SXM 040 ISO

The SXM 040 ISO offers a compact design with few moving parts, high starting torque, high efficiency and low weight.

The high-performance and robust bent-axis design, well-dimensioned double tapered roller bearings and well-proven gear synchronisation ensure high efficiency, reliable operation and long life. With a maximum pressure level of 450 bar, this motor is perfect for a variety of demanding applications in, for example, agriculture, construction, material handling, special vehicles, oil/gas, marine, fan drives, railway, energy and transport.

Other advantages:

- High maximum speed
- Smooth operation over the entire speed range
- Compact design and material-optimised and surface-treated housing
- High efficiency
- Valve plates
- Integrated anti-cavitation and flushing valves as option
- Speed sensor available as option
- Suitable for applications with high angular accelerations due to its high rotary stiffness

Sunfab Hydraulics AB, Box 1094, SE-824 12 Hudiksvall, Sweden.Tel: +46 650-367 00, E-mail: sunfab@sunfab.se Web: www.sunfab.com

Versions, main data

Example

SX	M	-	040	W	-	P	-	I43	-	W35	-	F	M	-	1	-	B	20	-	S
Line	1		2	3		4		5		6		7	8		9		10	11		12

Line

SX	Sunfab X

1. Type

M	Motor

2. Displacement

	040

3. Direction of rotation

W	Independent

4. Shaft seal

P	FPM, high pressure, high temperature

For low temperature applications, below -25 °C please contact Sunfab.

5. Mounting flange

ISO 3019-2	
I43	ISO 4-h ø125

6. Shaft

Spline DIN 5480	
W30	W30x2x14x9g
W32	W32x2x14x9g
W35	W35x2x16x9g
Key DIN 6885	
K30	ø 30 k6
K35	ø 35 k6

7. Connection cover

F	90° Mount flange vertical*

*According to SAE J518 code 62

8. Connections

M	Metric
U	UN

9. Additional

1	External drainage

10. Valves

A	Anti-Cavitation valve A-port
B	Anti-Cavitation valve B-port
F	Flushing valve
0	No valve

11. Addition valves

Anti-Cavitation valve	
00	No flushing
20	Flushing from return port with orifice 2.0 mm
Flushing valve	
20	Flushing from return port with orifice 2.0 mm

12. Speed Sensor

P	Prepared for Speed Sensor
S	Fitted speed sensor type Push Pull*

*See separate brochure "Speed Sensor Push Pull" for more information.

Sunfab Hydraulics AB, Box 1094, SE-824 12 Hudiksvall, Sweden.Tel: +46 650-367 00, E-mail: sunfab@sunfab.se Web: www.sunfab.com

SXM 040 ISO

Displacement		
cm^3/rev		41.2
Working pressure		
bar	*max intermittent*	450
	max continuous	420
Revolutions		
rpm	*max intermittent*	6400
	max continuous	5800
	min continuous	300
Max power		
kW	*max continuous / intermittent*	74
Starting torque theoretical value		
Nm/bar		0.66
Moment of inertia (x 10^{-3})		
$kg\,m^2$		2.6
Weight		
kg		21.0

