4/2 and 4/3 proportional directional valves direct operated, with electrical position feedback, without/with integrated electronics (OBE)

Types 4WRE and 4WREE

Nominal sizes 6 and 10
Component series 2X
Maximum operating pressure 315 bar
Maximum flow: 80 l/min (NS6)
180 l/min (NS10)

Overview of contents

<table>
<thead>
<tr>
<th>Contents</th>
<th>Page</th>
</tr>
</thead>
<tbody>
<tr>
<td>Features</td>
<td>1</td>
</tr>
<tr>
<td>Ordering details</td>
<td>2</td>
</tr>
<tr>
<td>Symbols</td>
<td>3</td>
</tr>
<tr>
<td>Function, section</td>
<td>4</td>
</tr>
<tr>
<td>Technical data</td>
<td>5, 6</td>
</tr>
<tr>
<td>Control electronics</td>
<td>6</td>
</tr>
<tr>
<td>Electrical connections, plug-in connectors</td>
<td>7, 8</td>
</tr>
<tr>
<td>Integrated electronics (OBE) for type 4WREE</td>
<td>8, 9</td>
</tr>
<tr>
<td>Characteristic curves</td>
<td>10...15</td>
</tr>
<tr>
<td>Unit dimensions</td>
<td>16...19</td>
</tr>
</tbody>
</table>

Features

- Direct operated proportional directional valve with electrical position feedback and integrated electronics (OBE) for type 4WREE
- Closed loop control of the direction and size of a flow
- Operation is by proportional solenoids with a central thread and removable coil
- For subplate mounting: Porting pattern to ISO 4401
  Subplates to catalogue sheets RE 45052 (NS6) or RE 45054 (NS10), separate order, see pages 16 ...19
- Spring centred control spool
- Control electronics
  • 4WREE
    - integrated electronics (OBE) with voltage input or current input (A1 resp. F1)
  • 4WRE (4/3 version), separate order:
    - digital or analogue amplifier in Eurocard format
    - analogue module amplifier
  • 4WRE…A (4/2 version), separate order:
    - analogue module amplifier

For information regarding the available spare parts see:
www.boschrexroth.com/spc
Ordering details

<table>
<thead>
<tr>
<th>4WRE</th>
<th>-2X/G24</th>
<th>V</th>
</tr>
</thead>
</table>

Without integrated electronics (OBE) = No code
With integrated electronics (OBE) = E

Nominal size 6 = 6
Nominal size 10 = 10

Seal material
V = FKM seals, suitable for mineral oil (HL, HLP) to DIN 51524

Electronic interfaces A1 or F1
For 4WREE
A1 = Command value input ± 10 VDC
F1 = Command value input 4 to 20 mA
No code = For 4WRE

Electrical connections
For 4WRE:
K4 = Without plug-in connector, with component plug to DIN EN 175301-803
Plug-in connector (solenoid, position transducer). separate order, see page 7

For 4WREE:
K31 = Without plug-in connector, with component plug to DIN EN 175201-804
Plug-in connector – separate order, see page 8

G24 = Power supply voltage 24 VDC

Nominal flow at a valve pressure differential \( \Delta p = 10 \) bar

<table>
<thead>
<tr>
<th>NS6</th>
<th>NS10</th>
</tr>
</thead>
<tbody>
<tr>
<td>8 l/min</td>
<td>25 l/min</td>
</tr>
<tr>
<td>16 l/min</td>
<td>25 l/min</td>
</tr>
<tr>
<td>32 l/min</td>
<td>50 l/min</td>
</tr>
</tbody>
</table>

With symbols E1 and W1:
P → A: \( q_{V_{\text{max}}} \)
P → B: \( q_{V}/2 \)
A → T: \( q_{V_{\text{max}}} \)

Note:
For spools W and WA there is, in the neutral position, a connection between A to T and B to T with approx. 3 % of the relevant nominal cross-section.
Symbols

Proportional directional valves without integrated electronics
Type 4WRE...

Proportional directional valves with integrated electronics
Type 4WREE...

Type 4WRE...A...

