



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

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 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 O X 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. Connections | | 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.

| 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 | <i>max intermittent</i> | 5800 | 5800 | 5800 | 5800 | 5800 | 5800 | 5800 | 5800 | 5800 | 5800 | 5800 | 5800 | 5800 |
| | <i>max continuous</i> | 5075 | 5075 | 5075 | 5075 | 5075 | 5075 | 5075 | 5075 | 5075 | 5075 | 5075 | 5075 | 5075 |
| Revolutions | | | | | | | | | | | | | | |
| rpm | <i>max intermittent</i> | 8800 | 8800 | 8800 | 7000 | 7000 | 6300 | 6300 | 6300 | 6300 | 5200 | 5200 | 5200 | 5200 |
| | <i>max continuous</i> | 8000 | 8000 | 8000 | 6300 | 6300 | 5700 | 5700 | 5700 | 5700 | 4700 | 4700 | 4700 | 4700 |
| | <i>min continuous</i> | 300 | 300 | 300 | 300 | 300 | 300 | 300 | 300 | 300 | 300 | 300 | 300 | 300 |
| Power | | | | | | | | | | | | | | |
| hp | <i>max intermittent</i> | 55 | 72 | 99 | 115 | 154 | 168 | 194 | 235 | 261 | 288 | 308 | 369 | 382 |
| | <i>max continuous</i> | 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 permitted peripheral velocity of the tapered roller bearing.

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

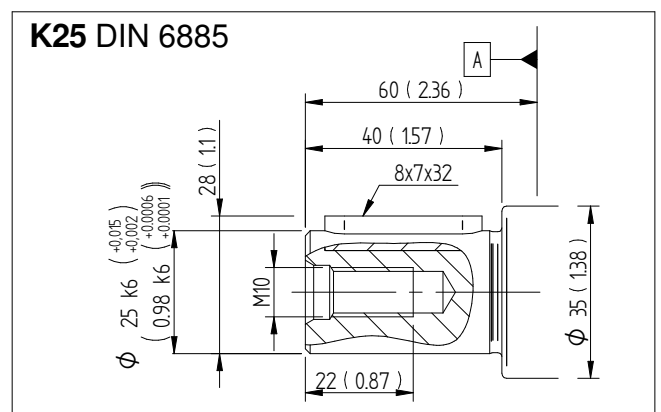
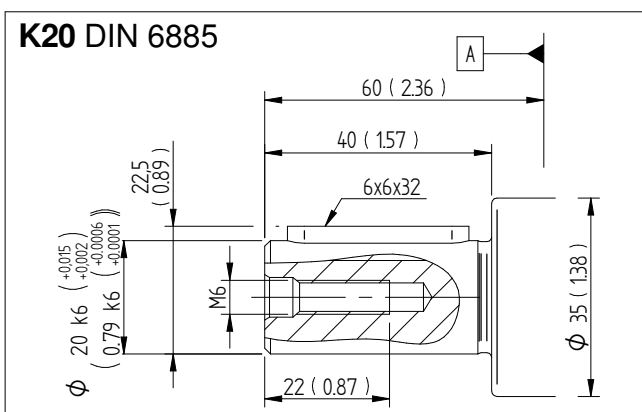
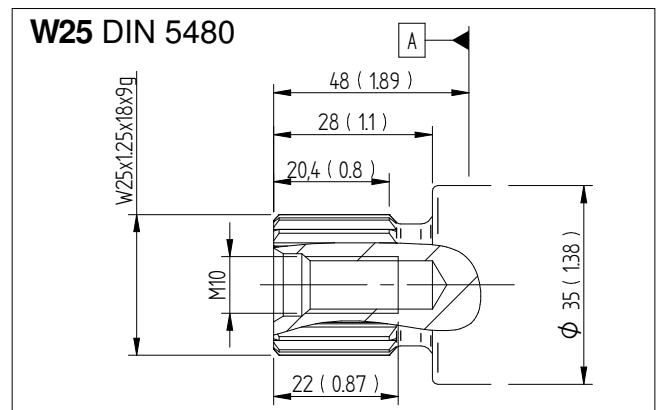
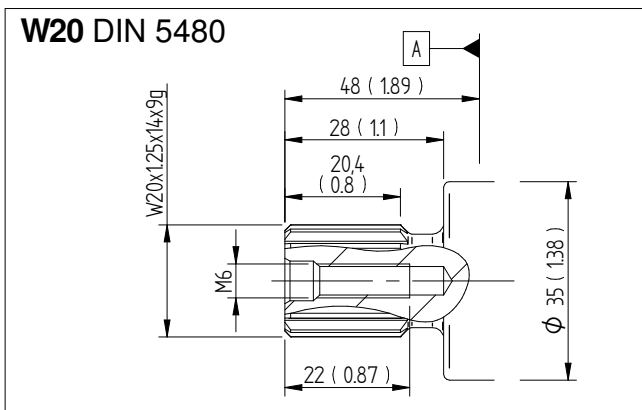
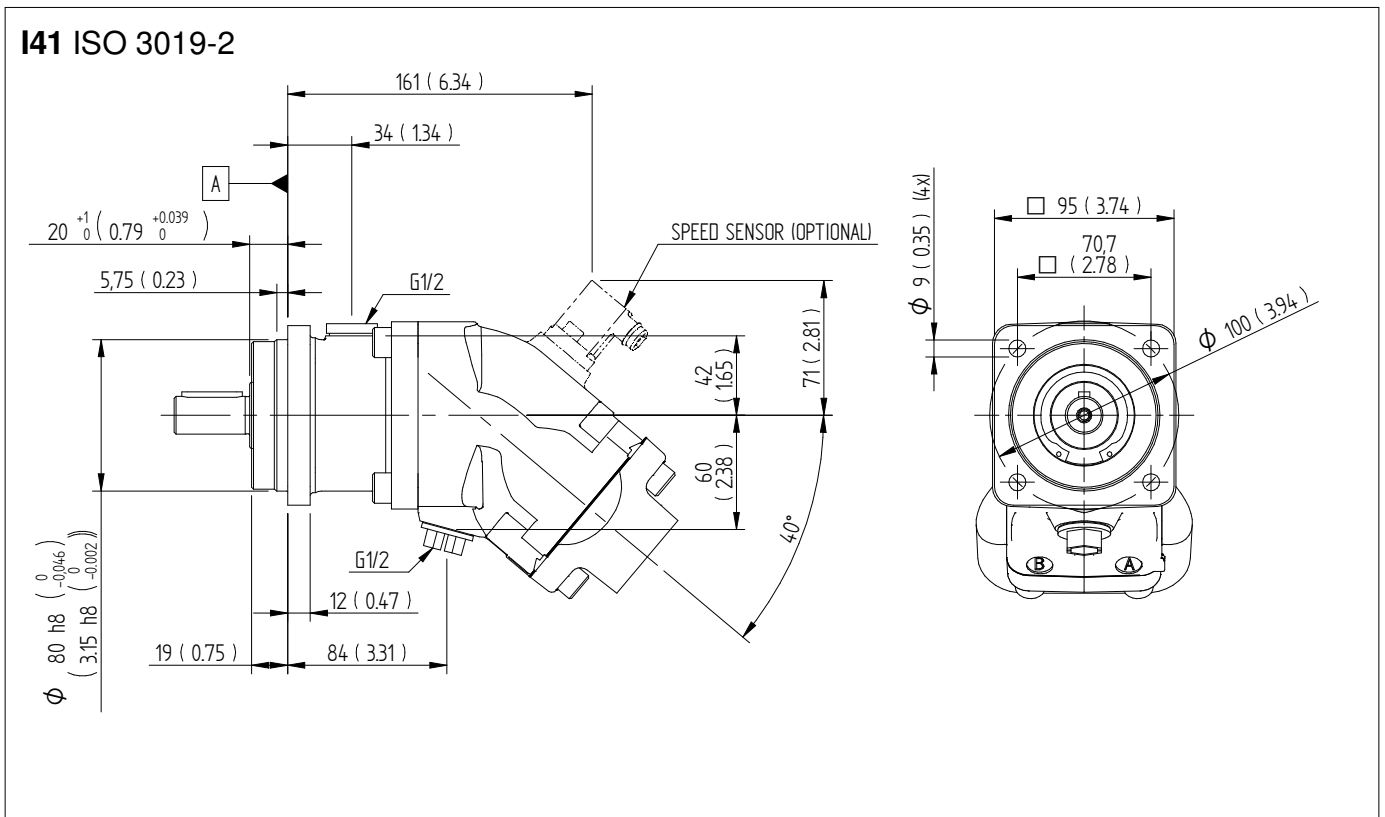
Continuous power data are based on maximum output power without external cooling of the motor housing.

