Eaton Fluid Power Ltd.

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Kyoto plant	Ooi-cho, Kameoka-shi, Kyoto 621-0017 TEL 0771-22-9600, FAX 0771-29-2021

※Specifications and dimensions on this catolog are subject to change without notice.

No.D155E-10.02

Printed in Japan
10.02 GP

DOWMAX®
ME MOTOR

Eaton Fluid Power Ltd.

ISO 9001 REGISTERED FIRM
DNV Certification B.V., THE NETHERLANDS
MGMT.SYS. RvA C 024

Precautions for Selecting DOWMAX Motors

⚠WARNING

＊Attention should be paid to the following matters when selecting DOWMAX motors. Carefully read precautions shown in the catalogue and instruction manual to thoroughly understand them before selecting motors.

＊Check that the hydraulic system is planned in a manner to satisfy the matters described in the catalogue, instruction manual, delivery drawing, manufacturing specifications, etc. Pay special attention to the following:

1) The performance curves shown is this catalogue show the summary (average values) of data on motors that have already been run-in. Provide sufficient margin of safety when selecting motors in accordance with specific applications.
When motors are mew (before running-in), they may fail to achieve the performance shown in the catalogue. Contact us if that will cause any problem.

2) In cases where high back pressure is applied to the outlet line of the motor in special application, the performance described in the catalogue may not be exhibited. Contact us if the back pressure applied to the outlet line of the motor exceeds 2.0MPa (20kgf/cm^2).

3) In cases where the motor is turned by a load, it is necessary to apply boost pressure to the suction line of the motor to prevent cavitation. The boost pressure is subject to the motor speed and the viscosity of hydraulic fluid. In general, apply pressure that exceeds the minimum, boost pressure shown for each model.

4) In cases where external load torque is applied to the motor shaft while the motor is at rest, the motor will turn (slip) due to the leakage inside the motor. If there is no supply circuit, cavitation occurs and the motor goes out of control. (For example, a load will drop suddenly.) Use a mechanical brake, as necessary in these cases.

5) In cases where the inertial force of a driving body is large, abnormal pressure will be produced. Measure the pressure of the actual motor, and use a brake valve if the peak pressure exceeds the value shown in the catalogue; otherwise the motor shaft, key, and other parts may be damaged. Plan pipe installation in a manner to satisfy matters described in the related instruction manual.

＊Precautions for mechanical brake.

1) Mechanical brake of DOWMAX motor is reverse-operation type, the brake is released when brake pilot line is pressurized.

a. Pay attention, when planning hydraulic circuit, to the brake pilot line not being pressurized at any time the brake is necessary, even if it's an instant time.

b. When residual pressure remains at the brake pilot line, brake torque decreases proportional to the residual pressure.
Brake torque shown in this catalogue is for the brake pilot line pressure of 0kgf/cm^2.

2) Mechanical brake of DOWMAX motor is originally for a static brake use (parking brake).
Avoid the use of dynamic brake to the utmost.
When dynamic brake is used unavoidably, pay attention to the followings:

a. Mechanical brake and hydraulic brake shall not be used together.
When mechanical and hydraulic brake are planned to be used together, consult us for the applicability.

b. Usage classified as "Unsafe range" in the "Brake Use Limit Judging Diagram" in the related Instruction Manual, shall be avoided.

c. When the brake is used as a dynamic brake, the brake friction plate will be worn.
Check the brake torque periodically, and replace the brake friction plates with new ones, if necessary.

3) Brake torque shown in this catalogue is for the use of standard mineral oil as a hydraulic fluid.
When other oils such as fire-resistant fluid or special oils contains additive are used, brake characteristics will differ from the value in the catalogue, consult us in the case.

＊Do not plan operation exceeding the usable conditions described in this catalogue. (This does not apply to motors made to special specifications if special mention is shown in the delivery drawing or product specifications.)

1) Operation exceeding the viscosity range of 15-500 cSt.

2) Operation exceeding the usable range (pressure and speed). Refer to this catalogue for confirmation of limits for respective models.

3) Operation exceeding the allowable external force (radial and thrust load). Refer to the shaft strength diagrams shown in this catalogue for confirmation.

4) Operation exceeding the operating conditions (pressure and speed) corresponding to the desired life of motor.
Check the bearing life diagrams shown in this catalogue for confirmation.

5) Operation in cold places (below -25℃)
(Contact us for special motors for operation at temperatures from -25℃ to -45℃.)

6) Operation that causes the case temperature to exceed 80℃.

＊Never remodel motors.

⚠CAUTION

＊Use the recommended hydraulic fluid shown in instruction manual. When fire-resistant fluid is used, strictly observe the cautions and notes described in the instruction manual. Standard motors cannot be used when phosphate-ester is used as hydraulic fluid. In that case, select the seal code of V or X (seal material: fluororubber). As in the case of water-glycol type hydraulic fluid, the motor life can substantially be shortened depending on the type of fire-resistant fluid.
(Contact us for the expected life of motor under specific operating condition.)

＊When the direction of rotation of the motor is to be changed frequently, select models with a spline shaft.

＊Metal chips, sand, and other fine foreign substances contained in hydraulic fluid will reach the sliding surface of the motor, advancing the abrasion of component parts and causing malfunction and seizure of the motor. Prevent entry of dust, and be sure to install a filter in the circuit. Refer to the related instruction manual for the filter specifications.

＊Precautions regarding the drain port position and drain piping are described in the related instruction manual. Be sure to refer to them and reflect them in the piping plan.

＊When installation of motor with its shaft facing upward is desired, select "DOWMAX for installing the shaft upward" (mentioned before) that permits air bleeding from the case.

＊Keep the drain pressure inside the motor case below 0.3MPa (3 kgf/cm^2). Take care the pressure as it rises depending on the tank position and the length and diameter of pipes. The pressure on the low-pressure side of the main port must be higher than the drain pressure.

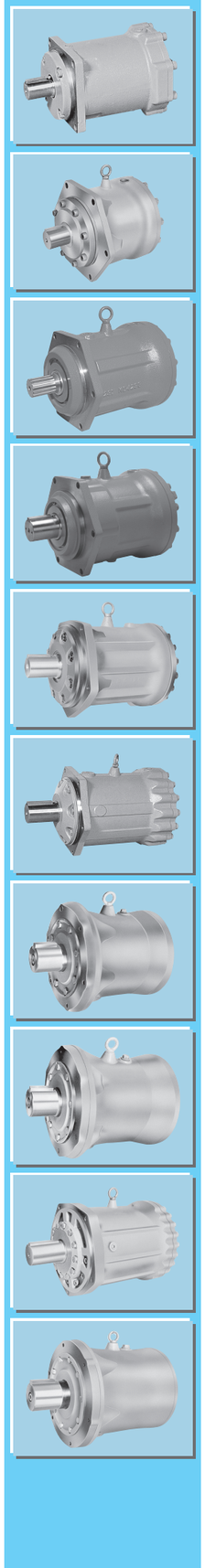
＊When the shaft is exposed to water or seawater, the standard seal will allow the shaft to rust, and the abraded oil seal may cause oil leakage. In such a case, select or specify models made to the double oil seal specifications.

DOWMAX®

INDEX

Array of DOWMAX.- Base Products

ME Series	2-Speed Motor	with Mechanical Brake	with Planetary-Gear			with Rotation Detector
			Single Reduction	Double Reduction	Shield Tunneling Applications	
ME100		MB100	●	●		●
ME150		MB150A	●	●	●	●
ME175		MB175A	●	●		●
ME300B	MK300	MB300B BP□□□	●	●		●
ME350B		MB350B	●	●		●
ME600B	MK600	BB□□□B BR□□□	●	●		●
ME750B		BC□□□	●	●		●
ME850B		BC□□□	●	●		●
ME1300A			●		●	●
ME1900			●			●
ME2600			●		●	●
ME3100						●
ME4100						●



DOWMAX®

EATON

DOWMAX® ME Motor

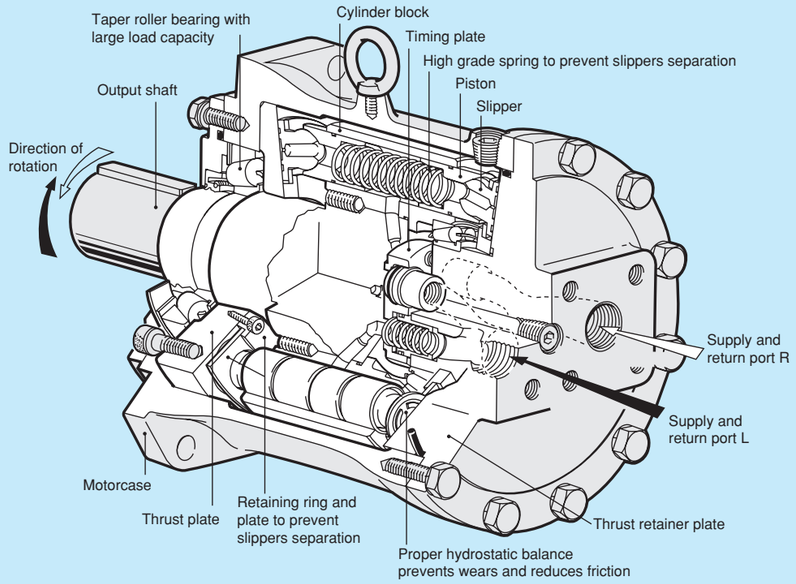
ME Low Speed High Torque Motor is a double swash plate type axial piston motor and has highest performance at low speed range.

- Wide range of models-13 displacements from 99 to 4097cm³/rev are available.
- High pressure—Continuous operating pressure 27.5Mpa (280kgf/cm²) & 24.5Mpa (250kgf/cm²).
- Smooth operation at low speed. Multiple pistons and double swash plate result in smooth rotation at speeds down to 1 rev/min.
- High starting torque and high overall efficiency.
- Compact and easy installation.
- Robust construction.
- Quiet operation.
- Unaffected by thermal shock (good for starting at cold temperature).
- Speed pickup system is available.

(INDEX)

Structure and Operation

Fluid entering the supply port is directed via internal passages and timing plate to the center of the cylinder bores. Fluid pressure forces the pistons apart causing the slippers to slide on the angled faces of the swash plates and rotate the barrel and shaft assembly. After work, fluid is exhausted through the timing plate and internal passages to the return port.



Performance Data

Model	Displacement cm³/rev	Rated Pressure MPa(kgf/cm²)	Peak Pressure MPa(kgf/cm²)	Rated Torque N·m(kgf·m)	Rated Speed rpm	Max. Speed rpm	Rated horse power kW(PS)	Mass kg
ME100	99	27.5 (280)	31.9 (325)	432 (44)	1000	1000	45 (62)	22
ME150※	152			667 (68)	600	800	42 (57)	42
ME175※	175			765 (78)	600	800	48 (65)	42
ME300B	300			1320 (135)	660	800	90 (123)	60
ME350B	350			1530 (156)	660	800	106 (144)	60
ME600B	600			2620 (267)	500	600	137 (186)	96
ME750B	750			3280 (334)	450	520	154 (210)	123
ME850B	848			3708 (378)	400	450	155 (211)	123
ME1300A	1345	24.5 (250)		5250 (535)	200	390	138 (188)	170
ME1900	1868			7290 (743)	140	260	128 (174)	270
ME2600	2578			10070 (1026)	110	230	159 (216)	350
ME3100	3104			12120 (1235)	110	230	186 (253)	364
ME4100	4097			15990 (1630)	75	200	211 (287)	520

□Limit of hydraulic fluid temperature; −20℃～+80℃
□Limit of hydraulic fluid viscosity; 15～500cSt (Advisable fluid viscosity range; 25～100cSt)
※ME150, ME175 is a special double swash plate motor.

Coding

ME 4100 — C W A S □□□□

Special Specification Number : No indication — Standard

Special spec.: S-Special Specification

Ports : No indication — Standard metric ports
A & B-Special ports for counter Balance valves (see table below)
E-SAE port

Seal : No indication-Standard seal (Nitrile Rubber)
V-Viton seal for phosphate ester fluid
W-Double seal (Nitrile Rubber)
X-Double seal (Viton)

Motor Shaft : C-Metric parallel keyed shaft with screws for key retention plate (std.)
P-Metric spline shaft
G-Metric hollowed spline shaft
B-1/10 tapered shaft
K-Inch size parallel keyed shaft
H-Inch size spline shaft
S-Other special shaft

Design No. : 1st design change "A"

Motor Size (Metric Displacement)

Series : High pressure series DOWMAX motor

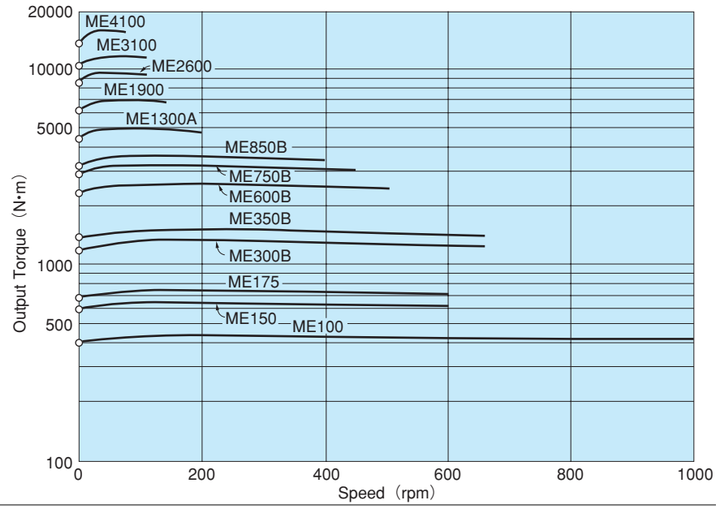
Port symbol for attaching counter Balance valve

—Means Std. port
＊Valves cannot be attached

Valve \ Motor	ME100	ME150～ME850B	ME1300A	ME1900	ME2600	ME3100	ME4100
C100□	—	A	A	A	A	—	—
C300□B	＊	B	A	B	B	—	B
CW300A	＊	B	A	B	B	—	B

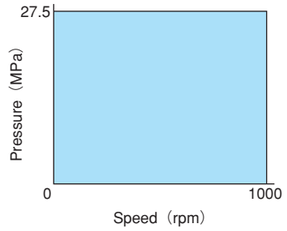
Selection Chart

This chart indicates the relation of actual torque and shaft rotation at the rated pressure of 27.5MPa (280 kgf/cm²) and 24.5MPa (250kgf/cm²).
Given the required torque and shaft speed the appropriate model can be selected from the diagram.
When the operating pressure differs from 27.5 or 24.5MPa (280 or 250kgf/cm²), refer to the performance date for the respective model.



ME100

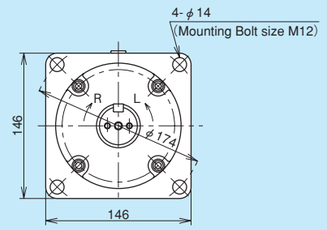
Applicable Range



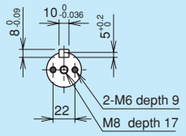
Displacement	99cm³/rev
Rated Pressure	27.5MPa (280kgf/cm²)
Peak Pressure	31.9MPa (325kgf/cm²)
Rated Torque	432N·m (44kgf·m)
Rated Speed	1000rpm
Max. Speed	1000rpm
Rated Horse Power	45kW (62PS)
Mass	22kg

Nominal Dimensions

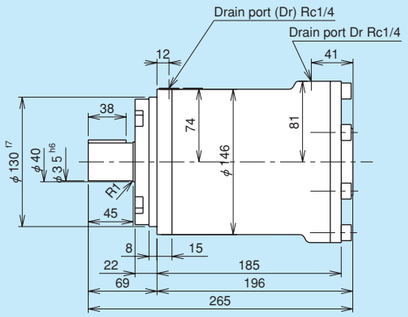
(Dimensions in mm)

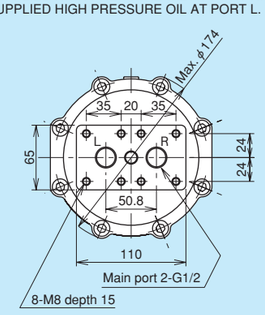


DIRECTION OF ROTATION
R : SUPPLIED HIGH PRESSURE OIL AT PORT R.
L : SUPPLIED HIGH PRESSURE OIL AT PORT L.



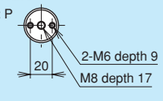
JIS B1301-1976
Shaft with screw for key retention
Shaft code : C

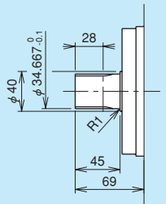




Splined shaft

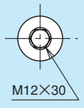
Shaft code : P

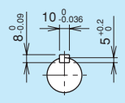




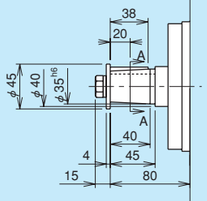
Tapered shaft (1/10 taper)

Shaft code : B (Single oil seal)



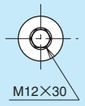


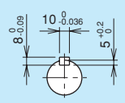
Seal land area of shaft is chrome plated



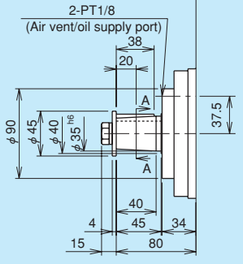
Tapered shaft (1/10 taper)

Shaft code : BW (Double oil seal)





Seal land area of shaft is chrome plated



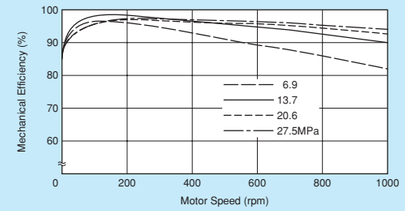
JIS D2001 Involute Spline 35 ×19×1.667 (Class b)

Shaft		Coefficient of profile shifting	+0.800
	Tool	Tooth form	Stub tooth
		Module	1.667
		Pressure angle	20°
	Number of teeth		19
	Dia. of basic pitch circle		31.667
	Tooth thickness	Grade	Class b (flank fit)
		Over-pin dia.	37.819 −0.019 −0.110 Pin dia.=φ3.0
		Over-all, across a given number of teeth (reference)	13.656 −0.002 −0.058 (3-teeth)
	Outer dia.		34.667
	Inner dia.		31.000
Hole		Coefficient of profile shifting	+0.800
	Tool	Tooth form	Stub tooth
		Module	1.667
		Pressure angle	20°
	Number of teeth		19
	Dia. of basic pitch circle		31.667
	Tooth width	Over-pin dia.	28.337 +0.085 0 Pin dia.=φ3.333 Thickness of chamfered part=2.80
		Over-all, Displacement across a given number of grooves (reference)	13.656 +0.036 +0.008 (3-teeth)
	Outer dia.		35.50
	Inner dia.		31.7 +0.025 0

Performance Data

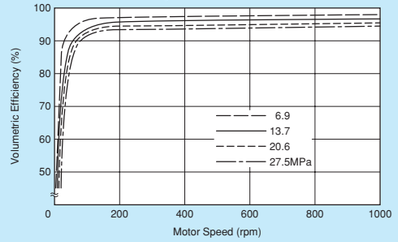
FLUID : SHELL TELLUS 56 (Viscosity 37cSt at 50°C)
The graphs shown are mean values obtained for production units.

Fig. 1 Mechanical Efficiency



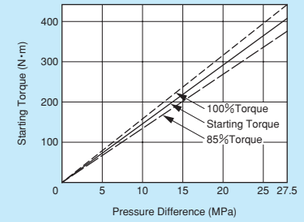
Mechanical efficiency at various speeds is shown for 4 operating pressures.

Fig. 2 Volumetric Efficiency



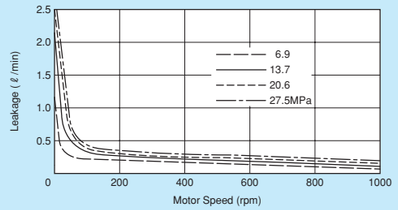
Volumetric efficiency at various speeds is shown for 4 operating pressures.

Fig. 3 Starting Torque



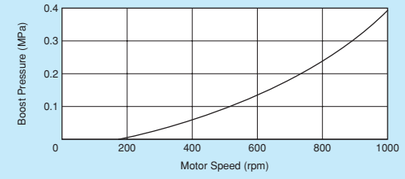
Starting torque versus effective pressure is shown.
Oil viscosity will not affect the starting torque efficiency.

Fig. 4 External Leakage



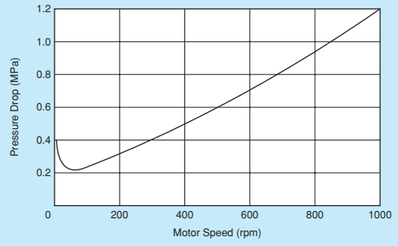
External leakage (from motor drain ports) relative to various speeds is shown for 4 operating pressures.

Fig. 5 Minimum Boost Pressure



It is important that sufficient inlet pressure is maintained, when the motor is operated as a pump or when the load overruns the motor, to prevent cavitation.

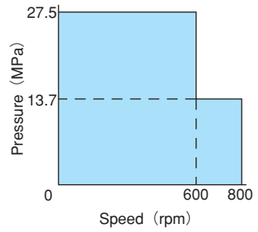
Fig. 6 Pressure Drop



Pressure necessary to run motor without load is shown for various speeds.

ME150

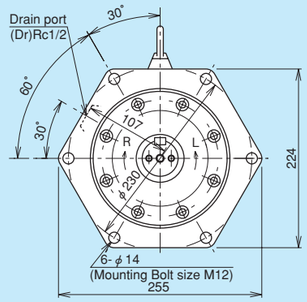
Applicable Range



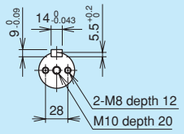
Displacement	152cm³/rev
Rated Pressure	27.5MPa (280kgf/cm²)
Peak Pressure	31.9MPa (325kgf/cm²)
Rated Torque	667N·m (68kgf·m)
Rated Speed	600rpm
Max. Speed	800rpm
Rated Horse Power	42kW (57PS)
Mass	42kg

Nominal Dimensions

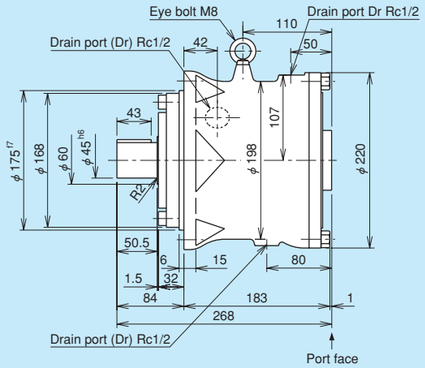
(Dimensions in mm)

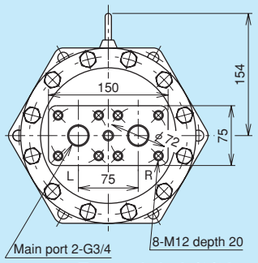


DIRECTION OF ROTATION
R : SUPPLIED HIGH PRESSURE OIL AT PORT R.
L : SUPPLIED HIGH PRESSURE OIL AT PORT L.



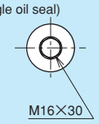
JIS B1301-1976
Shaft with screw for key retention
Shaft code : C

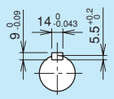




Tapered shaft (1/10 taper)

Shaft code : B (Single oil seal)

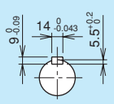




Seal land area of shaft is chrome plated

Tapered shaft (1/10 taper)

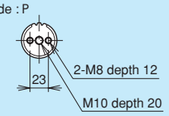
Shaft code : BW (Double oil seal)

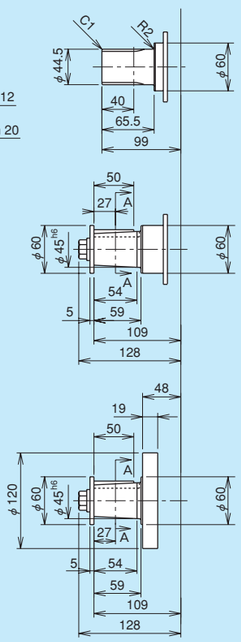


Seal land area of shaft is chrome plated

Splined shaft

Shaft code : P





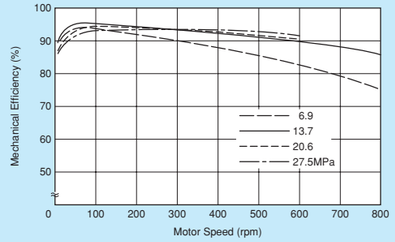
JIS D2001 Involute Spline 45 ×16×2.5 (Class b)

Shaft		Coefficient of profile shifting	+0.800
	Tool	Tooth form	Stub tooth
		Module	2.5
		Pressure angle	20°
		Number of teeth	16
		Dia. of basic pitch circle	40
	Tooth thickness	Grade	Class b (flank fit)
		Over-pin dia.	49.277 $^{-0.018}_{-0.107}$ Pin dia.=φ4.5
		Over-all, across a given number of teeth (reference)	20.379 $^{-0.001}_{-0.058}$ (3-teeth)
		Outer dia.	44.5
		Inner dia.	39
Hole		Coefficient of profile shifting	+0.800
	Tool	Tooth form	Stub tooth
		Module	2.5
		Pressure angle	20°
		Number of teeth	16
		Dia. of basic pitch circle	40
	Tooth width	Over-pin dia.	35.168 $^{+0.085}_{0}$ Pin dia.=φ5 Thickness of chamfered part=4.26
		Over-all, Displacement across a given number of grooves (reference)	20.379 $^{+0.030}_{-0.009}$ (3-teeth)
		Outer dia.	45.75
		Inner dia.	40 $^{+0.025}_{0}$

Performance Data

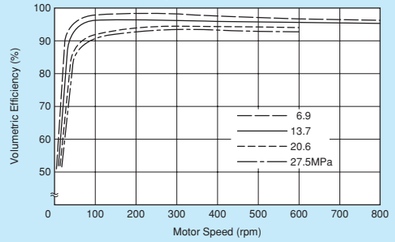
FLUID : SHELL TELLUS 56 (Viscosity 37cSt at 50°C)
The graphs shown are mean values obtained for production units.

Fig. 1 Mechanical Efficiency



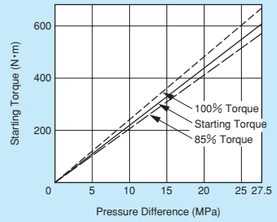
Mechanical efficiency at various speeds is shown for 4 operating pressures.

Fig. 2 Volumetric Efficiency



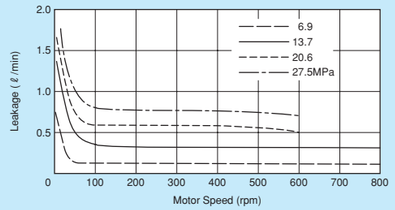
Volumetric efficiency at various speeds is shown for 4 operating pressures.

Fig. 3 Starting Torque



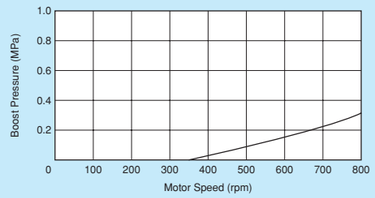
Starting torque versus effective pressure is shown.
Oil viscosity will not affect the starting torque efficiency.

Fig. 4 External Leakage



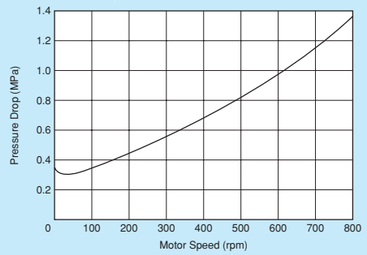
External leakage (from motor drain ports) relative to various speeds is shown for 4 operating pressures.

Fig. 5 Minimum Boost Pressure



It is important that sufficient inlet pressure is maintained, when the motor is operated as a pump or when the load overruns the motor, to prevent cavitation.

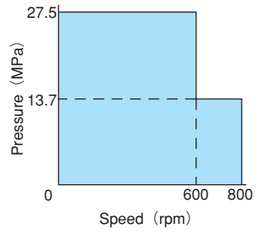
Fig. 6 Pressure Drop



Pressure necessary to run motor without load is shown for various speeds.

ME175

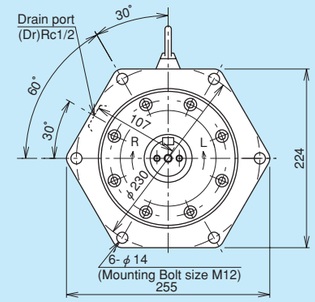
Applicable Range



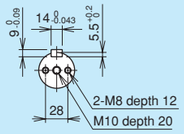
Displacement	175cm³/rev
Rated Pressure	27.5MPa (280kgf/cm²)
Peak Pressure	31.9MPa (325kgf/cm²)
Rated Torque	765N·m (78kgf·m)
Rated Speed	600rpm
Max. Speed	800rpm
Rated Horse Power	48kW (65PS)
Mass	42kg

Nominal Dimensions

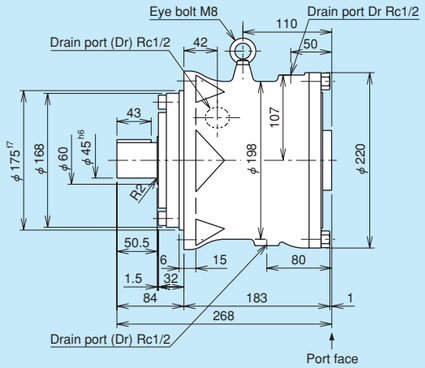
(Dimensions in mm)

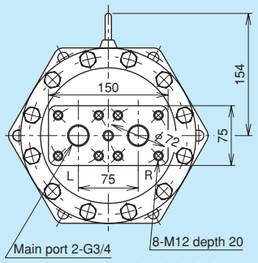


DIRECTION OF ROTATION
R : SUPPLIED HIGH PRESSURE OIL AT PORT R.
L : SUPPLIED HIGH PRESSURE OIL AT PORT L.



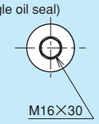
JIS B1301-1976
Shaft with screw for key retention
Shaft code : C

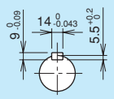




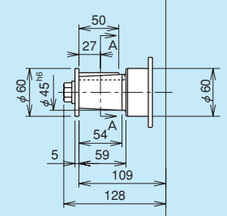
Tapered shaft (1/10 taper)

Shaft code : B (Single oil seal)



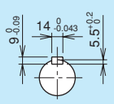


Seal land area of shaft is chrome plated

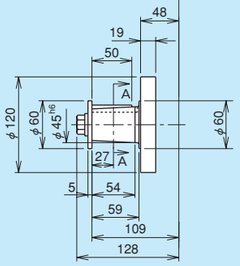


Tapered shaft (1/10 taper)

Shaft code : BW (Double oil seal)

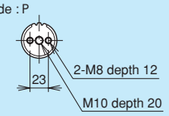


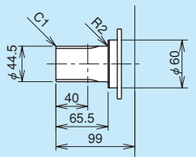
Seal land area of shaft is chrome plated



Splined shaft

Shaft code : P





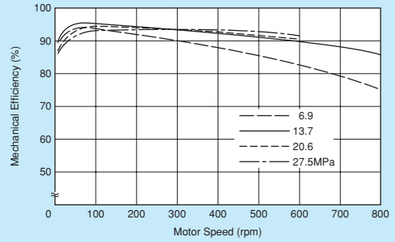
JIS D2001 Involute Spline 45 ×16×2.5 (Class b)

Shaft	Tool	Coefficient of profile shifting	+0.800
		Tooth form	Stub tooth
		Module	2.5
		Pressure angle	20°
	Number of teeth		16
	Dia. of basic pitch circle		40
	Tooth thickness	Grade	Class b (flank fit)
		Over-pin dia.	49.277 $^{-0.018}_{-0.107}$ Pin dia.= φ4.5
		Over-all, across a given number of teeth (reference)	20.379 $^{-0.001}_{-0.058}$ (3-teeth)
	Outer dia.		44.5
	Inner dia.		39
Hole	Tool	Coefficient of profile shifting	+0.800
		Tooth form	Stub tooth
		Module	2.5
		Pressure angle	20°
	Number of teeth		16
	Dia. of basic pitch circle		40
	Tooth width	Over-pin dia.	35.168 $^{+0.085}_{0}$ Pin dia.= φ5 Thickness of chamfered part=4.26
		Over-all, Displacement across a given number of grooves (reference)	20.379 $^{+0.030}_{-0.009}$ (3-teeth)
	Outer dia.		45.75
	Inner dia.		40 $^{+0.025}_{0}$

Performance Data

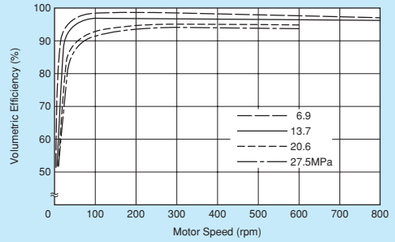
FLUID : SHELL TELLUS 56 (Viscosity 37cSt at 50°C)
The graphs shown are mean values obtained for production units.

Fig. 1 Mechanical Efficiency



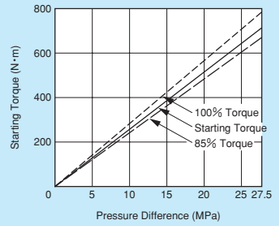
Mechanical efficiency at various speeds is shown for 4 operating pressures.

Fig. 2 Volumetric Efficiency



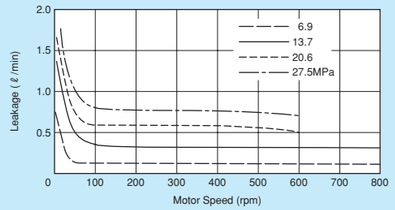
Volumetric efficiency at various speeds is shown for 4 operating pressures.

Fig. 3 Starting Torque



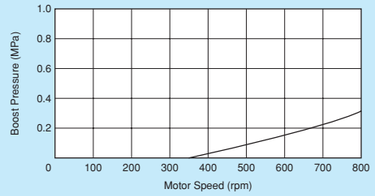
Starting torque versus effective pressure is shown.
Oil viscosity will not affect the starting torque efficiency.

Fig. 4 External Leakage



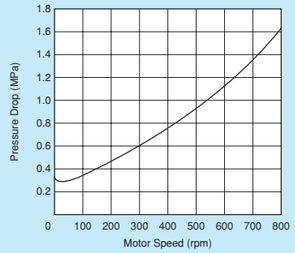
External leakage (from motor drain ports) relative to various speeds is shown for 4 operating pressures.

Fig. 5 Minimum Boost Pressure



It is important that sufficient inlet pressure is maintained, when the motor is operated as a pump or when the load overruns the motor, to prevent cavitation.

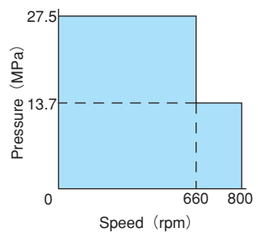
Fig. 6 Pressure Drop



Pressure necessary to run motor without load is shown for various speeds.

ME300B

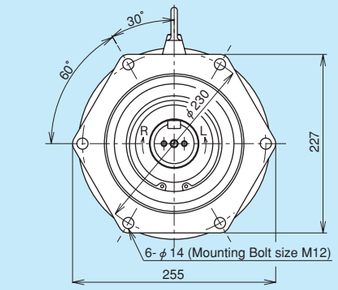
Applicable Range



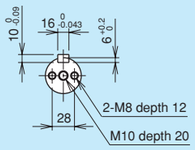
Displacement	300cm³/rev
Rated Pressure	27.5MPa (280kgf/cm²)
Peak Pressure	31.9MPa (325kgf/cm²)
Rated Torque	1320N·m (134kgf·m)
Rated Speed	660rpm
Max. Speed	800rpm
Rated Horse Power	90kW (123PS)
Mass	60kg

Nominal Dimensions

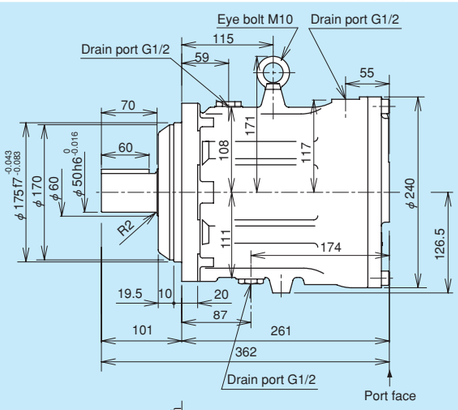
(Dimensions in mm)

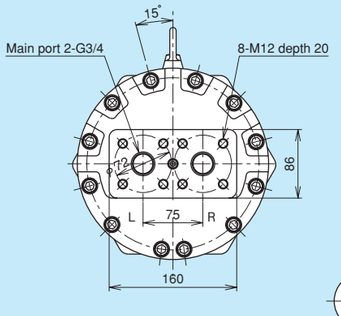


DIRECTION OF ROTATION
R : SUPPLIED HIGH PRESSURE OIL AT PORT R.
L : SUPPLIED HIGH PRESSURE OIL AT PORT L.



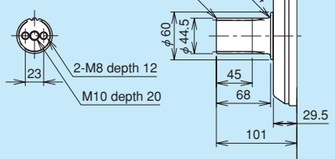
JIS B1301-1976
Shaft with screw for key retention
Shaft code : C





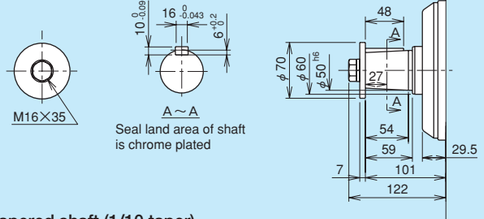
Splined shaft

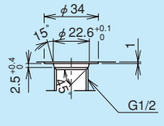
Shaft code : P



Tapered shaft (1/10 taper)

Shaft code : B (Single oil seal)

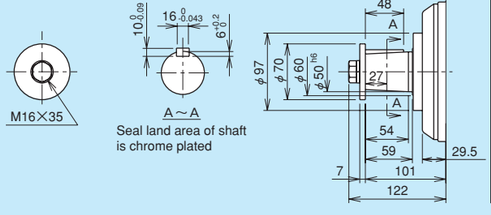


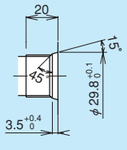


Details of drain port

Tapered shaft (1/10 taper)

Shaft code : BW (Double oil seal)





Details of main port

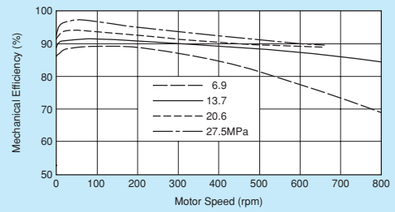
JIS D2001 Involute Spline 45 ×16×2.5 (Class b)

Shaft		Coefficient of profile shifting	+0.800
	Tool	Tooth form	Stub tooth
		Module	2.5
		Pressure angle	20°
	Number of teeth		16
	Dia. of basic pitch circle		40
	Tooth thickness	Grade	Class b (flank fit)
		Over-pin dia.	49.277 $^{-0.018}_{-0.107}$ Pin dia.=φ4.5
		Over-all, across a given number of teeth (reference)	20.379 $^{-0.001}_{-0.058}$ (3-teeth)
	Outer dia.		44.5
	Inner dia.		39
Hole		Coefficient of profile shifting	+0.800
	Tool	Tooth form	Stub tooth
		Module	2.5
		Pressure angle	20°
	Number of teeth		16
	Dia. of basic pitch circle		40
	Tooth width	Over-pin dia.	35.168 $^{+0.085}_{0}$ Pin dia.=φ5 Thickness of chamfered part=4.26
		Over-all, Displacement across a given number of grooves (reference)	20.379 $^{+0.030}_{-0.009}$ (3-teeth)
	Outer dia.		45.75
	Inner dia.		40 $^{+0.025}_{0}$

Performance Data

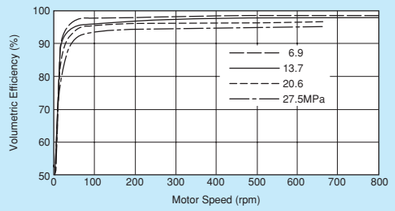
FLUID : SHELL TELLUS 56 (Viscosity 37cSt at 50°C)
The graphs shown are mean values obtained for production units.

Fig. 1 Mechanical Efficiency



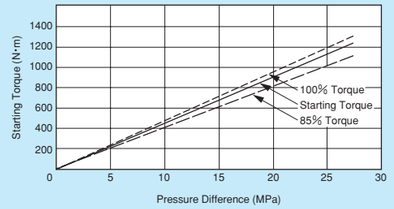
Mechanical efficiency at various speeds is shown for 4 operating pressures.

Fig. 2 Volumetric Efficiency



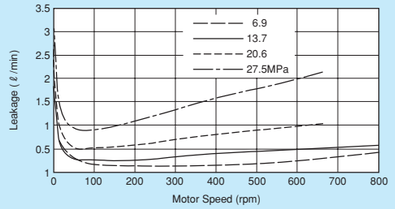
Volumetric efficiency at various speeds is shown for 4 operating pressures.

Fig. 3 Starting Torque



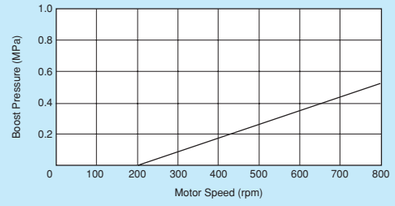
Starting torque versus effective pressure is shown.
Oil viscosity will not affect the starting torque efficiency.

Fig. 4 External Leakage



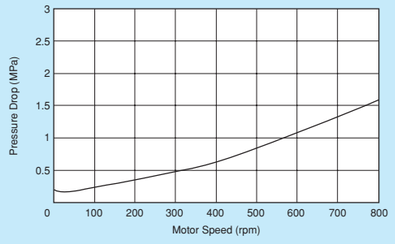
External leakage (from motor drain ports) relative to various speeds is shown for 4 operating pressures.

Fig. 5 Minimum Boost Pressure



It is important that sufficient inlet pressure is maintained, when the motor is operated as a pump or when the load overruns the motor, to prevent cavitation.