Type 4WREE...A...
Function, section

The 4/2 and 4/3 proportional directional valves are direct operated components of subplate mounting design. They are operated by proportional solenoids with central thread and removeable coil. The solenoids are optionally controlled by either external electronics (type 4WRE) or by the integrated electronics (type 4WREE).

Design:

The valve basically consists of:

- Housing (1) with mounting face
- Control spool (2) with compression springs (3 and 4) and spring plates (X1 and X2)
- Solenoids (5 and 6) and pole tubes (P1 and P2) with central thread
- Position transducer (7)
- Optional integrated control electronics (8)
- The mechanical zero point adjustment (9) is accessible via the Pg13.5 and the electrical zero point is accessible via the Pg7 (10) (type 4WREE)

Function:

- With the solenoids (5 and 6), de-energised, the control spool (2) is held in the central position by the compression springs (3 and 4) between the spring plates (X1 and X2)
- Direct operation of the control spool (2) by energising one of the proportional solenoids, e.g. control of solenoid "b" (6)
  → Movement of the control spool (2) to the left in proportion to the electrical input signal
  → Connection from P to A and B to T via orifice-like cross-sections with progressive flow characteristics
- De-energising of solenoids (6)
  → The control spool (2) is returned to the central position via the compression spring (3)

In the de-energised condition the spool (2) is held in a mechanical centre position by the solenoid return springs. This, for the spool symbol "V", does not relate to the hydraulic centre position! When the electrical valve closed loop control circuit is closed then the spool is positioned in the hydraulic centre position.

Valve with 2 switching positions: (type 4WRE...A...)

The function of this valve version is basically the same as that of the valve with 3 switched positions. The 2 switched position valves are however only fitted with solenoid "a" (5). A plug (11) is fitted in place on the 2nd proportional solenoid.

Note for type 4WRE 6...-2X/...

Draining of the tank line is to be prevented. Taking the installation conditions into account a back pressure is to be fitted (back pressure approx. 2 bar).
Technical data (for applications outside these parameters, please consult us!)

### General

<table>
<thead>
<tr>
<th>Nominal size</th>
<th>NS</th>
<th>6</th>
<th>10</th>
</tr>
</thead>
<tbody>
<tr>
<td>Installation</td>
<td>optional, preferably horizontal</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Storage temperature range</td>
<td>°C</td>
<td>–20 to +80</td>
<td></td>
</tr>
<tr>
<td>Ambient</td>
<td>4WRE</td>
<td>°C</td>
<td>–20 to +70</td>
</tr>
<tr>
<td>temperature range</td>
<td>4WREE</td>
<td>°C</td>
<td>–20 to +50</td>
</tr>
<tr>
<td>Weight</td>
<td>4WRE</td>
<td>kg</td>
<td>2.2</td>
</tr>
<tr>
<td></td>
<td>4WREE</td>
<td>kg</td>
<td>2.4</td>
</tr>
</tbody>
</table>

### Hydraulic (measured with HLP46, $\theta_{oil} = 40 \ ^\circ C \pm 5 \ ^\circ C$ and $p =100$ bar)

| Max. operating pressure | Ports A, B, P | bar | 315 |
| Port T | bar | 210 |
| Nominal flow $q_{VNom}$ at $\Delta p = 10$ bar | l/min | 8, 16, 32 | 25, 50, 75 |
| Max. permissible flow | l/min | 80 | 180 |
| Pressure fluid | Mineral oil (HL, HLP) to DIN 51524 other pressure fluids on request! |
| Pressure fluid temperature range | °C | –20 to +80 (preferably +40 to +50) |
| Viscosity range | mm²/s | 20 to 380 (preferably 30 to 46) |
| Max. permissible degree of pressure fluid contamination. | class 20/18/15 ¹) |
| Cleanliness class to ISO 4406 (c) | |
| Hysteresis | % | ≤ 0.1 |
| Reversal span | % | ≤ 0.05 |
| Response sensitivity | % | ≤ 0.05 |
| Zero point displacement with changes to the | %/10 K | 0.15 |
| pressure fluid temperature and operating temperature | %/100 bar | 0.1 |

¹) The cleanliness class stated for the components must be adhered too in hydraulic systems. Effective filtration prevents faults from occurring and at the same time increases the component service life.

