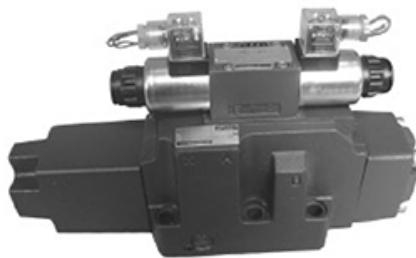




Catálogo de Produtos

4/2 and 4/3 Proportional Directional Valves pilot operated, with electrical position feedback, type HD-4WRZ(E)-7x

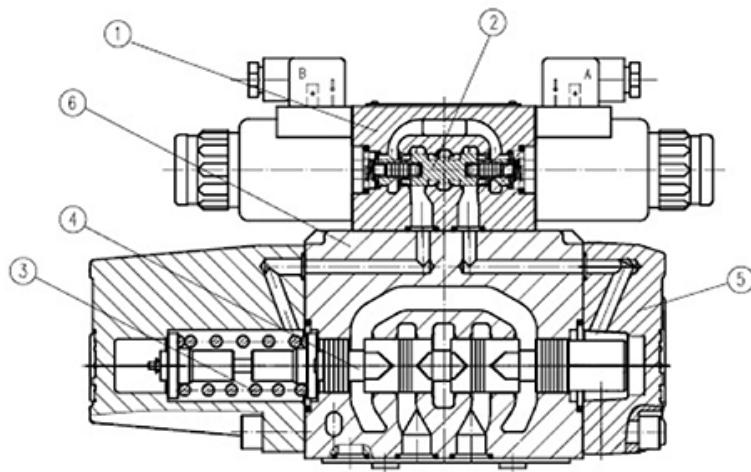
- Pilot operated proportional directional valve
- For subplate mounting
- The control of direction and rate of flow
- Spring centered control spool
- Valve and proportional control electronics from a single source



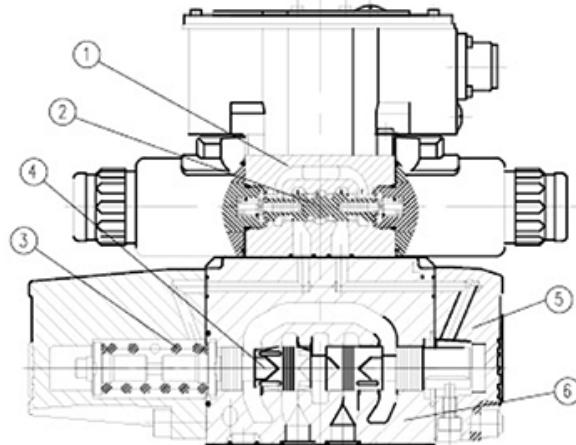
Function, section

The type HD-4WRZ(E)valves are pilot operated 4-way valves that are actuated via proportional solenoids, they control the direction and rate of flow. The valve basically comprises of: pilot valve ①, main spool ④, main valve ⑥, and centering spring ③. With the solenoid B in the de-energised condition the control spool ② move to the right. The pilot oil supply to the pilot valve is internal via port P or external via port X. Pilot oil flows via the pilot valve ① into the pressure chamber and moves the main spool ④ in proportion to the electrical input signal. The connection from P to A and from B to T is via orifice type cross-sections with progressive flow characteristics.

With the solenoid A in the de-energised condition the main spool move to the left. The connection from P to B and from A to T. De-energisation of the solenoid, the control spool and pilot spool ④ are moved back into their centre positions.



Type HD-4WRZ...-7X/...



Type HD-4WRZE...-7X/...

Ordering details

HD	4WR				+7X	/						*
Technology of Beijing Huade Hydraulic	=HD											
Hydraulic operation	=H											
Electro-hydraulic operation	=Z											
Only for WRZ:												
For external electronics	=No code											
With integrated electronics	=E											
Nominal size 10	= 10											
Nominal size 16	= 16											
Nominal size 25	= 25											
Nominal size 32	= 32											

Symbols

		A B
		P T
		E1- = E1-
		E3- = E3-
		W6- = W8-
		W9- = W9-
		C O
		C O
		P T
		EA = EA
		W6A = W6A

With symbols E1- and W8-:

$$\begin{aligned} P \rightarrow A &= q_{vmax} & B \rightarrow T &= q_v/2 \\ P \rightarrow B &= q_v/2 & A \rightarrow T &= q_{vmax} \end{aligned}$$

With symbols E3- and W9-:

$$\begin{aligned} P \rightarrow A &= q_{vmax} & B \rightarrow T &= closed \\ P \rightarrow B &= q_v/2 & A \rightarrow T &= q_{vmax} \end{aligned}$$

(Regenerative circuit, base of spool at port A)

Note: With spools W6-, W8-, W9-, W6A in their switched position "0", there is a connection from A to T and B to T with an opening of less than 2% of the relevant cross-section.

HD	4WR				+7X	/						*
----	-----	--	--	--	-----	---	--	--	--	--	--	---

Technology of Beijing
Huade Hydraulic =HD

Hydraulic operation =H

Electro-hydraulic operation =Z

Only for WRZ:

For external electronics =No code

With integrated electronics =E

Nominal size 10 = 10

Nominal size 16 = 16

Nominal size 25 = 25

Nominal size 32 = 32

Further details
in clear text

M= NBR seals

V= FKM seals

No code = Without pressure
reducing value
D3= With pressure reducing value
ZDR6DP0-4X/40YM (fixed setting)

No code = for WEH and WRZ
for 4WRZE
A1 = Com. value input $\pm 10V$
F1 = Com. value input 4 to 20mA

Electrical connection only for WRZ:

K4= With component plug

For WRZE:
K31= With component plug
Without plug-in connector

No code =	Pilot oil supply external, Pilot oil drain external
E =	Pilot oil supply internal, Pilot oil drain external
ET =	Pilot oil supply internal, Pilot oil drain internal
T =	Pilot oil supply external, Pilot oil drain internal

(type 4WRH only possible without code)

No code = Without hand override
N9 = With protected hand override

G24 = 24V DC (standard version)

6E = Proportional solenoid with removable coil

7X = Series 70 to 79(70 to 79: unchanged installation and connection dimensions)

Nominal flow in L/min with a valve pressure drop $\Delta p=1MPa$

25 = 25L/min	50 = 50L/min	85 = 85L/min	for nominal size 10
100 = 100L/min	150 = 150L/min	325 = 325L/min	for nominal size 16
220 = 220L/min	325 = 325L/min	520 = 520L/min	for nominal size 25
360 = 360L/min	520 = 520L/min	520 = 520L/min	for nominal size 32

Pilot oil supply

Pilot oil supply, throttle insert

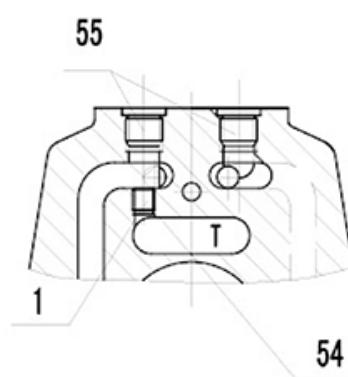
(example: NS16)

pilot oil supply external

pilot oil drain external

Ports 1 and 2 have to be plugged.

