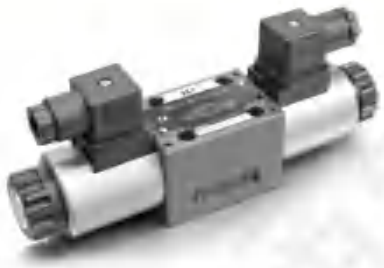
4WRA Series

1.Direct control proportional reversing valve,
without displacement electrical feedback, spool by the spring to the center;
2.Accurate stepless flow regulation (without pressure compensation)
and direction control can be realized;
3.Proportional electromagnet with center thread,
coil can be separately removed;
4.Used for bottom plate installation,
installation surface according to the unified international standard ISO 4401;
5. Electric control device has external type and integrated type,
which can be used interchangeably with similar products in Europe and America;



How to order

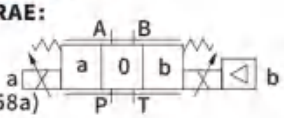
4WRAE6-C2-30 A-10-D24-N-K31-A1-V-**

- Direct action without displacement electrical feedback
- Electronic control
  Blank: Without intergratd
  E: With inergrate
- Nominal size
  6: NG 6
  10: NG 10
- Slide column function
  See slide column function table
- Nominal flow
  NG 6
  07:7L/min
  15:15L/min
  30:26L/min
  NG 10
  30:30L/min
  60:60L/min
- Slide column type
- Design code
- Power supply voltage
  Blank: None(for 4WRA)
  D24: DC24V(for 4WRAE)
- Emergency operation
  Blank: built-in emergency button
  N: None
- Electrical connection
  4WRA
  Blank: with coil plug(PG11)
  K4: None
  31: Wire type
  41: 2-piece plug-in type(SAE J858a)
  51: Pin type (DT04-2P)
  4WRAE
  Blank: with amplifier plug
  K31: None
- Control instruction
  Blank: for 4WRA;
  A1: Instruction value ±10V(for 4WRAE);
  F1: Instruction 4 to 20mA(for 4WRAE)
- Sealing material
  Blank: Nitrile rubber
  V: Fluorine rubber
- More details

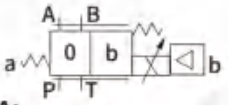
Symbols

4WRAE:

C*

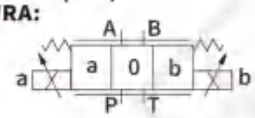


C*B

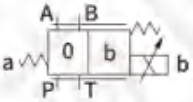


4WRA:

C*



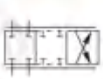
C*B



Note:
Nominal flow-rate measured at △P=10bar.
4WRA Series amplifying plate order separately.
Type 31/51 for NG 10 please contact with Technical Department.
Type 41 please contact with Technical Department.

Slide function

Specification

Application	Type	Graphic symbol		Application	Type	Graphic symbols	
3-position Spring centered	C2 C21			2-position Spring centered	C2B		
	C4 C41				C4B		

1.C21、C41 function, Including P→A: q_{max}, B→T: $q_{max}/2$; P→B: $q_{max}/2$, A→T: q_{max}.
2.C4、C4B function, A、B→T approximately 3% of the rated flow area.
3.For other functional forms of sliders, please consult our company.

Description

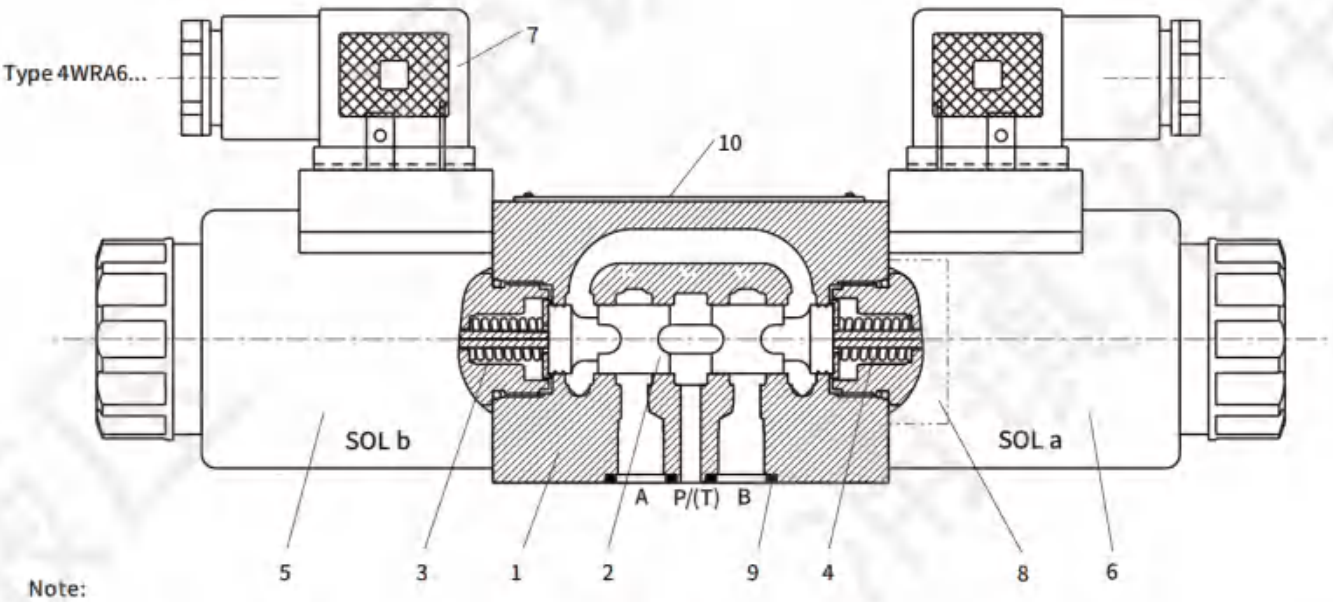
Structure

4WRA is a direct-acting two-position four-way and three-position four-way proportional directional valve, and the control of its electromagnet needs to be realized by an external electronic controller, or this is achieved by an integrated electric controller (4WRAE type)

The valve is mainly composed of the following parts:
—Valve body with mounting underside(1)
—Control spool(2)
—Spring centered (3 and 4)
—Proportional electromagnet with center thread(5 and 6)
—Optional proportional solenoid plug(7);For type 4WRAE, the electrical connector is optional.
—Optional screw plug(8)
—Sealing rings for oil ports P, A, B and T(9)
—Valve nameplate(10)

Functional Specification

—When the electromagnets (5 and 6) are not charged, the spring centered (3 and 4) holds the control spool (2) in the central position.
—When the proportional electromagnet is excited, it directly pushes the control spool(2).
—For example, when the proportional electromagnet (5) is excited, the control spool (2) is pushed to the right, and the displacement of the spool is proportional to the input electrical signal.
Meanwile, the P→B, A→T oil circuit is formed, and the throttling characteristics of the oil circuit are progressive.
—After the proportional electromagnet (5) loses power, the control spool (2) is pushed back to the center position by the center spring (4).
—An optional proportional coil plug (7) is electrically connected to an external amplifier plate.



Note:

1. The valve of two-position four-way structure is similar to that of three-position four-way, except that the two-position four-way has only one proportional electromagnet and the other proportional electromagnet plug A (8) is installed.
2. The oil in the return pipeline must be completely emptied, and the back pressure valve (about 2bar) must be installed in the loop if necessary.

Specification

Overview

Diamater		6	10
Mounting position		Free, Horizontal installation is recommended	
Storage temperature(°C)		-20~+80	
Application temperature(°C)	4WRA	-20~+70	
	4WRAE	-20~+50	
Weight (kg)	4WRA	2.0	6.6
	4WRAE	2.2	6.8

Hydraulic parameters (Measured at P=100bar，VG46，40±5°C)

Max working pressure(bar)	P,A,B: 315;T: 210	
Nominal flow-rate(L/min)(△p=10bar)	7, 15, 26	30, 60
Max. flow (L/min)	42(80:Double channel loop)	75(140:Double channel loop)
Hydraulic medium	Mineral oil (HL,HLP) to DIN51524,Other oil please consult our company!	
Oil temperature (°C)	-20~+80(+40~+50 preferably)	
Viscosity range	20~380mm²/s(30~46mm²/s preferably)	
Fluid Cleaning Class	NAS1638 Class 9 or ISO4406 Class 20/18/15	
Hysterics(%)	≤5	
Reverse error(%)	≤1	
Sensitivity(%)	≤0.5	

Coil characteristic

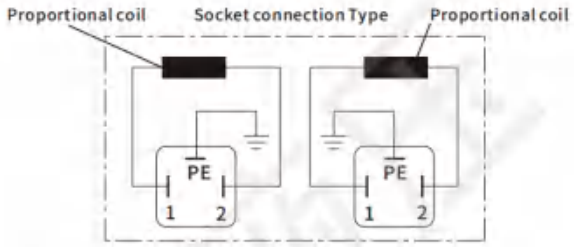
Diameter	6		10	
Rated current (A)	2.5	0.8	2.5	0.8
Rated resistance(Ω)	2	19.5	2	19.5
Level crossing rate	ED100%			
Protection level	IP65(Type 31/51 can reach IP67)			
Insulation grade	H			
Max. power (W)	18.7		32.7	

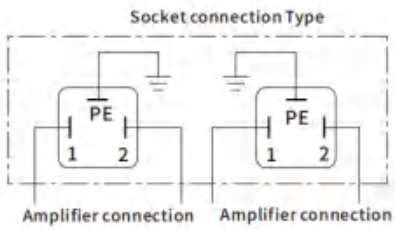
Integrated electronic control unit

Voltage(DC)	24V (19V-35V)
Power Loss(VA)	<45
Current draw(A)	<2
Instruction value input	±10V(R_e>50KΩ); 4~20mA(R_e<200Ω)
Ramp Times	0~5s adjustable
Electrical connection	With sockets according to DIN EN175201-804
Protection level	IP65

Electrical connection

Plug(According to DIN EN 175301-803)
4WRA

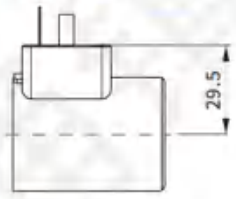




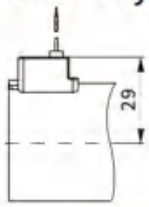
Plug-set screw M3
Tighten torque M_A=0.5Nm

Coil outlet type

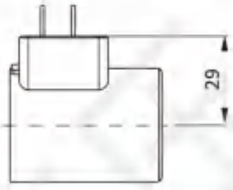
NG6:K4



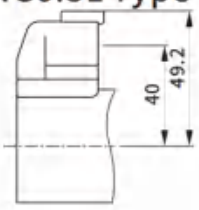
NG6:31 Type



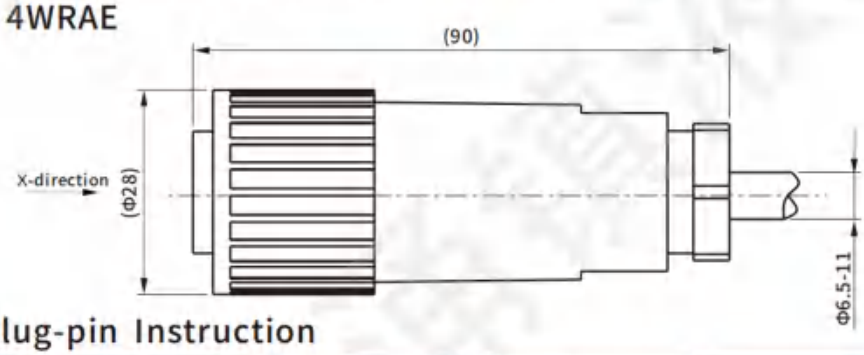
NG6:41 Type

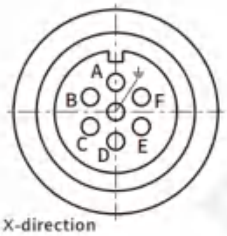


NG6:51 Type



Plug (According to DIN EN175201-804)
4WRAE





Plug-pin Instruction

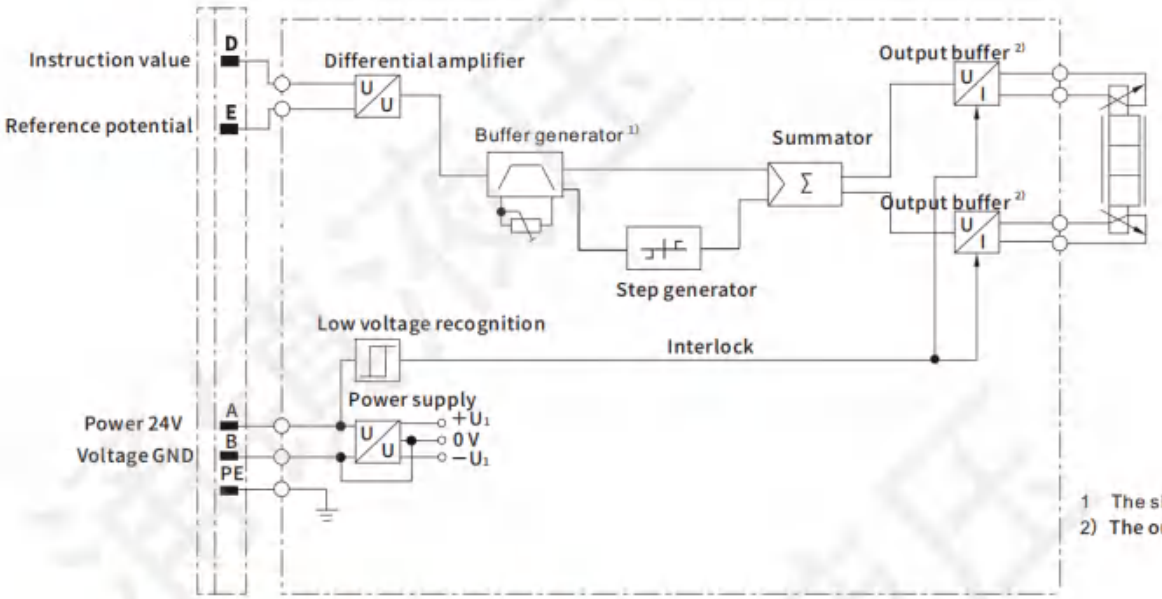
Pin	Function	-A1Voltage Type	-F1 Current Mode
A	Power voltage	24VDC(19V~35V)	
B		0V	
D	Instruction value input	±10V(R_e>50KΩ)	4~20mA(R_e<200Ω)
E		Instruction value input reference	
F	Actual Output	n.c.	n.c.
C		n.c.	
PE	Grounding	n.c.	

Note: Terminals C and F cannot be connected together

Instruction value:
Positive instruction input values added to D and E (0 ~ +10V or 12 ~20mA), SOL a On, energized P→A, B→T.
Negative instruction input values added to D and E(0~-10Vor12~4mA), SOL b On, energized P→B, A→T.
Cables:
For cables up to 25m in length, the LiYCY 5*0.75mm² type is recommended.
For cables not exceeding 50m in length, the LiYCY 5*1.0mm² type is recommended.
The outer diameter of the cable depends on the size of the plug.
The cable shield layer can be connected only to the ground of power port.

Inner block diagram of integrated amplifier

Port	Integrated amplifier plate	Valve



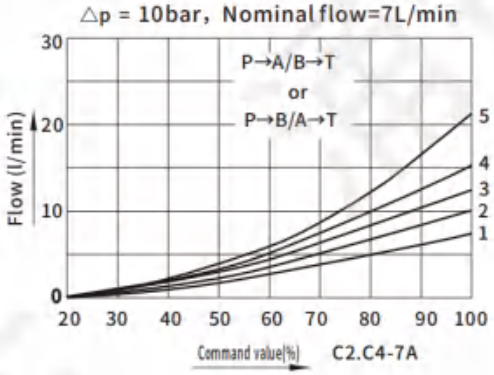
1 The slope time adjustment range is 0~5 seconds.
2) The output port has current output.

Characteristic curve

Characteristic Curve between pressure differential and flow(Measured at P=100bar,VG46,40±5°C)

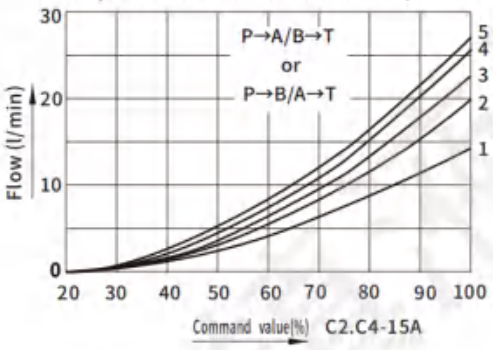
4WRA6/4WRAE6

△p = 10bar, Nominal flow=7L/min



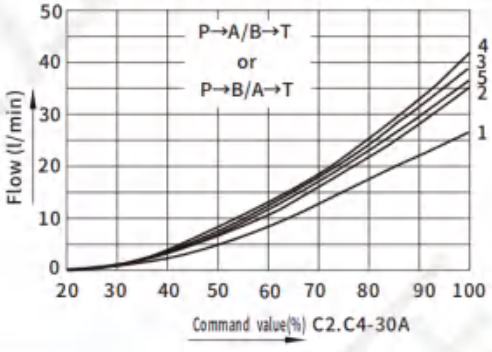
C2.C4-7A

△p = 10bar, Nominal flow15L/min



C2.C4-15A

△p = 10bar, Nominal flow =30L/min



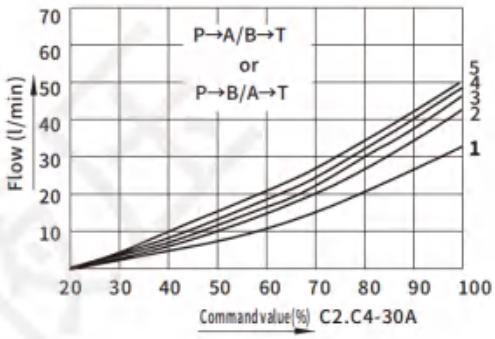
C2.C4-30A

1 △p = 10bar Constant
2 △p = 20bar Constant
3 △p = 30bar Constant
4 △p = 50bar Constant
5 △p = 100bar Constant

△p = Valve pressure differential
(Inlet Pressure Pp - Load pressure PL - return Pressure PT)

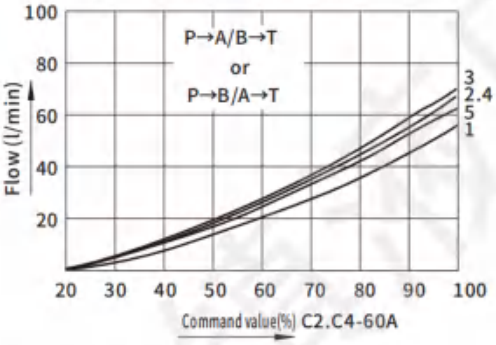
4WRA10/4WRAE10

△p = 10bar，Nominal flow=30L/min



1 △p = 10bar Constant
2 △p = 20bar Constant
3 △p = 30bar Constant
4 △p = 50bar Constant
5 △p = 100bar Constant

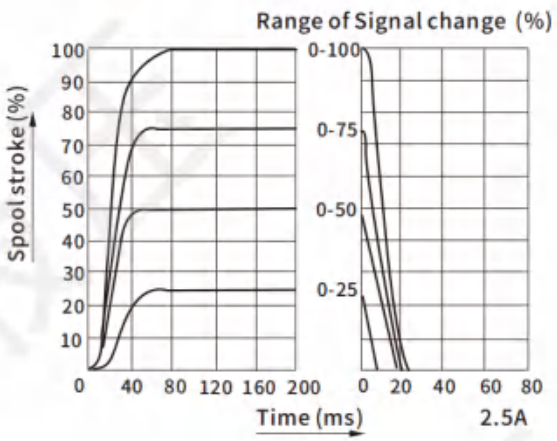
△p = 10bar时，Nominal flow=60L/min



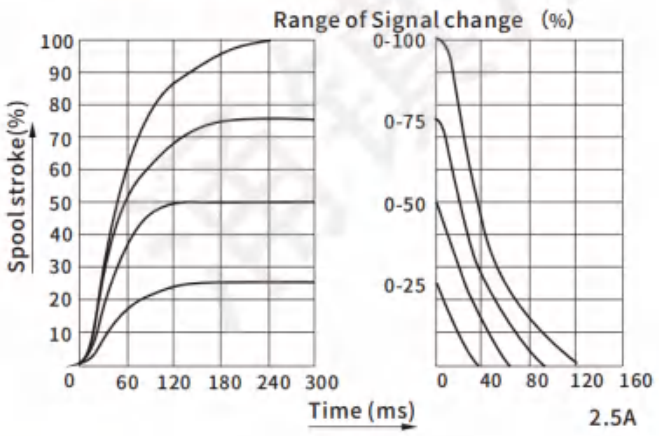
△p = Vale pressure differential
(Inlet Pressure Pp - Load pressure PL - return Pressure PT)

● Characteristic Curve of step response(Measured at P=100bar,VG46,40±5°C)

4WRA6/4WRAE6



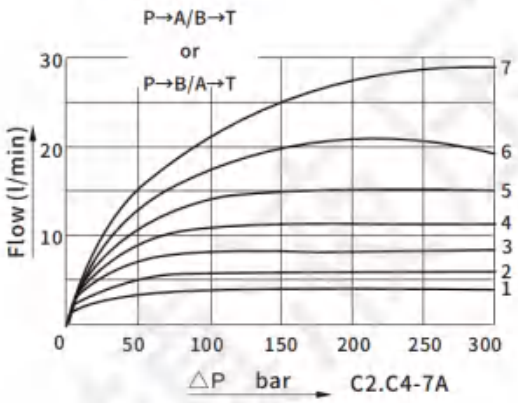
4WRA10/4WRAE10



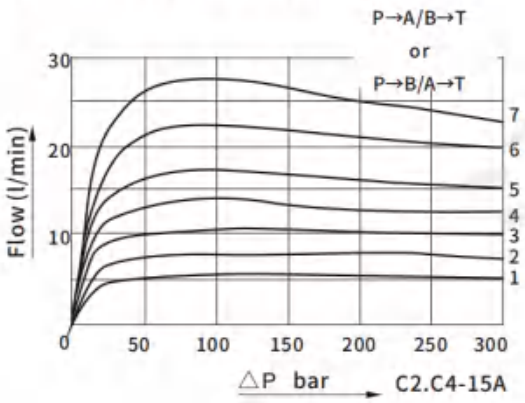
Characteristic Curve of power limit (Measured at VG46,40±5°C)

4WRA6/4WRAE6

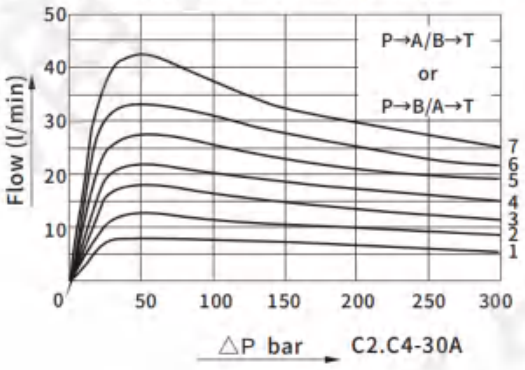
Power limit at the nominal flow of 7 L/min



Power limit at the nominal flow of 15 L/min



Power limit at the nominal flow of 30 L/min

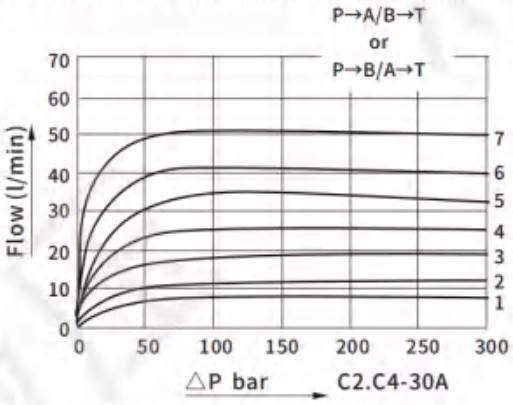


1 Command value=40%
2 Command value=50%
3 Command value=60%
4 Command value=70%
5 Command value=80%
6 Command value=90%
7 Command value=100%

If the power limit of the valve is exceeded,
the movement of the valve core will be unstable.

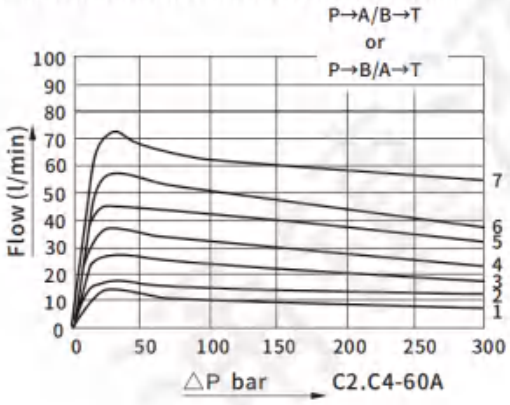
4WRA10/4WRAE10

Power limit at the nominal flow of 30 L/min



1 Command value = 40%
2 Command value = 50%
3 Command value = 60%
4 Command value = 70%
5 Command value = 80%
6 Command value = 90%
7 Command value = 100%

Power limit at the nominal flow of 60 L/min

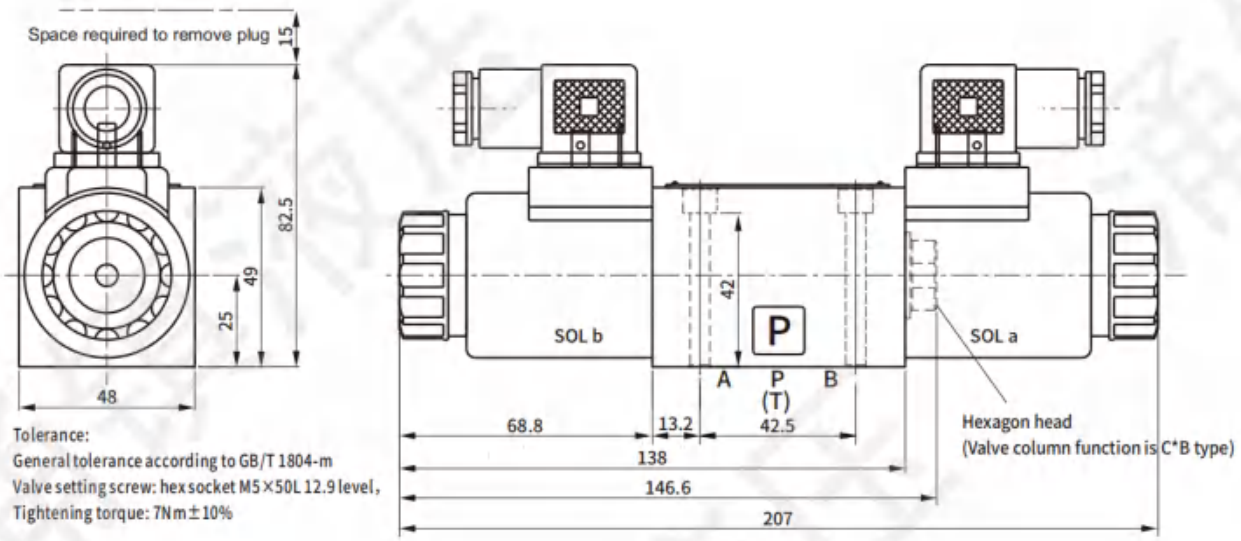


If the power limit of the valve is exceeded,
the movement of the valve core will be unstable.

