

ENGINEERING  
TOMORROW

*Danfoss*

# SLIP-IN CARTRIDGE VALVES

To ISO 7368 (DIN 24342)

PRESSURE FUNCTION (NG50 - 100)

DIRECTIONAL FUNCTION (NG80 - 160)



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by Danfoss

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Revision History

| Date     | Revision content                              | Version |
|----------|-----------------------------------------------|---------|
| Jun 2025 | Initial Release                               | 001     |
| Aug 2025 | Remove first character 'T' of function symbol | 002     |
|          |                                               |         |
|          |                                               |         |
|          |                                               |         |
|          |                                               |         |
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# Introduction to Slip in Valve

## Design Concept

Poppet type valves have been used in hydraulic systems for many years. They are commonly known as two-port check valves. In this Form, they serve as a one-way valve, allowing free flow in one direction while blocking flow in the reverse direction. With some refinement, these valves can be controlled to overcome the normal blocking action, thereby allowing control of flow in both directions. This is the basis of the control concept known as Slip in Valve. Refinements in hydraulic system development have led to greater use of manifold block construction. Block systems eliminate a multitude of interconnecting lines between components, thereby virtually eliminating potential leakage points and related oil waste. Inserting the active element of Slip in Valve into standardized cavities in the manifold and retaining this insert by a passive block (cover), completes the Slip in Valve concept.

## Slip in Valve Advantages

- System design flexibility
- Lower installed cost
- Smaller package size
- Better performance and control
- Improved reliability
- Higher pressure capability
- More efficient operation
- Elimination of external leakage and reduction of internal leakage
- Greater contamination tolerance
- Faster cycle times

## Principle

Basically, cartridges include sleeves, spring and spool. This cartridge has three areas written as  $A_A$ ,  $A_B$ , and  $A_{AP}$ . The area of port  $A_A$  is decided by the small diameter of spool. Port  $A_B$  area is the annular area between the valve seat and the large diameter of the spool. Area  $A_{AP}$  is decided by the diameter of spool. The pressure on area  $A_{AP}$  and spring force keep spool close to manifold block. Pressure on  $A_A$  and  $A_B$  tends to lift the spool off the valve seat, allowing oil to pass through the valve.

Tips:

The ratio  $\alpha_A = A_A / A_{AP}$  is called the area ratio of Slip in Valve, Figure 2, determined by the structure and the geometry of the cartridge, which has great influence on the performance of directional control function. The CVI series cartridges have one of such options of the ratio  $\alpha_A$ : 1:1, 1:1.1, 1:1.2, 1:1.5, 1:2.

A = Main port

B = Main port

AP = Spring chamber

$A_A$  = Effective area of port A

$A_B$  = Effective area of port B (annular)

$A_{AP}$  = Area related to poppet diameter

The valve opens and closes in accordance with the force balance formula:

$$(P_{AP} \times A_{AP}) + F_S - (P_A \times A_A) - (P_B \times A_B) - F_f$$

< 0

Valve opens

> 0

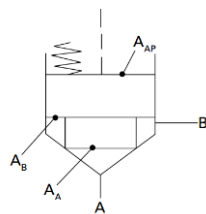
Valve closes

Where:

$F_S$  = Spring force

$F_f$  = Flow force

Graphic Symbol



$$\alpha_A = A_A : A_{AP}$$

Figure 2

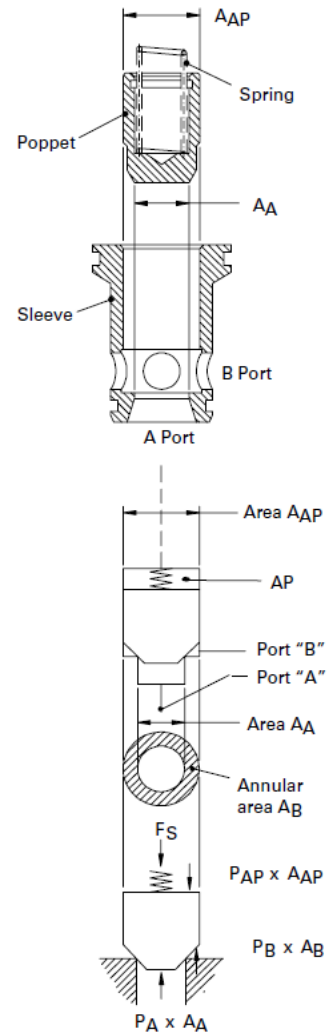


Figure 1

# Technical Parameters

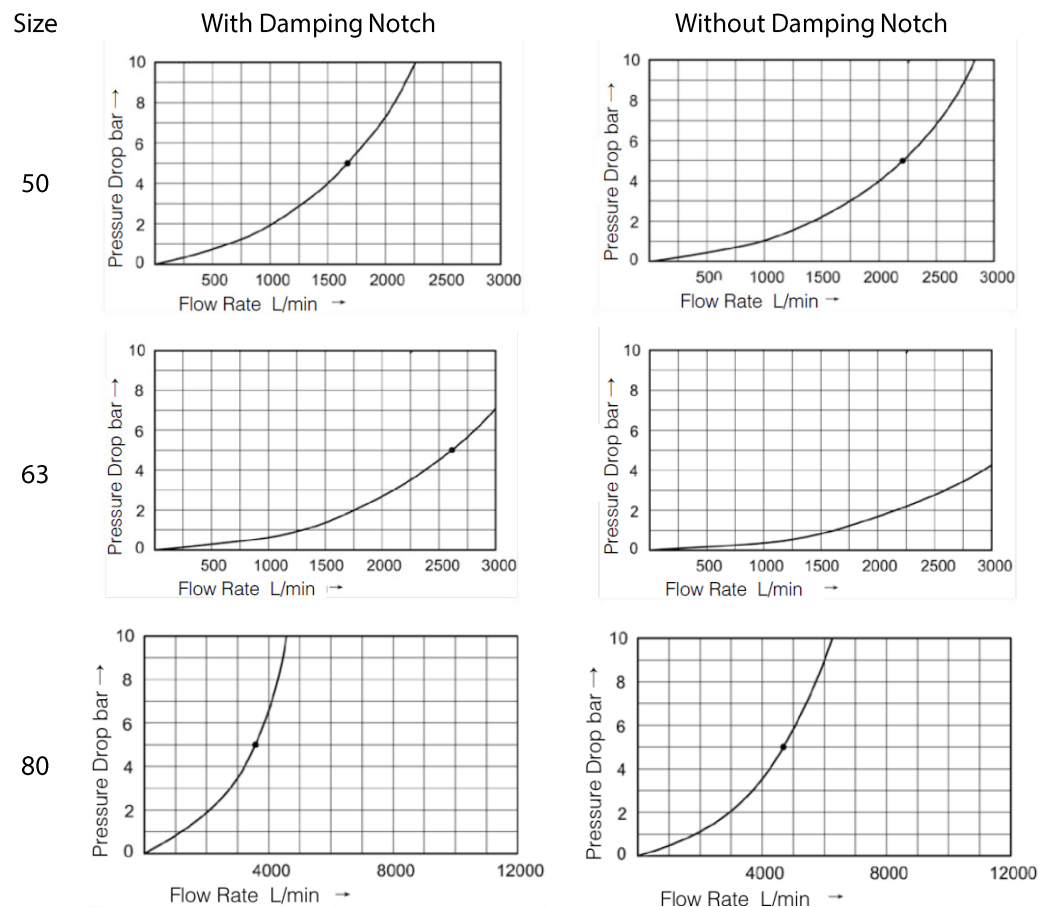
## Environmental Fluids

|                                      |                                                                                                                                                                                                                                                                                              |
|--------------------------------------|----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| Working Fluid                        | All seals are NBR. Water glycol, water-in-oil emulsion fluids and petroleum oil may be used with these standard seals.<br>Add prefix "F3" to the model code when phosphate ester type fluids or their blends are to be used. Alky-based or chlorinated hydrocarbon fluids are not to be used |
| Temperature Range (°C)               | -20 ... 80                                                                                                                                                                                                                                                                                   |
| Viscosity Range (mm <sup>2</sup> /s) | 2.8 ... 500                                                                                                                                                                                                                                                                                  |
| Cleanliness                          | At least 20/18/15 class (ISO4406)                                                                                                                                                                                                                                                            |
| Recommended Filter                   | $\beta_{10} \geq 75$                                                                                                                                                                                                                                                                         |
| Maximum Pressure                     | 350 Bar                                                                                                                                                                                                                                                                                      |

## Rated Flow (refer to P-Q Characteristics)

| Size       | mm                    | 50   | 63   | 80   | 100  | 125   | 160   |
|------------|-----------------------|------|------|------|------|-------|-------|
| Rated Flow | $\Delta P \leq 5$ Bar | 2000 | 3000 | 4600 | 8000 | 11500 | 18500 |
| L/min      | $\Delta P \leq 2$ Bar | 1200 | 2000 | 3000 | 5000 | 7500  | 12000 |

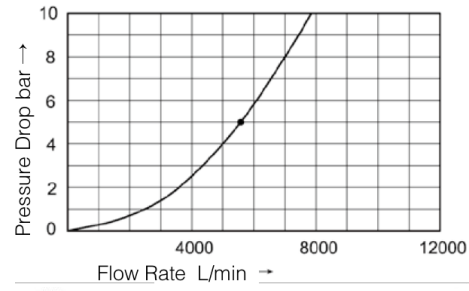
## P – Q Characteristics



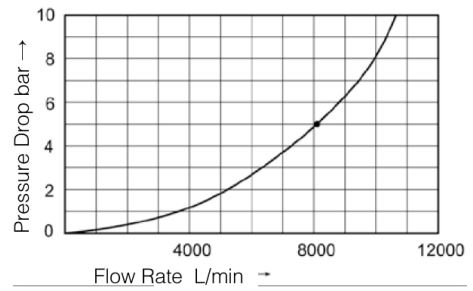
Size

With Damping Notch

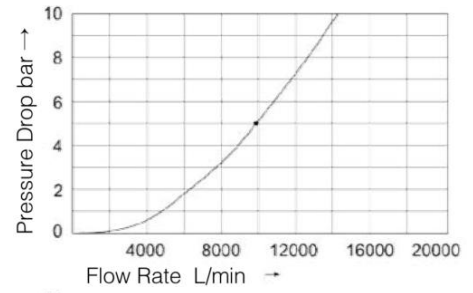
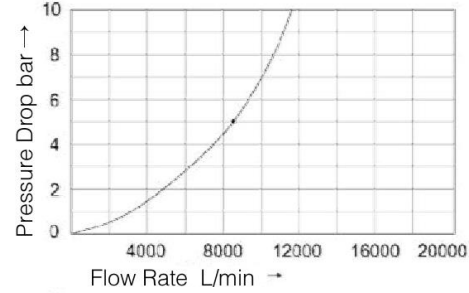
100



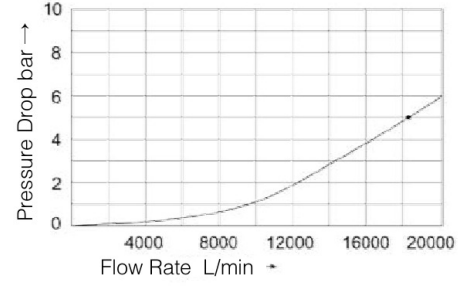
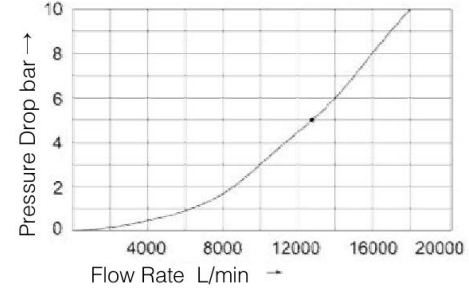
Without Damping Notch



