

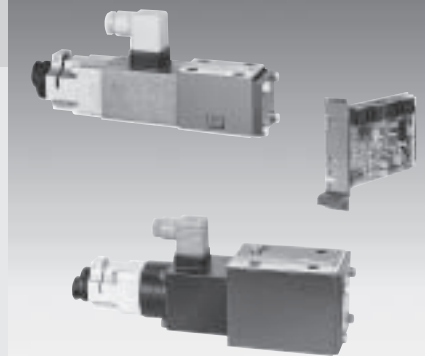
4/2 servo solenoid valves with positive overlap and position feedback (Lvdt AC/AC)

RE 29020/08.05
Replaces: 01.05

1/14

Type 4WRP..EA..

Size 6, 10
Unit series 1X
Maximum working pressure of P, A, B 315 bar, T 250 bar
Nominal flow rate 8...28 l/min (NG6), 16...63 l/min (NG10)



List of contents

| Contents | Page |
|--------------------------------------|-----------|
| Features | 1 |
| Ordering data | 2 |
| Preferred types | 2 |
| Function, sectional diagram, symbols | 3 and 4 |
| Technical data | 5 and 6 |
| External trigger electronics | 7 and 8 |
| Characteristic curves | 9 to 11 |
| Unit dimensions | 12 and 13 |

Features

- Directly operated NG6 and NG10 valves with positive overlap and external valve electronics
- Actuated on one side, symbol E
- Control solenoid with position feedback (Lvdt AC/AC)
- Suitable for use in electrohydraulic controls in production plants
- For subplate attachment, mounting hole configuration NG6 to ISO 4401-03-02-0-94 and NG10 with additional "L" port to ISO 4401-05-06-0-94
- External trigger electronics (order separately), see catalog section RE 30052 and RE 30054
- Subplates as per catalog section, NG6 RE 45053, NG10 RE 45055 (order separately)
- Solenoid and position transducer plug-in connectors included in scope of delivery

Variants on request

- For standard applications
- Special symbols and characteristic curves

Ordering data

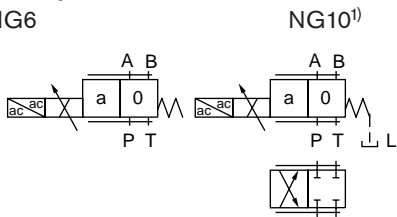
4WRP **E** **A** **S**-1X/G24 **Z4**/M *

For external trigger electronics = no code

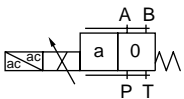
Size 6 = 6
Size 10 = 10

Symbols

4/2-way version
NG6



Side of inductive position transducer



(Standard) = A

1) Type 4WRP10
Mounting hole configuration with additional "L" port

Further information in plain text

M = NBR seals, suitable for mineral oils (HL, HLP) to DIN 51524

Electrical connection with plug to DIN 43560-AM2 with line socket, line socket included in scope of delivery

Voltage supply of trigger electronics +24 V DC

G24 =

1X = Unit series (installation and connection dimensions unchanged)

Flow characteristic Progressive

S =

Nominal flow rate at 10 bar valve pressure difference (5 bar per metering notch)

| Size 6 | Size 10 |
|---------------|---------------|
| 08 = 8 l/min | 16 = 16 l/min |
| 16 = 16 l/min | 32 = 32 l/min |
| 28 = 28 l/min | 63 = 63 l/min |

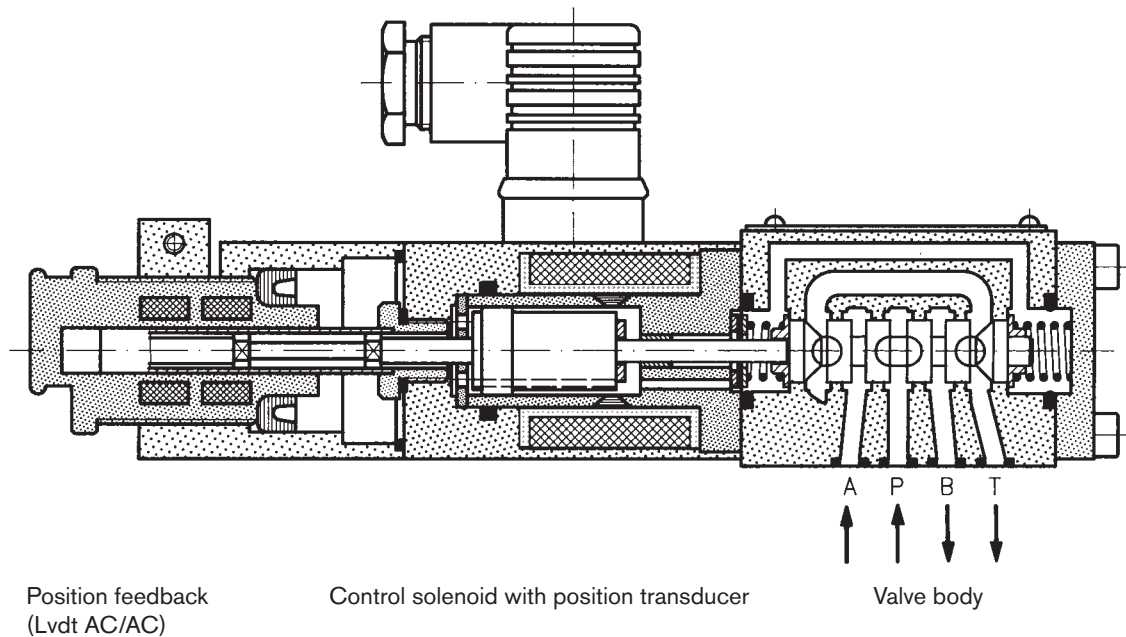
Preferred types

| Type 4WRP6 | Material No. | Typ 4WRP10 | Material No. |
|----------------------------|---------------|-----------------------|---------------|
| 4WRP6EA08S-1X/G24Z/M755 *) | 0 811 403 100 | 4WRP10EA16S-1X/G24Z/M | 0 811 403 003 |
| 4WRP6EA16S-1X/G24Z/M755 *) | 0 811 403 101 | 4WRP10EA32S-1X/G24Z/M | 0 811 403 002 |
| 4WRP6EA28S-1X/G24Z/M | 0 811 403 126 | 4WRP10EA63S-1X/G24Z/M | 0 811 403 001 |

