



SCM 025-108 M2 is a range of robust axial piston motors with cartridge flange especially suitable for winch-, slewing-, wheel- and track drives.

SCM 025-108 M2 is of the bent-axis type with spherical pistons. The design results in a compact motor with few moving parts, high starting torque and high reliability. The SCM 025-108 M2 covers the entire displacement range 1.55-6.59 cu in/rev. at a maximum pressure of 5800 psi. The motors well dimensioned, double tapered roller bearings permit high shaft loads and lead to excellent speed characteristics. The high level of reliability is based on the choice of materials, hardening methods, surface structures and the quality assured manufacturing process.

Other advantages:

- High maximum speed
- Smooth operation over the entire speed range
- High efficiency
- Suitable for applications with high angular accelerations due to its high rotary stiffness

Versions, main data

Example

SC	M	-	025	W	-	P	-	M21	-	W30	-	K3V2	M	-	1	00
Line	1		2	3		4		5		6		7	8		9	10

Line

SC	Sunfab Compact, bent-axis design
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1. Type

M	Motor
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2. Displacement

025	034	040	047	056	064	084	090	108
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3. Direction of rotation

W	Independent
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4. Shaft seal

P	FPM, high pressure, high temperature
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For low temperature applications, below -13 °F please contact Sunfab.

5. Mounting flange

		025	034	040	047	056	064	084	090	108
M21	ø 135	X	X	-	-	-	-	-	-	-
M22	ø 160	-	-	X	X	X	X	-	-	-
M23	ø 135	-	-	-	-	-	-	X	X	X

- = Not available

X = Standard, preferred

5. Shaft

Spline DIN 5480		025	034	040	047	056	064	084	090	108
W30	W30x2x14x9g	X	X	X	X	X	(X)	-	-	-
W35	W35x2x16x9g	-	-	X	X	X	X	X	X	X
W40	W40x2x18x9g	-	-	-	-	-	-	X	X	X

- = Not available

X = Standard, preferred

(X) = Limited maximum pressure, contact Sunfab

7. Connection cover

		025	034	040	047	056	064	084	090	108
V1	90° Mount flange vertical*	-	-	-	-	-	-	X	X	X
V2	90° Mount flange horizontal*	X	X	X	X	X	X	X	X	X

*According to SAE J518 code 62

8. Connection cover

		025	034	040	047	056	064	084	090	108
M	Metric	X	X	X	X	X	X	X	X	X

9. Additional

1	External drainage
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10. Speed Sensor

00	No Speed Sensor
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SCM 025–108 M2		025	034	040	047	056	064	084	090	108
Displacement										
cu in/rev		1.55	2.09	2.51	2.87	3.42	3.88	5.10	5.53	6.59
Working pressure										
psi	<i>max intermittent</i>	5800	5800	5800	5800	5800	5800	5800	5800	5075
	<i>max continuous</i>	5075	5075	5075	5075	5075	5075	5075	5075	4350
Revolutions										
rpm	<i>max intermittent</i>	7000	7000	6300	6300	6300	6300	5200	5200	5200
	<i>max continuous</i>	6300	6300	5700	5700	5700	5700	4700	4700	4700
	<i>min continuous</i>	300	300	300	300	300	300	300	300	300
Max power										
hp	<i>max intermittent</i>	115	154	168	194	235	261	288	308	308
	<i>max continuous</i>	54	74	80	87	107	121	134	148	148
Starting torque theoretical value										
lb-ft/1000psi		20	27	33	38	45	51	68	73	87
Moment of inertia (x 10⁻³)										
lb-ft-sec ²		0.8	0.8	1.9	1.9	1.9	1.9	5.5	5.5	5.5
Weight										
lb		24.2	24.2	40.3	40.3	40.3	40.3	57.3	57.3	57.3

Data concerning RPM are based on maximum permitted peripheral velocity of the tapered roller bearing.

Max intermittent power data may vary dependent on application. For further information please contact Sunfab.