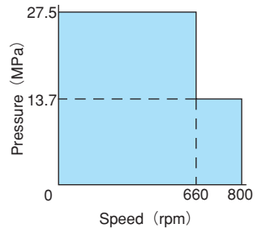
Fig. 6 Pressure Drop



Pressure necessary to run motor without load is shown for various speeds.

ME350B

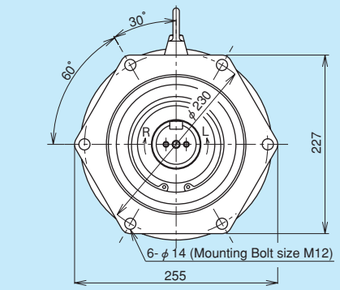
Applicable Range



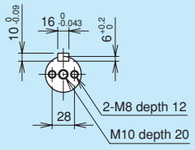
Displacement	350cm³/rev
Rated Pressure	27.5MPa (280kgf/cm²)
Peak Pressure	31.9MPa (325kgf/cm²)
Rated Torque	1530N·m (156kgf·m)
Rated Speed	660rpm
Max. Speed	800rpm
Rated Horse Power	106kW (144PS)
Mass	60kg

Nominal Dimensions

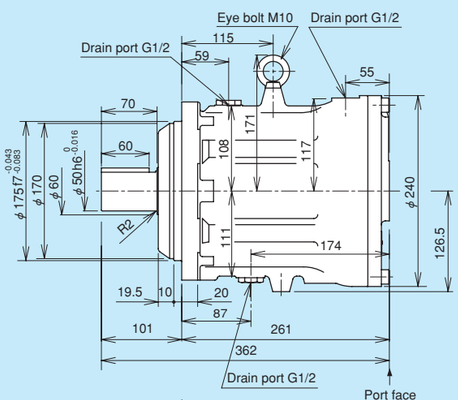
(Dimensions in mm)

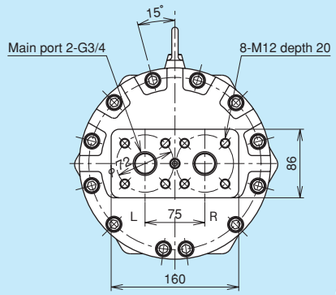


DIRECTION OF ROTATION
R : SUPPLIED HIGH PRESSURE OIL AT PORT R.
L : SUPPLIED HIGH PRESSURE OIL AT PORT L.



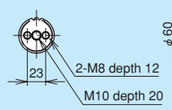
JIS B1301-1976
Shaft with screw for key retention
Shaft code : C

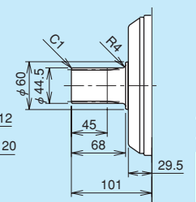




Splined shaft

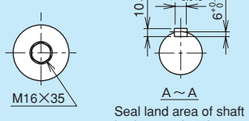
Shaft code : P

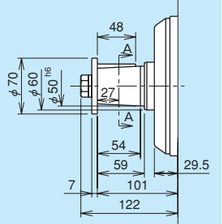


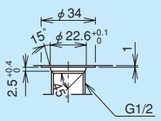


Tapered shaft (1/10 taper)

Shaft code : B (Single oil seal)



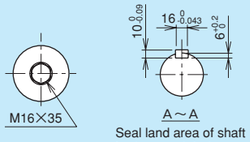


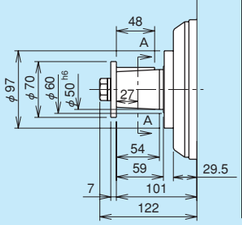


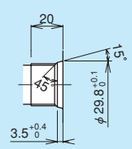
Details of drain port

Tapered shaft (1/10 taper)

Shaft code : BW (Double oil seal)







Details of main port

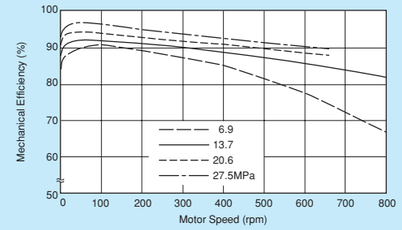
JIS D2001 Involute Spline 45 ×16×2.5 (Class b)

Shaft		Coefficient of profile shifting	+0.800
	Tool	Tooth form	Stub tooth
		Module	2.5
		Pressure angle	20°
		Number of teeth	16
		Dia. of basic pitch circle	40
	Tooth thickness	Grade	Class b (flank fit)
		Over-pin dia.	49.277 $^{-0.018}_{-0.107}$ Pin dia.=φ4.5
		Over-all, across a given number of teeth (reference)	20.379 $^{-0.001}_{-0.058}$ (3-teeth)
		Outer dia.	44.5
		Inner dia.	39
Hole		Coefficient of profile shifting	+0.800
	Tool	Tooth form	Stub tooth
		Module	2.5
		Pressure angle	20°
		Number of teeth	16
		Dia. of basic pitch circle	40
	Tooth width	Over-pin dia.	35.168 $^{+0.085}_{0}$ Pin dia.=φ5 Thickness of chamfered part=4.26
		Over-all, Displacement across a given number of grooves (reference)	20.379 $^{+0.039}_{-0.009}$ (3-teeth)
		Outer dia.	45.75
		Inner dia.	40 $^{+0.025}_{0}$

Performance Data

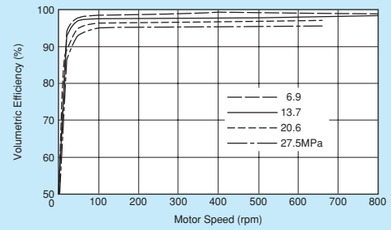
FLUID : SHELL TELLUS 56 (Viscosity 37cSt at 50°C)
The graphs shown are mean values obtained for production units.

Fig. 1 Mechanical Efficiency



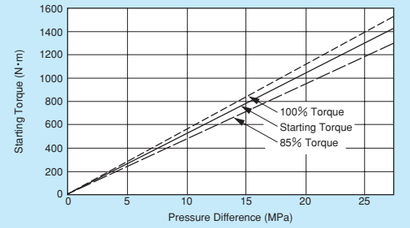
Mechanical efficiency at various speeds is shown for 4 operating pressures.

Fig. 2 Volumetric Efficiency



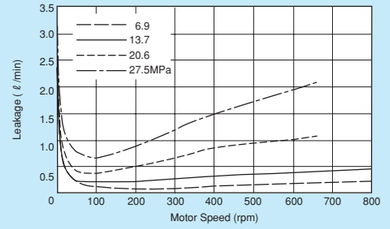
Volumetric efficiency at various speeds is shown for 4 operating pressures.

Fig. 3 Starting Torque



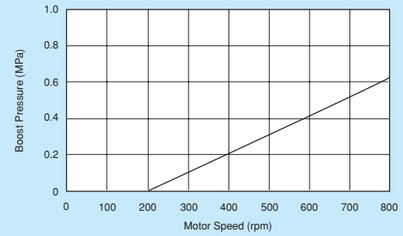
Starting torque versus effective pressure is shown.
Oil viscosity will not affect the starting torque efficiency.

Fig. 4 External Leakage



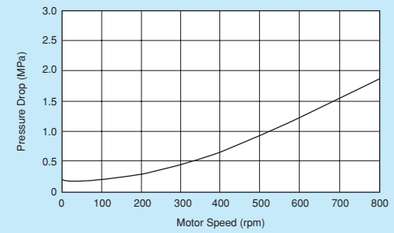
External leakage (from motor drain ports)
relative to various speeds is shown for 4 operating pressures.

Fig. 5 Minimum Boost Pressure



It is important that sufficient inlet pressure is maintained, when the motor is operated as a pump or when the load overruns the motor, to prevent cavitation.

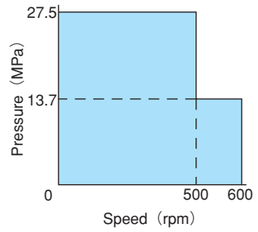
Fig. 6 Pressure Drop



Pressure necessary to run motor without load is shown for various speeds.

ME600B

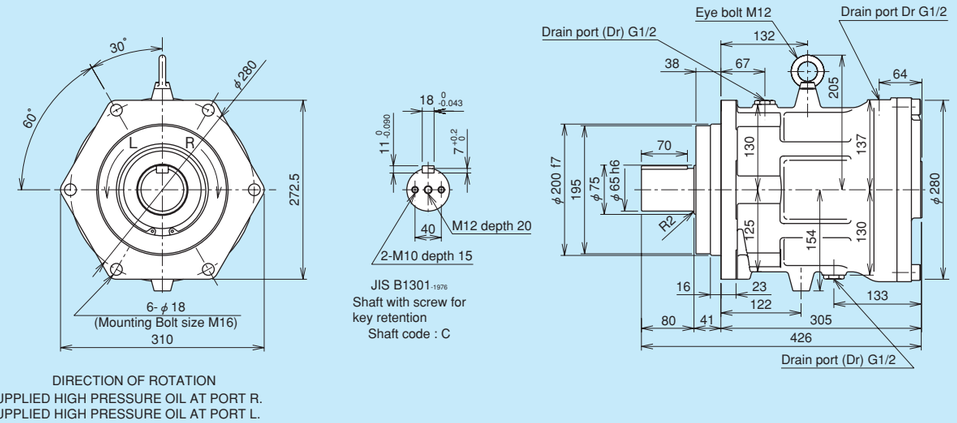
Applicable Range



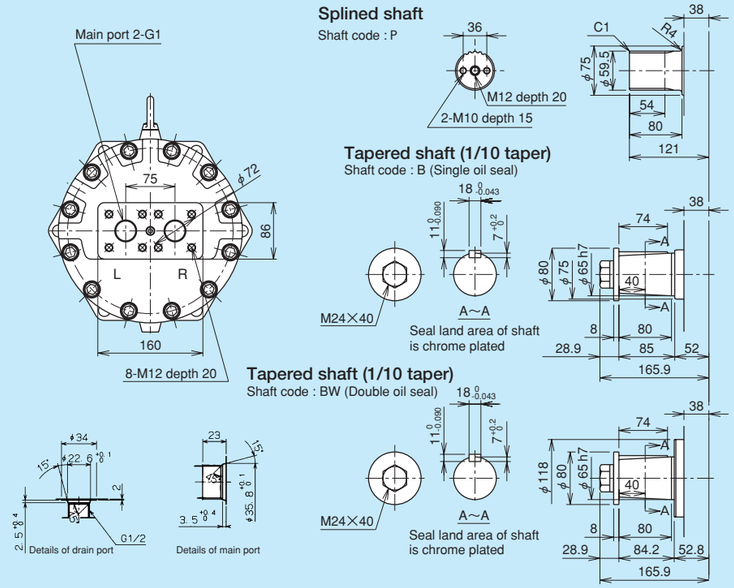
Displacement	600cm³/rev
Rated Pressure	27.5MPa (280kgf/cm²)
Peak Pressure	31.9MPa (325kgf/cm²)
Rated Torque	2620N·m (267kgf·m)
Rated Speed	500rpm
Max. Speed	600rpm
Rated Horse Power	137kW (186PS)
Mass	96kg

Nominal Dimensions

(Dimensions in mm)



DIRECTION OF ROTATION
R : SUPPLIED HIGH PRESSURE OIL AT PORT R.
L : SUPPLIED HIGH PRESSURE OIL AT PORT L.



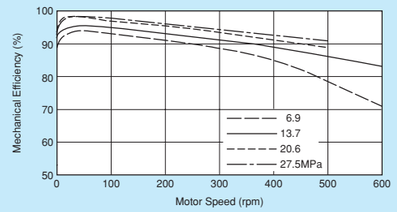
JIS D2001 Involute Spline 60 ×22×2.5 (Class b)

Shaft		Coefficient of profile shifting	+0.800
	Tool	Tooth form	Stub tooth
		Module	2.5
		Pressure angle	20°
	Number of teeth		22
	Dia. of basic pitch circle		55
	Tooth thickness	Grade	Class b (flank fit)
		Over-pin dia.	64.516 −0.020 −0.114 Pin dia.=φ4.5
		Over-all, across a given number of teeth (reference)	27.970 −0.001 −0.058 (4-teeth)
	Outer dia.		59.5
	Inner dia.		54
Hole		Coefficient of profile shifting	+0.800
	Tool	Tooth form	Stub tooth
		Module	2.5
		Pressure angle	20°
	Number of teeth		22
	Dia. of basic pitch circle		55
	Tooth width	Over-pin dia.	50.168 +0.086 0 Pin dia.=φ5 Thickness of chamfered part=4.26
		Over-all, Displacement across a given number of grooves (reference)	27.970 +0.030 −0.009 (4-teeth)
	Outer dia.		60.75
	Inner dia.		55 +0.030 0

Performance Data

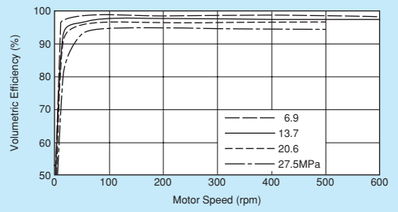
FLUID : SHELL TELLUS 56 (Viscosity 37cSt at 50°C)
The graphs shown are mean values obtained for production units.

Fig. 1 Mechanical Efficiency



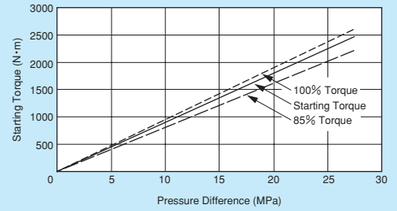
Mechanical efficiency at various speeds is shown for 4 operating pressures.

Fig. 2 Volumetric Efficiency



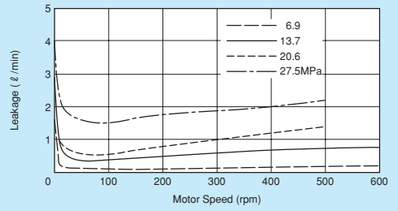
Volumetric efficiency at various speeds is shown for 4 operating pressures.

Fig. 3 Starting Torque



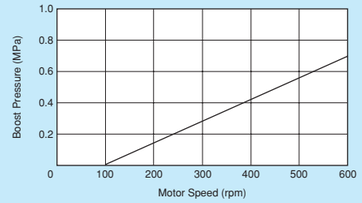
Starting torque versus effective pressure is shown.
Oil viscosity will not affect the starting torque efficiency.

Fig. 4 External Leakage



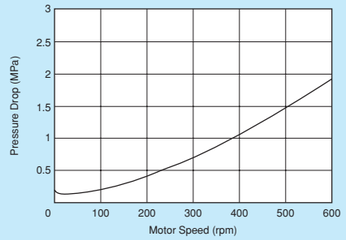
External leakage (from motor drain ports)
relative to various speeds is shown for 4 operating pressures.

Fig. 5 Minimum Boost Pressure



It is important that sufficient inlet pressure is maintained, when the motor is operated as a pump or when the load overruns the motor, to prevent cavitation.

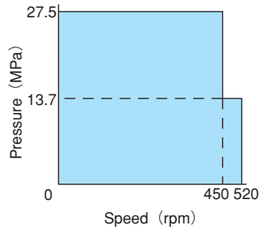
Fig. 6 Pressure Drop



Pressure necessary to run motor without load is shown for various speeds.

ME750B

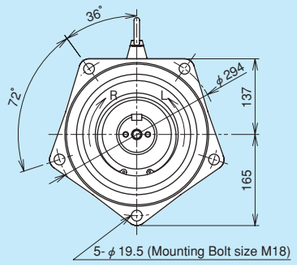
Applicable Range



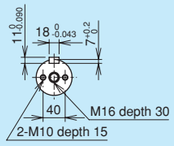
Displacement	750cm³/rev
Rated Pressure	27.5MPa (280kgf/cm²)
Peak Pressure	31.9MPa (325kgf/cm²)
Rated Torque	3280N·m (334kgf·m)
Rated Speed	450rpm
Max. Speed	520rpm
Rated Horse Power	154kW (210PS)
Mass	123kg

Nominal Dimensions

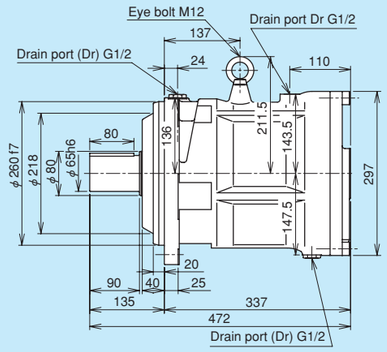
(Dimensions in mm)

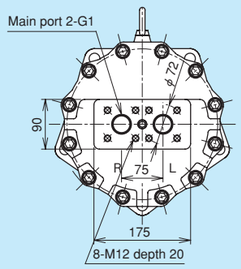


DIRECTION OF ROTATION
R : SUPPLIED HIGH PRESSURE OIL AT PORT R.
L : SUPPLIED HIGH PRESSURE OIL AT PORT L.



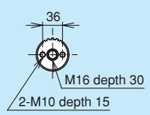
JIS B1301-1976
Shaft with screw for key retention
Shaft code : C

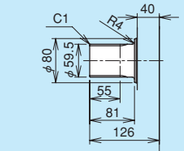




Splined shaft

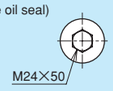
Shaft code : P

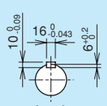




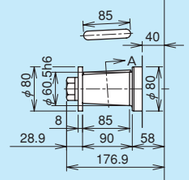
Tapered shaft (1/10 taper)

Shaft code : B (Single oil seal)



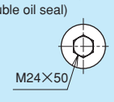


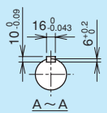
Seal land area of shaft is chrome plated



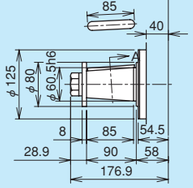
Tapered shaft (1/10 taper)

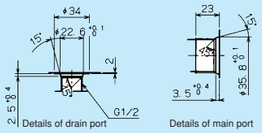
Shaft code : BW (Double oil seal)





Seal land area of shaft is chrome plated





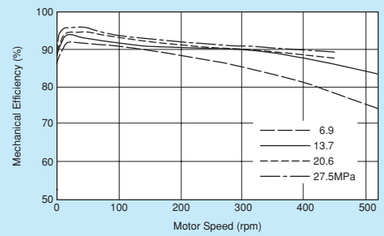
JIS D2001 Involute Spline 60 ×22×2.5 (Class b)

Shaft		Coefficient of profile shifting	+0.800
	Tool	Tooth form	Stub tooth
		Module	2.5
		Pressure angle	20°
		Number of teeth	22
		Dia. of basic pitch circle	55
	Tooth thickness	Grade	Class b (flank fit)
		Over-pin dia.	64.516 −0.020 −0.114 Pin dia.=φ4.5
		Over-all, across a given number of teeth (reference)	27.970 −0.001 −0.058 (4-teeth)
		Outer dia.	59.5
		Inner dia.	54
Hole		Coefficient of profile shifting	+0.800
	Tool	Tooth form	Stub tooth
		Module	2.5
		Pressure angle	20°
		Number of teeth	22
		Dia. of basic pitch circle	55
	Tooth width	Over-pin dia.	50.168 +0.086 0 Pin dia.=φ5 Thickness of chamfered part=4.26
		Over-all, Displacement across a given number of grooves (reference)	27.970 +0.030 −0.009 (4-teeth)
		Outer dia.	60.75
		Inner dia.	55 +0.030 0

Performance Data

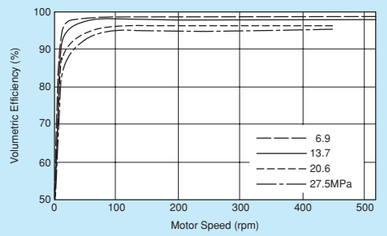
FLUID : SHELL TELLUS 56 (Viscosity 37cSt at 50°C)
The graphs shown are mean values obtained for production units.

Fig. 1 Mechanical Efficiency



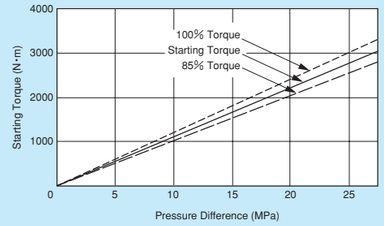
Mechanical efficiency at various speeds is shown for 4 operating pressures.

Fig. 2 Volumetric Efficiency



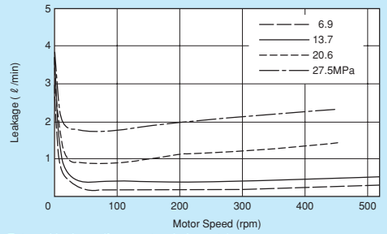
Volumetric efficiency at various speeds is shown for 4 operating pressures.

Fig. 3 Starting Torque



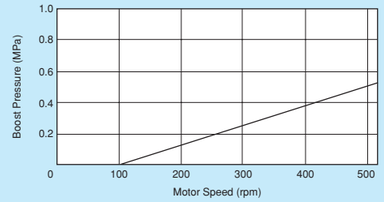
Starting torque versus effective pressure is shown.
Oil viscosity will not affect the starting torque efficiency.

Fig. 4 External Leakage



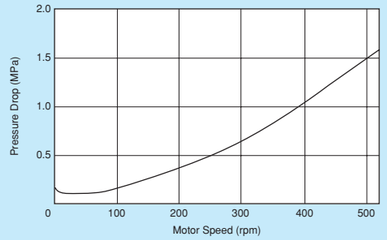
External leakage (from motor drain ports) relative to various speeds is shown for 4 operating pressures.

Fig. 5 Minimum Boost Pressure



It is important that sufficient inlet pressure is maintained, when the motor is operated as a pump or when the load overruns the motor, to prevent cavitation.

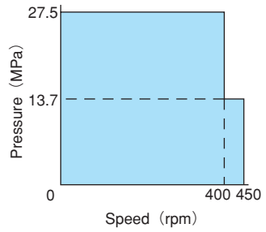
Fig. 6 Pressure Drop



Pressure necessary to run motor without load is shown for various speeds.

ME850B

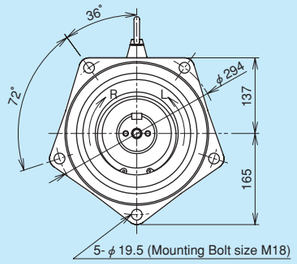
Applicable Range



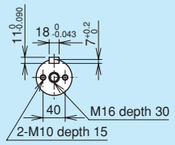
Displacement	848cm³/rev
Rated Pressure	27.5MPa (280kgf/cm²)
Peak Pressure	31.9MPa (325kgf/cm²)
Rated Torque	3708N·m (378kgf·m)
Rated Speed	400rpm
Max. Speed	450rpm
Rated Horse Power	155kW (211PS)
Mass	123kg

Nominal Dimensions

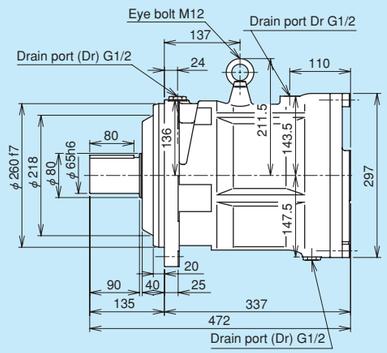
(Dimensions in mm)

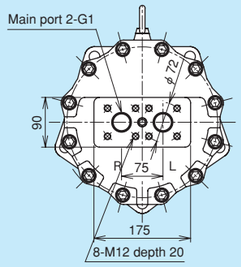


DIRECTION OF ROTATION
R : SUPPLIED HIGH PRESSURE OIL AT PORT R.
L : SUPPLIED HIGH PRESSURE OIL AT PORT L.



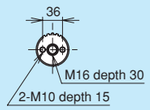
JIS B1301-1976
Shaft with screw for key retention
Shaft code : C

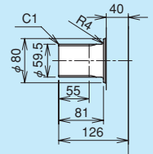




Splined shaft

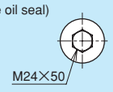
Shaft code : P

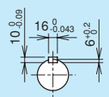




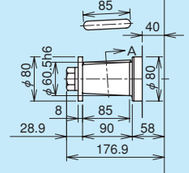
Tapered shaft (1/10 taper)

Shaft code : B (Single oil seal)



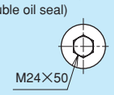


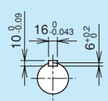
Seal land area of shaft is chrome plated



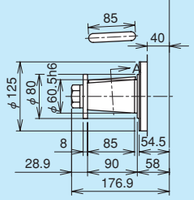
Tapered shaft (1/10 taper)

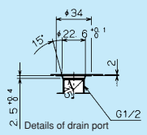
Shaft code : BW (Double oil seal)

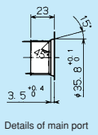




Seal land area of shaft is chrome plated







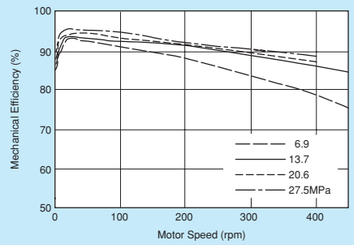
JIS D2001 Involute Spline 60 ×22×2.5 (Class b)

Shaft	Coefficient of profile shifting		+0.800
	Tool	Tooth form	Stub tooth
		Module	2.5
		Pressure angle	20°
	Number of teeth		22
	Dia. of basic pitch circle		55
	Tooth thickness	Grade	Class b (flank fit)
		Over-pin dia.	64.516 −0.020 −0.114 Pin dia.=φ4.5
		Over-all, across a given number of teeth (reference)	27.970 −0.001 −0.058 (4-teeth)
	Outer dia.		59.5
	Inner dia.		54
Hole	Coefficient of profile shifting		+0.800
	Tool	Tooth form	Stub tooth
		Module	2.5
		Pressure angle	20°
	Number of teeth		22
	Dia. of basic pitch circle		55
	Tooth width	Over-pin dia.	50.168 +0.086 0 Pin dia.=φ5 Thickness of chamfered part=4.26
		Over-all, Displacement across a given number of grooves (reference)	27.970 +0.030 −0.009 (4-teeth)
	Outer dia.		60.75
	Inner dia.		55 +0.030 0

Performance Data

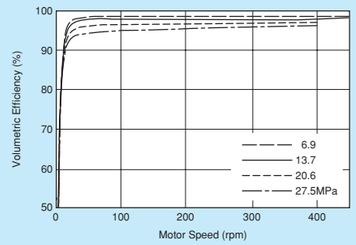
FLUID : SHELL TELLUS 56 (Viscosity 37cSt at 50°C)
The graphs shown are mean values obtained for production units.

Fig. 1 Mechanical Efficiency



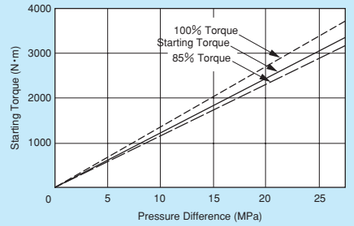
Mechanical efficiency at various speeds is shown for 4 operating pressures.

Fig. 2 Volumetric Efficiency



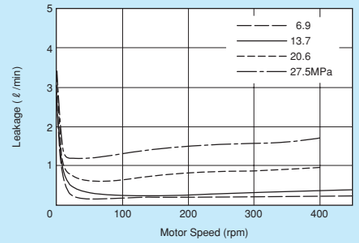
Volumetric efficiency at various speeds is shown for 4 operating pressures.

Fig. 3 Starting Torque



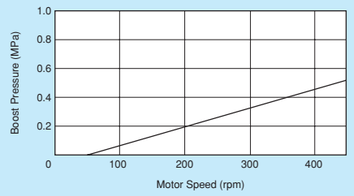
Starting torque versus effective pressure is shown.
Oil viscosity will not affect the starting torque efficiency.

Fig. 4 External Leakage



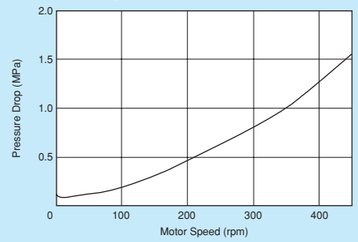
External leakage (from motor drain ports) relative to various speeds is shown for 4 operating pressures.

Fig. 5 Minimum Boost Pressure



It is important that sufficient inlet pressure is maintained, when the motor is operated as a pump or when the load overruns the motor, to prevent cavitation.

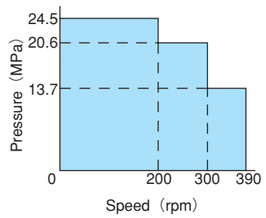
Fig. 6 Pressure Drop



Pressure necessary to run motor without load is shown for various speeds.

ME1300A

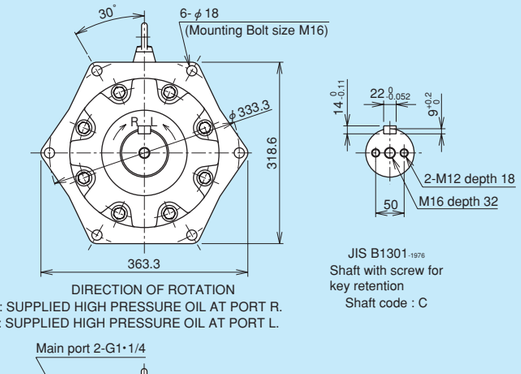
Applicable Range



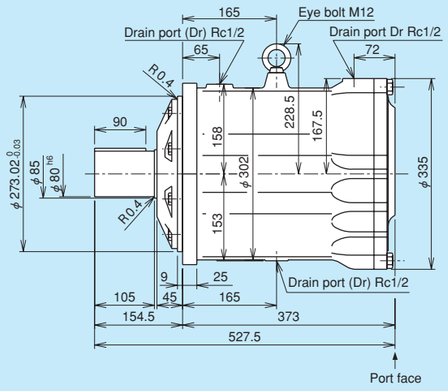
Displacement	1345cm³/rev
Rated Pressure	24.5MPa (250kgf/cm²)
Peak Pressure	31.9MPa (325kgf/cm²)
Rated Torque	5250N·m (535kgf·m)
Rated Speed	200rpm
Max. Speed	390rpm
Rated Horse Power	138kW (188PS)
Mass	170kg

Nominal Dimensions

(Dimensions in mm)

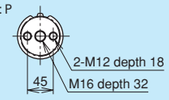


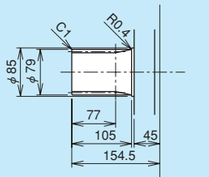
JIS B1301-1976
Shaft with screw for key retention
Shaft code : C



Splined shaft

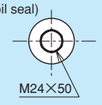
Shaft code : P

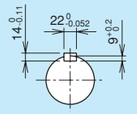




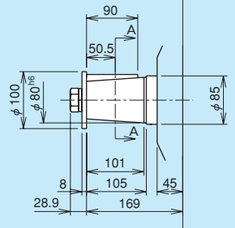
Tapered shaft (1/10 taper)

Shaft code : B (Single oil seal)



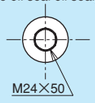


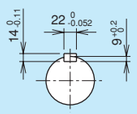
Seal land area of shaft is chrome plated



Tapered shaft (1/10 taper)

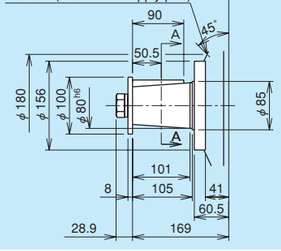
Shaft code : BW (Double oil seal oil seal)





Seal land area of shaft is chrome plated

2-Rc1/8 (Air vent/oil supply port)



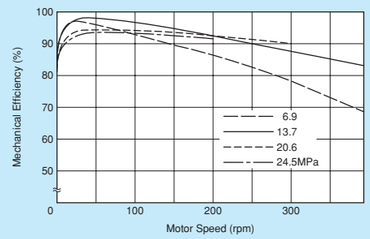
JIS D2001 Involute Spline 80 ×14×5 (Class b)

Shaft		Coefficient of profile shifting	+0.800
	Tool	Tooth form	Stub tooth
		Module	5
		Pressure angle	20°
	Number of teeth		14
	Dia. of basic pitch circle		70
	Tooth thickness	Grade	Class b (flank fit)
		Over-pin dia.	88.346 $^{-0.029}_{-0.154}$ Pin dia.=φ9
		Over-all, across a given number of teeth (reference)	40.618 $^{-0.002}_{-0.086}$ (3-teeth)
	Outer dia.		79
	Inner dia.		68
Hole		Coefficient of profile shifting	+0.800
	Tool	Tooth form	Stub tooth
		Module	5
		Pressure angle	20°
	Number of teeth		14
	Dia. of basic pitch circle		70
	Tooth width	Over-pin dia.	60.335 $^{+0.121}_{0}$ Pin dia.=φ10 Thickness of chamfered part=8.4
		Over-all, Displacement across a given number of grooves (reference)	40.618 $^{+0.043}_{-0.011}$ (3-teeth)
	Outer dia.		81.5
	Inner dia.		70 $^{+0.030}_{0}$

Performance Data

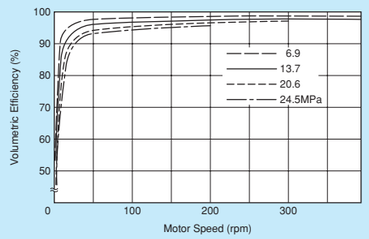
FLUID : SHELL TELLUS 56 (Viscosity 37cSt at 50°C)
The graphs shown are mean values obtained for production units.

Fig. 1 Mechanical Efficiency



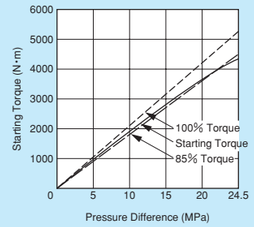
Mechanical efficiency at various speeds is shown for 4 operating pressures.

Fig. 2 Volumetric Efficiency



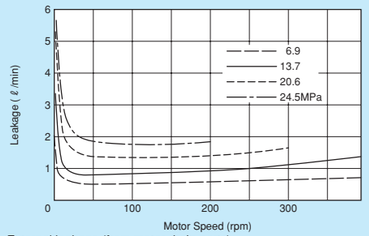
Volumetric efficiency at various speeds is shown for 4 operating pressures.

Fig. 3 Starting Torque



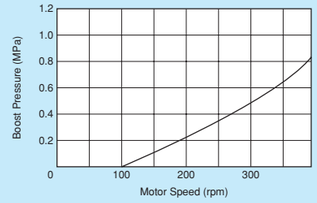
Starting torque versus effective pressure is shown.
Oil viscosity will not affect the starting torque efficiency.

Fig. 4 External Leakage



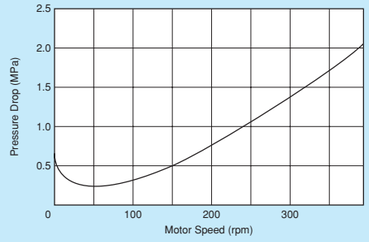
External leakage (from motor drain ports) relative to various speeds is shown for 4 operating pressures.

Fig. 5 Minimum Boost Pressure



It is important that sufficient inlet pressure is maintained, when the motor is operated as a pump or when the load overruns the motor, to prevent cavitation.

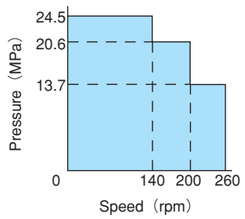
Fig. 6 Pressure Drop



Pressure necessary to run motor without load is shown for various speeds.

ME1900

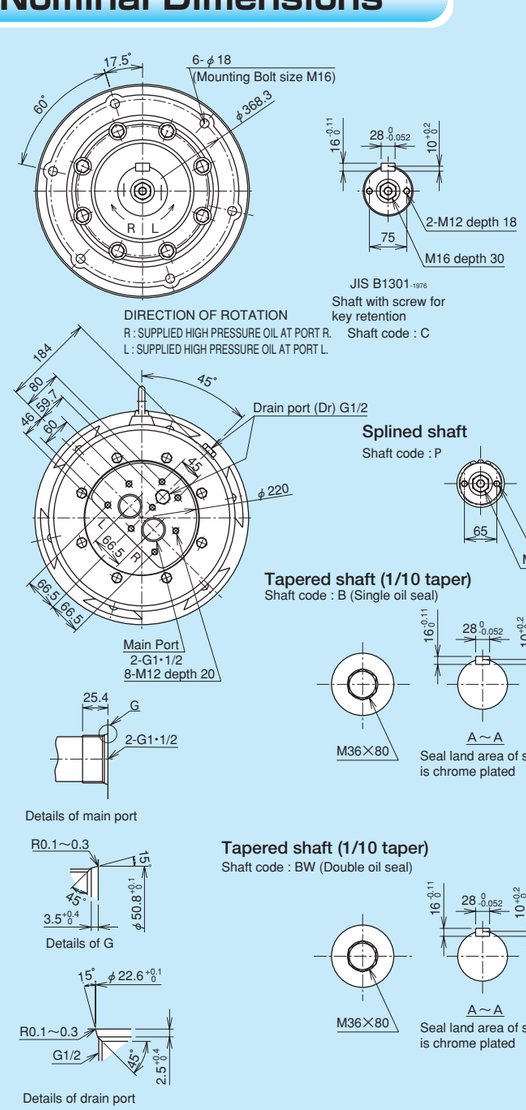
Applicable Range



Displacement	1868cm³/rev
Rated Pressure	24.5MPa (250kgf/cm²)
Peak Pressure	31.9MPa (325kgf/cm²)
Rated Torque	7290N·m (743kgf·m)
Rated Speed	140rpm
Max. Speed	260rpm
Rated Horse Power	128kW (174PS)
Mass	270kg

Nominal Dimensions

(Dimensions in mm)



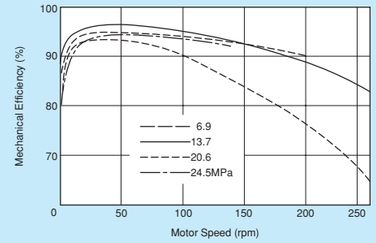
JIS D2001 Involute Spline 95 ×17×5 (Class a)

Shaft		Coefficient of profile shifting	+0.800
	Tool	Tooth form	Stub tooth
		Module	5
		Pressure angle	20°
	Number of teeth		17
	Dia. of basic pitch circle		85
	Tooth thickness	Grade	Class a (major dia. fit)
		Over-pin dia.	103.242 $^{-0.176}_{-0.306}$ Pin dia.=φ9
		Over-all, across a given number of teeth (reference)	40.828 $^{-0.084}_{-0.165}$ (3-teeth)
	Outer dia.		95 $^{-0.12}_{-0.155}$
	Inner dia.		83
Hole		Coefficient of profile shifting	+0.800
	Tool	Tooth form	Stub tooth
		Module	5
		Pressure angle	20°
	Number of teeth		17
	Dia. of basic pitch circle		85
	Tooth width	Over-pin dia.	74.972 $^{+0.122}_{0}$ Pin dia.=φ10 Thickness of chamfered part=8.4
		Over-all, Displacement across a given number of grooves (reference)	40.828 $^{+0.043}_{-0.011}$ (3-teeth)
	Outer dia.		95 $^{-0.038}_{-0.073}$
	Inner dia.		85 $^{+0.035}_{0}$

Performance Data

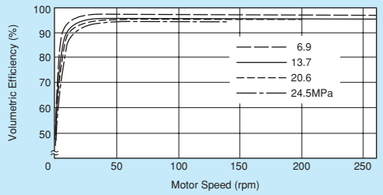
FLUID : SHELL TELLUS 56 (Viscosity 37cSt at 50°C)
The graphs shown are mean values obtained for production units.

Fig. 1 Mechanical Efficiency



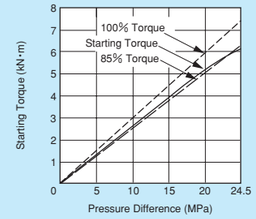
Mechanical efficiency at various speeds is shown for 4 operating pressures.

Fig. 2 Volumetric Efficiency



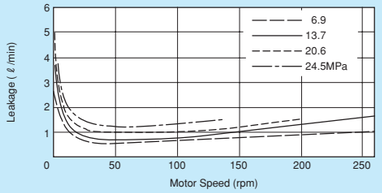
Volumetric efficiency at various speeds is shown for 4 operating pressures.

Fig. 3 Starting Torque



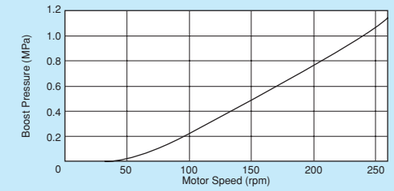
Starting torque versus effective pressure is shown.
Oil viscosity will not affect the starting torque efficiency.

Fig. 4 External Leakage



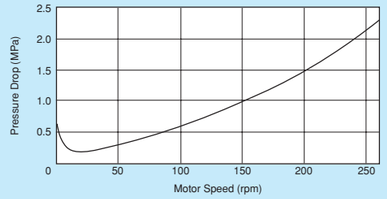
External leakage (from motor drain ports)
relative to various speeds is shown for 4 operating pressures.

Fig. 5 Minimum Boost Pressure



It is important that sufficient inlet pressure is maintained, when the motor is operated as a pump or when the load overruns the motor, to prevent cavitation.

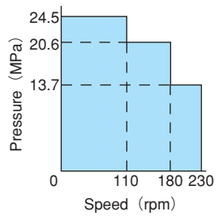
Fig. 6 Pressure Drop



Pressure necessary to run motor without load is shown for various speeds.