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

Dimensions SCM 010-017

Flange & shafts

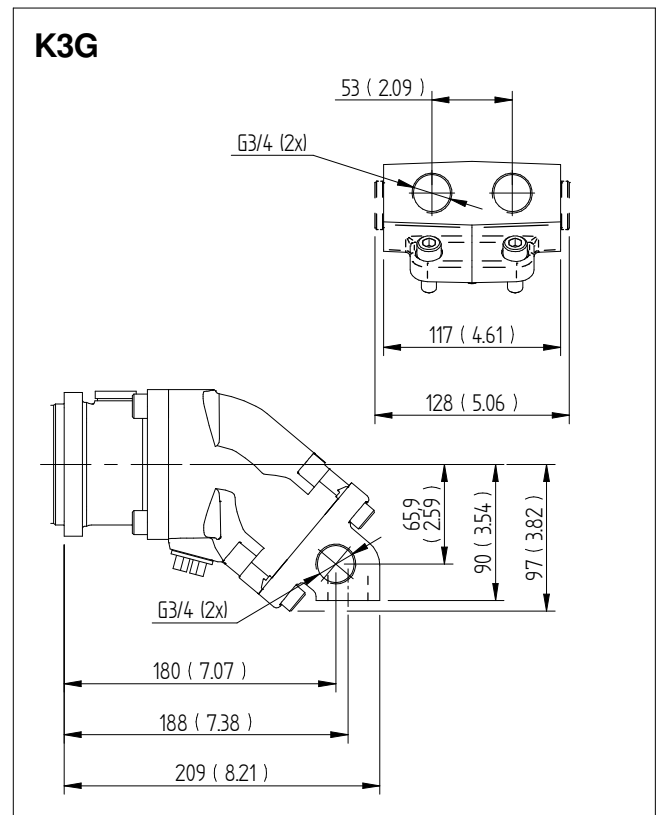
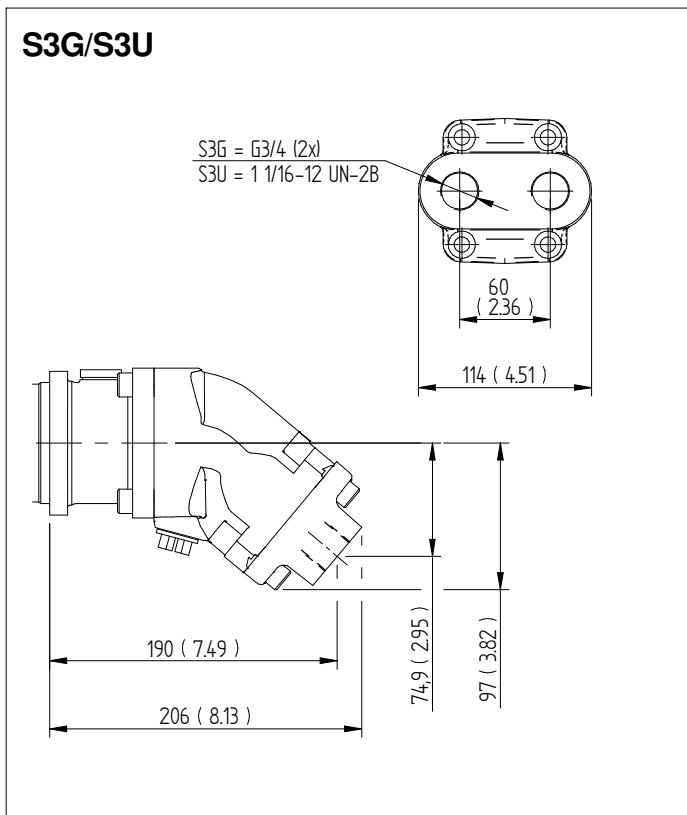
Millimeter (inch)



Dimensions SCM 010-017

Connection cover

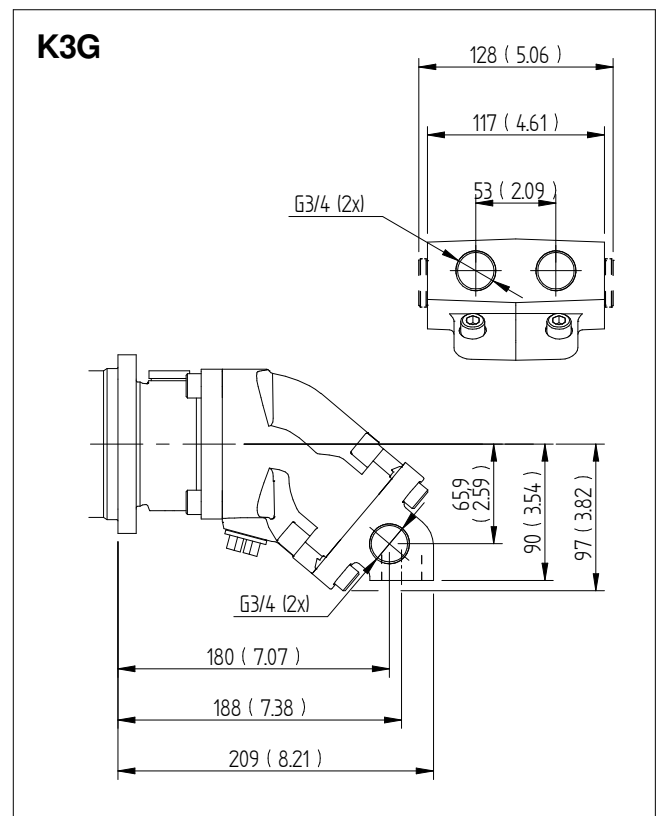
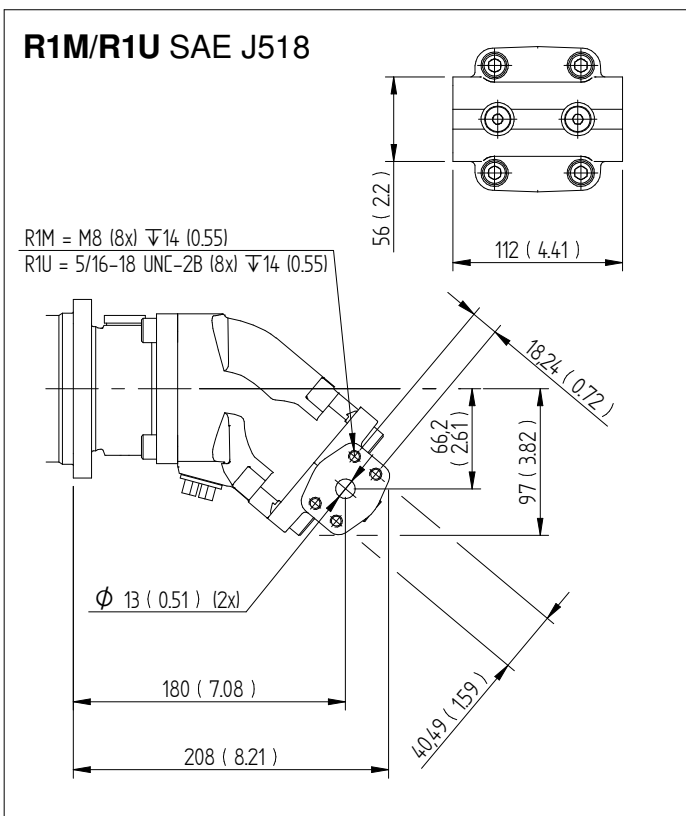
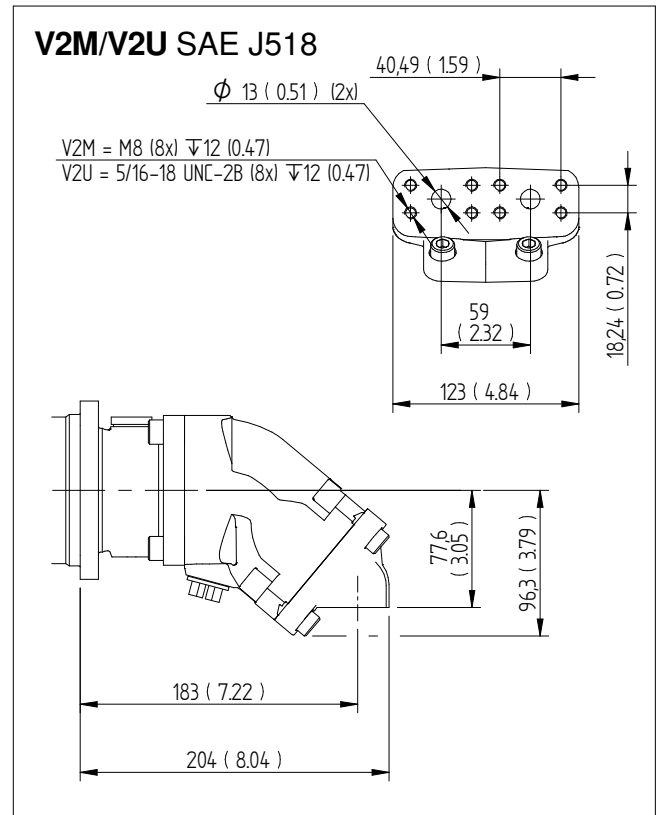
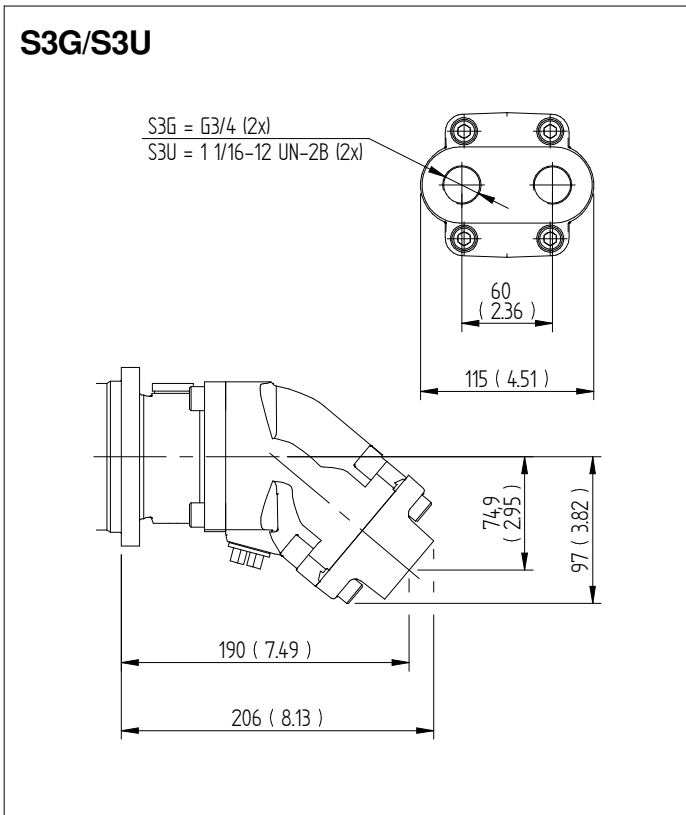
Millimeter (inch)