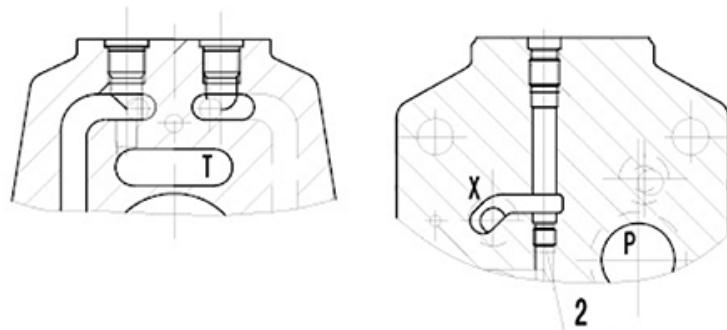
(Items 55: ZM12X1.5 items 41: ZM8X1
items 54: ZM6X1)



pilot oil supply external

pilot oil drain internal

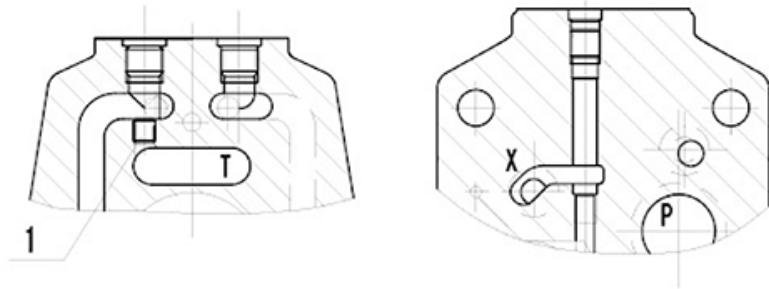
Port 2 has to be plugged.



pilot oil supply internal

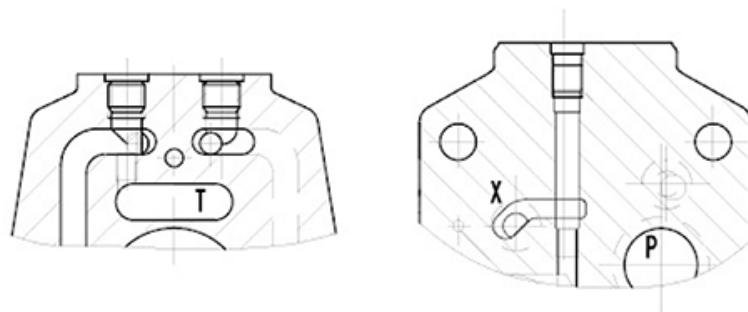
pilot oil drain external

Port 1 has to be plugged.



pilot oil supply internal

pilot oil drain internal



Technical data

Hydraulic

Nominal size		10	16	25	32
Operating pressure	pilot oil supply external	3~10			
-Pilot valve (MPa)	pilot oil supply internal	10~31.5	10~35		
-Main valve (MPa)		31.5	35		
Return line pressure (MPa)	Port T (pilot oil drain external)	31.5	25	25	15
	Port T (pilot oil drain internal)		3		
	Port Y		3		
Pilot oil volume for spool movement 0~100%	cm ³	1.7	4.6	10	26.5
Pilot oil flow at port X and Y for stepped form of input signal 0~100%	L/min	3.5	5.5	7	15.9
Flow through main valve	L/min	170	460	870	1600
Hysteresis	%	≤6			
Pressure fluid		Mineral oil to DIN 51 524			
Pressure fluid temperature range	°C	-20 ~ 80			
Viscosity range	mm ² /s ²	20~380			
Installation		optional, preferably horizontal			
Weight for version WRZ... (for WRZE...additionally 0.2kg)		7.8	13.4	18.2	42.2

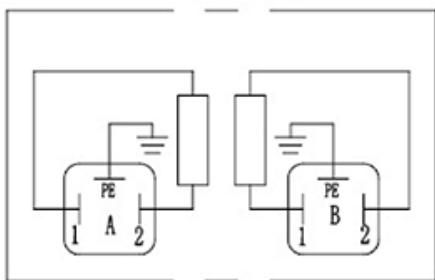
Electrical

Valve type	WRZ	WRZE
Voltage type	DC	
Max.current A	1.5	2.5
Solenoid coil resistance (Ω)	Cold value at 20°C Max.warm value	4.8 7.2
Protection	IP65	
Coil temperature °C	up to 150	
Duty %	100	
Control electronics	HD-VT-VSPA2-50-1X/...	integrated control electronics

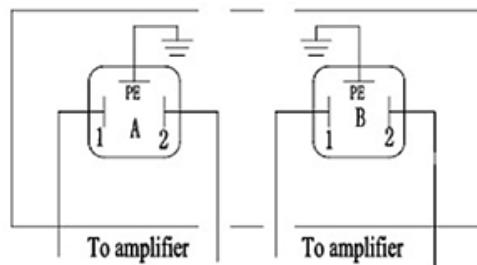
Electrical connections, plug-in connectors

For type 4WRZ... (without integrated electronics)

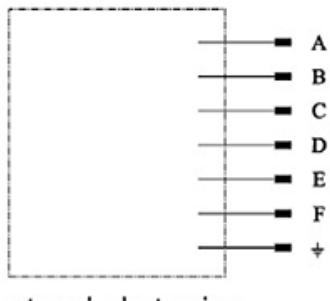
Connection at component plug



Connection at plug-in connector



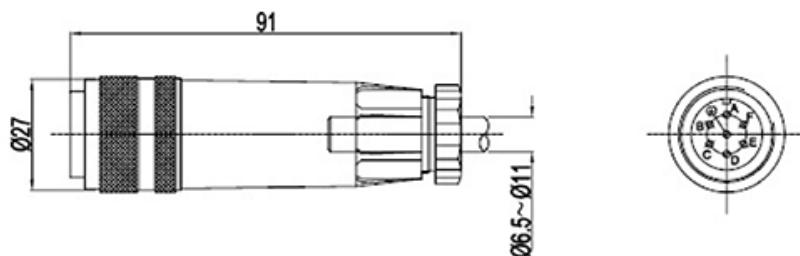
Component plug pin allocation



Slot alloc.	Connect with
A	solenoid A
B	solenoid B
C	solenoid A
D	solenoid B
E	n.a.
F	n.a.
PE	valve housing

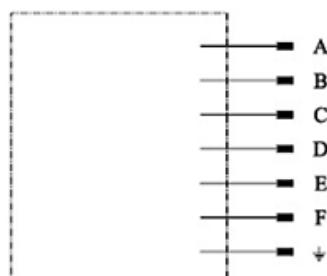
For type 4WRZE... (with integrated electronics)

Plug-in connector to E DIN 43 563-BF6-3 (plastic version)



Integrated control electronics for type HD-4WRZE

Component plug pin allocation



	Slot alloc.	Signal
Power supply	A B	24VDC (19 to 35VDC) GND
	C	n.c. ¹⁾
Differential amplifier input	D	com.value(±10V/4 to 20mA)
	E	ref.potential
	F	n.c. ¹⁾

Command value: A positive command value(0 to 10V or 12 to 20mA)at D and reference potential at E results in a flow from P to A and B to T.

A negative command value(0 to -10V or 12 to 4mA)at D and reference potential at E results in a flow from P to B and A to T.

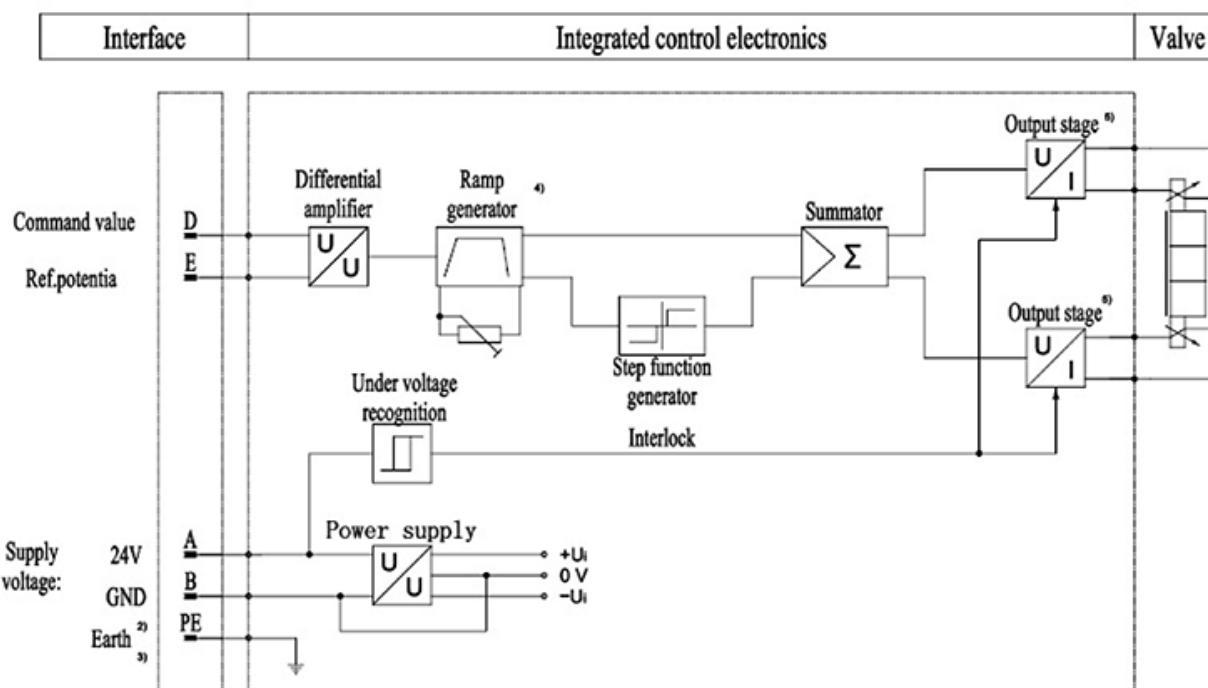
For valves with 1 solenoid on side a(spool variant EA and W6A)with the reference potential at E and a positive command value at D(0 to 10V or 4 to 20mA)results in a flow from P to B and A to T.

