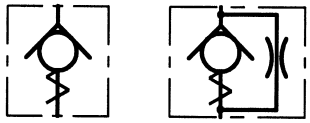
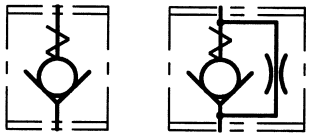
# Check Valves for SAE Flange Ports, Fit between Port and Flange, O-ring on one Face
## Series RVSAE 3/6..., 1000 l/min, 420 bar
## Patent No. 38 34 066



180°-inverted installation



Inverted installation normally requires
1 x ZPSAE… insert plate
and 1 x DPSAE… seal plate.

## 1 General

### 1.1 Product description

These patented dual-purpose SAE check valves are centred between the shafts of the four SAE flange bolts. This results in a compact, easy-to-install assembly.

The valves can be used without modification on both 3000 psi (210 bar) and 6000 psi (420 bar) SAE flange ports.

The no-flow direction can be reversed by inverting the valve.

Seal plates and insert plates are available as required – see also series RVSAE3/6DS.... with O-rings on both faces (Data Sht. 170-P-060100-E).

The valve design is based on a guided poppet that is hardened and ground.

In the no-flow direction, the valve closes.

The valves can be used for pressure relief in the opening direction, but only to a limited extent (consult Bucher Hydraulics for such applications).

### 1.2 Advantages

- Virtually leak-free
- High pressure rating
- Compact construction
- The same valve body is used for 3000 psi and 6000 psi ports
- Same valve body is used for no-flow directions A → B and B → A
- Optional orifice for metered flow in the no-flow direction

## 2 Main characteristics

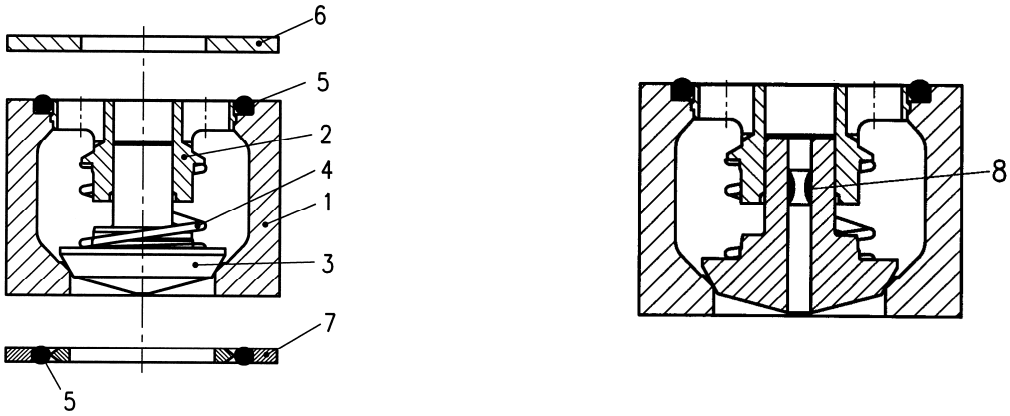
| | |
|---|---|
| Designation | SAE check valve |
| Design | guided spherical-poppet design |
| Mounting method | fits between port and flange |
| Size | for SAE ¾“ to 2“ flange ports |
| Dimensions | see Table in section 5, Dimensions |
| Mounting attitude | unrestricted |
| No-flow direction | reversible by inverting the valve (see symbols) |
| Operating pressure range | ...6000 psi (420 bar) |
| Opening pressure | 0.2 … 4 bar |
| Flow rate, Q max. | ...1000 l/min |
| Fluid | HL and HLP hydraulic oils to DIN 51524. Other fluids, contact Bucher Hydraulics |
| Temperature range | -30°C... +80°C |
| Viscosity range | 10 ... 500 mm²/s (cSt) |
| Min. fluid cleanliness | 18/14 to ISO 4406 / CETOP RP70H, 8…9 to NAS 1638 |

For applications outside these parameters, please contact Bucher Hydraulics.



