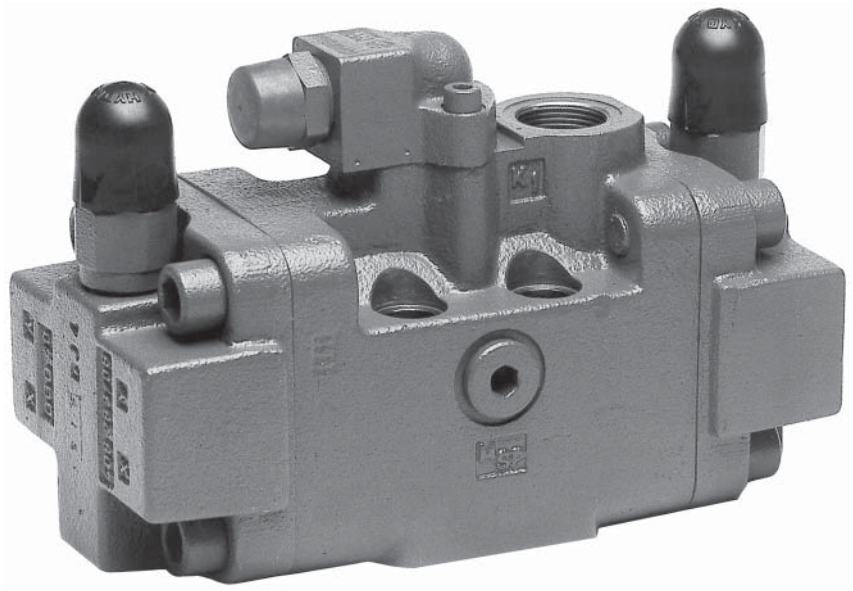
Rexroth
Bosch Group

# Scavenging and Pressure Relief Valve Block SDVB

Control Elements of the A4VSG and A2P

**RE 95533/03.96**

Replaces 01.82



The scavenging and pressure relief valve block serves to maintain the feed pressure, to exhaust excess oil and to limit the operating pressure in a closed hydraulic circuit.
Both service ports A and B can be pressurised with high or low pressure as required. The high pressure controlled scavenging spools ensure that upon changeover of the gigh and low pressure sides the scavenging valve is connected to the low pressure side.
Pilot operation of the double acting pressure relief valves allows simple setting, with minimum force, of the required pressure value for both pressure sides of the circuit. These settings may be carried out independent of one another. On sizes 30 and 50, remote control is also possible via external pilot oil connections (X and Y). When the relief valves are actuated, oil flows from the high pressure to the low pressure side.

The set pressure value corresponds to the pressure drop between high and low pressure side. This valve type is extremely compact in relation to its flow capacity.
The SDVB can also be used as a double-acting pressure relief valve. When used as a relief valve, the supply line to the scavenging valve is closed.
By means of independently or direct mounted unloading valves, the pilot valves can be connected externally with the tank or internally with the low pressure side. With this function the SDVB 30 and 50 can serve as a bypass valve. For high dynamic swivel operations with flushing and pressure relief valve block SDVB, when changing the high pressure side there will be free flow between A and B for a short time. Direct operated valve blocks are suitable for this application and are available in sizes 16 and 30 on request.

## Ordering code

| SDVB | | | | / | | | | |
|---|---|---|---|---|---|---|---|---|

**Description**

| | |
|---|---|
| scavenging and pressure relief valve block piloted | **SDVB** |

**Size**

| | |
|---|---|
| size 16 | **16** |
| size 30 | **30** |
| size 50 | **50** |

**Model** (see unit dimensions)

| | | |
|---|---|---|
| without direct operated flushing valve | without pre-load valve | **N** |
| with direct operated flushing valve | without pre-load valve | **S** |
| with direct operated flushing valve | without pre-load valve | **T*** |
| without direct operated flushing valve | with pre-load valve | **V** |
| with direct operated flushing valve | with pre-load valve | **W** |
| with direct operated flushing valve | with pre-load valve | **Z*** |

* Model T and Z only for SDVB 16 (in prep.) and SDVB 30

**Control type**

| pilot oil supply | pilot oil drain | unloading with / without | |
|---|---|---|---|
| internal | internal | ● | **1** |
| internal | external | ● | **2** |
| external | internal | ● | **3** |
| external | external | ● | **4** |
| internal (de-energised when closed) | external | ● | **5[1])** |
| internal with external pilot ports X-Y (plugged) | internal | ● | **6** |
| internal (de-energised when open) | external | ● | **7[1])** |

[1]) both solenoids must be operated simultaneously

**Model of port plate**

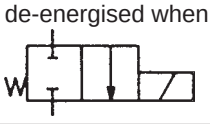
| | |
|---|---|
| port plate M 33 | **A** |
| port plate M 42 | **B** |
| port plate M 48 | **C** |
| port plate SAE 1 1/2" | **D** |
| without port plate | **N** |

**Series**

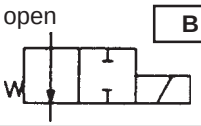
| | |
|---|---|
| **20** | SDVB 16 |
| **30** | SDVB 30/50 |