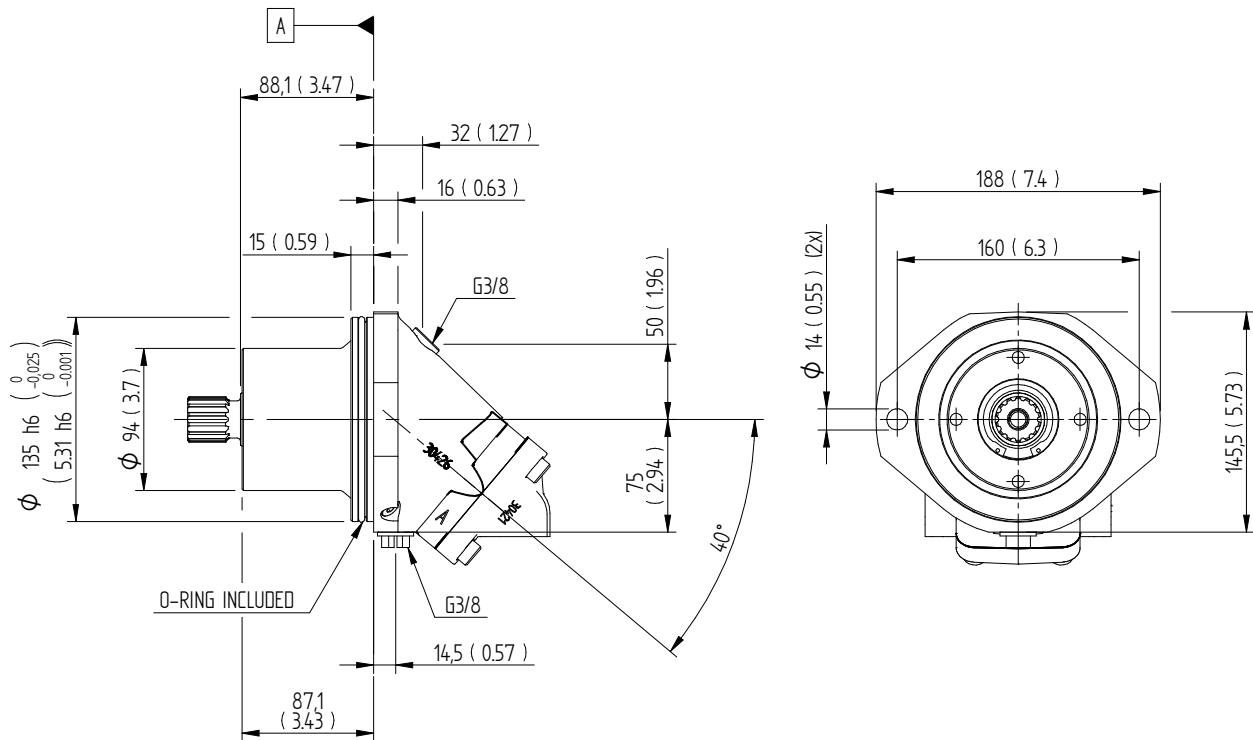
Continuous power data are based on maximum output power without external cooling of the motor housing.

Intermittent duty is defined as follows: max 6 seconds per minute, e g peak RPM when unloading or accelerating.

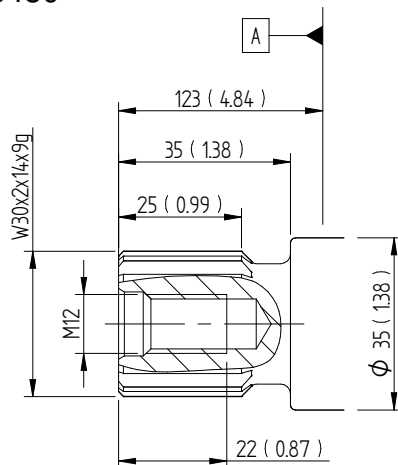
Dimensions SCM 025-034

Millimeter (inch)

