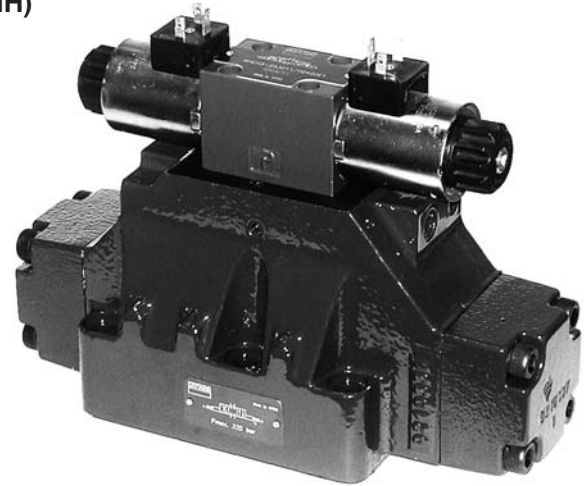
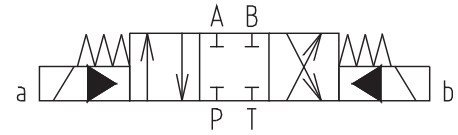


- Solenoid pilot operated directional valves (RNEH)
- Hydraulic pilot operated directional valves (RNH)
- Small energy input
- Manual overrides optional (only for RNEH)
- Installation dimensions to DIN 24 340 / ISO 4401 / CETOP RP121-H



## Functional Description

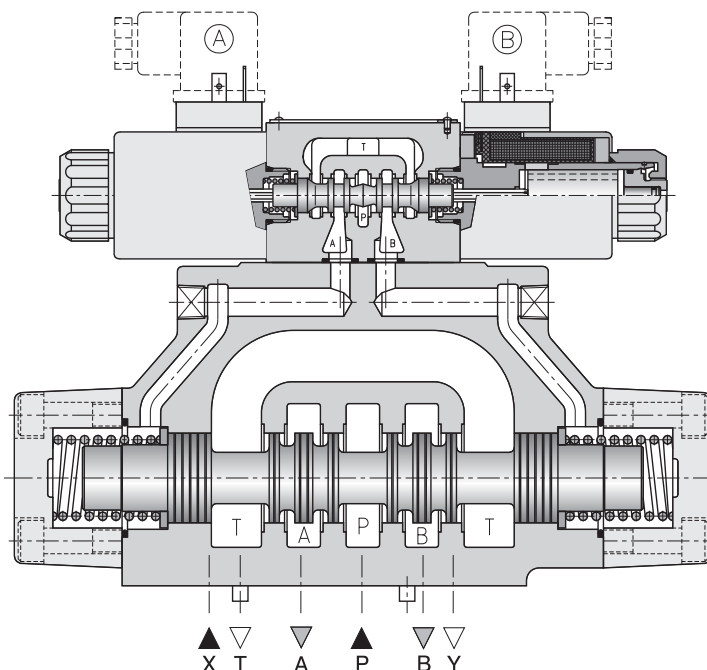
The RNEH solenoid operated - hydropiloted valves are consisting of an RPE3-06 type solenoid operated directional control valve (see data sheet HA 4010) that operates a 4-way hydropiloted control valve with a connection surface in accordance with the ISO 4401 standards. They are available in various configurations and spool types.

The pilot and the drain connections can be made internal or external by inserting or removing the accordant threaded plugs located in the main directional control valve.

A wide range of configurations and different solenoid operated - hydropiloted directional control valve spool positions are available:

- 4-way, 3-position directional control valve, with two solenoids; positioning of the spool in center position is obtained with centering springs.
- 4-way, 2-position directional valve, with one solenoid and one return spring or two solenoids and detent of the spool position.

The basic surface treatment of the valve housing is phosphate coated and the solenoids are zinc coated.