Connection cable: Recommended: - up to 25m cable length LiYCY 5×0.75mm²;

- up to 50m cable length LiYCY 5×1.0mm²;

Outside diameter 6.5 to 11mm or 8 to 13.5mm

Only attach screen to PE on the supply side.



1) Slots C and F must not be connected

2) Port PE is connected to cooling body and valve housing

3) Earth is screwed to valve housing and cover

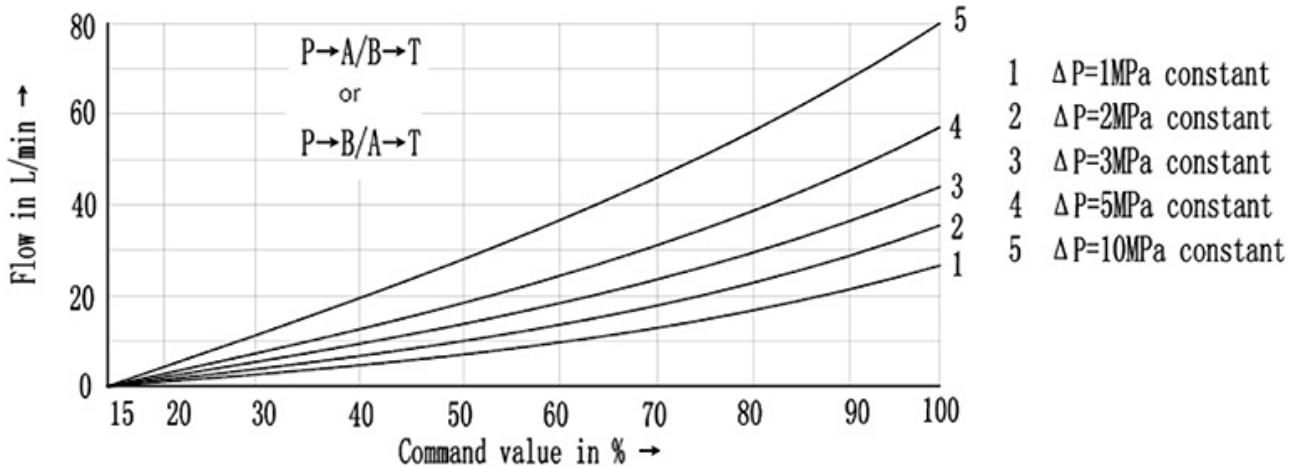
4) Ramp can be externally adjusted from 0 to 2.5 s; the same applies for Tup and Tdown

5) Output stage current regulated

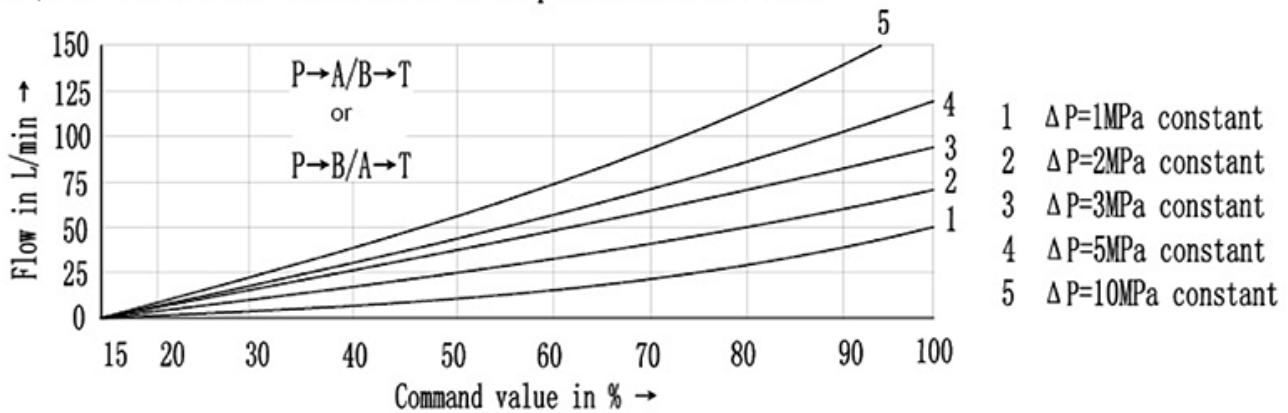
Characteristic curves ($P=10\text{ MPa}$, $v=36\times10^{-6}\text{ m}^2/\text{s}$, $t=50^\circ\text{C}$)

NS 10

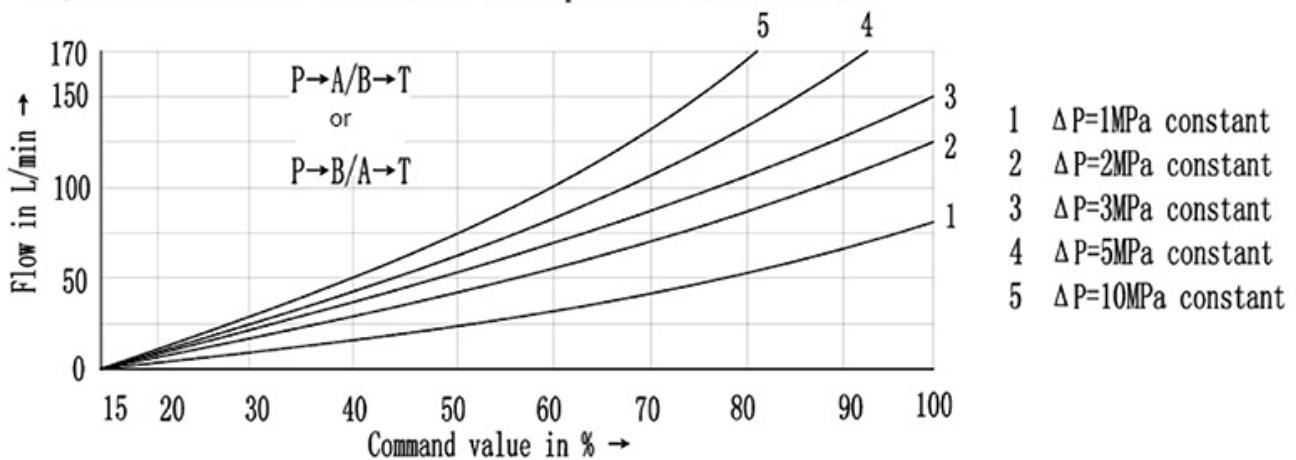
25L/min nominal flow with a 1MPa valve pressure differential



