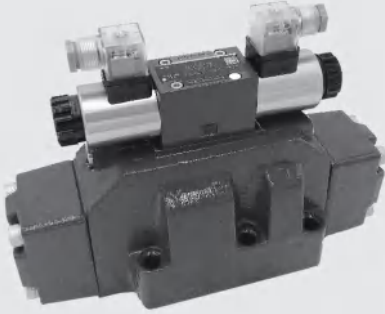


## Hydraulic or Electro-hydraulic Directional Valve

Model: WEH/WH...4X/6X/7XJ



01

- ◆ Size 10~32
- ◆ Maximum working pressure 350 bar
- ◆ Maximum working flow 1100 L/min

### Contents

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| reducing valve and pre-load valve       |       |
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### Features

- Mainly used to control the opening, closing and direction of liquid flow
  - Electro-hydraulic operation (WEH)
  - Hydraulic operation (WH)
  - Subplate mounting
- The mounting surface according to DIN24340 form A and ISO4401
- Spring or hydraulic centered
  - Spring or hydraulic return to initial position
  - Wet-pin DC or AC solenoid
  - Optional manual emergency operation
  - Individual or central electrical connection
  - Optional switching time adjustment
  - Optional pre-load valve in port P of the main valve
  - Auxiliary component, optional
  - Stroke adjustment of main spool
  - Stroke adjustment or end position sensor
  - Inductive or mechanical limit switch (proximity type) of the main spool

## Function description, sectional drawing

### Directional valve model WEH

The WEH directional valve is a directional spool valve with electro-hydraulic operation. It is used to control the opening, closing and direction of the liquid flow.

The valve mainly consists of valve body (1), main control spool (2), main valve with one or two reset springs (3.1) and (3.2), pilot valve (4) with one or two solenoids "a" (5.1) and "b" (5.2).

The main control spool is held in the neutral or initial position by the springs or pressure. For the valve with spring-centered, the two spring chambers (6) and (8) are connected to the oil tank through the pilot valve in the initial position. The pilot valve (4) is supplied with oil through the control line (7). The control oil can be supplied internally or externally (externally via port X).

The main control spool (2) is hydraulically operated by the pilot valve (4). Due to the operating of the pilot valve on one end of the main control spool, the spool moves to the operation position, then the valve opens in the operation direction and the fluid flows from P to A and B to T or P to B and A to T. The control oil can be drained internally or externally. An optional manual emergency operation (9) can move the control spool (10) in the pilot valve (4) when the solenoid is not energized.

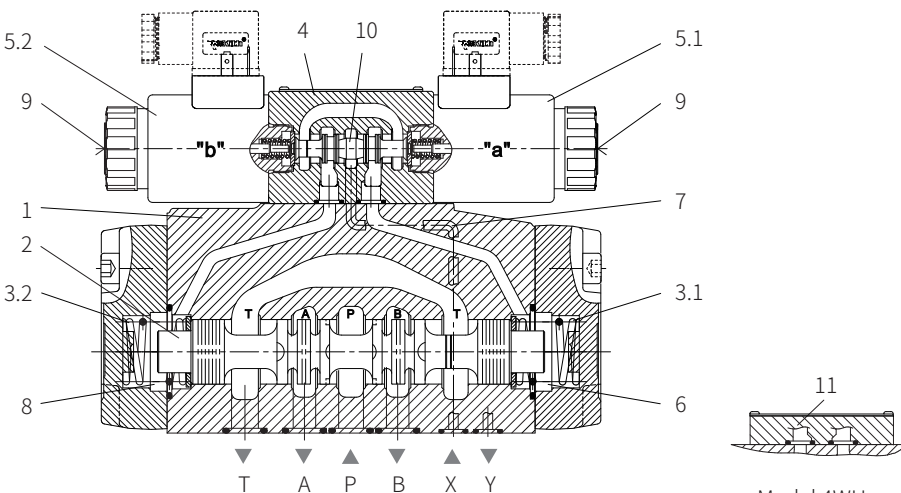
### Directional valve model WH

The WH directional valve is a hydraulically operated directional spool valve. It is used to control the opening, closing and direction of liquid flow.

The valve mainly consists of valve body (1), main control spool (2), one or two reset springs (3.1) and (3.2) with spring centered or spring return functions, and control cover (11).

The main control spool is operated by hydraulic directly. The spool is held in the neutral or initial position by springs or hydraulic pressure. The control oil is supplied and drained externally.

For the 4/3-way valve with spool spring centered, the main control spool (2) is held in the neutral position by two centered springs. The two spring chambers (6, 8) are connected to the oil ports X and Y through the control cover (11). When one end of the main control spool (2) is pressurized, the spool moves to the working position, thereby connecting the corresponding oil circuit.



Directional valve model 4WEH.

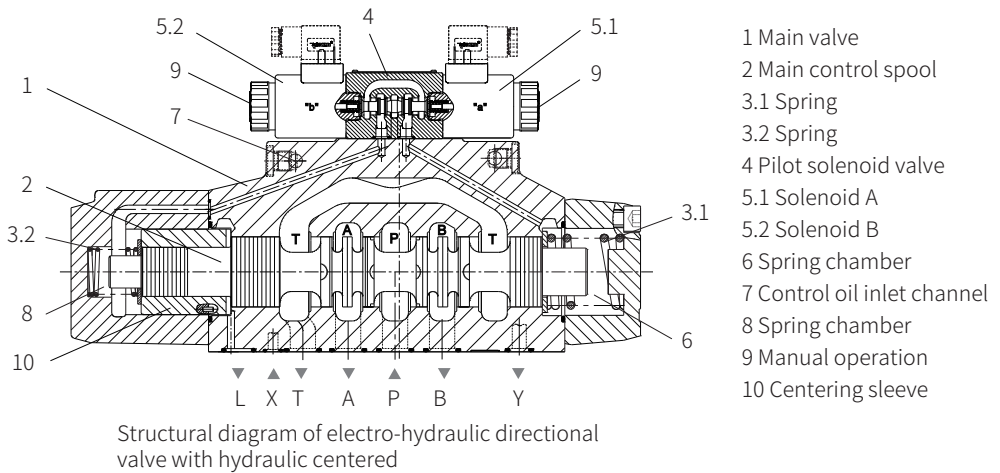
Model 4WH...

## Function description, sectional drawing

4/3-way directional valve with hydraulic centered of main valve, model WEH..H/

In this structure, the pressure oil acts on both end surfaces of the main control spool (2). The centering sleeve (10) locates the main control spool (2) and keeps it in the middle position.

If one end of the main control spool (2) is unloaded, the main control spool (2) moves to the working position under the pressure from the other end, thereby changing the direction of the oil flow. The unloaded control spool face displaces the returning pilot oil into port Y externally through the pilot valve (4). The oil is drained internal from port L to the tank directly.



## Function description, sectional drawing

### Pilot oil supply

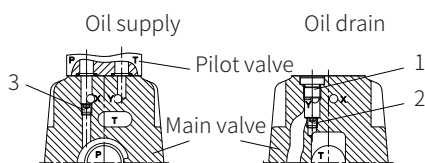
#### Model WEH10

- ◆ Conversion between internal supply and external supply:

The channel P on the top of the main valve body with M6 screw (3) is external supply, and is internal supply when M6 screw (3) is dismantled.

- ◆ Conversion between internal drain and external drain:

Removing the plug (1) and installing M6 screw (2) is external drain, dismantling M6 screw (2) is internal drain.



structure diagram of model WEH10...4XJ/  
supply and drain

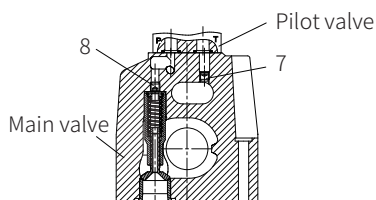
#### Model WEH16

- ◆ Conversion between internal supply and external supply:

The channel P on the bottom of the main valve with M6 screw (8) is external supply, and is internal supply when M6 screw (8) is dismantled.

- ◆ Conversion between internal drain and external drain:

The channel T on the top of the main valve with M6 screw (7) is external drain, and is internal drain when M6 screw (7) is dismantled.



structure diagram of model WEH16...7XJ/  
supply and drain

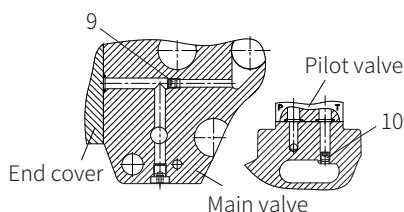
#### Model WEH25

- ◆ Conversion between internal supply and external supply:

The channel P on the top of the main valve with M6 screw (9) is external supply, and is internal supply when M6 screw (9) is dismantled.

- ◆ Conversion between internal drain and external drain:

The channel T on the top of the main valve with M6 screw (10) is external drain, and is internal drain when M6 screw (10) is dismantled.



structure diagram of model WEH25...  
supply and drain

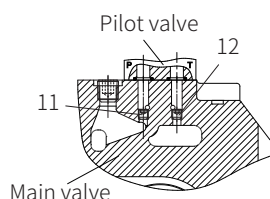
#### Model WEH32

- ◆ Conversion between internal supply and external supply:

The channel P on the top of the main valve with M6 screw (11) is external supply and is internal supply when M6 screw (11) is dismantled.

- ◆ Conversion between internal drain and external drain:

The channel T on the top of the main valve with M6 screw (12) is external drain and is internal drain when M6 screw (12) is dismantled.



structure diagram of model WEH32...  
supply and drain

## Models and specifications

[illegible]

1) For internal oil supply

\*Minimum control pressure: see page 231

\*To avoid impermissible maximum force peaks,  
a throttle (B10) must be installed in  
port P of the pilot valve

2) Only in conjunction with throttle "B10"

pilot oil supply

No code= pilot oil supply and drain external

E= pilot oil supply internal and drain external

FT<sup>1)</sup>= pilot oil supply and drain internal

T= pilot oil supply external and drain internal

(for model 4WH...only available as "no code")

(the 3-position valve with hydraulic centered

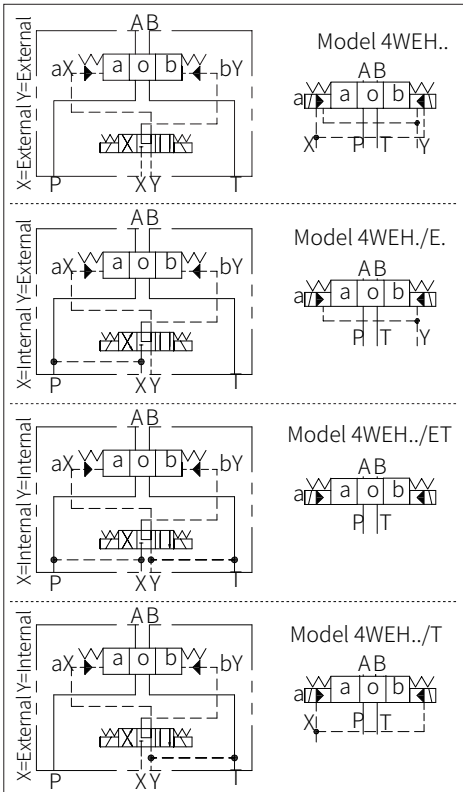
in ET and T types must meet:

$$P_{\text{pilot}} \geq 2 \times P_{\text{tank}} + P_{\text{pilot min}}$$

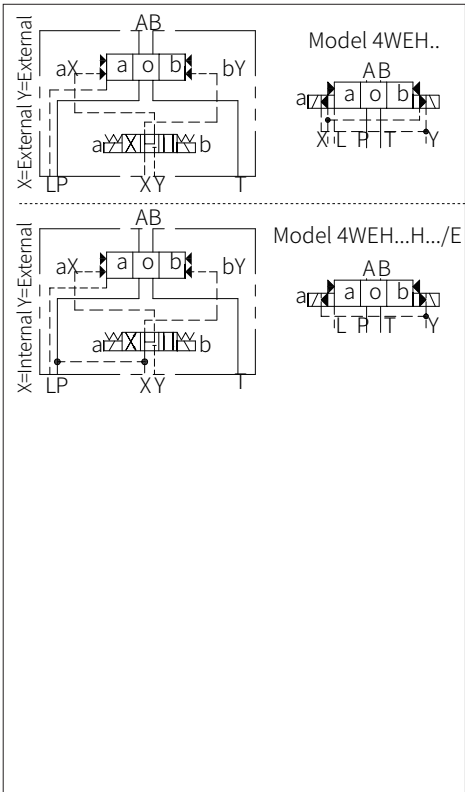
## Functional symbols

Detailed and simplified symbols for 3-position directional valves

Spring centered

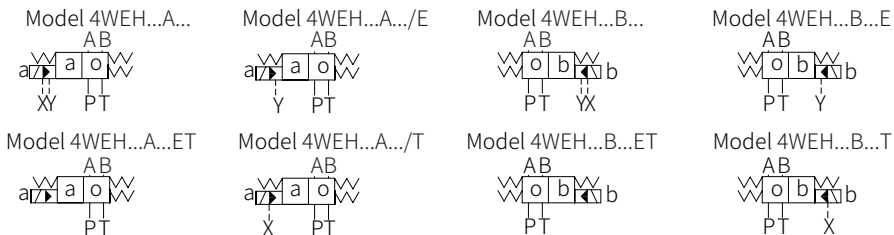


Hydraulic centered



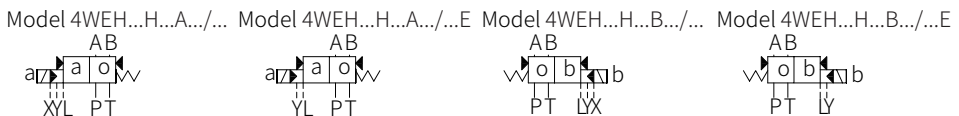
Spring return valves

(the solenoid at end A or B of the 2-position valve derived from the 3-position valve)



