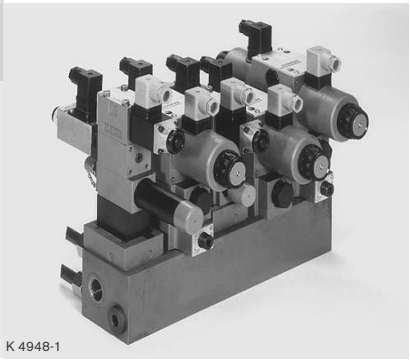
# Multi-station manifold blocks

**RE 48110/04.06** 1/8
Replaces: 10.05

**Type HSR 10**

Nominal size 10
Component series 1X; 3X
Maximum operating pressure 315 bar



K 4948-1

## Overview of contents



## Features

– Multi-station manifold blocks form the basis for ready to connect, as vertical stacking assemblies, control circuits.
– Very compact hydraulic circuits can be built-up on each axis, using vertically stacked sandwich plate valves in combination with NS10 directional control valves proportional valves.
– All circuits have a common pressure and tank port which are positioned on each end of the manifold block.
– Each control station has separate actuator ports A and B, which can be on the side (version C) or on the underside (version D) as required.

## Features

– The following are available as vertical stacking elements:
  • Pressure reducing valve ZDR to RE 26585
  • Pressure relief valve ZDB to RE 25761
  • Double check valve Z2S to RE 21553
  • Check valve Z1S to RE 21536
  • Double throttle check valve Z2FS to RE 27518
  • Pressure switch HED 8 to RE 50060
  • Sandwich plates to RE 48052
  • Directional valve
    - Electrical operation WE to RE 23327
    - Mechanical, manual and fluidic operation types WM., WP, WH. and WN to RE 22331
    - Pilot operated WEH 10 to RE 24751 [1)]
  • Proportional valve
    - Direct operated, without feedback type WRA to RE 29055
    - Direct operated with electrical feedback type WRE to RE 29061
    - Pilot operated, without feedback type WRZ/WRH to RE 29115 [1)]
  • Blanking plate, Material No. **R900302150**

**Note:**
**[1)] Please take the guidelines stated on page 8 into account!**

## Ordering details

| PLATTE | | HSR | 10– | / | | * |
|---|---|---|---|---|---|---|

**No. of control circuit stations in a vertical stacking assembly**

| | |
|---|---|
| For 1 control (on request) | **= 1** |
| For 2 controls | **= 2** |
| For 3 controls | **= 3** |
| For 4 controls | **= 4** |
| For 5 controls | **= 5** |
| For 6 controls | **= 6** |
| For 7 controls | **= 7** |
| For 8 controls | **= 8** |

Manifolds with
- Test points
- Pressure reducing function
- Other functions on request!

