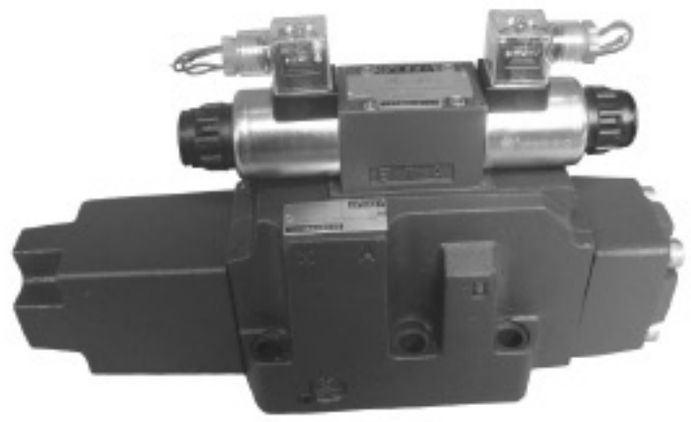
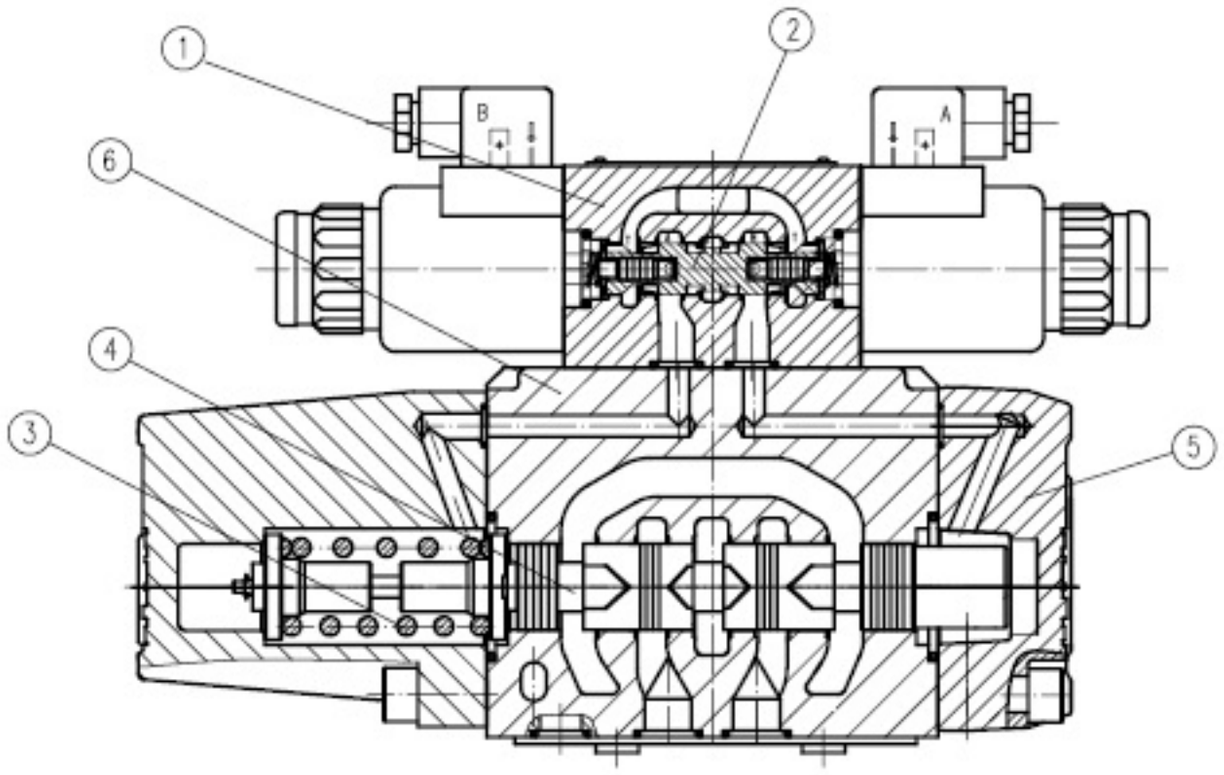
BEIJING HUADE HYDRAULIC INDUSTRAL GROUP Co.,LTD	4/2,and 4/3 proportional directional valves, pilot operated, without electrical position feedback, Type HD-4WRZ(E)-7X			
	Size 10,16,25,32	Up to 35MPa	Up to 1600L/min	

- 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

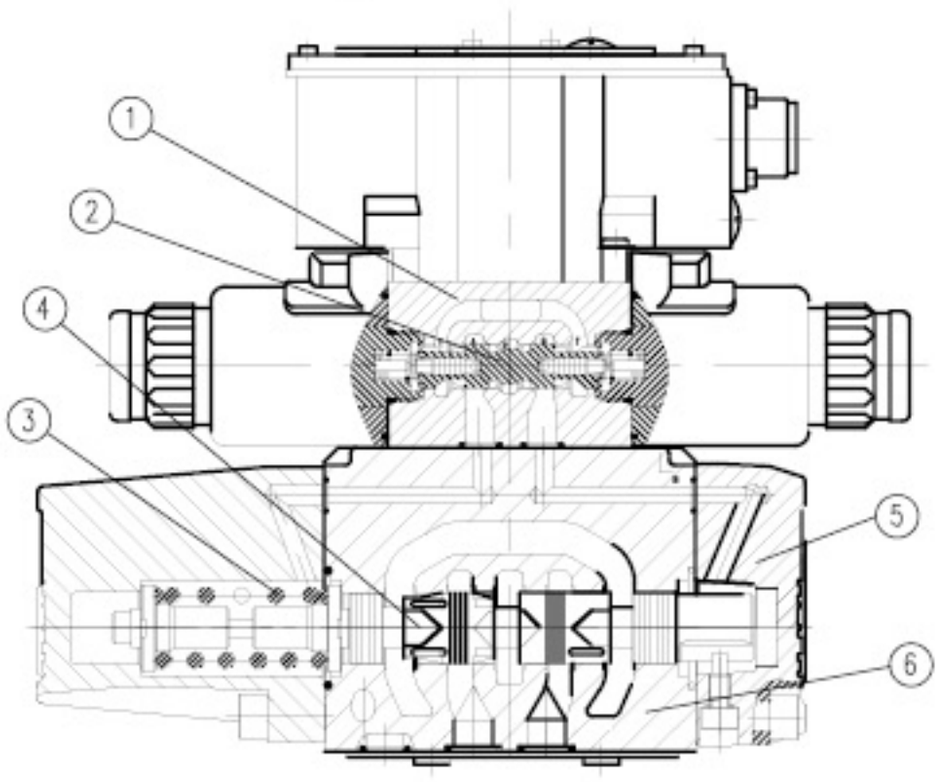


Function, section

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-enegised 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-enegised 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

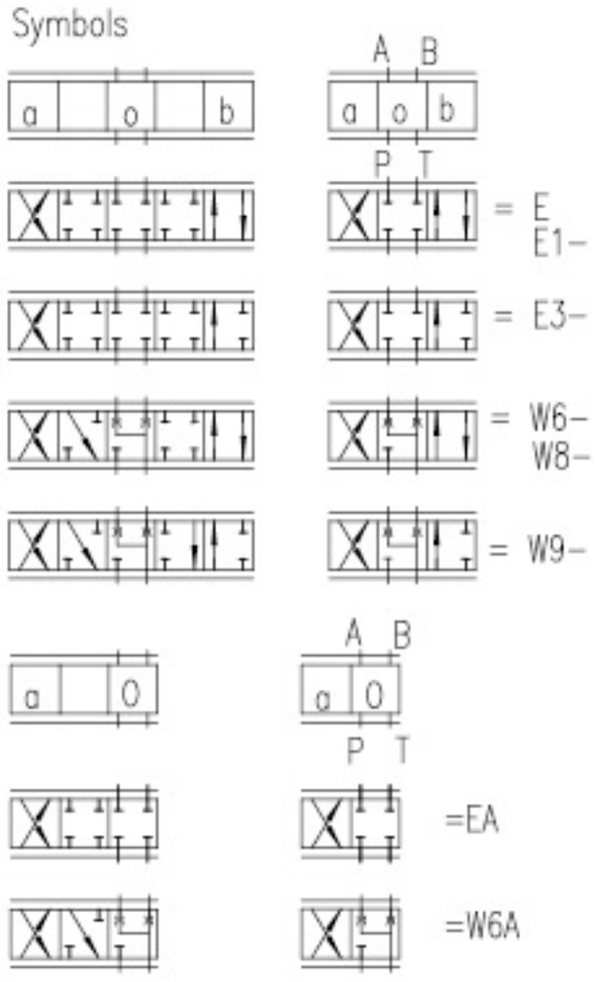
Nominal size 10 = 10

Nominal size 16 = 16

Nominal size 25 = 25

Nominal size 32 = 32

Symbols



With symbols E1- and W8-:

P→A=q_{vmax} B→T=q_v/2

P→B=q_v/2 A→T=q_{vmax}

With symbols E3- and W9-:

P→A=q_{vmax} B→T=closed

P→B=q_v/2 A→T=q_{vmax}

(Regenerative circuit, base of spool at port A)

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

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 ±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

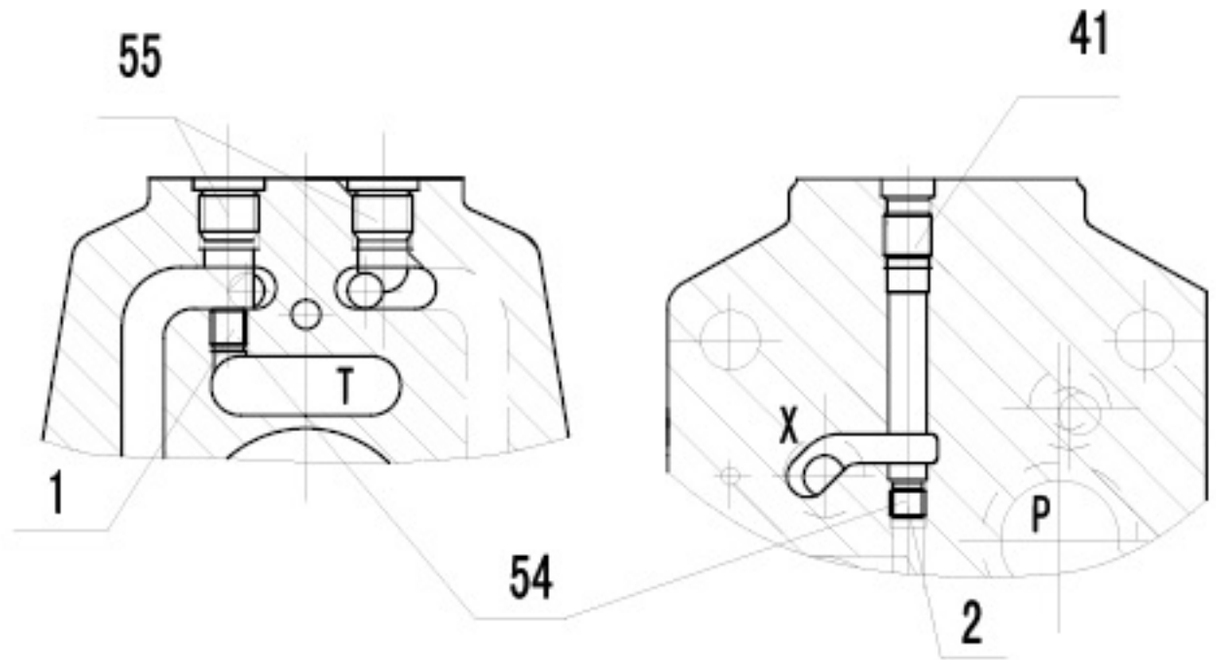
7X = Series 70 to 79(70 to 79: unchanged installation and connection dimensions)

