SCM 010-130 ISO

SCM 010-130 ISO is a range of robust axial piston motors especially suitable for mobile hydraulics.

SCM 010-130 ISO 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. It covers the entire displacement range 0.59 - 7.93 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
- Available in many different configurations of shafts and connections
- High efficiency
- Speed sensor available as option
- Suitable for applications with high angular accelerations due to its high rotary stiffness

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Versions, main data

Example

SC	M	-	012	W	-	P	-	I41	-	W25	-	K3	G	-	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

010	012	017	025	034	040	047	056	064	084	090	108	130

3. Direction of rotation

W	Independent

4. Shaft seal

P	FPM, high pressure, high temperature

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

5. Mounting flange

ISO 3019-2		010	012	017	025	034	040	047	056	064	084	090	108	130
I41	ISO 4-h ø80	X	X	X	-	-	-	-	-	-	-	-	-	-
I42	ISO 4-h ø100	-	O	O	X	X	-	-	-	-	-	-	-	-
I43	ISO 4-h ø125	-	-	-	-	-	X	X	X	X	-	-	-	-
I44	ISO 4-h ø140	-	-	-	-	-	-	-	-	-	X	X	O	O
I45	ISO 4-h ø160	-	-	-	-	-	-	-	-	-	O	O	X	X

- = Not available
X = Standard, preferred
O = Contact Sunfab

6. Shaft

		010	012	017	025	034	040	047	056	064	084	090	108	130
Spline DIN 5480														
W20	W20x1.25x14x9g	X	X	X	-	-	-	-	-	-	-	-	-	-
W25	W25x1.25x18x9g	X	X	X	X	(X)	-	-	-	-	-	-	-	-
W30	W30x2x14x9g	-	-	-	X	X	X	X	X	(X)	-	-	-	-
W32	W32x2x14x9g	-	-	-	-	-	X	X	X	(X)	-	-	-	-
W35	W35x2x16x9g	-	-	-	-	-	X	X	X	X	X	X	-	-
W40	W40x2x18x9g	-	-	-	-	-	-	-	-	-	X	X	X	X
W45	W45x2x21x9g	-	-	-	-	-	-	-	-	-	O	O	X	X
Key DIN 6885														
K20	ø 20 k6	X	X	X	-	-	-	-	-	-	-	-	-	-
K25	ø 25 k6	X	X	X	X	(X)	-	-	-	-	-	-	-	-
K30	ø 30 k6	-	-	O	O	X	X	X	X	(X)	-	-	-	-
K35	ø 35 k6	-	-	-	-	-	X	X	X	X	-	-	-	-
K40	ø 40 k6	-	-	-	-	-	-	-	-	-	X	X	O	O
K45	ø 45 k6	-	-	-	-	-	-	-	-	-	O	O	X	X

- = Not available
X = Standard, preferred
O = Contact Sunfab
(X) = Limited maximum pressure, contact Sunfab

7. Connection cover

		010	012	017	025	034	040	047	056	064	084	090	108	130
S1	40° Mount flange vertical*	-	-	-	-	-	-	-	-	-	X	X	X	X
S2	40° Mount flange horizontal*	-	-	-	X	X	X	X	X	X	-	-	-	-
S3	40° Threaded connection	X	X	X	X	X	-	-	-	-	-	-	-	-
V1	90° Mount flange vertical*	-	-	-	-	-	-	-	-	-	X	X	X	X
V2	90° Mount flange horizontal*	-	-	-	X	X	X	X	X	X	X	X	X	X
R1	Side connections, flanged*	-	-	-	X	X	X	X	X	X	X	X	X	X
K3	Combicover 90° side conn. thread	X	X	X	X	X	-	-	-	-	-	-	-	-

*According to SAE J518 code 62

8. Connection cover

		010	012	017	025	034	040	047	056	064	084	090	108	130
G	ISO G*	X	X	X	X	X	-	-	-	-	-	-	-	-
M	Metric **	-	-	-	X	X	X	X	X	X	X	X	X	X
U	UN***	X	X	X	X	X	X	X	X	X	X	X	X	X

*Only threaded connections
**Only flanged connections
***Not available for K3

9. Additional

1	External drainage

10. Speed Sensor

		010	012	017	025	034	040	047	056	064	084	090	108	130
00	No Speed Sensor	X	X	X	X	X	X	X	X	X	X	X	X	X
P1	Prepared for Speed Sensor	X	X	X	X	X	X	X	X	X	X	X	X	X
S1	Fitted Speed Sensor type PNP*	X	X	X	X	X	X	X	X	X	X	X	X	X
S2	Fitted Speed Sensor type NPN*	X	X	X	X	X	X	X	X	X	X	X	X	X

*See separate brochure "Speed Sensor hall" for more information.

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SCM 010-130 ISO		010	012	017	025	034	040	047	056	064	084	090	108	130
Displacement														
cu in/rev		0.59	0.77	1.04	1.55	2.09	2.51	2.87	3.46	3.88	5.10	5.53	6.59	7.93
Working pressure														
psi	*max intermittent*	5800	5800	5800	5800	5800	5800	5800	5800	5800	5800	5800	5800	5800
	max continuous	5075	5075	5075	5075	5075	5075	5075	5075	5075	5075	5075	5075	5075
Revolutions														
rpm	*max intermittent*	8800	8800	8800	7000	7000	6300	6300	6300	6300	5200	5200	5200	5200
	max continuous	8000	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	300
Power														
hp	*max intermittent*	55	72	99	115	154	168	194	235	261	288	308	369	382
	max continuous	20	27	34	54	74	80	87	107	121	134	148	174	181
Starting torque theoretical value														
lb-ft/1000psi		8	10	14	20	27	33	38	45	51	68	73	87	104
Moment of inertia (x 10^{-3})														
lb-ft-sec^2		0.7	0.7	0.7	0.8	0.8	1.9	1.9	1.9	1.9	5.5	5.5	5.5	5.5
Weight														
lb		18.7	18.7	18.7	20.9	20.9	36.4	36.4	36.4	36.4	61.7	61.7	67.2	67.2

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.

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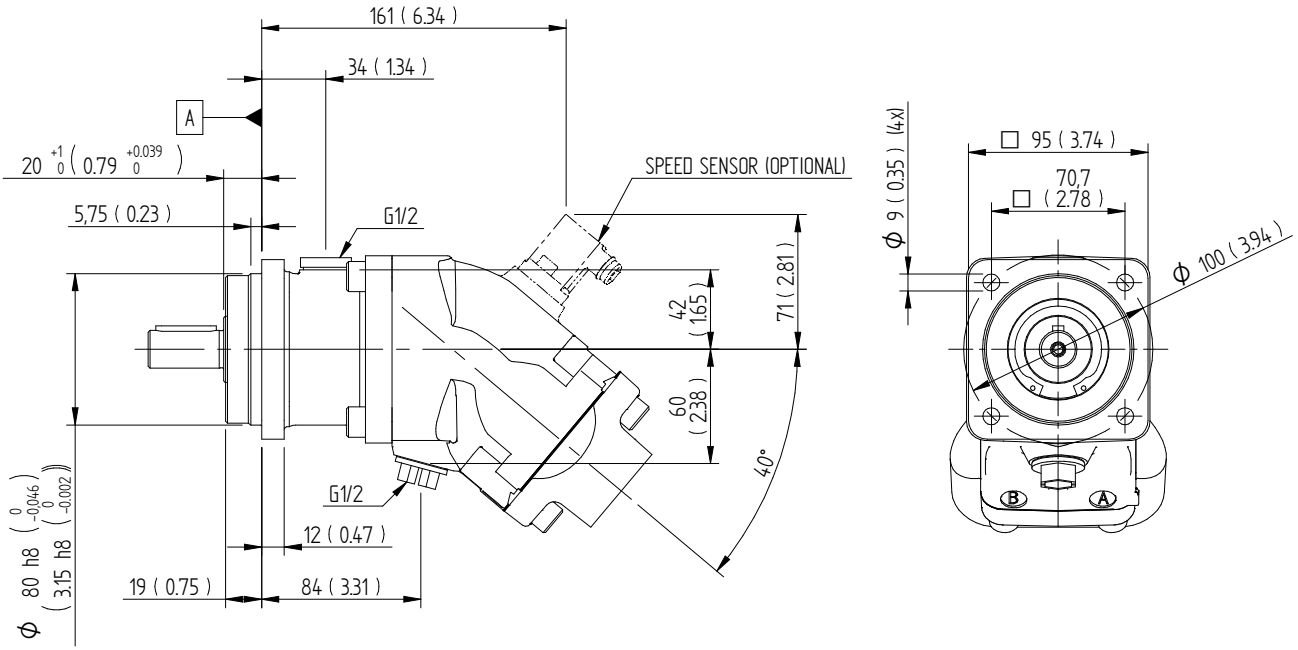
Dimensions SCM 010-017

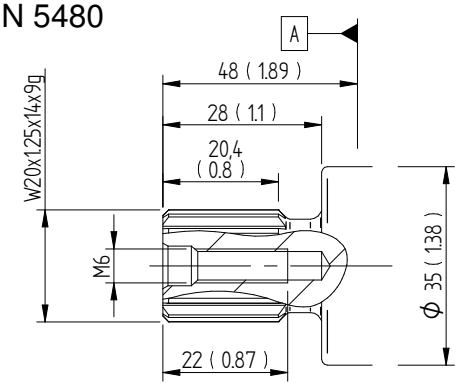
Flange & shafts

Millimeter (inch)

