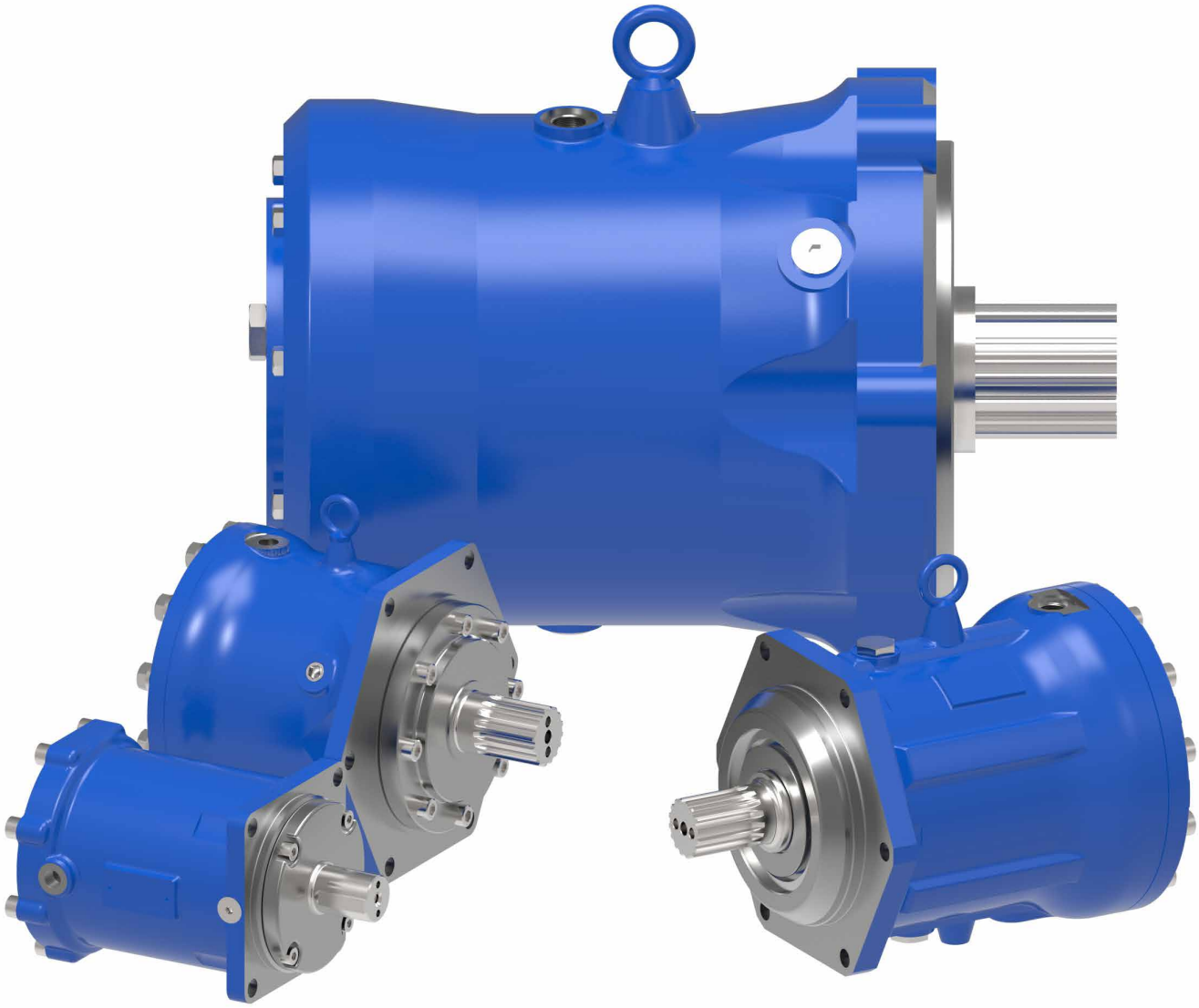
Eaton DOWMAX® ME motor

Pressure: 280/250 bar rated, 325bar peak
Displacement: 99 to 4097cc
Torque: 15,990 Nm rated (motor itself)

Low-speed high-torque axial piston motor



Powering Business Worldwide

Precautions for selecting DOWMAX motors

⚠ WARNING

- **Attention should be paid to the following matters when selecting DOWMAX motors.**
  Carefully read precautions shown in the catalog 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 catalog, instruction manual, delivery drawing, manufacturing specifications, etc. Pay special attention to the following:**

1. The performance curves shown is this catalog 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 new (before running-in), they may fail to achieve the performance shown in the catalog. 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 a special application, the performance described in the catalog may not be exhibited. Contact us if the back pressure applied to the outlet line of the motor exceeds 2.0MPa (20kgf/cm2).
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 catalog; 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. The mechanical brake of a DOWMAX motor is a reverse-operation type; the brake is released when brake pilot line is pressurized.
   a. Pay attention, when planning the hydraulic circuit, to the brake pilot line not being pressurized at any time the brake is necessary, even if for a short time.
   b. When residual pressure remains at the brake pilot line, brake torque decreases proportional to the residual pressure. Brake torque shown in this catalog is for the brake pilot line pressure of 0kgf/cm^2.
2. The 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 following:
   a. Mechanical brake and hydraulic brake shall not be used together. When the mechanical and hydraulic brake are planned to be used together, consult Eaton 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 catalog is for the use of standard mineral oil as a hydraulic fluid.
   When other oils such as fire-resistant fluid or special oils containing additive are used, brake characteristics will differ from the value in the catalog. Consult us in the case.

- **Do not plan operation exceeding the usable conditions described in this catalog. (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 catalog 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 catalog 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 catalog for confirmation.
5. Operation in cold places (below -25^{0}C).
   (Contact us for special motors for operation at temperatures from - 25^{0}C to -45^{0}C.)
6. Operation that causes the case temperature to exceed 80^{0}C.

***** Never remodel motors.

⚠ CAUTION

- Use the recommended hydraulic fluid shown in the 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/cm2). 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.

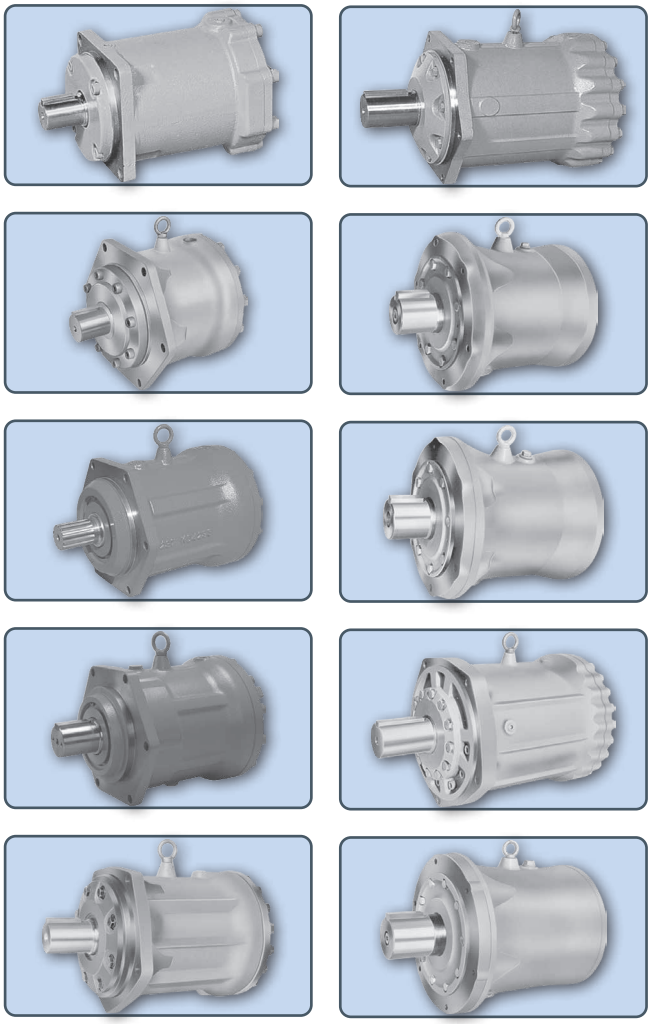
Table of contents

Array of DOWMAX base products

Optional features	Two-speed motor	Mechanical brake	Single stage planetary gearbox	Double stage planetary gearbox	Counter balance valve	Speed detection shaft	Speed sensor	Hollow shaft
ME100		X	X	X	X	X	X	
ME150		X	X	X	X	X	X	
ME175		X	X	X	X	X	X	
ME300B	X	X	X	X	X	X	X	
ME350B		X	X	X	X	X	X	
ME600B	X	X	X	X	X	X	X	
ME750B		X	X	X	X	X	X	
ME850B		X	X	X	X	X	X	
ME1300A			X	X	X	X	X	
ME1900			X		X	X	X	
ME2600			X		X	X	X	X
ME3100					X	X	X	
ME4100					X	X	X	X

Note: Above are standard available options, please contact Eaton representative for any other combinations - which is not available above.

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.

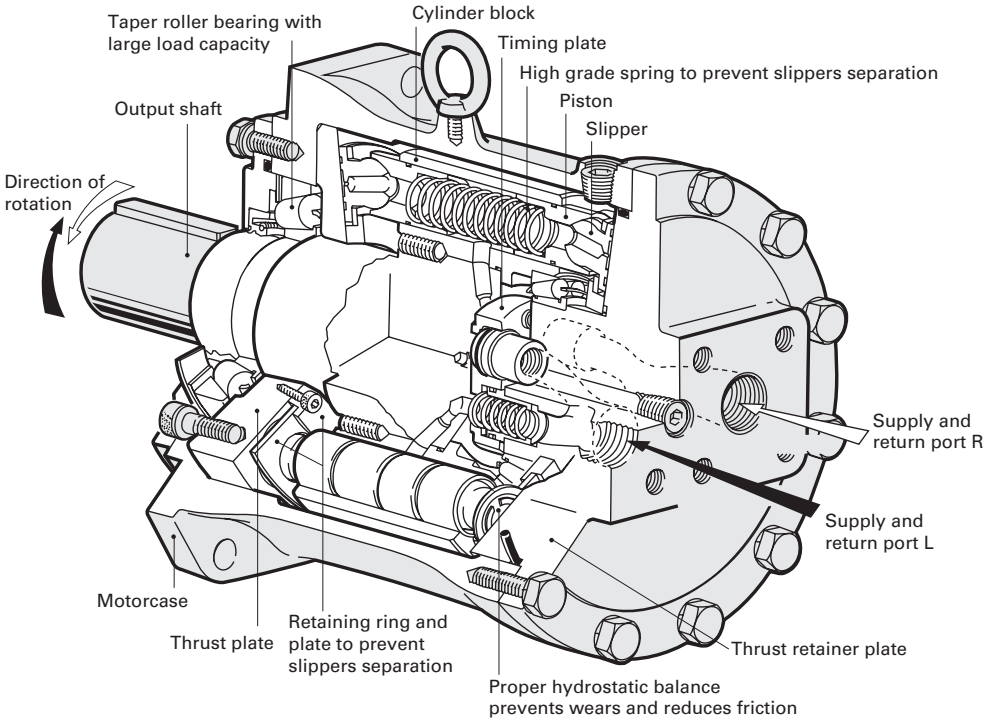
- Wide range of models - 13 displacements from 99 to 4097cm³/rev are available.
- High pressure-Continuous operating pressure 27.5Mpa (280kgf/cm2) & 24.5Mpa (250kgf/cm²).
- Smooth operation at low-speed. Multiple pistons and double swash plate result in smooth rotation at speeds down to 1 rev/min.
- 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.

Table of contents

DOWMAX® ME motor

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	Displace-ment cm³/rev	Rated pressure MPa (kgf/cm²)	Peak pressure MPa (kgf/cm²)	Rated torque Nm (kgfm)	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°C~80°C

☐ Limit of hydraulic fluid viscosity; 15~500cSt (Advisable fluid viscosity range; 25~100cSt)

DOWMAX® ME motor

Coding

ME 4100 – C W A S □□□□

Series
High pressure series DOWMAX ME motor

Motor size
(Metric displacement)

Design no.
1st design change "A"

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

Seal
No indication – Standard seal (Nitrile rubber)
V – Viton seal for phosphate ester fluid
W – Double seal (Nitrile rubber)
X – Double seal (Viton)

Ports
No indication – Standard metric ports
A & B – Special ports for counter balance valves (see table below)
E – SAE port

Special spec.
S – Special specification

Special specification number
No indication – Standard

Port symbol for attaching counter balance valve

– Means Std. port

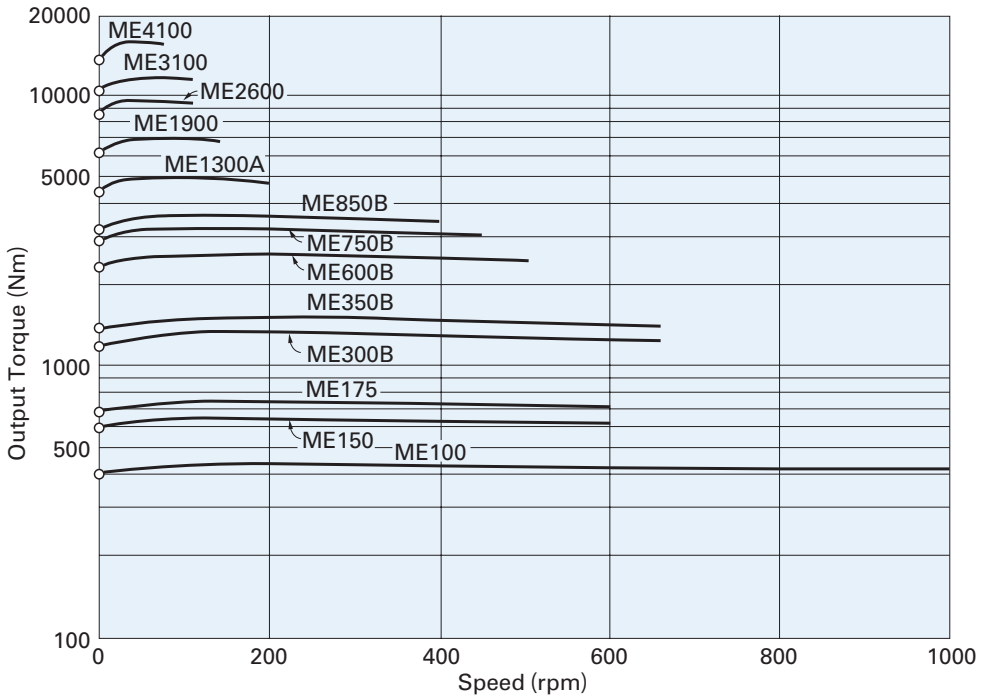
Valve \ Model	ME100	ME150~ ME850B	ME1300A	ME1900	ME2600	ME3100	ME4100
C100□	–	A	A	A	A	–	–
C300□B	*	B	A	B	B	–	B
CW300A	*	B	A	B	B	–	B

***** Valves cannot be attached

Selection chart

This chart indicates the relation of actual torque and shaft rotation at the rated pressure of 27.5MPa (280kgf/cm²) and 24.5MPa (250kgf/cm²).

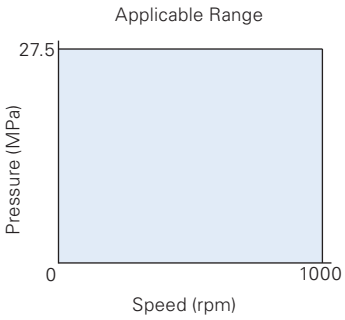
Given the required torque and shaft speed the appropriate model can be selected from the diagram. When the operating pressure differs from 27.5 or 24.5MPa (280 or 250kgf/cm²), refer to the performance date for the respective model.



DOWMAX® ME motor

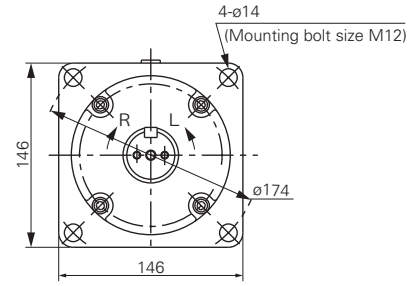
ME100

(Dimensions in mm)

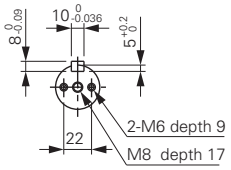


Displacement	99cm³/rev
Rated pressure	27.5MPa (280kgf/cm²)
Peak pressure	31.9MPa (325kgf/cm²)
Rated torque	432Nm (44kgfm)
Rated speed	1000rpm
Max. speed	1000rpm
Rated horse power	45kW (62PS)
Mass	22kg

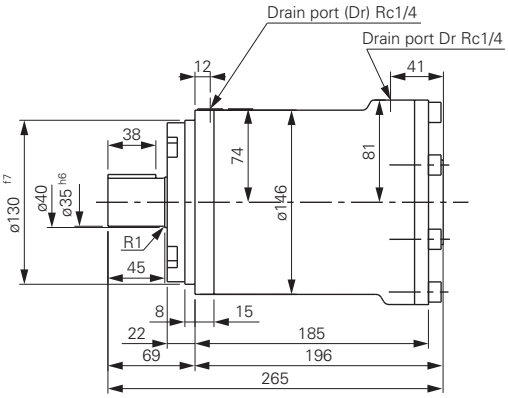
Nominal dimensions

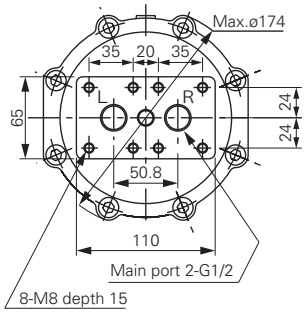


Direction of rotation
R : Supplied high pressure oil at port R
L : Supplied high pressure oil at port L



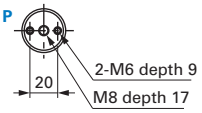
JIS B1301-1976
Shaft with screw for key retention
Shaft code : C

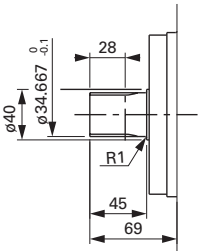




Splined shaft

Shaft code : P



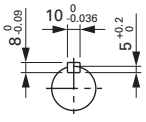


JIS D2001 Involute spline 35 x 19 x 1.667 (Class b)

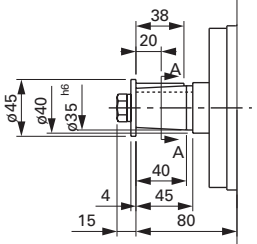
Shaft		Coefficient of profile shifting	+0.800
	Tool	Tooth form	Stub tooth
		Module	1.667
		Pressure angle	20°
		Number of teeth	19
		Dia. of basic pitch circle	31.667
	Tooth thickness	Grade	Class b (flank fit)
		Over-pin dia.	$37.819^{-0.019}_{-0.110}$ Pin dia.=Ø3.0
		Over-all, across a given number 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.=Ø3.333 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.	$31.7^{+0.025}_{0}$

Tapered shaft (1/10 taper)

Shaft code : B (Single oil seal)

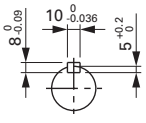


Seal land area of shaft is chrome plated

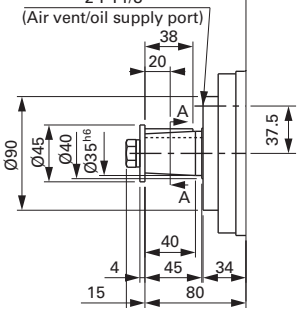


Tapered shaft (1/10 taper)

Shaft code : BW (Double oil seal)



Seal land area of shaft is chrome plated



Performance data

Fluid: Shell tellus 56 (Viscosity 37cSt at 50°C)
The graphs shown are mean values obtained for production units.

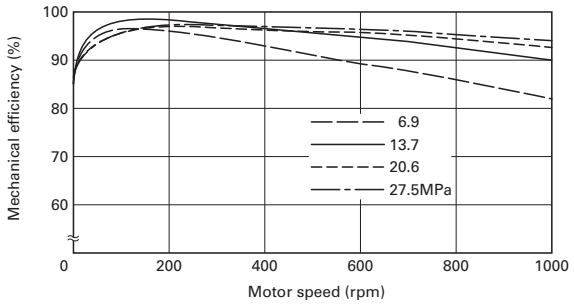


Fig. 1: Mechanical efficiency

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

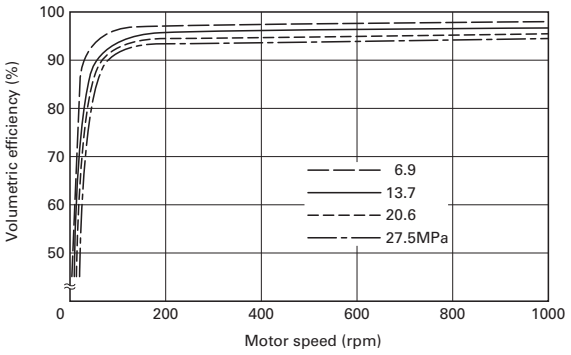


Fig. 2: Volumetric efficiency

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

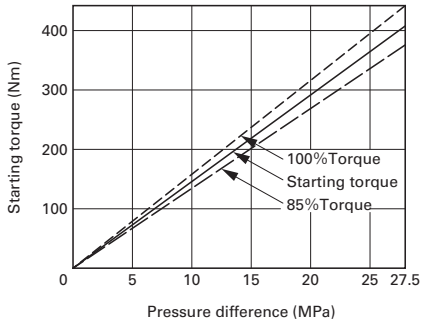


Fig. 3: Starting torque

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

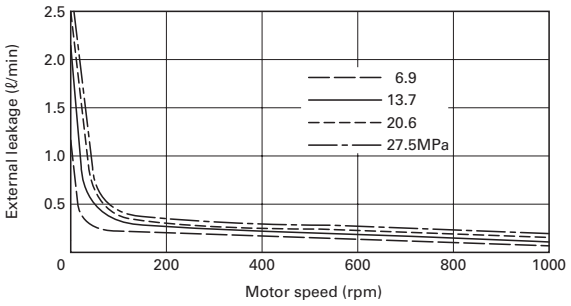


Fig. 4: External leakage

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

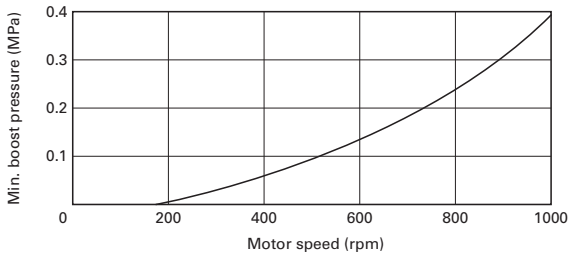


Fig. 5: Minimum boost pressure

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.

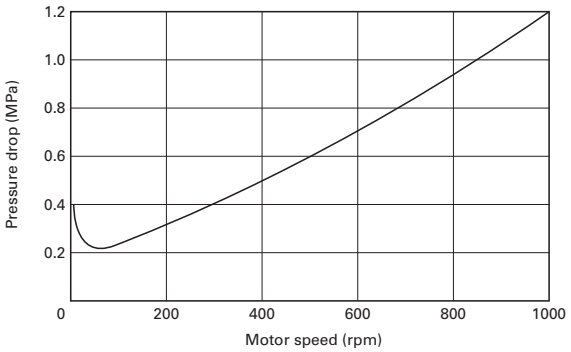


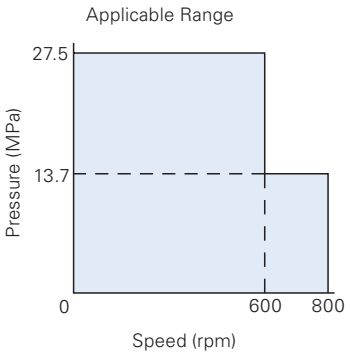
Fig. 6: Pressure drop

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

DOWMAX® ME motor

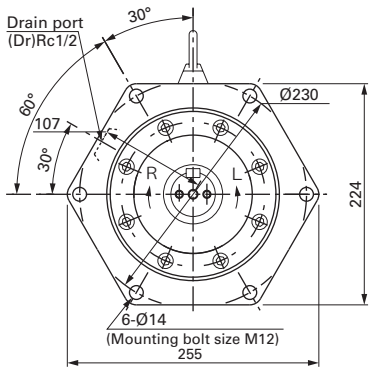
ME150

(Dimensions in mm)

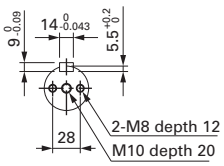


Displacement	152cm³/rev
Rated pressure	27.5MPa (280kgf/cm²)
Peak pressure	31.9MPa (325kgf/cm²)
Rated torque	667Nm (68kgfm)
Rated speed	600rpm
Max. speed	800rpm
Rated horse power	42kW (57PS)
Mass	42kg

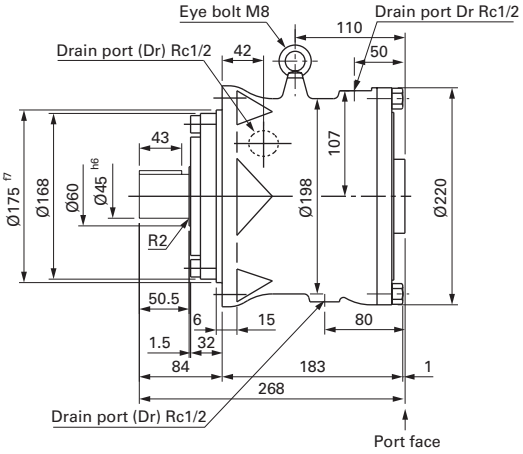
Nominal dimensions

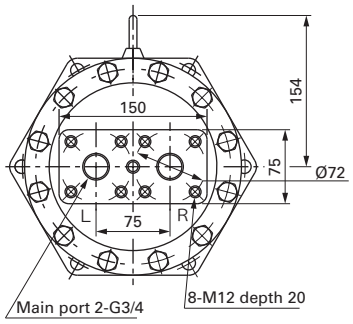


Direction of rotation
R : Supplied high pressure oil at port R
L : Supplied high pressure oil at port L



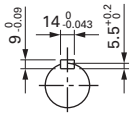
JIS B1301-1976
Shaft with screw for key retention
Shaft code : C





Tapered shaft (1/10 taper)

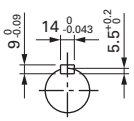
Shaft code : B (Single oil seal)



Seal land area of shaft is chrome plated

Tapered shaft (1/10 taper)

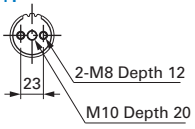
Shaft code : BW (Double oil seal)

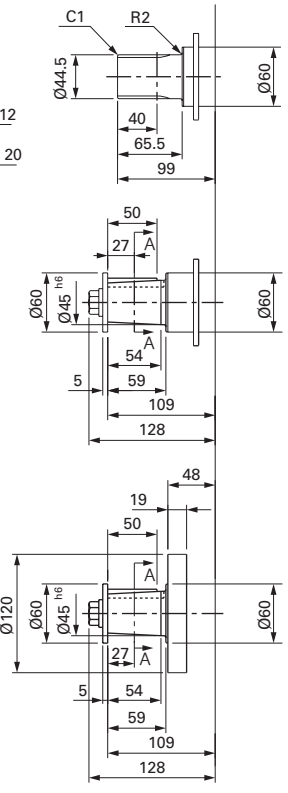


Seal land area of shaft is chrome plated

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
	Tooththickness	Grade	Class b (Flank fit)
		Over-pin dia	49.277 $^{-0.018}_{-0.107}$ Pin dia=Ø4.5
		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=Ø5 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.

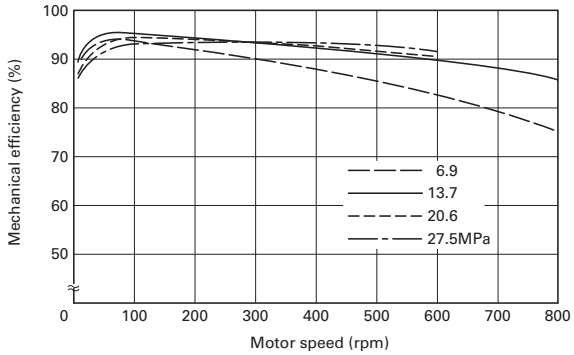


Fig. 1: Mechanical efficiency

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

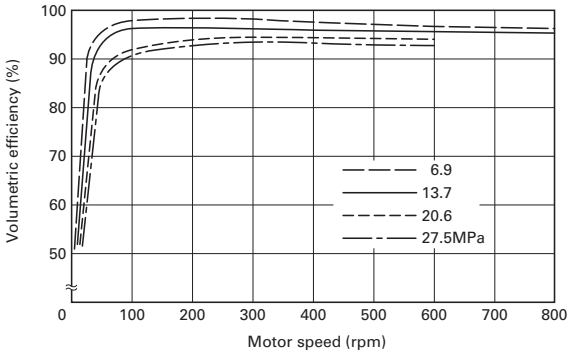


Fig. 2: Volumetric efficiency

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

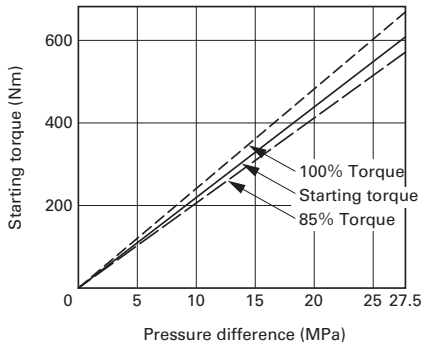


Fig. 3: Starting torque

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

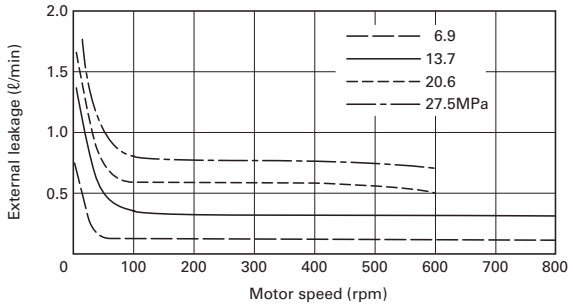


Fig. 4: External leakage

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

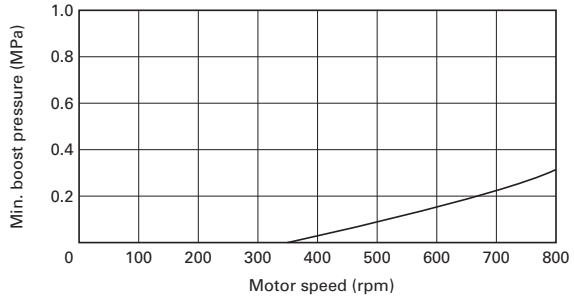


Fig. 5: Minimum boost pressure

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.

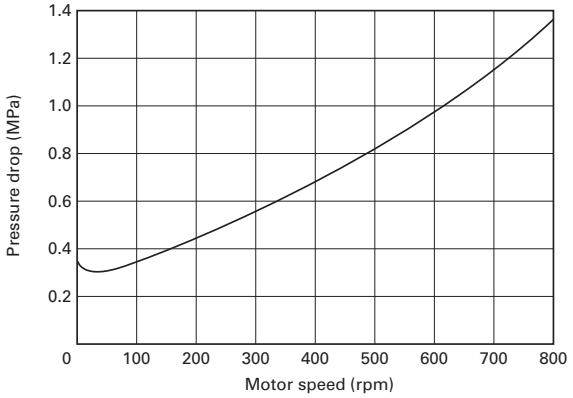


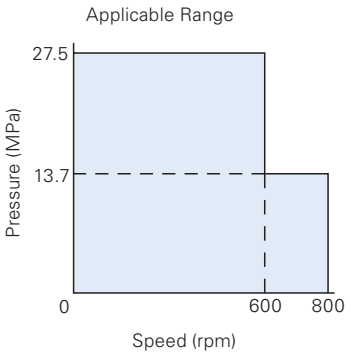
Fig. 6: Pressure drop

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

DOWMAX® ME motor

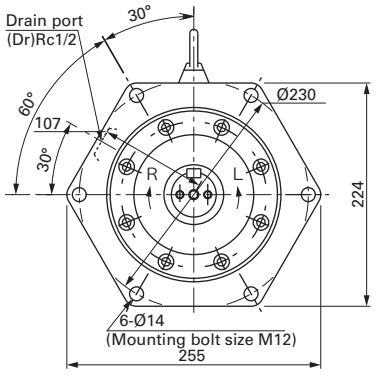
ME175

(Dimensions in mm)

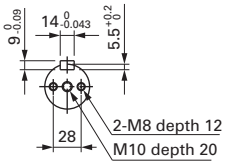


Displacement	175cm³/rev
Rated pressure	27.5MPa (280kgf/cm²)
Peak pressure	31.9MPa (325kgf/cm²)
Rated torque	765Nm (78kgfm)
Rated speed	600rpm
Max. speed	800rpm
Rated horse power	48kW (65PS)
Mass	42kg

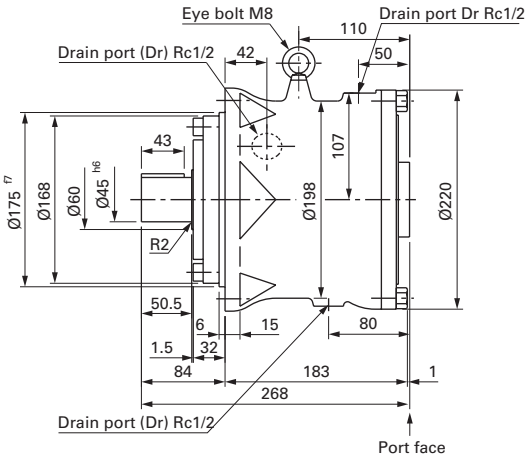
Nominal dimensions

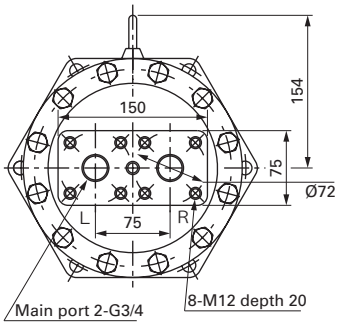


Direction of rotation
R : Supplied high pressure oil at port R
L : Supplied high pressure oil at port L



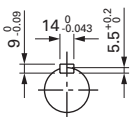
JIS B1301-1976
Shaft with screw for key retention
Shaft code : C





Tapered shaft (1/10 taper)

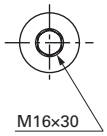
Shaft code : B (Single oil seal)

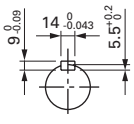


Seal land area of shaft is chrome plated

Tapered shaft (1/10 taper)

Shaft code : BW (Double oil seal)

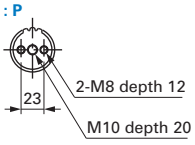


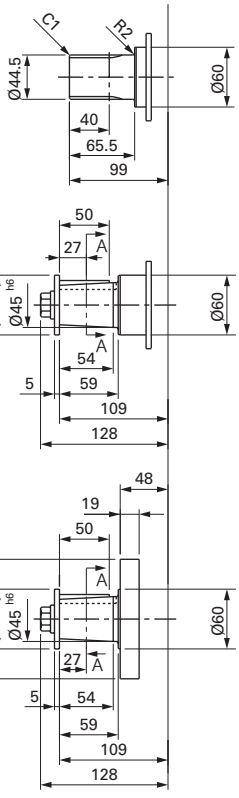


Seal land area of shaft is chrome plated

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
	Tooththickness	Grade	Class b (flank fit)
		Over-pin dia.	$49.277^{-0.018}_{-0.107}$ Pin dia.=Ø4.5
		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.=Ø5 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.

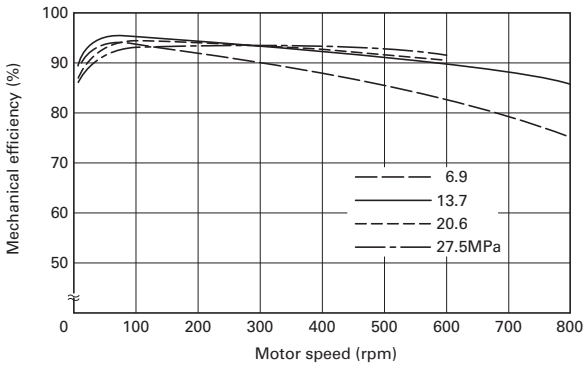


Fig. 1: Mechanical efficiency

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

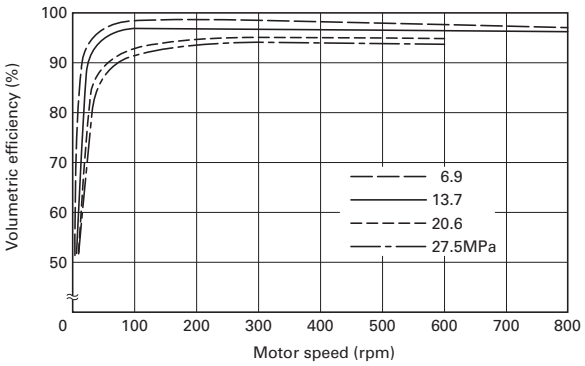


Fig. 2: Volumetric efficiency

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

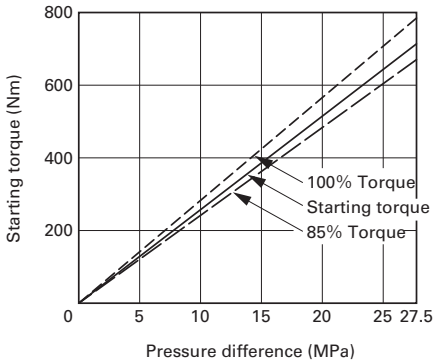


Fig. 3: Starting torque

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

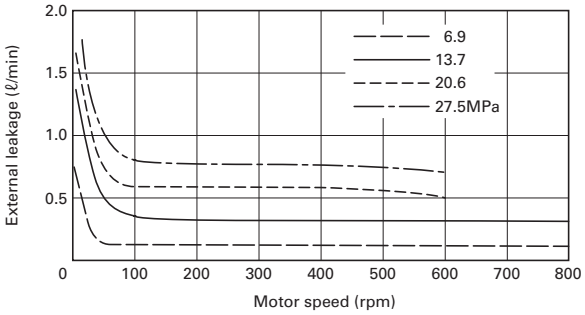


Fig. 4: External leakage

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

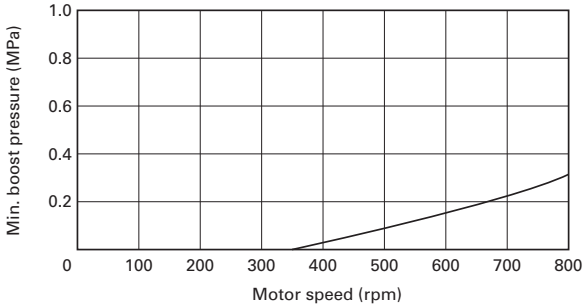


Fig. 5: Minimum boost pressure

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.

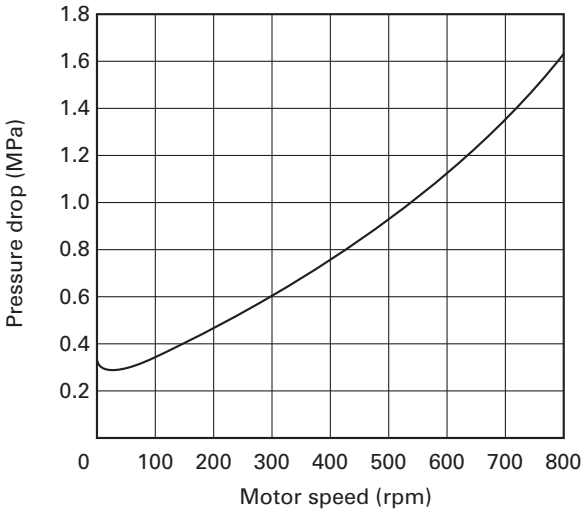


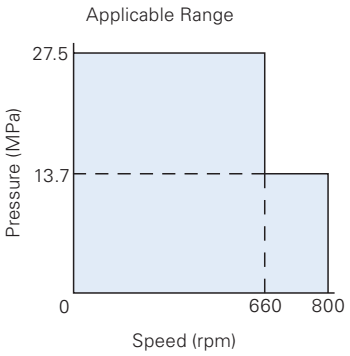
Fig. 6: Pressure drop

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

DOWMAX® ME motor

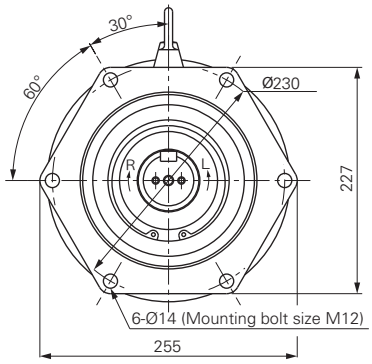
ME300B

(Dimensions in mm)

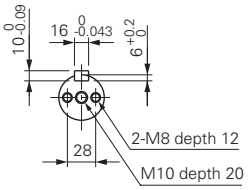


Displacement	300cm³/rev
Rated pressure	27.5MPa (280kgf/cm²)
Peak pressure	31.9MPa (325kgf/cm²)
Rated torque	1320Nm (134kgfm)
Rated speed	660rpm
Max. speed	800rpm
Rated horse power	90kW (123PS)
Mass	60kg

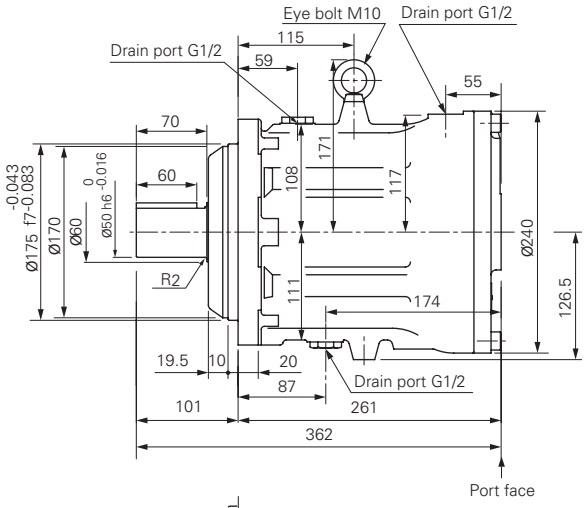
Nominal dimensions

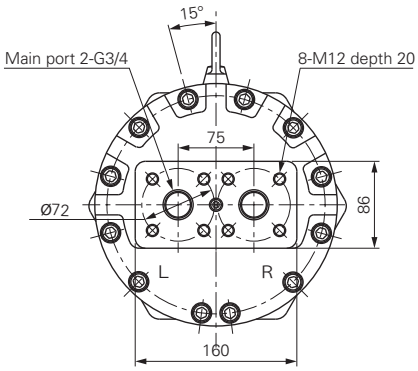


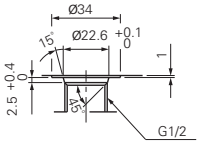
Direction of rotation
R : Supplied high pressure oil at port R
L : Supplied high pressure oil at port L



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



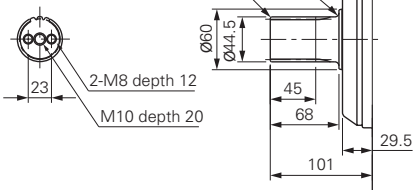




Details of drain port

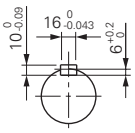
Splined shaft

Shaft code : P

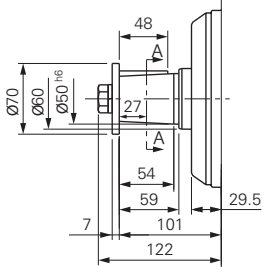


Tapered shaft (1/10 taper)

Shaft code : B (Single oil seal)

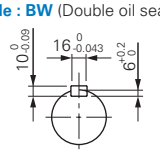


Seal land area of shaft is chrome plated

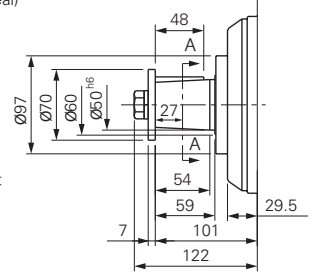


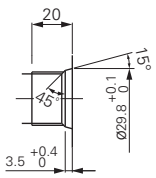
Tapered shaft (1/10 taper)

Shaft code : BW (Double oil seal)



Seal land area of shaft is chrome plated





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.=Ø4.5
		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.=Ø5 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 K46 (Viscosity 30cSt at 50°C)
The graphs shown are mean values obtained for production units.