Nominal flow in L/min with a valve pressure drop Δp=1MPa

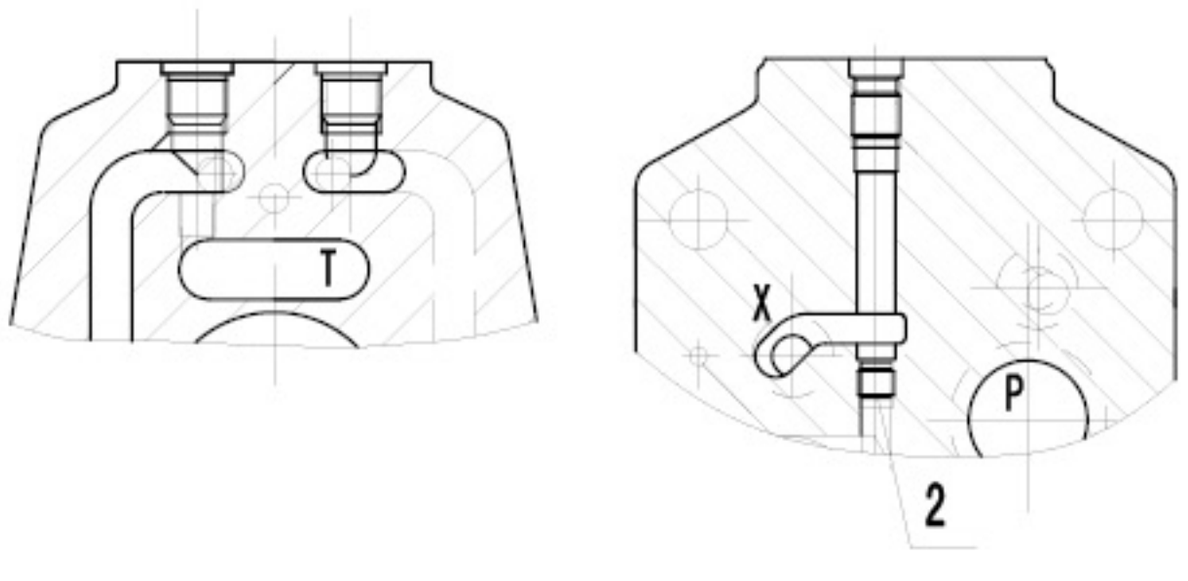
25 =25L/min	50 =50L/min	85 =85L/min	for nominal size 10
	100 =100L/min	150 =150L/min	for nominal size 16
	220 =220L/min	325 =325L/min	for nominal size 25
	360 =360L/min	520 =520L/min	for nominal size 32

Pilot oil supply

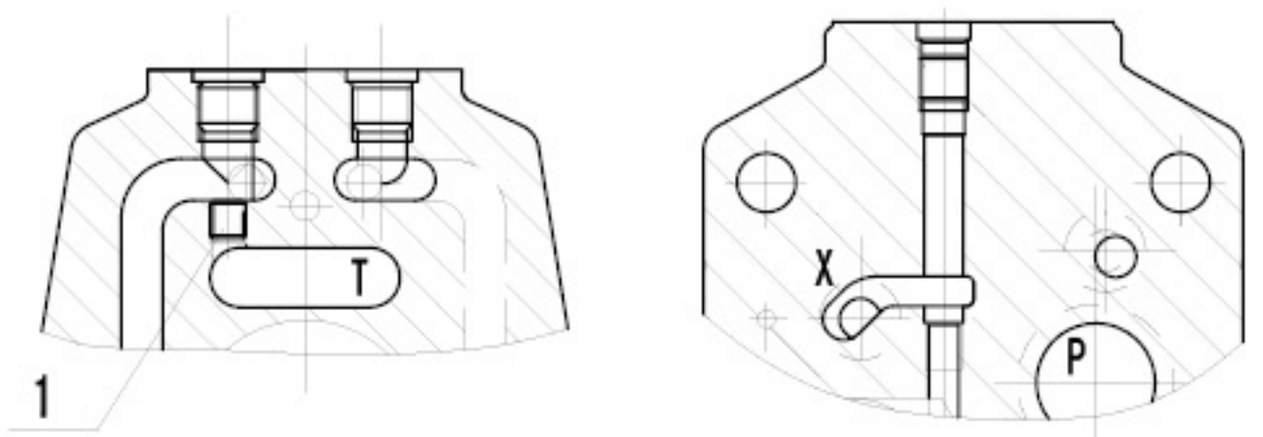
Pilot oil supply, throttle insert
(example:NS16)



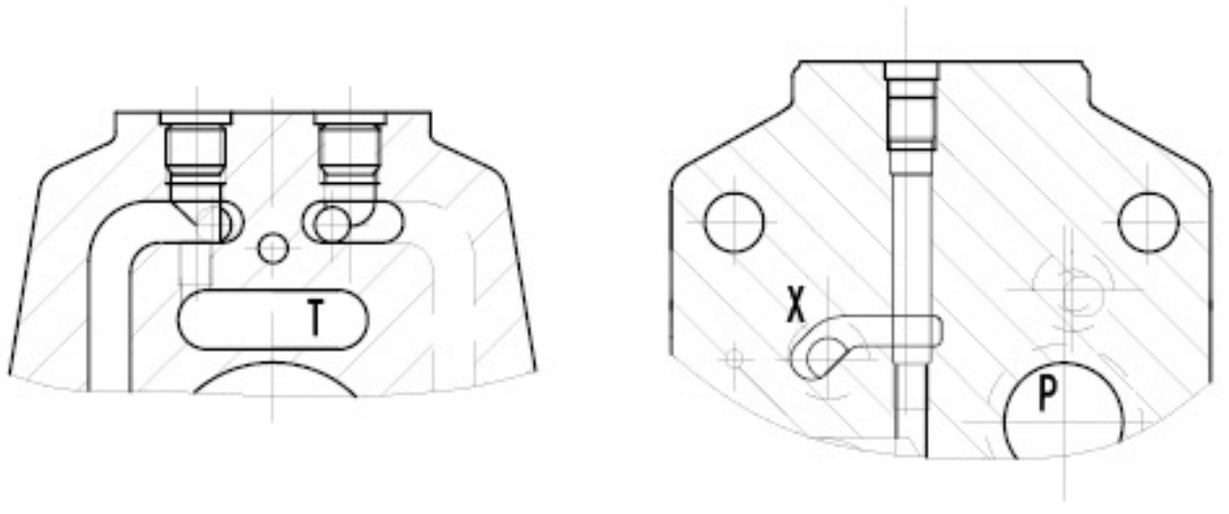
pilot oil supply external
pilot oil drain external
Ports 1 and 2 have to be plugged.
（Items 55:ZM12X1.5　　items 41:ZM8X1
items 54:ZM6X1）



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 valve （MPa）		pilot oil supply external	3~10			
		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		℃	-20 ~ 80			
Viscosity range		mm/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

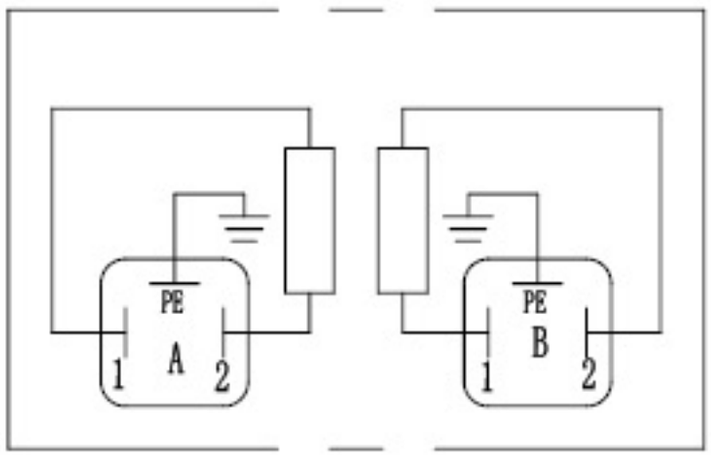
Electrical

Valve type			WRZ	WRZE
Voltage type			DC	
Max.current		A	1.5	2.5
Solenoid coil resistance （Ω）	Cold value at 20℃		4.8	2
	Max.warm value		7.2	3
Protection			IP65	
Coil temperature		℃	up to 150	
Duty		%	100	
Control electronics			HD-VT-VSPA2-50-1X/...	integrated control electronics

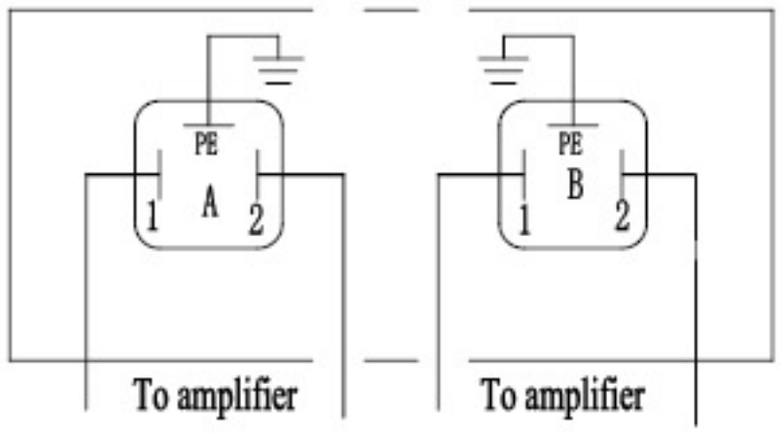
Electrical connections, plug-in connectors

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

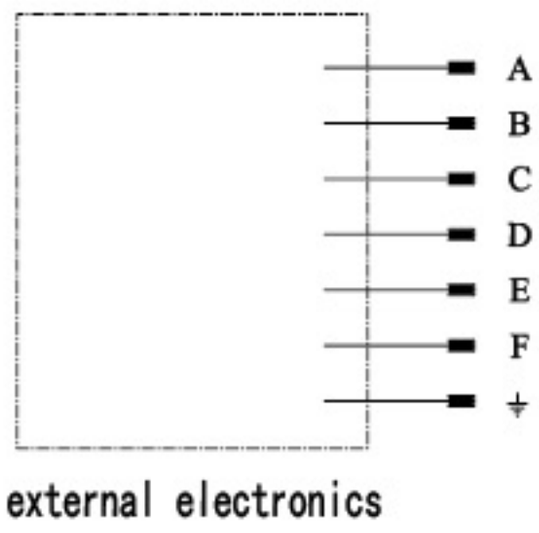
Connection at component plug



Connection at plug-in connector



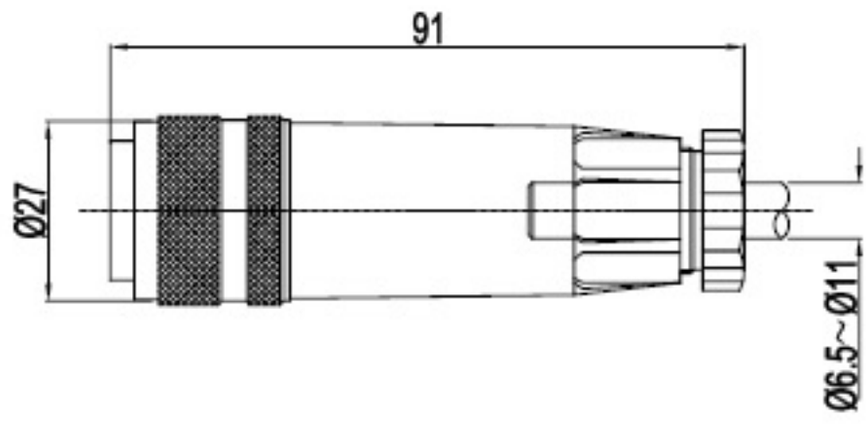
Component plug pin allocation



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

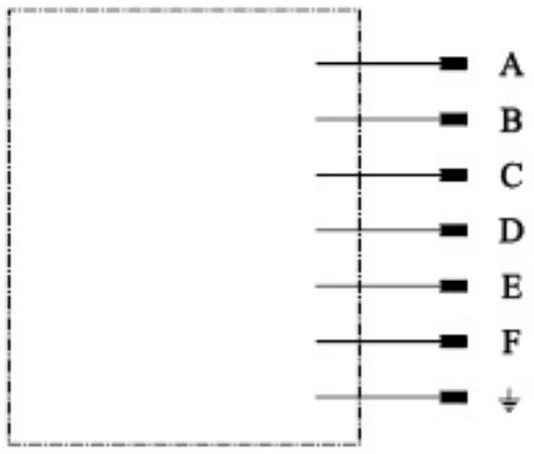
For type 4WRZE...(with integrated electronics)

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	24VDC（19 to 35VDC）
	B	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.