125



160

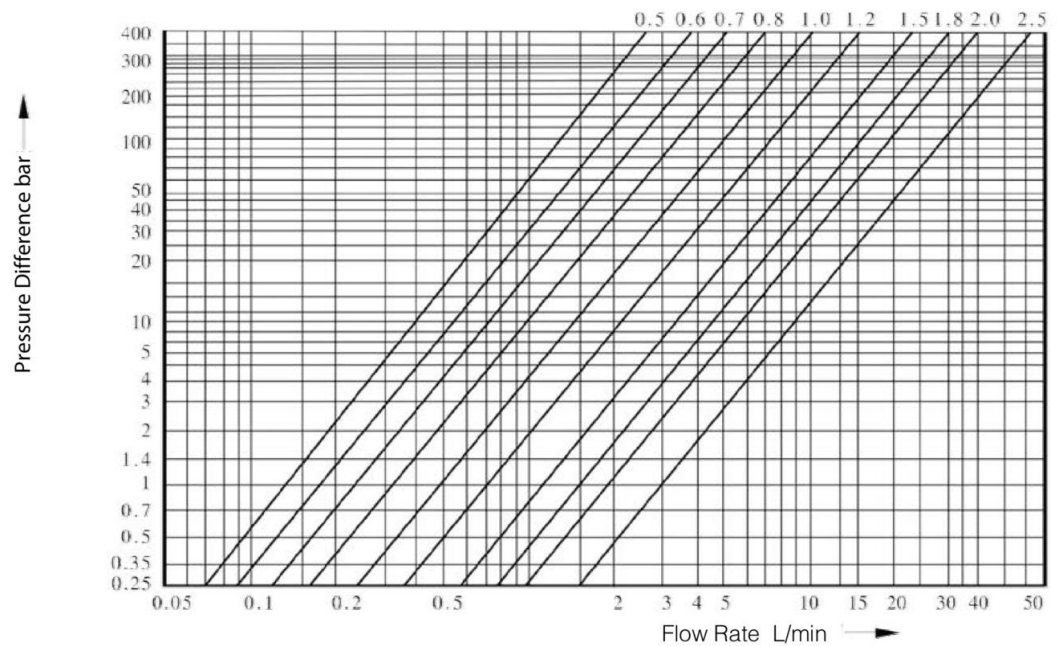


## Orifice

Damping orifice is very important in two-way Slip in Valve. Slip in Valve can be accurately adjusted to realize mechanical operation you need by changing the dimension of damping orifice or adding/ decreasing damping orifice.

Characteristic curves for selecting orifices

(Orifice unit: mm)



## Mounting Bolt Data

| Size             | 50  | 63   | 80  | 100  | 125  | 160  |
|------------------|-----|------|-----|------|------|------|
| Qty              | 4   | 4    | 8   | 8    | 8    | 12   |
| Spec.            | M20 | M30  | M24 | M30  | M36  | M42  |
| Bolt Torque (NM) | 500 | 1600 | 900 | 1800 | 3100 | 5000 |

Note: See detailed drawing of cover to get the Length of bolt

## Seals in Cover

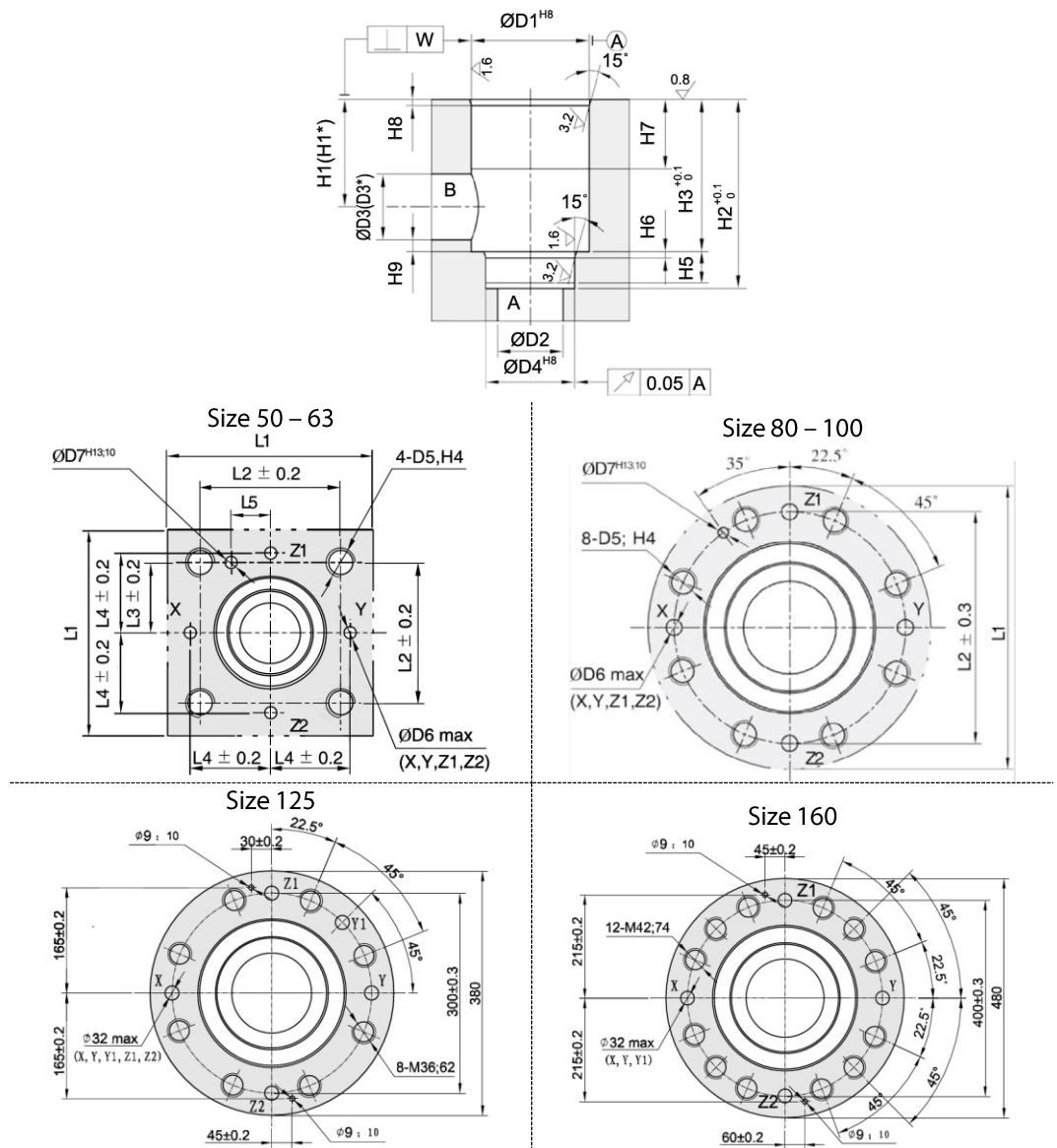
| Size              | 50         | 63         | 80         |
|-------------------|------------|------------|------------|
| O-Ring (Ømm X mm) | 12.37X2.62 | 15.54X2.62 | 26.57X3.53 |
| Size              | 100        | 125        | 160        |
| O-Ring (Ømm X mm) | 34.52X3.53 | 40.87X3.53 | 53.35X5.33 |

## Screw of Plug and Orifice

| Size                | 50 | 63  | 80  | 100 | 125 | 160   |
|---------------------|----|-----|-----|-----|-----|-------|
| U.S. Standard Screw | #6 | #8  | #8  | #8  | #8  | #16   |
| Screw of Orifice    | M6 | M10 | M10 | M10 | M10 | M33X2 |

# Insert Cavity Dimensions

Comply with ISO7368, DIN24342, GB2877, except for size 125 and 160



(Dimensions in mm)

| <b>Dimension</b>                                                                                                                                | <b>50</b> | <b>63</b> | <b>80</b> | <b>100</b> | <b>125</b>       | <b>160</b>       |
|-------------------------------------------------------------------------------------------------------------------------------------------------|-----------|-----------|-----------|------------|------------------|------------------|
| <b>ØD1</b>                                                                                                                                      | 90        | 120       | 145       | 180        | 225              | 300              |
| <b>ØD2</b>                                                                                                                                      | 50        | 63        | 80        | 100        | 150 <sup>1</sup> | 200 <sup>1</sup> |
| <b>ØD3</b>                                                                                                                                      | 50        | 63        | 80        | 100        | 125              | 200              |
| <b>(ØD3*)</b>                                                                                                                                   | 63        | 80        | 100       | 125        | 150              | 250 <sup>1</sup> |
| <b>ØD4</b>                                                                                                                                      | 68        | 90        | 110       | 135        | 200              | 270              |
| <b>ØD5</b>                                                                                                                                      | M20       | M30       | M24       | M30        | -                | -                |
| <b>ØD6</b>                                                                                                                                      | 10        | 12        | 16        | 20         | -                | -                |
| <b>ØD7</b>                                                                                                                                      | 8         | 8         | 10        | 10         | -                | -                |
| <b>H1</b>                                                                                                                                       | 72        | 95        | 130       | 155        | 192              | 268              |
| <b>(H1*)</b>                                                                                                                                    | 65.5      | 86.5      | 120       | 142        | 180              | 243              |
| <b>H2</b>                                                                                                                                       | 122       | 155       | 205       | 245        | 300              | 425              |
| <b>H3</b>                                                                                                                                       | 100       | 130       | 175       | 210        | 257              | 370              |
| <b>H4</b>                                                                                                                                       | 45        | 65        | 50        | 63         | -                | -                |
| <b>H5</b>                                                                                                                                       | 17        | 20        | 25        | 29         | 31               | 45               |
| <b>H6</b>                                                                                                                                       | 3         | 4         | 5         | 5          | 7±0.5            | 8±0.5            |
| <b>H7</b>                                                                                                                                       | 40        | 60        | 65        | 80         | 90               | 100              |
| <b>H8</b>                                                                                                                                       | 4         | 4         | 5         | 5          | 5.5±0.2          | 5.5±0.2          |
| <b>H9</b>                                                                                                                                       | 2.5       | 3         | 4.5       | 4.5        | 2                | 2                |
| <b>L1</b>                                                                                                                                       | 140       | 180       | 250       | 300        | -                | -                |
| <b>L2</b>                                                                                                                                       | 100       | 125       | 200       | 245        | -                | -                |
| <b>L3</b>                                                                                                                                       | 50        | 62.5      | -         | -          | -                | -                |
| <b>L4</b>                                                                                                                                       | 58        | 75        | -         | -          | -                | -                |
| <b>L5</b>                                                                                                                                       | 30        | 38        | -         | -          | -                | -                |
| <b>W</b>                                                                                                                                        | 0.1       | 0.2       | 0.2       | 0.2        | 0.2              | 0.2              |
| Notes:<br>'ØD3*' is the maximum value of 'ØD3'.<br>The size of 'H1*' is measured when 'ØD3' at the maximum value<br>'1' means maximum dimension |           |           |           |            |                  |                  |

