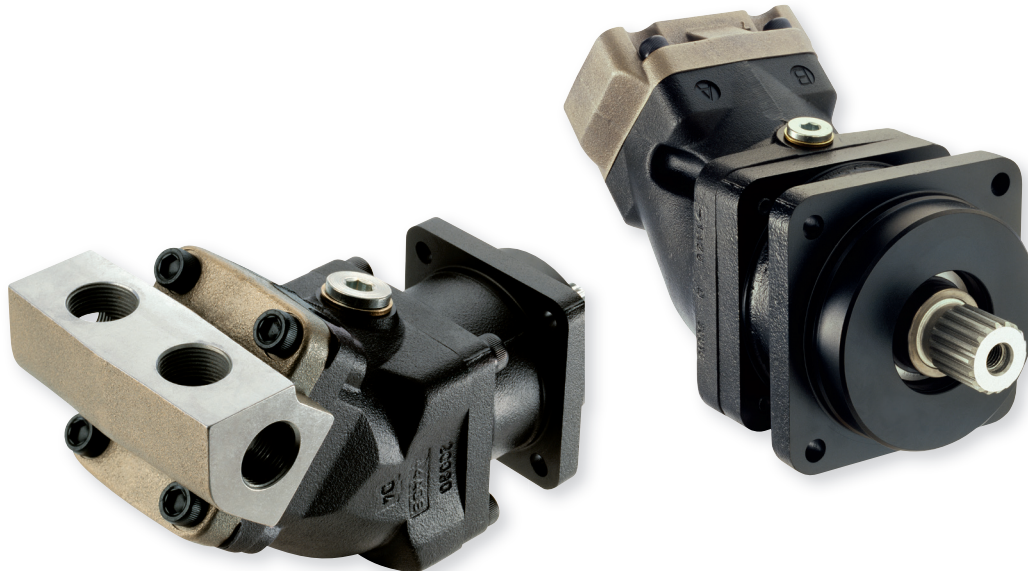


# Motor SCM 012-130

ISO



SUNFAB SCM is a range of robust axial piston motors especially suitable for mobile hydraulics.

SUNFAB SCM 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 covers the entire displacement range 12-130 cm<sup>3</sup>/rev at a maximum working pressure of 40 MPa.

SUNFAB SCM's well dimensioned, double tapered roller bearings permit high shaft loads and lead to excellent speed characteristics.

SUNFAB SCM's high level of reliability is based on the choice of materials, hardening methods, surface structures and the quality assured manufacturing process.

Type		012	017	025	034	040	047	056	064	084	090	108	130
Displacement	cm <sup>3</sup> /rev.	12.6	17.0	25.4	34.2	41.2	47.1	56.7	63.5	83.6	90.7	108.0	130.0
Working pressure	max. intermittent	40	40	40	40	40	40	40	40	40	40	40	35
	max. continuous	35	35	35	35	35	35	35	35	35	35	35	30
Revolutions	max. intermittent	8800	8800	7000	7000	6300	6300	6300	6300	5200	5200	5200	5200
	max. continuous	8000	8000	6300	6300	5700	5700	5700	5700	4700	4700	4700	4700
	min. continuous	300	300	300	300	300	300	300	300	300	300	300	300
Power	max. intermittent	54	74	86	115	125	145	175	195	215	230	275	285
	max. continuous	20	25	40	55	60	65	80	90	100	110	130	135
Start torque theoretical value	Nm/MPa	2.0	2.7	4.0	5.4	6.6	7.5	8.9	10.0	13.3	14.4	17.1	20.5
Mass moment of inertia ( x 10 <sup>-3</sup> )	kg m <sup>2</sup>	0.9	0.9	1.1	1.1	2.6	2.6	2.6	2.6	7.4	7.4	7.4	7.4
Weight	kg	8.5	8.5	9.5	9.5	16.5	16.5	16.5	16.5	28.0	28.0	30.5	30.5

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.

# Versions, main data

Example

<b>SC</b>	<b>M</b>	-	<b>012</b>	<b>W</b>	-	<b>N</b>	-	<b>I41</b>	-	<b>W25</b>	-	<b>S3</b>	<b>G</b>	-	<b>1</b>	<b>00</b>
Line	1		2	3		4		5		6		7	8		9	10

## Line

<b>SC</b>	Sunfab Compact, bent-axis design
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## 1. Type

<b>M</b>	Motor
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## 2. Displacement

<b>012</b>	<b>017</b>	<b>025</b>	<b>034</b>	<b>040</b>	<b>047</b>	<b>056</b>	<b>064</b>	<b>084</b>	<b>090</b>	<b>108</b>	<b>130</b>
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## 3. Direction of rotation

<b>W</b>	Independent
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## 4. Sealing

<b>N</b>	Nitrile
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<b>H</b>	High pressure, nitrile
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<b>V</b>	Viton
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## 5. Mounting flange

<b>ISO 3019-2</b>	<b>012</b>	<b>017</b>	<b>025</b>	<b>034</b>	<b>040</b>	<b>047</b>	<b>056</b>	<b>064</b>	<b>084</b>	<b>090</b>	<b>108</b>	<b>130</b>
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<b>I41</b>	ISO 4-h ø80	<b>X</b>	<b>X</b>	-	-	-	-	-	-	-	-	-
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<b>I42</b>	ISO 4-h ø100	<b>0</b>	<b>0</b>	<b>X</b>	<b>X</b>	-	-	-	-	-	-	-
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<b>I43</b>	ISO 4-h ø125	-	-	-	-	<b>X</b>	<b>X</b>	<b>X</b>	<b>X</b>	-	-	-
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<b>I44</b>	ISO 4-h ø140	-	-	-	-	-	-	-	<b>X</b>	<b>X</b>	<b>(X)</b>	<b>(X)</b>
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<b>I45</b>	ISO 4-h ø160	-	-	-	-	-	-	-	-	<b>(X)</b>	<b>(X)</b>	<b>X</b>	<b>X</b>
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## 6. Shaft

	<b>012</b>	<b>017</b>	<b>025</b>	<b>034</b>	<b>040</b>	<b>047</b>	<b>056</b>	<b>064</b>	<b>084</b>	<b>090</b>	<b>108</b>	<b>130</b>
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### Spline DIN 5480