ME2600

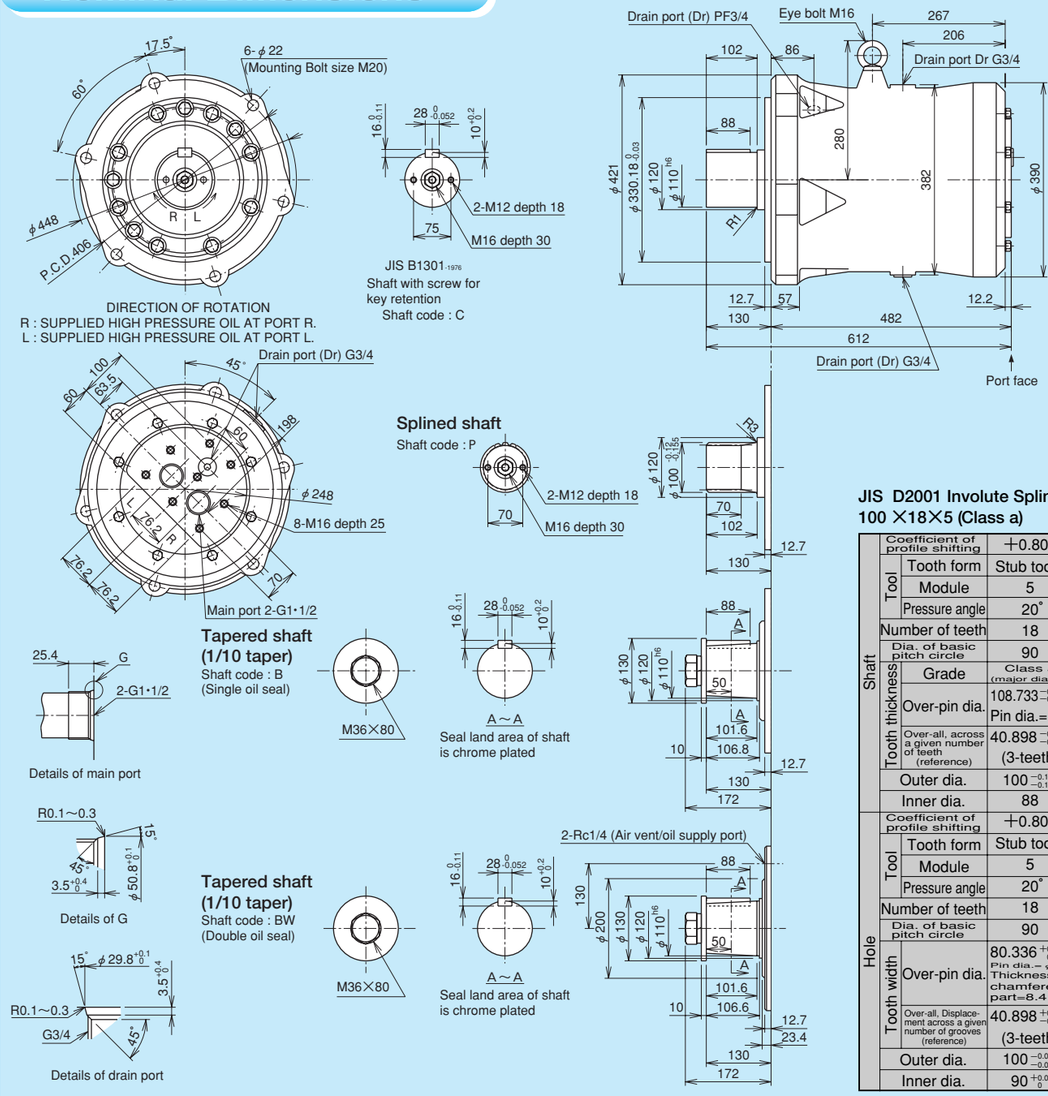
Applicable Range



Displacement	2578cm³/rev
Rated Pressure	24.5MPa (250kgf/cm²)
Peak Pressure	31.9MPa (325kgf/cm²)
Rated Torque	10060N·m (1026kgf·m)
Rated Speed	110rpm
Max. Speed	230rpm
Rated Horse Power	159kW (216PS)
Mass	350kg

Nominal Dimensions

(Dimensions in mm)



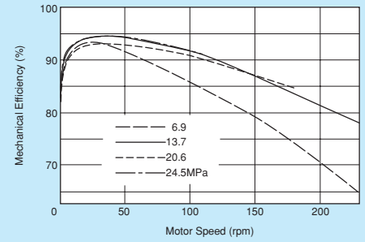
JIS D2001 Involute Spline 100 ×18×5 (Class a)

Shaft		Coefficient of profile shifting	+0.800
	Tool	Tooth form	Stub tooth
		Module	5
		Pressure angle	20°
	Number of teeth		18
	Dia. of basic pitch circle		90
	Tooth thickness	Grade	Class a (major dia. fit)
		Over-pin dia.	108.733 −0.179 −0.311 Pin dia.=φ9
		Over-all, across a given number of teeth (reference)	40.898 −0.084 −0.165 (3-teeth)
	Outer dia.		100 −0.12 −0.155
	Inner dia.		88
Hole		Coefficient of profile shifting	+0.800
	Tool	Tooth form	Stub tooth
		Module	5
		Pressure angle	20°
	Number of teeth		18
	Dia. of basic pitch circle		90
	Tooth width	Over-pin dia.	80.336 +0.122 0 Pin dia.=φ10 Thickness of chamfered part=8.4
		Over-all, Displacement across a given number of grooves (reference)	40.898 +0.043 −0.011 (3-teeth)
	Outer dia.		100 −0.038 −0.073
	Inner dia.		90 +0.035 0

Performance Data

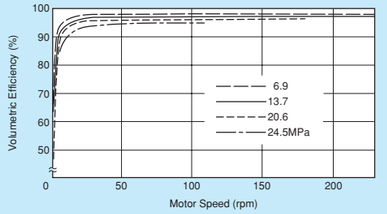
FLUID : SHELL TELLUS 56 (Viscosity 37cSt at 50°C)
The graphs shown are mean values obtained for production units.

Fig. 1 Mechanical Efficiency



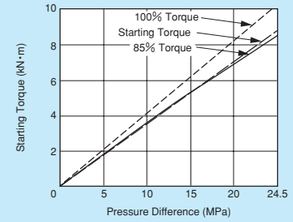
Mechanical efficiency at various speeds is shown for 4 operating pressures.

Fig. 2 Volumetric Efficiency



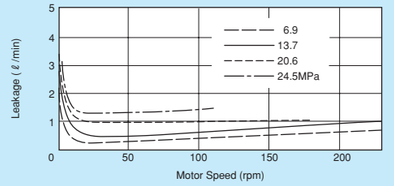
Volumetric efficiency at various speeds is shown for 4 operating pressures.

Fig. 3 Starting Torque



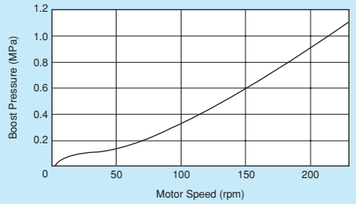
Starting torque versus effective pressure is shown.
Oil viscosity will not affect the starting torque efficiency.

Fig. 4 External Leakage



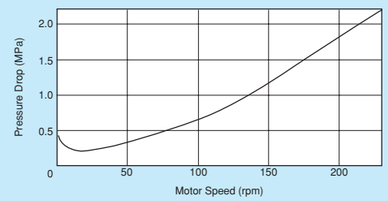
External leakage (from motor drain ports) relative to various speeds is shown for 4 operating pressures.

Fig. 5 Minimum Boost Pressure



It is important that sufficient inlet pressure is maintained, when the motor is operated as a pump or when the load overruns the motor, to prevent cavitation.

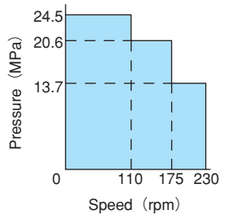
Fig. 6 Pressure Drop



Pressure necessary to run motor without load is shown for various speeds.

ME3100

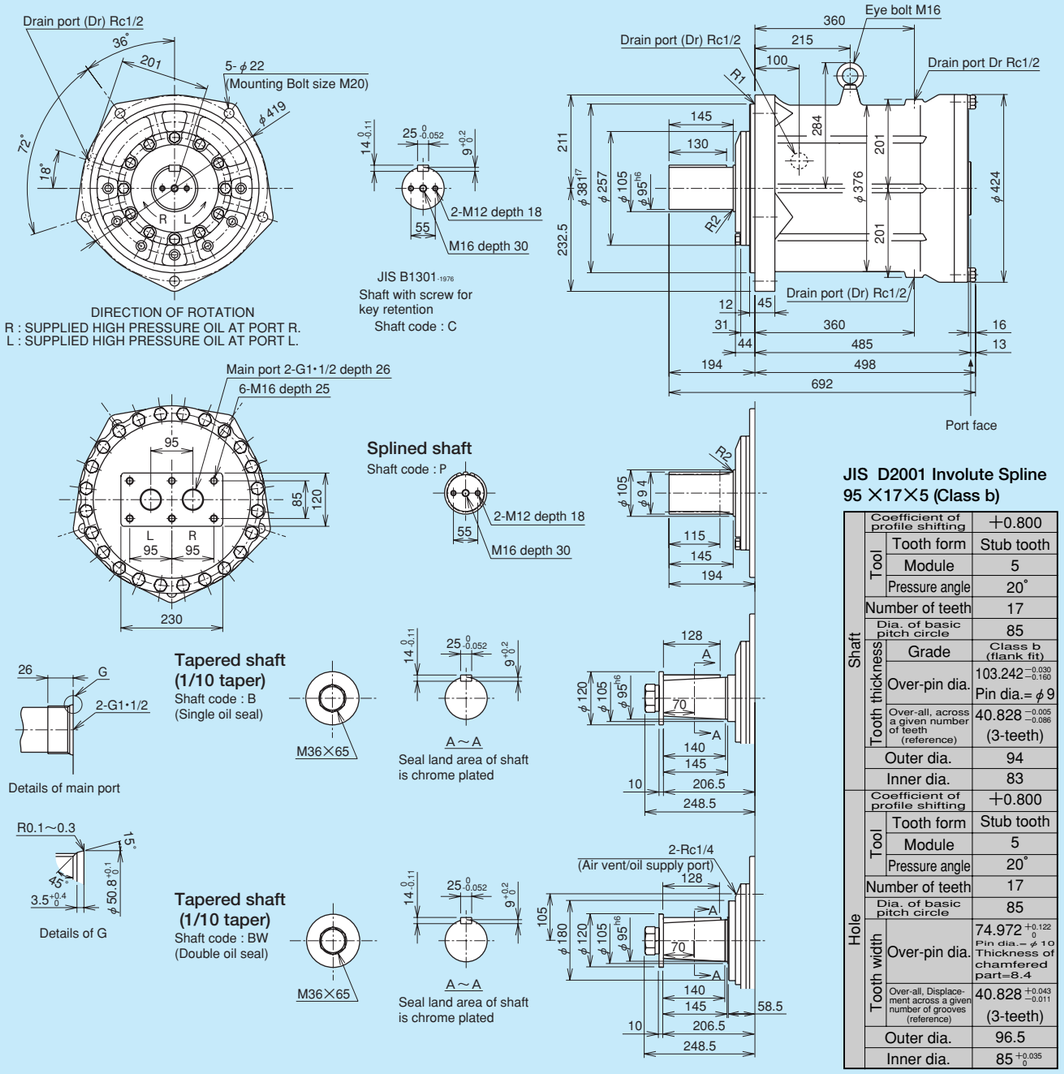
Applicable Range



Displacement	3104cm³/rev
Rated Pressure	24.5MPa (250kgf/cm²)
Peak Pressure	31.9MPa (325kgf/cm²)
Rated Torque	12110N·m (1235kgf·m)
Rated Speed	110rpm
Max. Speed	230rpm
Rated Horse Power	186kW (253PS)
Mass	364kg

Nominal Dimensions

(Dimensions in mm)

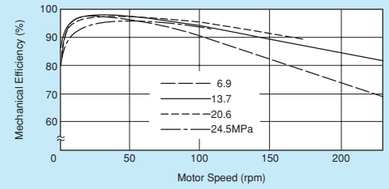


Shaft	Coefficient of profile shifting		+0.800
	Tool	Tooth form	Stub tooth
		Module	5
		Pressure angle	20°
	Number of teeth		17
	Dia. of basic pitch circle		85
	Tooth thickness	Grade	Class b (flank fit)
		Over-pin dia.	103.242 −0.030 −0.160 Pin dia.=φ9
		Over-all, across a given number of teeth (reference)	40.828 −0.005 −0.086 (3-teeth)
	Outer dia.		94
	Inner dia.		83
Hole	Coefficient of profile shifting		+0.800
	Tool	Tooth form	Stub tooth
		Module	5
		Pressure angle	20°
	Number of teeth		17
	Dia. of basic pitch circle		85
	Tooth width	Over-pin dia.	74.972 +0.122 0 Pin dia.=φ10 Thickness of chamfered part=8.4
		Over-all, Displacement across a given number of grooves (reference)	40.828 +0.043 −0.011 (3-teeth)
	Outer dia.		96.5
	Inner dia.		85 +0.035 0

Performance Data

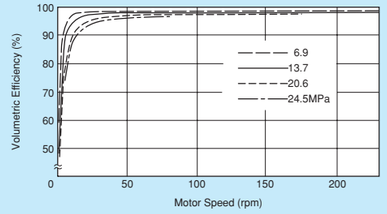
FLUID : SHELL TELLUS 56 (Viscosity 37cSt at 50°C)
The graphs shown are mean values obtained for production units.

Fig. 1 Mechanical Efficiency



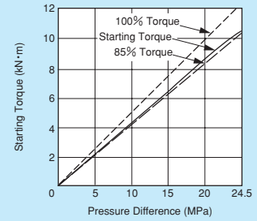
Mechanical efficiency at various speeds is shown for 4 operating pressures.

Fig. 2 Volumetric Efficiency



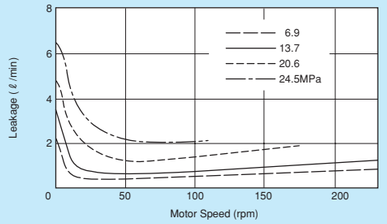
Volumetric efficiency at various speeds is shown for 4 operating pressures.

Fig. 3 Starting Torque



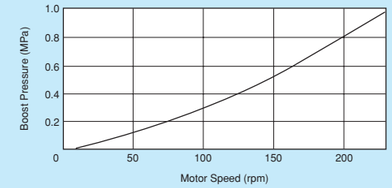
Starting torque versus effective pressure is shown.
Oil viscosity will not affect the starting torque efficiency.

Fig. 4 External Leakage



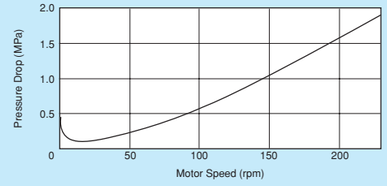
External leakage (from motor drain ports) relative to various speeds is shown for 4 operating pressures.

Fig. 5 Minimum Boost Pressure



It is important that sufficient inlet pressure is maintained, when the motor is operated as a pump or when the load overruns the motor, to prevent cavitation.

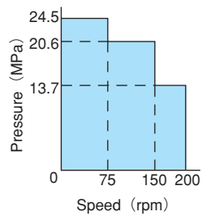
Fig. 6 Pressure Drop



Pressure necessary to run motor without load is shown for various speeds.

ME4100

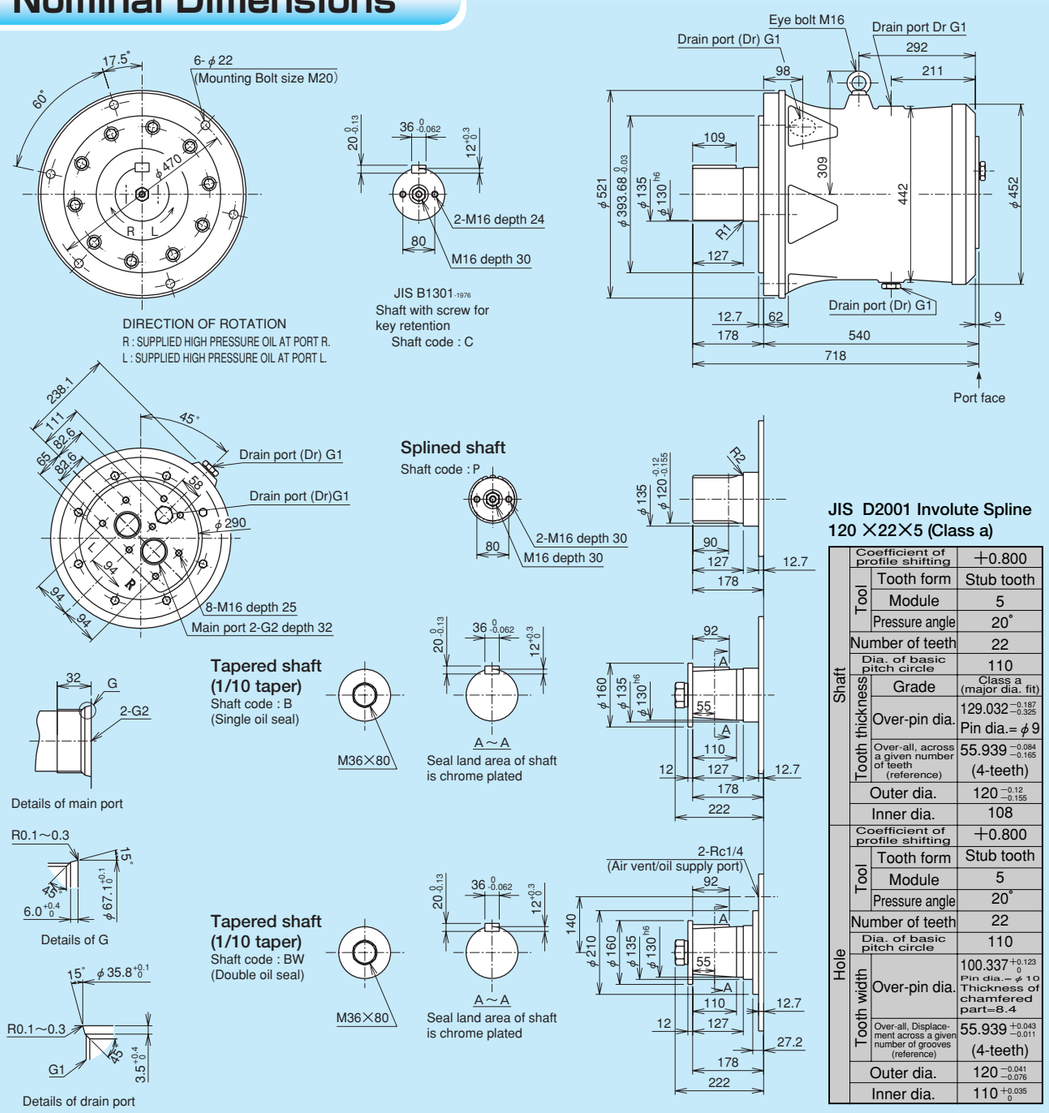
Applicable Range



Displacement	4097cm³/rev
Rated Pressure	24.5MPa (250kgf/cm²)
Peak Pressure	31.9MPa (325kgf/cm²)
Rated Torque	15990N·m (1630kgf·m)
Rated Speed	75rpm
Max. Speed	200rpm
Rated Horse Power	211kW (287PS)
Mass	520kg

Nominal Dimensions

(Dimensions in mm)

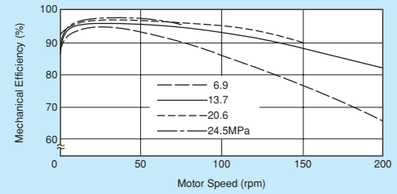


Shaft	Coefficient of profile shifting		+0.800
	Tool	Tooth form	Stub tooth
		Module	5
		Pressure angle	20°
	Number of teeth		22
	Dia. of basic pitch circle		110
	Tooth thickness	Grade	Class a (major dia. fit)
		Over-pin dia.	129.032 $^{-0.187}_{-0.325}$ Pin dia.=φ9
		Over-all, across a given number of teeth (reference)	55.939 $^{-0.084}_{-0.165}$ (4-teeth)
	Outer dia.		120 $^{-0.12}_{-0.155}$
	Inner dia.		108
Hole	Coefficient of profile shifting		+0.800
	Tool	Tooth form	Stub tooth
		Module	5
		Pressure angle	20°
	Number of teeth		22
	Dia. of basic pitch circle		110
	Tooth width	Over-pin dia.	100.337 $^{+0.123}_{0}$ Pin dia.= φ10 Thickness of chamfered part=8.4
		Over-all, Displacement across a given number of grooves (reference)	55.939 $^{+0.043}_{-0.011}$ (4-teeth)
	Outer dia.		120 $^{-0.041}_{-0.076}$
	Inner dia.		110 $^{+0.035}_{0}$

Performance Data

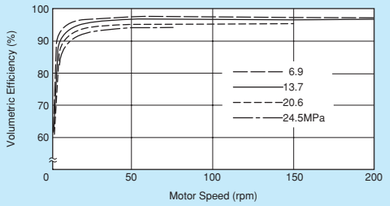
FLUID : SHELL TELLUS 56 (Viscosity 37cSt at 50°C)
The graphs shown are mean values obtained for production units.

Fig. 1 Mechanical Efficiency



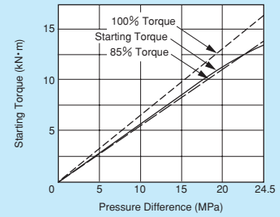
Mechanical efficiency at various speeds is shown for 4 operating pressures.

Fig. 2 Volumetric Efficiency



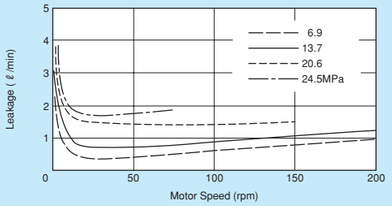
Volumetric efficiency at various speeds is shown for 4 operating pressures.

Fig. 3 Starting Torque



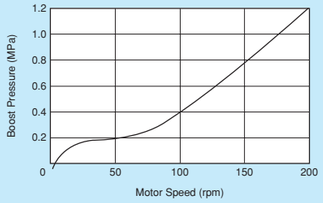
Starting torque versus effective pressure is shown.
Oil viscosity will not affect the starting torque efficiency.

Fig. 4 External Leakage



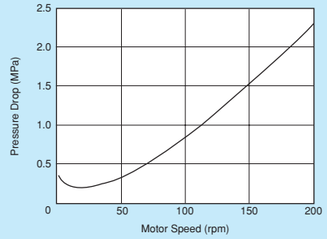
External leakage (from motor drain ports)
relative to various speeds is shown for 4 operating pressures.

Fig. 5 Minimum Boost Pressure



It is important that sufficient inlet pressure is maintained, when the motor is operated as a pump or when the load overruns the motor, to prevent cavitation.

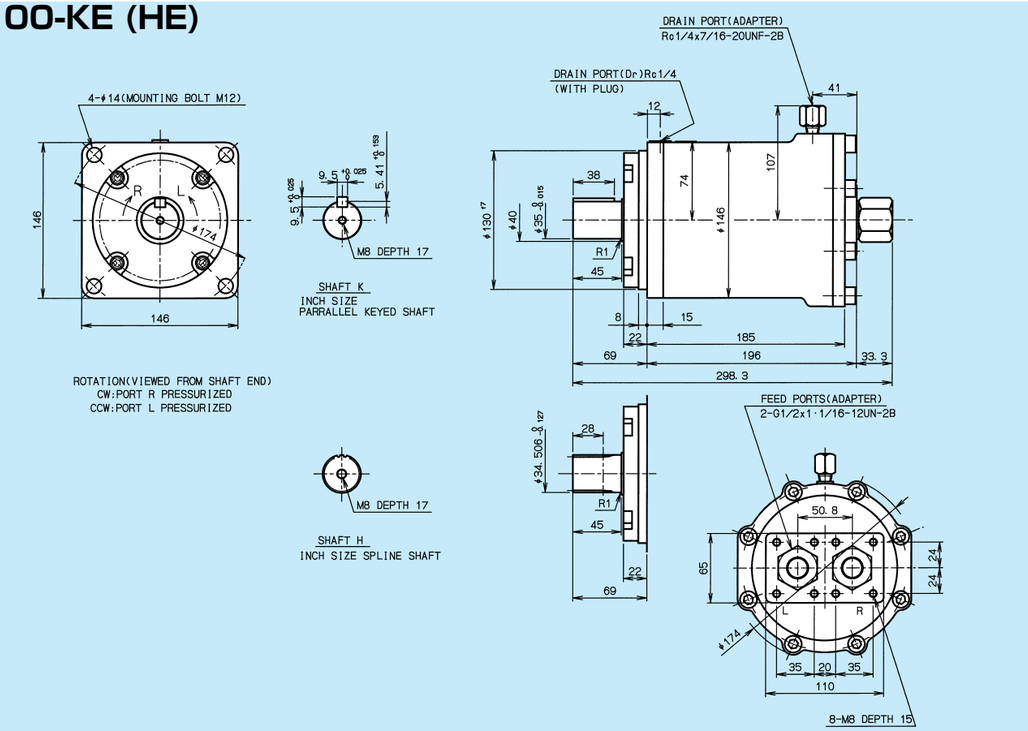
Fig. 6 Pressure Drop



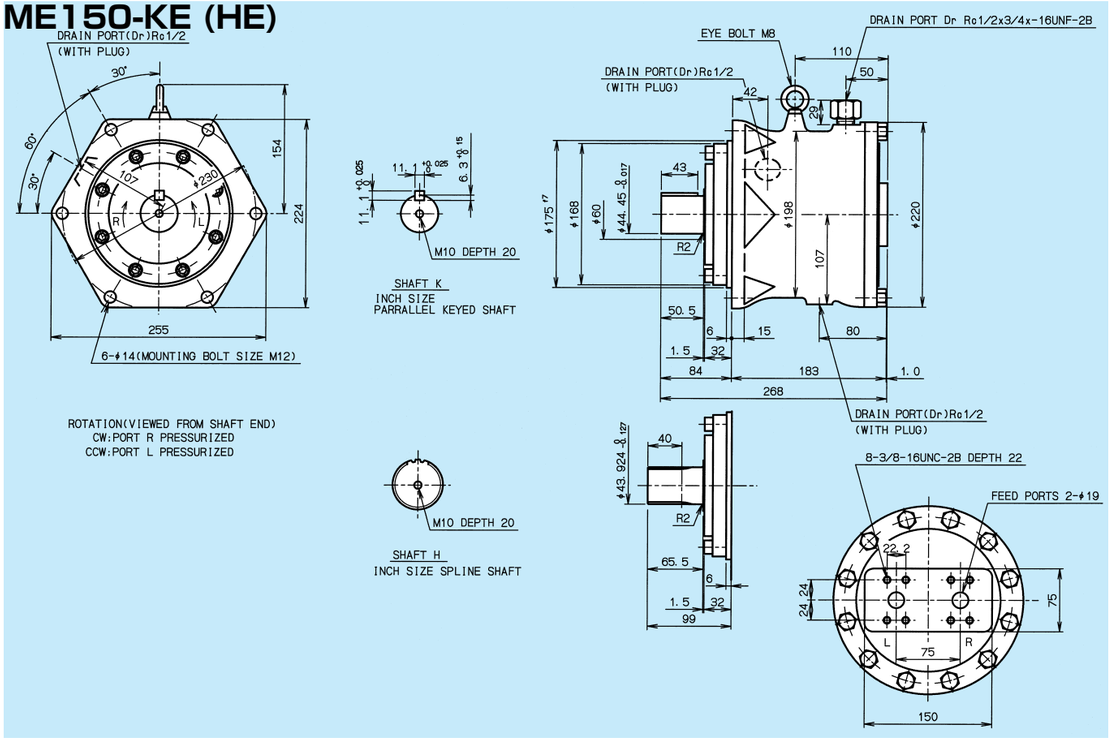
Pressure necessary to run motor without load is shown for various speeds.

Nominal Dimensions of inch size shaft and SAE ports

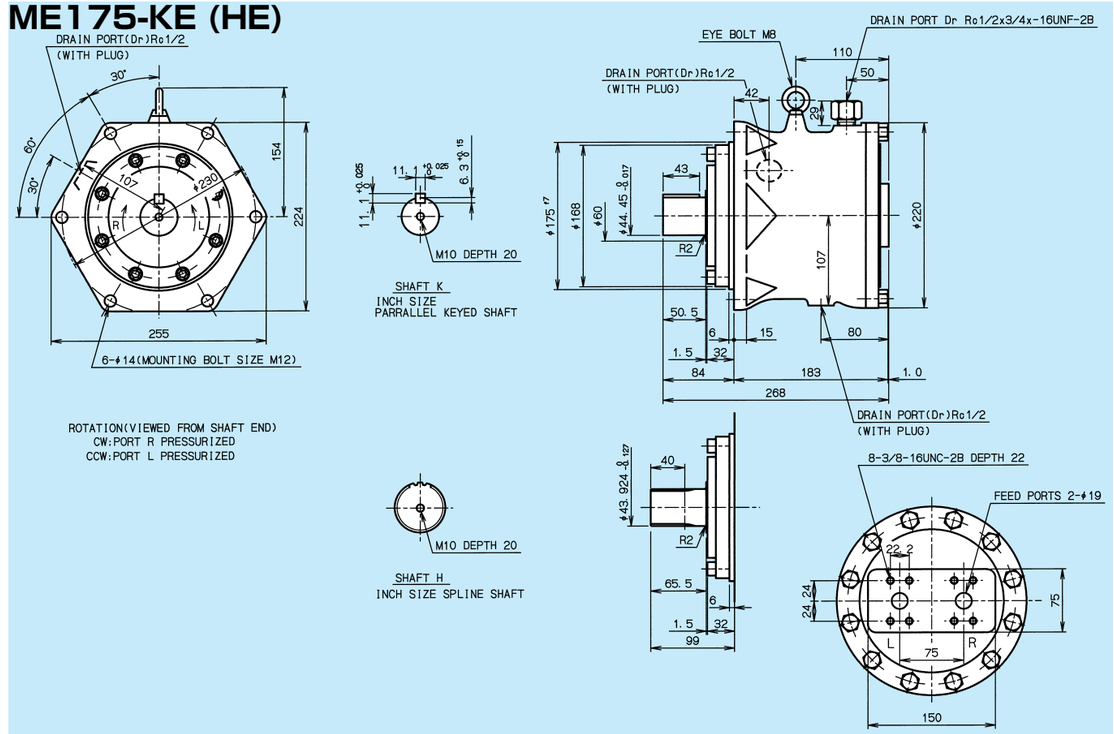
ME100-KE (HE)



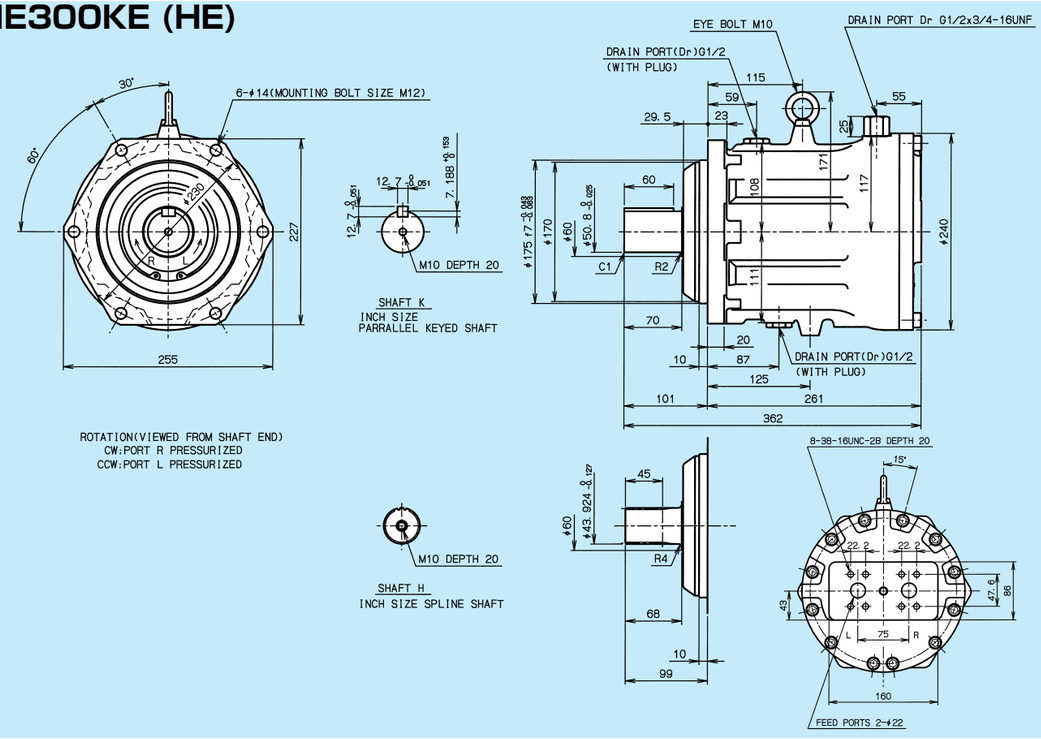
ME150-KE (HE)



ME175-KE (HE)



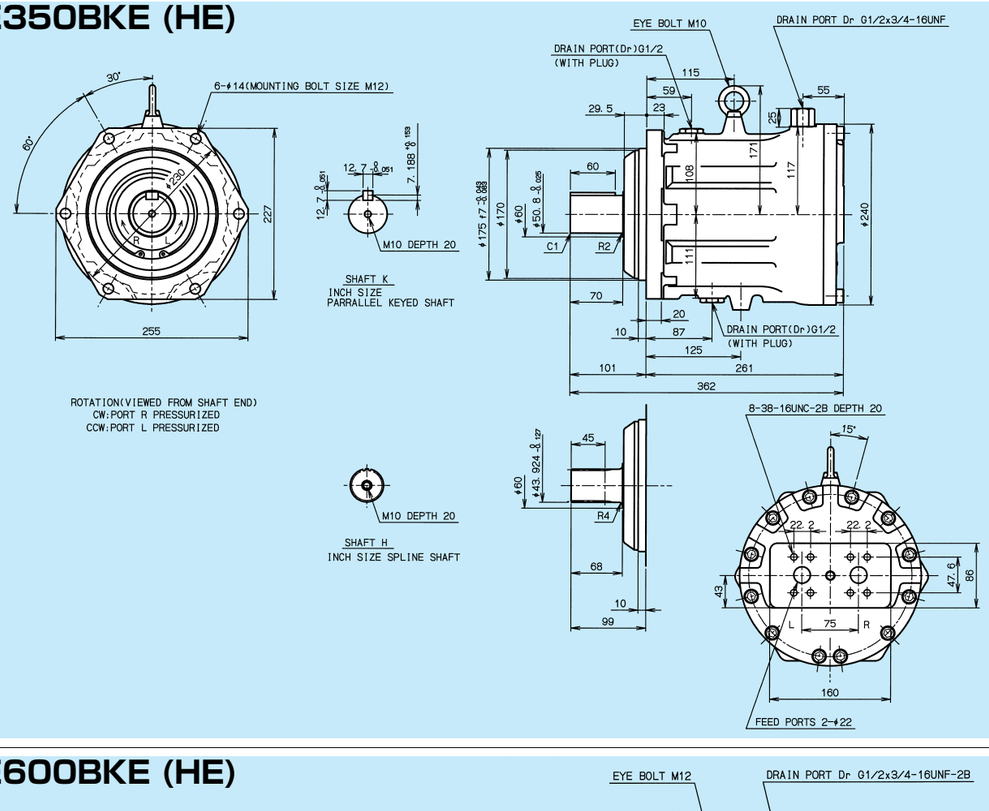
ME300KE (HE)



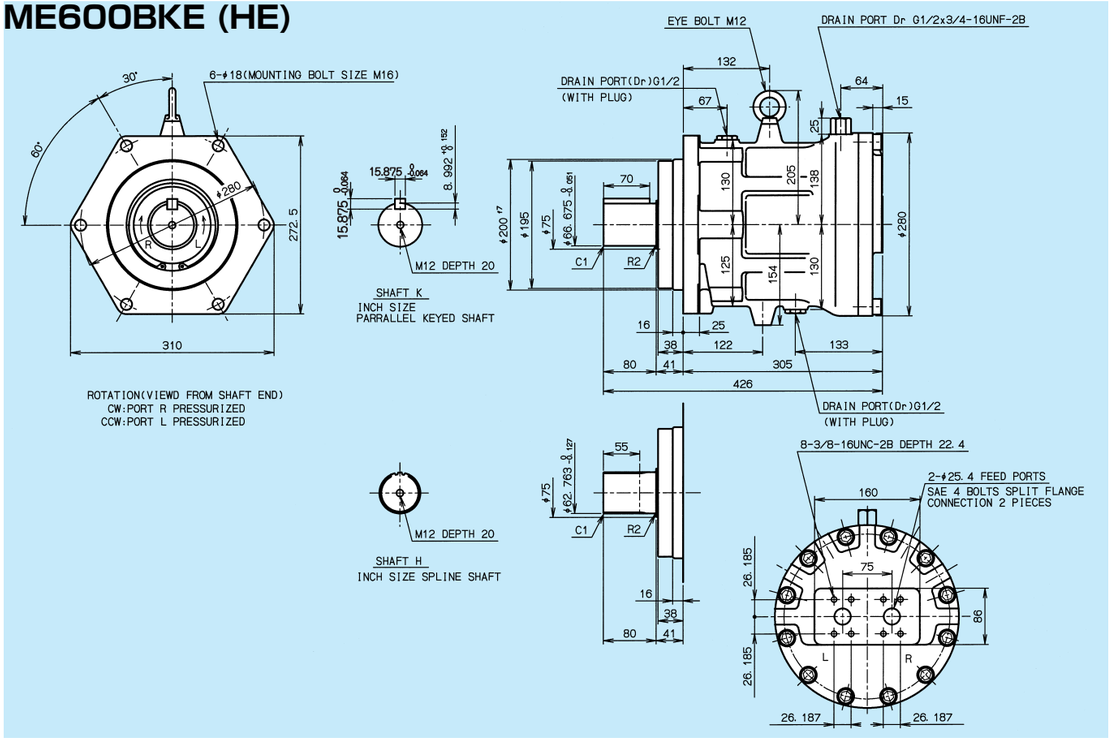
DOWMAX®ME MOTOR

Nominal Dimensions of inch size shaft and SAE ports

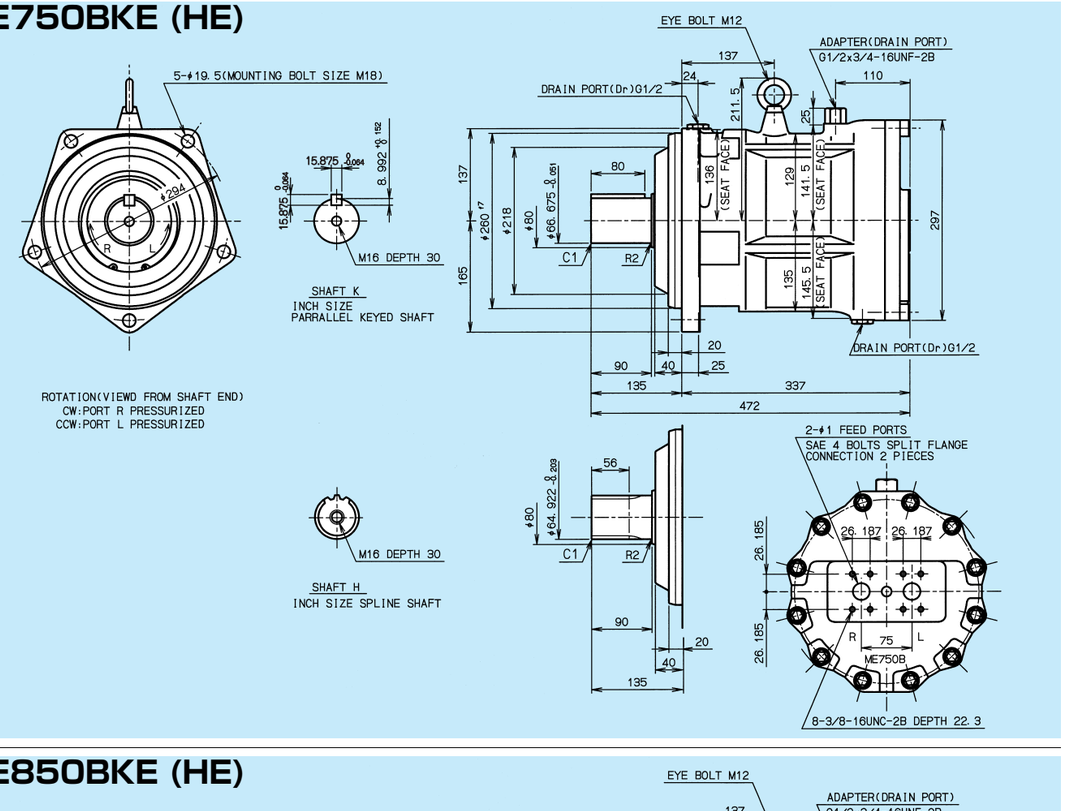
ME350BKE (HE)



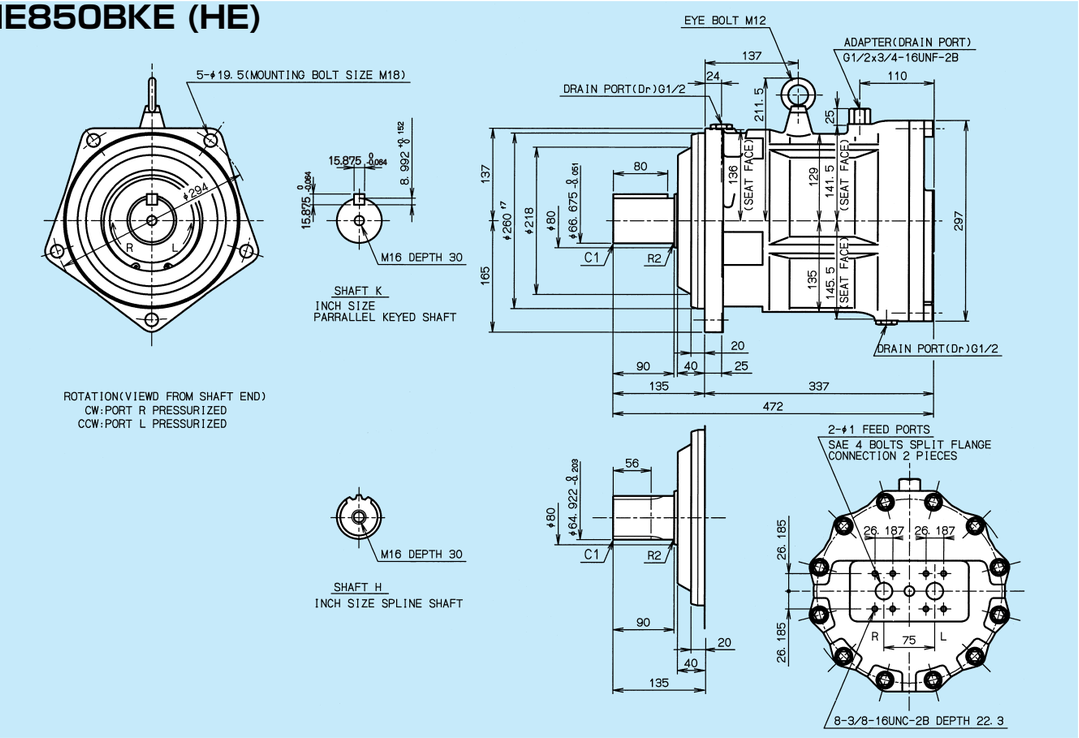
ME600BKE (HE)