# Directional Valve

## Model Codes

### Cover

| 1     | 2    | 3   | 4    | 5    | 6   | 7     | 8         | 9     |
|-------|------|-----|------|------|-----|-------|-----------|-------|
| (F3-) | CVCS | -** | -*** | -(W) | -20 | (-NC) | (-*** **) | (-**) |

|                                                             |                                                                                                      |
|-------------------------------------------------------------|------------------------------------------------------------------------------------------------------|
| <b>1 Seal Material</b>                                      |                                                                                                      |
| F3                                                          | Special seal                                                                                         |
| <b>2 Model</b>                                              |                                                                                                      |
| CVCS                                                        | Slip in Valve Cover to ISO 7368                                                                      |
| <b>3 Nominal size to ISO 7368 (DIN 24342)</b>               |                                                                                                      |
| 080                                                         | - 13(NG80)                                                                                           |
| 100                                                         | - 14(NG100)                                                                                          |
| 125                                                         | - 15(NG125)                                                                                          |
| 160                                                         | - 16(NG160)                                                                                          |
| <b>4 Function</b>                                           |                                                                                                      |
| D                                                           | Only w/ remote hole, w/o control valve                                                               |
| G*                                                          | W/ shuttle valve                                                                                     |
| GW*                                                         | W/ shuttle valve and Solenoid valve fitting surface                                                  |
| KW*                                                         | W/ shuttle valve and Solenoid valve fitting surface                                                  |
| WE*                                                         | W/ solenoid valve fitting surface                                                                    |
| H2                                                          | W/ stroke limiter                                                                                    |
| <b>5 Adjuster mechanism</b>                                 |                                                                                                      |
| W                                                           | Wrench adjustment with hex lock nut (only covers with stroke adjuster)                               |
| <b>6 Design number</b>                                      |                                                                                                      |
| 20                                                          | - 20 Series                                                                                          |
| <b>7 Normal Function (only for covers with pilot valve)</b> |                                                                                                      |
| NC                                                          | - Normally Closed                                                                                    |
| (blank)                                                     | - Normally Open                                                                                      |
| <b>8 Pilot control orifice location</b>                     |                                                                                                      |
|                                                             | Specify port location and orifice, if required<br>Example: P12 – Orifice with $\Phi$ 1.2mm in Port P |
| <b>9 Orifice Size</b>                                       |                                                                                                      |
|                                                             | Specify port location and orifice, if required Example: X12 – Orifice with $\Phi$ 1.2mm in Port X    |

## Insert

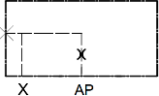
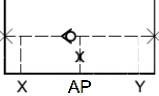
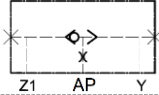
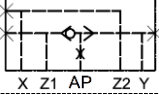
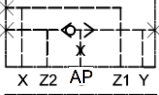
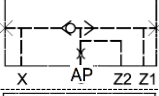
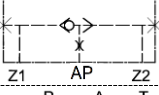
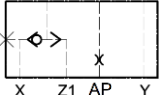
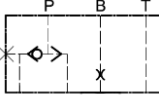
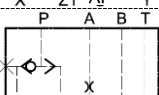
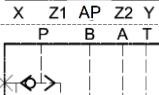
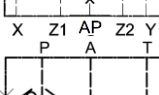
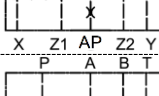
|              |            |            |            |           |           |            |              |
|--------------|------------|------------|------------|-----------|-----------|------------|--------------|
| <u>(F3-)</u> | <u>CVI</u> | <u>-**</u> | <u>-**</u> | <u>**</u> | <u>-*</u> | <u>-50</u> | <u>(-**)</u> |
| 1            | 2          | 3          | 4          | 5         | 6         | 7          | 8            |

|                                       |                                         |
|---------------------------------------|-----------------------------------------|
| 1 Seal Material                       |                                         |
| F3                                    | Special seals                           |
| 2 Model                               |                                         |
| CVI                                   | Slip in Valve Insert                    |
| 3 Nominal Size to ISO 7368(DIN 24342) |                                         |
| 080                                   | - 13(NG80)                              |
| 100                                   | - 14(NG100)                             |
| 125                                   | - 15(NG125)                             |
| 160                                   | - 16(NG160)                             |
| 4 Function                            |                                         |
| D                                     | - Normal                                |
| DC                                    | - With Orifice                          |
| R                                     | - With Damping                          |
| F                                     | - With Flow Restrictor                  |
| 5 Area Ration                         |                                         |
| 11                                    | - 1:1.1 Ratio                           |
| 12                                    | - 1:1.2 Ratio                           |
| 15                                    | - 1:1.5 Ratio                           |
| 20                                    | - 1:2.0 Ratio                           |
| 6 Cracking Pressure                   |                                         |
| LL                                    | - 1.0 Bar                               |
| L                                     | - 2.0 Bar                               |
| M                                     | - 3.0 Bar                               |
| H                                     | - 4.0 Bar                               |
| HH                                    | - 5.0 Bar                               |
| 7 Design Number                       |                                         |
| 50                                    | - 50 Series                             |
| 8 Orifice Size                        |                                         |
|                                       | Specify non-standard orifice size code. |

# Function Symbols

## Covers

(when ordering, specify orifice if required)

| Cover Type | Graphical Symbol                                                                    | Size |     |     |     | Demo                 |
|------------|-------------------------------------------------------------------------------------|------|-----|-----|-----|----------------------|
|            |                                                                                     | 80   | 100 | 125 | 160 |                      |
| D          |    | •    | •   | •   | •   | (F3-)CVCS-***-D -20  |
| GA         |    | •    | •   | •   | •   | (F3-)CVCS-***-GA-20  |
| GB         |    | •    | •   | •   | •   | (F3-)CVCS-***-GB-20  |
| GC         |    | •    | •   | •   | •   | (F3-)CVCS-***-GC-20  |
| GD         |   | •    | •   | •   | •   | (F3-)CVCS-***-GD-20  |
| GE         |  | •    | •   | •   | •   | (F3-)CVCS-***-GE-20  |
| GF         |  | •    | •   | •   | •   | (F3-)CVCS-***-GF-20  |
| GWA        |  | •    | •   | •   | •   | (F3-)CVCS-***-GWA-20 |
| GWB        |  | •    | •   | •   | •   | (F3-)CVCS-***-GWB-20 |
| GWC        |  | •    | •   | •   | •   | (F3-)CVCS-***-GWC-20 |
| GWD        |  | •    | •   | •   | •   | (F3-)CVCS-***-GWD-20 |
| GWE        |  | •    | •   | •   | •   | (F3-)CVCS-***-GWE-20 |
| GWF        |  | •    | •   | •   | •   | (F3-)CVCS-***-GWF-20 |

| Cover Type | Graphical Symbol | Size |     |     |     | Demo                  |
|------------|------------------|------|-----|-----|-----|-----------------------|
|            |                  | 80   | 100 | 125 | 160 |                       |
| KWA        |                  | •    | •   | •   | •   | (F3-)CVCS-***-KWA-20  |
| KWB        |                  | •    | •   | •   | •   | (F3-)CVCS-***-KWB-20  |
| KWC        |                  | •    | •   | •   | •   | (F3-)CVCS-***-KWC-20  |
| KWD        |                  | •    | •   | •   | •   | (F3-)CVCS-***-KWD-20  |
| KWE        |                  | •    | •   | •   | •   | (F3-)CVCS-***-KWE-20  |
| KWF        |                  | •    | •   | •   | •   | (F3-)CVCS-***-KWF-20  |
| KWG        |                  | •    | •   | •   | •   | (F3-)CVCS-***-KWG-20  |
| KWH        |                  | •    | •   | •   | •   | (F3-)CVCS-***-KWH-20  |
| WEA        |                  | •    | •   | •   | •   | (F3-)CVCS-***-WEA-20  |
| WEB        |                  | •    | •   | •   | •   | (F3-)CVCS-***-WEB-20  |
| WEZA       |                  | •    | •   | •   | •   | (F3-)CVCS-***-WEZA-20 |
| WEZB       |                  | •    | •   | •   | •   | (F3-)CVCS-***-WEZB-20 |
| WECA       |                  | •    | •   | •   | •   | (F3-)CVCS-***-WECA-20 |
| WECB       |                  | •    | •   | •   | •   | (F3-)CVCS-***-WECB-20 |
| WEMA       |                  | •    | •   | •   | •   | (F3-)CVCS-***-WEMA-20 |

| Cover Type | Graphical Symbol | Size |     |     |     | Demo                   |
|------------|------------------|------|-----|-----|-----|------------------------|
|            |                  | 80   | 100 | 125 | 160 |                        |
| WEMB       |                  | •    | •   | •   | •   | (F3-)CVCS-***-WEMB-20  |
| WEMZA      |                  | •    | •   | •   | •   | (F3-)CVCS-***-WEMZA-20 |
| WEMXA      |                  | •    | •   | •   | •   | (F3-)CVCS-***-WEMXA-20 |
| WERZA      |                  | •    | •   | •   | •   | (F3-)CVCS-***-WERZA-20 |
| WERZB      |                  | •    | •   | •   | •   | (F3-)CVCS-***-WERZB-20 |
| H2         |                  | •    | •   | •   | •   | (F3-)CVCS-***-H2-20    |

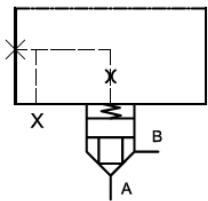
## Inserts

| Insert Type          | Function | Functional Symbol | Demo                        |                                  |                                                 |
|----------------------|----------|-------------------|-----------------------------|----------------------------------|-------------------------------------------------|
|                      |          |                   | Area Ratio<br>$A_A: A_{AP}$ | Cracking Pressure(psi)<br>A to B | Sizes 80 to 160 Sizes 80 to 160<br>Insert Model |
| Normal               | D**      |                   | 1:1.1                       | LL – 1.0                         | CVI-***-D11-LL-50                               |
| With Direct Check    | DC**     |                   | 1:1.1                       | LL – 1.0                         | CVI-***-DC11-LL-50                              |
| With damping         | R**      |                   | 1:1.1                       | LL – 1.0                         | CVI-***-R11-LL-50                               |
| With flow restrictor | F**      |                   | 1:1.1                       | LL – 1.0                         | CVI-***-F11-LL-50                               |

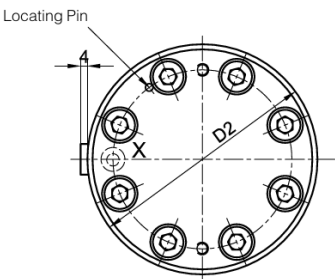
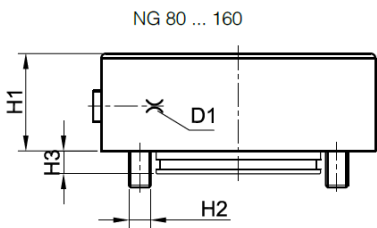
Cover Dimensions

Model Code:  
Function Symbol

CVCS-\*\*-D-20



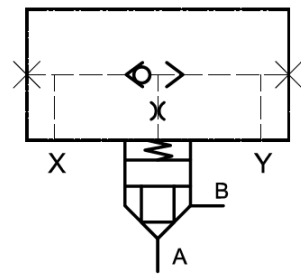
CVCS-\*\*-D-20



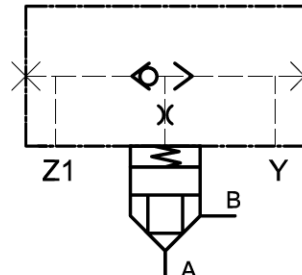
|    | 80     | 100     | 125     | 160     |
|----|--------|---------|---------|---------|
| D1 | M10    | M10     | M10     | M10     |
| D2 | 250    | 300     | 380     | 480     |
| H1 | 80     | 90      | 100     | 150     |
| H2 | M24X85 | M30X100 | M36X110 | M42X160 |
| H3 | 20     | 25      | 25      | 35      |