<b>W20</b>	W20x1.25x14x9g	<b>X</b>	<b>X</b>	-	-	-	-	-	-	-	-	-
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<b>W25</b>	W25x1.25x18x9g	<b>X</b>	<b>X</b>	<b>X</b>	<b>(X)</b>	-	-	-	-	-	-	-
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<b>W30</b>	W30x2x14x9g	-	-	<b>X</b>	<b>X</b>	<b>X</b>	<b>X</b>	<b>X</b>	<b>0</b>	-	-	-
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<b>W32</b>	W32x2x14x9g	-	-	-	-	<b>X</b>	<b>X</b>	<b>X</b>	<b>0</b>	-	-	-
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<b>W35</b>	W35x2x16x9g	-	-	-	-	<b>X</b>	<b>X</b>	<b>X</b>	<b>X</b>	<b>X</b>	<b>X</b>	-
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<b>W40</b>	W40x2x18x9g	-	-	-	-	-	-	-	-	<b>X</b>	<b>X</b>	<b>X</b>	<b>0</b>
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<b>W45</b>	W45x2x21x9g	-	-	-	-	-	-	-	-	<b>X</b>	<b>X</b>	<b>X</b>	<b>X</b>
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### Key DIN 6885

<b>K20</b>	ø 20 k6	<b>X</b>	<b>X</b>	-	-	-	-	-	-	-	-	-
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<b>K25</b>	ø 25 k6	<b>X</b>	<b>X</b>	<b>X</b>	<b>(X)</b>	-	-	-	-	-	-	-
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<b>K30</b>	ø 30 k6	<b>0</b>	<b>0</b>	<b>X</b>	<b>X</b>	<b>X</b>	<b>X</b>	<b>X</b>	<b>0</b>	-	-	-
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<b>K35</b>	ø 35 k6	-	-	-	-	<b>X</b>	<b>X</b>	<b>X</b>	<b>X</b>	-	-	-
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<b>K40</b>	ø 40 k6	-	-	-	-	-	-	-	-	<b>X</b>	<b>X</b>	<b>(X)</b>	-
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<b>K45</b>	ø 45 k6	-	-	-	-	-	-	-	-	<b>X</b>	<b>X</b>	<b>X</b>	<b>X</b>
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**X** = Standard, preferred

**(X)** = Available, option

**0** = Available on request, contact Sunfab

## 7. Connection cover

		<b>012</b>	<b>017</b>	<b>025</b>	<b>034</b>	<b>040</b>	<b>047</b>	<b>056</b>	<b>064</b>	<b>084</b>	<b>090</b>	<b>108</b>	<b>130</b>
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<b>S1</b>	40° Mount flange vertical*	-	-	-	-	-	-	-	-	<b>X</b>	<b>X</b>	<b>X</b>	<b>X</b>
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<b>S2</b>	40° Mount flange horizontal*	-	-	-	-	<b>X</b>	<b>X</b>	<b>X</b>	<b>X</b>	-	-	-	-
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<b>S3</b>	40° threaded connection	<b>X</b>	<b>X</b>	<b>X</b>	<b>X</b>	-	-	-	-	-	-	-	-
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<b>V1</b>	90° Mount flange vertical*	-	-	-	-	-	-	-	-	<b>X</b>	<b>X</b>	<b>X</b>	<b>X</b>
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<b>V2</b>	90° Mount flange horizontal*	-	-	<b>X</b>	<b>X</b>	<b>X</b>	<b>X</b>	<b>X</b>	<b>X</b>	<b>X</b>	<b>X</b>	<b>X</b>	<b>X</b>
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<b>R1</b>	Side connections, flanged*	-	-	<b>X</b>	<b>X</b>	<b>X</b>	<b>X</b>	<b>X</b>	<b>X</b>	<b>X</b>	<b>X</b>	<b>X</b>	<b>X</b>
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<b>K3</b>	Combicover 90° & side conn. thread.	<b>X</b>	<b>X</b>	<b>X</b>	<b>X</b>	-	-	-	-	-	-	-	-
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\* According to SAE J518 code 62

## 8. Connections

		<b>012</b>	<b>017</b>	<b>025</b>	<b>034</b>	<b>040</b>	<b>047</b>	<b>056</b>	<b>064</b>	<b>084</b>	<b>090</b>	<b>108</b>	<b>130</b>
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<b>G</b>	ISO G*	<b>X</b>	<b>X</b>	<b>X</b>	<b>X</b>	-	-	-	-	-	-	-	-
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<b>M</b>	Metric**	-	-	<b>X</b>	<b>X</b>	<b>X</b>	<b>X</b>	<b>X</b>	<b>X</b>	<b>X</b>	<b>X</b>	<b>X</b>	<b>X</b>
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<b>U</b>	UN***	<b>X</b>	<b>X</b>	<b>X</b>	<b>X</b>	<b>X</b>	<b>X</b>	<b>X</b>	<b>X</b>	<b>X</b>	<b>X</b>	<b>X</b>	<b>X</b>
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\* Only threaded connections

\*\* Only flanged connections

\*\*\* Only available for S covers

## 9. Additional

<b>1</b>	External drainage
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## 10. Speed sensor