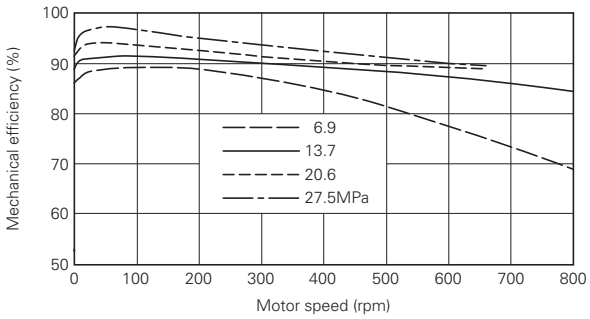


Fig. 1: Mechanical efficiency

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

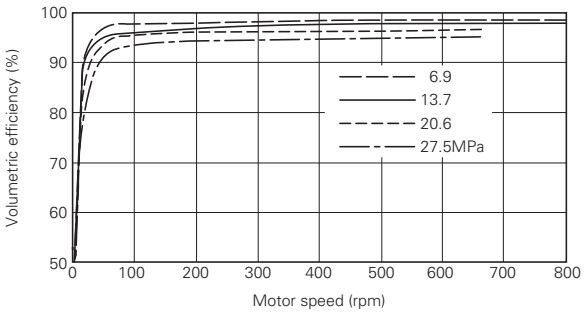


Fig. 2: Volumetric efficiency

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

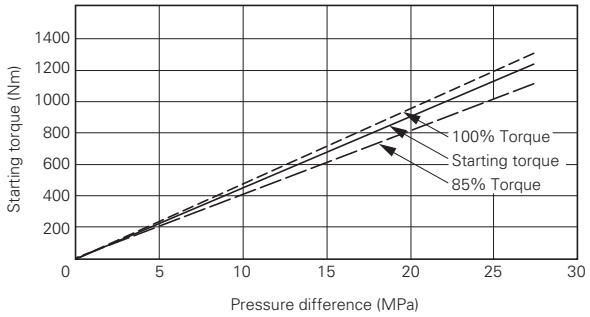


Fig. 3: Starting torque

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

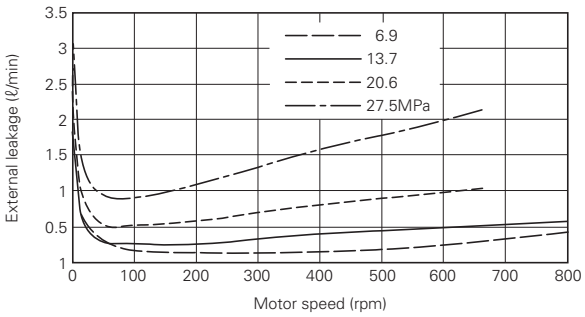


Fig. 4: External leakage

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

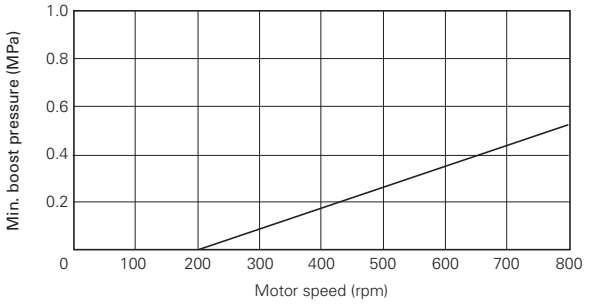


Fig. 5: Minimum boost pressure

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.

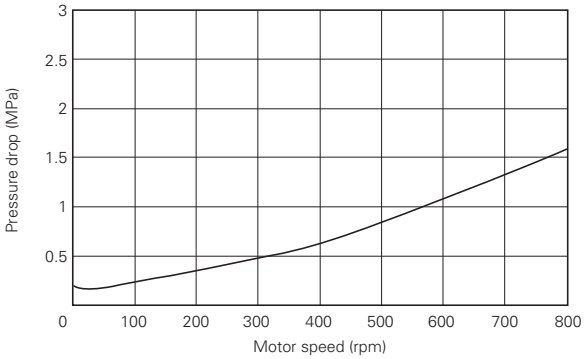


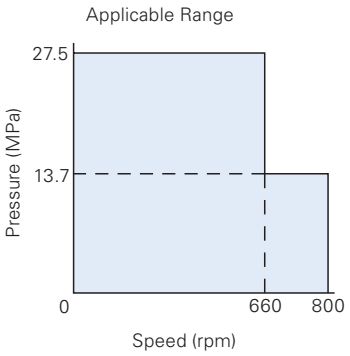
Fig. 6: Pressure drop

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

DOWMAX® ME motor

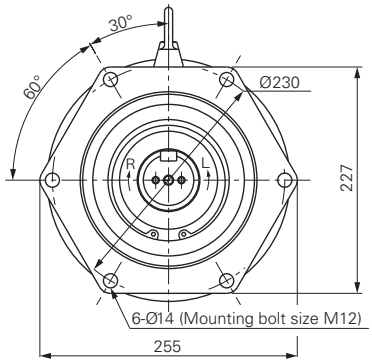
ME350B

(Dimensions in mm)

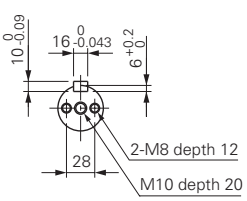


Displacement	350cm³/rev
Rated pressure	27.5MPa (280kgf/cm²)
Peak pressure	31.9MPa (325kgf/cm²)
Rated torque	1530Nm (156kgfm)
Rated speed	660rpm
Max. speed	800rpm
Rated horse power	106kW (144PS)
Mass	60kg

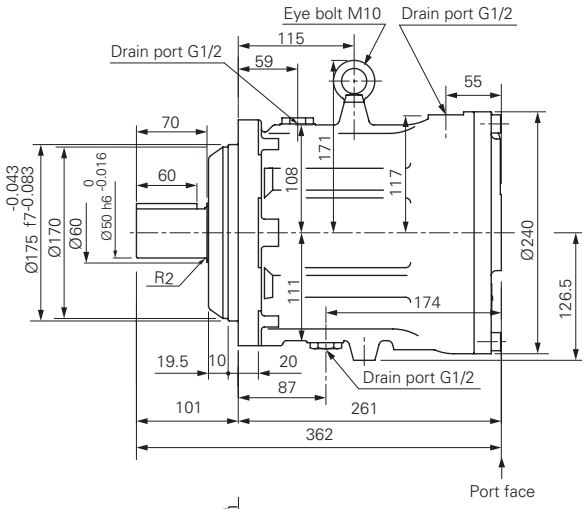
Nominal dimensions

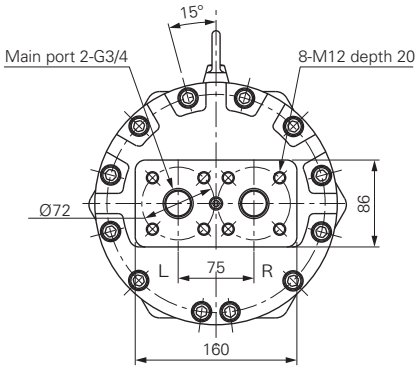


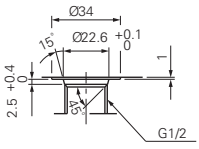
Direction of rotation
R : Supplied high pressure oil at port R
L : Supplied high pressure oil at port L



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

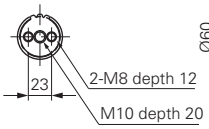


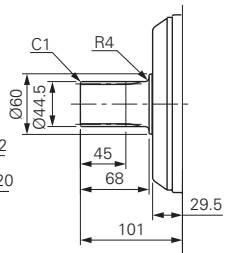




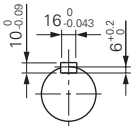
Details of drain port

Splined shaft
Shaft code : P

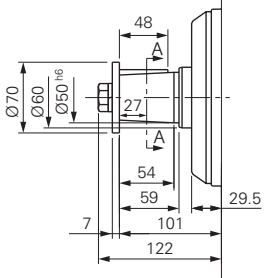




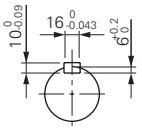
Tapered shaft (1/10 taper)
Shaft code : B (Single oil seal)



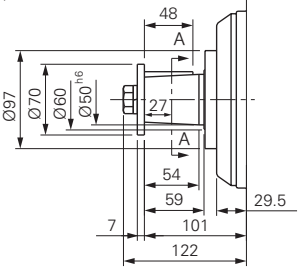
Seal land area of shaft is chrome plated

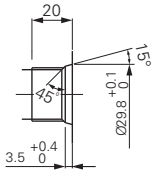


Tapered shaft (1/10 taper)
Shaft code : BW (Double oil seal)



Seal land area of shaft is chrome plated





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.=Ø4.5
		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.=Ø5 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 K46 (Viscosity 30cSt at 50°C)
The graphs shown are mean values obtained for production units.

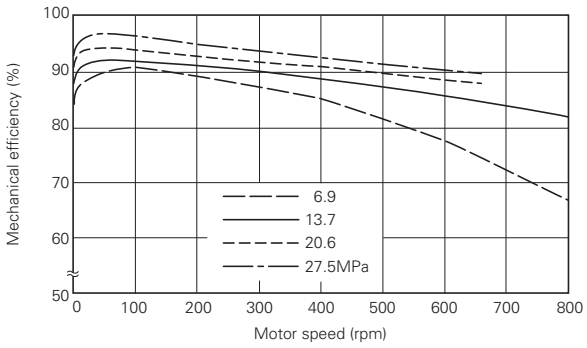


Fig. 1: Mechanical efficiency

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

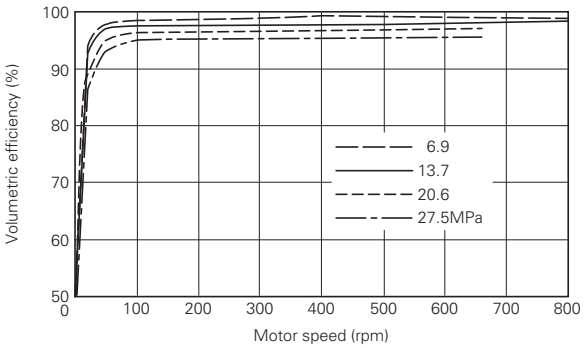


Fig. 2: Volumetric efficiency

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

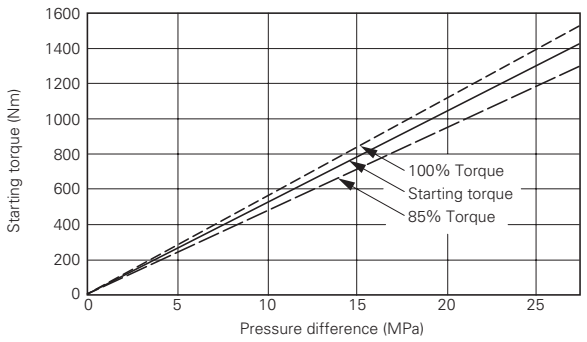


Fig. 3: Starting torque

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

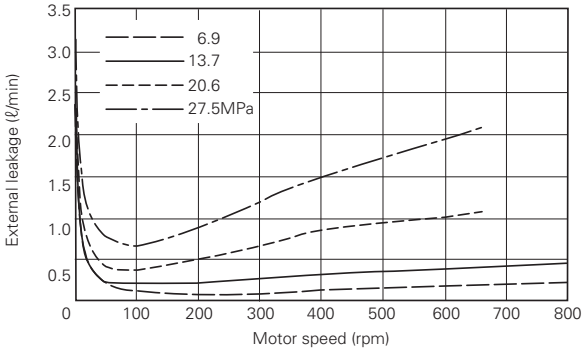


Fig. 4: External leakage

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

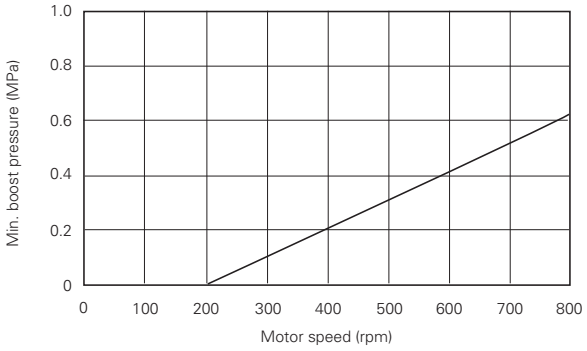


Fig. 5: Minimum boost pressure

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.

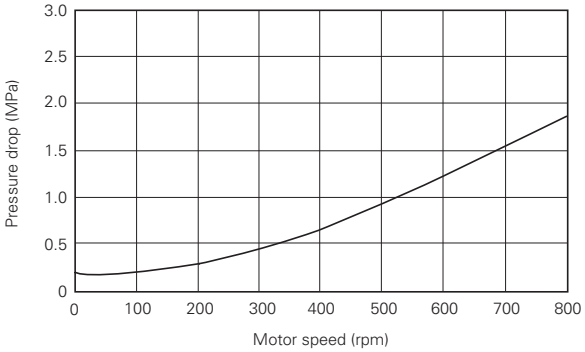


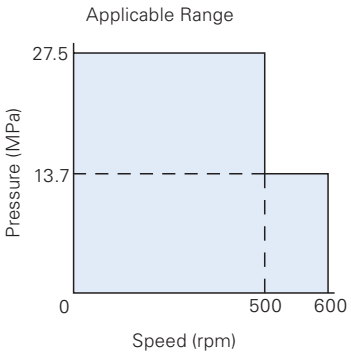
Fig. 6: Pressure drop

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

DOWMAX® ME motor

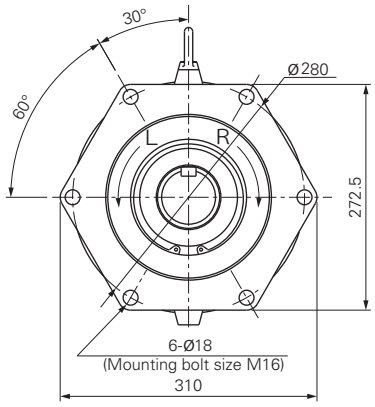
ME600B

(Dimensions in mm)

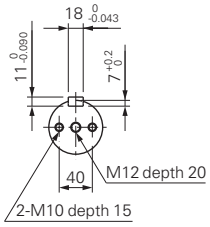


Displacement	600cm³/rev
Rated pressure	27.5MPa (280kgf/cm²)
Peak pressure	31.9MPa (325kgf/cm²)
Rated torque	2620Nm (267kgfm)
Rated speed	500rpm
Max. speed	600rpm
Rated horse power	137kW (186PS)
Mass	96kg

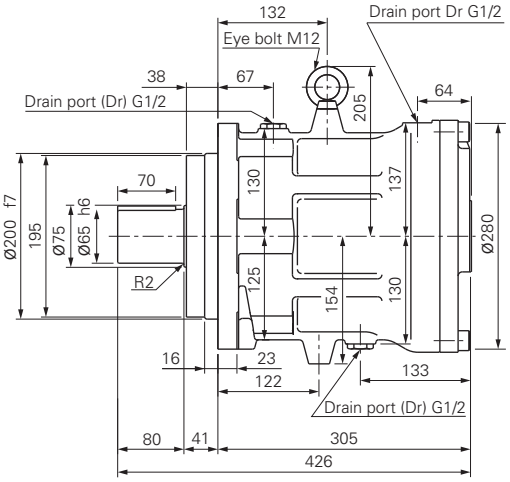
Nominal dimensions

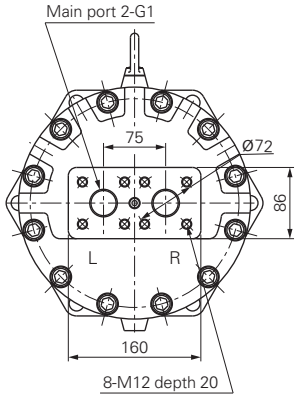


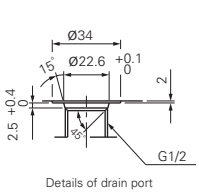
Direction of rotation
R : Supplied high pressure oil at port R
L : Supplied high pressure oil at port L



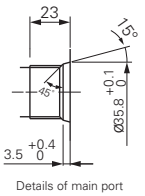
JIS B1301-1976
Shaft with screw for key retention
Shaft code : C







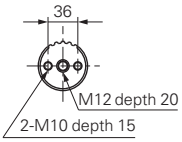
Details of drain port

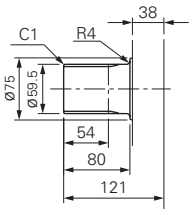


Details of main port

Splined shaft

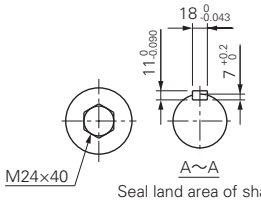
Shaft code : P



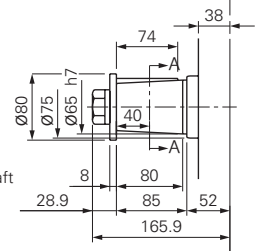


Tapered shaft (1/10 taper)

Shaft code : B (Single oil seal)

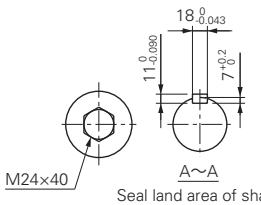


Seal land area of shaft is chrome plated

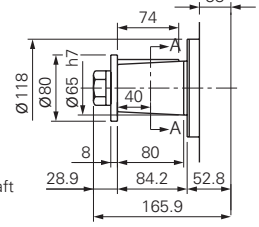


Tapered shaft (1/10 taper)

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.=Ø4.5
		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.=Ø5 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 K46 (Viscosity 30cSt at 50°C)
The graphs shown are mean values obtained for production units.

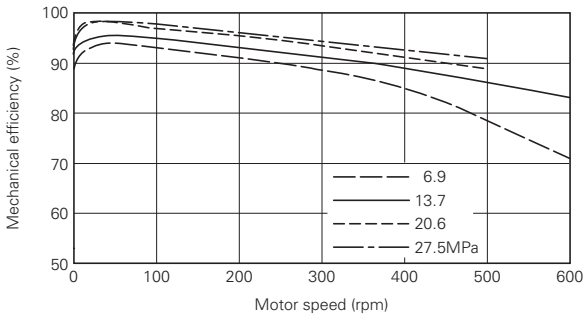


Fig. 1: Mechanical efficiency

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

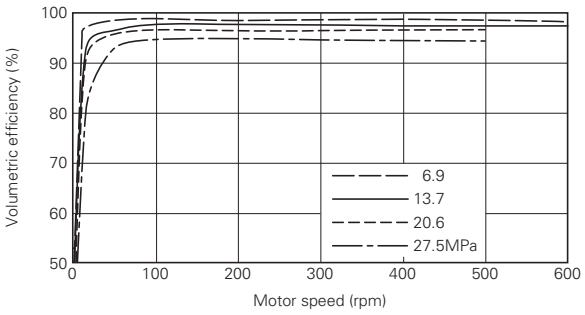


Fig. 2: Volumetric efficiency

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

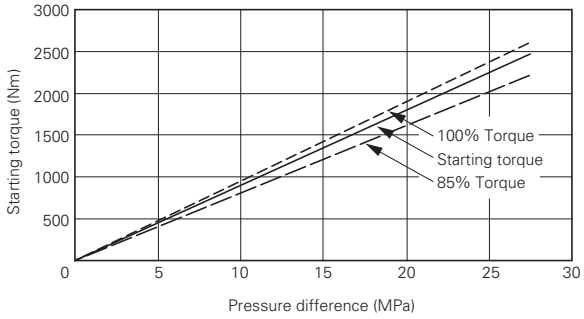


Fig. 3: Starting torque

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

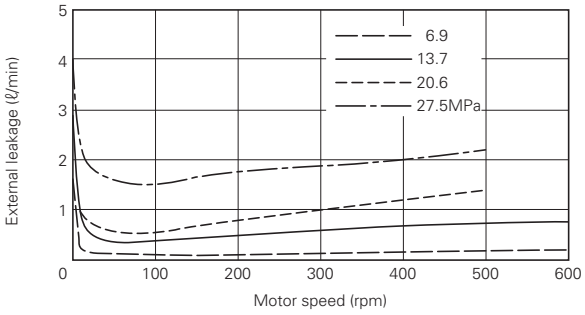


Fig. 4: External leakage

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

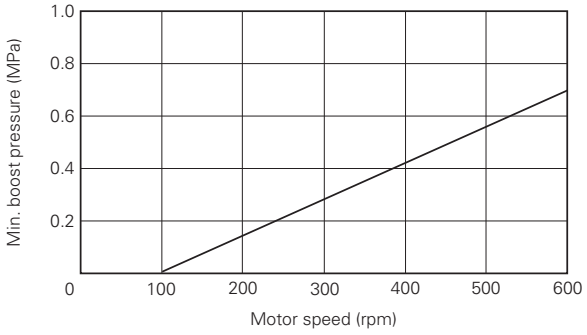


Fig. 5: Minimum boost pressure

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.

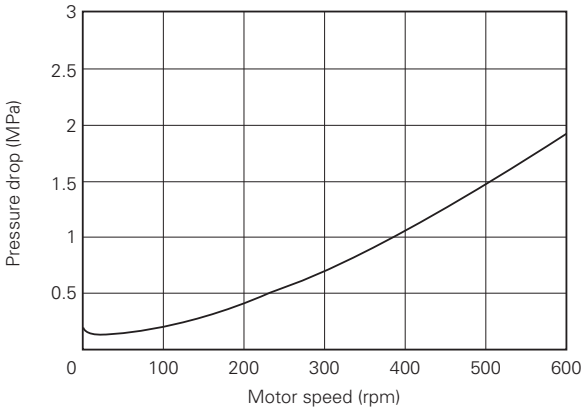


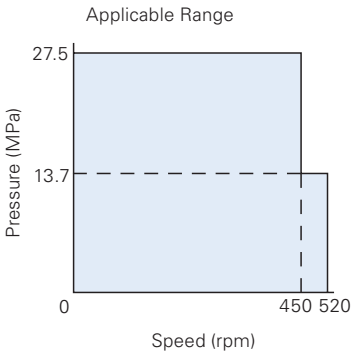
Fig. 6: Pressure drop

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

DOWMAX® ME motor

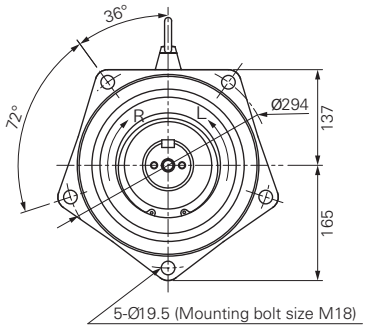
ME750B

(Dimensions in mm)

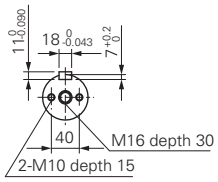


Displacement	750cm³/rev
Rated pressure	27.5MPa (280kgf/cm²)
Peak pressure	31.9MPa (325kgf/cm²)
Rated torque	3280Nm (334kgfm)
Rated speed	450rpm
Max. speed	520rpm
Rated horse power	154kW (210PS)
Mass	123kg

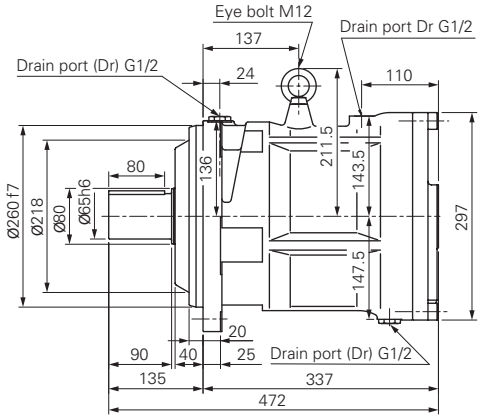
Nominal dimensions

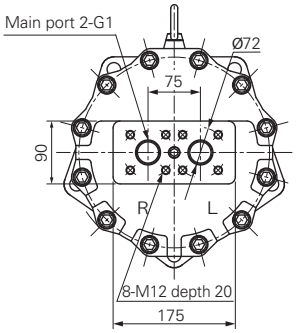


Direction of rotation
R : Supplied high pressure oil at port R
L : Supplied high pressure oil at port L



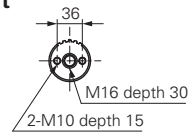
JIS B1301-1976
Shaft with screw for key retention
Shaft code : C

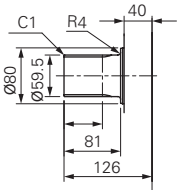




Splined shaft

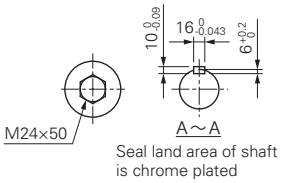
Shaft code : P



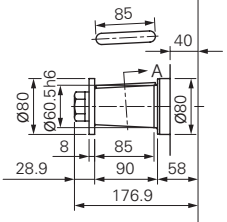


Tapered shaft (1/10 taper)

Shaft code : B (Single oil seal)

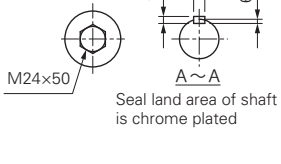


Seal land area of shaft is chrome plated

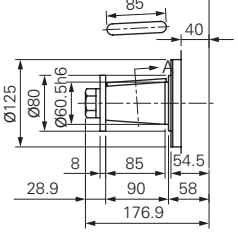


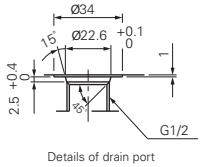
Tapered shaft (1/10 taper)

Shaft code : BW (Double oil seal)

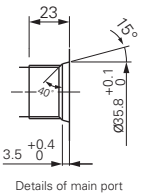


Seal land area of shaft is chrome plated





Details of drain port



Details of main port

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.=Ø4.5
		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.=Ø5 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 K46 (Viscosity 30cSt at 50°C)
The graphs shown are mean values obtained for production units.

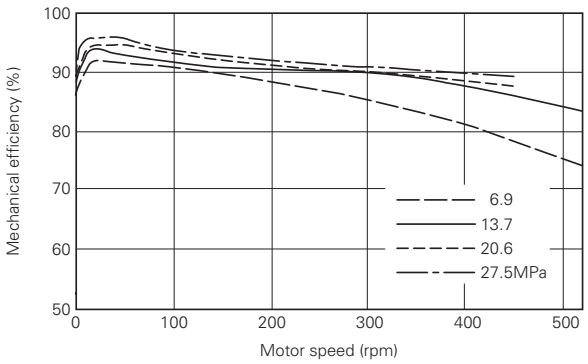


Fig. 1: Mechanical efficiency

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

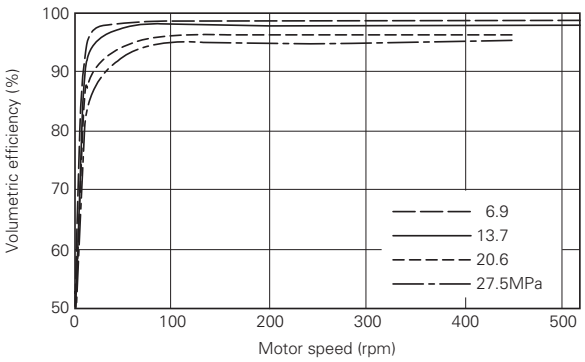


Fig. 2: Volumetric efficiency

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

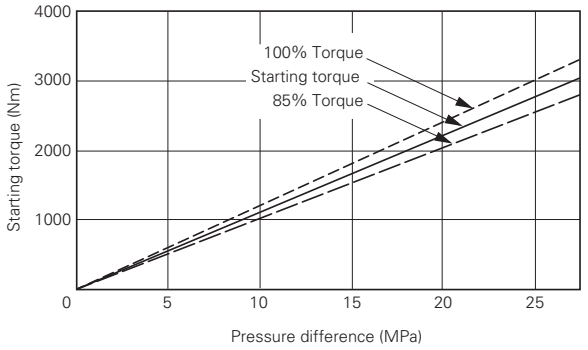


Fig. 3: Starting torque

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

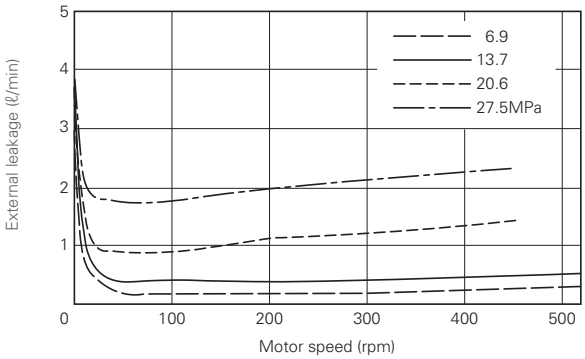


Fig. 4: External leakage

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

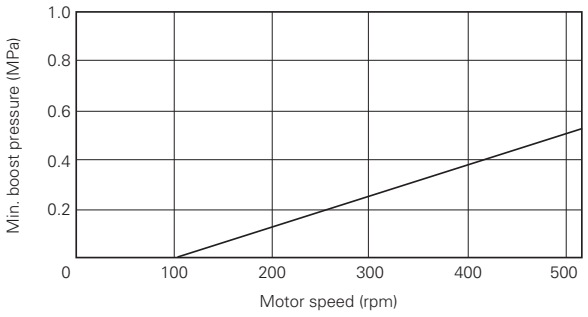


Fig. 5: Minimum boost pressure

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.

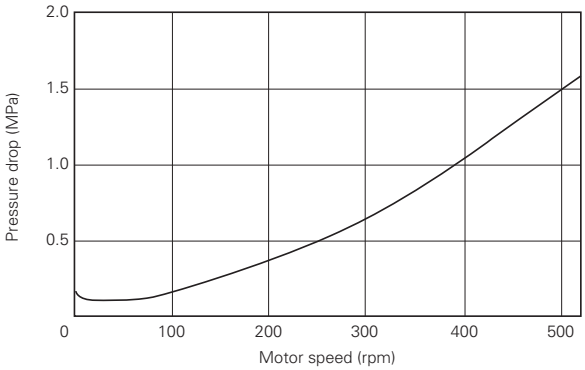


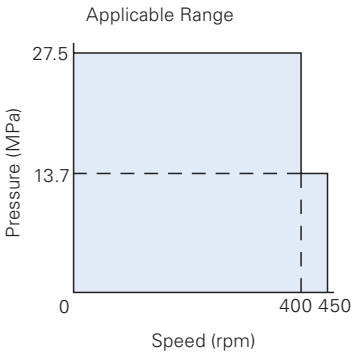
Fig. 6: Pressure drop

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

DOWMAX® ME motor

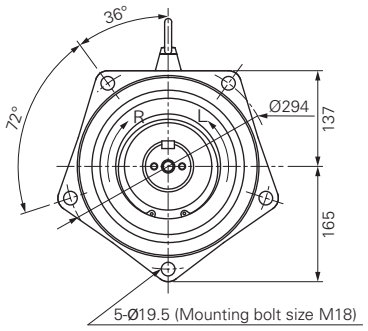
ME850B

(Dimensions in mm)

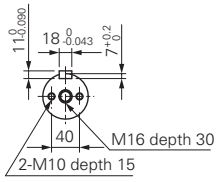


Displacement	848cm³/rev
Rated pressure	27.5MPa (280kgf/cm²)
Peak pressure	31.9MPa (325kgf/cm²)
Rated torque	3708Nm (378kgfm)
Rated speed	400rpm
Max. speed	450rpm
Rated horse power	155kW (211PS)
Mass	123kg

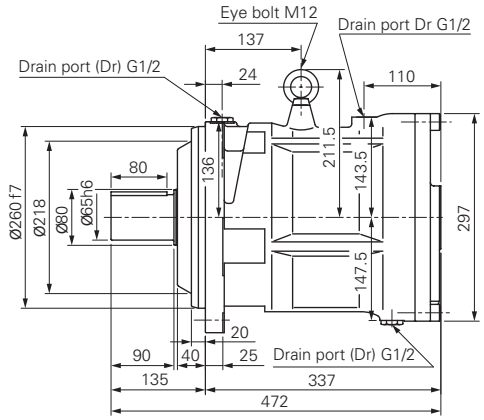
Nominal dimensions

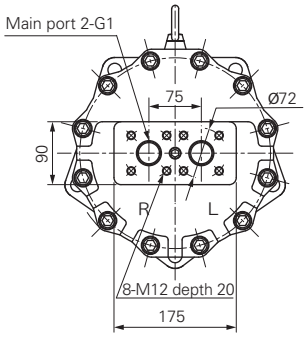


Direction of rotation
R : Supplied high pressure oil at port R
L : Supplied high pressure oil at port L



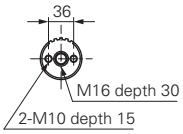
JIS B1301-1976
Shaft with screw for key retention
Shaft code : C

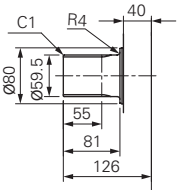




Splined shaft

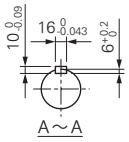
Shaft code : P



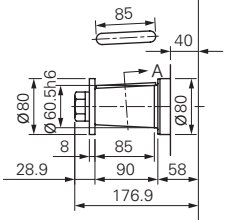


Tapered shaft (1/10 taper)

Shaft code : B (Single oil seal)

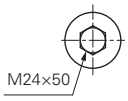


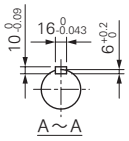
Seal land area of shaft is chrome plated



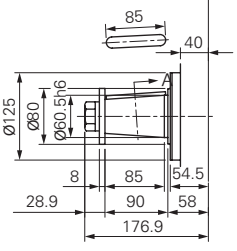
Tapered shaft (1/10 taper)

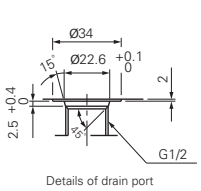
Shaft code : BW (Double oil seal)



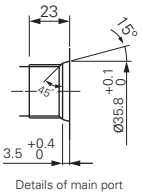


Seal land area of shaft is chrome plated





Details of drain port



Details of main port

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.=Ø4.5
		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.=Ø5 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 K46 (Viscosity 30cSt at 50°C)
The graphs shown are mean values obtained for production units.

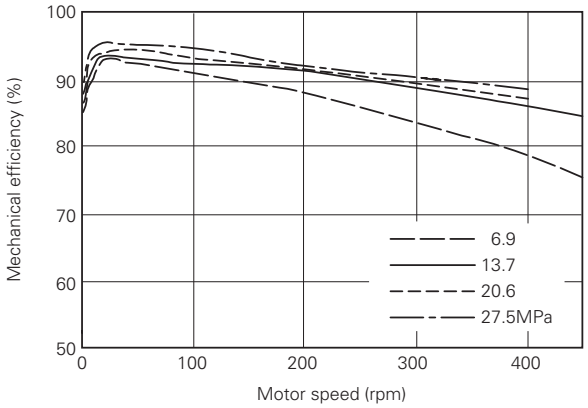


Fig. 1: Mechanical efficiency

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

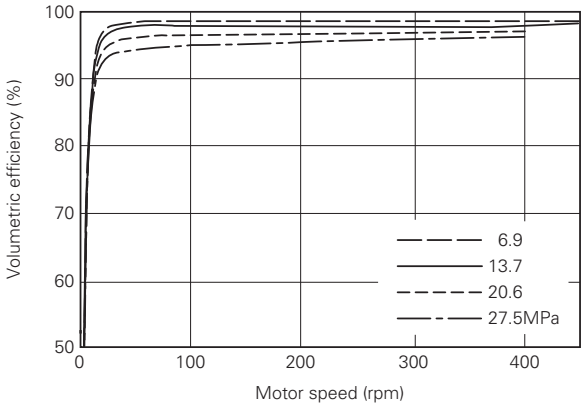


Fig. 2: Volumetric efficiency

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

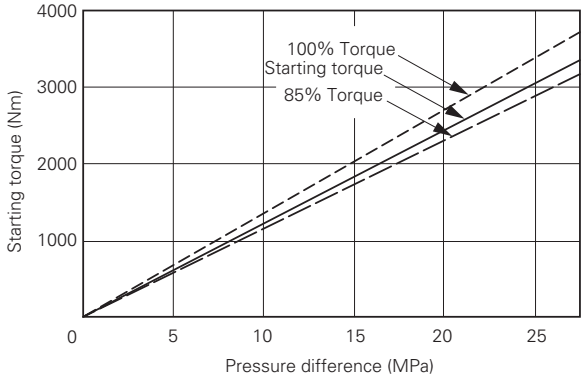


Fig. 3: Starting torque

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

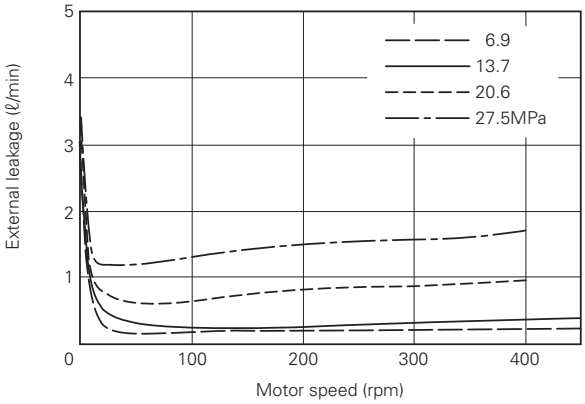


Fig. 4: External leakage

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

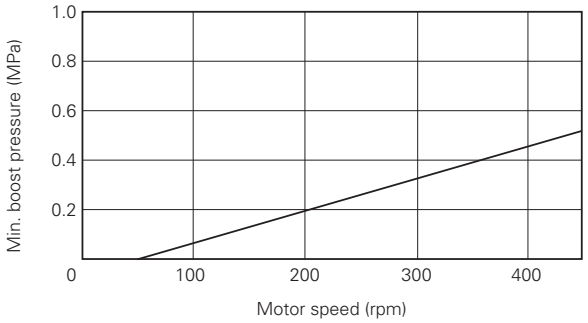


Fig. 5: Minimum boost pressure

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.

