

<b>BEIJING HUADE HYDRAULIC INDUSTRIAL GROUP Co.,LTD</b>	<b>Proportional pressure reducing valve of 3-way design Types HD-3DREP6 and HD-3DREPE6</b>			
	Size 6	Up to 10 MPa	Up to 15 L/min	

**Features:**

- Directly controlled proportional valves for the control of the pressure and direction of a flow
- Actuated via proportional solenoids with central thread and removable coil
- Hand override, optional
- Spring centered control spool
- Type HD-3DREPE with integrated electronics, interface A1
- External control electronics for type HD-3DREP:
- Analogue amplifier type HD-VT-VSPA2-50-1X/...in Eurocard format
- Digital amplifier type HD-VT-VSPD-1-1X/...in Eurocard format
- Electrical amplifier type HD-VT-11118 of modular design
- Valve and proportional control electronics from a single source



**Function, section**

The 3-way pressure reducing valve type HD-3DREP6...is directly actuated by proportional solenoids. They convert an electrical input signal into a proportional pressure output signal.

The proportional solenoids are controllable wet pin DC solenoids with central thread and removable coil. The solenoids are controlled optionally via external control electronics(type HD-3DREP)or by integrated control electronics(type HD-3DREPE).

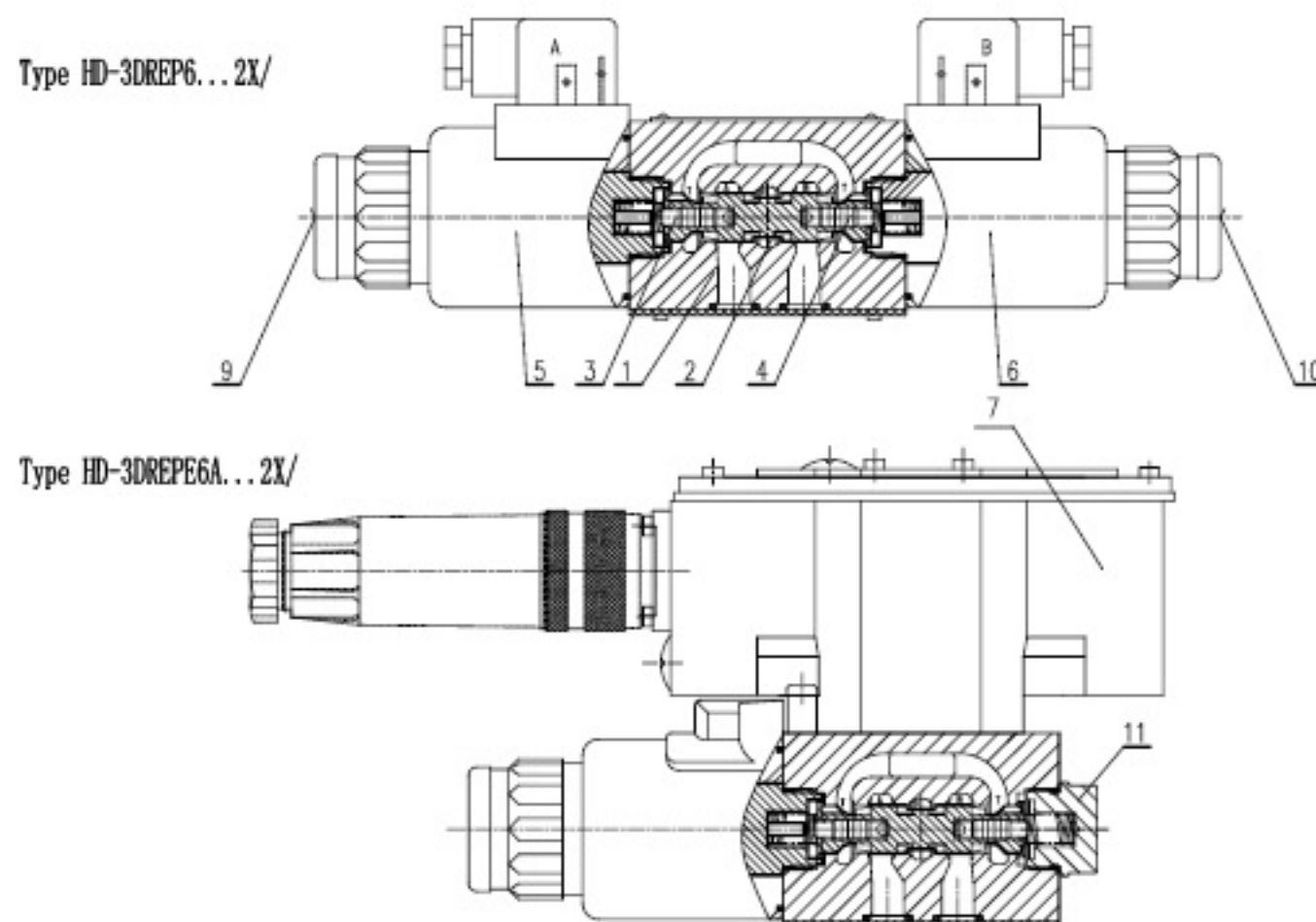
The valve mainly comprises of:solenoids(5 and 6),housing(1),control spool(2)with pressure measuring spools(3 and 4) and optional integrated valve electronics(7).

With the solenoids(5 and 6)de-energised the control spool(2)is held in its centre position by compression springs. The control spool (2)is directly actuated when one of the solenoids is energised.

E.g. by energising solenoid (5):the pressure measuring spool(3)and control spool(2)move to the right in proportion to the electrical input signal. The connection from P to B and A to T is via orifice form cross-sections with progressive flow characteristics.