Further details in clear text

**C =** Actuator ports on side

**D =** Actuator ports on underside

**01 =** Pipe threads to ISO 228 part 1

**02 =** Metric ISO threads to DIN 3852 part 1

**03 =** NPT threads

**1X =** Component series 10 to 19 (10 to 19: unchanged installation and connection dimensions)

**With enlarged connection threads**

**3X =** Component series 30 to 39 (30 to 39: unchanged installation and connection dimensions)

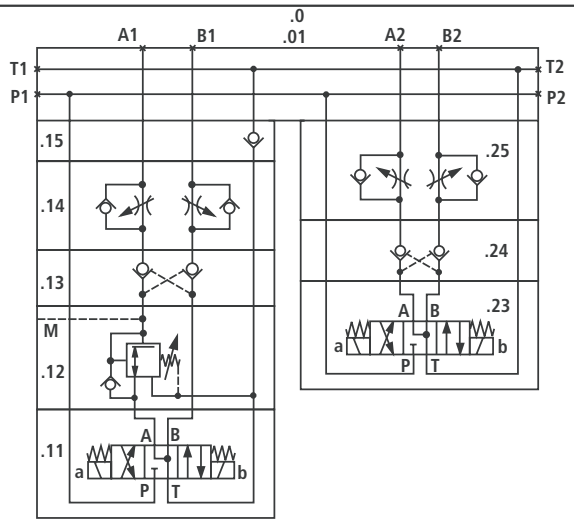
**10 =** Nominal size 10

**To order a multi-station manifold block with built-on valves, see below.**

## Required ordering details example for a manifold block assembly

**Example:**

2 station manifold block to circuit diagram HS-115-B234

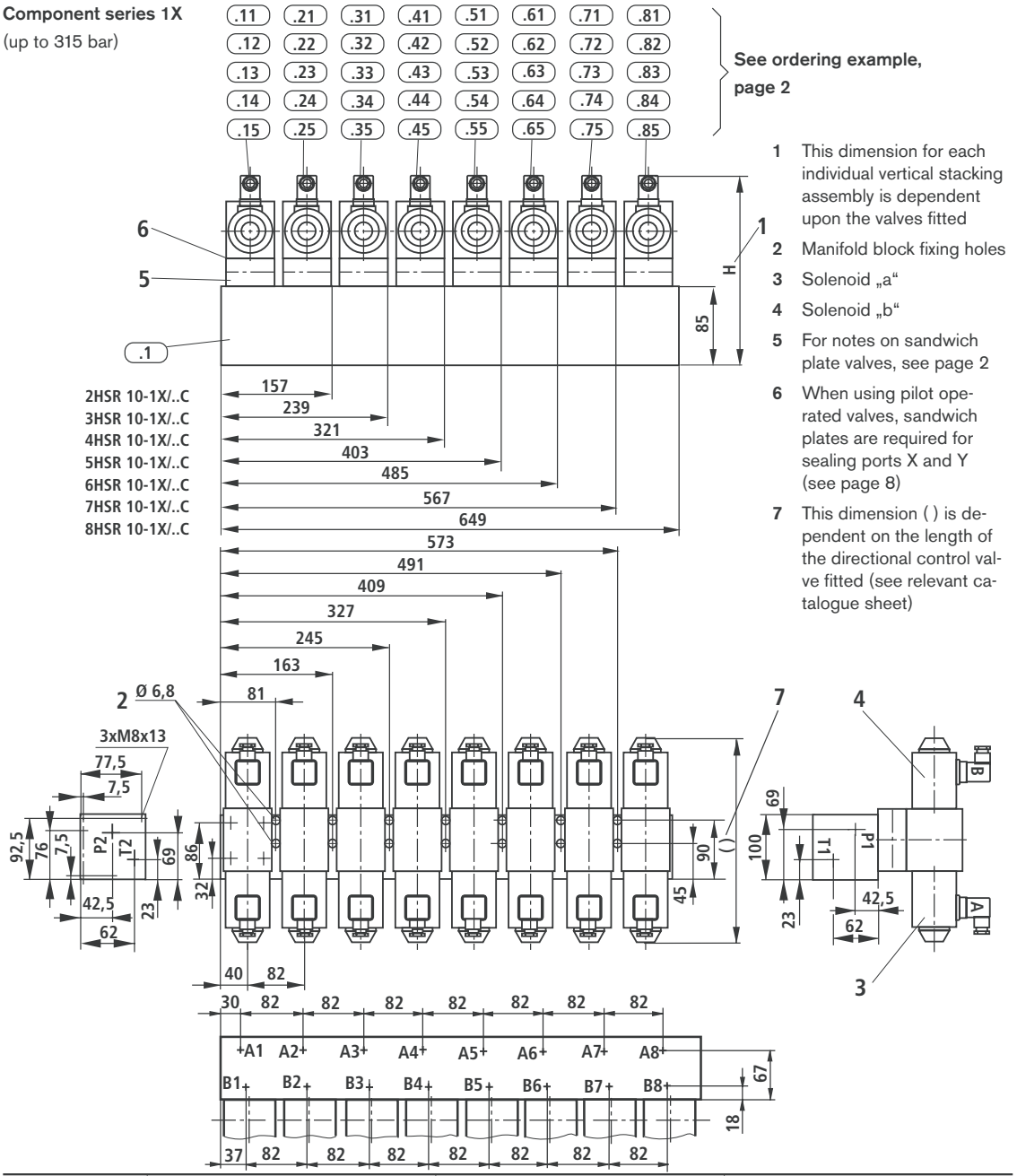



| Item | Qty. | Unit description | Type code | Material No. |
|---|---|---|---|---|
| .0 | 1 | Manifold block assembly | 2HSR 10 C1X/115B234... | [1] |
| .01 | 1 | Manifold block | PLATTE 2HSR 10-15/01C | R900154881 |
| .11 | 1 | Directional valve | 4WE 10 J3X/CG24N9K4 | R900589988 |
| .12 | 1 | Pressure reducing valve | ZDR 10 DA2-5X/150Y | R900406178 |
| .13 | 1 | Double check valve | Z2S 10 -2-3X/ | R900421985 |
| .14 | 1 | Double throttle check valve | Z2FS 10 -5-3X/V | R900517812 |
| .15 | 1 | Check valve | Z1S 10 T1-3X/V | R900417591 |
| | 4 | Stud | M6 x 240-10.9 DIN 939 | R900024864 |
| | 4 | Nut | M6-RN 115.43-CK45K | R900176105 |
| .23 | 1 | Directional valve | 4WE 10 J3X/CG24N9K4 | R900589988 |
| .24 | 1 | Double check valve | Z2S 10 -2-3X/ | R900421985 |
| .25 | 1 | Double throttle check valve | Z2FS 10 -5-3X/V | R900517812 |
| | 4 | S.H.C.S. | M6 x 140-10.9 DIN 912 | R913000443 |

[1] Material No. is defined by the factory!

