



**ГИДРООТВЕТ**  
доступная гидравлика

## 2-way high-response flow valve

Type 2WRCE...2X

NG 32~50  
Up to 420 bar  
Up to 4000 L/min



### Contents

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### Features

- Pilot operated 2-way high-response valve in block installation design
- Suitable for closed-loop controlling of position, pressure, force and velocity
- Pilot control valve (pilot):
  - Directly actuated controlled directional valve, with control spool and sleeve in servo quality
- Main stage: closed-loop position controlled
- Integrated open and closed-loop control electronics (OBE)
- Typical applications:
  - Plastic injection machines
  - Die-casting machines
  - Ceramics machines

Ordering code

| 2  | WRCE      |  | S |  |  | 2X / P- | G24 | K31 / |  | / | Q | * |
|--|-----------|--|---|--|--|---------|-----|-------|--|---|---|---|
| 2/2 directional valve  | = 2       |  |   |  |  |         |     |       |  |   |   |   |
| Electrically operated high-response valve for block installation with integrated electronics (OBE) | = WRCE    |  |   |  |  |         |     |       |  |   |   |   |
| Size 32  | = 32      |  |   |  |  |         |     |       |  |   |   |   |
| Size 40  | = 40      |  |   |  |  |         |     |       |  |   |   |   |
| Size 50  | = 50      |  |   |  |  |         |     |       |  |   |   |   |
| Seat piston  | = S       |  |   |  |  |         |     |       |  |   |   |   |
| Rated flow in l/min at 5 bar valve pressure drop   |           |  |   |  |  |         |     |       |  |   |   |   |
| Size 32: 800 l/min linear only ...S800L...   | = 800     |  |   |  |  |         |     |       |  |   |   |   |
| 600 l/min with fine control range only ...S600R...   | = 600     |  |   |  |  |         |     |       |  |   |   |   |
| Size 40: 1200 l/min linear only ...S1200L...   | = 1200    |  |   |  |  |         |     |       |  |   |   |   |
| 850 l/min with fine control range only ...S850R...   | = 850     |  |   |  |  |         |     |       |  |   |   |   |
| Size 50: 2000 l/min linear only ...S2000L...   | = 2000    |  |   |  |  |         |     |       |  |   |   |   |
| 1400 l/min with fine control range only ...S1400R...   | = 1400    |  |   |  |  |         |     |       |  |   |   |   |
| Characteristic curve form  |           |  |   |  |  |         |     |       |  |   |   |   |
| Linear   | = L       |  |   |  |  |         |     |       |  |   |   |   |
| Series 20 to 29  | = 2X      |  |   |  |  |         |     |       |  |   |   |   |
| (20 to 29: Unchanged installation and connection dimensions)                                       |           |  |   |  |  |         |     |       |  |   |   |   |
| Pilot control valve (pilot)  |           |  |   |  |  |         |     |       |  |   |   |   |
| Servo performance proportional valve   | = P       |  |   |  |  |         |     |       |  |   |   |   |
| Supply voltage 24 VDC  | = G24     |  |   |  |  |         |     |       |  |   |   |   |
| Electrical connection  |           |  |   |  |  |         |     |       |  |   |   |   |
| Without mating connector with connector according to DIN EN 175201-804                             | = K31     |  |   |  |  |         |     |       |  |   |   |   |
| With mating connector with connector according to DIN EN 175201-804                                | = Z31     |  |   |  |  |         |     |       |  |   |   |   |
| Electronics interfaces   |           |  |   |  |  |         |     |       |  |   |   |   |
| Command value 0...+10 V, actual value +0.5...+10 V   | = A1      |  |   |  |  |         |     |       |  |   |   |   |
| Command value 4...20 mA  | = F1      |  |   |  |  |         |     |       |  |   |   |   |
| Seal material  |           |  |   |  |  |         |     |       |  |   |   |   |
| FKM seals  | = V       |  |   |  |  |         |     |       |  |   |   |   |
| NBR seals  | = No code |  |   |  |  |         |     |       |  |   |   |   |
| When applying pilot pressure, 2WRCE closes actively  | = No code |  |   |  |  |         |     |       |  |   |   |   |
| When applying pilot pressure, 2WRCE opens actively   | = L       |  |   |  |  |         |     |       |  |   |   |   |
| Without band enable  | = No code |  |   |  |  |         |     |       |  |   |   |   |
| Band enable  | = Q       |  |   |  |  |         |     |       |  |   |   |   |