50L/min nominal flow with a 1MPa valve pressure differential



85L/min nominal flow with a 1MPa valve pressure differential

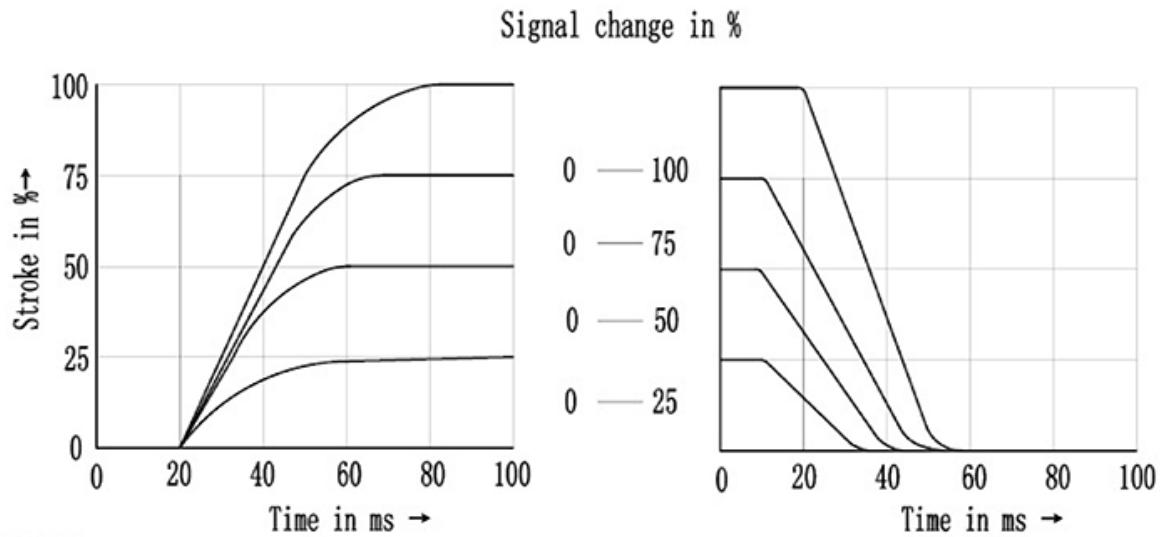


ΔP =value pressure differential (input pressure p_{in} minus load pressure p_L minus return line pressure p_r)

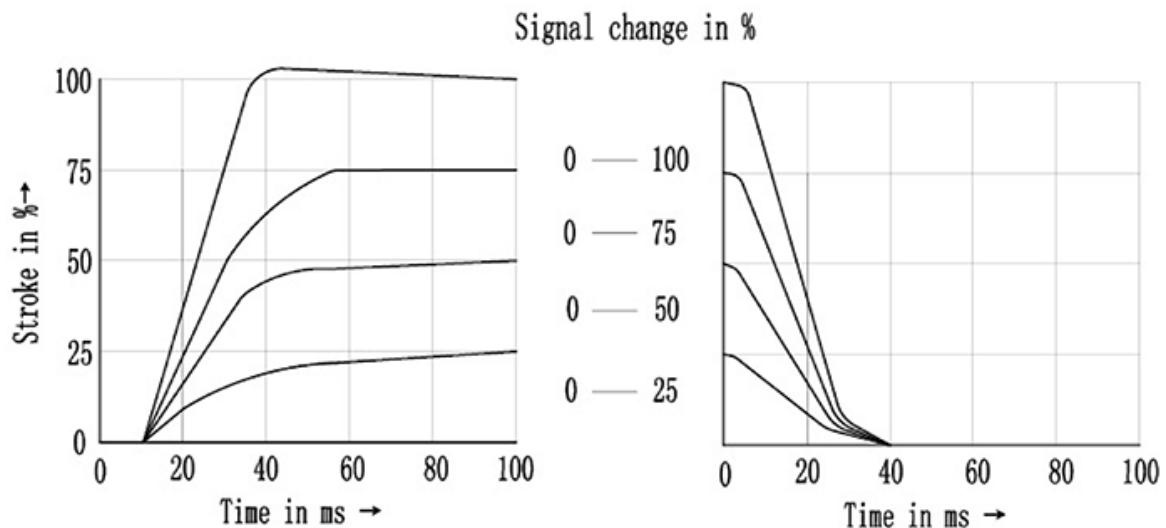
Characteristic curves ($P=10\text{ MPa}$, $v=36\times10^{-6}\text{ m}^2/\text{s}$, $t=50^\circ\text{C}$)

Transient function with a stepped form of electrical input signal, measured at $P_{st}=5\text{ MPa}$

Type HD-4WRZ10...

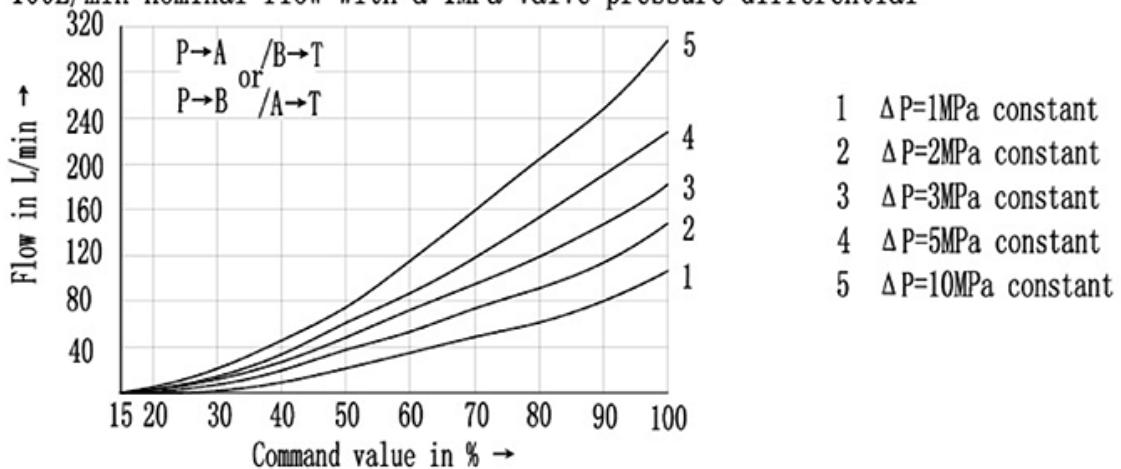


Type HD-4WRZE10...



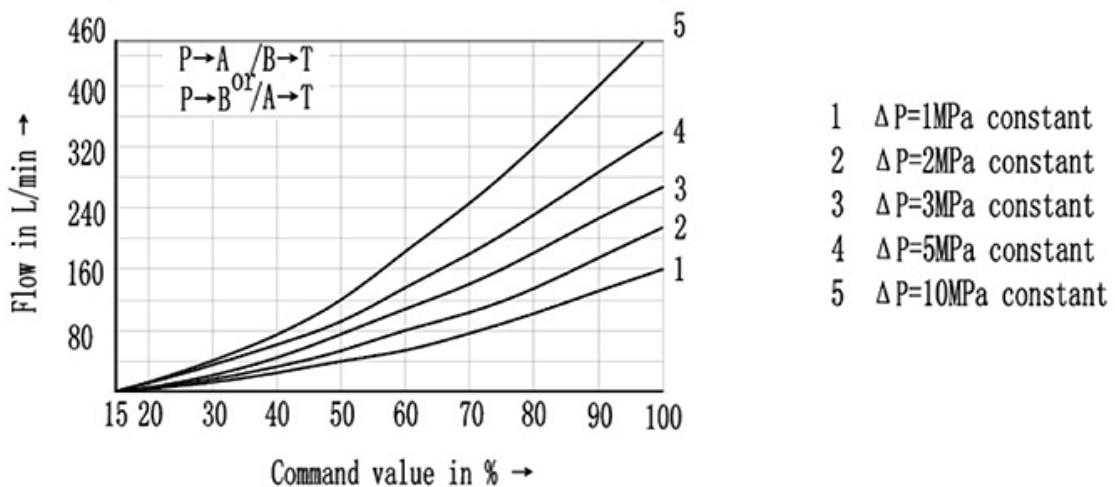
NS 16

100L/min nominal flow with a 1MPa valve pressure differential

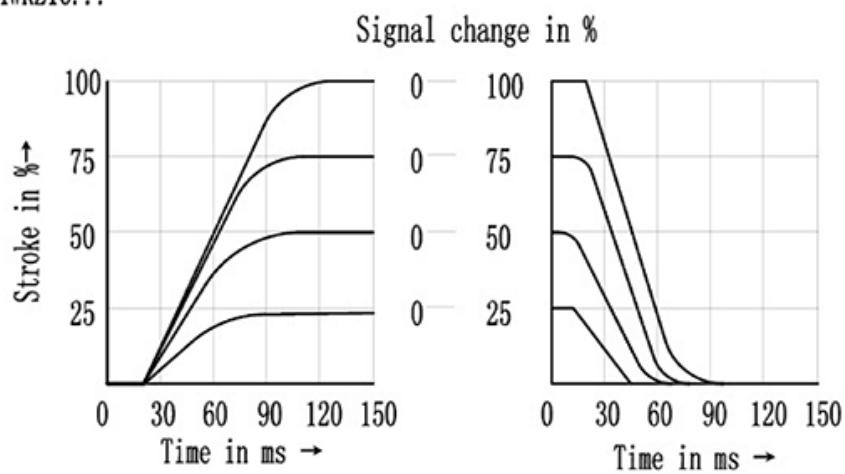


Characteristic curves ($P=10\text{ MPa}$, $v=36\times 10^{-6}\text{ m}^2/\text{s}$, $t=50^\circ\text{C}$)