Hydraulic return valves

(the solenoid at end A or B of the 2-position valve derived from the 3-position valve)



## Functional symbols

### Functional symbols of 3-position valves

#### 3-position valve

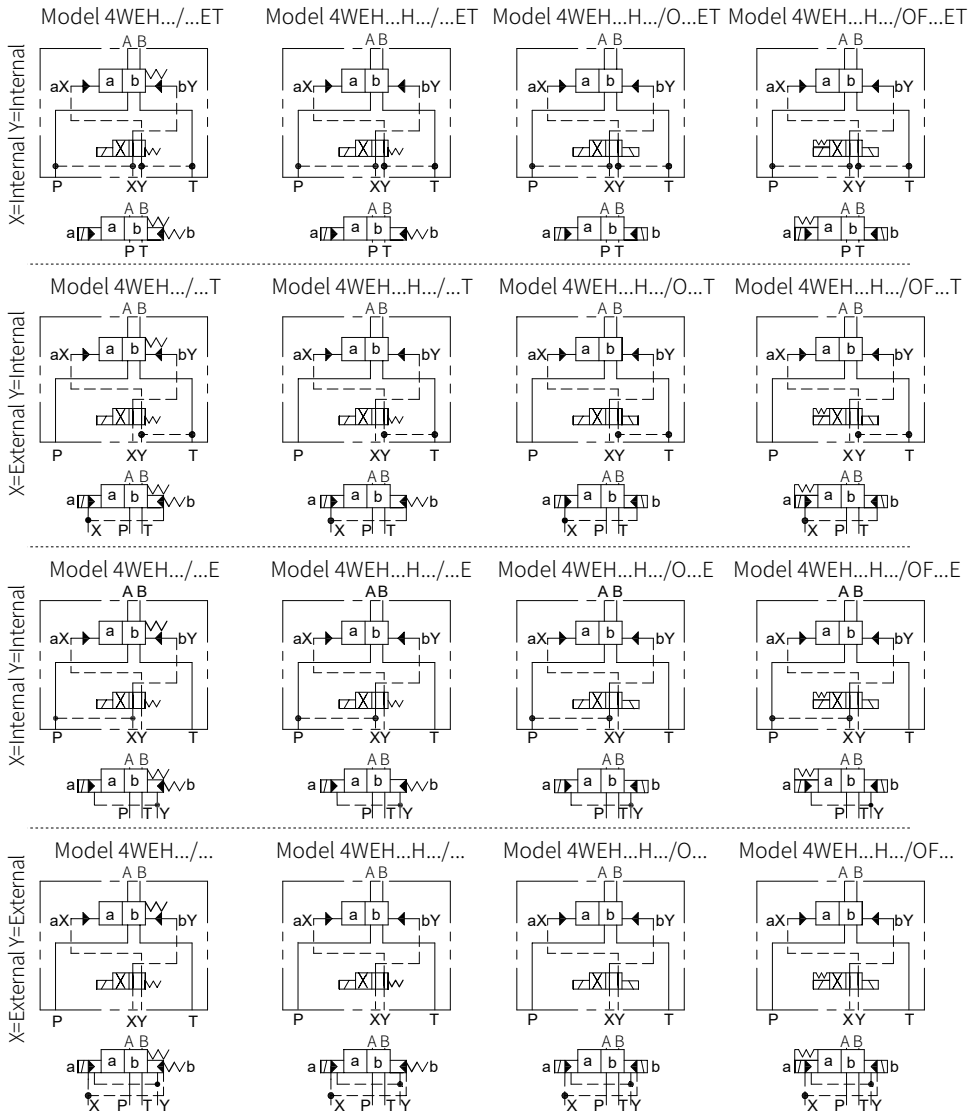
| 3-position valve model | Functional symbol | Transition function |
|------------------------|-------------------|---------------------|
| 4WEH...E.../... E      |                   |                     |
| 4WEH...F.../... F      |                   |                     |
| 4WEH...G.../... G      |                   |                     |
| 4WEH...H.../... H      |                   |                     |
| 4WEH...J.../... J      |                   |                     |
| 4WEH...L.../... L      |                   |                     |
| 4WEH...M.../... M      |                   |                     |
| 4WEH...P.../... P      |                   |                     |
| 4WEH...Q.../... Q      |                   |                     |
| 4WEH...R.../... R      |                   |                     |
| 4WEH...S.../... S      |                   |                     |
| 4WEH...T.../... T      |                   |                     |
| 4WEH...U.../... U      |                   |                     |
| 4WEH...V.../... V      |                   |                     |
| 4WEH...W.../... W      |                   |                     |

#### 2-position valve derived from 3-position valve

| 2-position valve model | Functional symbol<br>(Solenoid at end A) | 2-position valve model | Functional symbol<br>(Solenoid at end B) |
|------------------------|------------------------------------------|------------------------|------------------------------------------|
| 4WEH...EA.../... EA    |                                          | 4WEH...EB.../... EB    |                                          |
| 4WEH...FA.../... FA    |                                          | 4WEH...FB.../... FB    |                                          |
| 4WEH...GA.../... GA    |                                          | 4WEH...GB.../... GB    |                                          |
| 4WEH...HA.../... HA    |                                          | 4WEH...HB.../... HB    |                                          |
| 4WEH...JA.../... JA    |                                          | 4WEH...JB.../... JB    |                                          |
| 4WEH...LA.../... LA    |                                          | 4WEH...LB.../... LB    |                                          |
| 4WEH...MA.../... MA    |                                          | 4WEH...MB.../... MB    |                                          |
| 4WEH...PA.../... PA    |                                          | 4WEH...PB.../... PB    |                                          |
| 4WEH...QA.../... QA    |                                          | 4WEH...QB.../... QB    |                                          |
| 4WEH...RA.../... RA    |                                          | 4WEH...RB.../... RB    |                                          |
| 4WEH...SA.../... SA    |                                          | 4WEH...SB.../... SB    |                                          |
| 4WEH...TA.../... TA    |                                          | 4WEH...TB.../... TB    |                                          |
| 4WEH...UA.../... UA    |                                          | 4WEH...UB.../... UB    |                                          |
| 4WEH...VA.../... VA    |                                          | 4WEH...VB.../... VB    |                                          |
| 4WEH...WA.../... WA    |                                          | 4WEH...WB.../... WB    |                                          |

## Functional symbols

Detailed and simplified symbols for 2-position directional valves



Functional symbols of 2-position valves

|                              |   |   |   |   |   |
|------------------------------|---|---|---|---|---|
| Spool valve function:        | C | D | K | Z | Y |
| Spool valve function symbol: |   |   |   |   |   |
| Transition function:         |   |   |   |   |   |