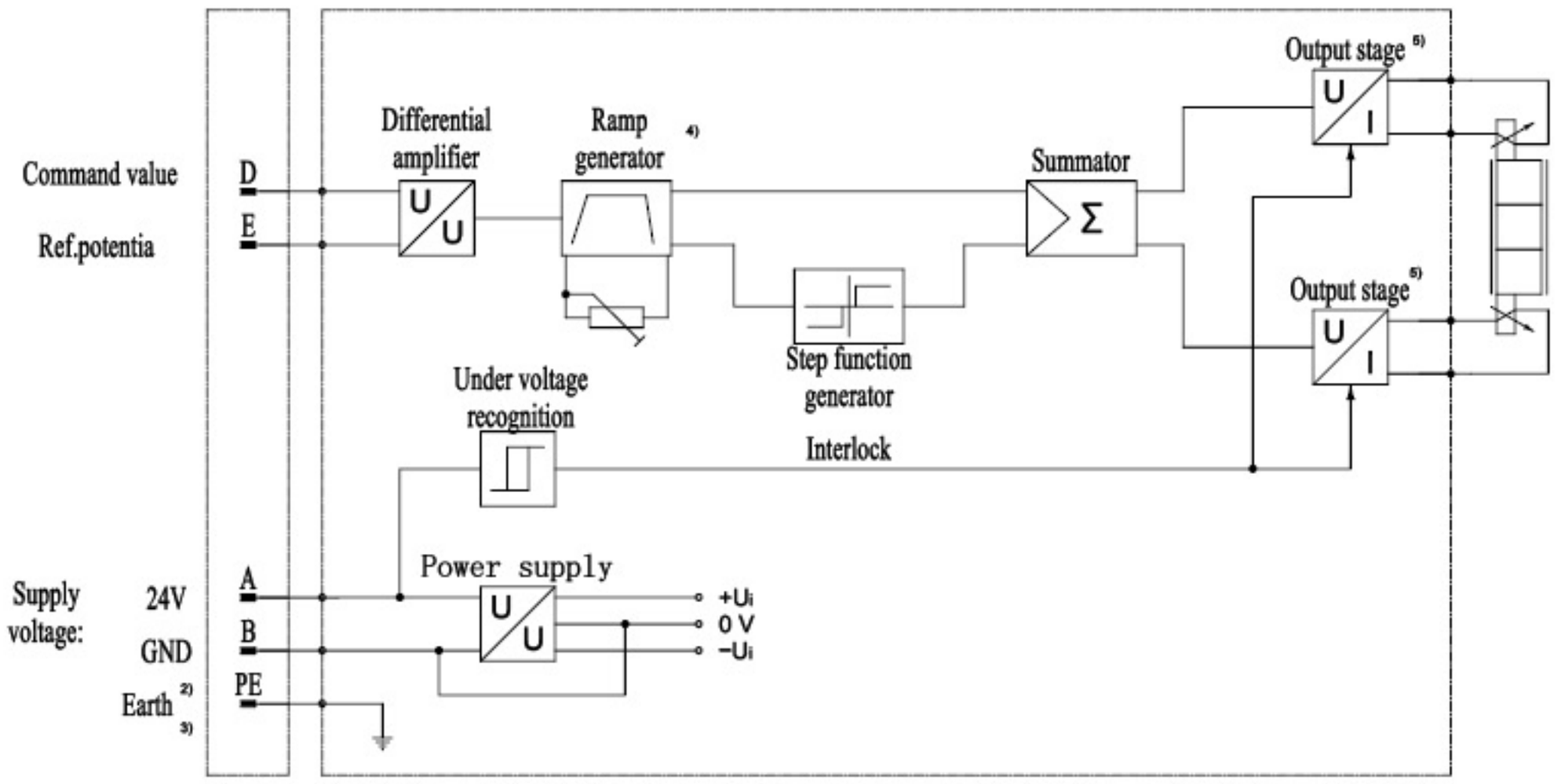
Connection cable: Recommended: - up to 25m cable length LiYCY 5×0.75mm^2;

- up to 50m cable length LiYCY 5×1.0mm^2;

Outside diameter 6.5 to 11mm or 8 to 13.5mm

Only attach screen to PE on the supply side.

Interface	Integrated control electronics	Valve



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

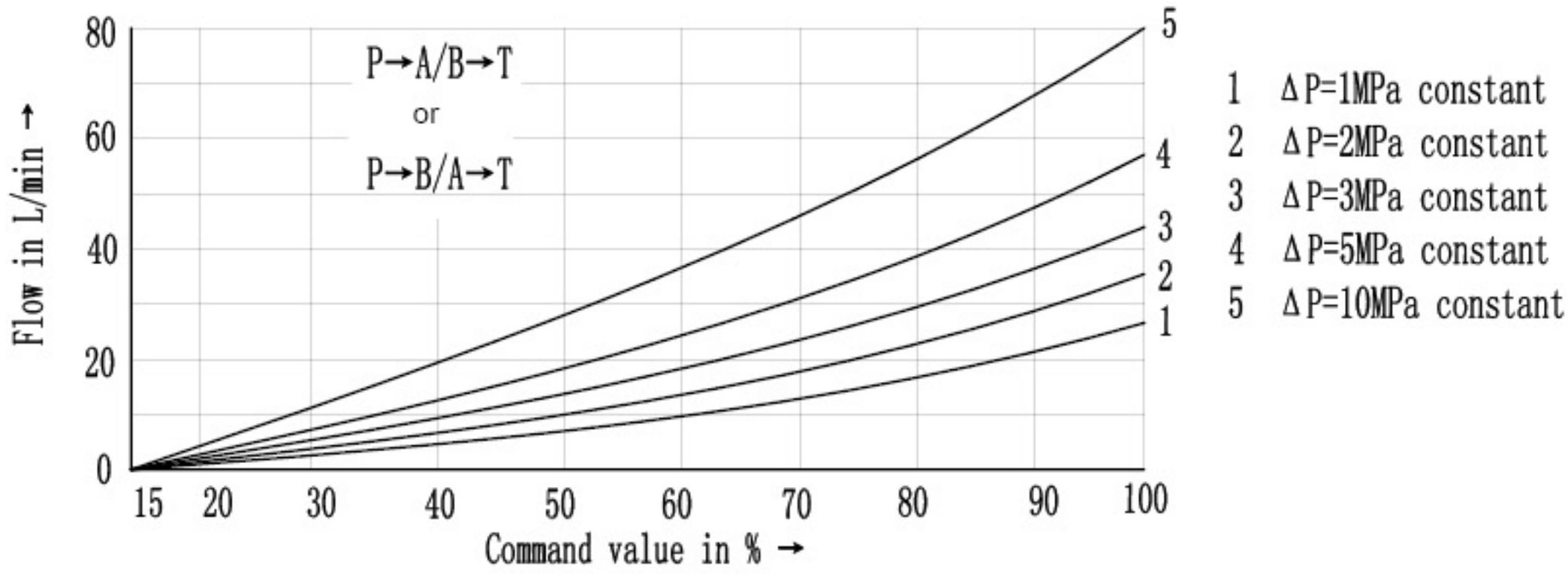
4) Ramp can be externally adjusted from 0 to 2.5 s; the same applies for Tup and Tdown

5) Output stage current regulated

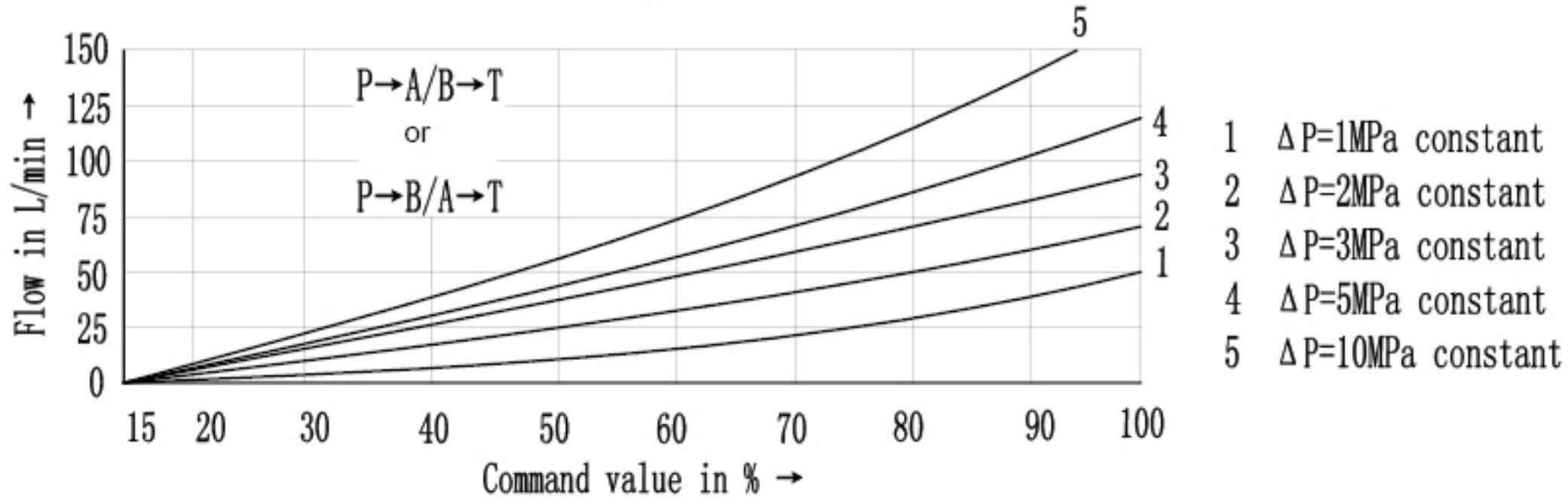
Characteristic curves (P=10MPa,v=36×10^{-6} m^2/s, t=50°C)

NS 10

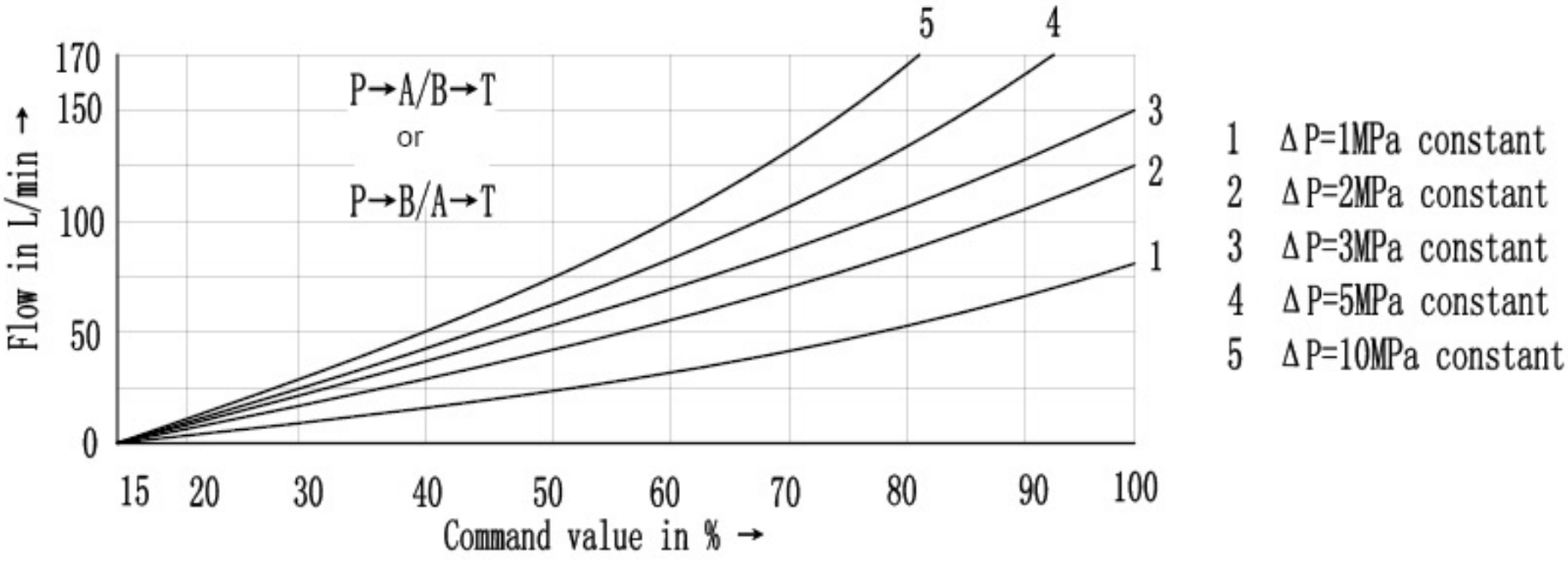
25L/min nominal flow with a 1MPa valve pressure differential