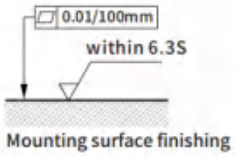
Dimensions

Units: mm

4WRA6

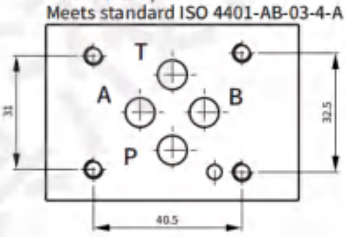


Tolerance:
General tolerance according to GB/T 1804-m
Valve setting screw: hex socket M5×50L 12.9 level,
Tightening torque: 7Nm±10%



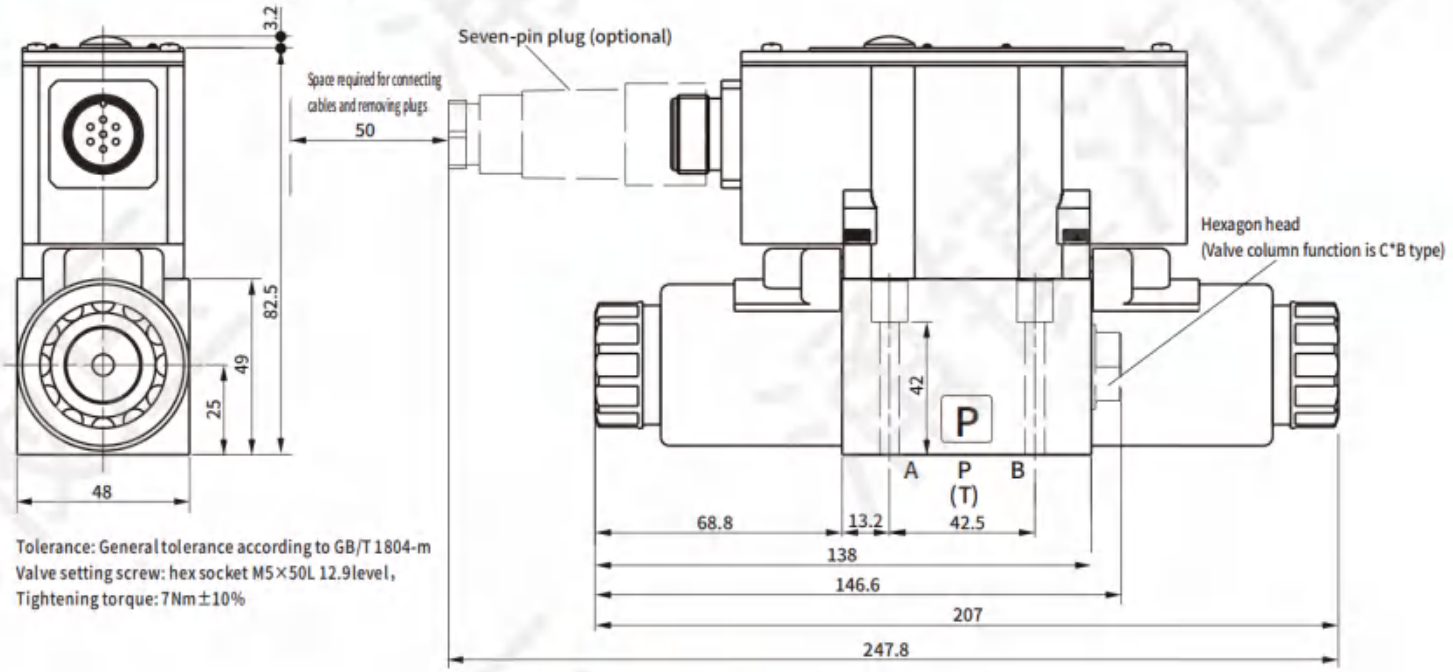
Mounting surface finishing

Install valve plate:
Meets standard ISO 4401-AB-03-4-A



4WRAE6

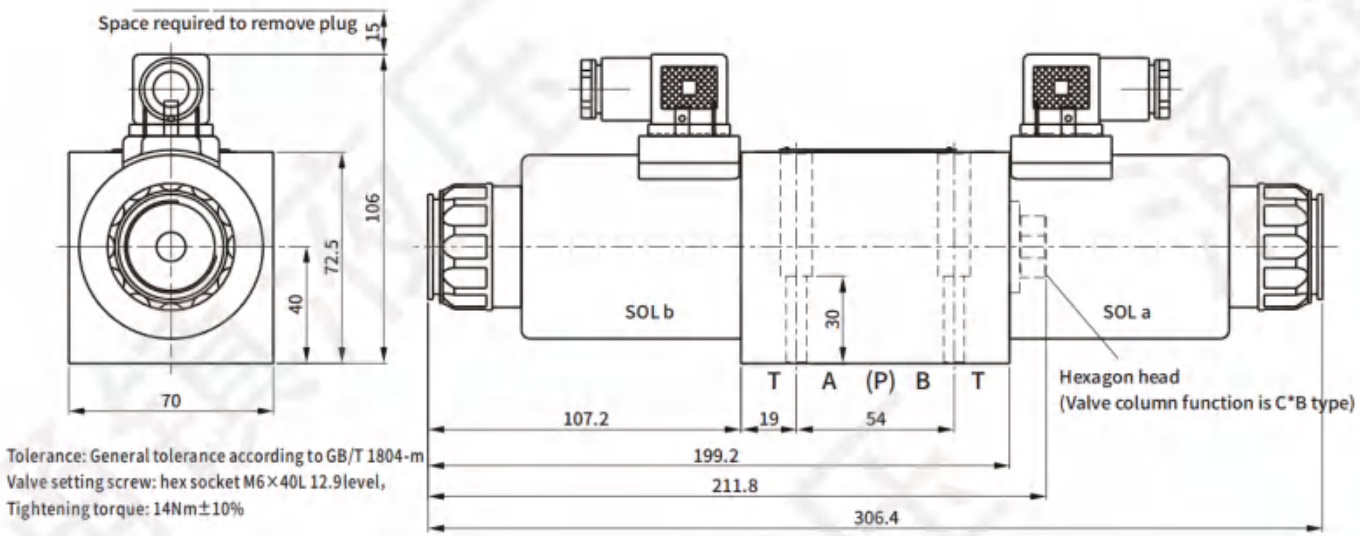
Units: mm



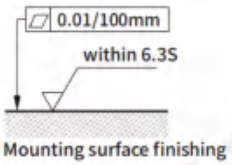
Tolerance: General tolerance according to GB/T 1804-m
Valve setting screw: hex socket M5×50L 12.9 level,
Tightening torque: 7Nm±10%

Units: mm

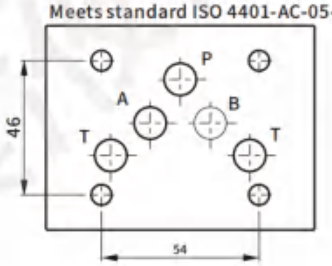
4WRA10



Tolerance: General tolerance according to GB/T 1804-m
Valve setting screw: hex socket M6×40L 12.9level,
Tightening torque: 14Nm±10%

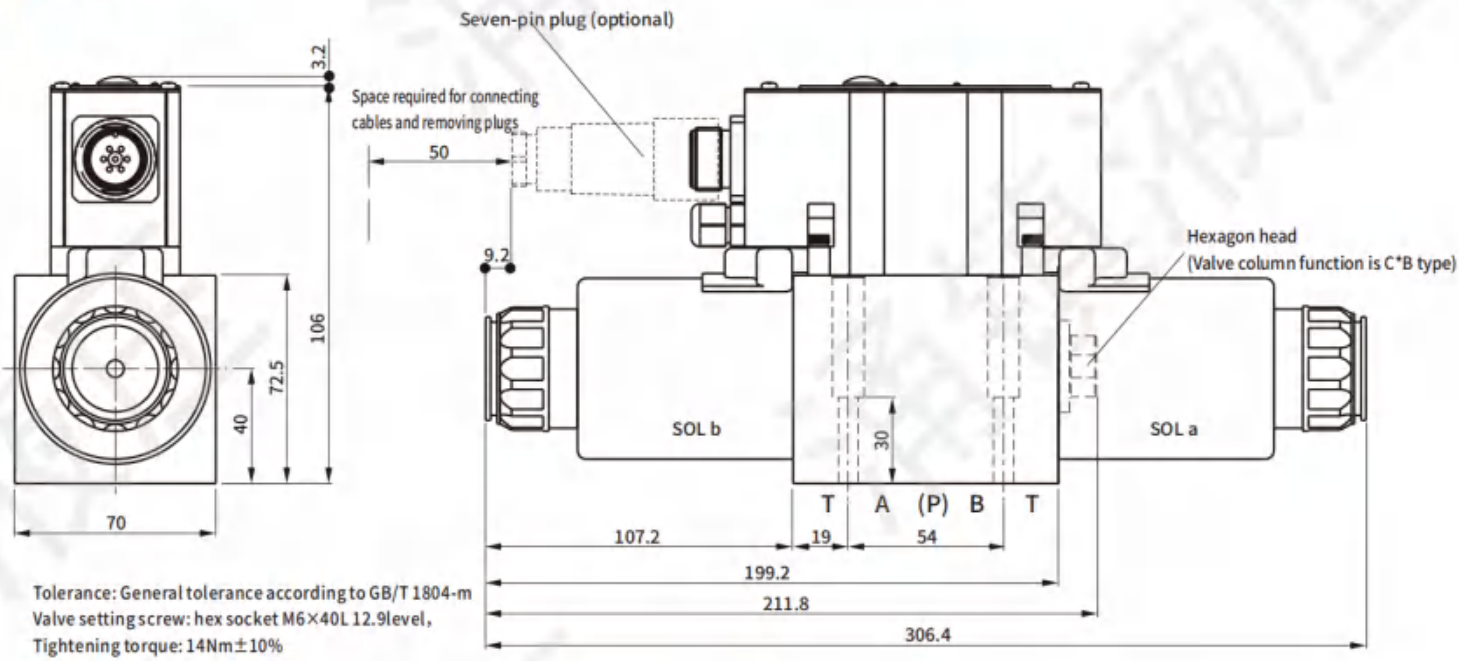


Install valve plate:
Meets standard ISO 4401-AC-05-4-A



4WRAE10

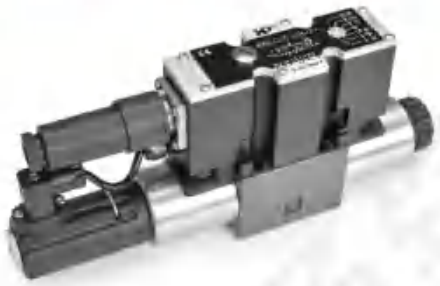
Units: mm



Tolerance: General tolerance according to GB/T 1804-m
Valve setting screw: hex socket M6×40L 12.9level,
Tightening torque: 14Nm±10%

4WREE Series

1. Direct control proportional directional valve, with displacement electrical feedback, spool by the spring to the center;
2. Accurate stepless flow regulation (without pressure compensation) and direction control can be realized;
3. Proportional electromagnet with center thread, coil can be separately removed;
4. Used for bottom plate installation, installation surface according to the unified international standard ISO 4401;
5. The magnifying plate adopts digital control, the clamping valve and high temperature will not easily burn the amplifier plate;
6. Electric control device has external type and integrated type, which can be used interchangeably with similar products in Europe and America.



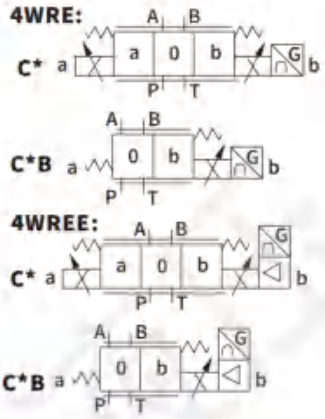
How to order

4WREE6-C2-32A-10-D24-N-K31-A1-V-**

- Direct action type with displacement electrical feedback
- Electronic control
  Blank: Without integrated
  E: With integrate
- Nominal size
  6: NG 6
  10: NG 10
- Slide column function
  See slide column function table
- Nominal flow rate
  NG 6
  08:8L/min
  16:16L/min
  32: 32L/min
  NG 10
  25:25L/min
  50:50L/min
  75:75L/min
- Slide column type
- Design code
- Power supply voltage
  Blank: none (for 4WRE);
  D24:DC24V(for 4WREE)
- Emergency operation
  N: None(Strandard)
- Electrical connection
  4WRE
  Blank: with coil plug(PG11)/ position sensor plug
  K4: None
  4WREE
  Blank: with amplifier plug
  K31: None
- Control Command
  Blank: for 4WRE
  A1: Command value±10V(for 4WREE)
  F1: Command value 4 to 20mA(for4WREE)
- Sealing materials
  Blank: Nitrilerubber
  V: Fluorinerubber
- More details

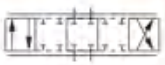
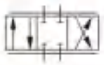
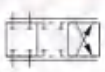
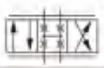
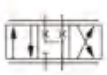
Note: 4WRE Serie samplifying plate order separately
Nominal flow-ratemeasured by △P=10bar

Symbols



Slide function

Specification

Application	Type	Graphic symbols		Application	Type	Graphic symbols	
3-position Spring centered	C2 C21			2- position Spring centered	C2B		
	C3 C31				/	/	/
	C4 C41				C4B		

1.C21、C31、C41function,Including P→A: q_{max}, B→T: $q_{max}/2$; P→B: $q_{max}/2$, A→T: q_{max}.
2.C4、C4Bfunction, A、B→Tapproximately 3% of therated flow area.
3.For other functional forms of sliders, please consult our company.

Description

Structure

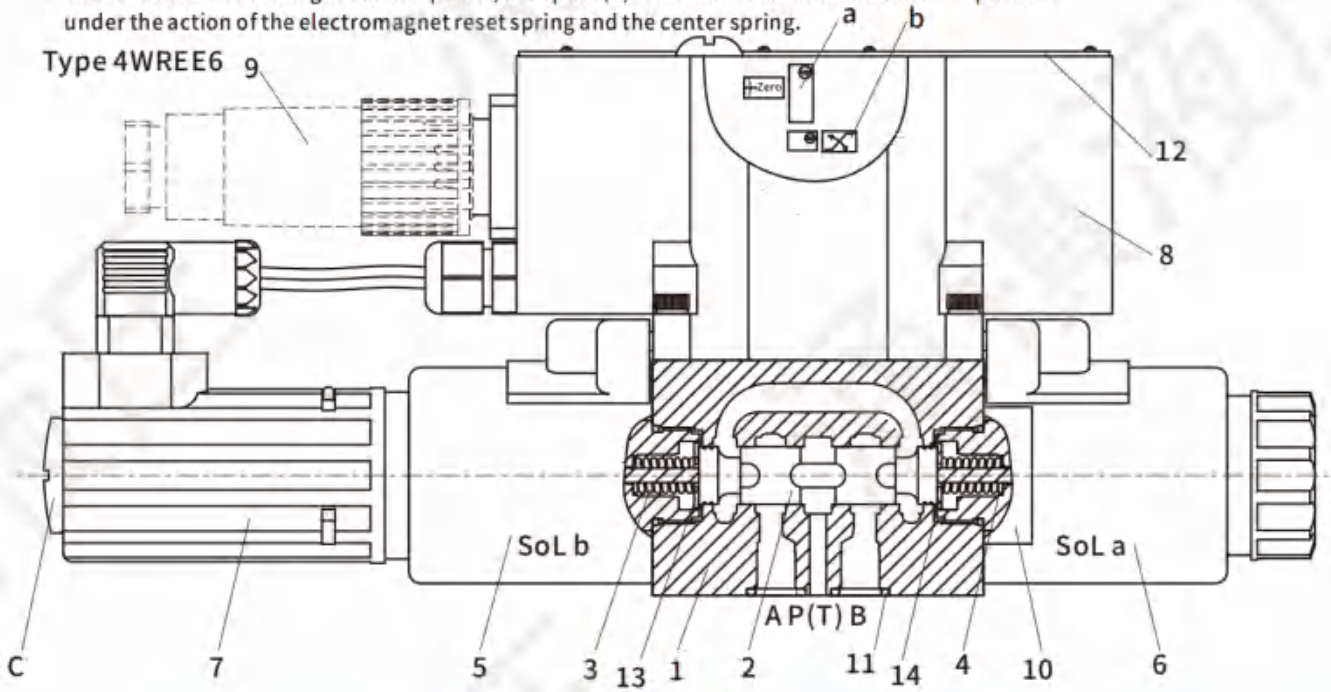
4WREE is a direct-acting two-position four-way and three-position four-way proportional direction valve, and the control of its electromagnet is realized by an integrated electronic controller, (4WRE series can be achieved by an external amplifier plate), the valve is mainly composed of the following parts:

—Valve body with mounting underside(1)
—Control spool(2)
—Spring centered(3 and 4)
—Proportional electromagnet with center thread(5 and 6)
—Position sensor(7)
—Integrated electric control unit(8)
—Optional plug for integrated electronic control unit(9);for type 4WRE， the coil and LVDT plug are optional.
—Optional screw plug(10)
—Sealing rings for oil ports P, A, B and T(11)
—Valve nameplate(12)

Functional Specification

—When the electromagnets (5 and 6) are not charged, the centring spring (3 and 4) holds the control spore (2) in a median position between the spring seat 13 and 14.
—When the proportional electromagnet is excited, it directly pushes the control spool (2).
—For example, when the proportional electromagnet (5) is excited, the control spool (2) is pushed to the right, and the displacement of the spool is proportional to the input electrical signal.
At this time, the P→B, A→T oil circuit is formed, and the throttling characteristics of the oil circuit are progressive.
—After the proportional electromagnet (5) loses power, the control spool (2) is pushed back to the center position by the center spring (4).
—The integrated electronic controller (8) receives the input signal and generates a proportional current signal to drive the electromagnet (5) or (6).
—The position sensor (7) detects the actual displacement of the spool (2) and feeds back to the integrated electronic controller (8) for closed-loop control.
—An optional integrated controller plug (9) is electrically connected to the integrated controller (8).
—In the case of electromagnet loss of power, the spool (2) remains in the mechanical center position under the action of the electromagnet reset spring and the center spring.

Type 4WREE6



Note:

1. The valve of the two-position four-way structure is similar to that of the three-position four-way, except that the two-position four-way has only one proportional electromagnet, and a screw plug is installed on the position of the other proportional electromagnet (10).
2. The oil in the return line must be avoided completely empty, and the back pressure valve (about 2bar) must be installed in the loop if necessary.
3. External adjustment of electrical zero position can be achieved by (a)
4. External adjustment of electrical slopes can be achieved through (b).
5. External adjustment of mechanical zero position can be achieved through (c).
6. When replacing an electric controller or electromagnet, the parameters must be re-adjusted, and any adjustment must be performed by a fully trained person.
7. Changing zero positions can cause damage to the system and must be adjusted by a fully trained person.

Specification

Overview

Nominal size		6	10
Installation		Optional, preferably Horizontal	
Storage temperature(°C)		-20~+80	
Application temperature(°C)	4WRE	-20~+70	
	4WREE	-20~+50	
Weight (kg)	4WRE	2.2	6.3
	4WREE	2.4	6.8

Hydraulic parameter(Measured at P=100bar，VG46，40±5°C)

Max. application pressure(bar)	P, A, B: 315;T:210	
Nominal flow(L/min) (△p=10bar)	8, 16, 32	25, 50, 75
Max. flow (L/min)	80	180
Pressure fluid	Mineral oil (HL, HLP) to DIN51524 other fluid please consult our company!	
Oil temperature	-20~+80°C(preferably+40~+50°C)	
Viscosity recommended range	20~380mm²/s(preferably 0~46mm²/s)	
Fluid Cleanliness Class	NAS1638 Class 9 or ISO4406 Class 20/18/15	
Hysteresis(%)	≤0.1	
Reverse error(%)	≤0.05	
Sensitivity(%)	≤0.05	
Temperature drift	0.15%/10K;0.1%/100bar	

Coil characteristic

Rated Current(A)		2.5	2.5
Rated resistance(Ω)		2.7	3.7
Level crossing rate		ED100%	
Electrical connection	4WREE	Wiring box type(Pin type)	
	4WRE	Plug type	
Protection Level		IP65	
Insulation grade		H	
MAX. power(W)		25	34.7

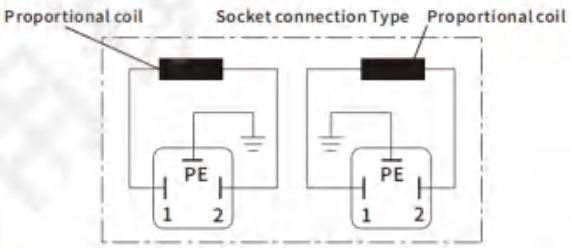
Integrated electronic control unit

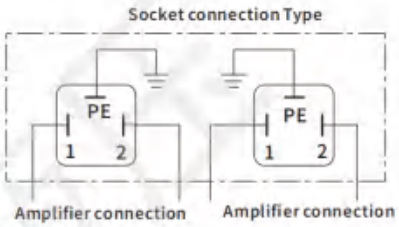
Voltage(DC)	24V (19V-35V)
Power Loss(VA)	<45
Current draw(A)	<2
Instruction value input	±10V(R_e>50KΩ); 4~20mA(R_e<200Ω)
Ramp Times	0~5s, adjustable
Electrical connection	With socket according to DINEN 175201-804
Protection level	IP65

Electrical connection

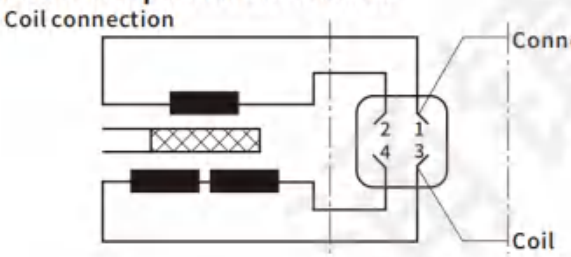
4WRE:

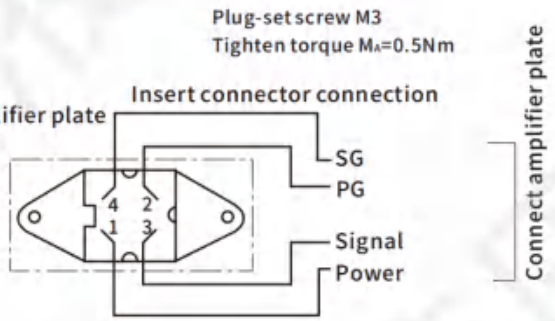
- Plug(According to DIN EN 175301-803)



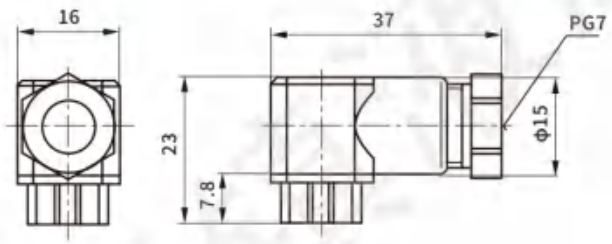


- Inductive position sensor



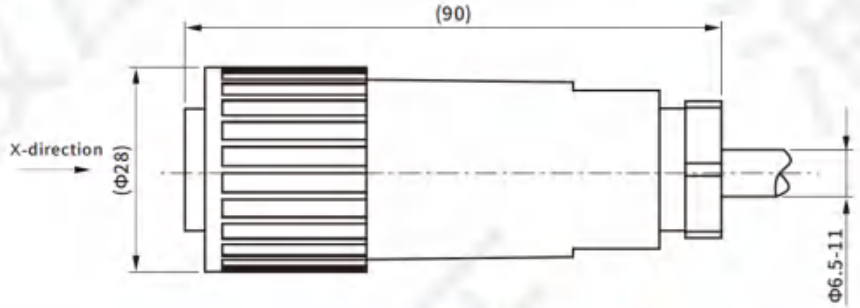


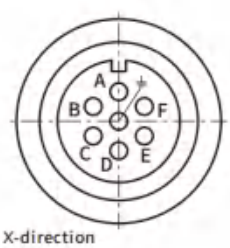
Note:
For cables up to 50m in length,
Please use a cable of type LiYcY4X0.25mm²
Connect the shield to the PE only on the supply side.