# Ordering Code

**RN**  **4-25**   /    /  **/33-**    /

**Directional Control Valve Pilot Operated**

**Seals**  
no designation NBR  
**V** FPM (Viton)

**Type of control**  
electrohydraulically operated **EH**  
hydraulically operated **H**

**Manual override**  
no designation standard  
**N1** covered with retaining nut  
**N2** covered with rubber boot

**Design series**

**Type of solenoid coil**  
**E1** with terminal for the connector\*  
**E2** with integrated quenching diode and terminal for the connector\*  
**E5** with integrated rectifier and terminal for the connector\*  
\* from EN 1745301-803

**Valve size** **25**  
**(D 08)**

**Number of operating positions**  
two positions **2**  
three positions **3**

**Rated supply voltage of solenoids \***  
(at the coil terminals)

**01200** 12 V DC / 2.72 A  
**02400** 24 V DC / 1.29 A  
**12060** 120 V AC / 0.35 A / 50 (60) Hz  
**23050** 230 V AC / 0.17 A / 50 (60) Hz

**Functional symbols**  
see the table Functional Symbols

The AC coils correspond with E5 type.  
\* Other voltages per request.

**Controls**  
if not required no designation  
main spool shifting speed control **D**  
shifting speed control, with orifice (0.8 mm) **PF**  
in port P of solenoid pilot valve

**Series number**

**Check valve incorporated on P-line**  
no designation if not required  
**C3** with check valve (see pages 5, 7)

**Piloting**  
if not required no designation  
external piloting (see note herebelow) **E**

**Drain**  
no designation external drain which is recommended when the valve is used with back pressure on the outlet  
**I** internal drain

**Note:**  
Piloting must always be external for valves with the H11 type pilot valve (available on request). Also valve must have external piloting for spools with P and T connected in the center position. Internal piloting is possible only with a C3 version valve (see page 7), or by installing a check valve with a setting of min. 5 bar on the outlet line. In this case the valve must have external drainage.  
Piloting must always be external for valves with the **RNH** type hydraulic control valve (available on request).

# Technical Data

|   |                          |   |
|---|--------------------------|---|
| Valve size  | mm (US)                  | 25 (D 08)   |
| Maximum flow rate from port P to A, B, T  | L/min (GPM )             | 600 (159)   |
| Max. operating pressure<br>ports P, A, B<br>port T<br>port T (external drain version) | bar (PSI)                | 320 (4600)<br>210 (3000)<br>250 (3600)                  |
| Pressure drop   | bar (PSI)                | see Pressure Drop $\Delta p-Q$                          |
| Hydraulic fluid   |                          | Hydraulic oils of power classes (HL, HLP) to DIN 51 524 |
| Fluid temperature range for NBR seals   | °C (°F )                 | -30 ... +80 (-22 ... +176)                              |
| Fluid temperature range for FPM seals   | °C (°F )                 | -20 ... +80 (-4 ... +176)                               |
| Ambient temperature max.  | °C (°F )                 | +50 (+122)  |
| Viscosity range   | mm <sup>2</sup> /s (SUS) | 20 ... 400 (98 ... 1840)                                |
| Maximum degree of fluid contamination   |                          | Class 21/18/15 to ISO 4406                              |
| Service life  | cycles                   | 10 <sup>7</sup>   |
| Enclosure type to EN 60 529   |                          | IP 65   |
| Weight - RNEH4-252<br>- RNEH4-253   | kg (lbs)                 | 15 (33)<br>15.6 (34.3)                                  |

## Functional Symbols

Symbols are referred to the solenoid valve RNEH. For the hydraulic control version RNH please verify the connection scheme (see page 7).

| Three positions with spring centering               |  | Three positions with spring centering |  |
|---|--|---------------------------------------|--|
| <b>Z11</b>  |  | <b>H11</b>                            |  |
| <b>Y11</b>  |  | <b>C11</b>                            |  |
| Two positions with return spring                    |  | Two positions with return spring      |  |
| <b>R51</b>  |  | <b>X51</b>                            |  |
| <b>R52</b>  |  | <b>X52</b>                            |  |
| Two positions with mechanical detent on pilot valve |  |                                       |  |
| <b>J17</b>  |  |                                       |  |
| <b>J27</b>  |  |                                       |  |

Besides the diagrams shown, which are the most frequently used, other special versions are available: consult our technical department for their identification, feasibility and operating limits.