## Technical parameters

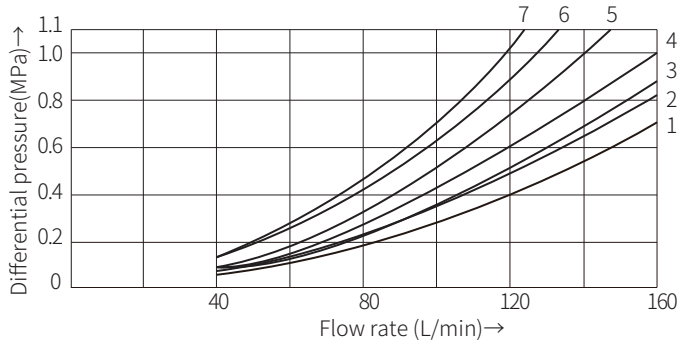
|                                                                                                                                                                                                                                                                                                                         |                                                                                            |                                                                                                                                         |                                          |                    |                    |                    |                    |
|-------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|--------------------------------------------------------------------------------------------|-----------------------------------------------------------------------------------------------------------------------------------------|------------------------------------------|--------------------|--------------------|--------------------|--------------------|
| Size                                                                                                                                                                                                                                                                                                                    |                                                                                            | 10                                                                                                                                      | 16                                       | 22                 | 25                 | 32                 |                    |
| Maximum working pressure                                                                                                                                                                                                                                                                                                |                                                                                            |                                                                                                                                         |                                          |                    |                    |                    |                    |
| Oil ports P, A, B                                                                                                                                                                                                                                                                                                       | (MPa)                                                                                      | 35                                                                                                                                      | 35                                       | 35                 | 35                 | 35                 |                    |
| Oil port T                                                                                                                                                                                                                                                                                                              | External Y port pilot oil drain                                                            | (MPa)                                                                                                                                   | 31.5 <sup>3)</sup>                       | 25                 | 25                 | 25                 |                    |
|                                                                                                                                                                                                                                                                                                                         | Internal Y port pilot oil drain                                                            | (MPa)                                                                                                                                   | 21 DC                                    |                    |                    |                    |                    |
|                                                                                                                                                                                                                                                                                                                         |                                                                                            | (MPa)                                                                                                                                   | 16 AC                                    |                    |                    |                    |                    |
| Oil port Y                                                                                                                                                                                                                                                                                                              | -DC solenoid                                                                               | (MPa)                                                                                                                                   | 21 DC                                    |                    |                    |                    |                    |
| External pilot oil drain                                                                                                                                                                                                                                                                                                | -AC solenoid                                                                               | (MPa)                                                                                                                                   | 16 AC                                    |                    |                    |                    |                    |
|                                                                                                                                                                                                                                                                                                                         | For 4WH type                                                                               | (MPa)                                                                                                                                   | 25 (Size 10、16、25、32)                    |                    | 21 (Size 22)       |                    |                    |
|                                                                                                                                                                                                                                                                                                                         | Maximum pilot pressure<br>(For high pilot pressure, a pressure reducing valve is required) | (MPa)                                                                                                                                   | 25 (Size 10、16、25、32)                    |                    | 21 (Size 22)       |                    |                    |
| Minimum pilot pressure                                                                                                                                                                                                                                                                                                  |                                                                                            |                                                                                                                                         | H-4W...                                  |                    |                    |                    |                    |
| -Pilot oil supply X external                                                                                                                                                                                                                                                                                            |                                                                                            |                                                                                                                                         |                                          |                    |                    |                    |                    |
| -Pilot oil supply X internal<br>(Not for spool C, F, G, H, P, T, V, Z, S <sup>2)</sup> )                                                                                                                                                                                                                                |                                                                                            |                                                                                                                                         |                                          |                    |                    |                    |                    |
|                                                                                                                                                                                                                                                                                                                         | Spring centered 3-position valve                                                           | (MPa)                                                                                                                                   | 1.0                                      | 1.4                | 1.25               | 1.3                | 0.85               |
|                                                                                                                                                                                                                                                                                                                         | Pressure centered 3-position valve                                                         | (MPa)                                                                                                                                   | -                                        | 1.4                | 1.05               | 1.8                | 0.85               |
|                                                                                                                                                                                                                                                                                                                         | Spring centered 2-position valve                                                           | (MPa)                                                                                                                                   | 1.0                                      | 1.4                | -                  | 1.3                | 1.0                |
|                                                                                                                                                                                                                                                                                                                         | Pressure centered 2-position valve                                                         | (MPa)                                                                                                                                   | 0.7                                      | 1.4                | 1.4                | 0.8                | 0.5                |
| Pilot oil supply X internal<br>(for spool C, F, G, H, P, T, V, Z, S <sup>2)</sup> )                                                                                                                                                                                                                                     |                                                                                            |                                                                                                                                         | 0.45 <sup>3)</sup>                       | 0.45 <sup>4)</sup> | 0.45 <sup>4)</sup> | 0.45 <sup>4)</sup> | 0.45 <sup>4)</sup> |
| 1) In a 3-position valve, pressure centered only possible if:<br>Ppilot ≥ 2xPtank + Ppilot min.                                                                                                                                                                                                                         |                                                                                            |                                                                                                                                         |                                          |                    |                    |                    |                    |
| 2) Spool S only for size 16.                                                                                                                                                                                                                                                                                            |                                                                                            |                                                                                                                                         |                                          |                    |                    |                    |                    |
| 3) For the spools C, F, G, H, P, T, V, Z, the internal pilot oil supply is only possible if the flow from P to T in the central position (for 3-position valve) or when the valve moves through the central position (for 2-position valve) is large enough to ensure the pressure differential as 0.65MPa from P to T. |                                                                                            |                                                                                                                                         |                                          |                    |                    |                    |                    |
| 4) For the spools C, F, G, H, P, T, V, Z, S-via the pre-load valve or correspondingly large flow.                                                                                                                                                                                                                       |                                                                                            |                                                                                                                                         |                                          |                    |                    |                    |                    |
| 5) 28MPa for model 4WEH10..., 31.5MPa for model H-4WEH10...<br>H-4WEH10... type is 31.5MPa                                                                                                                                                                                                                              |                                                                                            |                                                                                                                                         |                                          |                    |                    |                    |                    |
| Hydraulic oil                                                                                                                                                                                                                                                                                                           |                                                                                            | Mineral hydraulic oil or phosphate ester hydraulic oil                                                                                  |                                          |                    |                    |                    |                    |
| Temperature range                                                                                                                                                                                                                                                                                                       |                                                                                            | (°C)                                                                                                                                    | -30 to +80 (NBR seal) -20~+80 (FKM seal) |                    |                    |                    |                    |
| Viscosity range                                                                                                                                                                                                                                                                                                         |                                                                                            | (mm <sup>2</sup> /s)                                                                                                                    | 2.8 to 500                               |                    |                    |                    |                    |
| Cleanliness of oil                                                                                                                                                                                                                                                                                                      |                                                                                            | I The maximum allowable pollution level of oil is NAS1638 Class 9, so we recommend a filter with the minimum filtration accuracy β10≥75 |                                          |                    |                    |                    |                    |
| Pilot oil volume during switching process                                                                                                                                                                                                                                                                               |                                                                                            |                                                                                                                                         |                                          |                    |                    |                    |                    |
| 3-position valve spring centered                                                                                                                                                                                                                                                                                        |                                                                                            | (cm <sup>3</sup> )                                                                                                                      | 2.04                                     | 5.72               | 7.64               | 14.2               | 29.4               |
| 2-position valve                                                                                                                                                                                                                                                                                                        |                                                                                            | (cm <sup>3</sup> )                                                                                                                      | 4.08                                     | 11.45              | 15.28              | 28.4               | 58.8               |
| 3-position valve hydraulic centered                                                                                                                                                                                                                                                                                     |                                                                                            | (cm <sup>3</sup> )                                                                                                                      | -                                        | WH WEH             | - -                | WH WEH             | WH WEH             |
| From neutral position to position "a"                                                                                                                                                                                                                                                                                   |                                                                                            | (cm <sup>3</sup> )                                                                                                                      | -                                        | 2.83 2.83          | - -                | 7.15 7.15          | 14.4 14.4          |
| From position "a" to neutral position                                                                                                                                                                                                                                                                                   |                                                                                            | (cm <sup>3</sup> )                                                                                                                      | -                                        | 5.72 5.72          | - -                | 14.18 7.0          | 29.4 15.1          |
| From neutral position to position "b"                                                                                                                                                                                                                                                                                   |                                                                                            | (cm <sup>3</sup> )                                                                                                                      | -                                        | 5.72 5.72          | - -                | 14.18 14.15        | 29.4 29.4          |
| From position "b" to neutral position                                                                                                                                                                                                                                                                                   |                                                                                            | (cm <sup>3</sup> )                                                                                                                      | -                                        | 8.55 8.55          | - -                | 19.88 5.73         | 43.8 14.4          |
| Pilot oil flow for shortest switching time                                                                                                                                                                                                                                                                              |                                                                                            | (L/min)                                                                                                                                 | about 35                                 | about 35           | about 35           | about 35           | about 45           |
| Weight                                                                                                                                                                                                                                                                                                                  | Valve with one solenoid                                                                    | (kg)                                                                                                                                    | about 6.4                                | about 8.5          | about 11.5         | about 17.6         | about 40.5         |
|                                                                                                                                                                                                                                                                                                                         | Valve with two solenoid, spring centered                                                   | (kg)                                                                                                                                    | about 6.8                                | about 8.9          | about 11.9         | about 18.0         | about 41.0         |
|                                                                                                                                                                                                                                                                                                                         | Valve with two solenoid, hydraulic centered                                                | (kg)                                                                                                                                    | about 6.8                                | about 8.9          | about 11.9         | about 19.0         | about 41.0         |
|                                                                                                                                                                                                                                                                                                                         | Valve with hydraulic control                                                               | (kg)                                                                                                                                    | about 5.5                                | about 7.3          | about 10.5         | about 16.5         | about 39.5         |
|                                                                                                                                                                                                                                                                                                                         | Switching time adjustment                                                                  | (kg)                                                                                                                                    | about 0.8                                |                    |                    |                    |                    |
|                                                                                                                                                                                                                                                                                                                         | Pressure reducing valve                                                                    | (kg)                                                                                                                                    | about 0.4                                |                    |                    |                    |                    |
| Installation position                                                                                                                                                                                                                                                                                                   |                                                                                            | Optional, except for the hydraulic return valve C, D, K, Z, Y installed horizontal                                                      |                                          |                    |                    |                    |                    |

## Technical parameters

|                                                                                                |                                                                                                        |       |                   |         |                          |     |         |          |      |         |         |           |    |    |    |    |
|------------------------------------------------------------------------------------------------|--------------------------------------------------------------------------------------------------------|-------|-------------------|---------|--------------------------|-----|---------|----------|------|---------|---------|-----------|----|----|----|----|
| Switching time (refers to the time from the solenoid closing to the main valve fully opening.) |                                                                                                        |       |                   |         |                          |     |         |          |      |         |         |           |    |    |    |    |
| Size 10                                                                                        | Switching time for valve from neutral position to operating position (for DC (=) and AC (∼) operation) |       |                   |         |                          |     |         |          |      |         |         |           |    |    |    |    |
|                                                                                                | at pilot pressure                                                                                      |       | (MPa)             |         | ∼7=                      |     | ∼14=    |          | ∼21= |         | ∼25=    |           |    |    |    |    |
|                                                                                                | 3-position valve                                                                                       |       | (ms)              |         | 30                       | 65  | 25      | 60       | 20   | 55      | 15      | 50        |    |    |    |    |
|                                                                                                | 2-position valve                                                                                       |       | (ms)              |         | 35                       | 80  | 30      | 75       | 25   | 70      | 20      | 65        |    |    |    |    |
|                                                                                                | Switching time for valve from operating position to neutral position (ms)                              |       |                   |         |                          |     |         |          |      |         |         |           |    |    |    |    |
|                                                                                                | 3-position valve                                                                                       |       | (ms)              |         | 30                       |     |         |          |      |         |         |           |    |    |    |    |
| Size 16                                                                                        | 2-position valve                                                                                       |       | (ms)              |         | 35                       | 40  | 30      | 75       | 25   | 30      | 20      | 25        |    |    |    |    |
|                                                                                                | Switching time for valve from neutral position to operating position (for DC (=) and AC (∼) operation) |       |                   |         |                          |     |         |          |      |         |         |           |    |    |    |    |
|                                                                                                | at pilot pressure                                                                                      |       | (MPa)             |         | ∼7=                      |     | ∼15=    |          | ∼25= |         |         |           |    |    |    |    |
|                                                                                                | 3-position valve-spring centered                                                                       |       | (ms)              |         | 25...30                  |     | 40      | 25...30  |      | 40      | 25...30 |           | 40 |    |    |    |
|                                                                                                | 2-position valve                                                                                       |       | (ms)              |         | 30...35                  |     | 55      | 30...35  |      | 55      | 30...35 |           | 55 |    |    |    |
|                                                                                                | 3-position valve                                                                                       |       | Solenoid operated |         | a                        | b   | a       | b        | a    | b       | a       | b         | a  | b  |    |    |
|                                                                                                | - hydraulic centered                                                                                   |       | (ms)              |         | 30                       | 30  | 40      | 40       | 30   | 30      | 40      | 40        | 30 | 30 | 35 | 40 |
|                                                                                                | Switching time for valve from operating position to static position                                    |       |                   |         |                          |     |         |          |      |         |         |           |    |    |    |    |
|                                                                                                | 3-position valve                                                                                       |       | (ms)              |         | 20 to 35 for ∼; 30 for = |     |         |          |      |         |         |           |    |    |    |    |
|                                                                                                | 2-position valve                                                                                       |       | (ms)              |         | 30...50                  |     | 45      | 30...50  |      | 45      | 30...50 |           | 45 |    |    |    |
| 3-position valve                                                                               |                                                                                                        | From- |                   | a       | b                        | a   | b       | a        | b    | a       | b       | a         | b  |    |    |    |
| - hydraulic centered                                                                           |                                                                                                        | (ms)  |                   | 20...35 |                          | 20  | 20...55 |          | 20   | 20...35 |         | 20        |    |    |    |    |
| Size 25                                                                                        | Switching time for valve from neutral position to operating position (for DC (=) and AC (∼) operation) |       |                   |         |                          |     |         |          |      |         |         |           |    |    |    |    |
|                                                                                                | at pilot pressure                                                                                      |       | (MPa)             |         | ∼7=                      |     | ∼14=    |          | ∼21= |         | ∼25=    |           |    |    |    |    |
|                                                                                                | 3-position valve-spring centered                                                                       |       | (ms)              |         | 50                       | 85  | 40      | 75       | 35   | 70      | 30      | 65        |    |    |    |    |
|                                                                                                | 2-position valve                                                                                       |       | (ms)              |         | 120                      | 160 | 100     | 130      | 85   | 120     | 70      | 105       |    |    |    |    |
|                                                                                                | 3-position valve                                                                                       |       | Solenoid operated |         | a                        | b   | a       | b        | a    | b       | a       | b         | a  | b  |    |    |
|                                                                                                | - hydraulic centered                                                                                   |       | (ms)              |         | 20                       | 35  | 55      | 65       | 30   | 35      | 55      | 65        | 25 | 30 | 50 | 60 |
|                                                                                                | Switching time for valve from operating position to static position                                    |       |                   |         |                          |     |         |          |      |         |         |           |    |    |    |    |
|                                                                                                | 3-position valve                                                                                       |       | (ms)              |         | 40 to 55 for ∼; 40 for = |     |         |          |      |         |         |           |    |    |    |    |
|                                                                                                | 2-position valve                                                                                       |       | (ms)              |         | 120                      | 125 | 85      | 100      | 85   | 90      | 75      | 80        |    |    |    |    |
|                                                                                                | 3-position valve                                                                                       |       | From-             |         | a                        | b   | a       | b        | a    | b       | a       | b         | a  | b  |    |    |
| - hydraulic centered                                                                           |                                                                                                        | (ms)  |                   | 30...50 |                          | 30  | 35      | 30...50  | 30   | 35      | 30...50 | 30        | 35 |    |    |    |
| Size 32                                                                                        | Switching time for valve from neutral position to operating position (for DC (=) and AC (∼) operation) |       |                   |         |                          |     |         |          |      |         |         |           |    |    |    |    |
|                                                                                                | at pilot pressure                                                                                      |       | (MPa)             |         | ∼5=                      |     | ∼15=    |          | ∼25= |         |         |           |    |    |    |    |
|                                                                                                | 3-position valve-spring centered                                                                       |       | (ms)              |         | 65                       | 80  | 50      | 90       | 35   | 105     |         |           |    |    |    |    |
|                                                                                                | 2-position valve                                                                                       |       | (ms)              |         | 100                      | 130 | 75      | 100      | 60   | 115     |         |           |    |    |    |    |
|                                                                                                | 3-position valve                                                                                       |       | Solenoid operated |         | a                        | b   | a       | b        | a    | b       | a       | b         | a  | b  |    |    |
|                                                                                                | - hydraulic centered                                                                                   |       | (ms)              |         | 55                       | 35  | 100     | 105      | 40   | 45      | 85      | 95        | 35 | 40 | 85 | 95 |
|                                                                                                | Switching time for valve from operating position to static position                                    |       |                   |         |                          |     |         |          |      |         |         |           |    |    |    |    |
|                                                                                                | 3-position valve                                                                                       |       | (ms)              |         | 60 to 75 for ∼; 50 for = |     |         |          |      |         |         |           |    |    |    |    |
|                                                                                                | 2-position valve                                                                                       |       | (ms)              |         | 115...130                |     | 90      | 85...100 |      | 70      | 65...80 |           | 65 |    |    |    |
|                                                                                                | 3-position valve                                                                                       |       | From-             |         | a                        | b   | a       | b        | a    | b       | a       | b         | a  | b  |    |    |
| - hydraulic centered                                                                           |                                                                                                        | (ms)  |                   | 30...65 |                          | 30  | 40      | 60...90  |      | 30      | 40      | 105...155 |    | 50 | 50 |    |