4WREE:

- Plug (According to DIN EN175201-804)





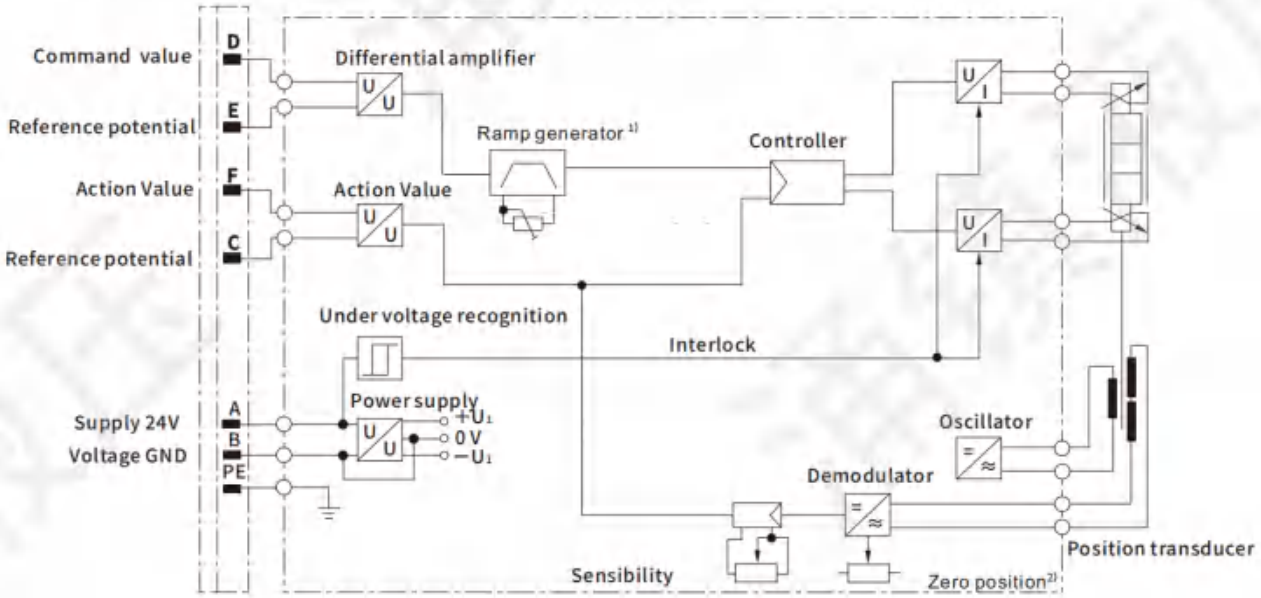
Plug &pin instructions

Pin	Function	-A1 Voltage type	-F1 Current mode
A	Power voltage	24VDC(19V~35V)	
B		0V	
D	Instruction value input	±10V(R_e>50KΩ)	4~20mA(R_e<200Ω)
E		Instruction value input reference	
F	Actual Output	±10V(Current-limiting 5mA)	4~20mA(Max. Load 300Ω)
C		Actual value output reference	
PE	Grounding	n.c.	

Command value:
Add a positive command input value (0 to +10V or 12 to 20mA) to D and E, SOL a ON,
will connect port P to port A, port B to port T.
Add a negative command input value (0 to -10V or 12 to 4mA) to D and E, SOL b ON,
will connect port P to port B, port A to port T.
Actual value:
The actual output value of pins C and F, which normally corresponds to the input instruction value.
The signals of pins C and F do not participate in control.
When the P and A ports and the B and T ports of the valve are connected,
the actual output value of the C and F pins is 0 to +10V or 12 to 20mA.
When the P and B ports and A and T ports of the valve are connected,
the actual output value of the C and F pins is 0 to -10V or 12 to 4mA.
Cables:
For cables up to 25m in length, the LiYCY 7*0.75mm2 type is recommended.
For cables up to 50m in length, LiYCY 7 x 1.0mm2 is recommended.
The outer diameter of the cable depends on the size of the plug.
The cable shield layer can be connected only to the power supply end.
Electrical signals (e.g., actual values) derived from the electronic controller
are not allowed to be used for the safety protection function of the switchgear.

Integrated electronics

Port	Integrated electronics	Valve

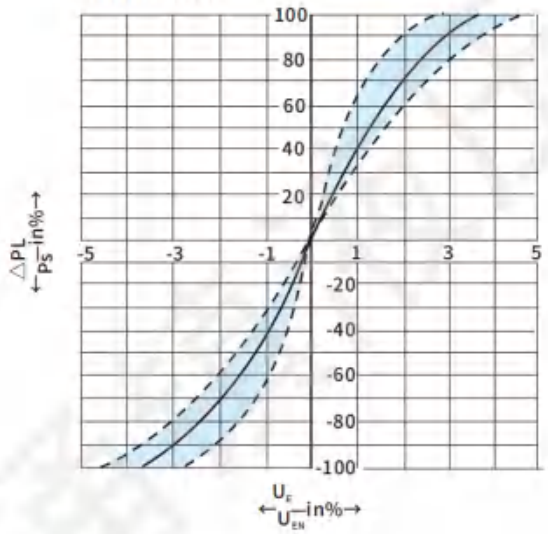


1. Buffer time is externally adjustable, ranging from 0 to 5 seconds.
2. Zero position is externally adjustable.

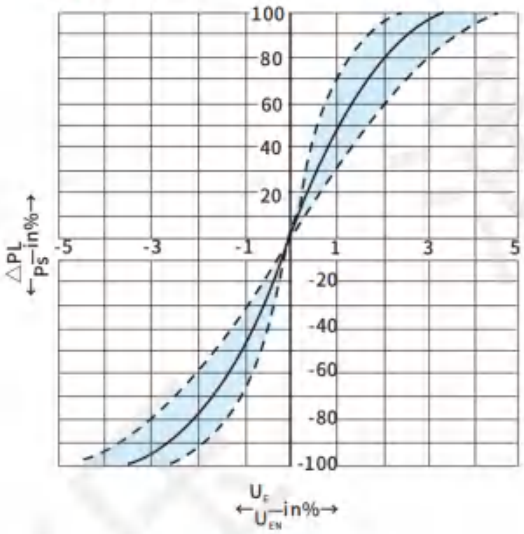
Characteristic curve

- Pressure - signal-characteristic curves (Measured at P=100bar,VG46,40±5°C,C3 function)

4WREE6

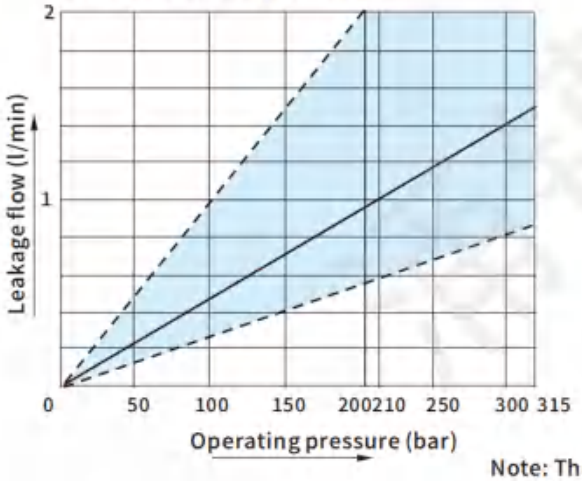


4WREE10

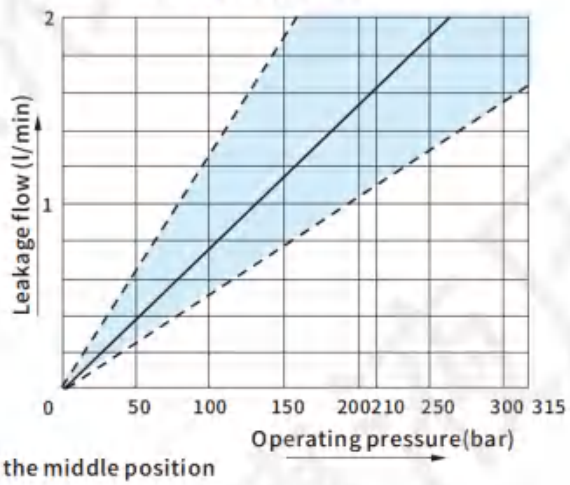


- Leakage characteristic curve (Measured at P=100bar,VG46,40±5°C,C3 function)

4WREE6(32l/min)



4WREE10(75l/min)

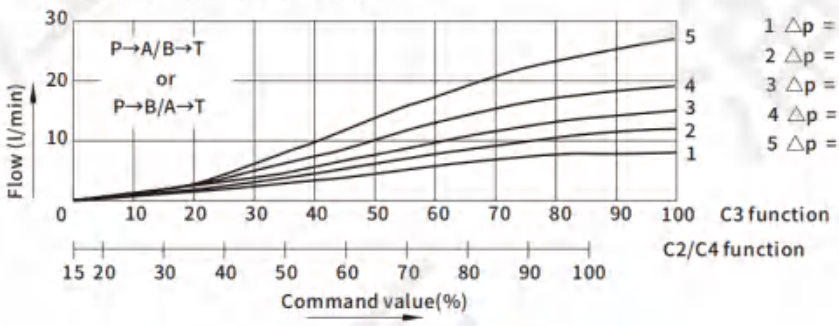


Note: The spool is in the middle position

- Pressure differential -flow-characteristic curve(Measured at P=100bar,VG46,40±5°C)

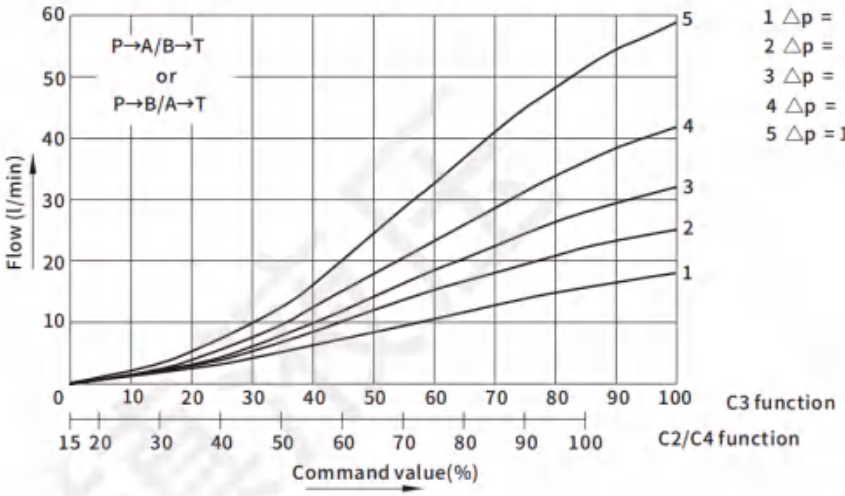
4WREE6

△p =10bar, nominal flow= 8L/min



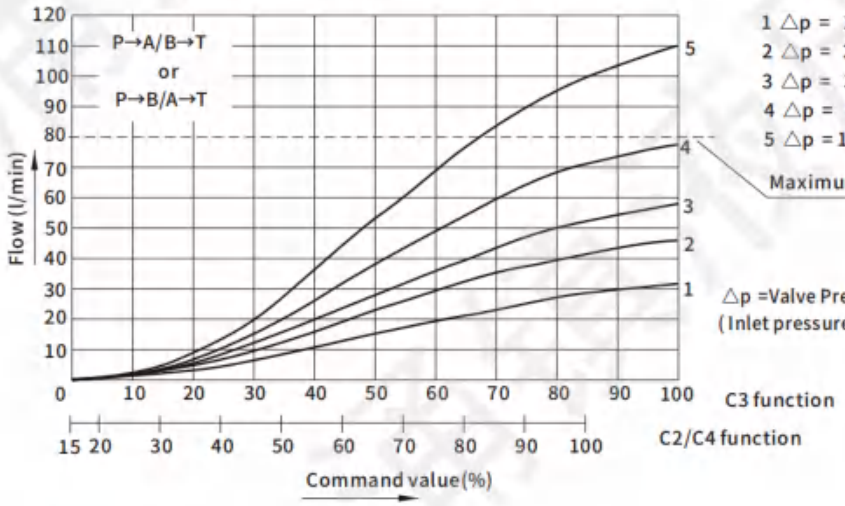
1 △p = 10bar constant
2 △p = 20bar constant
3 △p = 30bar constant
4 △p = 50bar constant
5 △p =100bar constant

△p =10bar，norminal flow= 16L/min



1 △p = 10bar Constant
2 △p = 20bar Constant
3 △p = 30bar Constant
4 △p = 50bar Constant
5 △p =100bar Constant

△p = 10bar，nominal flow =32L/min



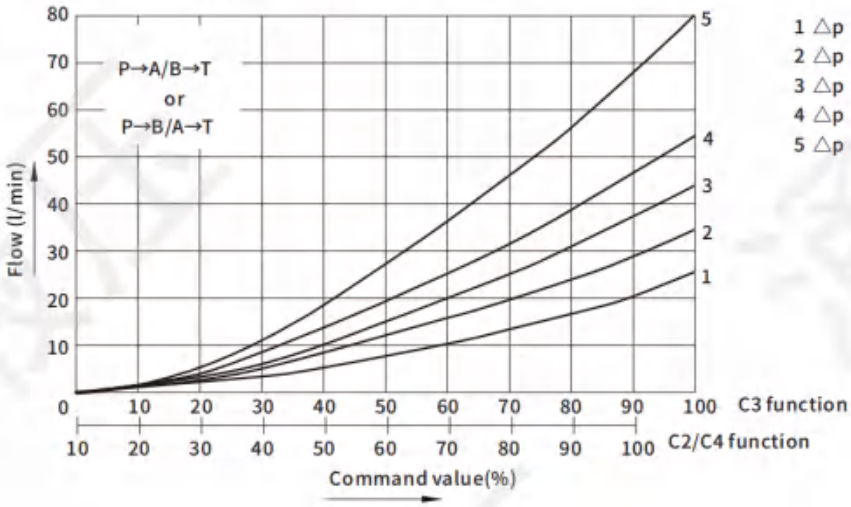
1 △p = 10bar Constant
2 △p = 20bar Constant
3 △p = 30bar Constant
4 △p = 50bar Constant
5 △p =100bar Constant

Maximum allowable flow

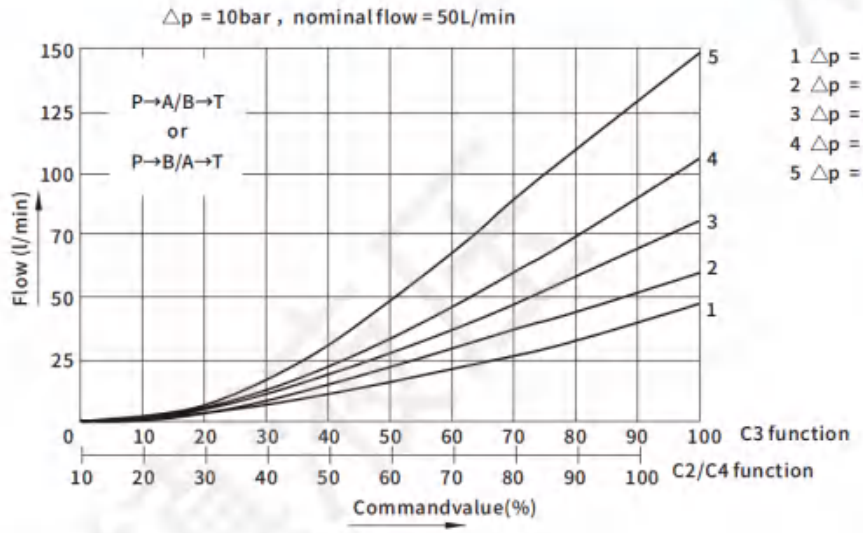
△p =Valve Pressure differential
(Inlet pressure Pp-Load pressure PL- return pressure PT)

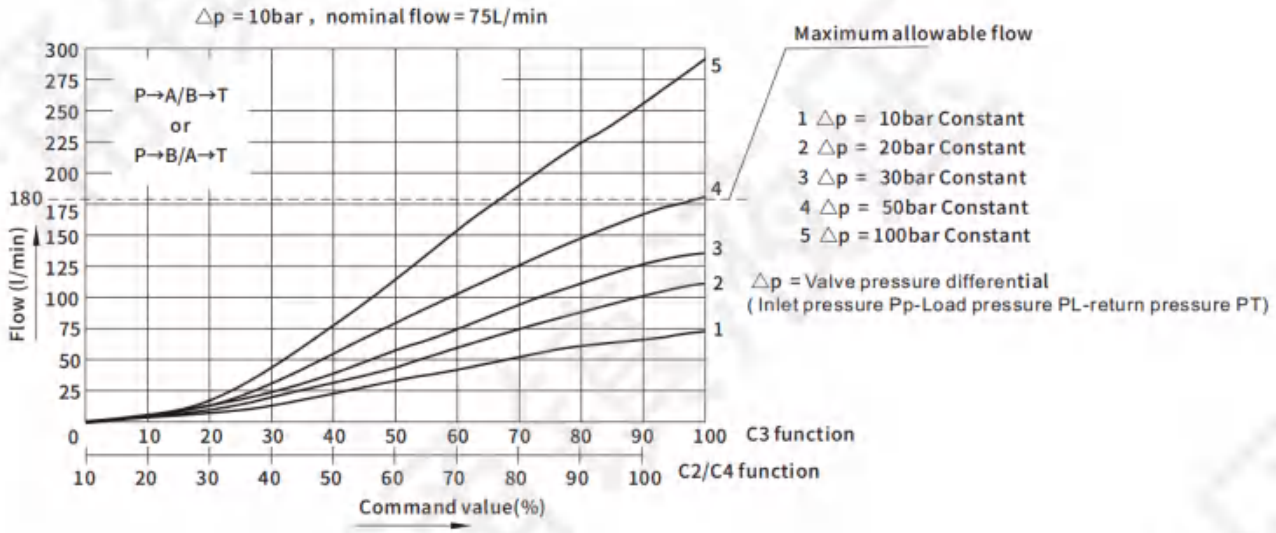
4WREE10

△p =10bar，nominal flow=25L/min



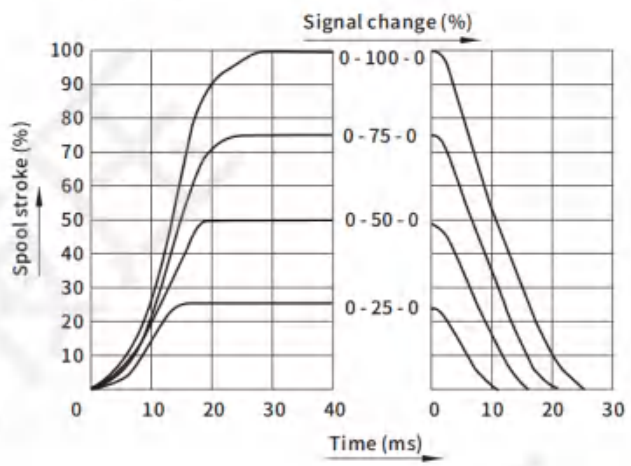
1 △p = 10bar Constant
2 △p = 20bar Constant
3 △p = 30bar Constant
4 △p = 50bar Constant
5 △p =100bar Constant



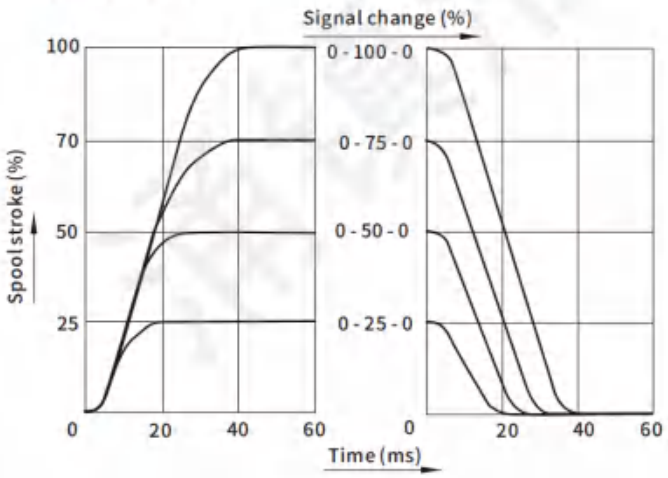


Characteristic Curve of step response(Measured at P=100bar,VG46,40±5°C)

4WREE6

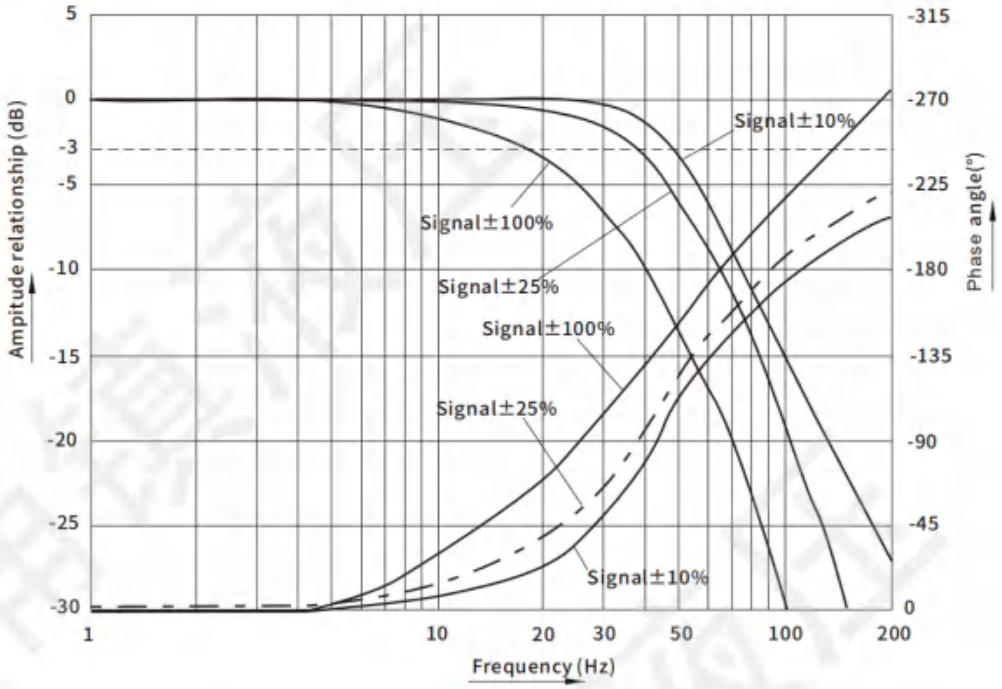


4WREE10

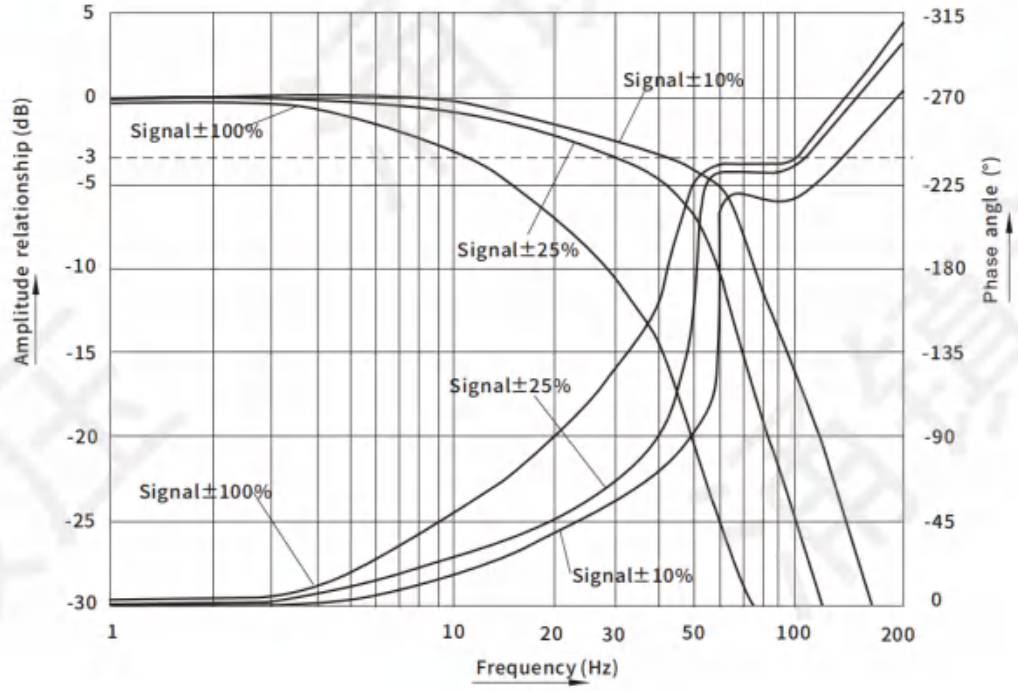


Characteristic curve of frequency response(Measure at P=100bar,VG46,40±5°C，C3)

4WREE6

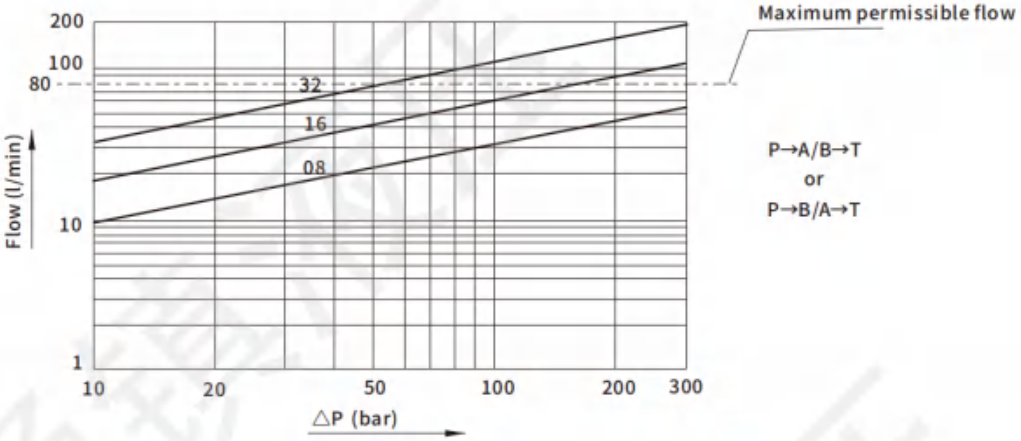


4WREE10



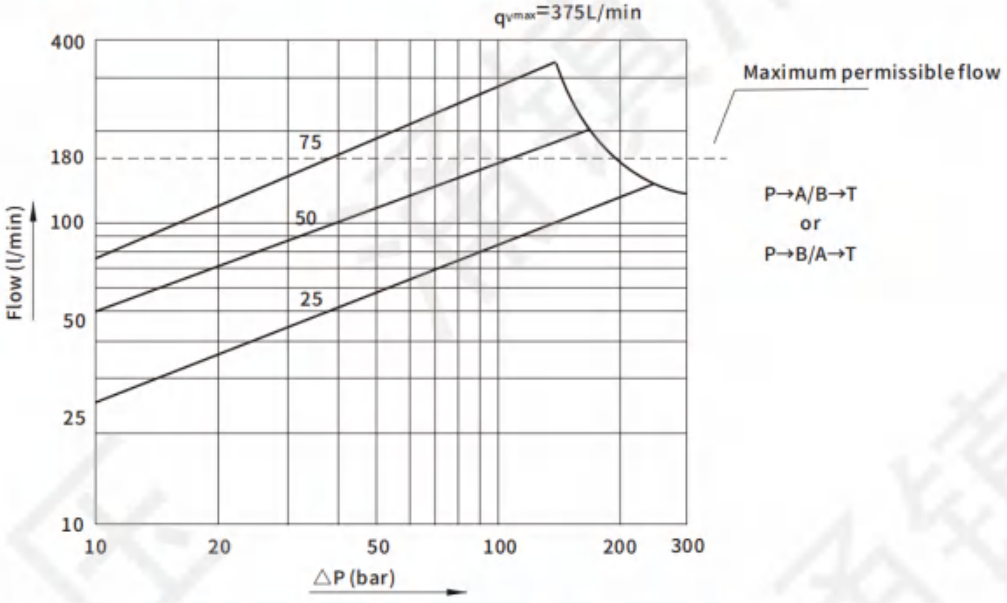
Power Limit characteristic curve (Measured at VG46,40±5°C,C3)

4WREE6



Take the maximum permissible flow of 80L/min into account.

