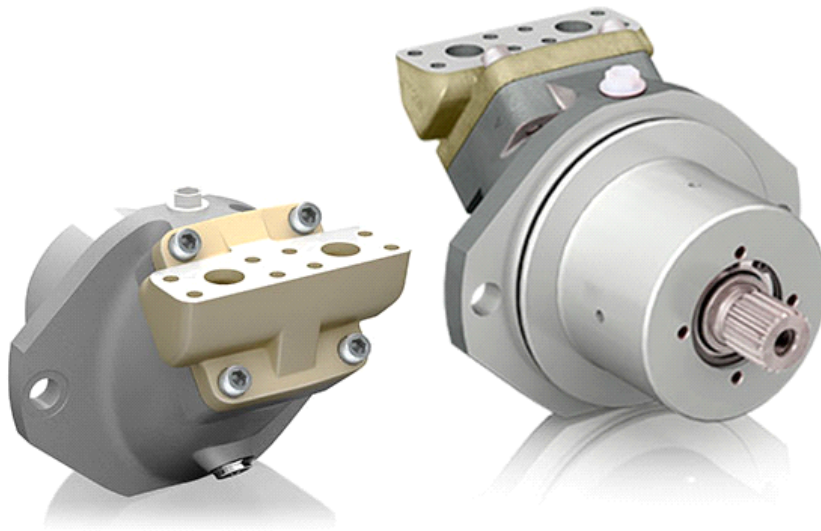




**Sunfab's SCM 025-108 M2 is a range of robust axial piston motors with cartridge flange especially suitable for winch-, slewing-, wheel- and track drives.**

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 25-108 cm<sup>3</sup>/rev. at a maximum pressure of 400 bar.

It's well dimensioned, double tapered roller bearings permit high shaft loads and lead to excellent speed characteristics. It's 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 | - | V2 | M | - | 1 | 00 |
| Line | 1 |   | 2   | 3 |   | 4 |   | 5   |   | 6   |   | 7  | 8 |   | 9 | 10 |

|      |                                  |
|------|----------------------------------|
| Line |                                  |
| SC   | Sunfab Compact, bent-axis design |

|         |       |
|---------|-------|
| 1. Type |       |
| M       | Motor |

|                 |     |     |     |     |     |     |     |     |
|-----------------|-----|-----|-----|-----|-----|-----|-----|-----|
| 2. Displacement |     |     |     |     |     |     |     |     |
| 025             | 034 | 040 | 047 | 056 | 064 | 084 | 090 | 108 |

|                          |             |
|--------------------------|-------------|
| 3. Direction of rotation |             |
| W                        | Independent |

|                                                                       |                                      |
|-----------------------------------------------------------------------|--------------------------------------|
| 4. Sealing                                                            |                                      |
| P                                                                     | FPM, high pressure, high temperature |
| For low temperature applications, below -25 °C 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 190 | -   | -   | -   | -   | -   | -   | X   | X   | X   |

|                 |             |     |     |     |     |     |     |     |     |     |
|-----------------|-------------|-----|-----|-----|-----|-----|-----|-----|-----|-----|
| 6. Shaft        |             | 025 | 034 | 040 | 047 | 056 | 064 | 084 | 090 | 108 |
| Spline DIN 5480 |             |     |     |     |     |     |     |     |     |     |
| W30             | W30x2x14x9g | X   | X   | X   | X   | X   | X   | -   | -   | -   |
| W35             | W35x2x16x9g | -   | -   | X   | X   | X   | X   | X   | X   | X   |
| W40             | W40x2x18x9g | -   | -   | -   | -   | -   | -   | X   | X   | X   |

X = Standard, preferred  
O = 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. Connections |        | 025 | 034 | 040 | 047 | 056 | 064 | 084 | 090 | 108 |
| M              | Metric | X   | X   | X   | X   | X   | X   | X   | X   | X   |