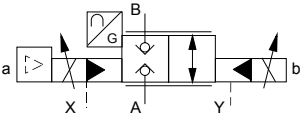
Symbols:

2WRCE

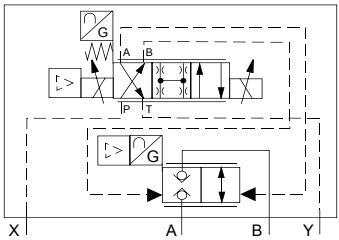
Simplified:

Detailed:

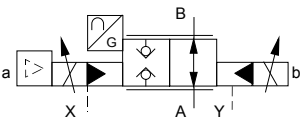
2WRCE...2X/P...



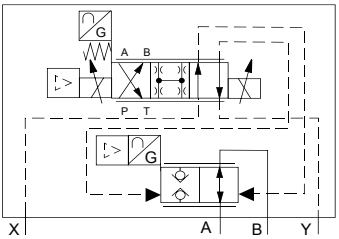
2WRCE...2X/P...



2WRCE...2X/P...L...



2WRCE...2X/P...L...



## Function and configuration

**2WRCE**

Valves of type 2WRCE...-2X/P... are 2-stage high-response valves.

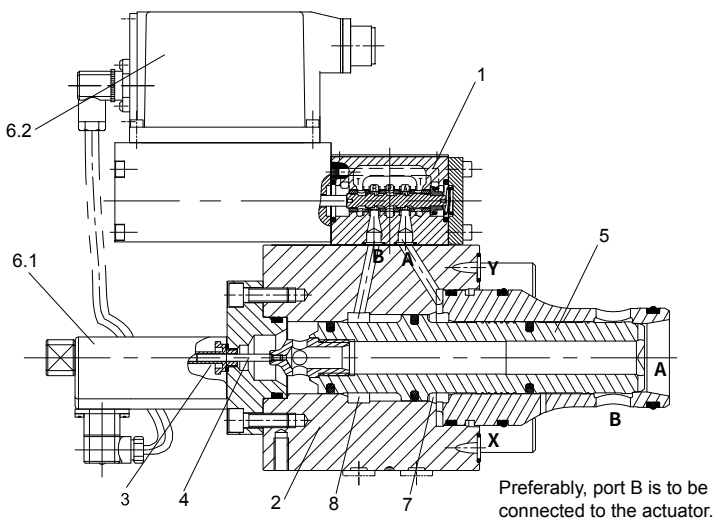
They control the quantity and direction of a flow and are mainly used in control loops.

**Set-up:**

They consist of the following assemblies:

- The pilot control valve (1) as 1-stage proportional valve (pilot), with a solenoid as electro-mechanical converters and a piston that is connected to the integrated pilot electronics via electrical feedback (6.2).
- The second stage (2) for flow control.
- An inductive position transducer (3) the core (4) of which is attached to the piston (5) of the second stage.
- Integrated LVDT electronics(6.1).

## Type 2WRCE40...-2X/P...



## Function

The integrated electronics (OBE) compares command and actual values and the solenoids of the pilot control valve are actuated with a proportional current according to the control deviation.

The pilot control valve takes a proportionally controlled position and controls the flow in and out of the control chambers A (7) and B (8) that actuate the main spool (5) through the closed valve control loop up to 0 control deviation.

This means that the stroke of the main spool is regulated proportionally to the command value. It must be noted that the flow also depends on the valve pressure drop.