For the selection of filters see catalogue sheets RE 50070, RE 50076, RE 50081, RE 50086 and RE 50088.
**Technical data** (for applications outside these parameters, please consult us!)

<table>
<thead>
<tr>
<th><strong>Electrical</strong></th>
<th></th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>Nominal size</td>
<td>NS</td>
<td>6</td>
</tr>
<tr>
<td>Voltage type</td>
<td>DC</td>
<td></td>
</tr>
<tr>
<td>Command value signal</td>
<td>Voltage input „A1“</td>
<td>V</td>
</tr>
<tr>
<td>for 4WREE</td>
<td>Current input „F1“</td>
<td>mA</td>
</tr>
<tr>
<td>Solenoid coil resistance</td>
<td>Cold value at 20 °C</td>
<td>Ω</td>
</tr>
<tr>
<td></td>
<td>Max. warm value</td>
<td>Ω</td>
</tr>
<tr>
<td>Duty</td>
<td>%</td>
<td>100</td>
</tr>
<tr>
<td>Max. coil temperature</td>
<td>°C</td>
<td>150</td>
</tr>
<tr>
<td>Electrical connections 4WRE</td>
<td>with component plug DIN EN 175301-803 and ISO 4400</td>
<td></td>
</tr>
<tr>
<td>see pages 7 and 8</td>
<td>plug-in connector to DIN EN 175301-803 and ISO 4400 2)</td>
<td></td>
</tr>
<tr>
<td>4WREE</td>
<td>with component plug DIN EN 175201-804</td>
<td></td>
</tr>
<tr>
<td></td>
<td>plug-in connector DIN EN 175201-804 2)</td>
<td></td>
</tr>
<tr>
<td>Valve protection to EN 60529</td>
<td>IP65 with mounted and fixed plug-in connector</td>
<td></td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th><strong>Control electronics</strong></th>
<th></th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>For 4WRE 4/3 version</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Amplifier in Eurocard format 2)</td>
<td>digital</td>
<td>VT-VRPD-2-2X/V0/0 to RE 30126</td>
</tr>
<tr>
<td>Modular amplifier 2)</td>
<td>analogue</td>
<td>VT-VRPA2-1-1X/V0 to RE 30119</td>
</tr>
<tr>
<td></td>
<td>analogue</td>
<td>VT-VRPA2-2-1X/V0 to RE 30119</td>
</tr>
<tr>
<td>For 4WRE…A… 4/2 version</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Modular amplifier 2)</td>
<td>analogue</td>
<td>VT-MRPA1-1 to RE 30219</td>
</tr>
<tr>
<td></td>
<td>analogue</td>
<td>VT-MRPA1-2 to RE 30219</td>
</tr>
<tr>
<td>For 4WREE</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Analogue command value module</td>
<td></td>
<td>VT-SWMA-1-1X/… to RE 29902</td>
</tr>
<tr>
<td>Analogue command value module</td>
<td></td>
<td>VT-SWMKA-1-1X/… to RE 29903</td>
</tr>
<tr>
<td>Analogue command value card</td>
<td></td>
<td>VT-SWKA-1-1X/… to RE 30255</td>
</tr>
<tr>
<td>Digital command value card</td>
<td></td>
<td>VT-HACD-1-1X/… to RE 30143</td>
</tr>
<tr>
<td>Supply voltage</td>
<td>Nominal voltage</td>
<td>VDC</td>
</tr>
<tr>
<td></td>
<td>Lower limiting value</td>
<td>V</td>
</tr>
<tr>
<td></td>
<td>Upper limiting value</td>
<td>V</td>
</tr>
<tr>
<td>Amplifier power consumption</td>
<td>$I_{\text{max}}$</td>
<td>A</td>
</tr>
<tr>
<td></td>
<td>Impulse current</td>
<td>A</td>
</tr>
</tbody>
</table>

1) Due to the occurring surface temperature of the solenoid coils, the European Standards EN 563 and EN 982 are to be taken into account!