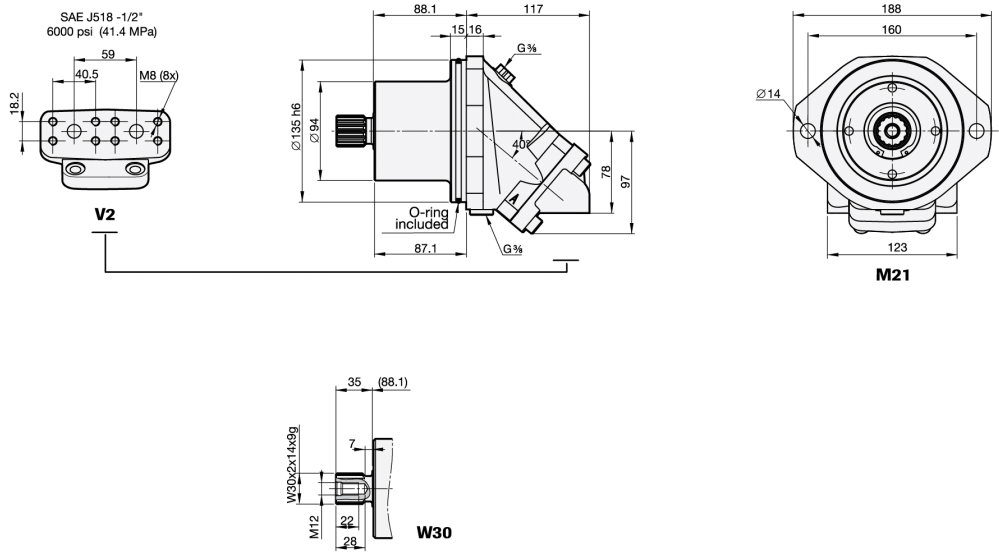
|               |                   |
|---------------|-------------------|
| 9. Additional |                   |
| 1             | External drainage |

|                 |                          |
|-----------------|--------------------------|
| 10. Accessories |                          |
| 00              | No accessories available |

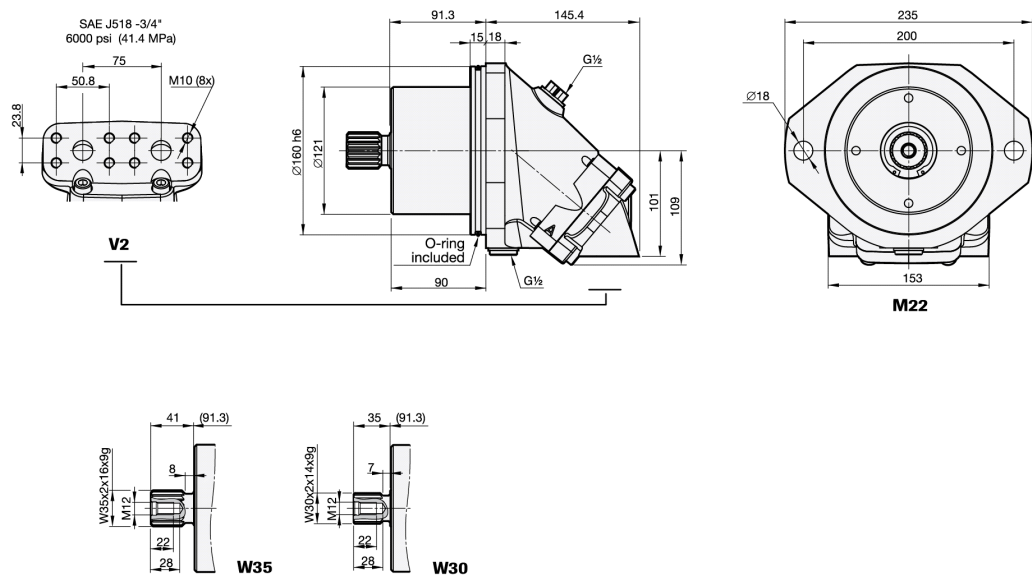
|                                         |                      |      |      |      |      |      |      |      |      |       |
|-----------------------------------------|----------------------|------|------|------|------|------|------|------|------|-------|
| <b>Motor SCM 025-108 M2</b>             |                      | 025  | 034  | 040  | 047  | 056  | 064  | 084  | 090  | 108   |
| Displacement                            | cm <sup>3</sup> /rev | 25.4 | 34.2 | 41.2 | 47.1 | 56.7 | 63.5 | 83.6 | 90.7 | 108.0 |
| Working pressure                        |                      |      |      |      |      |      |      |      |      |       |
| max intermittent                        | bar                  | 400  | 400  | 400  | 400  | 400  | 400  | 400  | 400  | 350   |
| max continuous                          |                      | 350  | 350  | 350  | 350  | 350  | 350  | 350  | 350  | 300   |
| Revolutions                             |                      |      |      |      |      |      |      |      |      |       |
| max intermittent                        | rpm                  | 7000 | 7000 | 6300 | 6300 | 6300 | 6300 | 5200 | 5200 | 5200  |
| max continuous                          |                      | 6300 | 6300 | 5700 | 5700 | 5700 | 5700 | 4700 | 4700 | 4700  |
| min continuous                          |                      | 300  | 300  | 300  | 300  | 300  | 300  | 300  | 300  | 300   |
| Power                                   |                      |      |      |      |      |      |      |      |      |       |
| max intermittent                        | kW                   | 86   | 115  | 125  | 145  | 175  | 195  | 215  | 230  | 230   |
| max continuous                          |                      | 40   | 55   | 60   | 65   | 80   | 90   | 100  | 110  | 110   |
| Starting torque theoretical value       | Nm/bar               | 0.40 | 0.54 | 0.66 | 0.75 | 0.89 | 1.00 | 1.33 | 1.44 | 1.71  |
| Moment of inertia (x 10 <sup>-3</sup> ) | kg m <sup>2</sup>    | 1.1  | 1.1  | 2.6  | 2.6  | 2.6  | 2.6  | 7.4  | 7.4  | 7.4   |
| Weight                                  | kg                   | 11.0 | 11.0 | 18.3 | 18.3 | 18.3 | 18.3 | 26.0 | 26.0 | 26.0  |

