

# Pilot Relief Valve/ Solenoid Pilot Relief Valve

Model: DB/DBW...5XJ



- ◆ Size 10 to 32
- ◆ Maximum working pressure 350 bar
- ◆ Maximum working flow 650L/min

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## Features

- Subplate mounting:  
size 10/20/30
- Threaded connection:  
size 10/15/20/25/32
- Setting pressure:  
5MPa/10MPa/20MPa/31.5bar/35MPa
- Flow rate:  
250L/min (for size 10 only)  
500L/min (for size 15, 20, 25)  
650L/min (for size 32 only)

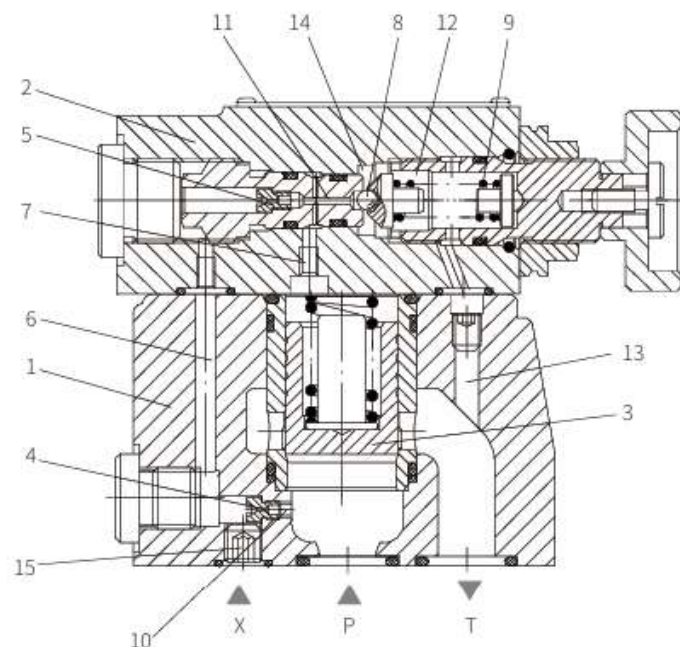
The DB and DBW pressure control valves are pilot operated relief valves.  
They are used to limit (DB), or to limit and unload by solenoids (DBW) of working pressure.

#### Pilot relief valve Model DB

This valve is basically composed of main valve (1) with main spool inserted (3) and pilot valve (2) with pressure adjustment element.

The pressure of port P acts on the main spool (3), meanwhile, the pressure is applied via control lines (6) and (7) with orifices (4) and (5) to the spring loaded side of the main spool (3) and on the ball (8) in the pilot valve (2). When the pressure in port P rises excess the spring setting pressure, the ball (8) overcomes the spring pressure (9) to open the pilot valve.

The signal is obtained internally via the control channels (10) and (6) from port P. The oil fluid on the spring loaded side of the main spool (3) flows into spring chamber (12) via control line (7), throttle (11) and ball (8). Thus, it flows internally via control line (13) into the tank for model DB, or flows externally via control line (14) into the tank for model DB...Y. Because of throttle (4) and (5), the pressure drop occurs at the main spool (3) and the connection from port P to port T is opened. The fluid flows from port P to port T while the setting working pressure is no changing. The pressure relief valve can unload or shift the different pressure (second pressure stage) by "X" port.

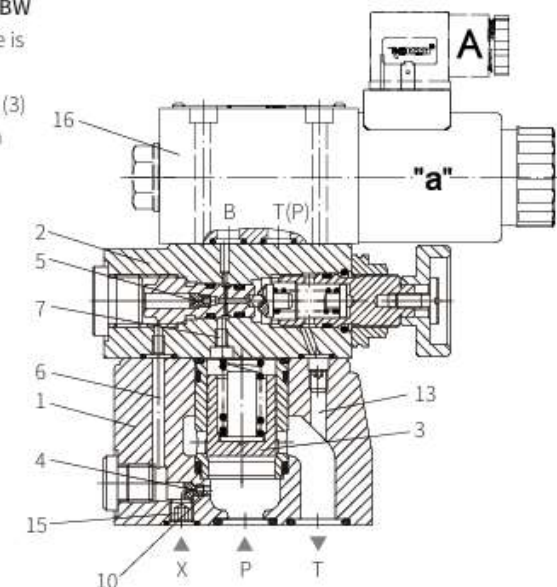


Model DB10-1-5XJ/

#### Solenoid pilot relief valve Model DBW

In principle, the function of this valve is same with model DB.