*) Progressive characteristic curve, with triangular notch (standard = semicircular notch)

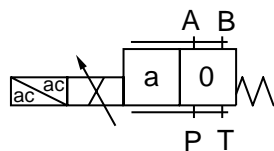
Function, sectional diagram

Type 4WRP6E..

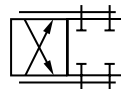


Symbols




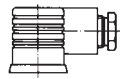
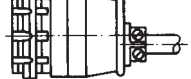
Position transducer: A-side



..E..



Accessories

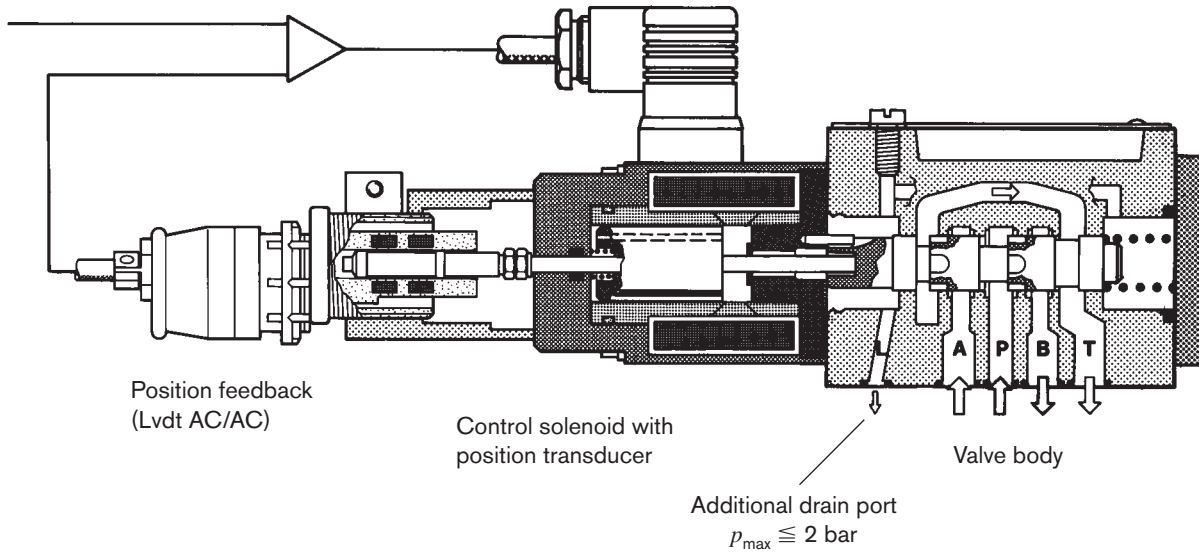
| | | |
|---|---|---------------|
| (4x)  ISO 4762-M5x30-10.9 | Fastening bolts | 2 910 151 166 |
|   | VT-VRPA1-527-10/V0/QV, see RE 30052 | 0 811 405 098 |
| | VT-VRPA1-527-10/V0/QV-RTP, see RE 30054 | 0 811 405 103 |
| | VT-VRPA1-527-10/V0/QV-RTS, see RE 30056 | 0 811 405 177 |
|   | Plug-in connector 2P+PE (M16x1.5) and 3P (Pg7) included in scope of delivery, see also RE 08008 | |

Testing and service equipment

- Test box type VT-PE-TB1, see RE 30063
- Test adapter type VT-PA-3, see RE 30070

Function, sectional diagram

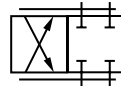
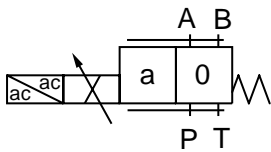
Type 4WRP10E..



Symbols

Position transducer: A-side

..E..



Accessories

| | | |
|---------------------------|---|---------------|
| (4x) ISO 4762-M6x35-10.9 | Fastening bolts | 2 910 151 207 |
| | VT-VRPA1-537-10/V0/QV, see RE 30052 | 0 811 405 099 |
| | VT-VRPA1-537-10/V0/QV-RTP, see RE 30054 | 0 811 405 104 |
| | VT-VRPA1-537-10/V0/QV-RTS, see RE 30056 | 0 811 405 178 |
| 2P+PE 3P | Plug-in connector 2P+PE (M16x1.5) and 3P (Pg7) included in scope of delivery, see also RE 08008 | |

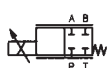
Testing and service equipment

- Test box type VT-PE-TB1, see RE 30063
- Test adapter type VT-PA-3, see RE 30070

Technical data (type 4WRP6EA..)

| General | |
|--------------------------------------|---|
| Construction | Spool type valve |
| Actuation | Proportional solenoid with position control, external amplifier |
| Connection type | Subplate, mounting hole configuration NG6 (ISO 4401-03-02-0-94) |
| Mounting position | Optional |
| Ambient temperature range | °C -20...+50 |
| Weight | kg 2.2 |
| Vibration resistance, test condition | Max. 25 g, shaken in 3 dimensions (24 h) |