Data concerning RPM are based on maximum premitted 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.

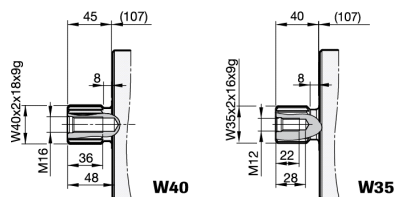
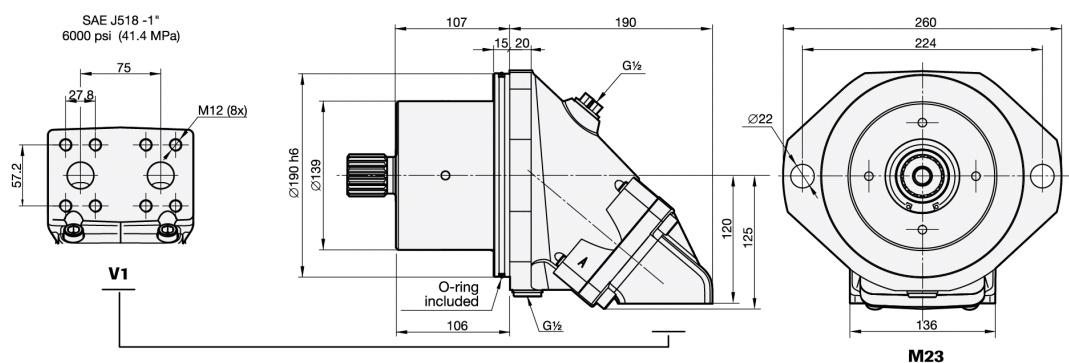
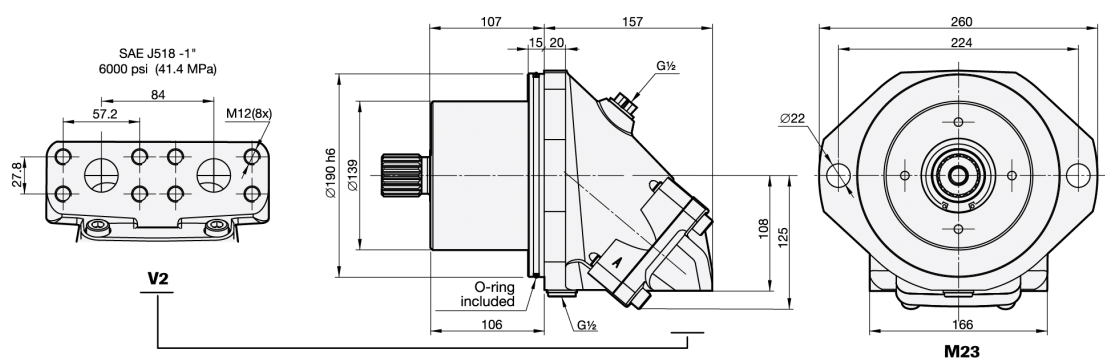
SCM 025-034 M2