Dimensions SCM 025-034

Connection cover

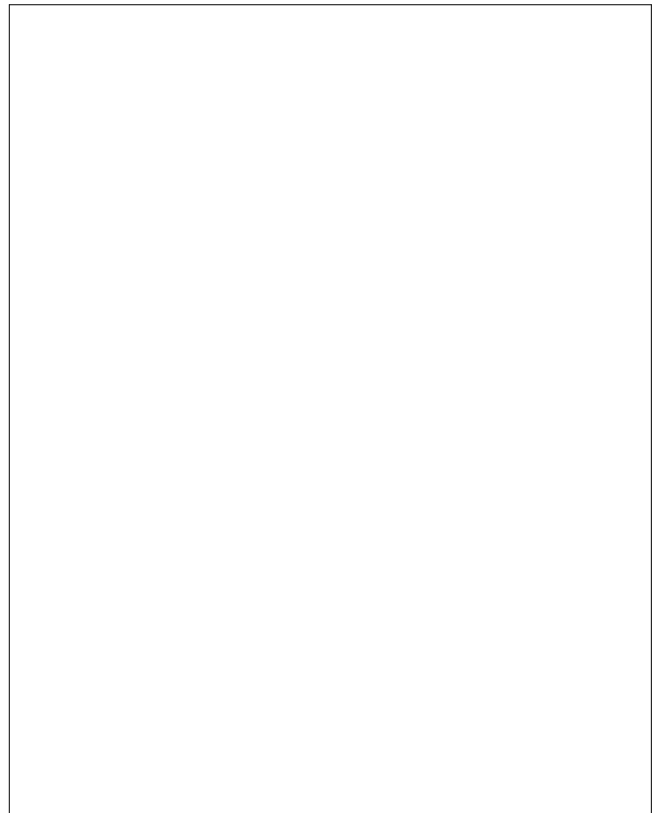
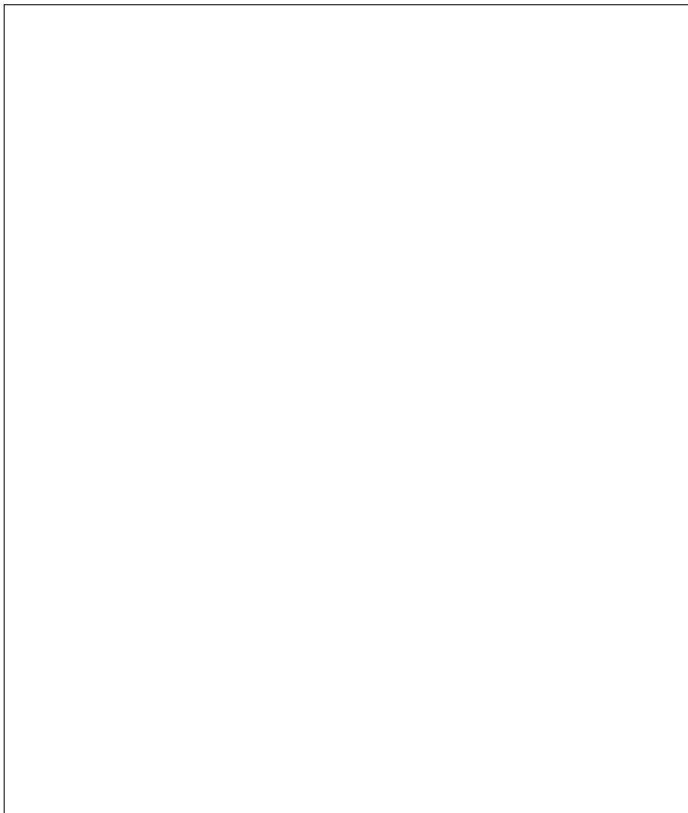
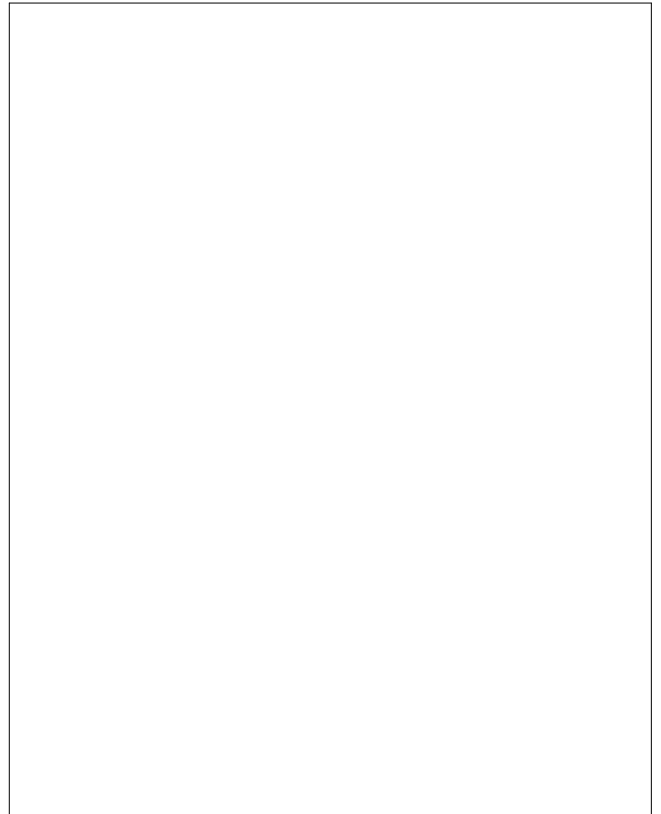
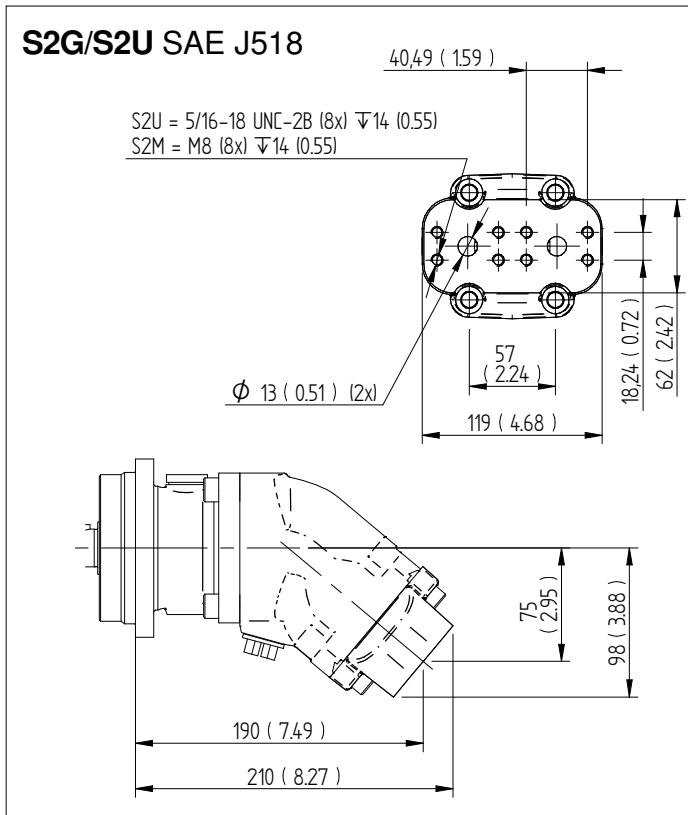
Millimeter (inch)