## Characteristic curve

Model 4WEH10...((Measured at  $\vartheta_{oil}=41\text{mm}^2/\text{s}$  and  $t=50^\circ\text{C}$ )



| Spool   | Working position |     |     |     | Spool | Working position |     |     |
|---------|------------------|-----|-----|-----|-------|------------------|-----|-----|
|         | P-A              | P-B | A-T | B-T |       | A-T              | B-T | P-T |
| E、D、Y   | 2                | 2   | 4   | 5   | F     | 3                | -   | 6   |
| F       | 1                | 4   | 1   | 4   | G,T   | -                | -   | 7   |
| G、T     | 4                | 2   | 2   | 6   |       | -                | -   | -   |
| H、C     | 4                | 4   | 1   | 4   |       | -                | -   | -   |
| J、K     | 1                | 2   | 1   | 3   | H     | 1                | 3   | 5   |
| L       | 2                | 3   | 1   | 4   | L     | 3                | -   | -   |
| M       | 4                | 4   | 3   | 4   | P     | -                | 7   | 5   |
| Q,V,W,Z | 2                | 2   | 3   | 5   | U     | -                | 4   | -   |
| R       | 2                | 2   | 3   | -   |       | -                | -   | -   |
| U       | 3                | 3   | 3   | 4   |       | -                | -   | -   |
| P       | 4                | 1   | 3   | 4   |       |                  |     |     |

## Characteristic limit

Model 4WEH10...((Measured at  $\vartheta_{oil}=41\text{mm}^2/\text{s}$  and  $t=50^\circ\text{C}$ )

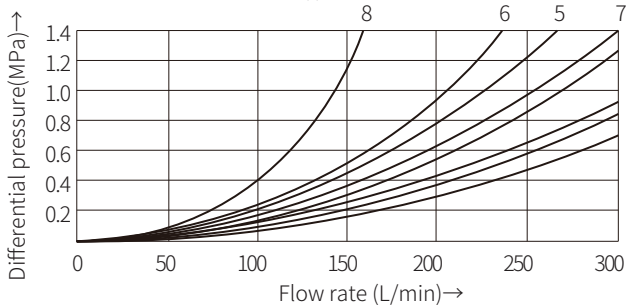
| Allowable flow of 2-position and 3-position valves (L/min) |                        |     |      |
|------------------------------------------------------------|------------------------|-----|------|
| Spool                                                      | Working pressure (MPa) |     |      |
|                                                            | 20                     | 25  | 31.5 |
| E、J、L、M、Q、R、U、V、W<br>C、D、K、Z、Y                             | 160                    |     |      |
| H                                                          | 160                    | 150 | 120  |
| G、T                                                        | 160                    | 160 | 140  |
| F、P                                                        | 160                    | 140 | 120  |

Notice:The given characteristic limits are suitable for the use of flow in both directions (e. g. from P to A and return from B to T at the same time).

Due to the power of the fluid in the valve, the characteristic limit allowed for only one flow direction might be significantly reduced (e.g. from P to A, while B is closed)!

The characteristic limits are measured when the solenoid is at the operating temperature, at 10% below the standard voltage and without tank preloading.

## Characteristic curve

 Model 4WEH16...((Measured at  $v_{oil}=41\text{mm}^2/\text{s}$  and  $t=50^\circ\text{C}$ )


| Spool     | Working position |     |     |     |     |
|-----------|------------------|-----|-----|-----|-----|
|           | P-A              | P-B | A-T | B-T | P-T |
| E、D、Y     | 1                | 1   | 1   | 3   | -   |
| F、P       | 2                | 2   | 3   | 3   | -   |
| G、T       | 5                | 1   | 3   | 7   | 6   |
| H、C、Q、V、Z | 2                | 2   | 3   | 3   | -   |
| J、K、L     | 1                | 1   | 3   | 3   | -   |
| M、W       | 2                | 2   | 4   | 3   | -   |
| R         | 2                | 2   | 4   | -   | -   |
| U         | 1                | 1   | 4   | 7   | -   |
| S         | 4                | 4   | 4   | -   | 8   |

## Characteristic limit

 Model 4WEH16...((Measured at  $v_{oil}=41\text{mm}^2/\text{s}$  and  $t=50^\circ\text{C}$ )

| Allowable flow of 2-position valve (L/min) |                        |     |     |     |     |
|--------------------------------------------|------------------------|-----|-----|-----|-----|
| Spool                                      | Working pressure (MPa) |     |     |     |     |
|                                            | 7                      | 14  | 21  | 28  | 35  |
| Main valve spring return <sup>1)</sup>     |                        |     |     |     |     |
| C、D、K、Z、Y                                  | 300                    | 300 | 300 | 300 | 300 |
| Main valve spring return <sup>2)</sup>     |                        |     |     |     |     |
| C                                          | 300                    | 300 | 300 | 300 | 300 |
| D、Y                                        | 300                    | 270 | 260 | 250 | 230 |
| K                                          | 300                    | 250 | 240 | 230 | 210 |
| Z                                          | 300                    | 260 | 190 | 180 | 160 |
| Main valve hydraulic return                |                        |     |     |     |     |
| HC、HD、HK                                   | 300                    | 300 | 300 | 300 | 300 |
| HZ、HY                                      | 300                    | 300 | 300 | 300 | 300 |

| Allowable flow of 3-position valve (L/min)        |                        |     |     |     |                                   |
|---------------------------------------------------|------------------------|-----|-----|-----|-----------------------------------|
| Spool                                             | Working pressure (MPa) |     |     |     |                                   |
|                                                   | 7                      | 14  | 21  | 28  | 35                                |
| Main valve spring return <sup>1)</sup>            |                        |     |     |     |                                   |
| E、H、J、L、MQ、U、W、R                                  | 300                    | 300 | 300 | 300 | 300                               |
| F、P                                               | 300                    | 250 | 180 | 170 | 150                               |
| G、T                                               | 300                    | 300 | 240 | 210 | 190                               |
| S                                                 | 300                    | 300 | 300 | 250 | 220                               |
| V                                                 | 300                    | 250 | 210 | 200 | 180                               |
| Pressure centered (minimum pilot pressure 1.6MPa) |                        |     |     |     | Spools F, G, H P and S in general |
| All spools                                        | 300                    | 300 | 300 | 300 |                                   |

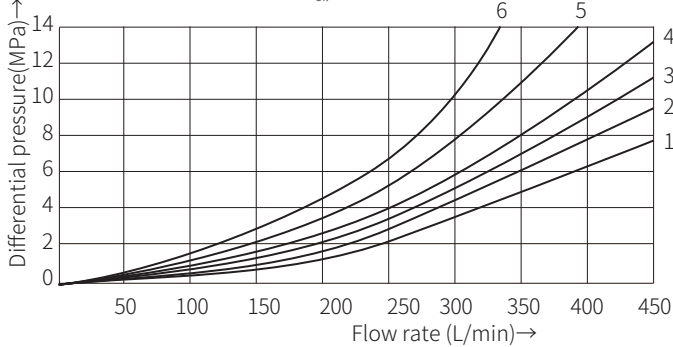
Notice:

When using a 4/3-way valve with pressure centered in the main spool which exceeds the given performance limits, a higher pilot pressure is required. Therefore, if the pressure is 35MPa and the flow is 300L/min in the circuit, the pilot pressure of 1.6MPa is required.

The maximum flow of the valve only depends on the acceptable pressure drop through the valve.

## Characteristic curve

Model 4WEH22...((Measured at  $\vartheta_{oil}=41\text{mm}^2/\text{s}$  and  $t=50^\circ\text{C}$ )



| Spool            | Working position |     |     |     |
|------------------|------------------|-----|-----|-----|
|                  | P-A              | P-B | A-T | B-T |
| E, M, P, Q, U, V | 2                | 2   | 1   | 4   |
| F                | 1                | 2   | 1   | 2   |
| G, T             | 2                | 2   | 2   | 4   |
| H, J, W          | 2                | 2   | 1   | 3   |
| L                | 2                | 2   | 1   | 2   |
| R                | 1                | 2   | 1   | -   |

| Spool | Working position |     |     |
|-------|------------------|-----|-----|
|       | A-T              | B-T | P-T |
| F     | -                | -   | 4   |
| G, P  | -                | -   | 6   |
| H     | -                | -   | 2   |
| L     | 4                | -   | -   |
| T     | -                | -   | 5   |
| U     | -                | 6   | -   |

## Characteristic limit

Model 4WEH22...((Measured at  $\vartheta_{oil}=41\text{mm}^2/\text{s}$  and  $t=50^\circ\text{C}$ )

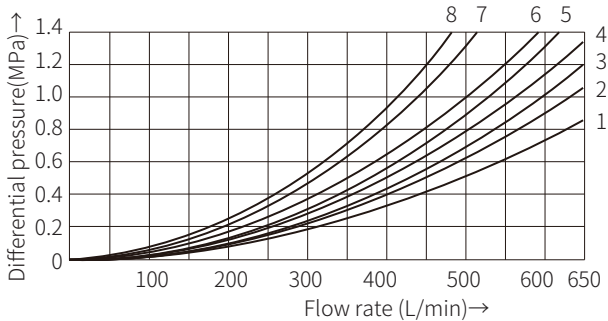
| Allowable flow of 2-position valve L/min                                 |                        |     |     |     |     |
|--------------------------------------------------------------------------|------------------------|-----|-----|-----|-----|
| Spool                                                                    | Working pressure (MPa) |     |     |     |     |
|                                                                          | 7                      | 14  | 21  | 28  | 35  |
| X external supply main valve spring return (with Ppilot min=11bar/14bar) |                        |     |     |     |     |
| C, D, K, Y, Z                                                            | 450                    | 450 | 450 | 450 | 450 |
| X external supply main valve spring return <sup>1)</sup>                 | 450                    | 450 | 320 | 250 | 200 |
| C                                                                        | 450                    | 450 | 450 | 400 | 320 |
| D, Y                                                                     | 450                    | 450 | 450 | 400 | 320 |
| K                                                                        | 450                    | 215 | 150 | 120 | 100 |
| Z                                                                        | 350                    | 300 | 290 | 260 | 160 |
| X external supply hydraulic centered                                     |                        |     |     |     |     |
| HC, HD, HK, HY, HZ                                                       | 450                    | 450 | 450 | 450 | 450 |
| HC../O..                                                                 | 450                    | 450 | 450 | 450 | 450 |
| HD../O..                                                                 | 450                    | 450 | 450 | 450 | 450 |
| HK../O..                                                                 | 450                    | 450 | 450 | 450 | 450 |
| HZ../O..                                                                 | 450                    | 450 | 450 | 450 | 450 |
| HC../OF..                                                                | 450                    | 450 | 450 | 450 | 450 |
| HD../OF..                                                                | 450                    | 450 | 450 | 450 | 450 |
| HK../OF..                                                                | 450                    | 450 | 450 | 450 | 450 |
| HZ../OF..                                                                | 450                    | 450 | 450 | 450 | 450 |

| Allowable flow of 3-position valve L/min |                        |     |     |     |     |
|------------------------------------------|------------------------|-----|-----|-----|-----|
| Spool                                    | Working pressure (MPa) |     |     |     |     |
|                                          | 7                      | 14  | 21  | 28  | 35  |
| X external supply spring centered        |                        |     |     |     |     |
| E, J, L, M, Q, U, W, R                   | 450                    | 450 | 450 | 450 | 450 |
| H                                        | 450                    | 450 | 300 | 260 | 230 |
| G                                        | 400                    | 350 | 250 | 200 | 180 |
| F                                        | 450                    | 270 | 175 | 130 | 110 |
| V                                        | 450                    | 300 | 240 | 220 | 160 |
| T                                        | 400                    | 300 | 240 | 200 | 160 |
| P                                        | 450                    | 270 | 180 | 170 | 110 |

When internal supply, a back pressure valve is required because of negative cover of spools Z, HZ, V and the flow less than 180L/min. It is also required due to negative cover of spools F, G, M, P and T.

1)The specified flow value is the limited value at which the reset spring can return the spool back to the end position when the pilot pressure disappears.