4WREE10

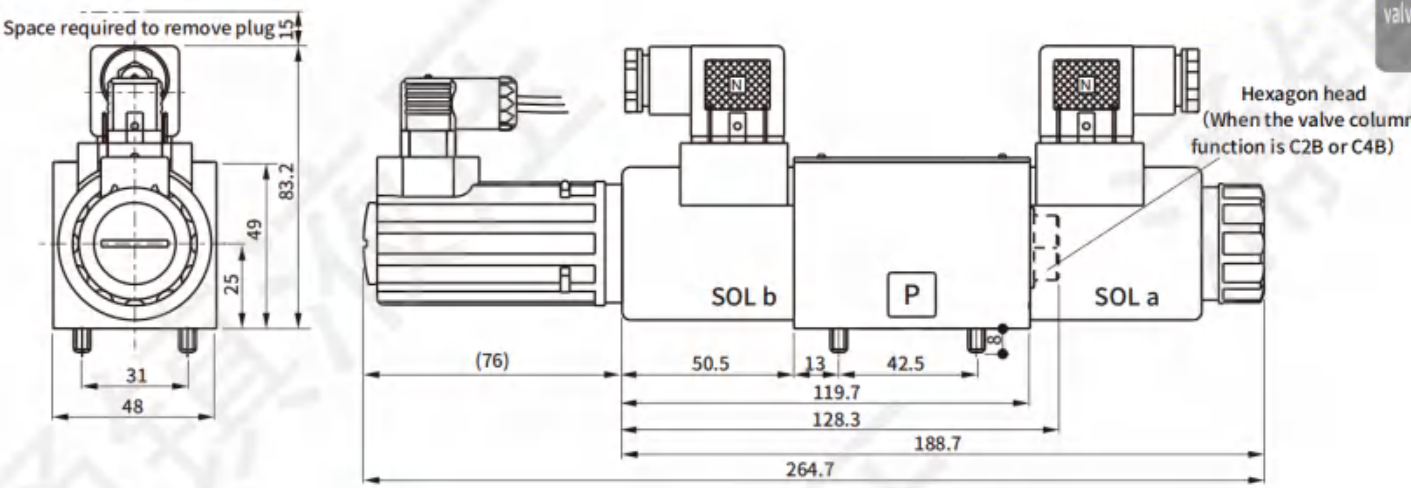


Take the maximum permissible flow of 180L/min into account.

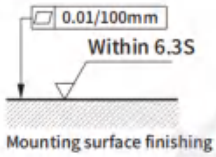
Dimensions

Units:mm

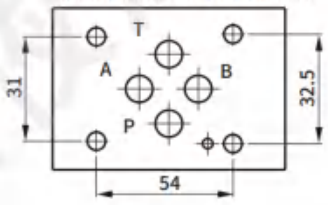
4WRE6



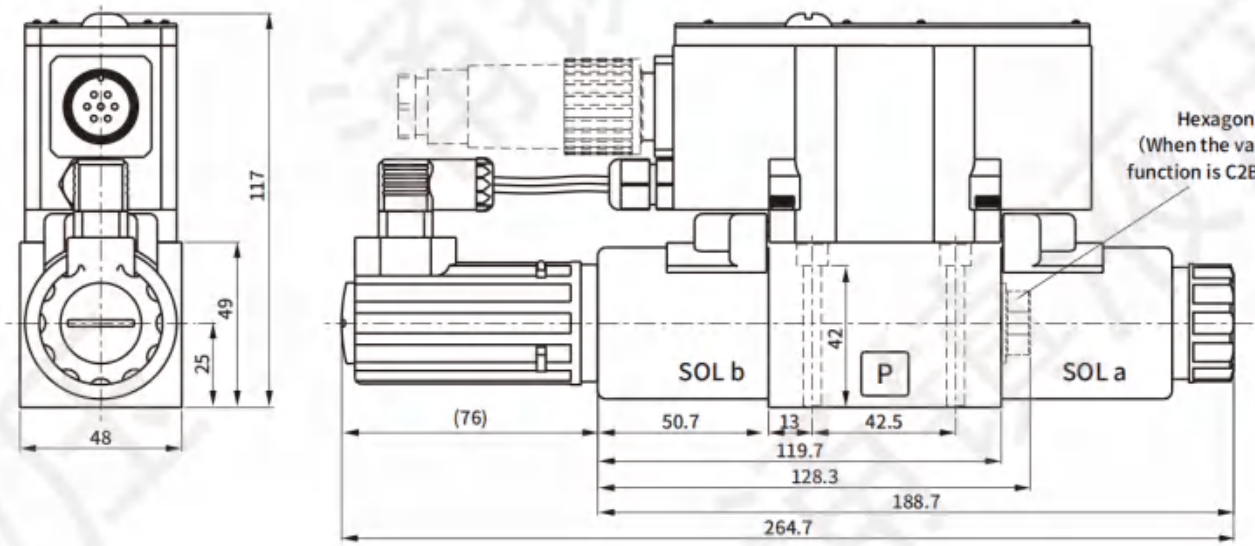
Tolerance: General tolerance according to GB/T 1804-m
Valve setting screw: hex socket M5×50L 12.9 level,
Tightening torque: 7Nm±10%



Install valve plate:
Meets standard ISO 4401-AB-03-4-A



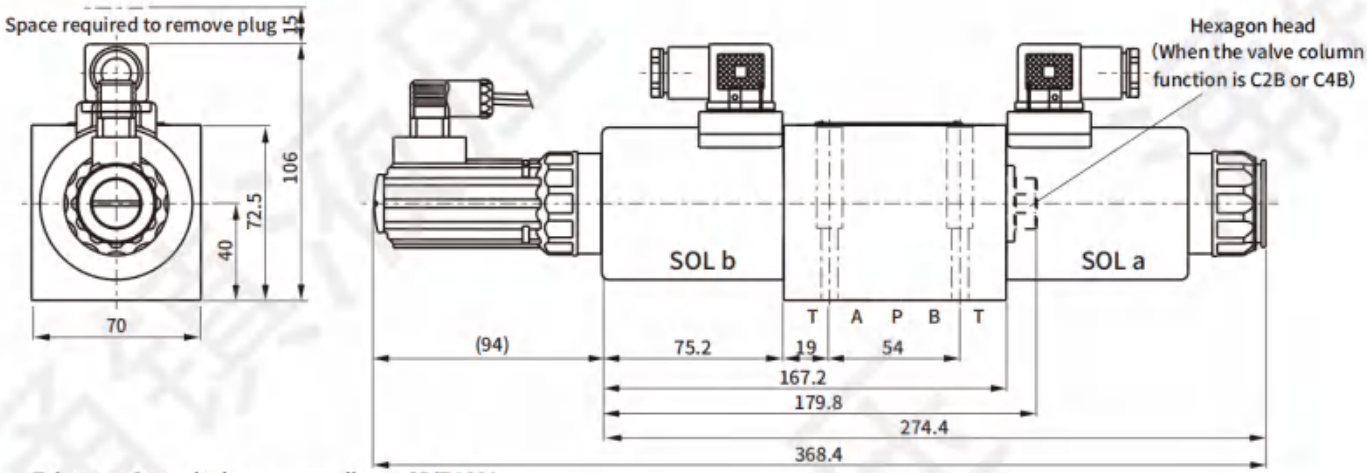
4WREE6



Dimensions

Units:mm

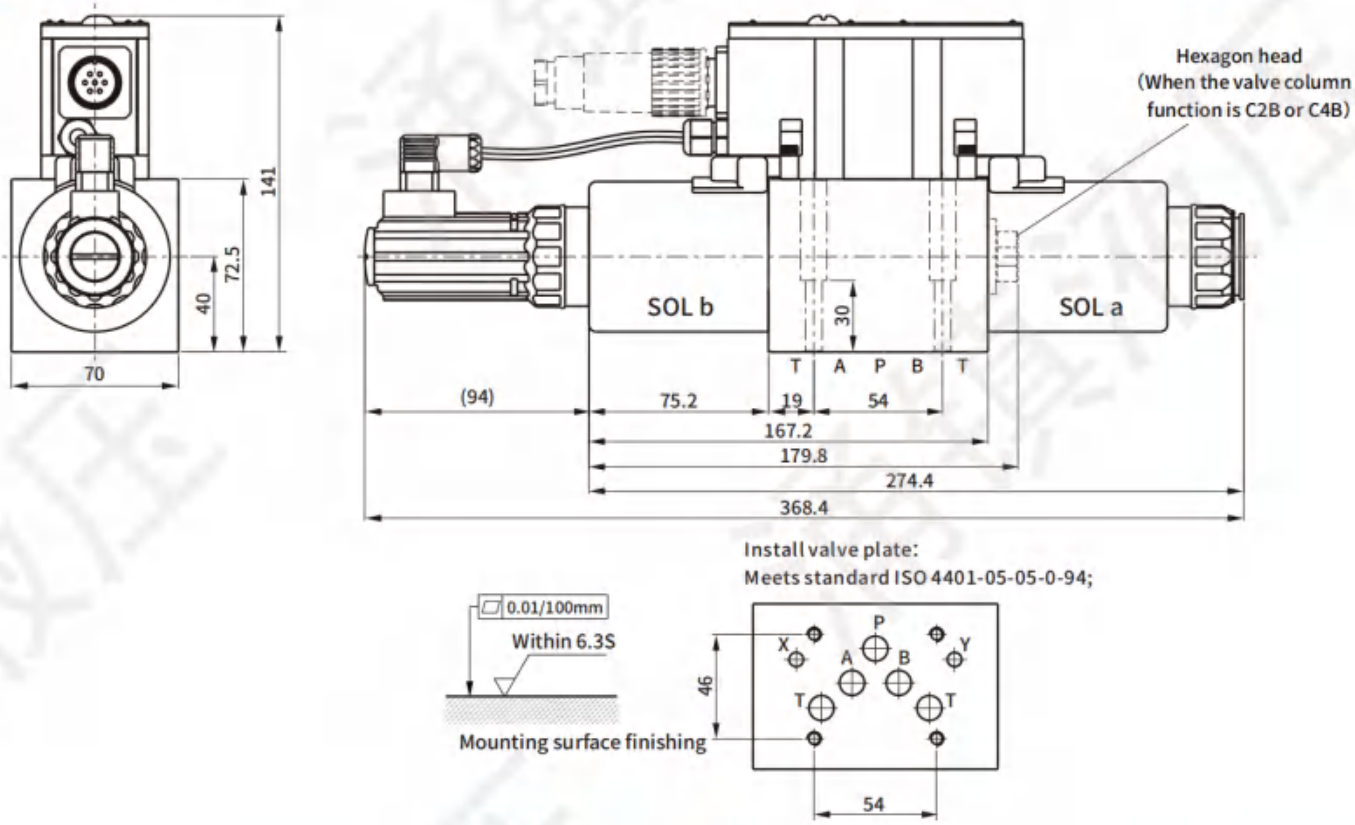
4WRE10



Tolerance: General tolerance according to GB/T 1804-m
Valve setting screw: hex socket M6×40L 12.9 level,
Tightening torque: 14Nm±10%

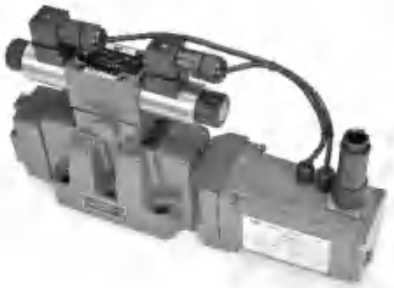
4WREE10

Units:mm



4WRKE Series

1. Pilot controlled two-stage proportional directional valve, with the main spool displacement electrical feedback, the main spool by the spring.
2. Accurate stepless flow regulation (no pressure compensation) and direction control can be achieved.
3. Pilot valve with central thread proportional electromagnet, coil can be removed separately.
4. For base plate installation, the mounting surface is in accordance with the unified international standard ISO 4401.
5. The amplifier board adopts digital control, the card valve and high temperature will not easily burn the amplifier board.
6. The electric controller is integrated and can be used interchangeably with similar products in Europe and America.
7. The pilot control is a single stage proportional direction valve.



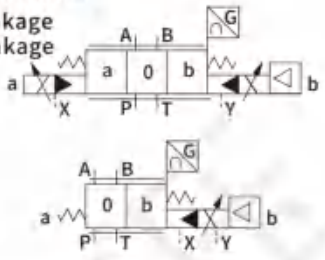
How to order

4WRKE16-C2-125A-10-D24-ET-K31-A1-D3-V-**

- Pilot-operated electrical feedback with displacement Integrated amplifier board
- Nominal size
  10: NG 10 16: NG 16
  25: NG 25 27: NG 27
  32: NG 32
- Slide function
  See slide function table
- Nominal flow rate
  NG 10
  25: 25L/min
  50: 50L/min
  100: 100L/min
  NG 25
  220: 220L/min
  350: 350L/min
  NG 16
  125: 125L/min
  200: 180L/min
  NG 27
  500: 500L/min
  NG 32
  400: 400L/min
  600: 600L/min
- Slide column type
- Design code
- Nominal flow-rate measured at △P=10bar
- Power supply voltage
  D24: DC24V
- Control type
  Blank: Internal control internal leakage
  E: External control internal leakage
  T: Internal control leaks
  ET: External control leakage
- Electrical connection
  Blank: Attached amplifier plug
  K31: None
- Control command
  A1: Command value ±10V
  F1: Command value 4 to 20mA
- D3: with fixed pressure reducing valve
  Blank: no fixed pressure reducing valve
- Sealing material
  Blank: Nitrile rubber
  V: Fluorine rubber
- More details

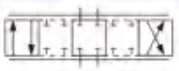
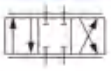
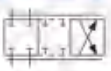
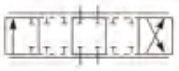
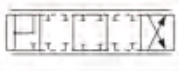
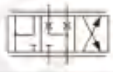
symbol

4WRKE:



Slide function

Specification

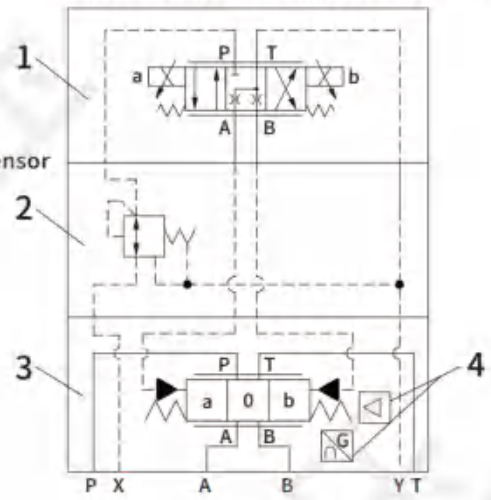
Application	Type	Graphic symbol		Application	Type	Graphic symbol	
3-position Spring centered	C2 C21			2-position Spring centered	C2B		
	C4 C41				C4B		
	C29			1.C21、C41function, Including P→A: q_{nom}, B→T: $q_{nom}/2$; P→B: $q_{nom}/2$, A→T: q_{nom} 2.C27,C47function, Including P→A: q_{nom}, B→P: $q_{nom}/2$; P→B: $q_{nom}/2$, A→T: q_{nom} 3.C29function, Including P→A: q_{nom}, B→T: off; P→B: $q_{nom}/2$, A→T: q_{nom} 4.C4、C4B、C41、C47function, A、B→T approximately 2% of the rated flow area. 5.For other functional forms of sliders,please consult our company.		
	C27						
	C47						

Description

Detailed functional symbols

Pilot control oil external control external discharge

1 Pilot control valve
2 Set the pressure reducing valve D3
3 Main valve
4 Integrated electric control & displacement sensor



Structure

4WRKE valve is a three-position four-way pilot type two-stage proportional direction control valve, which controls the size and direction of the liquid flow.
Because the main valve slide core is controlled with position closed-loop, the slide core position has nothing to do with the hydraulic power when the flow rate is large.
The 4WRKE valve consists of three parts: pilot valve I, fixed pressure reducing valve II, and main valve III.
The basic composition of pilot valve I is as follows:
- Body with mounting underside (1)
- Control spool (2)
- Centring springs (3 and 4)
- Proportional electromagnets with center thread (5 and 6)

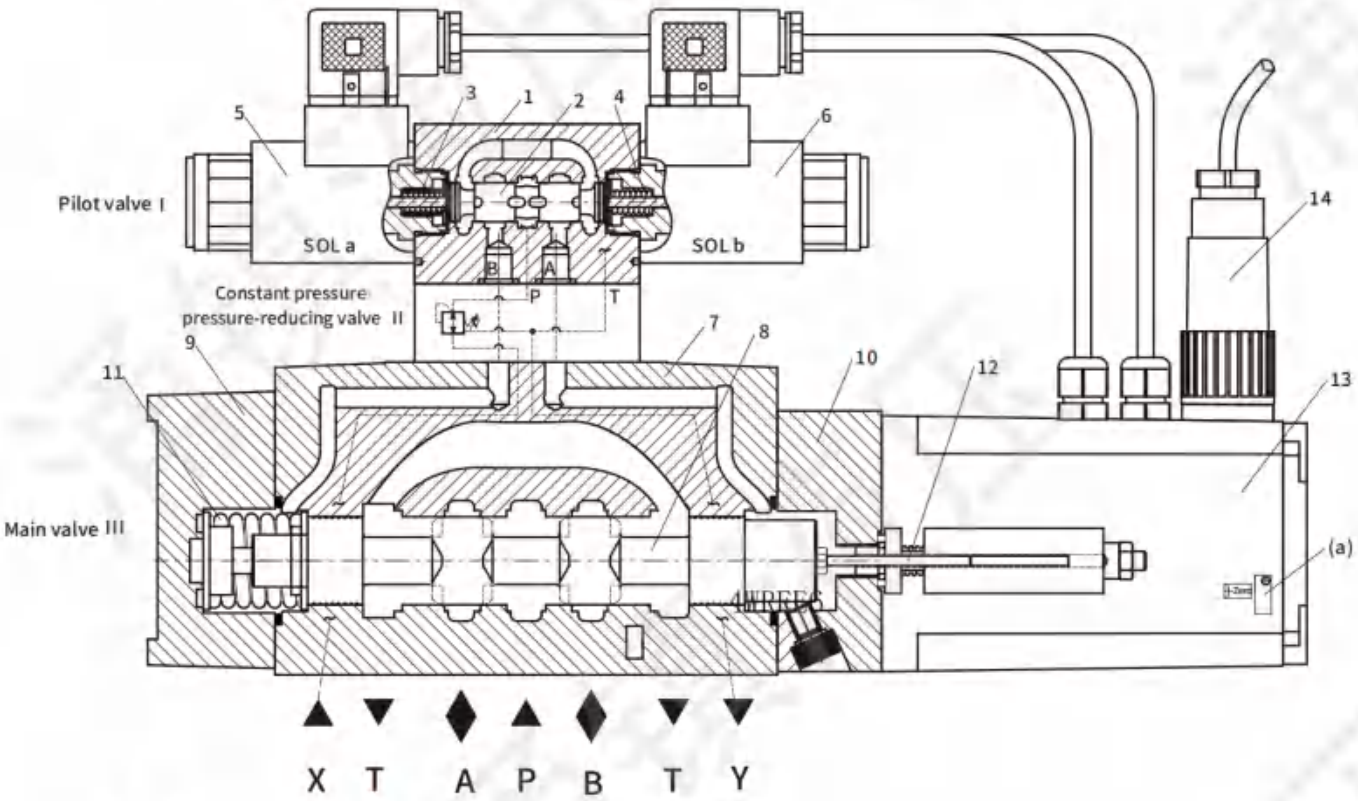
Main valve III basic composition is as follows:
- Main body with mounting underside (7)
- Main spool (8)
- End caps (9 and 10)
- Centring spring (11)
- Displacement Sensor (12)
- Integrated Amplifier (13)
- Optional plug for integrated electric controller (14)

Function

- Pilot valve I is a direct acting proportional directional valve,
when the electromagnet (5 and 6) is not charged, the control valve core (2) is under the action of the central spring (3 and 4)
Keep in the middle position, and the working oil ports (A and B) of the valve body (1) are communicated with the tank.
The control edge shape of the pilot control valve is designed and optimized according to the type 4WRKE proportional direction valve.
- When the integrated amplifier (13) has no signal input, the main spool (8) remains in the middle position under the action of the central spring (11); End cover
The oil in the control chamber (9 and 10) is communicated to the tank through the pilot valve I.
- The pressure reduction function of the constant pressure reducing valve II keeps the pressure constant in the P chamber of the pilot valve I.
- When the input signal is given to the integrated amplifier (13), the control spool (2) is pushed to the left if the proportional electromagnet (6) is excited

At the side, the oil circuit of pilot valve I is P→B, A→T, and the oil at port B flows to the control chamber of the end cover (9), pushing the main spool (8) to the right
Move so that port P of the main valve III passes through port B and port A passes through port T.

- Simultaneously the displacement sensor (12) detects the actual position value of the main spool (8) in real time and feeds back to the integrated amplifier (13), which will
The input signal is compared with the spore displacement signal for deviation correction control, and the resulting deviation current is applied to the proportional electromagnet (6).
Thus, the main spool (8) is maintained in a stable position.
- The movement position of the main spool (8) is proportional to the size of the input signal.
- Optional integrated controller plug (14) for electrical connection to integrated amplifier (13).



Note:

1. When replacing the pilot control valve or electric controller, the amplifier parameters must be re-adjusted.
2. The oil in the return pipeline must be completely emptied, and the back pressure valve (about 2bar) must be installed in the loop if necessary.
3. External adjustment of electrical zero position can be achieved through (a).
4. Changes to electrical and mechanical zeros may cause damage to the system and must be adjusted by fully trained personnel.