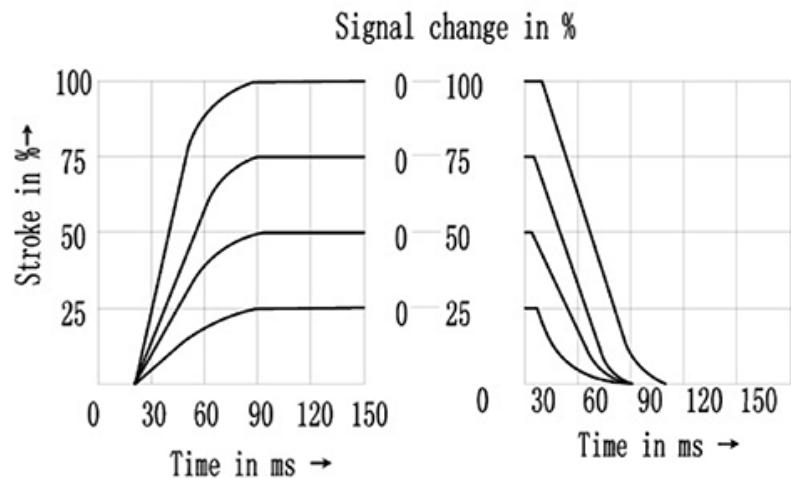
150L/min nominal flow with a 1MPa valve pressure differential



Transient function with a stepped form of electrical input signal, measured at $P_{st}=5\text{ MPa}$
Type HD-4WRZ16...



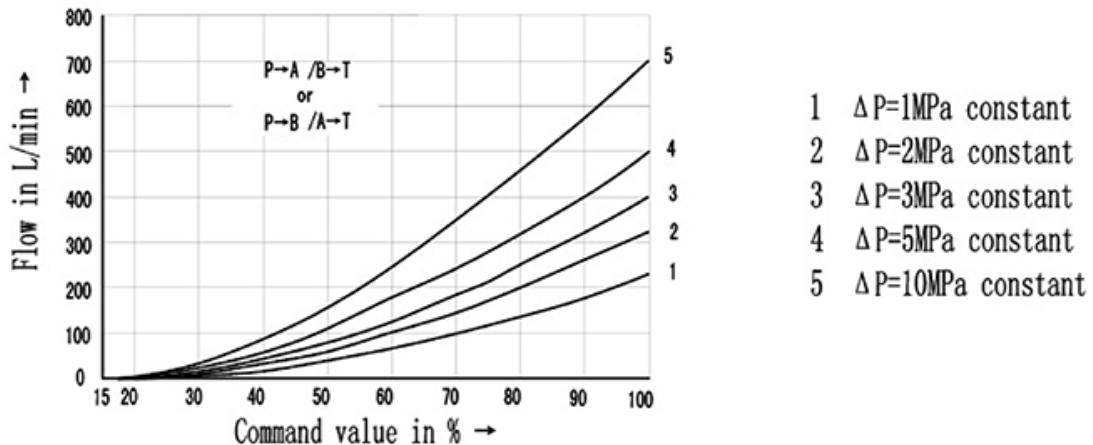
Type HD-4WRZE16...



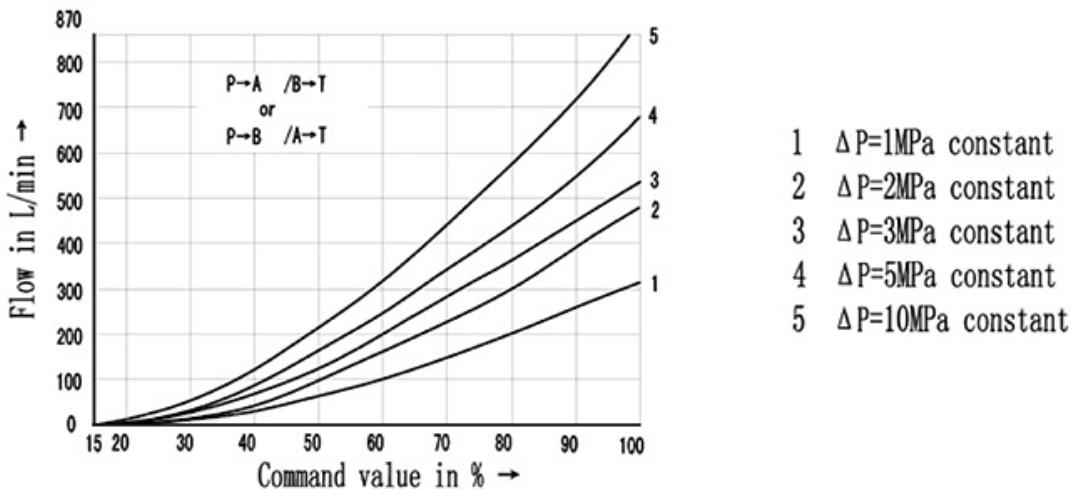
Characteristic curves ($P=10\text{ MPa}$, $v=36\times10^{-6}\text{ m}^2/\text{s}$, $t=50^\circ\text{C}$)

NS 25

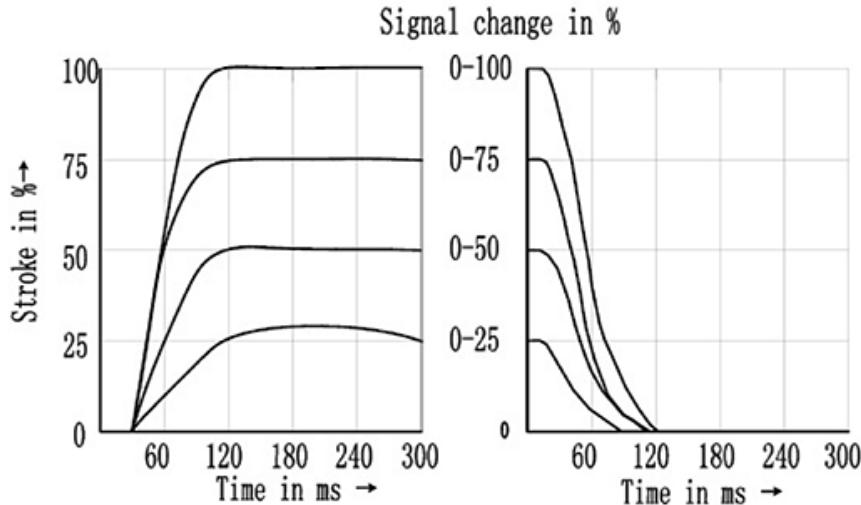
220L/min nominal flow with a 1MPa valve pressure differential



325L/min nominal flow with a 1MPa valve pressure differential

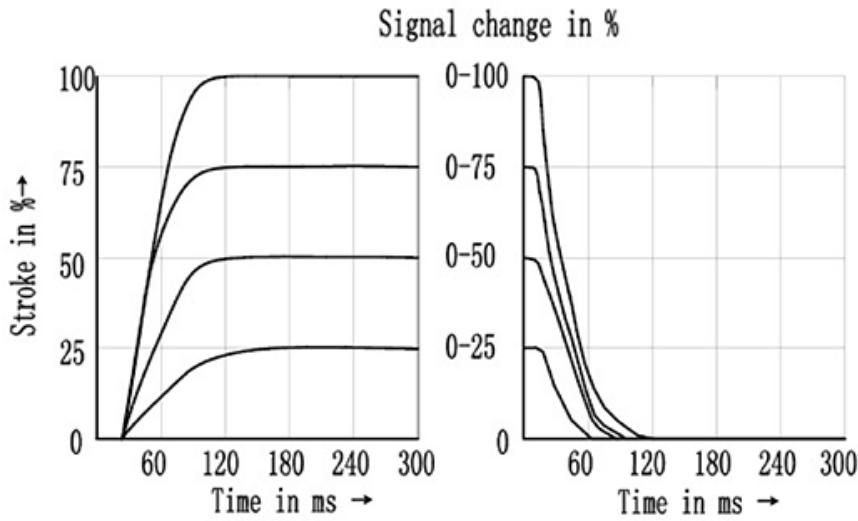


Transient function with a stepped form of electrical input signal, measured at $P_{st}=5\text{ MPa}$
Type HD-4WRZ25...