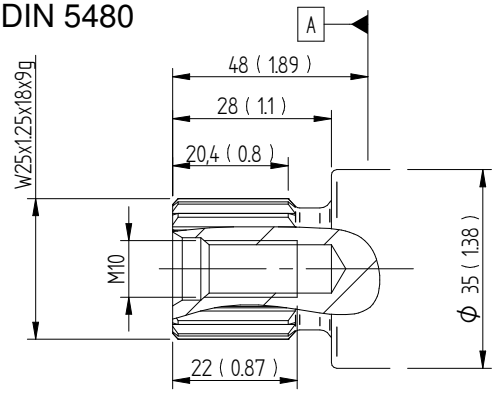
I41 ISO 3019-2



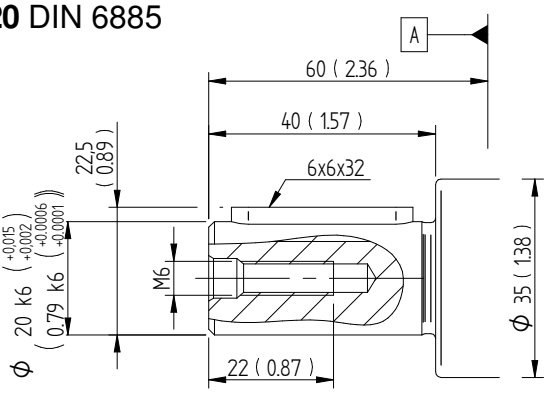
W20 DIN 5480



W25 DIN 5480



K20 DIN 6885



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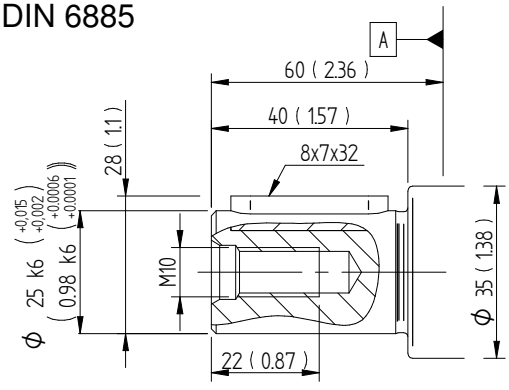

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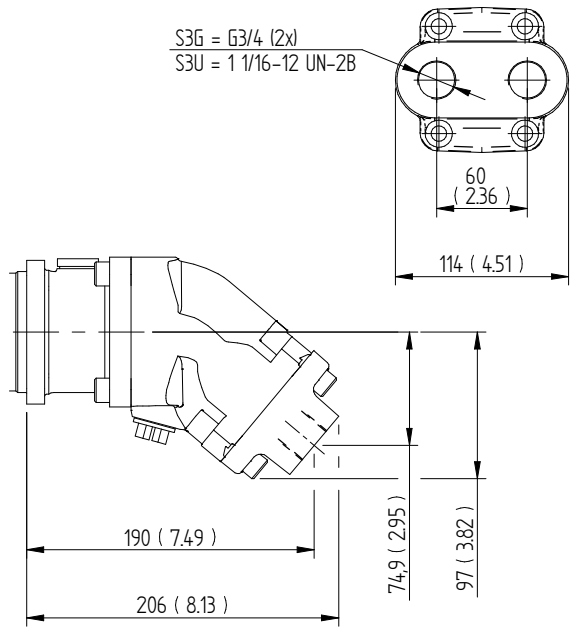
Dimensions SCM 010-017

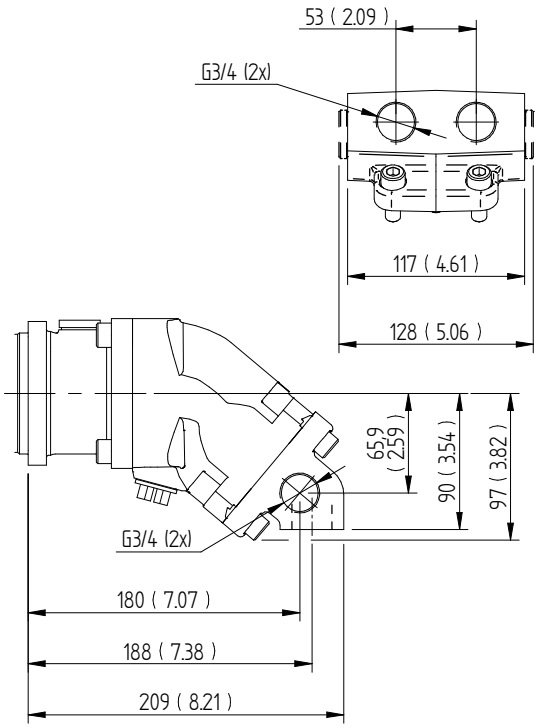
Connection cover

Millimeter (inch)

S3G/S3U



K3G



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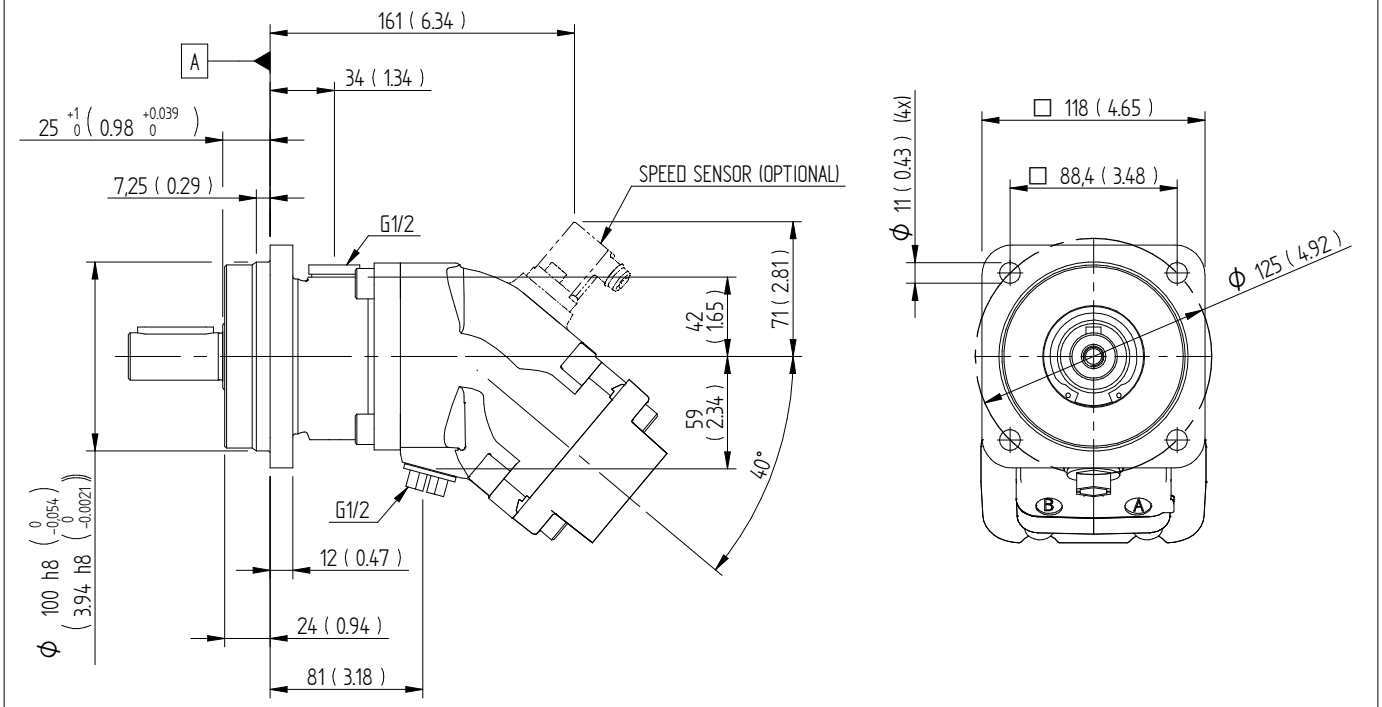
Dimensions SCM 025-034

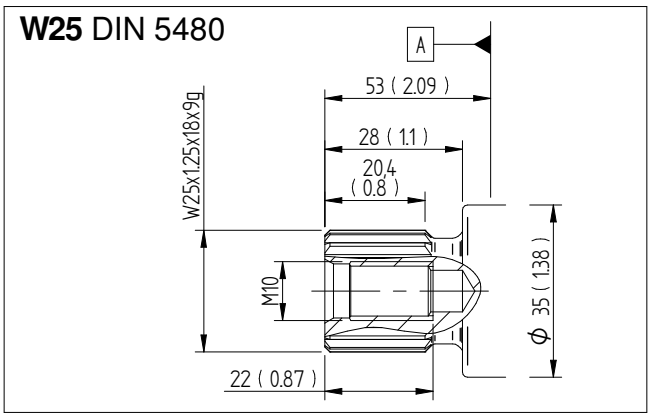
Flange & shafts

Millimeter (inch)