## Technical data

## Type 2WRCE

| General  |  |                                   |                              |      |      |
|--|--|-----------------------------------|------------------------------|------|------|
| Sizes  |  |                                   | 32                           | 40   | 50   |
| Weight   | kg   |                                   | 11.2                         | 17.3 | 24.6 |
| Weight with shut-off valve ...../...WK or .../...WL...   | kg   |                                   | 12.5                         | 18.6 | 25.9 |
| Size of the pilot control valve (pilot)  | Size   |                                   | 6                            | 6    | 6    |
| Installation position  |  | Any, preferably horizontal        |                              |      |      |
| Storage temperature range  | °C   | -20 to +80                        |                              |      |      |
| Ambient temperature range  | °C   | -20 to +50                        |                              |      |      |
| Hydraulic (measured with HLP32, $\vartheta_{oil}=40^{\circ}\text{C} \pm 5^{\circ}\text{C}$ )                   |  |                                   |                              |      |      |
| Maximum operating pressures  | - Main stage ports A, B  | bar                               | 350 for NG32-40,420 for NG50 |      |      |
|  | - Pilot control valve port X                                   | bar                               | 315                          |      |      |
|  | - Pilot control valve port Y                                   | bar                               | 210                          |      |      |
| Rated flow at $\Delta p = 5$ bar   | - Design ...S...L (linear)                                     | L/min                             | 800                          | 1200 | 2000 |
|  | - Design ...S...R (linear with progressive fine control range) |                                   | 600                          | 850  | 1400 |
| Nominal flow of pilot valve at $\Delta p=70$ bar   | L/min  |                                   | 12                           | 40   | 40   |
| Leakage of pilot valve at P = 100 bar  | L/min  |                                   | 0.3                          | 0.7  | 0.7  |
| Hydraulic fluid  |  | Mineral oil (HL,HLP) to DIN 51524 |                              |      |      |
| Hydraulic fluid temperature range  | °C   | -20 to +80; preferably +40 to +50 |                              |      |      |
| Viscosity range  | mm <sup>2</sup> /s   | 20 to 380; preferably 30 to 45    |                              |      |      |
| Maximum admissible degree of contamination of the hydraulic fluid, cleanliness class according to ISO 4406 (c) |  | Class 20/18/15                    |                              |      |      |
| Hysteresis   | %  | ≤ 0.2                             |                              |      |      |
| Range of inversion   | %  | ≤ 0.1                             |                              |      |      |
| Response sensitivity   | %  | ≤ 0.1                             |                              |      |      |
| Response time 0 ~ 100% step signal   | ms   | ≤ 20                              |                              |      |      |

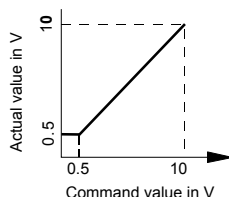
| Electric   |                               |   |            |            |            |
|--|-------------------------------|---|------------|------------|------------|
| Voltage type                                       |                               | Direct voltage                                |            |            |            |
| Type of signal                                     |                               | Analog  |            |            |            |
| Opening point calibration                          |                               | %   | $\leq 1$   |            |            |
| Zero shift upon change of:                         | - Hydraulic fluid temperature | %/10 K  | $\leq 0.3$ | $\leq 0.3$ | $\leq 0.3$ |
|  | - Pilot pressure in X         | %/100 bar                                     | $\leq 0.7$ | $\leq 0.7$ | $\leq 0.7$ |
|  | - Return flow pressure in Y   | %/bar   | $\leq 0.3$ | $\leq 0.3$ | $\leq 0.3$ |
| Protection class of the valve according to EN60529 |                               | IP65 with mating connector mounted and locked |            |            |            |

Nominal command value range for 2WRC:

0 to +10 V  $\triangleq$  0 to 100%

In the command value range of 0 to 0.5 V, the actual value remains constant at 0.5 V.