ME750BKE (HE)



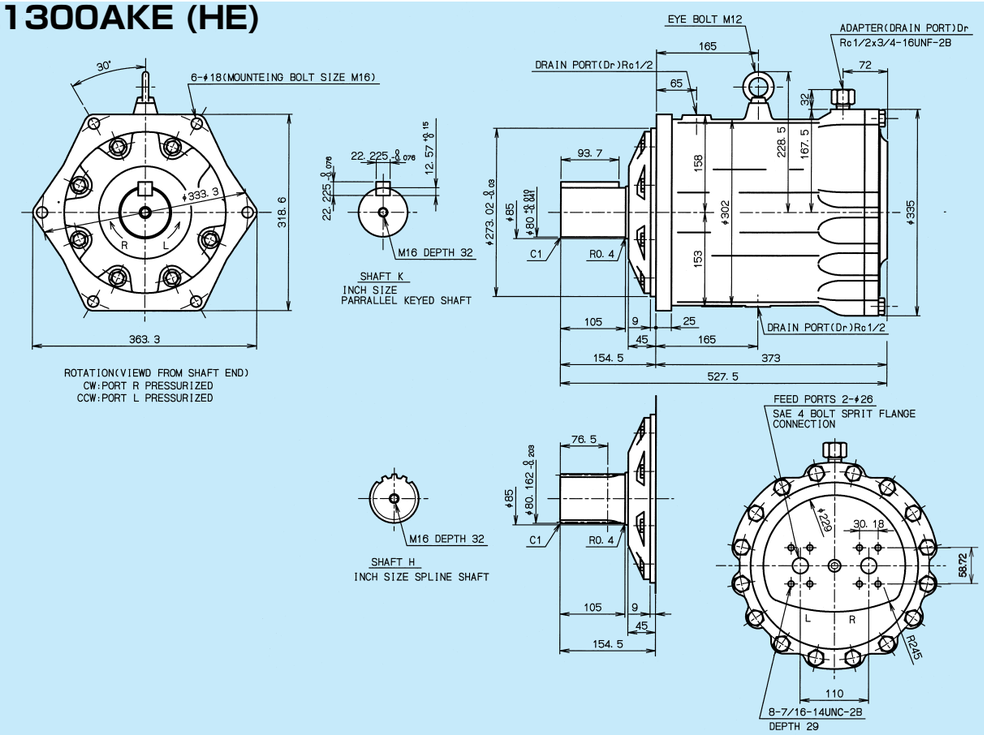
ME850BKE (HE)



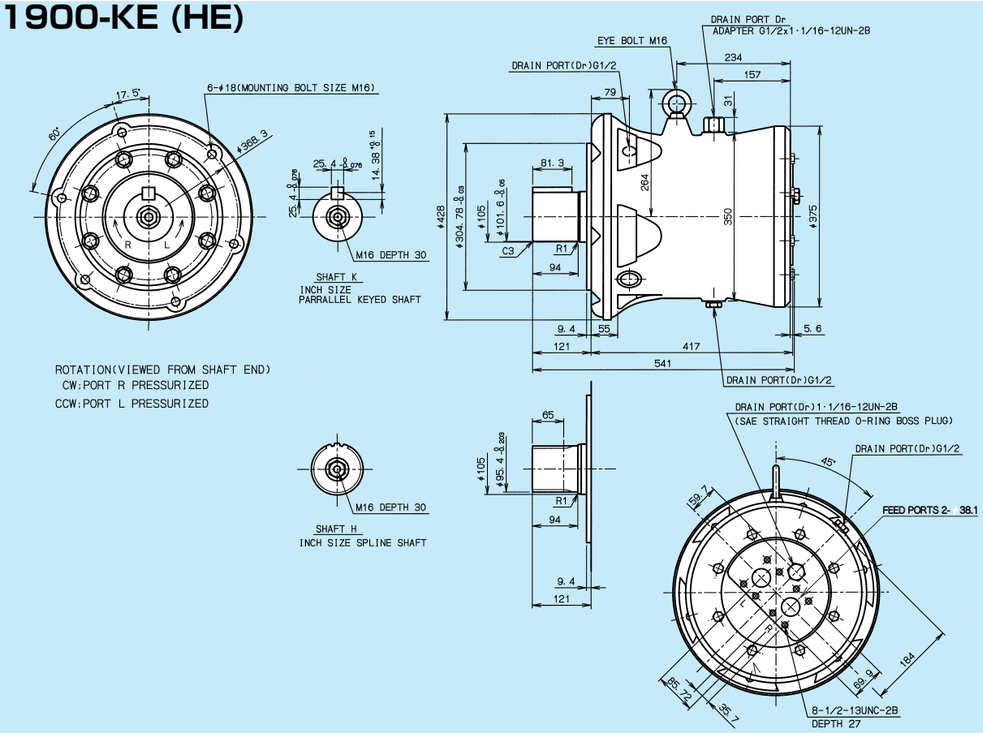
DOWMAX®ME MOTOR

Nominal Dimensions of inch size shaft and SAE ports

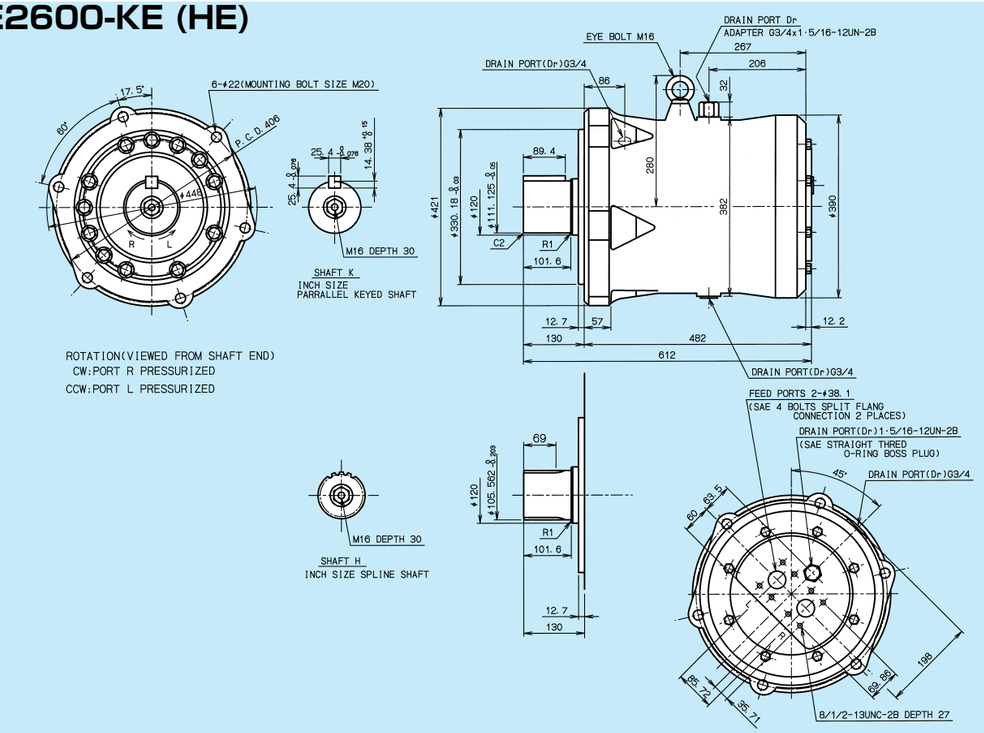
ME1300AKE (HE)



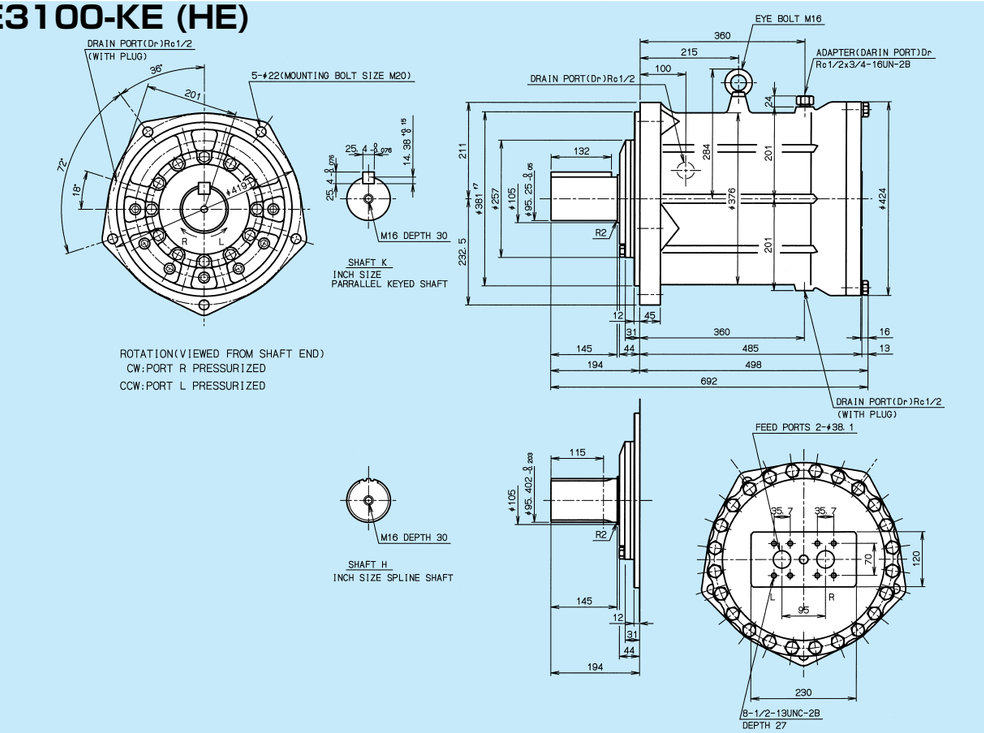
ME1900-KE (HE)



ME2600-KE (HE)

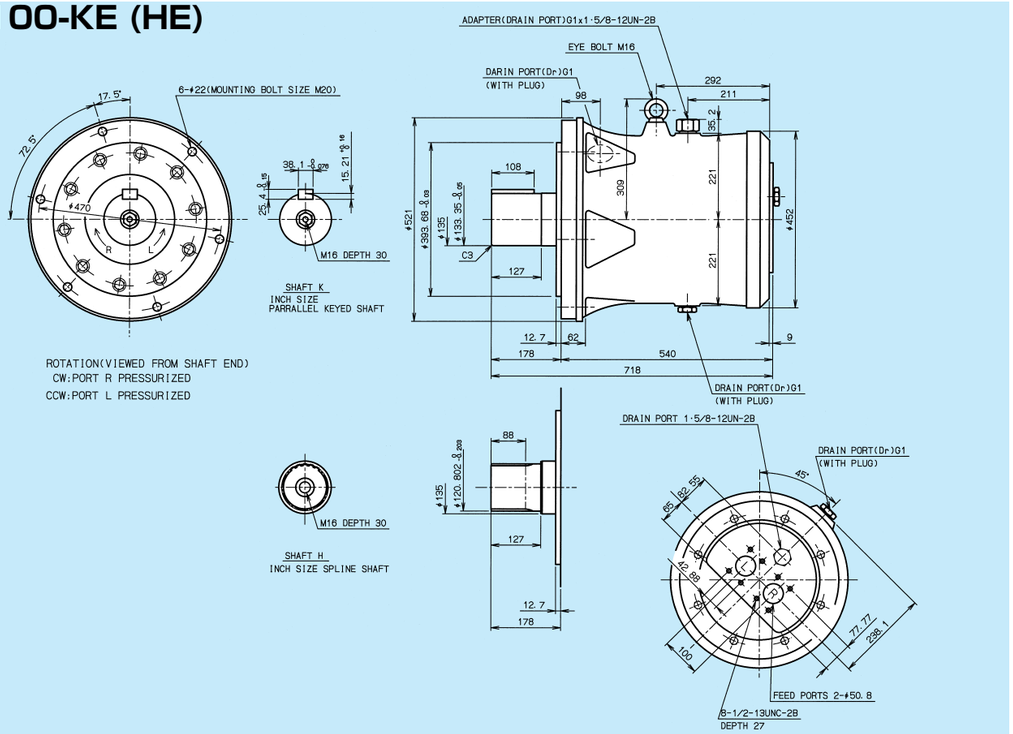


ME3100-KE (HE)



Nominal Dimensions of inch size shaft and SAE ports

ME4100-KE (HE)



MEMO

Specification of Spline

ME100

Type Of Spline: Involute: Flat Root Side Fit
Pressure Angle 30°: Pitch 16/32
Class 1 Fit: To B. S. 3550 Or A. S. A. -B5-15

Shaft	No. Of Teeth	21
	Pitch Dia.	33.338
	Base Dia.	28.872
	Tooth Thickness	$2.416\ ^{0}_{-0.030}$
	Major Dia.	$34.506\ ^{0}_{-0.127}$
	Form Dia.	31.648
	Minor Dia.	$31.052\ ^{+0.279}_{0}$
	Fillet Radius	0.28
Hole	No. Of Teeth	21
	Pitch	16/32
	Pressure Angle	30°
	Pitch Dia.	33.338
	Major Dia.	$34.925\ ^{+0.279}_{0}$
	Minor Dia.	$31.750\ ^{+0.127}_{0}$
	Space Width	$2.535\ ^{+0.03}_{0}$

ME150 & ME175

Type Of Spline: Involute: Flat Root Side Fit
Pressure Angle 30°: Pitch 12/24
Class 1 Fit: To B. S. 3550 Or A. S. A. -B5-15

Shaft	No. Of Teeth	20
	Pitch Dia.	42.334
	Base Dia.	36.662
	Tooth Thickness	$3.286\ ^{-0.045}_{-0.078}$
	Major Dia.	$43.924\ ^{0}_{-0.127}$
	Form Dia.	40.114
	Minor Dia.	39.692
	Fillet Radius	0.3556
Hole	No. Of Teeth	20
	Pitch	12/24
	Pressure Angle	30°
	Pitch Dia.	42.3342
	Major Dia.	$44.450\ ^{+0.33}_{0}$
	Minor Dia.	$40.216\ ^{+0.12}_{0}$
	Space Width	$3.368\ ^{+0.033}_{0}$

ME300B & ME350B

Type Of Spline: Involute: Flat Root Side Fit
Pressure Angle 30°: Pitch 12/24
Class 1 Fit: To B. S. 3550 Or A. S. A. -B5-15

Shaft	No. Of Teeth	20
	Pitch Dia.	42.334
	Base Dia.	36.662
	Tooth Thickness	$3.286\ ^{-0.045}_{-0.078}$
	Major Dia.	$43.924\ ^{0}_{-0.127}$
	Form Dia.	40.114
	Minor Dia.	39.692
	Fillet Radius	0.3556
Hole	No. Of Teeth	20
	Pitch	12/24
	Pressure Angle	30°
	Pitch Dia.	42.3342
	Major Dia.	$44.450\ ^{+0.33}_{0}$
	Minor Dia.	$40.216\ ^{+0.12}_{0}$
	Space Width	$3.368\ ^{+0.033}_{0}$

ME600B

Type Of Spline: Involute: Flat Root Side Fit
Pressure Angle 30°: Pitch 8/16
Class 1 Fit: To B. S. 3550 Or A. S. A. -B5-15

Shaft	No. Of Teeth	19
	Pitch Dia.	60.325
	Base Dia.	52.243
	Tooth Thickness	$4.897\ ^{0}_{-0.035}$
	Major Dia.	$62.763\ ^{0}_{-0.127}$
	Form Dia.	57.028
	Minor Dia.	$56.413\ ^{0}_{-0.457}$
	Fillet Radius	0.991
Hole	No. Of Teeth	19
	Pitch	8/16
	Pressure Angle	30°
	Pitch Dia.	60.325
	Major Dia.	$63.50\ ^{+0.457}_{0}$
	Minor Dia.	$57.15\ ^{+0.127}_{0}$
	Space Width	$5.034\ ^{+0.036}_{0}$

ME750B & ME850B

Type Of Spline: Involute: Flat Root Side Fit
Pressure Angle 30°: Pitch 5/10
Class 1 Fit: To B. S. 3550 Or A. S. A. -B5-15

Shaft	No. Of Teeth	12
	Pitch Dia.	60.96
	Base Dia.	52.79
	Tooth Thickness	$7.935\ ^{-0.051}_{-0.089}$
	Major Dia.	$64.922\ ^{0}_{-0.203}$
	Form Dia.	56.055
	Minor Dia.	$54.762\ ^{0}_{-0.635}$
	Fillet Radius	0.9906
Hole	No. Of Teeth	12
	Pitch	5/10
	Pressure Angle	30°
	Pitch Dia.	60.96
	Major Dia.	$66.04\ ^{+0.635}_{0}$
	Minor Dia.	$56.177\ ^{+0.203}_{0}$
	Space Width	$8.034\ ^{+0.038}_{0}$

ME1300A

Type Of Spline: Involute: Flat Root Side Fit
Pressure Angle 30°: Pitch 5/10
Class 1 Fit: To B. S. 3550 Or A. S. A. -B5-15

Shaft	No. Of Teeth	15
	Pitch Dia.	76.2
	Base Dia.	65.992
	Tooth Thickness	$7.879\ ^{0}_{-0.038}$
	Major Dia.	$80.162\ ^{0}_{-0.203}$
	Form Dia.	71.00
	Minor Dia.	$70.000\ ^{0}_{-0.633}$
	Fillet Radius	0.889
Hole	No. Of Teeth	15
	Pitch	5/10
	Pressure Angle	30°
	Pitch Dia.	76.2
	Major Dia.	$81.28\ ^{+0.635}_{0}$
	Minor Dia.	$71.252\ ^{+0.203}_{0}$
	Space Width	$8.037\ ^{+0.038}_{0}$

Specification of Spline

ME1900

Type Of Spline: Involute: Flat Root Side Fit
Pressure Angle 30°: Pitch 5/10
Class 1 Fit: To B. S. 3550 Or A. S. A. -B5-15

Shaft	No. Of Teeth	18
	Pitch Dia.	91.44
	Base Dia.	79.19
	Tooth Thickness	7.932/7.836
	Major Dia.	$95.402\ ^{0}_{-0.203}$
	Form Dia.	86.215
	Minor Dia.	$85.242\ ^{0}_{-0.635}$
	Fillet Radius	0.813
Hole	No. Of Teeth	18
	Pitch	5/10
	Pressure Angle	30°
	Pitch Dia.	91.44
	Major Dia.	$96.52\ ^{+0.635}_{0}$
	Minor Dia.	$86.398\ ^{+0.203}_{0}$
	Space Width	$8.037\ ^{+0.04}_{0}$

ME2600

Type Of Spline: Involute: Flat Root Side Fit
Pressure Angle 30°: Pitch 5/10
Class 1 Fit: To B. S. 3550 Or A. S. A. -B5-15

Shaft	No. Of Teeth	20
	Pitch Dia.	101.6
	Base Dia.	87.988
	Tooth Thickness	$7.932\ ^{-0.058}_{-0.099}$
	Major Dia.	$105.562\ ^{0}_{-0.203}$
	Form Dia.	96.317
	Minor Dia.	$95.402\ ^{0}_{-0.635}$
	Fillet Radius	0.7874
Hole	No. Of Teeth	20
	Pitch	5/10
	Pressure Angle	30°
	Pitch Dia.	101.6
	Major Dia.	$106.68\ ^{+0.63}_{0}$
	Minor Dia.	$96.52\ ^{+0.20}_{0}$
	Space Width	$8.039\ ^{+0.041}_{0}$

ME3100

Type Of Spline: Involute: Flat Root Side Fit
Pressure Angle 30°: Pitch 5/10
Class 1 Fit: To B. S. 3550 Or A. S. A. -B5-15

Shaft	No. Of Teeth	18
	Pitch Dia.	91.440
	Base Dia.	79.190
	Tooth Thickness	$7.932\ ^{-0.055}_{-0.099}$
	Major Dia.	$95.402\ ^{0}_{-0.203}$
	Form Dia.	86.215
	Minor Dia.	$85.242\ ^{0}_{-0.635}$
	Fillet Radius	0.813
Hole	No. Of Teeth	18
	Pitch	5/10
	Pressure Angle	30°
	Pitch Dia.	91.44
	Major Dia.	$96.52\ ^{+0.635}_{0}$
	Minor Dia.	$86.398\ ^{+0.203}_{0}$
	Space Width	$8.042\ ^{+0.035}_{0}$

ME4100

Type Of Spline: Involute: Flat Root Side Fit
Pressure Angle 30°: Pitch 5/10
Class 1 Fit: To B. S. 3550 Or A. S. A. -B5-15

Shaft	No. Of Teeth	23
	Pitch Dia.	116.84
	Base Dia.	101.186
	Tooth Thickness	7.932/7.831
	Major Dia.	$120.802\ ^{0}_{-0.203}$
	Form Dia.	115.526
	Minor Dia.	$110.642\ ^{0}_{-0.635}$
	Fillet Radius	0.762
Hole	No. Of Teeth	23
	Pitch	5/10
	Pressure Angle	30°
	Pitch Dia.	116.84
	Major Dia.	$121.92\ ^{+0.635}_{0}$
	Minor Dia.	$111.76\ ^{+0.203}_{0}$
	Space Width	$8.042\ ^{+0.040}_{0}$

BEARING LIFE AND ALLOWABLE RADIAL LOAD FOR SHAFT

NOTE 1. If motors are operated within the proper ratings and conditions, the operational life is determined by the Bearing Life.

2. In order to maintain the maximum bearing life, when a radial load is imposed on the output shaft the motor should be installed as illustrated in Fig. 2 or Fig. 3;
   For a uni-directional application, motor should be installed so that side load acts as shown in Fig. 2.
   For a bi-directional application, a radial load for each rotational direction being applied, the motor should be installed so that side loads act as shown in Fig. 3.

3. The graphs shown are the bearing life (B-10 Life) at 100 rpm shaft speed (500 rpm only for ME100) for various pressures and radial loads.
   When the shaft speed differs from 100 rpm (500 rpm only for ME100) the bearing life can be obtained by the following formula:

$$\text{B-10 Life} = \text{(Bearing Life obtainable in the graph)} \times \frac{\text{100 (500 for ME100)}}{\text{Actual Shaft Speed, rpm}}$$

   In case where the side load acts at a different location to the midpoint of the shaft projection please refer to us.

4. Applications with axial thrust loads should be referred to us.
5. When motor is used in Meter-Out circuit, pressure in Fig. 2 & 3 shaft be a sum of motor inlet and outlet pressure.
6. Bearing life varies due to kind of fluid. Bearing life should be decided by multiplying by the factor below:

Fluid type	life factor
Mineral-based fluid	1.0
Phosphate-ester fluid	1.0
Water-glycol w/o forced lubrication	0.05～0.10
Water-glycol w/ forced lubrication	0.6

ME100

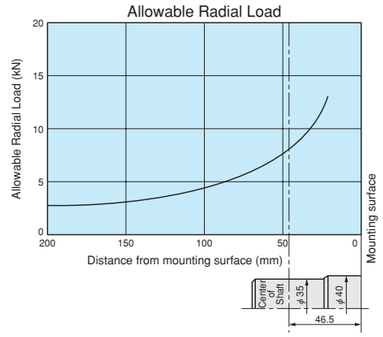


Fig. 1

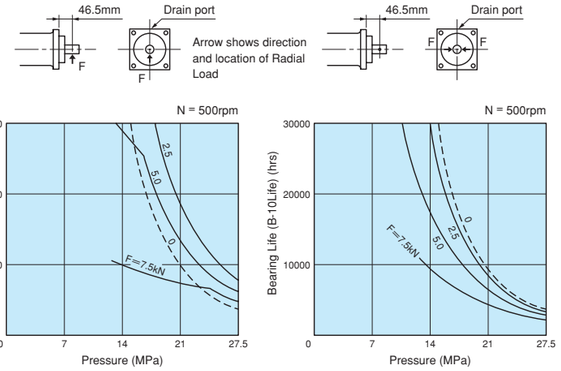


Fig. 2

Fig. 3

ME150

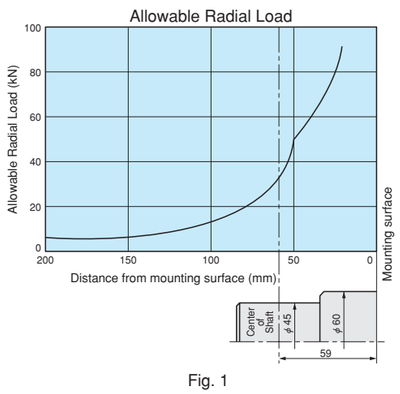


Fig. 1

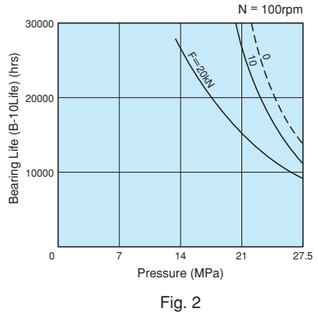


Fig. 2

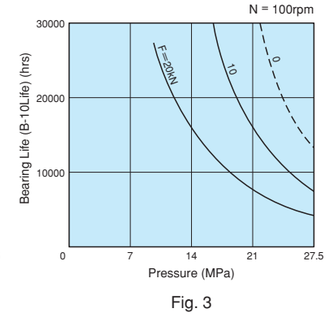


Fig. 3

ME175

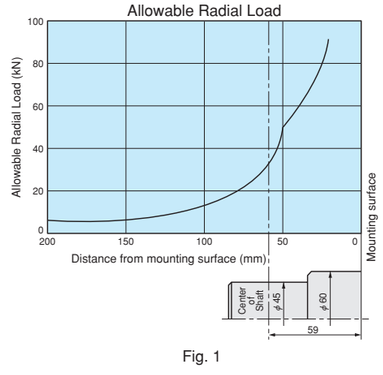


Fig. 1

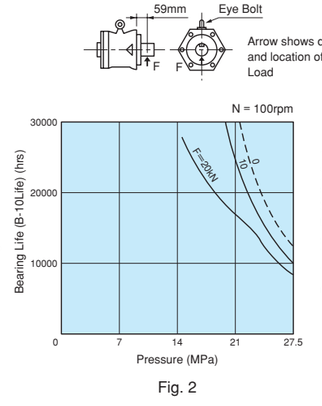


Fig. 2

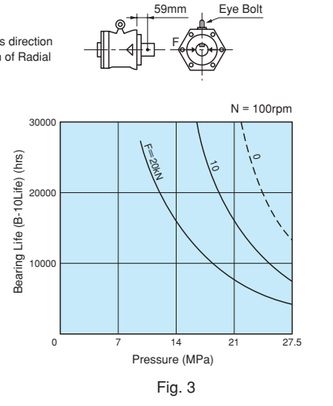


Fig. 3

ME300B

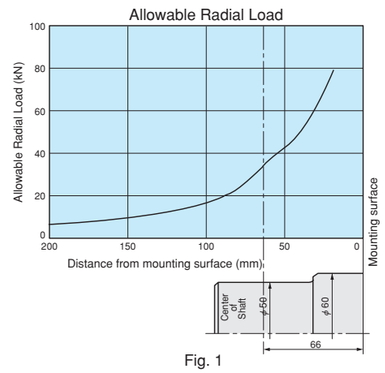


Fig. 1

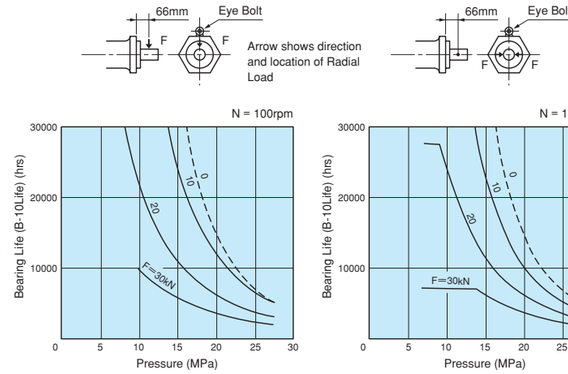


Fig. 2

Fig. 3

ME350B

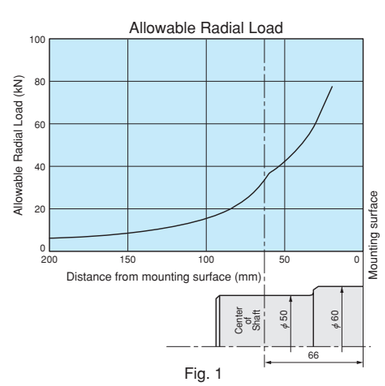


Fig. 1

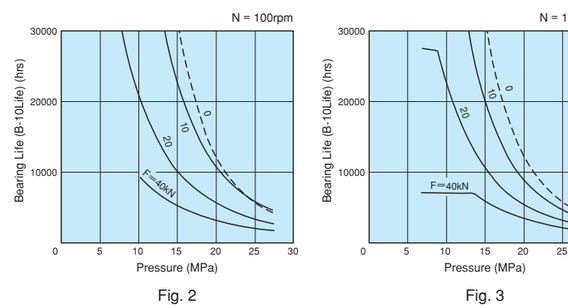
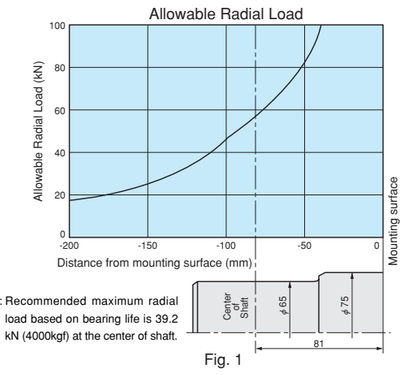


Fig. 2

Fig. 3

ME600B



※Note: Recommended maximum radial load based on bearing life is 39.2 kN (4000kgf) at the center of shaft.

Fig. 1

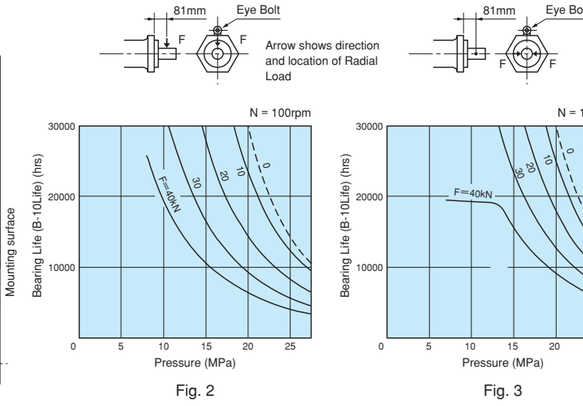


Fig. 2

Fig. 3

BEARING LIFE AND ALLOWABLE RADIAL LOAD FOR SHAFT

NOTE 1. If motors are operated within the proper ratings and conditions, the operational life is determined by the Bearing Life.
2. In order to maintain the maximum bearing life, when a radial load is imposed on the output shaft the motor should be installed as illustrated in Fig. 2 or Fig. 3;
For a uni-directional application, motor should be installed so that side load acts as shown in Fig. 2.
For a bi-directional application, a radial load for each rotational direction being applied, the motor should be installed so that side loads act as shown in Fig. 3.
3. The graphs shown are the bearing life (B-10 Life) at 100 rpm shaft speed (500 rpm only for ME100) for various pressures and radial loads.
When the shaft speed differs from 100 rpm (500 rpm only for ME100) the bearing life can be obtained by the following formula:

$$\text{B-10 Life} = \text{(Bearing Life obtainable in the graph)} \times \frac{100\ (500 \text{ for ME100})}{\text{Actual Shaft Speed, rpm}}$$

In case where the side load acts at a different location to the midpoint of the shaft projection please refer to us.
4. Applications with axial thrust loads should be referred to us.
5. When motor is used in Meter-Out circuit, pressure in Fig. 2 & 3 shaft be a sum of motor inlet and outlet pressure.
6. Bearing life varies due to kind of fluid. Bearing life should be decided by multiplying by the factor below:

Fluid type	life factor
Mineral-based fluid	1.0
Phosphate-ester fluid	1.0
Water-glycol w/o forced lubrication	0.05～0.10
Water-glycol w/ forced lubrication	0.6

ME750B

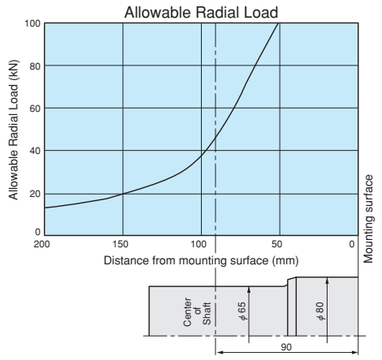


Fig. 1

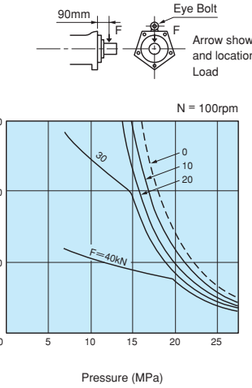


Fig. 2

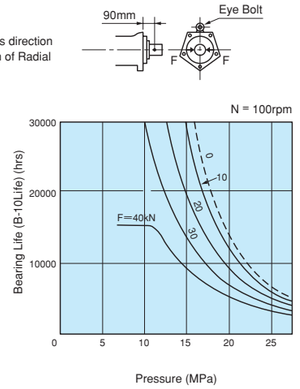


Fig. 3

ME850B

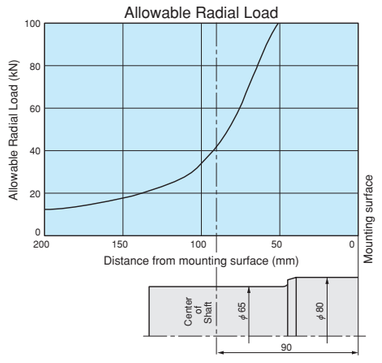


Fig. 1

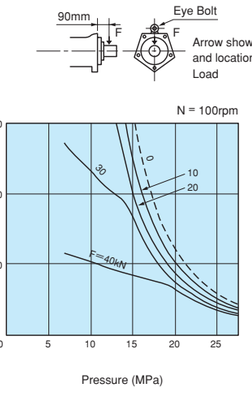


Fig. 2

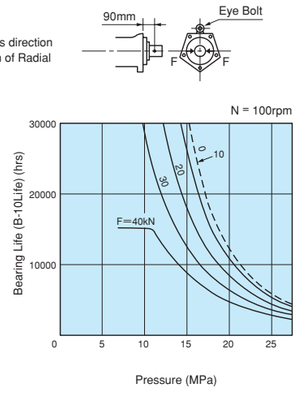


Fig. 3

ME1300A

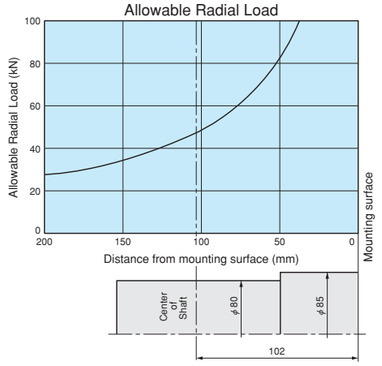


Fig. 1

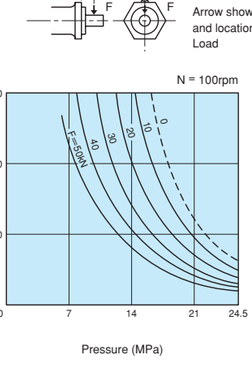


Fig. 2

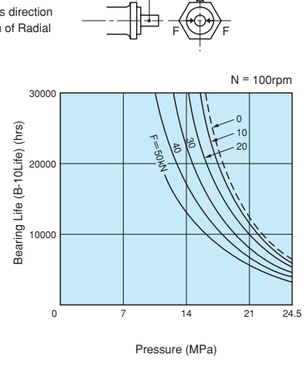


Fig. 3

ME1900

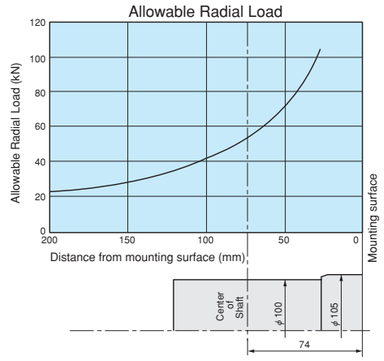


Fig. 1

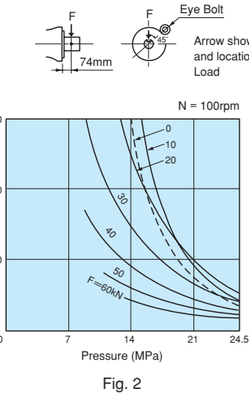


Fig. 2

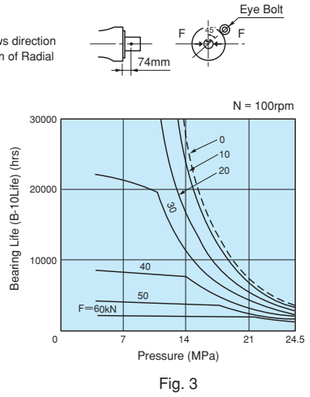


Fig. 3

ME2600

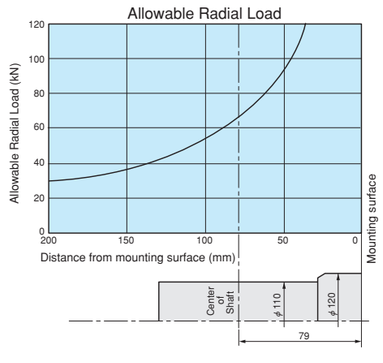


Fig. 1

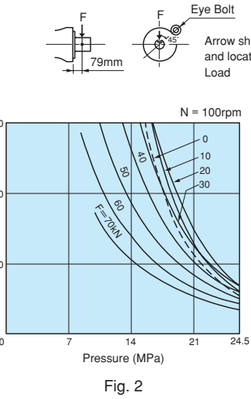


Fig. 2

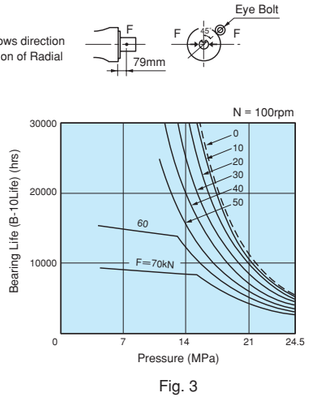


Fig. 3

ME3100

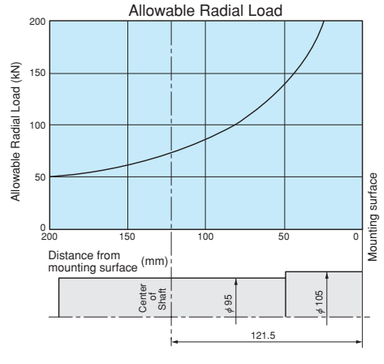


Fig. 1

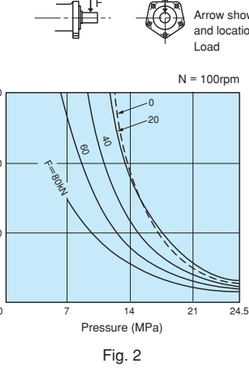


Fig. 2

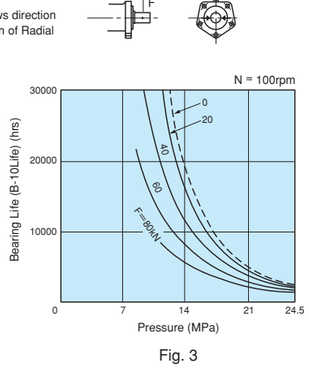


Fig. 3

BEARING LIFE AND ALLOWABLE RADIAL LOAD FOR SHAFT

ME4100

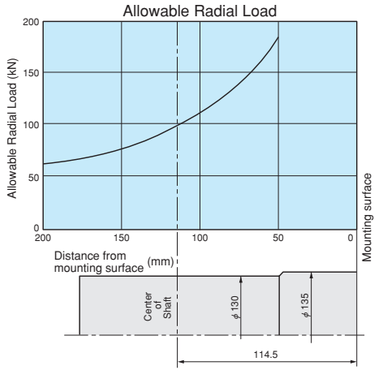


Fig. 1

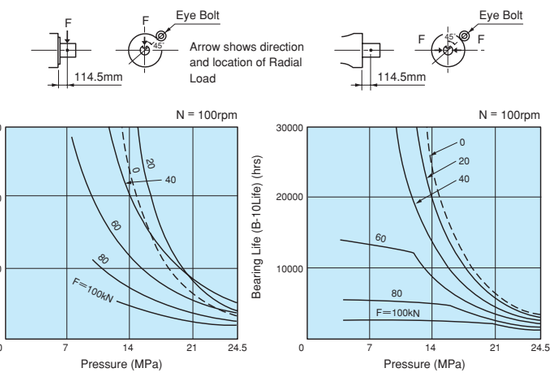


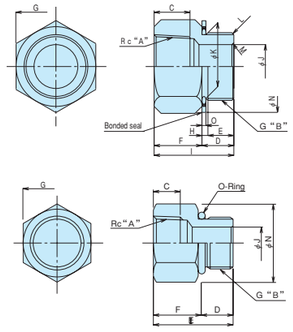
Fig. 2

Fig. 3

MEMO

Accessary Parts Dimensions

Adapter



Part No.	A	B	C	D	E	F	G	H	I	J	K	L	M	N	O	Part No. of bonded seal
T21154-1-A	Rc1/2	G1/2	15	14	11	22	27	3	36	10	18	C1	C1	30	2.3	DW0036A-004
T21154-2-A	3/4	3/4	17	16	12	25	36	3	41	16	23.5	C1	C1	35	2.3	DW0036A-006
T21154-3-A	1	1	19	18	15	27	41	3	45	21.5	29.5	C1	C1	42	3.2	DW0036A-008
T21154-4-A	1-1/4	1-1/4	22	21	18	30	50	3	51	38	38	C1.5	C2	54	2.3	DW0036A-010
T21154-5-A	1-1/2	1-1/2	22	21	18	30	60	3	51	44	44	C1.5	C2	65	3.2	DW0036A-012
T21154-6-A	2	2	26	26	22	36	70	4	62	56	56	C1.5	C2	72	3.2	DW0036A-016

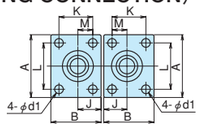
NOTE) The Part No. with suffix "-A" indicates that adapter is supplied with bonded seal.