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



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

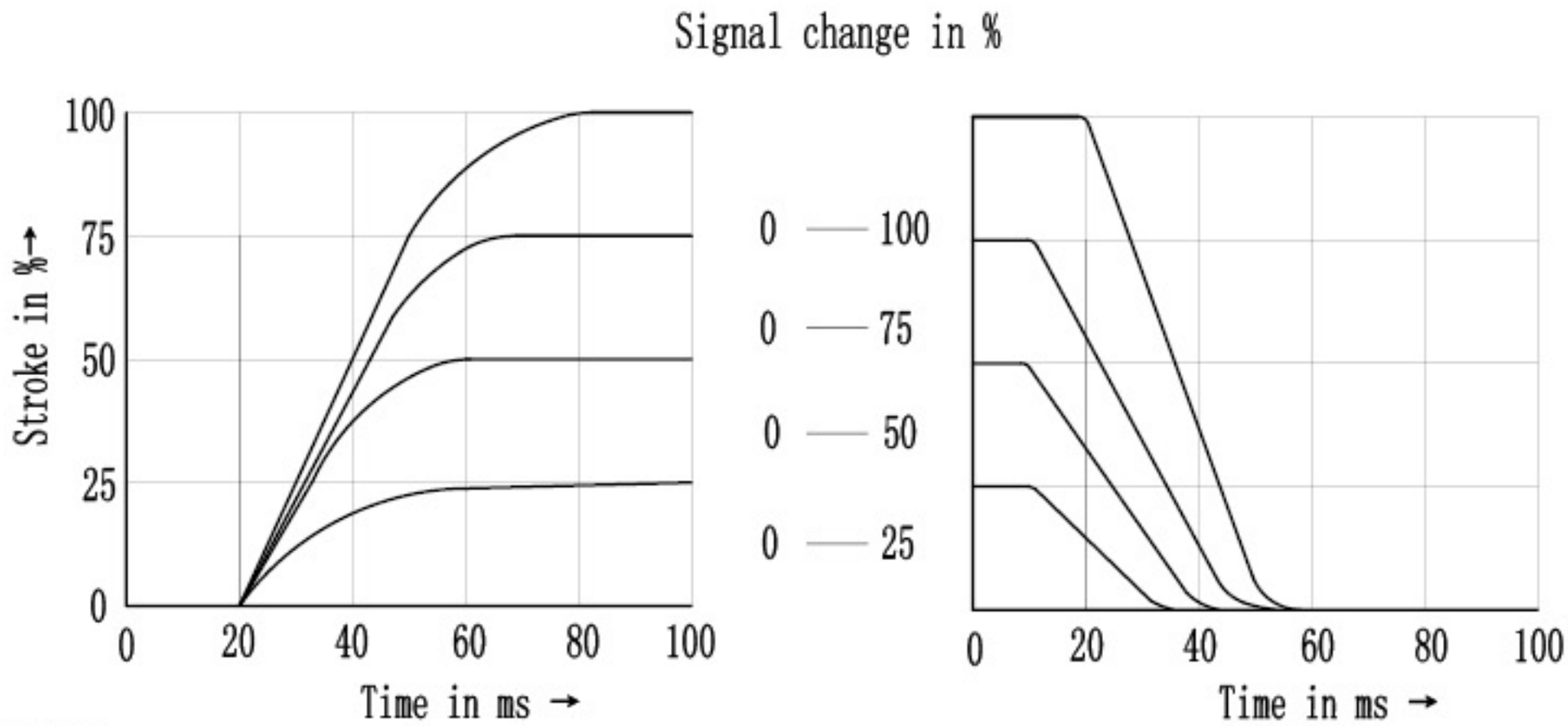


ΔP=value pressure differential(input pressure p_P minus load pressure p_L minus return line pressure p_T)

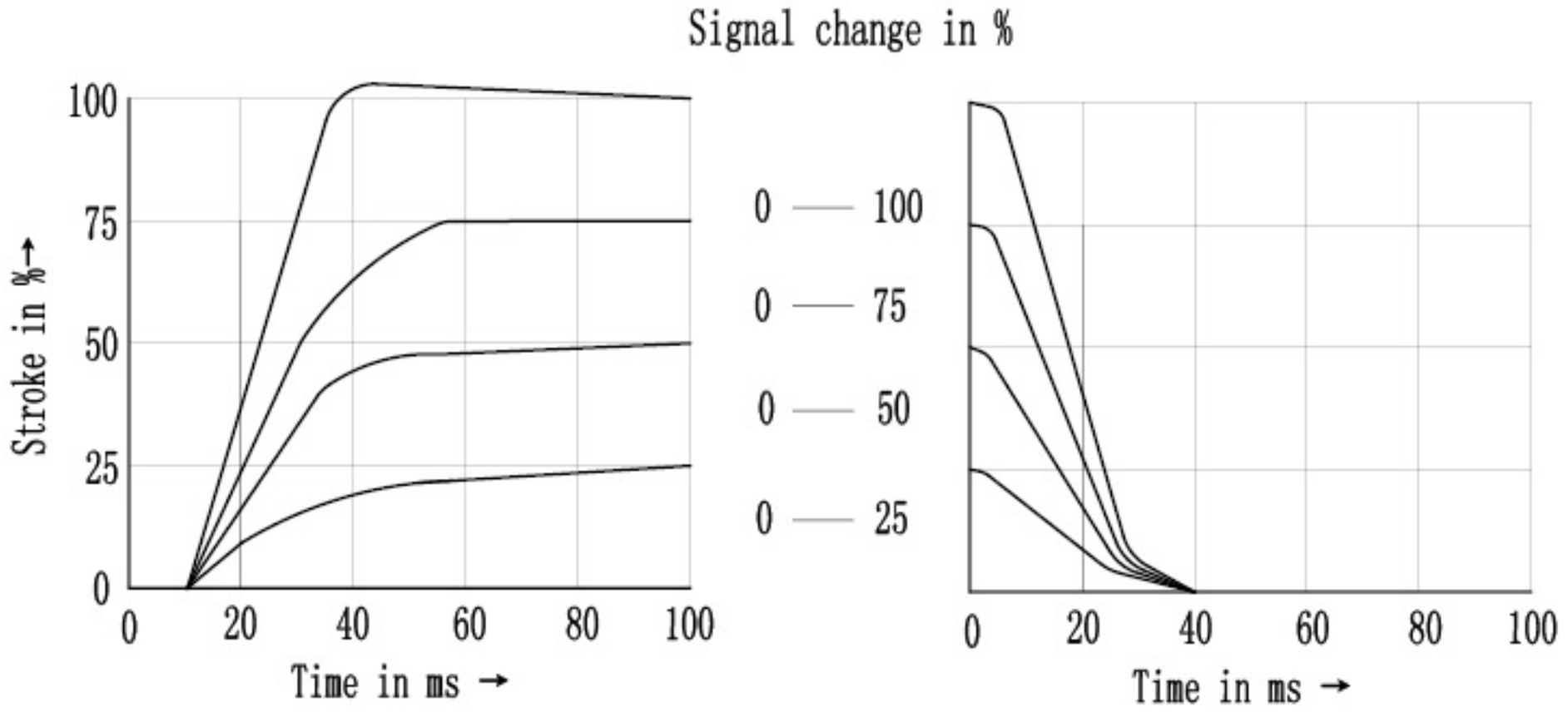
Characteristic curves (P=10MPa,v=36×10^{-6} m^2/s, t=50°C)

Transient function with a stepped form of electrical input signal, measured at Pst=5MPa

Type HD-4WRZ10...

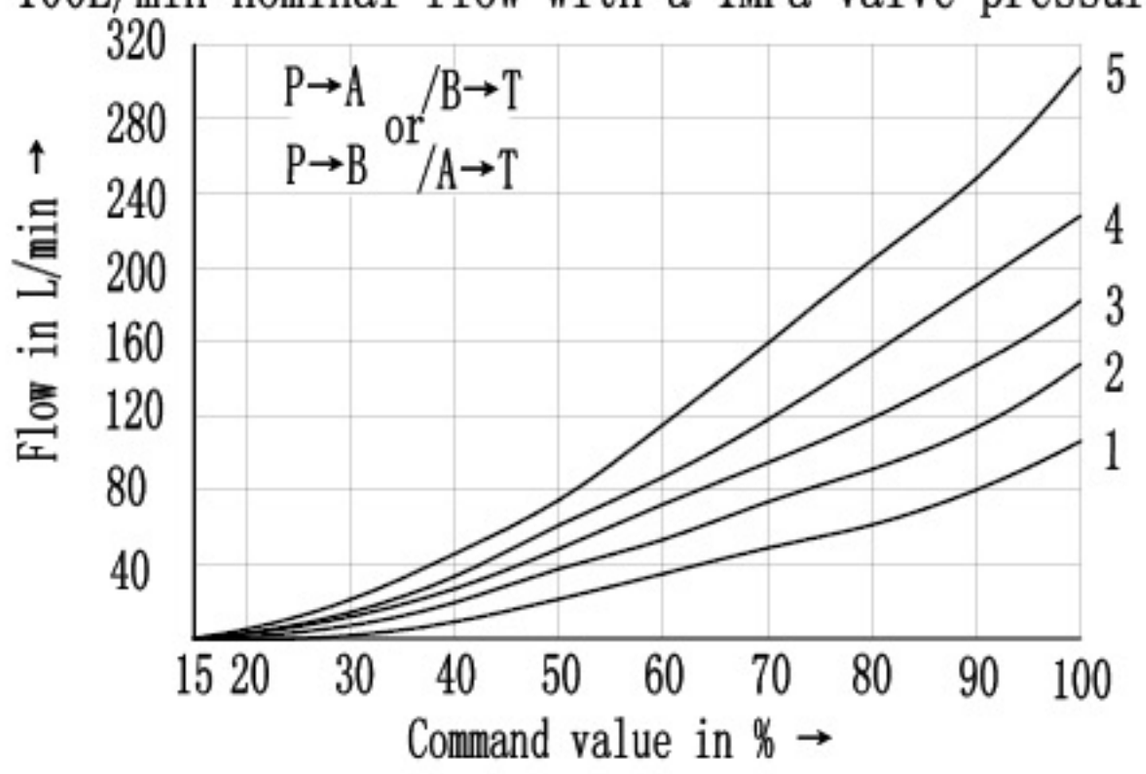


Type HD-4WRZE10...



NS 16

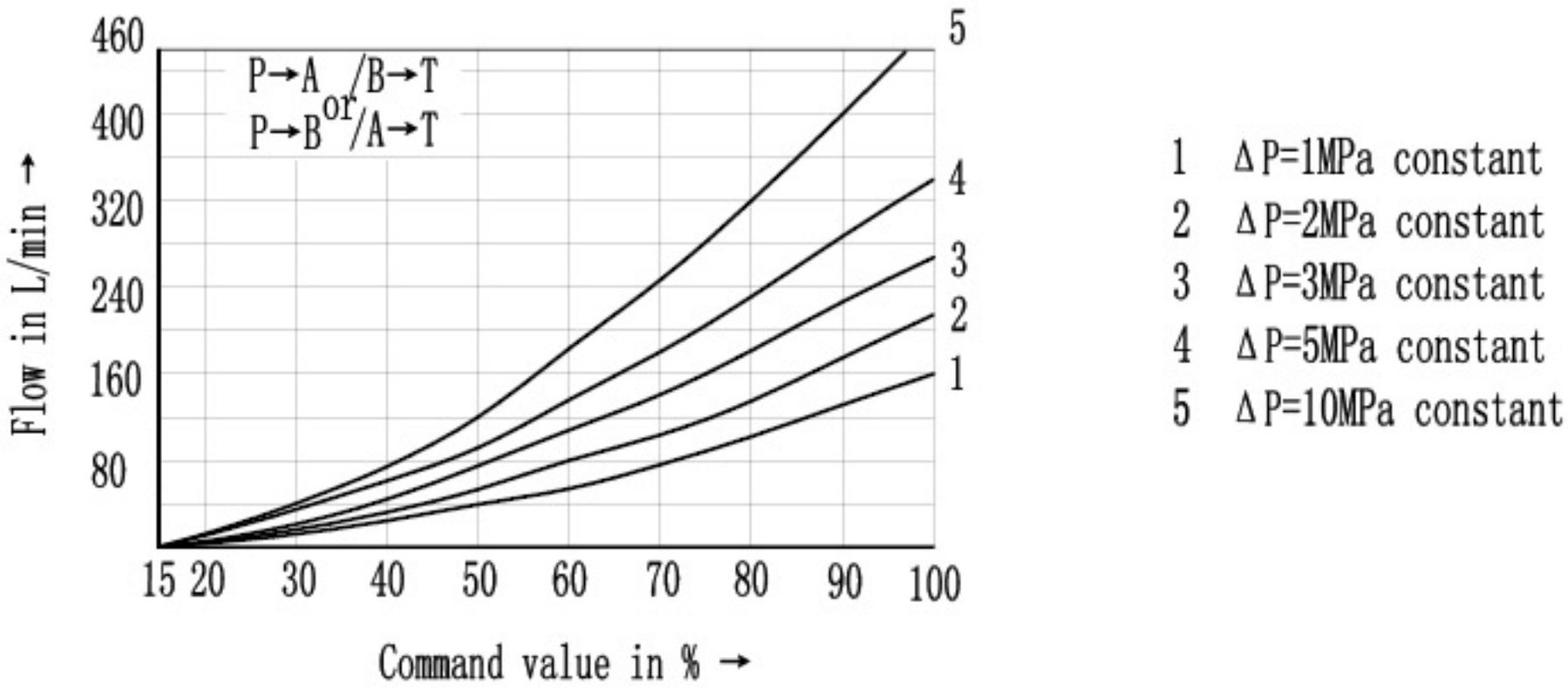
100L/min nominal flow with a 1MPa valve pressure differential