**Classification:** **4.30.10.70.10**
Reference: 170-P-060000-E-03 / 08.15

## 3 Schematic section




## 4 Components

| Item | Qty. | Description |
|---|---|---|
| 1 | 1 | Body |
| 2 | 1 | Guide bush |
| 3 | 1 | Spherical poppet |
| 4 | 1 | Spring |
| 5 | 1 | O-ring |
| 6 | - | Insert plate (if required, order separately) |
| 7 | - | Seal plate (if required, order separately) |
| 8 | - | Metering orifice (optional model: RVSAE...-D1x,,.-...) |

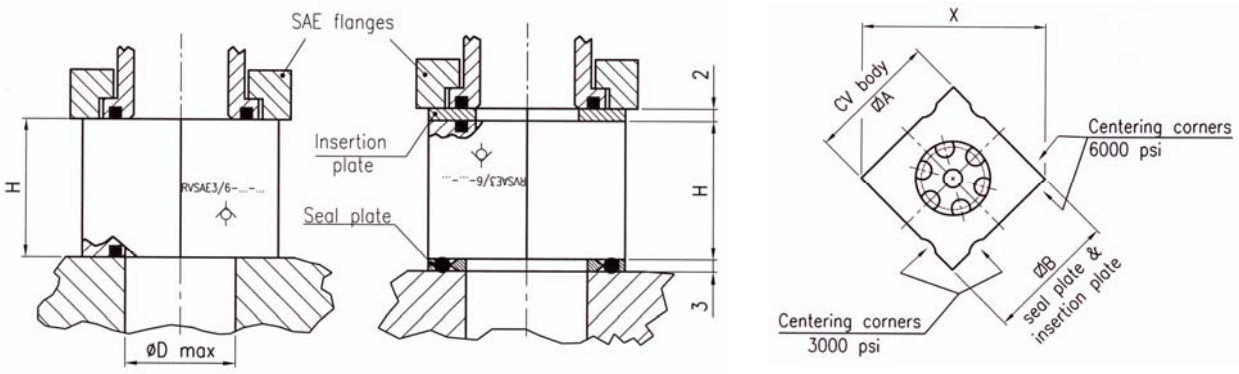
## 5 Dimensions

### 5.1 Dimensions – valves

CV function

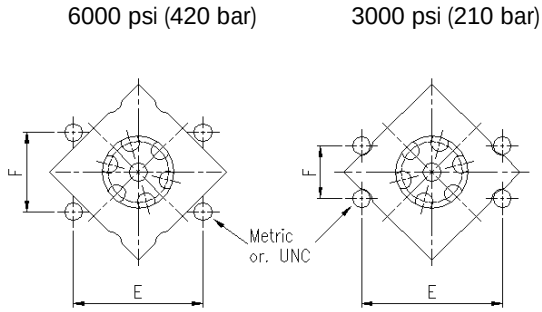
CV function inverted by 180°

Plan view




| | | H | A | B | ØD | X | O-ring |
|---|---|---|---|---|---|---|---|
| 3000 / 6000 psi (210 / 420 bar) | RVSAE3/6-34-… | 30 | 42.5 | 42.5 | 19 | 60 | 24.99 x 3.53 N90 |
| | RVSAE3/6-11-… | 35 | 47.9 | 47.9 | 25 | 68 | 32.92 x 3.53 N90 |
| | RVSAE3/6-114-… | 40 | 55.4 | 55.4 | 29.5 | 78.5 | 37.69 x 3.53 N90 |
| | RVSAE3/6-112-… | 45 | 65.8 | 65.8 | 35 | 93 | 47.22 x 3.53 N90 |
| | RVSAE3/6-21-... | 60 | 79.7 | 79.7 | 42 | 113 | 53.57 x 3.53 N90 |