SCM 040-064 M2



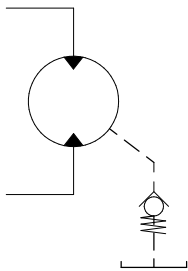
## SCM 084-108 M2



# General instructions

## Shaft seal

| Motor SCM | Code | Max. housing pressure bar at rpm |      |      |      |      |
|-----------|------|----------------------------------|------|------|------|------|
|           |      | 1500                             | 3000 | 5200 | 6300 | 7000 |
| 025-034   | P    | 7                                | 7    | 4    | 3.5  | 3    |
| 040-064   | P    | 7                                | 6    | 3.5  | 3    | -    |
| 084-130   | P    | 7                                | 4    | 3    | -    | -    |



Code according to page2. 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.

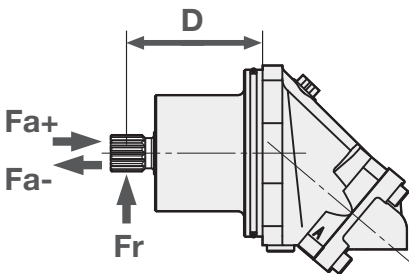
The housing pressure must be equal to or greater than the external pressure on the shaft seal.

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.

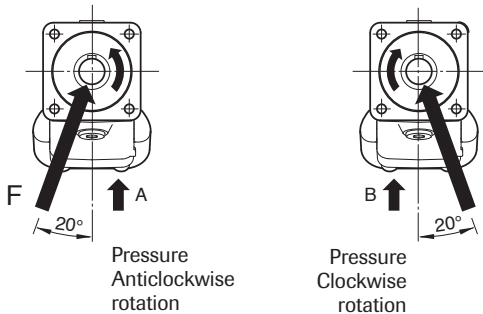
## Shaft loads

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.



Optimal force direction of radial load



| SCM M2                                               |    | 025 | 034 | 040 | 047 | 056 | 064 | 084  | 090  | 108 |
|------------------------------------------------------|----|-----|-----|-----|-----|-----|-----|------|------|-----|
| Max recommended shaft loads                          |    |     |     |     |     |     |     |      |      |     |
| Fr (radial) max <sup>1)</sup>                        | kN | 7.5 | 7.5 | 7.5 | 8   | 8.5 | 8.5 | 14.5 | 14.5 | 15  |
| Distance D (to point of force)                       | mm | 100 | 100 | 110 | 110 | 110 | 110 | 120  | 120  | 120 |
| Fa (axial) + (at standstill/ 0 bar pressure) max     | kN | 3   | 3   | 4   | 4   | 4   | 4   | 5    | 5    | 5   |
| Fa (axial) - (at standstill/ 0 bar pressure) max     | kN | 7   | 7   | 7   | 7   | 10  | 11  | 13   | 14   | 16  |
| Fa (axial) + (at 400 bar pressure) max <sup>2)</sup> | kN | 7   | 7   | 7   | 7   | 10  | 11  | 13   | 14   | 16  |
| Fa (axial) - (at 400 bar pressure) max <sup>2)</sup> | kN | 0   | 0   | 0   | 0   | 0   | 0   | 0    | 0    | 0   |

<sup>1)</sup> Fr (radial) max; Calculation based on running conditions: 300 bar / 2000 rpm  
<sup>1)</sup> Fr (radial) max; Calculation based on optimal force direction (Fr max will be lower in other force directions)  
<sup>1)</sup> Fr (radial) max; In running conditions higher than 300 bar and/or 2000 rpm the max limits for Fr (radial) max will be lower

<sup>2)</sup> Fa (axial) + Will increase bearing life  
<sup>2)</sup> Fa (axial) - Will decrease bearing life

For other forces, please contact Sunfab for advice.