Dimensions SCM 025-034

Connection cover

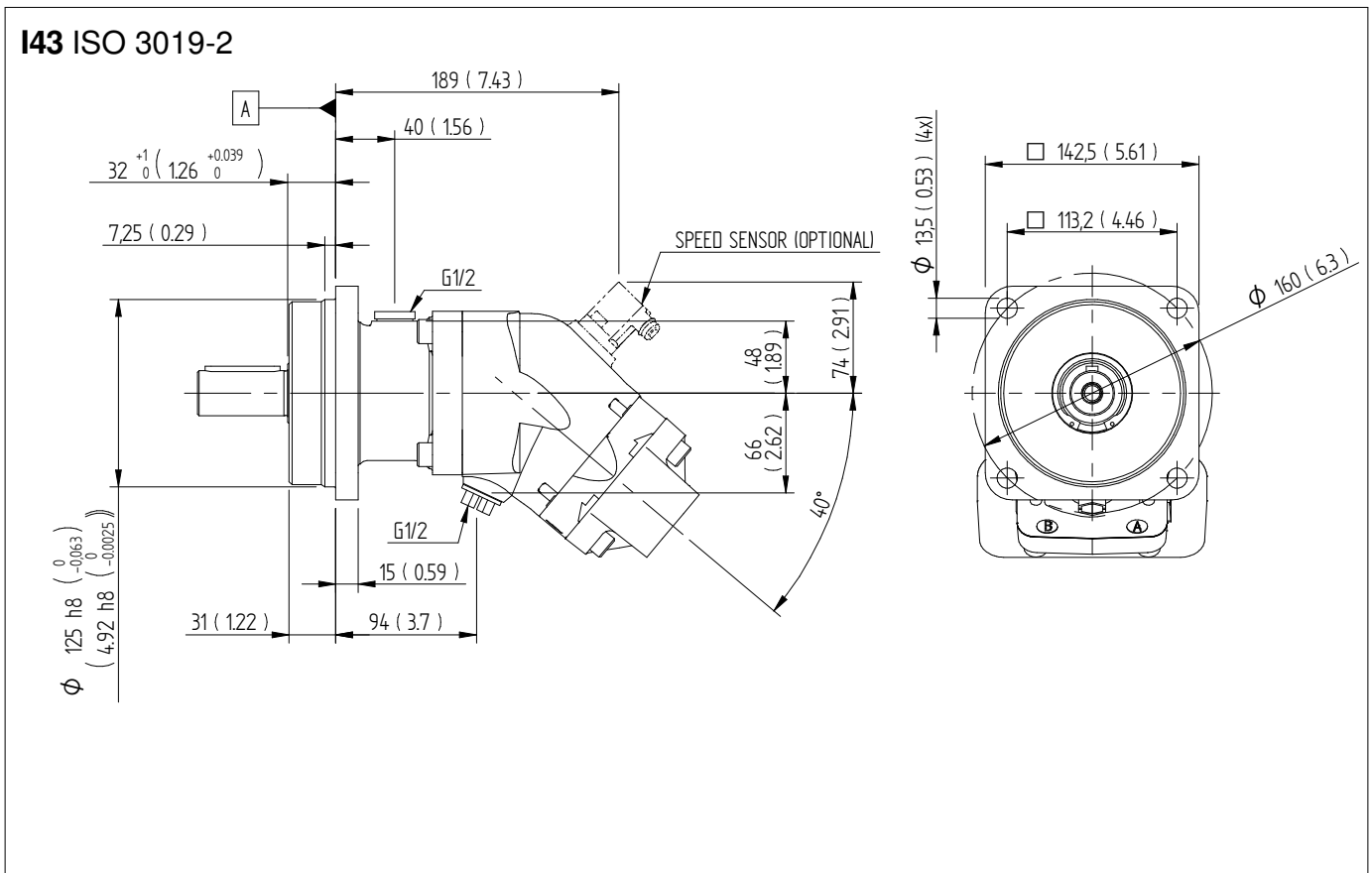
Millimeter (inch)



Dimensions SCM 040-064

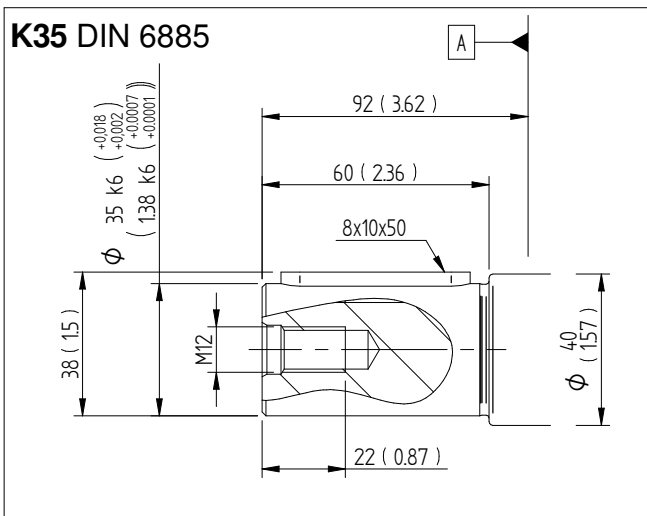
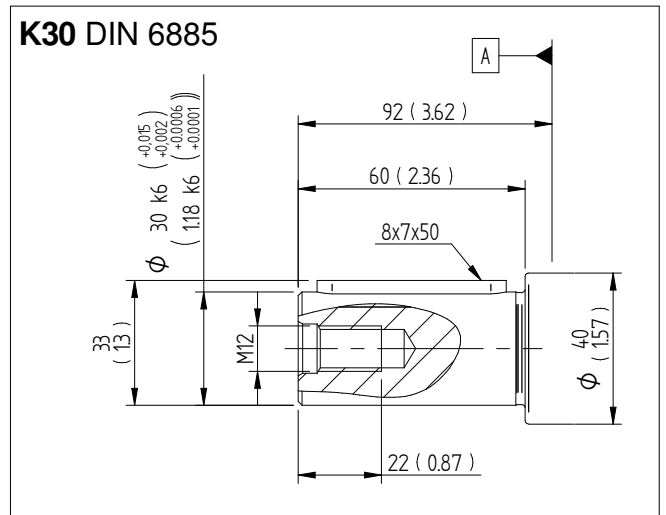
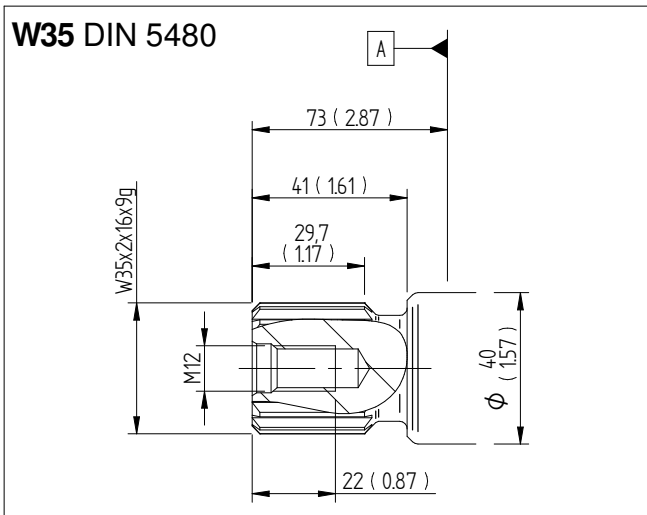
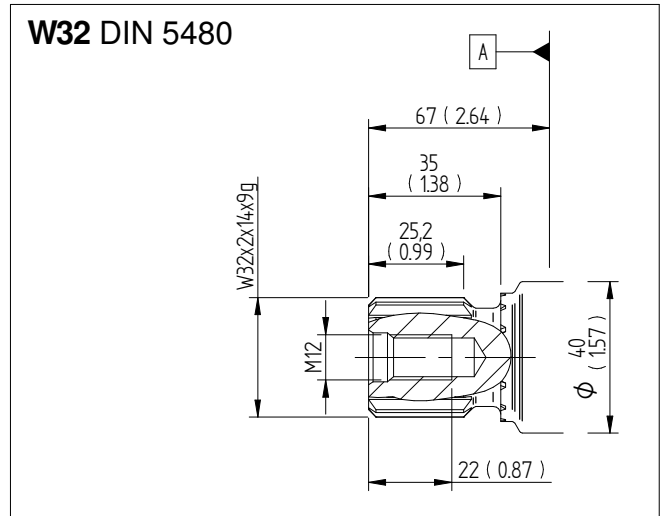
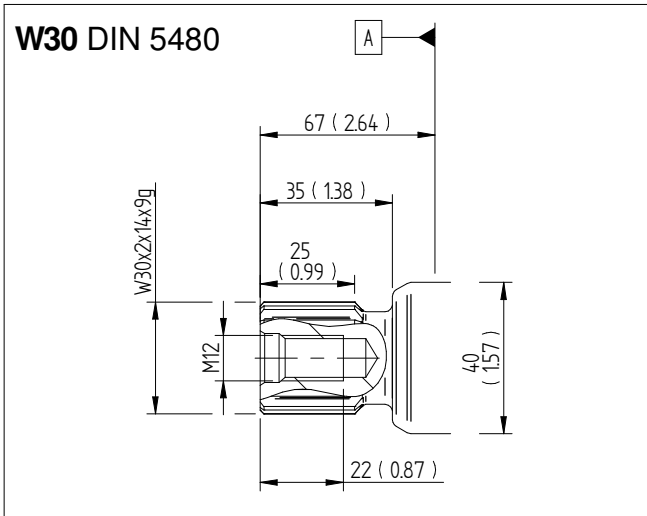
Flange