**Symbols for control type 5**

de-energised when closed **A**



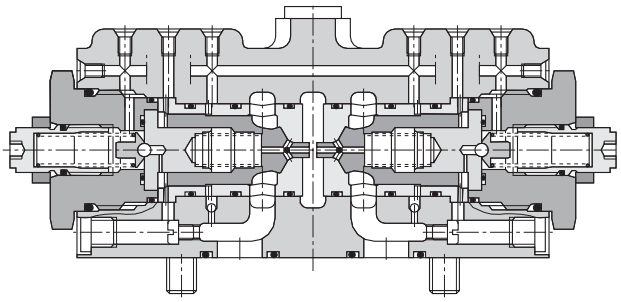
open **B**

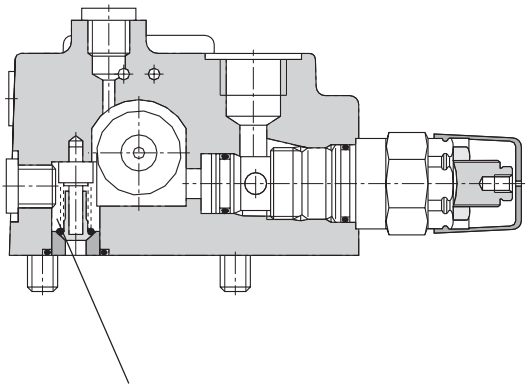


**Voltages types for control type 5**

| | |
|---|---|
| 12 V DC voltage - A closed | **1** |
| 24 V DC voltage - B open | **2** |
| 110-R AC voltage | **3** |
| 220-R AC voltage | **4** |
| 220-50 AC voltage | **5** |

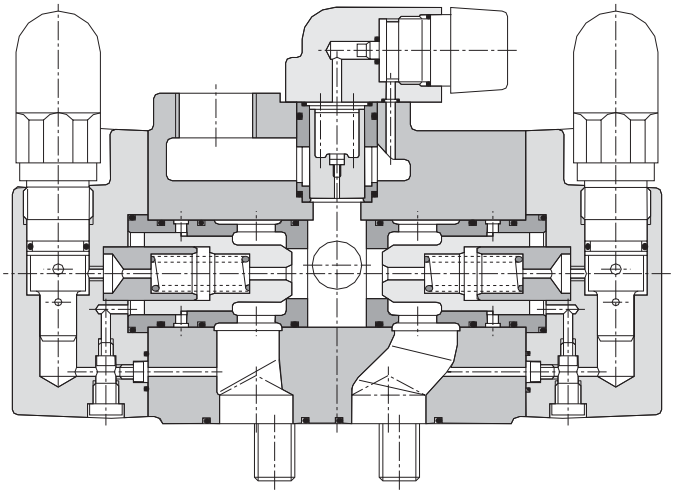
## Construction

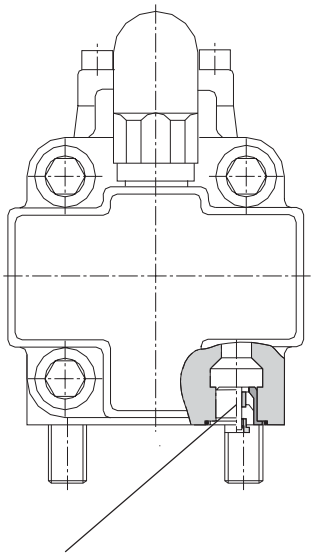




**SDVB 16**

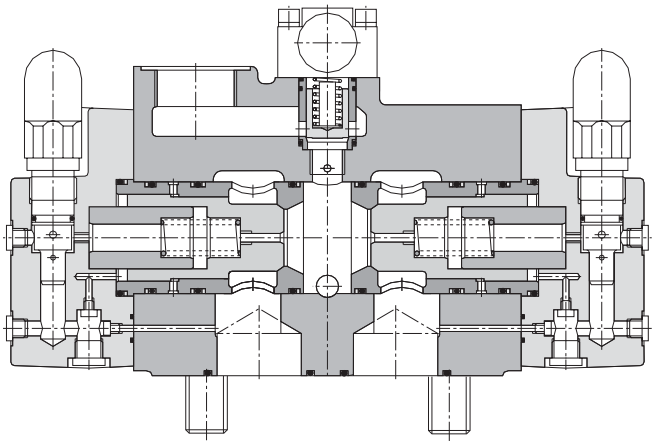
pre-load valve if A4VSG mounted

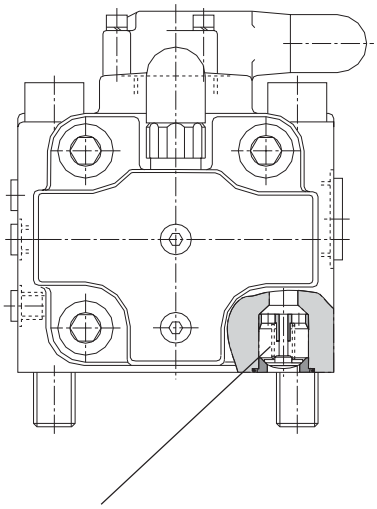




**SDVB 30**

pre-load valve if A4VSG and A2P directly mounted



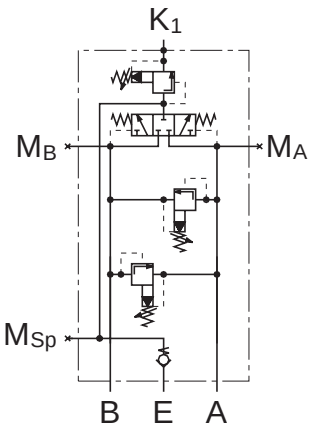


**SDVB 50**

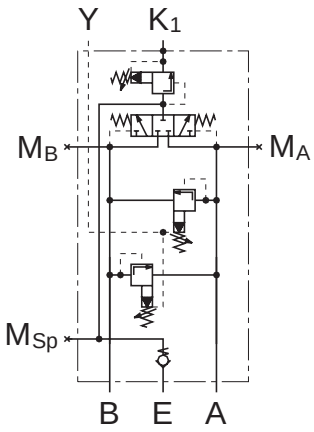
pre-load valve if A4VSG and A2P directly mounted