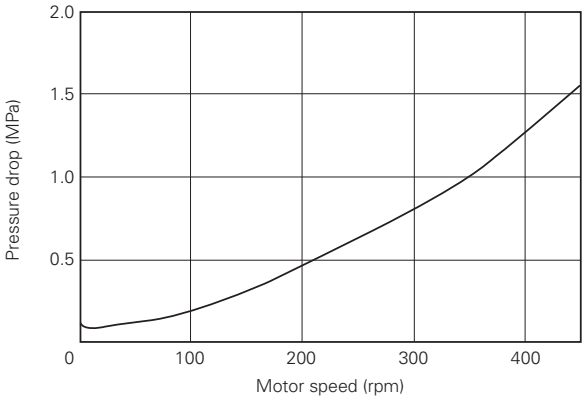


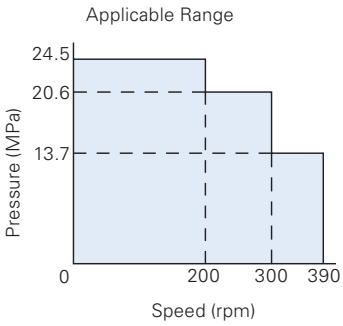
Fig. 6: Pressure drop

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

DOWMAX® ME motor

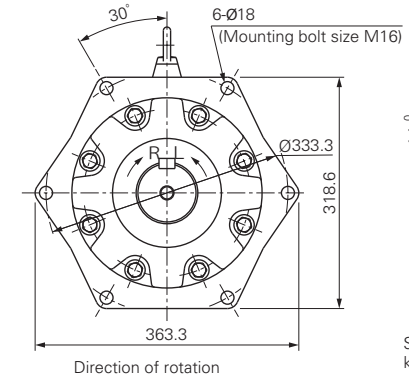
ME1300A

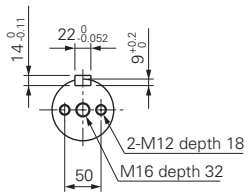
(Dimensions in mm)



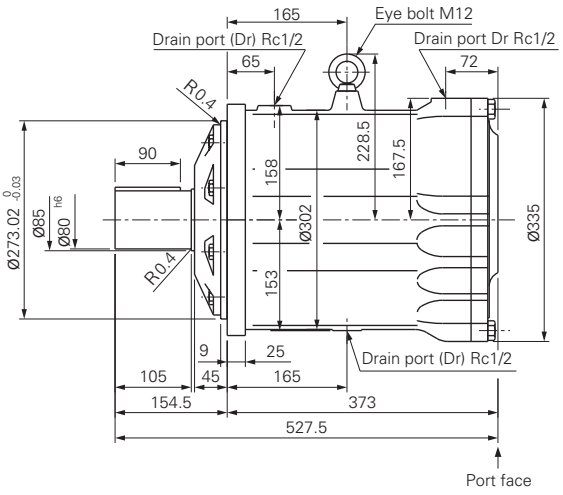
Displacement	1345cm³/rev
Rated pressure	24.5MPa (250kgf/cm²)
Peak pressure	31.9MPa (325kgf/cm²)
Rated torque	5250Nm (535kgfm)
Rated speed	200rpm
Max. speed	390rpm
Rated horse power	138kW (188PS)
Mass	170kg

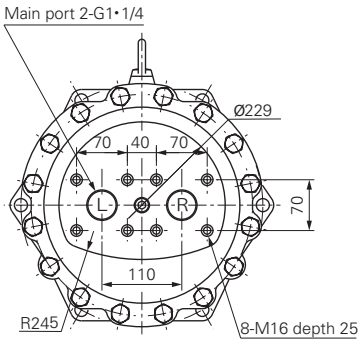
Nominal dimensions





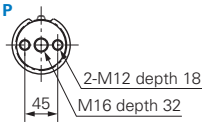
JIS B1301-1976
Shaft with screw for key retention
Shaft code : C





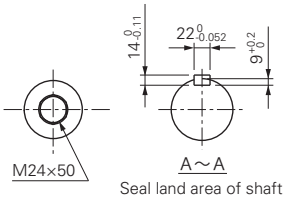
Splined shaft

Shaft code : P



Tapered shaft (1/10 taper)

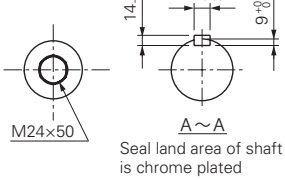
Shaft code : B (Single oil seal)



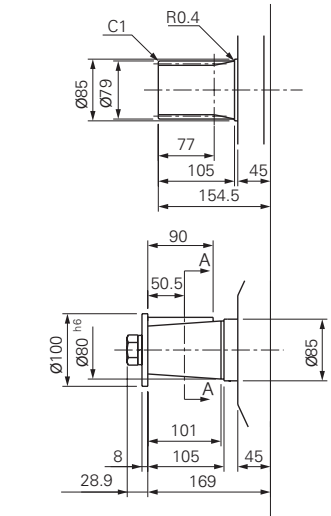
Seal land area of shaft is chrome plated

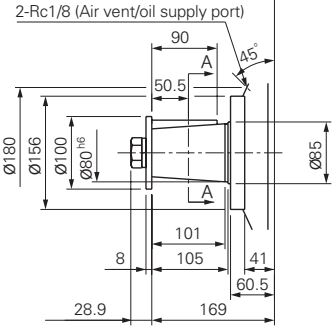
Tapered shaft (1/10 taper)

Shaft code : BW (Double oil seal oil seal)



Seal land area of shaft is chrome plated





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.=Ø9
		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.=Ø10 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.

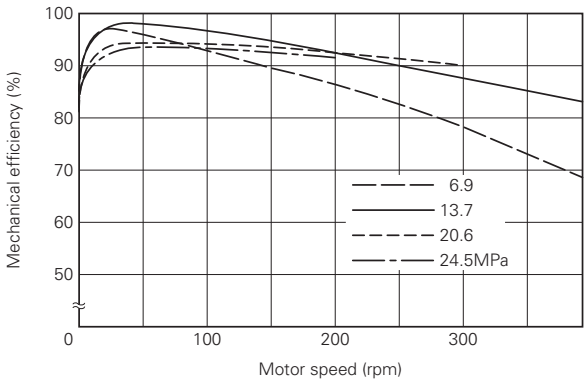


Fig. 1: Mechanical efficiency

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

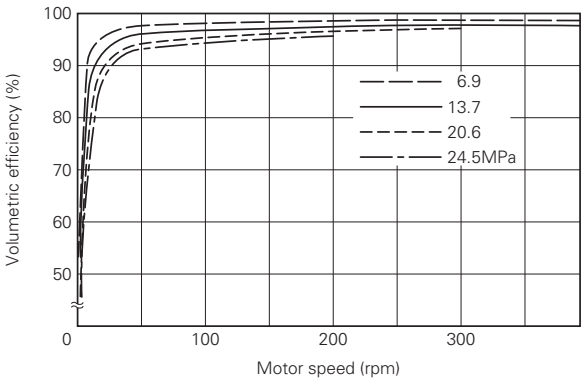


Fig. 2: Volumetric efficiency

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

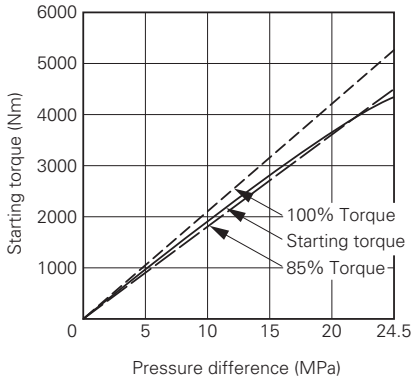


Fig. 3: Starting torque

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

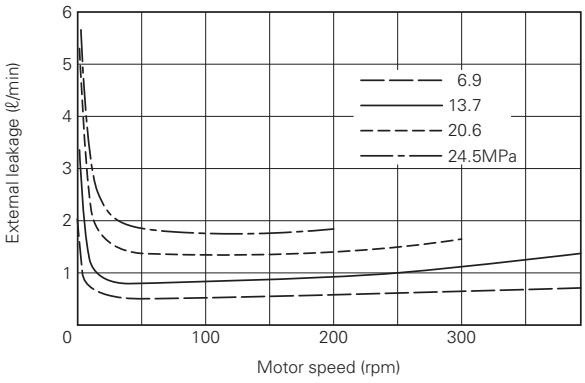


Fig. 4: External leakage

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

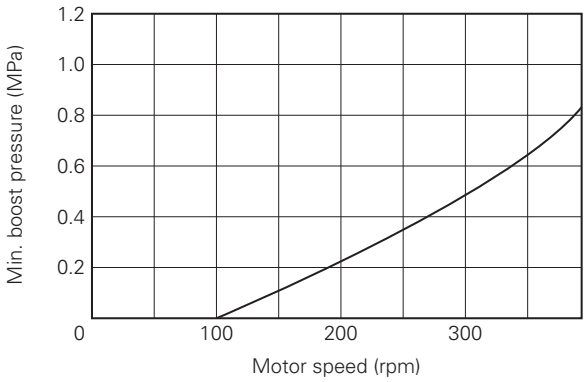


Fig. 5: Minimum boost pressure

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.

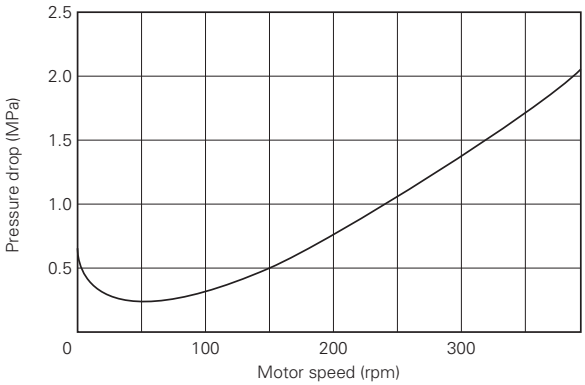


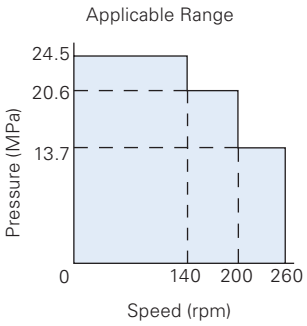
Fig. 6: Pressure drop

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

DOWMAX® ME motor

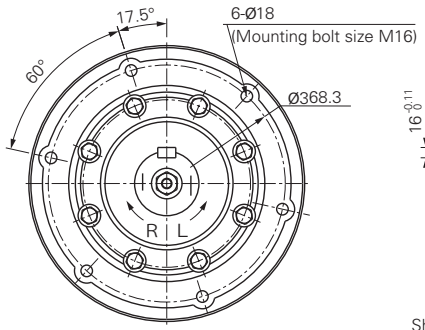
ME1900

(Dimensions in mm)

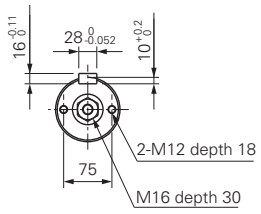


Displacement	1868cm³/rev
Rated pressure	24.5MPa (250kgf/cm²)
Peak pressure	31.9MPa (325kgf/cm²)
Rated torque	7290Nm (743kgfm)
Rated speed	140rpm
Max. speed	260rpm
Rated horse power	128kW (174PS)
Mass	270kg

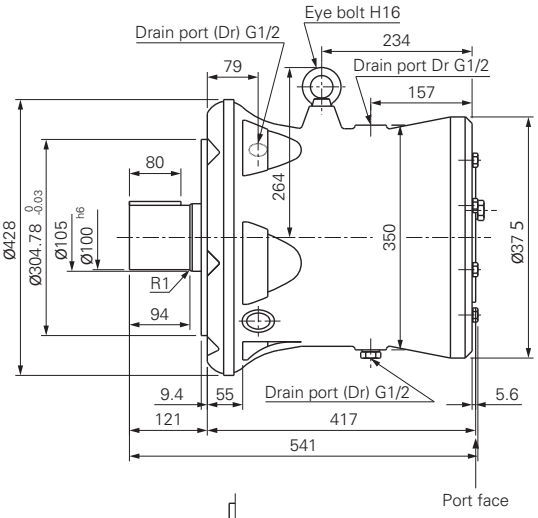
Nominal dimensions

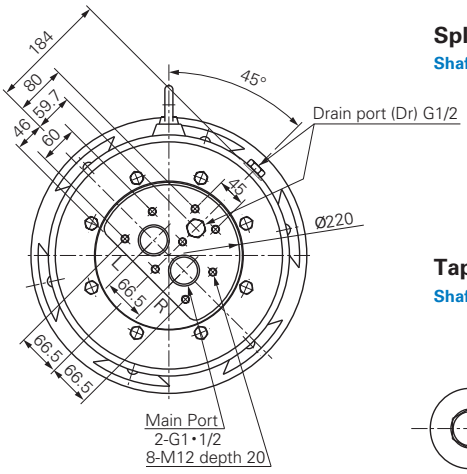


Direction of rotation
R : Supplied high pressure oil at port R
L : Supplied high pressure oil at port L



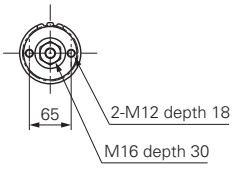
JIS B1301-1976
Shaft with screw for key retention
Shaft code : C

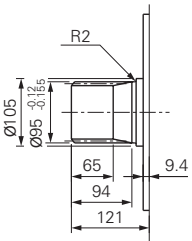




Splined shaft

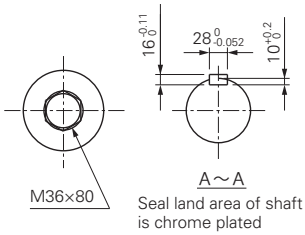
Shaft code : P

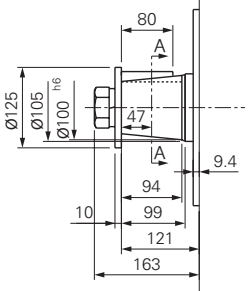


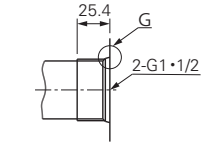


Tapered shaft (1/10 taper)

Shaft code : B (Single oil seal)



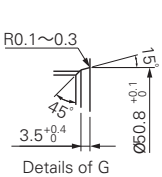




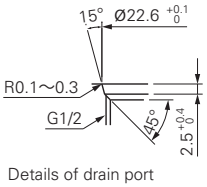
Details of main port

Tapered shaft (1/10 taper)

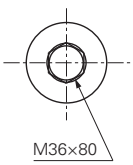
Shaft code : BW (Double oil seal)

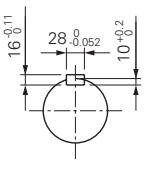


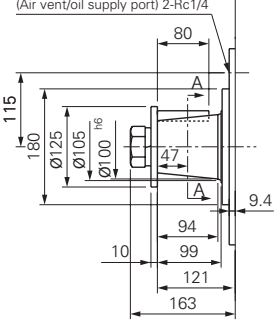
Details of G



Details of drain port







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.=Ø9
		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.=Ø10 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.

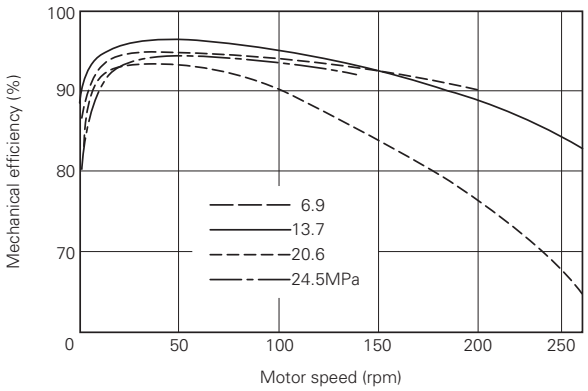


Fig. 1: Mechanical efficiency

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

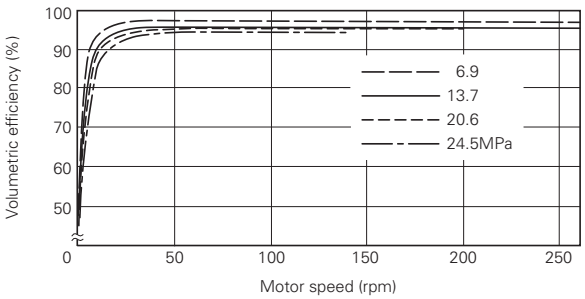


Fig. 2: Volumetric efficiency

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

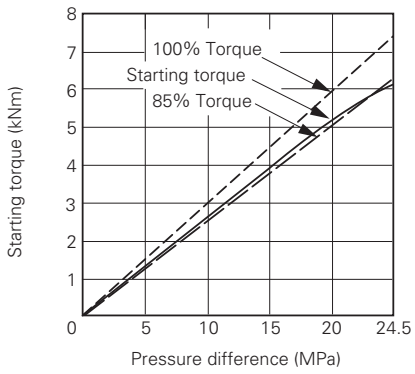


Fig. 3: Starting torque

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

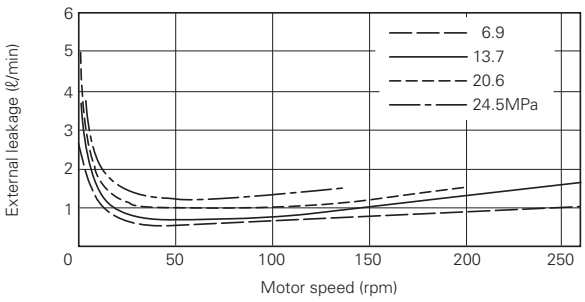


Fig. 4: External leakage

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

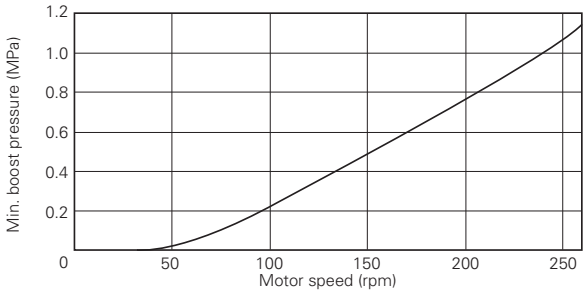


Fig. 5: Minimum boost pressure

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.

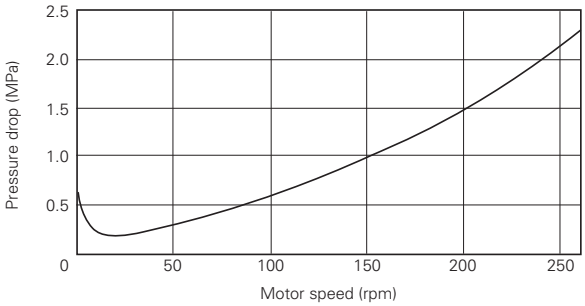


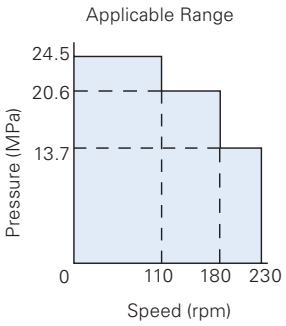
Fig. 6: Pressure drop

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

DOWMAX® ME motor

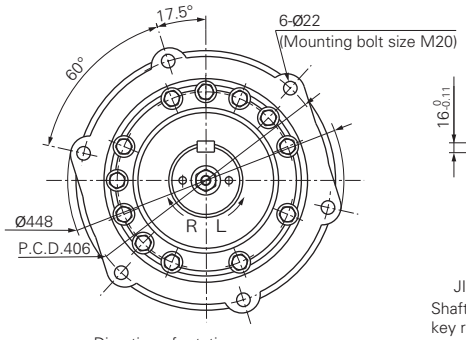
ME2600

(Dimensions in mm)

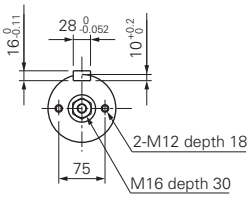


Displacement	2578cm³/rev
Rated pressure	24.5MPa (250kgf/cm²)
Peak pressure	31.9MPa (325kgf/cm²)
Rated torque	10060Nm (1026kgfm)
Rated speed	110rpm
Max. speed	230rpm
Rated horse power	159kW (216PS)
Mass	350kg

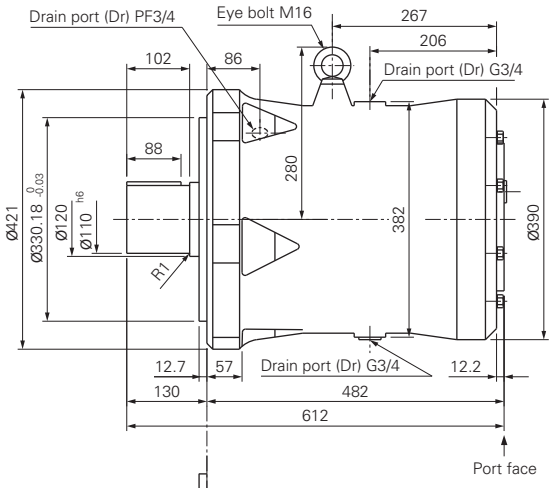
Nominal dimensions

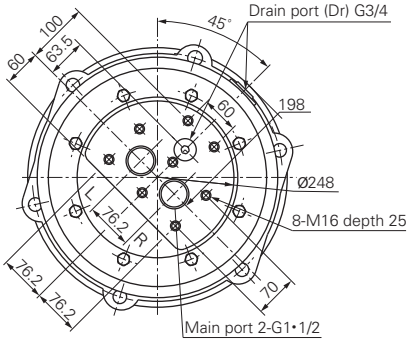


Direction of rotation
R : Supplied high pressure oil at port R
L : Supplied high pressure oil at port L



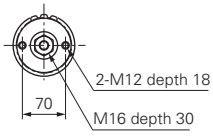
JIS B1301-1976
Shaft with screw for key retention
Shaft code : C

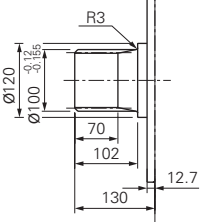




Splined shaft

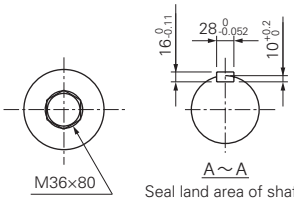
Shaft code : P



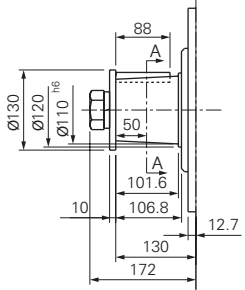


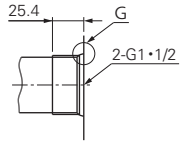
Tapered shaft (1/10 taper)

Shaft code : B (Single oil seal)



Seal land area of shaft is chrome plated

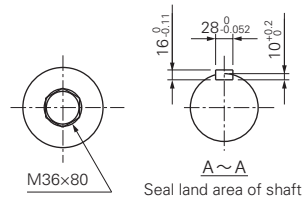




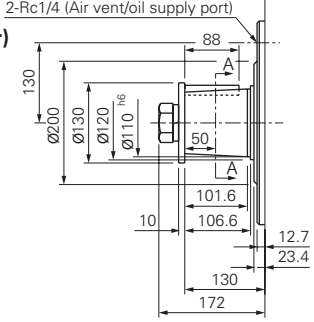
Details of main port

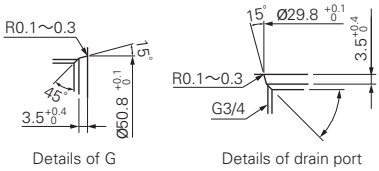
Tapered shaft (1/10 taper)

Shaft code : BW (Double oil seal)



Seal land area of shaft is chrome plated





Details of G　　Details of drain port

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.=Ø9
		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.=Ø10 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.

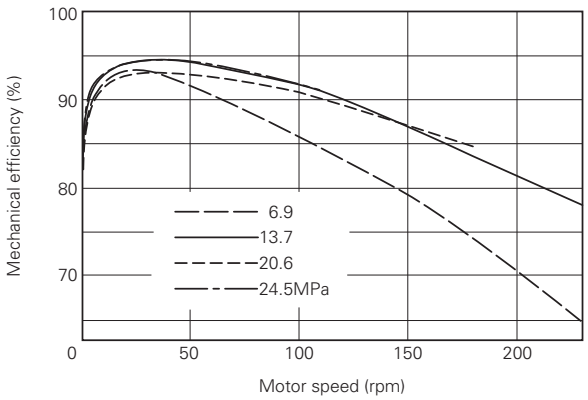


Fig. 1: Mechanical efficiency

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

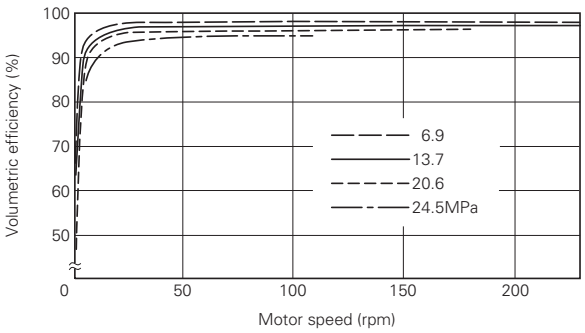


Fig. 2: Volumetric efficiency

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

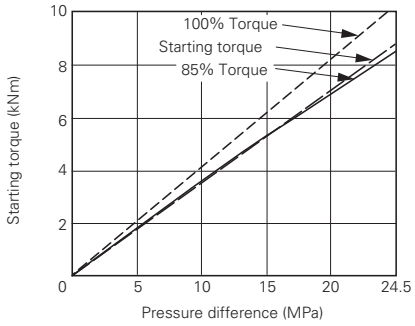


Fig. 3: Starting torque

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

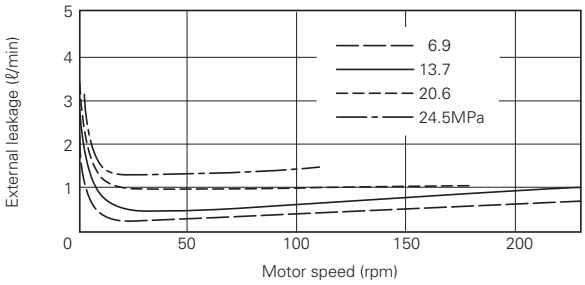


Fig. 4: External leakage

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

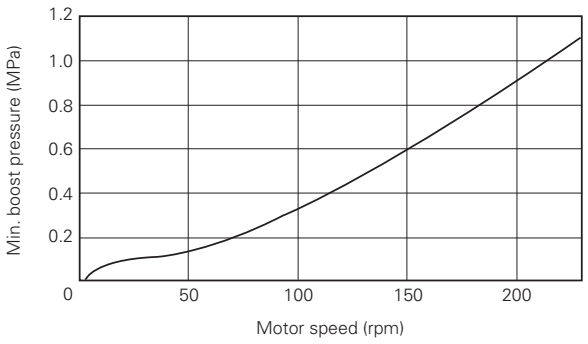


Fig. 5: Minimum boost pressure

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.

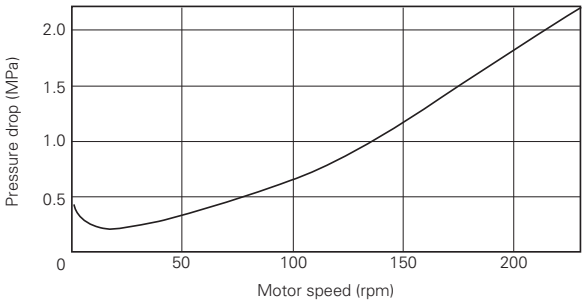


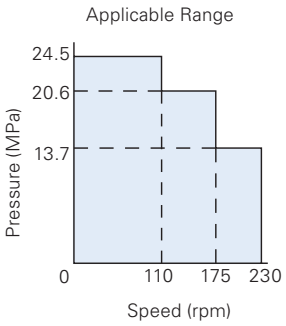
Fig. 6: Pressure drop

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

DOWMAX® ME motor

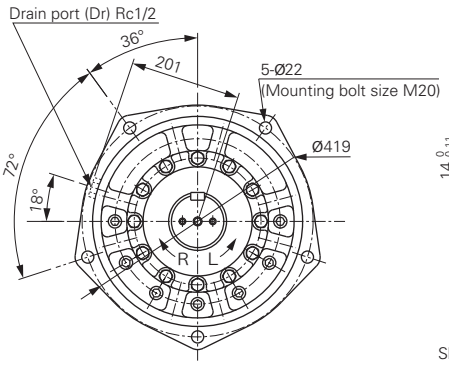
ME3100

(Dimensions in mm)

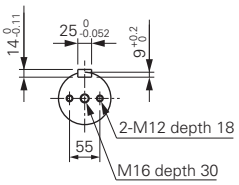


Displacement	3104cm³/rev
Rated pressure	24.5MPa (250kgf/cm²)
Peak pressure	31.9MPa (325kgf/cm²)
Rated torque	12110Nm (1235kgfm)
Rated speed	110rpm
Max. speed	230rpm
Rated horse power	186kW (253PS)
Mass	364kg

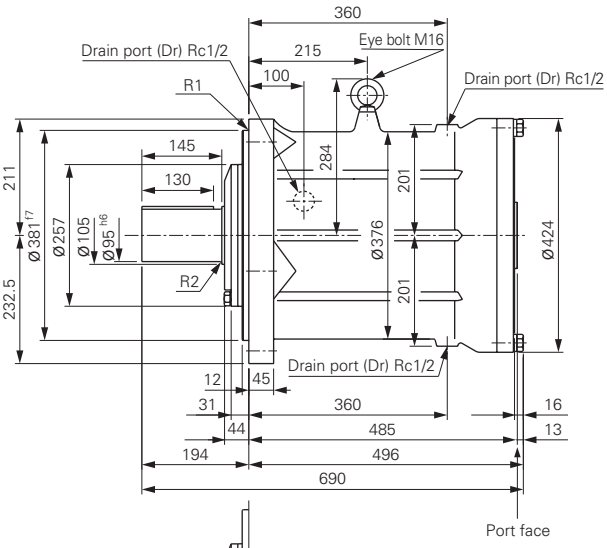
Nominal dimensions

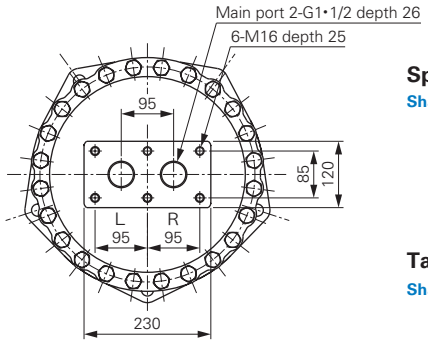


Direction of rotation
R : Supplied high pressure oil at port R
L : Supplied high pressure oil at port L



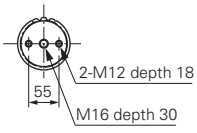
JIS B1301-1976
Shaft with screw for key retention
Shaft code : C

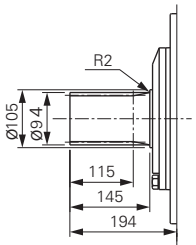




Splined shaft

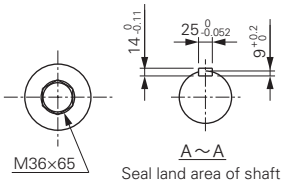
Shaft code : P



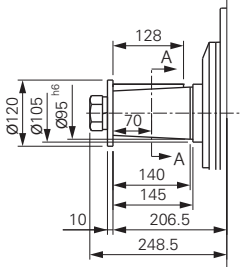


Tapered shaft (1/10 taper)

Shaft code : B (Single oil seal)

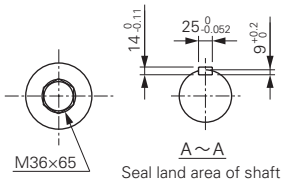


Seal land area of shaft is chrome plated

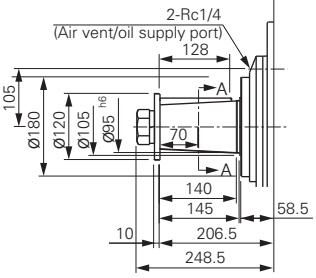


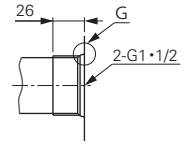
Tapered shaft (1/10 taper)

Shaft code : BW (Double oil seal)

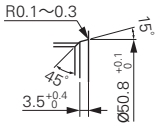


Seal land area of shaft is chrome plated





Details of main port



Details of G

JIS D2001 Involute spline 95 × 17 × 5 (Class b)

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.=Ø9
		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.=Ø10 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.

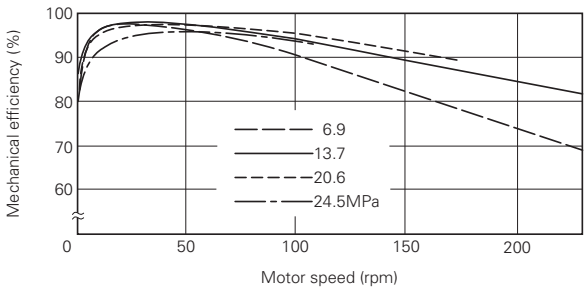


Fig. 1: Mechanical efficiency

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

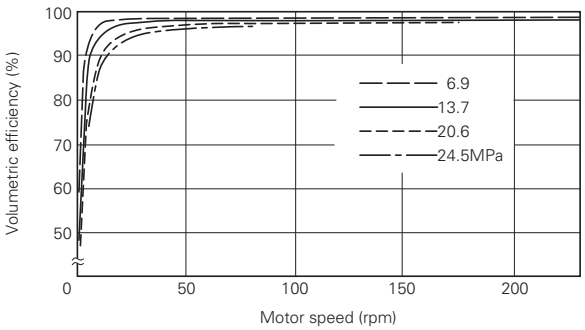


Fig. 2: Volumetric efficiency

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

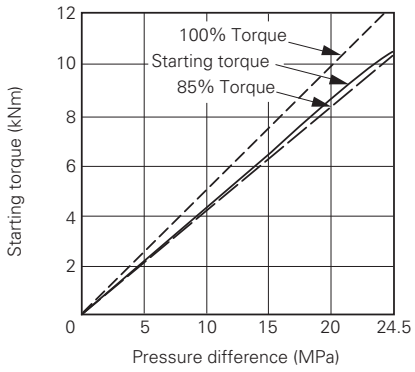


Fig. 3: Starting torque

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

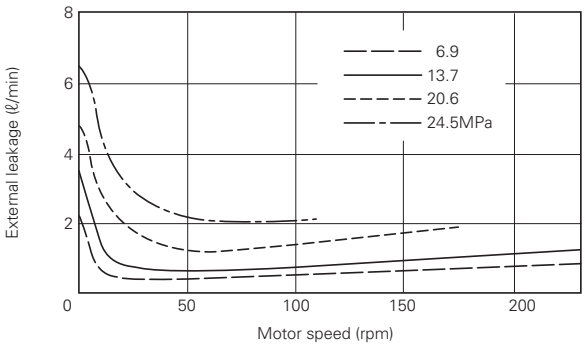


Fig. 4: External leakage

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

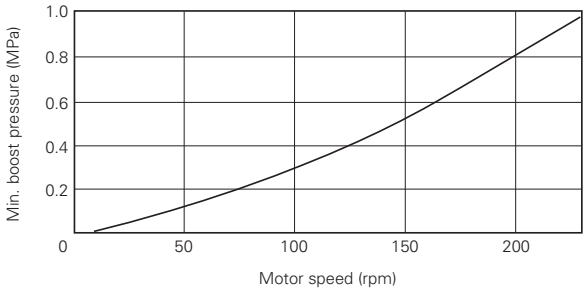


Fig. 5: Minimum boost pressure

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.

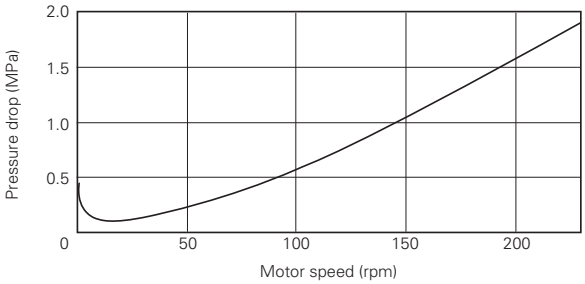


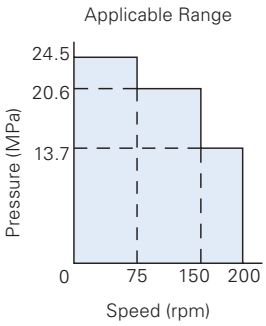
Fig. 6: Pressure drop

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

DOWMAX® ME motor

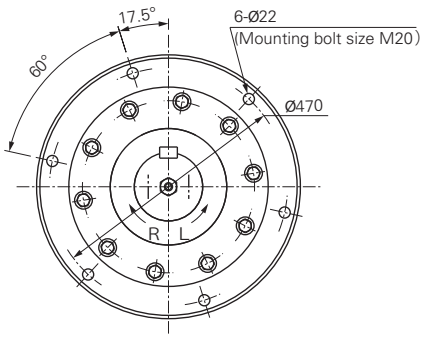
ME4100

(Dimensions in mm)

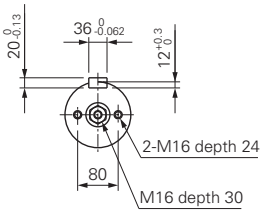


Displacement	4097cm³/rev
Rated pressure	24.5MPa (250kgf/cm²)
Peak pressure	31.9MPa (325kgf/cm²)
Rated torque	15990Nm (1630kgfm)
Rated speed	75rpm
Max. speed	200rpm
Rated horse power	211kW (287PS)
Mass	520kg

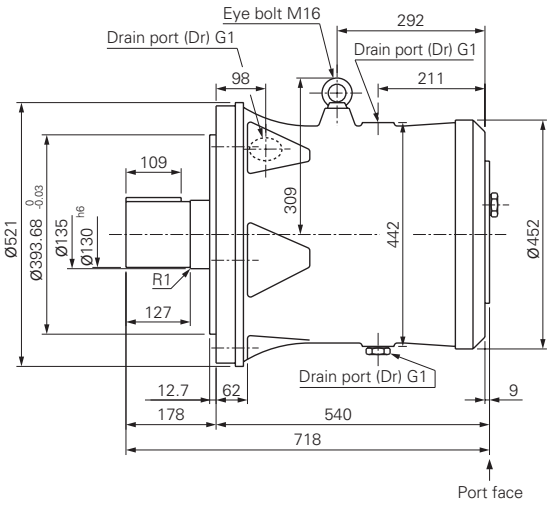
Nominal dimensions



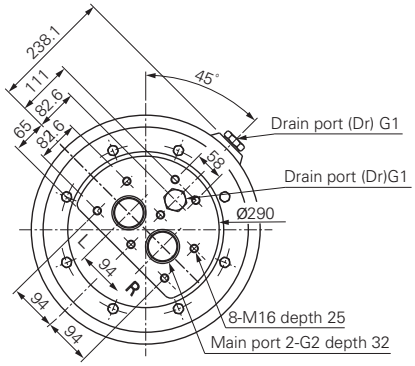
Direction of rotation
R : Supplied high pressure oil at port R
L : Supplied high pressure oil at port L



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

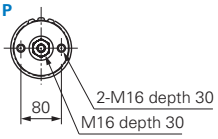


Port face



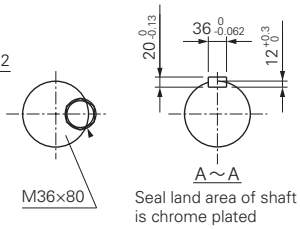
Splined shaft

Shaft code : P



Tapered shaft (1/10 taper)

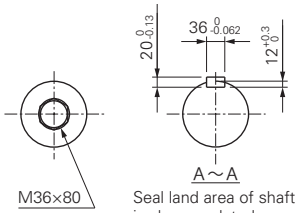
Shaft code : B (Single oil seal)



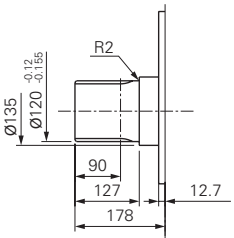
Seal land area of shaft is chrome plated

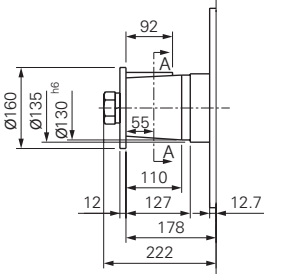
Tapered shaft (1/10 taper)

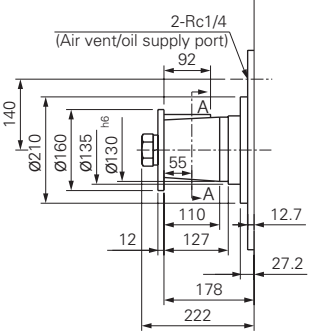
Shaft code : BW (Double oil seal)

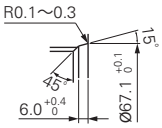


Seal land area of shaft is chrome plated

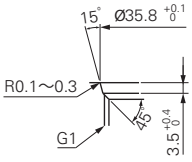




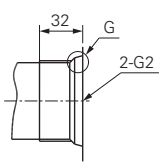




Details of G



Details of drain port



Details of main port

JIS D2001 Involute spline 120 × 22 × 5 (Class a)

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.=Ø9
		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.=Ø10 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.

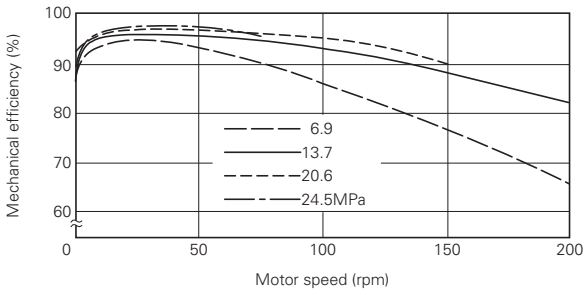


Fig. 1: Mechanical efficiency

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

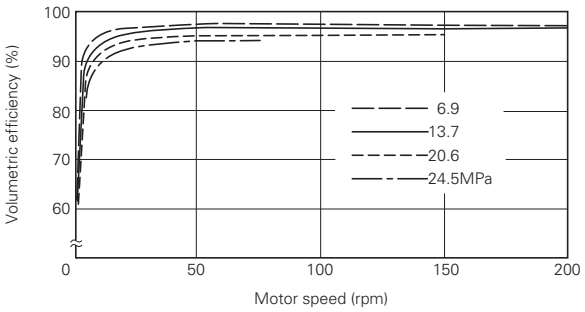


Fig. 2: Volumetric efficiency

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

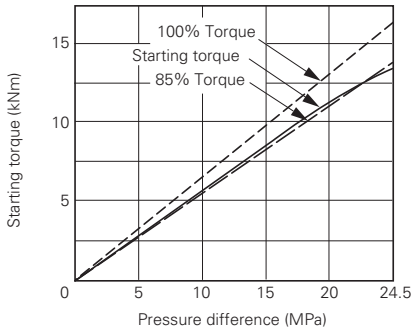


Fig. 3: Starting torque

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

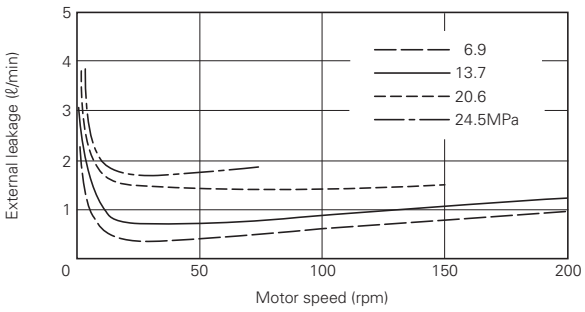


Fig. 4: External leakage

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

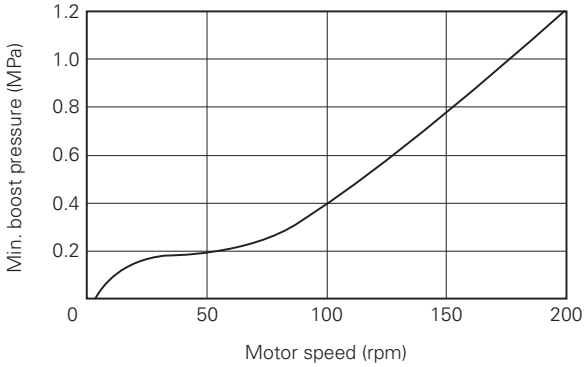


Fig. 5: Minimum boost pressure

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.