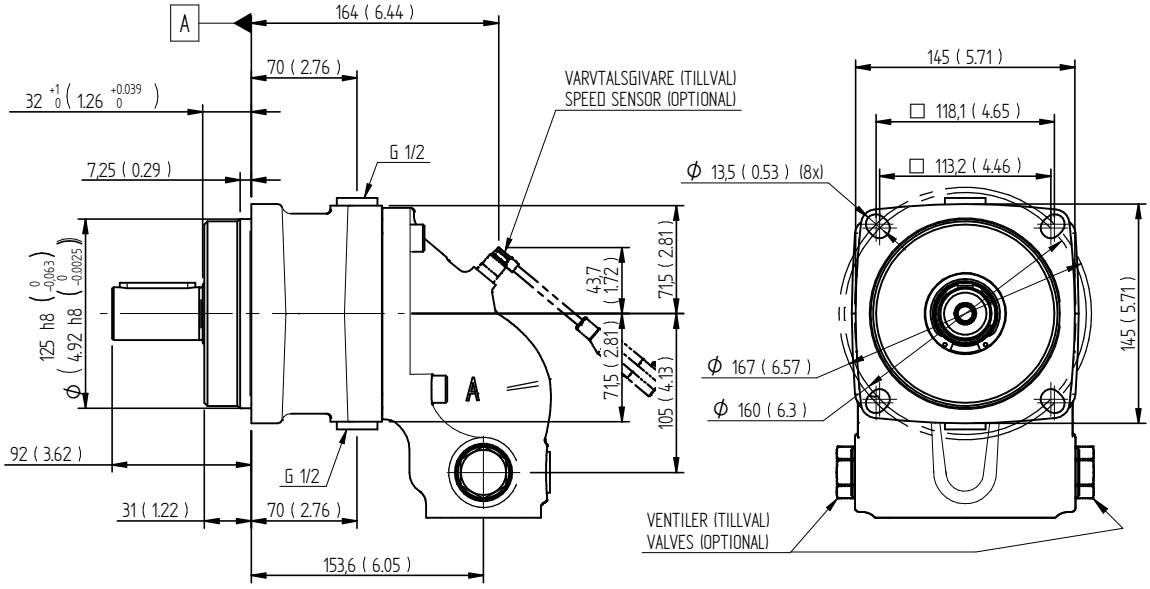
Data concerning RPM are based on maximum permitted peripheral velocity of the tapered roller bearing.
Continuous power data are based on maximum output power without external flushing of the motor at 40 °C system temperature. NOTE! External flushing might be needed.
Intermittent duty is defined as follows: max 6 seconds per minute, e g peak RPM when unloading or accelerating.

Sunfab Hydraulics AB, Box 1094, SE-824 12 Hudiksvall, Sweden.Tel: +46 650-367 00, E-mail: sunfab@sunfab.se Web: www.sunfab.com

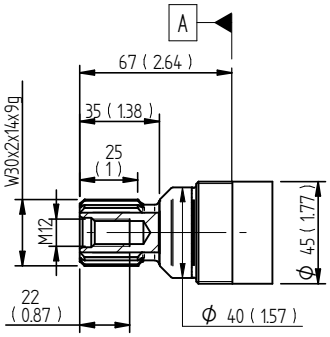
Dimensions SXM 040

Millimeter (inch)