1 ΔP=1MPa constant
2 ΔP=2MPa constant
3 ΔP=3MPa constant
4 ΔP=5MPa constant
5 ΔP=10MPa constant

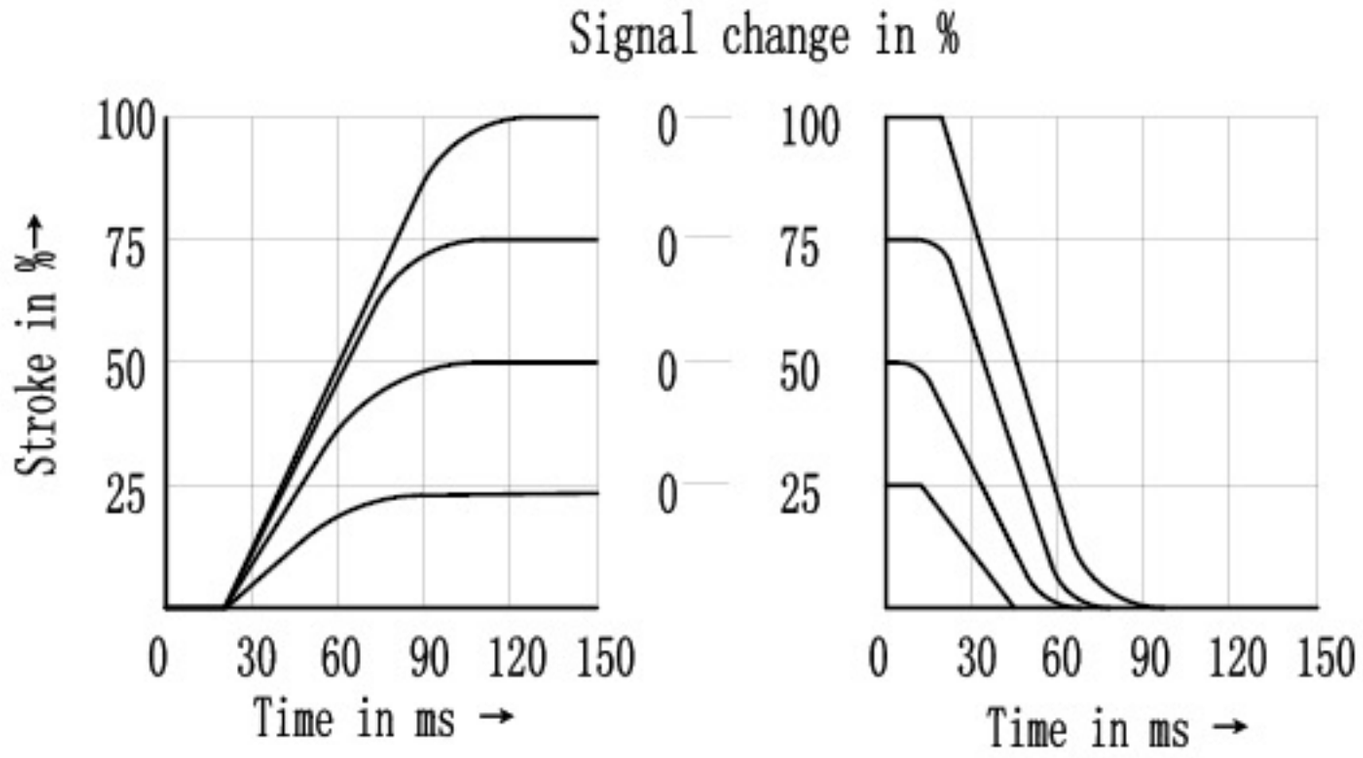
Characteristic curves (P=10MPa,v=36×10^{-6} m^2/s, t=50°C)

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

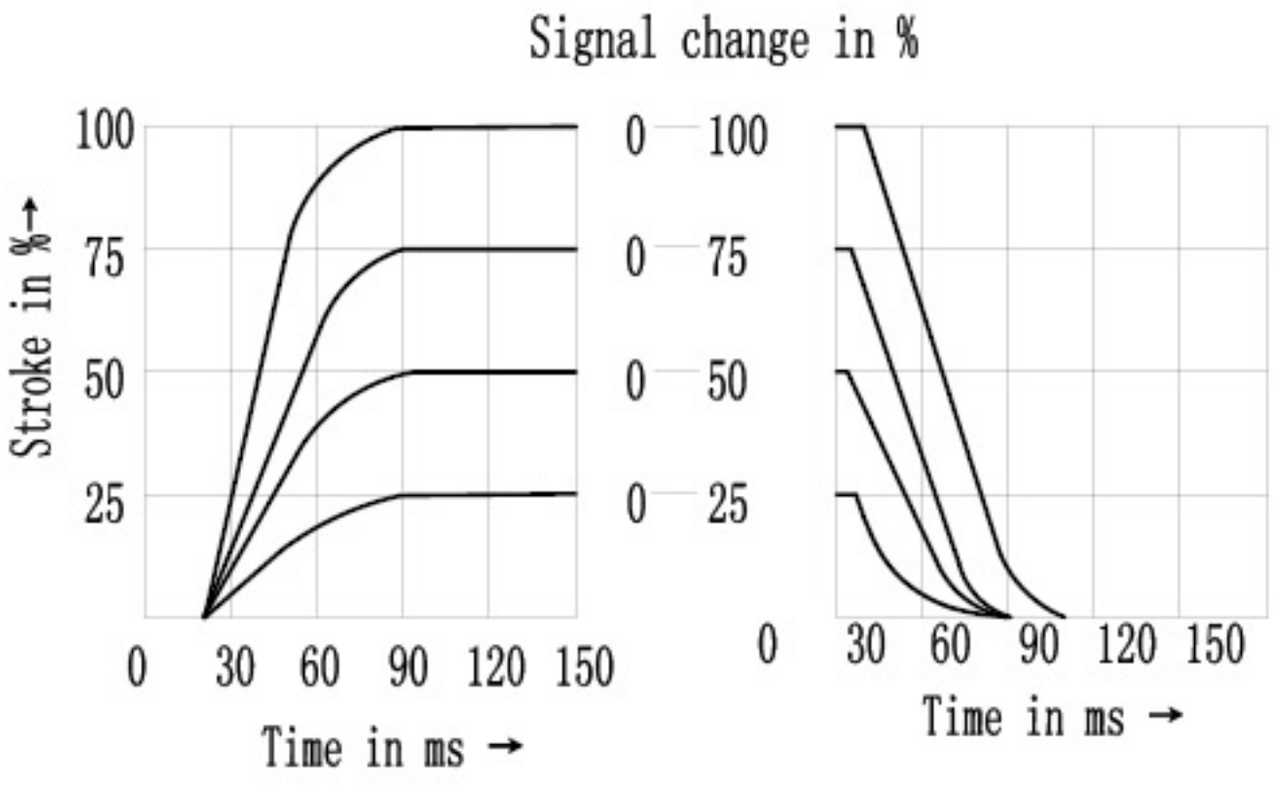


Transient function with a stepped form of electrical input signal, measured at Pst=5MPa

Type HD-4WRZ16...



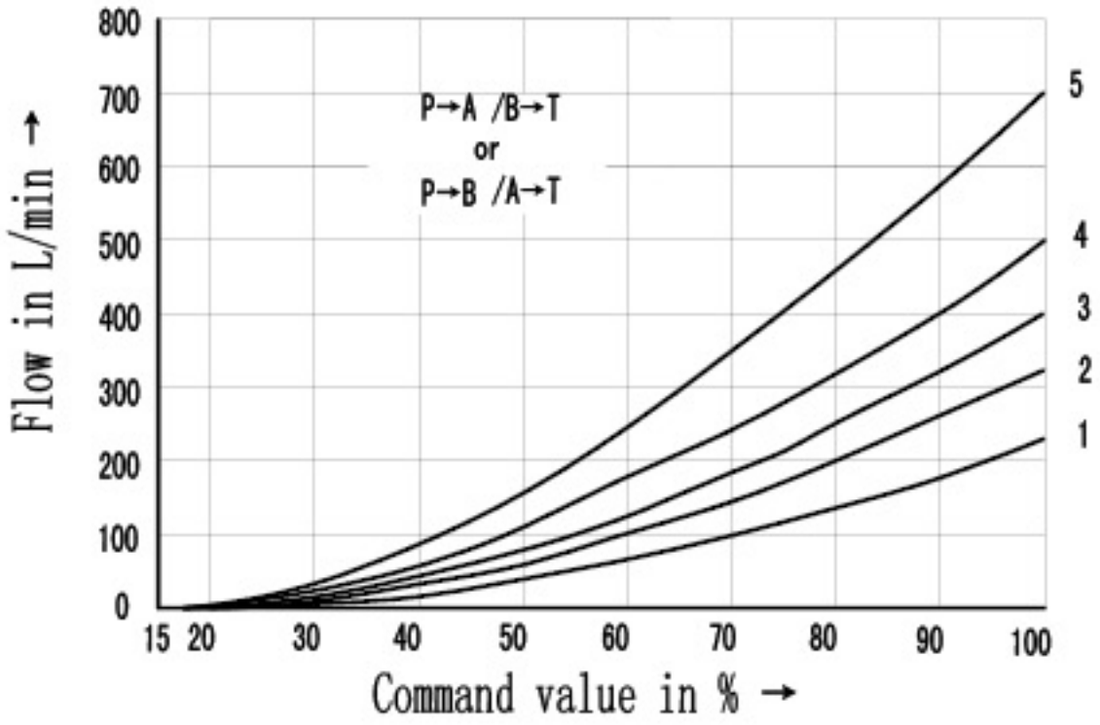
Type HD-4WRZE16...



Characteristic curves (P=10MPa,v=36×10^{-6} m^2/s, t=50°C)