Part No.	A	B	C	D	E	F	G	J	N	Mass (g)	O-Ring
DW0331A-002	Rc1/4	G1/4	11	12	29	17	19	5	19	35	1BP11
DW0331A-003	3/8	3/8	12	12	31	19	22	8	22	55	1BP14
DW0331A-004	1/2	1/2	15	16	38	22	27	10	27	90	1BP18
DW0331A-006	3/4	3/4	17	17	42	25	36	16	36	180	1BP22.4
DW0331A-008	1	1	19	21	48	27	41	22	41	230	1BP29
DW0331A-010	1-1/4	1-1/4	22	21	51	30	50	27	50	380	1BP38
DW0331A-012	1-1/2	1-1/2	22	21	51	30	60	33	60	490	1BP44
DW0331A-016	2	2	26	25	61	36	70	44	70	780	1BP56

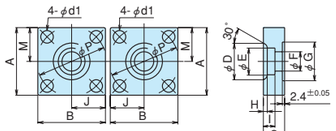
NOTE) The O-ring and the fitting are JIS standard product. It is possible to use a marketing product, too.

Straight Flange
(SOCKET WELDING CONNECTION)

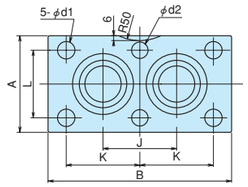
ME100, ME1300A



ME150～ME850



ME1900～ME4100

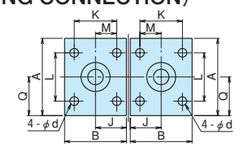


Dowmax model	ME100	ME150 ME175 ME300B ME350B	ME600B ME750B ME850B	ME1300A	ME1900	ME2600	ME3100	ME4100
Part No.	DM0277A-A	DA0751A-A	DB0467A-A	DE0512A-A	T10838-A	T10841-A	DK0026B-A	T10845-A
A	65	70	70	100	84	100	120	114
B	52	70	70	100	165	190	230	230
C	22	22	25	36	40	40	40	40
D	32	38	45	63	63	63	63	75
E	22.2	27.7	34.5	49.1	49.1	49.1	49.3	61.1
F	16	20	25	37.5	37.5	37.5	37.5	47.5
G	30	40	45	55	60	65	60	80
H	3.5	4	4	7	7	7	7	7
I	11	12	14	18	18.5	18	18	20
J	24	35	35	50	66.5	76.2	95	94
K	35	—	—	70	66.5	76.2	95	94
L	48	—	—	70	60	70	85	82.5
M	15.4	35	35	35	—	—	—	—
P	—	72	72	—	—	—	—	—
d1	9	13	13	18	14	18	18	18
d2	—	—	—	—	14	17	18	18
O-Ring	1BG25	1BG35	1BG40	1BG50	1BG55	1BG60	1BG55	1BG75
Hex. socket head bolt	8-M8X35	8-M12X40	8-M12X45	8-M16X60	6-M12X60	6-M16X60	6-M16X60	6-M16X60

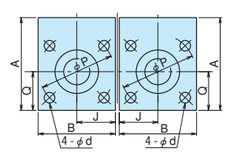
NOTE) The cut shown with R50 is only for ME2600.

Elbow Flange
(SOCKET WELDING CONNECTION)

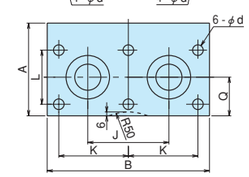
ME100, ME1300A

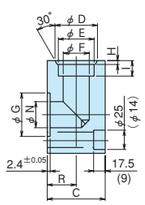


ME150～ME850



ME1900～ME4100



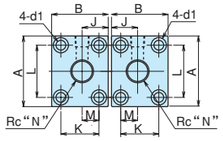


NOTE)
1. The spot-facing for hex. socket head bolt is only for ME100 & ME3100. ( ) dimensions are for ME100.
2. The cut shown with R50 is only for ME2600.

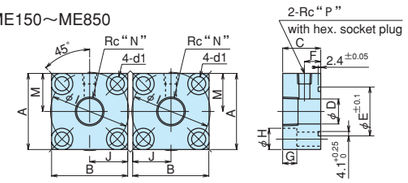
Dowmax model	ME100	ME150 ME175 ME300B ME350B	ME600B ME750B ME850B	ME1300A	ME1900	ME2600	ME3100	ME4100
Part No.	DM0278A-A	DA0683B-A	DB0369A-A	DE0513A-A	T22130-A	T22131-A	DK0037B-A	T22132-A
A	75	80	85	110	106	114	125	132
B	52	73	70	100	165	190	230	230
C	38	45	60	71	71	71	90	85
D	32	38	45	63	63	63	56	75
E	22.2	27.7	34.5	49.1	49.1	49.1	43.2	61.1
F	16	20	25	37.5	37.5	37.5	31.5	47.5
G	30	40	45	55	60	65	60	80
H	3.5	4	4	7	7	7	7	7
I	11	12	14	18	18	18	18	20
J	24	36.5	35	50	66.5	76.2	95	94
K	35	—	—	70	66.5	76.2	95	94
L	48	—	—	70	60	70	85	82.5
M	15.4	—	—	35	—	—	—	—
N	16	20	25	37.5	37.5	37.5	37.5	47.5
P	—	72	72	—	—	—	—	—
Q	33	37.5	37.5	50	42	50	60	57
R	20	23	35	35.5	35.5	35.5	52.5	42.5
d	9	13	13	18	14	17	18	18
O-Ring	1BG25	1BG35	1BG40	1BG50	1BG55	1BG60	1BG55	1BG75
Hex. socket head bolt (with spring washer)	—	—	8-M12X80	8-M16X95	6-M12X90	6-M16X90	—	6-M16X105
Hex. socket head bolt	8-M8X40	8-M12X60	—	—	—	—	6-M16X95	—

Straight Flange
(THREAD CONNECTION)

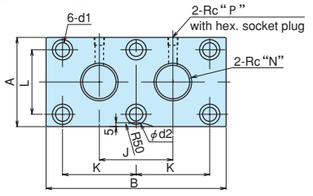
ME100, ME1300A



ME150～ME850



ME1900～ME4100

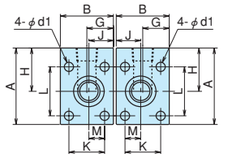


Dowmax Model	ME100	ME150 ME175 ME300B ME350B	ME600B ME750B ME850B	ME1300A	ME1900	ME2600	ME3100	ME4100
Part No.	DM0250A-A	DA0724A-A	DB0401A-A	DE0489A-A	DG0191A-A	DH0148B-A	DK0141A-A	DJ0166B-A
A	65	70	70	100	84	100	120	114
B	52	70	70	100	165	190	230	230
C	20	35	35	40	35	40	40	40
D	18	23.5	29.5	38	44	44	44	44
E	30	45	45	55	60	65	60	80
F	10	15	15	15	15	15	15	20
G	9	13	13	17	17	17	17	18
H	14	20	20	26	26	26	26	26
I	—	72	72	—	—	—	—	—
J	24	35	35	50	66.5	76.2	95	94
K	35	—	—	70	66.5	76.2	95	94
L	48	—	—	70	60	70	85	82.5
M	15.4	35	35	35	—	—	—	—
N	Rc1/2	Rc3/4	Rc1	Rc1・1/4	Rc1・1/2	Rc1・1/2	Rc1・1/2	Rc1・1/2
P	Rc1/4	Rc1/4	Rc1/4	Rc1/4	Rc1/4	Rc1/4	Rc1/4	Rc1/4
d1	9	13	13	18	14	18	18	18
d2	—	—	—	—	14	17	18	18
O-Ring	1BG25	1BG40	1BG40	1BG50	1BG55	1BG60	1BG55	1BG75
Hex. socket head bolt	8-M8X20	8-M12X40	8-M12X40	8-M16X45	6-M12X40	6-M16X45	6-M16X45	6-M16X45

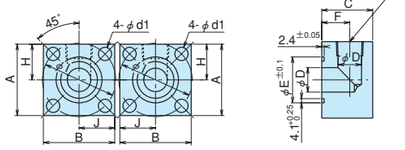
NOTE) The cut shown with R50 is only for ME2600.

Elbow Flange
(THREAD CONNECTION)

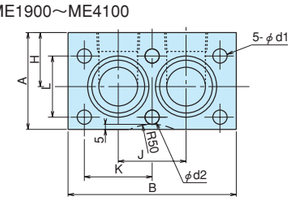
ME100, ME1300A



ME150～ME850



ME1900～ME4100



Dowmax Model	ME100	ME150 ME175 ME300B ME350B	ME600B ME750B ME850B	ME1300A	ME1900	ME2600	ME3100	ME4100
Part No.	DM0282A-A	DA0795A-A	DB0468A-A	DE0517A-A	DG0211A-A	DH0152B-A	DK0142A-A	DJ0170A-A
A	75	70	85	110	97	110	120	117
B	52	70	70	100	165	190	230	230
C	40	50	55	65	70	70	70	70
D	18	23.5	29.5	38	44	44	44	44
E	30	45	45	55	60	65	60	80
F	23	27.5	30	36	37.5	37.5	37.5	37.5
G	26	—	—	—	—	—	—	—
H	42.5	35	50	60	55	60	60	60
I	—	72	72	—	—	—	—	—
J	24	35	35	50	66.5	76.2	95	94
K	35	—	—	70	66.5	76.2	95	94
L	48	—	—	70	60	70	85	82.5
M	15.4	—	—	—	—	—	—	—
N	Rc1/2	Rc3/4	Rc1	Rc1・1/4	Rc1・1/2	Rc1・1/2	Rc1・1/2	Rc1・1/2
d1	9	13	13	18	14	18	18	18
d2	—	—	—	—	14	17	18	18
O-Ring	1BG25	1BG40	1BG40	1BG50	1BG55	1BG60	1BG55	1BG75
Hex. socket head bolt	8-M8X50	8-M12X65	8-M12X70	8-M16X85	6-M12X80	6-M16X85	6-M16X85	6-M16X85

NOTE) The cut shown with R50 is only for ME2600.

DOWMAX Motor Standardized for Special Functions

＊The following motors with special functions are available.
Select an appropriate motor that best suits your requirements.

1. DOWMAX Motors with Rotation Detecting Shaft

- These motors are for speed control use on injection molding machines, steel rolling mills, winches, etc. In these applications, they sense rotary motions and detect rotational speed for control.
- Each DOWMAX motor in the ME Series can be supplied with a rotation detecting shaft.
- Refer to drawing ; DZ3503B.

2. DOWMAX Motors for Water-Glycol Hydraulic Fluid use (with flushing circuit)

- Water-glycol fluid, commonly employed as fire-resistant hydraulic oil, shorten bearing life because of it's low lubricating property. This DOWMAX motor is equipped with internal flushing circuit in order to extend the bearing life.
- Refer to drawing ; DZ5821B and DZ5861B (with flow control valve).

3. DOWMAX for installing the shaft upward

1) With air bleeding hole ····· • An air bleeding hole (with plug) is provided in the end cover in order to facilitate oil filling in the motor casing before operation.
• Refer to drawing ; DZ5823B.

2) With special drain port····· • The highest portion of the motor (when its shaft faces upward) is provided with a special drain port to completely fill the motor casing with oil.
• Refer to drawing ; DZ5822B.

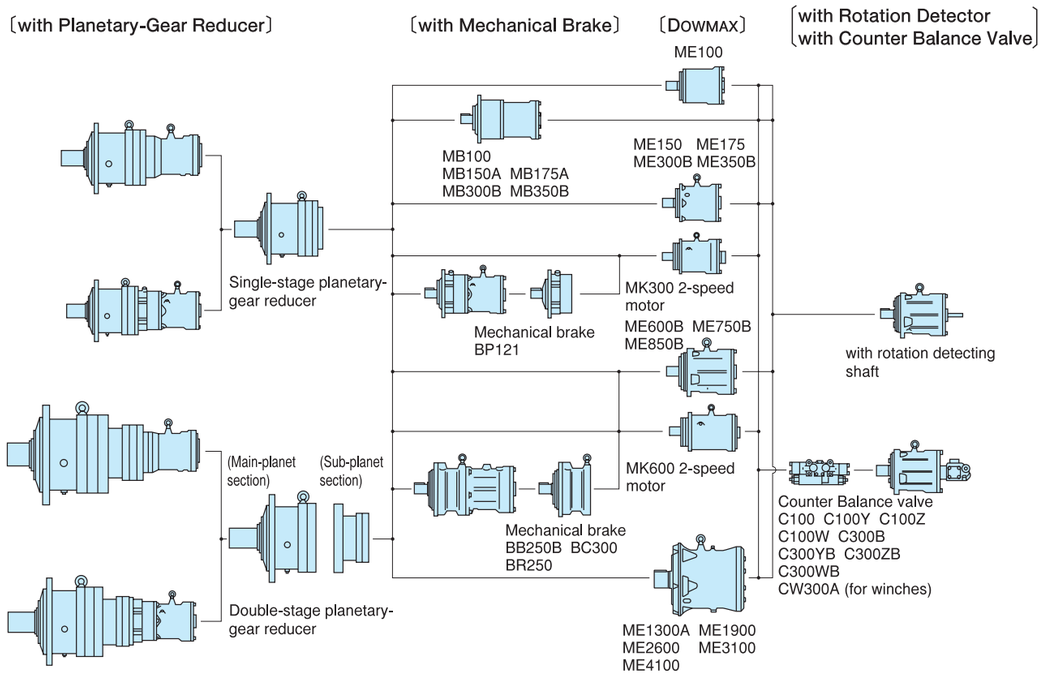
4. Coating and rustproofing

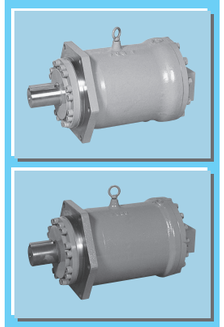
- In addition to the standard coating, 8 types of coating system are standardized for DOWMAX motors.
  Refer to drawing ; DZ6373B
- The uncoated surfaces (excluding the nameplate) of all DOWMAX motors are rustproofed. This standard rustproofing is valid for approx. three months. Contact us if the storage period will be longer than that or the motor is to be used in a corrosive atmosphere.

5. Others

1) Contact us for motors with special capacities, such as 250, 450, and 530 cc/rev.
2) Contact us for the cold-resistant specification for operation at temperatures from -25℃ to -45℃. (Standard motors are usable up to -25℃.)
3) A socket welding type flange is shown in this catalogue for main port piping. A screw type flange is also available.
Refer to drawing ; DZ5831B (straight flange, screw connection) and DZ5852B (elbow flange, screw connection).

Array of DOWMAX Base Products





DOWMAX®

EATON

DOWMAX® 2-Speed Motor

The structure of this 2-speed motor is simple because of a construction where the front and rear piston travel independently, making use of the advantages of the opposed piston and double swash plates motor.

- HIGH STARTING EFFICIENCY Because of the same working structure as standard DOWMAX motor.
- GOOD LOW-SPEED PERFORMANCE Because of multiple-piston construction.
- SLIM CONFIGURATION Motor diameter is same as standard DOWMAX motor.
- CHANGE-OVER BETWEEN LARGE AND SMALL DISPLACEMENT CAN BE DONE WHILE RUNNING WITH A LOAD.
- NO SEPARATE PILOT PRESSURE IS REQUIRED FOR CHANGE-OVER BECAUSE OF THE SELF PRESSURE UTILIZED AS A PILOT PRESSURE.

(INDEX)

Performance Data

Model	Displacement cm³/rev	Rated Pressure MPa (kgf/cm²)	Peak Pressure MPa (kgf/cm²)	Rated Torque N・m (kgf・m)	Max. Speed rpm	Change-over Pilot Pressure MPa (kgf/cm²)	Max. Pressure for Pilot Port MPa (kgf/cm²)	Pilot Piston Stroke Volume cm³	Mass kg
MK300	304/152	24.5 (250)	31.9 (325)	1190/594 (121/61)	600/800	more than self-pressure min.0.98 (min.10)	31.9 (325)	3.1	60
MK600	602/301	24.5 (250)	31.9 (325)	2350/1180 (240/120)	300/600	more than self-pressure min.0.98 (min.10)	31.9 (325)	4.1	110

□Limit of hydraulic fluid temperature; −20℃～+80℃
□Limit of hydraulic fluid viscosity; 15～500cSt (Advisable fluid viscosity range; 25～100cSt)
□In case motors are used, as it's output shaft to be positioned upward, special specification should be applied. In this case, please contact us.

Construction & Working Principle

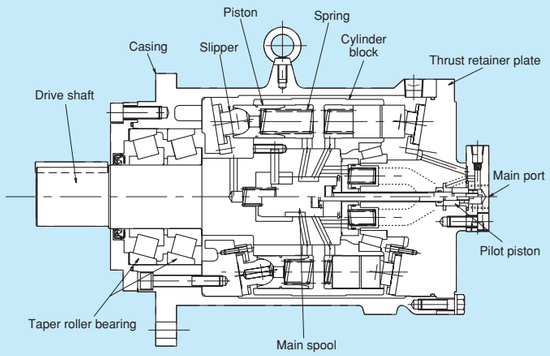


Fig. 1

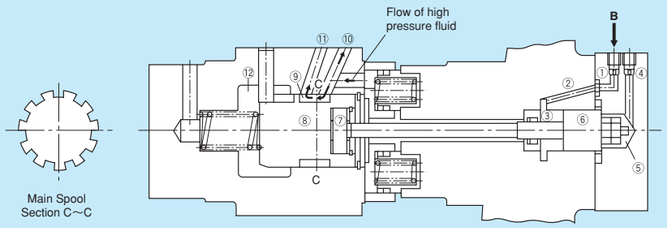


Fig. 2

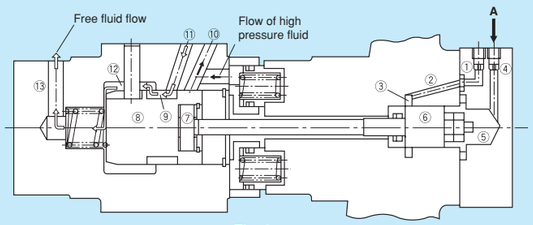


Fig. 3

In the Fig. 1 the high pressure fluid flowing in from the main port enters through the passage in the thrust retainer plate. It then flows into the port which opens at the shaft end surface which slides against the timing plate, and branches into both right and left cylinders.
One flow reaches the piston bores at the right side of the cylinder block, after passing through port holes of the shaft and cylinder block. The other flows into the piston bores at the left side through the groove in the main spool and port holes in the shaft and cylinder block.
Thus the drive shaft starts to rotate through the rotation of cylinder block which is caused by the tangential force on the swash plates exerted by the axial movement of pistons (the pistons are located in the cylinder block which is integral with a drive shaft).
The low-pressure fluid, after working on the pistons, is pushed back by the pistons in the cylinder bore, flows out from the low-pressure main port, through the passage in the reverse way as it came in.

Fig. 2 shows a case of large displacement.
When high pressure fluid is fed to the pilot pressure port B, it arrives at the pilot piston chamber 3 through the passage 1 and 2, and pushes the pilot piston 6 to the right. With the pilot piston 6 pressed to the right side, the main spool 8 also moves to the right by the piston rod 7.
The groove 9 on the main spool comes to the position shown in Fig. 2. With this movement of the main spool, the high pressure fluid coming from the main port flows into both passages of 10 and 11 and exerts force on the right and left pistons, thus working as a large displacement motor.

Fig. 3 shows a case of small displacement.
When high pressure fluid is fed to the pilot pressure port A, it flows to the pilot piston chamber 5 through the passage 4 , and pushes the pilot piston 6 to the left. With the movement of the pilot piston 6 to the left side, the main spool 8 also moves to the left by the piston rod 7.
The groove 9 on the main spool comes to the position shown in Fig. 3. With this movement of the main spool, the high pressure fluid coming from the main port flows only to the passage 10, exerting force only on the right pistons thus working as a small displacement motor.
In this case, although high pressure fluid does not flow to the left side pistons, it reciprocates in the cylinders repeating suction and discharge stroke along with the shaft rotation. This is made possible because the groove 9 around the main spool is positioned as shown by which each left side cylinder is channelled through the passage 12. Further, as the passage 12 is connected with the hole 13, fluid is supplied and cooled through the flow to the drain.

MODEL CODE & SYMBOLS

MK 300 — C ※ F2 A S □□□

- **Special Specification Number**
- **Special Specification Code :** No Sign — Standard Specification
  S — Special Specification
- **Valve Code :** No Sign — w/o Valve
  A — Solenoid Valve, AC100V
  B — Solenoid Valve, AC200V
  C — Solenoid Valve, DC12V
  D — Solenoid Valve, DC24V
  M — MANUAL
- **Flange** F1 — Flange w/o Shuttle Valve (Rc3/4 Port)
  FA — Flange w/o Shuttle Valve (1 1/16- 12UN-2B Port)
  F2 — Flange w/ Shuttle Valve (Rc3/4 Port)
  FB — Flange w/ Shuttle Valve (1 1/16- 12UN-2B Port)
- **Seal Code :** No Sign — Standard Seal (Nitrile Rubber)
- **Shaft Code** C — Parallel keyed shaft with screws for key retention plate (Std.)
  P — Metric spline shaft
  K — Inch size keyed shaft
  H — Inch size spline shaft
- **Design No.** (Beginning with — and in alphabetical order hence forth)
- **Motor Size** (Metric Displacement)
- **Model Code :** DOWMAX 2-speed series motor

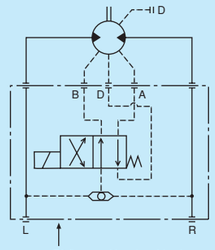
CHANGE-OVER CIRCUIT IN 2-SPEED OPERATION

[Basic conditions of a change-over operation]

1. The change-over pilot pressure is basically self-pressure.
   However, when a separate pilot pressure other than system-pressure is used, it must be higher than the system-pressure.
2. When the system-pressure is utilized as the pilot pressure for the change-over, the change-over can not be done if the system-pressure is below 1MPa (10 kgf/cm²).
   (If back-pressure exists at the low pressure side of the change-over pilot pressure, the system-pressure must be larger than the back pressure by 1MPa (10 kgf/cm²) or more.)

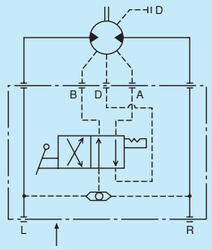
[Example of 2-speed change-over circuit]

1. Where a F2 flange with solenoid valve is used.



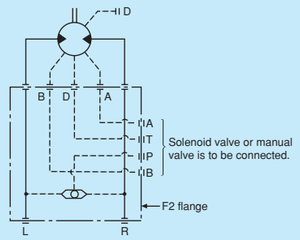
F2 flange with solenoid valve

2. Where a F2 flange with manual valve is used.

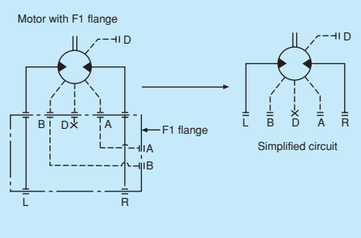


F2 flange with manual valve

3. Where a F2 flange is used.



4. Where a F1 flange (without shuttle valve) is used.

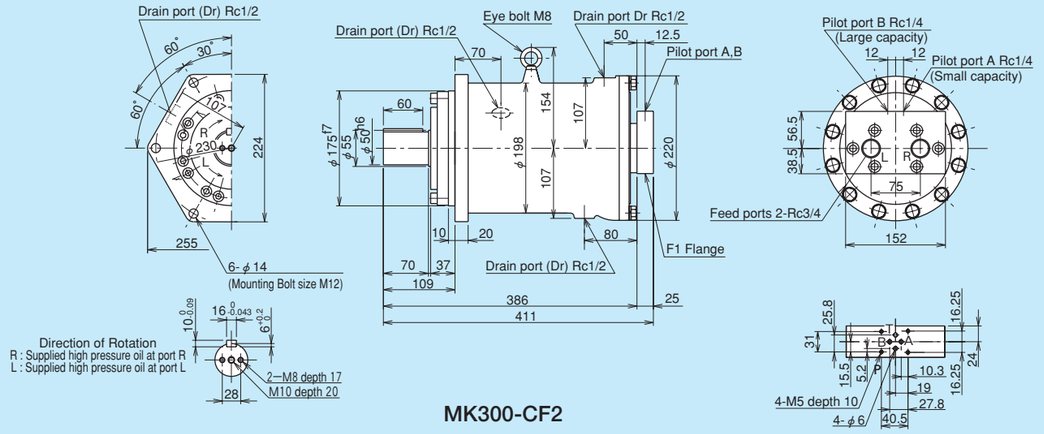


MK300

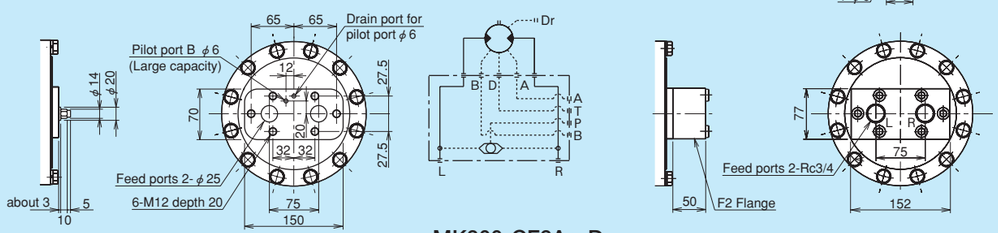
Displacement	304/152cm³/rev
Rated Pressure	24.5MPa (250kgf/cm²)
Peak Pressure	31.9MPa (325kgf/cm²)
Rated Torque	1190/594N·m (121/61kgf·m)
Max. Speed	600/800rpm
Change-over Pilot Pressure	more than self-pressure, Min.0.98MPa (10kgf/cm²)
Max. Pressure for Pilot Port	31.9MPa (325kgf/cm²)
Pilot Piston Stroke Volume	3.1cm³
Mass	60kg

Nominal Dimensions

MK300-CF1



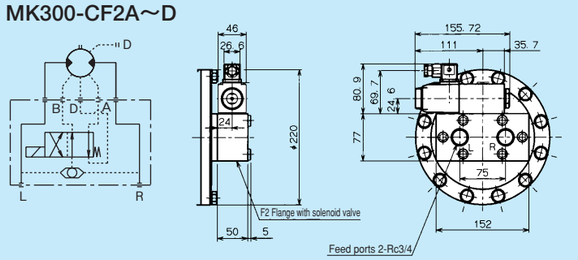
MK300-CF2



Detail of the flange center

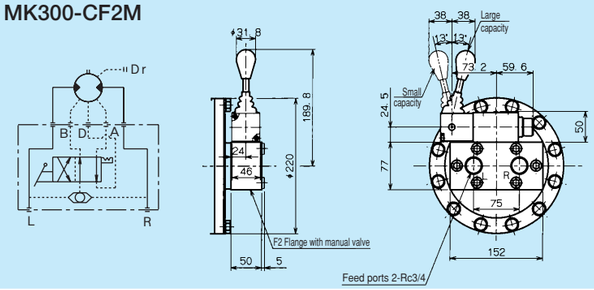
When manufacfuring a flange in the customer, the flange central part process like the figure above.

MK300-CF2A～D



Change of capacity
Large capacity : Solenoid valve off
Small capacity : Solenoid valve on

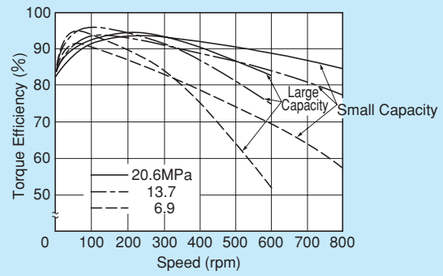
MK300-CF2M

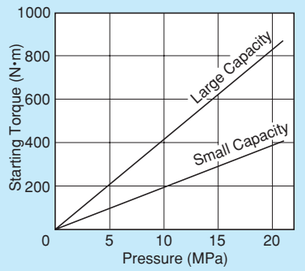


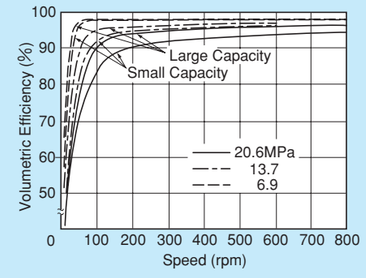
Change of capacity
Large capacity : operate the lever to the right
Small capacity : operate the lever to the left

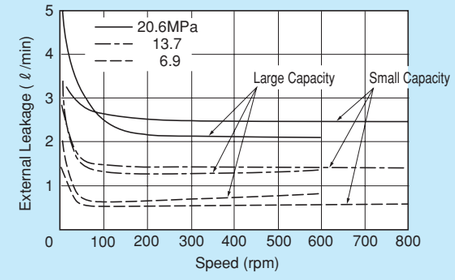
Performance Data

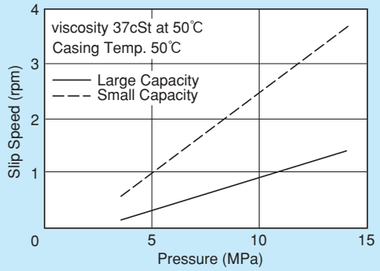
FLUID : SHELL TELLUS 56 (Viscosity 37cSt at 50°C)
The graphs shown are mean values obtained for production units.

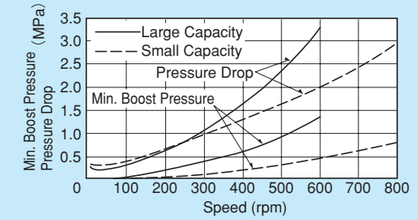










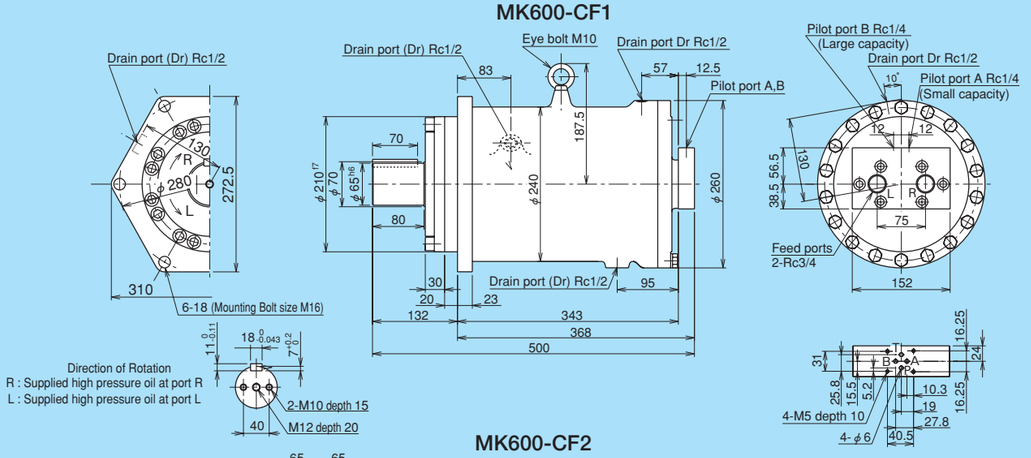


MK600

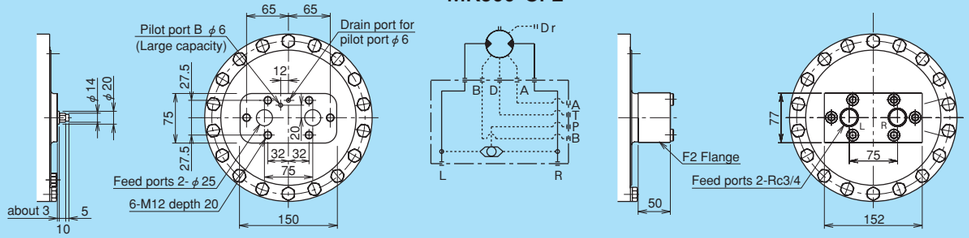
Displacement	602/301cm³/rev
Rated Pressure	24.5MPa (250kgf/cm²)
Peak Pressure	31.9MPa (325kgf/cm²)
Rated Torque	2354/1177N·m (240/120kgf·m)
Max. Speed	300/600rpm
Change-over Pilot Pressure	more than self-pressure, Min.0.98MPa (10kgf/cm²)
Max. Pressure for Pilot Port	31.9MPa (325kgf/cm²)
Pilot Piston Stroke Volume	4.1cm³
Mass	110kg

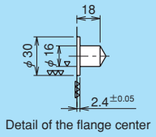
Nominal Dimensions

MK600-CF1



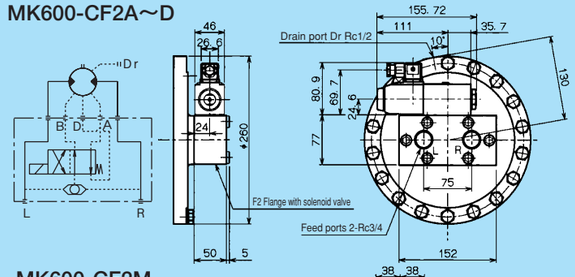
MK600-CF2





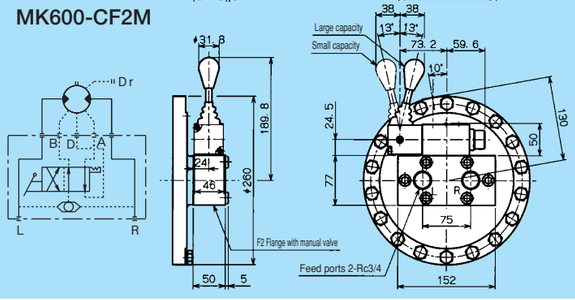
When manufacfuring a flange in the customer, the flange central part process like the figure above.

MK600-CF2A～D



Change of capacity
Large capacity : Solenoid valve off
Small capacity : Solenoid valve on

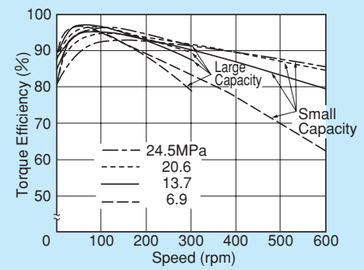
MK600-CF2M

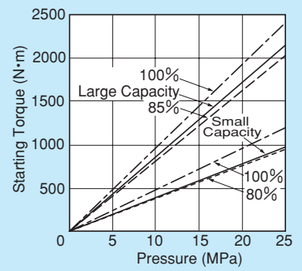


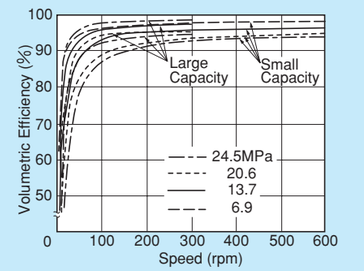
Change of capacity
Large capacity : operate the lever to the right
Small capacity : operate the lever to the left

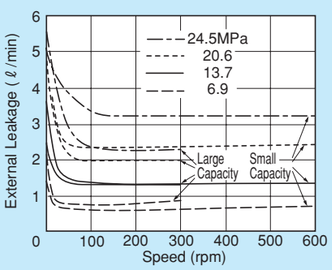
Performance Data

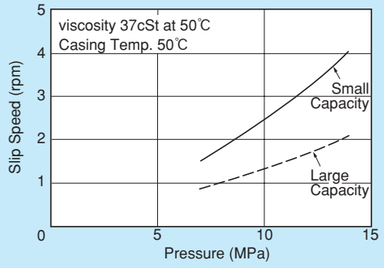
FLUID : SHELL TELLUS 56 (Viscosity 37cSt at 50°C)
The graphs shown are mean values obtained for production units.

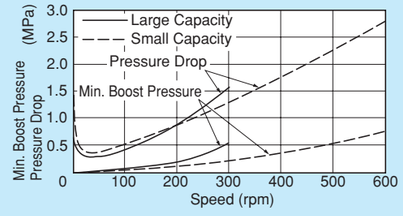












BEARING LIFE AND ALLOWABLE RADIAL LOAD FOR SHAFT

NOTE 1. If motors are operated within the proper ratings and conditions, the operational life is determined by the Bearing Life.

2. In order to maintain the maximum bearing life, when a radial load is imposed on the output shaft the motor should be installed as illustrated in Fig. 2 or Fig. 3;
   For a uni-directional application, motor should be installed so that side load acts as shown in Fig. 2.
   For a bi-directional application, a radial load for each rotational direction being applied, the motor should be installed so that side loads act as shown in Fig. 3.

3. The graphs shown are the bearing life (B-10 Life) at 100 rpm shaft speed for various pressures and radial loads.
   When the shaft speed differs from 100 rpm the bearing life can be obtained by the following formula:

$$\text{B-10 Life} = \text{(Bearing Life obtainable in the graph)} \times \frac{100}{\text{Actual Shaft Speed, rpm}}$$

   In case where the side load acts at a different location to the midpoint of the shaft projection please refer to us.

4. Applications with axial thrust loads should be referred to us.
5. When motor is used in Meter-Out circuit, pressure in Fig. 2 & 3 shaft be a sum of motor inlet and outlet pressure.
6. Bearing life varies due to kind of fluid. Bearing life should be decided by multiplying by the factor below:

Fluid type	life factor
Mineral-based fluid	1.0
Phosphate-ester fluid	1.0
Water-glycol w/o forced lubrication	0.05～0.10
Water-glycol w/ forced lubrication	0.6

MK300

Allowable Max. Radial Load

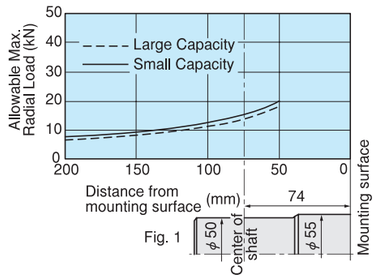


Fig. 1

Bearing Life

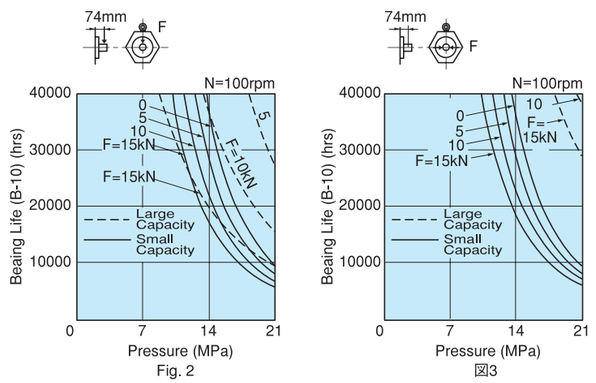


Fig. 2

図3

MK600

Allowable Max. Radial Load

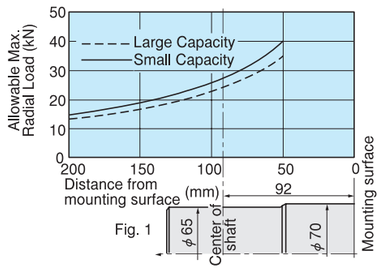


Fig. 1

Bearing Life

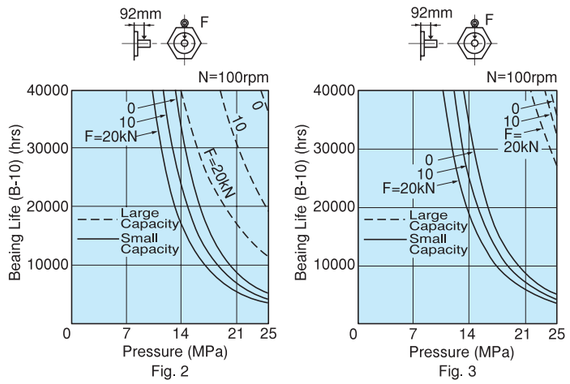
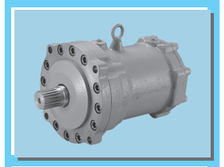


Fig. 2

Fig. 3



DOWMAX®

EATON

DOWMAX® with Mechanical Brake

This brake is a wet multi-disc type and is of a pressure-release type (negative brake type) where the brake is on at all time and is released only when the pilot fluid is led through the brake releasing port. Any adjustment after initial installation is not required.

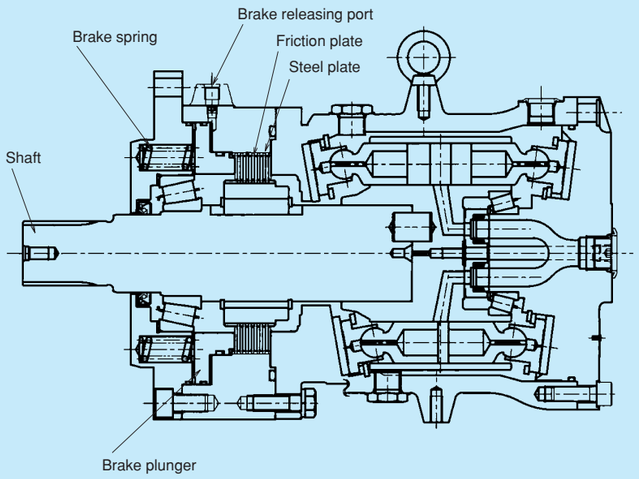
The mechanical brake provides the following two types. Select one depending on application.