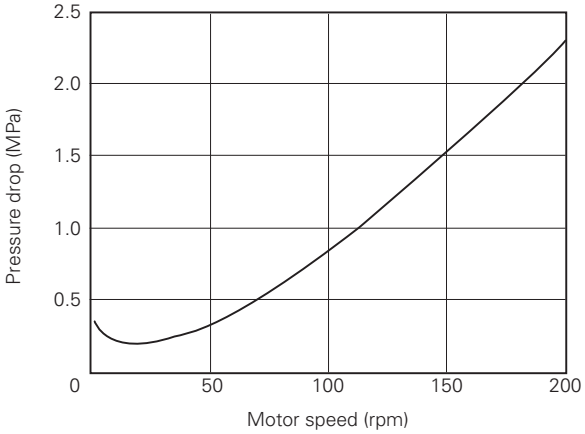
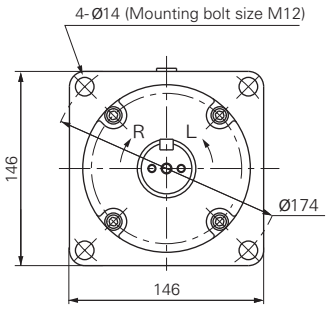


Fig. 6: Pressure drop

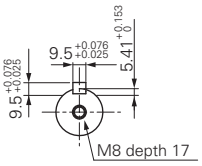
Pressure necessary to run motor without load is shown for various speeds.

Nominal dimensions of inch size shaft and SAE ports

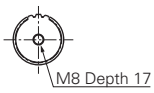
ME100-KE (HE)



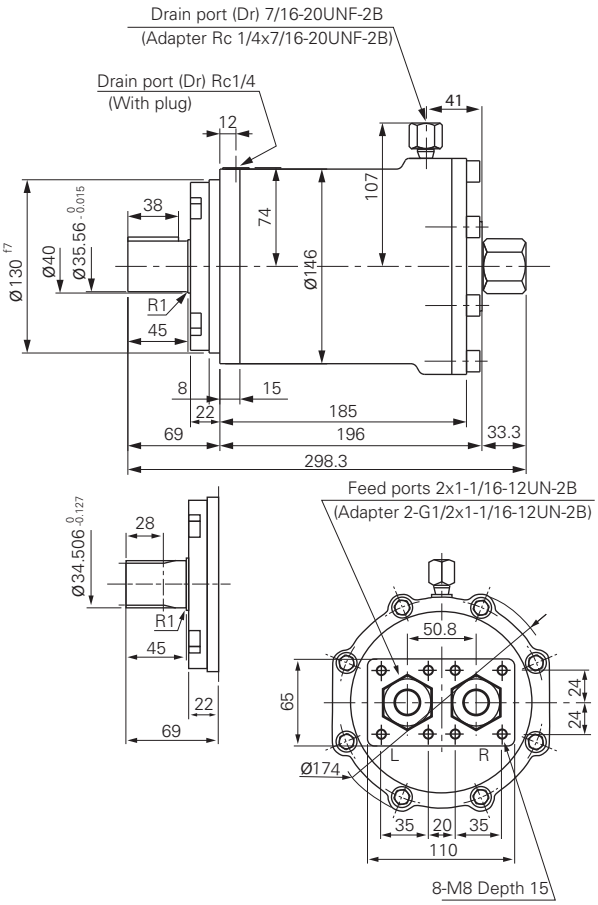
Rotation (Viewed from shaft end)
CW : Port R pressurized
CCW : Port L pressurized



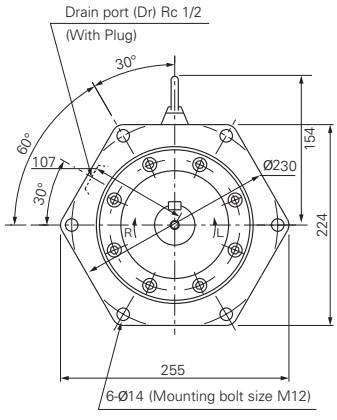
Shaft K
Inch size
Parrallel keyed shaft



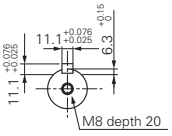
Shaft H
Inch size spline shaft



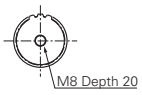
ME150-KE (HE)



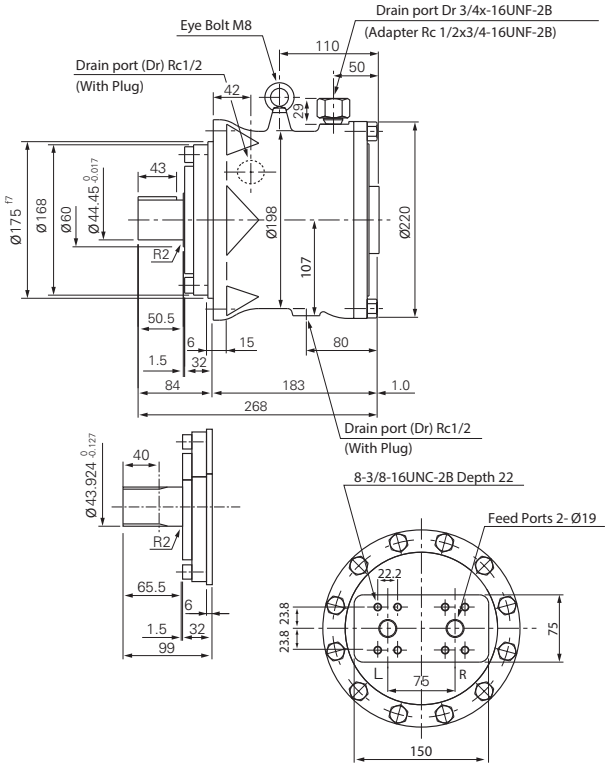
Rotation (Viewed from shaft end)
CW : Port R pressurized
CCW : Port L pressurized



Shaft K
Inch size
Parrallel keyed shaft

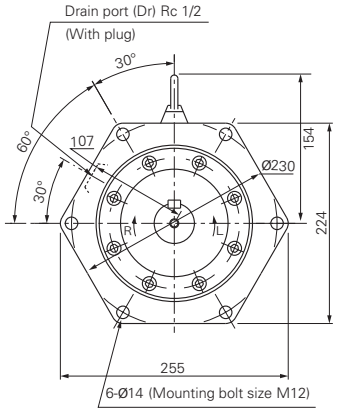


Shaft H
Inch size spline shaft

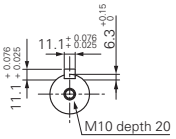


DOWMAX® ME motor

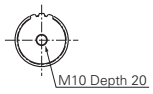
ME175-KE (HE)



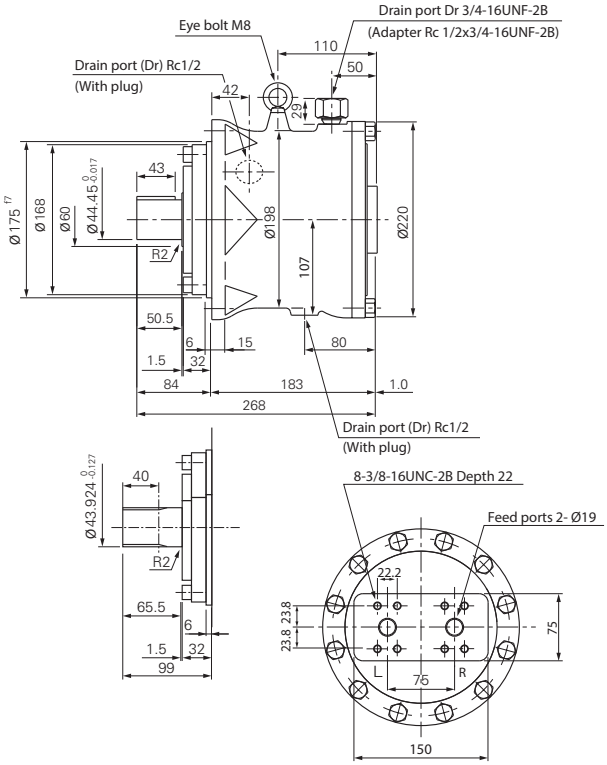
Rotation (Viewed from shaft end)
CW : Port R pressurized
CCW : Port L pressurized



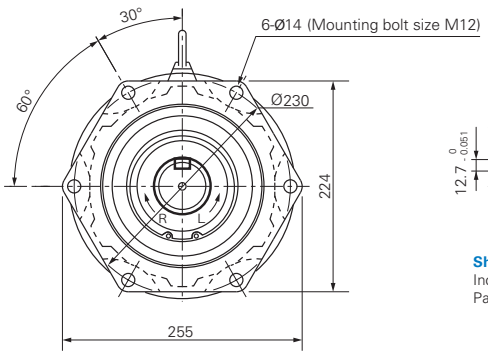
Shaft K
Inch size
Parrallel keyed shaft



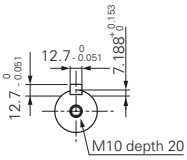
Shaft H
Inch size spline shaft



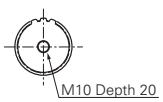
ME300KE (HE)



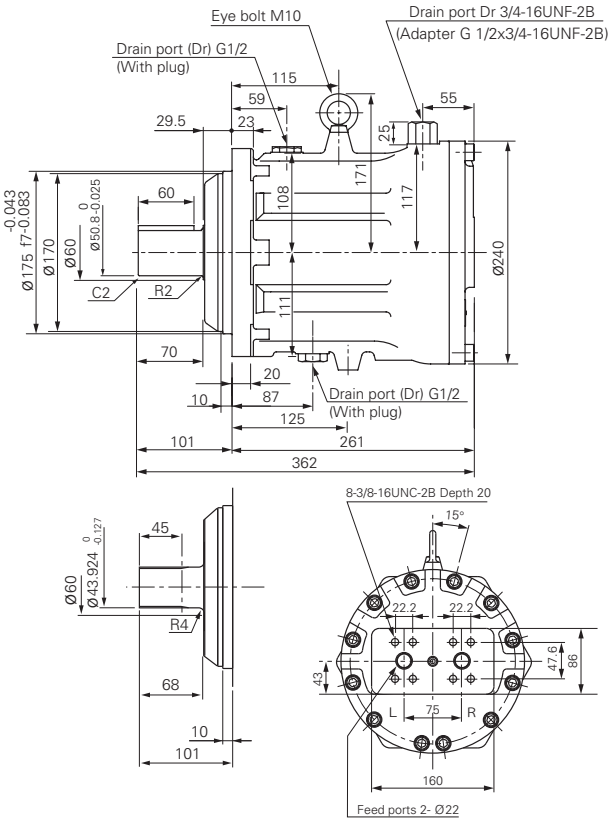
Rotation (Viewed from shaft end)
CW : Port R pressurized
CCW : Port L pressurized



Shaft K
Inch size
Parrallel keyed shaft

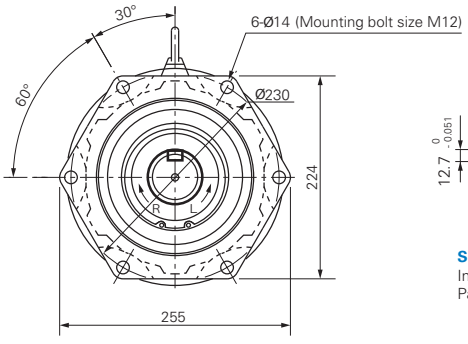


Shaft H
Inch size spline shaft

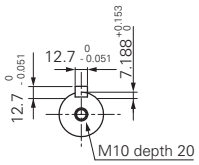


Nominal dimensions of inch size shaft and SAE ports

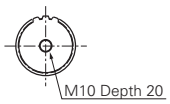
ME350BKE (HE)



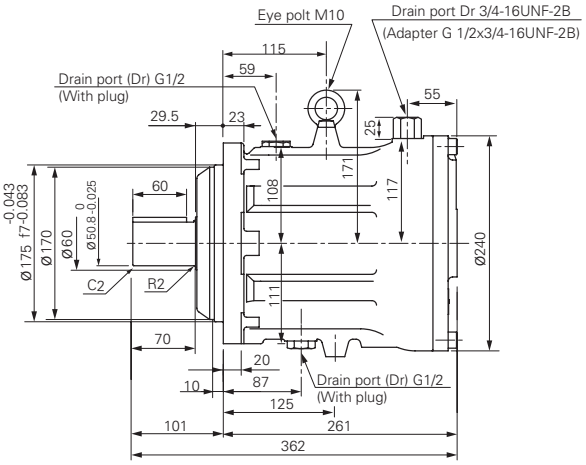
Rotation (Viewed from shaft end)
CW : Port R pressurized
CCW : Port L pressurized

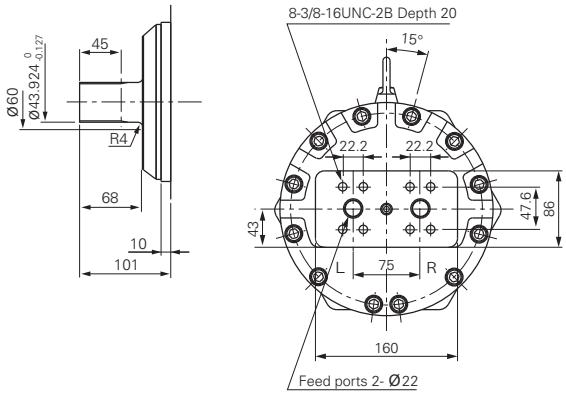


Shaft K
Inch size
Parrallel keyed shaft

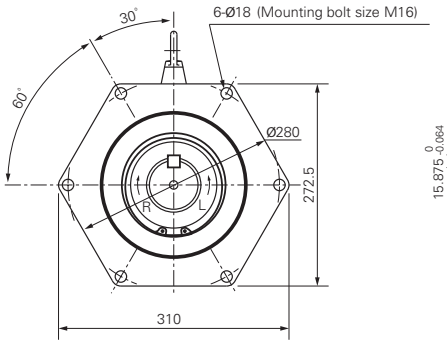


Shaft H
Inch size spline shaft

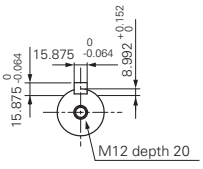




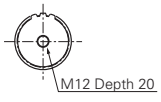
ME600BKE (HE)



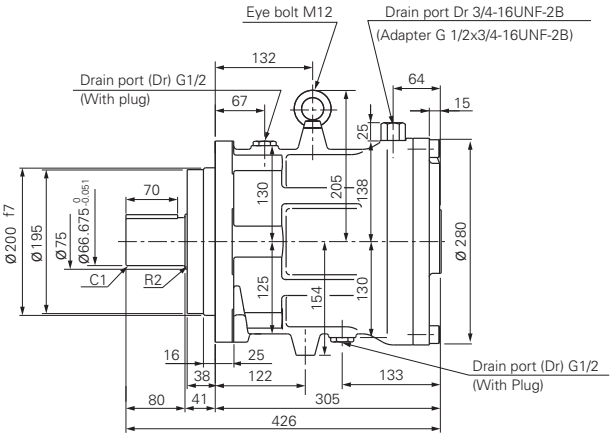
Rotation (Viewed from shaft end)
CW : Port R pressurized
CCW : Port L pressurized

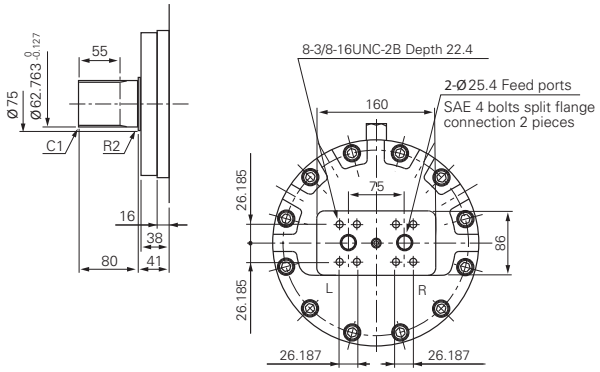


Shaft K
Inch size
Parrallel keyed shaft



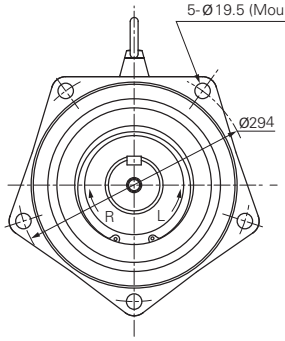
Shaft H
Inch size spline shaft

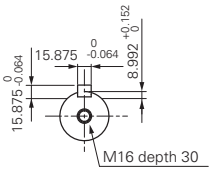




DOWMAX® ME motor

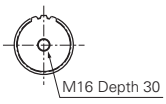
ME750BKE (HE)



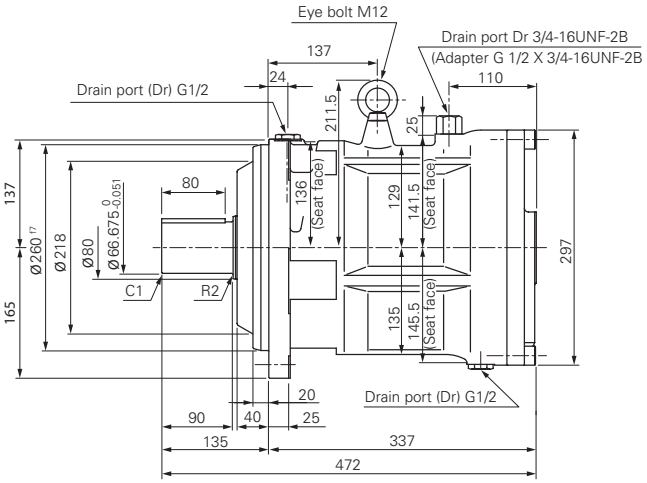


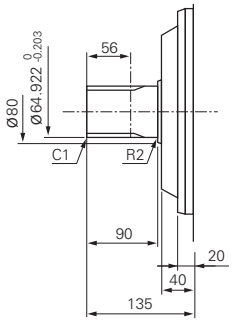
Shaft K
Inch size
Parrallel keyed shaft

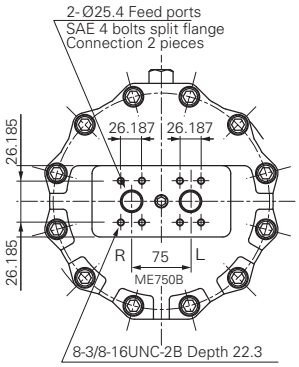
Rotation (Viewed from shaft end)
CW : Port R pressurized
CCW : Port L pressurized



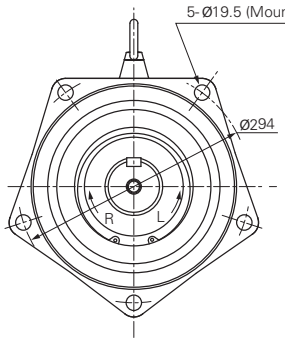
Shaft H
Inch size spline shaft

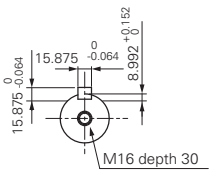






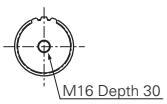
ME850BKE (HE)



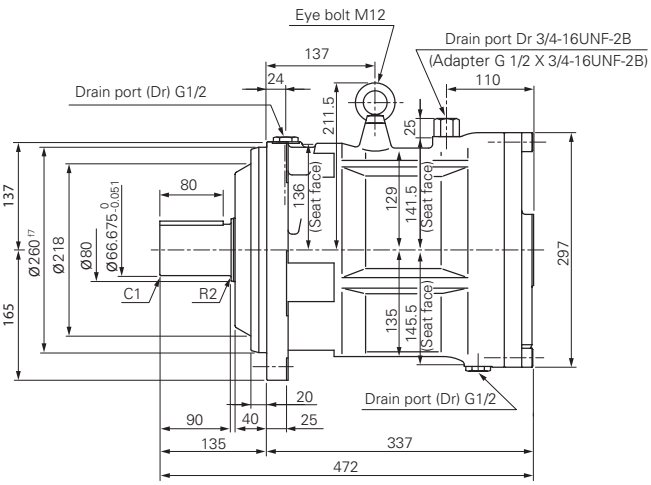


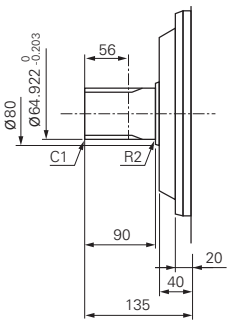
Shaft K
Inch size
Parrallel keyed shaft

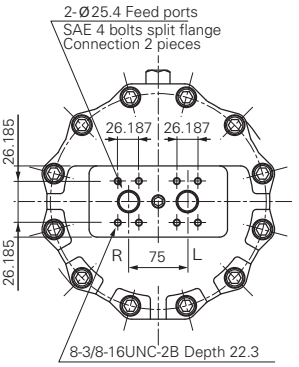
Rotation (Viewed from shaft end)
CW : Port R pressurized
CCW : Port L pressurized



Shaft H
Inch size spline shaft

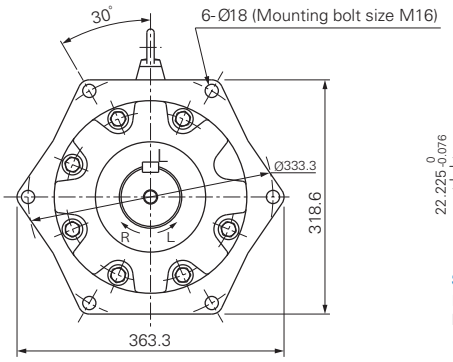




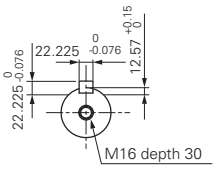


Nominal dimensions of inch size shaft and SAE ports

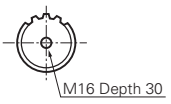
ME1300AKE (HE)



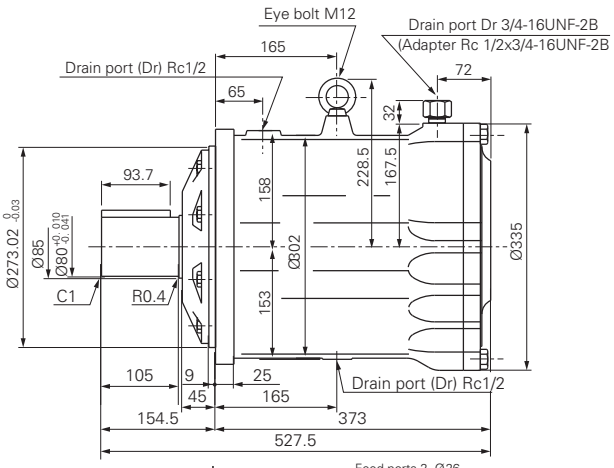
Rotation (Viewed from shaft end)
CW : Port R pressurized
CCW : Port L pressurized

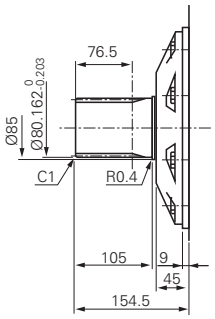


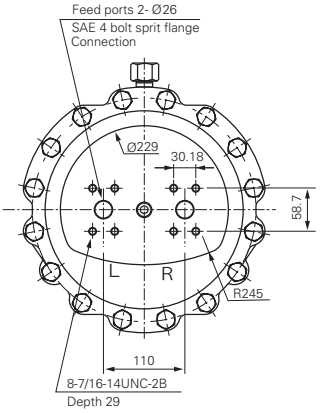
Shaft K
Inch size
Parrallel keyed shaft



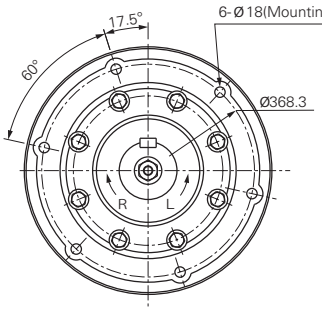
Shaft H
Inch size spline shaft



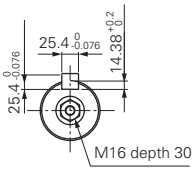




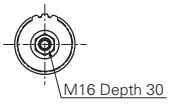
ME1900-KE (HE)



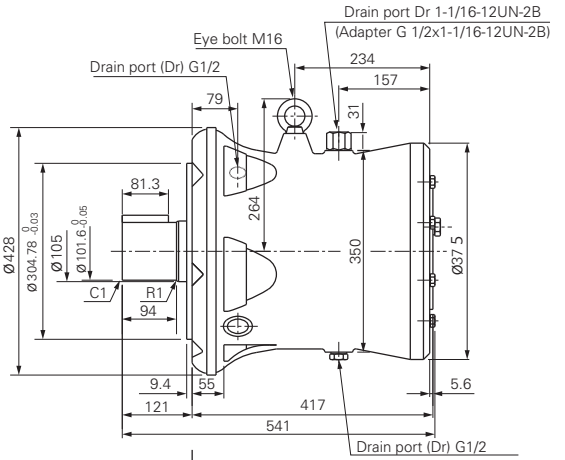
Rotation (Viewed from shaft end)
CW : Port R pressurized
CCW : Port L pressurized

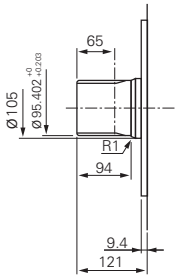


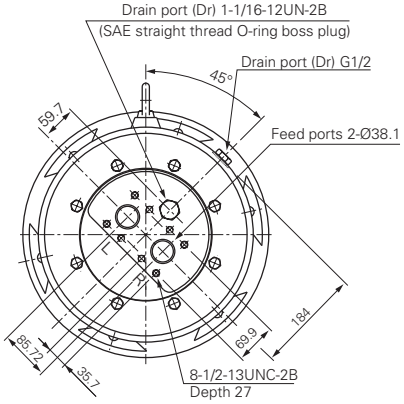
Shaft K
Inch size
Parrallel keyed shaft



Shaft H
Inch size spline shaft

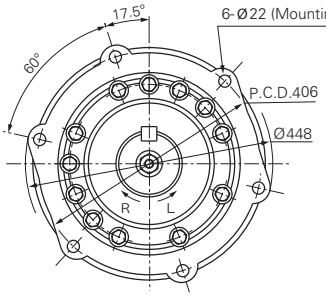




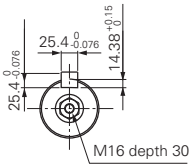


DOWMAX® ME motor

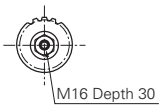
ME2600-KE (HE)



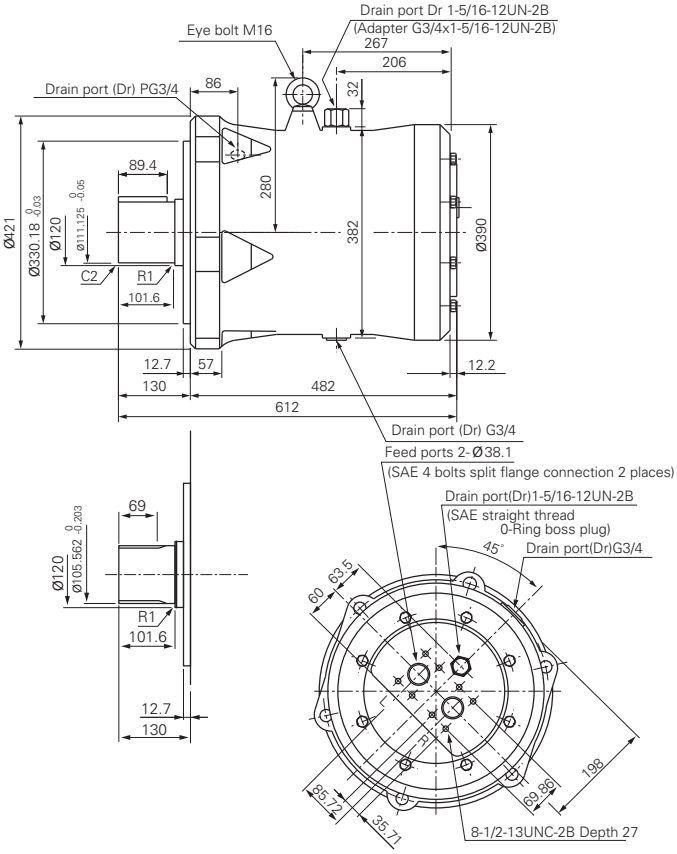
Rotation (Viewed from shaft end)
CW : Port R pressurized
CCW : Port L pressurized



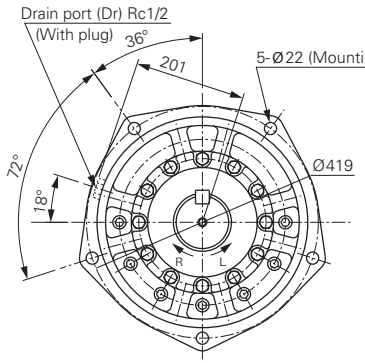
Shaft K
Inch size
Parrallel keyed shaft



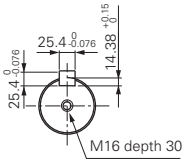
Shaft H
Inch size spline shaft



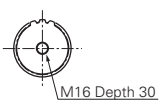
ME3100-KE (HE)



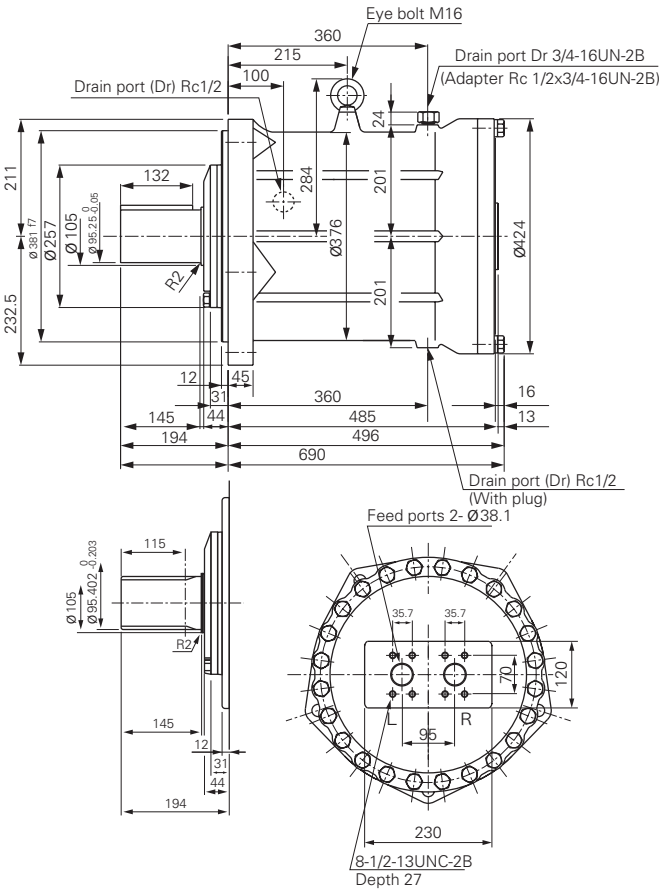
Rotation (Viewed from shaft end)
CW : Port R pressurized
CCW : Port L pressurized



Shaft K
Inch size
Parrallel keyed shaft

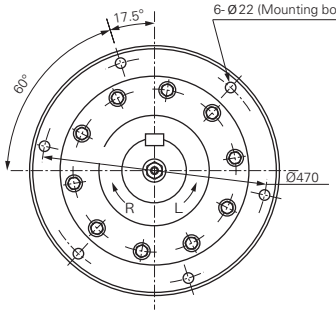


Shaft H
Inch size spline shaft

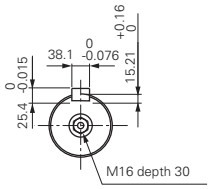


Nominal dimensions of inch size shaft and SAE ports

ME4100-KE (HE)

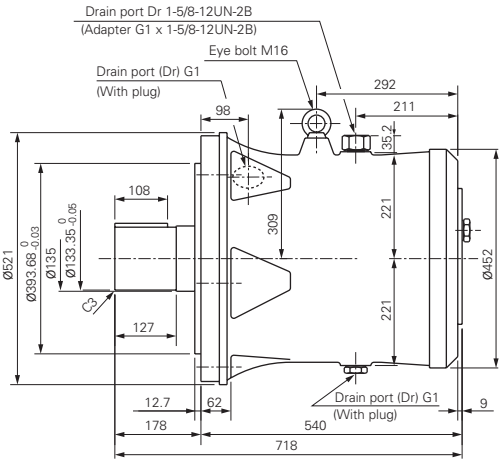


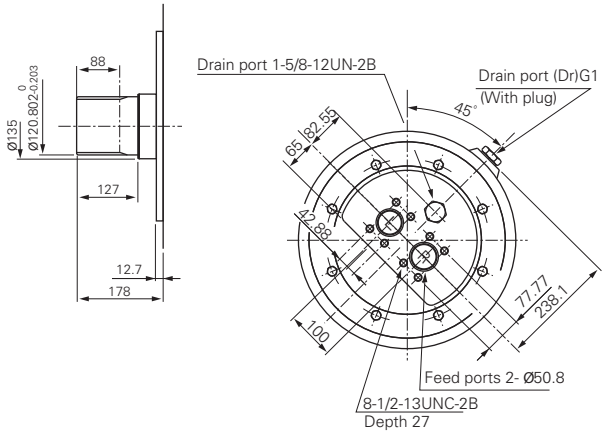
Rotation (Viewed from shaft end)
CW : Port R pressurized
CCW : Port L pressurized



Shaft K
Inch size
Parrallel keyed shaft

Shaft H
Inch size spline shaft





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	$8.037\ ^{+0.038}_{0}$

DOWMAX® ME motor

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

ME100

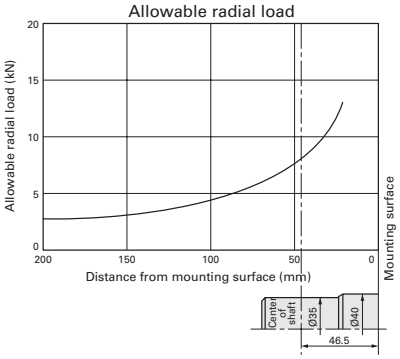


Fig. 1

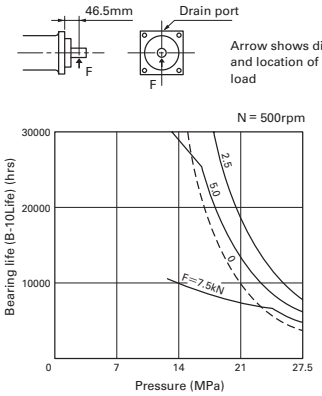


Fig. 2

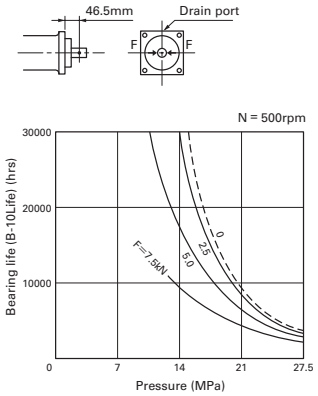


Fig. 3

ME150

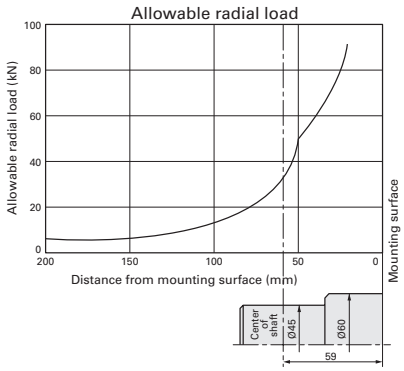


Fig. 1

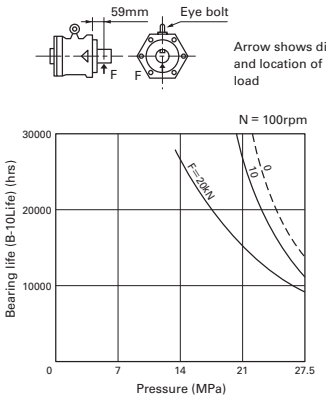


Fig. 2

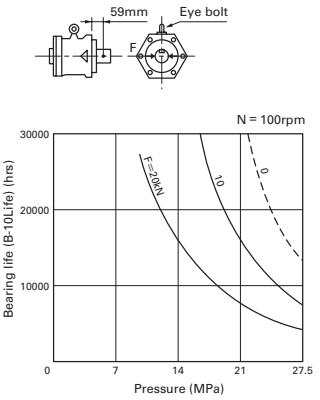


Fig. 3

ME175

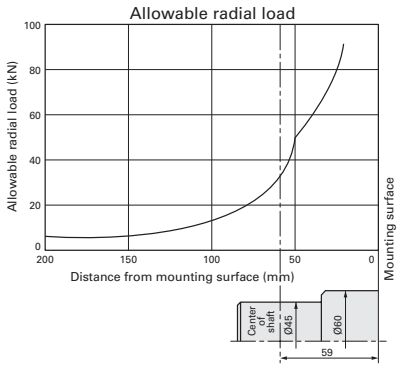


Fig. 1

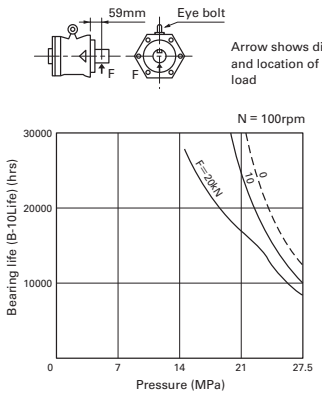


Fig. 2

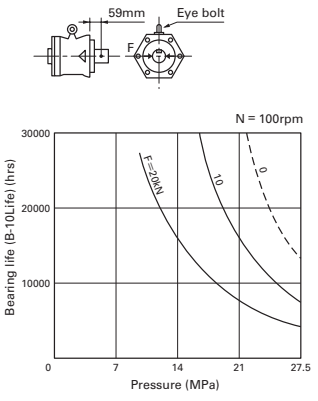


Fig. 3

DOWMAX® ME motor

ME300B

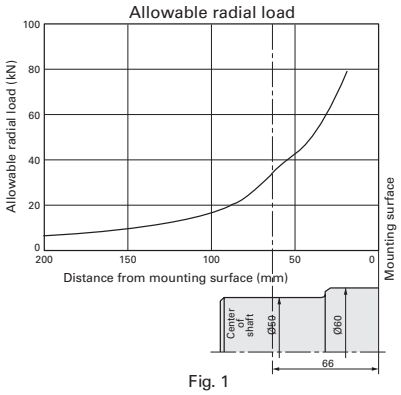


Fig. 1

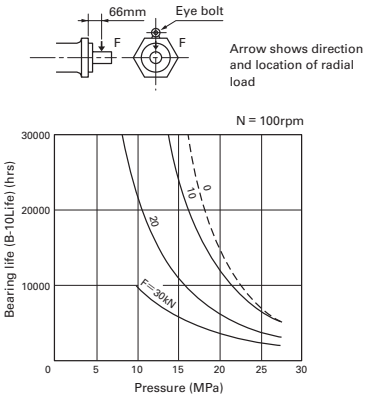


Fig. 2

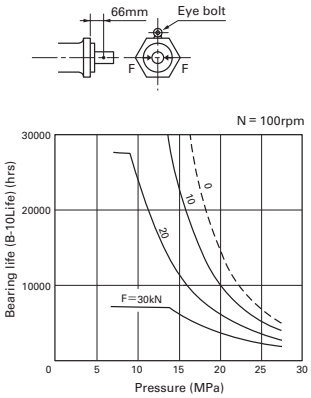


Fig. 3

ME350B

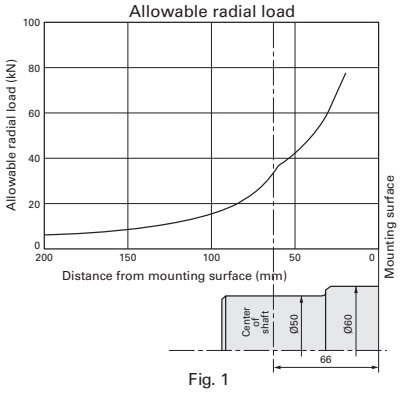


Fig. 1

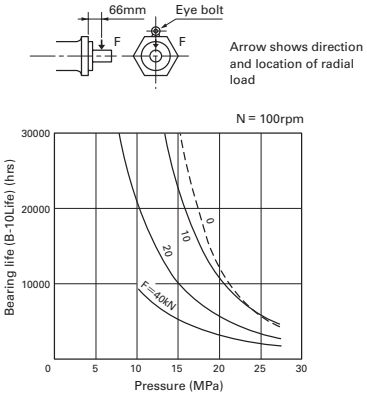


Fig. 2

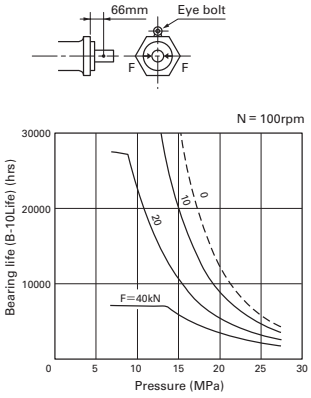


Fig. 3

ME600B

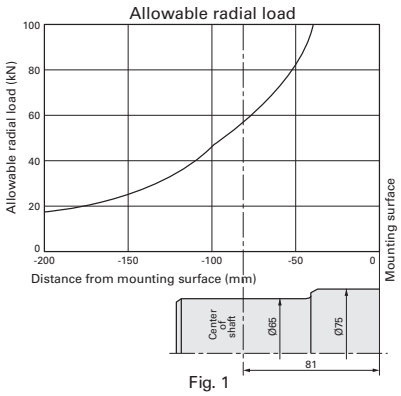


Fig. 1

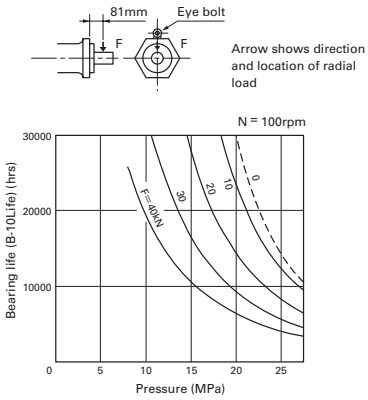


Fig. 2

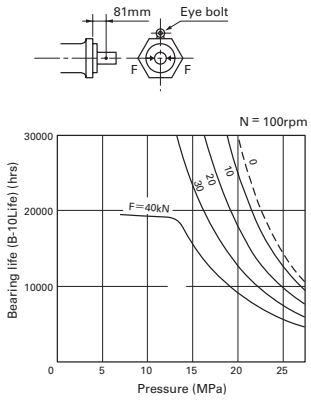


Fig. 3

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:

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

   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 as shown in table:

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

Bearing life and allowable radial load for shaft

ME750B

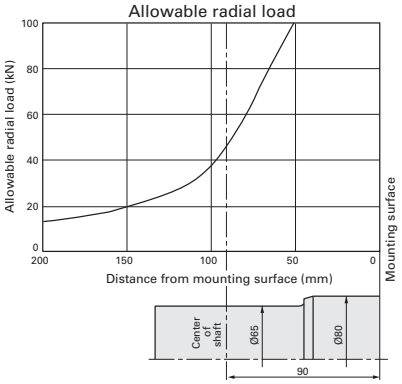


Fig. 1

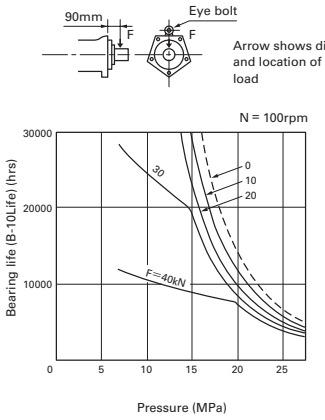


Fig. 2

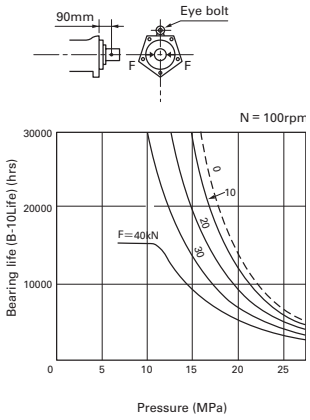


Fig. 3

ME850B

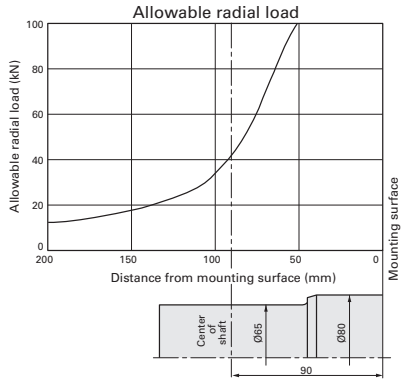


Fig. 1

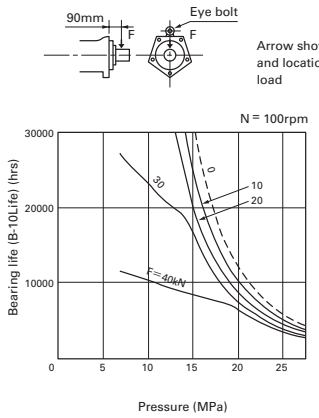


Fig. 2

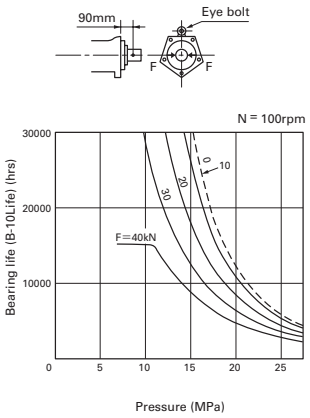


Fig. 3

ME1300A

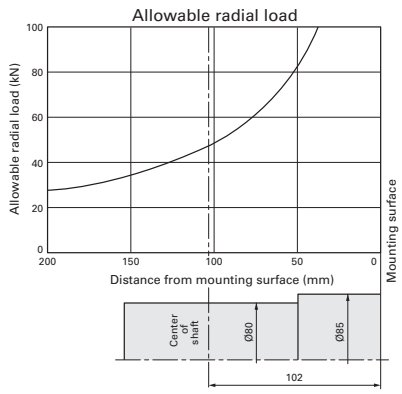


Fig. 1

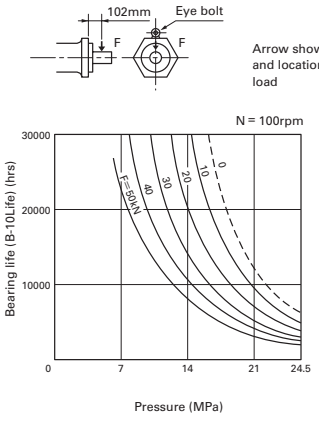


Fig. 2

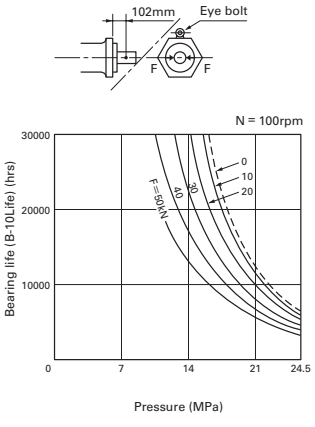


Fig. 3

DOWMAX® ME motor

ME1900

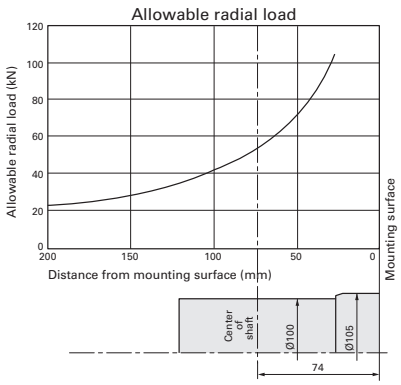


Fig. 1

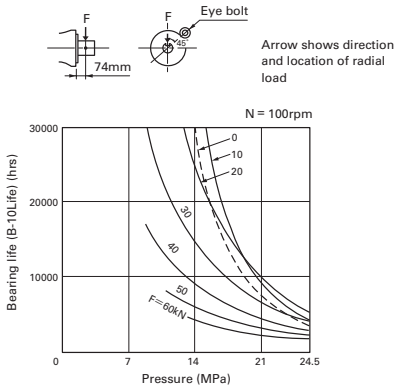


Fig. 2

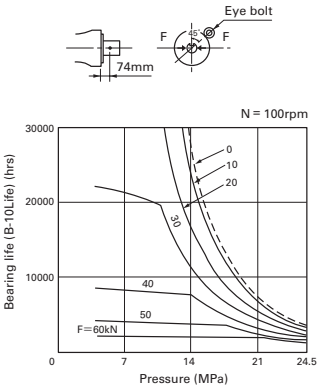


Fig. 3

ME2600

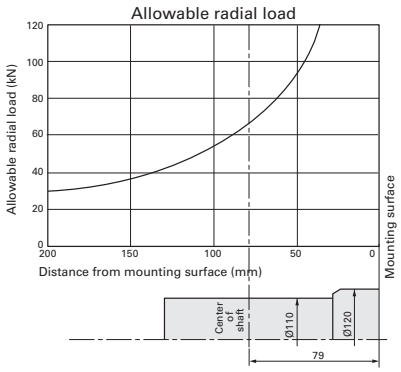


Fig. 1

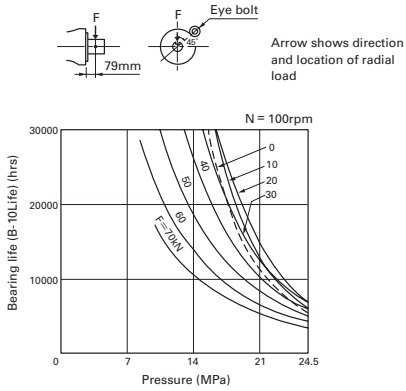


Fig. 2

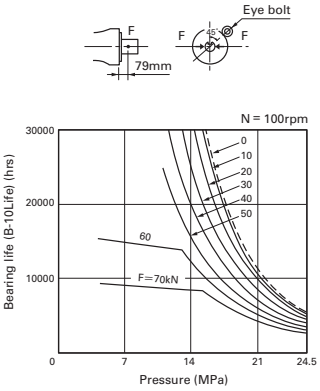


Fig. 3

ME3100

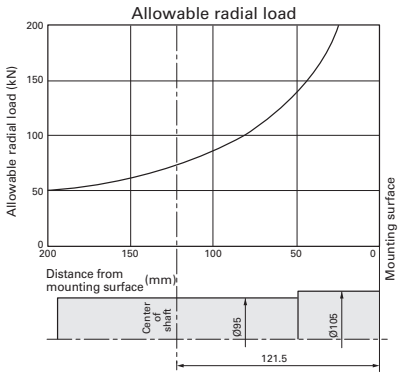


Fig. 1

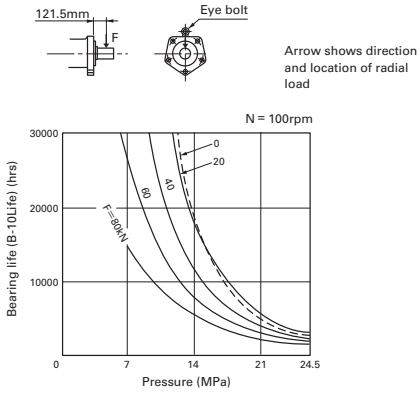


Fig. 2

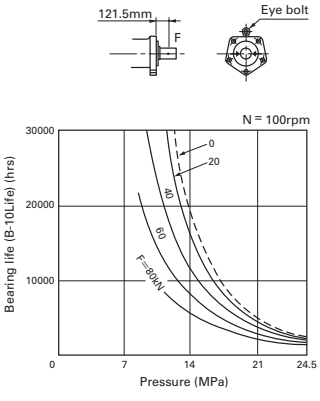


Fig. 3

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:

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

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 as shown in table:

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

Bearing life and allowable radial load for shaft

ME4100

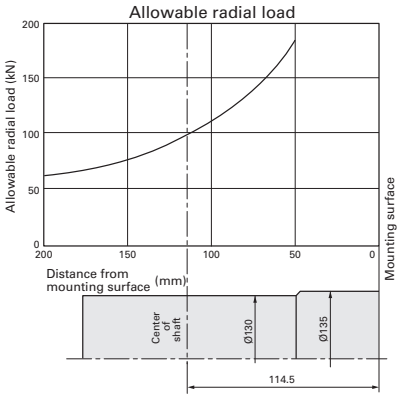


Fig. 1

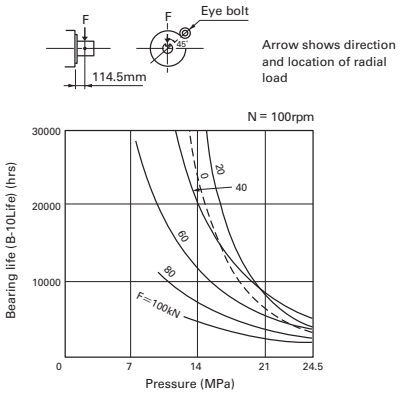


Fig. 2

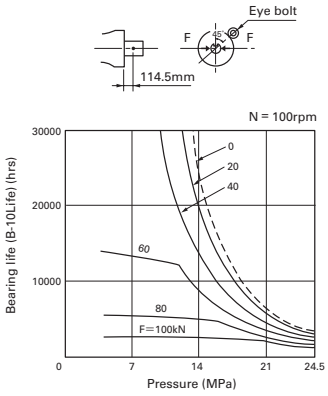
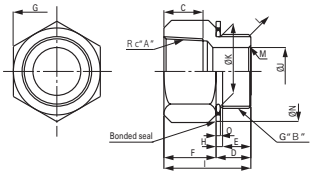


Fig. 3

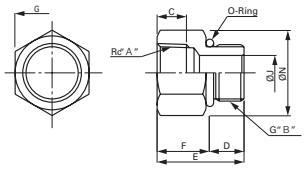
Accessary parts dimensions

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	Rc½	G½	15	14	11	22	27	3	36	10	18	C1	C1	30	2.3	DW0036A-004
T21154-2-A	¾	¾	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	1-¼	1-¼	22	21	18	30	50	3	51	27.5	38	C1.5	C2	54	2.3	DW0036A-010
T21154-5-A	1-½	1-½	22	21	18	30	60	3	51	33	44	C1.5	C2	65	3.2	DW0036A-012
T21154-6-A	2	2	26	26	22	36	70	4	62	44	56	C1.5	C2	72	3.2	DW0036A-016

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



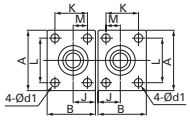
Note: The O-ring and the fitting are JIS standard product. It is possible to use a marketing product, too.

Part No.	A	B	C	D	E	F	G	J	N	Mass (g)	O-Ring
DW0331A-002	Rc¼	G¼	11	12	29	17	19	5	19	35	1BP11
DW0331A-003	⅜	⅜	12	12	31	19	22	8	22	55	1BP14
DW0331A-004	½	½	15	16	38	22	27	10	27	90	1BP18
DW0331A-006	¾	¾	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	1-¼	1-¼	22	21	51	30	50	27	50	380	1BP38
DW0331A-012	1-½	1-½	22	21	51	30	60	33	60	490	1BP44
DW0331A-016	2	2	26	25	61	36	70	44	70	780	1BP56

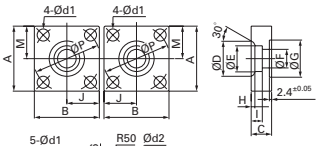
Straight flange

(Socket welding connection)

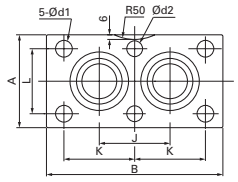
ME100, ME1300A



ME150～ME850



ME1900～ME4100



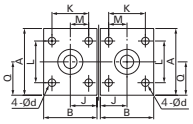
Note: The cut shown with R50 is only for ME2600.

Dowmax Model	ME100	ME150 ME175 ME300B ME350B	ME600B ME750B ME850B	ME1300A	ME1900	ME2600	ME3100	ME4100
Part No.	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

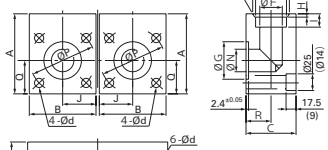
Elbow flange

(Socket welding connection)

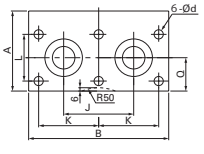
ME100, ME1300A



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.

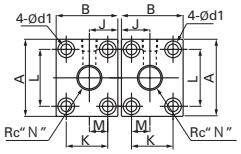
Dowmax Model	ME100	ME150 ME175 ME300B ME350B	ME600B ME750B ME850B	ME1300A	ME1900	ME2600	ME3100	ME4100
Part No.	DM0278A-A	DA0683B-A	DB0369A-A	DE0513A-A	T22130-A	T22131-A	DK0037B-A	T22132-A
A	75	80	85	110	106	114	125	132
B	52	73	70	100	165	190	230	230
C	38	45	60	71	71	71	90	85
D	32	38	45	63	63	63	56	75
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-M12×80	8-M16×95	6-M12×90	6-M16×90	—	6-M16×105
Hex. socket head bolt	8-M8×40	8-M12×60	—	—	—	—	6-M16×95	—

DOWMAX® ME motor

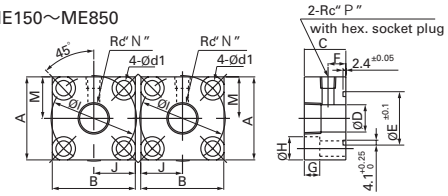
Straight flange

(Thread connection)

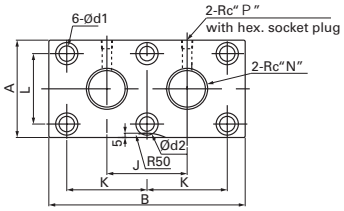
ME100, ME1300A



ME150～ME850



ME1900～ME4100



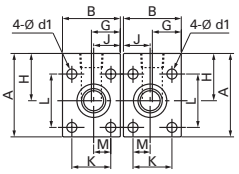
Note: The cut shown with R50 is only for ME2600.

Dowmax Model	ME100	ME150 ME175 ME300B ME350B	ME600B ME750B ME850B	ME1300A	ME1900	ME2600	ME3100	ME4100
Part No.	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	13	17	17	18
H	14	20	20	26	20	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	Rc½	Rc¾	Rc1	Rc1•¼	Rc1•½	Rc1•½	Rc1•½	Rc1•½
P	Rc¼	Rc¼	Rc¼	Rc¼	Rc¼	Rc¼	Rc¼	Rc¼
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-M8×20	8-M12×40	8-M12×40	8-M16×45	6-M12×40	6-M16×45	6-M16×45	6-M16×45

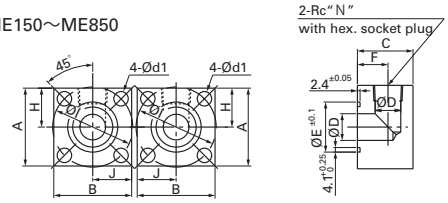
Elbow flange

(Thread connection)

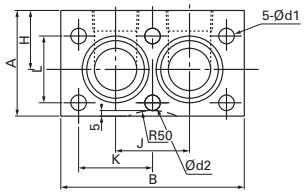
ME100, ME1300A



ME150～ME850



ME1900～ME4100



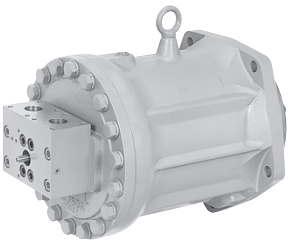
Note: The cut shown with R50 is only for ME2600.

Dowmax Model	ME100	ME150 ME175 ME300B ME350B	ME600B ME750B ME850B	ME1300A	ME1900	ME2600	ME3100	ME4100
Part No.	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	Rc½	Rc¾	Rc1	Rc1•¼	Rc1•½	Rc1•½	Rc1•½	Rc1•½
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-M8×50	8-M12×65	8-M12×70	8-M16×85	6-M12×80	6-M16×85	6-M16×85	6-M16×85

DOWMAX motor standardizes for special function

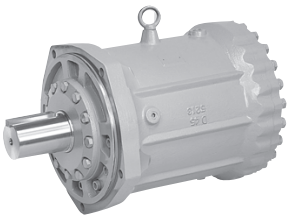
* The following motors with special functions are available.
  Select an appropriate motor that best suits your requirements.

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 fireresistant 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; DZ5821 B and DZ5861B (with flow control valve).

3. DOWMAX for installing the shaft upward

- 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.
- 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. DOWMAX motors with speed sensor

- With Shaft encoder type: motor shaft comes with the option, where customer can fit their own encoder
- With Pulse type: motor comes with compact no contact type speed sensor, which can measure 9 to 11 pulse per revolution
- Contact us for any other customized Sensor which needs more accuracy, or specific outputs

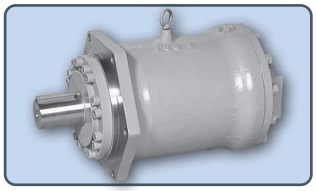
5. Coating and rustproofing

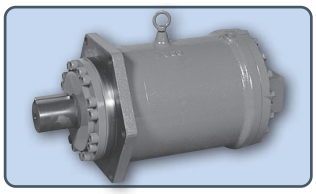
- In addition to the standard coating, 8 types of coating system are standardized for DOWMAX motors.
  Refer to drawing; DZ6373B
- The uncoated surfaces (excluding the nameplate) of all DOWMAX motors are rustproofed. This standard rustproofing is valid for approx. three months. Contact us if the storage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

6. Others

- Contact us for motors with special capacities, such as 250, 450, and 530 cc/rev.
- Contact us for the cold-resistant specification for operation at temperatures from -25°C to -45°C. (Standard motors are usable up to -25°C .)
- A socket welding type flange is shown in this catalog for main port piping. A screw type flange is also available.
  Refer to drawing; DZ5831 B (straight flange, screw connection) and DZ5852B (elbow flange, screw connection).

DOWMAX® two-speed motor





The structure of this two-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.**

Table of contents

DOWMAX® two-speed motor

Performance data

Model	Displace-ment cm³/rev	Rated pressure MPa (kgf/cm²)	Peak pressure MPa (kgf/cm²)	Rated torque Nm (kgfm)	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°C~+80°C

☐ 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 and working principle

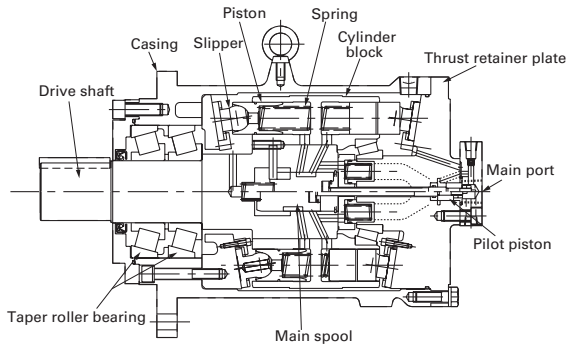


Fig. 1

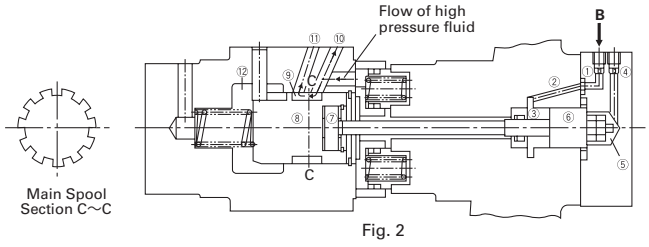


Fig. 2

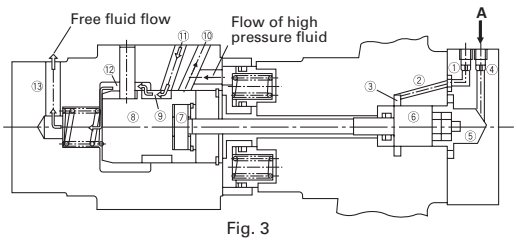


Fig. 3

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.

DOWMAX® two-speed motor

Model code & symbols

MK 300 – C ※ F2 A S □□□

Model code
DOWMAX two-speed series motor

Motor size
(Metric displacement)

Design no.
(Beginning with – and in alphabetical order hence forth)

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

Seal code
No sign – Standard seal (Nitrile rubber)

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)

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

Special specification number

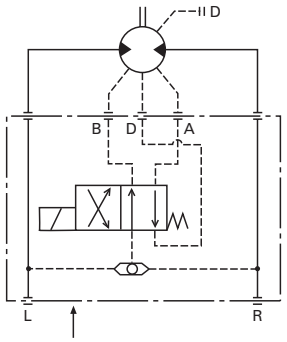
Change-over circuit in two-speed operation

(Basic conditions of a changeover 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/cm^2). (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/cm^2) or more.)

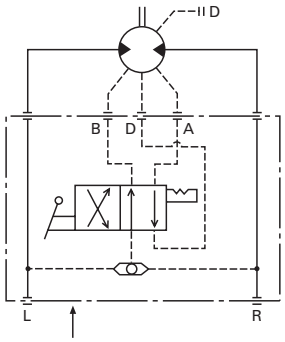
(Example of 2-speed change-over circuit)

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



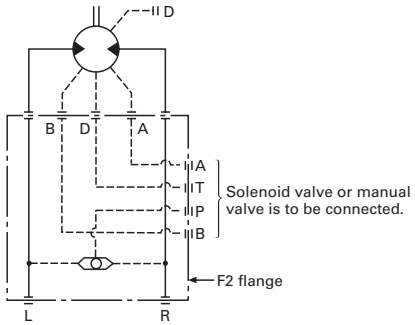
F2 flange with solenoid valve

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

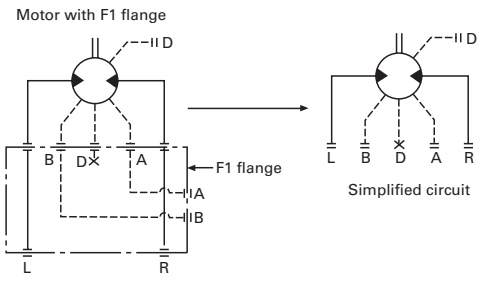


F2 flange with manual valve

3. Where a F2 flange is used.



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



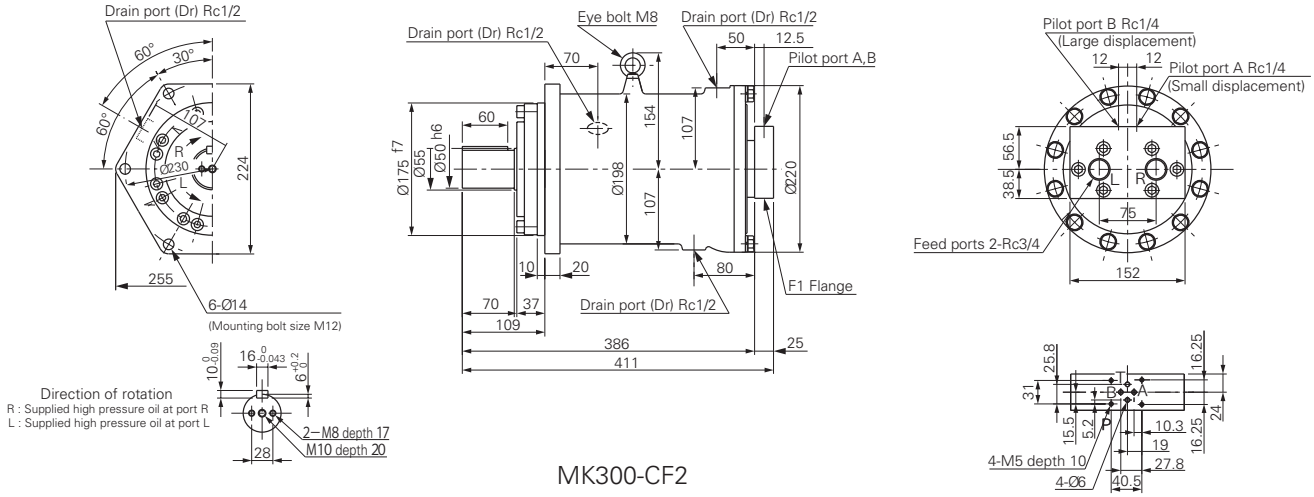
DOWMAX® two-speed motor

MK300

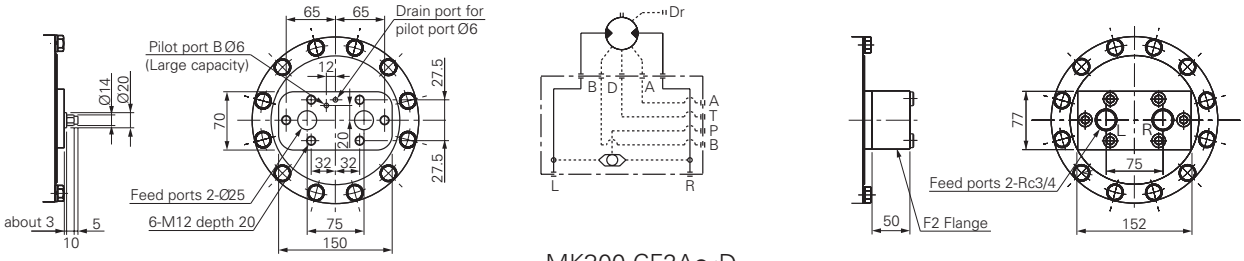
Displacement	304/152cm³/rev
Rated pressure	24.5MPa (250kgf/cm²)
Peak pressure	31.9MPa (325kgf/cm²)
Rated torque	1190/594Nm (121/61kgfm)
Max. Speed	600/800rpm
Change-over pilot pressure	more than self-pressure, Min.0.98MPa (10kgf/cm²)
Max. pressure for pilot port	31.9MPa (325kgf/cm²)
Pilot piston stroke volume	3.1cm³
Mass	60kg

Nominal dimensions

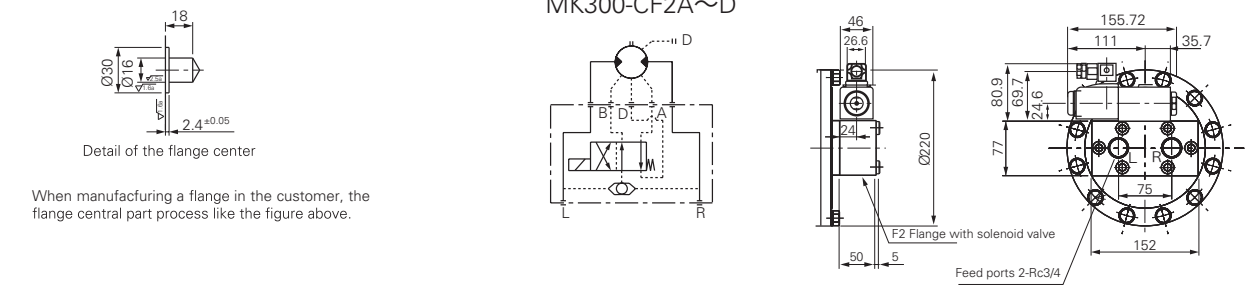
MK300-CF1



MK300-CF2

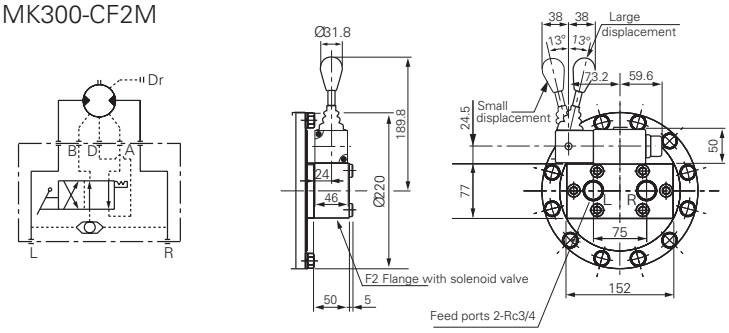


MK300-CF2A～D



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

MK300-CF2M

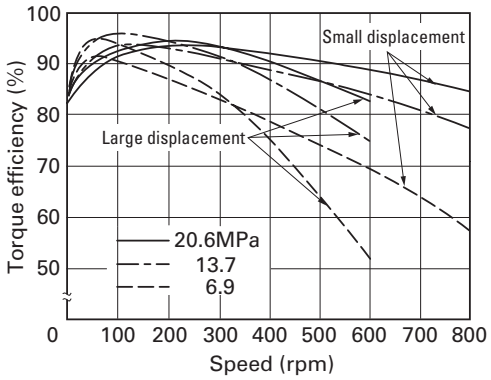


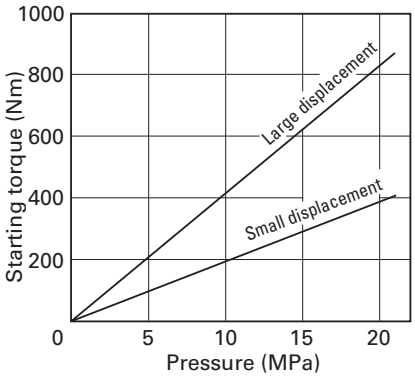
Change of capacity
Large displacement: Operate the lever to the right
Small displacement: Operate the lever to the left

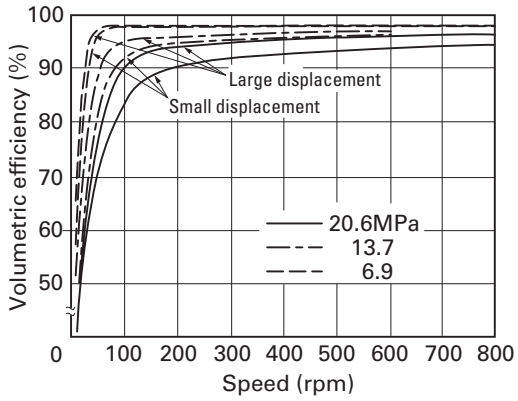
DOWMAX® two-speed motor

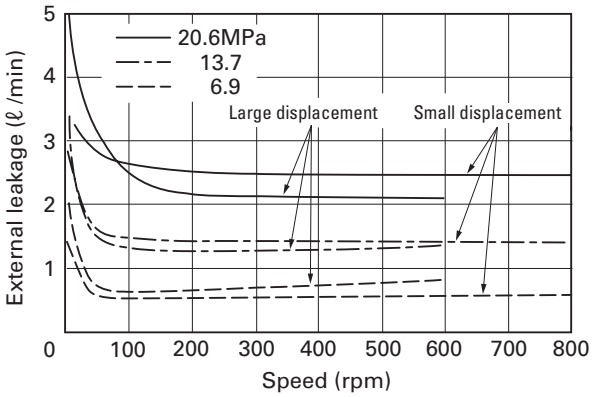
Performance data

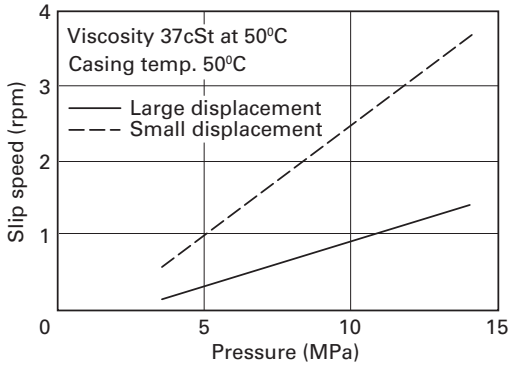
Fluid : Shell tellus 56 (Viscosity 37cSt at 50°C)
The graphs shown are mean values obtained for production units.

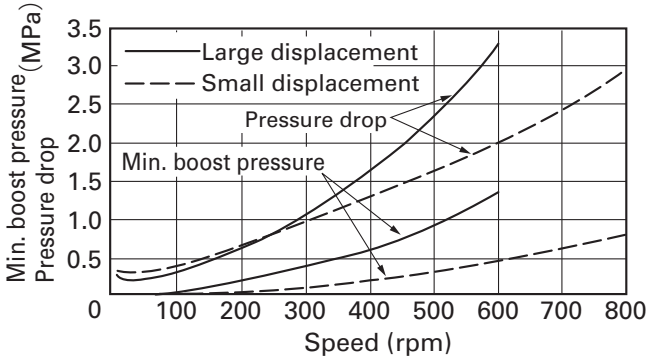












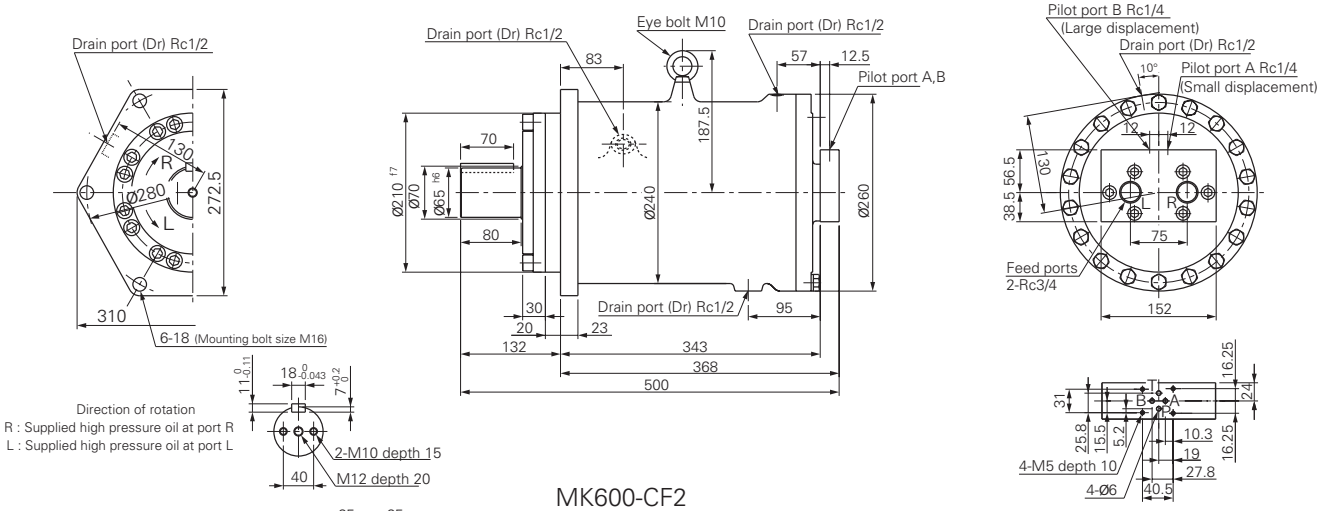
DOWMAX® two-speed motor

MK600

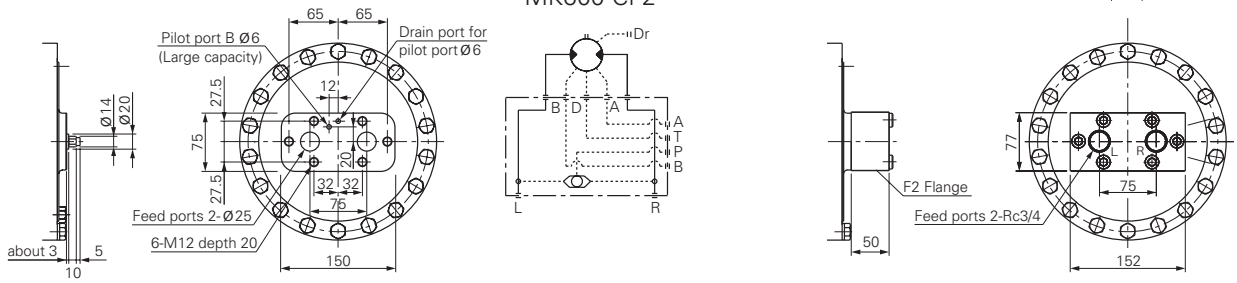
Displacement	602/301cm³/rev
Rated pressure	24.5MPa (250kgf/cm²)
Peak pressure	31.9MPa (325kgf/cm²)
Rated torque	2354/1177Nm (240/120kgfm)
Max. Speed	300/600rpm
Change-over pilot pressure	more than self-pressure, Min.0.98MPa (10kgf/cm²)
Max. pressure for pilot port	31.9MPa (325kgf/cm²)
Pilot piston stroke volume	4.1cm³
Mass	110kg

Nominal dimensions

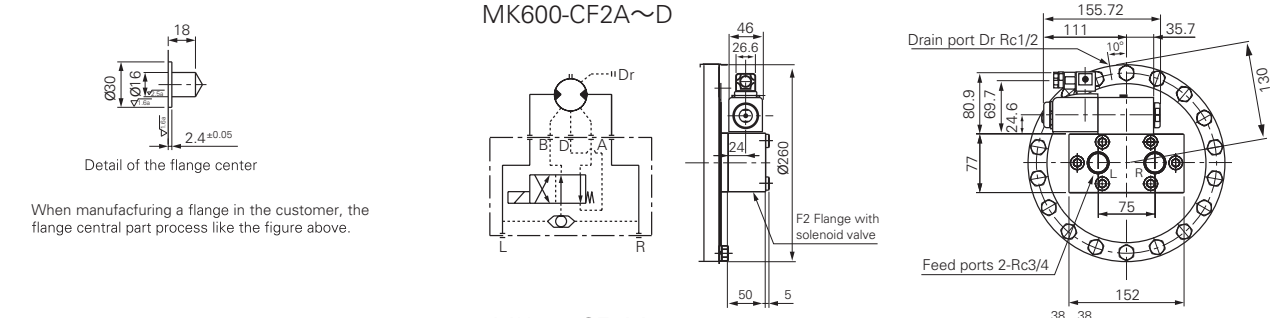
MK600-CF1



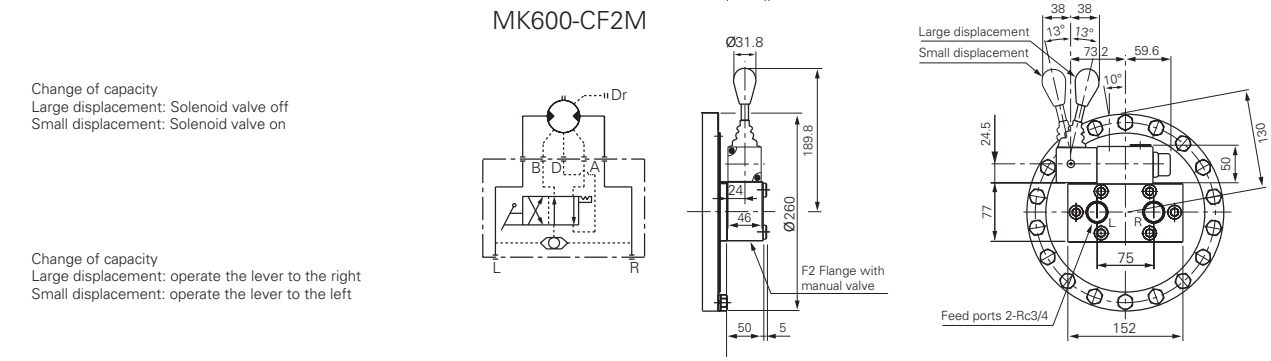
MK600-CF2



MK600-CF2A～D



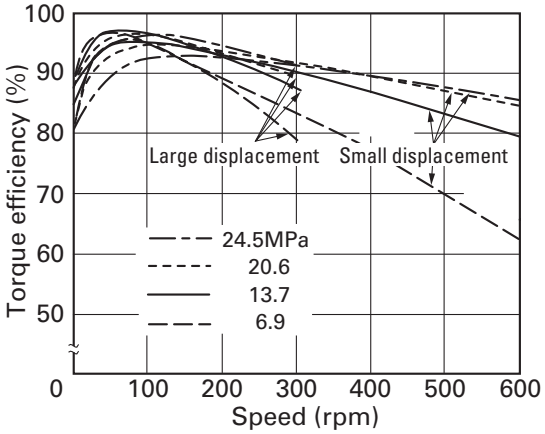
MK600-CF2M

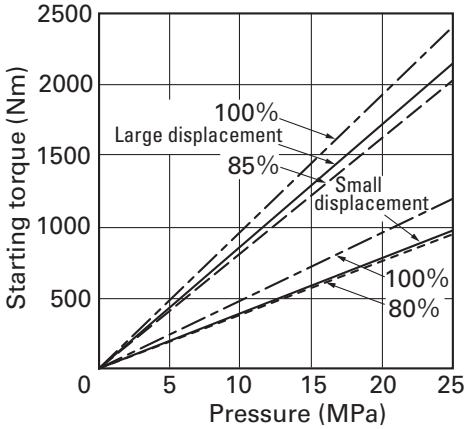


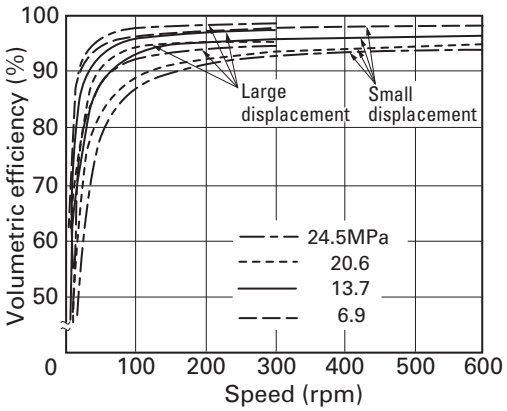
DOWMAX® two-speed motor

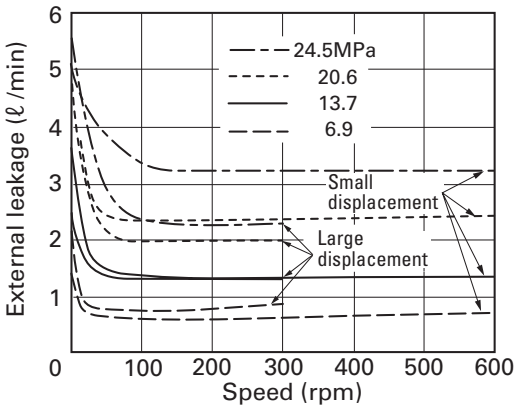
Performance data

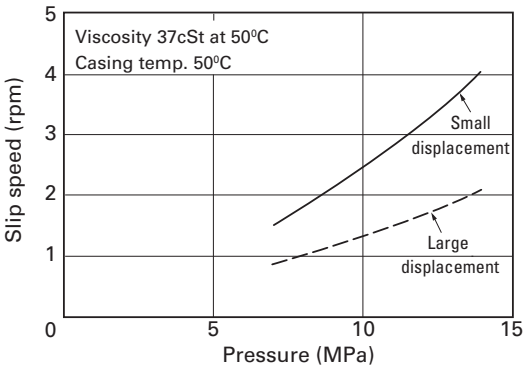
Fluid : Shell tellus 56 (Viscosity 37cSt at 50°C)
The graphs shown are mean values obtained for production units.