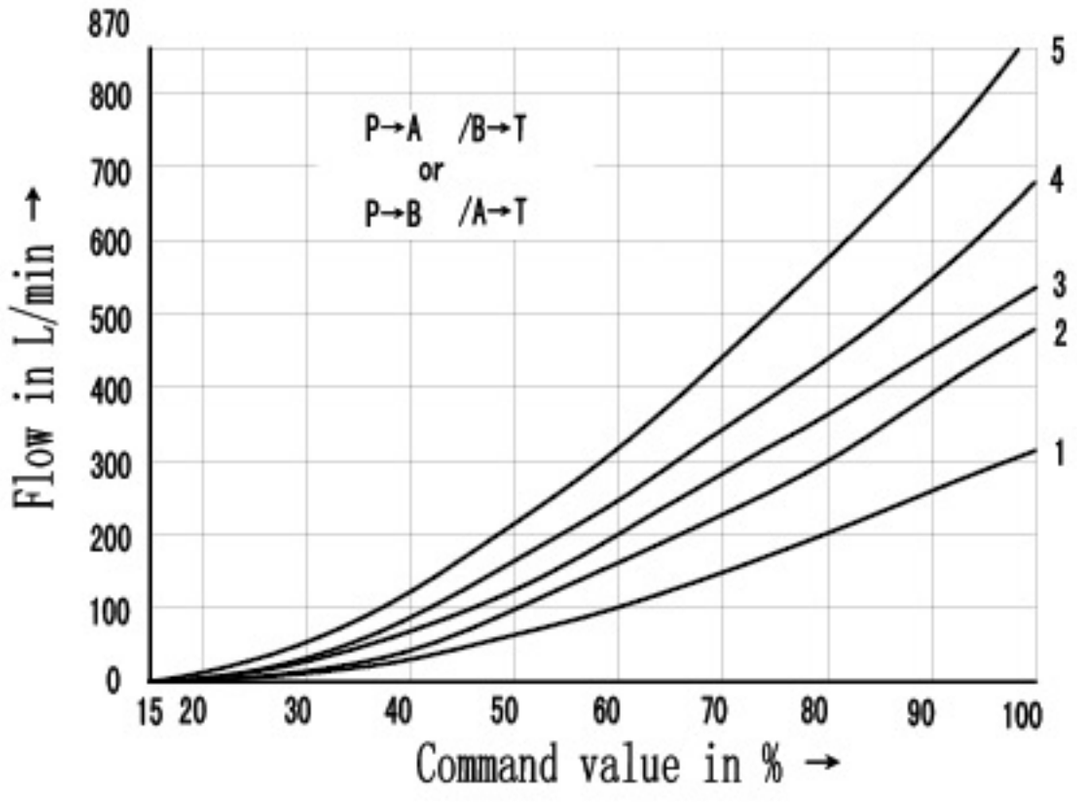
NS 25

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



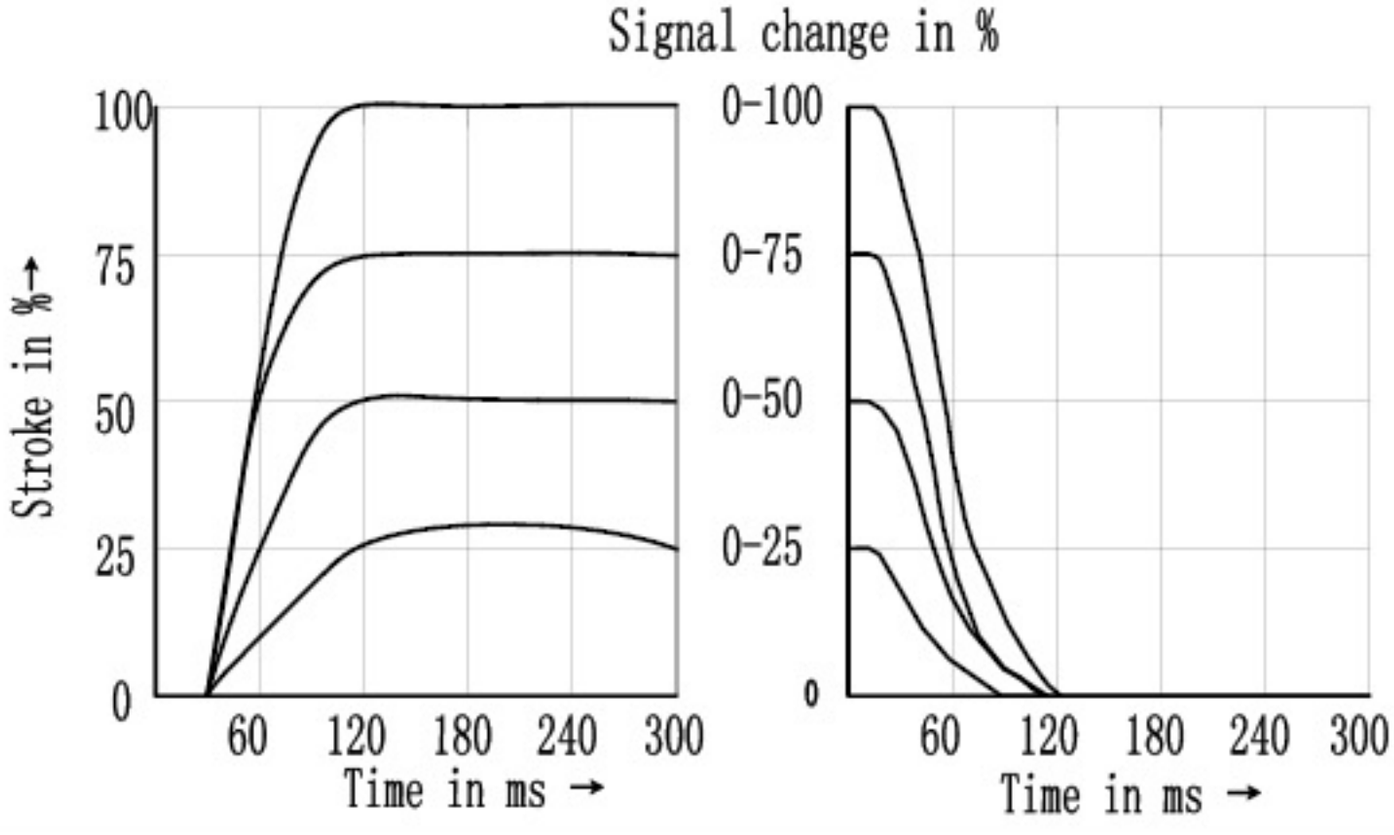
1 ΔP=1MPa constant
2 ΔP=2MPa constant
3 ΔP=3MPa constant
4 ΔP=5MPa constant
5 ΔP=10MPa constant

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



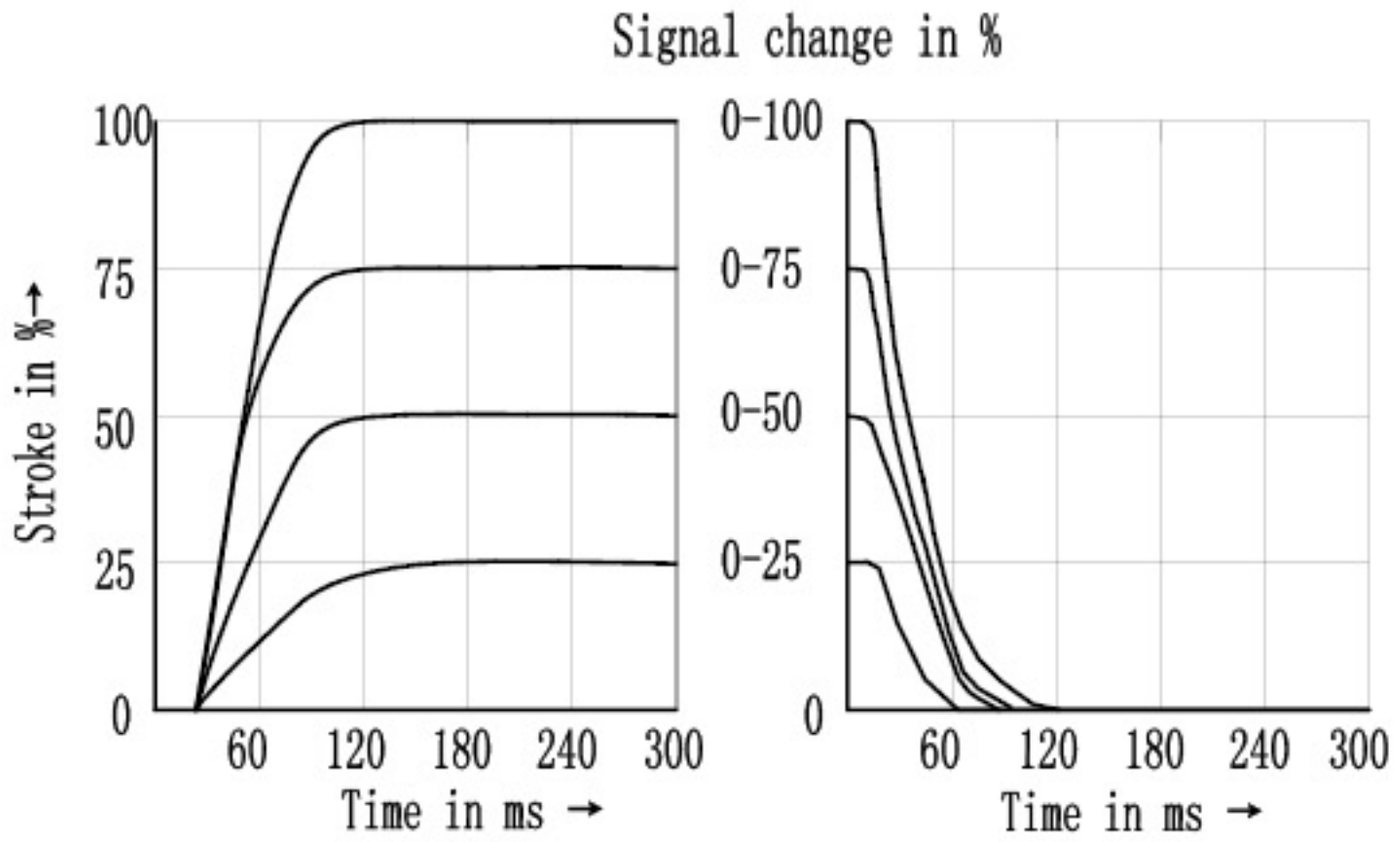
1 ΔP=1MPa constant
2 ΔP=2MPa constant
3 ΔP=3MPa constant
4 ΔP=5MPa constant
5 ΔP=10MPa constant

Transient function with a stepped form of electrical input signal,measured at Pst=5MPa
Type HD-4WRZ25...



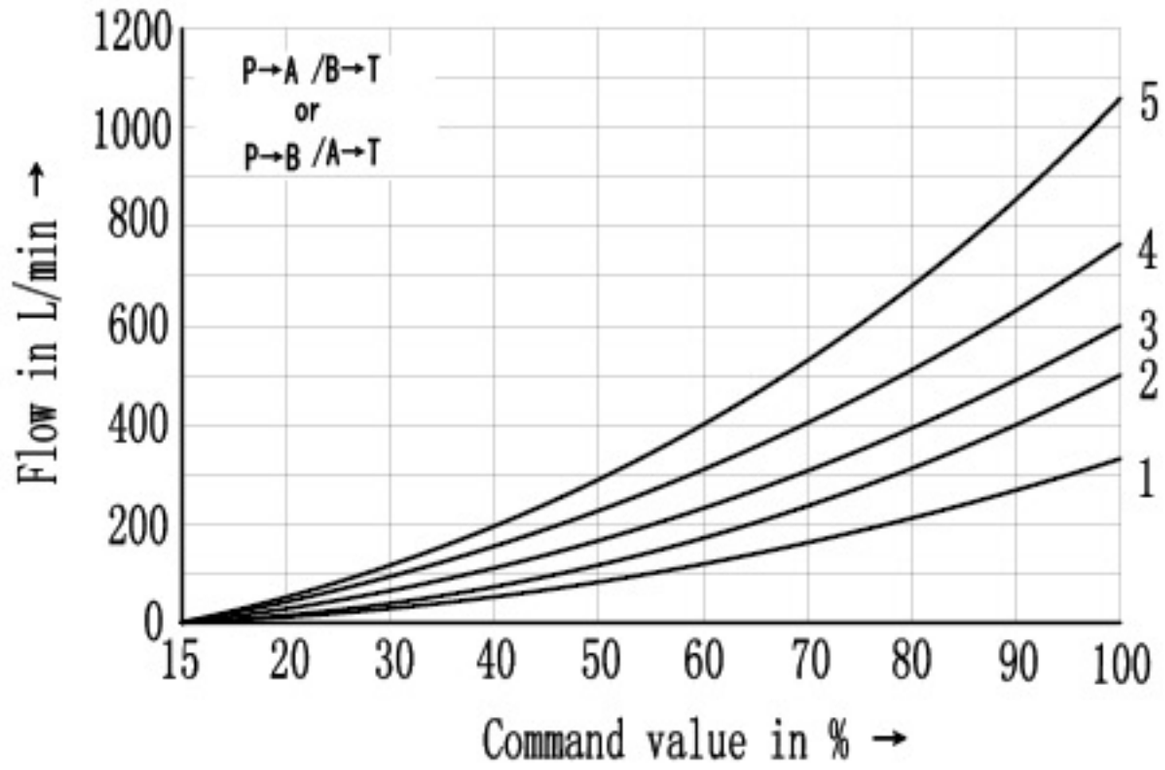
Characteristic curves (P=10MPa,v=36×10^{-6} m^2/s, t=50°C)

Type HD-4WRZE25...