		<b>012</b>	<b>017</b>	<b>025</b>	<b>034</b>	<b>040</b>	<b>047</b>	<b>056</b>	<b>064</b>	<b>084</b>	<b>090</b>	<b>108</b>	<b>130</b>
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<b>00</b>	No speed sensor	<b>X</b>	<b>X</b>	<b>X</b>	<b>X</b>	<b>X</b>	<b>X</b>	<b>X</b>	<b>X</b>	<b>X</b>	<b>X</b>	<b>X</b>	<b>X</b>
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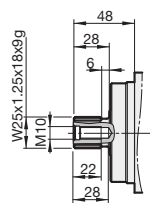
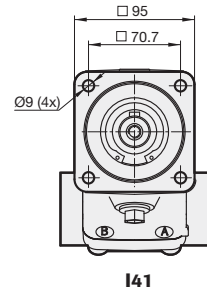
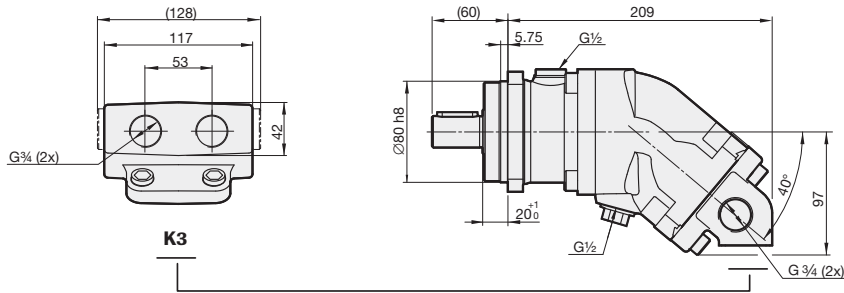
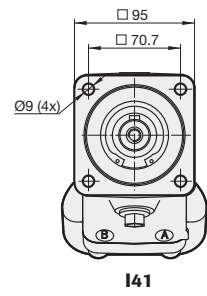
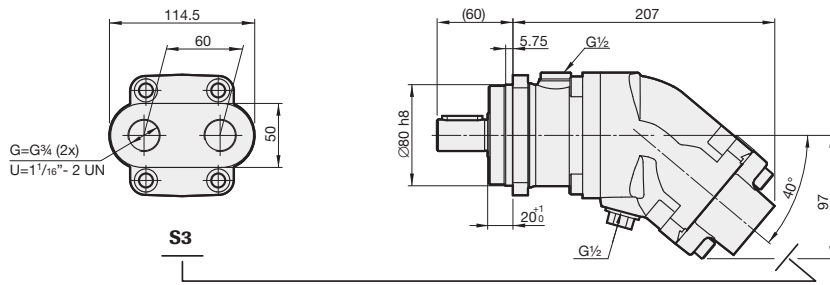
<b>P1</b>	Prepared for speed sensor	<b>X</b>	<b>X</b>	<b>X</b>	<b>X</b>	<b>X</b>	<b>X</b>	<b>X</b>	<b>X</b>	-	-	-	-
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<b>S1</b>	Fitted speed sensor type PNP*	<b>X</b>	<b>X</b>	<b>X</b>	<b>X</b>	<b>X</b>	<b>X</b>	<b>X</b>	<b>X</b>	-	-	-	-
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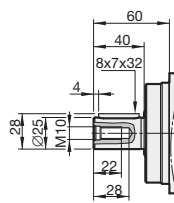
<b>S2</b>	Fitted speed sensor type NPN*	<b>X</b>	<b>X</b>	<b>X</b>	<b>X</b>	<b>X</b>	<b>X</b>	<b>X</b>	<b>X</b>	-	-	-	-
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\* See separate brochure "Speed sensor hall" for more information

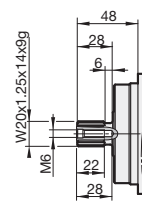
# Dimensions SCM 012-017



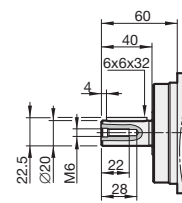
W25



K25

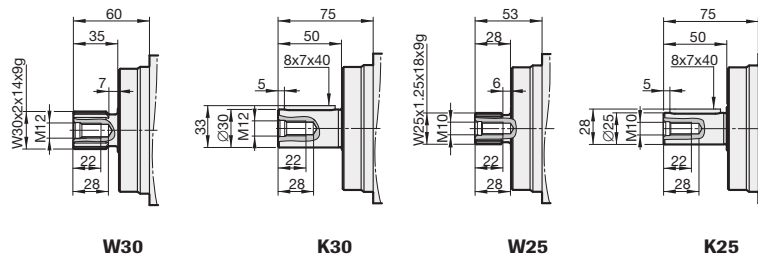
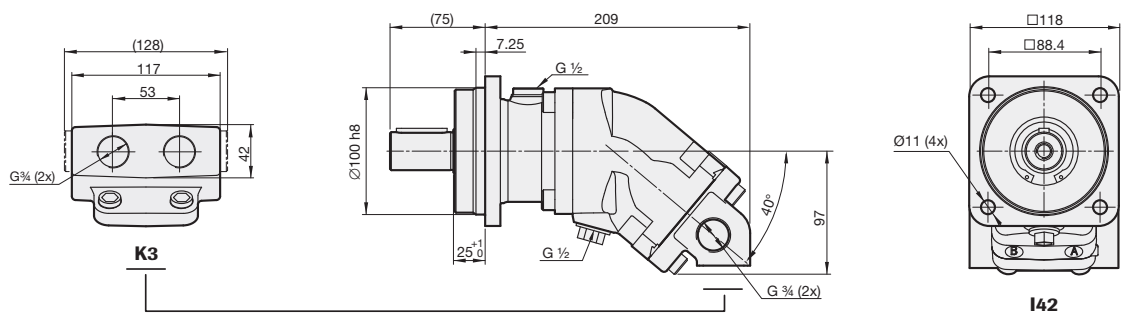
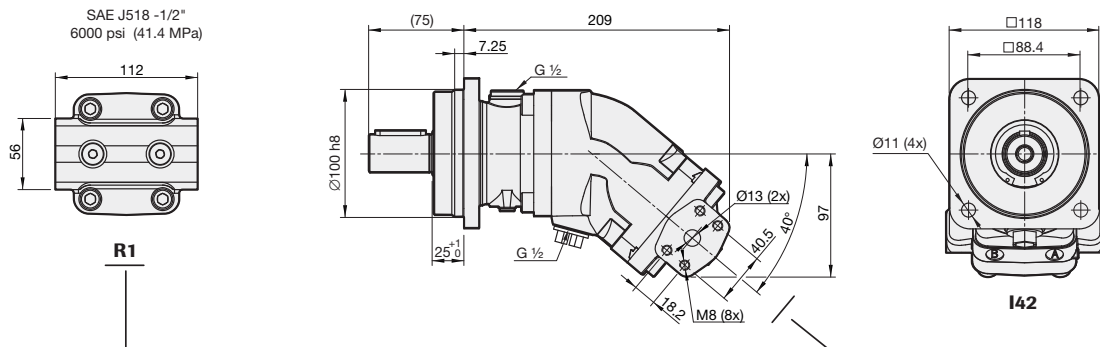
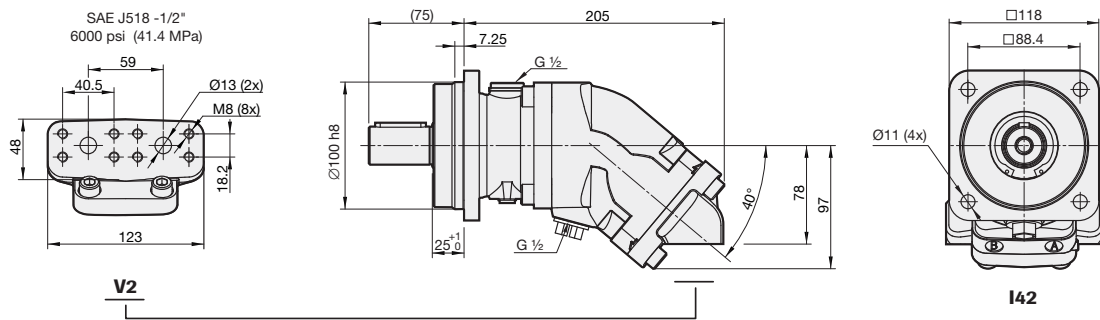
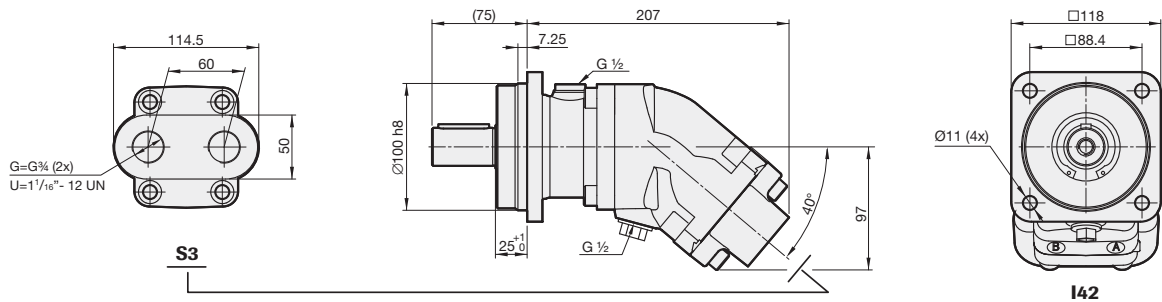