Hydraulic (measured with HLP 46, $\vartheta_{oil} = 40^\circ\text{C} \pm 5^\circ\text{C}$)

| | | | |
|---|---|---|----------|
| Pressure fluid | Hydraulic oil to DIN 51524...535, other fluids after prior consultation | | |
| Viscosity range | recommended | mm ² /s | 20...100 |
| | max. permitted | mm ² /s | 10...800 |
| Pressure fluid temperature range | °C | -20...+80 | |
| Maximum permissible degree of contamination of pressure fluid Purity class to ISO 4406 (c) | Class 18/16/13 ¹⁾ | | |
| Direction of flow | See symbol | | |
| Nominal flow at $\Delta p = 5 \text{ bar per notch } ^{2)}$ | l/min | 8 | 16 |
| Max. working pressure | bar | Port P, A, B: 315 | |
| Max. pressure | bar | Port T: 250 | |
| Leakage per metering edge ($\Delta p = 100 \text{ bar}$) | $I_m = 0$ |  $\leq 80 \text{ cm}^3/\text{min}$ | |

Electrical

| | | |
|---|---|-----|
| Cyclic duration factor | % | 100 |
| Power supply | 24 V _{nom} (external amplifier) | |
| Degree of protection | IP 65 to DIN 40050 and IEC 14434/5 | |
| Solenoid connection | Unit plug DIN 43650/ISO 4400, M16x1.5 (2P+PE) | |
| Position transducer connection | Unit plug Pg7 (4P) | |
| Max. solenoid current | A | 2.7 |
| Coil resistance R_{20} | Ω | 3 |
| Max. power consumption at 100% load and operating temperature | VA | 40 |

Static/Dynamic³⁾

| | | |
|---------------------------------------|--------------------|-----------------|
| Hysteresis | % | ≤ 0.3 |
| Range of inversion | % | ≤ 0.2 |
| Manufacturing tolerance for Q_{max} | % | ≈ 10 |
| Response time | 100% signal change | ms ≈ 12 |
| | 10% signal change | ms ≈ 7 |

¹⁾ The purity classes stated for the components must be complied with in hydraulic systems. Effective filtration prevents problems and also extends the service life of components. For a selection of filters, see catalog sections RE 50070, RE 50076 and RE 50081.

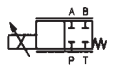
²⁾ Flow rate at a different Δp $q_x = q_{nom} \cdot \sqrt{\frac{\Delta p_x}{5}}$

³⁾ All specifications achieved in conjunction with proportional amplifier: 0 811 405 098

Technical data (type 4WRP10EA..)

| General | |
|--------------------------------------|--|
| Construction | Spool type valve |
| Actuation | Proportional solenoid with position control, external amplifier |
| Connection type | Subplate, mounting hole configuration NG10 (ISO 4401-05-06-0-94) |
| Mounting position | Optional |
| Ambient temperature range | °C -20...+50 |
| Weight | kg 7.0 |
| Vibration resistance, test condition | Max. 25 g, shaken in 3 dimensions (24 h) |

Hydraulic (measured with HLP 46, $\vartheta_{oil} = 40^\circ\text{C} \pm 5^\circ\text{C}$)

| | | | |
|---|---|---|----------|
| Pressure fluid | Hydraulic oil to DIN 51524...535, other fluids after prior consultation | | |
| Viscosity range | recommended | mm ² /s | 20...100 |
| | max. permitted | mm ² /s | 10...800 |
| Pressure fluid temperature range | °C | -20...+80 | |
| Maximum permissible degree of contamination of pressure fluid Purity class to ISO 4406 (c) | Class 18/16/13 ¹⁾ | | |
| Direction of flow | See symbol | | |
| Nominal flow at $\Delta p = 5$ bar per notch ²⁾ | l/min | 16 | 32 |
| Max. working pressure | bar | Port P, A, B: 315 | |
| | bar | Port T: 250 | |
| Max. pressure | bar | Port L: 2 | |
| | bar | | |
| Leakage per metering edge ($\Delta p = 100$ bar) | $I_m = 0$ |  $\leq 80 \text{ cm}^3/\text{min}$ | |

Electrical

| | | |
|---|---|-----|
| Cyclic duration factor | % | 100 |
| Power supply | 24 V _{nom} (external amplifier) | |
| Degree of protection | IP 65 to DIN 40050 and IEC 14434/5 | |
| Solenoid connection | Unit plug DIN 43650/ISO 4400, M16x1.5 (2P+PE) | |
| Position transducer connection | Unit plug Pg7 (4P) | |
| Max. solenoid current | A | 3.7 |
| Coil resistance R_{20} | Ω | 2.5 |
| Max. power consumption at 100% load and operating temperature | VA | 60 |

Static/Dynamic³⁾

| | | |
|---------------------------------------|--------------------|-----------------|
| Hysteresis | % | ≤ 0.3 |
| Range of inversion | % | ≤ 0.2 |
| Manufacturing tolerance for Q_{max} | % | ≈ 10 |
| Response time | 100% signal change | ms ≈ 25 |
| | 10% signal change | ms ≈ 15 |