De-energisation of the solenoid (5):the control spool(2)is returned to its centre position by the compression springs. In the middle position the connections A and B to T are opened, therefore the pressure fluid can freely flow to tank. An optional hand overrides(9 or 10),makes is possible to move the control spool(2)without energising the solenoid.

The function of this version of the 2 position valve is basically the same as that of the valve with 3 switching position. The 2 position valves are however only fitted with either solenoid 5 or 6. A plug (11)is fitted in place of the second solenoid.



## Ordering details

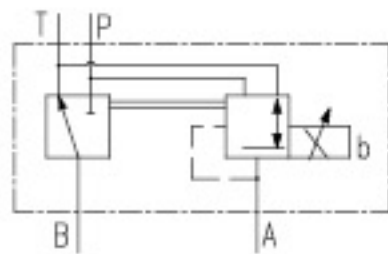
HD-3DREP 6-2X/E G24 / \*

Technology of Beijing  
Huade Hydraulic =HD

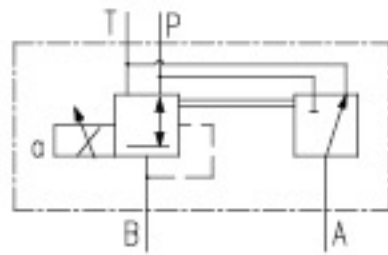
For external control electronics =No code  
With integrated control electronics =E

Nominal size 6 = 6

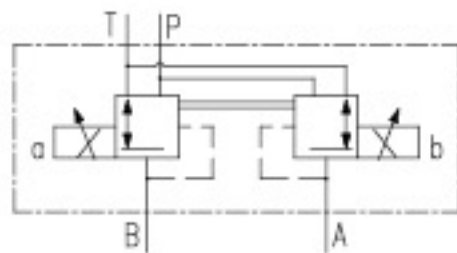
### Symbols



=A



=B



=C

Further details in clear text

No code= NBR seals  
V= FKM seals

No code = for HD-3DREP  
for HD-3DREPE

A1 = Com. value input  $\pm 10V$

For HD-3DREP  
K4= With component plug  
Without plug-in connector

For HD-3DREPE  
K31= With component plug  
Without plug-in connector

No code = Without hand override

N9 = With protected hand override

G24 = Supply voltage for the control electronics  
24V DC

E = Proportional solenoid with removable coil

16 = Pressure stage 1.6MPa

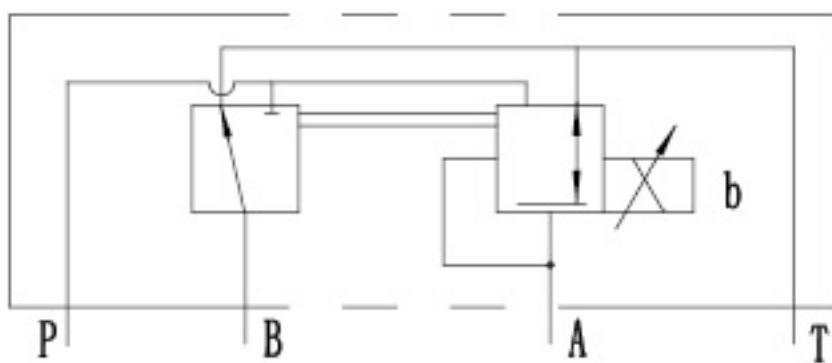
25 = Pressure stage 2.5MPa

45 = Pressure stage 4.5MPa

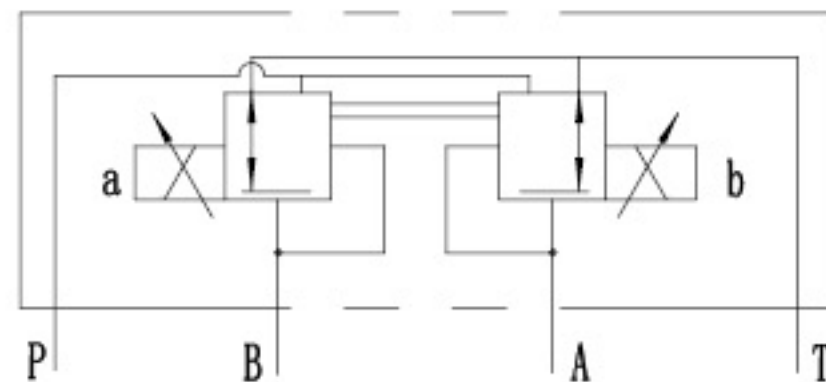
2X = Series 20 to 29  
(20 to 29: unchanged installation and connection dimensions)

## Symbols

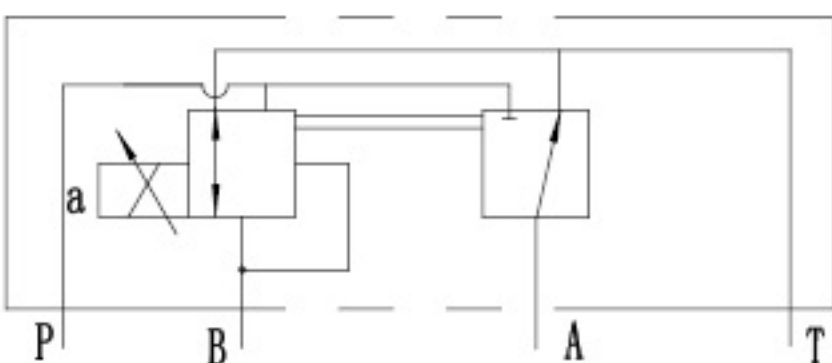
Type HD-3DREP6A-2X/...E...