## **Control type** (with pre-load valve)

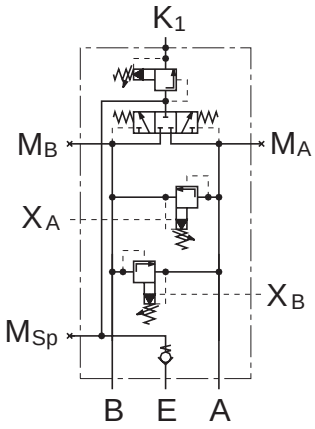
Control Type 1



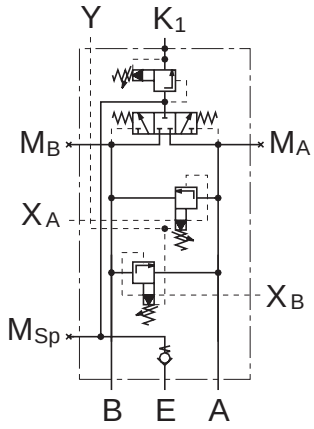

Control Type 2



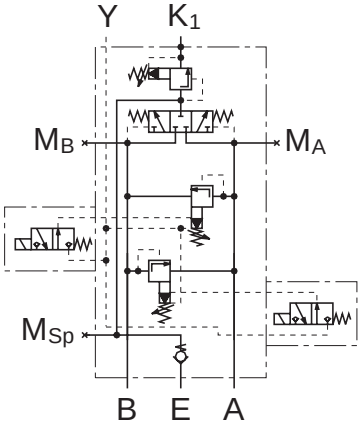

Control Type 3



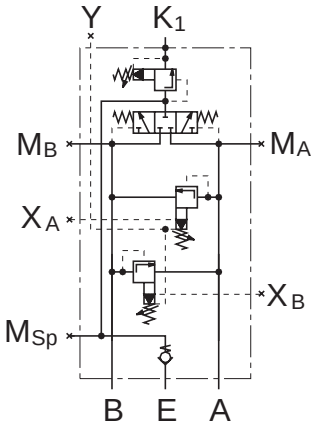

Control Type 4



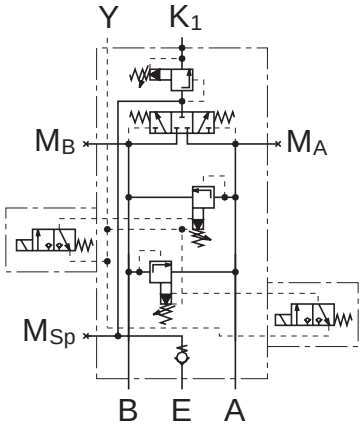

Control Type 5




Control Type 6




Control Type 7




The types of control shown only apply to size 16.
With the SDVB 30 and 50 there are two X and two Y ports.
Control types for size 30 are same as those for sizes 16 and 50 but without gauge ports MA and MB.

## Technical data (partly to VDI 3276)

**Design:** combined scavenging and pressure relief valves controlled by operating pressure

**Mounting:** flange model with O-ring seal (4 fixing holes in housing)

Pipe connections and connection sizes: see Unit Dimensions

**Weight (kg)**

| Size | 16 | 30 | 50 |
|---|---|---|---|
| without subplate | 6,5 | 23 | 61 |
| with subplate | | 30 | 68 |

**Mounting position:** optional

**Direction of flow:** from A to B resp. B to A and from A to $K_1$ resp. B to $K_1$

**Operating pressure range:** $p_N$ = 0…400 bar

The pressure measured at port $X_{A/B}$ is only identical to the pressure in the service line as long as the pressure relief valve is not actuated. Once the pilot valve has begun to open, the operating pressure in the main line can be around 15% higher. It is therefore recommended to measure the operating pressure direct at $M_A$ or $M_B$ resp. A or B.

**Pressure setting range:**
Operating pressure: $p_{v\,min}$…$p_{v\,max}$ = 50…400 bar
Scavenging pressure at nominal flow $Q_{NSp}$: SDVB 16, 30 and 50 are infinitely adjustable. Please state the required pressure setting for operating pressure and scavenging pressure when ordering. More details see RE 92100.