## Characteristic curve

 Model 4WEH25...((Measured at  $v_{oil}=41\text{mm}^2/\text{s}$  and  $t=50^\circ\text{C}$ )


| Spool | Working position |     |     |     | Spool | Working position |     |     |     |
|-------|------------------|-----|-----|-----|-------|------------------|-----|-----|-----|
|       | P-A              | P-B | A-T | B-T |       | P-A              | P-B | A-T | B-T |
| E     | 1                | 1   | 1   | 3   | P     | 4                | 1   | 1   | 5   |
| F     | 1                | 4   | 3   | 3   | Q     | 2                | 2   | 3   | 5   |
| G     | 3                | 1   | 2   | 4   | Z     | 1                | 1   | 1   | -   |
| H     | 4                | 4   | 3   | 4   | U     | 2                | 1   | 1   | 6   |
| J     | 2                | 2   | 3   | 5   | V     | 4                | 4   | 3   | 6   |
| L     | 2                | 2   | 3   | 3   | W     | 1                | 1   | 1   | 3   |
| M     | 4                | 4   | 1   | 4   | T     | 3                | 1   | 2   | 4   |

## Characteristic limit

 Model 4WEH25...((Measured at  $v_{oil}=41\text{mm}^2/\text{s}$  and  $t=50^\circ\text{C}$ )

| Allowable flow of 2-position valve (L/min) |                        |     |     |     |     | with pre-load valve and X port internal supply |
|--------------------------------------------|------------------------|-----|-----|-----|-----|------------------------------------------------|
| Spool                                      | Working pressure (MPa) |     |     |     |     |                                                |
|                                            | 7                      | 14  | 21  | 28  | 35  |                                                |
| Main valve spring return <sup>1)</sup>     |                        |     |     |     |     | Spools C and Z approx. to 180 L/min            |
| C, D, K, Z, Y                              | 700                    | 700 | 700 | 700 | 700 |                                                |
| Main valve spring return <sup>2)</sup>     |                        |     |     |     |     |                                                |
| C                                          | 700                    | 700 | 700 | 700 | 700 |                                                |
| D, Y                                       | 700                    | 650 | 400 | 350 | 300 |                                                |
| K                                          | 700                    | 650 | 420 | 370 | 320 |                                                |
| Z                                          | 700                    | 700 | 650 | 480 | 400 | Spools HC and HZ approximately to 180L/min     |
| Main valve spring return                   |                        |     |     |     |     |                                                |
| HC, HD, HK                                 | 700                    | 700 | 700 | 700 | 700 |                                                |
| HZ, HY                                     | 700                    | 700 | 700 | 700 | 700 |                                                |
| HC.../O                                    | 700                    | 700 | 700 | 700 | 700 |                                                |
| HD.../O                                    | 700                    | 700 | 700 | 700 | 700 |                                                |
| HK.../O                                    | 700                    | 700 | 700 | 700 | 700 |                                                |
| HZ.../O                                    | 700                    | 700 | 700 | 700 | 700 |                                                |
| HC.../OF                                   | 700                    | 700 | 700 | 700 | 700 |                                                |
| HD.../OF                                   | 700                    | 700 | 700 | 700 | 700 |                                                |
| HK.../OF                                   | 700                    | 700 | 700 | 700 | 700 |                                                |
| HZ.../OF                                   | 700                    | 700 | 700 | 700 | 700 |                                                |

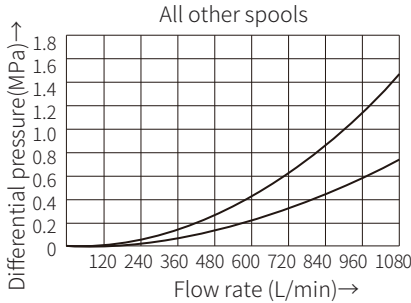
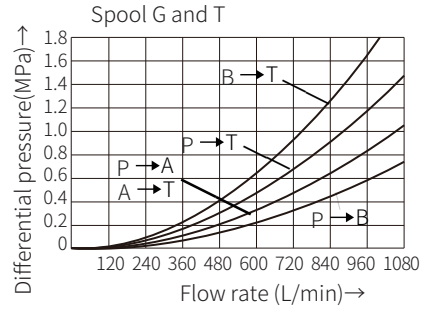
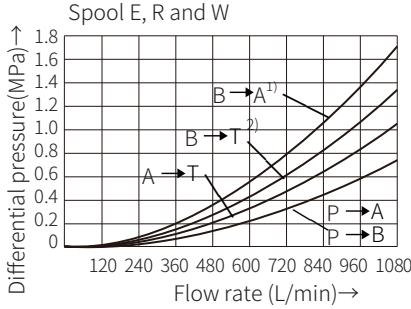
| Allowable flow of 3-position valve (L/min)           |                        |     |     |     |     | with pre-load valve and X port internal supply  |
|------------------------------------------------------|------------------------|-----|-----|-----|-----|-------------------------------------------------|
| Spool                                                | Working pressure (MPa) |     |     |     |     |                                                 |
|                                                      | 7                      | 14  | 21  | 28  | 35  |                                                 |
| spring centered                                      |                        |     |     |     |     | Spools F, G, HP and T approximately to 180L/min |
| E、L、M<br>Q、U、W                                       | 700                    | 700 | 700 | 700 | 650 |                                                 |
| G/T                                                  | 400                    | 400 | 400 | 400 | 400 |                                                 |
| F                                                    | 650                    | 550 | 430 | 330 | 300 |                                                 |
| H                                                    | 700                    | 650 | 550 | 400 | 360 |                                                 |
| J                                                    | 700                    | 700 | 650 | 600 | 520 |                                                 |
| P                                                    | 650                    | 550 | 430 | 330 | 300 |                                                 |
| V                                                    | 650                    | 550 | 400 | 350 | 310 |                                                 |
| R                                                    | 700                    | 700 | 700 | 650 | 680 |                                                 |
| Pressure centered<br>(minimum pilot pressure 1.8MPa) |                        |     |     |     |     |                                                 |
| E/F/H/J                                              | 700                    | 700 | 700 | 700 | 650 |                                                 |
| L/M/P/Q                                              | 700                    | 700 | 700 | 700 | 650 |                                                 |
| R/U/V/W                                              | 700                    | 700 | 700 | 700 | 650 |                                                 |
| G/T                                                  | 400                    | 400 | 400 | 400 | 400 |                                                 |
| When the pilot pressure higher than 3MPa             |                        |     |     |     |     |                                                 |
| G/T                                                  | 700                    | 700 | 700 | 700 | 700 |                                                 |

1) The given flow value can be achieved when the minimum pilot pressure of 1.3MPa exists.

2) The given flow value is limiting the value at which the reset spring can return the valve when the pilot pressure decreases.

## Characteristic curve

Model 4WEH32...((Measured at  $\vartheta_{oil}=41\text{mm}^2/\text{s}$  and  $t=50^\circ\text{C}$ )



- 1) Only for spool R  
2) Not for spool R

## Characteristic limit

Model 4WEH32...((Measured at  $\vartheta_{oil}=41\text{mm}^2/\text{s}$  and  $t=50^\circ\text{C}$ )

| Allowable flow of 2-position valve (L/min) |                        |      |     |     |     |  | Allowable flow of 3-position valve (L/min)            |                        |      |     |     |     | with pre-load valve and X port internal supply    |
|--------------------------------------------|------------------------|------|-----|-----|-----|--|-------------------------------------------------------|------------------------|------|-----|-----|-----|---------------------------------------------------|
| Spool                                      | Working pressure (MPa) |      |     |     |     |  | Spool                                                 | Working pressure (MPa) |      |     |     |     |                                                   |
|                                            | 7                      | 14   | 21  | 28  | 25  |  |                                                       | 7                      | 14   | 21  | 28  | 25  |                                                   |
| Main valve spring return <sup>1)</sup>     |                        |      |     |     |     |  | Main valve spring return <sup>1)</sup>                |                        |      |     |     |     |                                                   |
| C, D, K, Z, Y                              | 1100                   | 1040 | 860 | 750 | 680 |  | E, H, J, L, M<br>Q, U, W, R                           | 1100                   | 1040 | 860 | 750 | 680 |                                                   |
| Main valve spring return <sup>2)</sup>     |                        |      |     |     |     |  | Main valve spring return <sup>2)</sup>                |                        |      |     |     |     |                                                   |
| C                                          | 1100                   | 1040 | 860 | 800 | 700 |  | G, T, H, F, P                                         | 900                    | 900  | 800 | 650 | 450 | Spools F, G, H, P and T approximately to 180L/min |
| D, Y                                       | 1100                   | 1040 | 540 | 480 | 420 |  | V                                                     | 1100                   | 1000 | 680 | 500 | 450 |                                                   |
| K                                          | 1100                   | 1040 | 860 | 500 | 450 |  | Pressure centered<br>(minimum pilot pressure 0.85MPa) |                        |      |     |     |     |                                                   |
| Z                                          | 1100                   | 1040 | 860 | 750 | 650 |  | All spools                                            | 1100                   | 1040 | 860 | 750 | 680 |                                                   |
| Main valve hydraulic return                |                        |      |     |     |     |  |                                                       |                        |      |     |     |     |                                                   |
| HC, HD, HK                                 | 1100                   | 1040 | 860 | 750 | 680 |  |                                                       |                        |      |     |     |     |                                                   |
| HZ, HY                                     | 1100                   | 1040 | 860 | 750 | 680 |  |                                                       |                        |      |     |     |     |                                                   |

Notice:

When using a 4/3-way valve with pressure centered in the main position which exceeds the given performance

- 1) The given flow value can be achieved when the minimum pilot pressure of 1.0MPa exists.  
2) The given flow value is limiting the value at which the reset spring can return the valve when the pilot pressure decreases.

Notice:

When using a 4/3-way valve with pressure centered in the main spool which exceeds the given performance limits, a higher pilot pressure is required. Therefore, if the pressure is 35MPa and the flow is 300L/min in the circuit, the pilot pressure of 1.5MPa is required.

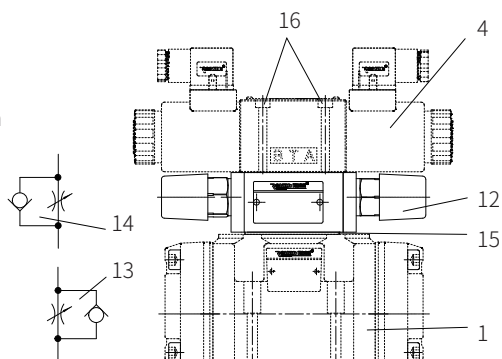
The maximum flow of the valve only depends on the acceptable pressure drop through the valve.

## Switching time adjustment, pressure reducing valve and pre-load valve

### Switching time adjustment

To control the switching time of the main valve(1), a double throttle check valve (12) is installed between the pilot valve and the main valve.

Conversion from meter-in control (13) to meter-out control (14): Remove the pilot valve (4) but retain the O-ring support plate (15), turn the throttle check valve around its longitudinal axis and reassemble it on the mounting surface, install the pilot valve (4). Tightening torque  $M_A=9\text{Nm}$  for fixing screw (16).

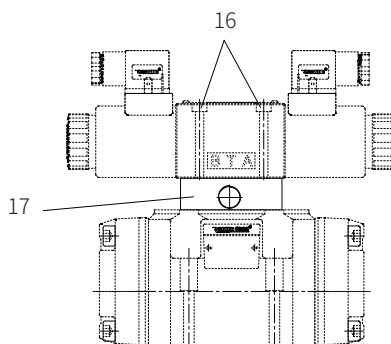


Model 4WEH.../S or S2

### Pressure reducing valve "D3"

The pressure reducing valve (17) must be used if the pilot pressure exceeds 25MPa. The secondary pressure should be maintained at 4.5MPa. When using the pressure reducing valve D3, it must install a plug-in throttle B10 in port P of the pilot valve.

Tightening torque  $M_A=9\text{Nm}$  for fixing screw (16).

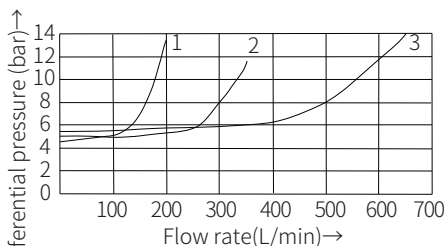


Model 4WEH.../.../D3

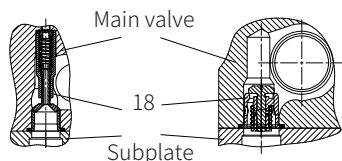
### Pre-load valve (not for size 10)

In the valve with pressureless bypass and internal pilot oil supply, a pre-load valve (18) the differential pressure of the pre-load valve is to be added to the differential pressure of the main valve to result in one total value (see characteristic curve).

The cracking pressure of the valve is about 4.5MPa.