Millimeter (inch)



Dimensions SCM 040-064 Shafts

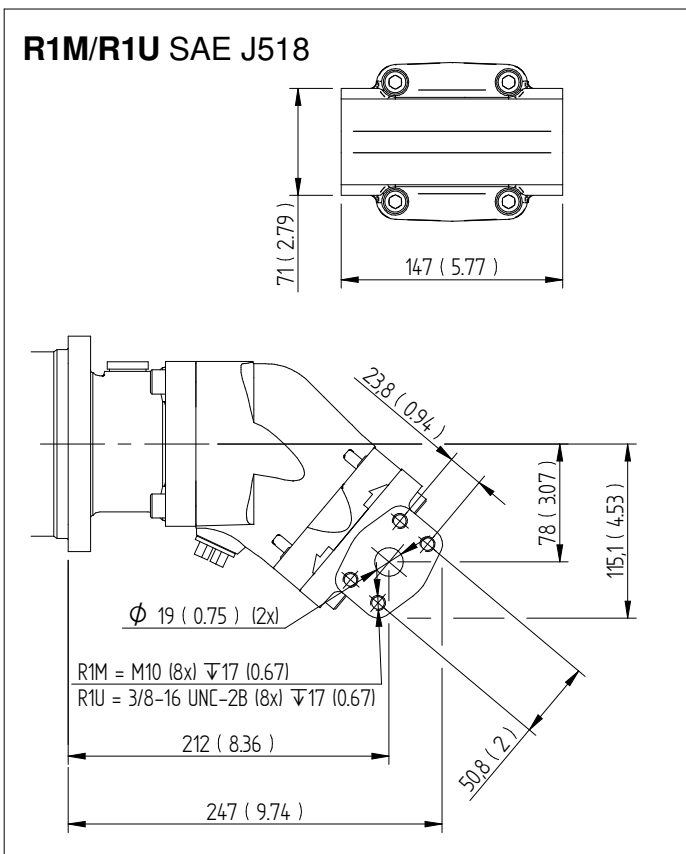
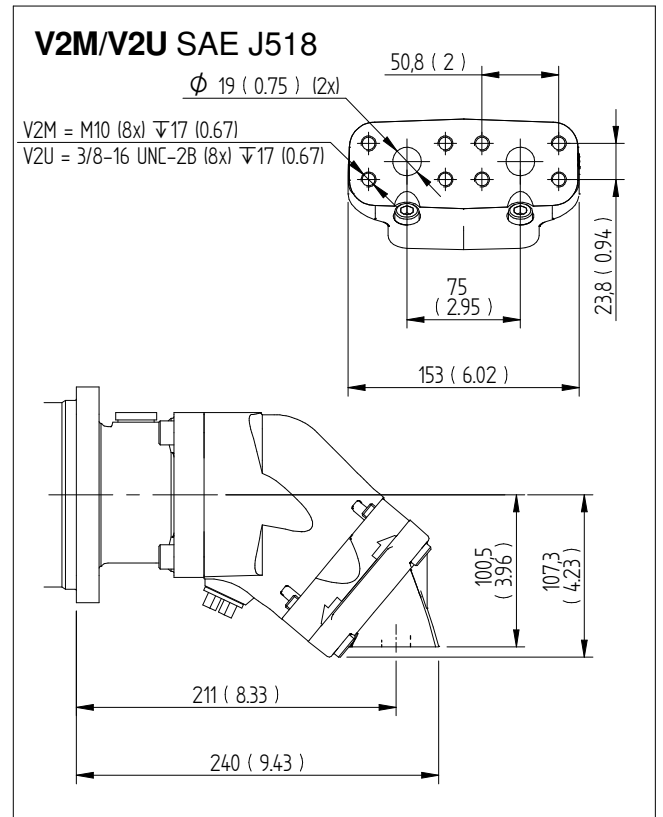
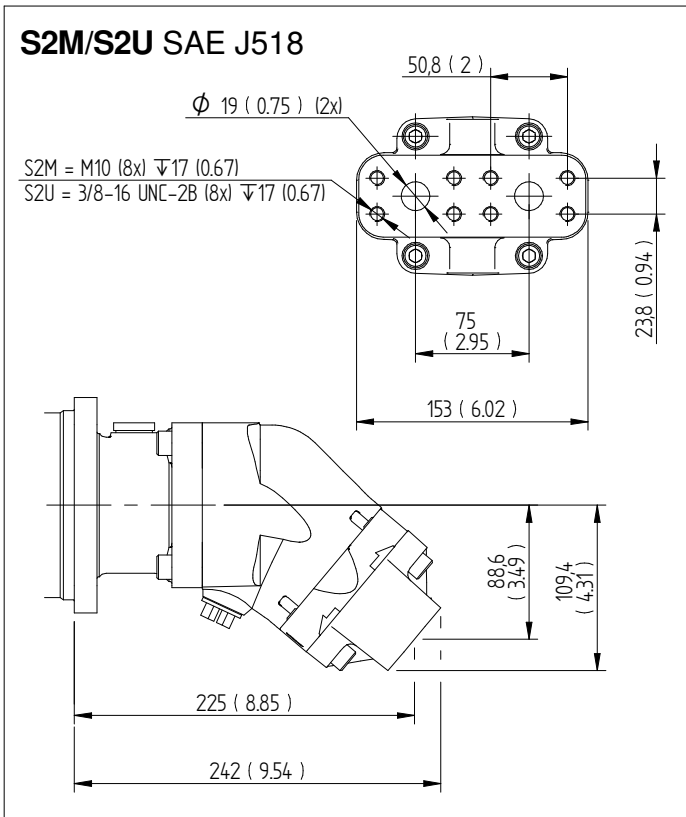
Millimeter (inch)