## **Unit dimensions:** actuator ports on **side „C“** (dimensions in mm)

**Component series 1X**
(up to 315 bar)




1 This dimension for each individual vertical stacking assembly is dependent upon the valves fitted
2 Manifold block fixing holes
3 Solenoid „a“
4 Solenoid „b“
5 For notes on sandwich plate valves, see page 2
6 When using pilot operated valves, sandwich plates are required for sealing ports X and Y (see page 8)
7 This dimension ( ) is dependent on the length of the directional control valve fitted (see relevant catalogue sheet)

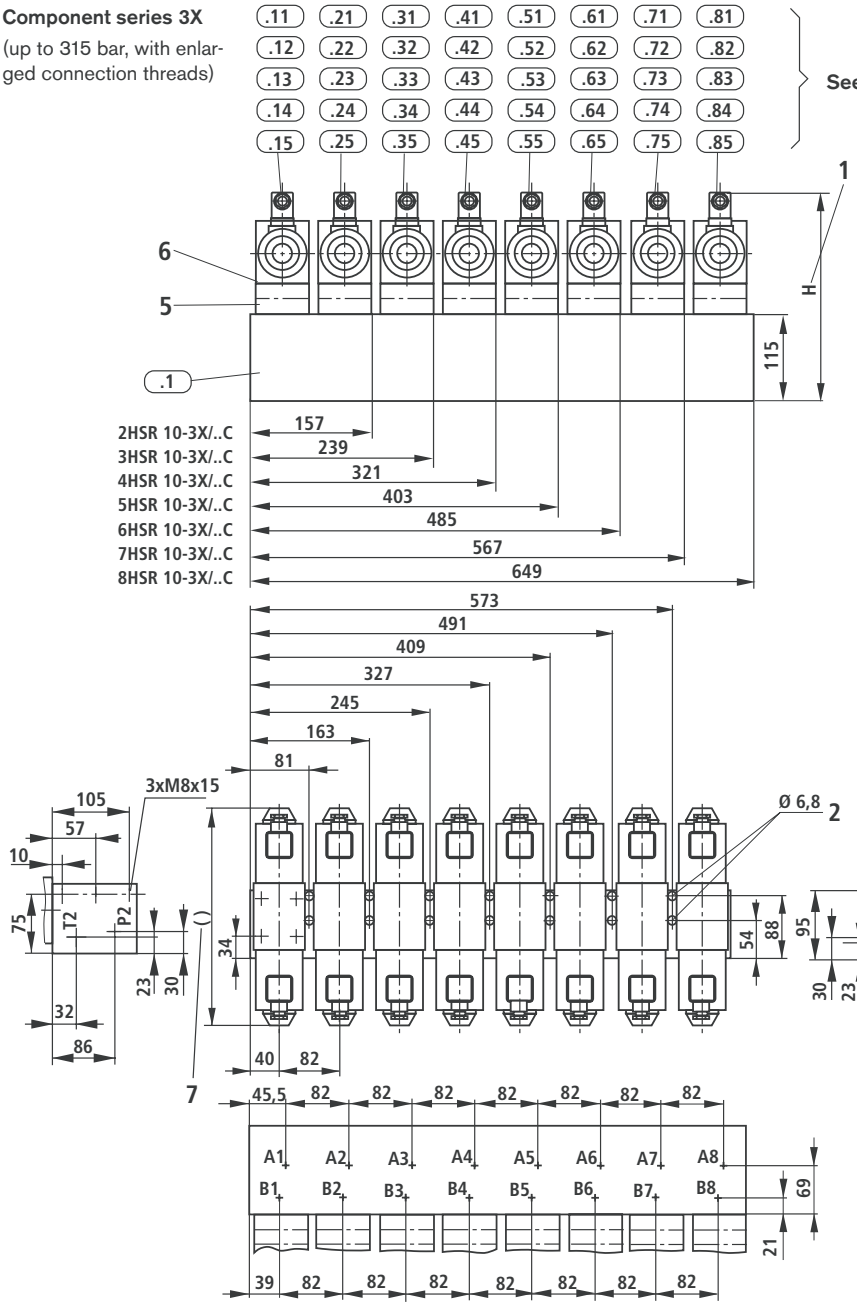
| Type of thread | Pipe threads to ISO 228 part 1 | | Metric ISO threads to DIN 3852 part 1 | | NPT threads | |
|---|---|---|---|---|---|---|
| Port | A1..A8; B1..B8 | P1, P2, T1, T2 | A1..A8; B1..B8 | P1, P2, T1, T2 | A1..A8; B1..B8 | P1, P2, T1, T2 |
| Thread Ø | G 1/2 | G 3/4 | M22 x 1,5 | M27 x 2 | 1/2“ NPT | 3/4“ NPT |
| Thread depth | 14 | 16 | 14 | 16 | 23 | 23 |
| Spot face Ø | 34 | 42 | 34 | 42 | – | – |
| Spot face depth | 1 | 1 | 1 | 1 | – | – |

## **Unit dimensions:** actuator ports on **side „C“** (dimensions in mm)

**Component series 3X**
(up to 315 bar, with enlarged connection threads)

.11 .21 .31 .41 .51 .61 .71 .81
.12 .22 .32 .42 .52 .62 .72 .82
.13 .23 .33 .43 .53 .63 .73 .83
.14 .24 .34 .44 .54 .64 .74 .84
.15 .25 .35 .45 .55 .65 .75 .85