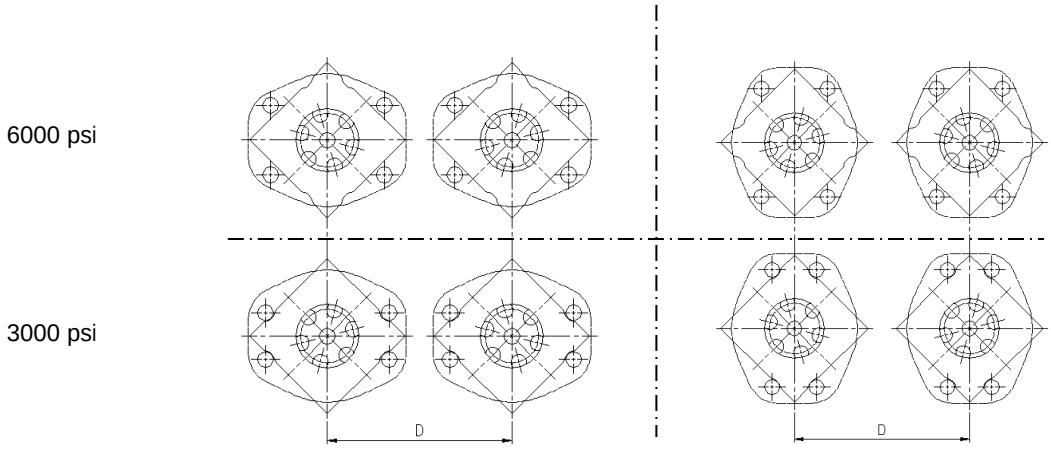
## 5.2 Dimensions – SAE flange ports




| | | Suitable for flange: E | F | M | UNC | Tightening torque for the flange bolts |
|---|---|---|---|---|---|---|
| 3000 psi (210 bar) | RVSAE3/6-34-... | 47.6 | 22.2 | M 10 | 3/8” | The tightening torque depends on the grade of the connecting bolts that are used at the SAE flange port |
| | RVSAE3/6-11-... | 52.4 | 26.2 | M 10 | 3/8” | |
| | RVSAE3/6-114-... | 58.7 | 30.2 | M 10 | --- *) | |
| | RVSAE3/6-112-... | 69.9 | 35.7 | M 12 | ½” | |
| | RVSAE3/6-21-... | 77.8 | 42.9 | M 12 | ½” | |
| 6000 psi 420 (bar) | RVSAE3/6-34-... | 50.8 | 23.8 | M 10 | 3/8” | |
| | RVSAE3/6-11-... | 57.2 | 27.8 | M 12 | 7/16” | |
| | RVSAE3/6-114-... | 66.7 | 31.8 | M 14 | ½” | |
| | RVSAE3/6-112-... | 79.4 | 36.5 | M 16 | 5/8” | |
| | RVSAE3/6-21-... | 96.6 | 44.5 | M 20 | ¾” | |

*) RVSAE3/6-114… on a 3000 psi port accepts M10 bolts only.

## 5.3 Minimum distance between 2 SAE check valves



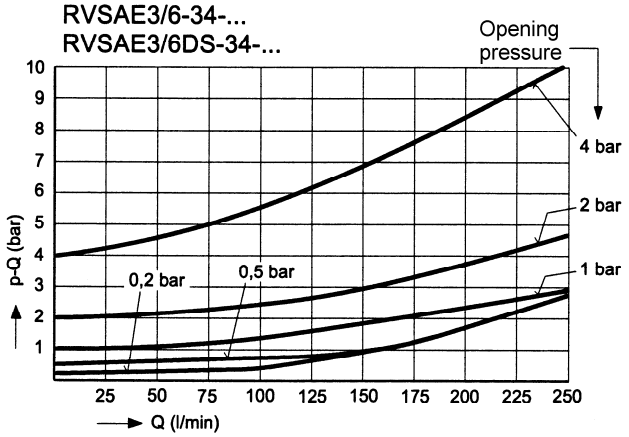

shorter distances on inquiry

| | | $D_{min}$ |
|---|---|---|
| 3000 psi (210 bar) und 6000 psi 420 (bar) | RVSAE3/6-34-... | 61,00 |
| | RVSAE3/6-11-... | 69,00 |
| | RVSAE3/6-114-... | 79,50 |
| | RVSAE3/6-112-... | 94,00 |
| | RVSAE3/6-21-... | 114,00 |