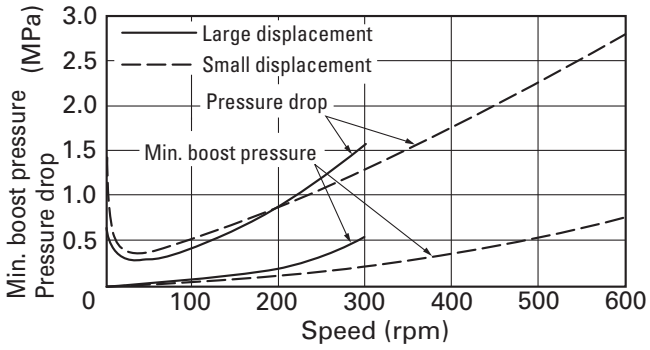












Bearing life and allowable radial load for shaft

MK300

Allowable max. radial load

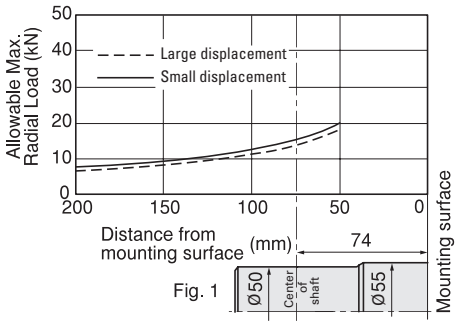


Fig. 1

Bearing life

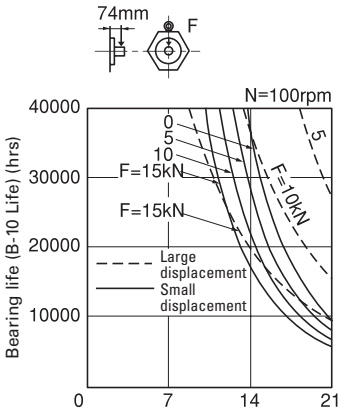


Fig. 2

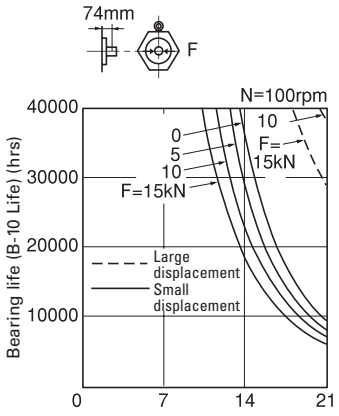


Fig. 3

MK600

Allowable max. radial load

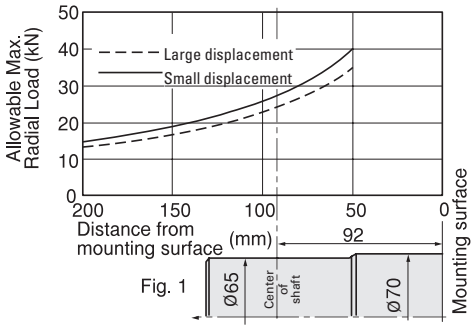


Fig. 1

Bearing life

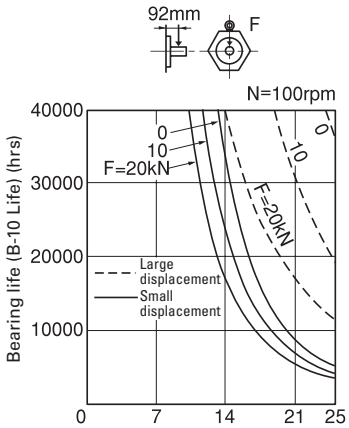


Fig. 2

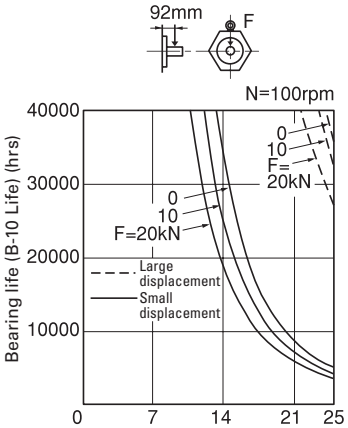


Fig. 3

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 pres sures and radial loads.
   When the shaft speed differs from 100 rpm the bearing life can be obtained by the following formula:

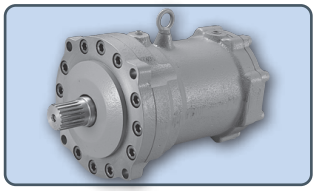
   B-10 Life = (Bearing life obtainable in the graph) x $\frac{100}{\text{Actual shaft speed, rpm}}$

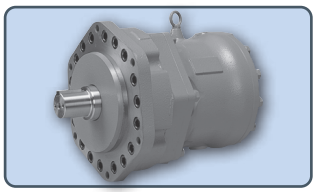
   In case where the side load acts at a different location to the midpoint of the shaft projection please refer to us.

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 recommended:

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

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.

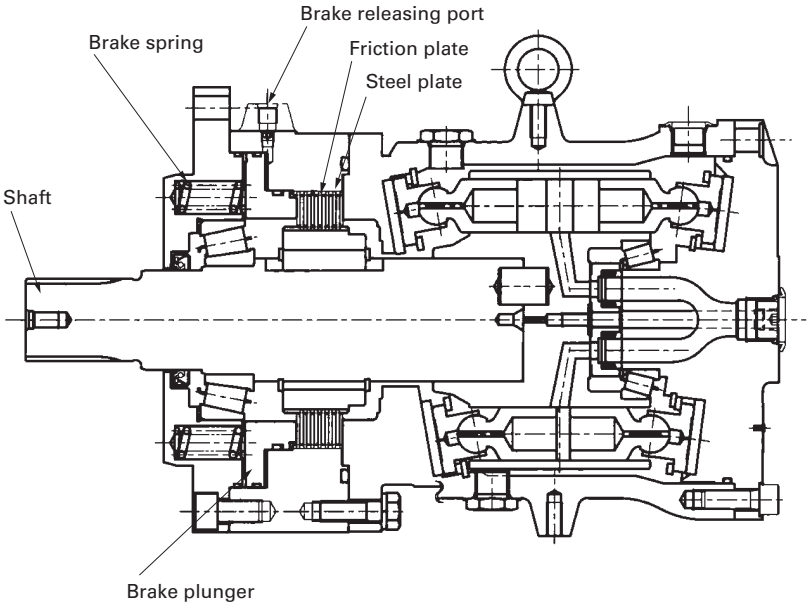
The mechanical brake provides the following two types. Select one depending on application.

- 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.

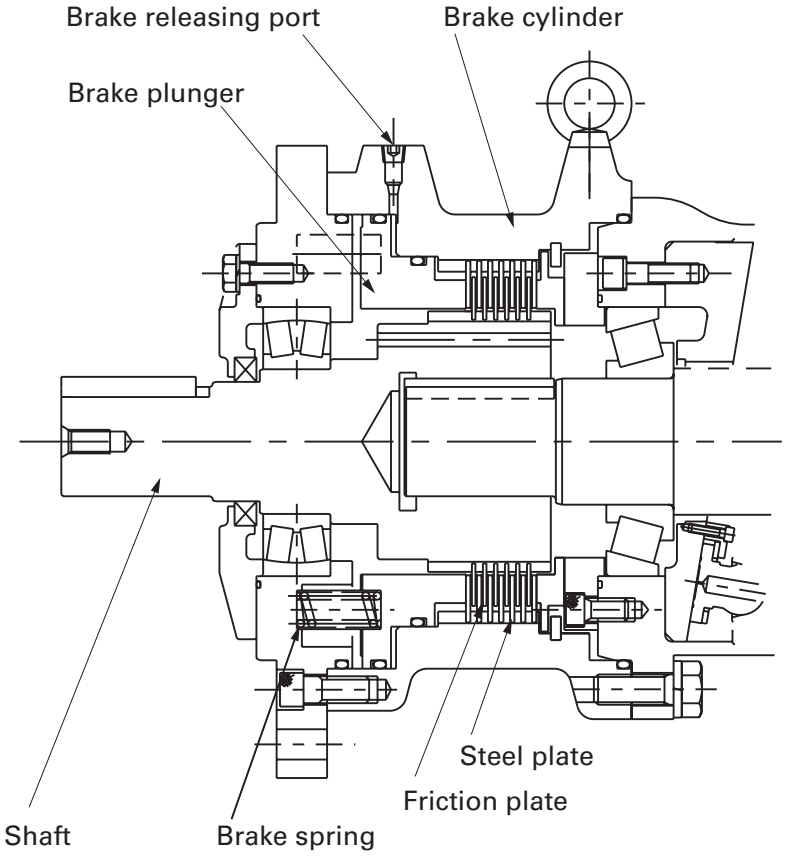
Table of contents

DOWMAX® with mechanical brake

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.

DOWMAX® with mechanical brake

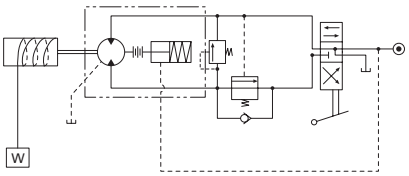
Performance data

Model	Hydraulic motor						Mechanical brake				Mass
	Displace-ment	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)	Nm (kgfm)	rpm	rpm	Nm (kgfm)	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)	450	520	2940 (300)				217
ME850BCS2570+BC300-C	848			3700 (377)	400	450					
MK300-FS001+BP121-C	304	24.5 (250)		1190 (121)	600	600	1190 (121)			37	102
	152			594 (61)	800	800					
MK600-CS002+BR250-C	602			2350 (240)	300	300	2450 (250)			58	204
	301			1180 (120)	600	600					

Examples of application

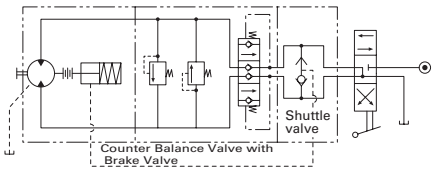
Winch circuit.

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

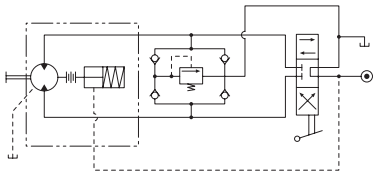


Truck (carrier) drive circuit.

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.

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. Every displacement have a specific curve, which is shown in respective motor brake characteristic graph, to show 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, these curves shows the lower limit of these values.

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.

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 pres sures and radial loads.
When the shaft speed differs from 100 rpm the bearing life can be obtained by the following formula:

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

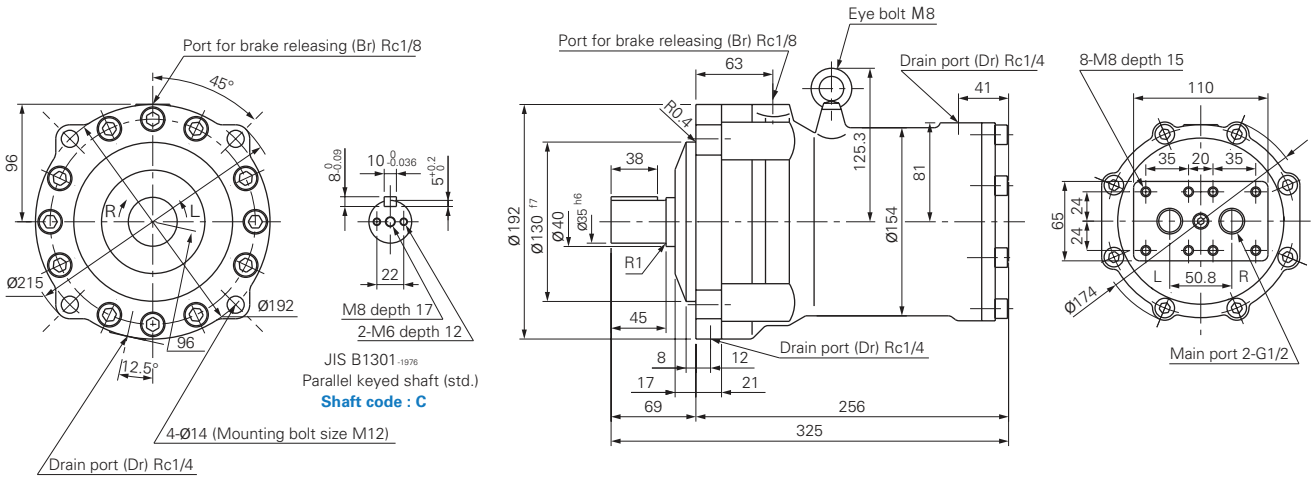
Caution : In case where the side load acts at a different location to the midpoint of the shaft projection please refer to us.

DOWMAX® with mechanical brake

MB100–C40

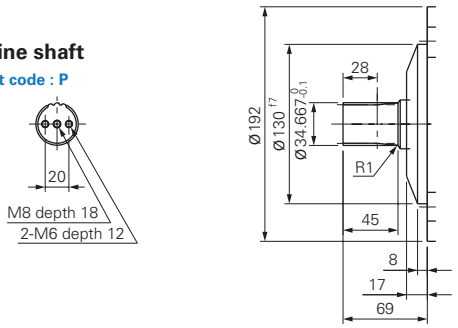
Hydraulic motor	Displacement	99cm³/rev
	Rated pressure	27.5MPa (280kgf/cm²)
	Peak pressure	31.9MPa (325kgf/cm²)
	Rated torque (theoretical)	432Nm (44kgfm)
	Rated speed	1000rpm
	Max. speed	1000rpm
Mechanical brake	Static brake torque	392Nm (40kgfm)
	Brake releasing pressure	1.2MPa (12.5kgf/cm²)
	Endurable press. of brake cylinder	31.9MPa (325kgf/cm²)
	Brake cylinder stroke volume	13cm³
GD²		0.08kgm²
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
	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.= Ø3.0
		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

DOWMAX® with mechanical brake

Coding

MB 100 – C 40 □ □ □□□

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

Special spec.
- **No indication** – Standard specification
- **S** – Special specification

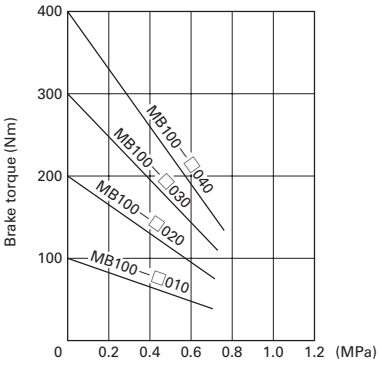
Special specification number

Brake torque

Indication sign	040	030	020	010
Brake torque Nm (kgfm)	392 (40)	294 (30)	196 (20)	98 (10)

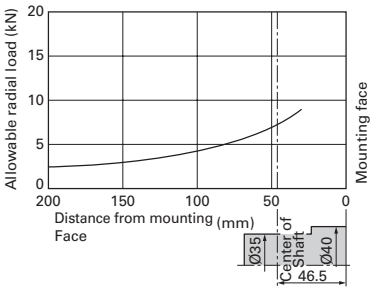
Port
- **No indication** – Standard metric port *C100□ counter balance valve fits with standard metric port (No. code)
- **E** – Unified threaded port

Brake characteristics

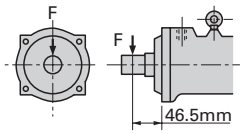
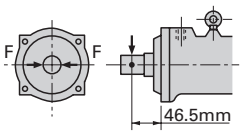
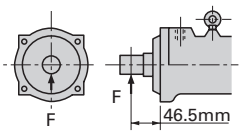
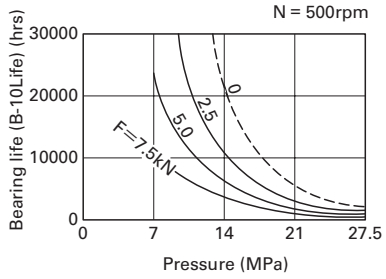
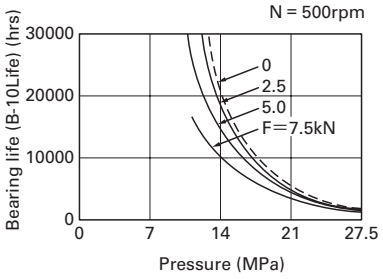
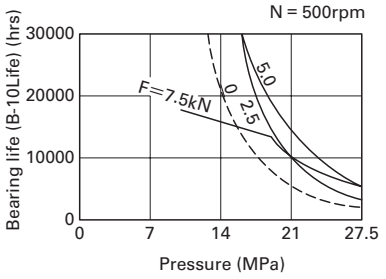


(Pressure at brake releasing port) minus (Drain pressure in case)

Allowable radial load



Bearing life

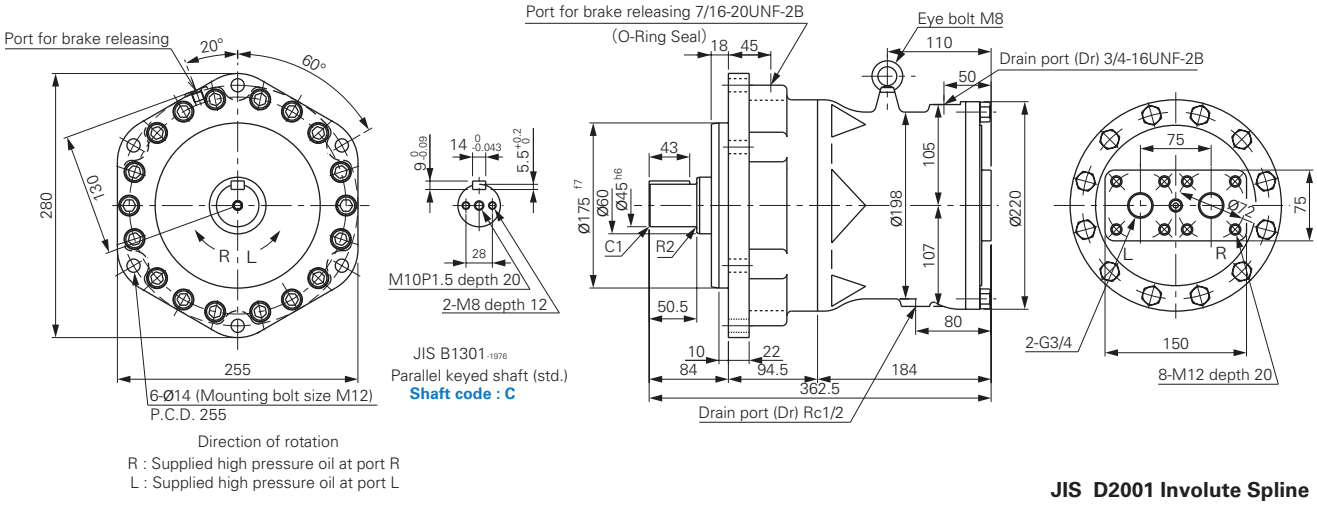
Direction of radial load			
MB100			

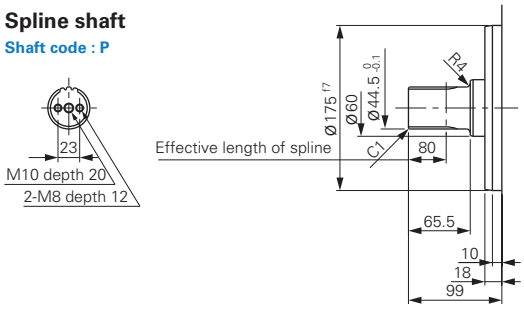
DOWMAX® with mechanical brake

MB150AP100
MB175AP100

Hydraulic motor	Displacement	152	175	cm^3/rev
	Rated pressure	27.5 (280)		MPa (kgf/cm^2)
	Peak pressure	31.9 (325)		MPa (kgf/cm^2)
	Rated torque (theoretical)	667 (68)	765 (78)	Nm (kgfm)
	Rated speed	600		rpm
	Max. speed	800		rpm
Mechanical brake	Static brake torque	981 (100)		Nm (kgfm)
	Brake releasing pressure	1.0 (10)		MPa (kgf/cm^2)
	Endurable press. of brake cylinder	31.9 (325)		MPa (kgf/cm^2)
	Brake cylinder stroke volume	20		cm^3
GD^2		0.25		kgm^2
Casing capacity		1.0		ℓ
Mass		71		kg

Outline dimensions





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. = Ø4.5
		Over-all. across a given number of teeth (reference)	20.379 $^{-0.001}_{-0.058}$ (3-teeth)
	Outer dia.		44.5
	Inner dia.		39

DOWMAX® with mechanical brake

Coding

MB 175 A P 100 □ □ □□□

DOWMAX model No.		
Model	150	175
Displacement (cm³/rev)	152	175

Design no. (1st design change "A")

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

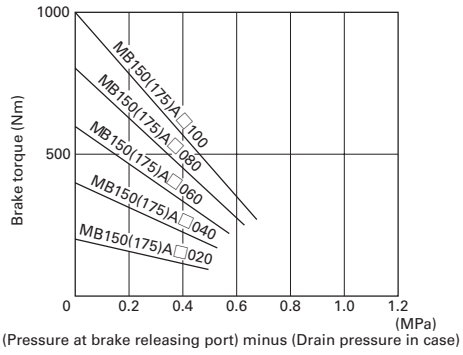
Indication sign	100	080	060	040	020
Brake torque Nm (kgfm)	981 (100)	785 (80)	589 (60)	392 (40)	196 (20)

Special spec.
No indication – Standard specification
S – Special specification

Special specification number

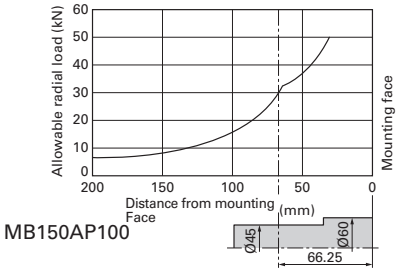
Port
No indication – Standard metric port
A – C100□ counter balance valve mounting port
B – C300□ B & CW300A counter balance valve mounting port

Brake characteristics

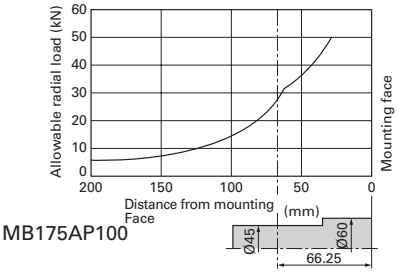


(Pressure at brake releasing port) minus (Drain pressure in case)

Allowable radial load

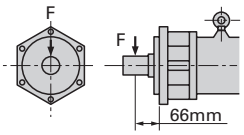
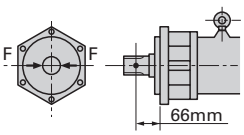
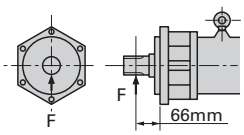
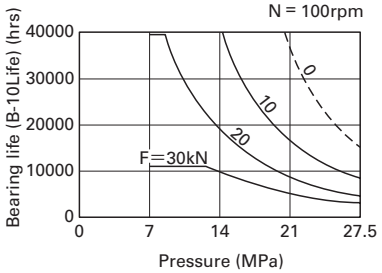
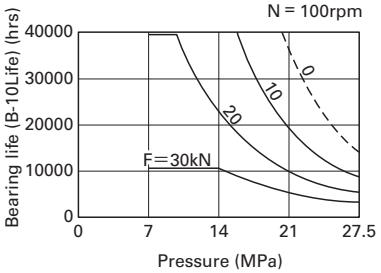
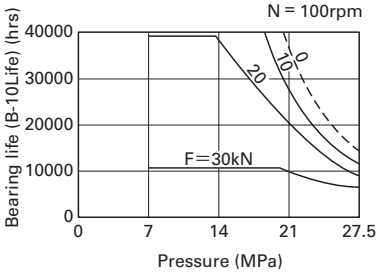
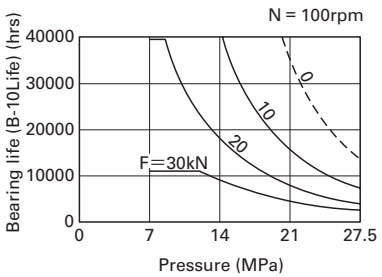
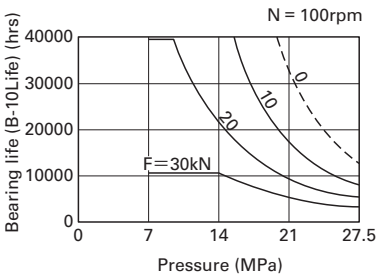
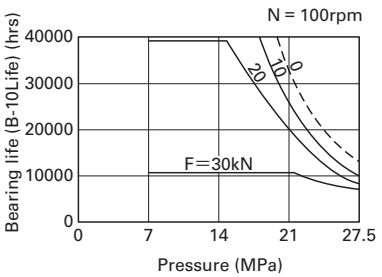


MB150AP100



MB175AP100

Bearing life

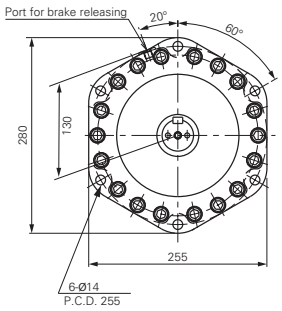
Direction of radial load			
MB150A			
MB175A			

DOWMAX® with mechanical brake

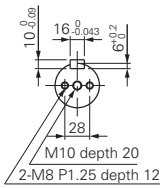
MB300BP150
MB350BP150

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)	Nm (kgfm)
	Rated speed	660		rpm
	Max. speed	800		rpm
Mechanical brake	Static brake torque	1470 (150)		Nm (kgfm)
	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		kgm²
Casing capacity		1.5		ℓ
Mass		89		kg

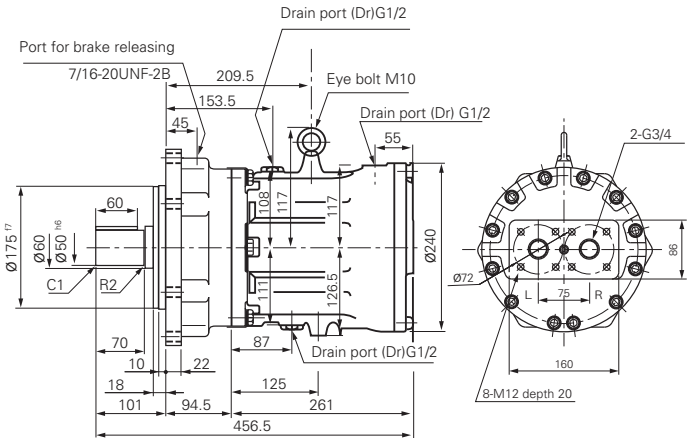
Outline dimensions

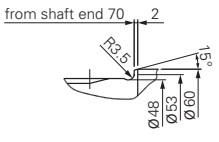


Direction of rotation
R : Supplied high pressure oil at port R
L : Supplied high pressure oil at port L



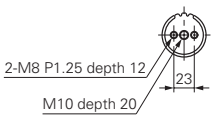
JIS B1301-1976
Parallel keyed shaft (std.)
Shaft code : C

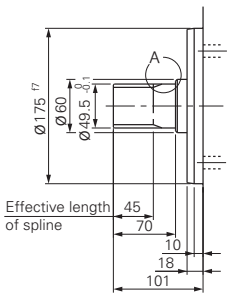


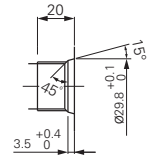


Details of "A"

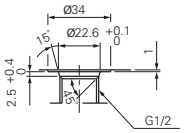
Spline shaft
Shaft code : P







Details of main port



Details of drain port

JIS D2001 Involute spline 50 × 18 × 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	18
		Dia. of basic pitch circle	40
	Tooth thickness	Grade	Class b (flank fit)
		Over-pin dia.	54.366 $^{-0.019}_{-0.109}$ Pin dia.=Ø4.5
		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

DOWMAX® with mechanical brake

Coding

MB 300 B P 150 □ □ □□□

DOWMAX model No.

Model	300	350
Displacement (cm³/rev)	300	350

Design no. (1st design change "A")

Output shaft

- **C** – Standard shaft (New JIS key straight shaft)
- **P** – Metric Spline shaft
- **S** – Special shaft

Indication sign	150	125	100	075	050	025
Brake torque Nm (kgfm)	1470 (150)	1230 (125)	981 (100)	736 (75)	491 (50)	245 (25)

Special spec.

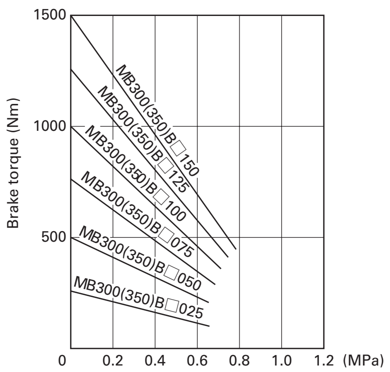
- **No indication** – Standard specification
- **S** – Special specification

Special specification number

Port

- **No indication** – Standard metric port
- **A** – C100□ ccounter balance valve mounting port
- **B** – C300□ B & CW300A counter balance valve mounting port

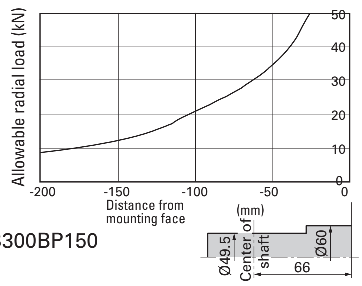
Brake characteristics



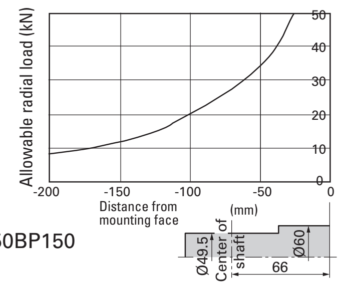
(Pressure at brake releasing port) minus (Drain pressure in case)

Allowable radial load

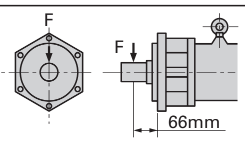
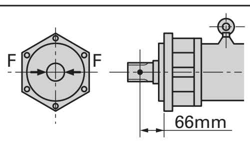
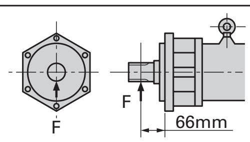
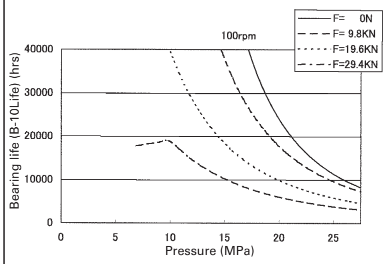
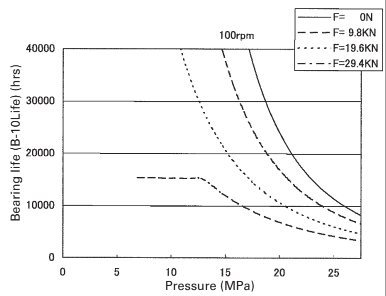
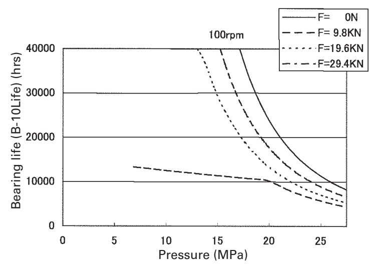
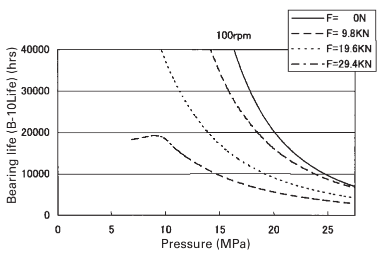
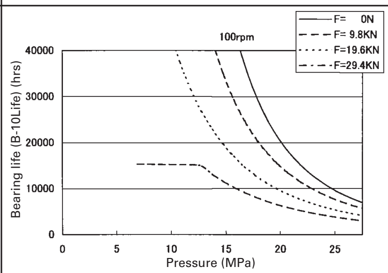
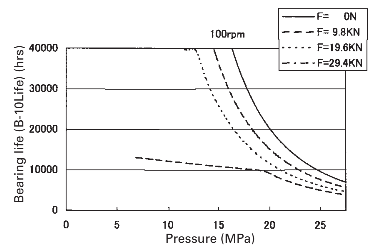
MB300BP150



MB350BP150



Bearing life

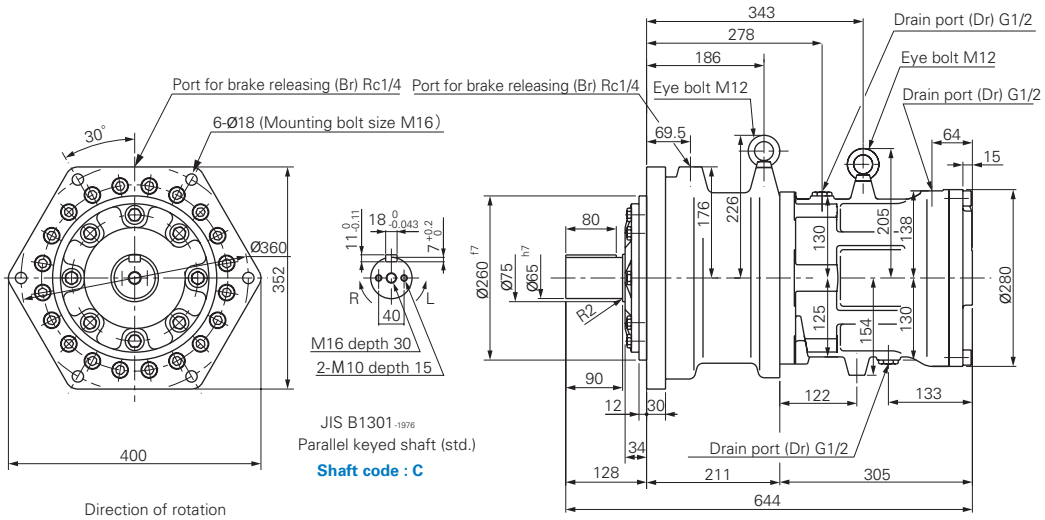
Direction of radial load			
MB300B			
MB350B			

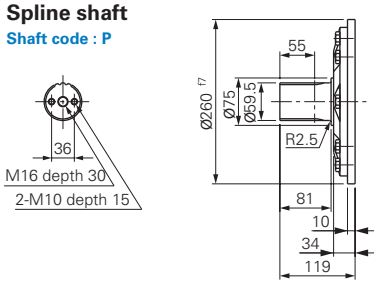
DOWMAX® with mechanical brake

ME600BCS2550+BB250BC

Hydraulic motor	Displacement	600cm³/rev
	Rated pressure	27.5MPa (280kgf/cm²)
	Peak pressure	31.9MPa (325kgf/cm²)
	Rated torque (theoretical)	2620Nm (267kgfm)
	Rated speed	500rpm
	Max. speed	600rpm
Mechanical brake	Static brake torque	2450Nm (250kgfm)
	Brake releasing pressure	1.2MPa (12kgf/cm²)
	Endurable press. of brake cylinder	31.9MPa (325kgf/cm²)
	Brake cylinder stroke volume	58cm³
GD²		0.91kgm2
Casing capacity		2.7ℓ
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.=Ø4.5
		Over-all. across a given number of teeth (reference)	$27.970^{-0.001}_{-0.058}$ (4-teeth)
	Outer dia.		59.5
	Inner dia.		54

DOWMAX® with mechanical brake

Coding

ME600BC □ S2550+BB250BC □ □□□

Port

No indication – Standard metric port
A – C100□ counter balance valve mounting port
B – C300□ B & CW300A counter balance valve mounting port

Brake torque

Indication sign	250	200	150	100	050
Brake torque Nm (kgfm)	2450 (250)	1960 (200)	1470 (150)	981 (100)	491 (50)

Special Spec.