# Performance Characteristic

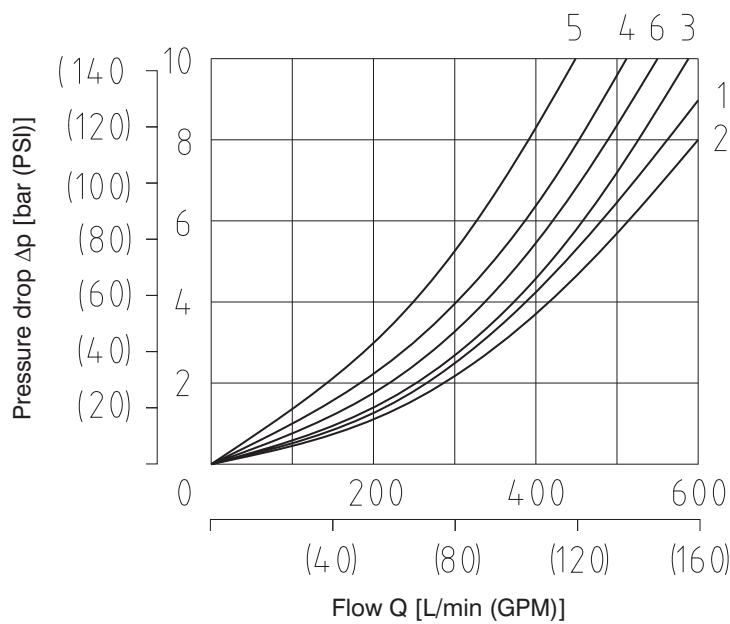
| Pressures in bar (PSI)                 | MIN.     | MAX.       |
|--|----------|------------|
| Pilot pressure                         | 5 (72.5) | 210 (3045) |
| Pressure on line T with internal drain | -        | 140 (2030) |
| Pressure on line T with external drain | -        | 250 (3625) |

| Maximum flow rates in L/min (GPM) | PRESSURES           |                     |
|-----------------------------------|---------------------|---------------------|
|                                   | 210 bar (3045 PSI ) | 320 bar (4640 PSI ) |
| Spool type C11                    | 500 (133)           | 450 (119)           |
| All other spools                  | 600 (159)           | 500 (133)           |

## Pressure Drop $\Delta p$ -Q

Measured at  $v = 32 \text{ mm}^2/\text{s}$  (156 SUS) and  $t = 40 \text{ }^\circ\text{C}$  (104  $^\circ\text{F}$ )

Pressure drop  $\Delta p$  related to flow rate.



| Spool type             | Spool position | Connections |       |       |       |       |
|------------------------|----------------|-------------|-------|-------|-------|-------|
|                        |                | P - A       | P - B | A - T | B - T | P - T |
| <b>Curves on graph</b> |                |             |       |       |       |       |
| Z11                    | Energized      | 1           | 1     | 2     | 3     |       |
| H11                    | De-energized   |             |       |       |       | 6*    |
|                        | Energized      | 5           | 5     | 1     | 2     |       |
| Y11                    | De-energized   |             |       | 4°    | 4°    |       |
|                        | Energized      | 1           | 1     | 1     | 2     |       |
| C11                    | De-energized   |             |       |       |       | 6     |
|                        | Energized      | 6           | 6     | 3     | 4     |       |
| R51, R52, X51, X52     | De-energized   | 1           |       |       | 1     |       |
|                        | Energized      |             | 1     | 2     |       |       |
| J17, J27               | Energized      | 1           | 1     | 2     | 3     |       |

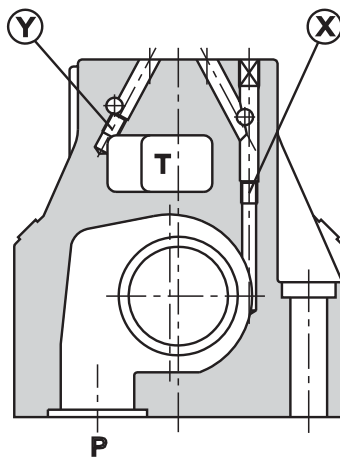
\* A-B blocked    • B blocked    ° A blocked