**See ordering example, page 2**

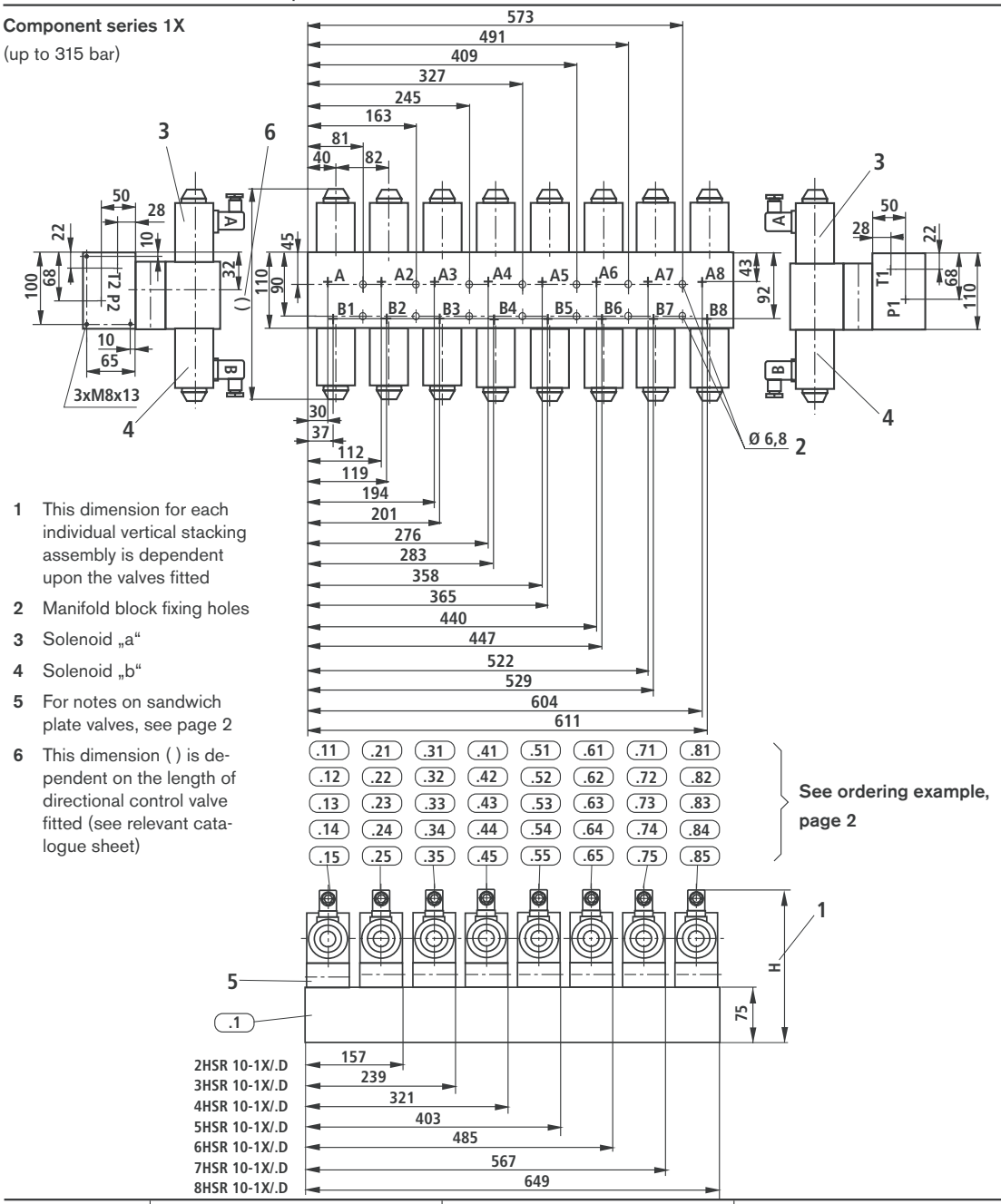



1 This dimension for each individual vertical stacking is dependent upon the valves fitted
2 Manifold block fixing holes
3 Solenoid „a“
4 Solenoid „b“
5 For notes on sandwich plate valves, see page 2
6 When using pilot operated valves, sandwich plates are required for sealing ports X and Y (see page 8)
7 This dimension ( ) is dependent on the length of the directional valve fitted (see relevant catalogue sheet)

| Thread type | Pipe threads to ISO 228 part 1 | | Metric ISO threads to DIN 3852 part 1 | | NPT threads | |
|---|---|---|---|---|---|---|
| Port | A1..A8; B1..B8 | P1, P2, T1, T2 | A1..A8; B1..B8 | P1, P2, T1, T2 | A1..A8; B1..B8 | P1, P2, T1, T2 |
| Thread Ø | G 3/4 | G 1 | M27 x 2 | M33 x 2 | 3/4“ NPT | 1“ NPT |
| Thread depth | 16 | 18 | 16 | 18 | 23 | 27 |
| Spot face Ø | 42 | 47 | 42 | 47 | – | – |
| Spot face depth | 1 | 1 | 1 | 1 | – | – |