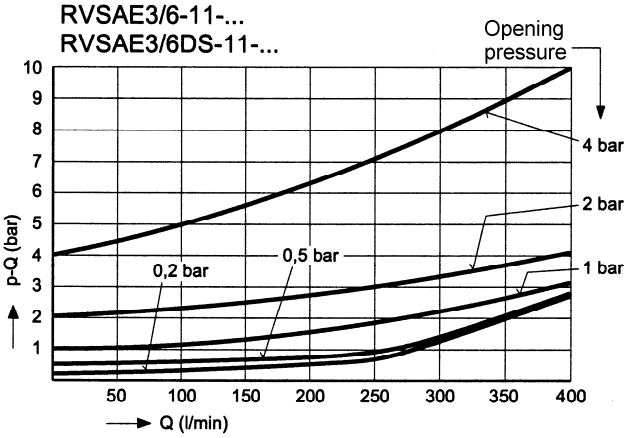
## 6 Performance graphs

measured with oil viscosity 33 mm²/s (cSt)

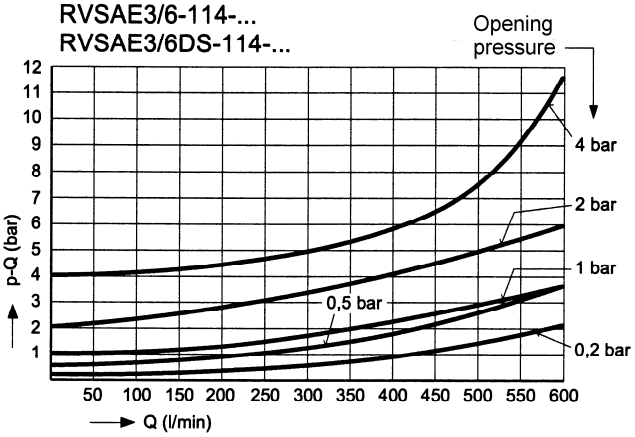
RVSAE3/6-34-...
RVSAE3/6DS-34-...



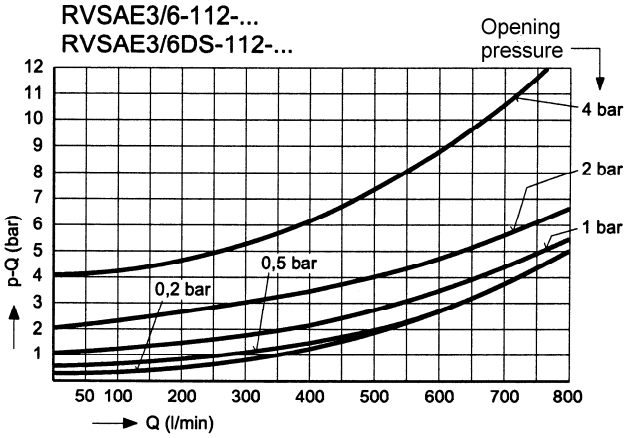

RVSAE3/6-11-...
RVSAE3/6DS-11-...