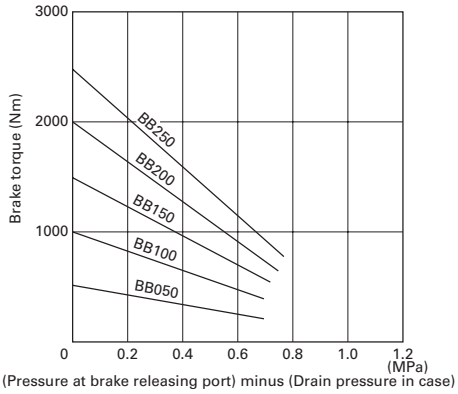
No indication – Standard specification
S – Special specification

Motor shaft

C – Standard shaft (New JIS key straight shaft)
P – Metric Spline shaft
S – Special shaft

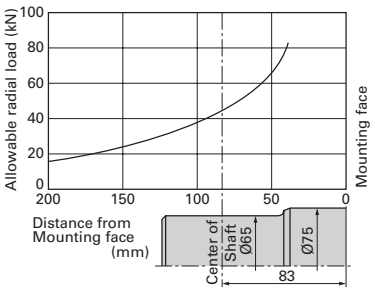
Special Specification Number

Brake characteristics

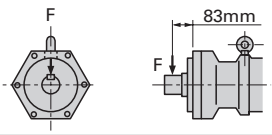
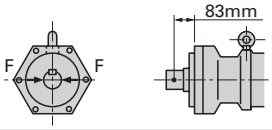
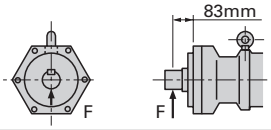
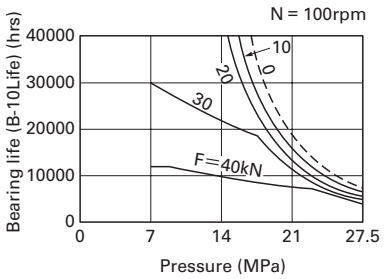
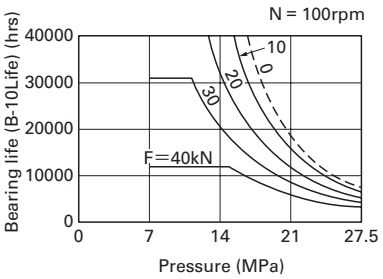
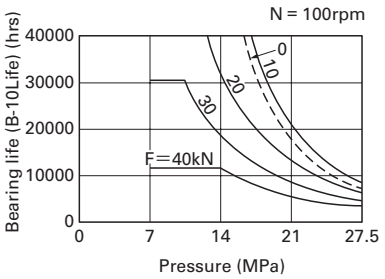


(Pressure at brake releasing port) minus (Drain pressure in case)

Allowable radial load



Bearing life

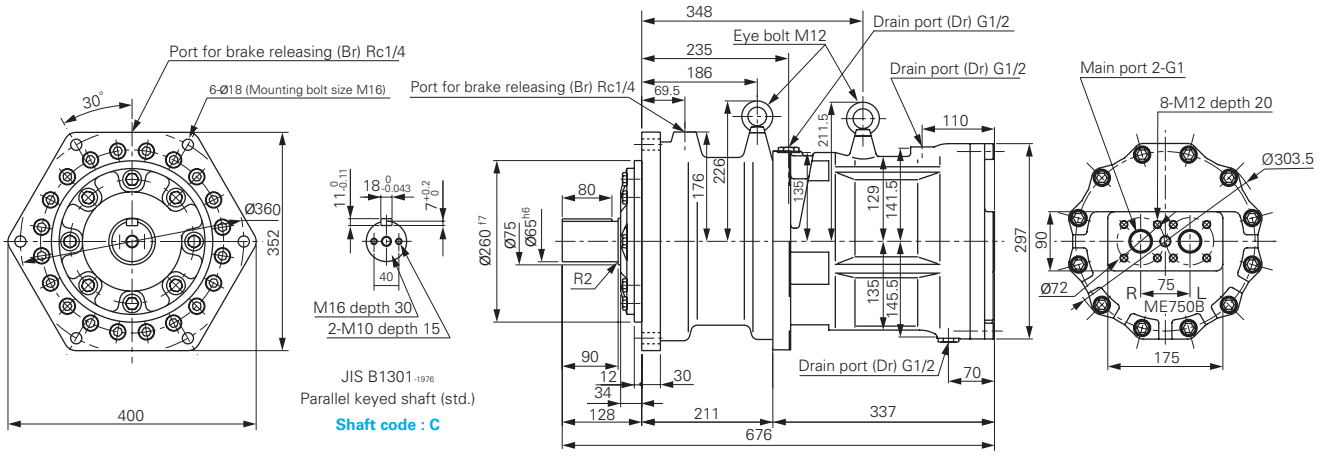
Direction of radial load			
ME600B			

DOWMAX® with mechanical brake

ME750BCS2560+BC300-C
ME850BCS2570+BC300-C

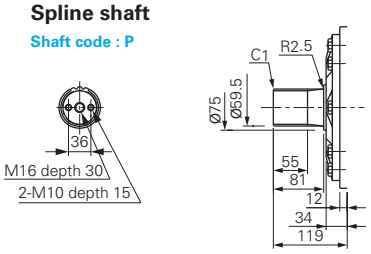
Hydraulic motor	Displacement	750	848	cm^3/rev
	Rated pressure	27.5 (280)		MPa (kgf/cm^2)
	Peak pressure	31.9 (325)		MPa (kgf/cm^2)
	Rated torque (theoretical)	3280 (334)	3708 (378)	Nm (kgfm)
	Rated speed	450	400	rpm
	Max. speed	520	450	rpm
Mechanical brake	Static brake torque	2940 (300)		Nm (kgfm)
	Brake releasing pressure	1.2 (12)		MPa (kgf/cm^2)
	Endurable press. of brake cylinder	31.9 (325)		MPa (kgf/cm^2)
	Brake cylinder stroke volume	58		cm^3
GD^2		1.25		kgm^2
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
	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.=Ø4.5
		Over-all. across a given number of teeth (reference)	$27.970^{-0.001}_{-0.058}$ (4-teeth)
	Outer dia.		49.5
	Inner dia.		54

DOWMAX® with mechanical brake

Coding

ME750BC□S2560+ BC300-C □ □□□

DOWMAX model No.		
Model	ME750B	ME850B
Displacement (cm^3/rev)	750	848

Port
No indication – Standard metric port
A – C100□ counter balance valve mounting port
B – C300□ B & CW300A counter balance valve mounting port

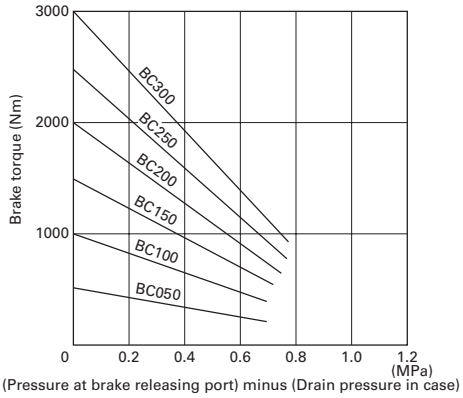
Motor shaft
C – Standard shaft (New JIS key straight shaft)
P – Metric spline shaft
S – Special shaft

Special specification number

Special spec.
No indication – Standard specification
S – Special specification

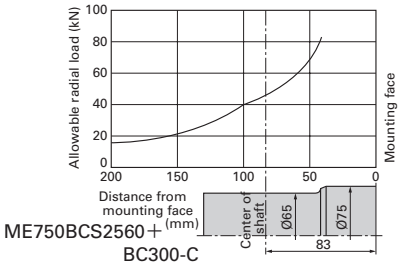
Brake torque						
Indication sign	300	250	200	150	100	050
Brake torque Nm (kgfm)	2940 (300)	2450 (250)	1960 (200)	1470 (150)	981 (100)	491 (50)

Brake characteristics

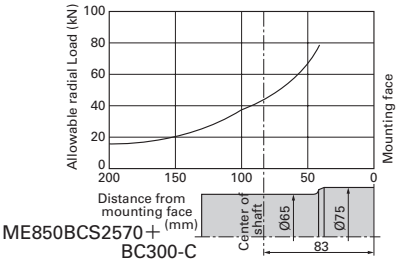


(Pressure at brake releasing port) minus (Drain pressure in case)

Allowable radial load

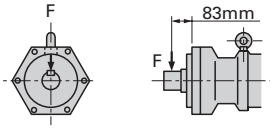
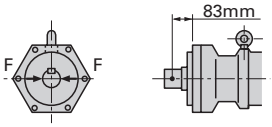
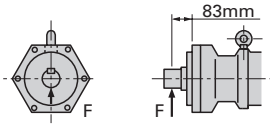
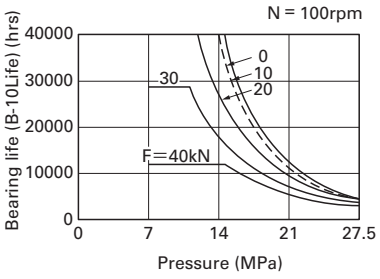
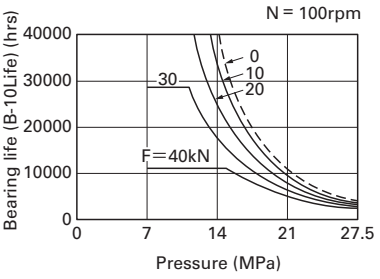
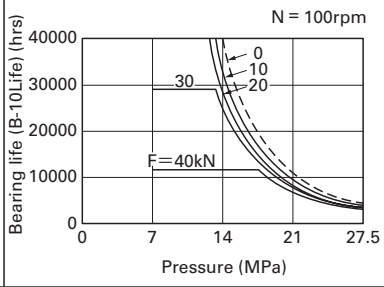
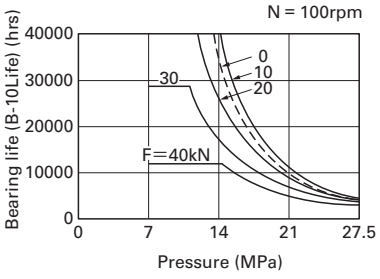
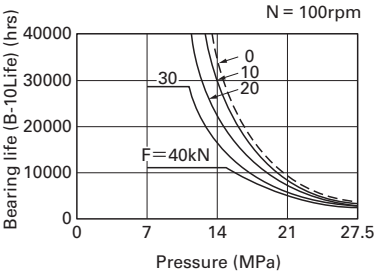
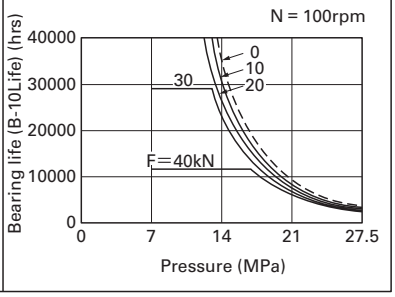


ME750BCS2560+ BC300-C



ME850BCS2570+ BC300-C

Bearing life

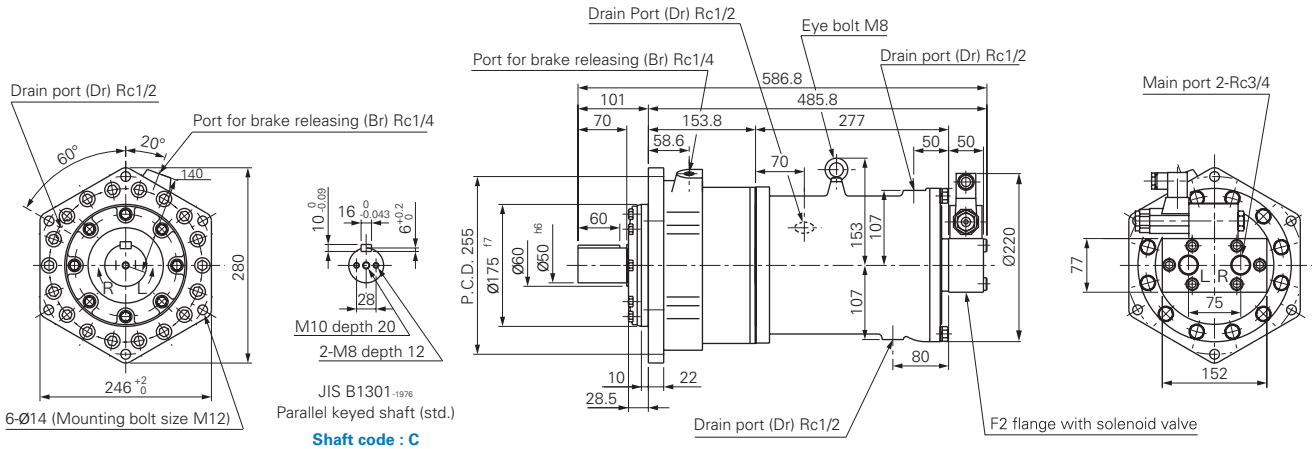
Direction of radial load			
			
ME750B			
ME850B			

DOWMAX® with mechanical brake

MK300-FS001+BP121-C

Hydraulic motor	Displacement	304	152	cm³/rev
	Rated pressure	24.5 (250)		MPa (kgf/cm²)
	Peak pressure	31.9 (325)		MPa (kgf/cm²)
	Rated torque (theoretical)	1190 (121)	594 (61)	Nm (kgfm)
	Rated speed	600	800	rpm
	Max. speed	600	800	rpm
Mechanical brake	Static brake torque	1190 (121)		Nm (kgfm)
	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		cm³
GD²		0.34		kgm²
Casing capacity		1.9		ℓ
Mass		102		kg

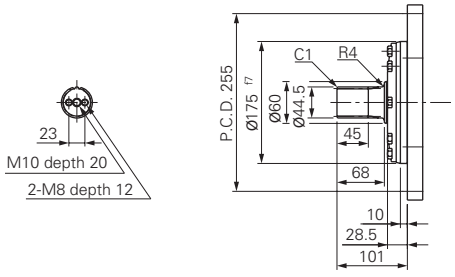
Outline dimensions



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
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.=Ø4.5
		Over-all. across a given number of teeth (reference)	$20.379^{-0.001}_{-0.058}$ (3-teeth)
	Outer dia.		44.5
	Inner dia.		39

DOWMAX® with mechanical brake

Coding

MK300-FF2AS001+BP121-C□ □□□

Directional valve sign
Flange sign
Refer to Page 52

Brake torque

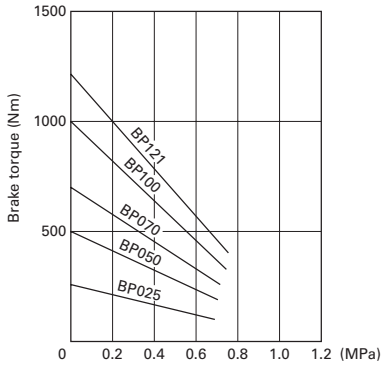
Indication sign	121	100	070	050	025
Brake torque Nm (kgfm)	1190 (121)	981 (100)	687 (70)	491 (50)	245 (25)

Output shaft
C – Standard shaft (New JIS key straight shaft)
P – Metric spline shaft
S – Special shaft

Special specification number

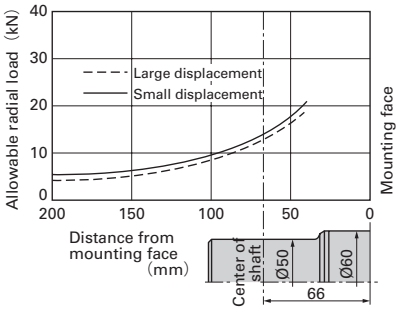
Special spec.
No indication – Standard specification
S – Special specification

Brake characteristics

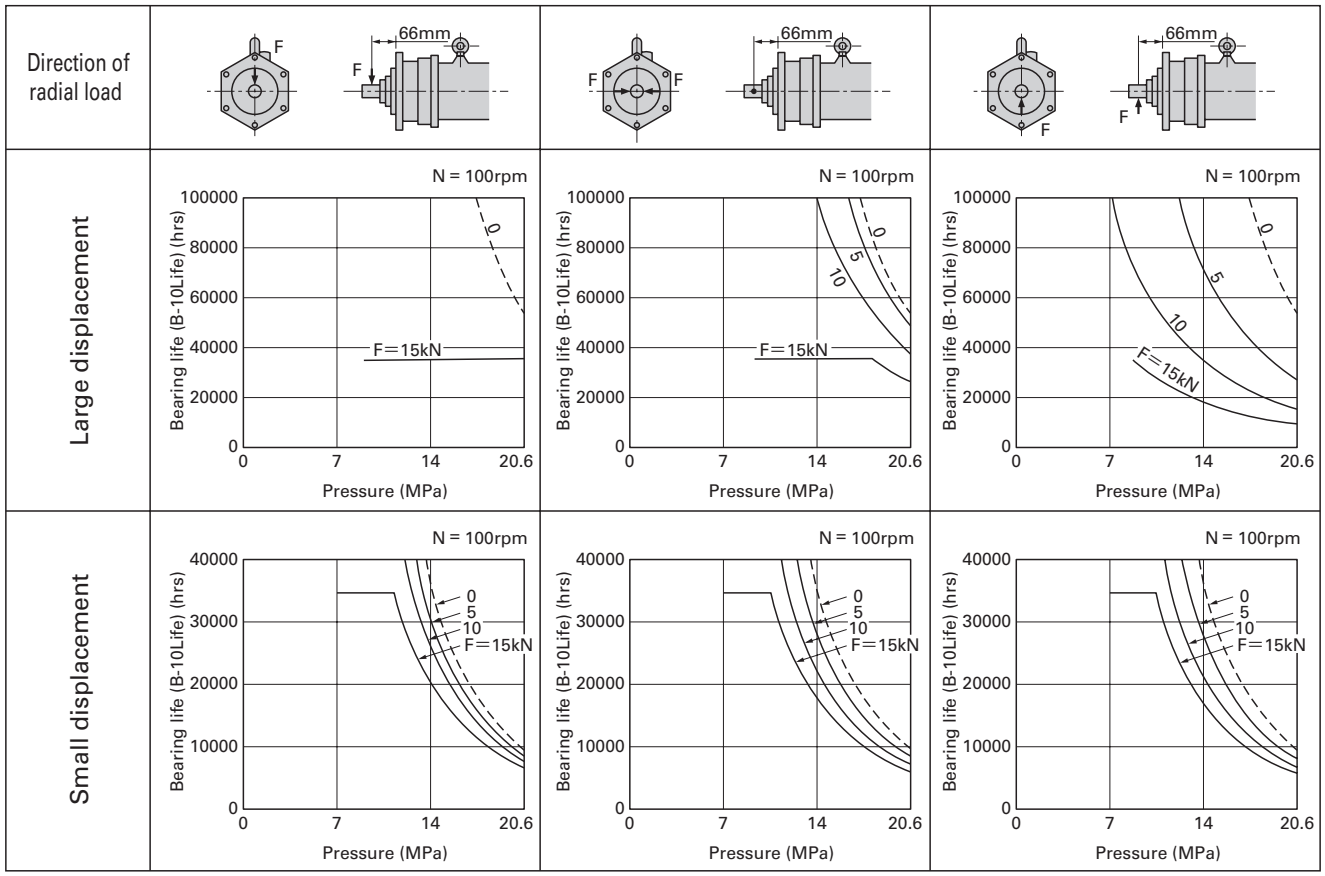


(Pressure at brake releasing port) minus (Drain pressure in case)

Allowable radial load



Bearing life

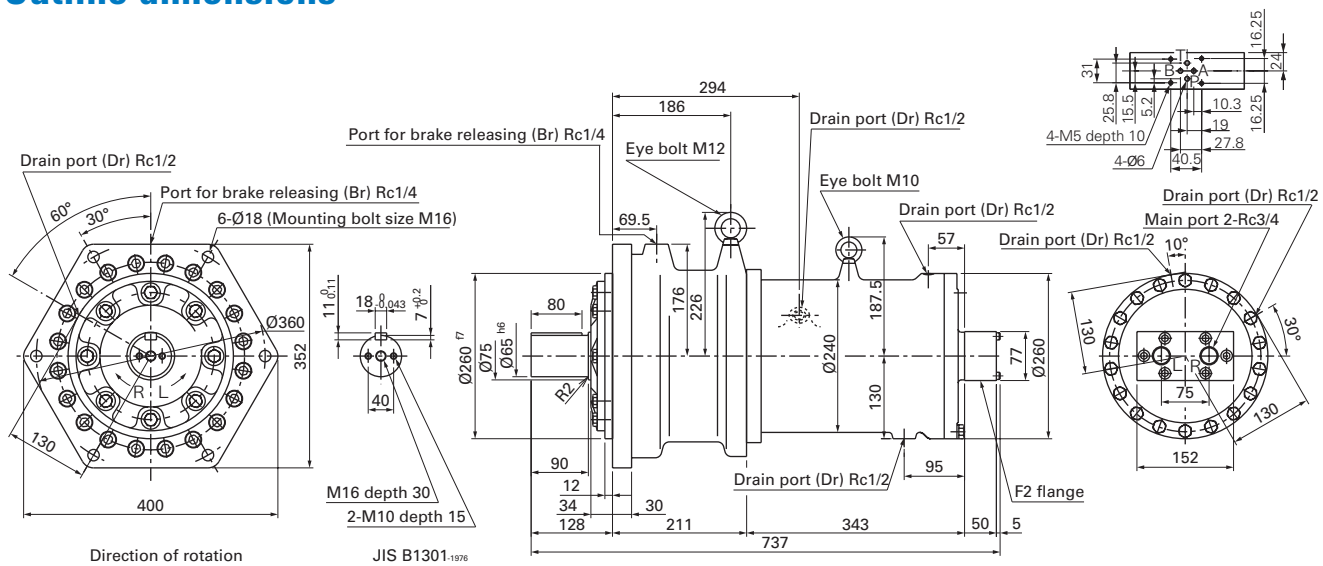


DOWMAX® with mechanical brake

MK600-CS002+BR250-C

Hydraulic motor	Displacement	602	301	cm^3/rev
	Rated pressure	24.5 (250)		MPa (kgf/cm^2)
	Peak pressure	31.9 (325)		MPa (kgf/cm^2)
	Rated torque (theoretical)	2350 (240)	1180 (120)	Nm (kgfm)
	Rated speed	300	600	rpm
	Max. speed	300	600	rpm
Mechanical brake	Static brake torque	2450 (250)		Nm (kgfm)
	Brake releasing pressure	1.2 (12)		MPa (kgf/cm^2)
	Endurable press. of brake cylinder	31.9 (325)		MPa (kgf/cm^2)
	Brake cylinder stroke volume	58		cm^3
GD^2		1.0		kgm^2
Casing capacity		2.9		ℓ
Mass		204		kg

Outline dimensions

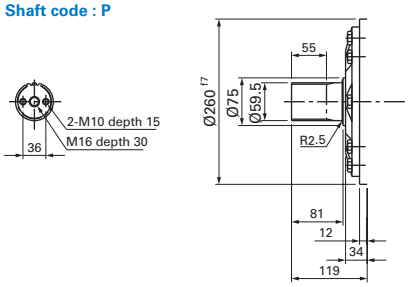


Direction of rotation
R : Supplied high pressure oil at port R
L : Supplied high pressure oil at port L

JIS B1301-1976
Parallel keyed shaft (std.)
Shaft code : C

Spline shaft

Shaft code : P



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
	Tooththickness	Grade	Class b (flank fit)
		Over-pin dia.	$64.516^{-0.020}_{-0.114}$ Pin dia.=Ø4.5
		Over-all. across a given number of teeth (reference)	$27.970^{-0.001}_{-0.058}$ (4-teeth)
	Outer dia.		59.5
	Inner dia.		54

DOWMAX® with mechanical brake

Coding

MK600-CF2AS002+BR250-C□ □□□

Directional valve sign
Flange sign
Refer to Page 52

Brake torque

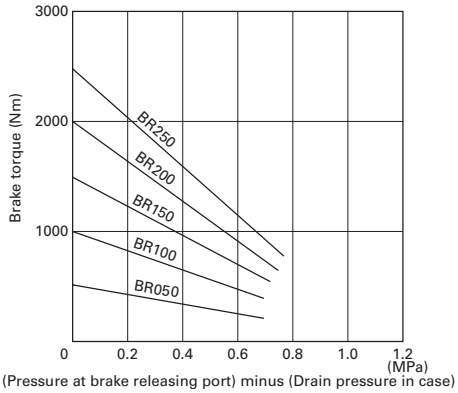
Indication sign	250	200	150	100	050
Brake torque Nm (kgfm)	2450 (250)	1960 (200)	1470 (150)	981 (100)	491 (50)

Output shaft
C – Standard shaft (New JIS key straight shaft)
P – Metric spline shaft
S – Special shaft

Special specification number

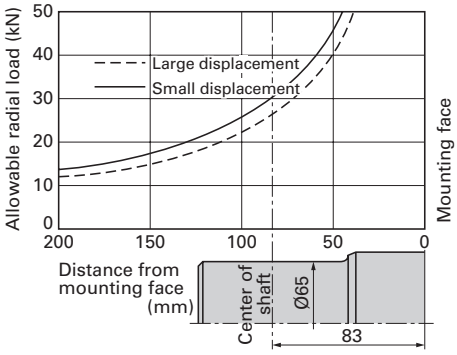
Special spec.
No indication – Standard specification
S – Special specification

Brake characteristics

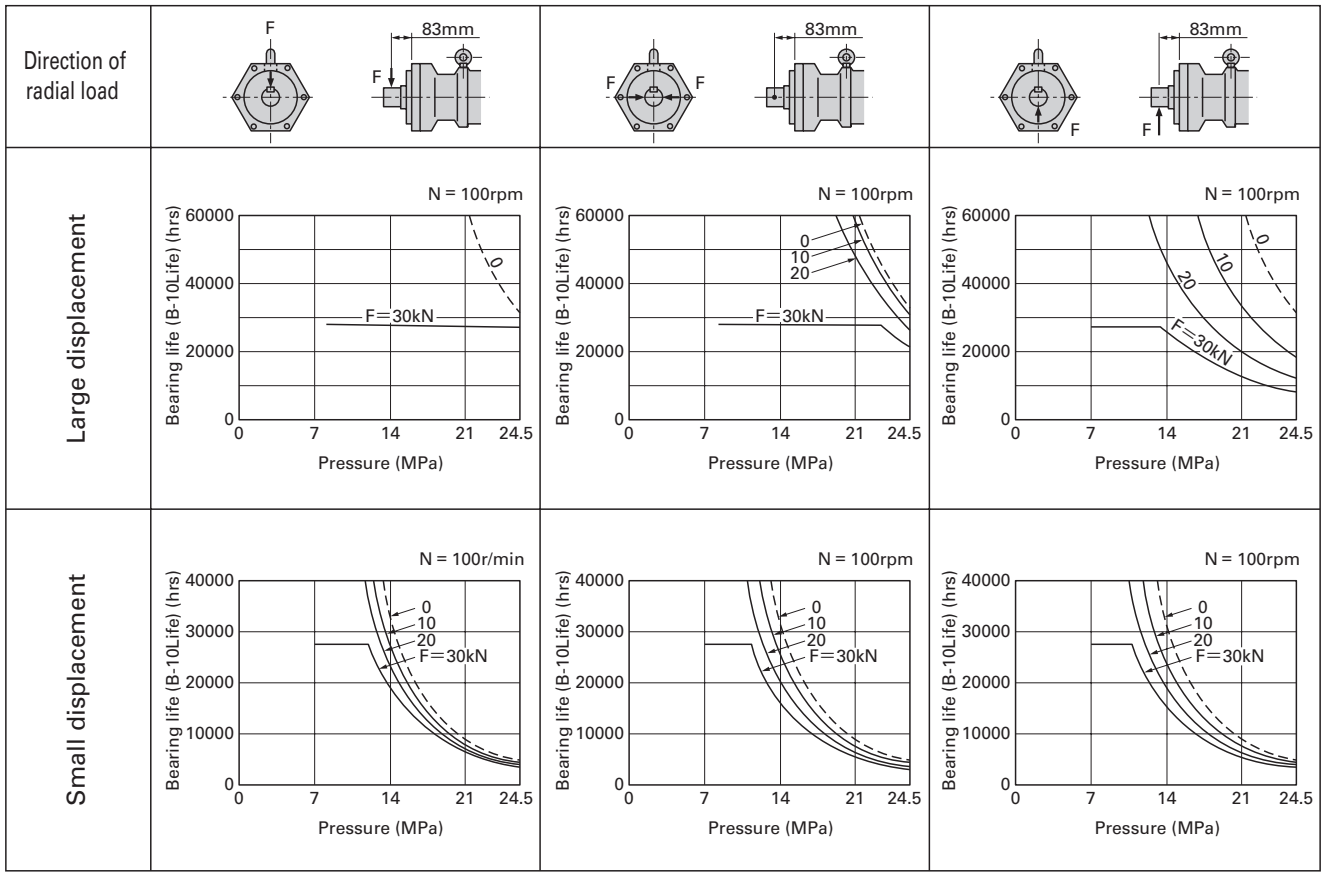


(Pressure at brake releasing port) minus (Drain pressure in case)

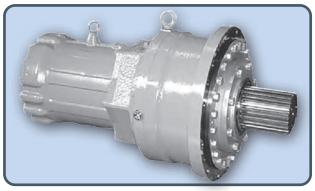
Allowable radial load

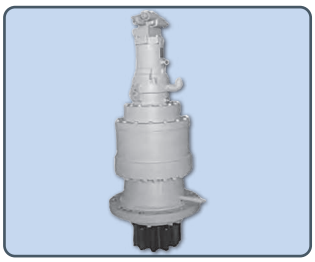


Bearing life



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 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:

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 catalog is useful for frequent use.

Note: This catalog contains planetary gear combinations which are frequently used. There motors can be mage compatible for high-torque, high reduction ratio other than specified values in this catalog. We appreciate your inquiry in this regard.

Single-Stage Reduction Gear with DOWMAX motor (Reduction ratio: 5.091)

Double-Stage Reduction Gear with DOWMAX motor (Reduction ratio: 24 or 26.3)

DOWMAX motor is developed with planetary gear suitable for the application of Shield Tunneling.

All kind of DOWMAX motor (two-speed, with Mechanical Brake, with Counter Balance Valve etc.} and special motor and planetary gear reduction motor combined together are compatible.

Model no.

Hydraulic motor

ME 300 B G

Series	Motor size	Design code	Motor shaft
DOWMAX motor	Metric displacement		**G** – Metric hollowed spline shaft **C** – Metric parallel keyed shaft

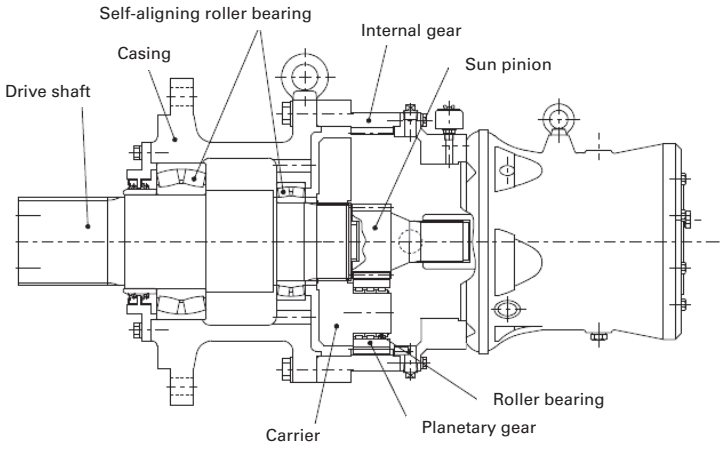
Gear reducer

GE 180 H F P 005 - 002

Planetary gear	Mounting direction	Mounting type	Part number
Size number	**H** – Horizontal **V** – Vertical / Shaft downward (basic standard) **W** – Vertical / Shaft upward (special)	**F** – Direct connection with flange **H** – Foot mount (basic standard)	Gear ratio
			Output shaft **P** – Metric spline shaft **N** – Metric parallel keyed shaft **S** – Other special shafts

DOWMAX® motor with planetary gear

Single reduction
Gear ratio 5.091



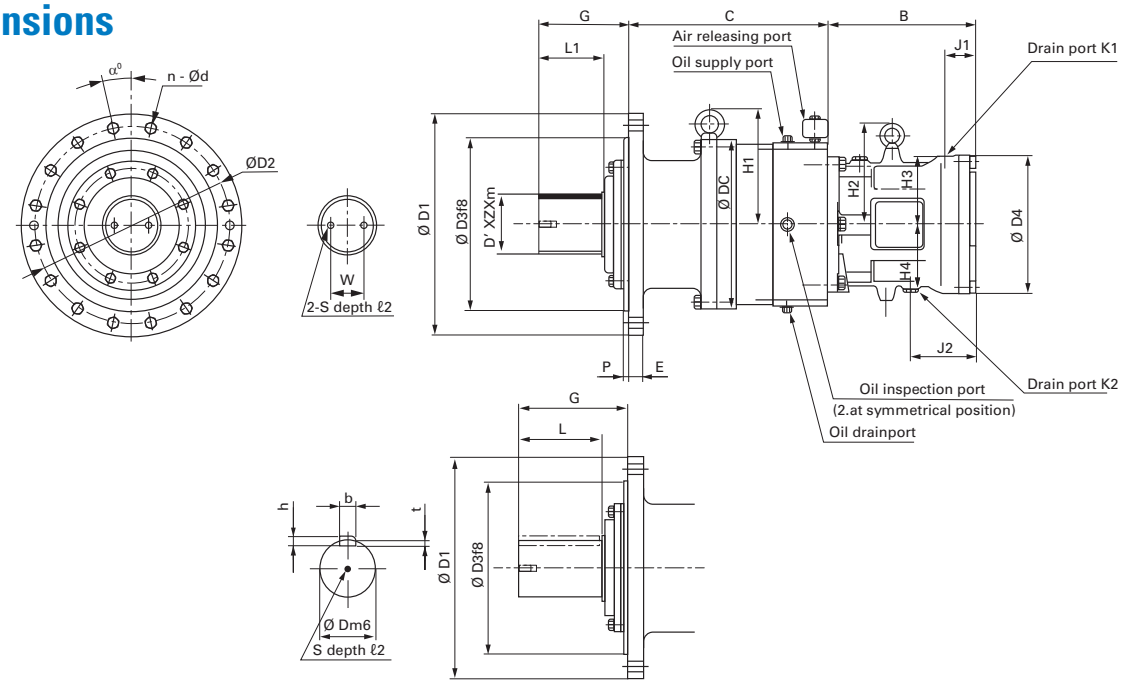
Specification

Motor model	Gear motor	Gear ratio	Equivalent displacement (cm^3/rev)	Rated speed (rpm)	Continuous operation		Intermittent max.		Allowable radial load (N)	Mass (kg)
					Output torque (Nm)	Effective pressure (MPa)	Output torque (Nm)	Effective pressure (MPa)		
ME100-C	GE180HFP005-002	5.091	504	80	1025	13.7	2380	31.9	31000	107
				20	2055	27.5			37200	
				10	2055	27.5			37200	
ME150-G	GE180HFP005-004	5.091	774	80	1510	13.3	3630	31.6	31000	132
				20	3020	26.7			37200	
				10	3100	27.4			37200	
ME175-G	GE180HFP005-006	5.091	891	80	1510	11.4	3630	27.5	31000	132
				20	3020	22.9			37200	
				10	3300	25.0			37200	
ME300BG	GE224HFP005-008	5.091	1527	80	2810	12.4	6760	29.9	62000	190
				20	5630	24.9			80300	
				10	6140	27.1			80300	
ME350BG	GE250HFP005-010	5.091	1782	80	3630	13.7	8420	31.9	73000	260
				20	7260	27.5			92000	
				10	7260	27.5			92000	
ME600BG	GE280HFP005-012	5.091	3055	80	5040	11.1	12100	26.7	85000	346
				20	10080	22.3			117000	
				10	11000	24.3			117000	
ME750BG	GE315HFP005-014	5.091	3818	80	6500	11.5	18050	31.9	126000	443
				20	15560	27.5			176000	
				10	15560	27.5			176000	
ME850BG	GE315HFP005-016	5.091	4317	80	7790	12.2	18700	29.2	126000	443
				20	15580	24.3			176000	
				10	17000	26.6			176000	
ME1300AG	GE355HFP005-018	5.091	6847	60	11000	10.8	27600	27.2	223000	590
				20	23000	22.7			264000	
				10	24900	24.5			264000	
ME1900-G	GE400HFP005-020	5.091	9510	40	18100	12.8	39600	28.1	264000	870
				15	33000	23.4			338000	
				10	34500	24.5			338000	
ME2600-G	GE450HFP005-022	5.091	13125	35	30200	15.5	55200	28.4	350000	1150
				15	46000	23.6			411000	
				10	47600	24.5			411000	

- The allowable output torque differs for the output speed used.
- The intermittent max. torque shall be within the duty cycle of 1% per every time.
- 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.
- Incase 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 detail information for motor, please refer to catalog another page.
- In case motor are used, as its output shaft to be positioned upward or downward, special specification (Double oil seal) should be applied. In this case, please contact us.
- Please contact us if none of the above meet the specification. Special specification should be applied.

DOWMAX® motor with planetary gear

Dimensions



Single reduction

Involute spline shaft (Old Std. JIS D2001-1959, Side fit, Class b)

Model	D'	Z	m	L_1	L_2	S	W
	Dia.	No. of teeth	Module				
GE180***005	75	23	3	80	25	M12	40
GE224***005	93	29	3	120	35	M16	60
GE250***005	110	20	5	120	35	M16	70
GE280***005	120	22	5	130	35	M16	70
GE315***005	130	24	5	130	35	M16	80
GE355***005	150	28	5	145	40	M20	90
GE400***005	170	32	5	170	40	M20	100
GE450***005	200	38	5	200	50	M24	130

Parallel keyed shaft (Key Std. JIS B1301-1976, Parallel key)

Model								G
	D (m6)	b	h	t	S	L_2	L	
GE180***005	70	20	12	7.5	M12	28	110	164
GE224***005	90	25	14	9	M12	28	140	202
GE250***005	105	28	16	10	M12	28	140	207
GE280***005	115	32	18	11	M12	28	170	223
GE315***005	125	32	18	11	M12	28	170	239
GE355***005	145	36	20	12	M16	30	210	285
GE400***005	165	40	22	13	M16	30	225	315
GE450***005	195	45	25	15	M16	30	270	358

Planetary gear

Model	C	D_1	D_2	D_3 (f8)	DC	E	G	H_1	P	d	n	α	Lub Oil (ℓ)
GE180***005	283	300	270	230	245	20	134	164	10	14	16	11.25	1.2
GE224***005	342	380	340	280	290	28	182	196	10	22	12	15	2
GE250***005	363	410	360	285	315	28	187	218	10	22	16	11.25	3
GE280***005	405	450	400	350	345	30	183	233	10	22	16	11.25	4
GE315***005	438	465	425	320	390	40	199	266	20	22	16	11.25	6
GE355***005	519	560	500	420	445	45	220	294	25	33	16	11.25	9
GE400***005	566	625	555	485	540	45	260	360	25	33	16	11.25	16
GE450***005	633	710	640	570	575	55	288	398	25	33	16	11.25	21

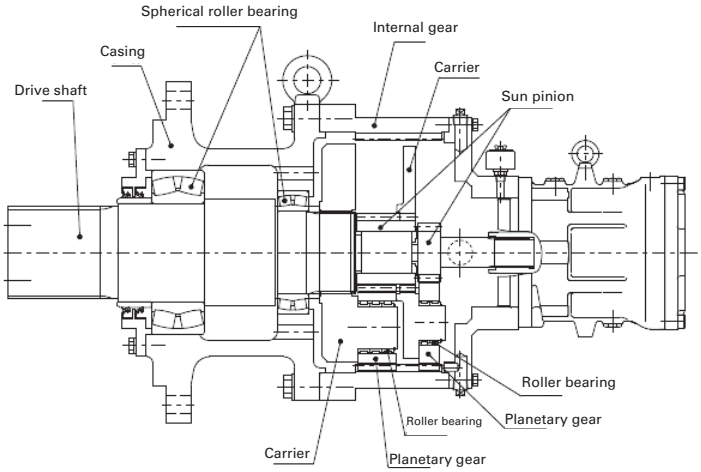
Note: Volume of lubrication oil shows for horizontal installtaion.

Hydraulic motor with hollow shaft

Model	B	D_4	H_2	H_3	H_4	J_1	J_2	K_1	k_2
ME100	196	174	–	81	–	41	–	Rc¼	–
ME150	184	220	154	107	107	50	80	Rc½	Rc½
ME175	184	220	154	107	107	50	80	Rc½	Rc½
ME300B	261	240	171	116	111	55	174	G½	G½
ME350B	261	240	171	116	111	55	174	G½	G½
ME600B	305	280	205	137	130	64	133	G½	G½
ME750B	337	297	211.5	141.5	145.5	110	70	G½	G½
ME850B	337	297	211.5	141.5	145.5	110	70	G½	G½
ME1300A	373	335	228.5	167.5	153	72	208	Rc½	Rc½
ME1900	417	375	264	175	175	162.5	162.5	G½	G½
ME2600	482	390	280	191	191	218.2	218.2	G¾	G¾

DOWMAX® motor with planetary gear

Double reduction
Gear ratio 24 or 26.3



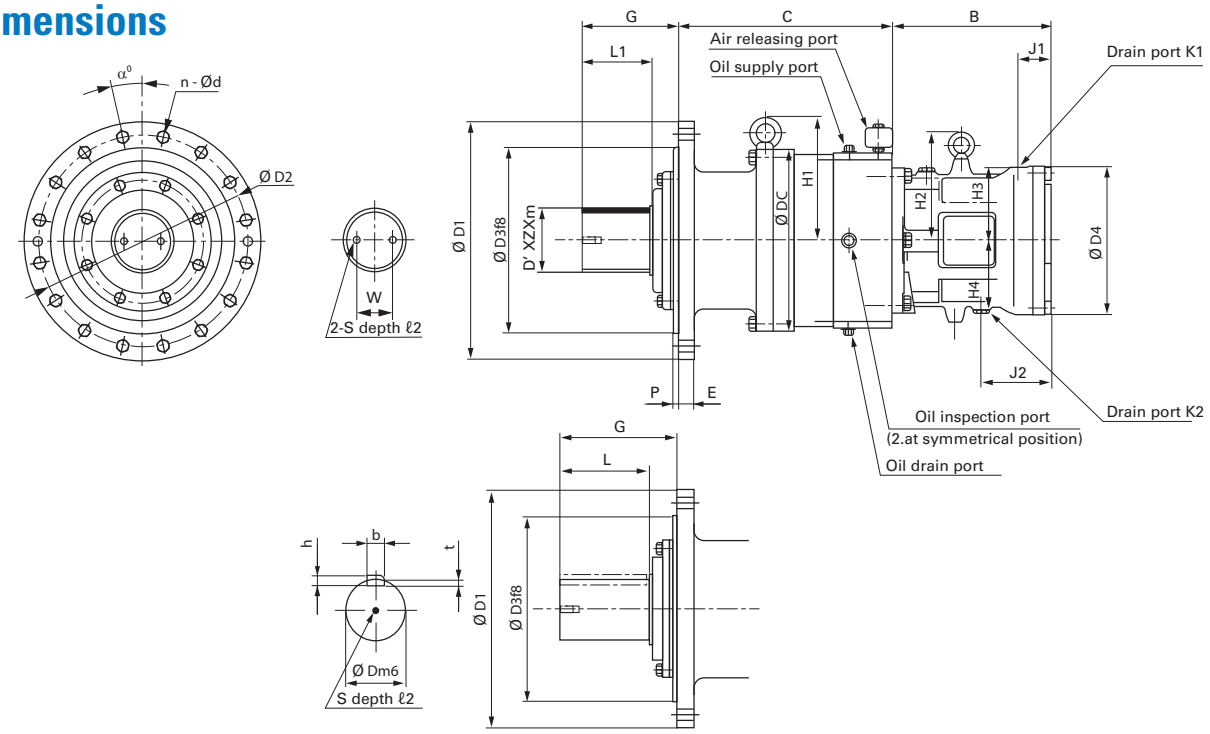
Specification

Model	Gear model	Gear ratio	Equivalent displacement (cm³/rev)	Rated speed (rpm)	Continuous operation		Intermittent max.		Allowable radial load (kN)	Mass (kg)
					Output torque (Nm)	Effective pressure (MPa)	Output torque (Nm)	Effective pressure (MPa)		
ME100-C	GE250HFP026-024	26.3	2604	38	6030	16.0	11760	31.1	92000	272
				20	9800	25.9			92000	
				10	10400	27.5			92000	
ME150-G	GE31MHFP024-026	24.0	3648	25	12700	24.0	16870	31.9	176000	392
				10	14530	27.4			176000	
				5	14530	27.4			176000	
ME175-G	GE31MHFP024-028	24.0	4200	25	14000	23.0	19400	31.8	176000	392
				10	16730	27.4			176000	
				5	16730	27.4			176000	
ME300BG	GE31MHFP024-030	24.0	7200	25	14100	13.5	26400	25.3	176000	420
				10	22000	21.0			176000	
				5	24000	23.0			176000	
ME350BG	GE31MHFP024-032	24.0	8400	25	14100	11.6	26400	21.6	176000	420
				10	22000	18.0			176000	
				5	24000	19.7			176000	
ME300BG	GE355HFP024-034	24.0	7200	25	18300	17.5	33300	31.9	264000	510
				10	28690	27.4			264000	
				5	28690	27.4			264000	
ME350BG	GE355HFP024-036	24.0	8400	25	18300	15.0	36850	30.2	264000	510
				10	30000	24.6			264000	
				5	33400	27.4			264000	
ME600BG	GE355HFP024-038	24.0	14400	25	18300	8.8	36850	17.6	264000	556
				10	30000	14.3			264000	
				5	33500	16.0			264000	
ME750BG	GE400HFP024-040	24.0	18000	21	30000	11.5	58800	22.5	320000	773
				10	47400	18.1			338000	
				5	53400	20.4			338000	
ME850BG	GE400HFP024-042	24.0	20352	18	35000	11.8	58800	19.9	338000	773
				10	47400	16.0			338000	
				5	53400	18.1			338000	
ME850BG	GE450HFP024-044	24.0	20352	18	40500	13.7	78890	26.7	411000	1023
				10	63000	21.3			411000	
				5	71700	24.3			411000	
ME1300AG	GE500HFP024-046	24.0	32280	16	56700	12.1	103290	22.0	470000	1370
				10	62300	13.3			470000	
				5	93900	20.0			470000	

- 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: 0.96
- 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.
- In case motor are used, as its output shaft to be positioned upward or downward, special specification (Double oil seal) should be applied. In this case, please contact us.
- Please contact us if none of the above meet the specification. Special specification should be applied.

DOWMAX® Double reduction

Dimensions



Double reduction

Involute spline shaft (Old std. JIS D2001-1959, Side fit, Class b)

Model	D'	Z	m	L_1	L_2	S	W
	Dia.	No. of teeth	Module				
GE250***026	110	20	5	120	35	M16	70
GE31M***024	130	24	5	130	35	M16	80
GE355***024	150	28	5	145	40	M20	90
GE400***024	170	32	5	170	40	M20	100
GE450***024	200	38	5	200	50	M24	130
GE500***024	220	27	7.5	250	50	M24	130

Parallel keyed shaft (Key std. JIS B1301-1976, Parallel key)

Model								G
	D (m6)	b	h	t	S	L_2	L	
GE250***026	105	28	16	10	M12	28	140	207
GE31M***024	125	32	18	11	M12	28	170	239
GE355***024	145	36	20	12	M16	30	210	285
GE400***024	165	40	22	13	M16	30	225	315
GE450***024	195	45	25	15	M16	30	270	358
GE500***024	215	50	28	17	M20	35	300	408

Planetary gear

Model	C	D_1	D_2	D_3 (f8)	DC	E	G	H_1	P	d	n	α	Lub Oil (ℓ)
GE250***026	412	410	360	285	315	28	187	218	10	22	16	11.25	4
GE31M***024	499	465	425	320	400	40	199	271	20	22	16	11.25	7
GE355***024	589	560	500	420	445	45	220	294	25	33	16	11.25	10
GE400***024	643	625	555	485	540	45	260	360	25	33	16	11.25	18
GE450***024	723	710	640	570	575	55	288	398	25	33	16	11.25	23
GE500***024	782	780	690	600	640	60	358	452	25	39	16	11.25	30

Note: Volume of lubrication oil shows for horizontal installtaion.