## **Unit dimensions:** actuator ports on **underside „D“** (dimensions in mm)

**Component series 1X**
(up to 315 bar)

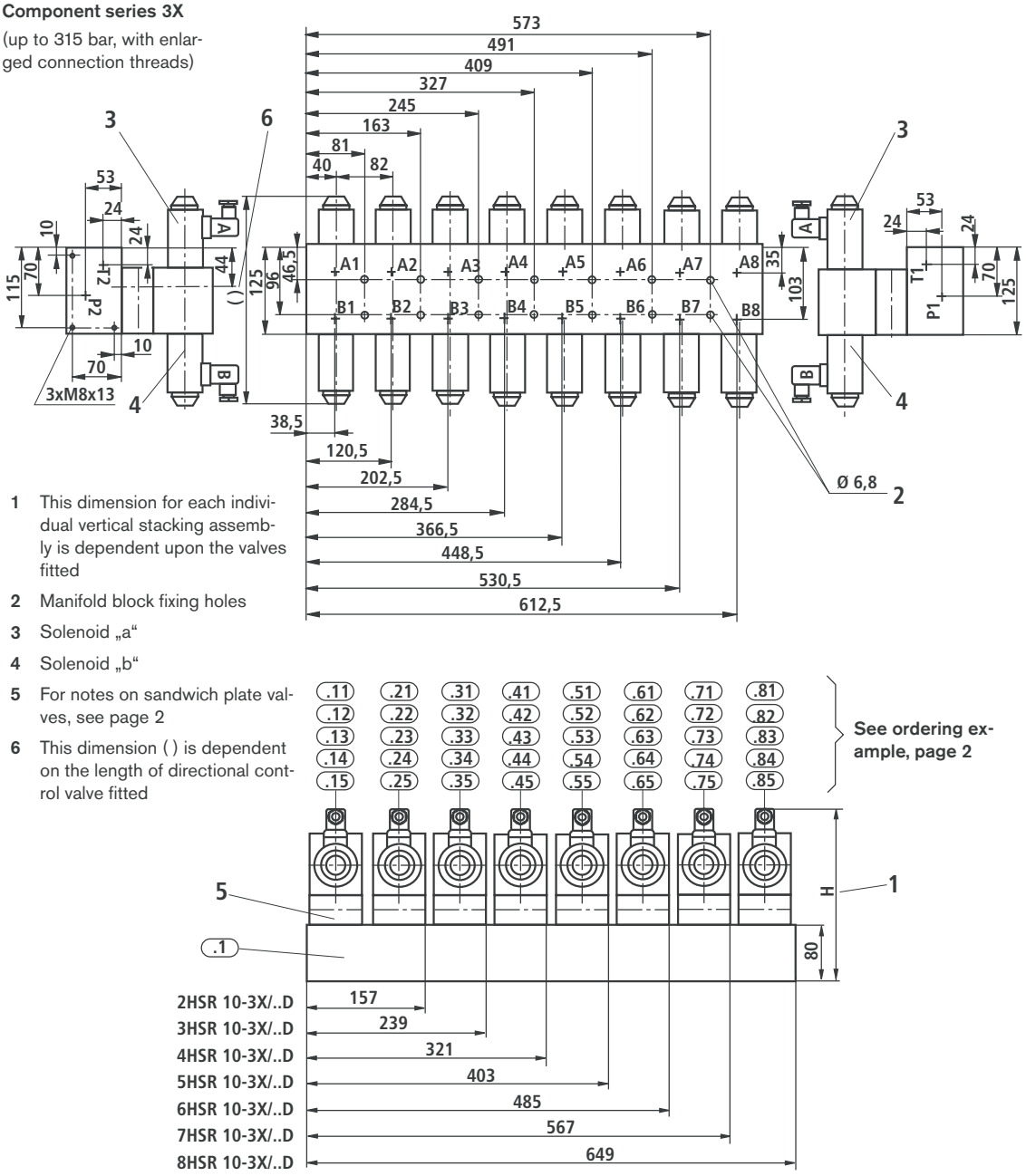



1 This dimension for each individual vertical stacking assembly is dependent upon the valves fitted
2 Manifold block fixing holes
3 Solenoid „a“
4 Solenoid „b“
5 For notes on sandwich plate valves, see page 2
6 This dimension ( ) is dependent on the length of directional control valve fitted (see relevant catalogue sheet)

| Thread type | Pipe threads to ISO 228 part 1 | | Metric ISO threads to DIN 3852 part 1 | | NPT threads | |
|---|---|---|---|---|---|---|
| Port | A1..A8; B1..B8 | P1, P2, T1, T2 | A1..A8; B1..B8 | P1, P2, T1, T2 | A1..A8; B1..B8 | P1, P2, T1, T2 |
| Thread Ø | G 1/2 | G 3/4 | M22 x 1,5 | M27 x 2 | 1/2“ NPT | 3/4“ NPT |
| Thread depth | 14 | 16 | 14 | 16 | 23 | 23 |
| Spot face Ø | 34 | 42 | 34 | 42 | – | – |
| Spot face depth | 1 | 1 | 1 | 1 | – | – |

## **Unit dimensions:** actuator ports on **underside „D“** (dimensions in mm)

**Component series 3X**
(up to 315 bar, with enlarged connection threads)







| Thread type | Pipe threads to ISO 228 part 1 | | Metric ISO threads to DIN 3852 part 1 | | NPT threads | |
|---|---|---|---|---|---|---|
| Port | A1..A8; B1..B8 | P1, P2, T1, T2 | A1..A8; B1..B8 | P1, P2, T1, T2 | A1..A8; B1..B8 | P1, P2, T1, T2 |
| Thread Ø | G 3/4 | G 1 | M27 x 2 | M33 x 2 | 3/4“ NPT | 1“ NPT |
| Thread depth | 16 | 18 | 16 | 18 | 23 | 27 |
| Spot face Ø | 42 | 47 | 42 | 47 | – | – |
| Spot face depth | 1 | 1 | 1 | 1 | – | – |