M21



W30 DIN 5480

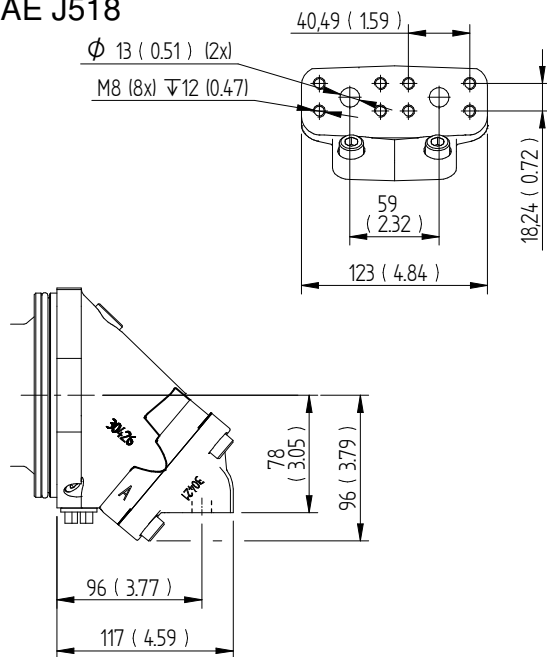


Dimensions SCM 025-034

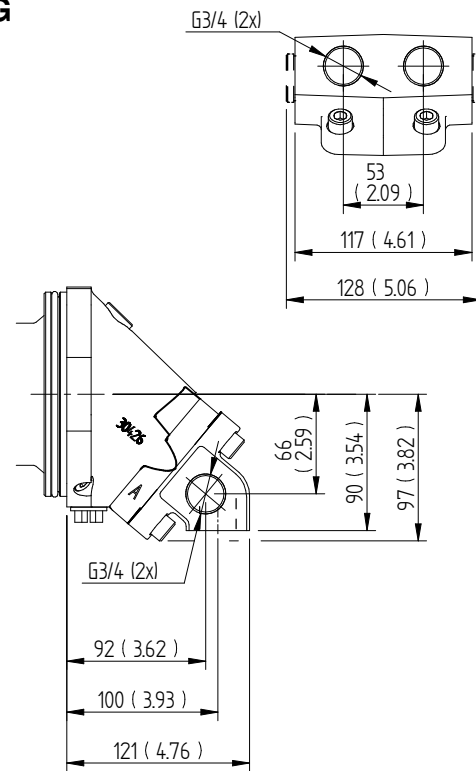
Connection cover

Millimeter (inch)