**Fluid temperature range**
$\vartheta_{m\,min}$…$\vartheta_{m\,max}$ = –20° C…+80° C

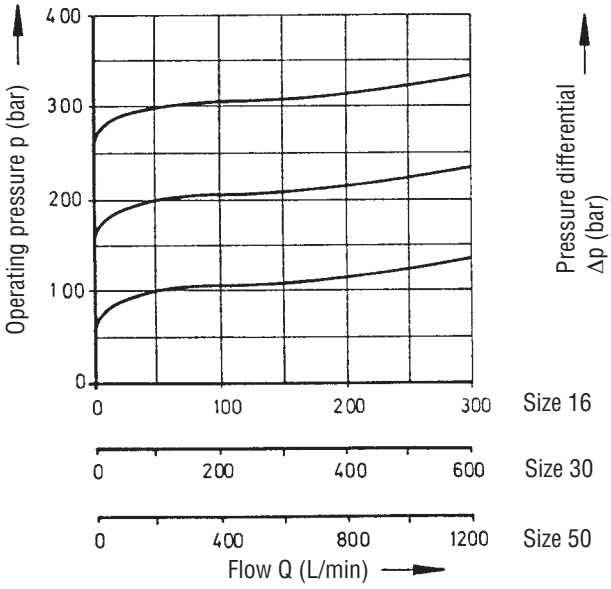
**Viscosity range** $\nu_{min}$…$\nu_{max}$ = 10…1000 mm²/s

**Nominal flow**

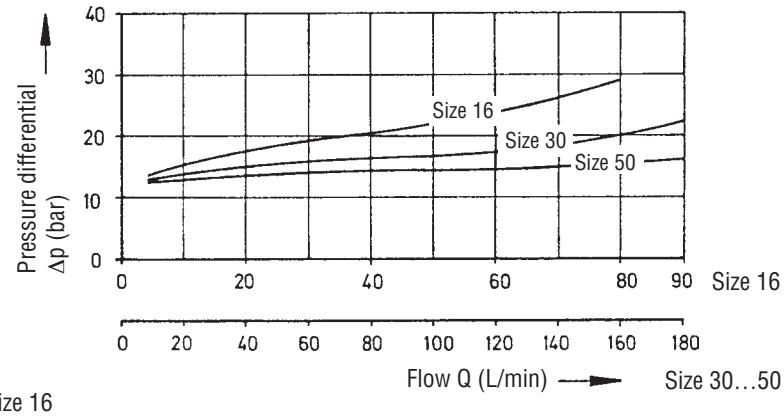
| Size | 16 | 30 | 50 |
|---|---|---|---|
| Main circuit $Q_N$ (L/min) | 200 | 600 | 1200 |
| Scavenging circuit $Q_{NSp}$ (L/min) | 40 | 100 | 200 |

**Δp-Q-Characteristics**

**Operating pressure p = f (Q)**



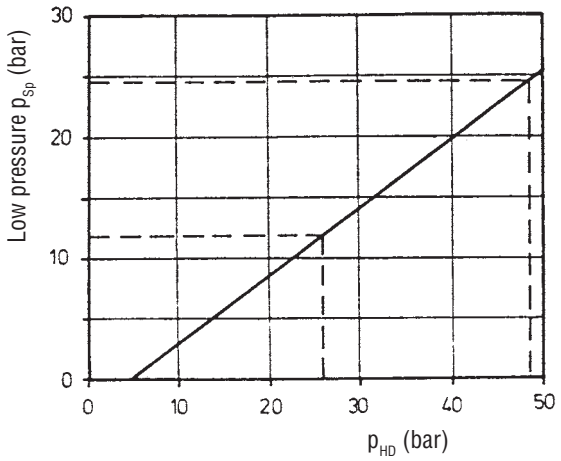

**Scavenging pressure $p_{Sp}$ = f ($Q_{Sp}$)**



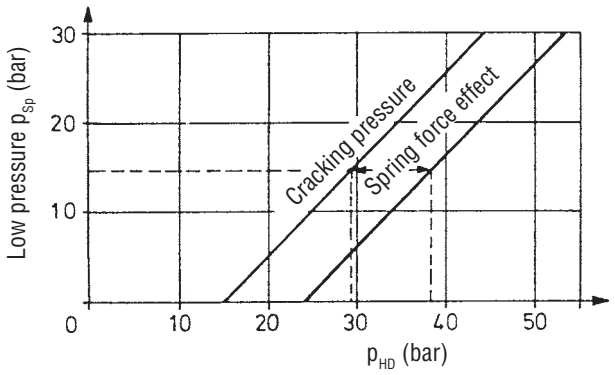

**Pressure setting** (Operating pressure)

| Size | 16 | 30 | 50 |
|---|---|---|---|
| p (bar/Umdr.) approx. | 150 | 105 | 105 |

SDVB 16




SDVB 30 and 50




**Switching pressure**

In order to switch both sides of the circuit A and B to the scavenging valve, a pressure differential between the high pressure and low pressure sides is required.

This pressure differential and therefore the switching pressure on the high pressure side is dependent on the setting on the low pressure side. With the SDVB 30 and 50, the spring force effect must also be taken into consideration, since this requires a pressure increase of around 9 bar until the valve poppet is fully open (see diagrams on left).

**Max. pilot oil volume**

$Q_{St\ max}$ (taken from main circuit)

| **Size** | **16** | **30** | **50** |
|---|---|---|---|
| $Q_{St\ max}$ (L/min) | ≈4 | ≈5 | ≈6 |

**Remote control**

To allow the setting of different pressure values for the pressure relief valves, external pilot oil connections "X" and "Y" are provided for remote control.

**Functional variations**

The SDVB 16 to 50 may also be used as a double acting pressure relief valve.

If only the double acting pressure relief valve function is required, the supply line to the scavenging valve is closed or the pressure setting of the scavenging valve is set higher than that on the relevant low pressure side.