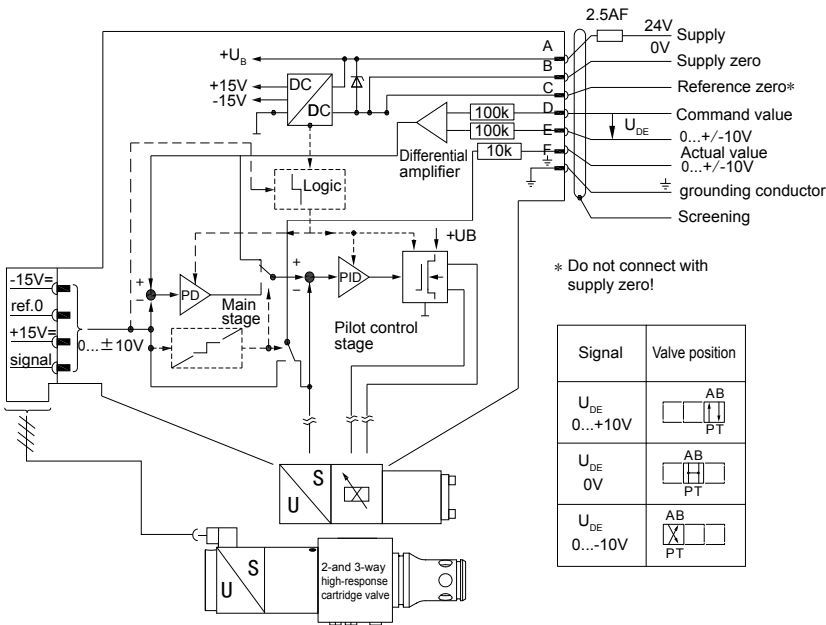
In case of a slow command value modification from 0.5 V to +10 V, the actual value follows the command value within  $\pm 0.15$  V.