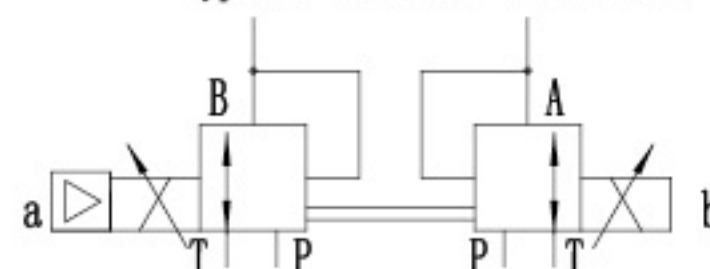
Type HD-3DREP6C-2X/...E...



Type HD-3DREP6B-2X/...E...



Example of a valve with integrated control electronics  
Type HD-3DREPE6C-2X/...E...



## Technical data

### Hydraulic

Valve type		HD-3DREP	HD-3DREPE
Operating pressure range MPa	Port P	2 to 10 for pressure stage 1.6	
		3 to 10 for pressure stage 2.5	
		5 to 10 for pressure stage 4.5	
	Port T	0 to 3	
Max. flow	L/min	15 ( $\Delta p=5\text{MPa}$ )	
Filter fineness	$\mu\text{m}$	$\leq 20$ (preferably $\leq 10$ )	
Hysteresis	%	$\leq 5$	
Repeatability accuracy	%	$\leq 1$	
Response sensitivity	%	$\leq 0.5$	
Pressure fluid		Mineral oil, or phosphate ester	
Viscosity range	$\text{mm}^2/\text{s}$	20 ~ 380	
Pressure fluid temperature range	$^{\circ}\text{C}$	-20~+80	
Weight	Kg	2.0	2.2

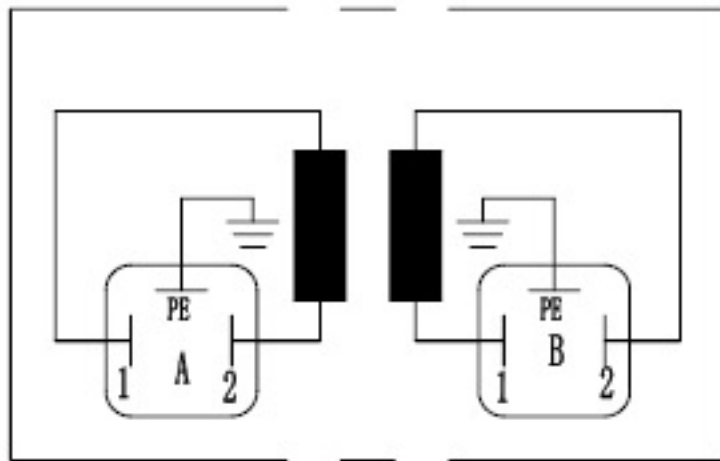
### Electrical

Electrical data, solenoid			
Valve type		HD-3DREP	HD-3DREPE
Voltage type		DC	DC
Nominal voltage	V	24	
Max. current	A	1.5	2.5
Solenoid coil resistance ( $\Omega$ )	Cold value at 20 $^{\circ}\text{C}$	4.8	2
	Max. warm value	7.2	3
Duty	%	100	
Coil temperature	$^{\circ}\text{C}$	up to 150	
Protection		IP65	
Electrical, control electronics			
Amplifier		HD-VT-VSPA2-50-1X/T1 (With 1 ramp time) HD-VT-VSPA2-50-1X/T5 (With 5 ramp times)	integrated control electronics
Supply voltage	Nominal voltage	VDC	24
	Lower limiting value	V	19
	Upper limiting value	V	35
current consumption	$I_{\text{max}}$	A	1.8
	Impulse current	A	4

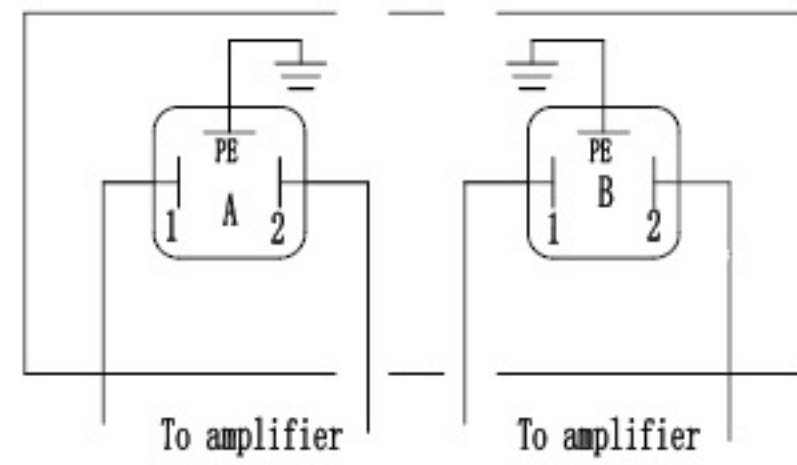
## Electrical connections, plug-in connectors