- 1 Size 16
- 2 Size 25
- 3 Size 32



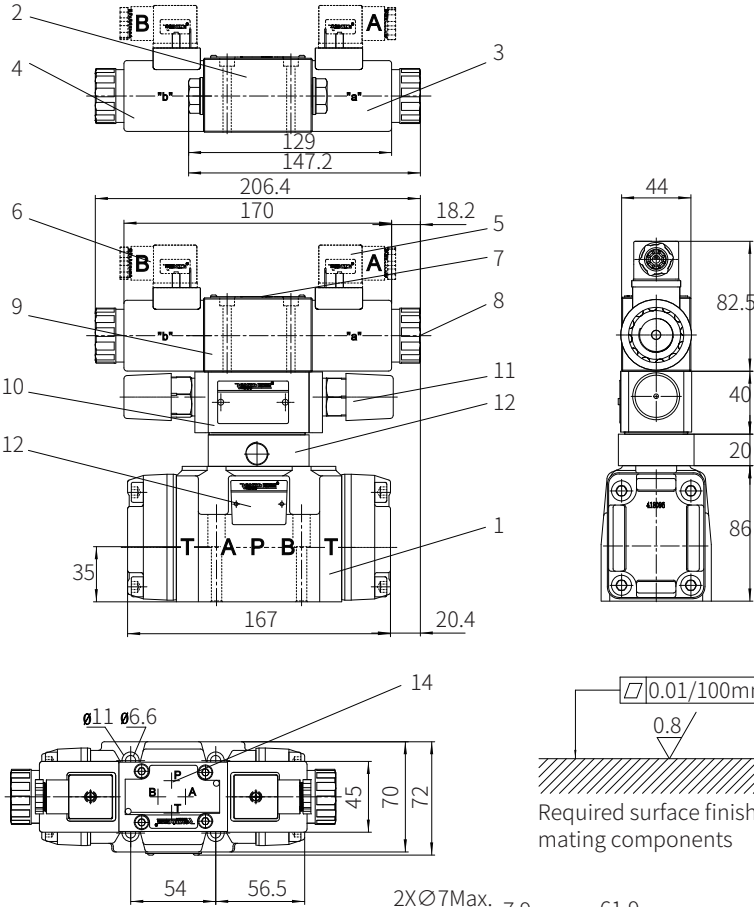
Model 4WEH16...-7X/.../P4.5

Model 4WEH25.../.../P4.5  
4WEH32.../.../P4.5

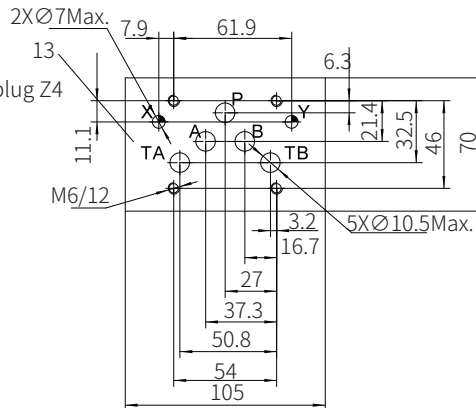
## Component size

Size unit: mm

WEH10...4XJ/...



- 1 Main valve
- 2 22-position valve with onesolenoid and plug Z4
- 3 Solenoid a
- 4 Solenoid b
- 5 Gray plug(or transparent plug)
- 6 Black plug(or transparent plug)
- 7 Name plate of pilot valve
- 8 Manual emergency operation
- 9 2-position or 3-position valve with two solenoids and plug Z4
- 10 Switching time adjustment
- 11 Adjustment bolt
- 12 Pressure reducing valve
- 13 Port layout of main valve (valve mounting surface)
- 14 Port position of pilot oil
- 15 Name plate of complete valve



Valve fixing screw  
M6x45-10.9 grade GB/T70.1-2000  
Tightening torque  $M_A=13.7\text{Nm}$

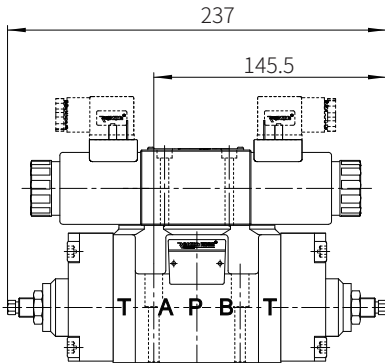
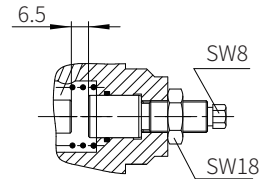
## Component size

**Size unit: mm**

Dimension of additional devices for model WEH10

The installation range of the stroke adjustment is 6.5mm. The stroke limiter is used to adjust the stroke of the main spool. Loosen the lock nut and rotate the adjusting rod clockwise, the stroke of the main spool will be shortened (the adjustment must be carried out without pressure in the control chamber)

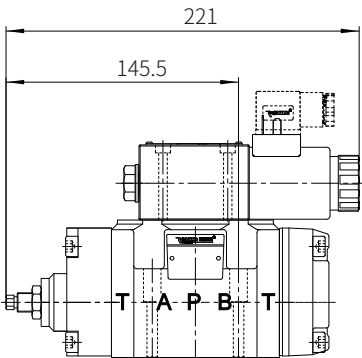
1 turn = 1mm stroke



Stroke adjustment installed on the ends A and B of the main valve.../10

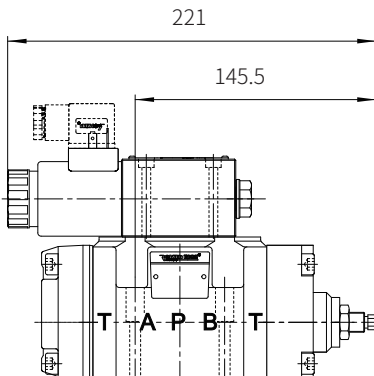
Stroke adjustment installed on the end A of the main valve.../11

Stroke adjustment installed on the end B of the main valve.../12



Stroke adjustment installed on the end A of the main valve.../11

(2-position valve, symbols C, D, K, Z)



Stroke adjustment installed on the end B of the main valve.../12

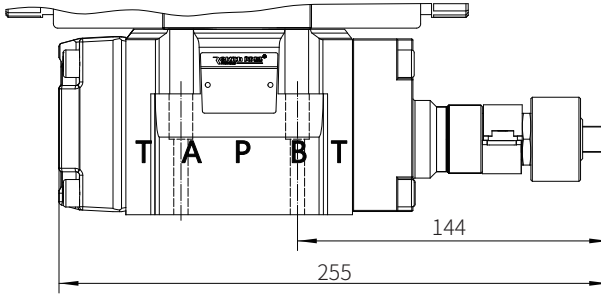
(2-position valve, symbol Y)

## Component size

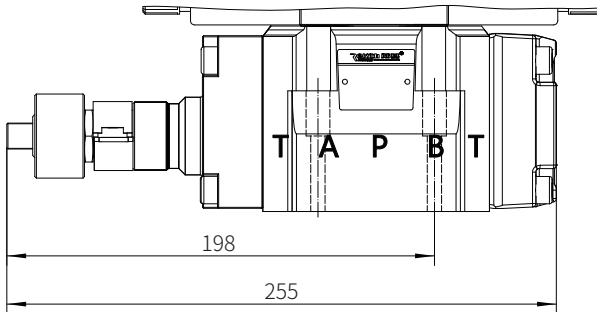
Size unit: mm

WEH10 with "QM" spool position monitoring

Monitored spool position "a"(switch position on B side), ordering code 4WEH10...4XJ/...QMAG24

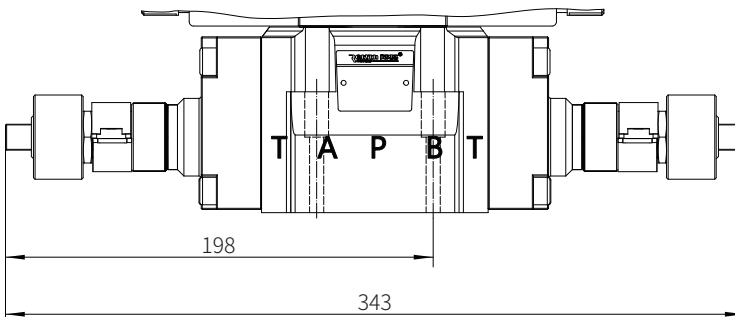


Monitored spool position "b"(switch position on A side), ordering code 4WEH10...4XJ/...QMBG24



Monitored spool position "a" and "b"(switch position on A and B side),  
ordering code 4WEH10...4XJ/...QMABG24

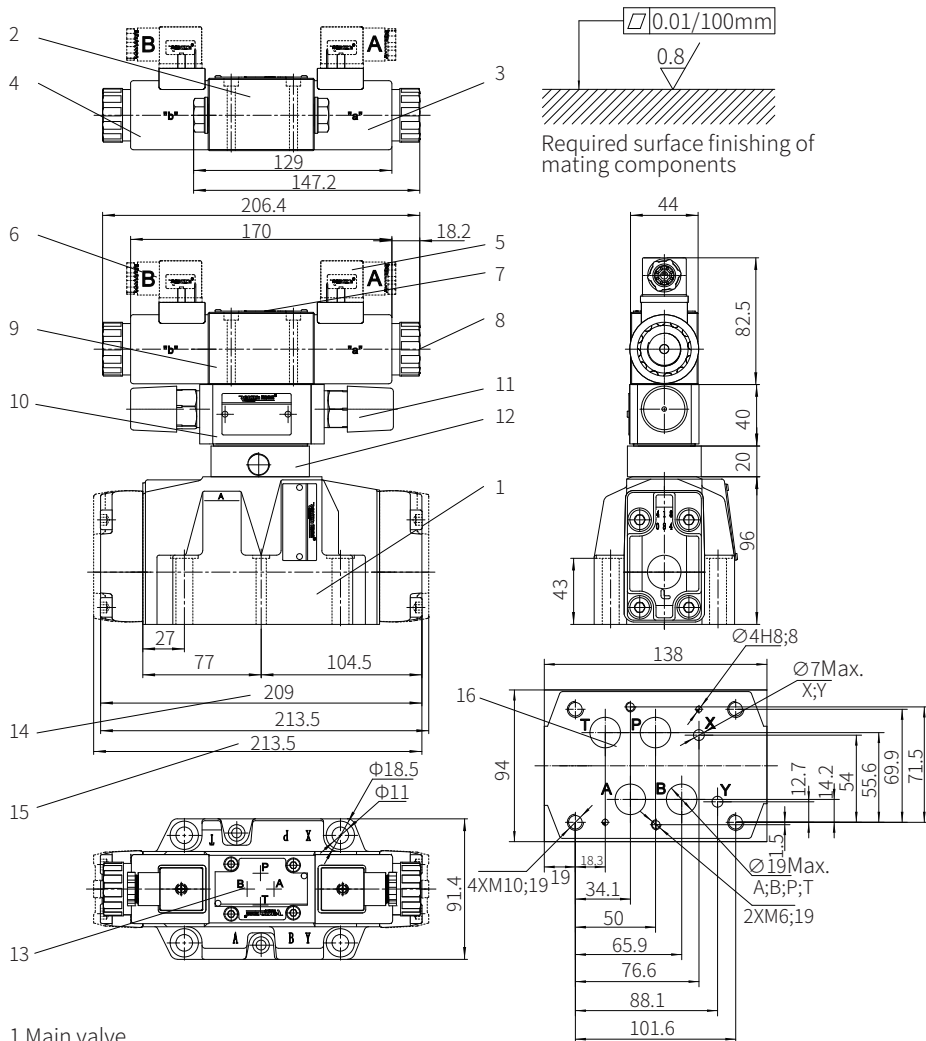
Monitored spool position "0"(switch position on A and B side), ordering code 4WEH10...4XJ/...QMOG24



## Component size

Size unit: mm

WEH16...7XJ/...