# Integrated electronics

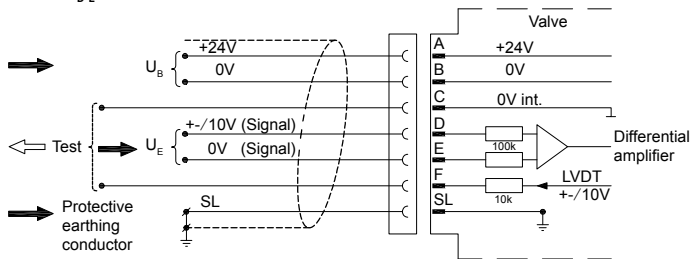
## Block diagram/Pinout

Version A1:  $U_{D-E}$  0...±10V



## Pin assignment 6P+PE

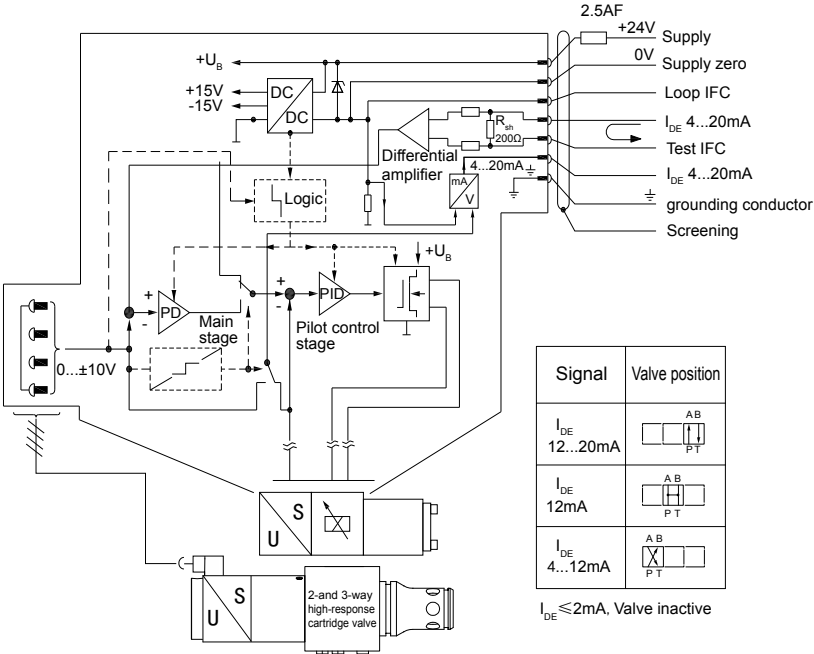
Version A1:  $U_{D-E}$  0...±10V



Integrated electronics

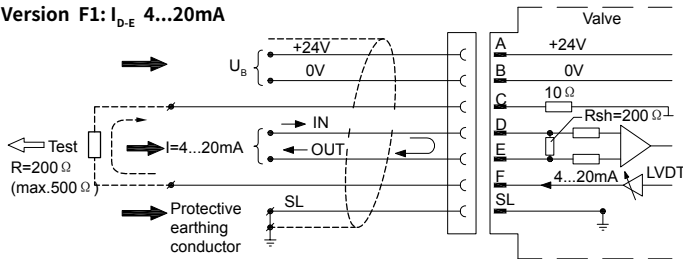
Block diagram / Pinout

Version F1:  $I_{D-E}$  4...20mA



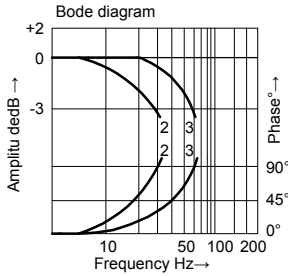
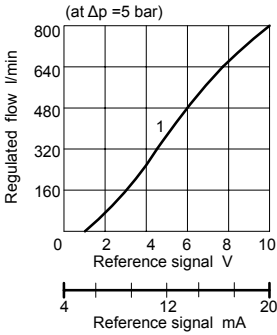
Pin assignment 6P+PE

Version F1:  $I_{D-E}$  4...20mA



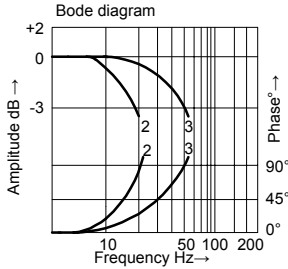
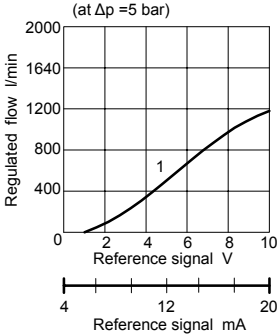
**Characteristic curves** (measured with HLP46,  $\theta_{oil}=50^{\circ}\text{C}$ ,  $P=100\text{bar}$ )

**Type: 2WRCE32S800L-2X/P...**



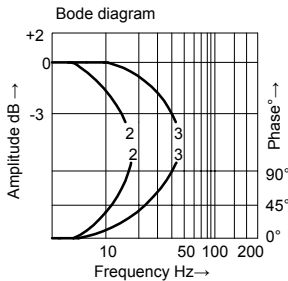
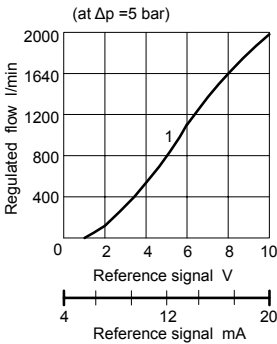
- 1= Ratedflow line
- 2= Command value:  
10% ↔ 90%
- 3= Command value:  
50% ± 5%

**Type: 2WRCE40S1200L-2X/P...**



- 1= Ratedflow line
- 2= Command value:  
10% ↔ 90%
- 3= Command value:  
50% ± 5%

**Type: 2WRCE50S2000L-2X/P...**



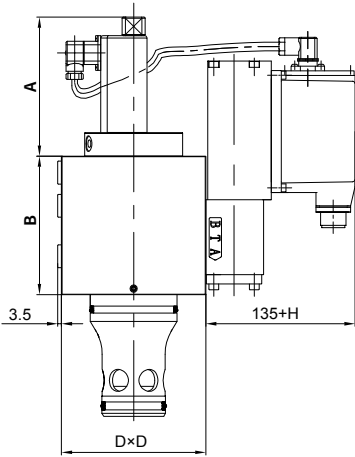
- 1= Ratedflow line
- 2= Command value:  
10% ↔ 90%
- 3= Command value:  
50% ± 5%



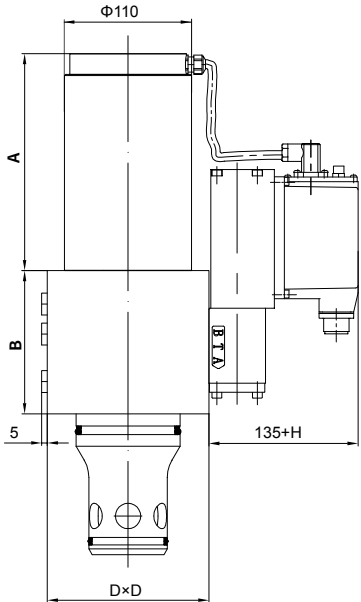
Unit dimensions: Types 2WRCE

(nominal dimensions in mm)