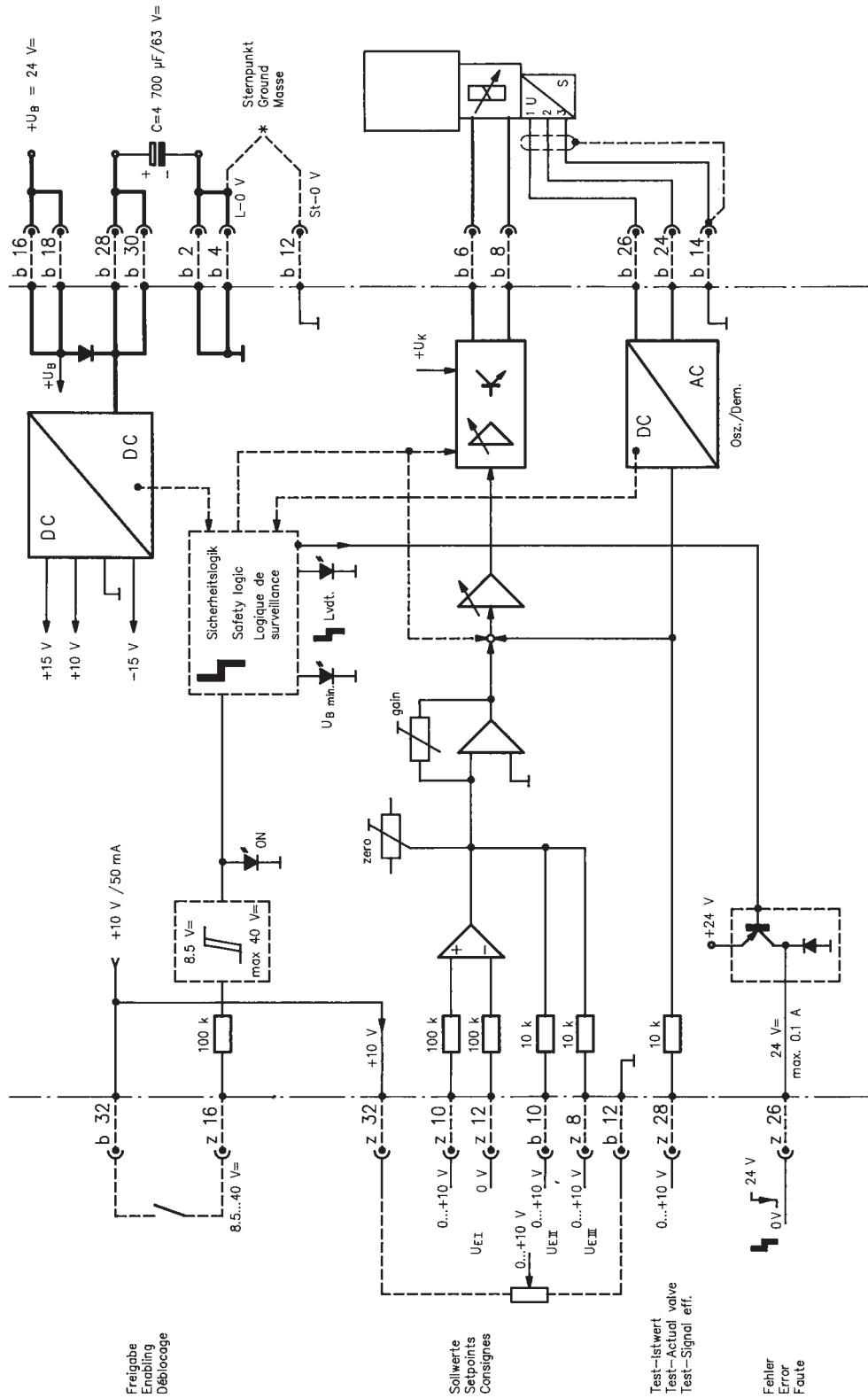
¹⁾ The purity classes stated for the components must be complied with in hydraulic systems. Effective filtration prevents problems and also extends the service life of components. For a selection of filters, see catalog sections RE 50070, RE 50076 and RE 50081.

²⁾ Flow rate at a different Δp $q_x = q_{nom} \cdot \sqrt{\frac{\Delta p_x}{5}}$

³⁾ All specifications achieved in conjunction with proportional amplifier: 0 811 405 099

Valve with external trigger electronics (standard without ramps, RE 30052)