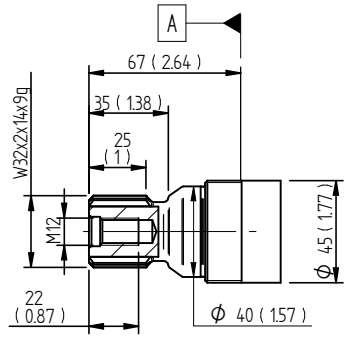
I43 ISO 3019-2



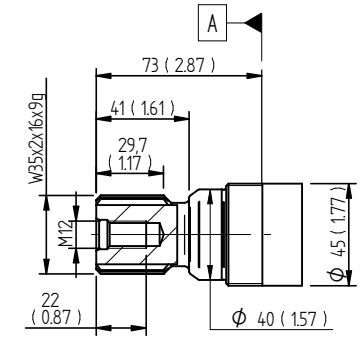
W30 DIN 5480



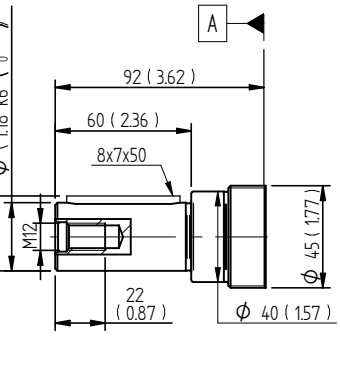
W32 DIN 5480



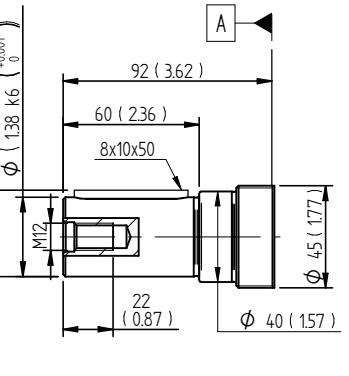
W35 DIN 5480



K30 DIN 6885



K35 DIN 6885

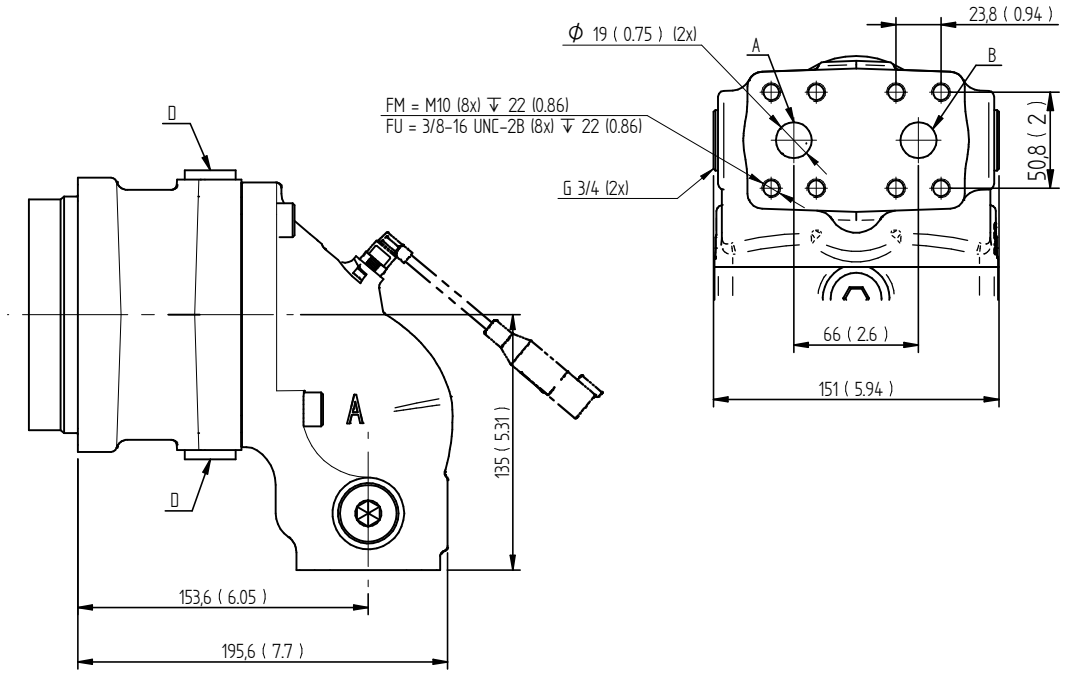


Sunfab Hydraulics AB, Box 1094, SE-824 12 Hudiksvall, Sweden.Tel: +46 650-367 00, E-mail: sunfab@sunfab.se Web: www.sunfab.com

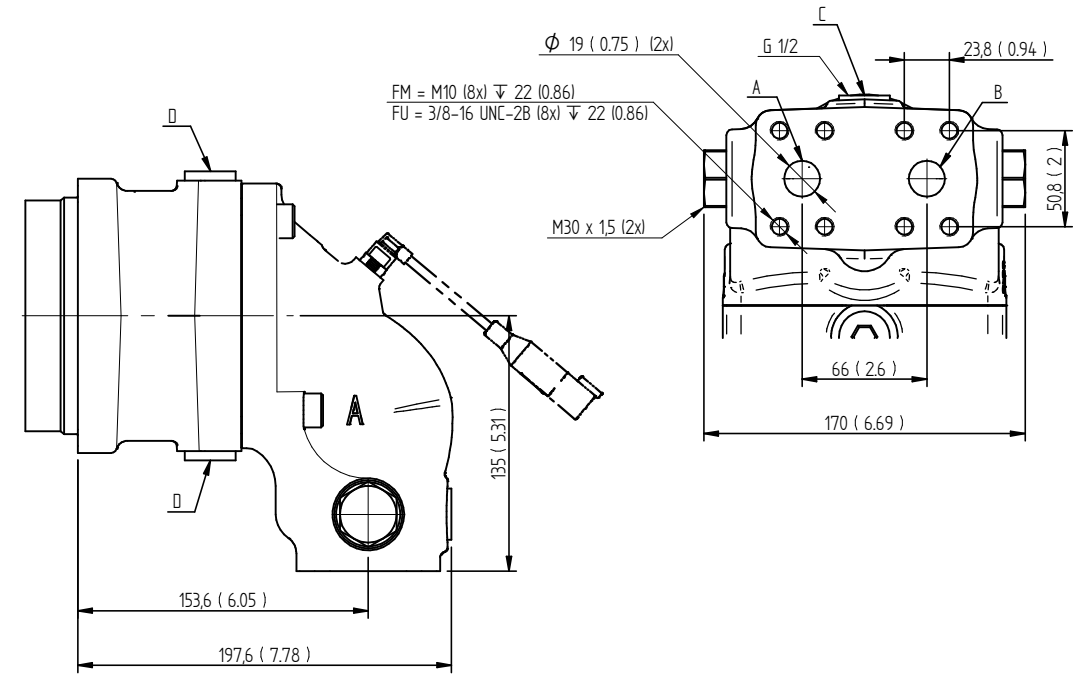
Dimensions SXM 040
Connection

Millimeter (inch)