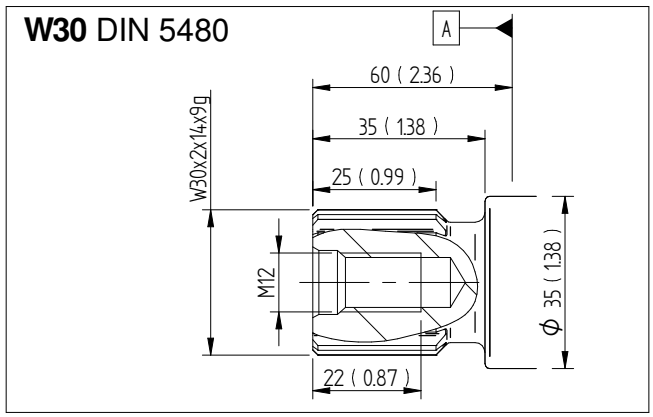
I42 ISO 3019-2



W25 DIN 5480



W30 DIN 5480



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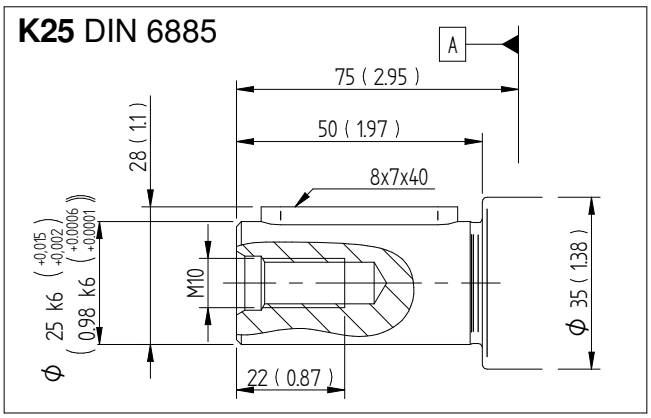
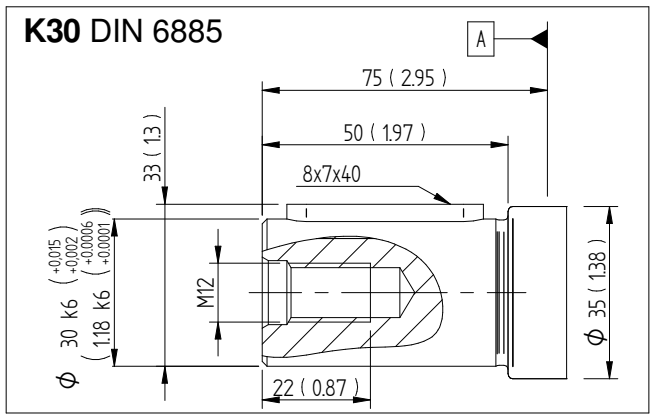


K30 DIN 6885



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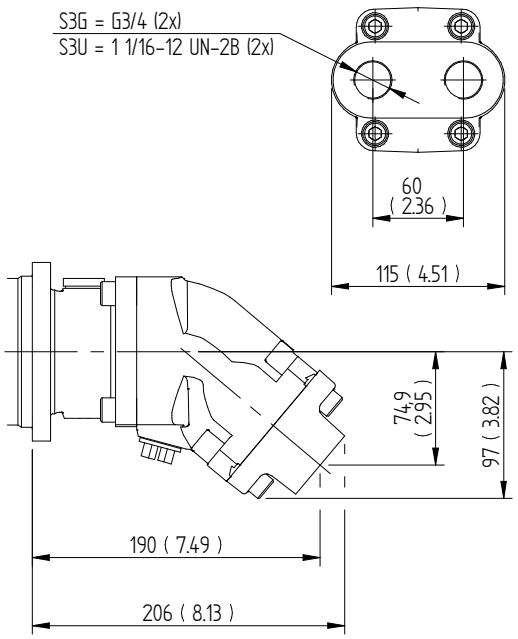
Dimensions SCM 025-034

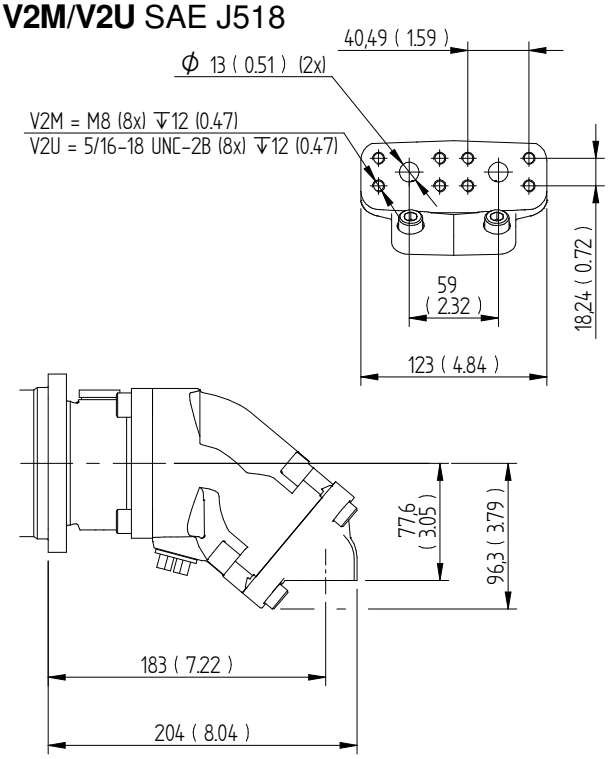
Connection cover

Millimeter (inch)

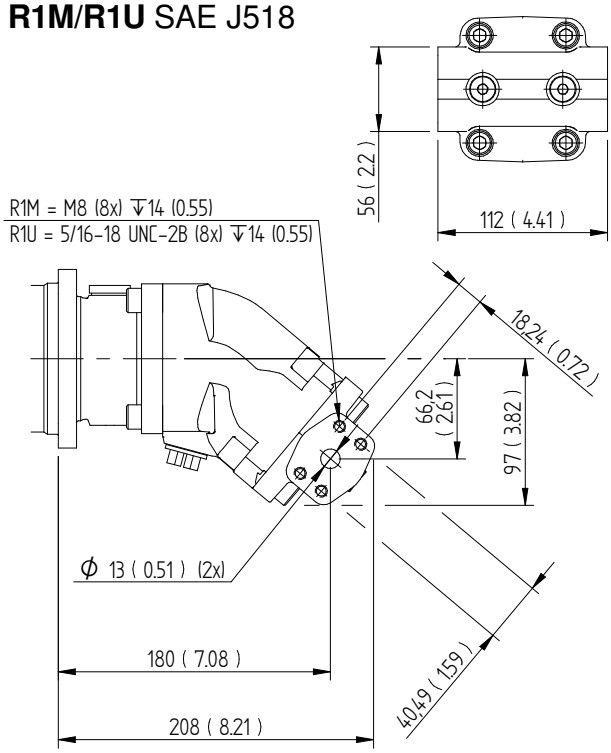
S3G/S3U



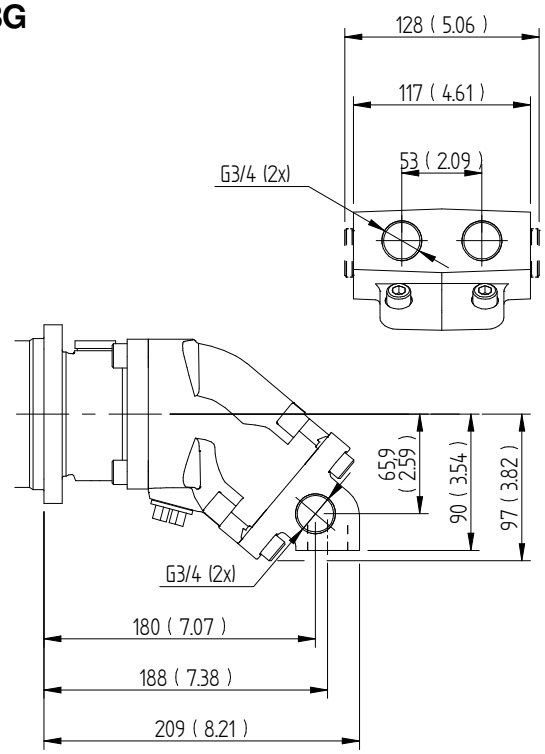
V2M/V2U SAE J518



R1M/R1U SAE J518



K3G



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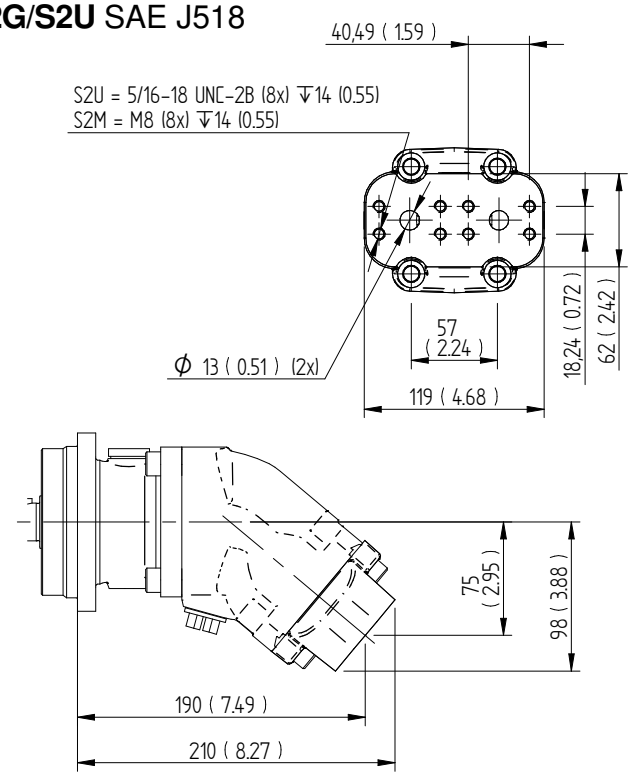
Dimensions SCM 025-034