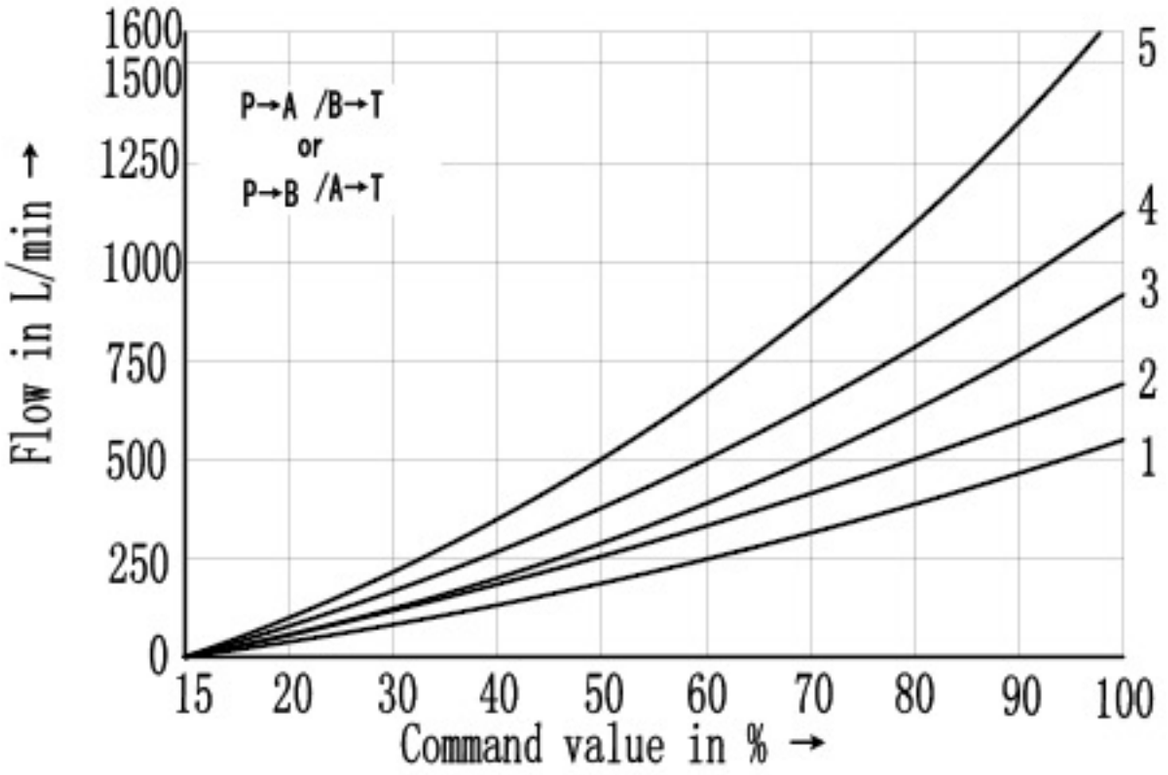
NS 32

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



1 ΔP=1MPa constant
2 ΔP=2MPa constant
3 ΔP=3MPa constant
4 ΔP=5MPa constant
5 ΔP=10MPa constant

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

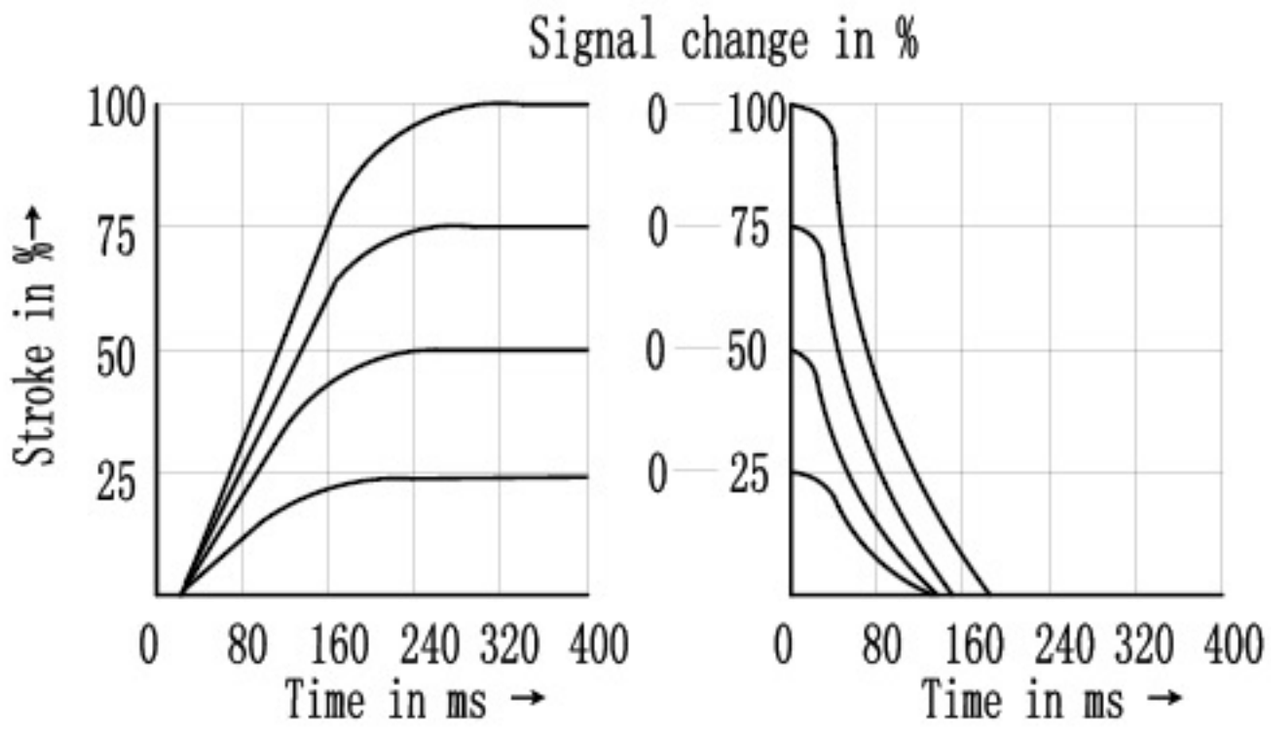


1 ΔP=1MPa constant
2 ΔP=2MPa constant
3 ΔP=3MPa constant
4 ΔP=5MPa constant
5 ΔP=10MPa constant

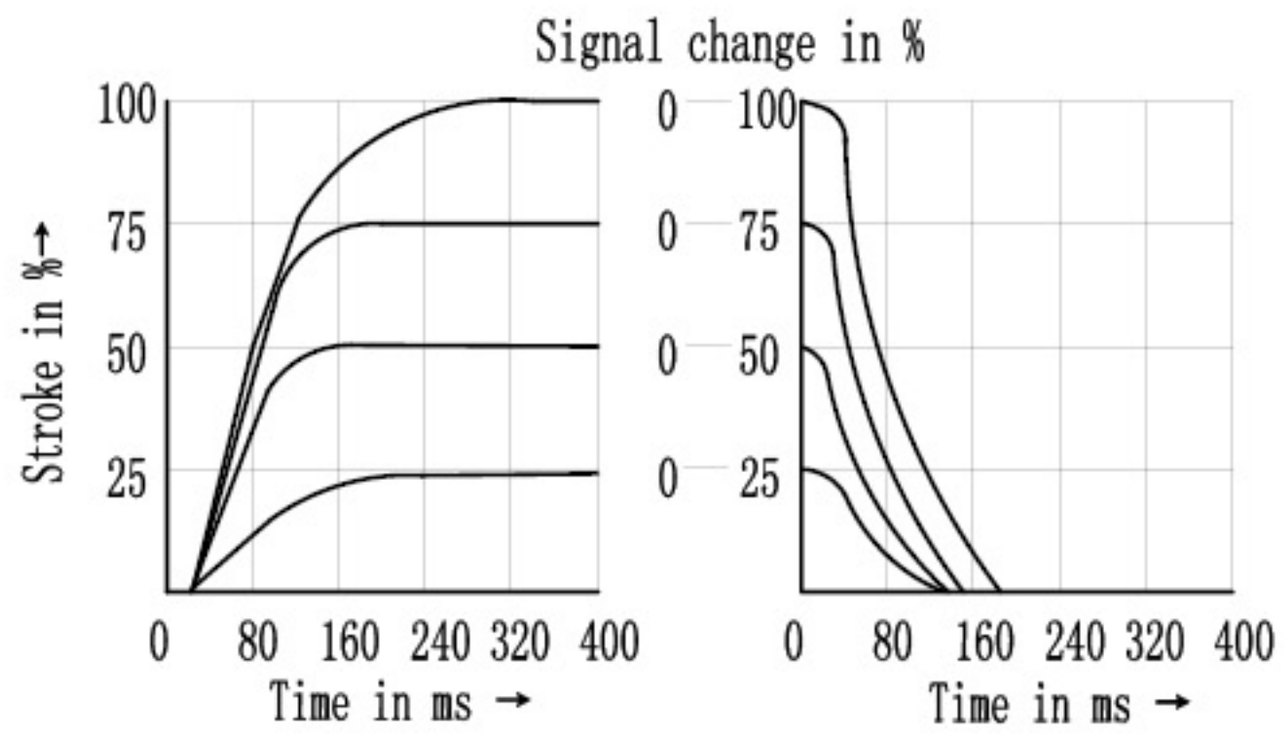
Characteristic curves (P=10MPa,v=36×10^{-6} m^2/s, t=50°C)

Transient function with a stepped form of electrical input signal, measured at Pst=5MPa

Type HD-4WRZ32...

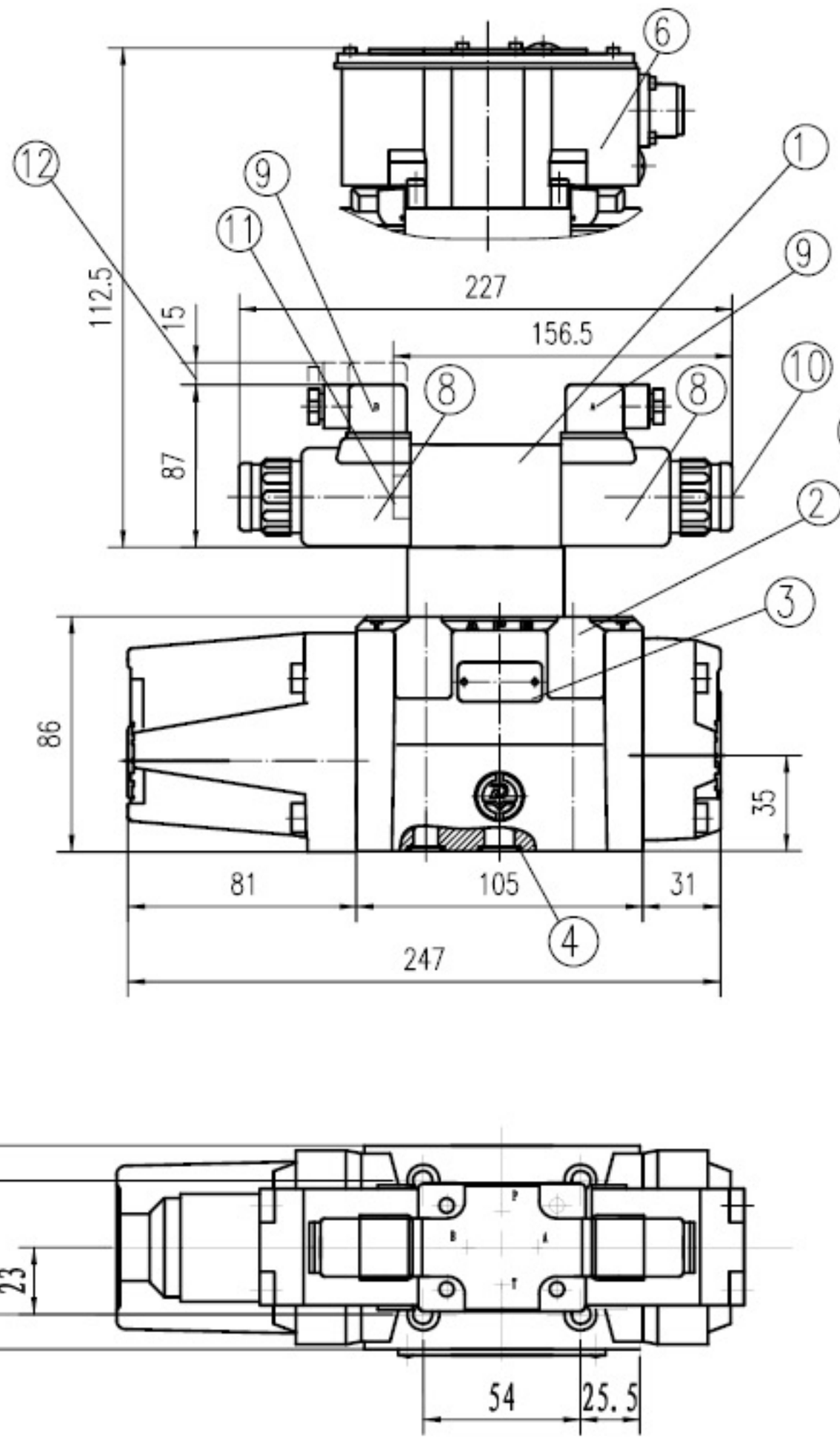


Type HD-4WRZE32...