W20

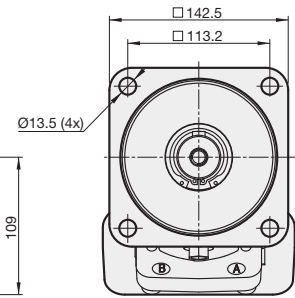
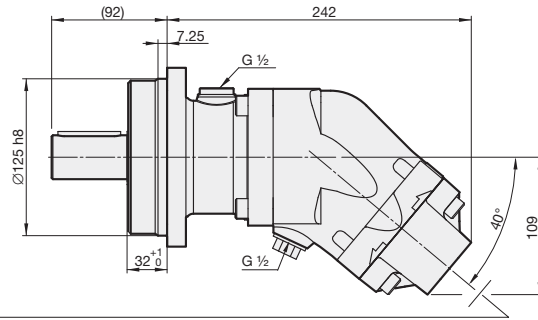
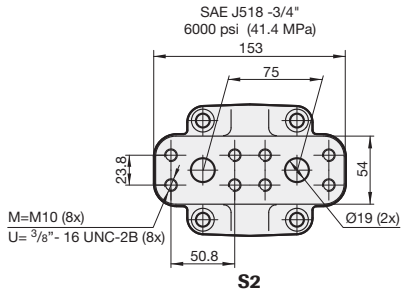


K20

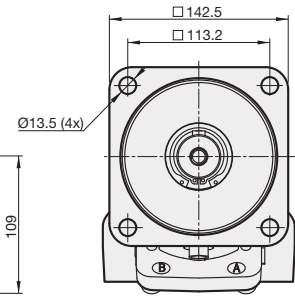
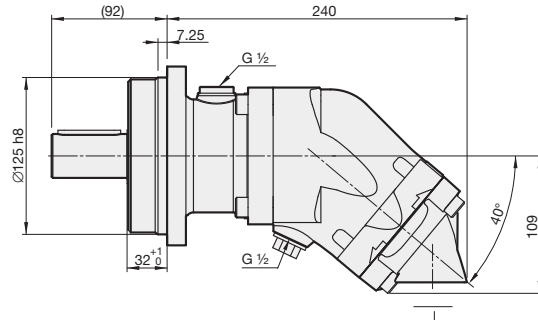
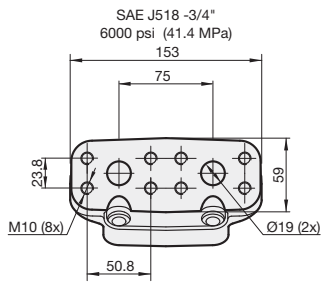
# SCM 025-034



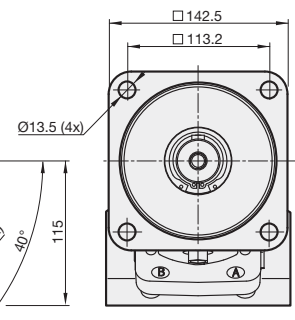
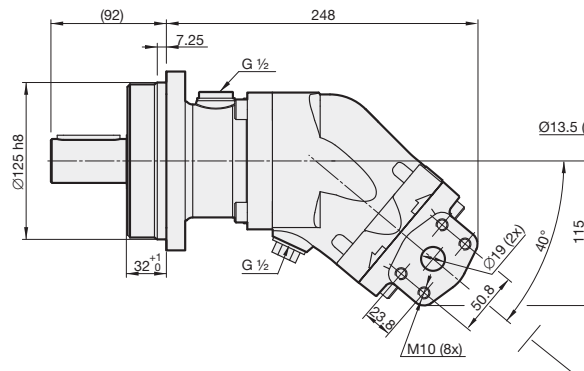
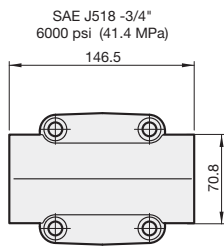
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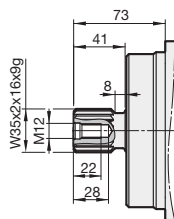
**I43**



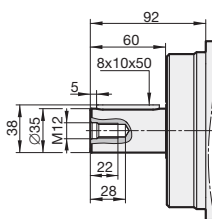
**I43**



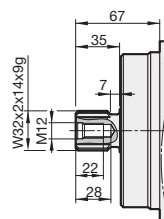
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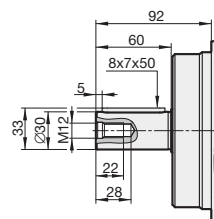
**W35**