Specification

Overview

Nominal size	10	16	25	27	32
Installation	Optional, preferably horizontal				
Storage Temperature(°C)	-20 ~ +80				
Operating temperature(°C)	-20 ~ +50				
Weight (kg)(Including "D3")	8.7	11.2	17.5	18.5	31.5

Hydraulic parameter(Measured at P=100bar，VG46，40±5°C)

Nominal size		10	16	25	27	32
Operating pressure (bar)	External control port X	25~315				
	Main oil ports P,A,B	<315			<210	<315
Return pressure (bar)	Main oil port T(Leakage time)	<250			<210	<250
	Drain port Y(including internal drain)	Static<10(Pilot valve)				
Nominal flow rate(L/min)(△p=10bar)		25, 50, 100	125, 180	220, 350	500	400, 600
Max. allowable flow(L/min)		170	460	870	1000	1600
X and Y control the oil flow and input the step signal(L/min)(0~100%，315bar)		4.1	8.5	11.7	11.7	13
Pressure fluid		Mineral oil (HL, HLP) to DIN 51524 , other fluid please consult our company!				
Oil temperature		-20~ +80°C(preferably +40 ~ +50°C)				
Viscosity range		20~380mm²/s(preferably 30~46mm²/s)				
Degree of contamination	Pilot control valve	NAS1638 Class 7 or ISO4406 Class 18/16/13				
	Main valve	NAS1638 Class 9 or ISO4406 Class 20/18/15				
Hysteresis(%)		≤1				
Sensitivity(%)		≤0.5				

Coil characteristic

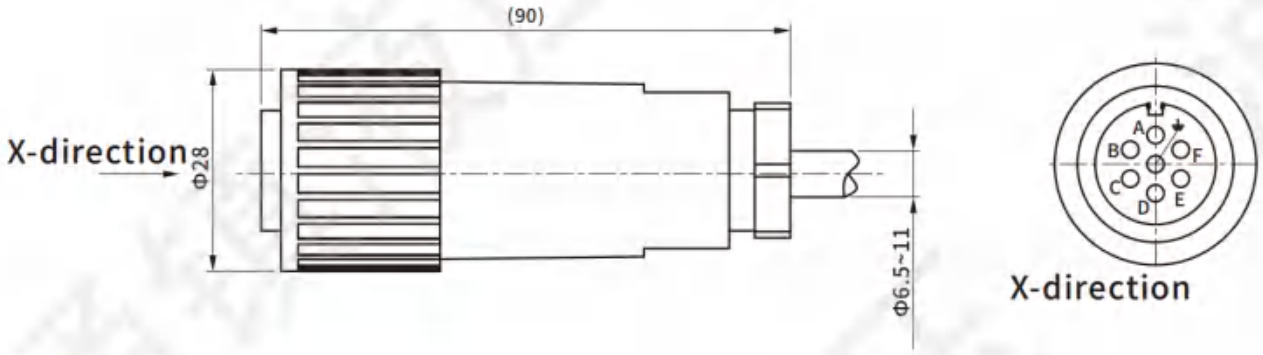
Rated current (A)(pilot valve)	2.0
Rated resistance(Ω)	2.7
Level crossing rate	ED100%
Electrical connection	Plug-type
Level of protection	IP65
Insulation grade	H
Maximum power(W)	17.5

Integrated electronic control unit

Operating voltage(DC)	24V (19V-35V)
Power consumption	<72VA
Current drain	<2A
Instruction value input	±10V(Re>50KΩ); 4~20mA(R_e<200Ω)
Ramp time	0~5s adjustable
Electrical connection	With sockets according to DIN EN 175201-804
Level of protection	IP65

Electrical connection

Plug (According to DIN EN175201-804)

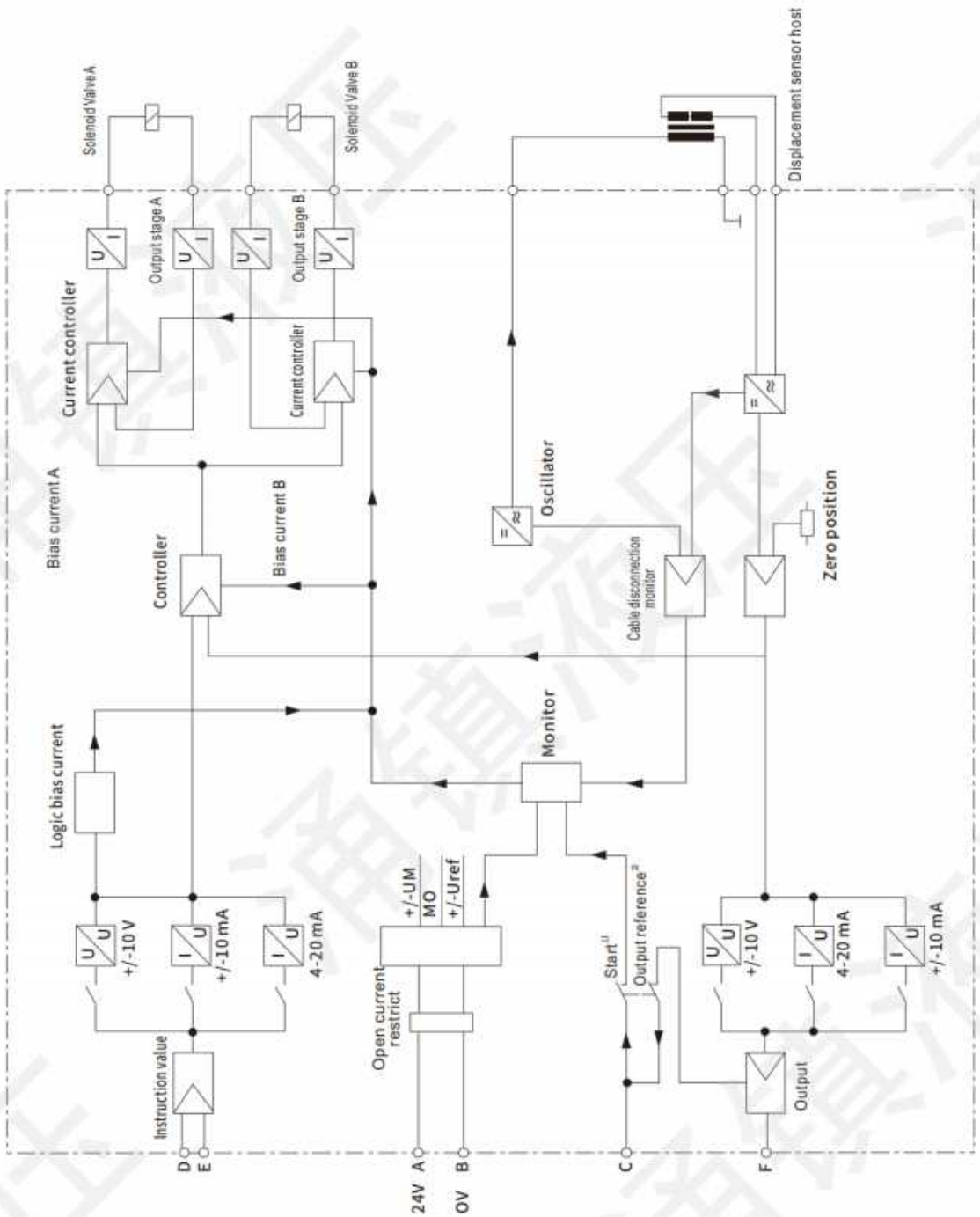


Plug pin instructions

Pin	function	-A1 Voltage type	-F1 Current mode
A	Power voltage	24VDC(19V~35V)	
B		0V	
D	Command value input	±10V(R_e>50KΩ)	4~20mA(R_e<200Ω)
E		Command value input reference	
F	Actual value output	±10V(Current-limiting 5mA)	4~20mA(Max. load 300Ω)
C		Actual value output reference	
PE	Grounding	n.c.	

Command value:
Add a positive command input value (0 ~ +10V or 12 ~20mA) to D and E, SOL a ON, will connect port P to port A, port B to port T.
Add a negative command input value (0 ~ -10V or 12 ~ 4mA) to D and E, SOL b ON, will connect port P to port B, port A to port T.
Actual value:
The actual output value of pins C and F, which normally corresponds to the input instruction value.
Pin C and F signals do not participate in control.
When the P and A ports and the B and T ports of the valve are connected,
the actual output value of the C and F pins is 0 to +10V or 12 to 20mA.
When the P and B ports and A and T ports of the valve are connected,
the actual output value of the C and F pins is 0 to -10V or 12 to 4mA.
Connecting cable:
For cables up to 25m in length, the LiYCY 7*0.75mm2 type is recommended.
For cables up to 50m in length, LiYCY 7 x 1.0mm2 is recommended.
The outer diameter of the cable depends on the size of the plug.
The cable shield layer can be connected only to the power supply end.

Internal block diagram of integrated amplifier

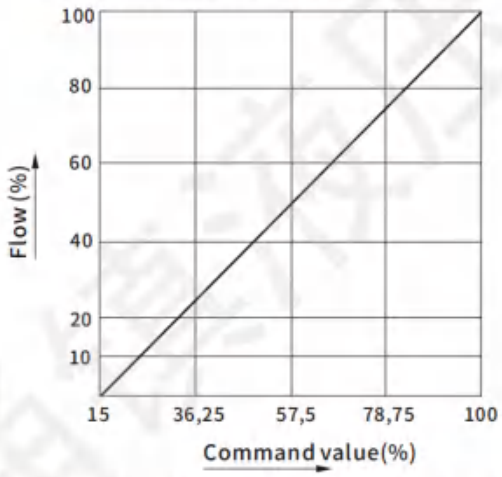


Characteristic Curve

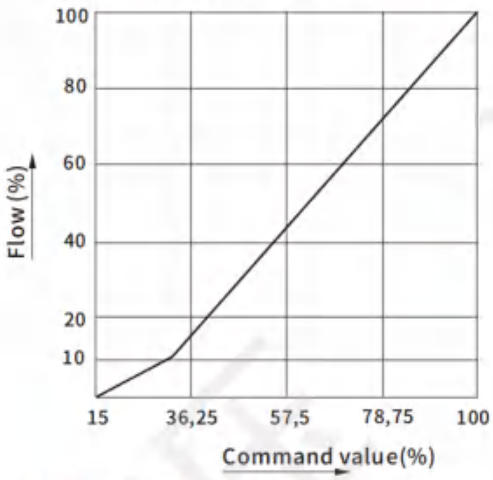
- Flow - command value curve (Measured at P=100bar,VG46,40±5°C)

Flow instruction functions in various cases，such asP→A/B→T is 10bar，or P→A/A→Teach control edge is5bar。

The spool characteristic curve is linear.

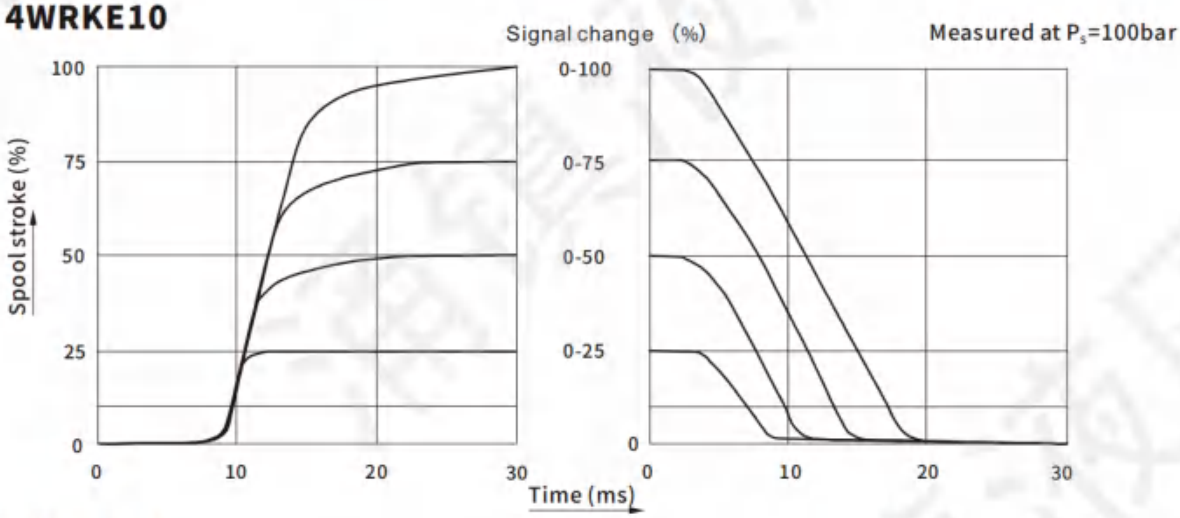


The spool characteristic curve is linear (with fine adjustment area)

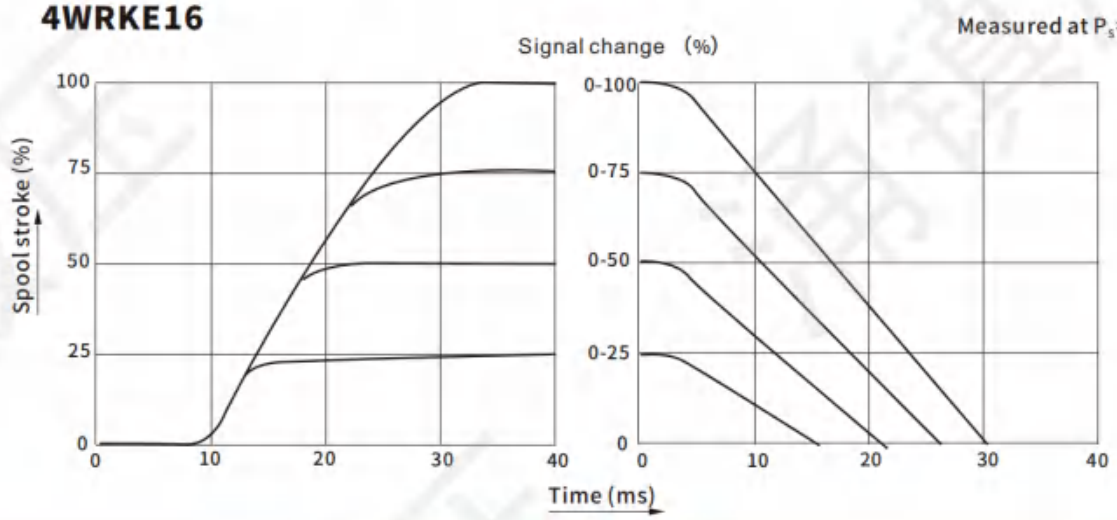


- Step response curves(Measured at P=100bar,VG46,40±5°C)

4WRKE10

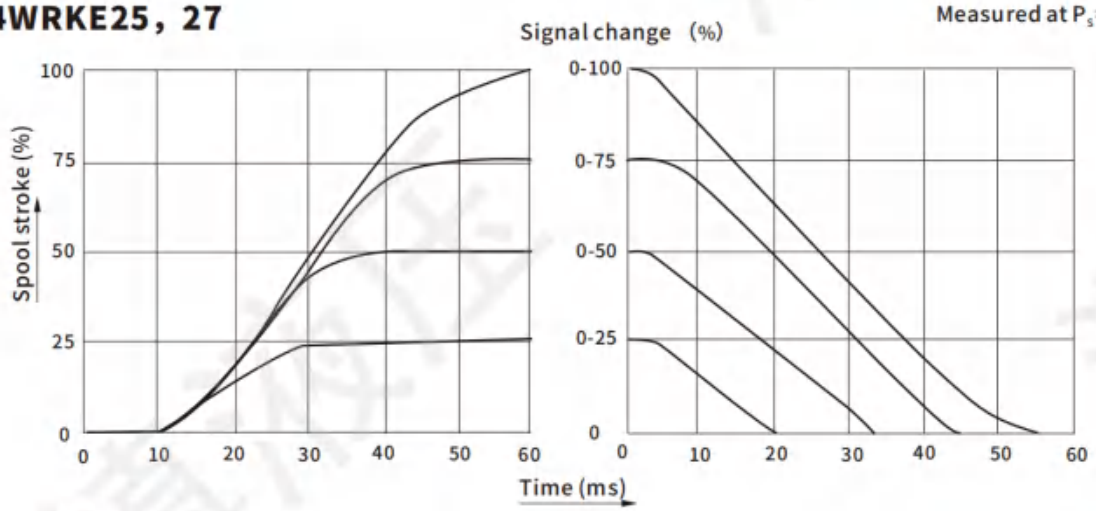


4WRKE16



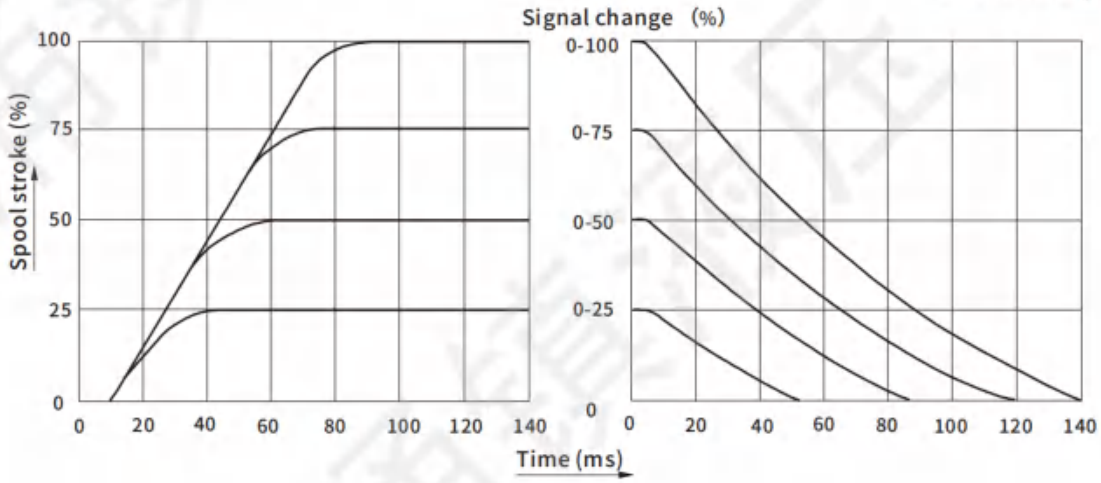
4WRKE25, 27

Measured at P_s=100bar



4WRKE32

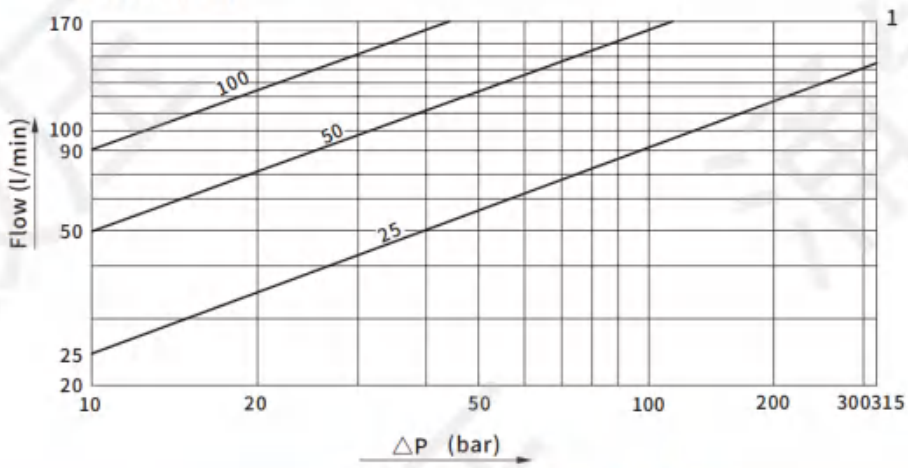
Measured at P_s=100bar



Characteristic Curve

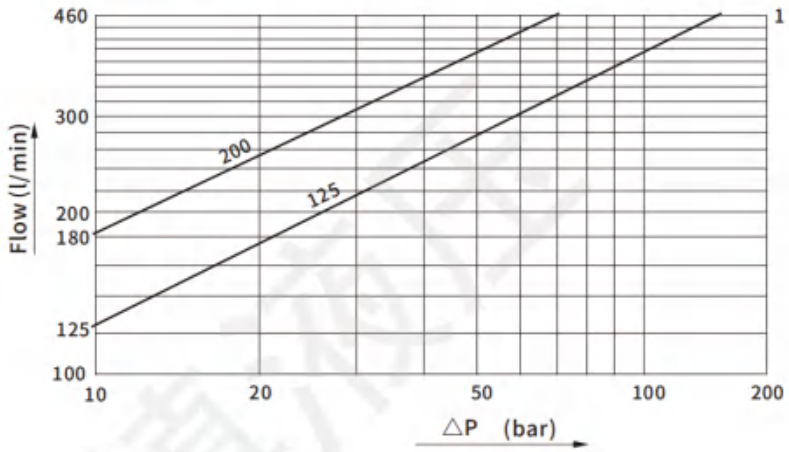
- Flow-load curve at maximum opening(Measured at VG46,40±5°C)

4WRKE10



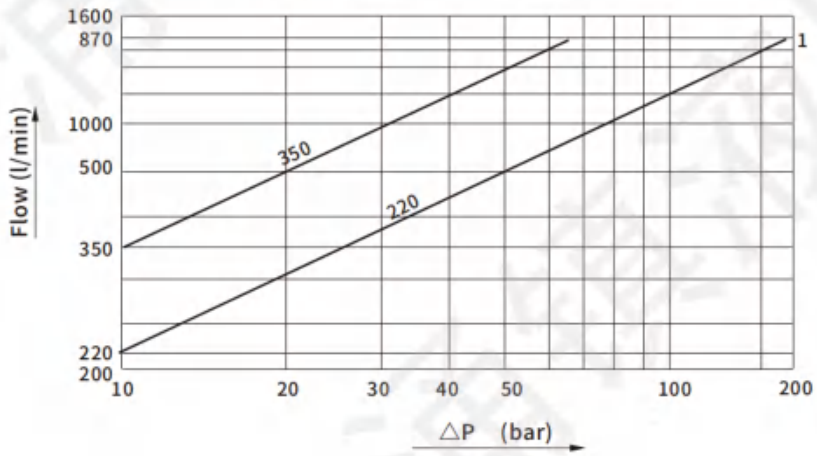
1=Recommended flow limitation
(Flow = 30m/s)

4WRKE16



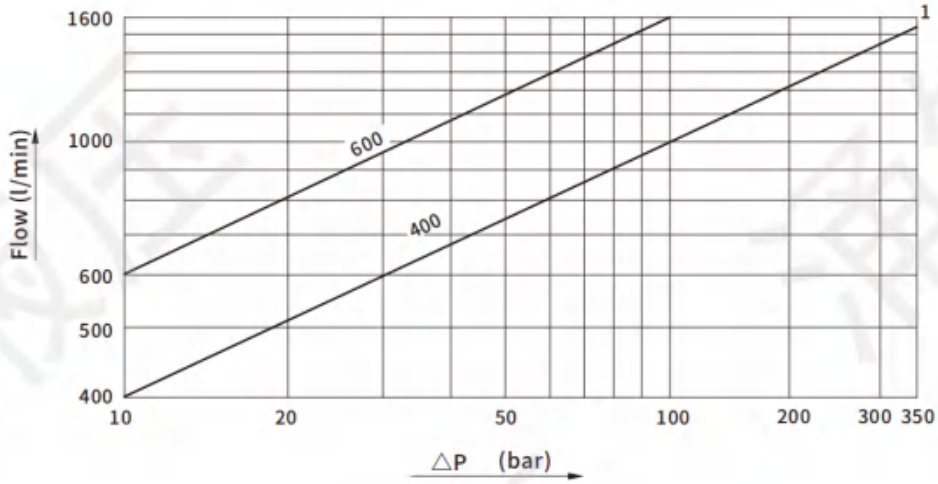
1=Recommended flow limitation
(Flow= 30m/s)

4WRKE25, 27



1=Recommended flow limitation
(Flow= 30m/s)

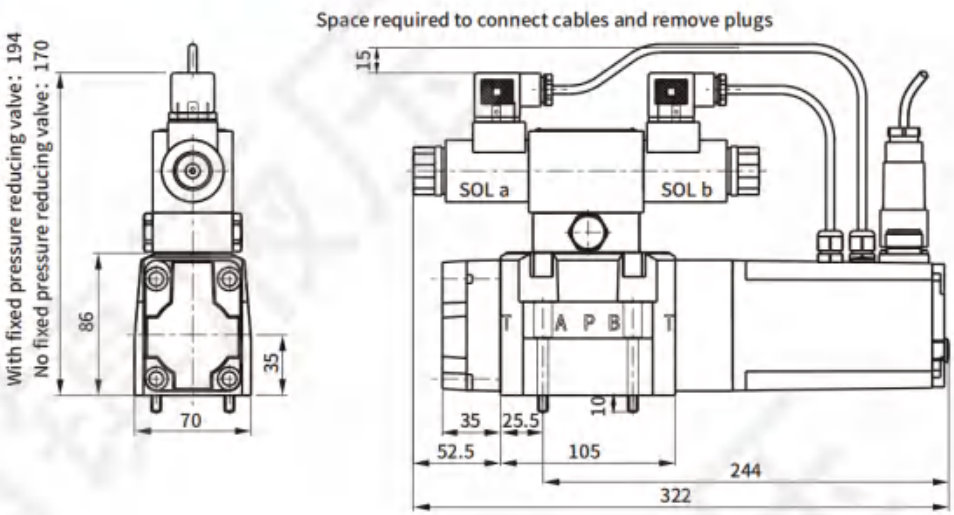
4WRKE32

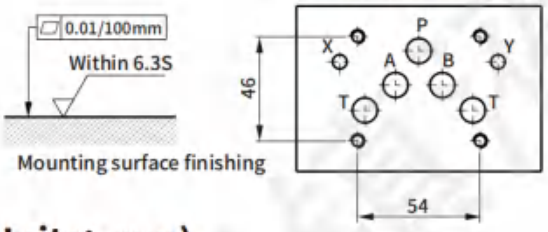


1=Recommended flow limitation
(Flow=30m/s)

Dimensions

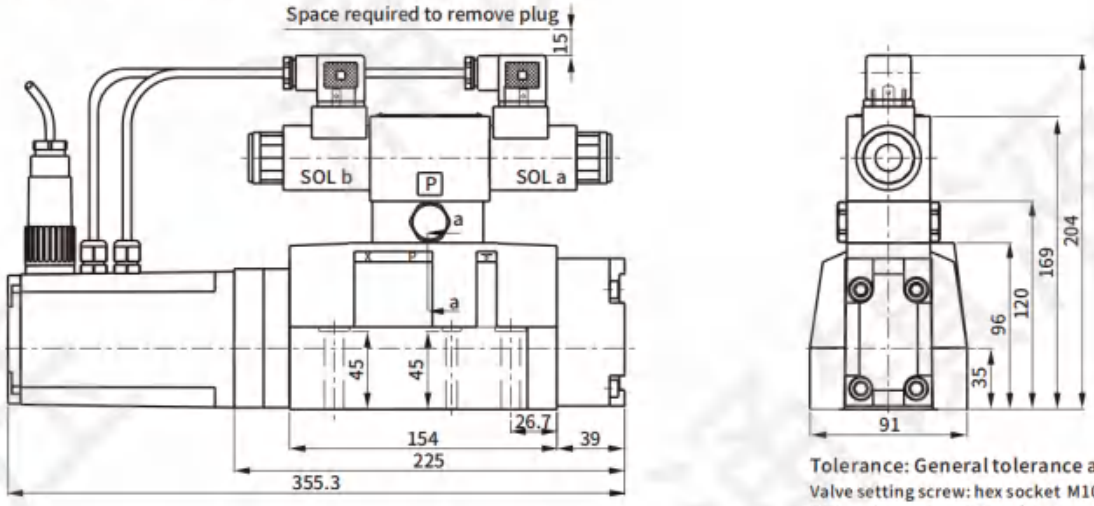
4WRKE10(Units: mm)