- Cartridge type mechanical brake which enables easy mounting and dismounting with the hydraulic motor (BB, BC, BP, BR types)
- Integral shaft type mechanical brake which is compact and light weight (MB type)

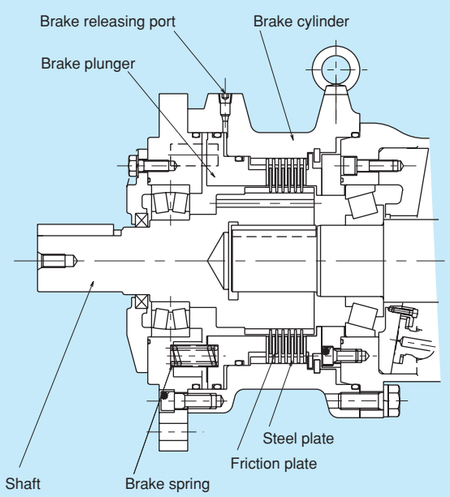
□The mechanical brake is highly durable as it has adopted wet type multiple discs/plates.
□Having a large torque capacity, it is suited for a wide range of applications.
□Safe operation is ensured as it is a pressure-release type (brake is only released by applying pressure).
□Being compact in construction, it is easy to design its installation on any equipment.
□It provides a large radial load capability, because of a large capacity roller bearing being adopted on the drive shaft.
□The brake motor has a quick access for servicing as the removal of either brake or motor can easily be made.

(INDEX) Structure, Operation, Performance Data, Examples of Application ··60

Structure & Operating Principle



Structure of integral shaft type mechanical brake (MB type: Above drawing shows MB300B.)



Structure of cartridge type mechanical brake (BB, BC, BP, BR types)

The internal structure of the mechanical brake is shown above. The friction plates and steel plates are located one side the other, and the braking torque is generated by the friction force applied when the spring presses these plates. The friction plates are placed on the splined drive shaft for cartridge type and on the brake spline for integral shaft type, which are connected to the motor shaft with a key. The steel plates are placed on the brake cylinder for cartridge type and brake plunger for integral shaft type by splines. The braking torque is generated by the force of the spring, and when a pressure higher than a spring force is applied in the brake releasing port, the friction plates and steel plates are separated and the brake is released. When the pressure at the brake releasing port is lowered, the brake plunger is pressed against the friction plate by the spring force, and the brake torque is generated by the friction force between the plates.

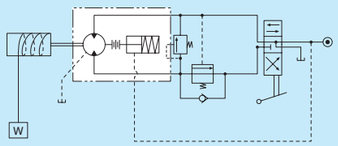
Performance Data

Model	Hydraulic Motor						Mechanical Brake				Mass
	Displacement	Rated pressure	Peak pressure	Rated torque	Rated speed	Max. speed	Static brake torque	Brake releasing pressure	Max. pressure for cylinder	Brake cylinder stroke volume	
	cm³/rev	MPa (kgf/cm²)	MPa (kgf/cm²)	N·m (kgf·m)	rpm	rpm	N·m (kgf·m)	MPa (kgf/cm²)	MPa (kgf/cm²)	cm³	kg
MB100-C40	99	27.5 (280)	31.9 (325)	432 (44)	1000	1000	392 (40)	1.23 (12.5)	31.9 (325)	13	34
MB150AP100	152			667 (68)	600	800	980 (100)	1.0 (10)		20	71
MB175AP100	175			765 (78)	600	800					
MB300BP150	300			1320 (134)	660	800	1470 (150)	1.2 (12)			89
MB350BP150	350			1530 (156)	660	800					
ME600BCS2550+BB250BC	600			2620 (267)	500	600	2450 (250)			58	190
ME750BCS2560+BC300-C	750			3280 (334)	400	520	2940 (300)				217
ME850BCS2570+BC300-C	848			3700 (377)	350	450					
MK300-FS001+BP121-C	304	24.5 (250)		1190 (121)	600	600	1190 (121)			37	102
	152			594 (61)	800	800					
MK600-NS002+BR250-C	602			2350 (240)	300	300	2450 (250)			58	204
	301			1180 (120)	600	600					

EXAMPLES OF APPLICATION

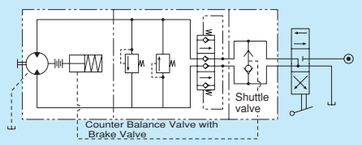
Winch Circuit.

A case where the mechanical brake is applied to hold the load, when a change-over lever at neutral.

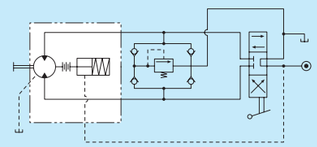


Truck (carrier) Drive Circuit.

A case where the mechanical brake is used in combination with counter balance valve with brake valves, for traction drive use.



A case where the mechanical brake is used in combination with brake valve, for traction drive use.



When this mechanical brake is used as dynamic brake, the friction plate will slip against steel plate, and in some cases excessive heat would be generated by friction. In such a case, please contact us.

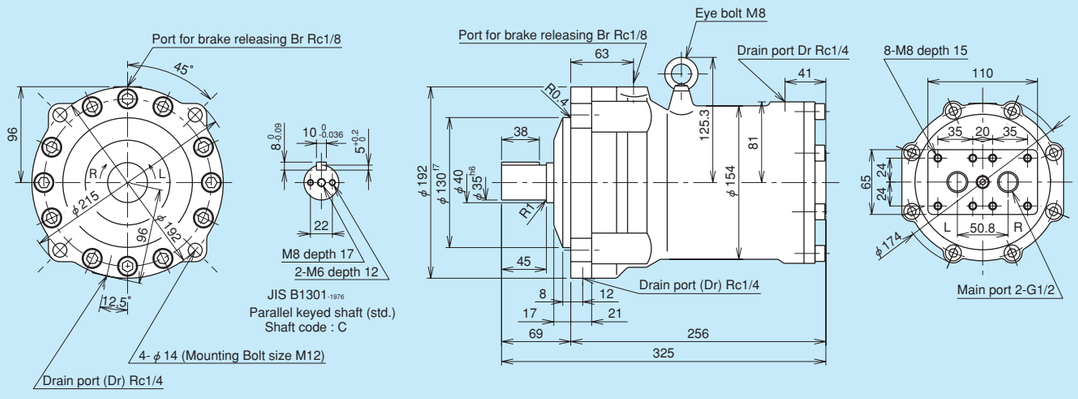
CAUTION; In case motors are used as it's output shaft to be positioned upward, some modification would be necessary. In this case, please contact us.

DOWMAX®with Mechanical Brake

MB100–C40

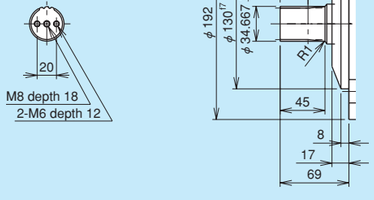
Hydraulic Motor	Displacement	99cm³/rev
	Rated pressure	27.5MPa (280kgf/cm²)
	Peak pressure	31.9MPa (325kgf/cm²)
	Rated torque (theoretical)	432N·m (44kgf·m)
	Rated speed	1000rpm
	Max. speed	1000rpm
Mechanical Brake	Static brake torque	392N·m (40kgf·m)
	Brake releasing pressure	1.2MPa (12.5kgf/cm²)
	Endurable press. of brake cylinder	31.9MPa (325kgf/cm²)
	Brake cylinder stroke volume	13cm³
GD²		0.08kg·m²
Casing capacity		0.7 ℓ
Mass		34kg

OUTLINE DIMENSIONS



Direction of rotation
R : Supplied high pressure oil at port R.
L : Supplied high pressure oil at port L.

Spline shaft
Shaft code : P



JIS D2001 Involute Spline
35 ×19×1.667 (Class b)

Shaft	Coefficient of profile shifting		+0.800
	Tooth thickness	Tool: Tooth form	Stub tooth
		Tool: Module	1.667
		Tool: Pressure angle	20°
		Number of teeth	19
		Dia. of basic pitch circle	31.667
		Grade	Class b (flank fit)
		Over-pin dia.	37.819 −0.019 −0.110
			Pin dia.= φ3.0
		Over-all. across a given number of teeth (reference)	13.656 −0.002 −0.058 (3-teeth)
	Outer dia.		34.667
	Inner dia.		31.000

CODING

MB 100 — C 40 □ □ □□□

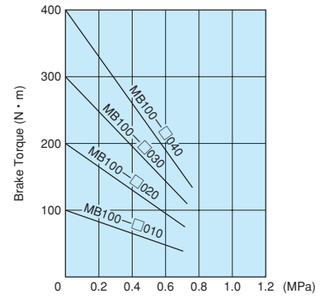
- Special specification number
- Special Spec.: No indication: Standard specification; S : Special specification
- Port: No indication: Standard metric port; ＊C100□ counter balance valve fits with standard metric port (No. code); E : Unified threaded port
- Brake torque:

Indication sign	040	030	020	010
Brake torque N·m (kgf·m)	392 (40)	294 (30)	196 (20)	98 (10)

- Output shaft: C : Standard shaft (New JIS key straight shaft); P : Metric Spline shaft; S : Special shaft

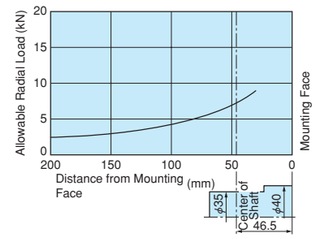
BRAKE CHARACTERISTICS

The Brake torque is generated in proportion to the force exerted between the friction plates and steel plates. Therefore, the brake torque varies with the pressure at the brake releasing port and the drain pressure in the motor case. The chart, right, shows the relationship between the brake torque vs. the pressure at the brake releasing port and the drain pressure in the motor case.
Brake torque varies due to unevenness of friction coefficient between friction plate and steel plate. The curve shows the lower limit of these values.

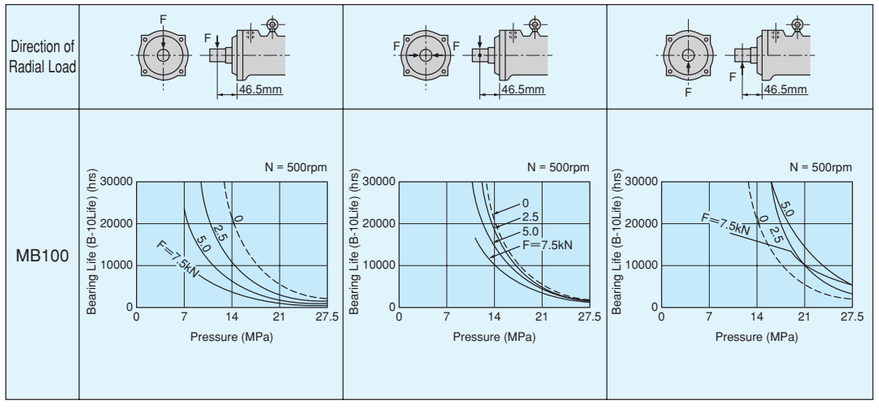


(Pressure at brake releasing port) minus (Drain pressure in case)

ALLOWABLE RADIAL LOAD



BEARING LIFE



NOTE 1. If motors are operated within the proper ratings and conditions, the operational life is determined by the Bearing Life.
2. Bearing life varies due to the direction of radial load to shaft.
3. The graphs shown are the bearing life (B-10 Life) at 500 rpm shaft speed for various pressures and radial loads.
When the shaft speed differs from 100 rpm the bearing life can be obtained by the formula below:

$$\text{B-10 Life} = (\text{Bearing Life obtainable in the graph at 500 rpm}) \times \frac{500}{\text{Actual Shaft Speed, RPM}}$$

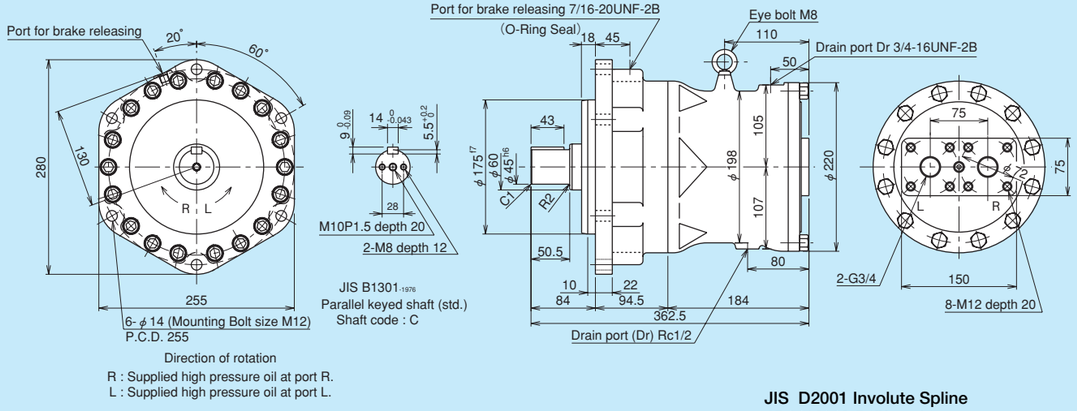
In case where the side load acts at a different location to the midpoint of the shaft projection please refer to us.
4. Applications with axial thrust loads should be referred to us.
5. When motor is used in Meter-Out circuit, pressure in the figure shall be a sum of motor inlet and outlet pressure.
6. When water-glycol fluid is used, bearing life comes remarkably short. In this case please refer to us.

DOWMAX®with Mechanical Brake

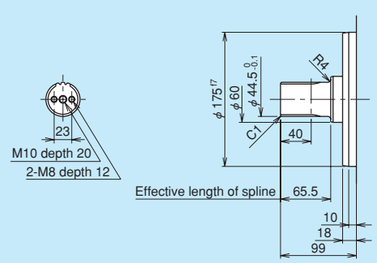
MB150AP100
MB175AP100

Hydraulic Motor	Displacement	152	175	cm³/rev
	Rated pressure	27.5 (280)		MPa (kgf/cm²)
	Peak pressure	31.9 (325)		MPa (kgf/cm²)
	Rated torque (theoretical)	667 (68)	765 (78)	N·m (kgf·m)
	Rated speed	600		rpm
	Max. speed	800		rpm
Mechanical Brake	Static brake torque	981 (100)		N·m (kgf·m)
	Brake releasing pressure	1.0 (10)		MPa (kgf/cm²)
	Endurable press. of brake cylinder	31.9 (325)		MPa (kgf/cm²)
	Brake cylinder stroke volume	20		cm³
GD²		0.25		kg·m²
Casing capacity		1.0		ℓ
Mass		71		kg

OUTLINE DIMENSIONS



Spline shaft
Shaft code : P



JIS D2001 Involute Spline
45 ×16×2.5 (Class b)

Shaft	Coefficient of profile shifting		+0.800
	Tooth thickness	Tooth form	Stub tooth
		Module	2.5
		Pressure angle	20°
	Number of teeth		16
	Dia. of basic pitch circle		40
		Grade	Class b (flank fit)
		Over-pin dia.	49.277 $^{-0.018}_{-0.107}$ Pin dia.= φ4.5
		Over-all. across a given number of teeth (reference)	20.379 $^{-0.001}_{-0.058}$ (3-teeth)
	Outer dia.		44.5
	Inner dia.		39

CODING

MB 175 A P 100 □ □ □□□

- Special specification number
- Special Spec. { No indication: Standard specification; S : Special specification }
- Port { No indication: Standard metric ports; A : C100□ counter balance valve mounting port; B : C300□ B&CW300A counter balance valve mounting port }
- Brake torque

Indication sign	100	080	060	040	020
Brake torque N·m (kgf·m)	981 (100)	785 (80)	589 (60)	392 (40)	196 (20)

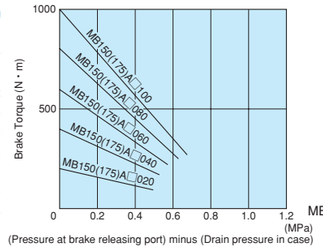
- Output shaft { C : Standard shaft (New JIS key straight shaft); P : Metric Spline shaft; S : Special shaft }
- Design No. (1st design change "A")

DOWMAX model No.

Model	150	175
Displacement (cm³/rev)	152	175

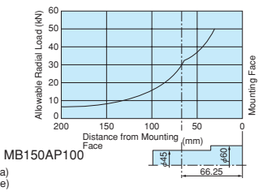
BRAKE CHARACTERISTICS

The Brake torque is generated in proportion to the force exerted between the friction plates and steel plates. Therefore, the brake torque varies with the pressure at the brake releasing port and the drain pressure in the motor case. The chart, right, shows the relationship between the brake torque vs. the pressure at the brake releasing port and the drain pressure in the motor case. Brake torque varies due to unevenness of friction coefficient between friction plate and steel plate. The curve shows the lower limit of these values.

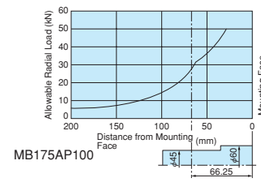


(Pressure at brake releasing port) minus (Drain pressure in case)

ALLOWABLE RADIAL LOAD

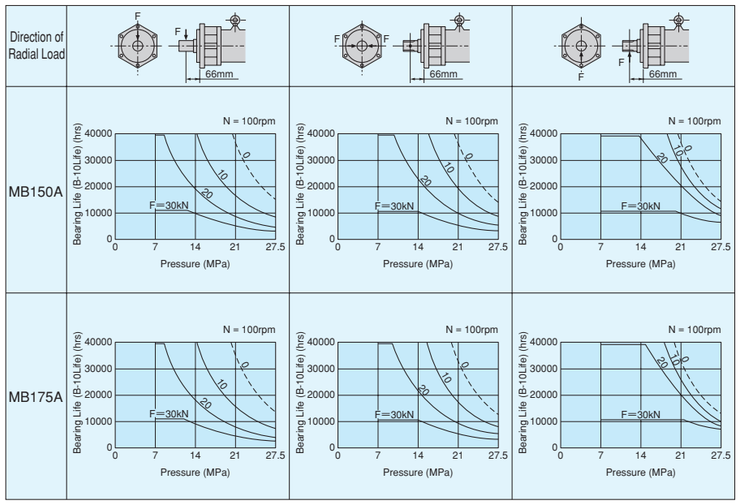


MB150AP100



MB175AP100

BEARING LIFE



NOTE 1. If motors are operated within the proper ratings and conditions, the operational life is determined by the Bearing Life.
2. Bearing life varies due to the direction of radial load to shaft.
3. The graphs shown are the bearing life (B-10 Life) at 100 rpm shaft speed for various pressures and radial loads.
When the shaft speed differs from 100 rpm the bearing life can be obtained by the formula below:

$$\text{B-10 Life} = (\text{Bearing Life obtainable in the graph at 100 rpm}) \times \frac{100}{\text{Actual Shaft Speed, RPM}}$$

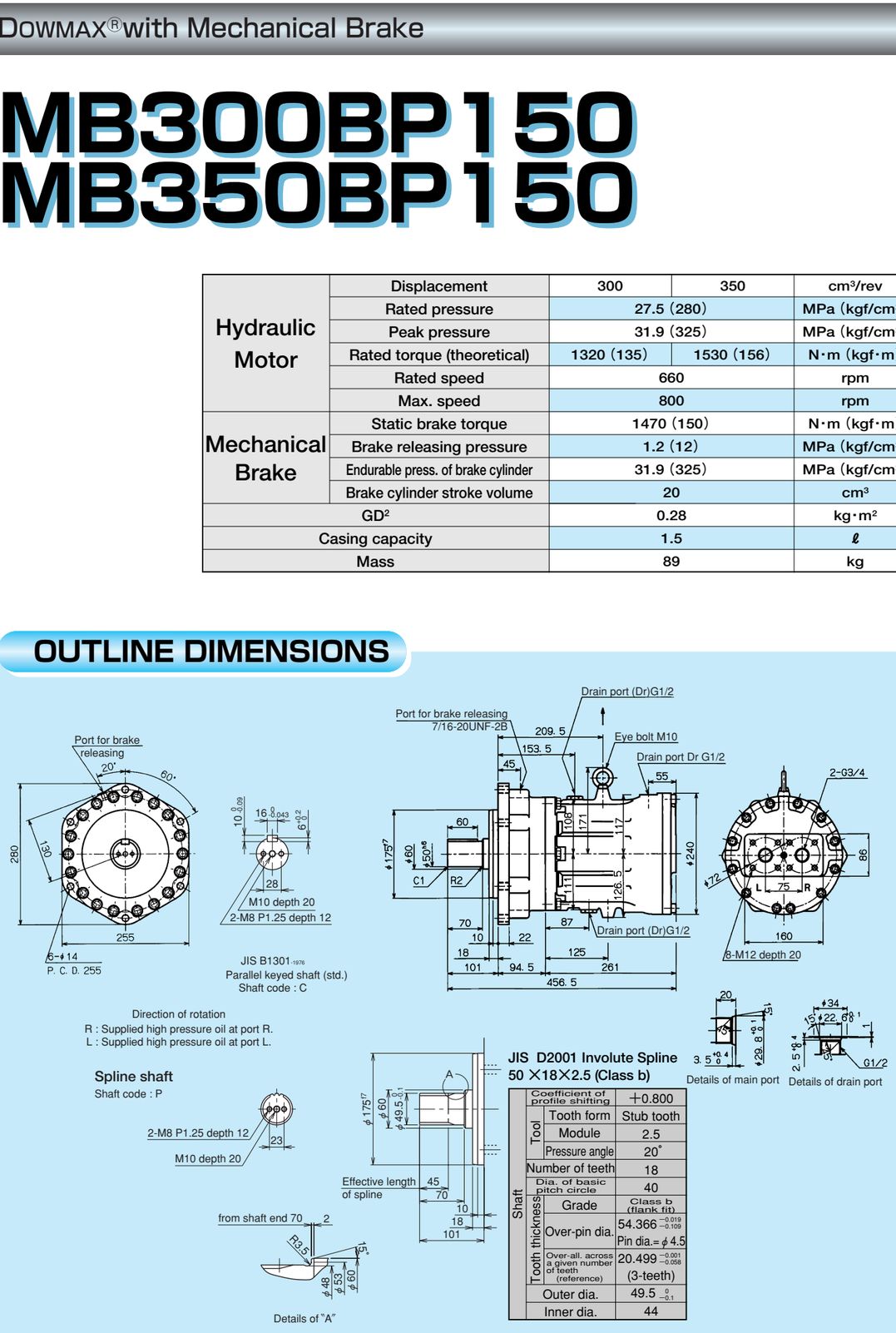
In case where the side load acts at a different location to the midpoint of the shaft projection please refer to us.
4. Applications with axial thrust loads should be referred to us.
5. When motor is used in Meter-Out circuit, pressure in the figure shall be a sum of motor inlet and outlet pressure.
6. When water-glycol fluid is used, bearing life comes remarkably short. In this case please refer to us.

DOWMAX®with Mechanical Brake

MB300BP150
MB350BP150

Hydraulic Motor	Displacement	300	350	cm³/rev
	Rated pressure	27.5 (280)		MPa (kgf/cm²)
	Peak pressure	31.9 (325)		MPa (kgf/cm²)
	Rated torque (theoretical)	1320 (135)	1530 (156)	N·m (kgf·m)
	Rated speed	660		rpm
	Max. speed	800		rpm
Mechanical Brake	Static brake torque	1470 (150)		N·m (kgf·m)
	Brake releasing pressure	1.2 (12)		MPa (kgf/cm²)
	Endurable press. of brake cylinder	31.9 (325)		MPa (kgf/cm²)
	Brake cylinder stroke volume	20		cm³
GD²		0.28		kg·m²
Casing capacity		1.5		ℓ
Mass		89		kg

OUTLINE DIMENSIONS



Shaft	Coefficient of profile shifting	+0.800
	Tooth thickness: Tool: Tooth form	Stub tooth
	Tooth thickness: Tool: Module	2.5
	Tooth thickness: Tool: Pressure angle	20°
	Number of teeth	18
	Dia. of basic pitch circle	40
	Tooth thickness: Grade	Class b (flank fit)
	Tooth thickness: Over-pin dia.	54.366 $^{-0.019}_{-0.109}$ / Pin dia.= φ 4.5
	Tooth thickness: Over-all. across a given number of teeth (reference)	20.499 $^{-0.001}_{-0.058}$ (3-teeth)
	Outer dia.	49.5 $^{0}_{-0.1}$
	Inner dia.	44

CODING

MB 300 B P 150 □ □ □□□

- Special specification number
- Special Spec. { No indication: Standard specification / S : Special specification
- Port { No indication: Standard metric ports / A : C100□ counter balance valve mounting port / B : C300□ B&CW300A counter balance valve mounting port
- Brake torque

Indication sign	150	125	100	075	050	025
Brake torque N·m (kgf·m)	1470 (150)	1230 (125)	981 (100)	736 (75)	491 (50)	245 (25)

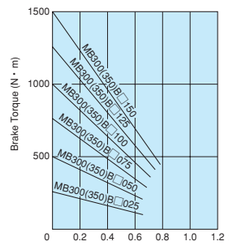
- Output shaft { C : Standard shaft (New JIS key straight shaft) / P : Metric Spline shaft / S : Special shaft
- Design No. (1st design change "A")

DOWMAX model No.

Model	300	350
Displacement (cm³/rev)	300	350

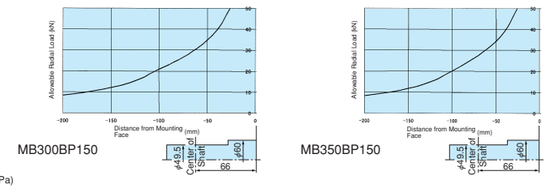
BRAKE CHARACTERISTICS

The Brake torque is generated in proportion to the force exerted between the friction plates and steel plates. Therefore, the brake torque varies with the pressure at the brake releasing port and the drain pressure in the motor case. The chart, right, shows the relationship between the brake torque vs. the pressure at the brake releasing port and the drain pressure in the motor case. Brake torque varies due to unevenness of friction coefficient between friction plate and steel plate. The curve shows the lower limit of these values.

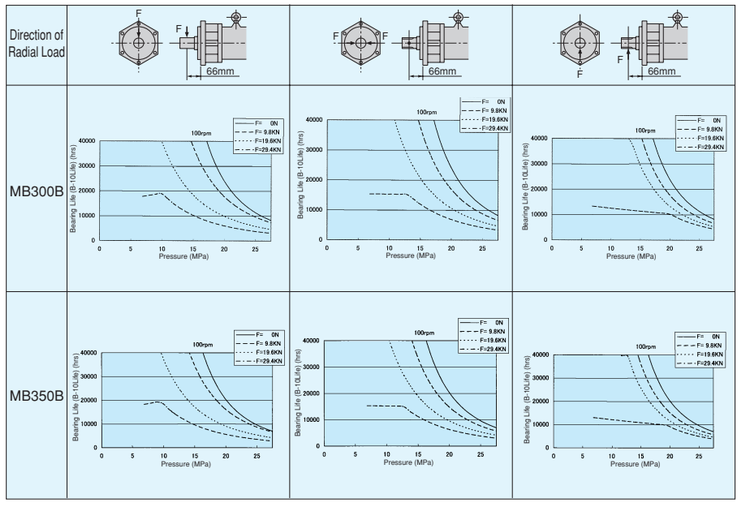


(Pressure at brake releasing port) minus (Drain pressure in case)

ALLOWABLE RADIAL LOAD



BEARING LIFE



NOTE 1. If motors are operated within the proper ratings and conditions, the operational life is determined by the Bearing Life.
2. Bearing life varies due to the direction of radial load to shaft.
3. The graphs shown are the bearing life (B-10 Life) at 100 rpm shaft speed for various pressures and radial loads.
When the shaft speed differs from 100 rpm the bearing life can be obtained by the formula below:

$$\text{B-10 Life} = (\text{Bearing Life obtainable in the graph at 100 rpm}) \times \frac{100}{\text{Actual Shaft Speed, RPM}}$$

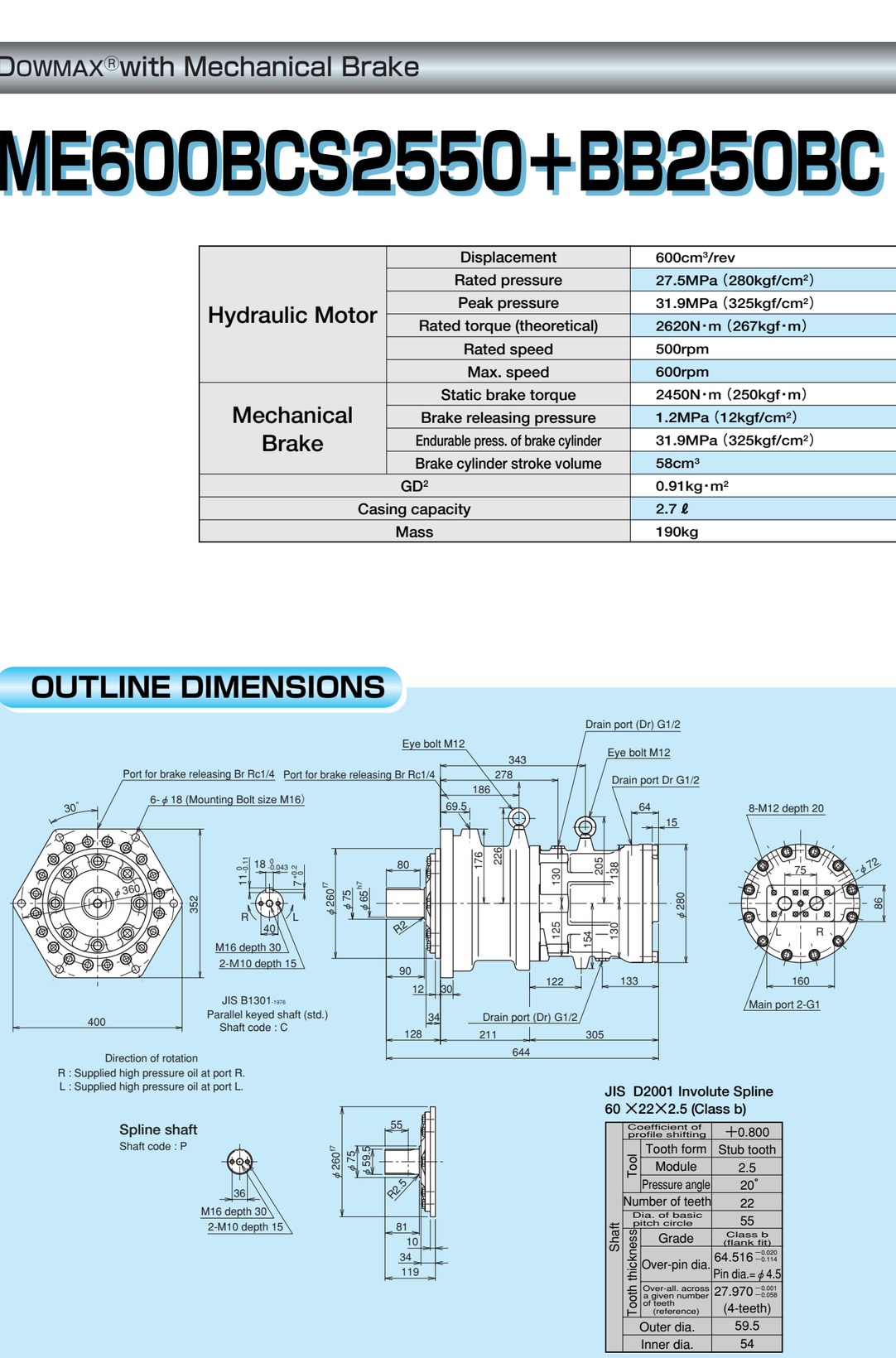
In case where the side load acts at a different location to the midpoint of the shaft projection please refer to us.
4. Applications with axial thrust loads should be referred to us.
5. When motor is used in Meter-Out circuit, pressure in the figure shall be a sum of motor inlet and outlet pressure.
6. When water-glycol fluid is used, bearing life comes remarkably short. In this case please refer to us.

DOWMAX®with Mechanical Brake

ME600BCS2550+BB250BC

Hydraulic Motor	Displacement	600cm³/rev
	Rated pressure	27.5MPa (280kgf/cm²)
	Peak pressure	31.9MPa (325kgf/cm²)
	Rated torque (theoretical)	2620N·m (267kgf·m)
	Rated speed	500rpm
	Max. speed	600rpm
Mechanical Brake	Static brake torque	2450N·m (250kgf·m)
	Brake releasing pressure	1.2MPa (12kgf/cm²)
	Endurable press. of brake cylinder	31.9MPa (325kgf/cm²)
	Brake cylinder stroke volume	58cm³
GD²		0.91kg·m²
Casing capacity		2.7 ℓ
Mass		190kg

OUTLINE DIMENSIONS



JIS D2001 Involute Spline
60 ×22×2.5 (Class b)

Shaft	Coefficient of profile shifting		+0.800
	Tool	Tooth form	Stub tooth
		Module	2.5
		Pressure angle	20°
	Number of teeth		22
	Dia. of basic pitch circle		55
	Tooth thickness	Grade	Class b (flank fit)
		Over-pin dia.	$64.516^{-0.020}_{-0.114}$ Pin dia.=φ4.5
		Over-all. across a given number of teeth (reference)	$27.970^{-0.001}_{-0.058}$ (4-teeth)
	Outer dia.		59.5
	Inner dia.		54

CODING

ME600BC□S2550+BB250BC □ □□□

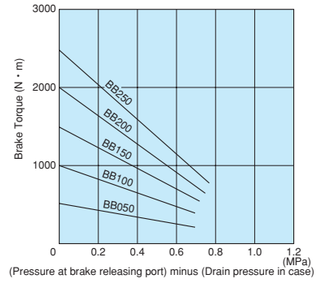
- Special specification number
- Special Spec. — No indication: Standard specification; S : Special specification
- Motor shaft — C : Standard shaft (New JIS key straight shaft); P : Metric Spline shaft; S : Special shaft
- Brake torque

Indication sign	250	200	150	100	050
Brake torque N·m (kgf·m)	2450 (250)	1960 (200)	1470 (150)	981 (100)	491 (50)

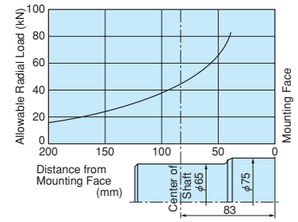
- Port — No indication: Standard metric ports; A : C100□ counter balance valve mounting port; B : C300□ B&CW300A counter balance valve mounting port

BRAKE CHARACTERISTICS

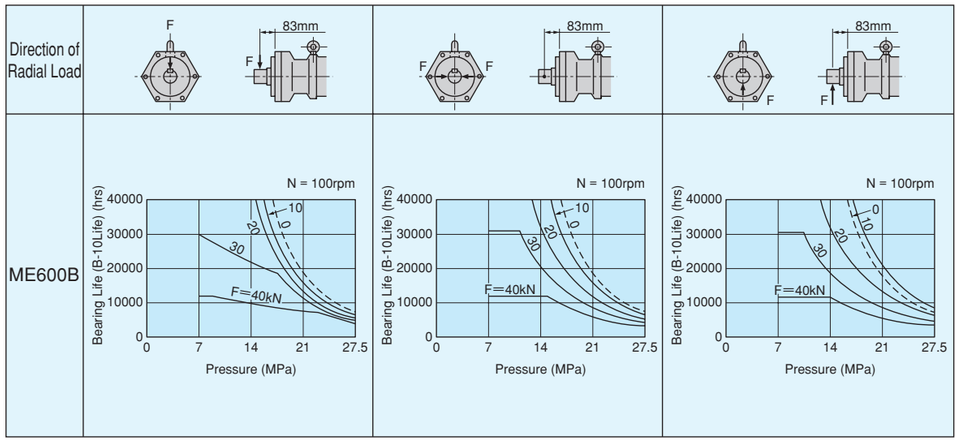
The Brake torque is generated in proportion to the force exerted between the friction plates and steel plates. Therefore, the brake torque varies with the pressure at the brake releasing port and the drain pressure in the motor case. The chart, right, shows the relationship between the brake torque vs. the pressure at the brake releasing port and the drain pressure in the motor case. Brake torque varies due to unevenness of friction coefficient between friction plate and steel plate. The curve shows the lower limit of these values.



ALLOWABLE RADIAL LOAD



BEARING LIFE



NOTE 1. If motors are operated within the proper ratings and conditions, the operational life is determined by the Bearing Life.
2. Bearing life varies due to the direction of radial load to shaft.
3. The graphs shown are the bearing life (B-10 Life) at 100 rpm shaft speed for various pressures and radial loads.
When the shaft speed differs from 100 rpm the bearing life can be obtained by the formula below:

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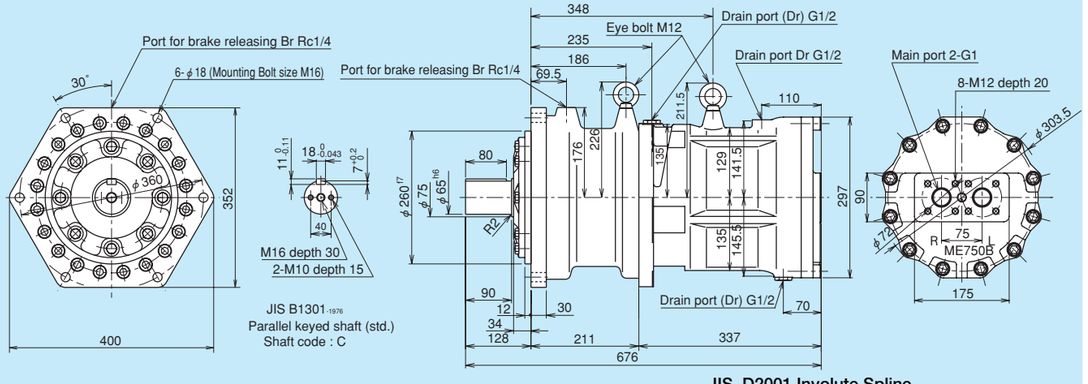
In case where the side load acts at a different location to the midpoint of the shaft projection please refer to us.
4. Applications with axial thrust loads should be referred to us.
5. When motor is used in Meter-Out circuit, pressure in the figure shall be a sum of motor inlet and outlet pressure.
6. When water-glycol fluid is used, bearing life comes remarkably short. In this case please refer to us.

DOWMAX®with Mechanical Brake

ME750BCS2560+BC300-C
ME850BCS2570+BC300-C

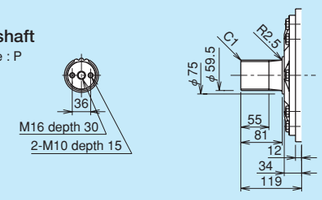
Hydraulic Motor	Displacement	750	848	cm³/rev
	Rated pressure	27.5 (280)		MPa (kgf/cm²)
	Peak pressure	31.9 (325)		MPa (kgf/cm²)
	Rated torque (theoretical)	3280 (334)	3708 (378)	N·m (kgf·m)
	Rated speed	450	400	rpm
	Max. speed	520	450	rpm
Mechanical Brake	Static brake torque	2940 (300)		N·m (kgf·m)
	Brake releasing pressure	1.2 (12)		MPa (kgf/cm²)
	Endurable press. of brake cylinder	31.9 (325)		MPa (kgf/cm²)
	Brake cylinder stroke volume	58		cm³
GD²		1.25		kg·m²
Casing capacity		3.0		ℓ
Mass		217		kg

OUTLINE DIMENSIONS



Direction of rotation
R : Supplied high pressure oil at port R.
L : Supplied high pressure oil at port L.

Spline shaft
Shaft code : P



JIS D2001 Involute Spline
60 ×22×2.5 (Class b)

Shaft		Coefficient of profile shifting	+0.800
	Tooth thickness (Tool)	Tooth form	Stub tooth
		Module	2.5
		Pressure angle	20°
	Number of teeth		22
	Tooth thickness	Dia. of basic pitch circle	55
		Grade	Class b (flank fit)
		Over-pin dia.	$64.516^{-0.020}_{-0.114}$ Pin dia.= φ4.5
		Over-all. across a given number of teeth (reference)	$27.970^{-0.001}_{-0.058}$ (4-teeth)
	Outer dia.		49.5
	Inner dia.		54

CODING

ME750BC□S2560+BC300-C□ □□□

- Special specification number
- Special Spec. { No indication: Standard specification; S : Special specification }
- Motor shaft { C : Standard shaft (New JIS key straight shaft); P : Metric Spline shaft; S : Special shaft }
- Brake torque

Indication sign	300	250	200	150	100	050
Brake torque N·m (kgf·m)	2940 (300)	2450 (250)	1960 (200)	1470 (150)	981 (100)	491 (50)

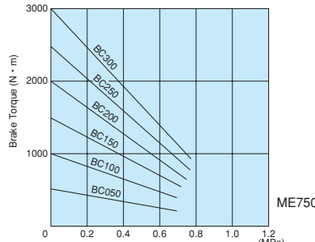
- Port { No indication: Standard metric ports; A : C100□ counter balance valve mounting port; B : C300□ B&CW300A counter balance valve mounting port }

DOWMAX model No.

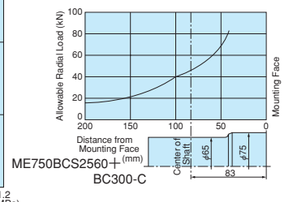
Model	ME750B	ME850B
Displacement (cm³/rev)	750	848

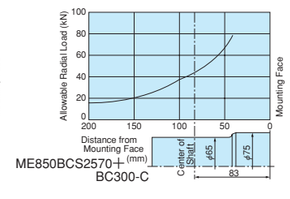
BRAKE CHARACTERISTICS

The Brake torque is generated in proportion to the force exerted between the friction plates and steel plates. Therefore, the brake torque varies with the pressure at the brake releasing port and the drain pressure in the motor case. The chart, right, shows the relationship between the brake torque vs. the pressure at the brake releasing port and the drain pressure in the motor case. Brake torque varies due to unevenness of friction coefficient between friction plate and steel plate. The curve shows the lower limit of these values.