FM/FU SAE J518, ¾ in, UTAN VENTILER / WITHOUT VALVES



FM/FU SAE J518, ¾ in, MED VENTILER / WITH VALVES



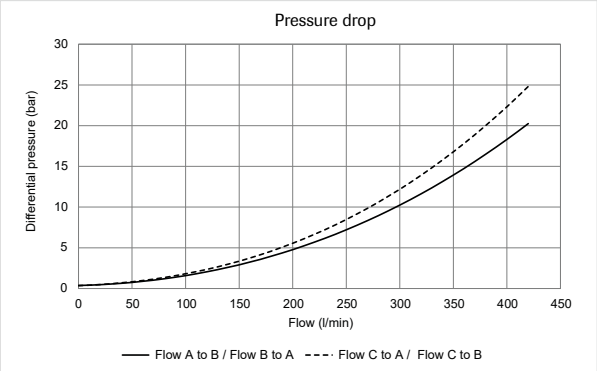
Sunfab Hydraulics AB, Box 1094, SE-824 12 Hudiksvall, Sweden.Tel: +46 650-367 00, E-mail: sunfab@sunfab.se Web: www.sunfab.com

Anti-cavitation valve

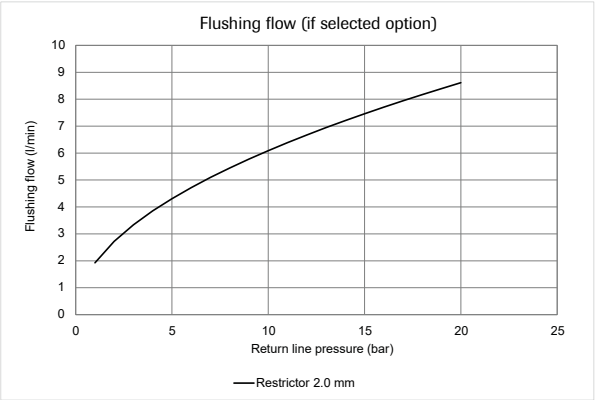
Sunfab's anti-cavitation valve is used to minimise the risk of cavitation damage associated with insufficient inlet pressure. This can occur, for example, in applications with a relatively large rotating mass with a long run-down time (e.g. fan operations).

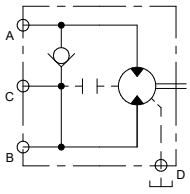
The anti-cavitation valve is one-way but can be installed in either motor direction. The motor can also be ordered with two anti-cavitation valves to allow the motor to run in both directions. In that case, an external supply of make-up oil is required at port C on the motor.
Sunfab's anti-cavitation valve can also be combined with flushing from the return port. As standard, we supply the motor with a 2.0 mm restriction if this option is selected.

Function:
A check valve between the pressure and return ports opens to ensure a flow of oil to the motor if the inlet pressure to the motor becomes too low. It is therefore important to have a specific back pressure on the return line, which if necessary can be created by means of a back-pressure valve.