V2M SAE J518



K3G

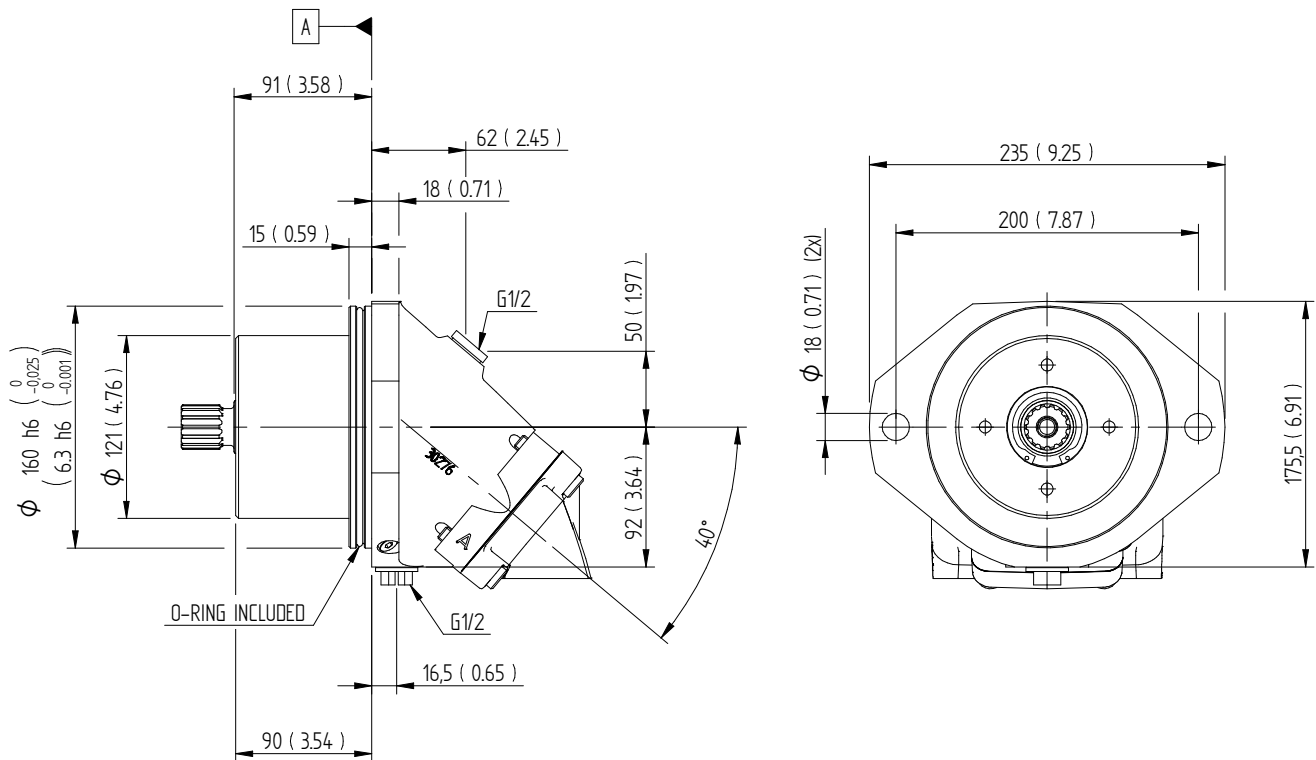


Dimensions SCM 040-064

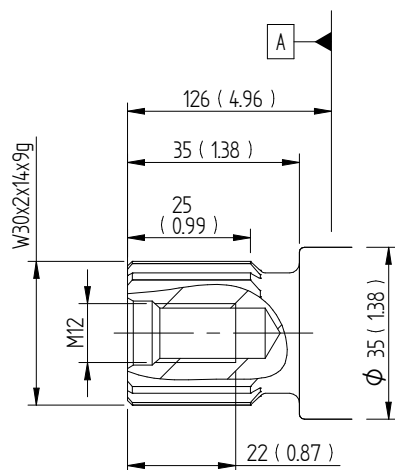
Flange & shafts

Millimeter (inch)