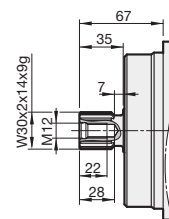
**K35**



**W32**

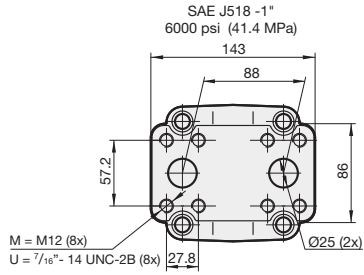


**K30**

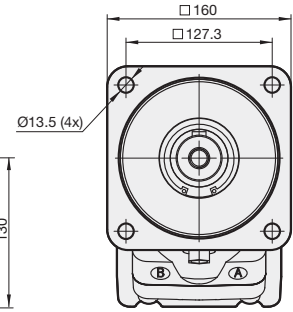
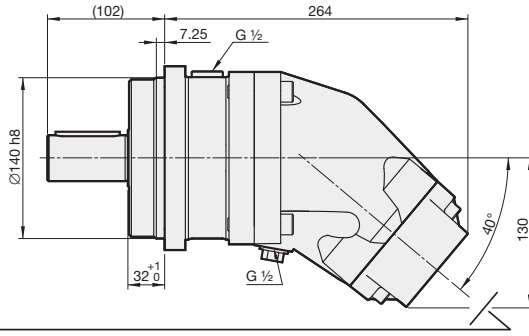