Connection cover

Millimeter (inch)

S2G/S2U SAE J518



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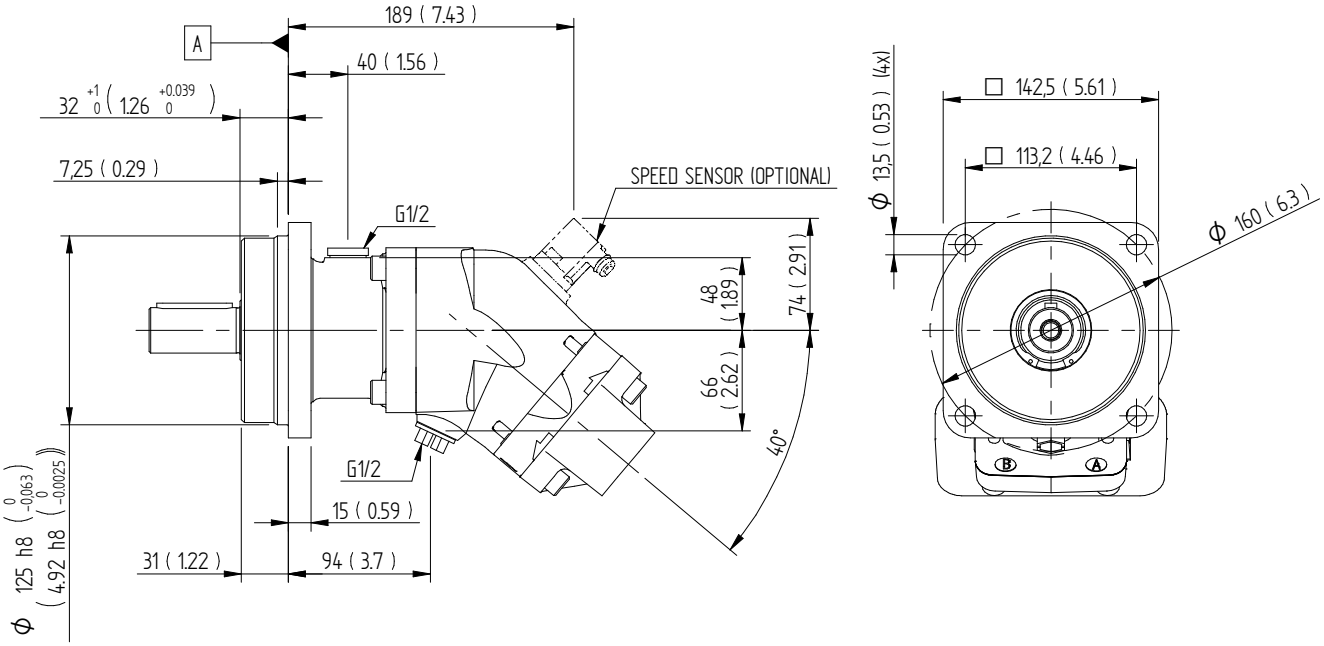
Dimensions SCM 040-064

Flange

Millimeter (inch)

I43 ISO 3019-2



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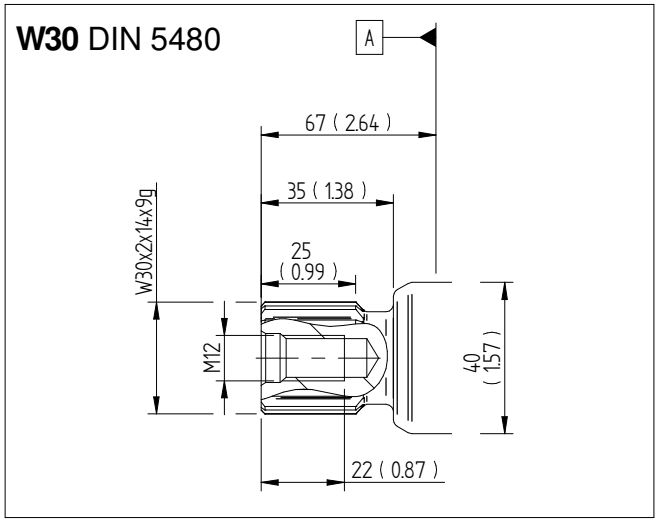
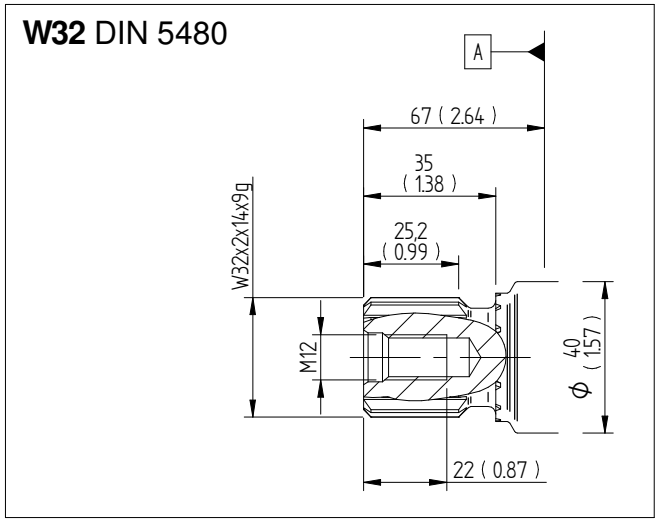
Dimensions SCM 040-064
Shafts

Millimeter (inch)

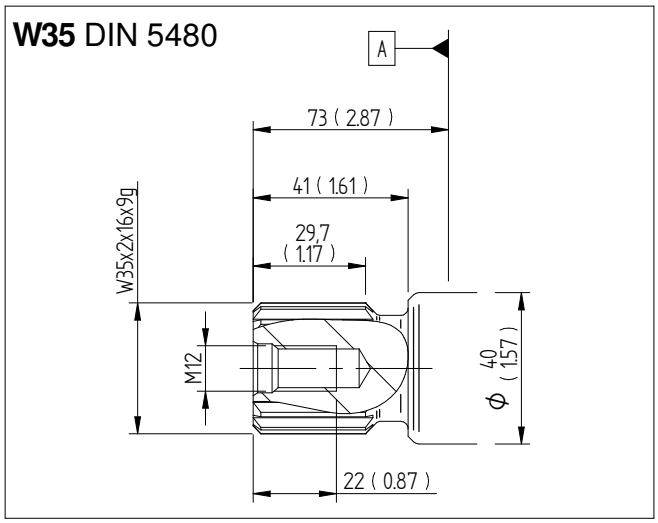
W30 DIN 5480



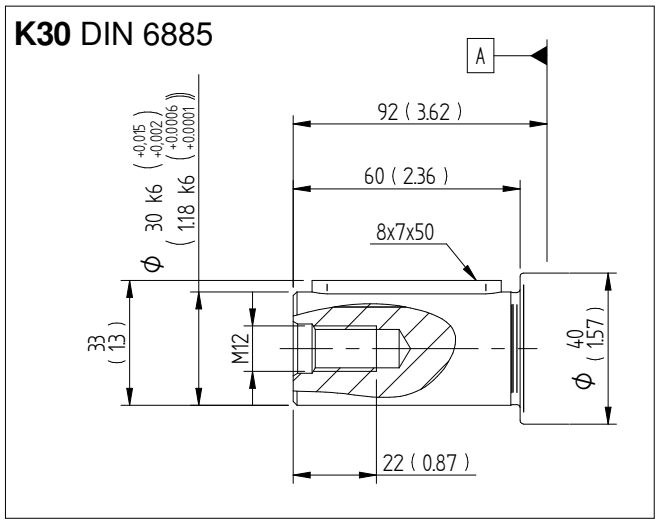
W32 DIN 5480



W35 DIN 5480



K30 DIN 6885



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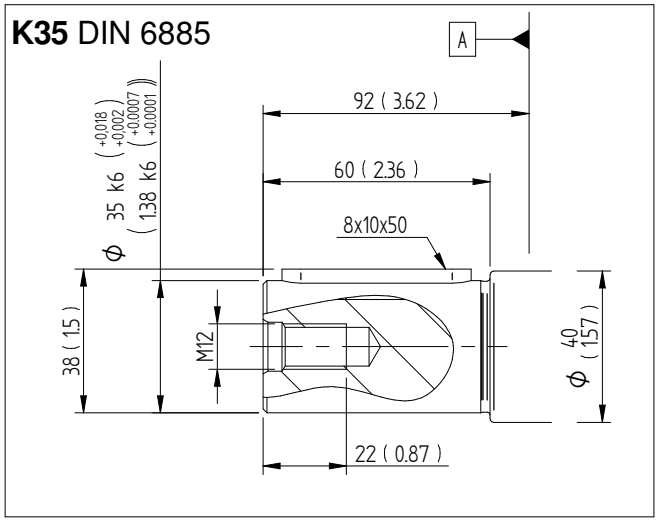