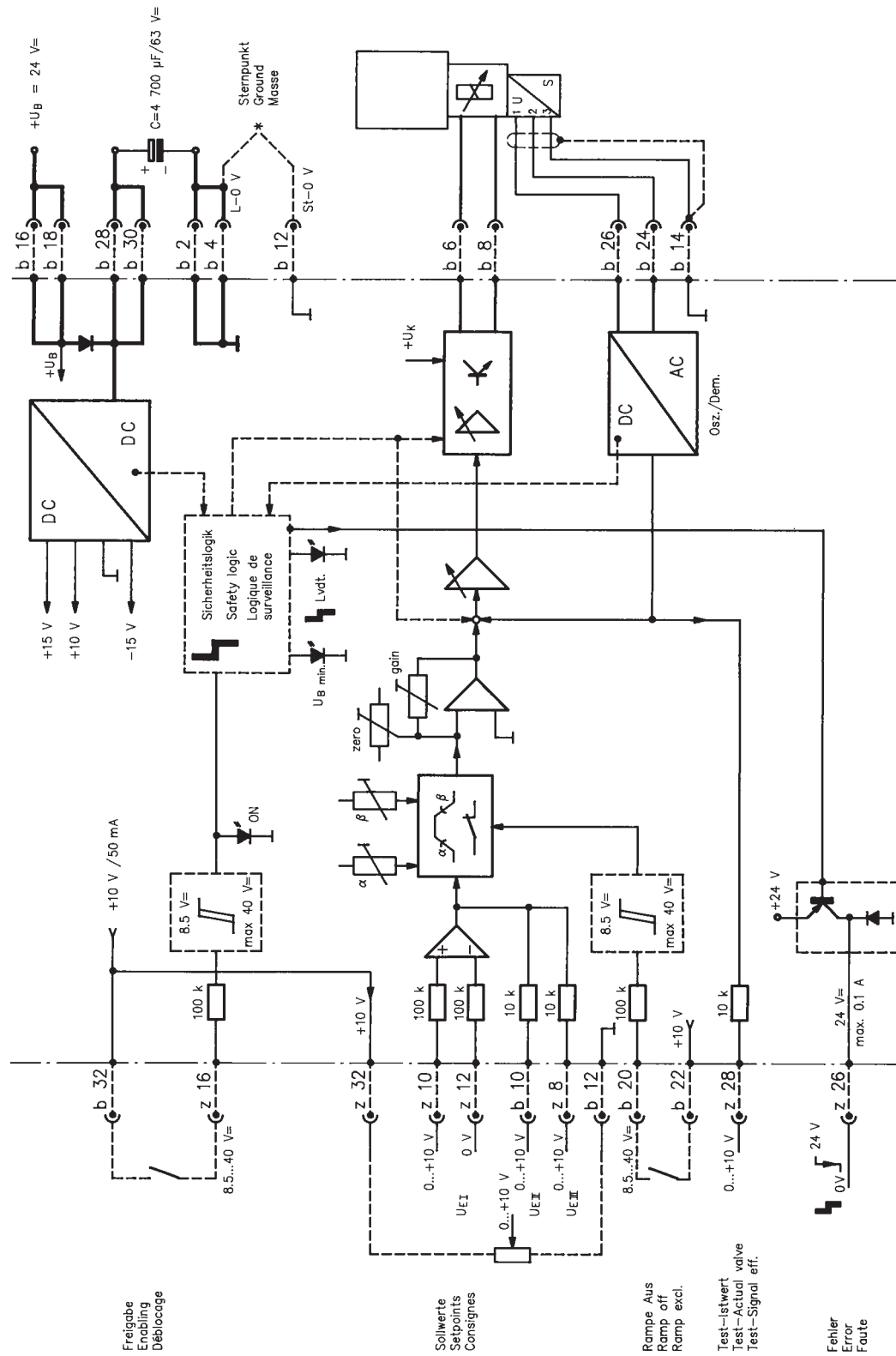
Circuit diagram/pin assignment



Versions of trigger electronics:
 - With ramps, see page 8
 and RE 30054

Valve with external trigger electronics (with ramps, RE 30054)

Circuit diagram/pin assignment

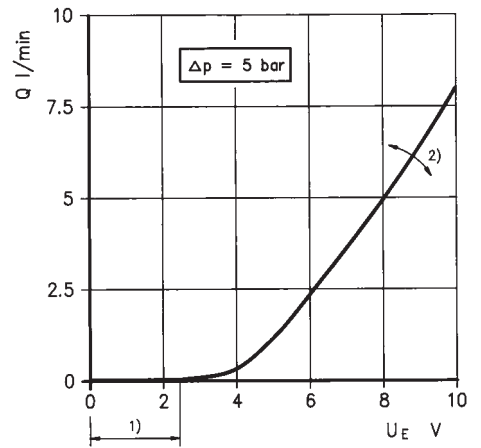
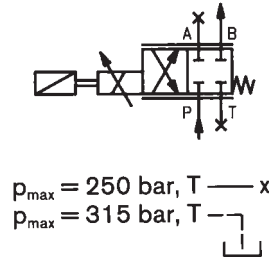


Versions of trigger electronics:
 - With ramps, see page 7
 and RE 30052

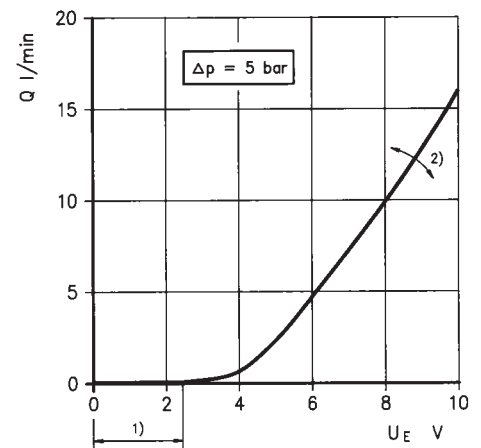
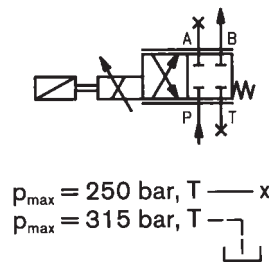
Characteristic curves type 4WRP6E.. (measured with HLP 46, $\vartheta_{oil} = 40^\circ\text{C} \pm 5^\circ\text{C}$)

Flow rate/Signal function (at $\Delta p = 5 \text{ bar}$ per notch)

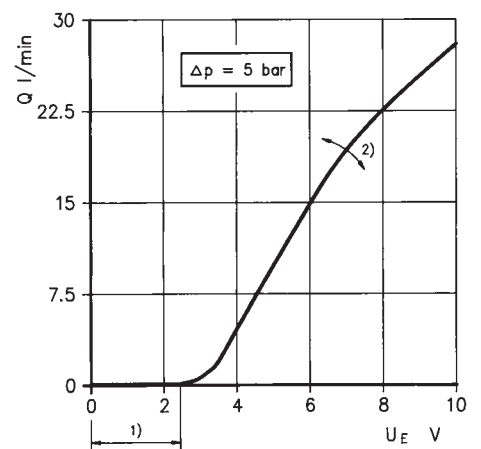
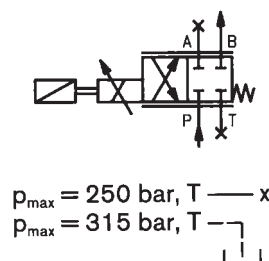
$Q_{nom} = 8 \text{ l/min}$



$Q_{nom} = 16 \text{ l/min}$



$Q_{nom} = 28 \text{ l/min}$



Valve amplifier

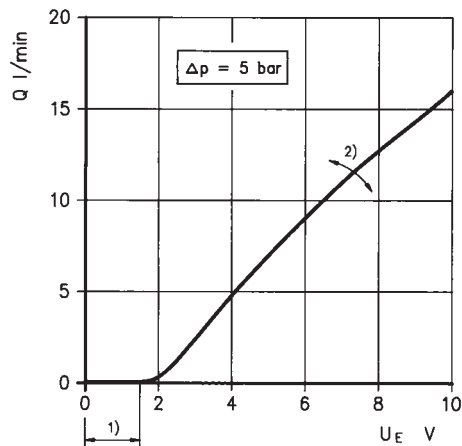
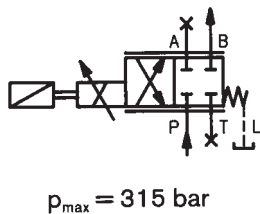
1) Zero adjustment

