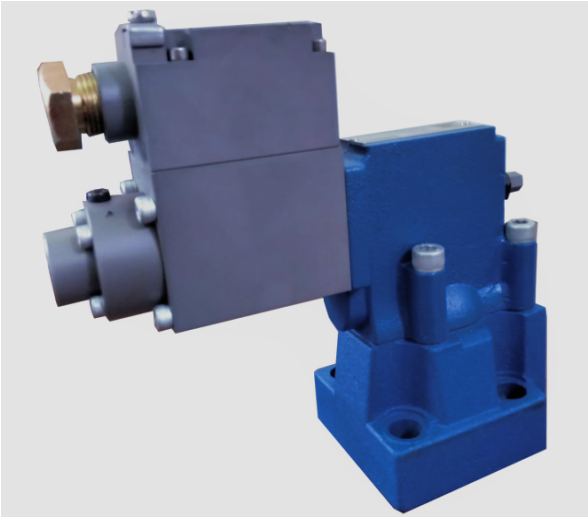
# Explosion isolation Proportional pressure relief valve

## Type HD-DBE/DBEM...30B/FB



Sizes 10, 25 and 32
Up to 315 bar
Up to 600 L/min

### Features

-Sub-plate mounting:
- Porting pattern to DIN 24 340 form E and ISO 6264
- For installation in manifolds
- 4 pressure ratings
- Max. pressure limitation , optional
- Amplifier type VT-2000 (must be ordered separately)

### Contents

## Function and configuration

DBE valves are pilot operated pressure relief valves. They are used to continuously set the pressure in hydraulic systems by electrical signal.
Basically these valves consist of a pilot valve (1) with proportional solenoid (2) and the main valve (3) with main spool insert (4).

**Type HD-DBE...FB**
The pressure limit is in relation to the electrical current value and set by the proportional solenoid (2). The system pressure is applied to the main spool (4). At the same time the pressure is applied to the spring loaded side of the main spool (4) and the pilot poppet (6) via orifice (5) at the pilot valve (1). If the hydraulic force exceeds the solenoid force, the pilot poppet (6) opens. Pilot fluid can flow back to tank and pressure drop caused by the orifices effects the main spool (4). Then main spool (4) opens the channel from pump to tank.

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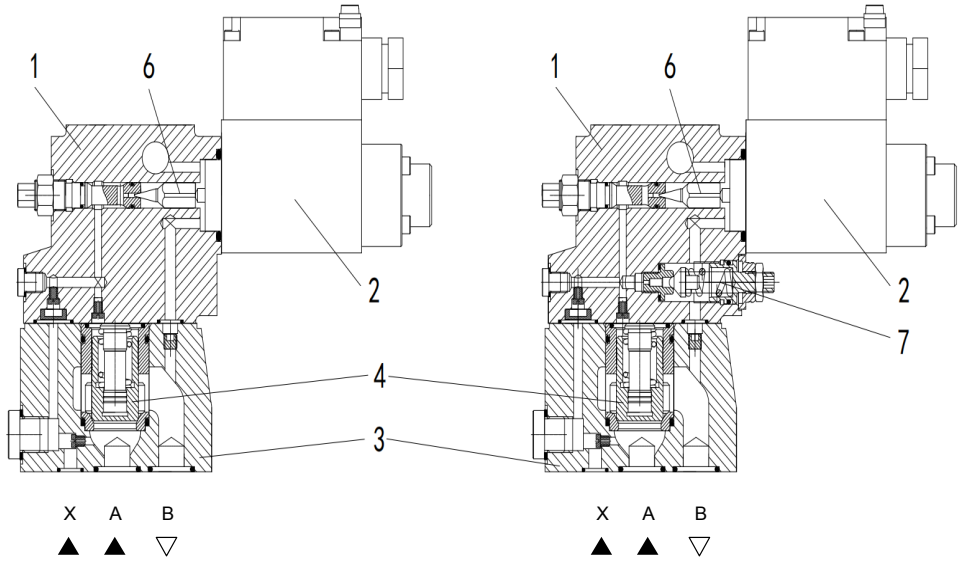
Optionally the valve can be supplied with an additional spring loaded pilot control valve (7) for maximum pressure safety (redundant pressure safety).






**Type HD-DBE...FB** **Type HD-DBEM...FB**

## Ordering code

| 01 | | 02 | 03 | 04 | | 05 | | 06 | 07 | 08 | | 09 | 10 |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| HD | – | DBE | | | – | 30B | / | | | G24 | / | FB | * |

| | | |
|---|---|---|
| 01 | Huade hydraulic | HD |
| 02 | Proportional pressure relief valve | DBE |
| 03 | Without maximum pressure safety | No code |
| | With maximum pressure safety | M |
| 04 | Nominal size 10 | 10 |
| | Nominal size 25 | 20 |
| | Nominal size 32 | 30 |
| 05 | Series 30 | 30B |
| 06 | Max pressure 50 Bar | 50 |
| | Max pressure 100 Bar | 100 |
| | Max pressure 200 Bar | 200 |
| | Max pressure 315 Bar | 315 |
| 07 | Pilot oil return external | Y |
| | Unloading port X, pilot oil return external | XY |
| 08 | 24 V DC voltage | G24 |
| 09 | Explosion isolation Exd I | FB |
| | Explosion isolation Exd II C T4 | FB1 |
| 10 | Further details in the plain text | * |