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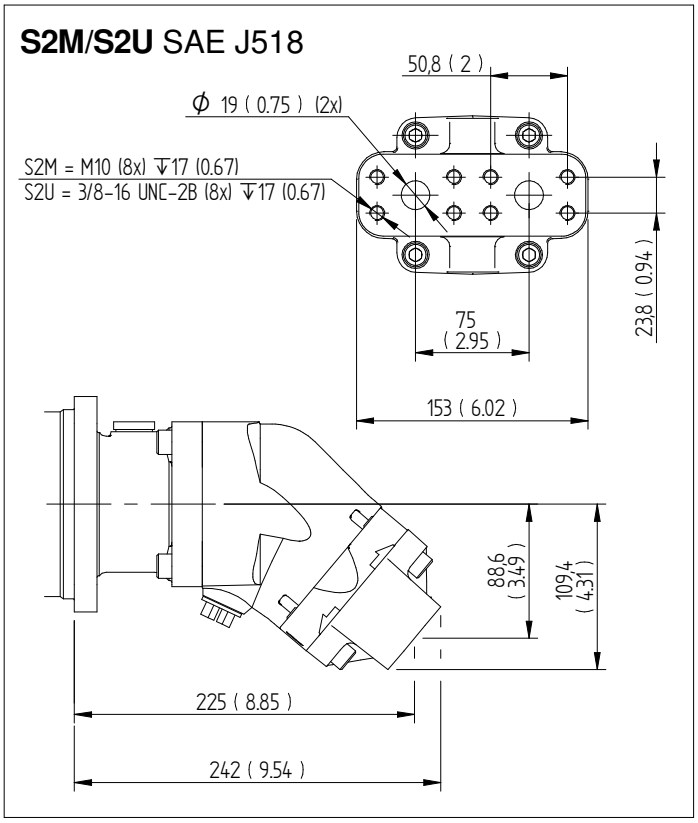
Dimensions SCM 040-064

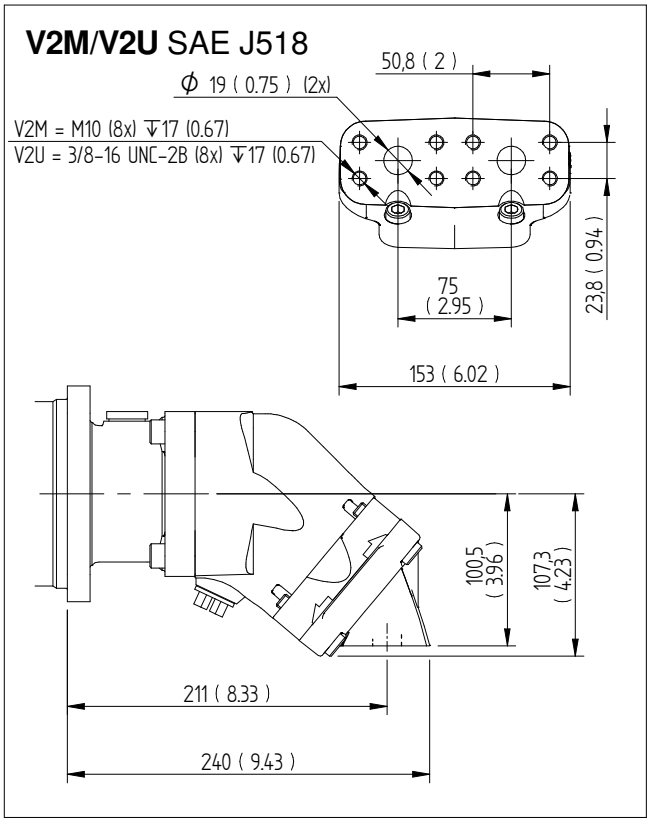
Connection cover

Millimeter (inch)

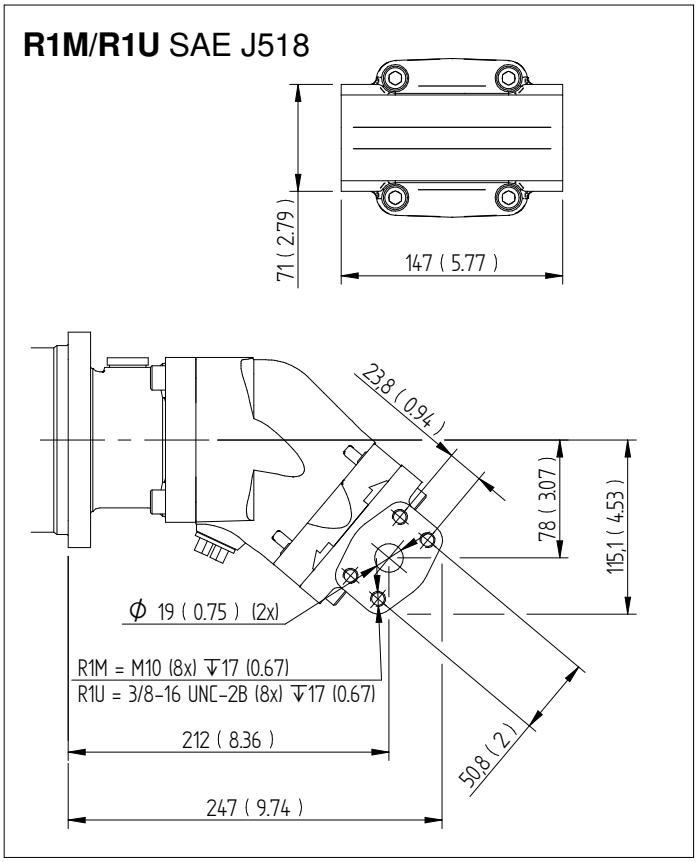
S2M/S2U SAE J518



V2M/V2U SAE J518



R1M/R1U SAE J518



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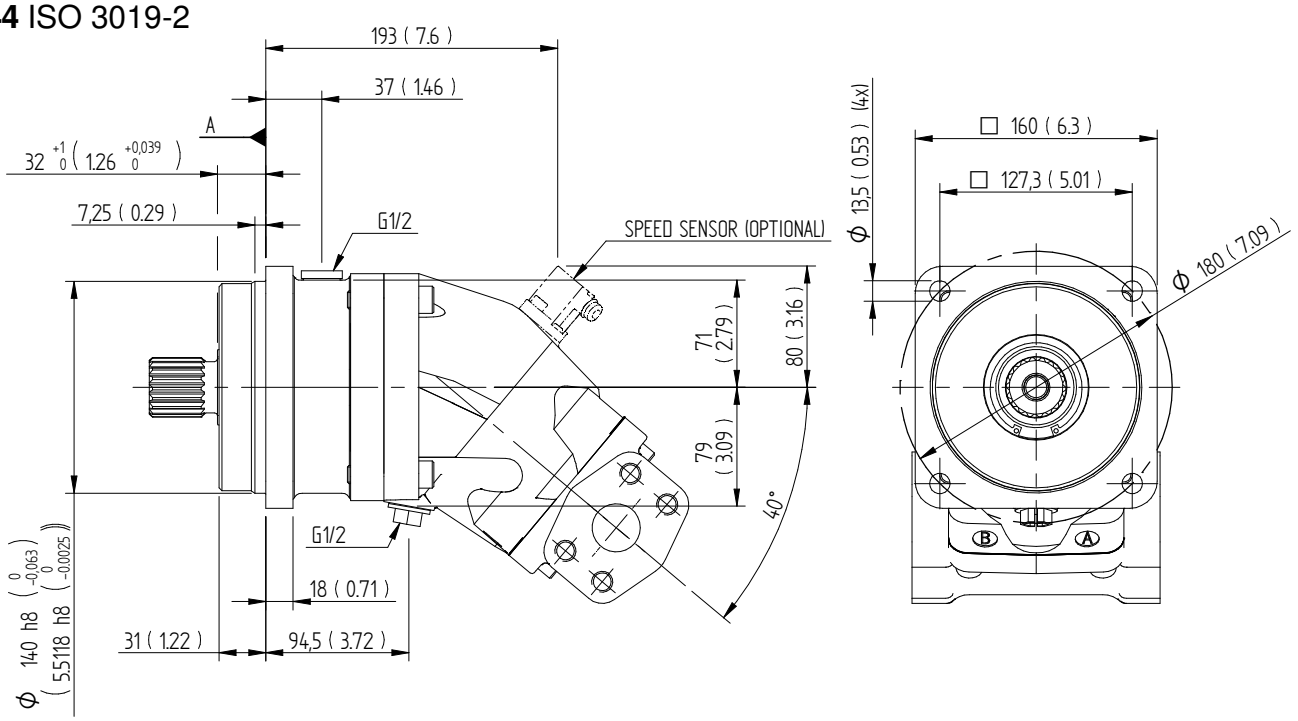
Dimensions SCM 084-090

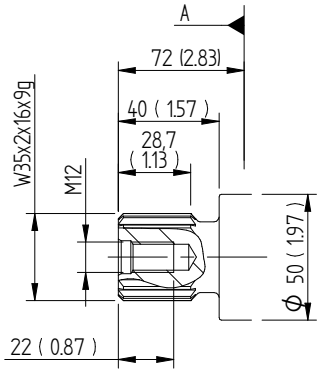
Flange & shafts

Millimeter (inch)