## Pilot and Drain

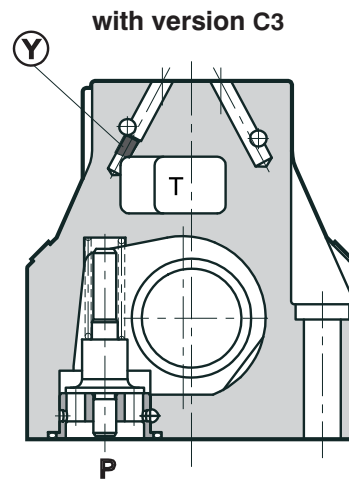
The RNEH valves are available with pilot and drain, both internal and external. The version with external drain allows for a higher back pressure on the outlet.

| Type of valve         |                                   | Plug assembly |     |
|-----------------------|-----------------------------------|---------------|-----|
|                       |                                   | X             | Y   |
| <b>RNEH4-25**/*</b>   | Internal pilot and external drain | NO*           | YES |
| <b>RNEH4-25**/*I</b>  | Internal pilot and internal drain | NO*           | NO  |
| <b>RNEH4-25**/*E</b>  | External pilot and external drain | YES           | YES |
| <b>RNEH4-25**/*EI</b> | External pilot and internal drain | YES           | NO  |

\* C3 version is available only with internal pilot.



X: plug M6 x 8 for external pilot  
Y: plug M6 x 8 for external drain



Y: plug M6 x 8 for external drain

## Electrical Features

### Solenoids

The operating solenoids are DC solenoids. For AC supply the solenoids are provided with rectifier which are integrated in the EN connector socket as part of the solenoid. The connectors can be turned by 90°. By loosening the nut, the solenoids can be turned or replaced without interfering with any seals of the valve.

In the case of solenoid malfunction or power failure, the spool of the valve can be shifted by manual override, provided the pressure in T-port does not exceed 25 bar.