- |                                                                 |                                                                                                                                                                             |
|-----------------------------------------------------------------|-----------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| 1 Main valve                                                    |                                                                                                                                                                             |
| 2 2-position valve with onesolenoid and plug Z4                 |                                                                                                                                                                             |
| 3 Solenoid a                                                    |                                                                                                                                                                             |
| 4 Solenoid b                                                    | 13 Port layout of main valve(valve mounting surface)                                                                                                                        |
| 5 Gray plug(or transparent plug)                                | 14 Size of 3-position valve with spring centered                                                                                                                            |
| 6 Black plug(or transparentplug)                                | 15 Size of 2-position valve with spring centered                                                                                                                            |
| 7 Name plate of pilot valve                                     | 16 Main valve connection diagram                                                                                                                                            |
| 8 Manual emergency operation                                    |                                                                                                                                                                             |
| 9 2-position or 3-position valve with two solenoids and plug Z4 |                                                                                                                                                                             |
| 10 Switching time adjustment                                    |                                                                                                                                                                             |
| 11 Adjustment bolt                                              | Valve fixing screw<br>2-M6x55-10.9 grade GB/T70.1-2000<br>Tightening torque $M_A=13.7\text{Nm}$<br>4-M10x60-10.9 grade GB/T70.1-2000<br>Tightening torque $M_A=60\text{Nm}$ |
| 12 Pressure reducing valve                                      |                                                                                                                                                                             |

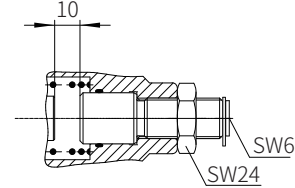
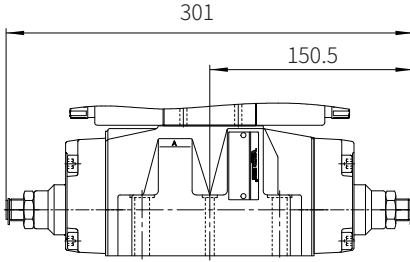
## Component size

Size unit: mm

Dimension of additional devices for model WEH16

The installation range of the stroke adjustment is 10mm. The stroke limiter is used to adjust the stroke of the main spool. Loosen the lock nut and rotate the adjusting rod clockwise, the stroke of the main spool will be shortened (the adjustment must be carried out without pressure in the control chamber)

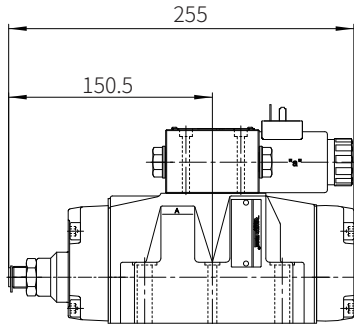
1 turn = 1.5mm stroke



Stroke adjustment installed on the ends A and B of the main valve.../10

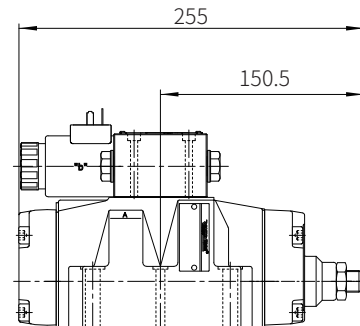
Stroke adjustment installed on the end A of the main valve.../11

Stroke adjustment installed on the end B of the main valve.../12



Stroke adjustment installed on the end A of the main valve.../11

(2-position valve, symbols C, D, K, Z)



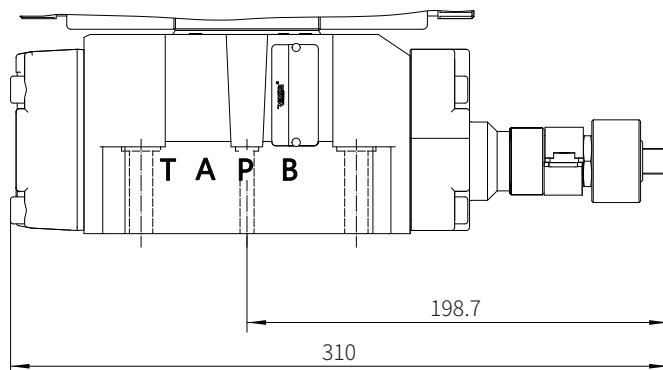
Stroke adjustment installed on the end B of the main valve.../12

(2-position valve, symbol Y)

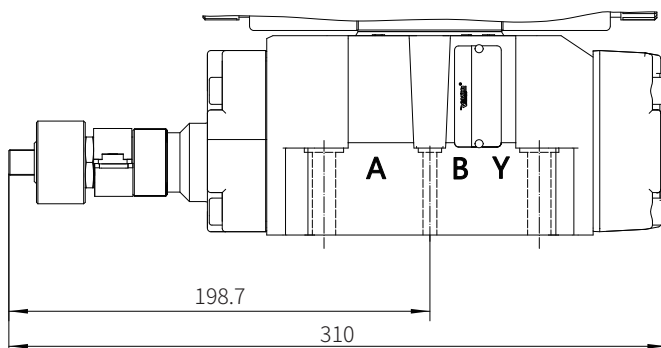
**Component size**
**Size unit: mm**

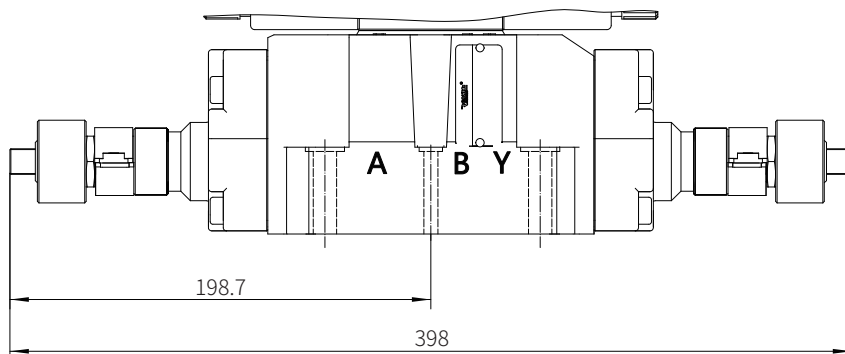
WEH16 with "QM" spool position monitoring

Monitored spool position "a"(switch position on B side), ordering code 4WEH16...7XJ/...QMAG24



Monitored spool position "b"(switch position on A side), ordering code 4WEH16...7XJ/...QMBG24

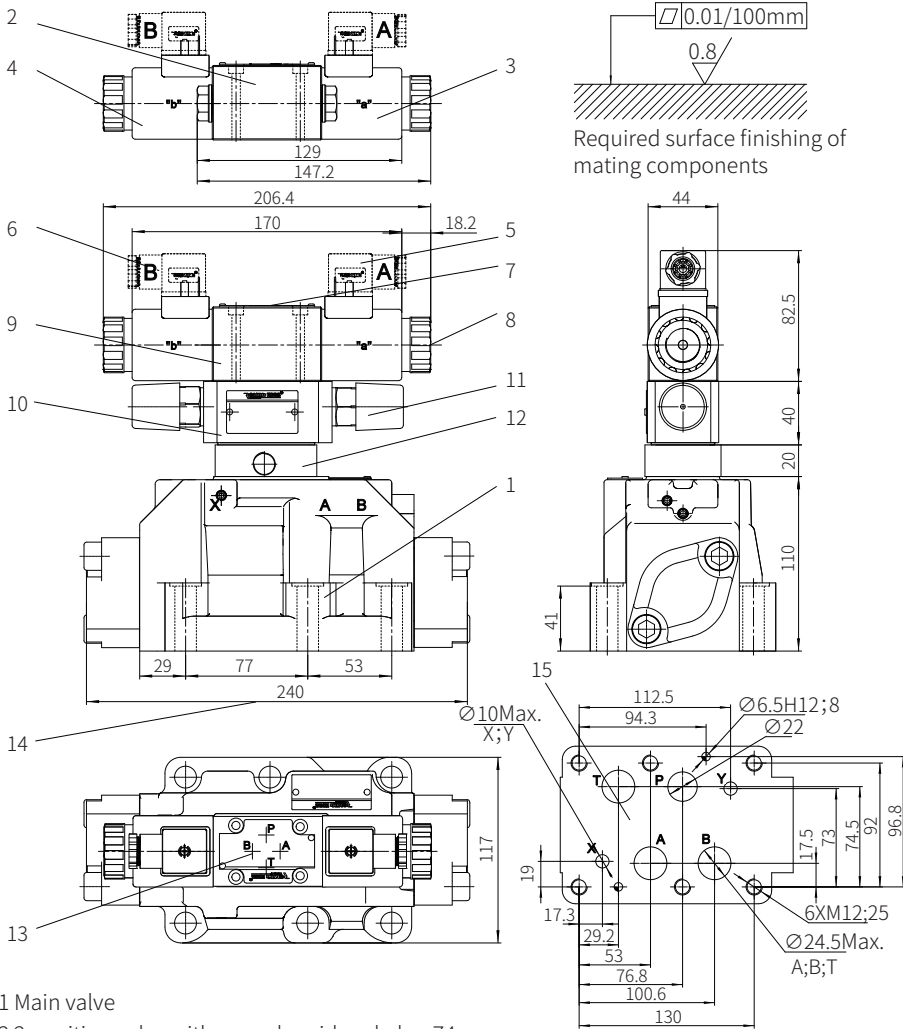

 Monitored spool position "a" and "b"(switch position on A and B side),  
 ordering code 4WEH16...7XJ/...QMABG24

 Monitored spool position "0"(switch position on A and B side),  
 ordering code 4WEH16...7XJ/...QMOG24


## Component size

Size unit: mm

WEH22...TXJ/...



1 Main valve

2 2-position valve with one solenoid and plug Z4

3 Solenoid a

4 Solenoid b

5 Gray plug (or transparent plug)

6 Black plug (or transparent plug)

7 Name plate of pilot valve

8 Manual emergency operation

9 2-position or 3-position valve with two solenoids and plug Z4

10 Switching time adjustment

11 Adjustment bolt

12 Pressure reducing valve

13 Port layout of main valve

(valve mounting surface)

14 Size of 3-position valve with spring centered

15 Main valve connection diagram

Valve fixing screw

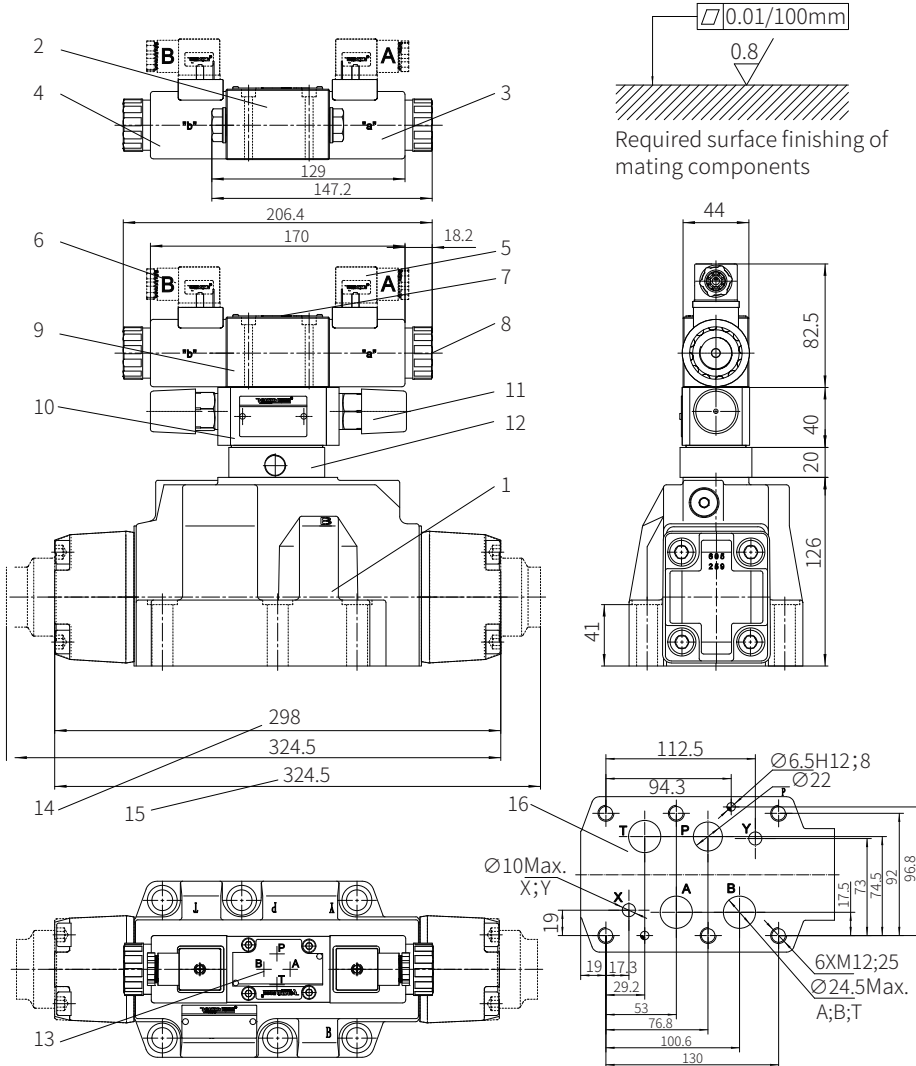
6-M12x60-10.9 grade GB/T70.1-2000

Tightening torque  $M_A = 95 \text{ Nm}$

## Component size

Size unit: mm

WEH25...6XJ/...