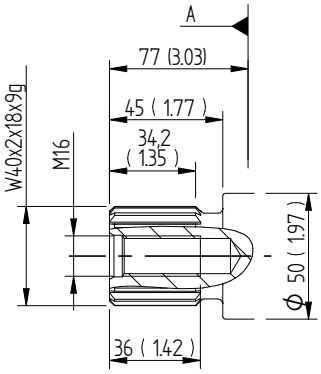
I44 ISO 3019-2



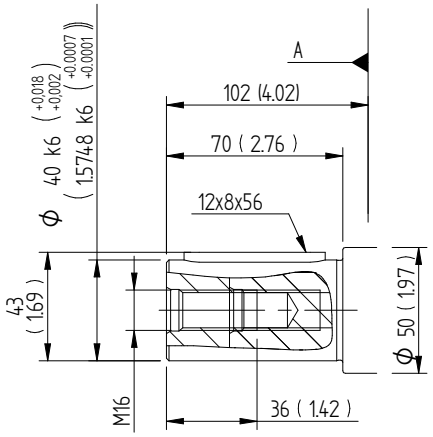
W35 DIN 5480



W40 DIN 5480



K40 DIN 6885



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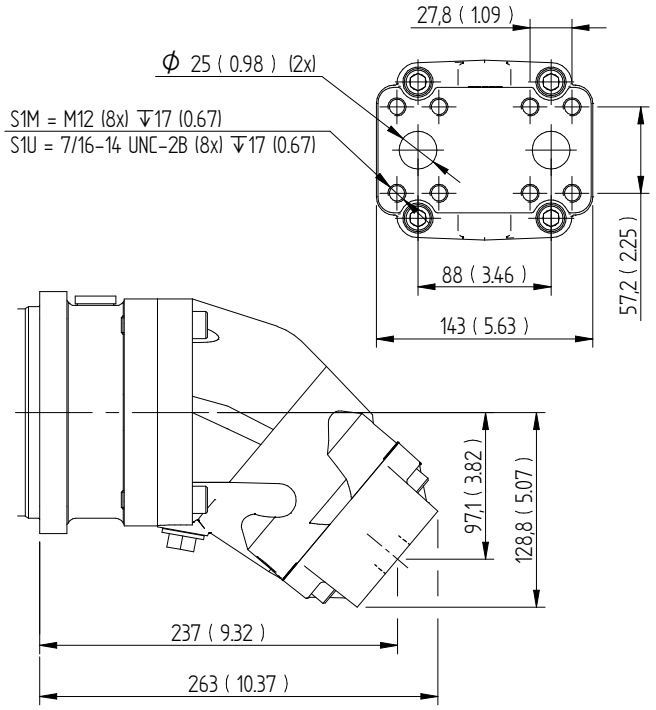
Dimensions SCM 084-090

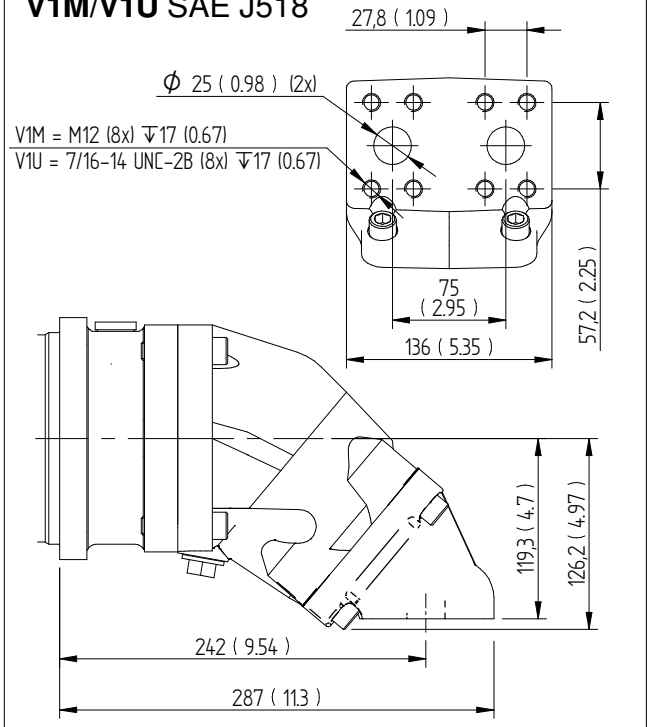
Connection cover

Millimeter (inch)

S1M/S1U SAE J518



V1M/V1U SAE J518



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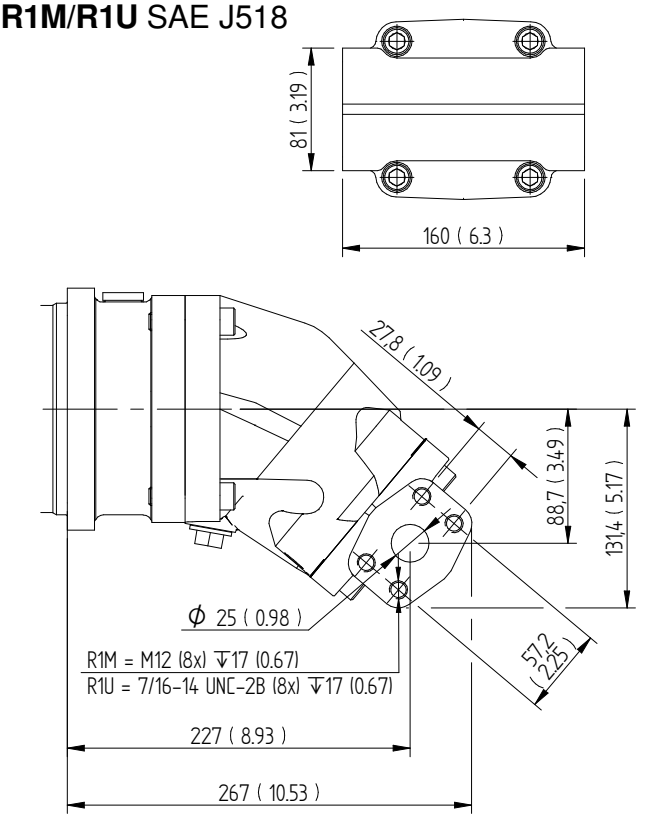
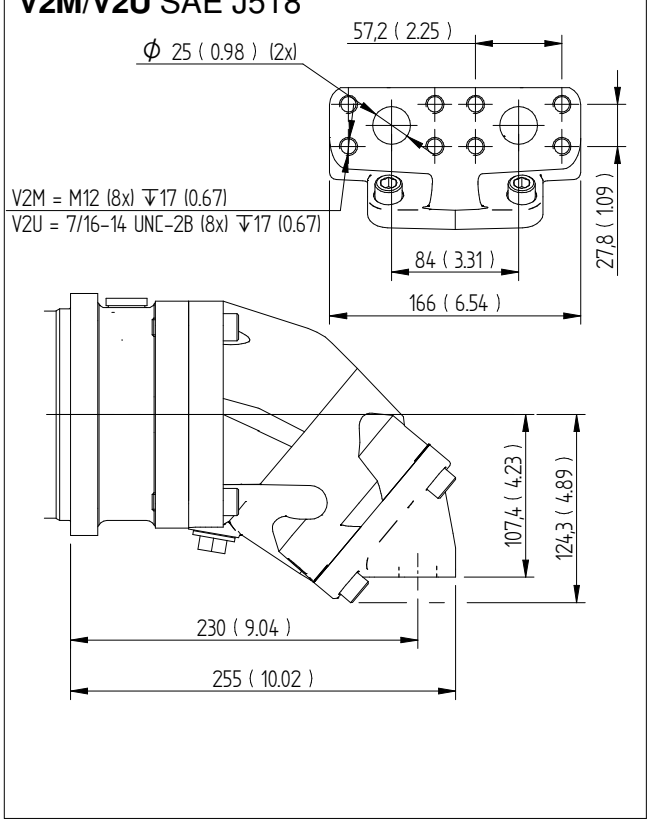


V2M/V2U SAE J518



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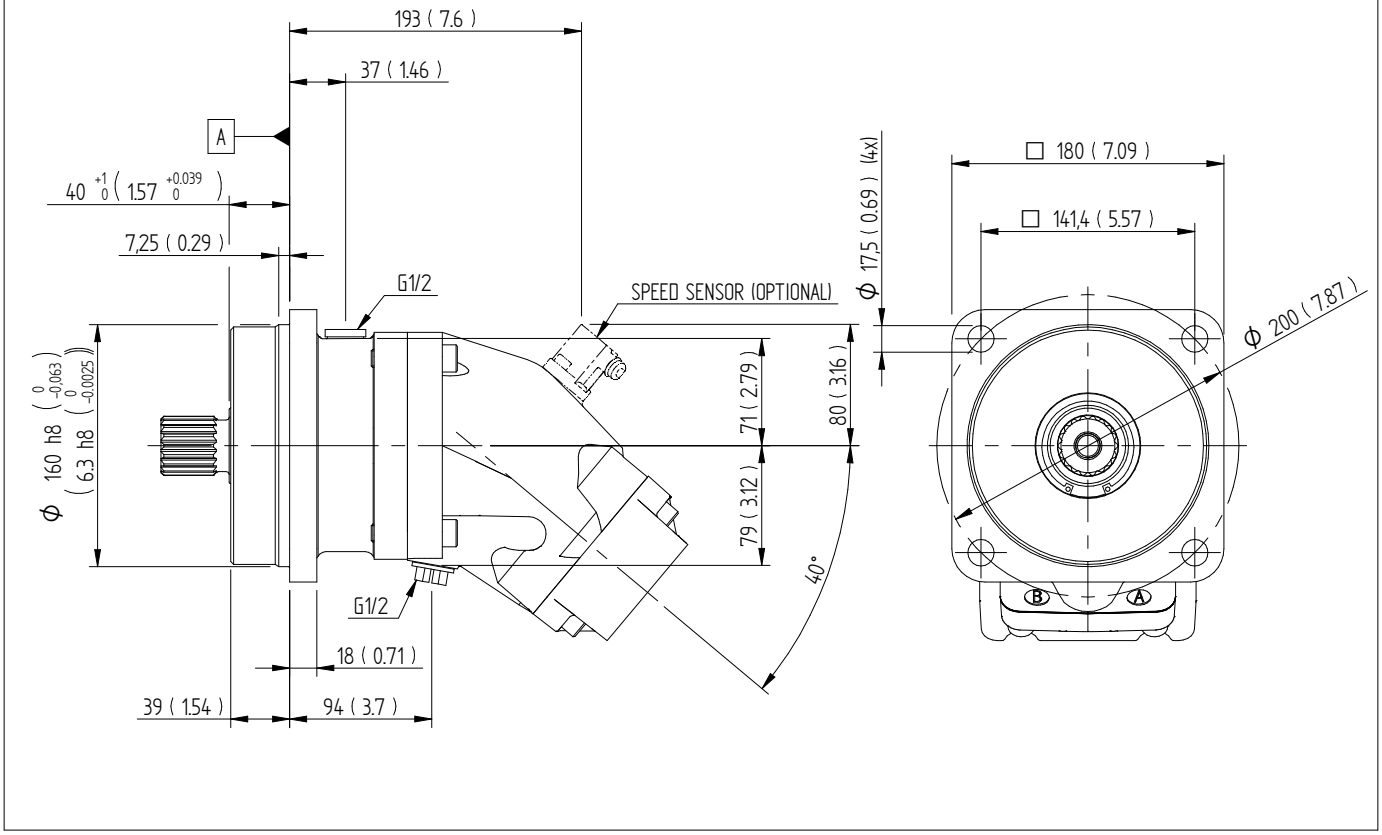
Dimensions SCM 108-130