2) Sensitivity adjustment

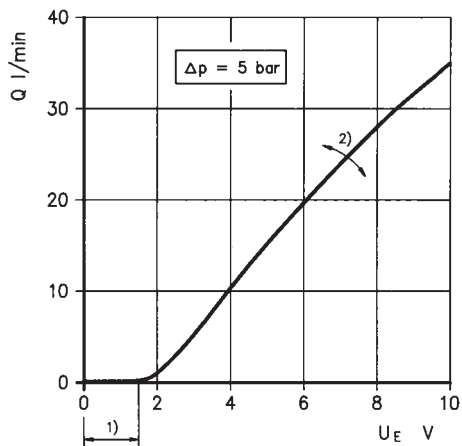
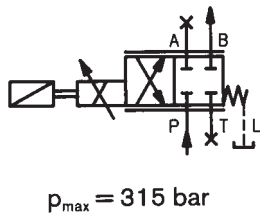
Characteristic curves type 4WRP10E.. (measured with HLP 46, $\vartheta_{oil} = 40^\circ\text{C} \pm 5^\circ\text{C}$)

Flow rate/Signal function (at $\Delta p = 5 \text{ bar}$ per notch)

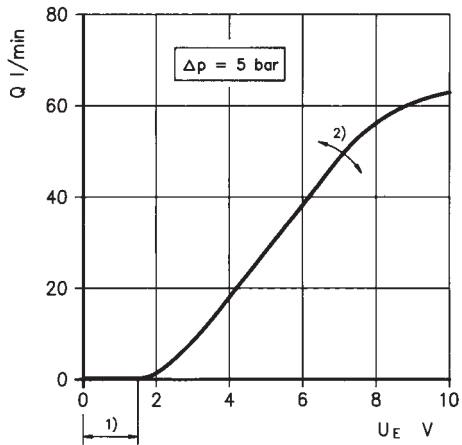
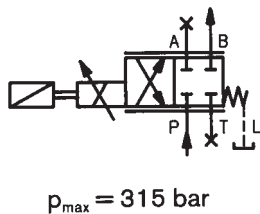
$Q_{nom} = 16 \text{ l/min}$



$Q_{nom} = 32 \text{ l/min}$



$Q_{nom} = 63 \text{ l/min}$



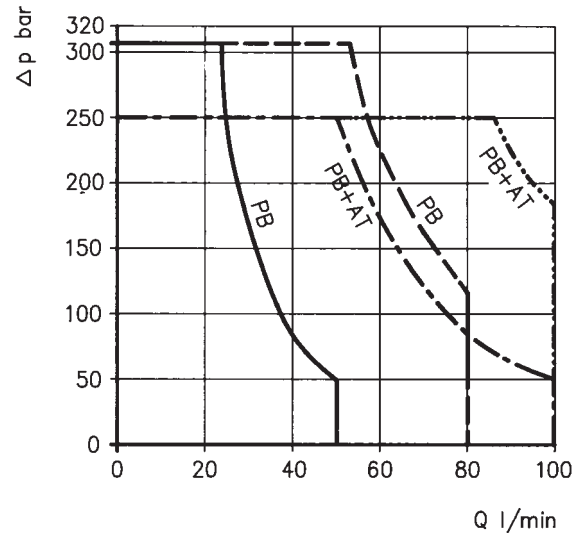
Valve amplifier

- 1) Zero adjustment
- 2) Sensitivity adjustment

Operating limits (measured with HLP 46, $\vartheta_{oil} = 40^\circ\text{C} \pm 5^\circ\text{C}$)

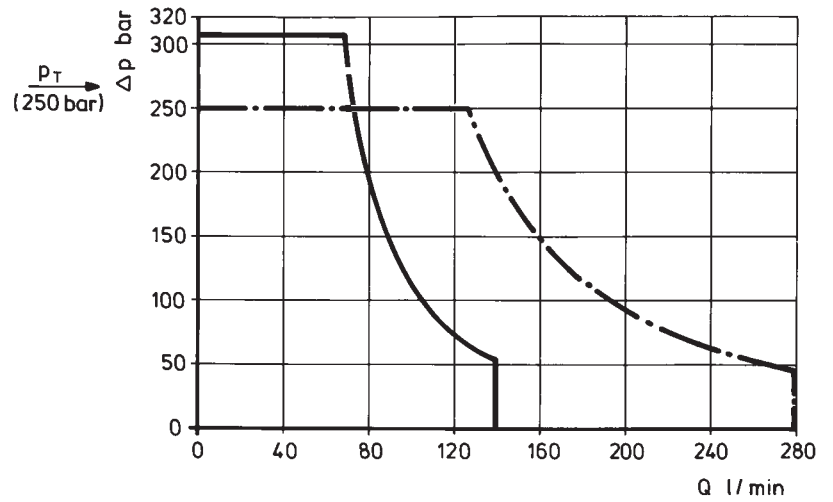
Type 4WRP6EA..

$Q_N 16$ ————— single flow
 - - - - - double flow
 $Q_N 28$ - - - - - single flow
 ———— .. ———— double flow

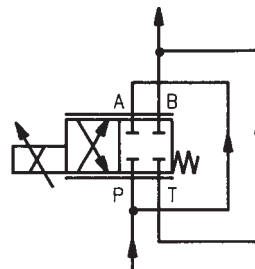


Type 4WRP10EA..