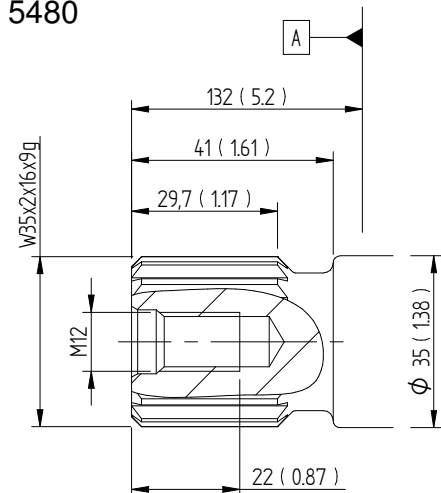
M22



W30 DIN 5480



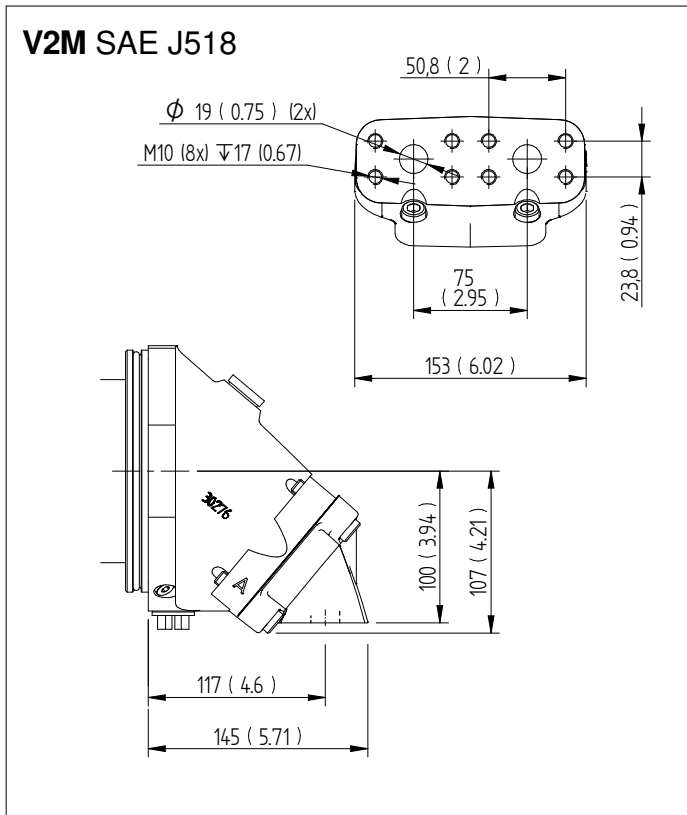
W35 DIN 5480



Dimensions SCM 040-064

Connection cover

Millimeter (inch)