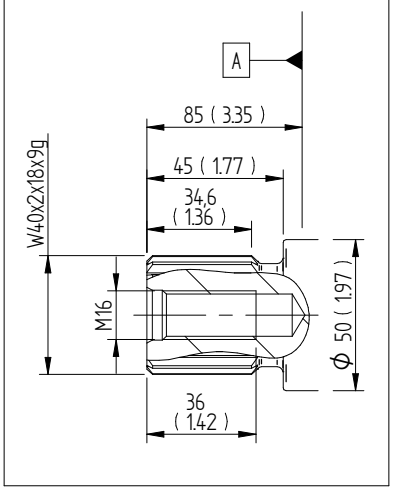
Flange & shafts

Millimeter (inch)

I45 ISO 3019-2



W40 DIN 5480



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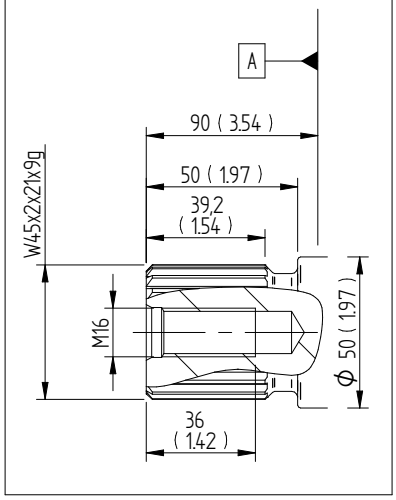

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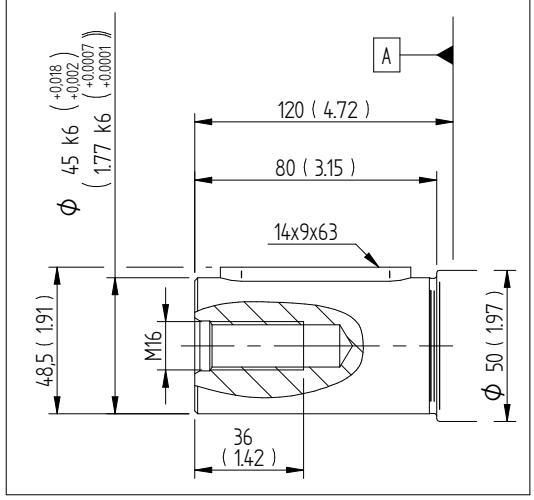

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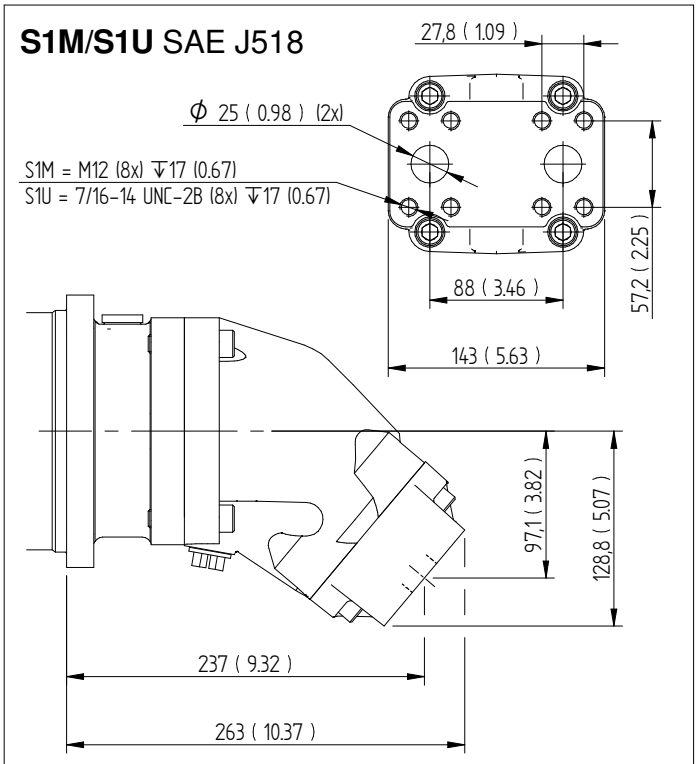
Dimensions SCM 108-130

Connection cover

Millimeter (inch)

S1M/S1U SAE J518



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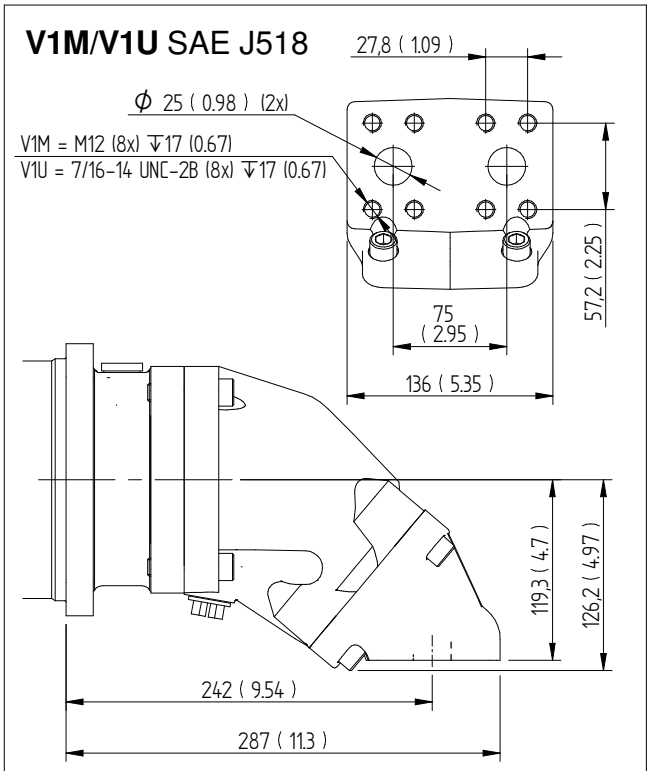

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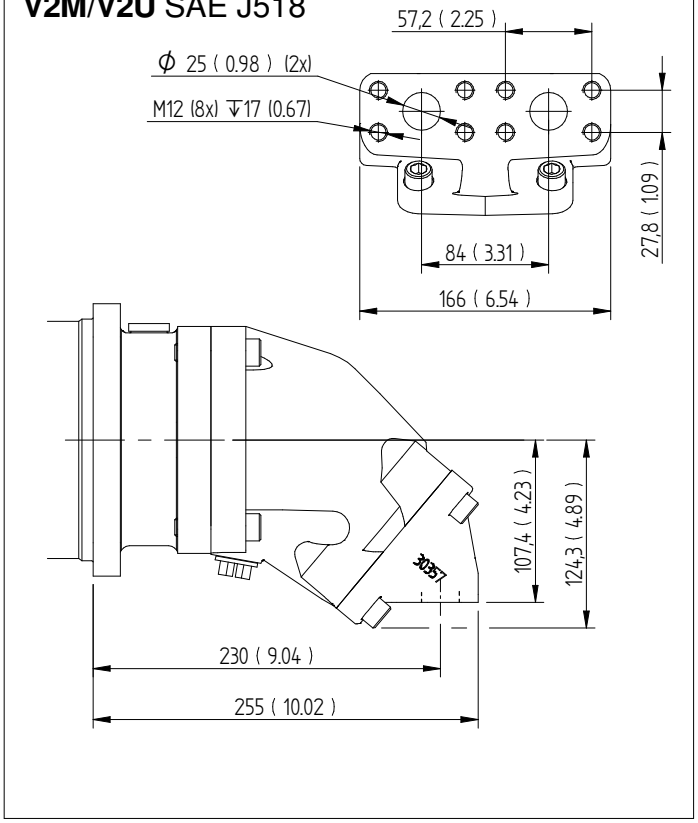