2) Separate order

**Note:** For details regarding the environmental simulation test covering EMC (electromagnetic compatibility), climate and mechanical loading see RE 29061-U (declaration regarding environmental compatibility).
Electrical connections, plug-in connectors (nominal dimensions in mm)

For type 4WRE (without integrated electronics)

Connections on the component plug

Connections on the plug-in connector

Plug-in connector CECC 75 301-803-A002FA-H3D08-G to DIN EN 175301-803 and ISO 4400
Solenoid a, colour grey
Separate order under Material No. R901017010
Solenoid b, colour black
Separate order under Material No. R901017011

1 fixing screw M3
Tightening torque $M_A = 0.5$ Nm

Inductive position transducer

Coil connections

Connection to the plug connector

Plug-in connector 4-pin Pg7-G4W1F
Separate order under Material No. R900023126
Connection cable:
Recommended: Up to 50 m cable length type LiYCY 4 x 0.25 mm²
Only connect screen to PE on the supply side.
Integrated electronics (OBE) for type 4WREE (nominal dimensions in mm)

For type 4WREE (with integrated electronics (OBE))

Plug-in connector to DIN EN 175201-804
Separate order under Material No. R900021267 (plastic version)
Angled form – separate order under Material No. R9000217845
Fo pin allocation also see block circuit diagram, page 9

Plug-in connector to DIN EN 175201-804
Separate order under Material No. R900223890 (metal version)

Component plug allocation

<table>
<thead>
<tr>
<th>Contact</th>
<th>Interface A1 signal</th>
<th>Interface F1 signal</th>
</tr>
</thead>
<tbody>
<tr>
<td>Supply voltage</td>
<td>A 24 VDC ( u(t) = 19.4 ) to ( 35 ) V; ( I_{\text{max}} = 2 ) A</td>
<td></td>
</tr>
<tr>
<td>Reference potential actual value</td>
<td>B 0 V</td>
<td></td>
</tr>
<tr>
<td>Differential amplifier input</td>
<td>C ref. contact F; ( R_e &gt; 50 ) k( \Omega )</td>
<td></td>
</tr>
<tr>
<td></td>
<td>D ( \pm 10 ) V command value; ( R_e &gt; 50 ) k( \Omega )</td>
<td></td>
</tr>
<tr>
<td></td>
<td>E reference potential command value</td>
<td></td>
</tr>
<tr>
<td>Measurement output (actual value)</td>
<td>F ( \pm 10 ) V actual value</td>
<td></td>
</tr>
<tr>
<td></td>
<td>(limiting load ( 5 ) mA)</td>
<td></td>
</tr>
<tr>
<td></td>
<td>PE connected with cooling body and valve housing</td>
<td></td>
</tr>
</tbody>
</table>

Command value: A positive command value \( 0 \) to \( +10 \) V (or \( 12 \) to \( 20 \) mA) at D and the reference potential at E results in a flow from P to A and B to T.
A negative command value \( 0 \) to \( -10 \) V (or \( 12 \) to \( 4 \) mA) at D and the reference potential at E results in a flow from P to B and A to T.

For a valve with 1 solenoid on side a (e.g. spool variants EA and WA) a positive command value \( 0 \) to \( +10 \) V (or \( 4 \) to \( 20 \) mA) at D and the reference potential at E results in a flow from P to B and A to T.

Actual value: Actual value \( 0 \) to \( +10 \) V resp. \( 12 \) to \( 20 \) mA at F and the reference potential at C results in flow from P to A and B to T, \( 0 \) to \( -10 \) V resp. \( 4 \) to \( 12 \) mA results in flow from P to B and A to T.
For a valve with 1 solenoid results \( 4 \) to \( 20 \) mA at F and the reference potential at C results in flow from P to A and B to T.

Connection cable: Recommended: – up to \( 25 \) m cable length type LiYCY \( 7 \times 0.75 \) mm\(^2\)
– up to \( 50 \) m cable length type LiYCY \( 7 \times 1.0 \) mm\(^2\)
For outside diameter see plug-in connector sketch
Only connect screen to PE on the supply line.
Integrated electronics (OBE) for type 4WREE

Block circuit diagram / connection allocation

<table>
<thead>
<tr>
<th>Interface</th>
<th>Integrated electronics (OBE)</th>
<th>Valve</th>
</tr>
</thead>
<tbody>
<tr>
<td>Command value</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Ref. potential</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Actual value</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Ref. potential</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Supply 24 V</td>
<td></td>
<td></td>
</tr>
<tr>
<td>voltage GND</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Protective conductor</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

Differential amplifier
Ref. potential
Actual value
Under voltage recognition
Power supply
Differential amplifier
Ref. potential
Actual value
Under voltage recognition

Controller
Interlock
Oscillator
Demodulator
Sensitivity
Zero point
Position transducer

Note: Electrical signals processed by control electronics (e.g. actual value) must not be used for switching off safety relevant machine functions!
(Also see the European Standard "Safety requirements of fluid power systems and components – hydraulics", EN 982!)