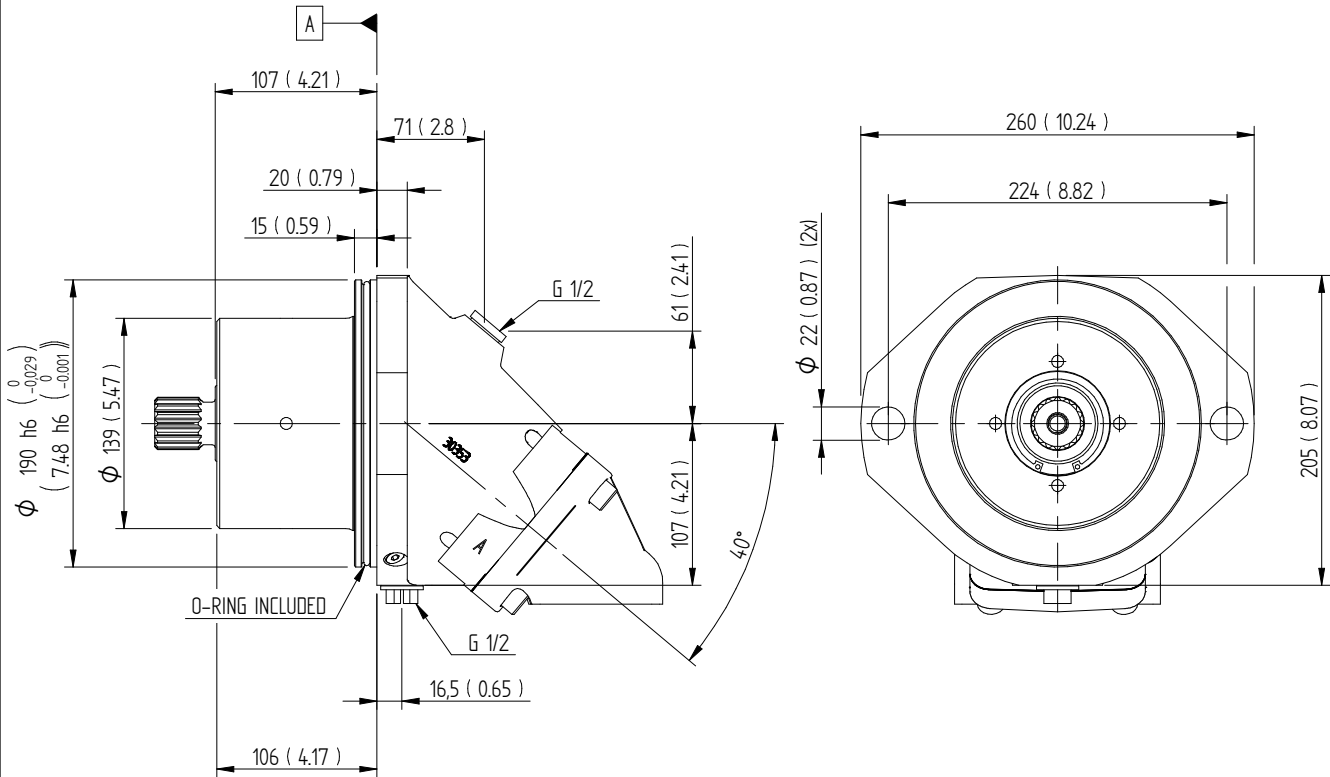


Dimensions SCM 084-108

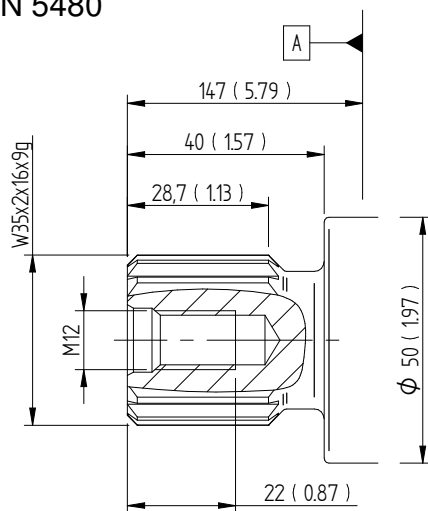
Flange & shafts

Millimeter (inch)