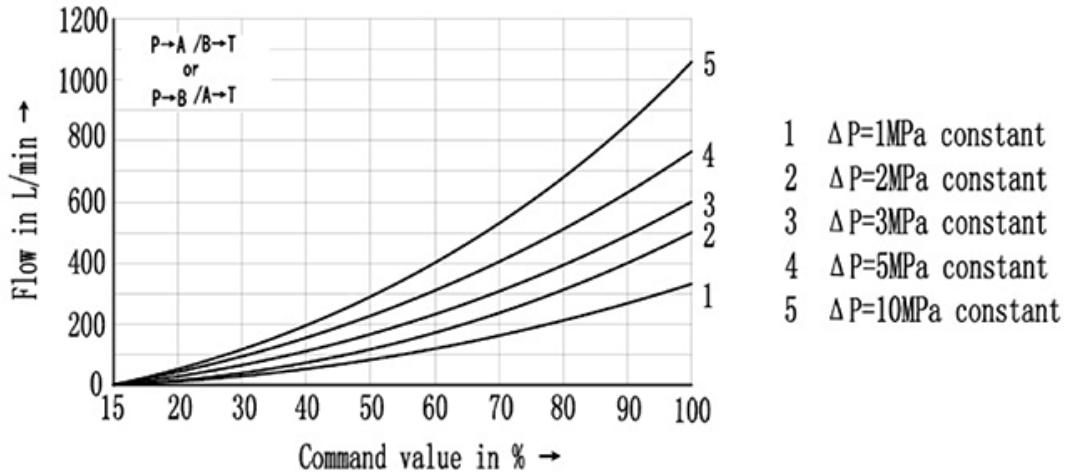
Characteristic curves ($P=10\text{ MPa}$, $v=36\times10^{-6}\text{ m}^2/\text{s}$, $t=50^\circ\text{C}$)

Type HD-4WRZE25...

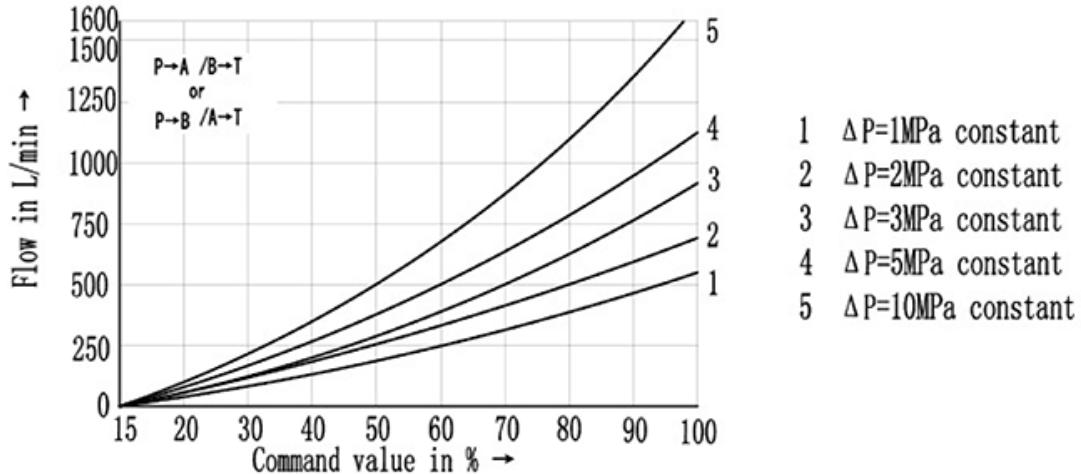


NS 32

360L/min nominal flow with a 1MPa valve pressure differential



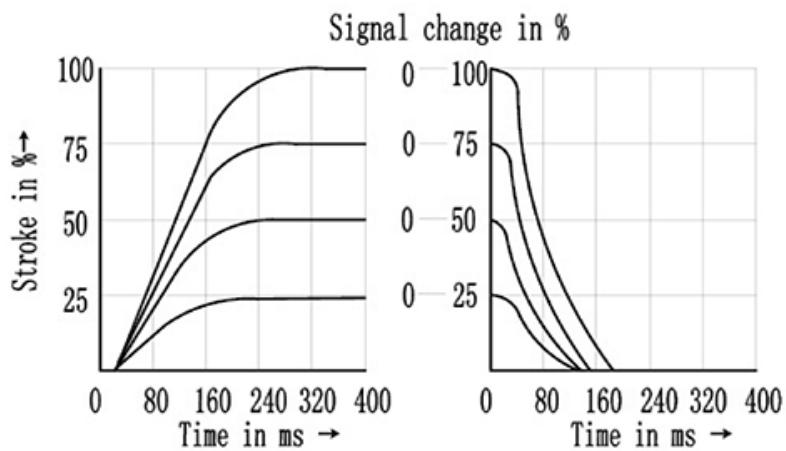
520L/min nominal flow with a 1MPa valve pressure differential



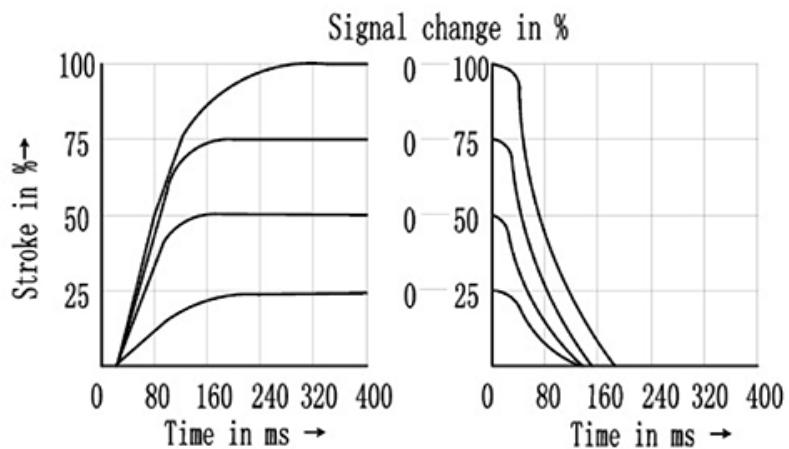
Characteristic curves ($P=10\text{ MPa}$, $v=36 \times 10^{-6} \text{ m}^2/\text{s}$, $t=50^\circ\text{C}$)