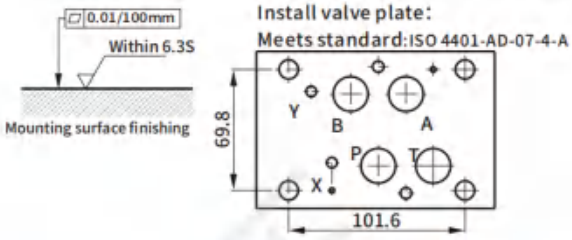




Tolerance: General tolerance according to GB/T 1804-m
Valve setting screw: hex socket M6×45L 12.9level,
Tightening torque: 14Nm±10%

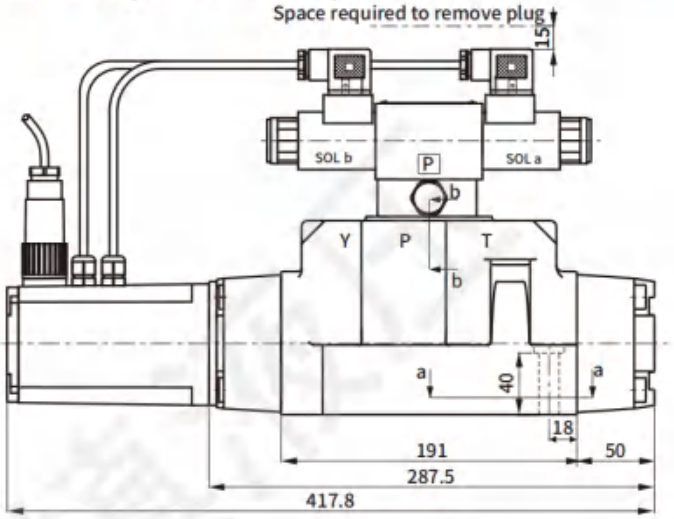
4WRKE16(Units: mm)

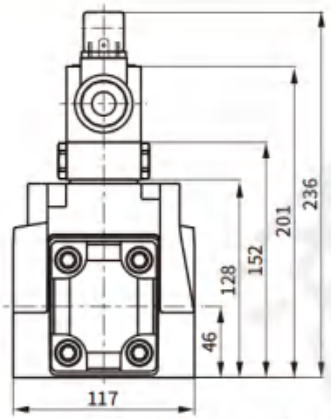




Tolerance: General tolerance according to GB/T 1804-m
Valve setting screw: hex socket M10×60L 12.9 level,
Tightening torque: 58Nm±10%
Valve setting screw: hex socket M6×55L 12.9 level,
Tightening torque: 14Nm±10%

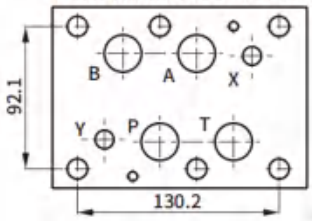
4WRKE25(Units: mm)

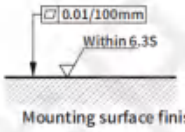




Tolerance: General tolerance according to GB/T 1804-m
Valve setting screw: hex socket M12×60L 12.9 level,
Tightening torque: 100Nm±10%

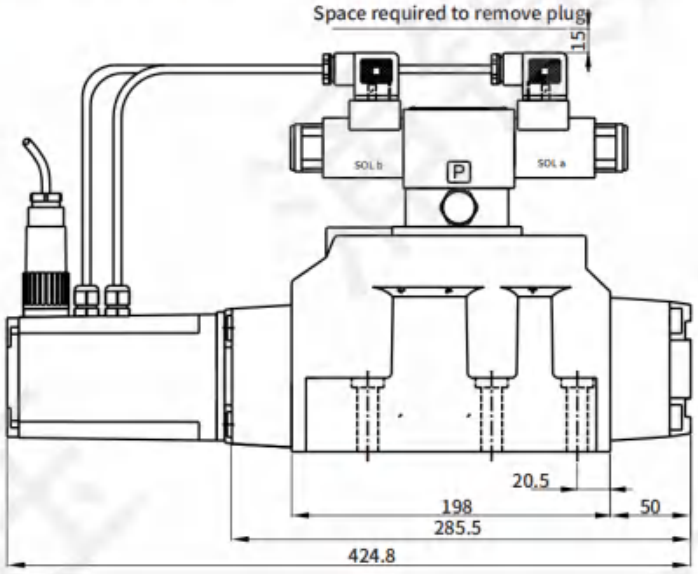
Install valve plate:
Meets standard ISO 4401-AE-08-4-A

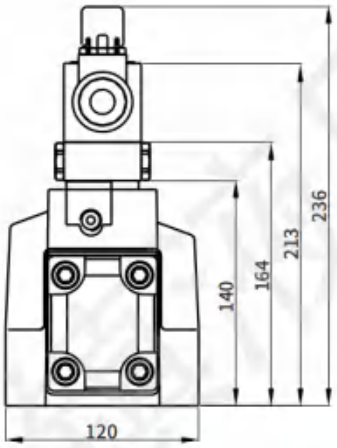




Mounting surface finishing

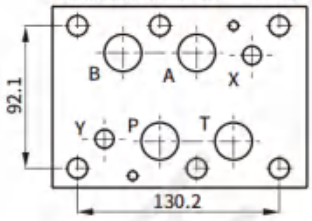
4WRKE27(Units: mm)

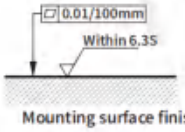




Tolerance: General tolerance according to GB/T 1804-m
Valve setting screw: hex socket M12×60L 12.9 level,
Tightening torque: 100Nm±10%

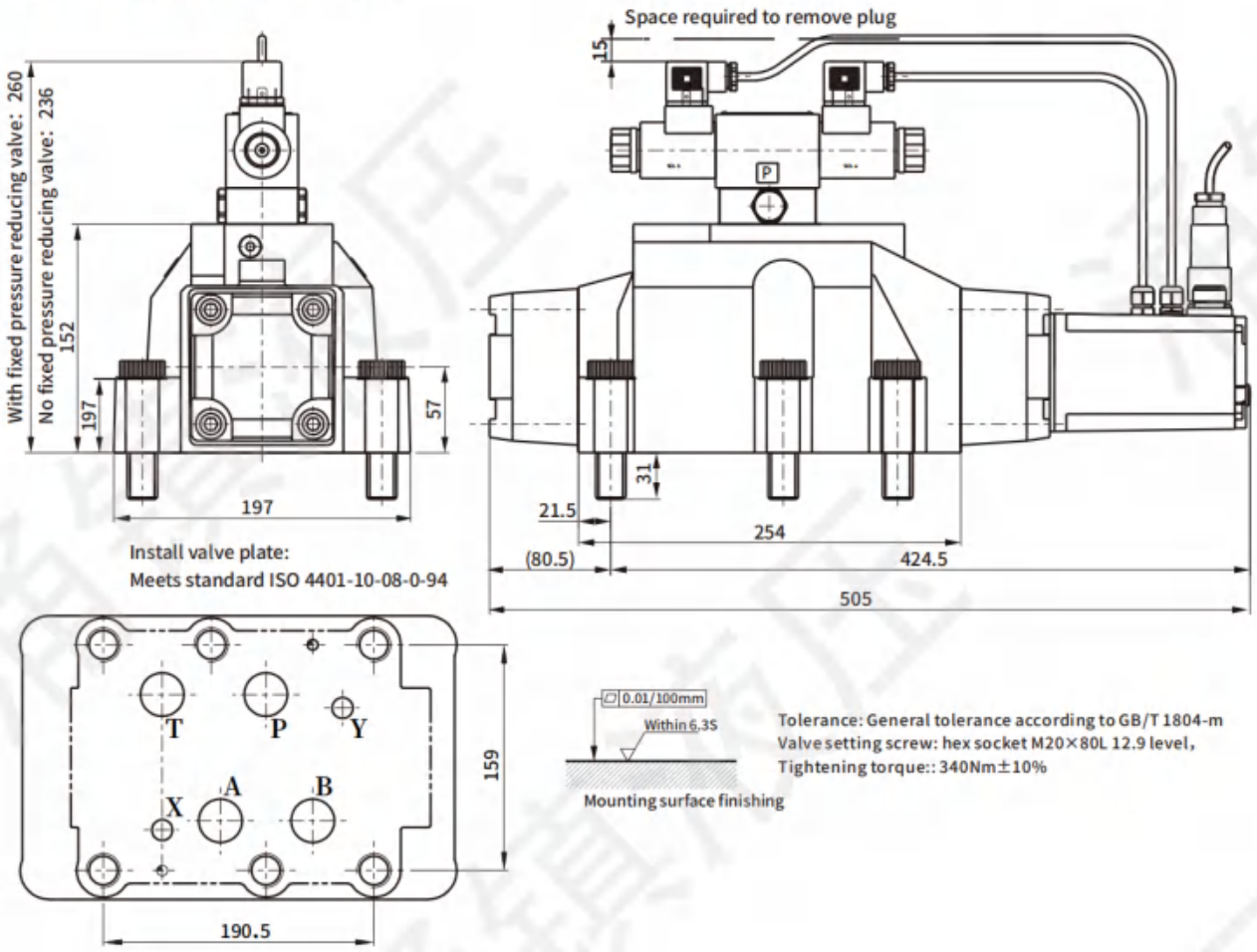
Install valve plate:
Meets standard ISO 4401-08-08-0-05





Mounting surface finishing

4WRKE32(Units: mm)



4WRZ Series

1. Pilot type control two-stage proportional directional valve, without the main spool displacement electrical feedback, the main spool by the spring.
2. Accurate stepless flow regulation (no pressure compensation) and direction control can be achieved.
3. Pilot valve with central thread proportional electromagnet, coil can be removed separately.
4. Electromagnet with optional manual emergency operation.
5. For base plate installation, the installation surface is in accordance with the unified international standard ISO 4401.
6. The electric controller is external, which can be used interchangeably with similar products in Europe and America.
7. Optional proportional directional valve with built-in amplifier plate.

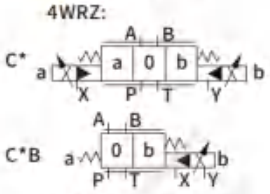
How to order

4WRZE16-C2-150A-10-D24-N9-ET-K31-A1-D3-V-**

- Pilot type without displacement electrical feedback
- Electronic control — Blank: For external; E: With Integrated
- Nominal size — 10:NG10 16: NG16 25: NG 25 32: NG 32
- Slide function — See slide function table
- Nominal flow
  - NG 10: 25:25L/min; 50:50L/min; 85:85L/min
  - NG 16: 100:100L/min; 150:150L/min
  - NG 25 size: 220:220L/min; 325:325L/min
  - NG 32: 360:360L/min; 520:520L/min
- Slide column type
- Design code
- Power supply voltage — Blank: None (for 4WRZ); D24:DC24V(for 4WRZE)
- Electromagnet operation — Blank: no manual emergency operation; N9: Manual emergency operation with guard
- Control form — Blank: internal control and internal leakage; E: external control and internal leakage; T: Internal control leakage; ET: External control leakage
- Electrical connection — 4WRZ: Blank: with coil plug (PG11), K4: None; 4WRZE: Blank: with amplifier plug, K31: None
- Control command — Blank: for 4WRZ; A1: Command value ±10V(for 4WRZE); F1: Command value 4~20mA(for 4WRZE)
- Blank: no fixed pressure reducing valve; D3: With fixed pressure reducing valve
- Sealing material — Blank: Nitrile rubber; V: Fluorine rubber
- More details

Symbols

4WRZ:



4WRZE:

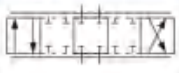
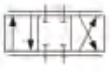
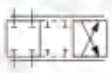
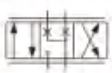
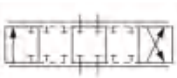
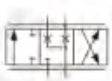
Note:

Nominal flow rate is measured at valve pressure differential △P=10bar

The 4WRZ series magnifying plates must be ordered separately

Slide function

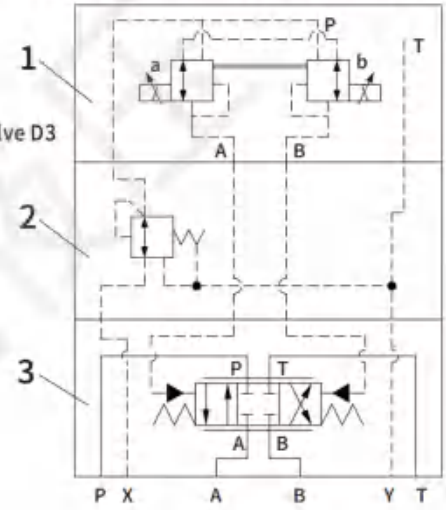
Specification

Application	Type	Oil circuit symbol		Application	Type	Oil circuit symbol	
3-position Spring centered	C2 C21			2-position Spring centered	C2B		
	C4 C41				C4B		
	C29			1.C21,C41function,including P→A:qmax,B→T: qmax/2; P→B: qmax/2, A→T: qmax。 2.C29,C49function, including P→A: qmax, B→T: off; P→B: qmax/2, A→T: qmax。 3.C4, C4B, C41, C49function, A, B→T is approximately equivalent to the rating worth 2% of the flow area. 4.For other functional forms of sliders, please consult our company.			
	C49						

Description

Detailed functional symbols

Pilot control oil external control external discharge



1 Pilot control valve
2 Set the pressure reducing valve D3
3 Main valve

Construction

The 4WRZ valve is a three-position four-way pilot type two-stage proportional direction control valve, which controls the size and direction of the liquid flow.
The 4WRZ valve consists of three parts: pilot valve I, fixed pressure reducing valve II(optional), and main valve III.
The basic composition of pilot valve I is as follows:
- Body with mounting underside (1)
- Control spool (2)
- Pressure measuring pistons (3 and 4)
- Centring springs (5 and 6)
- Proportional electromagnets with center thread (7 and 8)
- Optional plug (9); For the 4WRZE series, the connector of the amplifier board is optional.

Main valve III basic composition is as follows:
- Main body with mounting underside (10)
- Main spool (11)
- End caps (12 and 13)
- Centring spring (14)

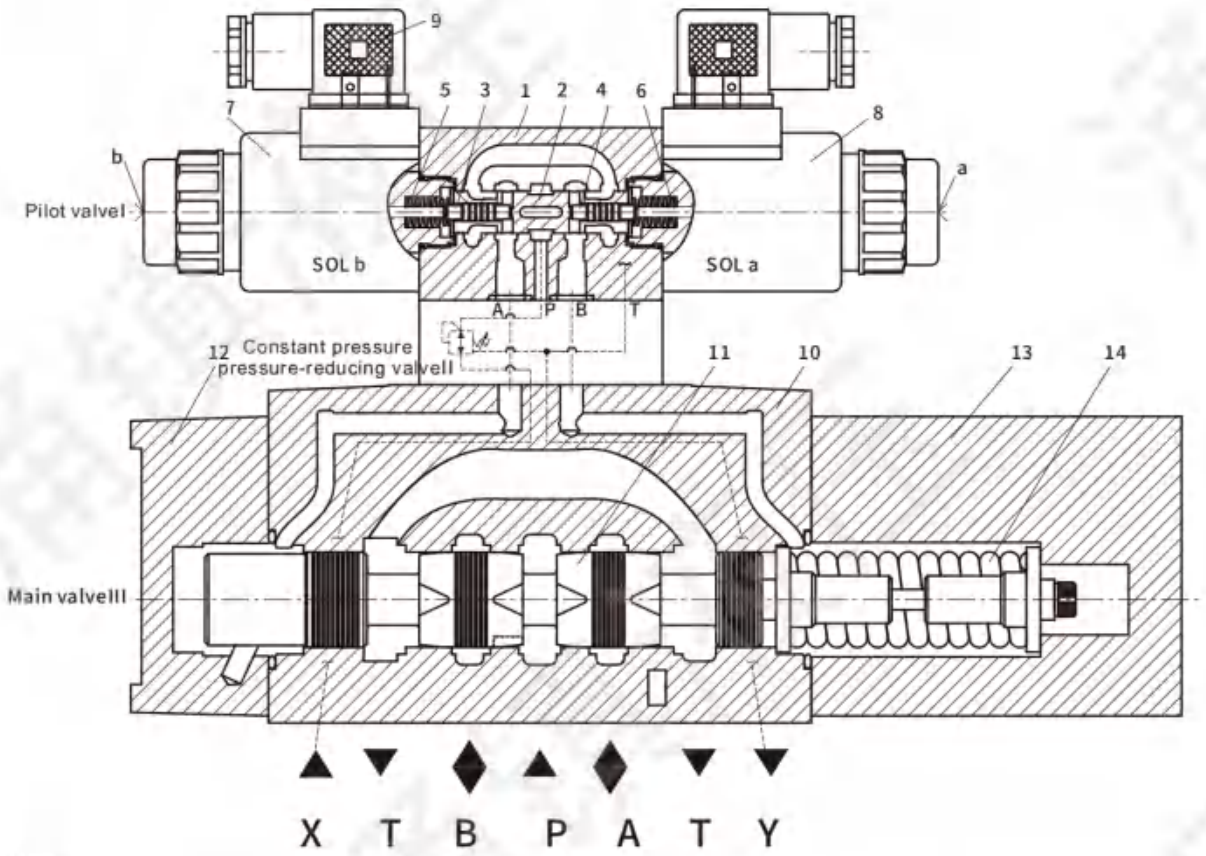
Function

- Pilot valve I is a direct-acting three-way proportional pressure reducing valve. Its function is to convert an input signal into a pressure proportional to it the output signal.
- Proportional electromagnets (7 and 8) are of wet construction, their stroke is adjustable, with center thread, and the coil can be removed separately.
- When the proportional electromagnets (7 and 8) are not charged, the control spore (2) remains in the middle position under the action of the central spring (5 and 6), when the valve body(1) the working oil ports (A and B) are communicated with the fuel tank; The main spool (11) is held in the center position under the action of the center spring (14) and the end cap

The oil in the control chamber (12 and 13) is communicated to the tank through the pilot valve I.
- The pressure reduction function of the constant pressure reducing valve II keeps the pressure constant in the P chamber of the pilot valve I (optional).
- When the proportional electromagnet (8) is excited, the control spool (2) and pressure measuring piston (4) are pushed to the left, and the oil circuit of pilot valve I is P→A, B

→T, the oil from port A flows to the control chamber of the end cover (12), and pushes the main spool (11) to move to the right, so that the P port of the main valve III passes through port A and port B
Through the T port, the throttling characteristic is progressive.

- The movement position of the main spore (11) is proportional to the excitation current of the proportional electromagnets (7 and 8).
- Optional plug (9) for electrical connection to external amplifier.
- Optional proportional electromagnet manual emergency operation (a and b), which enables pilot valve I to move when the electromagnet is not energized.



Note:

1. When replacing the pilot control valve or electronic controller, the parameters of the electromagnet and amplifier must be re-adjusted.
2. The oil in the return pipeline must be completely emptied, and the back pressure valve (about 2bar) must be installed in the loop if necessary.
3. The selection of pressure reducing valve II is related to the pressure of the control port.
4. A manual emergency operation may cause the device to run out of control.

Specification

Overview

Nominal size		10	16	25	32
Installation		Optional, preferably horizontal.			
Storage temperature (°C)		-20~ +80			
Operating temperature(°C)	4WRZ	-20~+70			
	4WRZE	-20~+50			
Weight(kg) (contain"D3")	4WRZ	9.5	12	19	43
	4WRZE	9.7	12.2	19.2	43.2

Hydraulic parameter(Measured at P=100bar，VG46，40±5°C)

Diameter		10	16	25	32
Operating pressure (bar)	Pilot valve (external and internal control)	Do not install "D3"(30 ~ 100)			
		Install "D3"(100 ~ 315)	Install "D3"(100 ~ 350)		
	Main oil ports P,A,B	<315	<350		
Return pressure(T)(bar)	Pilot external oil return	<315	<250	<250	<150
	Pilot internal oil return	Stactic<30			
	Drain port Y	Stactic<30(Pilot valve)			
Control oil volume (main valve 0→100% reversing)cm^3		1.7	4.6	10	26.5
Max. permissible flow(L/min)		170	460	870	1600
X and Y control oil flow, input step signal (L/min)(0 ~ 100%)		3.5	5.5	7	15.9
Hydraulic fluid		Mineral oil (HL, HLP) to DIN 51524 , other oil please consult our company!			
Fluid temperature		-20~+80°C(preferably +40~+50°C)			
Viscosity range		20~380mm^2/s(preferably 30 ~46mm^2/s)			
Degree of contamination	Pilot control valve	NAS1638 Class 7 or ISO4406 Class 18/16/13			
	Main valve	NAS1638 Class 9 or ISO4406 Class 20/18/15			
Hysteresis (%)		≤6			

Coil characteristic

Nominal size	10/16/25/32		
Rated current (A)(pilot valve)	0.8	1.5	2.5
Rated resistance(Ω)	19.5	5	2
Level crossing rate	ED100%		
Electrical connection		Plug type	Pin type
Level of protection	IP65		
Insulation grade	H		
Max. power(W)	18.7	17	18.7

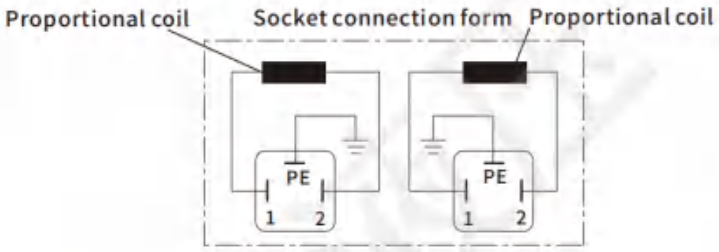
Integrated electronic control unit

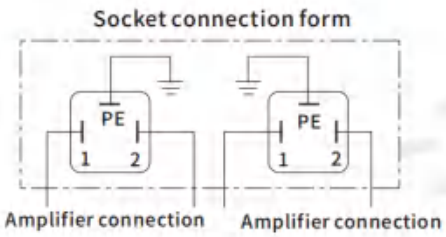
Operating pressure(DC)	24V (19V-35V)
Power consumption(VA)	<45
Current drain(A)	<2
Instruction value input	±10V(R_e>50KΩ); 4~20mA(R_e<200Ω)
Ramp time	0~5s adjustable
Electrical connection	With sockets according to DIN EN 175201-804
Level of protection	IP65

Electrical connection

Plug (according to DIN EN175301-803)

4WRZ:

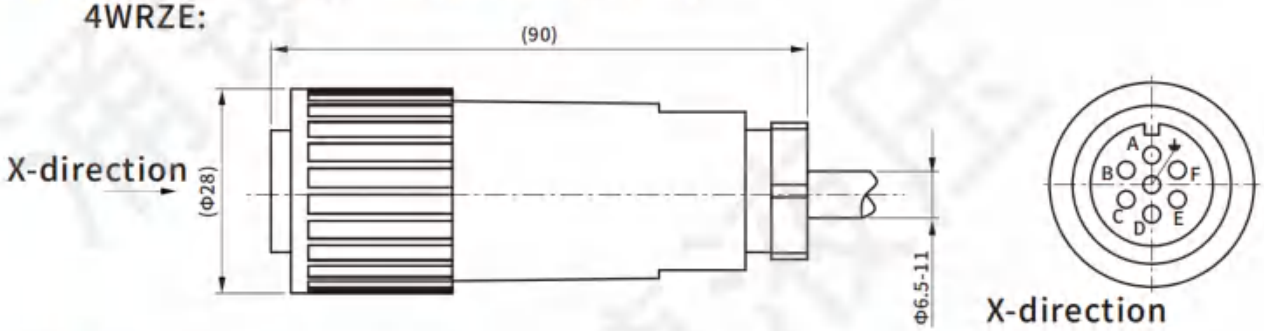




Plug setting screw M3
Tightening torque M_A=0.5Nm

Plug (according to DIN EN175201-804)

4WRZE:



Plug pin instructions

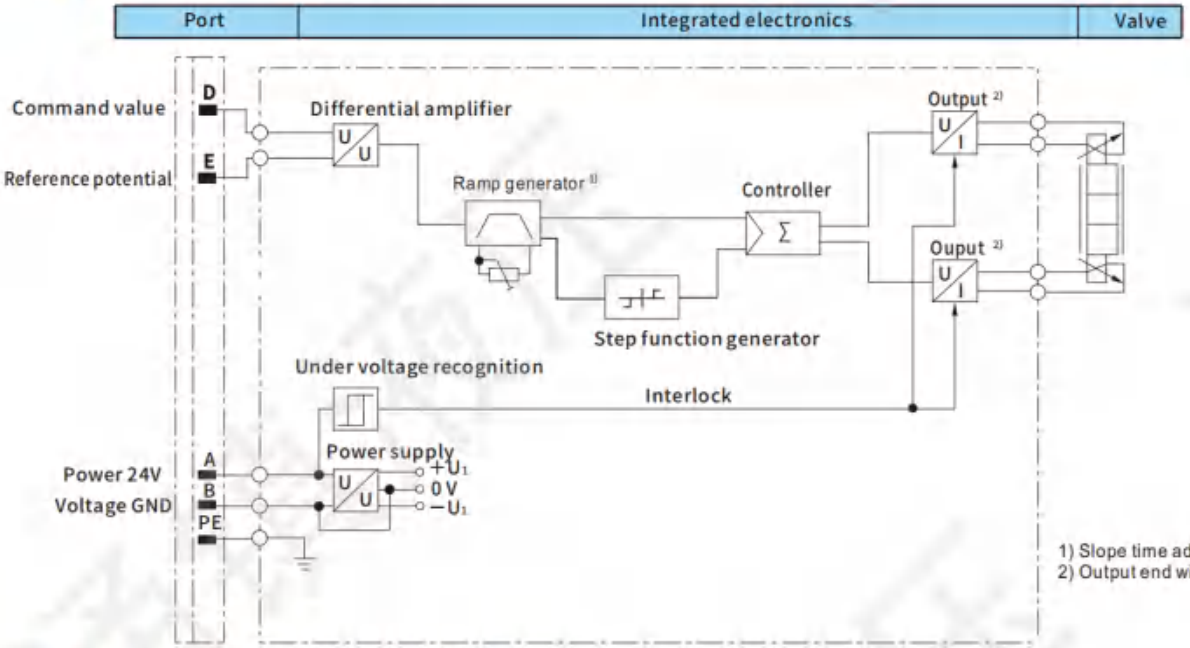
Pin	Pin function	-A1 voltage type	-F1 current mode
A	Power voltage	24VDC(19V~35V)	
B		0V	
D	Command value input	±10V(R_e>50KΩ)	4~20mA(R_e<200Ω)
E		Command value input reference	
F	Actual value output	n.c.	n.c.
C		n.c.	
PE	Grounding	n.c.	