Dimensions SCM 040-064

Connection cover

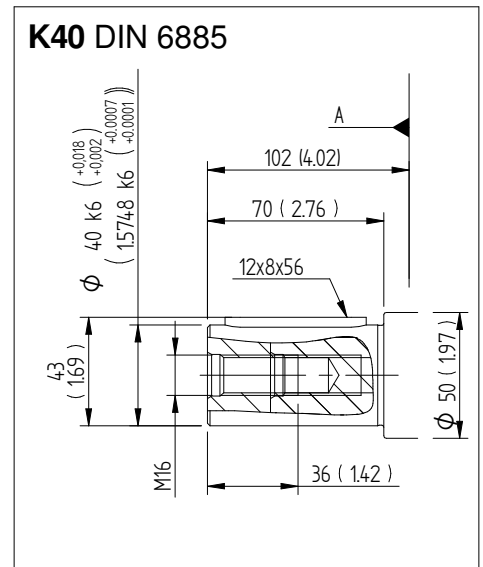
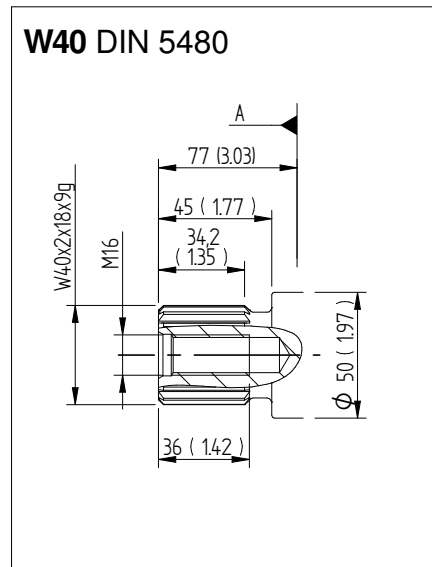
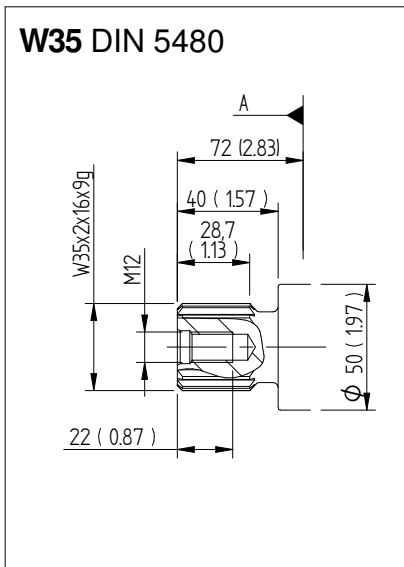
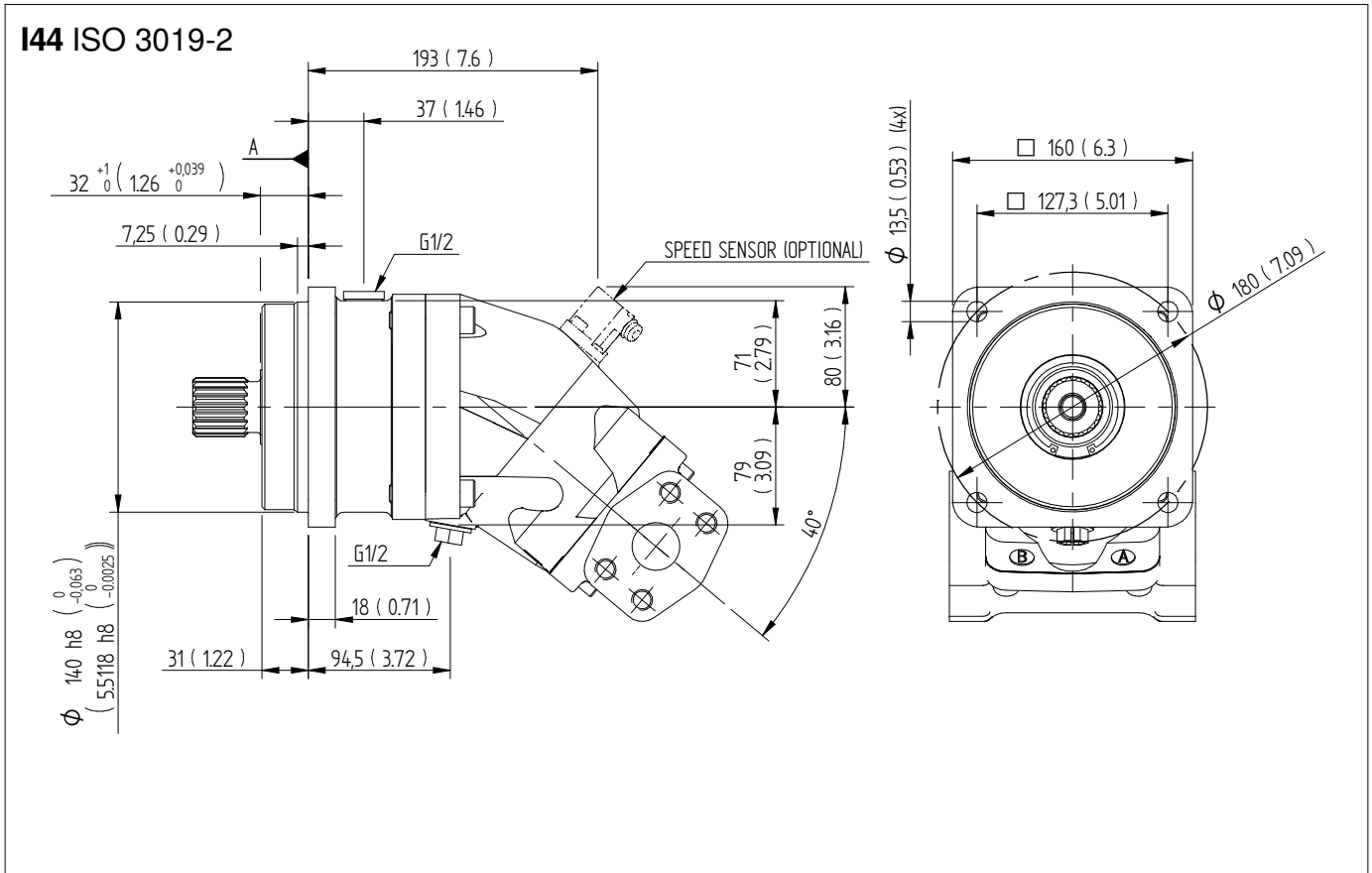
Millimeter (inch)



Dimensions SCM 084-090

Flange & shafts

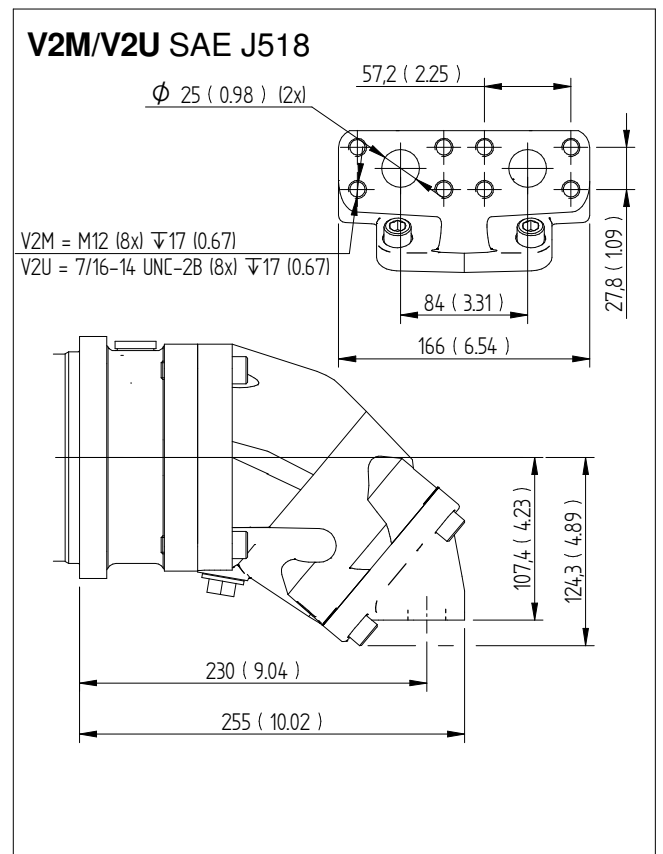
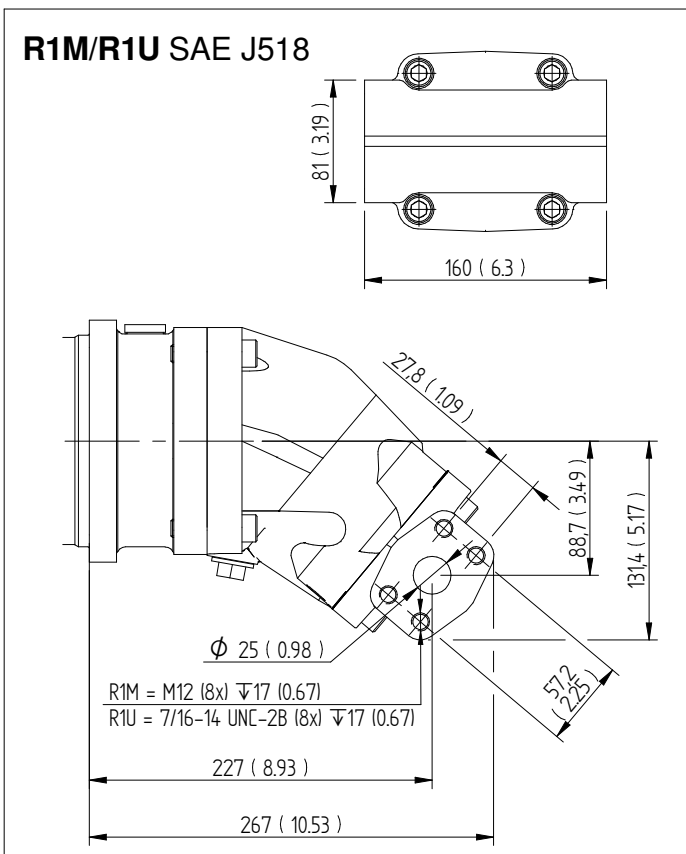
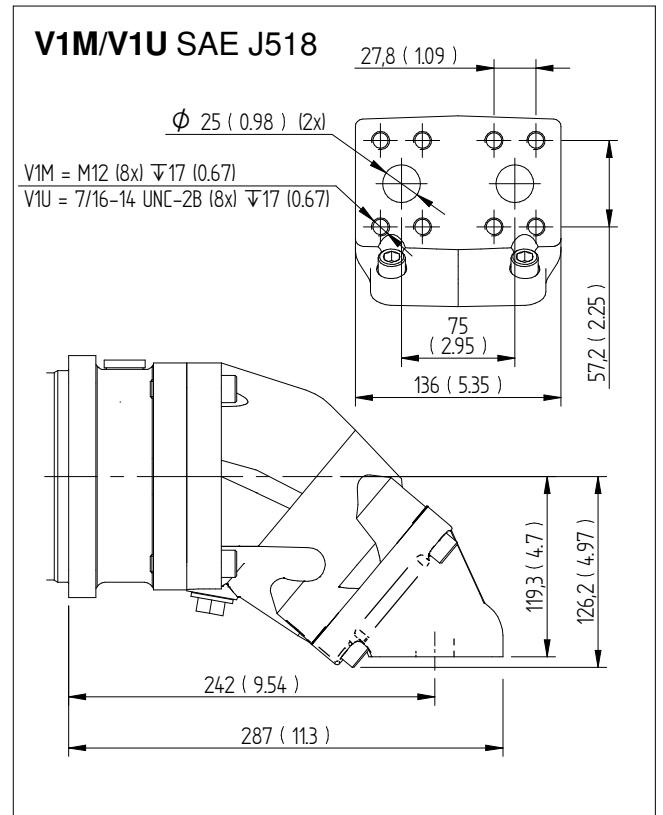
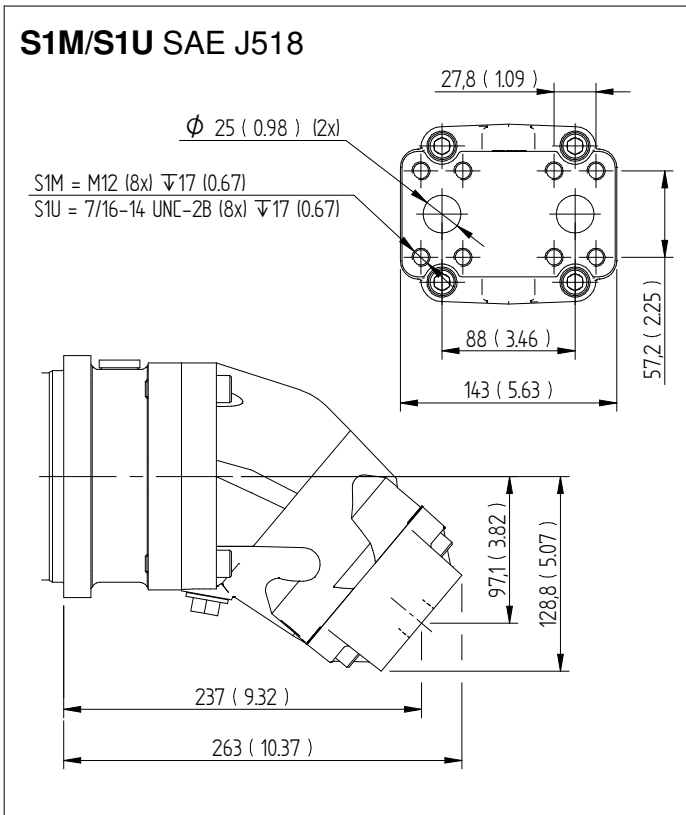
Millimeter (inch)