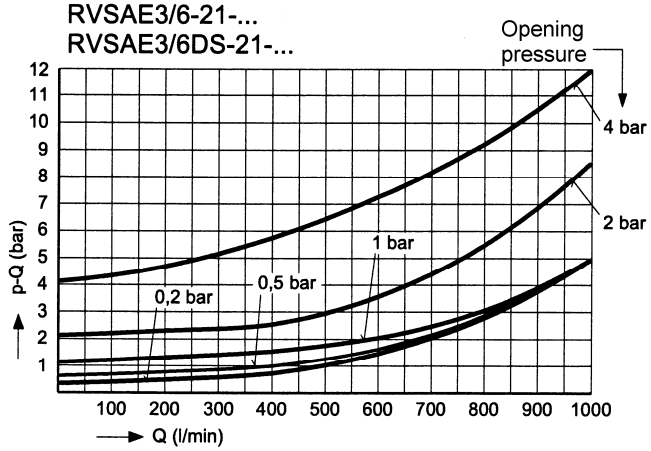

RVSAE3/6-114-...
RVSAE3/6DS-114-...




RVSAE3/6-112-...
RVSAE3/6DS-112-...




RVSAE3/6-21-...
RVSAE3/6DS-21-...



## 7 Ordering details

Model code key – check valve

Ex. RV | SAE | 3/6 | __ - __ - _ - _ - _

| | |
|---|---|
| Check valve | RV |
| for SAE flange port (fits between port and flange) | SAE |
| Dual-purpose body 3000 psi / 6000 psi | 3/6 |
| O-ring on one face only | (blank) |
| **Nominal size** | |
| ¾“ | 34 |
| 1“ | 11 |
| $1^1/_4$“ | 114 |
| $1^1/_2$“ | 112 |
| 2“ | 21 |
| **Opening pressure** | |
| 0.2 bar | 02 |
| 0.5 bar | 05 |
| 1 bar | 1 |
| 2 bar | 2 |
| 4 bar | 4 |
| **Metering orifice** | |
| Without orifice | (blank) |
| With orifice (by consultation) | D1x… |
| **O-ring** | |
| Nitrile (standard) | (blank) |
| Viton | V |

**Contact Bucher Hydraulics for further information on:**
- other opening pressures
- special materials
- customised designs

Model code key – seal plate (complete with O-ring and retaining ring)

Ex. DPSAE - _____ - _

| | |
|---|---|
| Seal plate for SAE check valve | DPSAE |
| **Nominal size** | |
| ¾“ | 34 |
| 1“ | 11 |
| $1^1/_4$“ | 114 |
| $1^1/_2$“ | 112 |
| 2“ | 21 |
| **O-ring** | |
| Nitrile (standard) | (blank) |
| Viton | V |

Model code key – insert plate

Ex. ZPSAE - _____

| | |
|---|---|
| Insert plate for SAE check valve | ZPSAE |
| **Nominal size** | |
| ¾“ | 34 |
| 1“ | 11 |
| $1^1/_4$“ | 114 |
| $1^1/_2$“ | 112 |
| 2“ | 21 |

## 8 Design and installation notes

By turning them through 90°, the RVSAE3/6-… dual-purpose bodies, the seal plates and insert plates can be used on both 3000 psi and 6000 psi ports of the same nominal size.

Where a seal plate and an insert plate are added, it is seldom necessary to fit longer SAE flange connecting bolts.

The installation dimensions and tolerances must be maintained.

Referring to the free-flow direction, nozzles and orifices must not be situated directly before the check valve (see data sheet 170-P-059000-E).

When fitting the valve, take particular care to ensure that the valve is firmly seated on the sealing surface, but that valve components are not deformed by the use of excessive force.

Use the specified tightening torque when fitting the SAE flange connecting bolts.

## 9 Application notes

The maximum operating pressure must not be exceeded and any pressure peaks must be taken into consideration.

The specified nominal flow rate must not be exceeded.

In applications such as accumulator circuits, where sudden pressure can be applied to the valve in the free-flow direction, ensure that the specified flow ratings are not exceeded.

Buyers bear the sole responsibility for ensuring that the selected products are suitable for their applications. Buyers normally establish this by undertaking qualification programs on test stands, or by evaluating the performance of prototype machines or systems.

**info.dah@ bucherhydraulics.com** **www.bucherhydraulics.com**