————— single flow
 - - - - - double flow




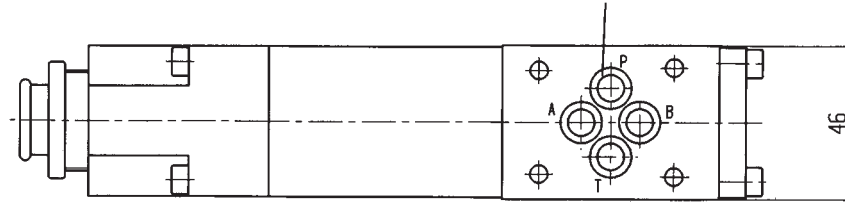
Doubled flow rate
 $p_{max} = 250$ bar



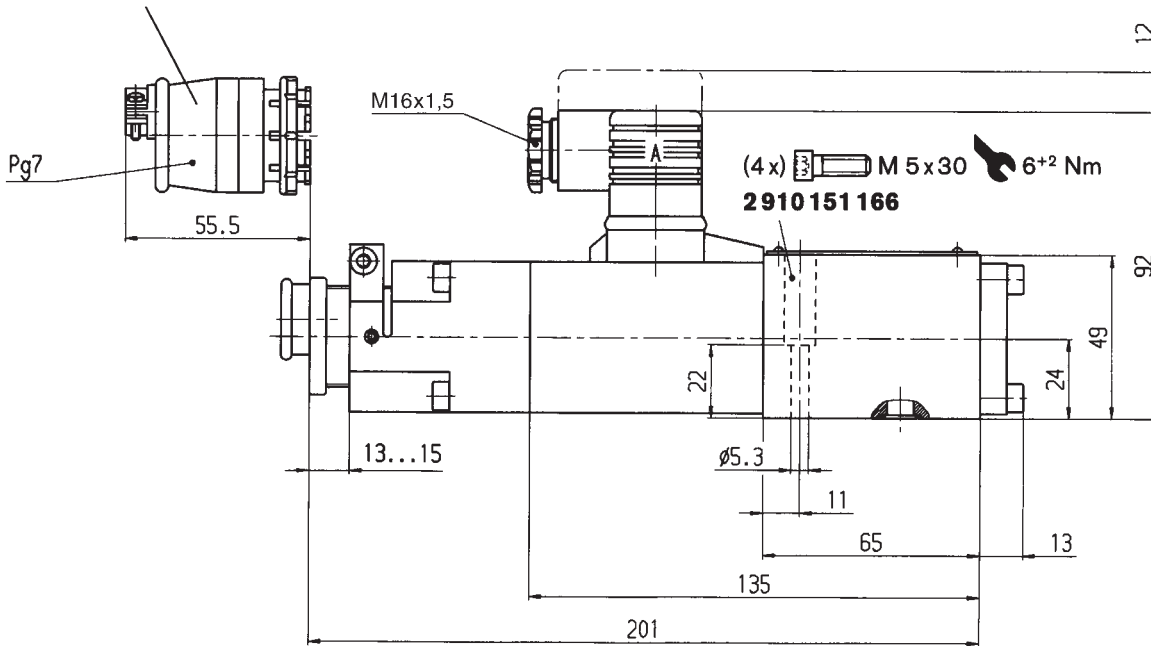
Unit dimensions type 4WRP6E.. (nominal dimensions in mm)

→ FD: 10/97

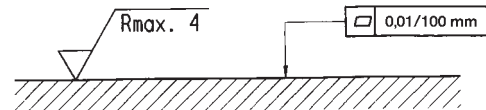
(4 x)  9,25 x 1,78 NBR
1810 210 120



1834484040



Required surface quality of mating component



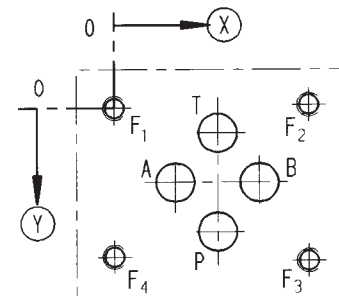
Mounting hole configuration: NG6 (ISO 4401-03-02-0-94)
For subplates, see catalog section RE 45053

¹⁾ Deviates from standard

²⁾ Thread depth:

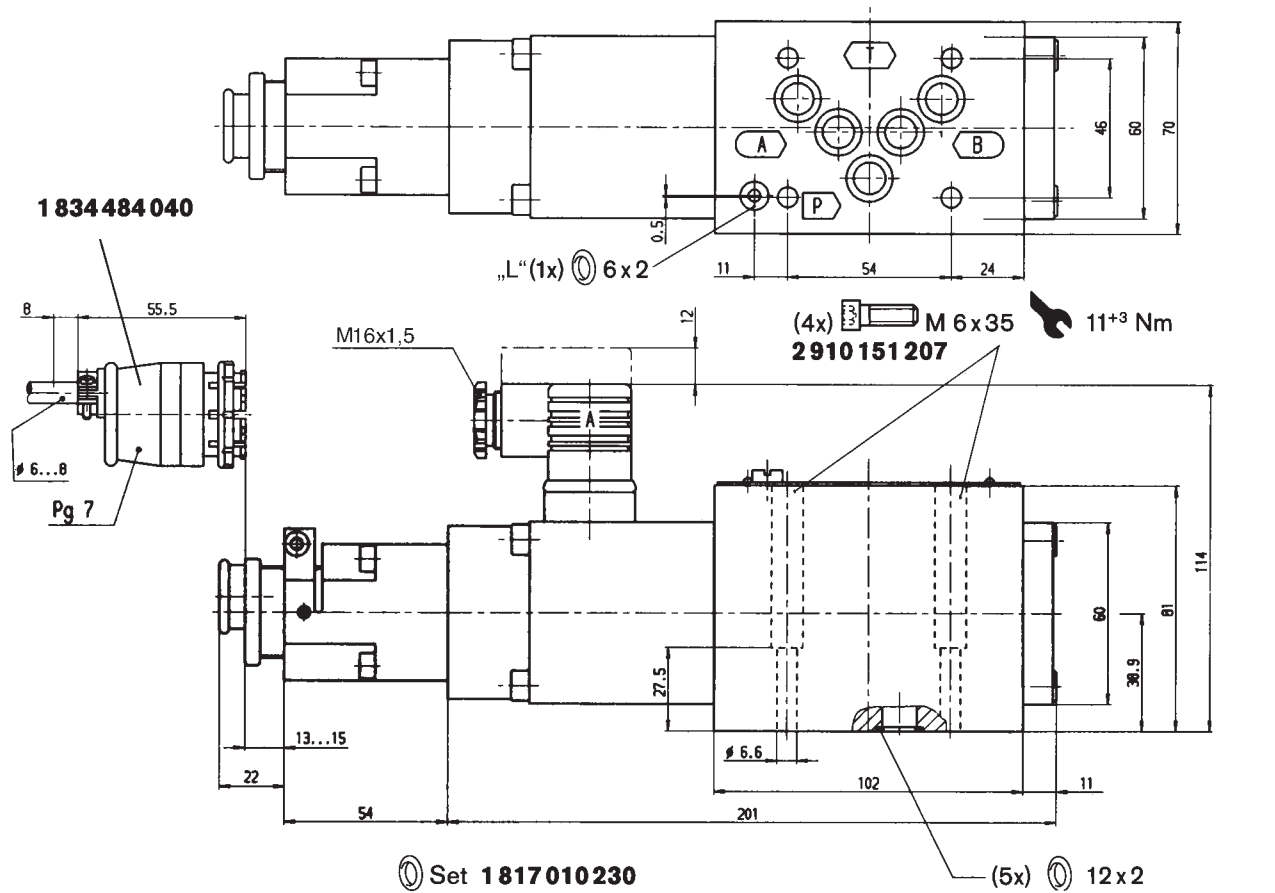
Ferrous metal 1.5 x Ø

Non-ferrous 2 x Ø

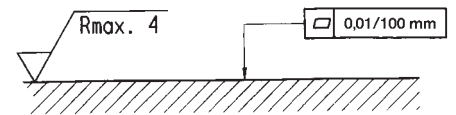


| | P | A | T | B | F ₁ | F ₂ | F ₃ | F ₄ |
|---|-----------------|-----------------|-----------------|-----------------|------------------|------------------|------------------|------------------|
| ⊗ | 21.5 | 12.5 | 21.5 | 30.2 | 0 | 40.5 | 40.5 | 0 |
| ⊙ | 25.9 | 15.5 | 5.1 | 15.5 | 0 | -0.75 | 31.75 | 31 |
| ∅ | 8 ¹⁾ | 8 ¹⁾ | 8 ¹⁾ | 8 ¹⁾ | M5 ²⁾ | M5 ²⁾ | M5 ²⁾ | M5 ²⁾ |

Unit dimensions type 4WRP10E.. (nominal dimensions in mm)

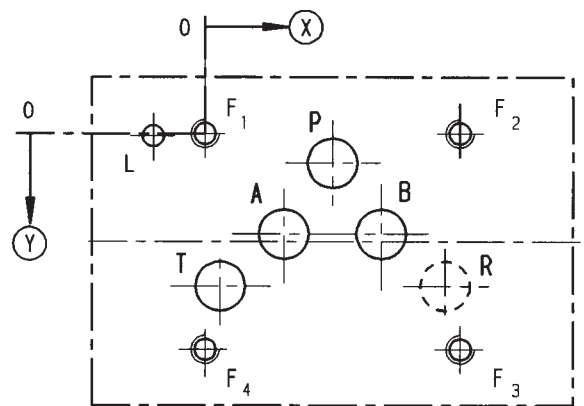


Required surface quality of mating component



Mounting hole configuration: NG10 (ISO 4401-05-06-0-94)
 For subplates, see catalog section RE 45055

- 1) Deviates from standard
- 2) Thread depth:
 Ferrous metal $1.5 \times \phi^*$
 Non-ferrous $2 \times \phi$
- * (NG10 min. 10.5 mm)



| | P | A | T | B | F ₁ | F ₂ | F ₃ | F ₄ | R | L |
|---|--------------------|--------------------|--------------------|--------------------|------------------|------------------|------------------|------------------|--------------------|-----|
| ⊗ | 27 | 16.7 | 3.2 | 37.3 | 0 | 54 | 54 | 0 | 50.8 | -11 |
| ⊙ | 6.3 | 21.4 | 32.5 | 21.4 | 0 | 0 | 46 | 46 | 32.5 | 0.5 |
| ∅ | 10.5 ¹⁾ | 10.5 ¹⁾ | 10.5 ¹⁾ | 10.5 ¹⁾ | M6 ²⁾ | M6 ²⁾ | M6 ²⁾ | M6 ²⁾ | 10.5 ¹⁾ | 4.5 |

Notes

Notes

Bosch Rexroth AG
Hydraulics
Zum Eisengießer 1
97816 Lohr am Main, Germany
Telefon +49 (0) 93 52 / 18-0
Telefax +49 (0) 93 52 / 18-23 58
documentation@boschrexroth.de
www.boschrexroth.de

© This document, as well as the data, specifications and other information set forth in it, are the exclusive property of Bosch Rexroth AG. It may not be reproduced or given to third parties without its consent.

The data specified above only serve to describe the product. No statements concerning a certain condition or suitability for a certain application can be derived from our information. The information given does not release the user from the obligation of own judgement and verification. It must be remembered that our products are subject to a natural process of wear and aging.

Notes