## Symbols


HD-DBE...Y...FB


HD-DBE...XY...FB


HD-DBEM...Y...FB


HD-DBEM...XY...FB

## Technical data

| | | | | |
|---|---|---|---|---|
| Fluid | | Mineral oil suitable for NBR and FKM seal | | |
| | | Phosphate ester for FKM seal | | |
| Fluid temperature range | °C | -30 to +80 (NBR seal) | | |
| | | -20 to +80 (FKM seal) | | |
| Viscosity range | $mm^2/s$ | 2.8 to 380 | | |
| Degree of contamination | | Maximum permissible degree of fluid contamination:<br>Class 9. NAS 1638 or 20/18/15, ISO4406 | | |
| Max.operating pressure<br>Port A, B, X | bar | 315 | | |
| Max.setting pressure | bar | 50; 100; 200; 315 | | |
| Min.setting pressure | | In relation to Flow (Q), see characteristic curves | | |
| Pressure at zero command value | | = min.setting pressure | | |
| Return oil pressure port Y | bar | Separate and at zero pressure to tank | | |
| Max. pressure safety<br>(infinitely adjustable) | | setting pressure | Pressure range under Max. safety pressure | |
| | | 50 bar | $10\text{-}60^{+20}$ bar | |
| | | 100 bar | $10\text{-}120^{+20}$ bar | |
| | | 200 bar | $10\text{-}220^{+20}$ bar | |
| | | 315 bar | $10\text{-}340^{+20}$ bar | |
| Max. pressure safety<br>setting condition | | When rated pressure is 50 bar, between 60 bar and 80 bar | | |
| | | When rated pressure is 100 bar, between120 bar and 140 bar | | |
| | | When rated pressure is 200 bar, between 220 bar and 240 bar | | |
| | | When rated pressure is 315 bar, between 340 bar and 360 bar | | |
| Nominal size | | 10 | 25 | 32 |
| Max. flow-rate | L/min | 200 | 400 | 600 |
| Pilot oil (for pilot valve) | L/min | 0.7 to 2 | | |
| Linearity | | ±3.5% | | |
| Repeatability | | <±2% | | |
| Hysteresis | | with shimmy | | without shimmy |
| | | ±1.5% P max<br>(200Hz, amplitude 200mAssl) | | ±4.5% P max |
| Shifting time | | 30~150ms (undependent with the system) | | |

## Electrical data

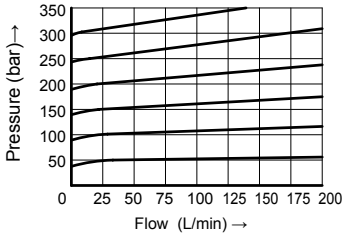
| | | |
|---|---|---|
| Power source | | DC |
| Min. solenoid current | mA | 100 |
| Max. solenoid current | mA | 800 |
| Coil resistance | | 19.5Ω at 20°C , Max. warm value : 28.8Ω |
| Working status | | Continuous |
| Max. working enviromental temperature | | +50°C |
| Electrical connection | | Plug-in connector to DIN EN 175301-803/ISO 4400 |
| Insulation to DIN 40 050 | | IP 65 |
| Ampilfier | | VT2000 |

## Characteristic curves

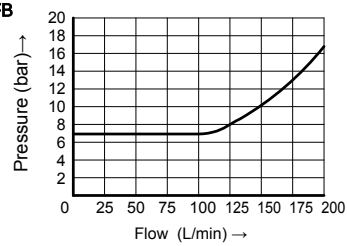
(Measured at $\vartheta_{oil}$ =40°C ±5°C , using HLP46)