1) The protective conductor (PE) is connected to the cooling body and the valve housing!
2) The ramp is externally adjustable from 0 to 2.5 s; the same applies for \( T_{up} \) and \( T_{down} \)
3) Zero point is externally adjustable

Note: Electrical signals processed by control electronics (e.g. actual value) must not be used for switching off safety relevant machine functions!
(Also see the European Standard "Safety requirements of fluid power systems and components – hydraulics", EN 982!)

1) The protective conductor (PE) is connected to the cooling body and the valve housing!
2) The ramp is externally adjustable from 0 to 2.5 s; the same applies for \( T_{up} \) and \( T_{down} \)
3) Zero point is externally adjustable
Characteristic curves for type 4WREE (measured with HLP46, $T_{oil} = 40 \degree C \pm 5 \degree C$)  

**Pressure-signal-characteristic curves** ($V_{spool}$), $p_s = 100$ bar

**NS6**

![Graph NS6](image1)

**NS10**

![Graph NS10](image2)

**Leakage flow** with the spool in the central position

**Type 4WREE 6 V32**

![Graph Type 4WREE 6 V32](image3)

**Type 4WREE 10 V75**

![Graph Type 4WREE 10 V75](image4)
Characterisitic curves for type 4WREE (measured with HLP46, \(\theta_{\text{oil}} = 40 ^\circ C \pm 5 ^\circ C\) and \(p = 100\) bar) NS6

8 l/min nominal flow at a 10 bar valve pressure differential

1. \(\Delta p = 10\) bar constant
2. \(\Delta p = 20\) bar constant
3. \(\Delta p = 30\) bar constant
4. \(\Delta p = 50\) bar constant
5. \(\Delta p = 100\) bar constant

16 l/min nominal flow at a 10 bar valve pressure differential

1. \(\Delta p = 10\) bar constant
2. \(\Delta p = 20\) bar constant
3. \(\Delta p = 30\) bar constant
4. \(\Delta p = 50\) bar constant
5. \(\Delta p = 100\) bar constant

32 l/min nominal flow at a 10 bar valve pressure differential

1. \(\Delta p = 10\) bar constant
2. \(\Delta p = 20\) bar constant
3. \(\Delta p = 30\) bar constant
4. \(\Delta p = 50\) bar constant
5. \(\Delta p = 100\) bar constant

Max. permissible flow

Note:
Take the performance limits on page 15 into account!

\(\Delta p\) = Valve pressure differential (inlet pressure \(p_i\) minus load pressure \(p_L\) minus return pressure \(p_T\))
Characteristic curves for type 4WREE (measured with HLP46, $\dot{v}_{\text{oil}} = 40 ^\circ C \pm 5 ^\circ C$ and $\rho = 100$ bar) NS10

1. $\Delta p = 10$ bar constant
2. $\Delta p = 20$ bar constant
3. $\Delta p = 30$ bar constant
4. $\Delta p = 50$ bar constant
5. $\Delta p = 100$ bar constant

Max. permissible flow

Note:
Take the performance limits on page 15 into account!