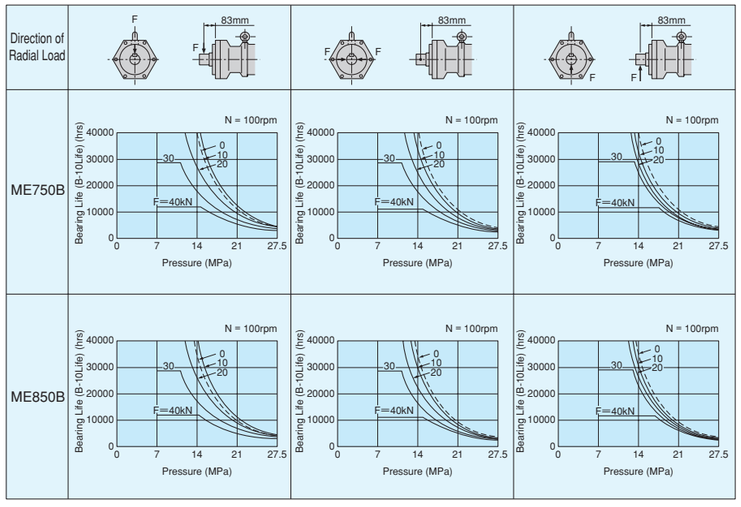


ALLOWABLE RADIAL LOAD





BEARING LIFE



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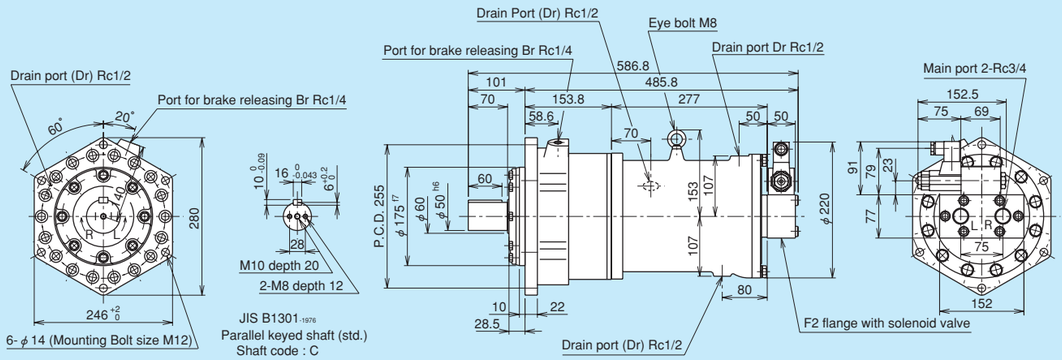
In case where the side load acts at a different location to the midpoint of the shaft projection please refer to us.
4. Applications with axial thrust loads should be referred to us.
5. When motor is used in Meter-Out circuit, pressure in the figure shall be a sum of motor inlet and outlet pressure.
6. When water-glycol fluid is used, bearing life comes remarkably short. In this case please refer to us.

DOWMAX®with Mechanical Brake

MK300-FS001+BP121-C

Hydraulic Motor	Displacement	304	152	cm^3/rev
	Rated pressure	24.5 (250)		MPa (kgf/cm²)
	Peak pressure	31.9 (325)		MPa (kgf/cm²)
	Rated torque (theoretical)	1190 (121)	594 (61)	N·m (kgf·m)
	Rated speed	600	800	rpm
	Max. speed	600	800	rpm
Mechanical Brake	Static brake torque	1190 (121)		N·m (kgf·m)
	Brake releasing pressure	1.2 (12)		MPa (kgf/cm²)
	Endurable press. of brake cylinder	31.9 (325)		MPa (kgf/cm²)
	Brake cylinder stroke volume	37		cm^3
GD^2		0.34		$kg·m^2$
Casing capacity		1.9		ℓ
Mass		102		kg

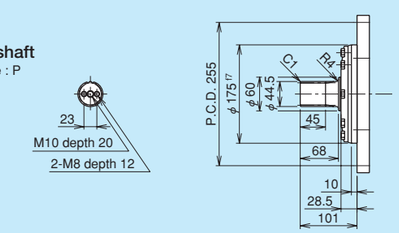
OUTLINE DIMENSIONS



JIS D2001 Involute Spline
45 ×16×2.5 (Class b)

Shaft	Coefficient of profile shifting		+0.800
	Tooth thickness	Tool: Tooth form	Stub tooth
		Tool: Module	2.5
		Tool: Pressure angle	20°
		Number of teeth	16
		Dia. of basic pitch circle	40
		Grade	Class b (flank fit)
		Over-pin dia.	$49.277^{-0.018}_{-0.107}$ Pin dia.= ϕ 4.5
		Over-all, across a given number of teeth (reference)	$20.379^{-0.001}_{-0.058}$ (3-teeth)
		Outer dia.	44.5
		Inner dia.	39

Spline shaft
Shaft code : P



CODING

MK300-FF2AS001+BP121-C□ □□□

- Special specification number
- Special Spec.: No indication: Standard specification; S : Special specification
- Output shaft: C : Standard shaft (New JIS key straight shaft); P : Metric Spline shaft; S : Special shaft
- Brake torque

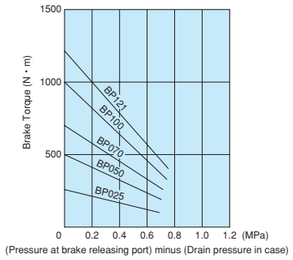
Indication sign	121	100	070	050	025
Brake torque N·m (kgf·m)	1190 (121)	981 (100)	687 (70)	491 (50)	245 (25)

- Directional valve sign
- Flange sign

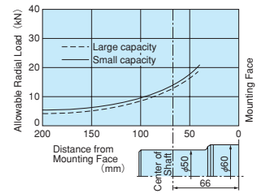
Refer to Page 52

BRAKE CHARACTERISTICS

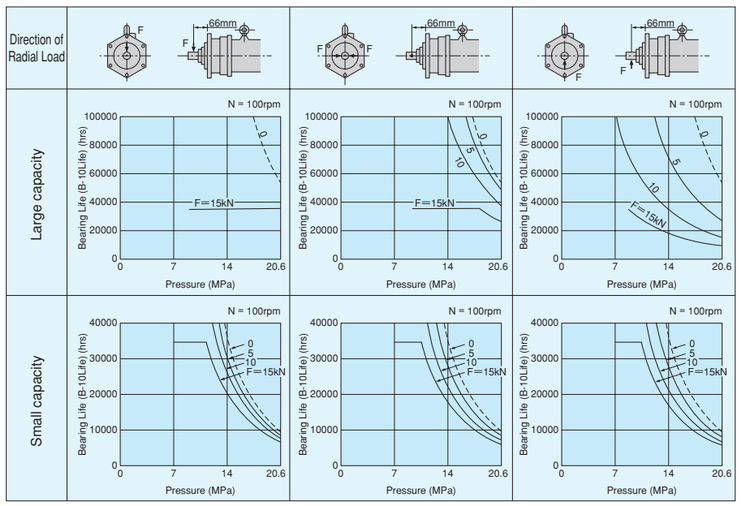
The Brake torque is generated in proportion to the force exerted between the friction plates and steel plates. Therefore, the brake torque varies with the pressure at the brake releasing port and the drain pressure in the motor case. The chart, right, shows the relationship between the brake torque vs. the pressure at the brake releasing port and the drain pressure in the motor case. Brake torque varies due to unevenness of friction coefficient between friction plate and steel plate. The curve shows the lower limit of these values.



ALLOWABLE RADIAL LOAD



BEARING LIFE



NOTE 1. If motors are operated within the proper ratings and conditions, the operational life is determined by the Bearing Life.
2. Bearing life varies due to the direction of radial load to shaft.
3. The graphs shown are the bearing life (B-10 Life) at 100 rpm shaft speed for various pressures and radial loads.
When the shaft speed differs from 100 rpm the bearing life can be obtained by the formula below:

$$\text{B-10 Life} = (\text{Bearing Life obtainable in the graph at 100 rpm}) \times \frac{100}{\text{Actual Shaft Speed, RPM}}$$

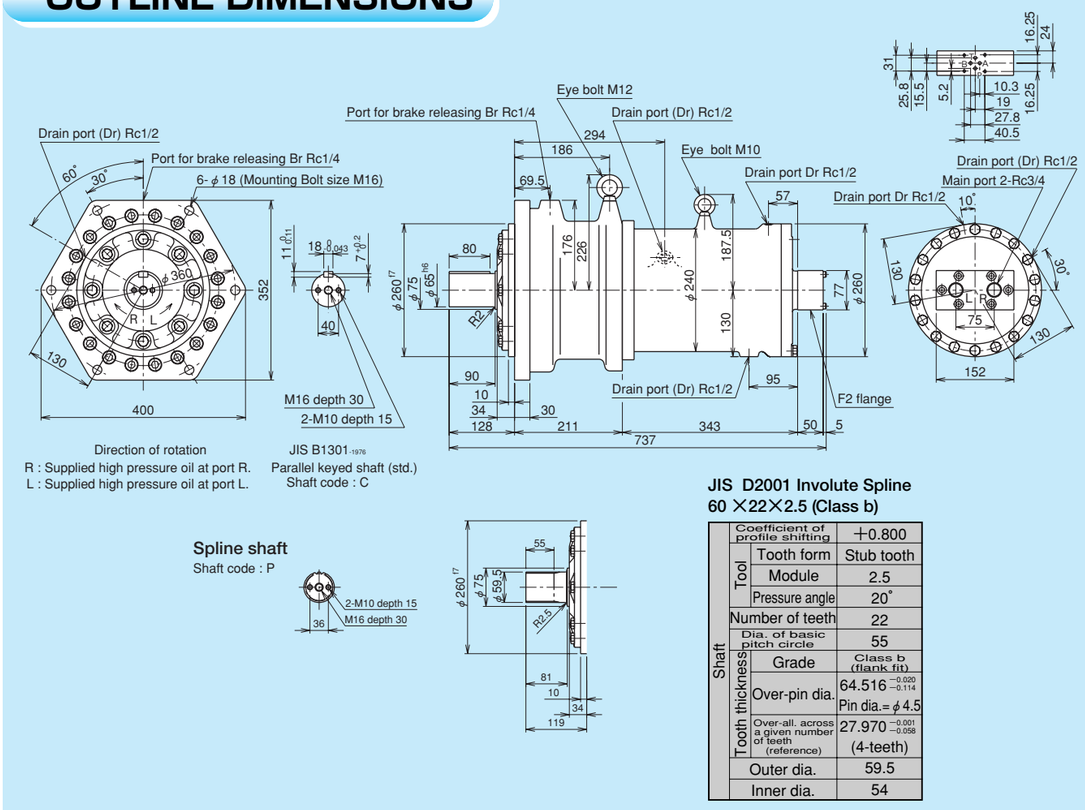
In case where the side load acts at a different location to the midpoint of the shaft projection please refer to us.
4. Applications with axial thrust loads should be referred to us.
5. When motor is used in Meter-Out circuit, pressure in the figure shall be a sum of motor inlet and outlet pressure.
6. When water-glycol fluid is used, bearing life comes remarkably short. In this case please refer to us.

DOWMAX®with Mechanical Brake

MK600-NS002+BR250-C

Hydraulic Motor	Displacement	602	301	cm^3/rev
	Rated pressure	24.5 (250)		MPa (kgf/cm²)
	Peak pressure	31.9 (325)		MPa (kgf/cm²)
	Rated torque (theoretical)	2350 (240)	1180 (120)	N·m (kgf·m)
	Rated speed	300	600	rpm
	Max. speed	300	600	rpm
Mechanical Brake	Static brake torque	2450 (250)		N·m (kgf·m)
	Brake releasing pressure	1.2 (12)		MPa (kgf/cm²)
	Endurable press. of brake cylinder	31.9 (325)		MPa (kgf/cm²)
	Brake cylinder stroke volume	58		cm^3
GD²		1.0		kg·m²
Casing capacity		2.9		ℓ
Mass		204		kg

OUTLINE DIMENSIONS



JIS D2001 Involute Spline
60 ×22×2.5 (Class b)

Shaft	Coefficient of profile shifting		+0.800
	Tool	Tooth form	Stub tooth
		Module	2.5
		Pressure angle	20°
	Number of teeth		22
	Dia. of basic pitch circle		55
	Tooth thickness	Grade	Class b (flank fit)
		Over-pin dia.	$64.516^{-0.020}_{-0.114}$ Pin dia.= φ4.5
		Over-all. across a given number of teeth (reference)	$27.970^{-0.001}_{-0.058}$ (4-teeth)
	Outer dia.		59.5
	Inner dia.		54

CODING

MK600-NF2AS002+BR250-C□ □□□

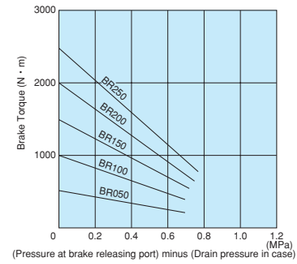
- Special specification number
- Special Spec.: No indication: Standard specification; S : Special specification
- Output shaft: C : Standard shaft (New JIS key straight shaft); P : Metric Spline shaft; S : Special shaft
- Brake torque

Indication sign	250	200	150	100	050
Brake torque N·m (kgf·m)	2450 (250)	1960 (200)	1470 (150)	981 (100)	491 (50)

- Directional valve sign / Flange sign: Refer to Page 52

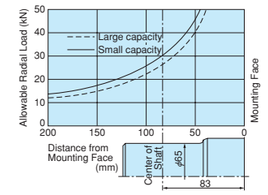
BRAKE CHARACTERISTICS

The Brake torque is generated in proportion to the force exerted between the friction plates and steel plates. Therefore, the brake torque varies with the pressure at the brake releasing port and the drain pressure in the motor case. The chart, right, shows the relationship between the brake torque vs. the pressure at the brake releasing port and the drain pressure in the motor case. Brake torque varies due to unevenness of friction coefficient between friction plate and steel plate. The curve shows the lower limit of these values.

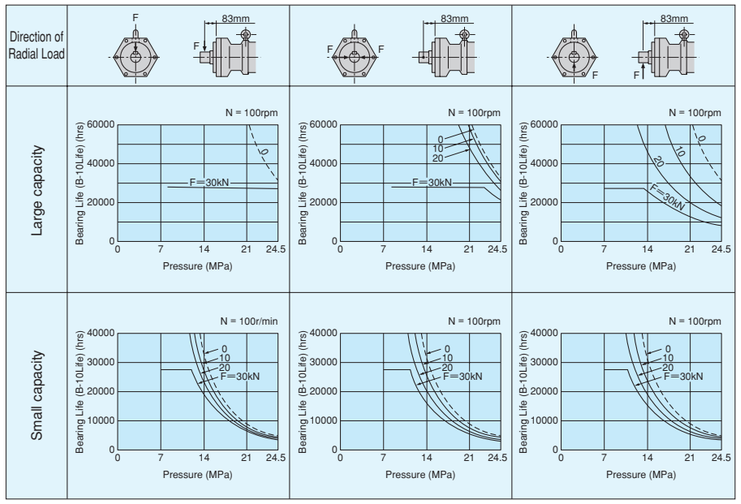


(Pressure at brake releasing port) minus (Drain pressure in case)

ALLOWABLE RADIAL LOAD



BEARING LIFE



NOTE 1. If motors are operated within the proper ratings and conditions, the operational life is determined by the Bearing Life.
2. Bearing life varies due to the direction of radial load to shaft.
3. The graphs shown are the bearing life (B-10 Life) at 100 rpm shaft speed for various pressures and radial loads.
When the shaft speed differs from 100 rpm the bearing life can be obtained by the formula below:

$$\text{B-10 Life} = (\text{Bearing Life obtainable in the graph at 100 rpm}) \times \frac{100}{\text{Actual Shaft Speed, RPM}}$$

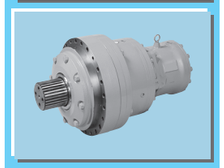
In case where the side load acts at a different location to the midpoint of the shaft projection please refer to us.
4. Applications with axial thrust loads should be referred to us.
5. When motor is used in Meter-Out circuit, pressure in the figure shall be a sum of motor inlet and outlet pressure.
6. When water-glycol fluid is used, bearing life comes remarkably short. In this case please refer to us.

MEMO

DOWMAX®

EATON

DOWMAX® Motor with PLANETARY GEAR



With a recent trend that a larger capacity is required for machinery like those for construction, ship/marine equipment and steel mill, a compact hydraulic motor with a larger torque capacity is much more required.
Geared motor DOWMAX (using Sumitomo planetary reduction gear) is developed to answer this requirement and they are already proving its merits in many fields including the shield tunneling machines, steel mill equipment.

Hydraulic Motor : DOWMAX MOTOR - a reputable low speed high torque motor for its superior performance and reliability owing to the structure of the double swash plate and opposed multiple piston.

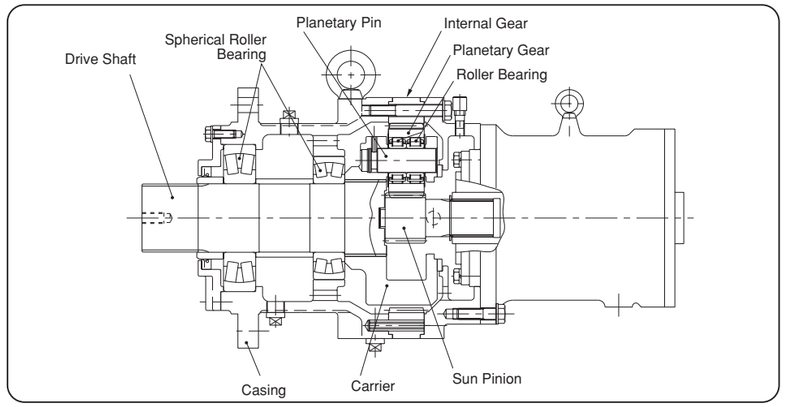
+

Reduction Gear : Sumitomo planetary gears boast impact-resistance, superior anti-wear features, reliability for long time use and compact size, as they are manufactured with high quality material through heat treatment and high-precision gear cutting, based on the principle of an effective load distribution.

This catalogue is useful for frequent use.

Single-Stage Reduction Gear with DOWMAX Motor (Reduction ratio: 5.053)
Double-Stage Reduction Gear with DOWMAX Motor (Reduction ratio: 25.53)
DOWMAX motor is developed with planetary gear suitable for the application of Shield Tunneling.
All kind of DOWMAX motor (2-speed, with Mechanical Brake, with Counter Balance Valve etc.) and special motor and planetary gear reduction motor combined together are compatible.
Moreover motors can be made compatible for high torque, high reduction ratio other than specified in this catalogue.
We appreciate your enquiry in this regard.

Single Reduction Gear Ratio 5.053



SPECIFICATION

Model		Gear Ratio	Equivalent Displacement cm³/rev	Rated Speed rpm	Continuous Operation		Intermittent Max.		Allowable Radial Load kN	MASS kg
Motor	Gear				Output Torque N·m (kgf·m)	Effective Pressure MPa (kgf/cm²)	Output Torque N·m (kgf·m)	Effective Pressure MPa (kgf/cm²)		
ME100-C	CPHFL-60S-5	5.053	500	40	2030 (207)	27.5 (280)	2365 (241)	31.9 (325)	50	80
				20	2030 (207)	27.5 (280)			50	
				10	2030 (207)	27.5 (280)			50	
ME150-G	CPHFL-66S-5	5.053	768	40	3030 (309)	26.7 (272)	3630 (370)	31.9 (325)	65	115
				20	3120 (318)	27.5 (280)			65	
				10	3120 (318)	27.5 (280)			65	
ME175-G	CPHFL-66S-5	5.053	884	40	3030 (309)	23.2 (236)	4180 (426)	31.9 (325)	65	115
				20	3430 (350)	26.2 (267)			65	
				10	3590 (366)	27.5 (280)			65	
ME300BG	CPHFL-72S-5	5.053	1516	40	4330 (441)	19.2 (196)	6380 (650)	28.4 (289)	80	150
				20	4910 (500)	21.8 (222)			86	
				10	5550 (566)	24.7 (252)			86	
ME350BG	CPHFL-72D-5	5.053	1769	40	6000 (612)	22.9 (233)	8360 (852)	31.9 (325)	100	182
				20	6820 (695)	26.0 (265)			108	
				10	7190 (733)	27.5 (280)			108	
ME600BG	CPHFL-84D-5	5.053	3032	40	8490 (865)	18.8 (192)	12650 (1290)	28.2 (287)	110	274
				20	9620 (981)	21.4 (218)			137	
				10	10900 (1110)	24.2 (247)			137	
ME750BG	CPHFL-90D-5	5.053	3790	40	11200 (1140)	19.9 (203)	16700 (1700)	29.7 (303)	125	335
				20	12800 (1300)	22.7 (231)			141	
				10	14400 (1470)	25.7 (262)			165	
ME850BG	CPHFL-90D-5	5.053	4285	40	11200 (1140)	17.7 (180)	16700 (1700)	26.3 (268)	125	335
				20	12800 (1300)	20.1 (205)			141	
				10	14400 (1470)	22.8 (232)			165	
ME1300AG	CPHFL-108D-5	5.053	6796	29	20800 (2120)	20.7 (211)	29400 (3000)	29.2 (298)	196	505
				20	22600 (2300)	22.4 (228)			215	
				10	25500 (2600)	25.3 (258)			240	
ME1900-G	CPHFL-120D-5	5.053	9439	22	28800 (2940)	20.6 (210)	39200 (4000)	28.1 (286)	280	720
				15	31900 (3250)	22.8 (232)			280	
				10	34000 (3470)	24.3 (248)			280	
ME2600-G	CPHFL-132D-5	5.053	13027	23	39700 (4050)	20.6 (210)	54900 (5600)	28.4 (290)	318	1011
				15	44200 (4500)	22.9 (233)			350	
				10	47400 (4830)	24.5 (250)			350	

- The allowable output torque differs for the output speed used.
- The intermittent max. torque shall be within the duty cycle of 1% per every minute.
- Effective pressure is calculated for the rated output torque, by using following values for efficiency
  Mechanical efficiency of gear (Single reduction) :0.98
  Mechanical efficiency of gear (Double reduction) :0.95
  Torque efficiency of motor :0.95
- The allowable radial load is at the midpoint of the standard shaft length.
- In case motor casing pressure (Drain line) comes below 0 gauge pressure even when motor is off-operation, special specification (Double oil seal) should be applied. In this case please contact us.
- For detailed information for motor, please refer to catalogue another page.
- In case motors are used, as it's output shaft to be positioned upward, special specification (Double oil seal) should be applied. In this case, please contact us.
- Models with different ratios (multiple planetary reduction gear) or higher torque (larger gear size) to the standard models are also available. Please refer to us.

MODEL No.

〔Motor〕

ME 300 □ G

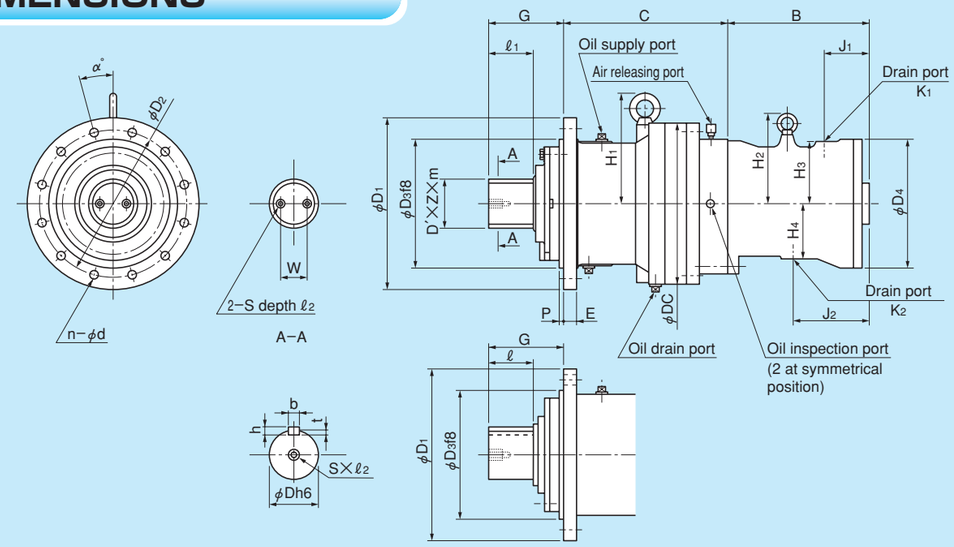
- **Motor Shaft** { G : Metric hollowed spline shaft / C : Metric parallel keyed shaft }
- **Design Cord:** beginning with - and in the alphabetical order hence force
- **Motor size:** Metric displacement
- **Series:** High pressure series DOWMAX motor

〔Gear〕

CP H □ L - 120D - 5 - P

- **Output Shaft** { P : Metric spline shaft / N : Metric parallel keyed shaft / S : Other special shafts }
- **Gear Ratio**
- **Size number**
- **With hydraulic motor**
- **Mounting type** { H : Foot mount (at Horizontal mounting, H is omitted) / F : Direct connection with flange }
- **Mounting Direction** { H : Horizontal / V : Vertical (shaft downward) / W : Vertical (shaft upward) }
- **Planetary series**

DIMENSIONS



Involute Spline Shaft

(Std: JIS D2001-1959, Side fit, class b)

Model	D' Dia.	Z No. of Teeth	m Module	ℓ1	ℓ2	S	W
60S	65	24	2.5	55	20	M10	40
66S	75	18	3.75	60	20	M10	40
72S	80	19	3.75	65	20	M10	40
72D	90	22	3.75	70	24	M12	50
84D	100	25	3.75	80	32	M16	60
90D	110	20	5.0	90	32	M16	60
108D	130	24	5.0	110	45	M20	80
120D	150	18	7.5	120	45	M20	80
132D	160	19	7.5	130	51	M24	100

Parallel Keyed Shaft

(Key Std.: JIS B1301-1976, parallel Key)

Model	D	b	h	t	S	ℓ2	ℓ	G
60S	65	18	11	7	M16	29	130	180
66S	75	20	12	7.5	M20	34	150	200
72S	80	22	14	9	M20	34	160	210
72D	90	25	14	9	M24	42	180	240
84D	100	28	16	10	M24	42	200	260
90D	110	28	16	10	M24	42	220	290
108D	130	32	18	11	M30	52	260	330
120D	150	36	20	12	M30	52	300	380
132D	160	40	22	13	M36	62	320	410

Planetary Gear

Model	C	D1	D2	D3	DC	E	G	H1	P	d	n	α (Degree)	Volume of Lubrication Oil (ℓ)
60S	271	270	230	190	246	20	105	174	7	18	8	22.5	1.5
66S	272	300	260	220	270	20	110	186	7	18	8	22.5	2.1
72S	292	320	280	240	298	25	115	200	7	18	12	15	2.3
72D	326	360	310	260	310	25	130	232	8	18	12	15	3.1
84D	354	380	330	280	352	30	140	247	10	22	12	15	4.3
90D	386	400	350	300	375	30	160	259	10	22	12	15	5.2
108D	493	480	420	360	450	35	180	315	13	26	12	15	8.1
120D	509	530	460	390	500	40	200	339	13	33	12	15	12.2
132D	560	580	510	440	550	40	220	385	14	33	12	15	12.7

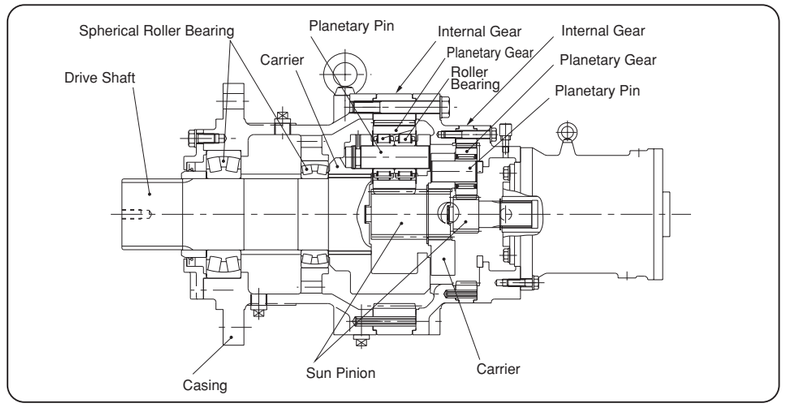
(Note) Volume of lubrication oil shows for horizontal installation

Hydraulic Motor

Model	B	D4	H2	H3	H4	J1	J2	K1	K2
ME100	196	174	—	81	—	41	—	Rc1/4	—
ME150	184	220	154	107	107	50	80	Rc1/2	Rc1/2
ME175	184	220	154	107	107	50	80	Rc1/2	Rc1/2
ME300B	261	240	171	116	107	55	174	G1/2	G1/2
ME350B	261	240	171	116	107	55	174	G1/2	G1/2
ME600B	305	280	205	137	130	64	133	G1/2	G1/2
ME750B	337	297	211.5	141.5	145.5	110	70	G1/2	G1/2
ME850B	337	297	211.5	141.5	145.5	110	70	G1/2	G1/2
ME1300A	373	335	228.5	167	155	72	208	Rc1/2	Rc1/2
ME1900	420.4	375	264	175	175	166	166	G1/2	G1/2
ME2600	482	390	280	191	191	218.2	218.2	G3/4	G3/4

(Note) Details for motor to be referred to catalogue another page.

Double Reduction Gear Ratio 25.53



SPECIFICATION

Model		Gear Ratio	Equivalent Displacement cm³/rev	Rated Speed rpm	Continuous Operation		Intermittent Max.		Allowable Radial Load kN	MASS kg
Motor	Gear				Output Torque N·m (kgf·m)	Effective Pressure MPa (kgf/cm²)	Output Torque N·m (kgf·m)	Effective Pressure MPa (kgf/cm²)		
ME100-C	CPHFL-96D-26	25.53	2527	39	8530 (870)	23.5 (240)	11600 (1180)	31.9 (325)	150	263
				20	10012 (1021)	27.5 (280)			185	
				10	10012 (1021)	27.5 (280)			198	
ME150-G	CPHFL-96D-26	25.53	3881	23	14200 (1450)	25.5 (260)	17800 (1810)	31.9 (325)	180	260
				10	15300 (1560)	27.5 (280)			198	
				5	15300 (1560)	27.5 (280)			198	
ME175-G	CPHFL-96D-26	25.53	4468	23	15600 (1590)	24.3 (248)	20400 (2080)	31.9 (325)	180	260
				10	17654 (1800)	27.5 (280)			198	
				5	17654 (1800)	27.5 (280)			198	
ME300BG	CPHFL-96D-26	25.53	7659	23	16900 (1720)	15.3 (156)	22600 (2300)	20.5 (209)	180	280
				10	19620 (2000)	17.9 (182)			198	
				5	22200 (2260)	20.1 (205)			198	
ME350BG	CPHFL-96D-26	25.53	8936	23	16900 (1720)	13.1 (134)	22600 (2300)	17.6 (179)	180	280
				10	19620 (2000)	15.3 (156)			198	
				5	22200 (2260)	17.3 (176)			198	
ME300BG	CPHFL-108D-26	25.53	7659	23	20800 (2120)	18.9 (193)	29400 (3000)	26.8 (273)	209	429
				10	25500 (2600)	23.2 (236)			240	
				5	28800 (2940)	26.2 (267)			240	
ME350BG	CPHFL-108D-26	25.53	8936	23	21900 (2230)	17.1 (174)	29400 (3000)	23.0 (234)	209	429
				10	25500 (2600)	19.9 (203)			240	
				5	28800 (2940)	22.5 (229)			240	
ME600BG	CPHFL-120D-26	25.53	15318	23	29100 (2970)	13.2 (135)	39200 (4000)	17.9 (182)	280	644
				10	34000 (3470)	15.5 (158)			280	
				5	38500 (3920)	17.5 (178)			280	
ME750BG	CPHFL-132D-26	25.53	19148	15	43700 (4450)	15.9 (162)	54900 (5600)	20.0 (204)	350	760
				10	47400 (4830)	17.3 (176)			350	
				5	53500 (5450)	19.4 (198)			350	
ME850BG	CPHFL-132D-26	25.53	21649	13	44900 (4580)	14.4 (147)	54900 (5600)	17.7 (180)	350	760
				10	47400 (4830)	15.2 (155)			350	
				5	53500 (5450)	17.2 (175)			350	
ME850BG	CPHFL-144D-26	25.53	21649	13	59200 (6030)	19.0 (194)	72600 (7400)	23.3 (238)	450	1090
				10	62300 (6350)	20.0 (204)			480	
				5	70400 (7180)	22.7 (231)			480	

- The allowable output torque differs for the output speed used.
- The intermittent max. torque shall be within the duty cycle of 1% per every minute.
- Effective pressure is calculated for the rated output torque, by using following values for efficiency
  Mechanical efficiency of gear (Single reduction) :0.98
  Mechanical efficiency of gear (Double reduction) :0.95
  Torque efficiency of motor :0.95
- The allowable radial load is at the midpoint of the standard shaft length.
- In case motor casing pressure (Drain line) comes below 0 gauge pressure even when motor is off-operation, special specification (Double oil seal) should be applied. In this case please contact us.
- For detailed information for motor, please refer to catalogue another page.
- In case motors are used, as it's output shaft to be positioned upward, special specification (Double oil seal) should be applied. In this case, please contact us.
- Models with different ratios (multiple planetary reduction gear) or higher torque (larger gear size) to the standard models are also available. Please refer to us.

MODEL No.

〔Motor〕

ME 300 □ G

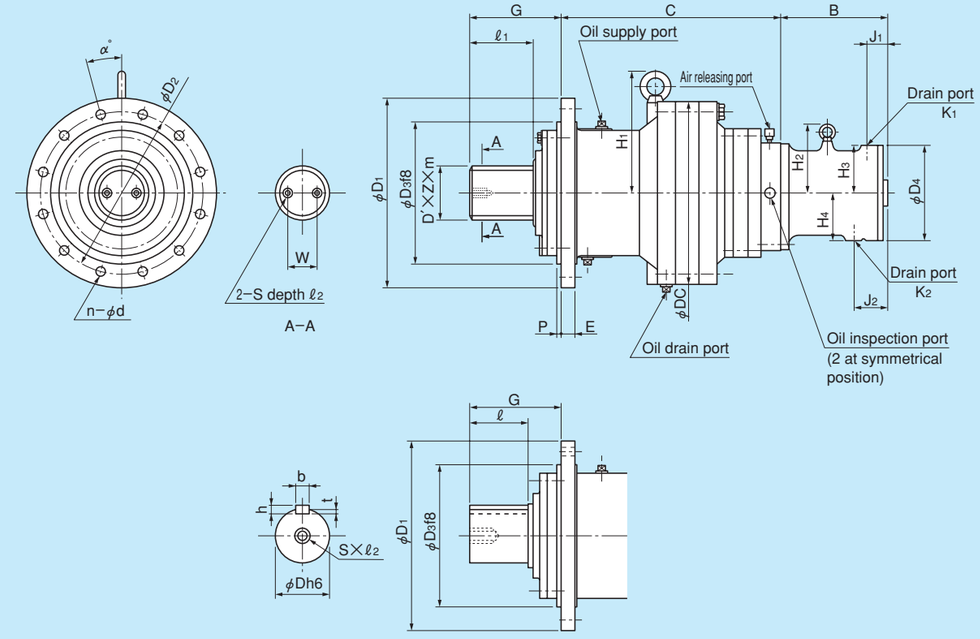
- Motor Shaft: G : Metric hollowed spline shaft; C : Metric parallel keyed shaft
- Design Cord: beginning with - and in the alphabetical order hence force
- Motor size: Metric displacement
- Series: High pressure series DOWMAX motor

〔Gear〕

CP H □ L - 120D - 26 - P

- Output Shaft: P : Metric spline shaft; N : Metric parallel keyed shaft; S : Other special shafts
- Gear Ratio
- Size number
- With hydraulic motor
- Mounting type: H : Foot mount (at Horizontal mounting, H is omitted); F : Direct connection with flange
- Mounting Direction: H : Horizontal; V : Vertical (shaft downward); W : Vertical (shaft upward)
- Planetary series

DIMENSIONS



Involute Spline Shaft

(Std: JIS D2001-1959, Side fit, class b)

Model	D' Dia.	Z No. of Teeth	m Module	ℓ 1	ℓ 2	S	W
96D	120	22	5.0	100	35	M16	63
108D	130	24	5.0	110	45	M20	80
120D	150	18	7.5	120	45	M20	80
132D	160	19	7.5	130	51	M24	100
144D	180	22	7.5	150	51	M24	100

Parallel Keyed Shaft

(Key Std.: JIS B1301-1976, parallel Key)

Model	D	b	h	t	S	ℓ 2	ℓ	G
96D	120	32	18	11	M30	52	240	310
108D	130	32	18	11	M30	52	260	330
120D	150	36	20	12	M30	52	300	380
132D	160	40	22	13	M36	62	320	410

Planetary Gear

Model	C	D₁	D₂	D₃	DC	E	G	H₁	P	d	n	α (Degree)	Volume of Lubrication Oil (ℓ)
96D	*500	440	380	320	405	35	170	274	12	26	12	15	7
108D	552	480	420	360	450	35	180	315	13	26	12	15	9
120D	602	530	460	390	500	40	200	340	13	33	12	15	12
132D	648	580	510	440	550	40	220	385	14	33	12	15	13
144D	736	650	560	470	600	45	240	410	14	39	12	15	20

*530 for ME100

(Note) Volume of lubrication oil shows for horizontal installation

Hydraulic Motor

Model	B	D₄	H₂	H₃	H₄	J₁	J₂	K₁	K₂
ME100	196	174	—	81	—	41	—	Rc1/4	—
ME150	184	220	154	107	107	50	80	Rc1/2	Rc1/2
ME175	184	220	154	107	107	50	80	Rc1/2	Rc1/2
ME300B	261	240	171	116	107	55	174	G1/2	G1/2
ME350B	261	240	171	116	107	55	174	G1/2	G1/2
ME600B	305	280	205	137	130	64	133	G1/2	G1/2
ME750B	337	297	211.5	141.5	145.5	110	70	G1/2	G1/2
ME850B	337	297	211.5	141.5	145.5	110	70	G1/2	G1/2

(Note) Details for motor to be referred to catalogue another page.

Shield Tunneling Application

DOWMAX Motor With Planetary Gear Reduction Are Widely Used In Shield Tunneling Application Due To Outstanding Durability And High Efficiency.

- **High Performance Result**··· Good result in all Shield Tunneling Operation.
- **High Pressure Application**··· Rated pressure 20.6 MPa, Max. pressure 24.5 MPa
- **Compact**····· Compact and light weight due to special DOWMAX shape.
- **Outstanding Durability**····· DOWMAX and planetary gear has sufficient durability for Shield Tunneling Operation
- **Smooth Operation**····· Even at full power DOWMAX with Planetary Gear can be run smooth and noise free.
- **Smooth Operation Even At Low Speed**··· With excellent performance at Low Speed and Positioning performance DOWMAX can be used as Electors also.

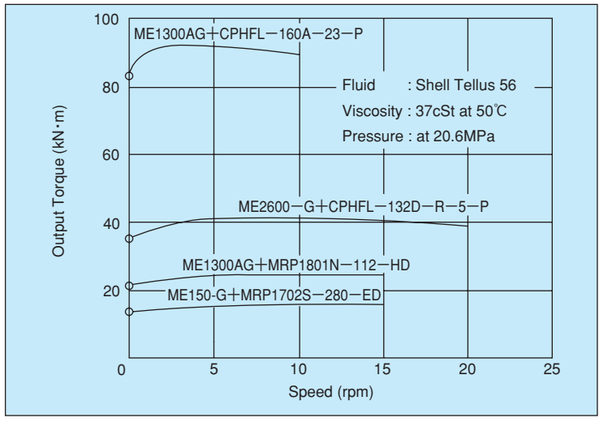
SPECIFICATION

Model	Gear Ratio	Equivalent Displacement cm³/rev	Rated Pressure MPa (kgf/cm²)	Max. Pressure MPa (kgf/cm²)	Rated Torque N·m (kgf·m)	Max. Torque N·m (kgf·m)	Rated Speed rpm	Allowable Radial Load kN	Radial Load Point (Distance from mounting surface) mm	MASS kg
ME2600-G+CPHFL-132D-R-5-P	1/5.053	13026	20.6 (210)	24.5 (250)	40581 (4138)	48290 (4924)	20	333	155	1100
ME1300AG+CPHFL-160A-23-P	1/22.97	30895	20.6 (210)	24.5 (250)	96226 (9809)	114551 (11677)	10	640	230	1450
ME150-G+MRP1702S-280-ED	1/31.03	4717	20.6 (210)	24.5 (250)	14710 (1500)	17652 (1800)	20	160	128	252
ME1300AG+MRP1801N-112-HD	1/6	8070	20.6 (210)	24.5 (250)	25125 (2562)	29910 (3050)	15	250	142.5	500

☐Rated output torque and peak output torque is 95% of efficiency
☐For the service life refer other catalogue in conjunction with this catalogue as life varies with different models.
Rated speed is suitable for the rated pressure.
In case of low pressure used continuously, there are other models also suitable for application according to use.
Please enquire for any further requirement.
☐This catalogue is exclusively for Shield Cutter Drive. Therefore useful for Horizontal use only.
In case of requirement of shaft in Upward or Downward direction please enquire as it becomes special specification.
☐In case DOWMAX motors of this series are required to be used for the operation other than cutter and that of Shield Tunneling please discuss with us.
☐DOWMAX motor with Planetary Gear can also be built with other reduction ratio as well as torque specification than those mentioned in the catalogue.
We appreciate your enquiry for these models.