Model Code:  
Function Symbol

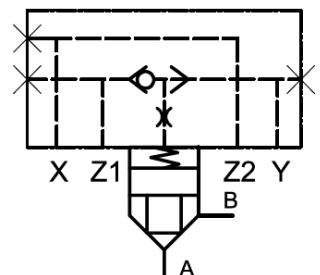
**CVCS-\*\*-G\*-20**



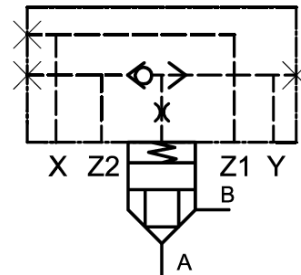
CVCS-\*\*-GA-20



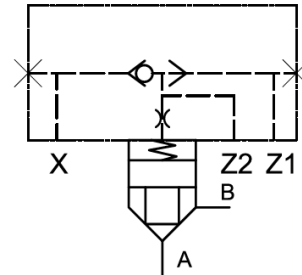
CVCS-\*\*-GB-20



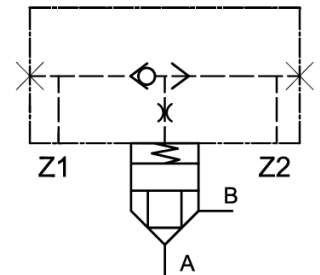
CVCS-\*\*-GC-20



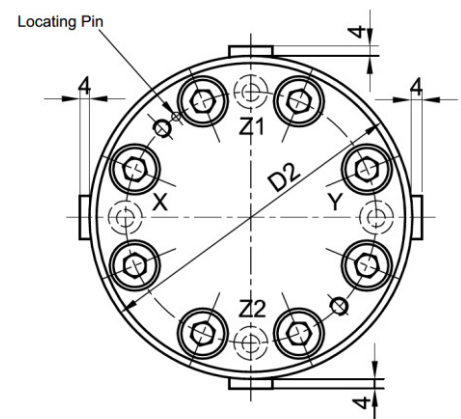
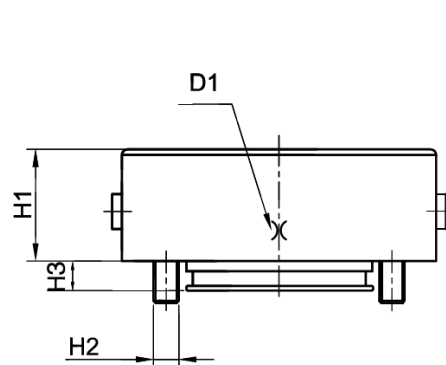
CVCS-\*\*-GD-20



CVCS-\*\*-GE-20



CVCS-\*\*-GF-20

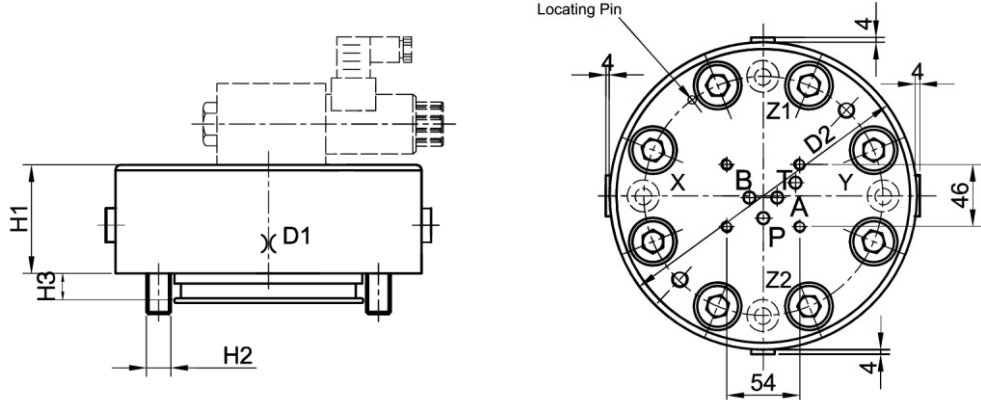
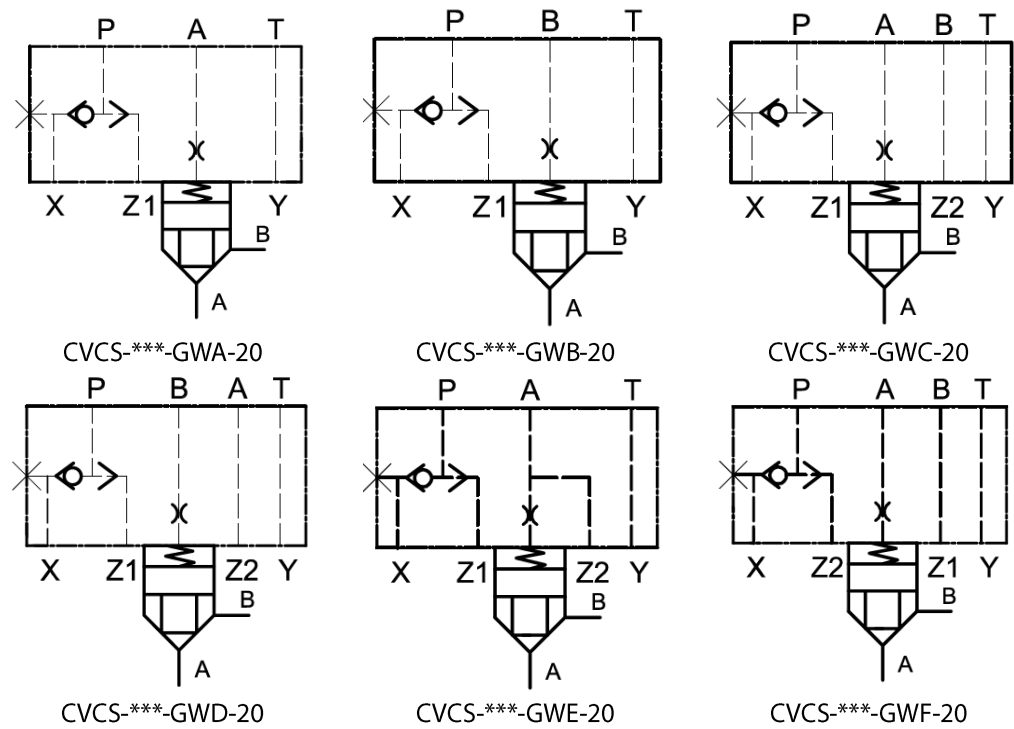


|           | <b>80</b> | <b>100</b> | <b>125</b> | <b>160</b> |
|-----------|-----------|------------|------------|------------|
| <b>D1</b> | M10       | M10        | M10        | M10        |
| <b>D2</b> | 250       | 300        | 380        | 480        |
| <b>H1</b> | 80        | 90         | 100        | 150        |
| <b>H2</b> | M24X85    | M30X100    | M36X110    | M42X160    |
| <b>H3</b> | 20        | 25         | 25         | 35         |

Model Code:

CVCS-\*\*\*-GW\*-20

Function Symbol

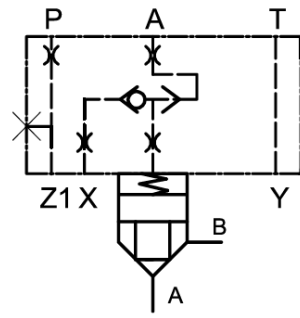


|    | 80     | 100     | 125     | 160     |
|----|--------|---------|---------|---------|
| D1 | M10    | M10     | M10     | M10     |
| D2 | 250    | 300     | 380     | 480     |
| H1 | 80     | 90      | 100     | 150     |
| H2 | M24X85 | M30X100 | M36X110 | M42X160 |
| H3 | 20     | 25      | 25      | 35      |

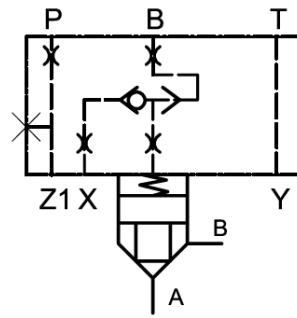
Model Code:

CVCS-\*\*\*-KW\*-20

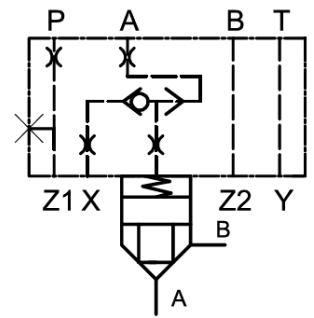
Function Symbol



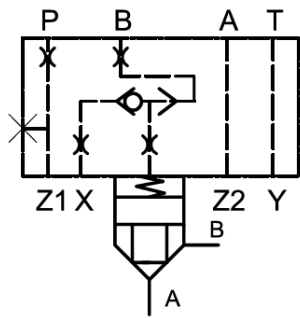
CVCS-\*\*\*-KWA-20



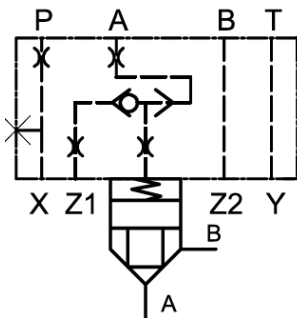
CVCS-\*\*\*-KWB-20



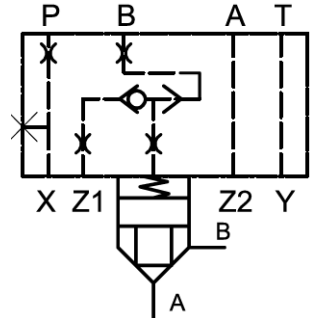
CVCS-\*\*\*-KWC-20



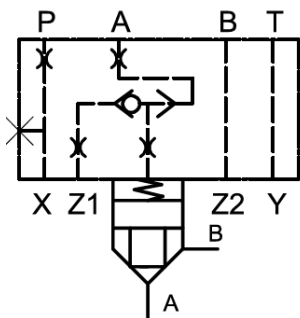
CVCS-\*\*\*-KWD-20



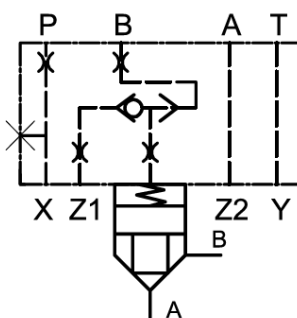
CVCS-\*\*\*-KWE-20



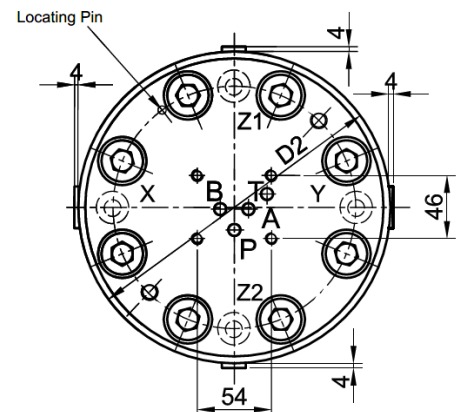
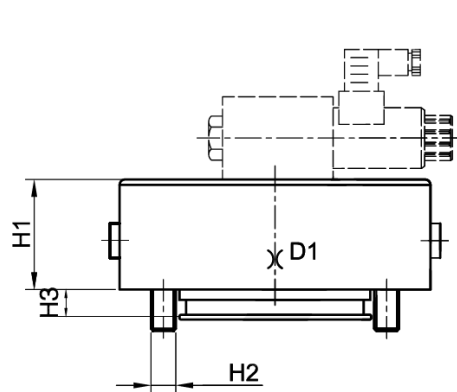
CVCS-\*\*\*-KWF-20