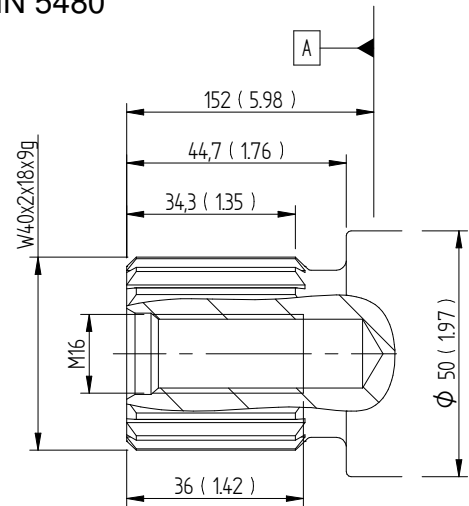
M23



W35 DIN 5480



W40 DIN 5480

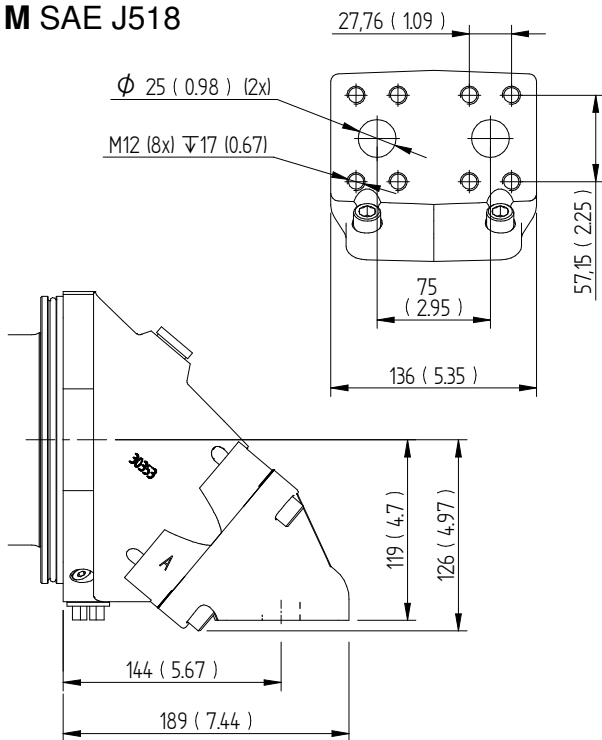


Dimensions SCM 084-108

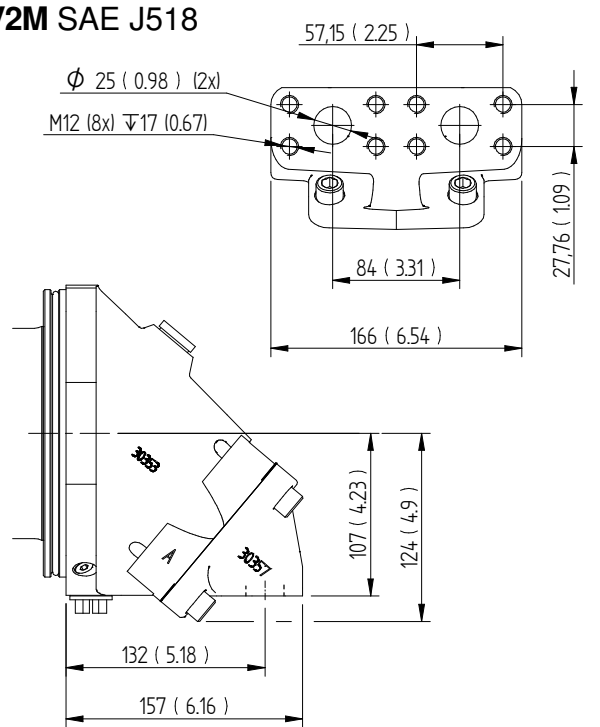
Connection cover

Millimeter (inch)

V1M SAE J518



V2M SAE J518



General instructions

Shaft seal

Motor SCM	Code	Max. housing pressure psi at RPM				
		1500	3000	5200	6300	8800
010-034	P	102	102	58	51	36
040-064	P	102	87	51	44	-
084-130	P	102	58	44	-	-

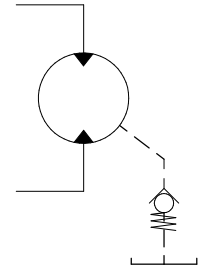
Code according to page 2. Versions main data.

For low temperature applications, below -13 °F please contact Sunfab.

The drainage oil should have a maximum temperature of 239 °F 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.

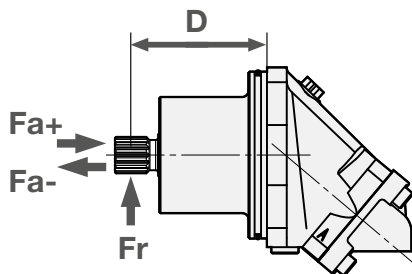
To ensure the function of the shaft seal and lubrication of the motor, we recommend a min. housing pressure of 7 psi. If needed, a spring loaded check valve of 7 psi can be installed on the housing drain line.



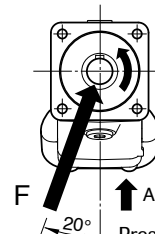
Shaft loads

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.

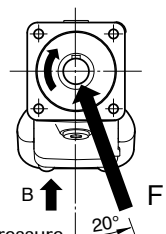
External load on the shaft, as well as its size, direction and location also affects the bearing life.



Optimal force direction of radial load



Pressure Anticlockwise rotation



Pressure Clockwise rotation

SCM M2		025	034	040	047	056	064	084	090	108
Max recommended shaft loads										
Fr (radial) max ¹	lbf	1685	1685	1685	1800	1900	1900	3250	3250	3375
Distance D (to point of force)	in	3.94	3.94	4.33	4.33	4.33	4.33	4.72	4.72	4.72
Fa (axial) + (at standstill/ 0 PSI pressure) max	lbf	675	675	900	900	900	900	1125	1125	1125
Fa (axial) - (at standstill/ 0 PSI pressure) max	lbf	1575	1575	1575	1575	2250	2475	2925	3150	3600
Fa (axial) + (at 5800 PSI pressure) max ²	lbf	1575	1575	1575	1575	2250	2475	2925	3150	3600
Fa (axial) - (at 5800 PSI pressure) max ²	lbf	0	0	0	0	0	0	0	0	0

¹) Fr (radial) max; Calculation based on running conditions: 4350 PSI / 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 4350 PSI 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.

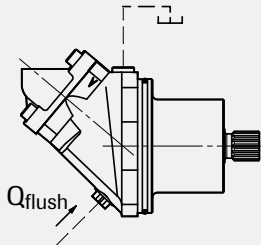
Temperatures/Housing cooling

Excessive system temperature reduces the life of the shaft seal and can lower the oil viscosity below the recommended level. A system temperature of 140 °F and a drain flow temperature of 239 °F must not be exceeded.