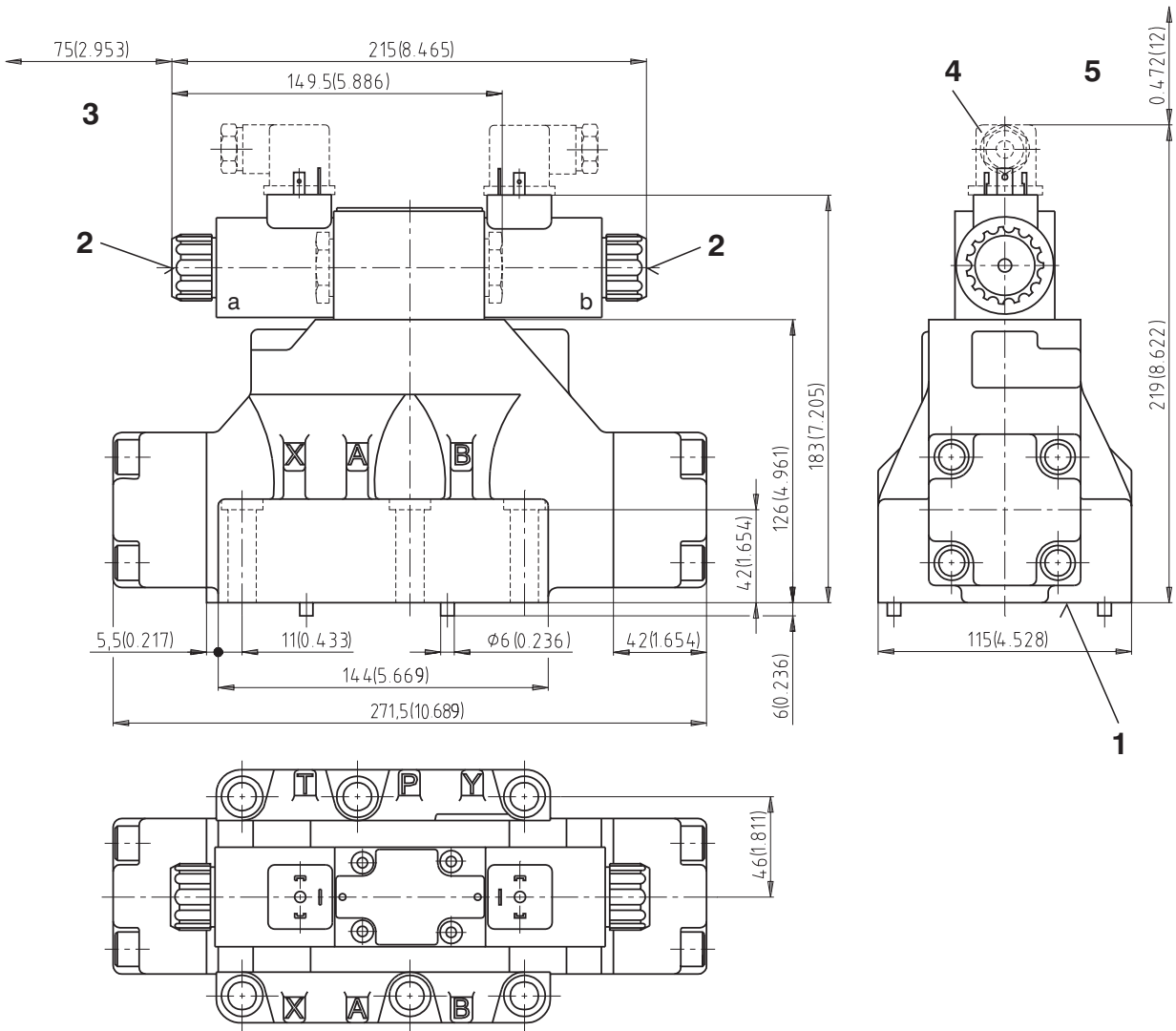
|   |     | DC solenoid | AC solenoid |
|---|-----|-------------|-------------|
| Max. allowable voltage variation                      | %   | -10 ... +6  | ±10         |
| Max. switching frequency                              | 1/h | 8 000       |             |
| Switching times ±10 %, energizing (two position)      | ms  | 75          | 60          |
| Switching times ±10 %, de-energizing (two position)   | ms  | 90          | 90          |
| Switching times ±10 %, energizing (three position)    | ms  | 55          | 45          |
| Switching times ±10 %, de-energizing (three position) | ms  | 60          | 60          |
| Duty cycle  | %   | 100         |             |
| Enclosure type to EN 60 529                           |     | IP 65       |             |

The values indicated refer to a solenoid valve operating with piloting pressure 100 bar, with mineral oil at a temperature of 40 °C, a viscosity of 32 mm<sup>2</sup>/s and with PA and BT connections. The switch on times are obtained from the time the spool switches over. The switch off times are measured at the time pressure variation occurs in the line.

# Valve Dimensions

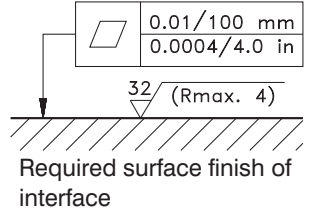
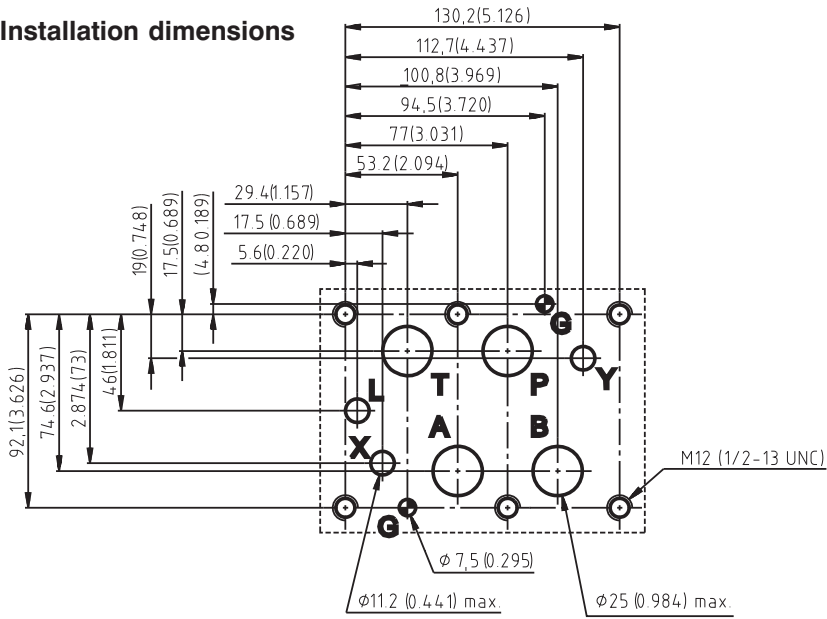
Dimensions in millimetres (inches)