But the unloading of the main spool (3) is achieved by operating the built-on directional valve (16).



Model DBW10-1-5XJ/

#### Solenoid pilot relief valve with switching shock damping(sandwich), model DBW...S...R12

The connection from B2 to B1 opens with delay when switching shock damping valve (17) used, it can prevent pressure peaks and unloading shocks in the return line. The valve is installed between pilot valve and directional control valve (16). The degree of damping (unloading shock) depends on the size of throttle (18). Throttle Ø1.2mm is used as standard size (ordering code...R12...).

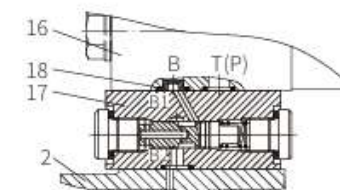
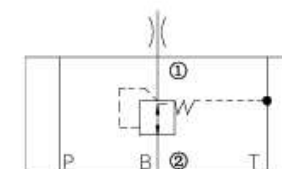


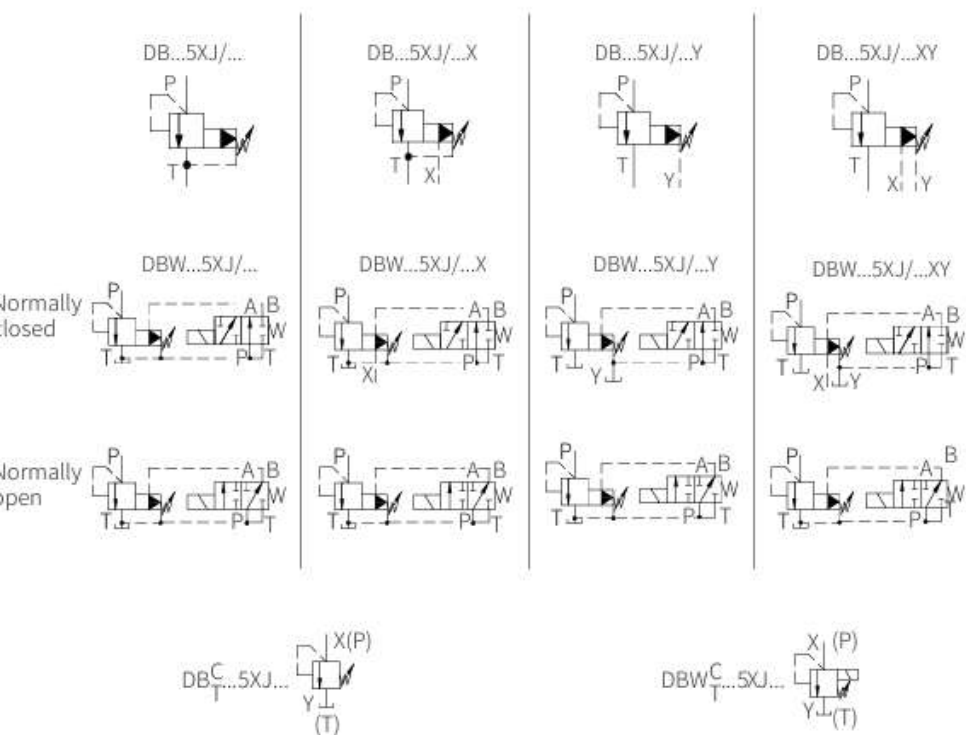
Illustration: directional valve opened



- The unloading function (directional valve function of DBW) cannot be used as safety function!
- When power off or cable breakage, Model DBW... B... 5XJ/... should use the minimum setting pressure (circulation pressure).
- When power off or cable breakage, the pressure relief function of model DBW...A...5XJ/...is launched.
- The back pressure of pilot oil internal drain in port T or external drain in port Y is 1:1 added in pilot control pressure.