For type HD-3DREP

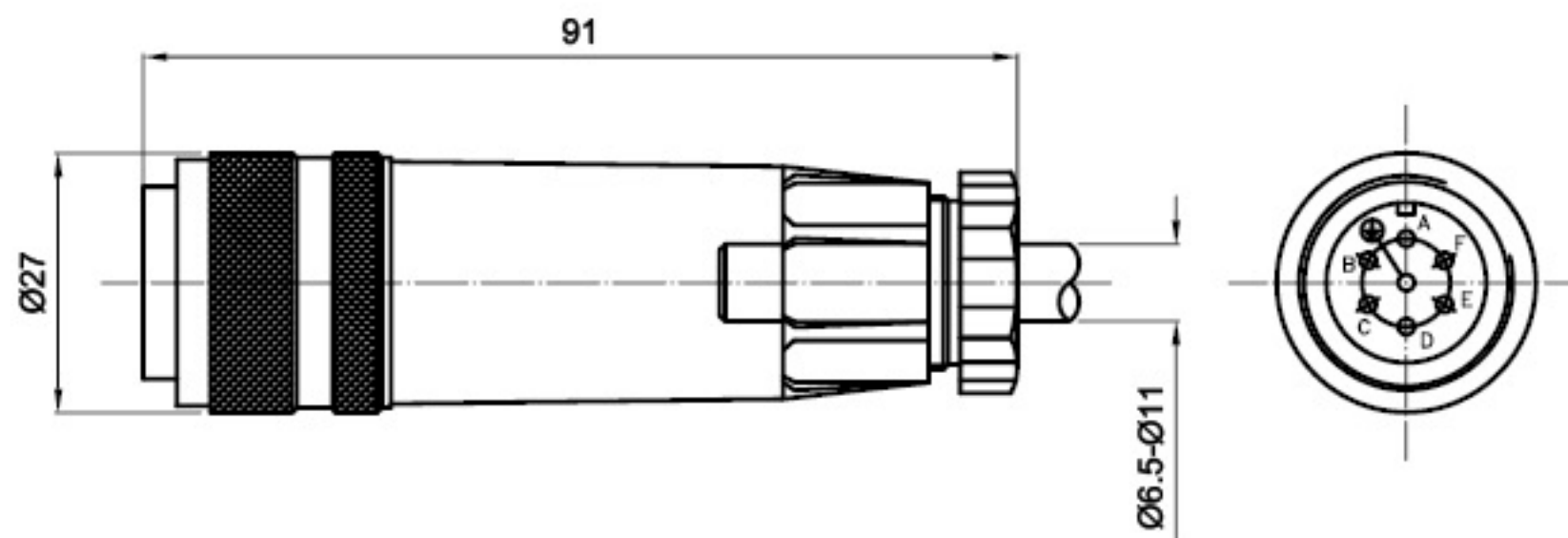
Connection at component plug



Connection at plug-in connector

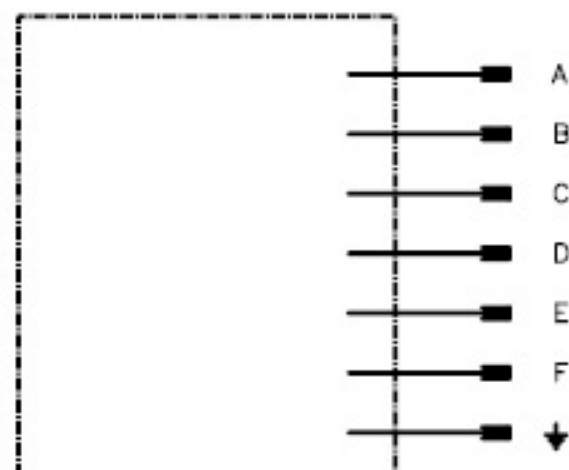


For pin allocation see block circuit diagram  
Plug-in connector to E DIN 43 563-BF6-3  
(separate order, plastic version)



# Integrated control electronics for type HD-3DREPE

## Component plug pin allocation



Integrated electronics  
(see below)

	Slot alloc.	Signal
Power supply	A	24VDC (19 to 35VDC)
	B	GND
	C	n. c.
Differential amplifier input	D	com. value ( $\pm 10V/4$ to 20mA)
	E	ref. potential
	F	n. c.

Command value: A positive command value (0 to 10V or 12 to 20mA) at D and the reference potential at E results in pressure in A.

A positive command value (0 to -10V or 12 to 4mA) at D and the reference potential at E results in pressure in B.