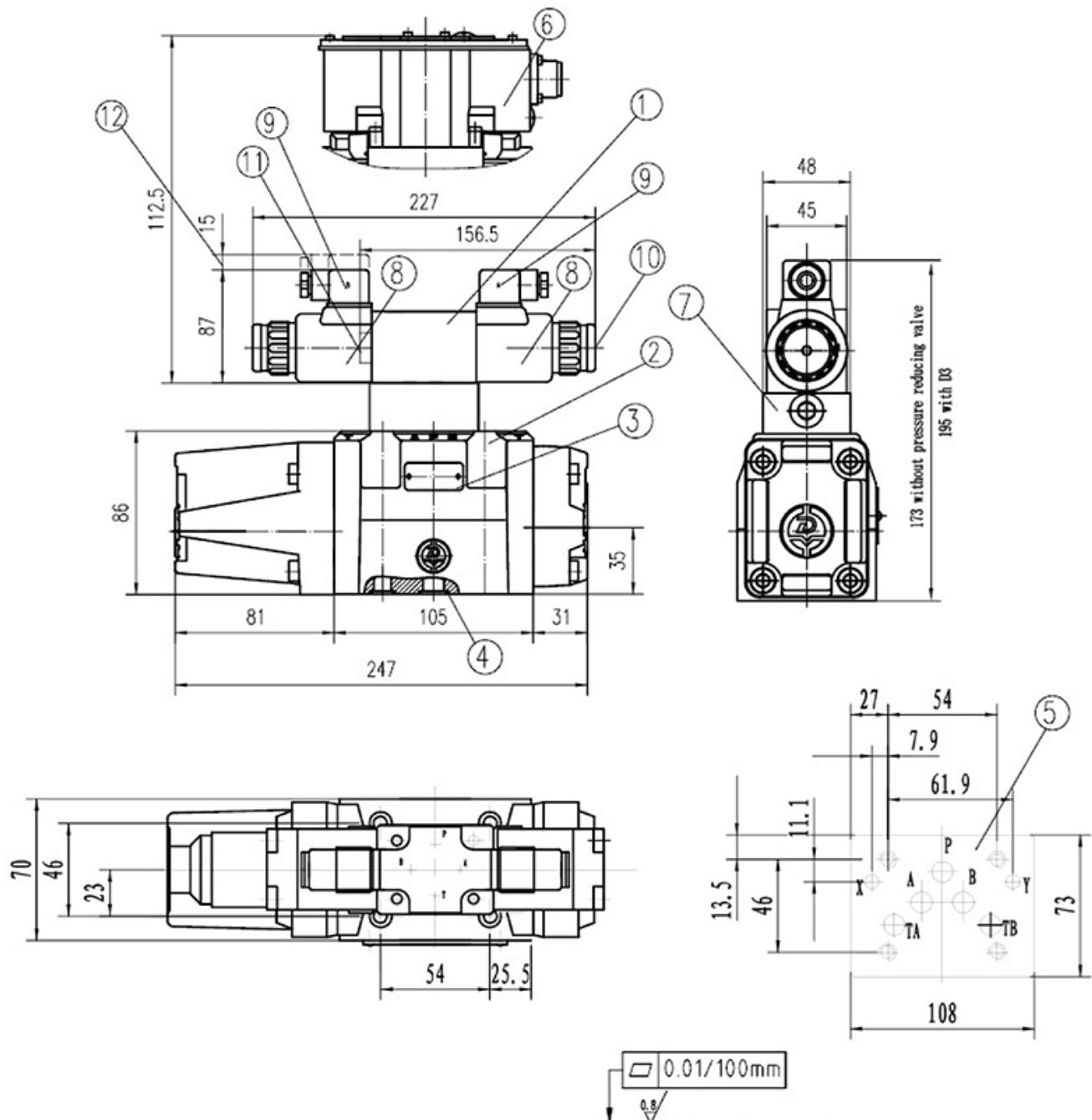
Transient function with a stepped form of electrical input signal, measured at $P_{st}=5\text{ MPa}$

Type HD-4WRZ32...



Type HD-4WRZE32...

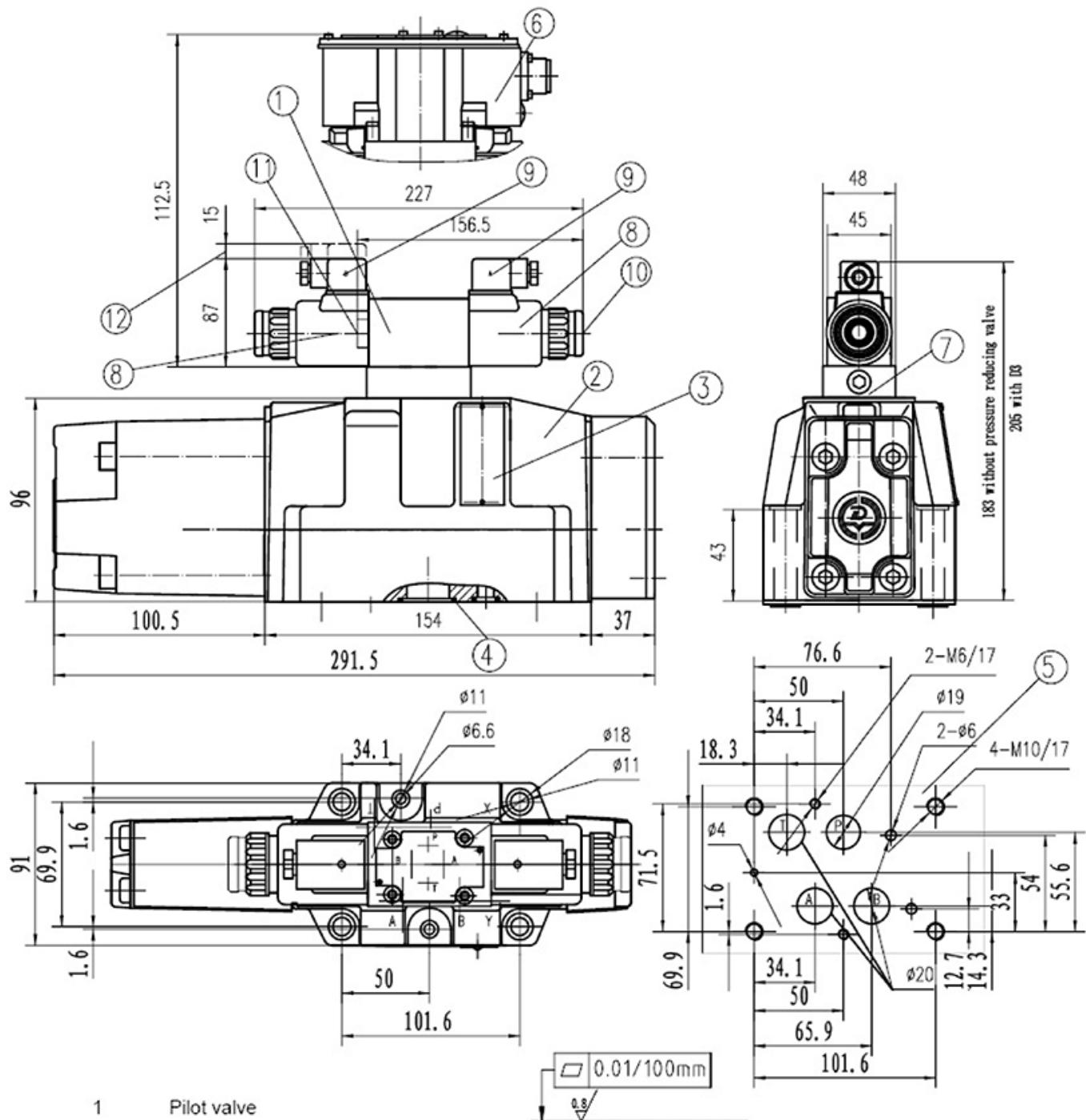




- 1 Pilot valve
- 2 Main valve
- 3 Nameplate for valve
- 4 O-ring 12X2(for ports A,B,P,T)
O-ring 10.82X1.78(for ports X,Y)
- 5 Machined valve mounting face
- 6 Integrated control electronics
- 7 Pressure reducing valve D3
- 8 Proportional solenoid "a", "b"
- 9 Plug-in connector "A", "B"