SELECTION CHART

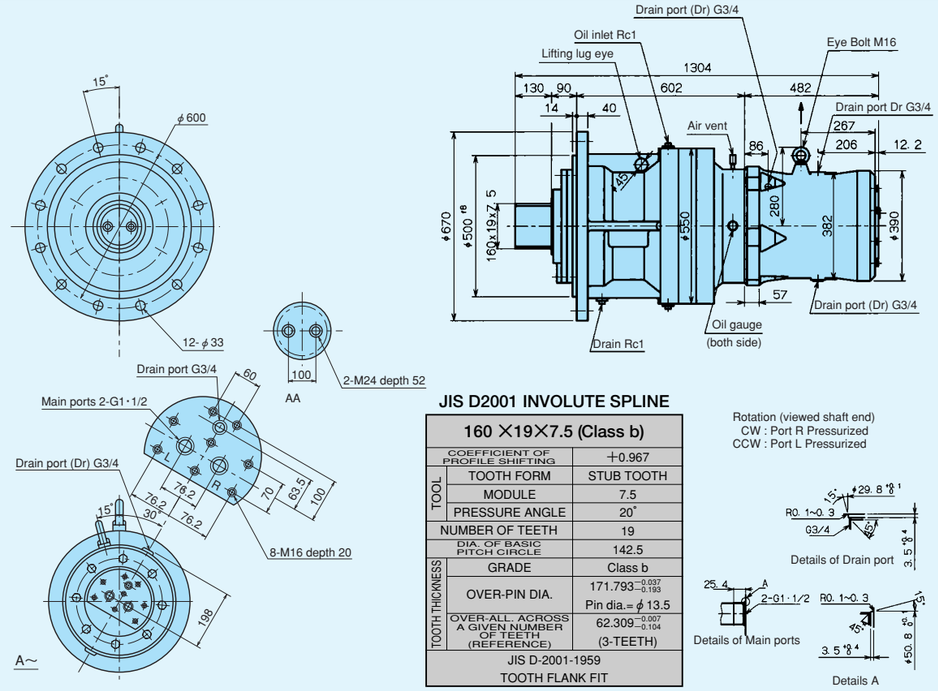
This chart indicates the relation of actual torque and shaft rotation at the rated pressure of 20.6MPa.
Given the required torque and shaft speed the appropriate model can be seleced from the diagram.
When the operating pressure differs from 20.6MPa, refer to the performance date for the respective model.



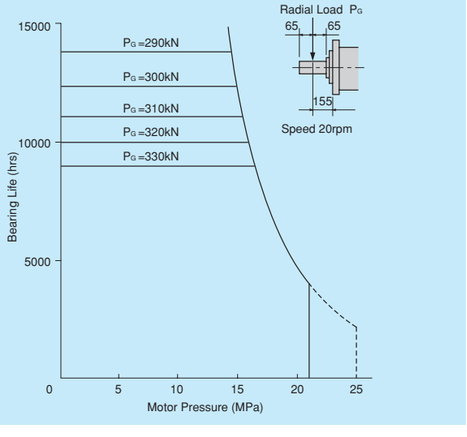
ME2600-G+CPHFL-132D-R-5-P

Gear Parts No. : DY0089B

Equivalent Displacement	13,026cm³/rev
Gear Ratio	1/5.053
Output Torque	40,581N·m
Max. Output Torque	48,290N·m
Rated Speed	20rpm



Bearing Life



1. Radial Load
The load applied radially on the midpoint of the shaft extension should be less than the value indicated below:

Pressure MPa	20.6
Radial Load kN	333

2. Bearing Life
The gear box bearing life will vary as shown on the chart depending on the radial load imposed on the output shaft. The chart indicates the bearing life (B-10 Life) when the output speed is 20 rpm with the varied pressures and the radial load magnitudes.
When the output speed is other than 20 rpm, it is obtained by the following formula:
B-10 Life=
(Bearing life obtainable on the chart) × $\frac{20}{\text{output speed}}$
The bearing life, when the load point is not at the middle of shaft extension, is different from the chart. Refer to factory in such a case.

3. Lubrication

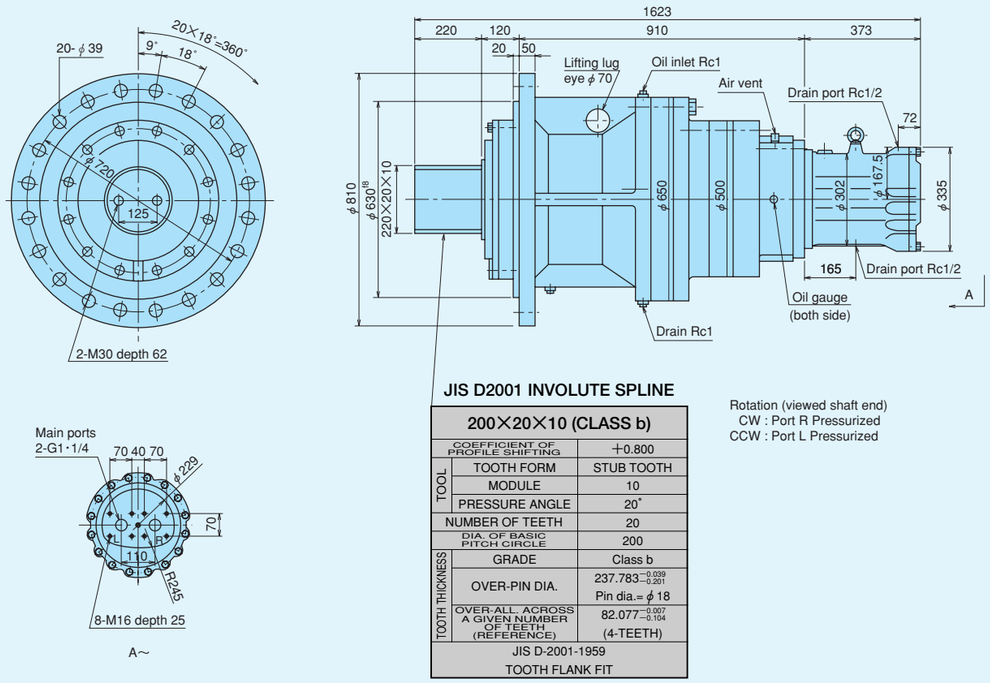
Quantity of lubricating oil	19L for horizontal use
Lubricating oil	Mild EP gear oil equivalent to ISO VG220 (ambient temp. 0～35℃)

4. For detailed information for motor, please refer to other page.

ME1300AG+CPHFL-160A-23-P

Gear Parts No. : DY0335B

Equivalent Displacement	30,895cm³/rev
Gear Ratio	1/22.97
Output Torque	96,226N・m
Max. Output Torque	114,551N・m
Rated Speed	10rpm

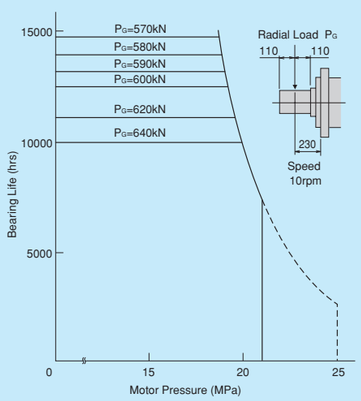


JIS D2001 INVOLUTE SPLINE

200×20×10 (CLASS b)		
COEFFICIENT OF PROFILE SHIFTING		+0.800
TOOL	TOOTH FORM	STUB TOOTH
	MODULE	10
	PRESSURE ANGLE	20°
NUMBER OF TEETH		20
DIA. OF BASIC PITCH CIRCLE		200
TOOTH THICKNESS	GRADE	Class b
	OVER-PIN DIA.	$237.783^{-0.039}_{-0.201}$ Pin dia.= φ18
	OVER-ALL ACROSS A GIVEN NUMBER OF TEETH (REFERENCE)	$82.077^{-0.007}_{-0.104}$ (4-TEETH)
JIS D-2001-1959 TOOTH FLANK FIT		

Rotation (viewed shaft end)
CW : Port R Pressurized
CCW : Port L Pressurized

Bearing Life



1. Radial Load
The load applied radially on the midpoint of the shaft extension should be less than the value indicated below:

Pressure MPa	20.6
Radial Load kN	640

2. Bearing Life
The gear box bearing life will vary as shown on the chart depending on the radial load imposed on the output shaft. The chart indicates the bearing life (B-10 Life) when the output speed is 15 rpm with the varied pressures and the radial load magnitudes.
When the output speed is other than 15 rpm, it is obtained by the following formula:
B-10 Life=
(Bearing life obtainable on the chart) × $\frac{15}{\text{output speed}}$
The bearing life, when the load point is not at the middle of shaft extension, is different from the chart. Refer to factory in such a case.

3. Lubrication

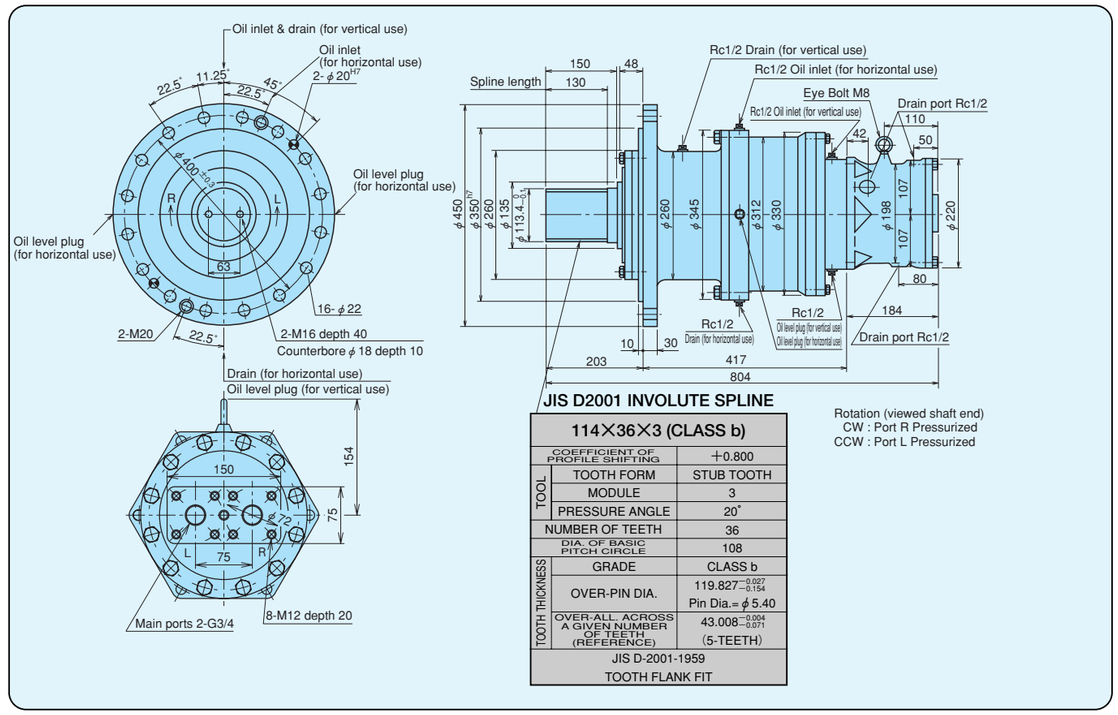
Quantity of lubricating oil	30L for horizontal use
Lubricating oil	Mild EP gear oil equivalent to ISO VG220 (ambient temp. 0～35℃)

4. For detailed information for motor, please refer to other page.

ME150-G+MRP1702S-280-ED

Gear Parts No. : DY0006A

Equivalent Displacement	4,717cm³/rev
Gear Ratio	1/31.03
Output Torque	14,710N・m
Max. Output Torque	17,652N・m
Rated Speed	20rpm

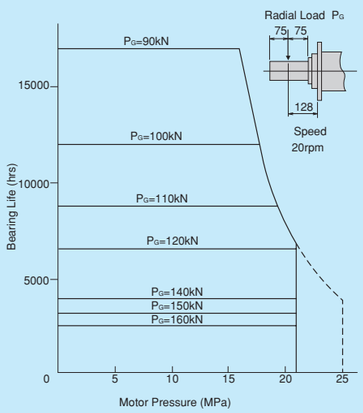


JIS D2001 INVOLUTE SPLINE

114×36×3 (CLASS b)		
COEFFICIENT OF PROFILE SHIFTING		+0.800
TOOL	TOOTH FORM	STUB TOOTH
	MODULE	3
	PRESSURE ANGLE	20°
NUMBER OF TEETH		36
DIA. OF BASIC PITCH CIRCLE		108
TOOTH THICKNESS	GRADE	CLASS b
	OVER-PIN DIA.	$119.827^{-0.027}_{-0.154}$ Pin Dia.= φ5.40
	OVER-ALL ACROSS A GIVEN NUMBER OF TEETH (REFERENCE)	$43.008^{-0.004}_{-0.071}$ (5-TEETH)
JIS D-2001-1959 TOOTH FLANK FIT		

Rotation (viewed shaft end)
CW : Port R Pressurized
CCW : Port L Pressurized

Bearing Life



1. Radial Load
The load applied radially on the midpoint of the shaft extension should be less than the value indicated below:

Pressure MPa	20.6
Radial Load kN	160

2. Bearing Life
The gear box bearing life will vary as shown on the chart depending on the radial load imposed on the output shaft. The chart indicates the bearing life (B-10 Life) when the output speed is 20 rpm with the varied pressures and the radial load magnitudes.
When the output speed is other than 20 rpm, it is obtained by the following formula:
B-10 Life=
(Bearing life obtainable on the chart) × $\frac{20}{\text{output speed}}$
The bearing life, when the load point is not at the middle of shaft extension, is different from the chart. Refer to factory in such a case.

3. Lubrication

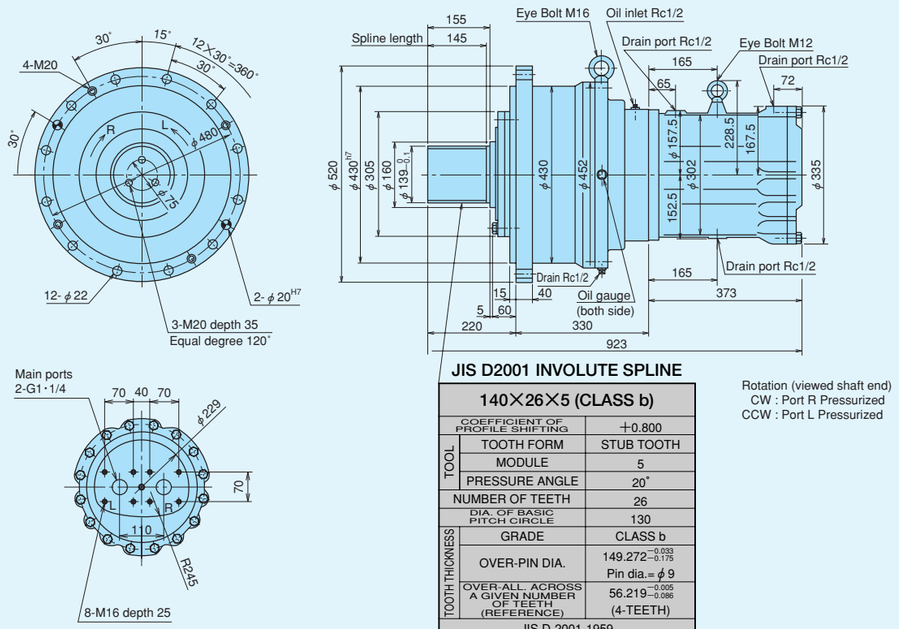
Quantity of lubricating oil	4L for horizontal use
Lubricating oil	Mild EP gear oil equivalent to ISO VG220 (ambient temp. 0～35℃)

4. For detailed information for motor, please refer to other page.

ME1300AG+MRP1801N-112-HD

Gear Parts No. : DY0455A

Equivalent Displacement	8,070cm³/rev
Gear Ratio	1/6
Output Torque	25,125N・m
Max. Output Torque	29,910N・m
Rated Speed	15rpm

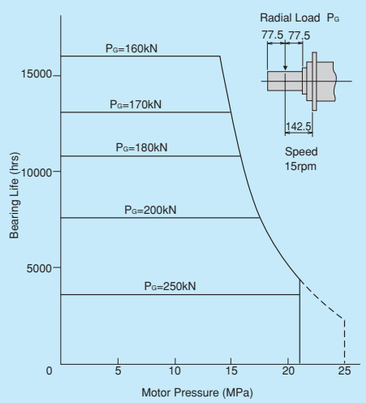


JIS D2001 INVOLUTE SPLINE

140×26×5 (CLASS b)		
COEFFICIENT OF PROFILE SHIFTING		+0.800
TOOL	TOOTH FORM	STUB TOOTH
TOOL	MODULE	5
TOOL	PRESSURE ANGLE	20°
NUMBER OF TEETH		26
DIA. OF BASIC PITCH CIRCLE		130
TOOTH THICKNESS	GRADE	CLASS b
TOOTH THICKNESS	OVER-PIN DIA.	$149.272^{-0.033}_{-0.175}$ Pin dia.=φ9
TOOTH THICKNESS	OVER-ALL, ACROSS A GIVEN NUMBER OF TEETH (REFERENCE)	$56.219^{-0.005}_{-0.086}$ (4-TEETH)
JIS D-2001-1959 TOOTH FLANK FIT		

Rotation (viewed shaft end)
CW : Port R Pressurized
CCW : Port L Pressurized

Bearing Life



1. Radial Load
The load applied radially on the midpoint of the shaft extension should be less than the value indicated below:

Pressure MPa	20.6
Radial Load kN	250

2. Bearing Life
The gear box bearing life will vary as shown on the chart depending on the radial load imposed on the output shaft. The chart indicates the bearing life (B-10 Life) when the output speed is 15 rpm with the varied pressures and the radial load magnitudes.
When the output speed is other than 15 rpm, it is obtained by the following formula:
B-10 Life=
(Bearing life obtainable on the chart) × $\frac{15}{\text{output speed}}$
The bearing life, when the load point is not at the middle of shaft extension, is different from the chart. Refer to factory in such a case.

3. Lubrication

Quantity of lubricating oil	6L for horizontal use
Lubricating oil	Mild EP gear oil equivalent to ISO VG220 (ambient temp. 0～35℃)

4. For detailed information for motor, please refer to other page.

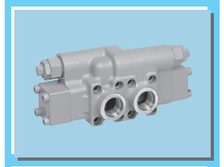
MEMO

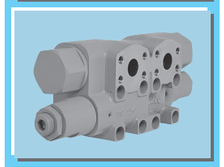
MEMO

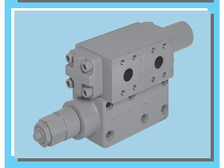
DOWMAX®

EATON

Counter Balance Valve with Brake Valves







This counter balance valve generates the braking pressure in the hydraulic motor, proportional to the load in lowering loads at slewing, running and winching operations and thus prevent overrunning of motor forced by loads.

In addition, the counter balance valve contains housed brake valves to protect the hydraulic motor from overloads as well as smooth acceleration and deceleration of load.

(INDEX)

MODEL CODE

CW 300 Y X — A ※ S □□□

- Special Specification No.
- Special Specification Code { No sign : Standard Specification / S : Special Specification
- Seal Code { No sign : Standard Seal (nitrile rubber) / V : Viton Seal (Fluoro-rubber)
- Accessory Sub-plate Code for Direct Connection with DOWMAX (refer to the table below)
- Design Code : (beginning with - and in alphabetical order henceforth)
- Cracking pressure { No sign : Standard cracking pressure / X : Higher cracking pressure model
- Special Function Code { No sign : Standard Product / Y : With mechanical brake release port / Z : With stroke adjusting mechanism for main spool / W : Y function + Z function
- Rated Flow (ℓ /min)
- Series Code { C : Counter Balance valve with two-directional brake valve / CW : Counter Balance valve with one-directional brake valve

SPECIFICATION

Model	Rated Flow ℓ /min	Adjustable Range of Relief Valve Pressure MPa (kgf/cm²)	MASS kg	Characteristics
C100	100	9.8～27.5 (100～280)	7	Allows smooth acceleration/deceleration at slewing, running and winching operations.
C100Y				To be used for hydraulic motors with mechanical brake, an automatic brake release ports is provided.
C100Z				To be used for devices at low flow rate and greater load changes, and matching with machines to be easily adjusted from outside.
C100W				Both Y and Z functions above are combined.
C300B	300		19	Allows smooth acceleration/deceleration at slewing, running and winching operations.
C300YB				To be used for hydraulic motors with mechanical brake, an automatic brake release ports is provided.
C300ZB				To be used for devices at low flow rate and greater load changes, and matching with machines to be easily adjusted from outside.
C300WB				Both Y and Z functions above are combined.
CW300A	200		24	This one-directional counter balance valve is used for winches allowing smooth rolling down operation.

□Operating oil temperature range : -20 to +80 degrees C.
□Operating oil viscosity range : 15 to 500cSt (optimum viscosity range : 25 to 100cSt)

※Accessory sub-plate code for direct connection with DOWMAX

Applicable DOWMAX Model	ME100	ME150 ME175 ME300B ME350B	ME600B	ME750B ME850B	ME1300A	ME1900	ME2600	ME3100	ME4100
C100□	—	A	N	C	R	G	H	K	J
C300□B		A	A	C	R	G	H	K	J
CW300A		A	A	C	R	G	H	K	J

(Models marked - can be directly connected without a sub-plate. However, a sub-plate code for direct connection in ME100+C100Y & C100W is M.)

OPERATION PRINCIPLE

1. Two-directional counter balance valves, C100, C300B

(During acceleration)

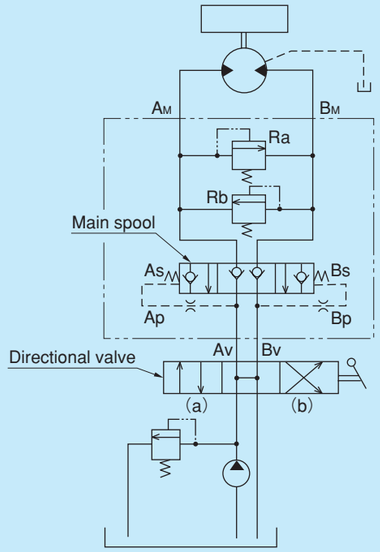
When the directional valve is switched to either direction to accelerate the hydraulic motor, assuming that the valve is switched to the (a) side, the fluid will be introduced to the Av port. Then, the fluid is directed to the spring chamber As at the edge surface of the main spool through the pilot passage Ap of the counter balance valve and thus, the main spool will move to the right direction. Then, the fluid flown into the Av port is introduced to the hydraulic motor from the A_M port through the check valve in the main spool. As the hydraulic motor cannot absorb all the fluid flown into the Av port until acceleration has been completed, the fluid pressure will rise upto the relief valve set pressure and the excessive fluid is discharged to the return line from the relief valve Ra.

(During neutral brake)

When the directional valve is returned to the neutral position, the pressure of Av and Bv become equivalent, reaching the tank pressure and thus the main spool of the counter balance valve will be pushed back to the neutral position by the spring force. As the return line is closed by the check valve in the main spool, the pressure at the return side will be raised upto the relief valve set pressure and the hydraulic brake is applied to the motor to stop rotation.

(Prevention of overrun)

When the hydraulic motor is going to overrun exceeding the pump discharge volume due to external loads, the pressure at the inflow side decreases and the main spool will return to the neutral position. Thus the brake is applied to the hydraulic motor and overrun is prevented.



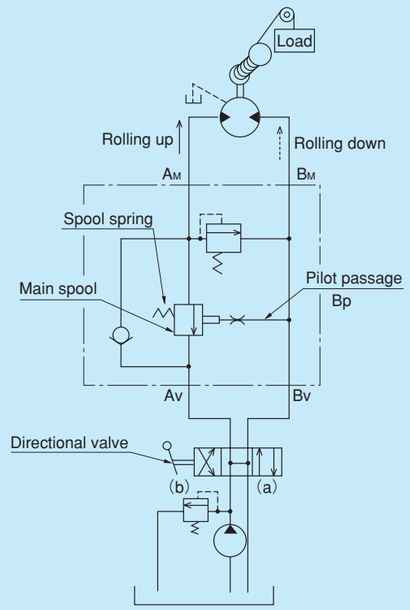
2. One-directional Counter balance Valve CW300A

(During Rolling up)

When the directional valve is switched to the (a) side and the fluid is introduced from the Av port, the fluid will be directed to the hydraulic motor inlet from A_M port through the check valve in the counter balance valve, and the load will be raised.
The fluid drained from the hydraulic motor outlet will be discharged to the Bv port through B_M port.

(During Rolling down)

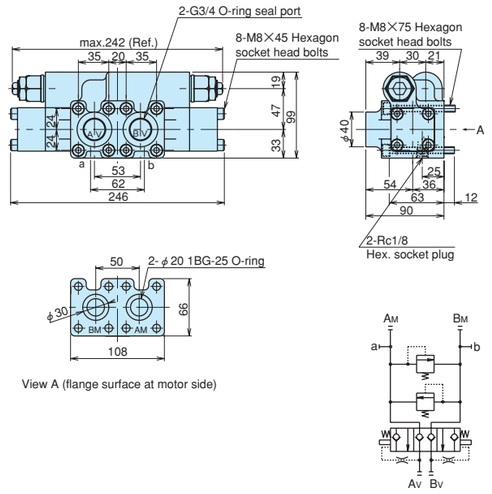
When the directional valve is switched to the (b) side, the fluid will be flown into the Bv port. The fluid introduced to the Bv port is directed to the main spool end surface through the pilot passage Bp. If the pilot pressure becomes higher than the spool spring force, the main spool will move to the left and the return side passage will be opened. The fluid flown into the Bv port is introduced to the hydraulic motor inlet through the Bm port and the load is lowered. The fluid discharged from the hydraulic motor outlet is drained to the Av port through the A_M port.
When the load is going to overrun exceeding the pump discharge volume due to gravity, the pressure at the inflow side of the motor is reduced and the pilot pressure decreases. Thus, the main spool is returned to the right side by the spring force and the return line is closed, which generates the pressure at the outlet side of the hydraulic motor and overrun is prevented.



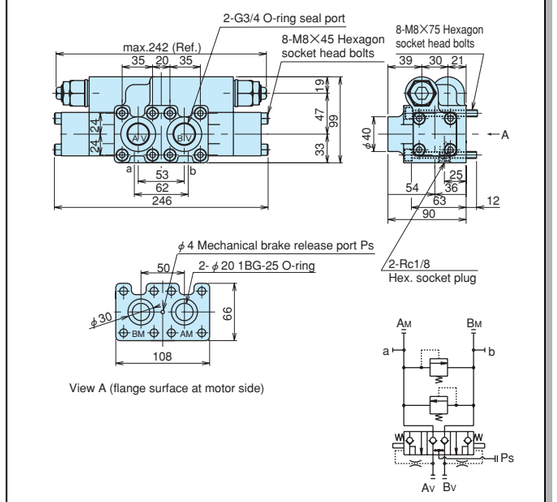
C100□

Rated Flow	100 ℓ /min
Adjusting Range of Relief Valve Set Pressure	9.8～27.5MPa (100～280kgf/cm²)
Main Spool Cracking Pressure	0.57MPa (5.8kgf/cm²)
〃 (Higher Cracking Pressure Model)	1.31MPa (13.4kgf/cm²)
Check Valve Cracking Pressure	0.015MPa (0.15kgf/cm²)
Mass	7kg

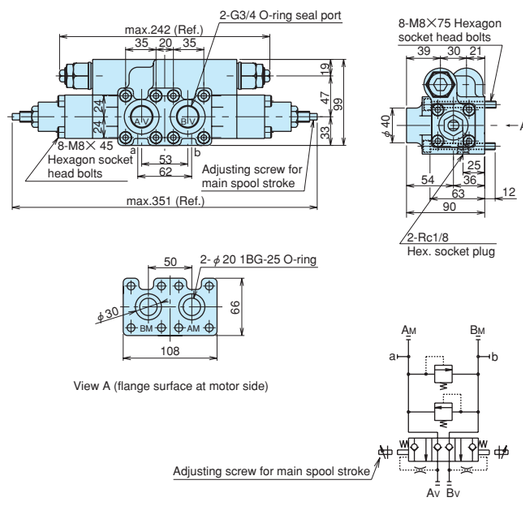
■C100



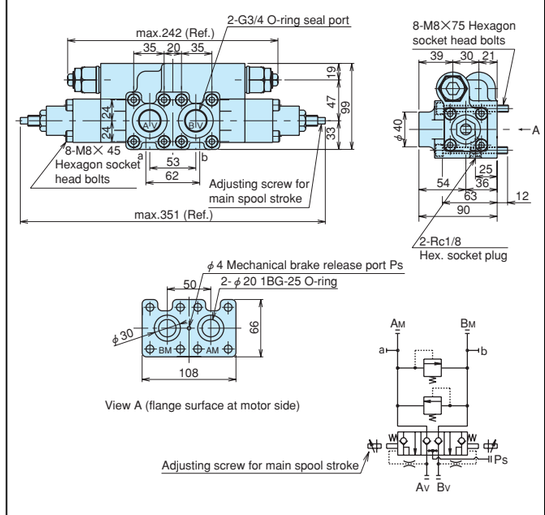
■C100Y



■C100Z



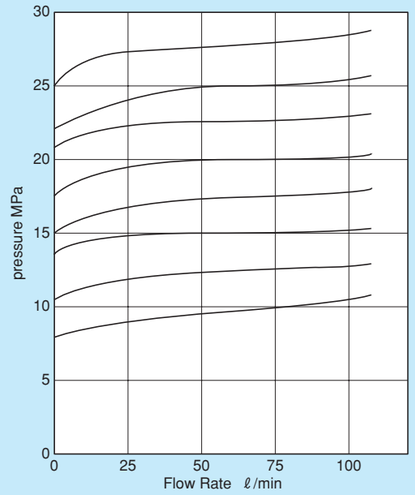
■C100W



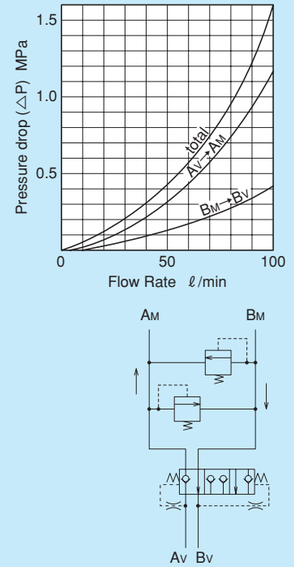
STANDARD PERFORMANCE DATA

Hydraulic fluid: SHELL TELLUS #56, viscosity:37 cSt (Oil temperature 50 degrees C.)
(Data are not guaranteed values but averages)

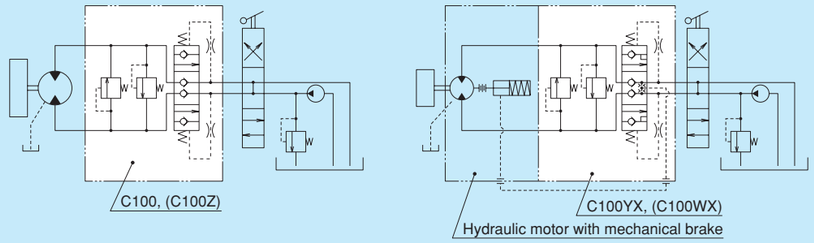
1. Pressure Override Performance



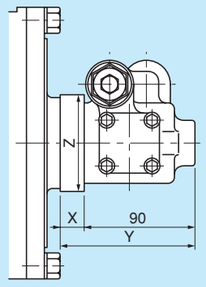
2. Pressure Drop



APPLICATION EXAMPLE



SUB-PLATE DIMENSION for DOWMAX HYDRAULIC MOTOR DIRECT CONNECTION



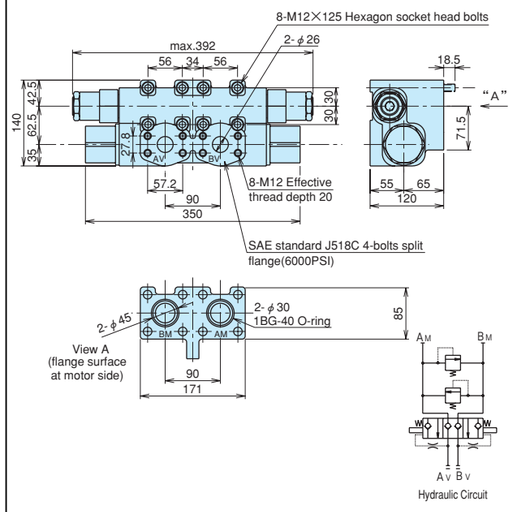
Motor Model	ME100	ME150 ME175 ME300B ME350B	ME600B	ME750B ME850B	ME1300A	ME1900	ME2600	ME3100	ME4100
sub-plate code	— (M)	A	N	C	R	G	H	K	J
X	— (20)	40	40	40	30	40	50	50	50
Y	90 (110)	130	130	130	120	130	140	140	140
Z	— (80)	80	80	82	110	100	120	120	115

Numbers in ( ) for ME 100 show sub-plate dimensions in direct connection with C100Y & C100W. ME100 with-mark can be directly connected without sub-plate.

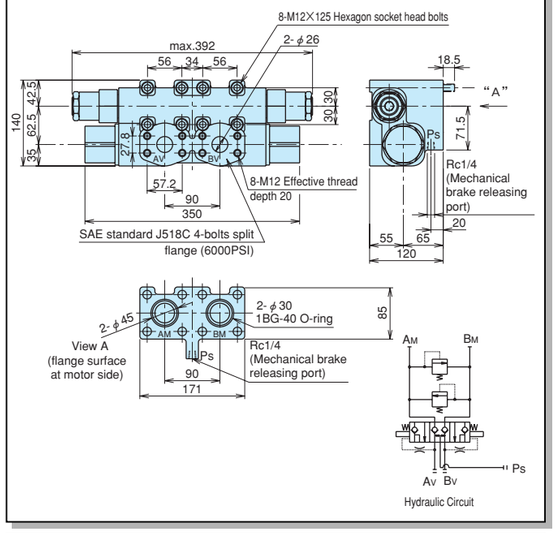
C300□B

Rated Flow	300 ℓ /min
Adjusting Range of Relief Valve Set Pressure	9.8～27.5MPa (100～280kgf/cm²)
Main Spool Cracking Pressure	0.59MPa (6.0kgf/cm²)
〃 (Higher Cracking Pressure Model)	1.18MPa (12kgf/cm²)
Check Valve Cracking Pressure	0.015MPa (0.15kgf/cm²)
Mass	19kg

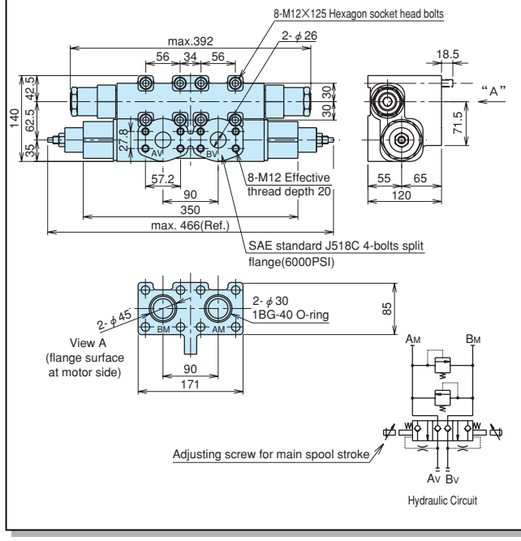
■C300B



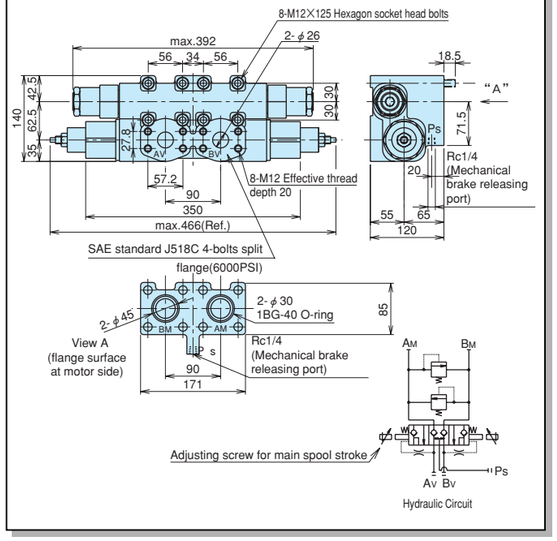
■C300YB



■C300ZB



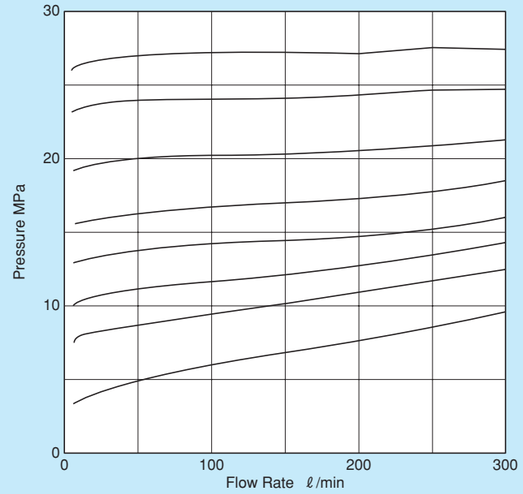
■C300WB



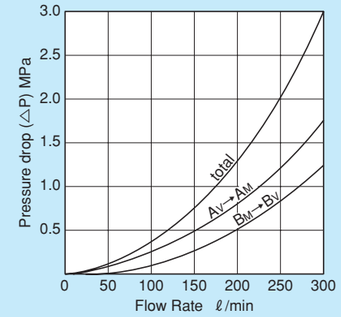
STANDARD PERFORMANCE DATA

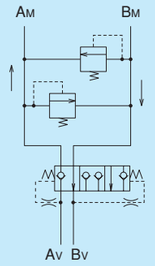
Hydraulic fluid: SHELL TELLUS #56, viscosity:37 cSt(Oil temperature 50 degrees C.)
(Data are not guaranteed values but averages)

1. Pressure Override Performance

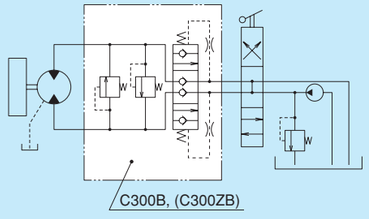


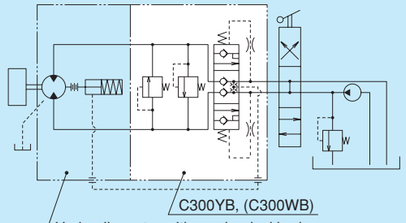
2. Pressure Drop



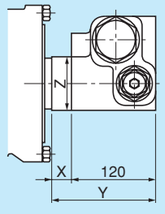


APPLICATION EXAMPLE





SUB-PLATE DIMENSION for DOWMAX HYDRAULIC MOTOR DIRECT CONNECTION

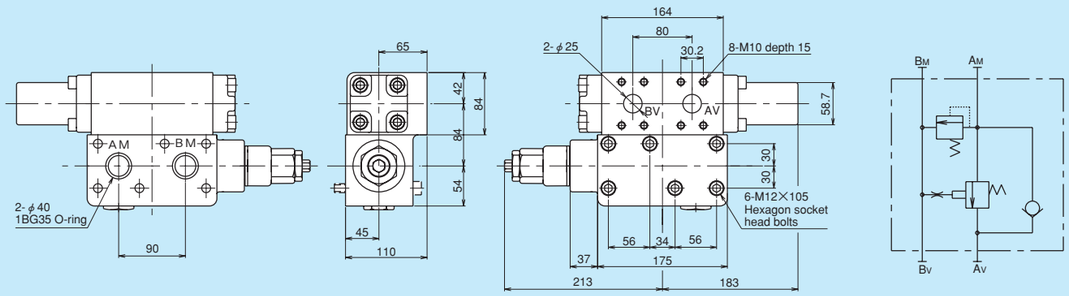


Motor Model	ME100	ME150 ME175 ME300B ME350B	ME600B	ME750B ME850B	ME1300A	ME1900	ME2600	ME3100	ME4100
sub-plate code		A	A	C	R	G	H	K	J
X		30	30	30	40	55	35	40	35
Y		150	150	150	160	175	155	160	155
Z		86	86	88	110	84	84	120	110

CW300A

Rated Flow	300 ℓ /min
Adjusting Range of Relief Valve Set Pressure	9.8～27.5MPa (100～280kgf/cm²)
Main Spool Cracking Pressure	0.87MPa (8.9kgf/cm²)
〃 (Higher Cracking Pressure Model)	1.37MPa (14kgf/cm²)
Check Valve Cracking Pressure	0.69MPa (7.0kgf/cm²)
Mass	24kg

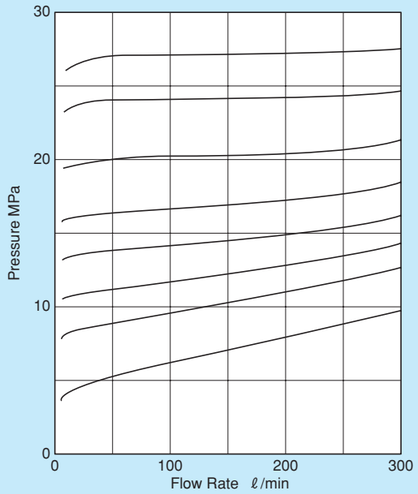
OUTLINE DIMENSIONS and CIRCUIT DIAGRAM



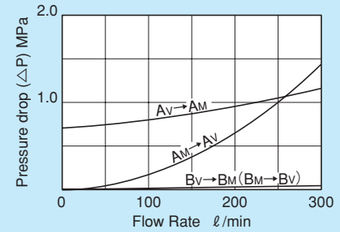
STANDARD PERFORMANCE DATA

Hydraulic fluid: SHELL TELLUS #56, viscosity:37 cSt(Oil temperature 50 degrees C.)
(Data are not guaranteed values but averages)

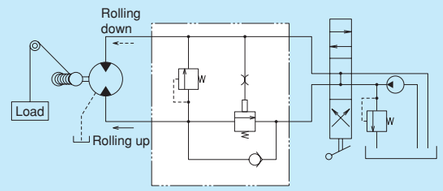
1. Pressure Override Performance



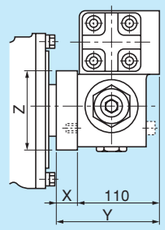
2. Pressure Drop



APPLICATION EXAMPLE



SUB-PLATE DIMENSION for DOWMAX HYDRAULIC MOTOR DIRECT CONNECTION



Motor Model	ME100	ME150 ME175 ME300B ME350B	ME600B	ME750B ME850B	ME1300A	ME1900	ME2600	ME3100	ME4100
Sub-plate code		A	A	C	R	G	H	K	J
X		30	30	30	40	55	35	40	35
Y		140	140	140	150	165	145	150	145
Z		86	86	88	110	84	84	120	110