## Fixing screws and permissible operating pressure in relation to the valves fitted

**Selection table for vertical stacking in conjunction with directional valve WE10** (also see page 8!), Cl = clamping length

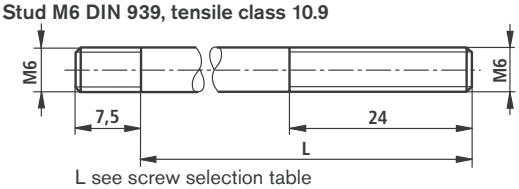
| Pressure reducing valve (Cl = 50 mm) | Pressure relief valve (Cl = 50 mm) | Double check valve (Cl = 50 mm) | Check valve (Cl = 50 mm) | Double throttle check valve (Cl = 50 mm) | Pressure switch with sandwich plate (Cl = 50 mm) | S.H.C.S. DIN 912 Studs DIN 939/RN 115.43 $M_A$ = 14 Nm | | Tensile strength | Material No. | Operating press. $p_{max}$ in bar |
|---|---|---|---|---|---|---|---|---|---|---|
| ZDR 10 D...-5X/... | | | | | | M6 x 90 | DIN 912 | 10.9 | R913000259 | 315 |
| | Z.DB 10 V...-4X/... | | | | | M6 x 90 | DIN 912 | 10.9 | R913000259 | 315 |
| | | Z2S 10 ..-3X/... | | | | M6 x 90 | DIN 912 | 10.9 | R913000259 | 315 |
| | | | Z1S 10 ..-.. /... | | | M6 x 90 | DIN 912 | 10.9 | R913000259 | 315 |
| | | | | Z2FS 10-3X/V | | M6 x 90 | DIN 912 | 10.9 | R913000259 | 315 |
| | | | | | HED 8 OH1X/.. | M6 x 90 | DIN 912 | 10.9 | R913000259 | 315 |
| ZDR 10 D...-5X/... | Z.DB 10 V...-4X/... | | | | | M6 x 140 | DIN 912 | 10.9 | R913000443 | 315 |
| ZDR 10 D...-5X/... | | Z2S 10 ..-3X/... | | | | M6 x 140 | DIN 912 | 10.9 | R913000443 | 315 |
| ZDR 10 D...-5X/... | | | Z1S 10 ..-.. /... | | | M6 x 140 | DIN 912 | 10.9 | R913000443 | 315 |
| ZDR 10 D...-5X/... | | | | Z2FS 10-3X/V | | M6 x 140 | DIN 912 | 10.9 | R913000443 | 315 |
| ZDR 10 D...-5X/... | | | | | HED 8 OH1X/.. | M6 x 140 | DIN 912 | 10.9 | R913000443 | 315 |
| | Z.DB 10 V...-4X/... | Z2S 10 ..-3X/... | | | | M6 x 140 | DIN 912 | 10.9 | R913000443 | 315 |
| | Z.DB 10 V...-4X/... | | Z1S 10 ..-.. /... | | | M6 x 140 | DIN 912 | 10.9 | R913000443 | 315 |
| | Z.DB 10 V...-4X/... | | | Z2FS 10-3X/V | | M6 x 140 | DIN 912 | 10.9 | R913000443 | 315 |
| | Z.DB 10 V...-4X/... | | | | HED 8 OH1X/.. | M6 x 140 | DIN 912 | 10.9 | R913000443 | 315 |
| | | Z2S 10 ..-3X/... | Z1S 10 ..-.. /... | | | M6 x 140 | DIN 912 | 10.9 | R913000443 | 315 |
| | | Z2S 10 ..-3X/... | | Z2FS 10-3X/V | | M6 x 140 | DIN 912 | 10.9 | R913000443 | 315 |
| | | Z2S 10 ..-3X/... | | | HED 8 OH1X/.. | M6 x 140 | DIN 912 | 10.9 | R913000443 | 315 |
| | | | Z1S 10 ..-.. /... | Z2FS 10-3X/V | | M6 x 140 | DIN 912 | 10.9 | R913000443 | 315 |
| | | | Z1S 10 ..-.. /... | | HED 8 OH1X/.. | M6 x 140 | DIN 912 | 10.9 | R913000443 | 315 |
| | | | | Z2FS 10-3X/V | HED 8 OH1X/.. | M6 x 140 | DIN 912 | 10.9 | R913000443 | 315 |
| ZDR 10 D...-5X/... | Z.DB 10 V...-4X/... | Z2S 10 ..-3X/... | | | | M6 x 190 | DIN 939 | 10.9 | R900014968 | 250 |
| ZDR 10 D..-5X/.. | Z.DB 10 V...-4X/... | | Z1S 10 ..-.. /... | | | M6 x 190 | DIN 939 | 10.9 | R900014968 | 250 |
| ZDR 10 D...-5X/... | Z.DB 10 V...-4X/... | | | Z2FS 10-3X/V | | M6 x 190 | DIN 939 | 10.9 | R900014968 | 315 |
| ZDR 10 D...-5X/... | Z.DB 10 V...-4X/... | | | | HED 8 OH1X/.. | M6 x 190 | DIN 939 | 10.9 | R900014968 | 315 |
| ZDR 10 D...-5X/... | | Z2S 10 ..-3X/... | Z1S 10 ..-.. /... | | | M6 x 190 | DIN 939 | 10.9 | R900014968 | 250 |
| ZDR 10 D...-5X/... | | Z2S 10 ..-3X/... | | Z2FS 10-3X/V | | M6 x 190 | DIN 939 | 10.9 | R900014968 | 315 |
| ZDR 10 D...-5X/... | | Z2S 10 ..-3X/... | | | HED 8 OH1X/.. | M6 x 190 | DIN 939 | 10.9 | R900014968 | 315 |
| ZDR 10 D...-5X/... | | | Z1S 10 ..-.. /... | Z2FS 10-3X/V | | M6 x 190 | DIN 939 | 10.9 | R900014968 | 315 |