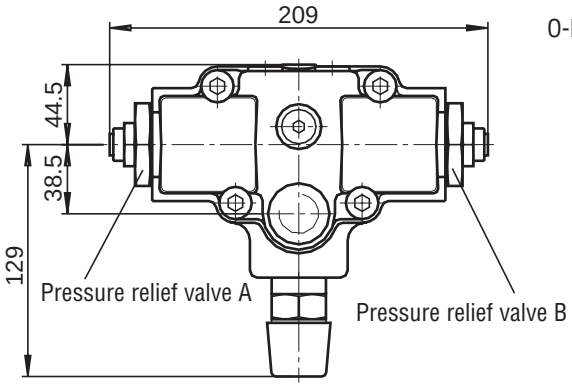
**Co-ordination with axial piston units**

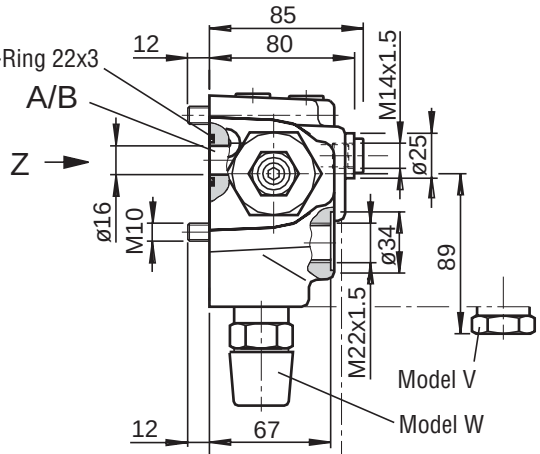
**Direct mounting**

| SDVB | Axial piston unit | | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | A4VSG | | | | | | | | | A2P, Series 5 | | | |
| | 40 | 71 | 125 | 180 | 250 | 355 | 500 | 750 | 1000 | 250 | 355 | 500 | 1000 |
| **16** | ● | ● | ● | ● | | | | | | | | | |
| **30** | | | | | ● | ● | ● | | | ● | ● | ● | |
| **50** | | | | | | | | ● | ● | | | | ● |

## Unit Dimensions Size 16

### Control Type 1

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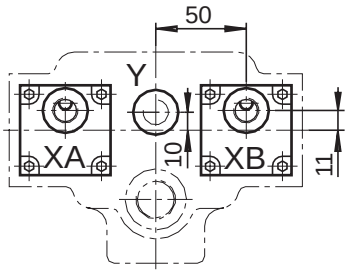
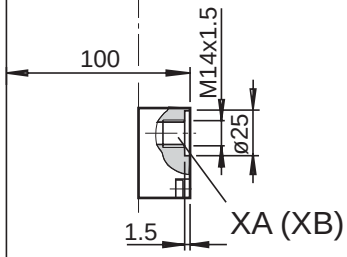
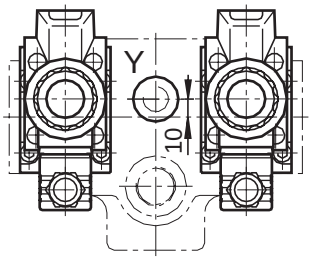
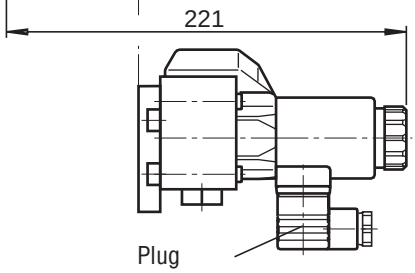