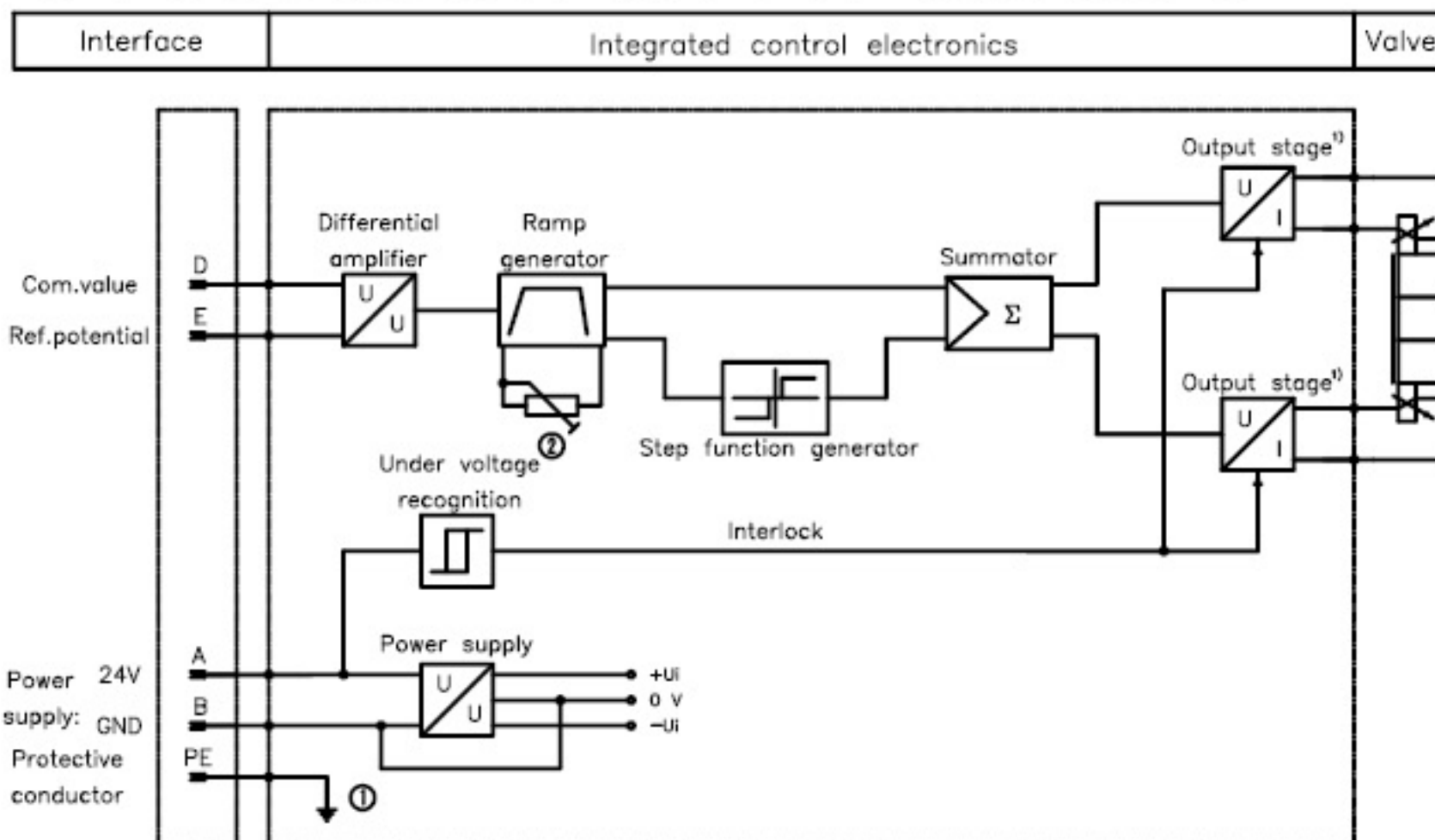
For a valve with one solenoid on side B (version A) a positive command value at D (4 to 20mA) and the reference potential at E, results in pressure in A and for a valve with one solenoid on side A (version B) a negative command value at D (4 to 20mA) and the reference potential at E, results in pressure in B.

Connection cable: Recommended: - up to 25m cable length LiYCY 5x0.75mm<sup>2</sup>;  
- up to 50m cable length LiYCY 5x1.0mm<sup>2</sup>;

Outside diameter 6.5 to 11mm or 8 to 13.5mm

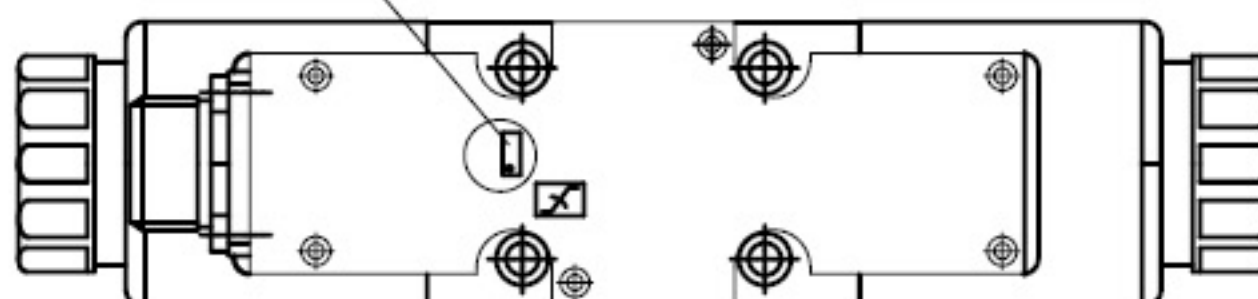
Only attach screen to PE on the supply side.

## Block circuit diagram/connection allocation for the integrated electronics



1 Protective conductor screwed onto housing and cover

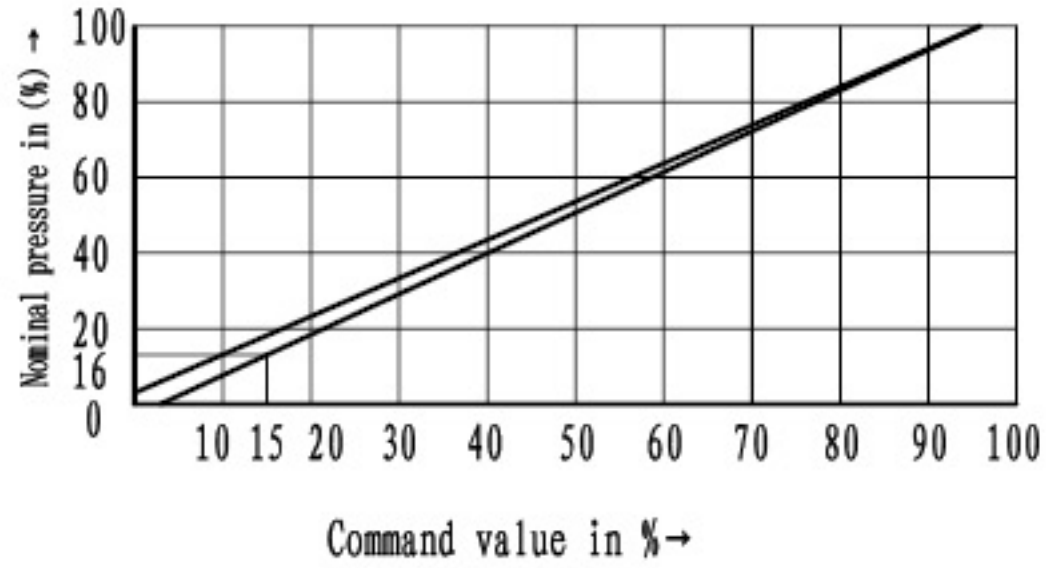
2 Ramp from 0 to 5s can be externally adjusted