CVCS-\*\*\*-KWG-20



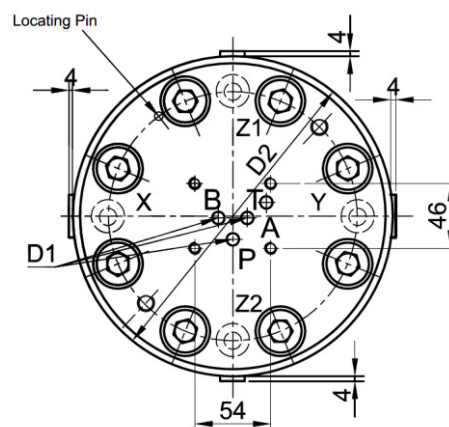
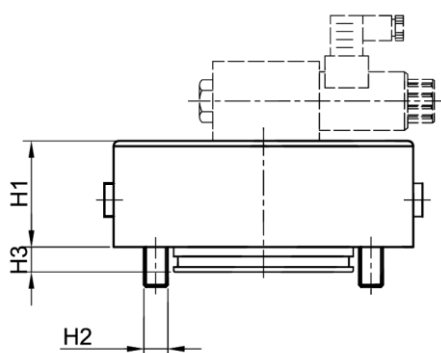
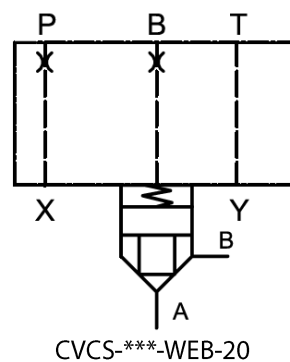
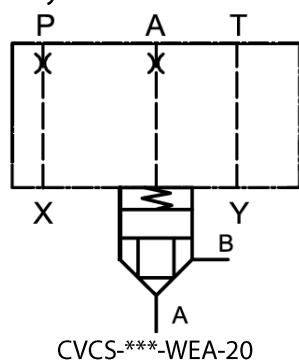
CVCS-\*\*\*-KWH-20



|           | 80     | 100     | 125     | 160     |
|-----------|--------|---------|---------|---------|
| <b>D1</b> | M10    | M10     | M10     | M10     |
| <b>D2</b> | 250    | 300     | 380     | 480     |
| <b>H1</b> | 80     | 90      | 100     | 150     |
| <b>H2</b> | M24X85 | M30X100 | M36X110 | M42X160 |
| <b>H3</b> | 20     | 25      | 25      | 35      |

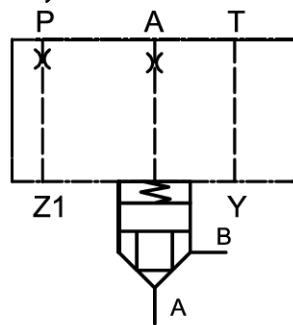
### Function Symbol

**CVCS-\*\*\*-WE\*-20**



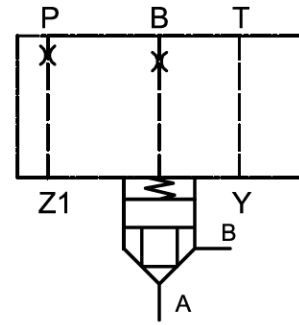
|    | 80     | 100     | 125     | 160     |
|----|--------|---------|---------|---------|
| D1 | M10    | M10     | M10     | M10     |
| D2 | 250    | 300     | 380     | 480     |
| H1 | M24    | 90      | 100     | 150     |
| H2 | M24X85 | M30X100 | M36X110 | M42X160 |
| H3 | 20     | 25      | 25      | 35      |

Model Code:  
Function Symbol

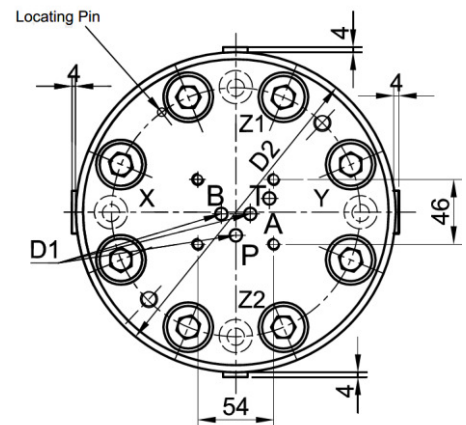
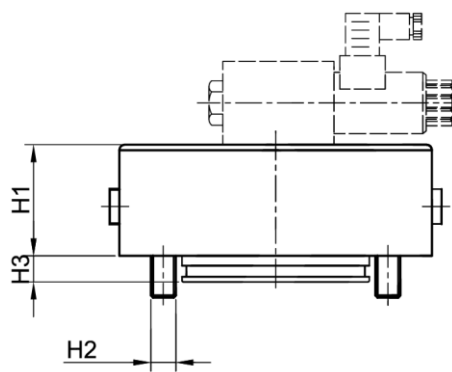


**CVCS-\*\*-WEZA-20**

**CVCS-\*\*-WEZ\*-20**



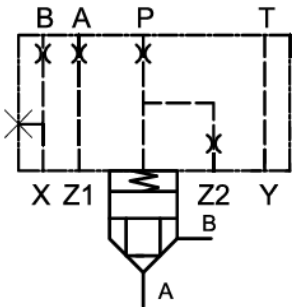
**CVCS-\*\*-WEZB-20**



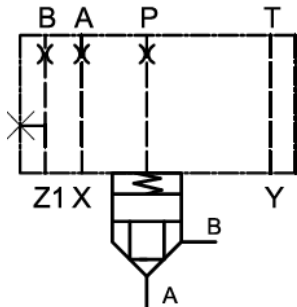
|           | <b>80</b> | <b>100</b> | <b>125</b> | <b>160</b> |
|-----------|-----------|------------|------------|------------|
| <b>D1</b> | M10       | M10        | M10        | M10        |
| <b>D2</b> | 250       | 300        | 380        | 480        |
| <b>H1</b> | 80        | 90         | 100        | 150        |
| <b>H2</b> | M24X85    | M30X100    | M36X110    | M42X160    |
| <b>H3</b> | 20        | 25         | 25         | 35         |

Model Code:

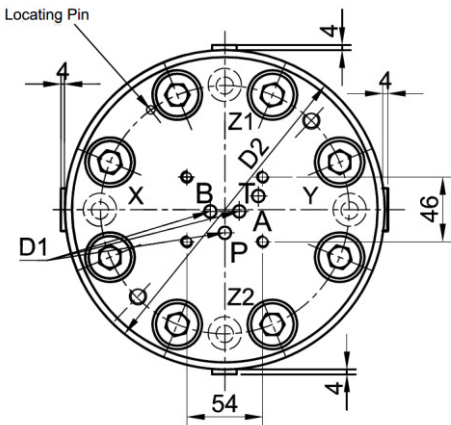
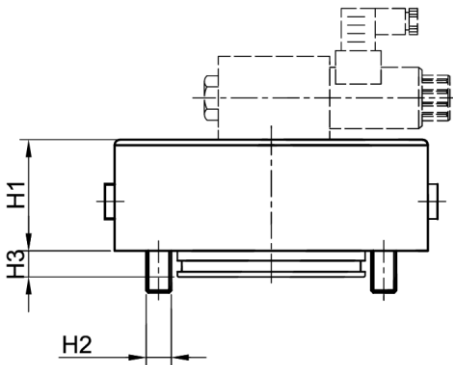
Function Symbol



CVCS-\*\*\*-WECA-20

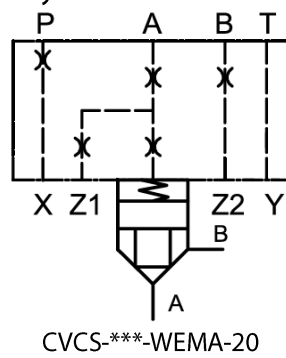


CVCS-\*\*\*-WECB-20

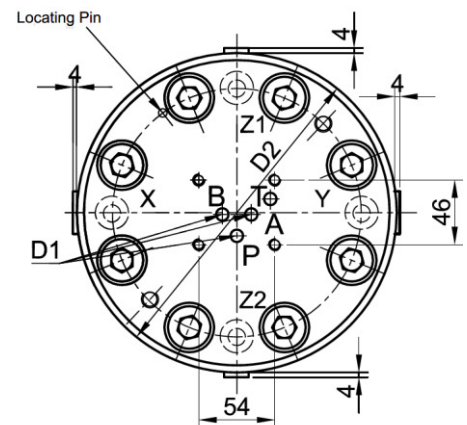
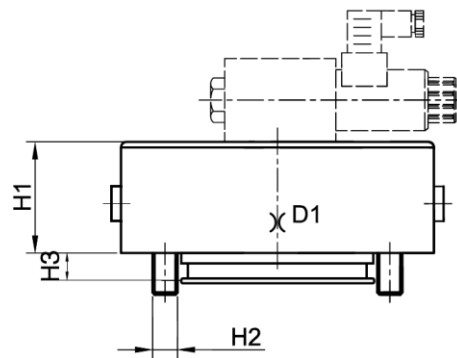
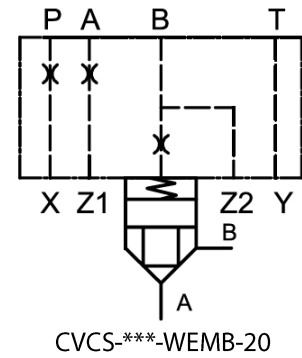


|    | 80     | 100     | 125     | 160     |
|----|--------|---------|---------|---------|
| D1 | M10    | M10     | M10     | M10     |
| D2 | 250    | 300     | 380     | 480     |
| H1 | 80     | 90      | 100     | 150     |
| H2 | M24X85 | M30X100 | M36X110 | M42X160 |
| H3 | 20     | 25      | 25      | 35      |

Model Code:  
Function Symbol



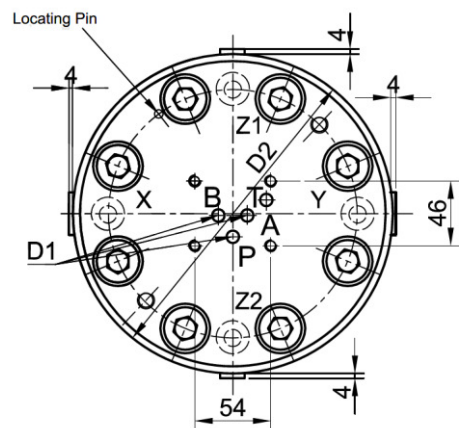
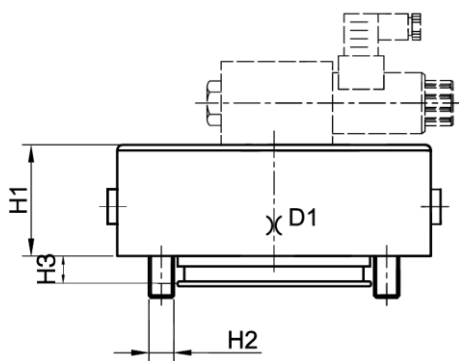
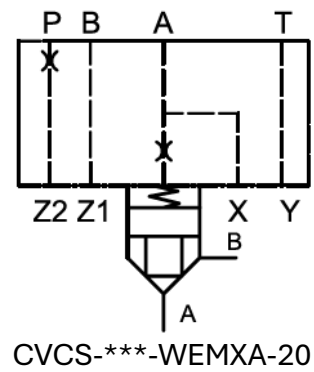
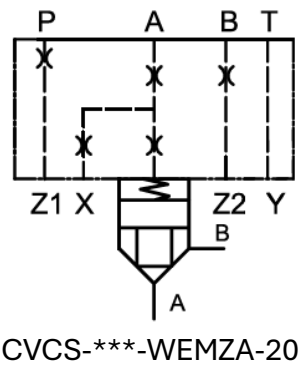
CVCS-\*\*\*-WEM\*-20



|           | 80     | 100     | 125     | 160     |
|-----------|--------|---------|---------|---------|
| <b>D1</b> | M10    | M10     | M10     | M10     |
| <b>D2</b> | 250    | 300     | 380     | 480     |
| <b>H1</b> | 80     | 90      | 100     | 150     |
| <b>H2</b> | M24X85 | M30X100 | M36X110 | M42X160 |
| <b>H3</b> | 20     | 25      | 25      | 35      |