Unit dimensions, NS10

Dimensions in mm



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"

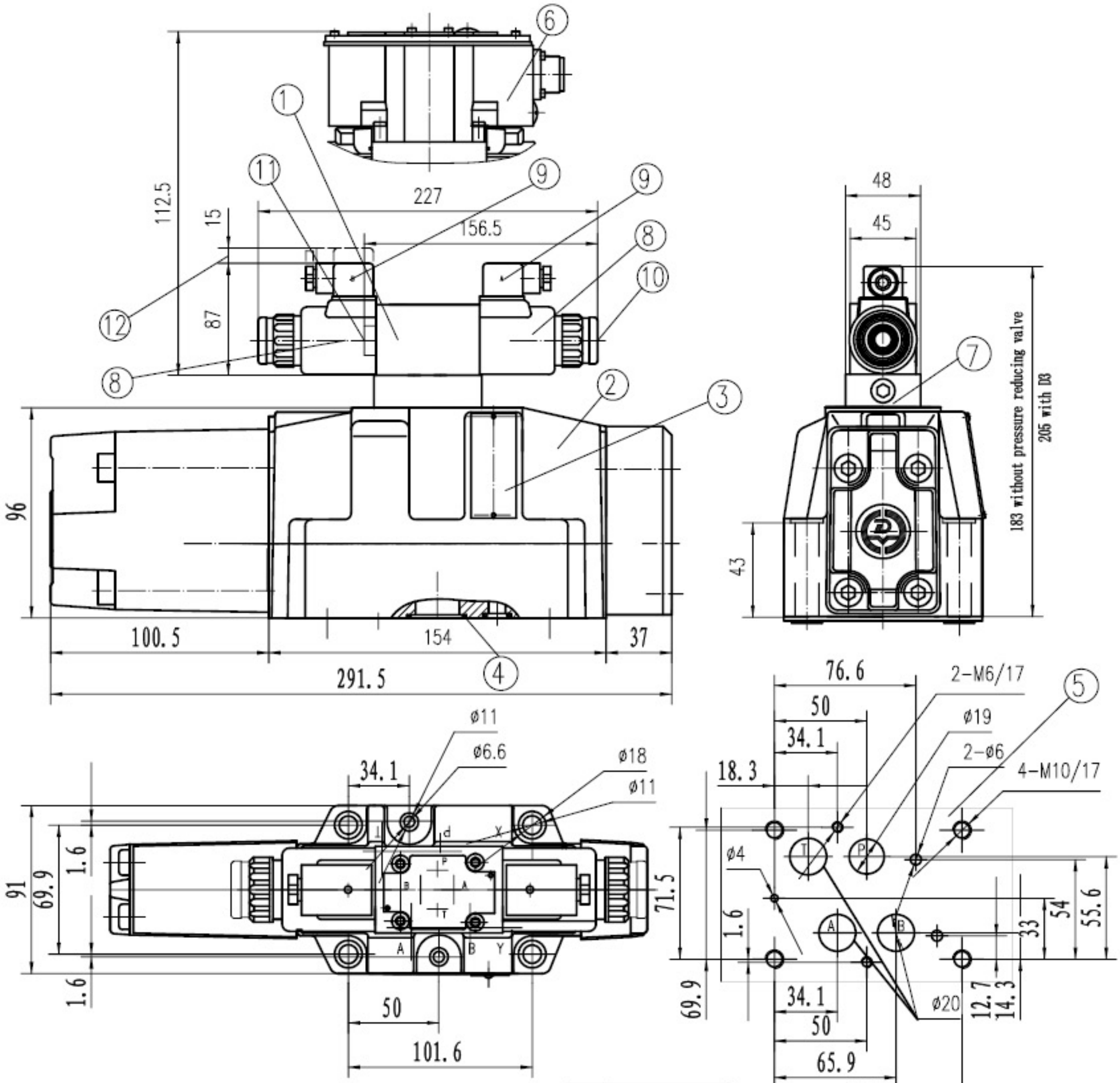
Required surface finish of mating piece

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 =15.5Nm

Unit dimensions, NS16

Dimensions in mm



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"

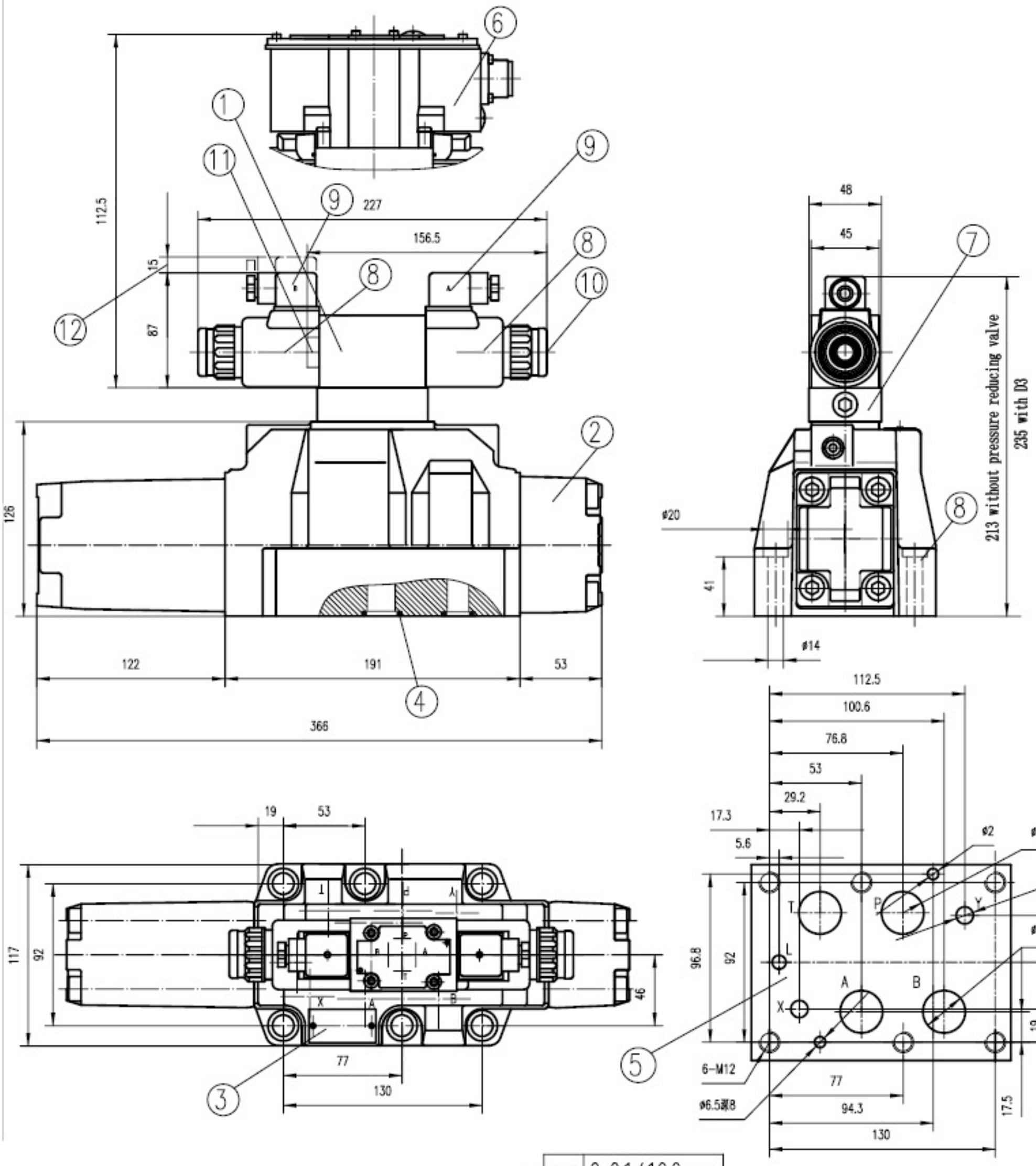
Required surface finish of mating piece

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=75Nm
2-M6x60 (GB/T70.1) M_A= 15.5Nm

Unit dimensions, NS25

Dimensions in mm

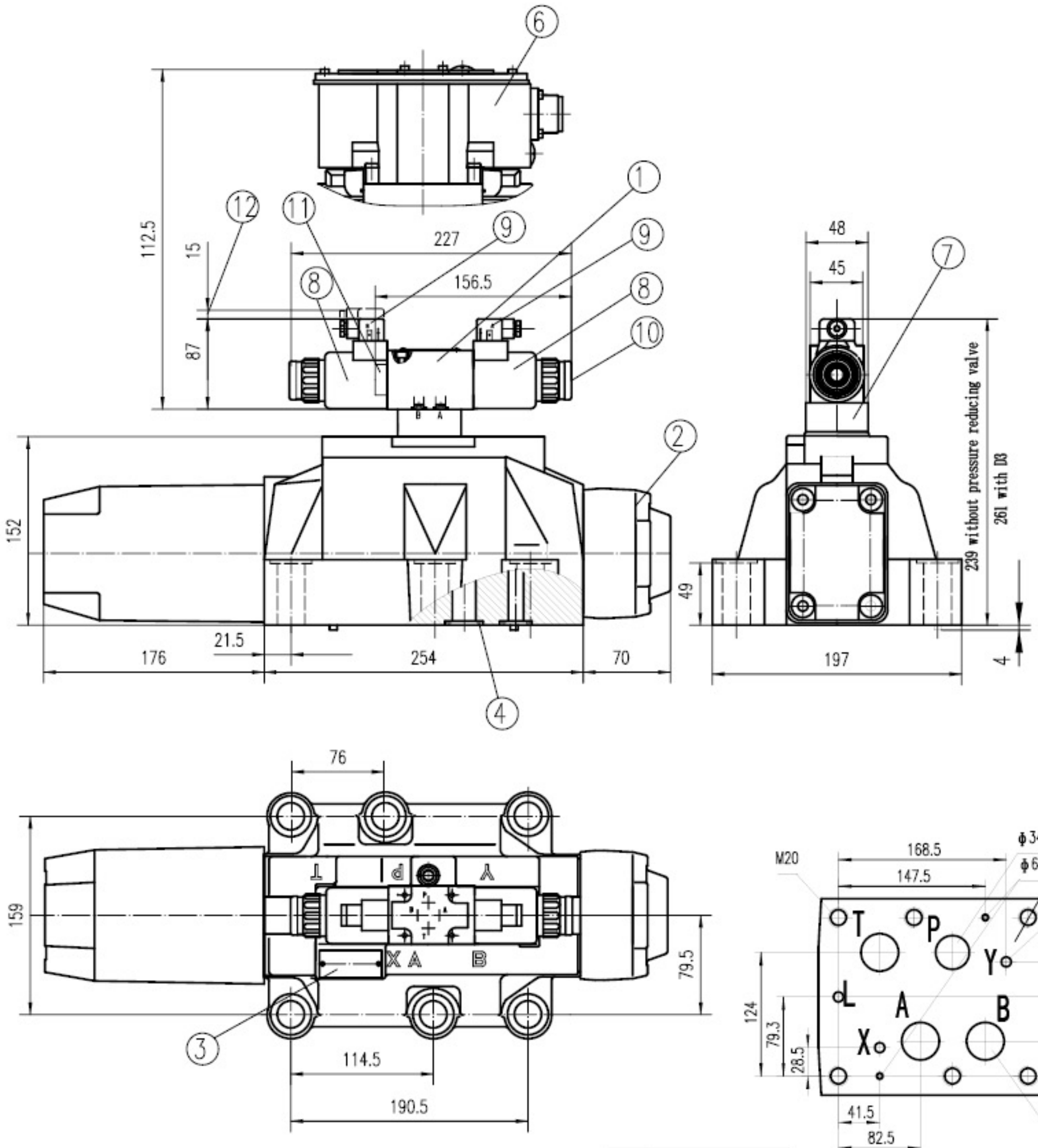


1 Pilot valve
2 Main valve
3 Nameplate for valve
4 O-ring 27X3(for ports A,B,P,T)
O-ring 19X3(for ports X,Y)
5 Machined valve mounting face
6 Integrated control electronics
7 Pressure reducing valve D3
8 Proportional solenoid "a", "b"
9 Plug-in connector "A", "B"
10 Protected hand override "N9"
11 Cover for valve with one solenoid
12 Space required to remove plug-in connector

Valve fixing screws:
6-M12x60 (GB/T70.1) M_A=130Nm

Unit dimensions, NS32

Dimensions in mm



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

Notice

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1. The fluid must be filtered. Minimum filter fineness is 20 μm.
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 $\overset{0.8}{\nabla}$.
6. Surface finish of mating piece is required to 0.01/100mm.