Dimensions SCM 084-090

Connection cover

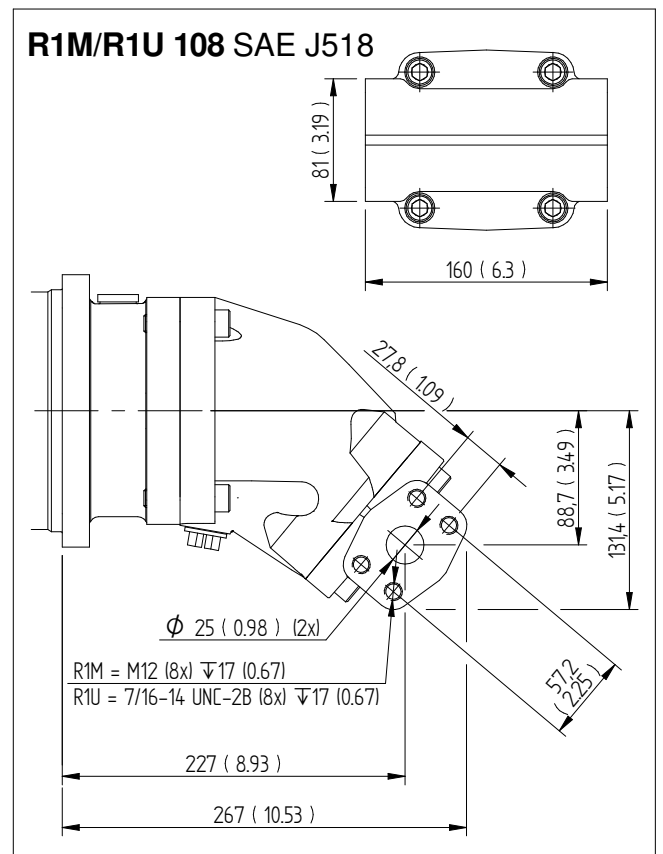
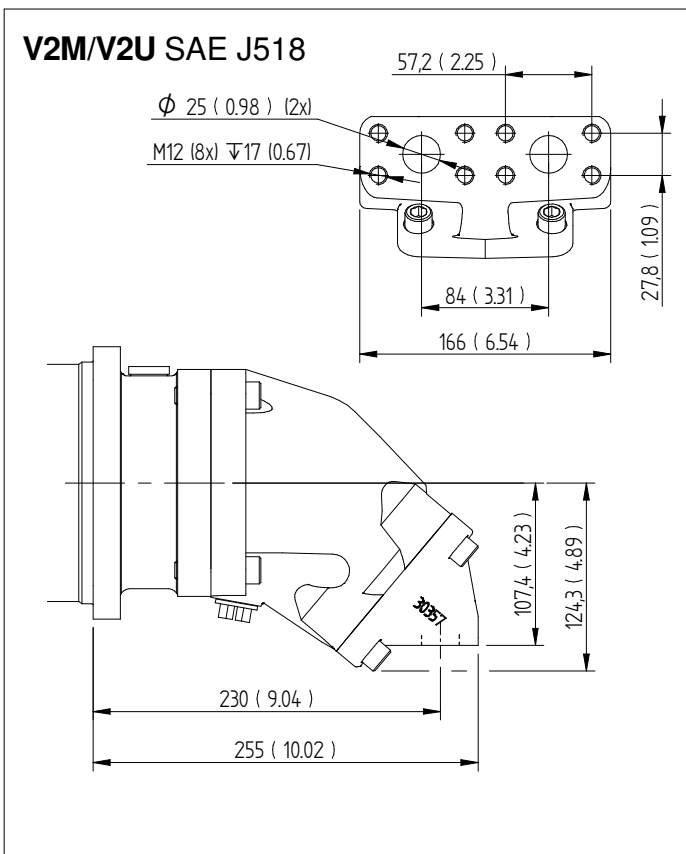
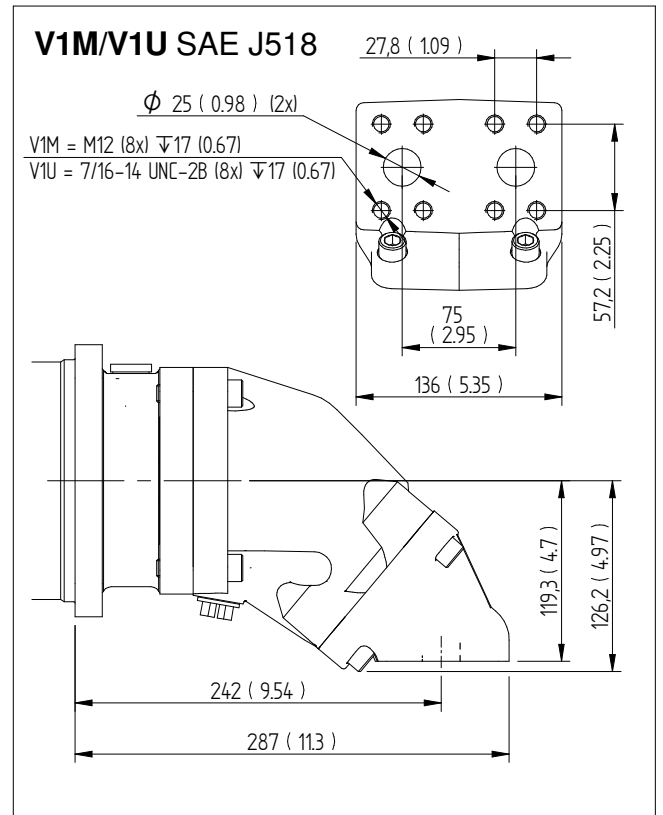
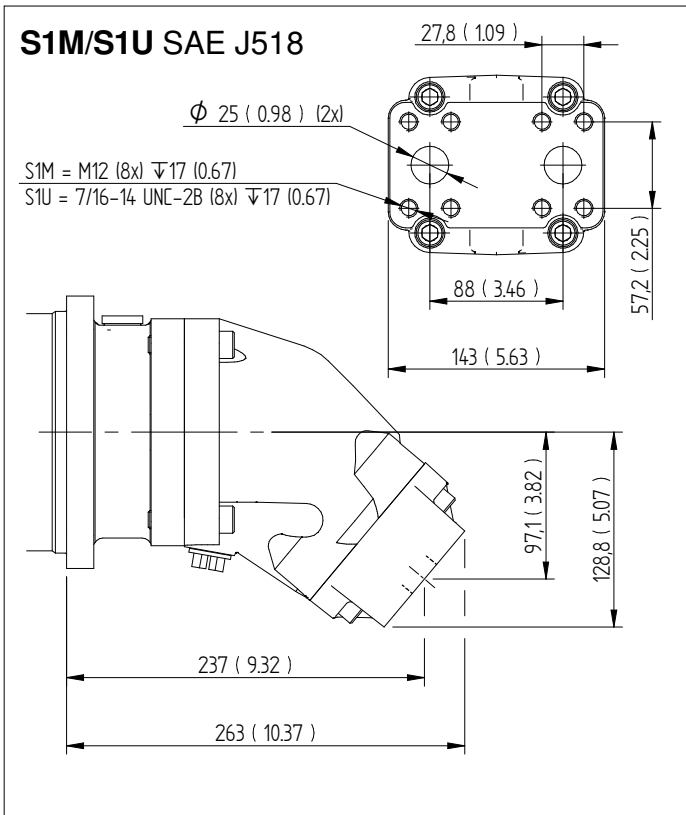
Millimeter (inch)