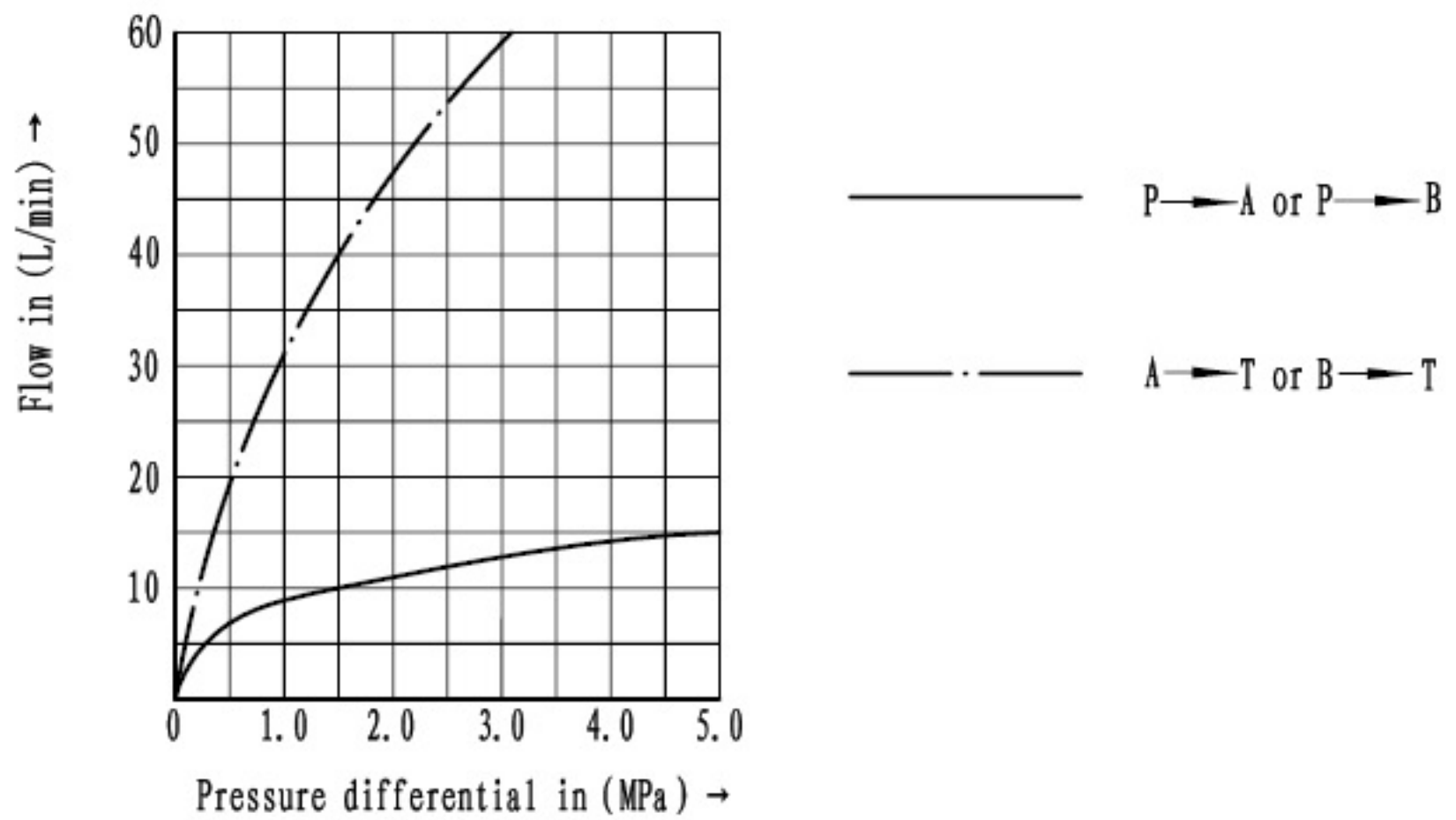
1) Output stages are current controlled

# Characteristic curves (P=10MPa, $v=36 \times 10^{-6} \text{ m}^2/\text{s}$ , $t=50^\circ\text{C}$ )

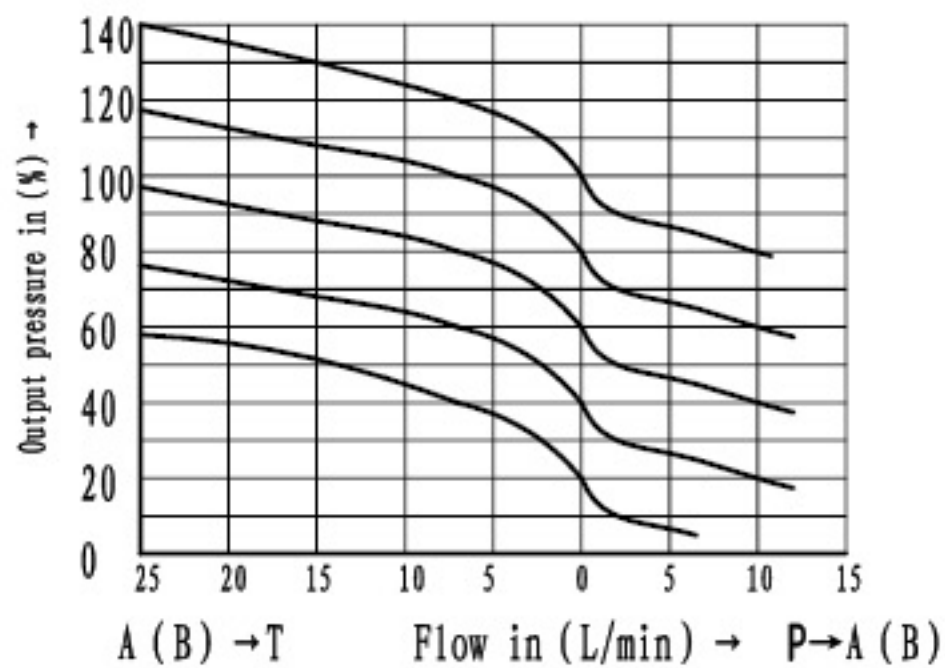