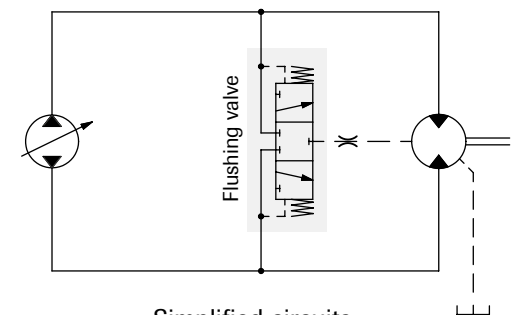
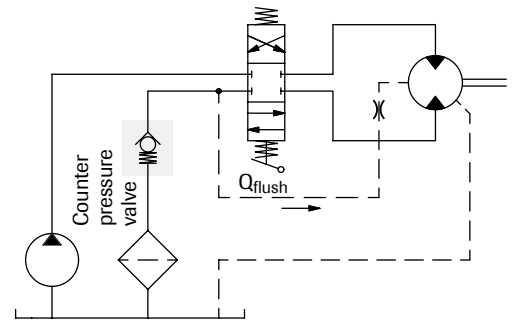
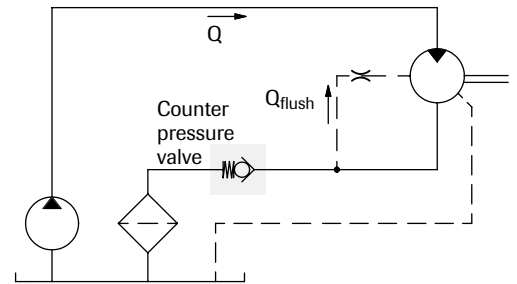
Cooling/flushing of the motor housing can be needed to keep the drain flow temperature at an acceptable level.

Suggested flow:

Motor SCM	Flushing GPM	Cont. RPM
012-034	0.5-2.1	≥ 2800
040-064	1.1-2.7	≥ 2500
084-130	1.6-3.2	≥ 2200



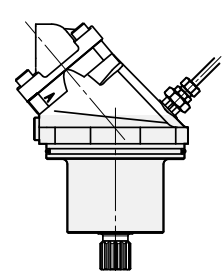
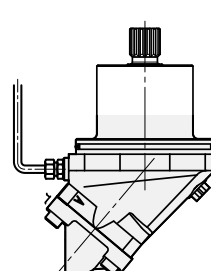
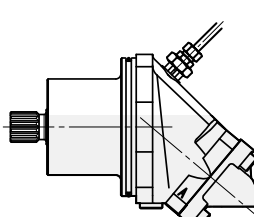
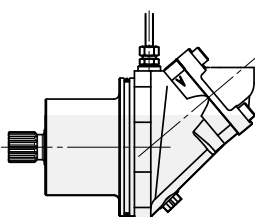
Housing flushing can be built up with the help of a flushing valve or taken directly from the return line. When the return pressure is too low this is compensated for by a counter pressure valve. The tank line is connected to the highest point as in the figure.



Simplified circuits

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.



Piping

Recommended oil velocity in pressure line max. 23 ft/s.

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.

Additional technical data

Noise levels and bearing life calculations available on request. Please contact Sunfab!

Useful formulaes

$$\text{Required flow rate } Q = \frac{D \times n}{231 \times \eta_v} \quad \text{GPM}$$

$$\text{Speed } n = \frac{Q \times 231 \times \eta_v}{D} \quad \text{RPM}$$

$$\text{Torque } M = \frac{D \times \Delta p \times \eta_{hm}}{75.6} \quad \text{lb-ft}$$

$$\text{Power } P = \frac{Q \times \Delta p \times \eta_t}{1714} \quad \text{hp}$$

D = displacement, cu in/revolution

n = speed, RPM

P = power, hp

Q = flow rate, GPM

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, psi



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

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