| ZDR 10 D...-5X/... | | | Z1S 10 ..-.. /... | | HED 8 OH1X/.. | M6 x 190 | DIN 939 | 10.9 | R900014968 | 315 |
| ZDR 10 D...-5X/... | | | | Z2FS 10-3X/V | HED 8 OH1X/.. | M6 x 190 | DIN 939 | 10.9 | R900014968 | 315 |
| | Z.DB 10 V...-4X/... | Z2S 10 ..-3X/... | Z1S 10 ..-.. /... | | | M6 x 190 | DIN 939 | 10.9 | R900014968 | 315 |
| | Z.DB 10 V...-4X/... | Z2S 10 ..-3X/... | | Z2FS 10-3X/V | | M6 x 190 | DIN 939 | 10.9 | R900014968 | 315 |
| | Z.DB 10 V...-4X/... | Z2S 10 ..-3X/... | | | HED 8 OH1X/... | M6 x 190 | DIN 939 | 10.9 | R900014968 | 315 |
| | Z.DB 10 V...-4X/... | | Z1S 10 ..-.. /... | Z2FS 10-3X/V | | M6 x 190 | DIN 939 | 10.9 | R900014968 | 315 |
| | Z.DB 10 V...-4X/... | | Z1S 10 ..-.. /... | | HED 8 OH1X/... | M6 x 190 | DIN 939 | 10.9 | R900014968 | 315 |
| | Z.DB 10 V...-4X/... | | | Z2FS 10-3X/V | HED 8 OH1X/... | M6 x 190 | DIN 939 | 10.9 | R900014968 | 315 |
| | | Z2S 10 ..-3X/... | Z1S 10 ..-.. /... | Z2FS 10-3X/V | | M6 x 190 | DIN 939 | 10.9 | R900014968 | 315 |
| | | Z2S 10 ..-3X/... | Z1S 10 ..-.. /... | | HED 8 OH1X/... | M6 x 190 | DIN 939 | 10.9 | R900014968 | 315 |
| | | | Z1S 10 ..-.. /... | Z2FS 10-3X/V | HED 8 OH1X/... | M6 x 190 | DIN 939 | 10.9 | R900014968 | 315 |
| ZDR 10 D...-5X/... | Z.DB 10 V...-4X/... | Z2S 10 ..-3X/... | Z1S 10 ..-.. /... | | | M6 x 240 | DIN 939 | 10.9 | R900024864 | 210 |
| ZDR 10 D...-5X/... | Z.DB 10 V...-4X/... | Z2S 10 ..-3X/... | | Z2FS 10-3X/V | | M6 x 240 | DIN 939 | 10.9 | R900024864 | 210 |
| ZDR 10 D...-5X/... | Z.DB 10 V...-4X/... | Z2S 10 ..-3X/... | | | HED 8 OH1X/... | M6 x 240 | DIN 939 | 10.9 | R900024864 | 210 |
| | Z.DB 10 V...-4X/... | Z2S 10 ..-3X/... | Z1S 10 ..-.. /... | Z2FS 10-3X/V | | M6 x 240 | DIN 939 | 10.9 | R900024864 | 210 |
| | Z.DB 10 V...-4X/... | Z2S 10 ..-3X/... | Z1S 10 ..-.. /... | | HED 8 OH1X/... | M6 x 240 | DIN 939 | 10.9 | R900024864 | 210 |
| | | Z2S 10 ..-3X/... | Z1S 10 ..-.. /... | Z2FS 10-3X/V | HED 8 OH1X/... | M6 x 240 | DIN 939 | 10.9 | R900024864 | 210 |
| ZDR 10 D...-5X/... | Z.DB 10 V...-4X/... | Z2S 10 ..-3X/... | Z1S 10 ..-.. /... | Z2FS 10-3X/V | | M6 x 295 | DIN 939 | 10.9 | R900012024 | 210 |
| ZDR 10 D...-5X/... | | Z2S 10 ..-3X/... | Z1S 10 ..-.. /... | Z2FS 10-3X/V | HED 8 OH1X/... | M6 x 295 | DIN 939 | 10.9 | R900012024 | 210 |
| ZDR 10 D...-5X/... | Z.DB 10 V...-4X/... | | Z1S 10 ..-.. /... | Z2FS 10-3X/V | HED 8 OH1X/... | M6 x 295 | DIN 939 | 10.9 | R900012024 | 210 |
| ZDR 10 D...-5X/... | Z.DB 10 V...-4X/... | Z2S 10 ..-3X/... | | Z2FS 10-3X/V | HED 8 OH1X/... | M6 x 295 | DIN 939 | 10.9 | R900012024 | 210 |
| ZDR 10 D...-5X/... | Z.DB 10 V...-4X/... | Z2S 10 ..-3X/... | Z1S 10 ..-.. /... | | HED 8 OH1X/... | M6 x 295 | DIN 939 | 10.9 | R900012024 | 210 |
| | Z.DB 10 V...-4X/... | Z2S 10 ..-3X/... | Z1S 10 ..-.. /... | Z2FS 10-3X/V | HED 8 OH1X/... | M6 x 295 | DIN 939 | 10.9 | R900012024 | 210 |
| Direct operated directional valve | | WE 10-3X + manifold block HSR 10 | | | | M6 x 40 | DIN 912 | 10.9 | R913000058 | 315 |
| Pilot operated directional valve | | WEH 10 + manifold block HSR 10 | | | | M6 x 45 | DIN 912 | 10.9 | R913000258 | 315 |
| Direct operated proportional valves | | WRA 10, WRE 10 + manifold block HSR 10 | | | | M6 x 40 | DIN 912 | 10.9 | R913000058 | 315 |
| Pilot operated proportional valves | | WRK 10, WRZ10 + manifold block HSR 10 | | | | M6 x 45 | DIN 912 | 10.9 | R913000258 | 315 |