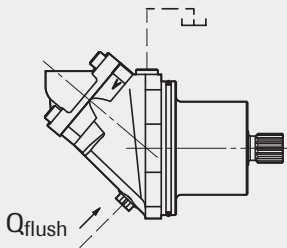
## Temperatures/Housing cooling

Excessive system temperature reduces the life of the shaft seal and can lower the oil viscosity below the recommended level. A system temperature of 60 °C and a drain flow temperature of 115 °C must not be exceeded.

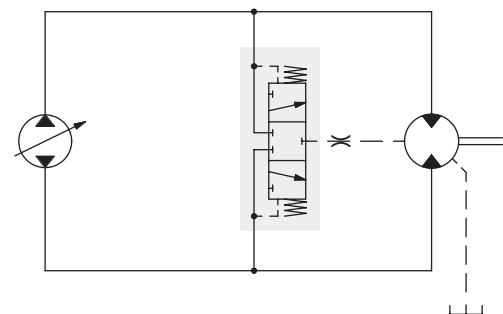
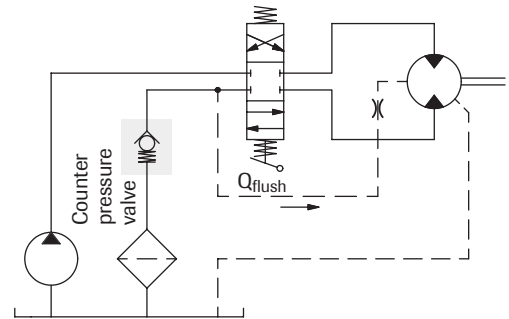
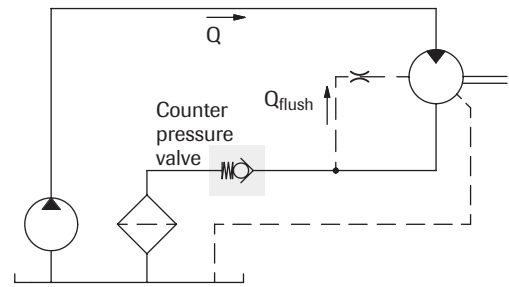
Cooling/flushing of the motor housing can be needed to keep the drain flow temperature at an acceptable level.

### Suggested flow:

| Motor SCM | Flushing l/min | Cont. RPM |
|-----------|----------------|-----------|
| 025-034   | 2-8            | ≥ 2800    |
| 040-064   | 4-10           | ≥ 2500    |
| 084-108   | 6-12           | ≥ 2200    |



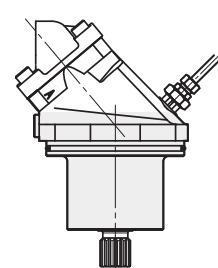
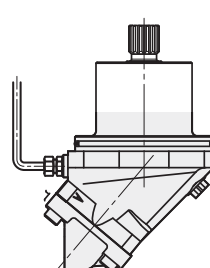
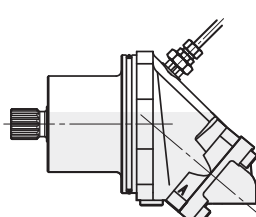
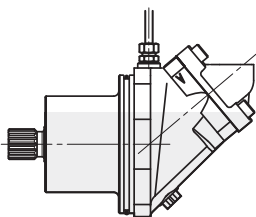
Housing flushing can be built up with the help of a flushing valve or taken directly from the return line. When the return pressure is too low this is compensated for by a counter pressure valve. The tank line is connected to the highest point as in the figure.



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. 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.

## Additional technical data

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

## 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<sup>3</sup>/revolution

$n$  = speed, revolution/min

$P$  = power, kW

$Q$  = flow rate, litres/min

$\eta_v$  = volumetric efficiency

$\eta_{hm}$  = hydraulic-mechanical efficiency

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

$M$  = torque, Nm

$\Delta p$  = pressure difference between the hydraulic motor inlet and outlet, MPa



## WARNING

When the motor is in use:

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

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