Required surface finish of
mating piece

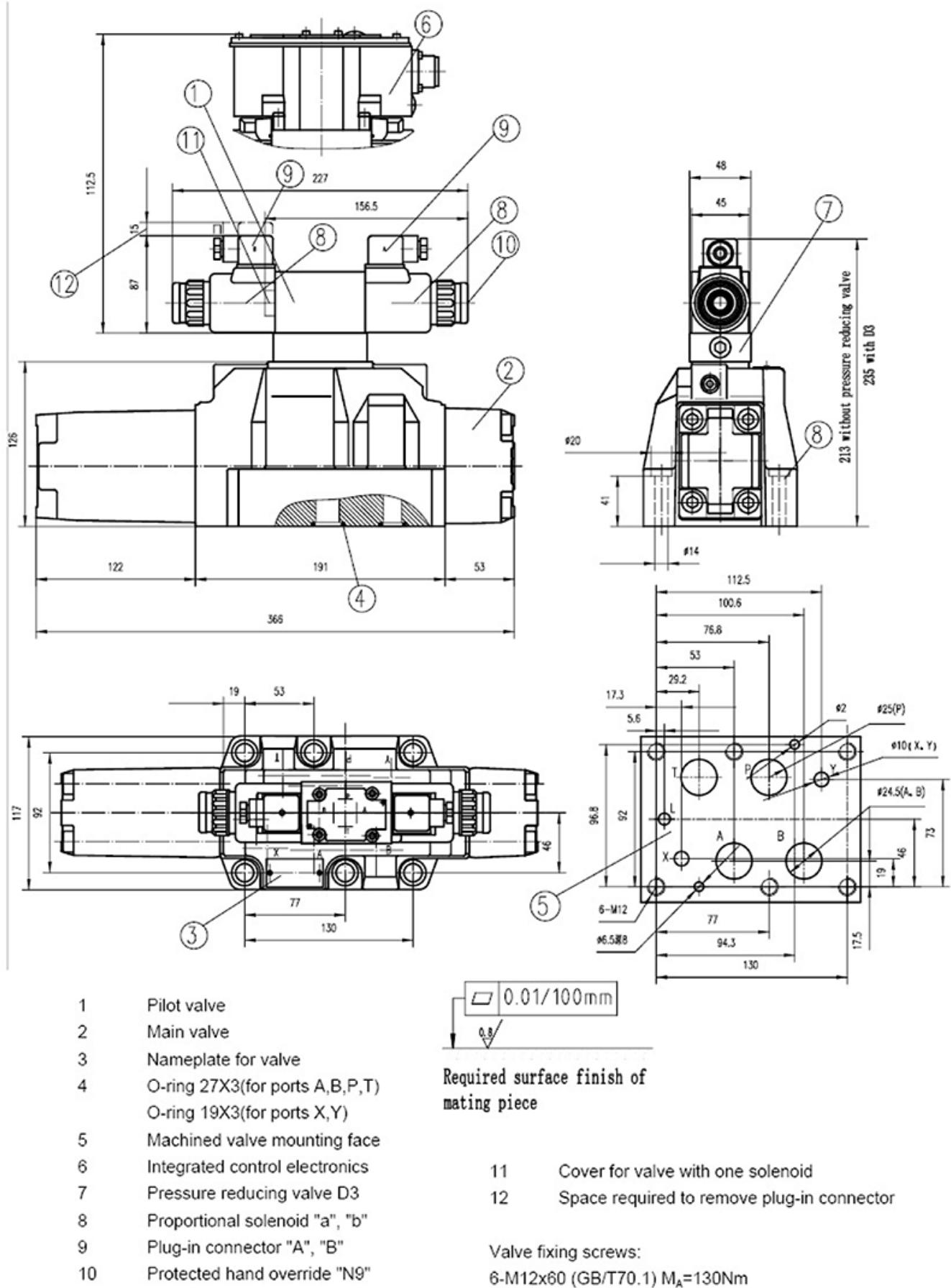
- 10 Protected hand override "N9"
 - 11 Cover for valve with one solenoid
 - 12 Space required to remove plug-in connector
- Valve fixing screws:
4-M6x45 (GB/T70.1) $M_A = 15.5\text{Nm}$

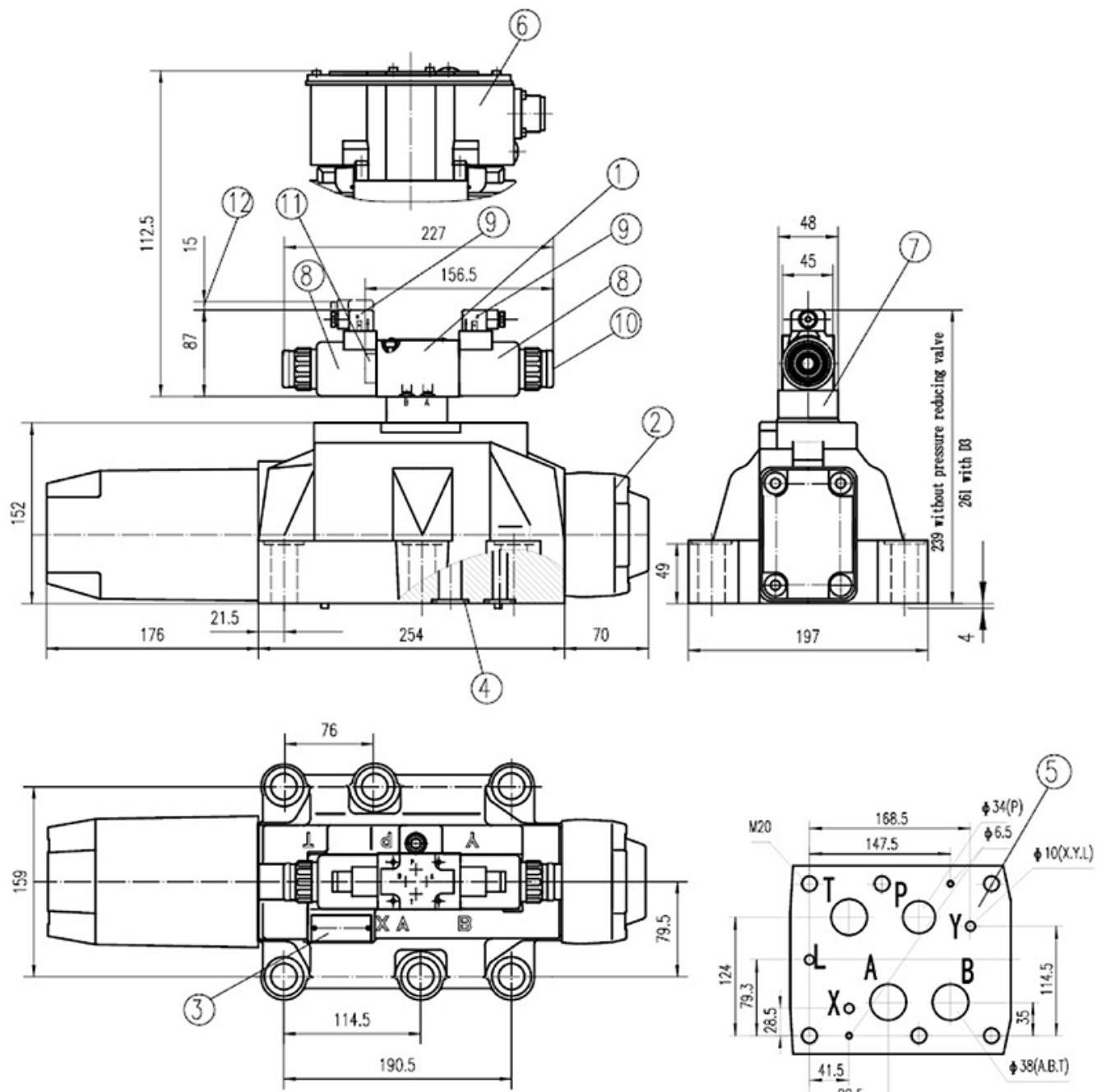


- 1 Pilot valve
- 2 Main valve
- 3 Nameplate for valve
- 4 O-ring 22X2.5(for ports A,B,P,T)
O-ring 12X2(for ports X,Y)
- 5 Machined valve mounting face
- 6 Integrated control electronics
- 7 Pressure reducing valve D3
- 8 Proportional solenoid "a", "b"
- 9 Plug-in connector "A", "B"
- 10 Protected hand override "N9"

Required surface finish of
mating piece

- 11 Cover for valve with one solenoid
 - 12 Space required to remove plug-in connector
- Valve fixing screws:
4-M10x60 (GB/T70.1) $M_A=75\text{Nm}$
2-M6x60 (GB/T70.1) $M_A= 15.5\text{Nm}$





- 1 Pilot valve
- 2 Main valve
- 3 Nameplate for valve
- 4 O-ring 42X3(ports A,B,P,T)
O-ring 19X3(for ports X,Y)
- 5 Machined valve mounting face
- 6 Integrated control electronics
- 7 Pressure reducing valve D3
- 8 Proportional solenoid "a", "b"
- 9 Plug-in connector "A", "B"
- 10 Protected hand override "N9"

Required surface finish of
mating piece

- 11 Cover for valve with one solenoid
- 12 Space required to remove plug-in connector

Valve fixing screws:
6-M20x80 (GB/T70.1) M_A=430N.m

ANNOTATIONS :

HUADE AMÉRICA

CEP : 03162-020

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