## Functional symbols



## Technical parameters

| Size                                                                                           |                       |       | Size 10<br>DB...10                                                                                                                                                                                                                             | Size 15<br>DB...15G | Size 20<br>DB...20 | Size 25<br>DB...25G | Size 32<br>DB...30 |
|------------------------------------------------------------------------------------------------|-----------------------|-------|------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|---------------------|--------------------|---------------------|--------------------|
| Weight Subplate mounting                                                                       | - DB...               | Kg    | 2.6                                                                                                                                                                                                                                            | —                   | 3.5                | —                   | 4.4                |
|                                                                                                | - DBW...              | Kg    | 4.05                                                                                                                                                                                                                                           | —                   | 4.95               | —                   | 5.85               |
|                                                                                                | - DBC...              | Kg    | 1.2                                                                                                                                                                                                                                            |                     |                    |                     |                    |
|                                                                                                | - DBWC...             | Kg    | 2.65                                                                                                                                                                                                                                           |                     |                    |                     |                    |
|                                                                                                | - DBC10 or 30...      | Kg    | 1.5                                                                                                                                                                                                                                            |                     |                    |                     |                    |
|                                                                                                | - DBWC10 or 30 ...    | Kg    | 2.95                                                                                                                                                                                                                                           |                     |                    |                     |                    |
| Threaded connection                                                                            | - DB...G              | Kg    | 5.3                                                                                                                                                                                                                                            | 5.2                 | 5.1                | 5.0                 | 4.8                |
|                                                                                                | - DBW...G             | Kg    | 6.75                                                                                                                                                                                                                                           | 6.65                | 6.55               | 6.45                | 6.25               |
| Installation position                                                                          |                       |       | optional                                                                                                                                                                                                                                       |                     |                    |                     |                    |
| Environment temperature range                                                                  | -DB...                | °C    | -30 to +50 (NBR seal)<br>-20 to +50 (FRM seal)                                                                                                                                                                                                 |                     |                    |                     |                    |
|                                                                                                | -DBW...               | °C    | -30 to +50 ((NBR seal)<br>-20 to +50 (FRM seal)                                                                                                                                                                                                |                     |                    |                     |                    |
| Minimum strength of valve body material<br>(use for subplate mounting and DBC.../DBWC..valves) |                       |       | The selection of valve body material has been included in the safety factor in all condition (e.g. referenced pressure strength, thread strength and tightening torques.)                                                                      |                     |                    |                     |                    |
| Hydraulic                                                                                      |                       |       |                                                                                                                                                                                                                                                |                     |                    |                     |                    |
| Maximum working pressure                                                                       | — Oil port P, X       | MPa   | 35.0                                                                                                                                                                                                                                           |                     |                    |                     |                    |
|                                                                                                | — Oil port T          | MPa   | 31.5                                                                                                                                                                                                                                           |                     |                    |                     |                    |
| Maximum back pressure                                                                          | — Oil port Y (DB)     | MPa   | 31.5                                                                                                                                                                                                                                           |                     |                    |                     |                    |
|                                                                                                | — Oil port Y, T (DBW) | MPa   | 21.0 (DC solenoid)<br>16.0 (AC solenoid)                                                                                                                                                                                                       |                     |                    |                     |                    |
| Maximum setting pressure                                                                       |                       | MPa   | 5.0; 10.0; 20.0; 31.5; 35.0                                                                                                                                                                                                                    |                     |                    |                     |                    |
| Minimum setting pressure                                                                       |                       | MPa   | Interrelated with flow (see the curve)                                                                                                                                                                                                         |                     |                    |                     |                    |
| Maximum flow                                                                                   | Subplate mounting     | L/min | 250                                                                                                                                                                                                                                            | —                   | 500                | —                   | 650                |
|                                                                                                | Threaded connection   | L/min | 250                                                                                                                                                                                                                                            | 500                 | 500                | 500                 | 650                |
| Oil fluid                                                                                      |                       |       | Mineral oil(HL,HLP) <sup>1)</sup> in accordance with DIN 51524; fast living organisms degraded oil according to VDMA 24568; HETG(Rapeseed oil) <sup>1)</sup> ; HEPG(Polyethylene glycol) <sup>2)</sup> ; HEES(synthetic ester) <sup>2)</sup> ; |                     |                    |                     |                    |
| Oil temperature range                                                                          |                       | °C    | -30 to +80 (NBR seal)<br>-20 to +80 (FRM seal)                                                                                                                                                                                                 |                     |                    |                     |                    |
| Viscosity range                                                                                |                       | mm²/s | 10 to 800                                                                                                                                                                                                                                      |                     |                    |                     |                    |
| Cleanliness of oil <sup>3)</sup>                                                               |                       |       | The maximum allowable pollution level of oil is ISO4406 Class 20/18/15                                                                                                                                                                         |                     |                    |                     |                    |

1)For NBR seal and FKM seal

2)Only for FKM seal

3)The oil must meet the cleanliness degree requested by the components in the hydraulic system.  
Effect oil filtration can prevent failure and increase the service life of the components.

(Measured when using HLP46,  $\vartheta_{oil} = 40^\circ\text{C} \pm 5^\circ\text{C}$ )