7 Name plate of pilot valve  
 8 Manual emergency operation  
 9 2-position or 3-position valve with  
 two solenoids and plug Z4

1 Main valve  
 2 2-position valve with  
 one solenoid and plug Z4  
 3 Solenoid a  
 4 Solenoid b

5 Gray plug (or transparent plug)  
 6 Black plug (or transparent plug)

10 Switching time adjustment  
 11 Adjustment bolt  
 12 Pressure reducing valve

13 Port layout of main valve  
 (valve mounting surface)

14 Size of 3-position valve with spring centered

15 Size of 2-position valve with spring centered

16 Main valve connection diagram

Valve fixing screw  
 6-M12x60-10.9 grade GB/T70.1-2000  
 Tightening torque  $M_A=95\text{Nm}$

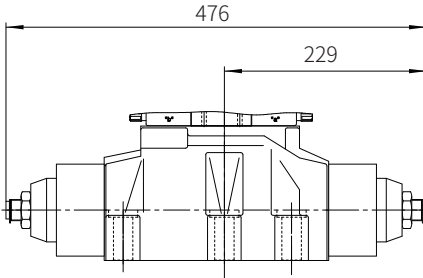
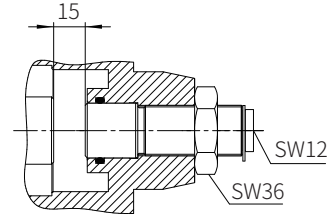
## Component size

Size unit: mm

Dimension of additional devices for model WEH25

The installation range of the stroke adjustment is 15mm. The stroke limiter is used to adjust the stroke of the main spool. Loosen the lock nut and rotate the adjusting rod clockwise, the stroke of the main spool will be shortened (the adjustment must be carried out without pressure in the control chamber)

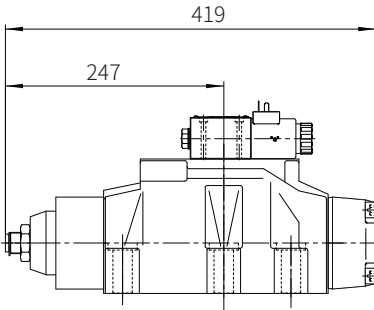
1 turn = 1.5mm stroke



Stroke adjustment installed on the ends A and B of the main valve.../10

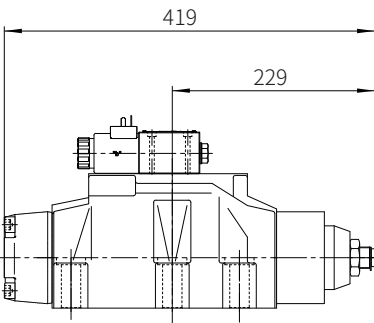
Stroke adjustment installed on the end A of the main valve.../11

Stroke adjustment installed on the end B of the main valve.../12



Stroke adjustment installed on the end A of the main valve.../11

(2-position valve, symbols C, D, K, Z)



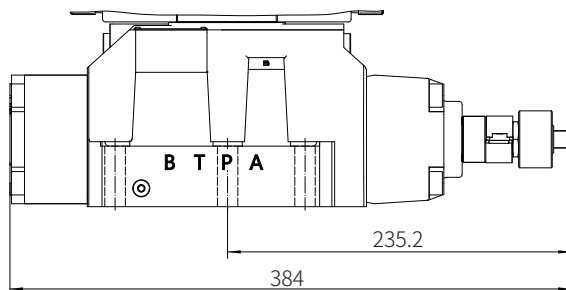
Stroke adjustment installed on the end B of the main valve.../12

(2-position valve, symbol Y)

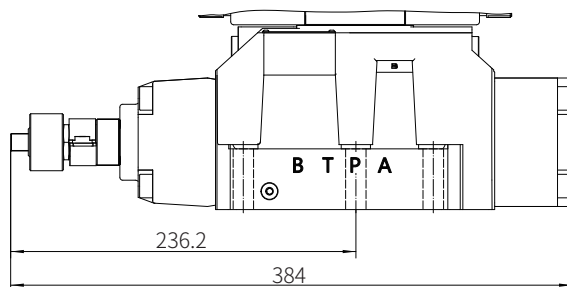
**Component size**
**Size unit: mm**

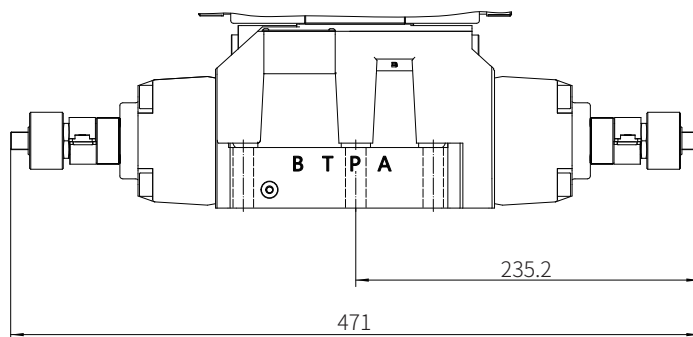
WEH25 with "QM" spool position monitoring

Monitored spool position "a"(switch position on B side), ordering code 4WEH25...6XJ/...QMAG24



Monitored spool position "b"(switch position on A side), ordering code 4WEH25...6XJ/...QMBG24

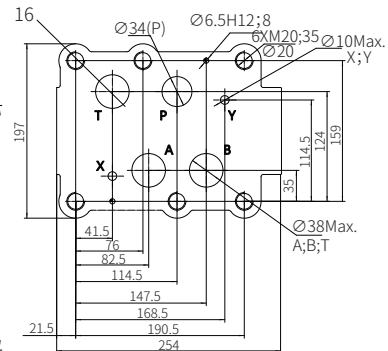
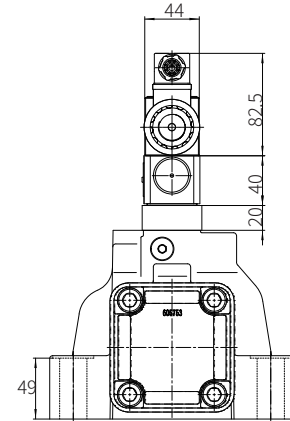
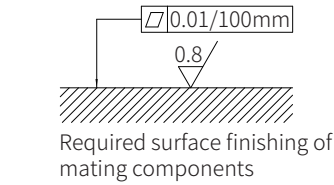
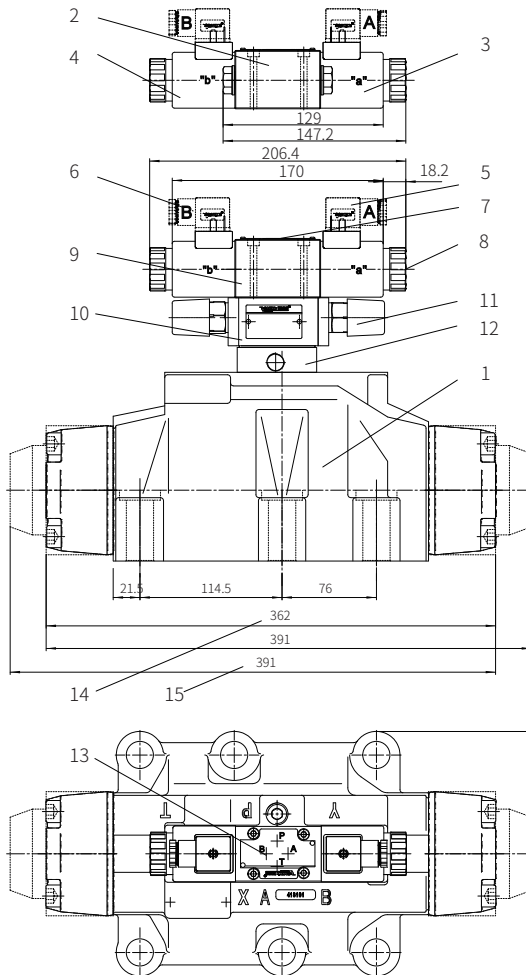

 Monitored spool position "a" and "b"(switch position on A and B side),  
 ordering code 4WEH25...6XJ/...QMABG24

 Monitored spool position "0"(switch position on A and B side),  
 ordering code 4WEH25...6XJ/...QMOG24


## Component size

Size unit: mm

WEH32...6XJ/...



- 1 Main valve
- 2-position valve with  
onesolenoid and plug Z4
- 3 Solenoid a
- 4 Solenoid b
- 5 Gray plug(or transparent plug)
- 6 Black plug (or transparent plug)
- 7 Name plate of pilot valve
- 8 Manual emergency operation
- 9 2-position or 3-position valvewith  
two solenoids and plug Z4
- 10 Switching time adjustment
- 11 Adjustment bolt
- 12 Pressure reducing valve

- 13 Port layout of main valve  
(valve mounting surface)  
14 Size of 3-position valve with spring centered  
15 Size of 2-position valve with spring centered  
16 Main valve connection diagram

Valve fixing screw

6-M20x80-10.9 grade GB/T70.1-2000

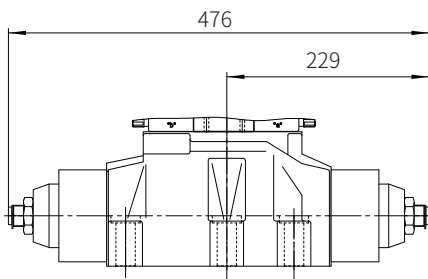
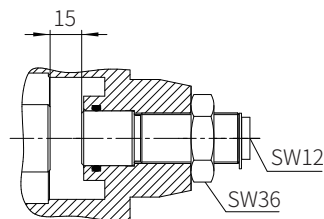
Tightening torque  $M_A = 373 \text{ Nm}$

**Component size**
**Size unit: mm**

Dimension of additional devices for model WEH32

The installation range of the stroke adjustment is 15mm. The stroke limiter is used to adjust the stroke of the main spool. Loosen the lock nut and rotate the adjusting rod clockwise, the stroke of the main spool will be shortened (the adjustment must be carried out without pressure in the control chamber)

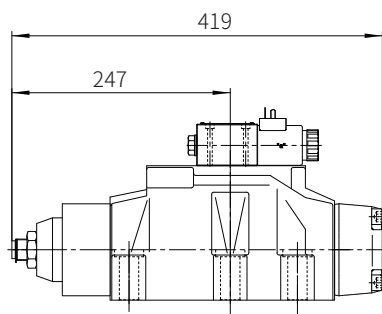
1 turn = 1.5mm stroke



Stroke adjustment installed on the ends A and B of the main valve.../10

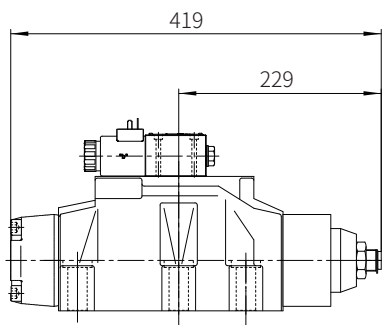
Stroke adjustment installed on the end A of the main valve.../11

Stroke adjustment installed on the end B of the main valve.../12



Stroke adjustment installed on the end A of the main valve.../11

(2-position valve, symbols C, D, K, Z)



Stroke adjustment installed on the end B of the main valve.../12

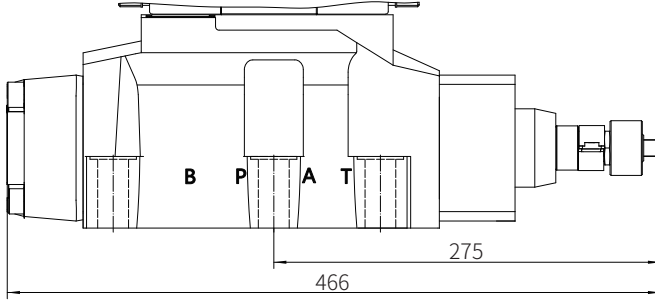
(2-position valve, symbol Y)

**Component size**

**Size unit: mm**

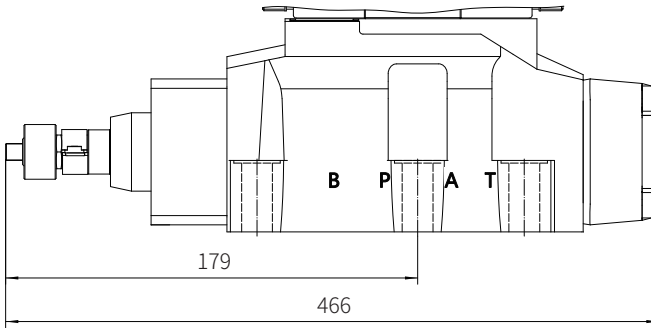
WEH32 with "QM" spool position monitoring

Monitored spool position "a"(switch position on B side), ordering code 4WEH32...6XJ/...QMAG24



01

Monitored spool position "b"(switch position on A side), ordering code 4WEH32...6XJ/...QMBG24



Monitored spool position "a" and "b"(switch position on A and B side),  
ordering code 4WEH32...6XJ/...QMABG24

Monitored spool position "0"(switch position on A and B side), ordering code 4WEH32...6XJ/...QM0G24