Operating pressure in relation to the flow

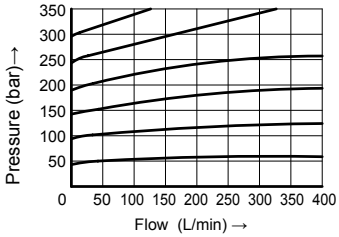
**HD-DBE10...FB**

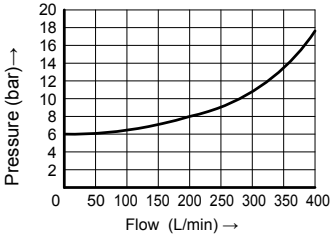



Min. setting pressure in relation to the flow

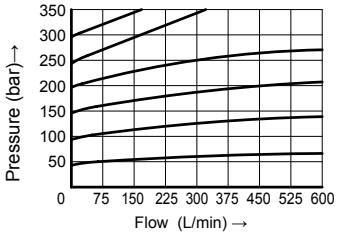


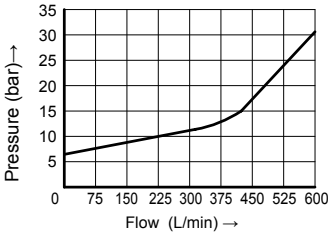

**HD-DBE20...FB**




**HD-DBE30...FB**

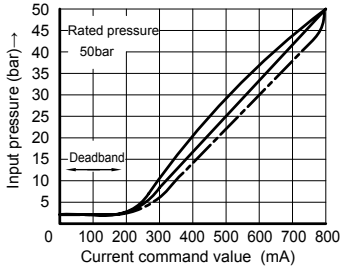


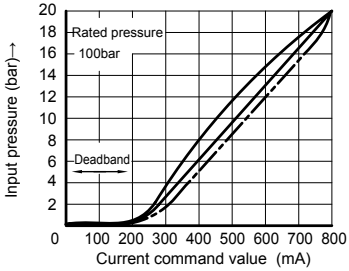



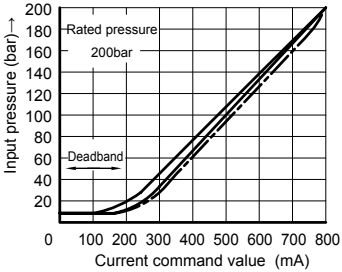
## Characteristic curves

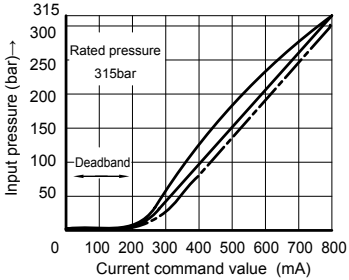
(Measured at $\vartheta_{oil}$=40°C ±5°C , using HLP46)

**Inputting pressure/current demand curve type HD-DBE10, 20 and 30...FB**




Measured under fow 27 L/min of type HD-DBE10,20and30...FB

**Hysteresis**

With shimmy ————

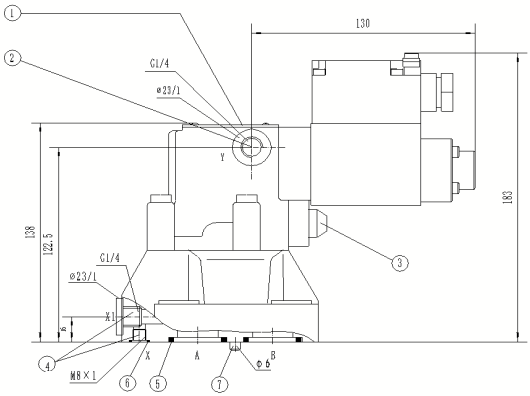
Without shimmy —·—·—

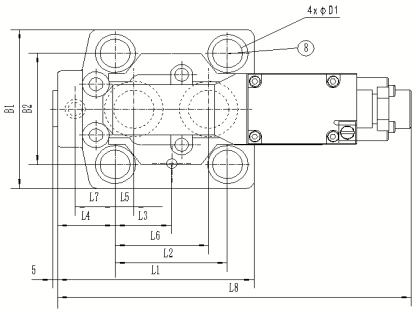
**Note:** To get min. preset pressure,
pilot current is not permitted to exceed 100mA .

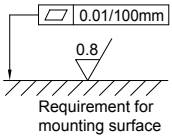
## Unit dimensions

(Dimensions in mm)

**Pressure relief valve of type HD-DBE/DBEM...FB**




1 Name plate
2 (Port Y)pilot oil drain always external and separate to tank at zero pressure.
3 Max. pressure limitation
4 External pilot supply (X and X1, optional)
5 O-ring (port A and B)
6 O-ring 9.25×1.78( port X)
7 Locating pin
8 Fixing screw hole

**Valve fixing screws:**

Internal hexagon screw GB/T 70.1-10.9,

**DBE/DBEM10:** M12×45, tightening torque, $M_A$=130 Nm

**DBE/DBEM20:** M16×50, tightening torque, $M_A$=310 Nm

**DBE/DBEM30:** M18×50, tightening torque, $M_A$=430 Nm

| Type | | B1 | B2 | Weight | O-ring (Port A and port B) | | |
|---|---|---|---|---|---|---|---|
| HD-DBE(M)...FB | 10 | 78 | 53.8 | 4.4kg | 17.12×2.62 | | |
| | 20 | 100 | 70 | 4.8kg | 28.17×3.53 | | |
| | 30 | 115 | 82.6 | 7.1kg | 34.52×3.53 | | |
| Type | | L1 | L2 | L3 | L4 | L5 | L6 |
| HD-DBE(M)...FB | 10 | 91 | 53.8 | 22.1 | 27.5 | 22.1 | 47.5 |
| | 20 | 116 | 66.7 | 33.4 | 33.3 | 11.1 | 55.6 |
| | 30 | 147.5 | 88.9 | 44.5 | 41 | 12.7 | 76.2 |
| Type | | L7 | L8 | D1 | D2 | D3 | D4 |
| HD-DBE(M)...FB | 10 | 0 | 193.5 | 14 | M12 | 6 | 12 |
| | 20 | 23.8 | 207 | 18 | M16 | 6 | 22 |
| | 30 | 31.8 | 217 | 20 | M18 | 7 | 30 |