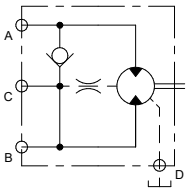


Valve opening pressure 0,3 bar

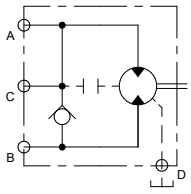




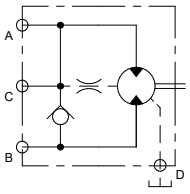
A00
Left rotation
without flushing



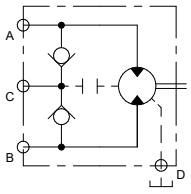
A20
Left rotation
with flushing



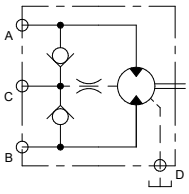
B00
Right rotation
without flushing



B20
Right rotation
with flushing



D00
Left/right rotation
without flushing

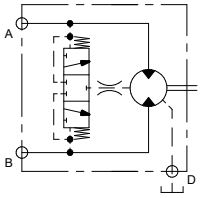


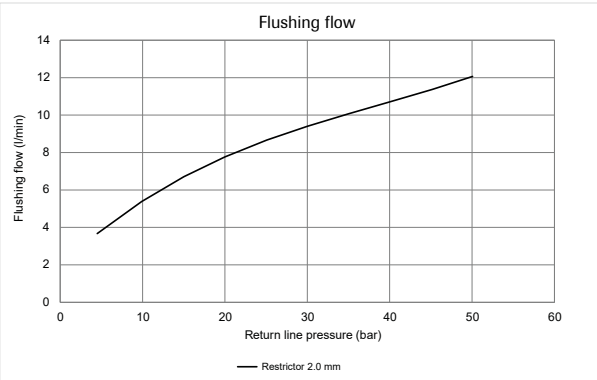
D20
Left/right rotation with
flushing

Flushing valve

Sunfab's flushing valve ensures that the oil temperature inside the motor housing remains at the recommended level. Excessively high temperatures lowers the viscosity of the oil and reduces the service life of the motor.

Function:
A small proportion of the motor's return oil flow is flushed through the motor housing and reduces the housing temperature.



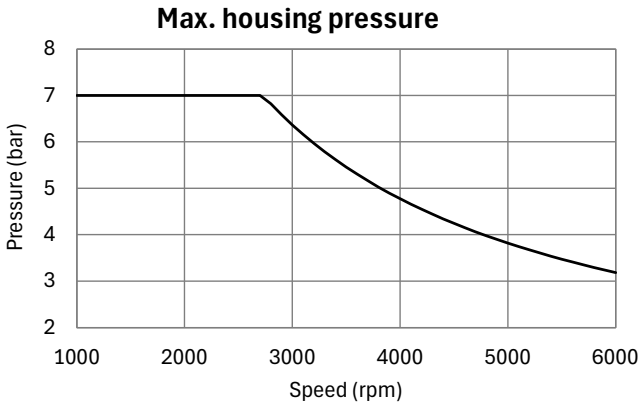


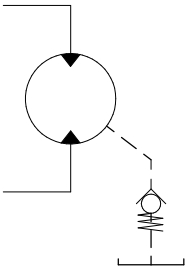
Valve opening pressure 9 bar

Sunfab Hydraulics AB, Box 1094, SE-824 12 Hudiksvall, Sweden.Tel: +46 650-367 00, E-mail: sunfab@sunfab.se Web: www.sunfab.com

General instructions

Shaft seal





Code according to page 2. Versions main data.

For low temperature applications, below -25 °C please contact Sunfab.

The drainage oil should have a maximum temperature of 115 °C with the P shaft seal. This temperature must not be exceeded.

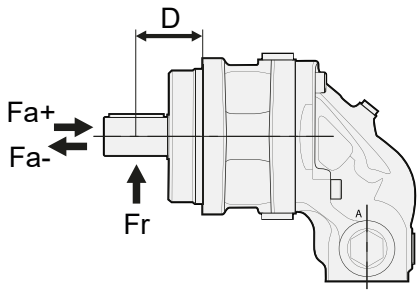
The housing pressure must be equal to or greater than the external pressure on the shaft seal.

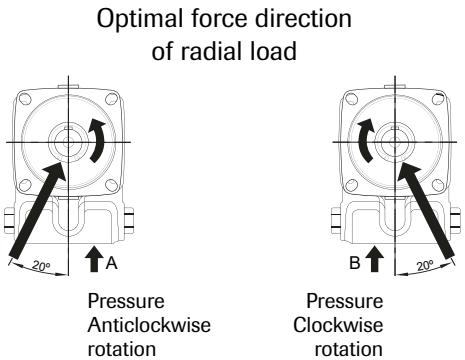
To ensure the function of the shaft seal and lubrication of the motor, we recommend a min. housing pressure of 0,5 bar. If needed, a spring loaded check valve of 0,5 bar can be installed on the housing drain line.

Shaft loads

The life of the motor is highly dependent on the bearing life. The bearings are affected by operating conditions such as speed, pressure, oil viscosity and filtration.

External load on the shaft, as well as its size, direction and location also affects the bearing life.