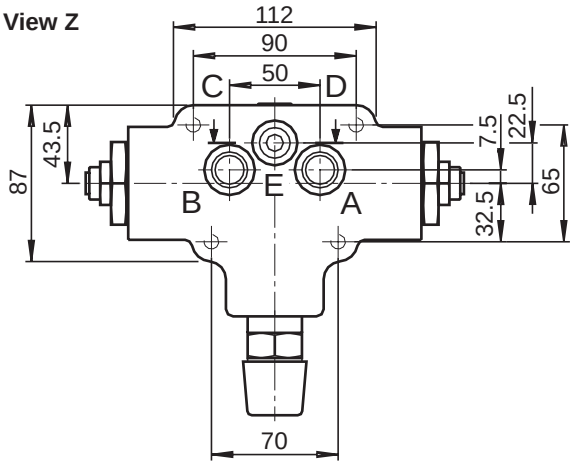




### Control Type 5; 7

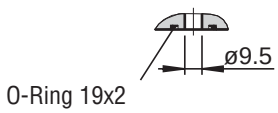


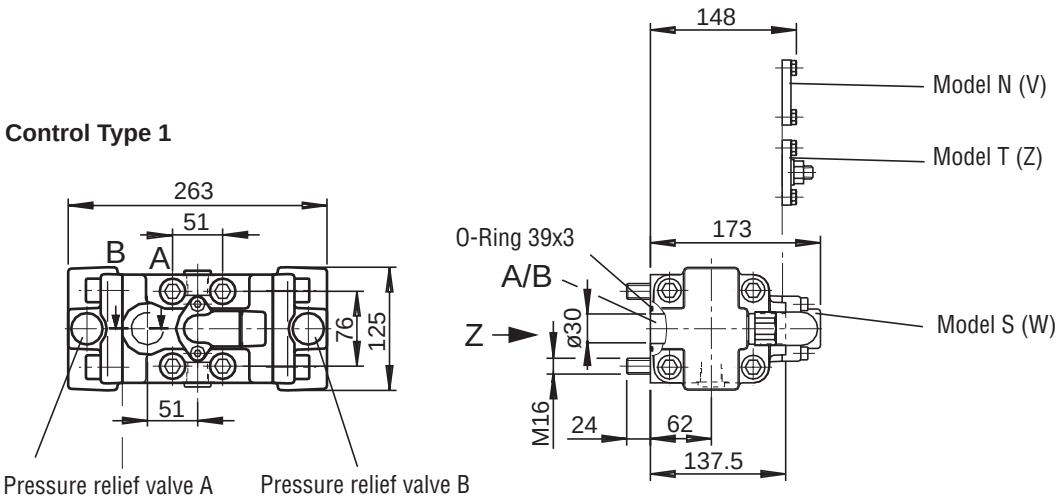

### View Z




### Section C-D



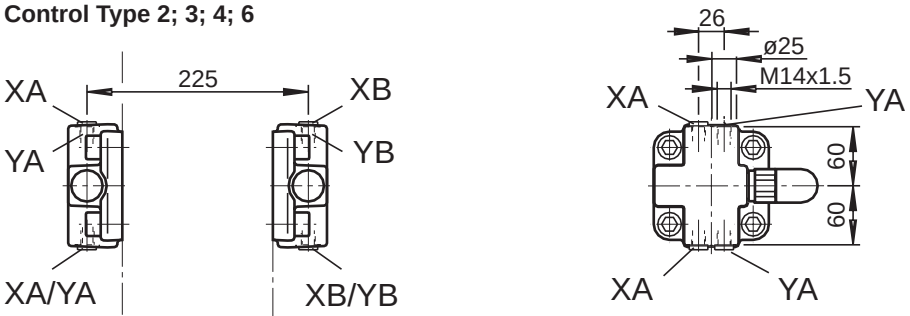
## Unit Dimensions Size 30




### Control Type 1




### Control Type 2; 3; 4; 6

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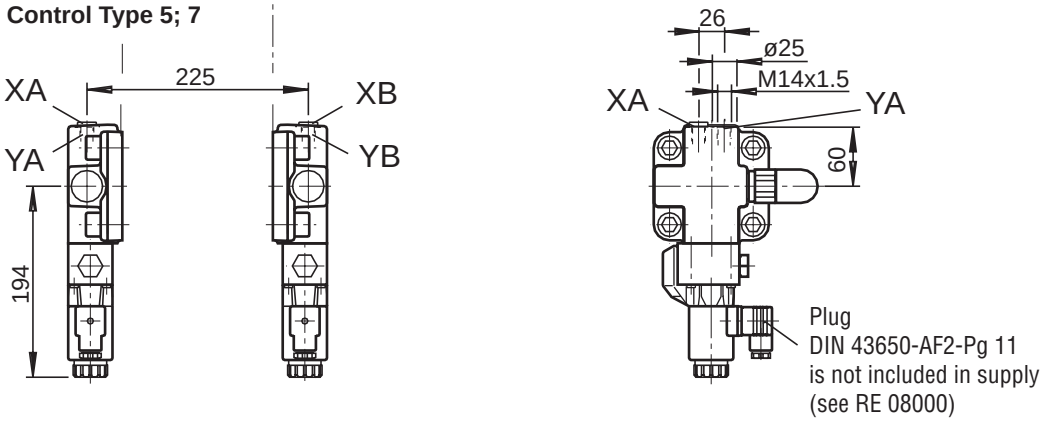


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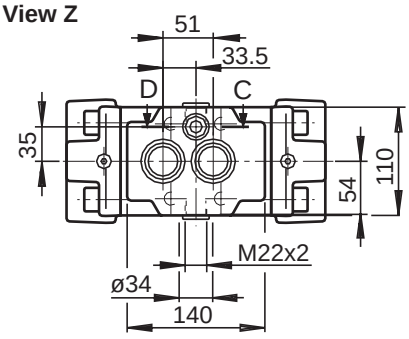


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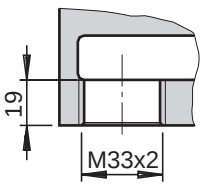


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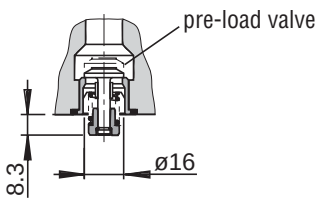
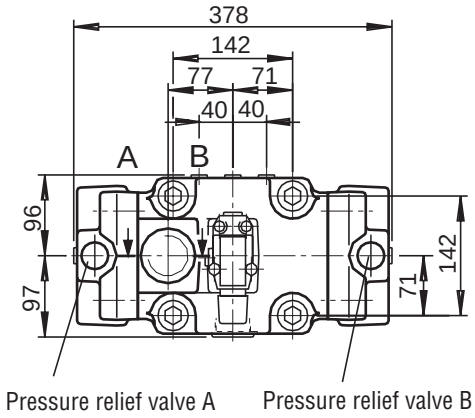
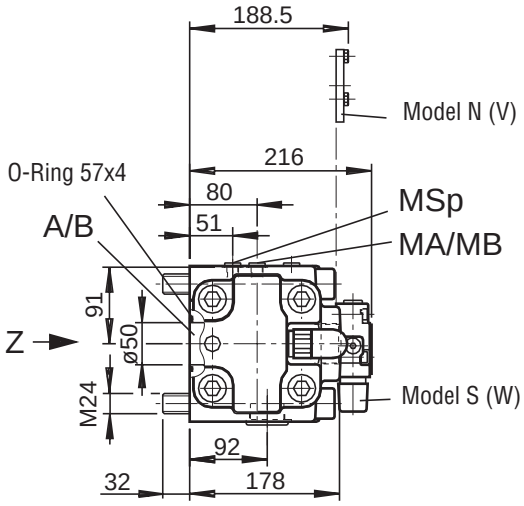