Note: Terminals C and F cannot be connected together

Command value:

Add a positive command input value (0 ~ +10V or 12 ~20mA) to D and E, SOL a ON, will connect port P to port A, port B to port T.
Add a negative command input value (0 ~ -10V or 12 ~ 4mA) to D and E, SOL b ON, will connect port P to port B, port A to port T.
Connecting cable:
For cables up to 25m in length, the LiYCY 5*0.75mm2 type is recommended.
For cables up to 50m in length, LiYCY 5 x 1.0mm2 is recommended.
The outer diameter of the cable depends on the size of the plug.
The cable shield layer can be connected only to the power supply end.

Integrated electronics



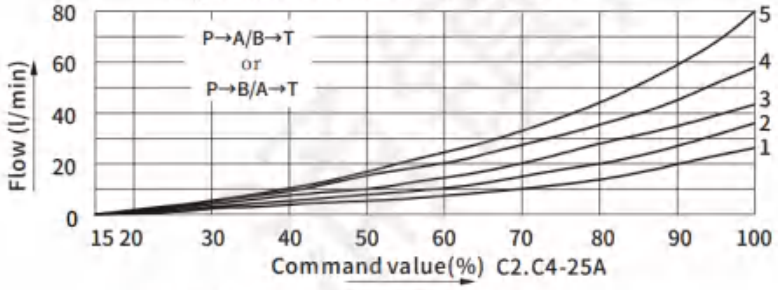
1) Slope time adjustment range is 0 to 5 seconds.
2) Output end with current output.

Characteristic Curve

Pressure differential-flow curve(Measured at P=100bar,VG46,40±5°C, C2/C4function)

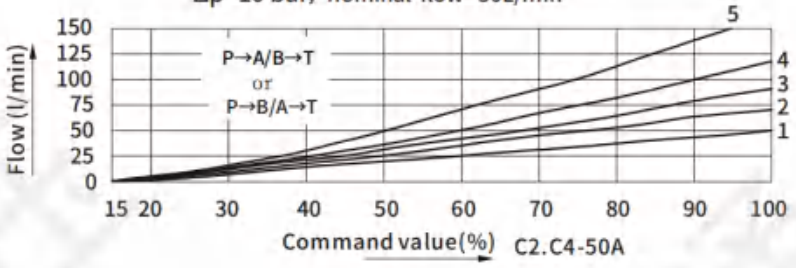
4WRZ10/4WRZE10

Δp=10 bar, nominal flow = 25L/min



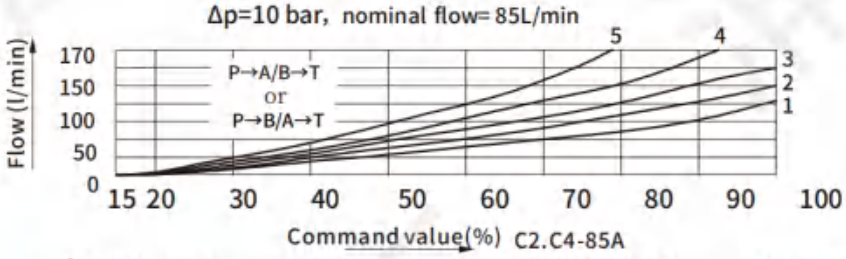
1 Δp=10bar Constant
2 Δp=20bar Constant
3 Δp=30bar Constant
4 Δp=50bar Constant
5 Δp=100bar Constant

Δp=10 bar, nominal flow=50L/min



1 Δp=10bar Constant
2 Δp=20bar Constant
3 Δp=30bar Constant
4 Δp=50bar Constant
5 Δp=100bar Constant

Δp=10 bar, nominal flow= 85L/min

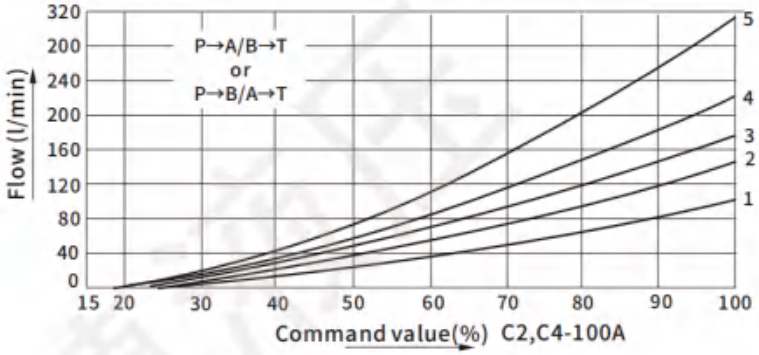


1 Δp=10bar Constant
2 Δp=20bar Constant
3 Δp=30bar Constant
4 Δp=50bar Constant
5 Δp=100bar Constant

Δp=Differential pressure of valves as specified in DIN 24 311 (inlet pressure Pp - load pressure PL - return pressure PT)

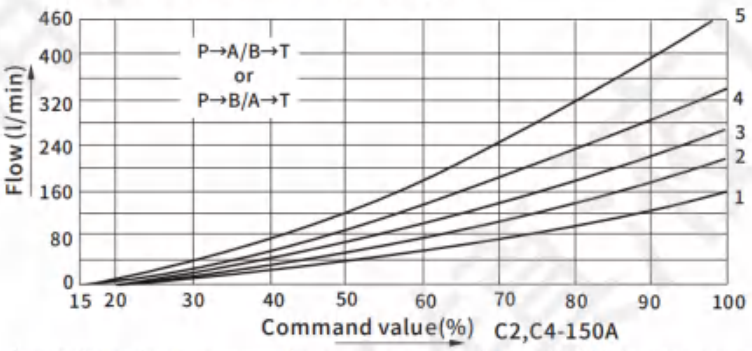
4WRZ16/4WRZE16

△p= 10 bar， nominal flow =100L/min



1 △p= 10 bar Constant
2 △p= 20 bar Constant
3 △p= 30 bar Constant
4 △p= 50 bar Constant
5 △p= 100 bar Constant

△p= 10 bar， nominal flow =150L/min

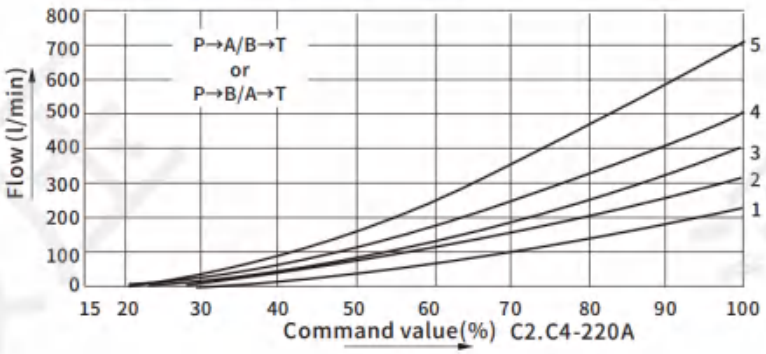


1 △p= 10 bar Constant
2 △p= 20 bar Constant
3 △p= 30 bar Constant
4 △p= 50 bar Constant
5 △p= 100 bar Constant

△p=Differential pressure of valves according to DIN 24311 (inlet pressure PP- load pressure PL- return pressurePT)

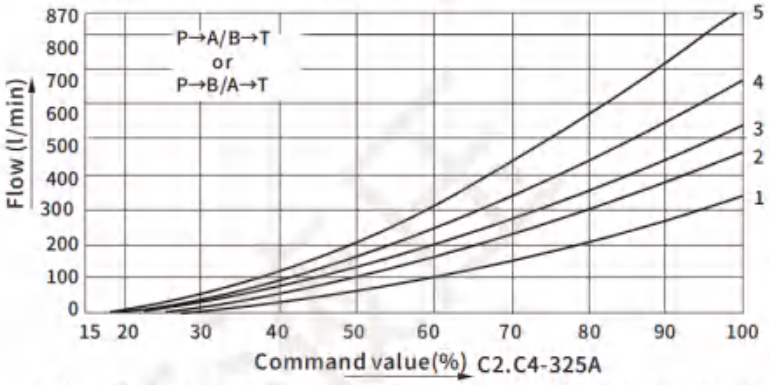
4WRZ25/4WRZE25

△p= 10 bar， nominal flow =220L/min



1 △p= 10 bar Constant
2 △p= 20 bar Constant
3 △p= 30 bar Constant
4 △p= 50 bar Constant
5 △p= 100 bar Constant

△p= 10 bar , nominal flow = 325L/min

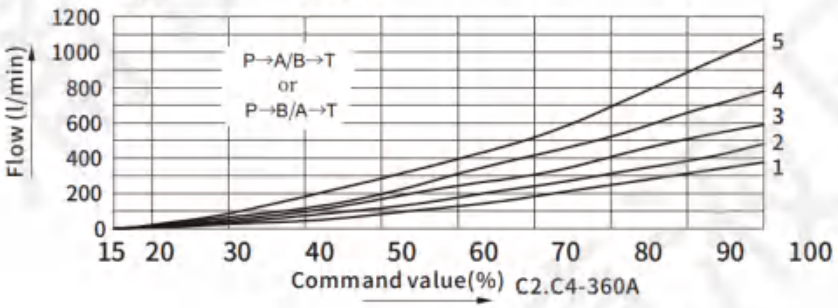


1 △p= 10 bar Constant
2 △p= 20 bar Constant
3 △p= 30 bar Constant
4 △p= 50 bar Constant
5 △p= 100 bar Constant

△p=Differential pressure of valves according to DIN 24311 (inlet pressureP_P - load pressureP_L-return pressureP_T)

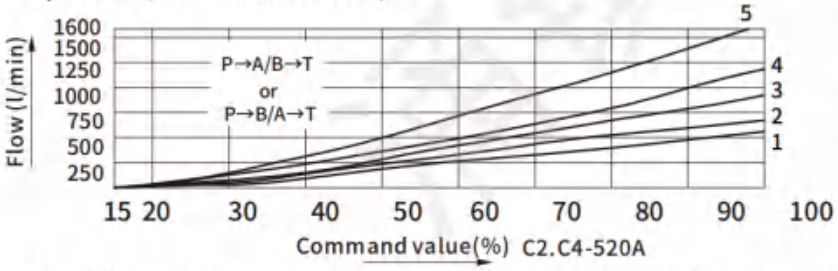
4WRZ32/4WRZE32

△p= 10 bar , nominal flow = 360L/min



1 △p= 10 bar Constant
2 △p= 20 bar Constant
3 △p= 30 bar Constant
4 △p= 50 bar Constant
5 △p= 100 bar Constant

△p= 10 bar , nominal flow = 520L/min

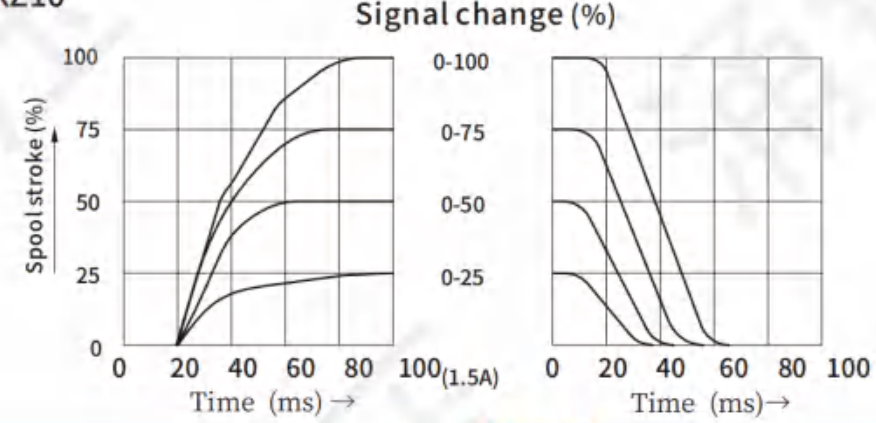


1 △p= 10 bar Constant
2 △p= 20 bar Constant
3 △p= 30 bar Constant
4 △p= 50 bar Constant
5 △p= 100 bar Constant

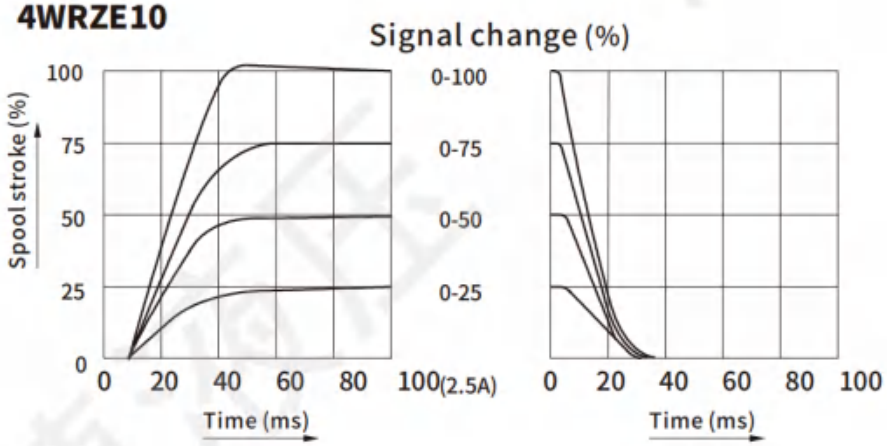
△p=Differential pressure of valves according to DIN 24311 (inlet pressureP_P - load pressureP_L-return pressureP_T)

Characteristic Curve of step response(Measured at P=50bar,VG46,40±5°C，C2/C4function)

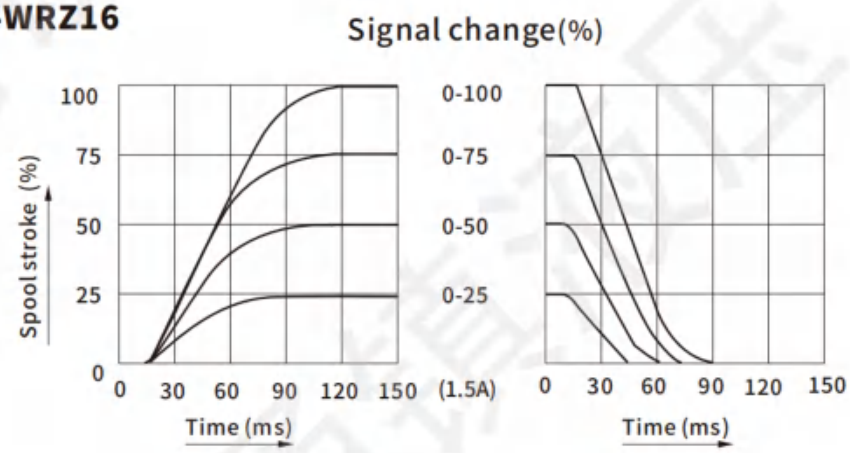
4WRZ10



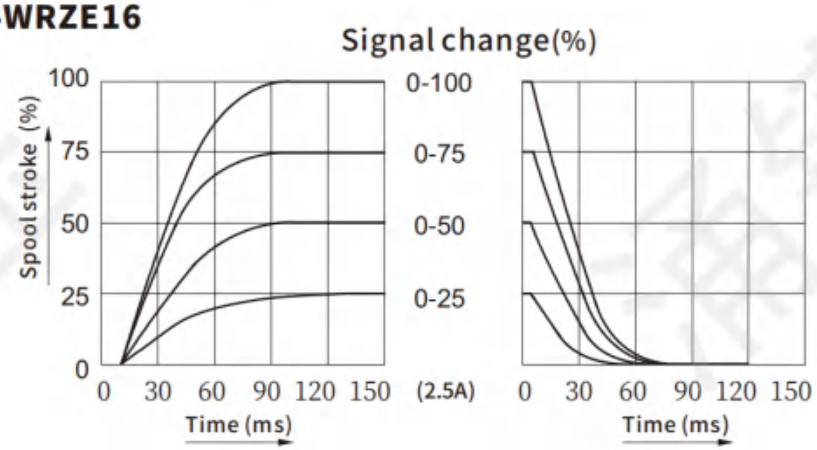
4WRZE10



4WRZ16

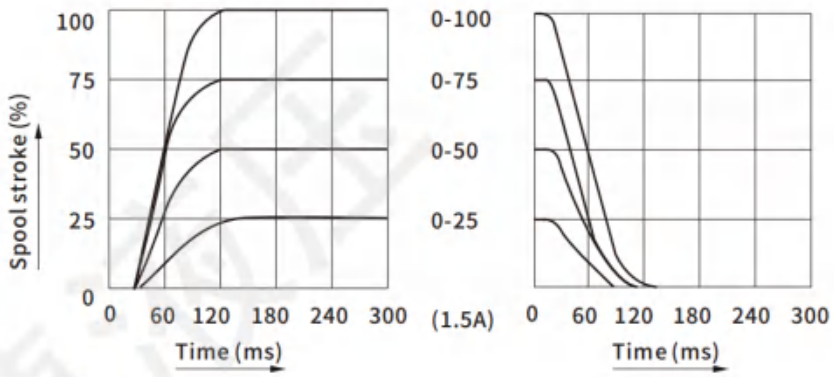


4WRZE16



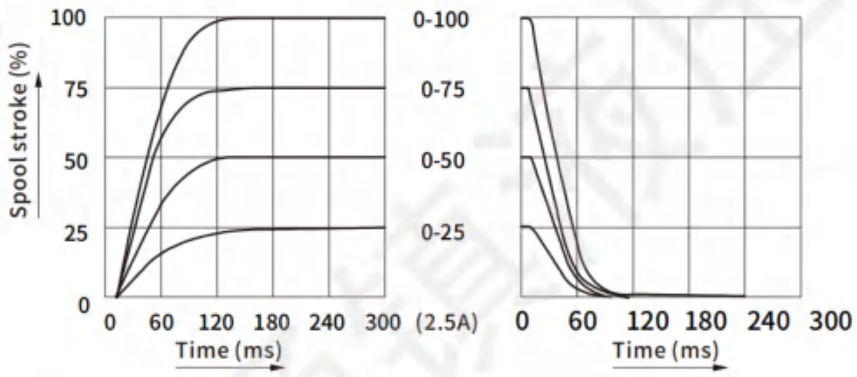
4WRZ25

Signal change (%)



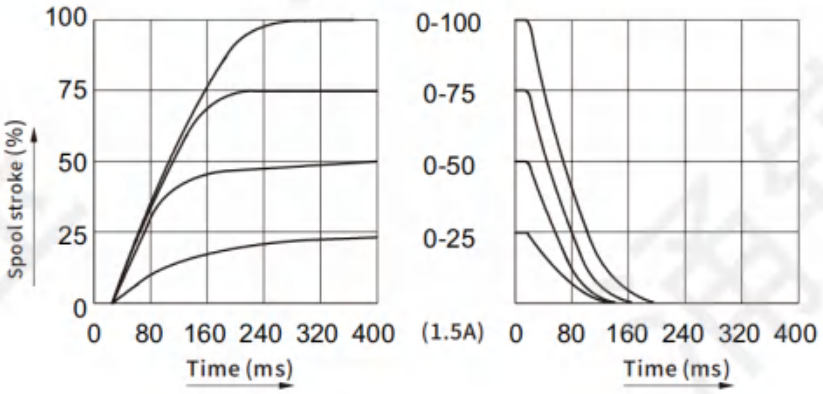
4WRZE25

Signal change (%)

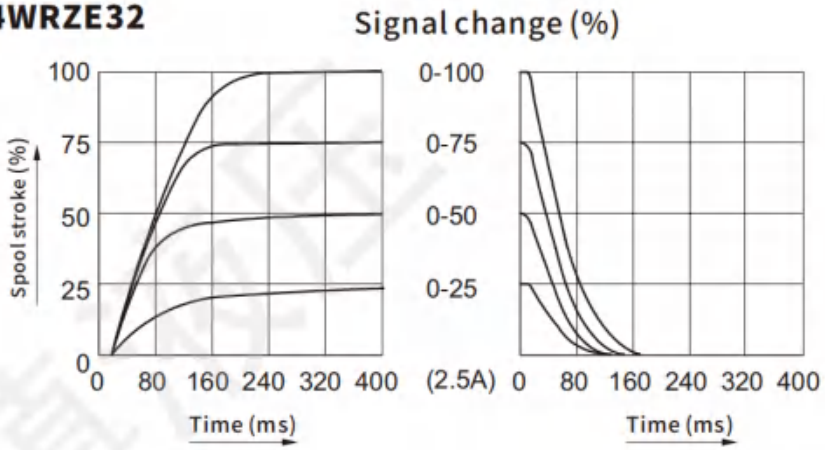


4WRZ32

Signal change (%)



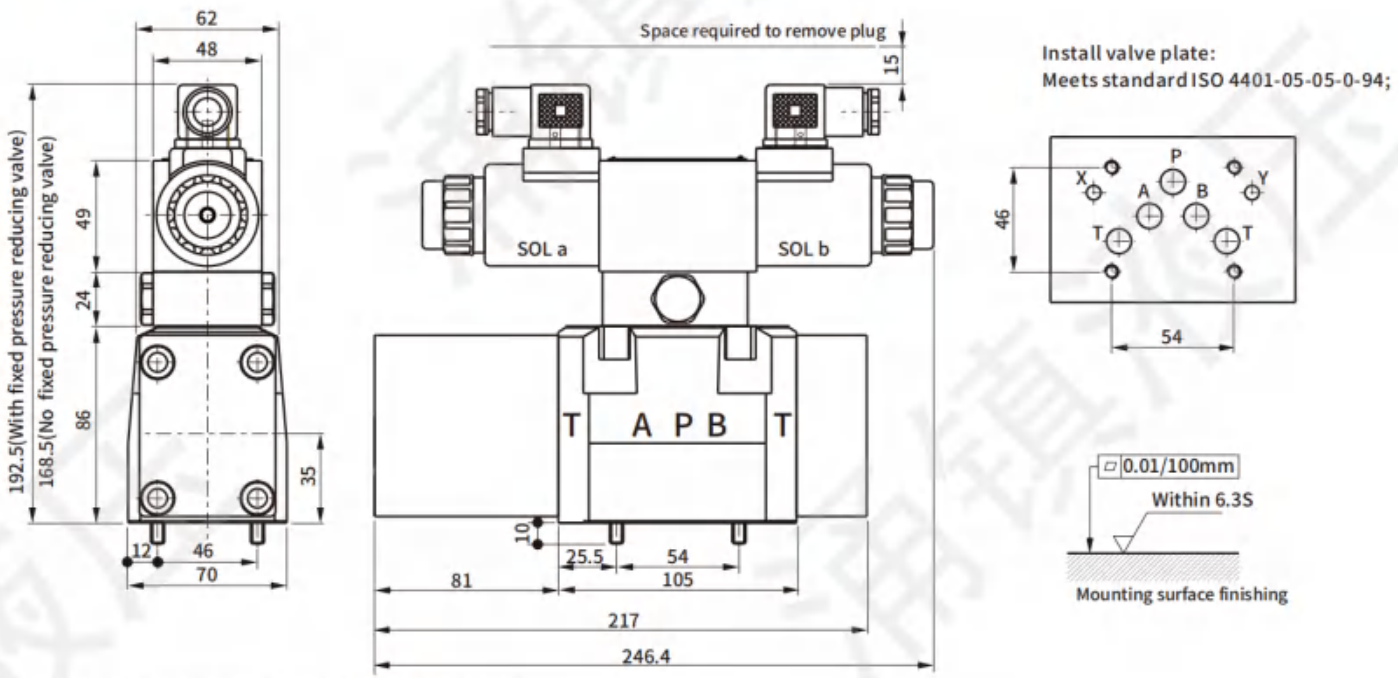
4WRZE32



Dimensions

Units: mm

4WRZ10

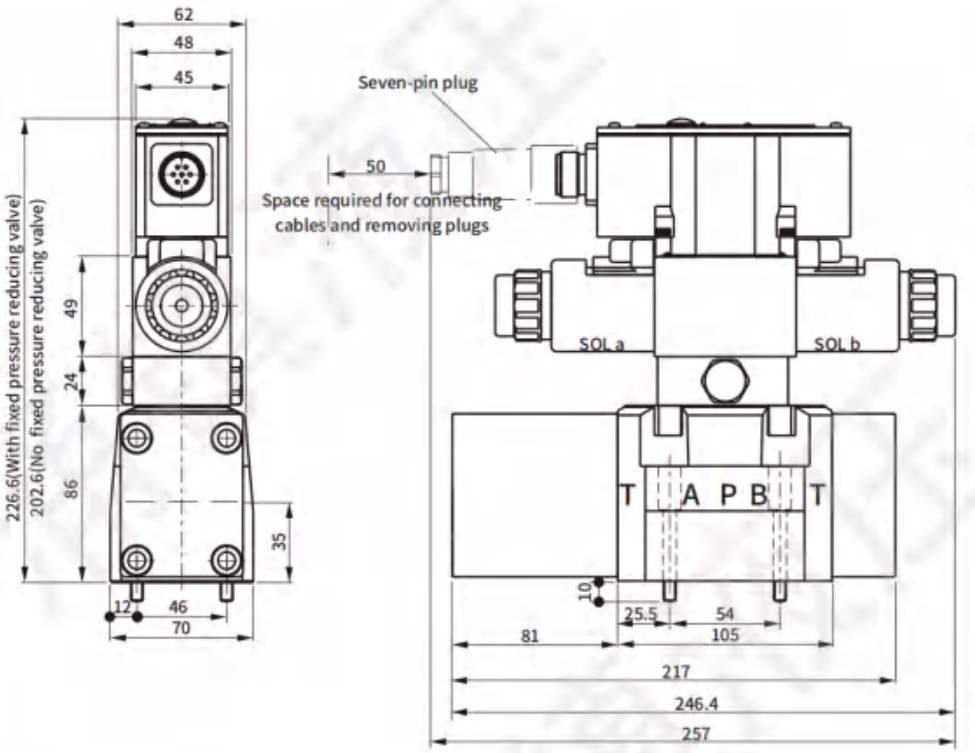


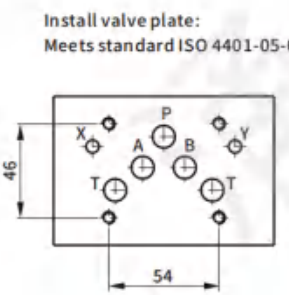
Tolerance: General tolerance according to GB/T 1804-m
Valve setting screw: hex socket M6×45L 12.9 level,
Tightening torque: 14Nm±10%