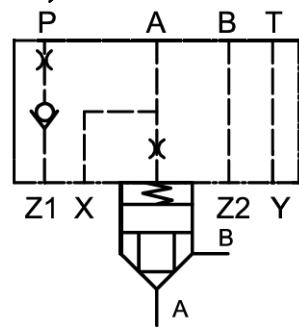
Model Code:  
Function Symbol

CVCS-\*\*\*-WEM\*-20



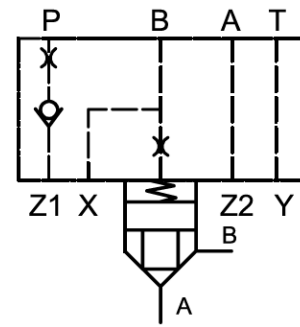
|           | 80     | 100     | 125     | 160     |
|-----------|--------|---------|---------|---------|
| <b>D1</b> | M10    | M10     | M10     | M10     |
| <b>D2</b> | 250    | 300     | 380     | 480     |
| <b>H1</b> | 80     | 90      | 100     | 150     |
| <b>H2</b> | M24X85 | M30X100 | M36X110 | M42X160 |
| <b>H3</b> | 20     | 25      | 25      | 35      |

Model Code:  
Function Symbol

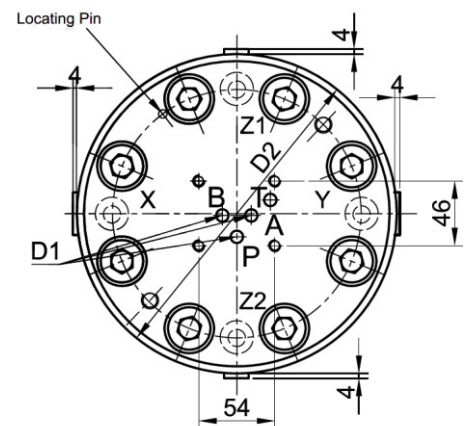
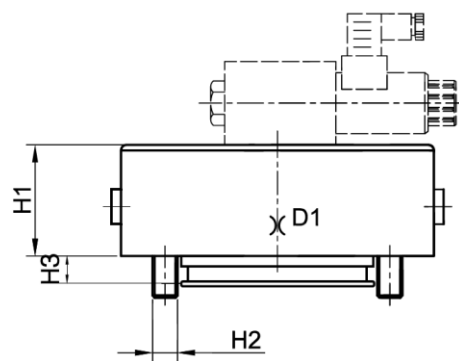


CVCS-\*\*\*-WERZA-20

**CVCS-\*\*\*-WER\*-20**



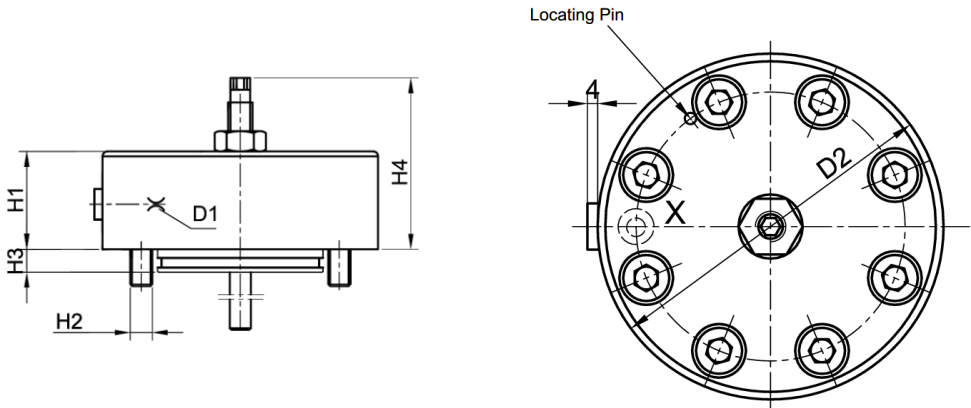
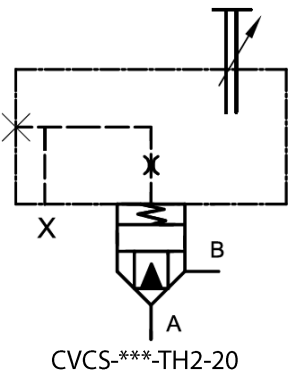
CVCS-\*\*\*-WERZB-20



|           | 80     | 100     | 125     | 160     |
|-----------|--------|---------|---------|---------|
| <b>D1</b> | M10    | M10     | M10     | M10     |
| <b>D2</b> | 250    | 300     | 380     | 480     |
| <b>H1</b> | 80     | 90      | 100     | 150     |
| <b>H2</b> | M24X85 | M30X100 | M36X110 | M42X160 |
| <b>H3</b> | 20     | 25      | 25      | 35      |

Model Code:  
Function Symbol

CVCS-\*\*\*-H2-20



|    | 80     | 100     | 125     | 160     |
|----|--------|---------|---------|---------|
| D1 | M10    | M10     | M10     | M10     |
| D2 | 250    | 300     | 380     | 480     |
| H1 | 80     | 90      | 100     | 150     |
| H2 | M24X85 | M30X100 | M36X110 | M42X160 |
| H3 | 20     | 25      | 25      | 35      |
| H4 | 205    | 225     | 235     | 315     |

# Pressure Control Valve

## Feature

### CVCS

- An innovative design in the CVCS series control covers is implemented. Screw-in Slip in Valve is widely used in the embedded pilot control element, which makes the structure of control cover more reasonable, the use and maintenance more convenient.
- Available in various configurations.  
You can choose cover plate of the universal plate connected solenoid directional valve and modular valve according to ISO4401-03/05 or cover plate with screw in Slip in Valve.
- The control cover is chemically nickel-plated on the surface, so it has high corrosion resistance.

### CVI

- Excellent P-Q characteristics, obvious improvement is made from previous series.
- Spools and sleeves can be configured to obtain various applications, satisfying the function of overflow decompression sequence and so on.
- Generally, area ratio is 1:1 and 1.07:1
- Available in different cracking pressure.

# Model Code

## Cover

|              |             |            |             |           |            |            |              |                  |
|--------------|-------------|------------|-------------|-----------|------------|------------|--------------|------------------|
| <u>(F3-)</u> | <u>CVCS</u> | <u>-**</u> | <u>-***</u> | <u>-W</u> | <u>-**</u> | <u>-20</u> | <u>(-NC)</u> | <u>(-*** **)</u> |
| 1            | 2           | 3          | 4           | 5         | 6          | 7          | 8            | 9                |

|                                        |                                                     |
|----------------------------------------|-----------------------------------------------------|
| 1 Seal Material                        |                                                     |
| F3                                     | Special seal                                        |
| 2 Model                                |                                                     |
| CVCS                                   | Slip in Valve Cover to ISO 7368                     |
| 3 Nominal size to ISO 7368 (DIN 24342) |                                                     |
| 050                                    | – 11(NG50)                                          |
| 063                                    | – 12(NG63)                                          |
| 080                                    | – 13(NG80)                                          |
| 100                                    | – 14(NG100)                                         |
| 4 Function                             |                                                     |
| DB*                                    | Relief valve function                               |
| DBR*                                   | Relief valve with check valve function              |
| DBW*                                   | Solenoid relief valve function                      |
| DBU                                    | Solenoid relief valve function                      |
| DBZ                                    | Two-stage pressure regulating relief valve function |
| 5 Adjuster mechanism (for A)           |                                                     |
| W                                      | wrench adjustment with hex lock nut (for all sizes) |
| 6 Adjustable Pressure                  |                                                     |
| 025                                    | 3 ~ 25 Bar                                          |
| 050                                    | 5 ~ 50 Bar                                          |
| 100                                    | 10 ~ 100 Bar                                        |
| 200                                    | 120 ~ 200 Bar                                       |
| 315                                    | 160 ~ 315 Bar                                       |
| 350                                    | 180 ~ 350 Bar                                       |
| 7 Design Number                        |                                                     |
| 20                                     | - 20 Series                                         |
| 8 Pilot control orifice location       |                                                     |
|                                        | Specify port location for non- standard orifice     |
| 9 Orifice Size                         |                                                     |
|                                        | Specify non-standard orifice size code              |

## Insert

| (F3-) | CVI | _** | _*** | _* | -50 |  |
|-------|-----|-----|------|----|-----|--|
| 1     | 2   | 3   | 4    | 5  | 6   |  |

|                                       |                                               |
|---------------------------------------|-----------------------------------------------|
| 1 Seal Material                       |                                               |
| F3                                    | Special seals                                 |
| 2 Model                               |                                               |
| CVI                                   | Slip in Valve Insert                          |
| 3 Nominal Size to ISO 7368(DIN 24342) |                                               |
| 050                                   | - 11(NG50)                                    |
| 063                                   | - 12(NG63)                                    |
| 080                                   | - 13(NG80)                                    |
| 100                                   | - 14(NG100)                                   |
| 4 Function                            |                                               |
| D10                                   | - Valve without orifice, Area Ratio 1:1       |
| D107                                  | - Valve without orifice, Area Ratio 1:1.07    |
| C10F                                  | - Valve with fixed orifice, Area Ratio 1:1    |
| C107F                                 | - Valve with fixed orifice, Area Ratio 1:1.07 |
| C107                                  | - Valve with orifice, Area Ratio 1:1.07       |
| 5 Cracking Pressure                   |                                               |
| LL                                    | - 1.0 Bar                                     |
| L                                     | - 2.0 Bar                                     |
| M                                     | - 3.0 Bar                                     |
| H                                     | - 4.0 Bar                                     |
| HH                                    | - 5.0 Bar                                     |
| 6 Design Number                       |                                               |
| 50                                    | - 50 Series                                   |

# Function Symbols

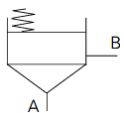
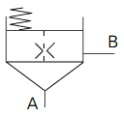
## Covers

| Cover Type         | Graphical Symbol | Size |    |    |     | Cover Model                                                                                     |
|--------------------|------------------|------|----|----|-----|-------------------------------------------------------------------------------------------------|
|                    |                  | 50   | 63 | 80 | 100 |                                                                                                 |
| DBT                |                  | •    | •  | •  | •   | (F3-)CVCS-***-DBT-W-***-20                                                                      |
| DBL                |                  | •    | •  | •  | •   | (F3-)CVCS-***-DBL-W-***-20                                                                      |
| DBWAT              |                  | •    | •  | •  | •   | (F3-)CVCS-***-DBWAT-W-***-20                                                                    |
| DBWT               |                  | •    | •  | •  | •   | (F3-)CVCS-***-DBWT-W-***-20                                                                     |
| DBU                |                  | •    | •  | •  | •   | (F3-)CVCS-***-DBU-W-***-20                                                                      |
| DBRA               |                  | •    | •  | •  | •   | (F3-)CVCS-***-DBRA-W-***-20                                                                     |
| DBRB               |                  | •    | •  | •  | •   | (F3-)CVCS-***-DBRB-W-***-20                                                                     |
| DBZ <sup>(1)</sup> |                  | •    | •  | •  | •   | The Upper Part:<br>CVCS-NG06/NG10-DBZT-W-**-20<br>The Lower Part:<br>CVCS-***-DBZ-W-***-20      |
| DBU <sup>(2)</sup> |                  | •    | •  | •  | •   | The Upper Part:<br>CVCS-NG06/10- ZDAT/ZDCT-W-**-20<br>The Lower Part:<br>CVCS-***- DBU-W-***-20 |