Size 32/40



Size 50

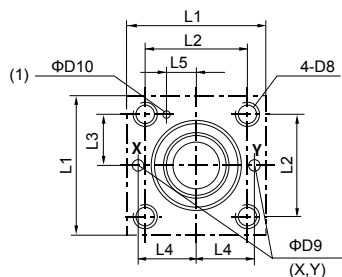


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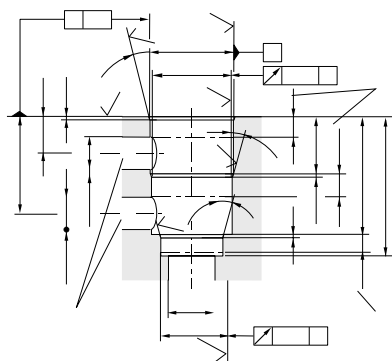
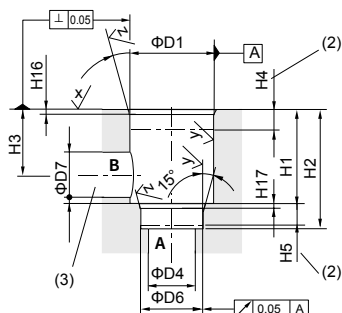
| Size | A   | B   | C   | H only for 2WRCE... WK15...<br>2WRCE... WL15... | Fastening bolts<br>class 12.9 | Tightening<br>torque |
|------|-----|-----|-----|---|-------------------------------|----------------------|
| 32   | 135 | 105 | 100 | 50  | 4- M16×60                     | 300 Nm               |
| 40   | 148 | 120 | 125 | 50  | 4- M20×70                     | 600 Nm               |
| 50   | 188 | 124 | 140 | 50  | 4- M20×80                     | 600 Nm               |

### Installation dimensions according to DIN ISO 7368

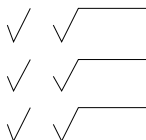
(dimensions in mm)



### Installation bore type 2WRCE



|                          |      |      |     |
|--------------------------|------|------|-----|
| Size                     | 32   | 40   | 50  |
| L1                       | 105  | 125  | 140 |
| L2 $\pm 0.2$             | 70   | 85   | 100 |
| L3 $\pm 0.2$             | 35   | 42.5 | 50  |
| L4 $\pm 0.2$             | 41   | 50   | 58  |
| L5                       | 17   | 23   | 30  |
| $\Phi D1^{H7}$           | 60   | 75   | 90  |
| $\Phi D2^{H7}$           | 58   | 73   | 87  |
| $\Phi D3^{H7}$           | 55   | 55   | 68  |
| $\Phi D4$                | 32   | 40   | 50  |
| $\Phi D5$                | 24   | 30   | 35  |
| $\Phi D6^{H7}$           | 45   | 55   | 68  |
| $\Phi D7$                | 32   | 40   | 50  |
| D8                       | M16  | M20  | M20 |
| max. $\Phi D9$           | 8    | 10   | 10  |
| $\Phi D10$               | 6    | 6    | 8   |
| H1 <sup>+0.2<br/>0</sup> | 70   | 87   | 100 |
| H2 <sup>+0.2<br/>0</sup> | 85   | 105  | 122 |
| H3                       | 52   | 64   | 72  |
| H4                       | 30   | 30   | 35  |
| H5                       | 13   | 15   | 17  |
| H7                       | 43.5 | 54   | 87  |
| H8                       | 85   | 105  | 143 |
| H9                       | 100  | 125  | 165 |
| H10                      | 30   | 36   | 66  |
| H11                      | 70.5 | 87   | 122 |
| H12                      | 18   | 21   | 48  |
| H13                      | 15   | 18   | 18  |
| H16                      | 2.5  | 3    | 4   |
| H17                      | 2.5  | 3    | 3   |
| H18                      | 35   | 45   | 45  |



- (1) Locating hole for locking pin
  - (2) Depth of fit minimum dimension
  - (3) The ports P, T and B can be positioned around the central axis of port A.
- Sufficient distance from the mounting bores and control bores is to be observed.