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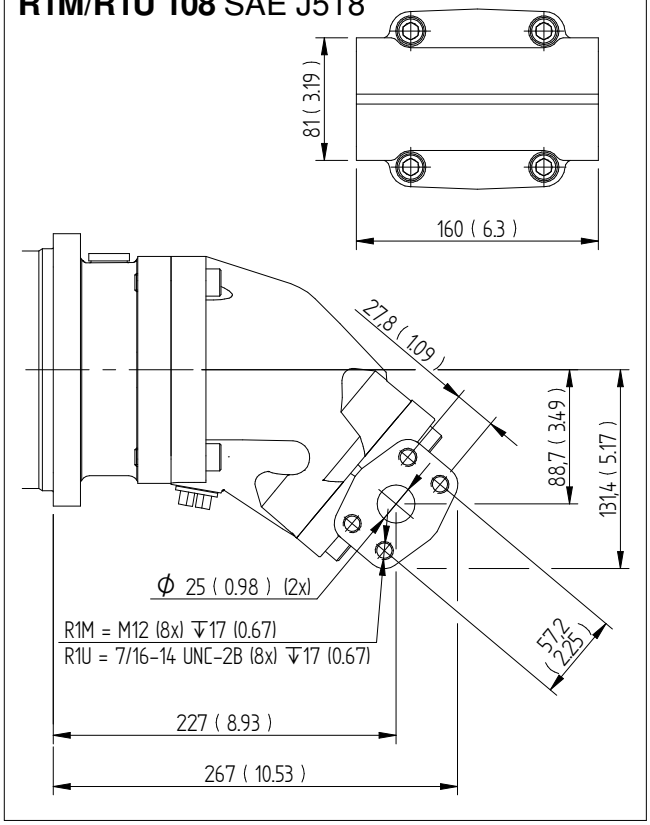

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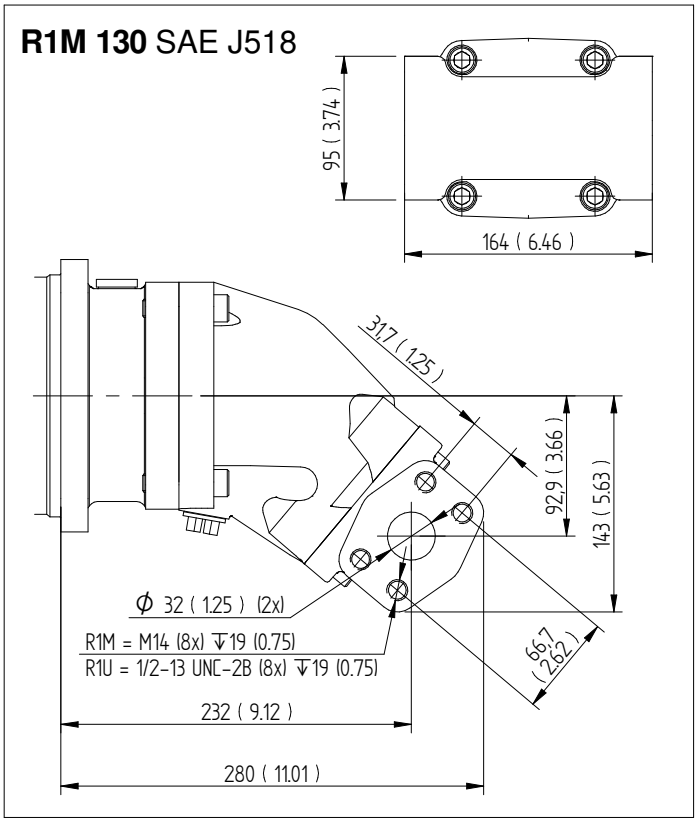
Dimensions SCM 108-130

Connection cover

Millimeter (inch)



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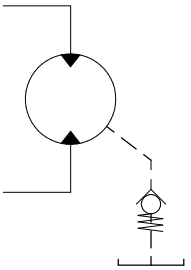
General instructions

Shaft seal



		Max. housing pressure psi at RPM				
Motor SCM	Code	*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.

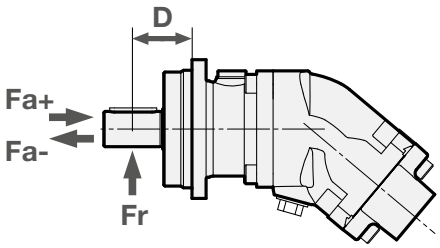
The housing pressure must be equal to or greater than the external pressure on the shaft seal.

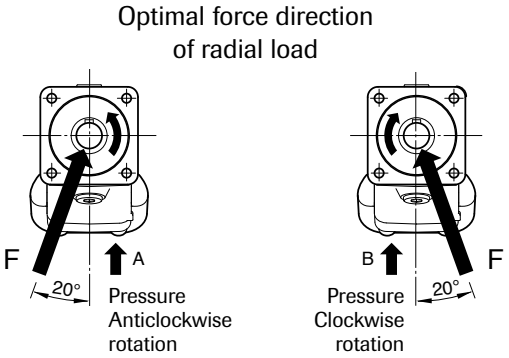
To ensure the function of the shaft seal and lubrication of the motor, we recommend a min. housing pressure of 7 psi. If needed, a spring loaded check valve of 7 psi can be installed on the housing drain line.

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.





SCM ISO Max recommended shaft loads		010	012	017	025	034	040	047	056	064	084	090	108	130
Fr (radial) max[1]	lbf	1575	1575	1575	1800	1800	1900	1900	2025	2025	2700	2800	2800	2925
Distance D (to point of force)	in	1.77	1.77	1.77	1.97	1.97	2.36	2.36	2.36	2.36	2.56	2.56	2.76	2.76
Fa (axial) + (at standstill/ 0 PSI pressure) max	lbf	675	675	675	675	675	900	900	900	900	1125	1125	1125	1125
Fa (axial) - (at standstill/ 0 PSI pressure) max	lbf	900	900	1125	1575	1575	1575	1575	2250	2475	2925	3150	3600	4275
Fa (axial) + (at 5800 PSI pressure) max[2]	lbf	900	900	1125	1575	1575	1575	1575	2250	2475	2925	3150	3600	4275
Fa (axial) - (at 5800 PSI pressure) max[2]	lbf	0	0	0	0	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.

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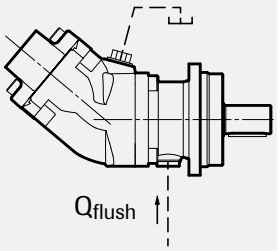
Temperatures/Housing cooling

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.

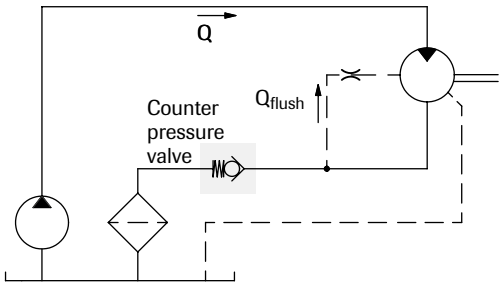
Cooling/flushing of the motor housing can be needed to keep the drain flow temperature at an acceptable level.

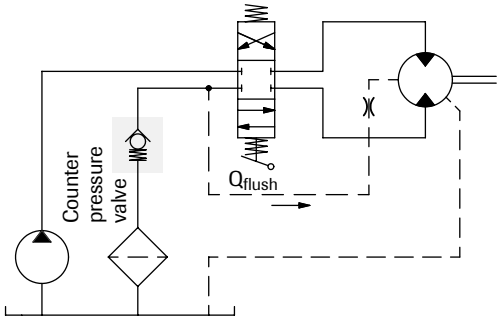
Suggested flow:

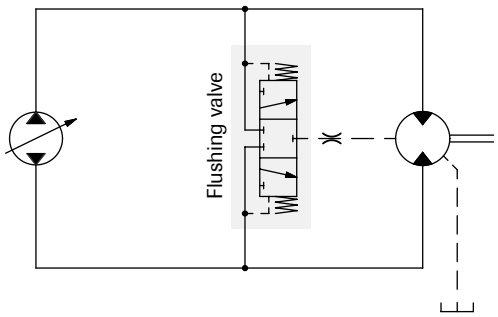
Motor SCM	Flushing GPM	Cont. RPM
012-034	0.5-2.1	≥ 2800
040-064	1.1-2.7	≥ 2500
084-130	1.6-3.2	≥ 2200



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.







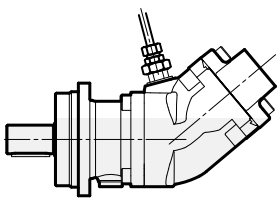
Simplified circuits

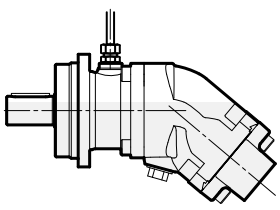
Installation

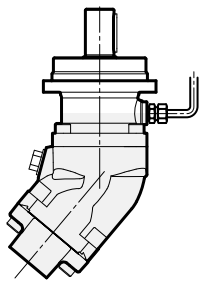
- The motor housing should be filled with oil to at least 50% before starting.

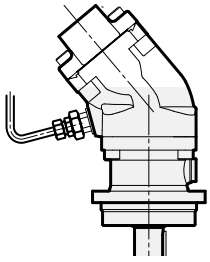
- The drainage pipe should be connected to topmost drainage outlet.

- The other end of the pipe should be connected to the oil tank at a point below the oil level.









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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

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

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

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

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

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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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