$\Delta p =$ Valve pressure differential (inlet pressure $\rho_p$ minus load pressure $\rho_L$ minus return pressure $\rho_r$)
Transient function with a stepped form of electrical input signal for type 4WREE NS6
(measured with HLP46, \( \vartheta_{\text{oil}} = 40 ^\circ \text{C} \pm 5 ^\circ \text{C} \) and \( p_s = 10 \text{ bar} \))

4/3 valve version
Spool symbol „E“

Frequency response characteristic curves for type 4WREE NS6
(measured with HLP46, \( \vartheta_{\text{oil}} = 40 ^\circ \text{C} \pm 5 ^\circ \text{C} \) and \( p_s = 10 \text{ bar} \))

4/3 valve version
Spool symbol „V“
Transient function with a stepped form of electrical input signal for type 4WREE (measured with HLP46, $\vartheta_{\text{oil}} = 40 ^\circ\text{C} \pm 5 ^\circ\text{C}$ and $p_s = 10$ bar)

4/3 valve version
Spool symbol „E”

Frequency response characteristic curves for type 4WREE (measured with HLP46, $\vartheta_{\text{oil}} = 40 ^\circ\text{C} \pm 5 ^\circ\text{C}$, $p_s = 10$ bar)

4/3 valve version
Spool symbol „V”
Flow for type 4WREE (measured with HLP46, $\theta_{\text{oil}} = 40^\circ \text{C} \pm 5^\circ \text{C}$)

Load function with maximum valve opening
Nominal flows 8, 16 and 32 l/min
Spool symbol „V“

Take the maximum permissible flow of 80 l/min into account!

Flow for type 4WREE (measured with HLP46, $\theta_{\text{oil}} = 40^\circ \text{C} \pm 5^\circ \text{C}$)

Load function with maximum valve opening
Nominal flows 25, 50 and 75 l/min
Spool symbol „V“

Take the maximum permissible flow of 180 l/min into account!
Unit dimensions: type 4WRE 6 (nominal dimensions in mm)

1. Valve housing
2. Proportional solenoid "a" with inductive position transducer
3. Proportional solenoid "b"
4. Plug-in connector "A", colour grey, separate order – see page 7
5. Plug-in connector "B", colour black, separate order – see page 7
6. Plug-in connector for inductive position transducer, separate order – see page 7
7. Plug for valves with one solenoid (2 switching positions, versions EA or WA)
8. Identical seal rings for ports A, B, P and T
9. Space required to remove the plug-in connector
10. Name plate
11. Machined valve mounting surface, connection location to ISO 4401 (with locating pin hole)

Subplates to catalogue sheet RE 45052 and valve fixing screws must be ordered separately.

Subplates:
- G341/01 (G1/4)
- G342/01 (G3/8)
- G502/01 (G1/2)

Valve fixing screws (separate order)
The following valve fixing screws are recommended:

- 4 S.H.C.S. ISO 4762 - M5 x 50 - 10.9 flZn-240h-L
  Friction value \( \mu_{\text{total}} = 0.09 \) to 0.14
  Tightening torque \( M_A = 7 \text{Nm} \pm 10\%
  Material No. R913000064 (separate order)
  or
- 4 S.H.C.S. ISO 4762 - M5 x 50 - 10.9
  Friction value \( \mu_{\text{total}} = 0.12 \) to 0.17
  Tightening torque \( M_A = 8.9 \text{Nm} \pm 10\% 

Tolerances to:
- General tolerances ISO 2768-mK

Required surface finish of the valve mounting surface

0.01/100mm
Rzmax 4

(123) to ISO 5783

- without locating pin hole “G”
- ports P, A, B and T mit Ø6 mm

Deviation from the standard:

- Code: 4401-03-02-0-94 (explanation to ISO 5783)
Unit dimensions: type 4WREE 6 (nominal dimensions in mm)

1. Valve housing
2. Proportional solenoid "a" with inductive position transducer
3. Proportional solenoid "b"
4. Plug for valves with one solenoid (2 switching positions, versions EA or WA)
5. Identical seal rings for ports A, B, P and T
6. Name plate
7. Machined valve mounting surface, connection location to ISO 4401 (with locating pin hole)
   Code: 4401-03-02-0-94 (explanation to ISO 5783)
   Deviation from the standard:
   - without locating pin hole "G"
   - ports P, A, B and T mit Ø8 mm
8. Integrated electronics (OBE)
9. Plug-in connector, separate order – see page 8

Subplates to catalogue sheet RE 45052 and valve fixing screws must be ordered separately.