(1) - The Upper Part: CVCS 06/10 DBZT

(2) - The Upper Part: CVCS06/10 ZDAT

## Insert

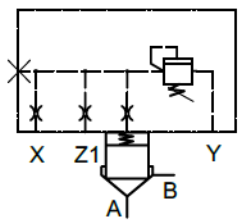
| Insert Type                  | Function | Function Symbol                                                                   | Area Ratio<br>$A_A: A_{AP}$ | Sizes/<br>Insert Model                                |
|------------------------------|----------|-----------------------------------------------------------------------------------|-----------------------------|-------------------------------------------------------|
| Insert<br>without<br>orifice | D10      |  | 1:1                         | CVI-***-D10-* <span style="color: red;">-</span> 50   |
|                              | D107     |                                                                                   | 1:1.07                      | CVI-***-D107-* <span style="color: red;">-</span> 50  |
| Insert<br>without<br>orifice | C10F     |  | 1:1                         | CVI-***-C10F-* <span style="color: red;">-</span> 50  |
|                              | C107F    |                                                                                   | 1:1.07                      | CVI-***-C107F-* <span style="color: red;">-</span> 50 |
|                              | C107     |                                                                                   | 1:1.07                      | CVI-***-C107F-* <span style="color: red;">-</span> 50 |

Cover Dimensions

Model Code:

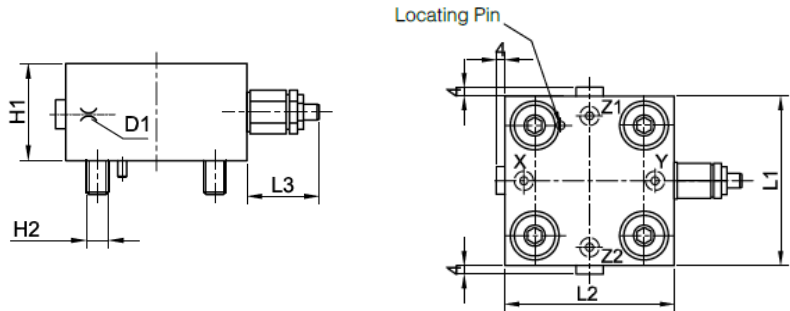
CVCS-\*\*\*-DBT-W-\*\*\*-20

Function Symbol

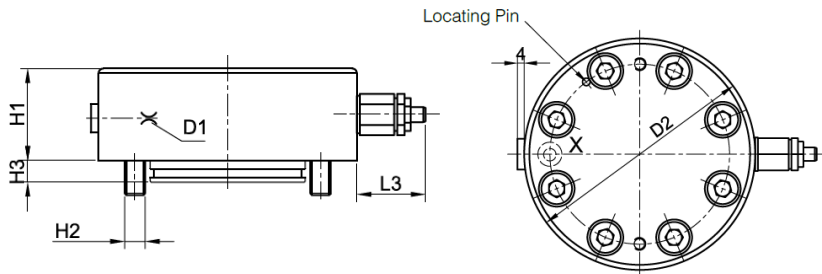


CVCS...DBT...

50 ... 63



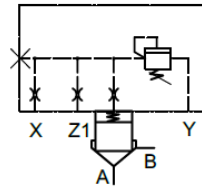
80 ... 100



|    | 50     | 63     | 80     | 100     |
|----|--------|--------|--------|---------|
| D1 | M6     | M10    | M10    | M10     |
| D2 | /      | /      | 250    | 300     |
| H1 | 70     | 80     | 80     | 90      |
| H2 | M20X75 | M30X90 | M24X85 | M30X100 |
| H3 | /      | /      | 20     | 25      |
| L1 | 140    | 180    | /      | /       |
| L2 | 140    | 180    | /      | /       |
| L3 | 50     | 55     | 55     | 55      |

## Model Code:

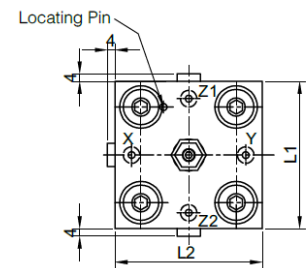
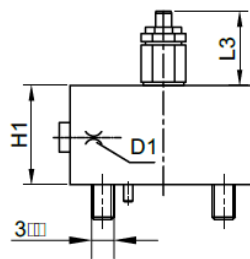
**CVCS-\*\*\*-DBL-W-\*\*\*-20**



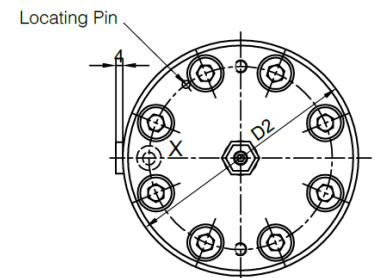
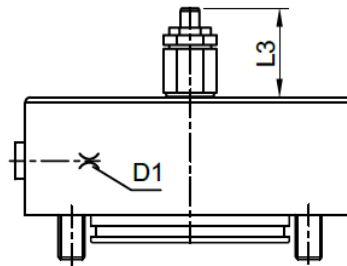
Function Symbol

CVCS...DBL...

50 ...63



80 ...100

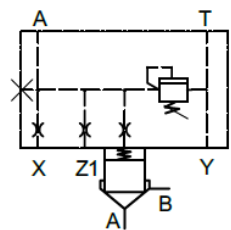


|           | 50     | 63     | 80     | 100     |
|-----------|--------|--------|--------|---------|
| <b>D1</b> | M6     | M10    | M10    | M10     |
| <b>D2</b> | /      | /      | 250    | 300     |
| <b>H1</b> | 70     | 80     | 80     | 90      |
| <b>H2</b> | M20X75 | M30X90 | M24X85 | M30X100 |
| <b>H3</b> | /      | /      | 20     | 25      |
| <b>L1</b> | 140    | 180    | /      | /       |
| <b>L2</b> | 140    | 180    | /      | /       |
| <b>L3</b> | 50     | 55     | 55     | 55      |

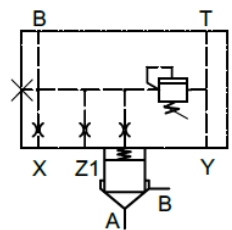
Model Code:

CVCS-\*\*\*-DBW\*\*-W-\*\*\*-20

Function Symbol

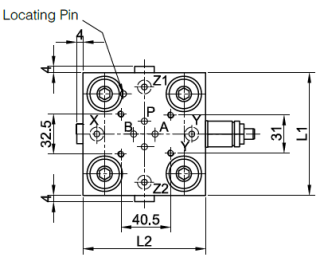
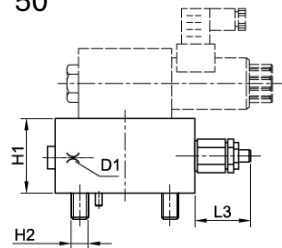


CVCS...DBWAT ...

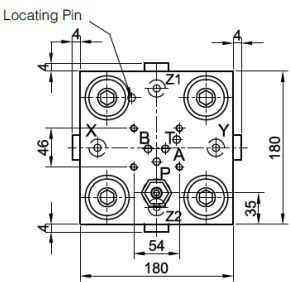
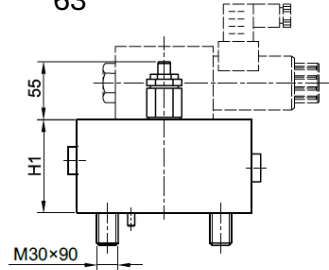


CVCS... DBWT .....

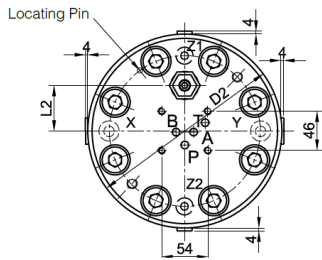
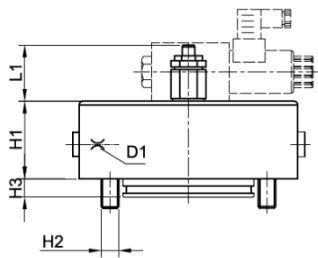
50



63



80 ...100

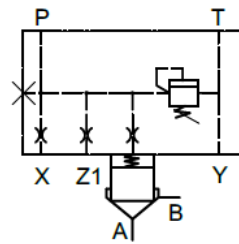


|    | 50     | 63     | 80     | 100     |
|----|--------|--------|--------|---------|
| D1 | M6     | M10    | M10    | M10     |
| D2 | /      | /      | 250    | 300     |
| H1 | 70     | 80     | 80     | 90      |
| H2 | M20X75 | M30X90 | M24X85 | M30X100 |
| H3 | /      | /      | 20     | 25      |
| L1 | 140    | 180    | 55     | 55      |
| L2 | 140    | 180    | 60     | 60      |
| L3 | 50     | 55     | /      | /       |

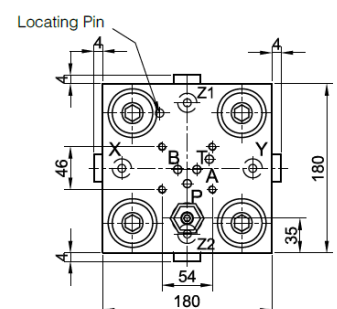
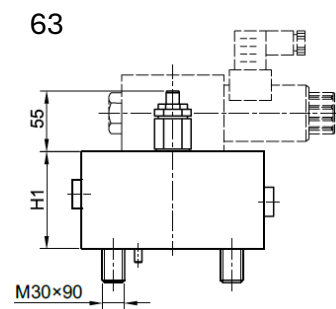
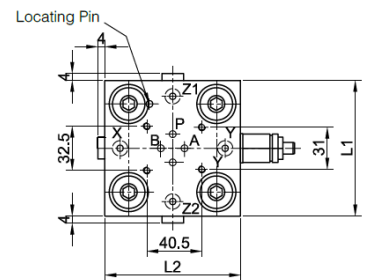
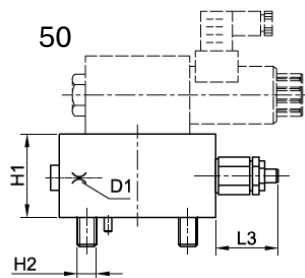
## Model Code:

**CVCS-\*\*\*-DBU-W-\*\*\*-20**

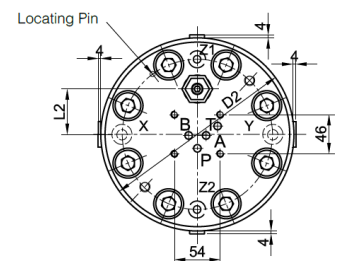
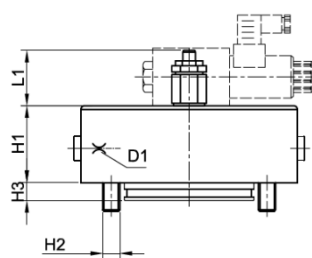
## Function Symbol



CVCS...DBU...



80 ...100

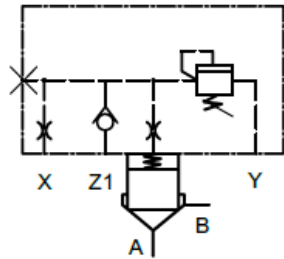


|           | 50     | 63     | 80     | 100     |
|-----------|--------|--------|--------|---------|
| <b>D1</b> | M6     | M10    | M10    | M10     |
| <b>D2</b> | /      | /      | 250    | 300     |
| <b>H1</b> | 70     | 80     | 80     | 90      |
| <b>H2</b> | M20X75 | M30X90 | M24X85 | M30X100 |
| <b>H3</b> | /      | /      | 20     | 25      |
| <b>L1</b> | 140    | 180    | 55     | 55      |
| <b>L2</b> | 140    | 180    | 60     | 60      |
| <b>L3</b> | 50     | 55     | /      | /       |

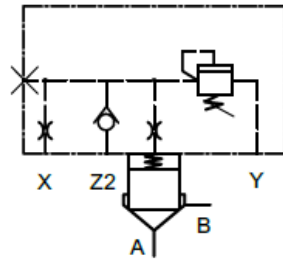
# Model Code:

**CVCS-\*\*\*-DBR\*-W-\*\*\*-20**

## Function Symbol

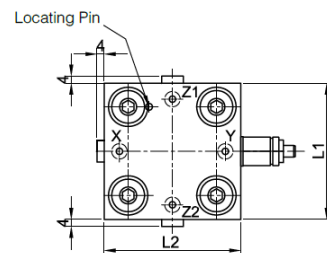
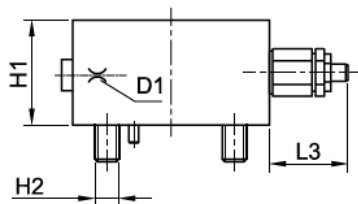


CVCS...DBRA...