SXM ISO Max recommended shaft loads		040
Fr (radial) max[1]	kN	8
Distance D (to point of force)	mm	62
Fa (axial) + (at standstill/ 0 bar pressure) max	kN	4
Fa (axial) - (at standstill/ 0 bar pressure) max	kN	10
Fa (axial) + (at 450 bar pressure) max[2]	kN	10
Fa (axial) - (at 450 bar pressure) max[2]	kN	0

[1]) Fr (radial) max; Calculation based on running conditions: 300 bar / 2000 rpm
[1]) Fr (radial) max; Calculation based on optimal force direction (Fr max will be lower in other force directions)
[1]) Fr (radial) max; In running conditions higher than 300 bar and/or 2000 rpm the max limits for Fr (radial) max will be lower
[2]) Fa (axial) + Will increase bearing life
[2]) Fa (axial) - Will decrease bearing life

For other forces, please contact Sunfab for advice.

Sunfab Hydraulics AB, Box 1094, SE-824 12 Hudiksvall, Sweden.Tel: +46 650-367 00, E-mail: sunfab@sunfab.se Web: www.sunfab.com

Temperatures/Housing cooling

Excessive system temperature reduces the life of the shaft seal and can lower the oil viscosity below the recommended level. A system temperature of 70 °C and a drain flow temperature of 115 °C must not be exceeded.

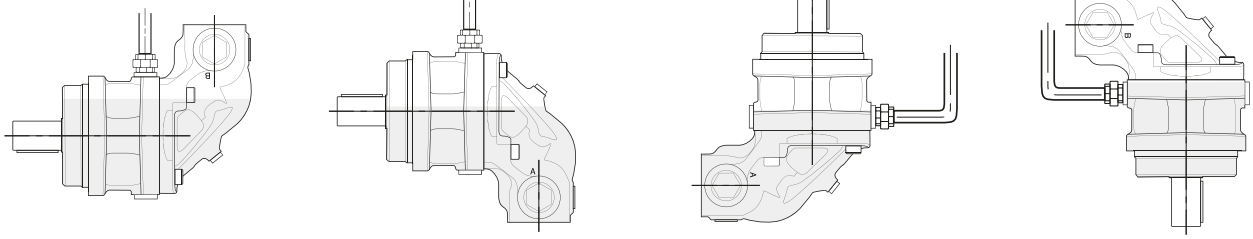
Cooling/flushing of the motor housing can be needed to keep the drain flow temperature at an acceptable level.

Suggested flow:

Motor SXM	Flushing l/min	Cont. RPM
040	4-10	≥ 2500

Installation

- The motor housing should be filled with oil to at least 50% before starting.
- The drainage pipe should be connected to topmost drainage outlet.
- The other end of the pipe should be connected to the oil tank at a point below the oil level.



Sunfab Hydraulics AB, Box 1094, SE-824 12 Hudiksvall, Sweden.Tel: +46 650-367 00, E-mail: sunfab@sunfab.se Web: www.sunfab.com

Piping

Recommended oil velocity in pressure line max. 7 m/sec

Filtering

Cleanliness according to ISO norm 4406, code 16/13.

Hydraulic fluids

High performance oils meeting ISO specifications – such as HM, DIN 51524-2 HLP, or better – must be used.

A min. viscosity of 10 cSt is required to keep the lubrication at a safe level.

The ideal viscosity is 20 - 40 cSt.

Useful formulaes

Required flow rate $Q = \frac{D \times n}{1000 \times \eta_v}$ litres/min.

Speed $n = \frac{Q \times 1000 \times \eta_v}{D}$ RPM

Torque $M = \frac{D \times \Delta p \times \eta_{hm}}{6.3}$ Nm

Power $P = \frac{Q \times \Delta p \times \eta_t}{60}$ kW

D = displacement, cm^3/revolution

n = speed, revolution/min

P = power, kW

Q = flow rate, litres/min

η_v = volumetric efficiency

η_{hm} = hydraulic-mechanical efficiency

η_t = overall efficiency = $\eta_v \times \eta_{hm}$

M = torque, Nm

Δp = pressure difference between the hydraulic motor inlet and outlet, MPa

Sunfab Hydraulics AB, Box 1094, SE-824 12 Hudiksvall, Sweden.Tel: +46 650-367 00, E-mail: sunfab@sunfab.se Web: www.sunfab.com

WARNING!

When the motor is in use:

1. Do not touch the pressure pipe
2. Watch out for rotating parts
3. The motor and pipes can reach high temperatures

Sunfab Hydraulics AB, Box 1094, SE-824 12 Hudiksvall, Sweden.Tel: +46 650-367 00, E-mail: sunfab@sunfab.se Web: www.sunfab.com