Subplates:
- G341/01 (G1/4)
- G342/01 (G3/8)
- G502/01 (G1/2)

Valve fixing screws (separate order)
The following valve fixing screws are recommended:
- 4 S.H.C.S. ISO 4762 - M5 x 50 - 10.9-fizn-240h-L
  (friction value $\mu_{\text{total}} = 0.09$ to 0.14)
  Tightening torque $M_A = 7 \text{ Nm} \pm 10\%$
  Material No. R913000064 (separate order)
or
- 4 S.H.C.S. ISO 4762 - M5 x 50 - 10.9
  (friction value $\mu_{\text{total}} = 0.12$ to 0.17)
  Tightening torque $M_A = 8.9 \text{ Nm} \pm 10\%$
Unit dimensions: type 4WRE 10 (nominal dimensions in mm)

1. Valve housing
2. Proportional solenoid "a" with inductive position transducer
3. Proportional solenoid "b"
4. Plug-in connector "A", colour grey, separate order – see page 7
5. Plug-in connector "B", colour black, separate order – see page 7
6. Plug-in connector for position transducer, separate order – see page 7
7. Plug for valves with one solenoid (2 switching positions, versions EA or WA)
8. Identical seal rings for ports A, B, P, T and T1
9. Space required to remove the plug-in connector
10. Name plate
11. Machined valve mounting surface, connection location to ISO 4401 (with locating pin hole)

Subplates to catalogue sheet RE 45054 and valve fixing screws must be ordered separately.

Subplates:
- G66/01 (G3/8)
- G67/01 (G1/2)
- G534/01 (G3/4)

Valve fixing screws (separate order)
The following valve fixing screws are recommended:
- 4 S.C.H.S. ISO 4762 - M6 x 40 - 10.9-f1Zn-240h-L (friction value $\mu_{\text{total}} = 0.09$ to 0.14)
  Tightening torque $M_a = 12.5 \text{ Nm} \pm 10\%$, Material No. R913000058 (separate order)
or
- 4 S.C.H.S. ISO 4762 - M6 x 40 - 10.9 (friction value $\mu_{\text{total}} = 0.12$ to 0.17)
  Tightening torque $M_a = 15.5 \text{ Nm} \pm 10\%$

Required surface finish of the valve mounting surface

Tolerances to: - General tolerances ISO 2768-mK

Code: 4401-05-04-0-94 (explanation to ISO 5783)

Deviation from the standard: Port T1 Ø11.2 mm

The following dimensions are in mm:
- 184.5
- 269.5
- 365
- 70
- 113.5
Unit dimensions: type 4WREE 10 (nominal dimensions in mm)

Subplates to catalogue sheet RE 45054 and valve fixing screws must be ordered separately.

**Subplates:**
- G66/01 (G3/8)
- G67/01 (G1/2)
- G534/01 (G3/4)

**Valve fixing screws** (separate order)
The following valve fixing screws are recommended:
- 4 S.C.H.S. ISO 4762 - M6 x 40 - 10.9-flZn-240h-L
  (friction value \( \mu_{\text{total}} = 0.09 \) to 0.14)
  Tightening torque \( M_n = 12.5 \) Nm ± 10%,
  Material No. R913000058 (separate order)
or
- 4 S.C.H.S. ISO 4762 - M6 x 40 - 10.9
  (friction value \( \mu_{\text{total}} = 0.12 \) to 0.17)
  Tightening torque \( M_n = 15.5 \) Nm ± 10%

**Tolerances to:**
- General tolerances ISO 2768-mK

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1. Valve housing
2. Proportional solenoid "a" with inductive position transducer
3. Proportional solenoid "b"
4. Plug for valves with one solenoid (2 switching positions, versions EA or WA)
5. Identical seal rings for ports A, B, P, T and T1
6. Name plate
7. Machined valve mounting surface, connection location to ISO 4401 (with locating pin hole)
   Code: 4401-05-04-0-94 (explanation to ISO 5783)
   Deviation from the standard: Port T1 Ø11.2 mm
8. Integrated electronics (OBE)
9. Plug-in connector, separate order – see page 8
10. Subplates to catalogue sheet RE 45054 and valve fixing screws must be ordered separately.

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**Required surface finish of the valve mounting surface:**
- \( R_{z \text{max}} 4 \)
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