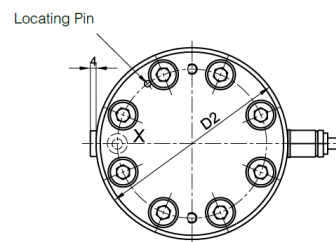
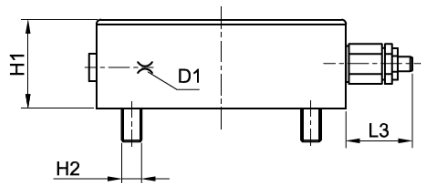


CVCS...DBRB...

50 ... 63



80 ...100



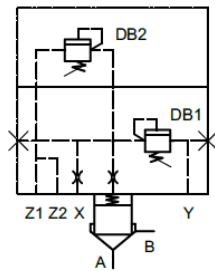
|           | 50     | 63     | 80     | 100     |
|-----------|--------|--------|--------|---------|
| <b>D1</b> | M6     | M10    | M10    | M10     |
| <b>D2</b> | /      | /      | 250    | 300     |
| <b>H1</b> | 70     | 80     | 80     | 90      |
| <b>H2</b> | M20X75 | M30X90 | M24X85 | M30X100 |
| <b>H3</b> | /      | /      | 20     | 25      |
| <b>L1</b> | 140    | 180    | /      | /       |
| <b>L2</b> | 140    | 180    | /      | /       |
| <b>L3</b> | 50     | 55     | 55     | 55      |

## Model Code:

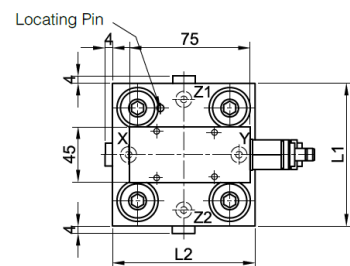
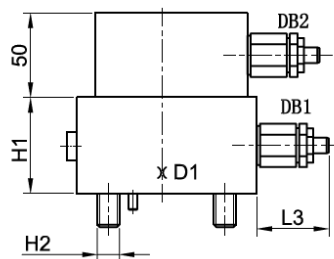
**The Upper Part: CVCS-NG06-DBZT-W-\*\*-20**

**The Lower Part: CVCS-\*\*\*-DBZ-W-\*\*\*-20**

## Function Symbol



CVCS...DBZ...



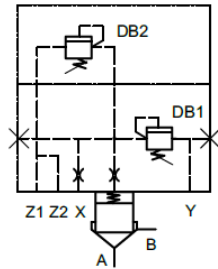
|           | 50     | 63     |
|-----------|--------|--------|
| <b>D1</b> | M6     | M10    |
| <b>H1</b> | 70     | 80     |
| <b>H2</b> | M20X75 | M30X90 |
| <b>L1</b> | 140    | 180    |
| <b>L2</b> | 140    | 180    |
| <b>L3</b> | 50     | 55     |

Model Code:

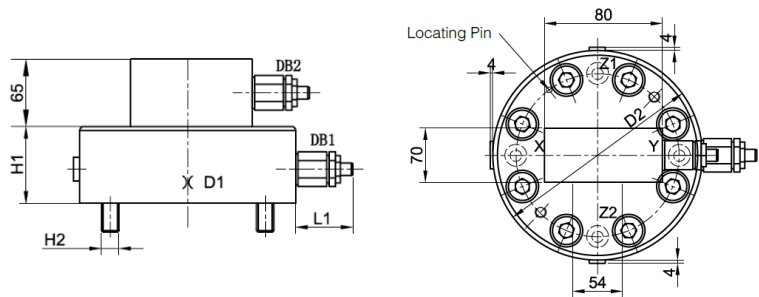
The Upper Part: CVCS-NG06-DBZT-W-\*\*-20

The Lower Part: CVCS-\*\*\*-DBZ-W-\*\*\*-20

Function Symbol



CVCS...DBZ...



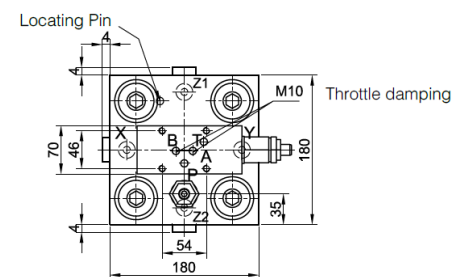
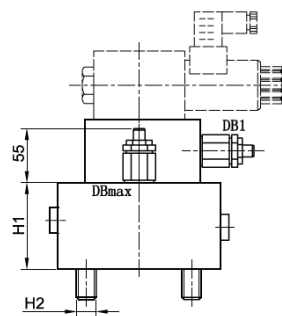
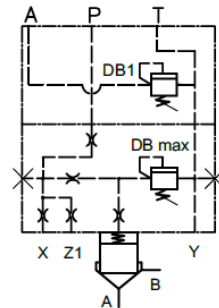
|    | 80     | 100     |
|----|--------|---------|
| D1 | M10    | M10     |
| D2 | 250    | 300     |
| H1 | 80     | 90      |
| H2 | M24X85 | M30X100 |
| H3 | 20     | 25      |
| L1 | 55     | 55      |

## Model Code:

**The Upper Part: CVCS-NG06- ZDAT-W-\*\*-20**

**The Lower Part: CVCS-\*\*\*- DBU-W-\*\*\*-20**

Function Symbol



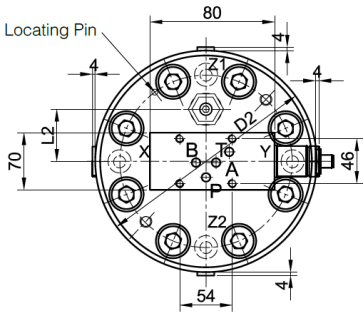
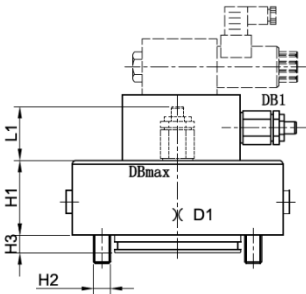
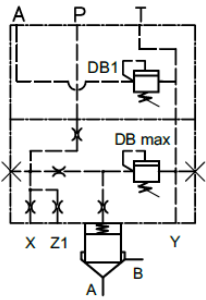
|           | 50     | 63     |
|-----------|--------|--------|
| <b>D1</b> | M6     | M10    |
| <b>H1</b> | 70     | 80     |
| <b>H2</b> | M20X75 | M30X90 |
| <b>L1</b> | 140    | 180    |
| <b>L2</b> | 140    | 180    |
| <b>L3</b> | 50     | 55     |

Model Code:

The Upper Part: CVCS-NG10- ZDAT-W-\*\*-20

The Lower Part: CVCS-\*\*\*- DBU-W-\*\*\*-20

Function Symbol



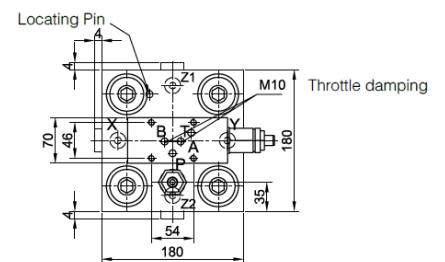
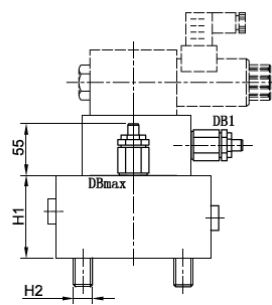
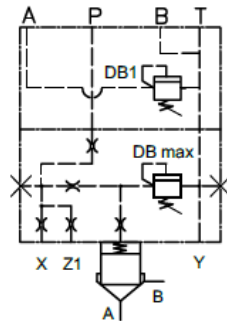
|    | 80     | 100     |
|----|--------|---------|
| D1 | M10    | M10     |
| D2 | 250    | 300     |
| H1 | 80     | 90      |
| H2 | M24X85 | M30X100 |
| H3 | 20     | 25      |
| L1 | 55     | 55      |
| L2 | 60     | 60      |

Model Code:

**The Upper Part: CVCS-NG06- ZDCT-W-\*\*-20**

**The Lower Part: CVCS-\*\*\*- DBU-W-\*\*\*-20**

Function Symbol



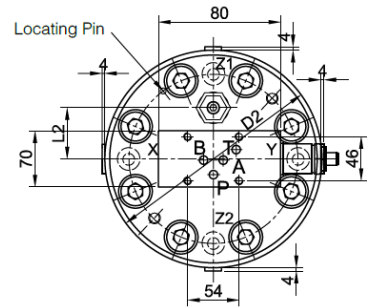
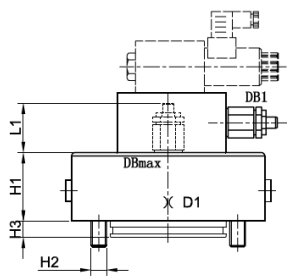
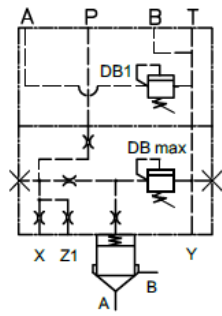
|           | <b>50</b> | <b>63</b> |
|-----------|-----------|-----------|
| <b>D1</b> | M6        | M10       |
| <b>H1</b> | 70        | 80        |
| <b>H2</b> | M20X75    | M30X90    |
| <b>L1</b> | 140       | 180       |
| <b>L2</b> | 140       | 180       |
| <b>L3</b> | 50        | 55        |

Model Code:

The Upper Part: CVCS-NG10- ZDCT-W-\*\*-20

The Lower Part: CVCS-\*\*\*- DBU-W-\*\*\*-20

Function Symbol



|    | 80     | 100     |
|----|--------|---------|
| D1 | M10    | M10     |
| D2 | 250    | 300     |
| H1 | 80     | 90      |
| H2 | M24X85 | M30X100 |
| H3 | 20     | 25      |
| L1 | 55     | 55      |
| L2 | 60     | 60      |

**Products we offer:**

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- DCV directional control valves
- Electric converters
- Electric machines
- Electric motors
- Fluid Conveyance
- Gear motors
- Gear pumps
- Hydraulic integrated circuits (HICs)
- Hydrostatic motors
- Hydrostatic pumps
- Industrial hydraulics
- Orbital motors
- PLUS+1® controllers
- PLUS+1® displays
- PLUS+1® joysticks and pedals
- PLUS+1® operator interfaces
- PLUS+1® sensors
- PLUS+1® software
- PLUS+1® software services, support and training
- Position controls and sensors
- PVG proportional valves
- Steering components and systems
- Telematics

**Danfoss Power Solutions** is a global manufacturer and supplier of high-quality hydraulic and electric components. We specialize in providing state-of-the-art technology and solutions that excel in the harsh operating conditions of the mobile off-highway and industrial markets as well as the marine sector. Building on our extensive applications expertise, we work closely with you to ensure exceptional performance for a broad range of applications. We help you and other customers around the world speed up system development, reduce costs and bring vehicles and vessels to market faster.

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