**W30**

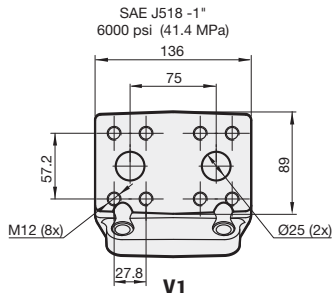
# SCM 084-090



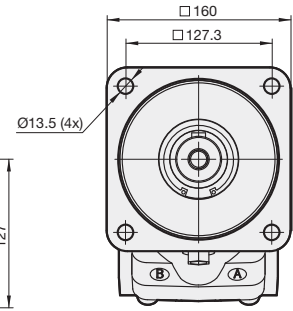
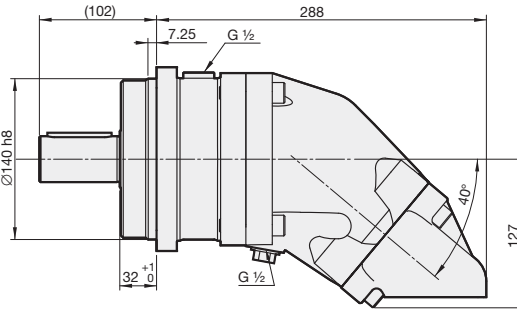
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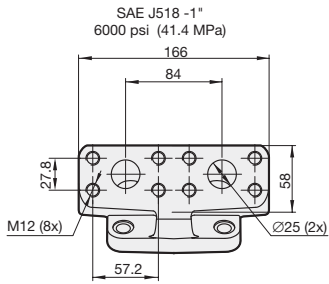
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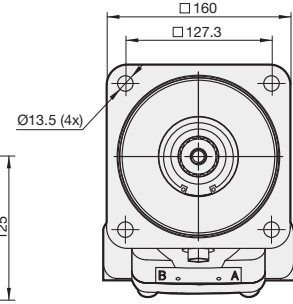
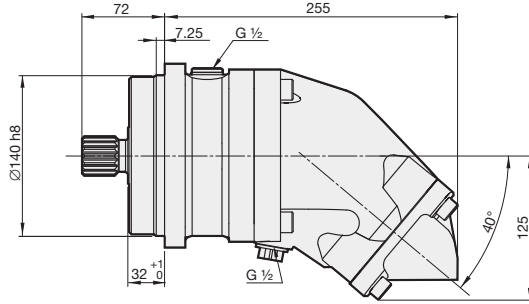
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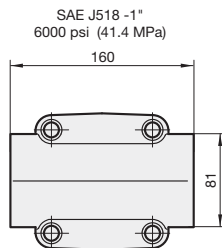
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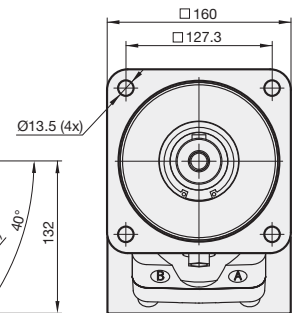
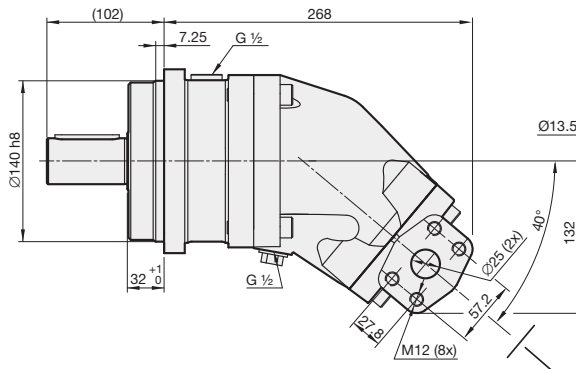
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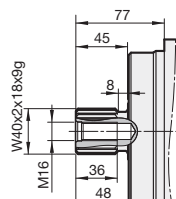
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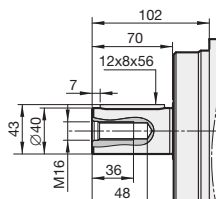
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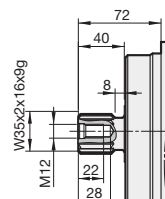
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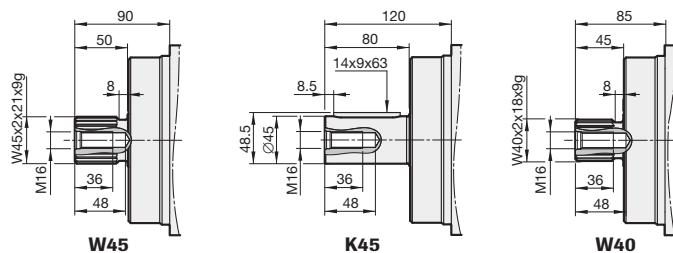
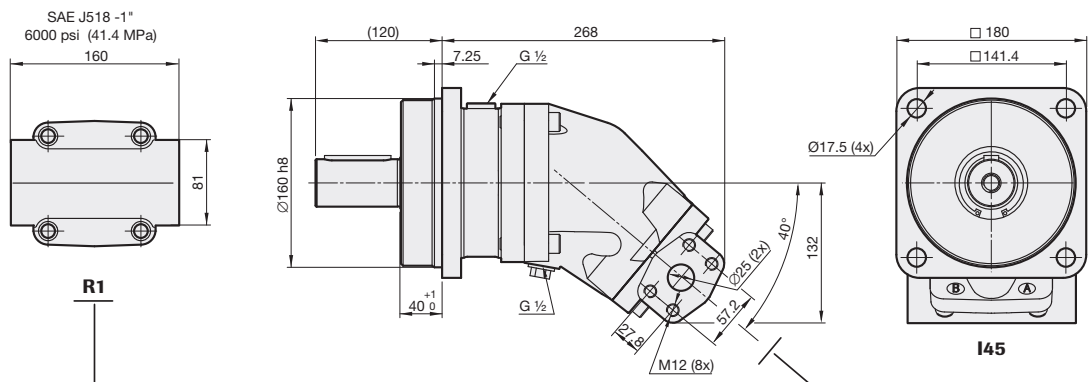
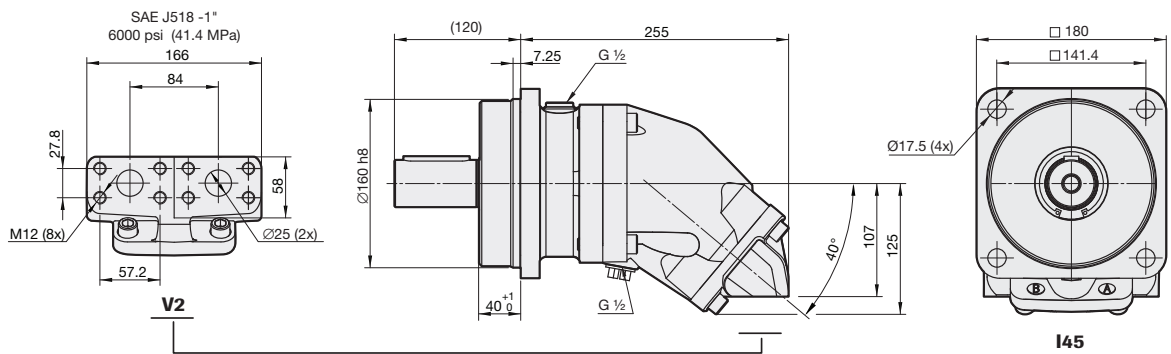
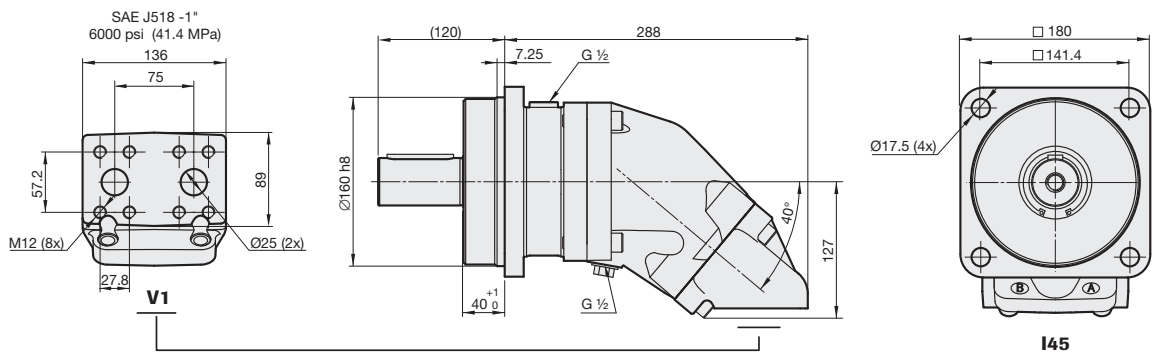
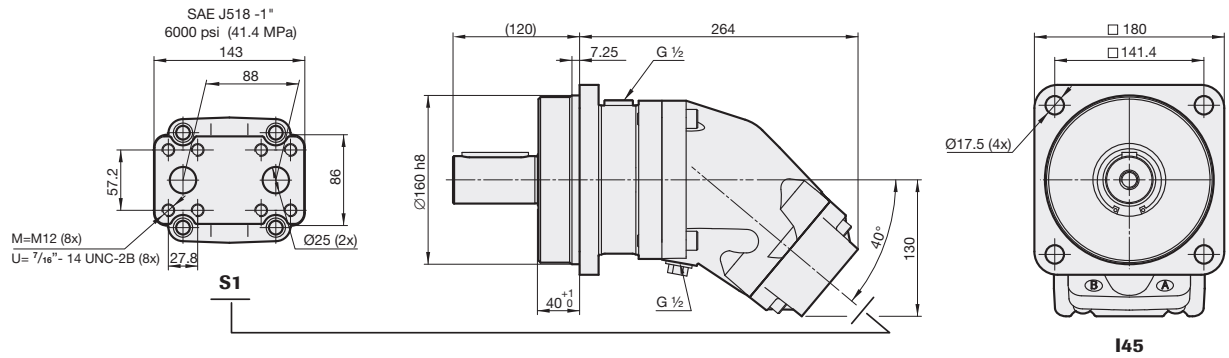