## **Fixing screws and permissible operating pressure** in relation to the valves fitted

**Notes:**

- The selection screw table shown on page 7 is not valid for directional valves protected against sea water, because these directional valves have different clamping lengths (for dimensions see catalogue sheets – sea water protected directional valves)

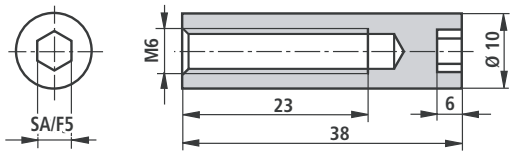
**Stud M6 DIN 939, tensile class 10.9**




L see screw selection table

- Directional valves with central connections „D“, „DL“, „DZ“ and „DZL“ can only be used for S.H.C.S. or studs and nut RN 115.43-C45V, Material No. R900176105.

**Nut M6 RN 115.43-CK45K, Material No. R900176105**




## Engineering guidelines

**Pressure reducing valve combined with a double check valve**

The pressure reducing valve ZDR..DA (pressure reduction in port A) **must** always be fitted between the directional valve and the double check valve Z2S.. . Leak-free closure of the system cannot otherwise be ensured.

**Pressure relief valve combined with a double check valve**

Leak-free closure of the actuator is **not** possible, if a pressure relief valve type ZDB../Z2DB.. effective in port A and/or B is used with a double check valve.

**Note:**

The installation of sandwich plates with 2 pressure switches with manifold blocks with actuator ports on side „C“ is not possible.

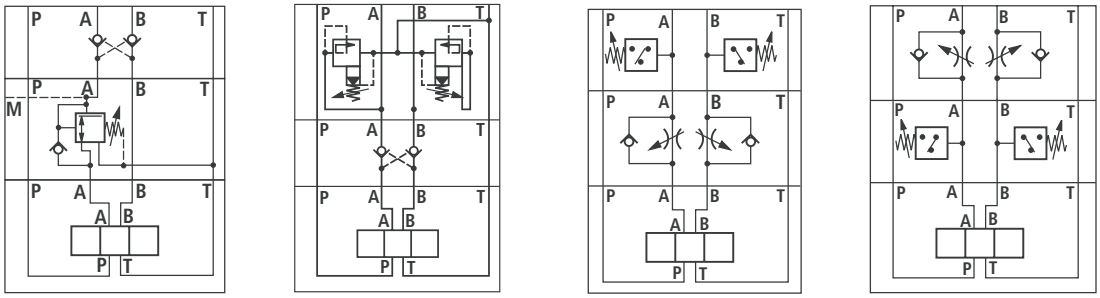
**Pressure switches combined with a double throttle check valve**

**meter-in control**

The pressure switch HED 8 OH, effective inport A and/or B, is fitted between the subplate and the double throttle check valve Z2FS.

**meter-out control**

The pressure switch HED 8 OH, effective in port A and/or B, is fitted between the directional valve and the double throttle check valve Z2FS.

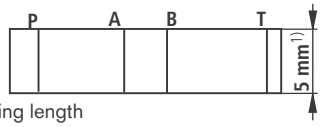



The circuits shown are only examples. These engineering guidelines also apply to valves of similar design and function.

## **Sandwich plate** (with or without separate ports X, Y) **for use with pilot operated directional valves**

**Note:**

When fitting pilot operated valves in conjunction with manifold version „C“ (actuator connections on the side) a sandwich plate is required to seal the X and Y ports, Material No. **R900320784** (NBR) or **R900321346** (FKM)!




1) Plate clamping length

**Note:**

External pilot oil supply is only possible with all variants by using a sandwich plate, Material No. **R900320785** (NBR) or **R900321347** (FKM)!