## Unit Dimensions Size 50

### Control Type 1

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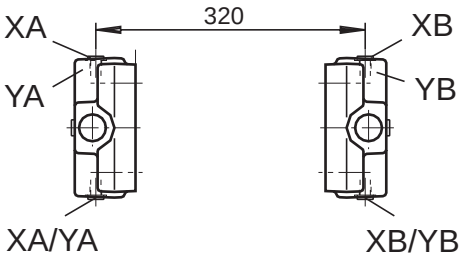
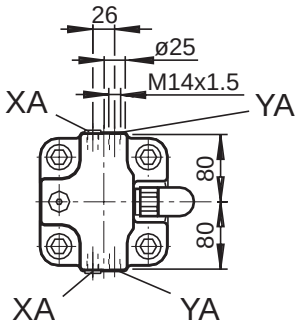
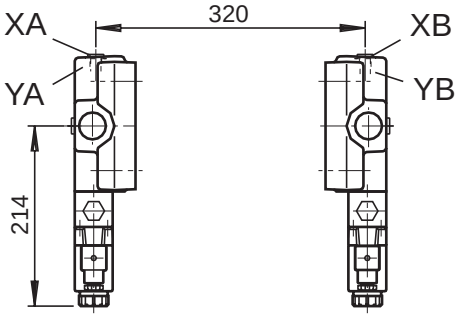
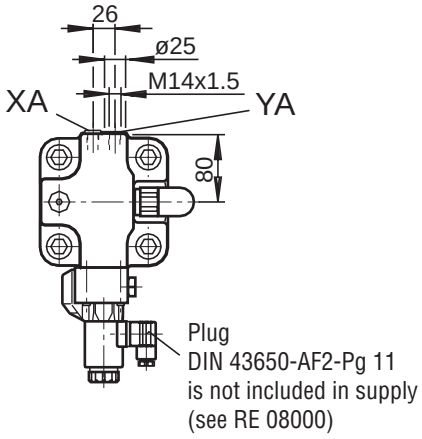


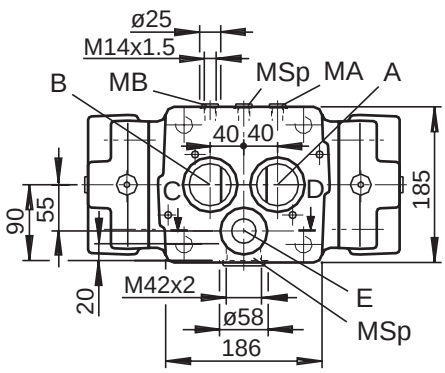




### Control Type 5; 7

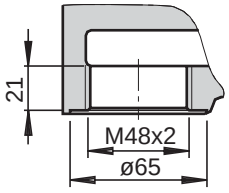



### View Z




### Section A-B

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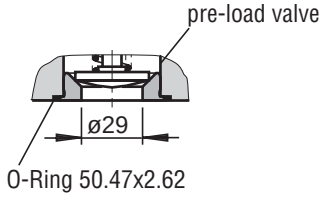
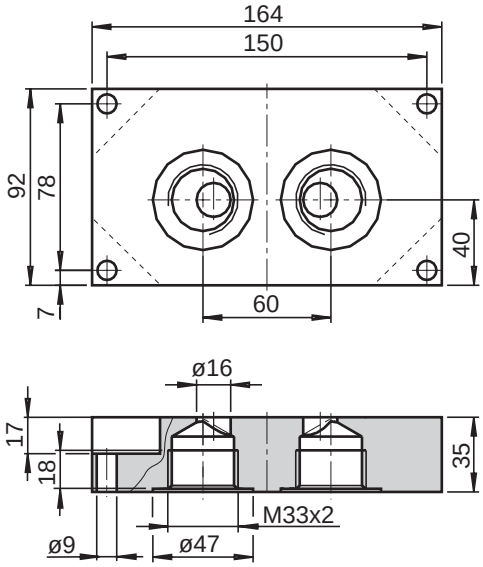
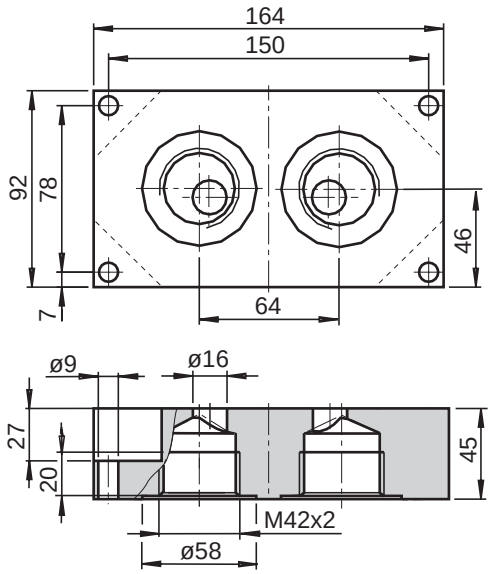