**K40**

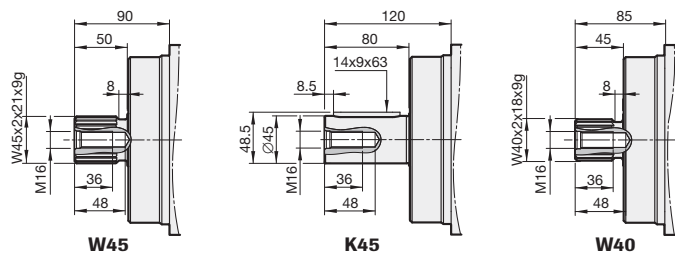
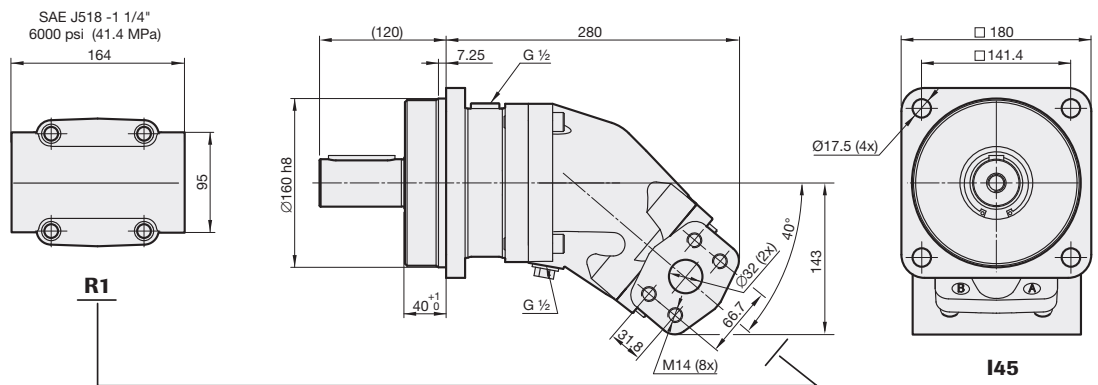
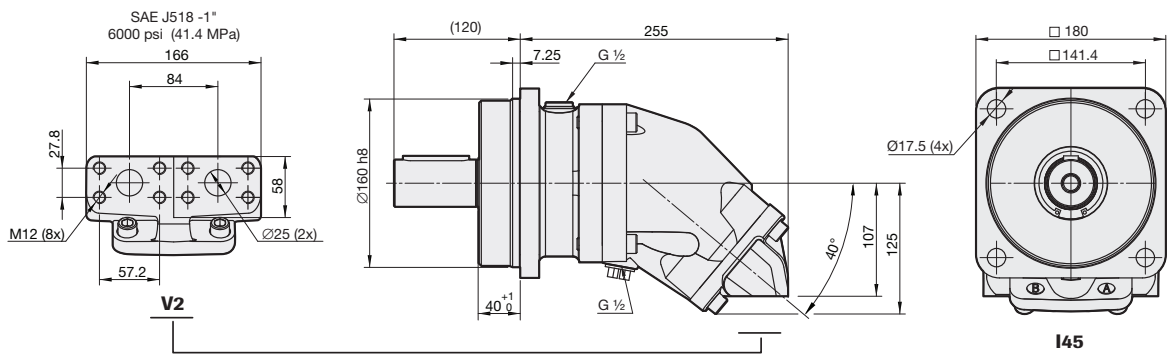
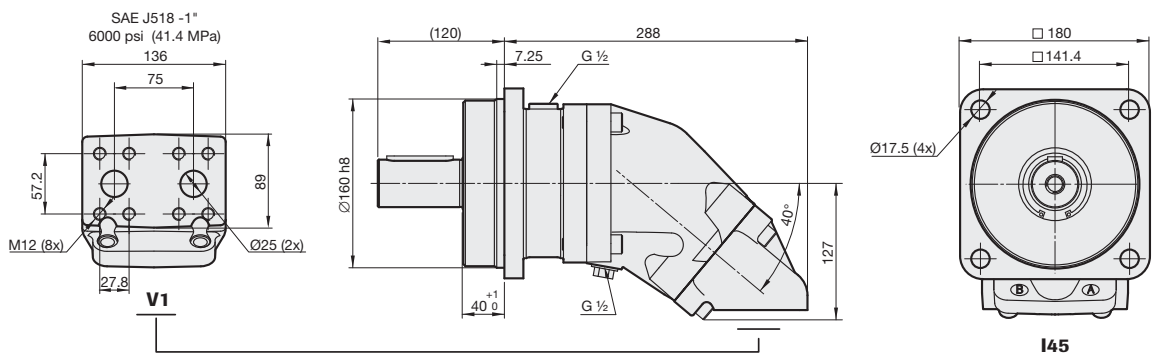
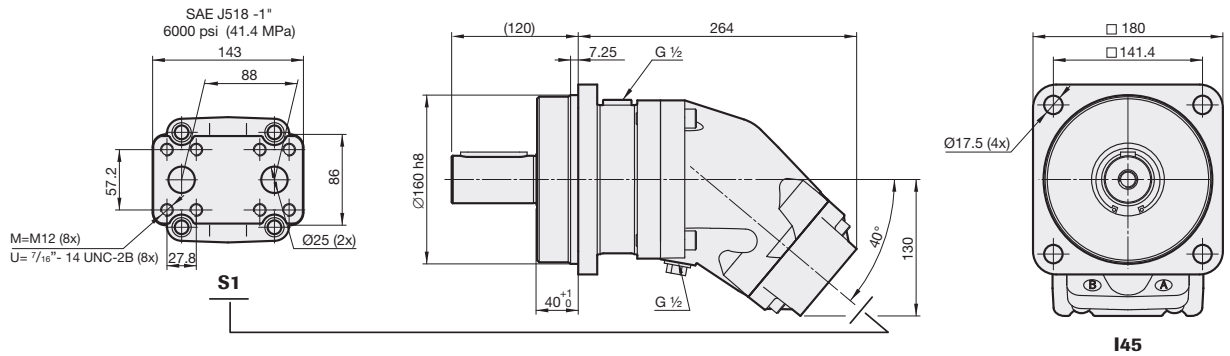


**W35**

# SCM 108



# SCM 130





# General instructions

## Choice of shaft seal

Motor SCM	Code	Temp.	Max. housing pressure MPa at rpm								
		°C	1000	2000	3000	4000	5000	6000	7000	8000	9000
012-034	N	75	0.55	0.27	0.18	0.14	0.11	0.09	0.08	0.07	0.06
	H	75	2.46	1.23	0.82	0.61	0.49	0.41	0.35	0.31	0.27
	V	90	0.55	0.27	0.18	0.14	0.11	0.09	0.08	0.07	0.06
040-064	N	75	0.55	0.27	0.18	0.14	0.11	0.09	0.08		
	H	75	2.46	1.23	0.82	0.61	0.49	0.41	0.35		
	V	90	0.55	0.27	0.18	0.14	0.11	0.09	0.08		
084-130	N	75	0.38	0.19	0.13	0.10	0.08	0.06			
	H	75	1.72	0.86	0.57	0.43	0.34	0.29			
	V	90	0.38	0.19	0.13	0.10	0.08	0.06			

Code according to page 2, Versions, main data

Factors affecting the choice of shaft seal include the hydraulic motor housing pressure and the drainage oil temperature.