Hydraulic motor with hollow shaft

Model	B	D_4	H_2	H_3	H_4	J_1	J_2	K_1	k_2
ME100	196	174	–	81	–	41	–	Rc¼	–
ME150	184	220	154	107	107	50	80	Rc½	Rc½
ME175	184	220	154	107	107	50	80	Rc½	Rc½
ME300B	261	240	171	116	111	55	174	G½	G½
ME350B	261	240	171	116	111	55	174	G½	G½
ME600B	305	280	205	137	130	64	133	G½	G½
ME750B	337	297	211.5	141.5	145.5	110	70	G½	G½
ME850B	337	297	211.5	141.5	145.5	110	70	G½	G½
ME1300A	373	335	228.5	167.5	153	72	208	Rc½	Rc½

DOWMAX® motor with planetary gear

Shield tunneling application

DOWMAX motors 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.

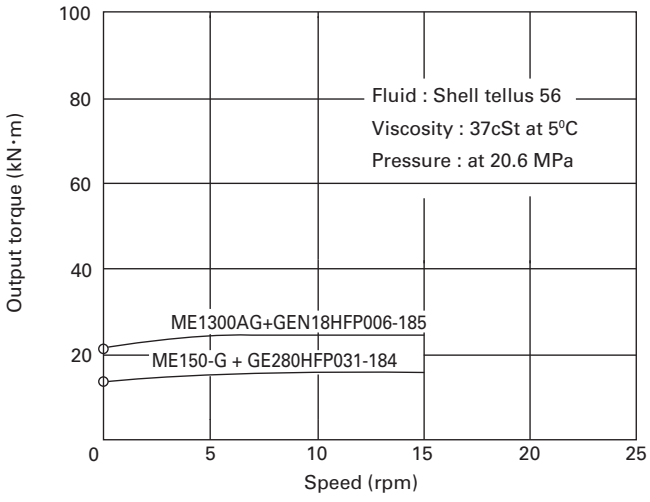
Specification

Model	Gear ratio	Equivalent displacement cm^3/rev	Rated pressure MPa (kgf/cm^2)	Max. pressure MPa (kgf/cm^2)	Rated torque Nm (kgfm)	Max. torque Nm (kgfm)	Rated speed (rpm)	Allowable radial load (kN)	Radial load point (Distance from mounting surface) (mm)	Mass kg
ME150-G + GE280HFP031-184	1/31.03	4717	20.6 (210)	24.5 (250)	14710 (1500)	17652 (1800)	20	160	128	252
ME1300AG+GEN18HFP006-185	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 catalog in conjunction with this catalog 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 catalog 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 catalog.
  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 data for the respective model.

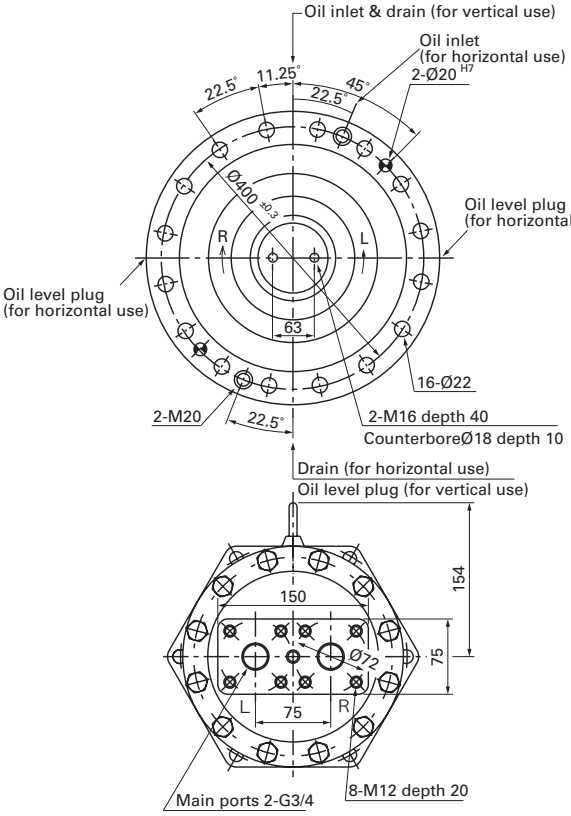


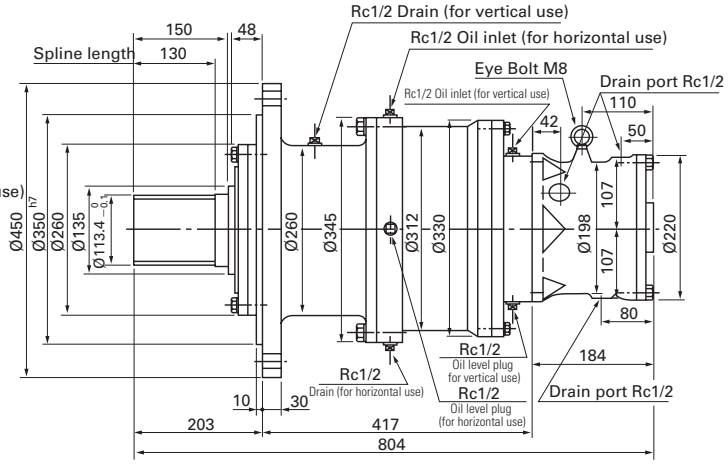
DOWMAX® Shield tunneling application

ME150-G+GE280HFP031-184

Gear Parts No.: DY2184B

Equivalent displacement	4,717cm³/rev
Gear ratio	1/31.03
Output torque	14,710Nm
Max. output torque	17,652Nm
Rated speed	20rpm



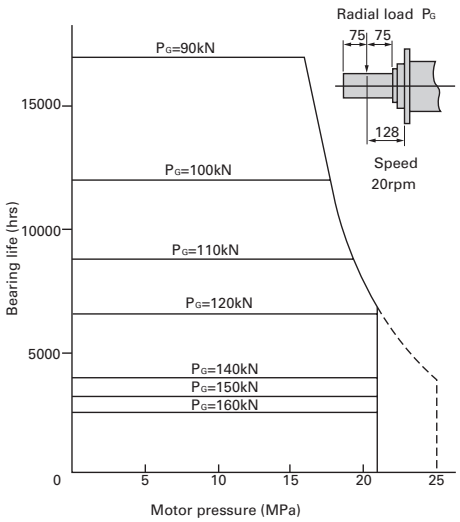


Rotation (viewed shaft end)
CW : Port R pressurized
CCW : Port L pressurized

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.=Ø5.40
	Over-all. across a gven number of teeth (reference)	$43.008^{-0.004}_{-0.071}$ (5-Teeth)
JIS D-2001-1959 Tooth Flank Fit		

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) X $\frac{20}{\text{Output speed}}$

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°C)

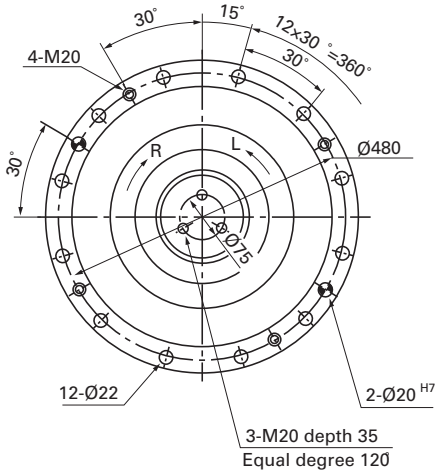
4. For detailed information for motor, please refer to other page.

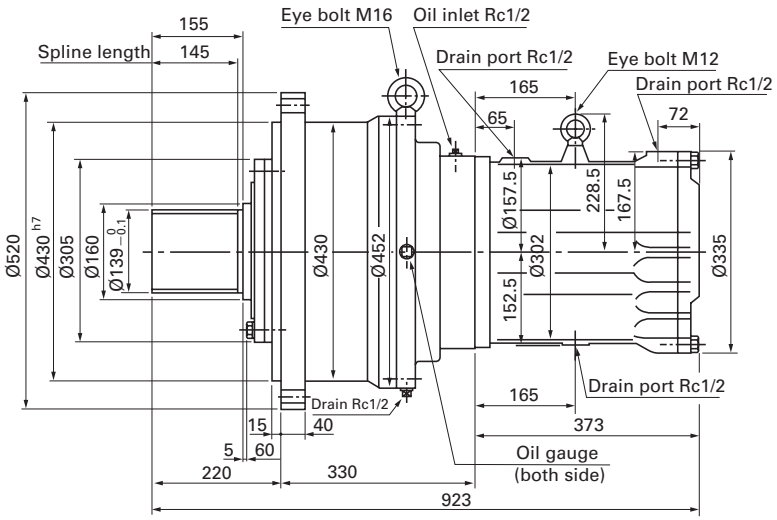
DOWMAX® motor with planetary gear

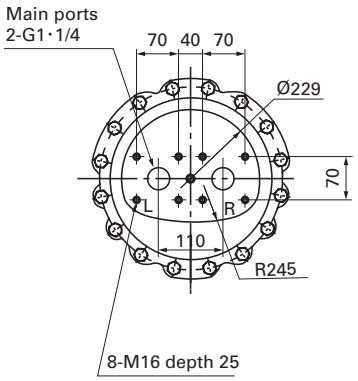
ME1300AG+GEN18HFP006-185

Gear Parts No.: DY2185B

Equivalent displacement	8,070cm³/rev
Gear ratio	1/6
Output torque	25,125Nm
Max. output torque	29,910Nm
Rated speed	15rpm





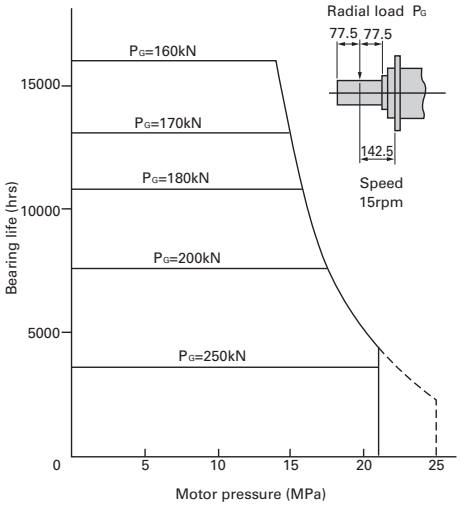


Rotation (viewed shaft end)
CW : Port R pressurized
CCW : Port L pressurized

JIS D2001 Involute spline

140 × 26 × 5 (Class b)		
Coefficient of profile shifting		+0.800
Tool	Tooth form	Stub tooth
	Module	5
	Pressure angle	20°
Number of teeth		26
Dia. of basic pitch circle		130
Tooth thickness	Grade	CLASS b
	Over-pin Dia.	$149.272^{-0.033}_{-0.175}$ Pin dia.=Ø9
	Over-all. across a given number of teeth (reference)	$56.219^{-0.005}_{-0.086}$ (4-teeth)
JIS D-2001-1959 Tooth flank fit		

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:

$$\text{B-10 Life} = \text{(Bearing life obtainable on the chart)} \times \frac{15}{\text{Output speed}}$$

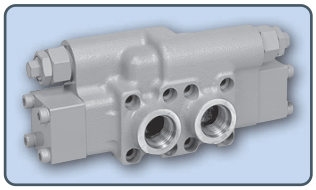
The bearing life, when the load point is not at the middle of shaft extension, is different from the chart. Refer to factory in such a case.

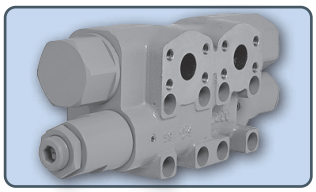
3. Lubrication

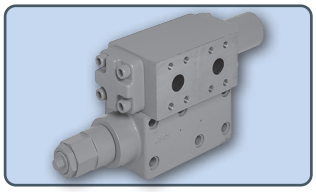
Quantity of lubricating oil	6L for horizontal use
Lubricating oil	Mild EP gear oil equivalent to ISO VG220 (ambient temp. 0~35°C)

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

DOWMAX® Counter balance valve with brake valves







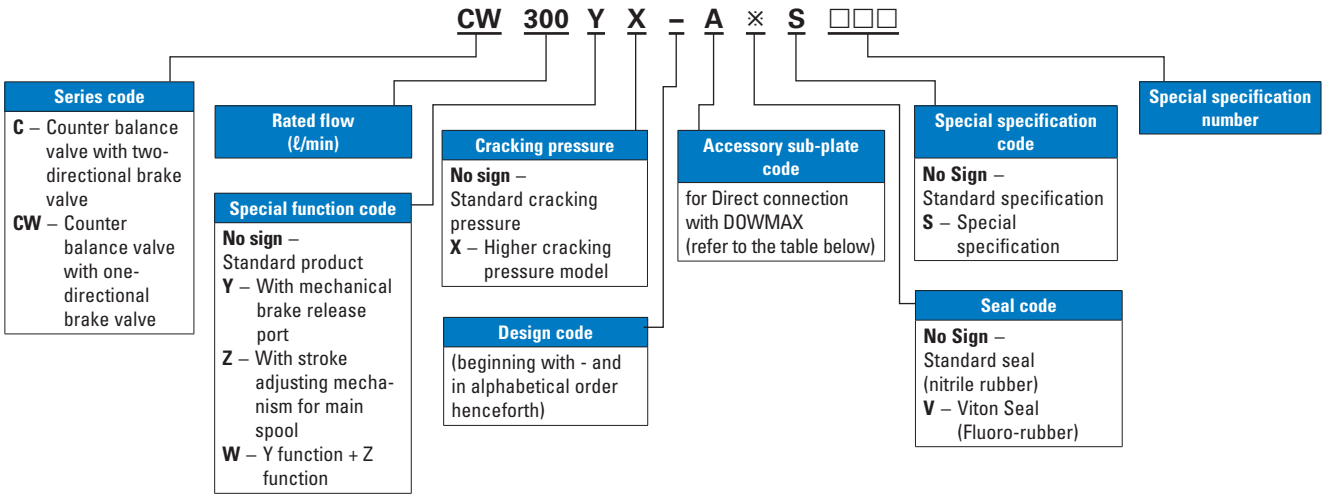
This counter balance valve generates the braking pressure in the hydraulic motor, proportional to the load in lowering loads at slewing, running and winching operations and thus prevent overrunning of motor forced by loads.

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.

Table of contents

Counter balance valve with brake valves

Model code



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	300		24	This one-directional counter balance valve is used for winches allowing smooth rolling down operation.

- Operating oil temperature range : -20⁰ to +80⁰ 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 NM.)

Counter balance valve with brake valves

Operation principle

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

(During acceleration)

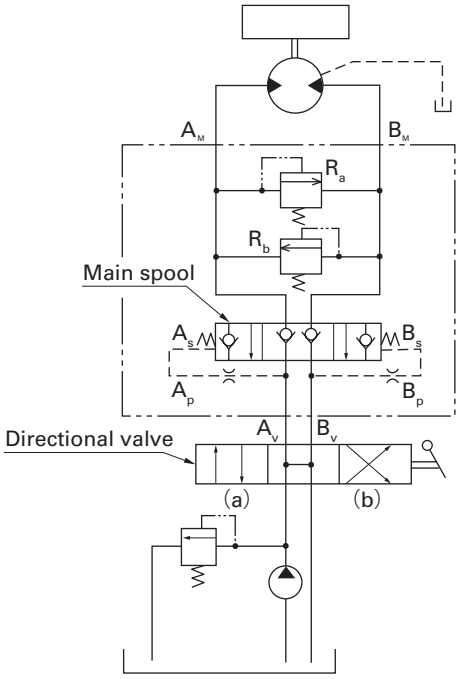
When the directional valve is switched to either direction to accelerate the hydraulic motor, assuming that the valve is switched to the (a) side, the fluid will be introduced to the A_v port. Then, the fluid is directed to the spring chamber A_s at the edge surface of the main spool through the pilot passage A_p of the counter balance valve and thus, the main spool will move to the right direction. Then, the fluid flown into the A_v port is introduced to the hydraulic motor from the A_M port through the check valve in the main spool. A_s the hydraulic motor cannot absorb all the fluid flown into the A_v 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 A_v and B_v 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 valves CW300A

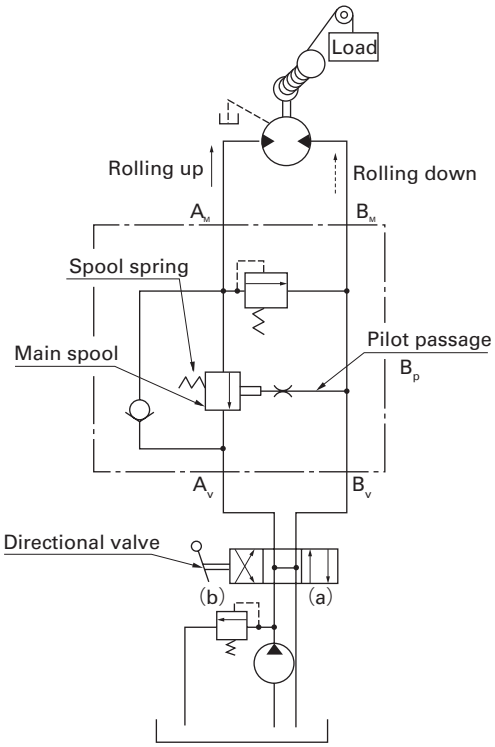
(During rolling up)

When the directional valve is switched to the (a) side and the fluid is introduced from the A_v 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 B_v 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 B_v port. The fluid introduced to the B_v port is directed to the main spool end surface through the pilot passage B_p. 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 B_v port is introduced to the hydraulic motor inlet through the B_m port and the load is lowered. The fluid discharged from the hydraulic motor outlet is drained to the A_v 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.

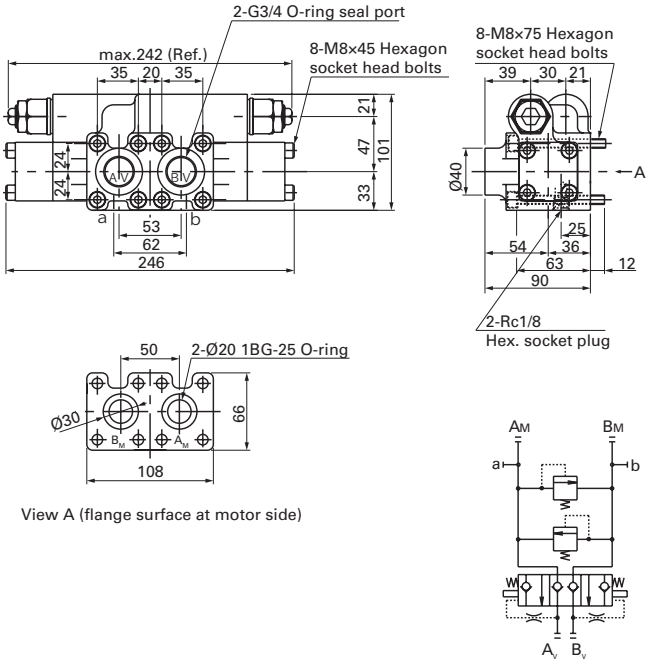


Counter balance valve with brake valves

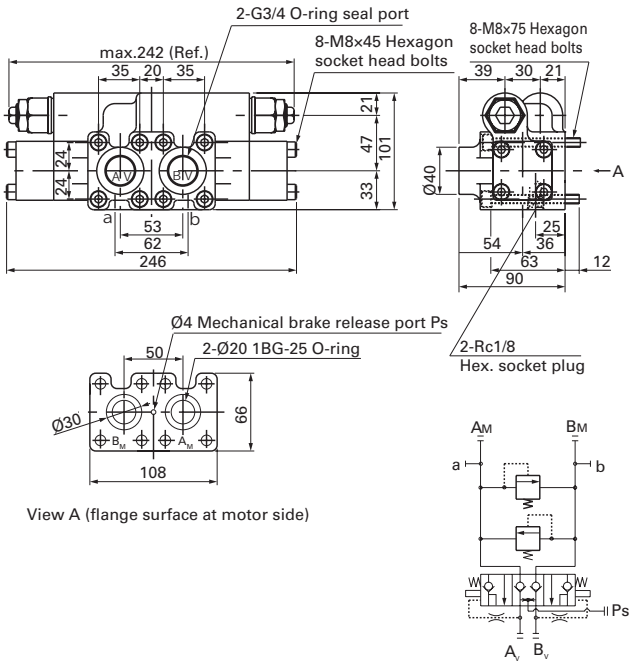
C100□

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

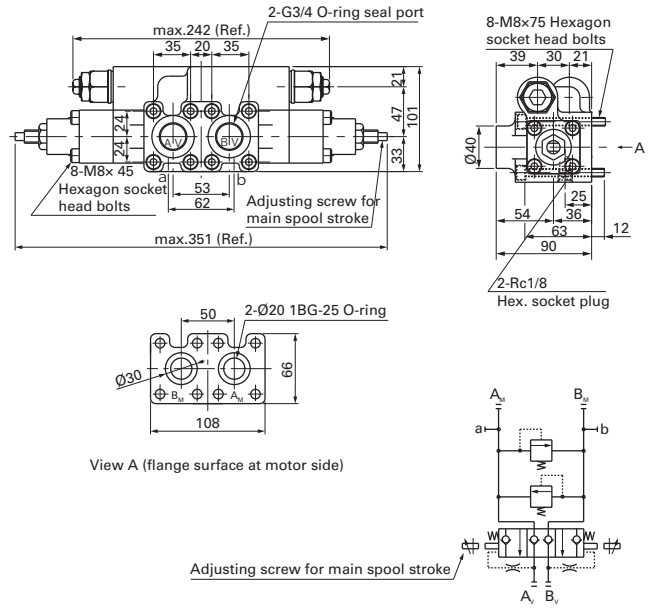
■C100



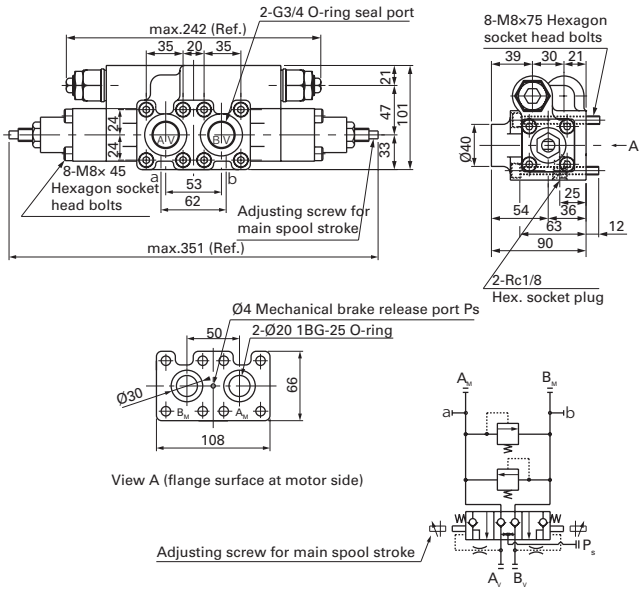
■C100Y



■C100Z



■C100W



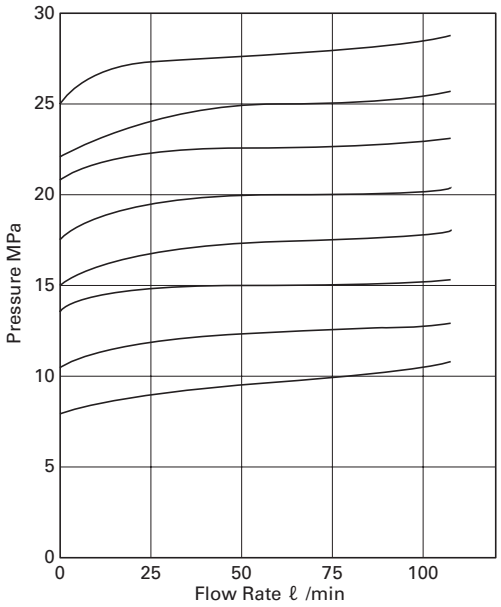
Counter balance valve with brake valves

Standard performance data

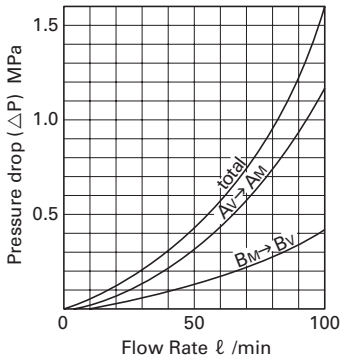
Hydraulic fluid: Shell tellus #56, viscosity: 37 cSt (Oil temperature 50° C.)

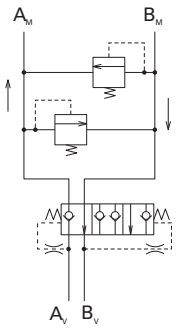
(Data are not guaranteed values but averages)

1. Pressure override performance

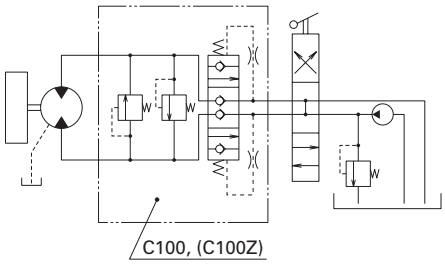


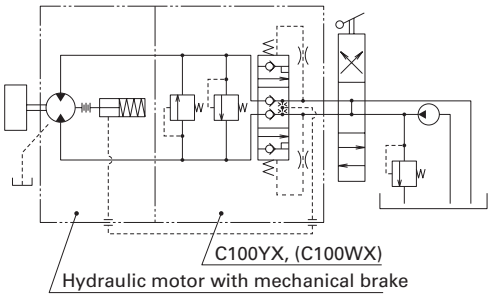
2. Pressure drop



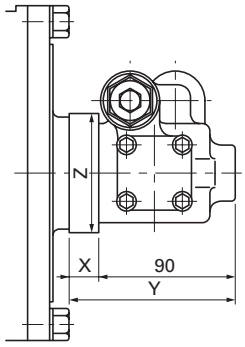


Application example





Sub-plate dimension for DOWMAX hydraulic motor direct connection



Motor Model	ME100	ME150 ME175 ME300B ME350B	ME600B	ME750B ME850B	ME1300A	ME1900	ME2600	ME3100	ME4100
Subplate 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

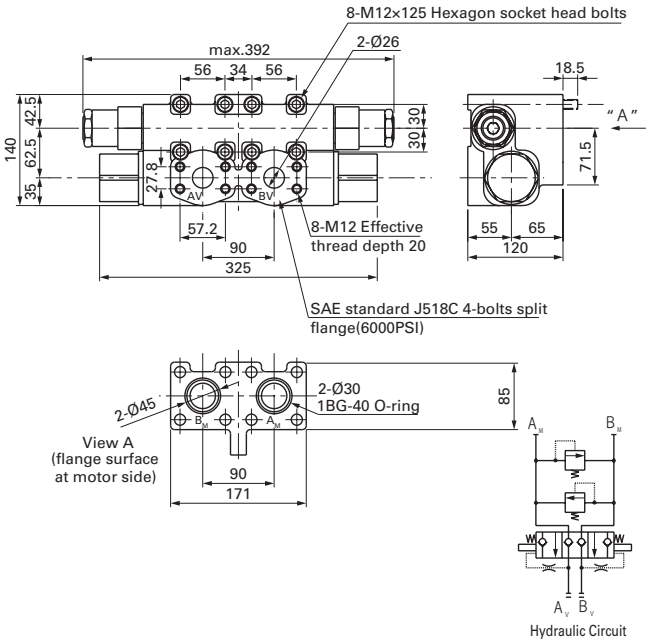
Numbers in ( ) for ME 100 show sub-plate dimensions in direct connection with C100Y & C100W. ME100 with-mark can be directly connected without sub-plate.

Counter balance valve with brake valves

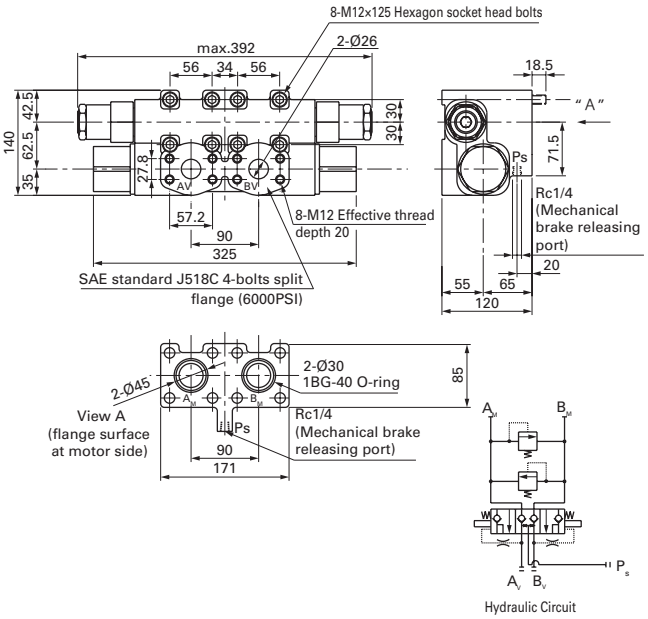
C300□B

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

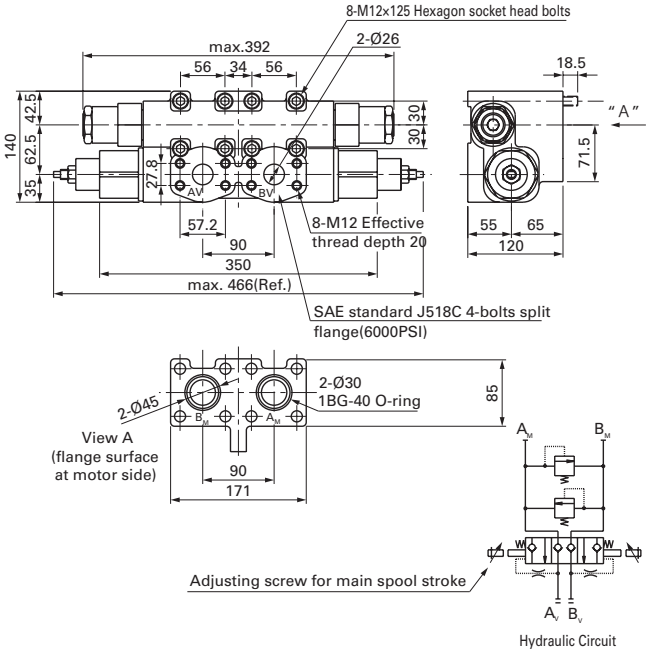
C300B



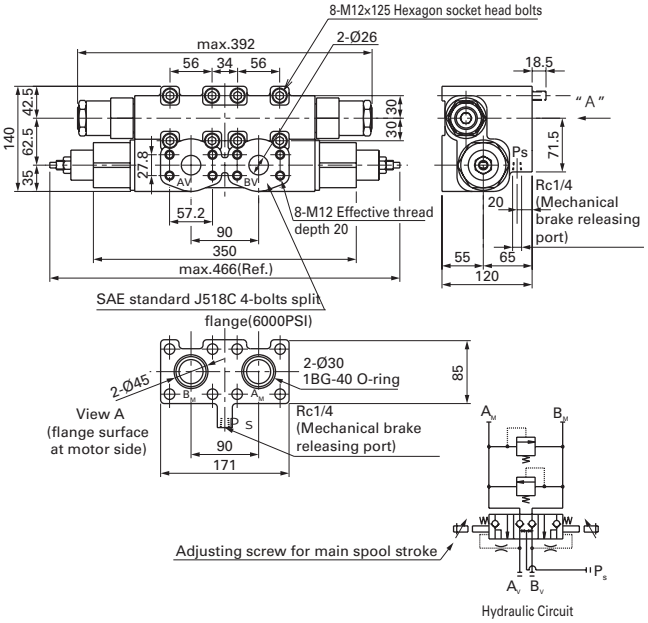
C300YB



C300ZB



C300WB



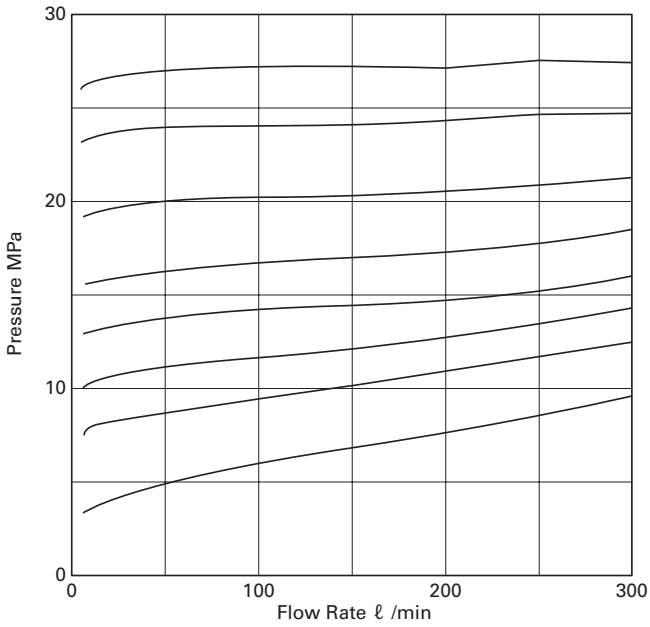
Counter balance valve with brake valves

Standard performance data

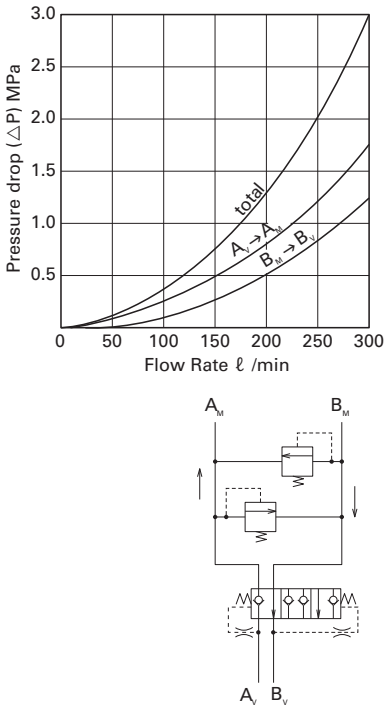
Hydraulic fluid: Shell tellus #56, viscosity: 37 cSt (Oil temperature 50⁰ C.)

(Data are not guaranteed values but averages)

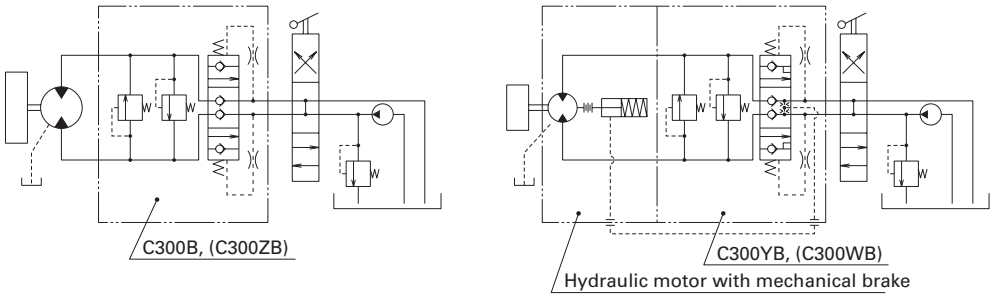
1. Pressure override performance



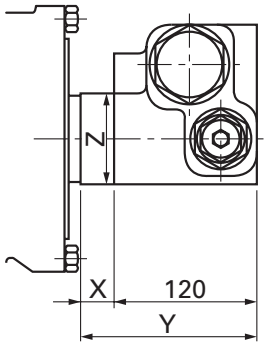
2. Pressure drop



Application example



Sub-plate dimension for DOWMAX hydraulic motor direct connection



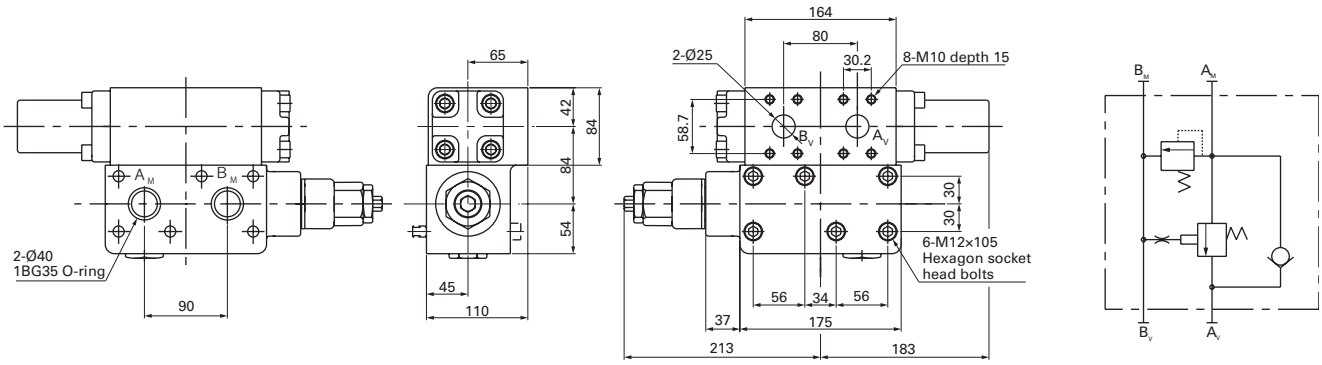
Motor Model	ME100	ME150 ME175 ME300B ME350B	ME600B	ME750B ME850B	ME1300A	ME1900	ME2600	ME3100	ME4100
Subplate code		A	A	C	R	G	H	K	J
X		30	30	30	40	55	35	40	35
Y		150	150	150	160	175	155	160	155
Z		86	86	88	110	84	84	120	110

Counter balance valve with brake valves

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



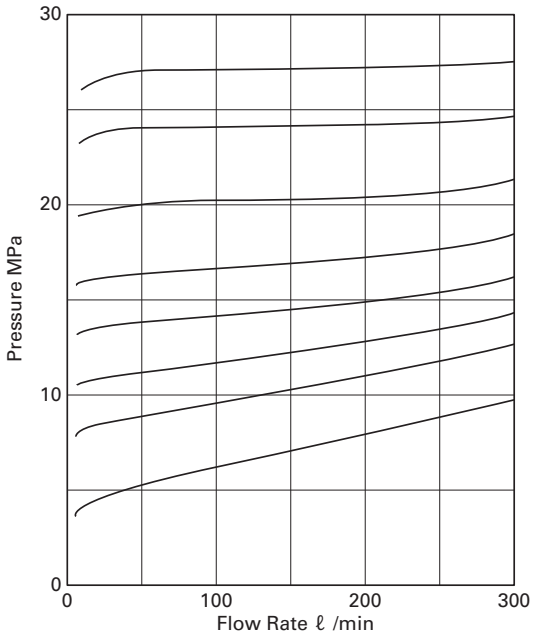
Counter balance valve with brake valves

Standard performance data

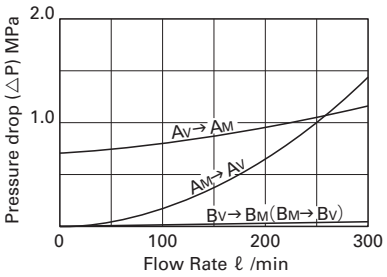
Hydraulic fluid: Shell tellus #56, viscosity: 37 cSt (Oil temperature 50° C.)

(Data are not guaranteed values but averages)

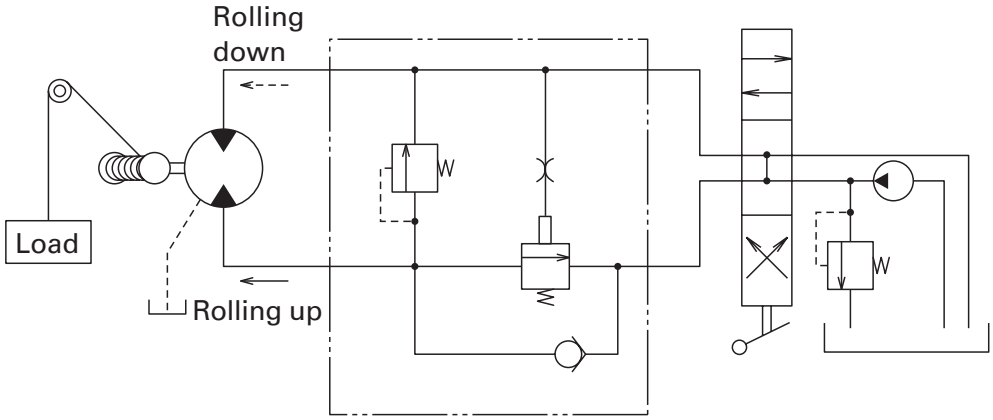
1. Pressure override performance



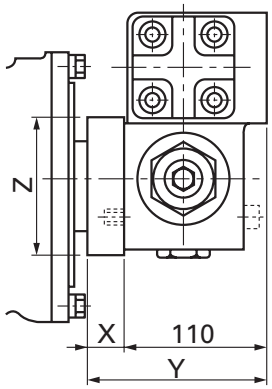
2. Pressure drop



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
Subplate 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

Eaton Industries (Japan) Ltd.

Head office & Tokyo sales office

8-11-37 Akasaka
Minato-ku, Tokyo 107-0052, Japan
TEL +81 3-5786-2560
FAX +81 3-5786-2561

Osaka sales office

Mainichi Bldg INTECIO 3-4-5 Umeda,
Kita-ku, Osaka 530-0001, Japan
TEL +81-6-6136-6105
FAX +81 6-6136-6107

Fukuoka sales office

Dai6 Green Bldg, 12-19, 2-chome,
Hakataekimae, Hakata-ku,
Fukuoka 812-0011
TEL 092-475-5364
FAX 092-412-2002

Kyoto plant

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

Eaton
EMEA Headquarters
Route de la Longeraie 7
1110 Morges, Switzerland
Eaton.eu

Publication No. E-MOPI-CC005-E1
July 2021

Follow us on social media to get the latest product and support information.

Powering Business Worldwide

Mi FLUID POWER SOLUTIONS®

Find a location near you!

Mi Fluid Power Solutions

Looking for specialized solutions for fluid power operations? Talk to the experts at Mi Fluid Power Solutions for expertise related to hydraulic power units, gearbox, and cylinder repair.

To view locations, scan QR Code or go to: **qrco.de/bd4Ofp**

MORE CHOICES. **MORE** INVENTORY. **MORE** EXPERTISE.