## RNEH4-252, RNEH4-253



- 1 Mounting surface with seal rings
- 2 Manual override
- 3 Space required to remove coil
- 4 Electrical connector (must be ordered separately)
- 5 Space required to remove connector

### Installation dimensions

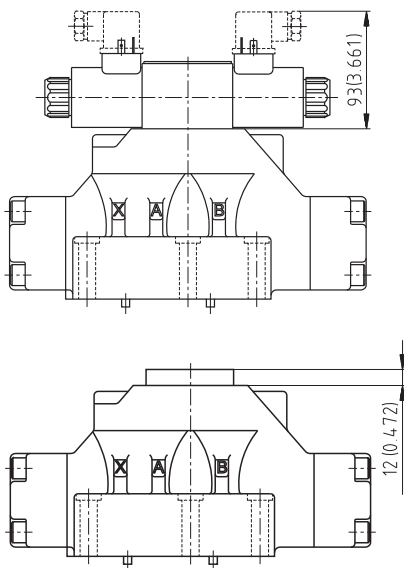


|                            |  |                         |
|----------------------------|--|-------------------------|
| Single valve fastening:    | 6 bolts M12 x 60 *                               | * Bolts is not supplied |
| Bolt torque:               | 69 Nm (50.9 ft-lbf) - bolts A 8.8                |                         |
| Threads of mounting holes: | M12 x 20 (1/2-13 UNC)                            |                         |
| Seal rings:                | 4 O-rings 29,82 x 2,62<br>2 O-rings 20,29 x 2,62 |                         |

## Type of Command

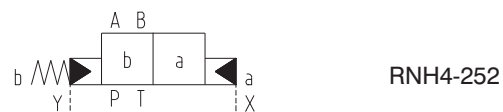
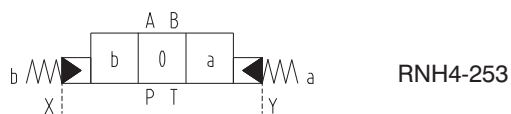
### Solenoid control: RNEH

The valve is supplied with a pilot solenoid valve type RPE3-06.



### Hydraulic control: RNH

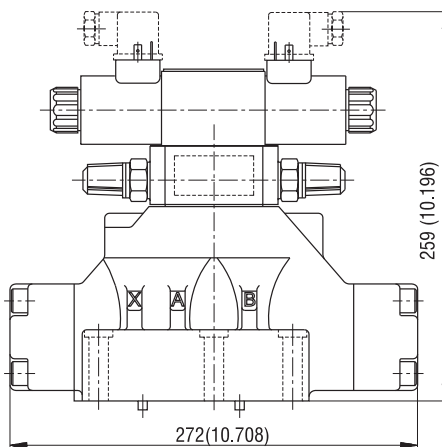
The valve is supplied with a cross-connection cover-plate. X and Y connections are used for the hydraulic control of the valve.



## Controls

### Control of the main spool shifting speed: D

By placing a 2VS3-06 type double flow control valve between the pilot solenoid valve and the hydropiloted valve, the piloted flow rate can be controlled and therefore the shifting speed can be varied. Add the letter **D** to the identification code to request this device.



## Manual Override

Whenever the solenoid valve installation may involve exposure to atmospheric agents or be used in tropical climates, the manual override, boot protection is recommended. Add the suffix **N1** or **N2** to request this device.

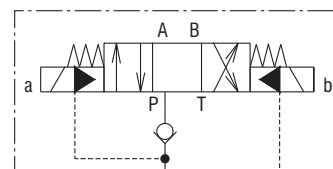
## Electrical Connector

The solenoid valves are never supplied with connector. Connectors must be ordered separately.