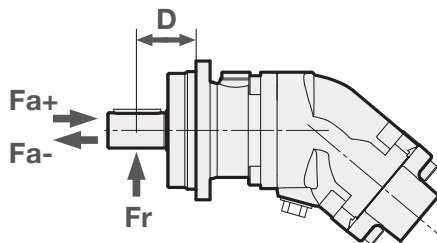
The drainage oil should have a maximum temperature of 75 °C with a Nitrile shaft seal and 90 °C with a Viton shaft seal. These temperatures must not be exceeded.

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

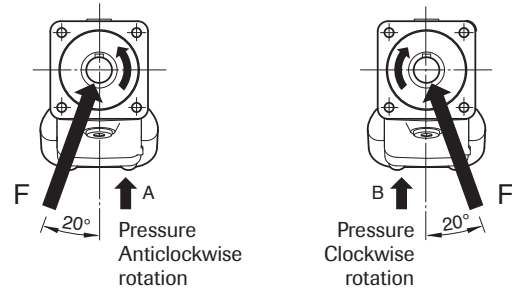
## Shaft loads

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 ISO Max recommended shaft loads		012	017	025	034	040	047	056	064	084	090	108	130
Fr (radial) max <sup>1</sup>	kN	7	7	8	8	8.5	8.5	9	9	12	12.5	12.5	13
Distance D (to point of force)	mm	45	45	50	50	60	60	60	60	65	65	70	70
Fa (axial) + (at standstill/ 0 bar pressure) max	kN	3	3	3	3	4	4	4	4	5	5	5	5
Fa (axial) - (at standstill/ 0 bar pressure) max	kN	4	5	7	7	7	7	10	11	13	14	16	19
Fa (axial) + (at 400 bar pressure) max <sup>2</sup>	kN	4	5	7	7	7	7	10	11	13	14	16	19
Fa (axial) - (at 400 bar pressure) max <sup>2</sup>	kN	0	0	0	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.

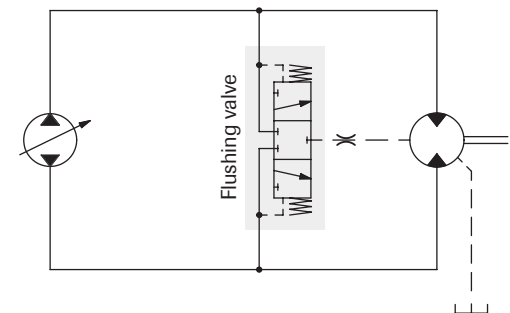
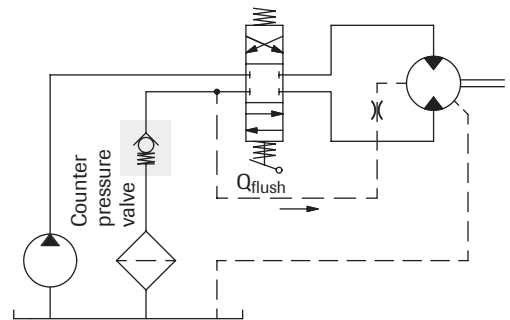
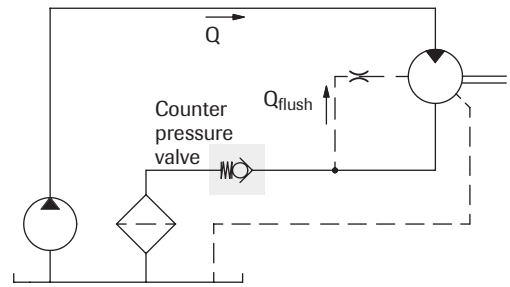
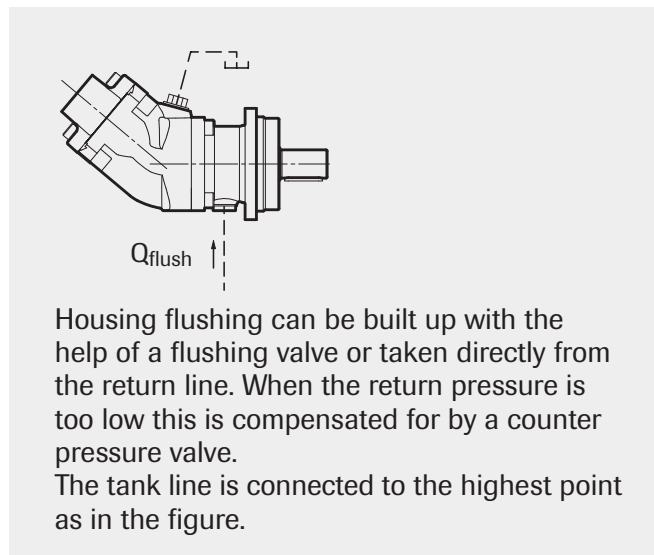
## Temperatures/Housing cooling

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 90 °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:

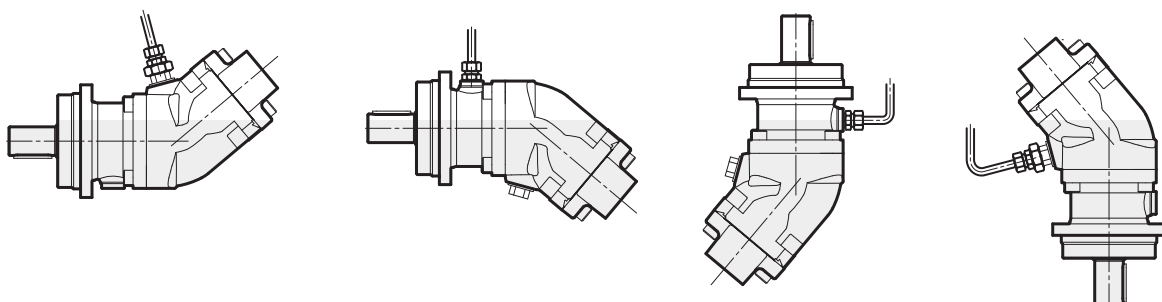
Motor SCM	Flushing l/min	Cont. RPM
012-034	2-8	≥ 2800
040-064	4-10	≥ 2500
084-130	6-12	≥ 2200



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 formulae

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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