Pressure stages 1.6, 2.5, and 4.5MPa



Pressure stages 1.6, 2.5, and 4.5MPa

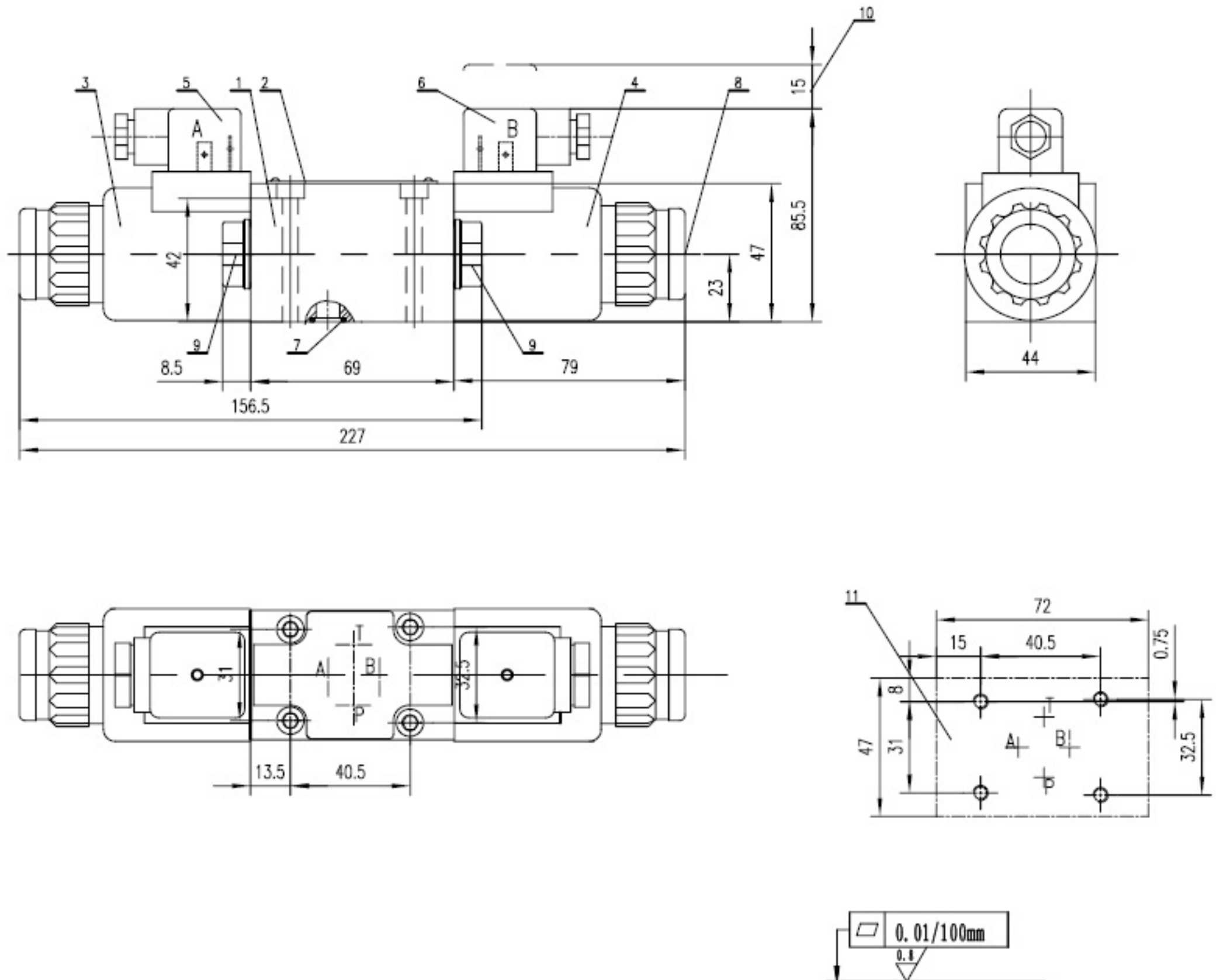


Pressure-flow relationship



# Unit dimensions:HD-3DREP

(Dimensions in mm)