## Special Configurations C3

### Check valve incorporated on line P: C3

Valve RNEH is available upon request with check valve incorporated on line P. This is particularly useful to obtain the necessary piloting pressure when the main control valve, in the rest position, has line P connected to the T outlet. The cracking pressure is 5 bar. Add **C3** to the identification code for this request.



**C3 version is available only with internal pilot.**

## Installation

Configurations with centering and recall springs can be mounted in any position; type J17, J27 valves - without springs and with mechanical retention must be mounted with the longitudinal axis horizontal. Valve fastening takes place by means of screws or tie rods, placing the valve on a flat surface, with values of planarity and smoothness that are equal to or better than those indicated in the drawing. If the minimum values of planarity or smoothness are not met, fluid leakages between valve and mounting surface can easily occur.

## Spare Parts

### Seal kit

|  | Design         | Dimensions, number    |                                     |                             | Ordering number               |   |                               |
|--|----------------|-----------------------|-------------------------------------|-----------------------------|-------------------------------|---|-------------------------------|
|  |                | O-ring                | Square ring                         | Back-up ring                |                               |   |                               |
| Head valve size 25 (D 08)                      | Standard - NBR | 29,82 x 2,62 (4 pcs.) | -                                   | -                           | 21850300                      |   |                               |
|  |                | 20,29 x 2,62 (2 pcs.) |                                     |                             |                               |   |                               |
|  |                | 40,94 x 2,62 (2 pcs.) |                                     |                             |                               |   |                               |
|  |                | 34,59 x 2,62* (1 pc.) |                                     |                             |                               |   |                               |
|  | Viton          | 29,82 x 2,62 (4 pcs.) |                                     |                             | -                             | - | 21850400                      |
|  |                | 20,29 x 2,62 (2 pcs.) |                                     |                             |                               |   |                               |
|  |                | 40,94 x 2,62 (2 pcs.) |                                     |                             |                               |   |                               |
|  |                | 34,59 x 2,62* (1 pc.) |                                     |                             |                               |   |                               |
| Throttle valve 2VS3-06-CS type number 15929600 | Standard - NBR | 18 x 2,65 (2 pcs.)    | 9,25 x 1,68 (4 pcs.)                | 6,73 x 9,43 x 1,14 (2 pcs.) | 15936300                      |   |                               |
|  |                | 6,9 x 1,8 (2 pcs.)    |                                     |                             |                               | - | 17,83 x 22,19 x 1,14 (2 pcs.) |
|  | Viton          | 17,12 x 2,62 (2 pcs.) | 9,43 x 6,73 x 1,14 (2 pcs.)         | 15936600                    |                               |   |                               |
|  |                | 9,25 x 1,78 (4 pcs.)  |                                     |                             | 17,83 x 22,19 x 1,14 (2 pcs.) |   |                               |
|  |                | 6,75 x 1,78 (2 pcs.)  | -                                   |                             |                               |   |                               |
|  |                | Control valve         | see data sheet ARGO-HYTOS - RPE3-06 |                             |                               |   |                               |

### Mounting bolt

|                                | Dimensions, number |                       | Tightening torque   | Ordering number |
|--------------------------------|--------------------|-----------------------|---------------------|-----------------|
| Fixation of extension of valve | Bolt M5 x 45       | DIN 912-10.9 (4 pcs.) | 8.9 Nm (6.6 ft-lbf) | 15845100        |
|                                | Bolt M5 x 98 - 8G  | (4 pcs.)              |                     | 16103700        |
|                                | Nut M5             |                       |                     |                 |

### Other

|             | Design | Ordering number |
|-------------|--------|-----------------|
| Cover plate | PA, BT | 15934200        |
|             | PB, TA | 15933700        |

## Caution!

- Service valve without range stated parameter consultation with manufacturer.
- Detailed information at control valve - see data sheet RPE3-06, HA 4010
- The packing foil is recyclable.
- The protective plate can be returned to manufacturer.
- The technical information regarding the product presented in this data sheet is for descriptive purposes only. It should not be construed in any case as a guaranteed representation of the product properties in the sense of the law.

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