,5	39
H	12	15	17	16	23	20
A 1	116	146	165	185	221	240
L 1	51	61	70	81	88	104
O 1	26	31	36	40	45	53

Subject to technical alterations

M 6/1(S) - M 8/1(S)

M 6/1 - M 16/1

Key DIN 6885

(S) = Motor with side ports

Leak-Oil

Pressure on

M 10/1(S) - M 16/1(S)

M 6/1 S - M 16/1 S

Leak-Oil

(S) = Motor with side ports

Leak-Oil without resistance
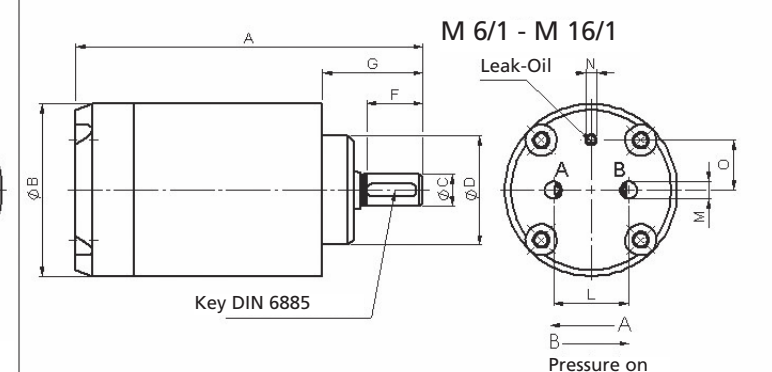
Pressure on
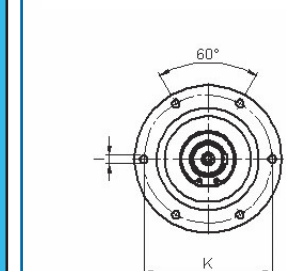
Breitenbach
Axial piston units
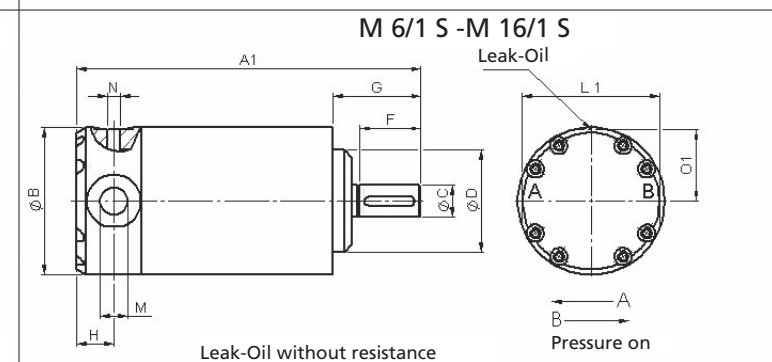
Results of the sound study
by IFAS

Custom design

– Slow running from 1 rpm

Additional custom designs in regard to type of construction, pressure, displacement, etc. on request.

Reversible axial piston pumps

Pumps with geometric displacement from 0.7 up to 30.7 cm³/revolution.

Motor/gearbox units

On request.

Medium

Mineral oil in accordance with DIN 51524, part 2. Other hydraulic fluids on request. The viscosity class is to be coordinated with the respective supplier of the mineral oil.

Only operate the system or the component with a medium, which sufficiently meets the requirements of the components utilised in the overall system.

Operating temperature of the medium

Maximum of +60°C. Other values on request. These values apply to mineral oil, whereby it must be ensured that the system does not overheat and additionally that the prescribed minimum temperature of the pressure medium does not drop below the specified value. In connection with this, all components of the entire system are to be taken into consideration.

Viscosity

The optimal viscosity depends on the existing conditions. Hence it must be differentiated whether the intended usage is projected for the following conditions: • artic • winter • summer • tropical or • in enclosed rooms in the central European area. Additionally, the starting viscosity in connection with the surrounding temperature must be observed. Hereby, the pour point (reaching the flow point) is an important quantity.

Prescribed oil purity

Permissible contamination class in accordance with ISO 4406: 19/17/14 respectively NAS 1638 class 8. The finer the degree of filtration the longer the service life of the axial piston motors/pumps respectively the entire system.

Our axial piston units and pumps are tested with mineral oil of the viscosity class ISO VG 32 at 50°C. This corresponds to a kinematic viscosity of approx. 20 mm²/s and is in the optimal range, also in regard to efficiency.

Ambient temperature

-20° to +40°C.

Location of installation

As desired.

Speeds

Please refer to the table on page 5. This table shows that at speeds of above 1500 rpm the pressure must be reduced correspondingly (Output limitation). When the lowest speeds are required from hydraulic motors, the return stroke must be pre-tensioned at 5 to 10 bar. In this manner, the hydraulic motor is secured hydraulically and enables smooth running.

Direction of rotation

As desired.

Drive concept

The drive shaft respectively the output shaft is connected via an elastic coupling. Couplings may only be installed with retracting respectively detaching devices. An axial load of the shaft is not permissible.

Noise values

The specified noise values apply as typical values due to the fact that factors such as room acoustics, connections, viscosity and reflection affect the noise levels. The motors were tested by the IFAS – institute for fluid power drives and controls of the university Aachen, Germany. The values were determined in accordance with DIN 45635, part 26. A tolerance of ± 2 dB(A) applies for the following curves. Additional acoustic pressure graphs are available on request starting with construction size 14.

Formulas

Power
$$P\,[kW] = \frac{\Delta p\,[bar] * Q\,[lmin]}{600}$$

Required volume flow
$$Q\,[l/min] = \frac{n\,[Upm] * Vg\,[ccm]}{\eta v * 1000}$$

Torque
$$M\,[Nm] = \frac{Vg\,[ccm] * \Delta p\,[bar] * \eta m}{63}$$

P	=	Power
Q	=	Pump capacity
M	=	Torque
Δp	=	Pressure difference between motor input and output
Vg	=	Displacement volume
n	=	Speed
ηv	=	Volumetric efficiency
ηm	=	Mechanical efficiency