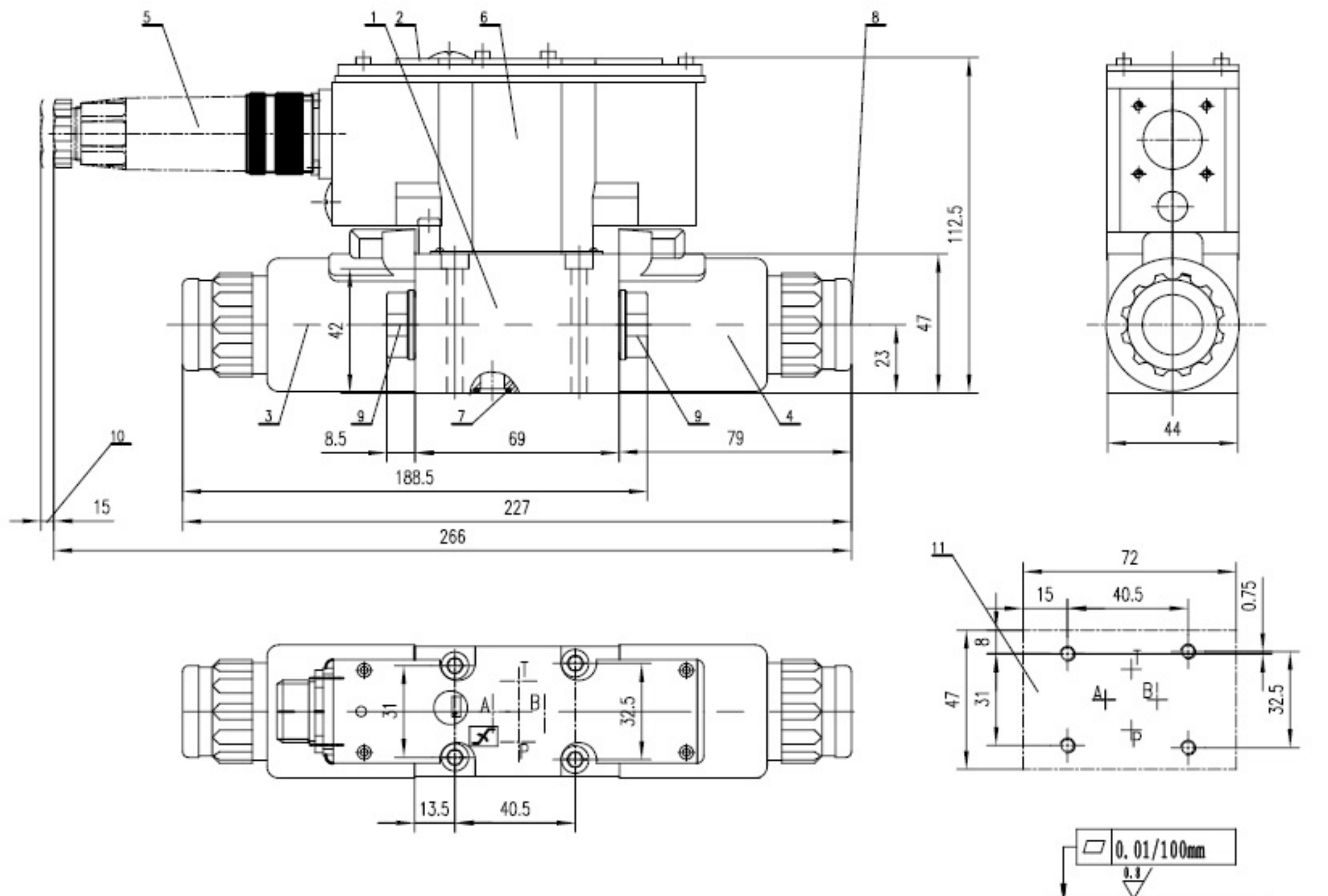


Required surface finish of mating piece

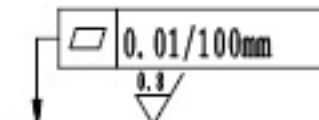
- 1 Valve housing
  - 2 Nameplate
  - 3 Proportional solenoid "a"
  - 4 Proportional solenoid "b"
  - 5 Plug-in connector "A"
  - 6 Plug-in connector "B"
  - 7 O-rings 9.25X1.78(for ports A,B,P,T)
  - 8 Protected hand override "N9"
  - 9 Cover for valves with one solenoid(versions "A"or"B")
  - 10 Space required to remove the plug-in connector
  - 11 Machined valve mounting face and position of the ports
- Subplates G341/01(G1/4")  
 G342/01(G3/8")  
 G502/01(G1/2")
- Valve fixing screws :4-M5X50 (GB/T70.1)  $M_A=8.9N.m$

## Unit dimensions:HD-3DREPE

(Dimensions in mm)



Required surface finish of mating piece



- |   |                                      |                      |  |
|---|--------------------------------------|----------------------|--|
| 1 | Valve housing                        | 9                    | Cover for valves with one solenoid(versions "A"or"B")  |
| 2 | Nameplate                            | 10                   | Space required to remove the plug-in connector         |
| 3 | Proportional solenoid "a"            | 11                   | Machined valve mounting face and position of the ports |
| 4 | Proportional solenoid "b"            | Subplates            | G341/01(G1/4")   |
| 5 | Plug-in connector(separate order)    |                      | G342/01(G3/8")   |
| 6 | Integrated control electronics       |                      | G502/01(G1/2")   |
| 7 | O-rings 9.25X1.78(for ports A,B,P,T) | Valve fixing screws: | 4-M5X50 (GB/T70.1) $M_A=8.9N.m$                        |
| 8 | Protected hand override "N9"         |                      |  |

## Throttle insert

When used as pilot valve with a proportional directional valve type HD-4WRZ then the following throttle inserts are to be used for ports A and B:

NS	10	16	25	32
n in mm	1.8	2.0	2.8	—



## Notice

### Notice

1. The fluid must be filtered. Minimum filter fineness is 20  $\mu\text{m}$ .
2. The tank must be sealing up and an air filter must be installed on air entrance.
3. Products without subplate when leaving factory, if need them, please ordering specially.
4. Valve fixing screws must be high intensity level (class 10.9). Please select and use them according to the parameter listed in the sample book.
5. Roughness of surface linked with the valve is required to  $\frac{0.8}{\sqrt{\text{ }}$ .
6. Surface finish of mating piece is required to 0.01/100mm.