Dimensions SCM 108-130

Connection cover

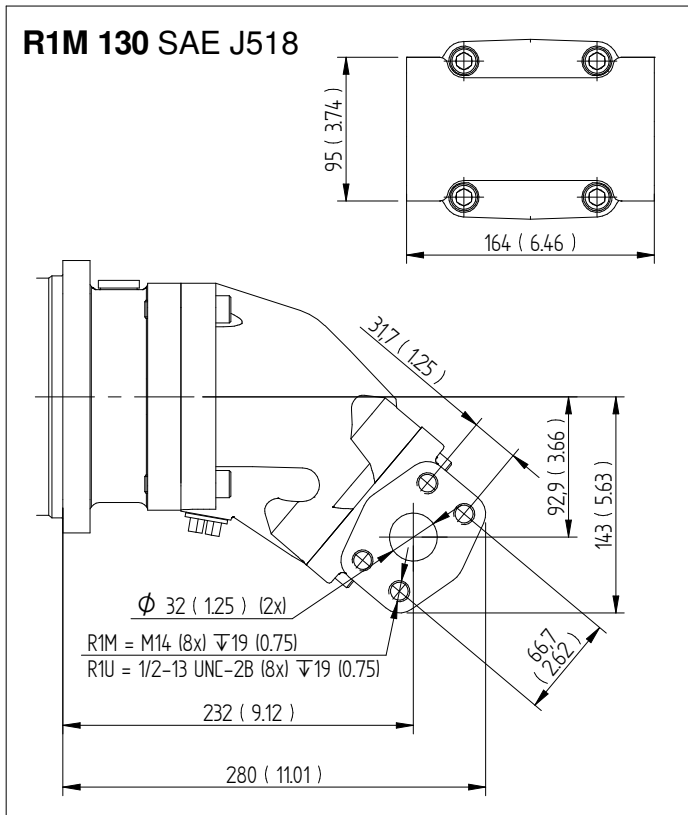
Millimeter (inch)



Dimensions SCM 108-130

Connection cover

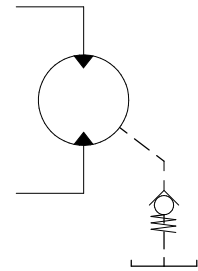
Millimeter (inch)



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.

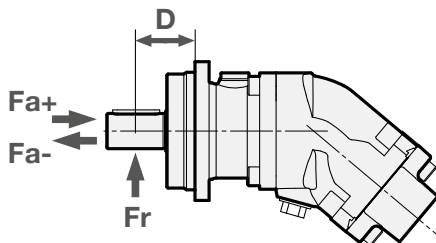
The housing pressure must be equal to or greater than the external pressure on the shaft seal.

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.

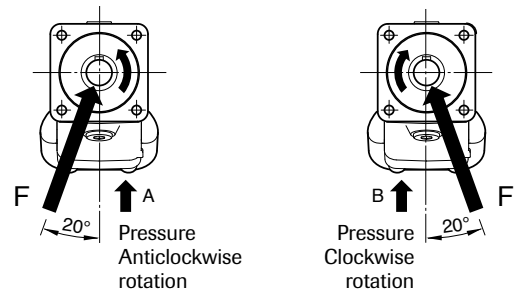
Shaft loads

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



| SCM ISO | | 010 | 012 | 017 | 025 | 034 | 040 | 047 | 056 | 064 | 084 | 090 | 108 | 130 |
|--|-----|------|------|------|------|------|------|------|------|------|------|------|------|------|
| Max recommended shaft loads | | | | | | | | | | | | | | |
| 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.

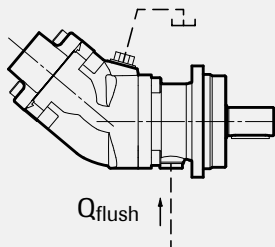
Temperatures/Housing cooling

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.

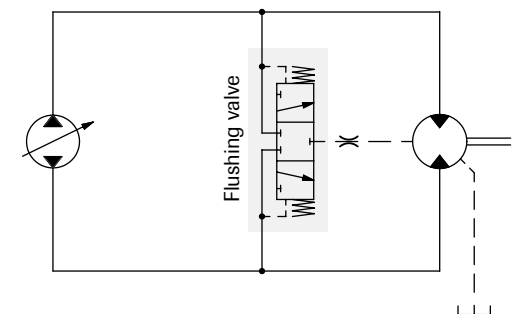
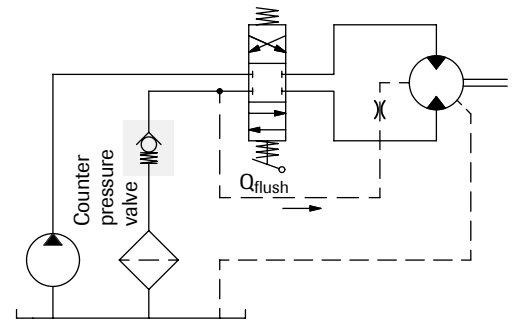
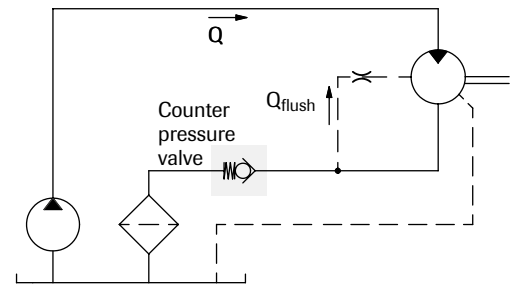
Cooling/flushing of the motor housing can be needed to keep the drain flow temperature at an acceptable level.

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 |



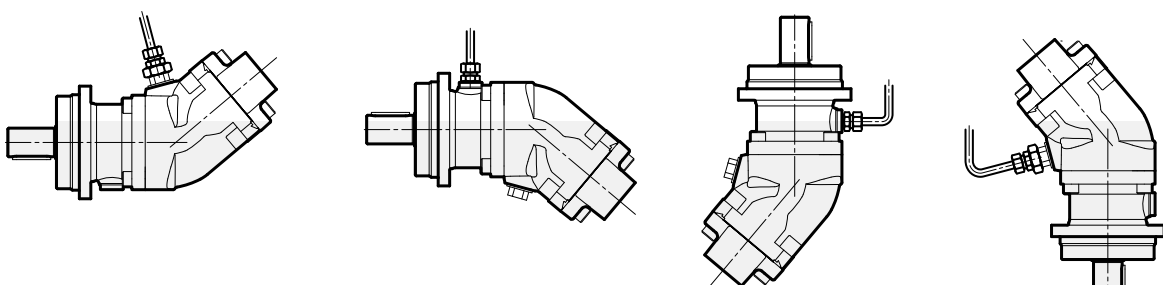
Housing flushing can be built up with the help of a flushing valve or taken directly from the return line. When the return pressure is too low this is compensated for by a counter pressure valve. The tank line is connected to the highest point as in the figure.



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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