## Subplate

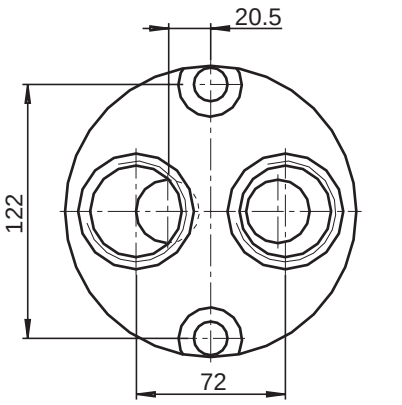
### SDVB 16 (M33x2)

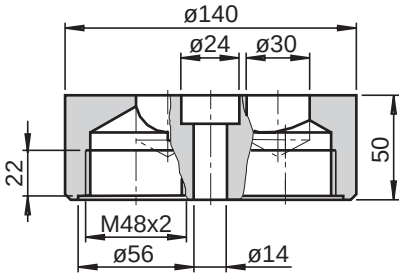



### SDVB 16 (M42x2)

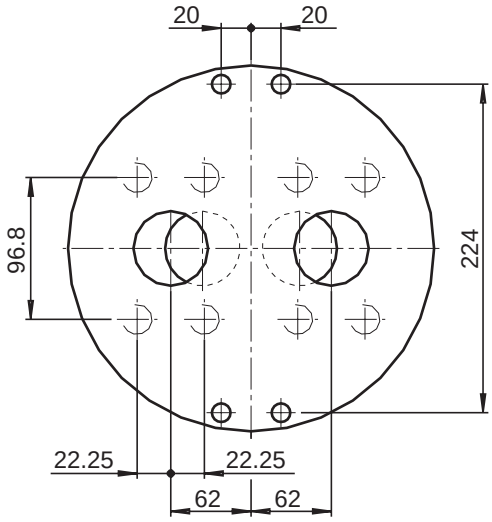


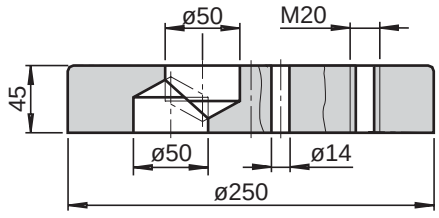

### SDVB 30



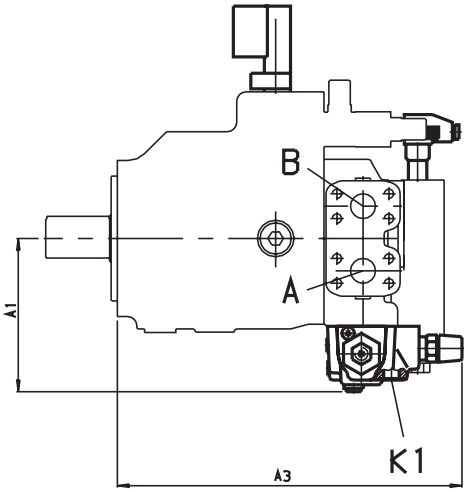

### SDVB 50

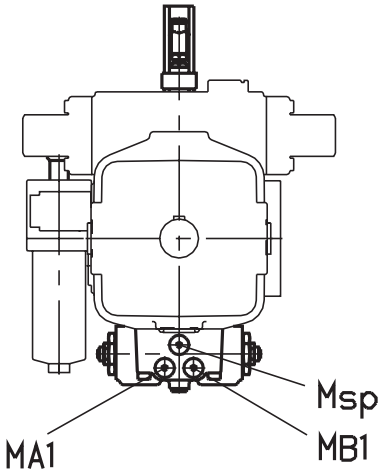


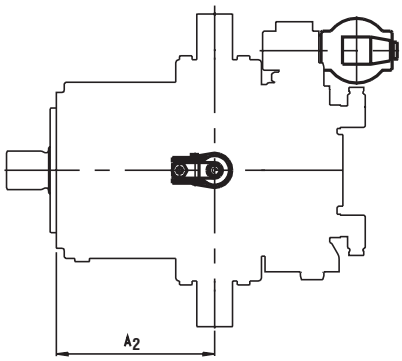



## Unit Dimensions

A4VSG with scavenging block SDVB 16




| Unit Dimensions | | | | Ports | | |
|---|---|---|---|---|---|---|
| **Size** | **$A_1$** | **$A_2$** | **$A_3$** | **$M_A$, $M_B$** | **$M_{SP}$** | **$K_1$** |
| **40** | 174 | 144 | approx. 364 | M14x1,5 | M14x1,5 | M22x1,5; 14 deep |
| **71** | 177 | 166 | 389 | M14x1,5 | M14x1,5 | M22x1,5; 14 deep |
| **125** | 196,5 | 203 | 442 | M14x1,5 | M14x1,5 | M22x1,5; 14 deep |
| **180** | 196,5 | 203 | 442 | M14x1,5 | M14x1,5 | M22x1,5; 14 deep |
| **250** | 317 | 248 | 448 | M14x1,5 | M22x1,5 | M33x2; 18 deep |
| **355** | 319 | 248 | 455 | M14x1,5 | M22x1,5 | M33x2; 18 deep |
| **500** | 353 | 279 | 487 | M14x1,5 | M22x1,5 | M33x2; 18 deep |

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