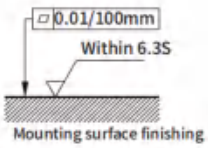
Dimensions

4WRZE10

Units: mm

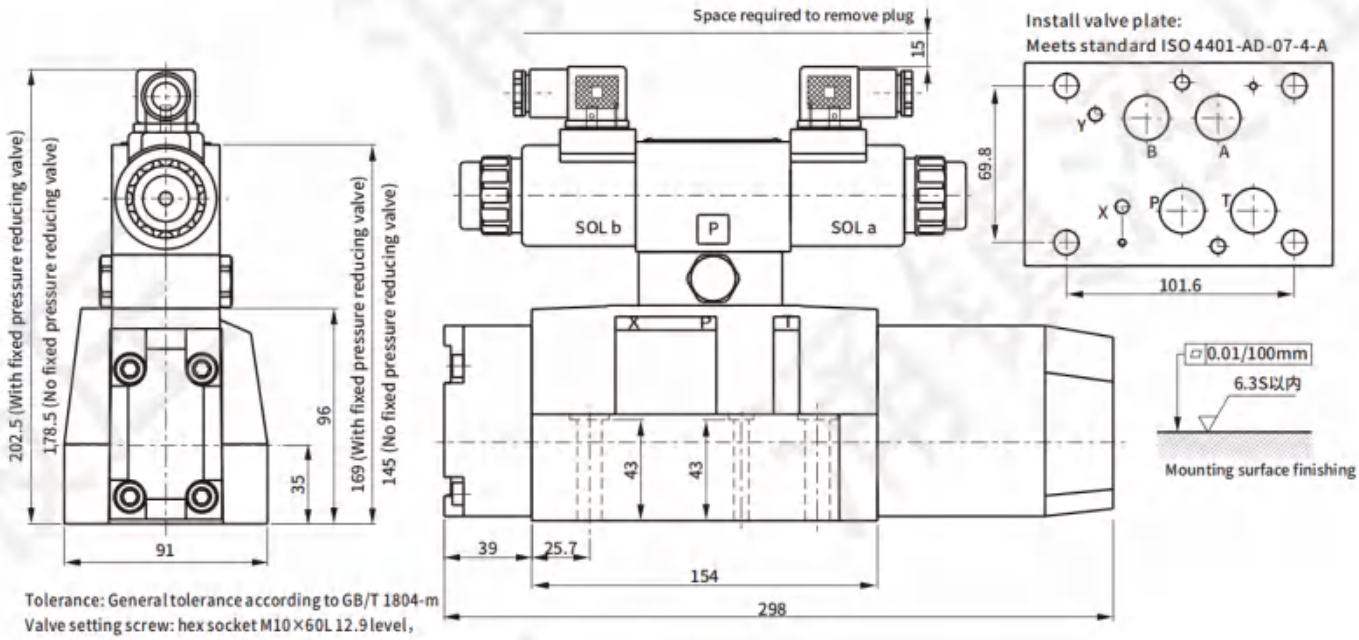






4WRZ16

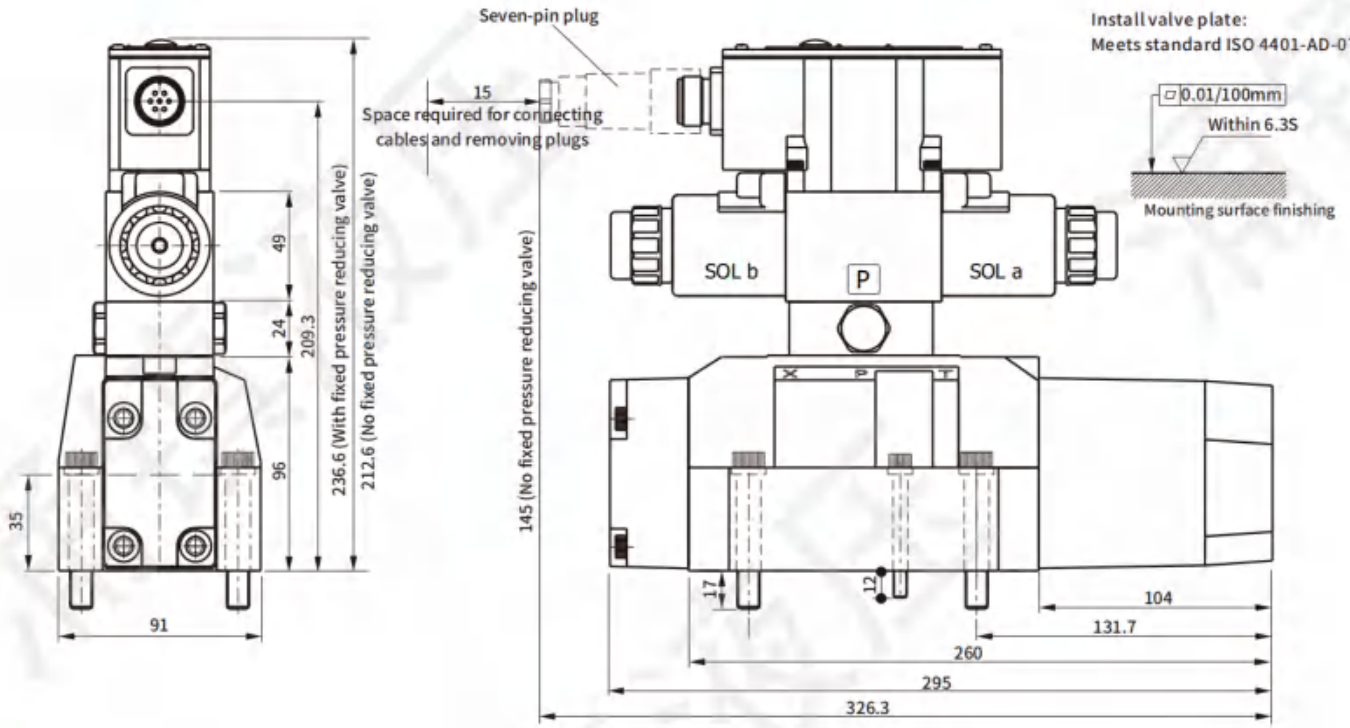
Units: mm



Tolerance: General tolerance according to GB/T 1804-m
Valve setting screw: hex socket M10×60L 12.9 level,
Tightening torque:58Nm±10%
Valve setting screw: hex socket M6×55L 12.9 level,
Tightening torque:14Nm±10%

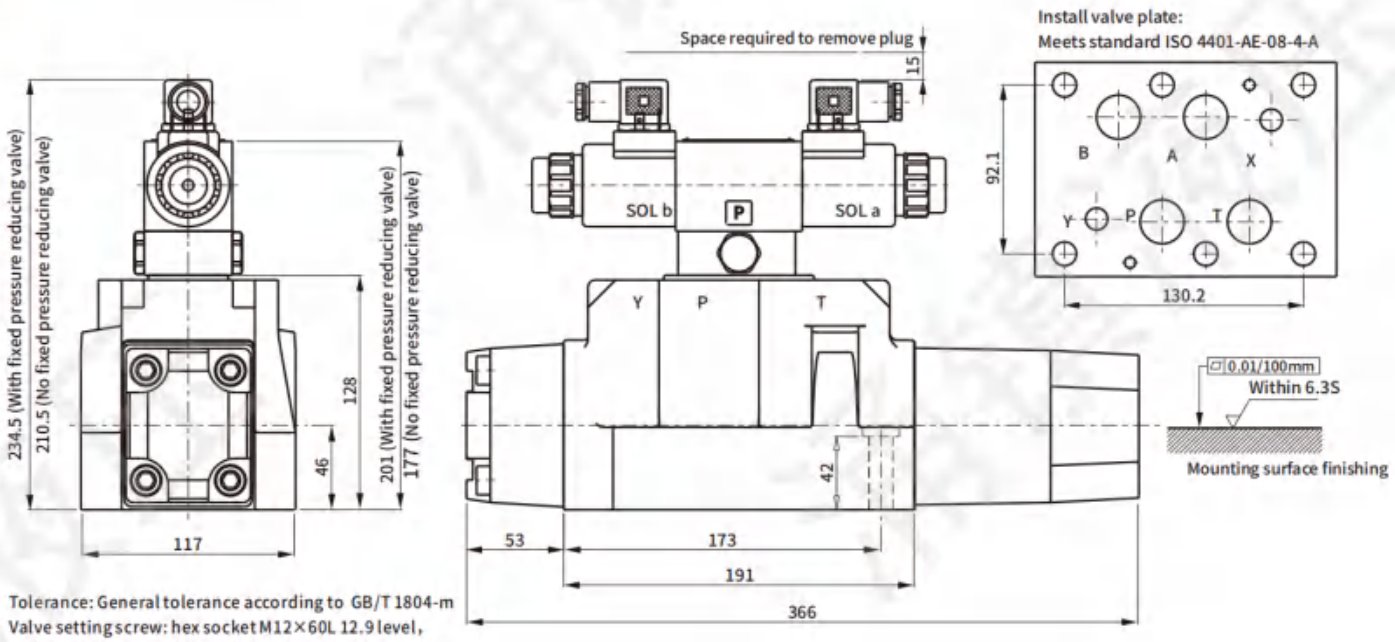
4WRZE16

Units: mm



4WRZ25

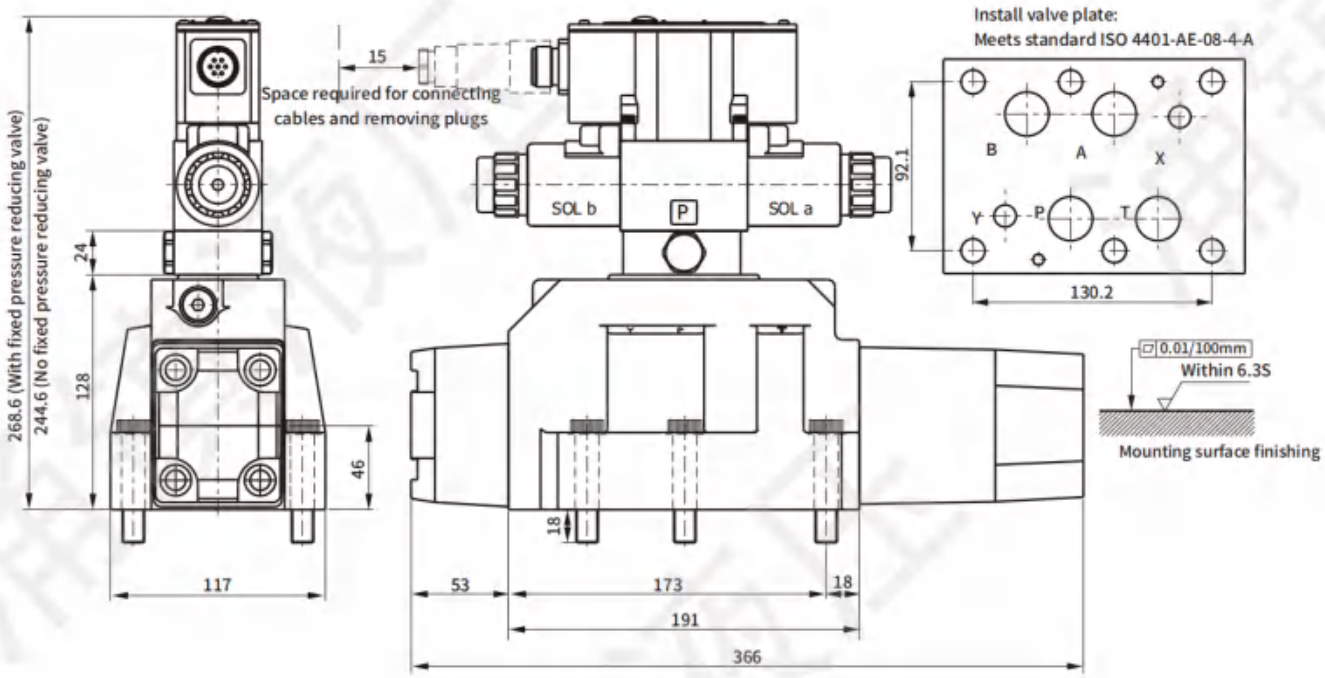
Units: mm



Tolerance: General tolerance according to GB/T 1804-m
Valve setting screw: hex socket M12×60L 12.9 level,
Tightening torque: 100Nm±10%

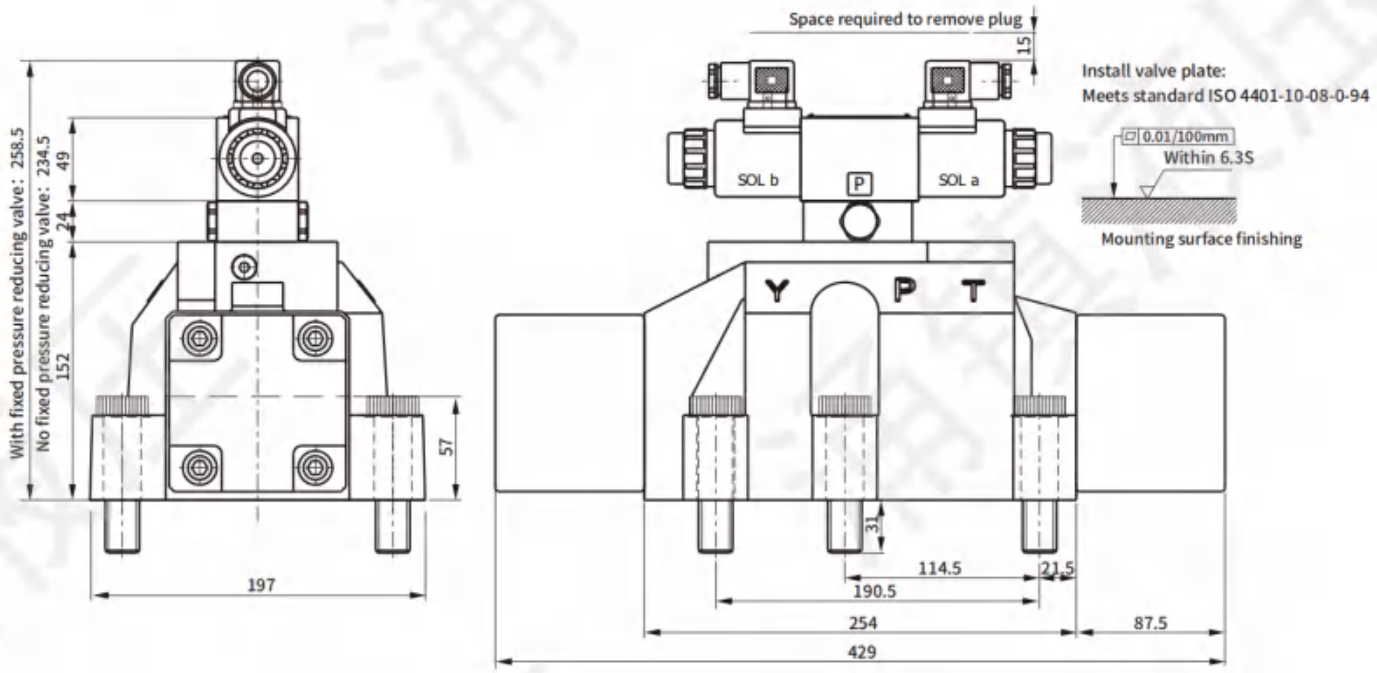
4WRZE25

Units: mm



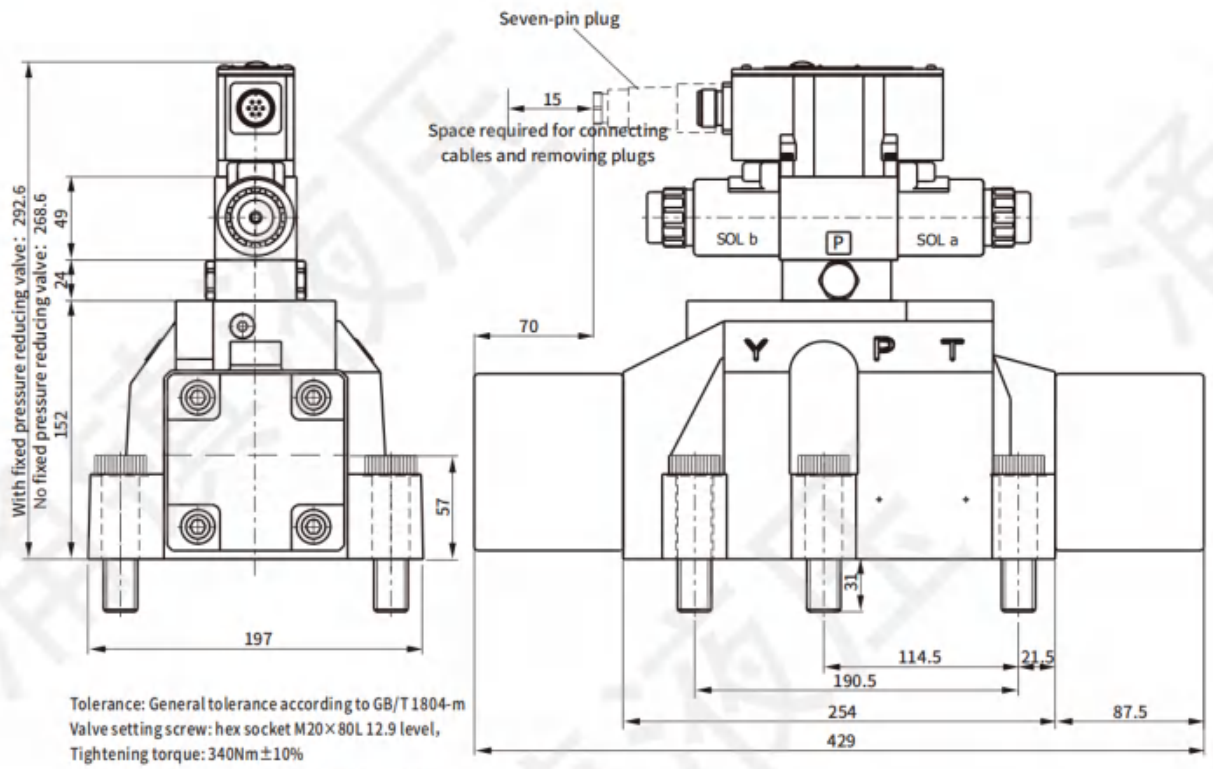
4WRZ32

Units: mm



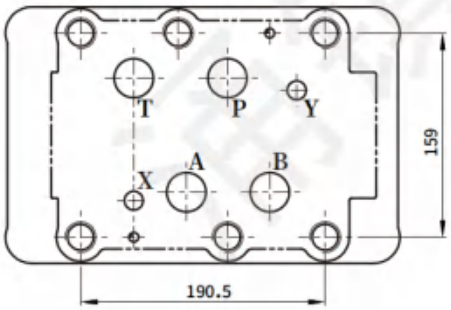
4WRZE32

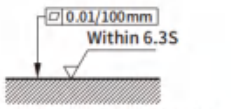
Units: mm



Tolerance: General tolerance according to GB/T 1804-m
Valve setting screw: hex socket M20×80L 12.9 level,
Tightening torque: 340Nm±10%

Install valve plate:
Meets standard ISO 4401-10-08-0-94





Mounting surface finishing

EMPR Series

1. Modular proportional pressure reducing valve reduces the installation and installation space.
2. No special installation skills are required and the hydraulic oil circuit can be added or changed quickly and easily.
3. The pressure in the system is proportional to the input current for rapid decompression control.
4. Suitable for clamping related devices of machine tools, because of the overflow function, can achieve fast response performance.

How to order

EMPR-02P-1-V-20

- Modular proportional pressure reducing valve
- Nominal size
  - 02: 6 diameter
  - 03: 10 diameter
- Function action hole
  - P: Phole
- Pressure regulation range
  - 0: 3-25bar
  - 1: 4-70bar
  - 2: 6-140bar
  - 3: 15-280bar
- Seal material
  - Blank: Nitrile rubber
  - V: Fluorine rubber
- Design code

Symbols

EMPR-*P-**

EMPR-*A-**

EMPR-*B-**

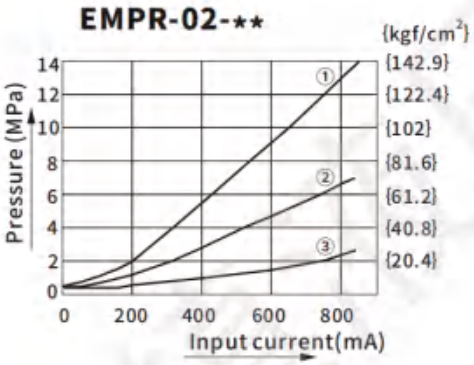
Specification

Model	Max. Operating Pressure(bar)	Max. flow (l/min)	Max.back pressure (bar)	Rated current(mA)	Coil Resistance (Ω) At 20°C	Hysteresis (%)
EMPR-02P-★-20	250	30	25	850	20	>3%
EMPR-03P-★-20		80				
EMPR-03A-★-20						
EMPR-03B-★-20						

Pressure drop characteristic curve

Input current-pressure characteristics

Hydraulic oil viscosity:32mm²/S

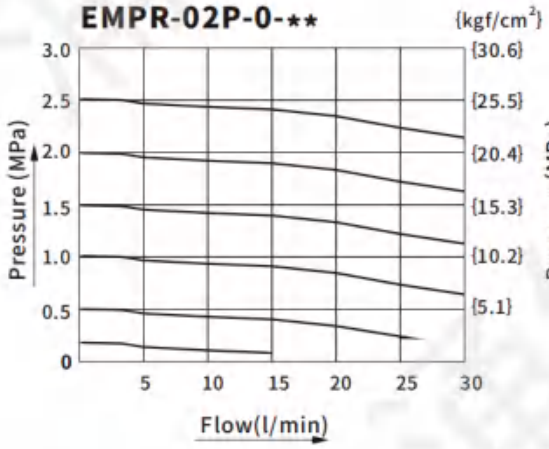


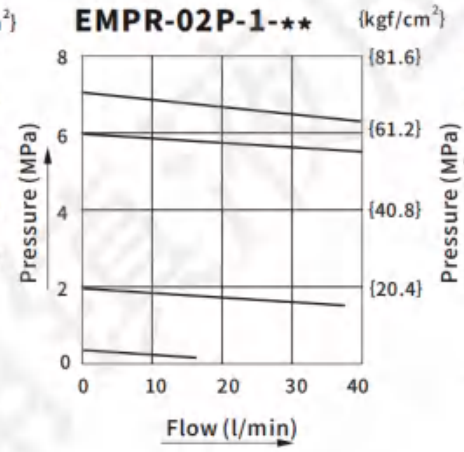
①EMPR-02P-2-**

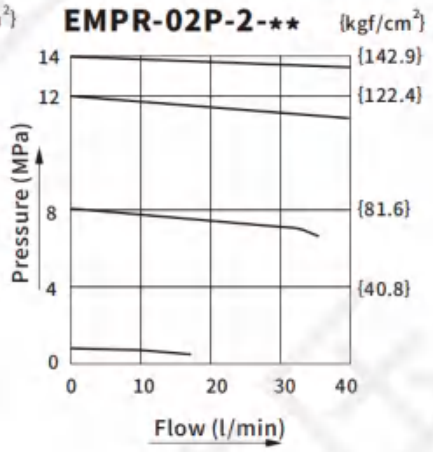
②EMPR-02P-1-**

③EMPR-02P-0-**

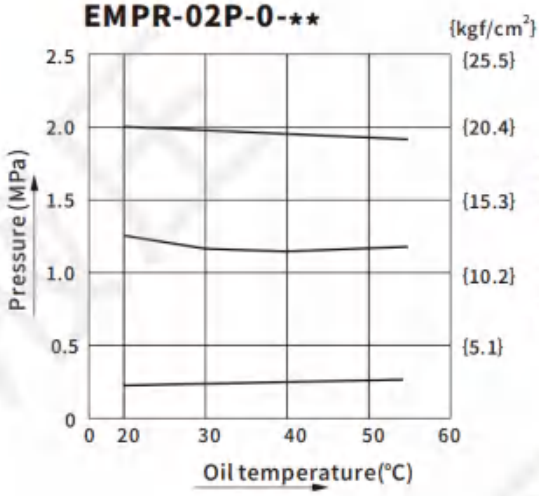
Flow-pressure characteristics

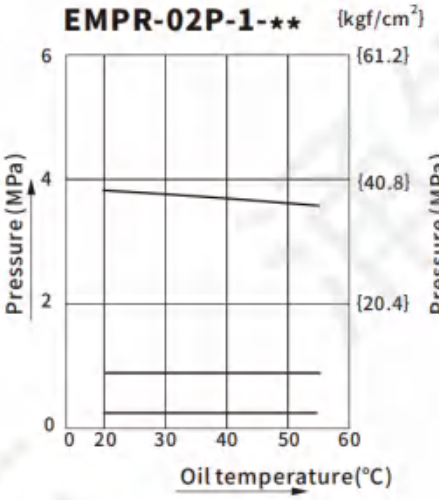


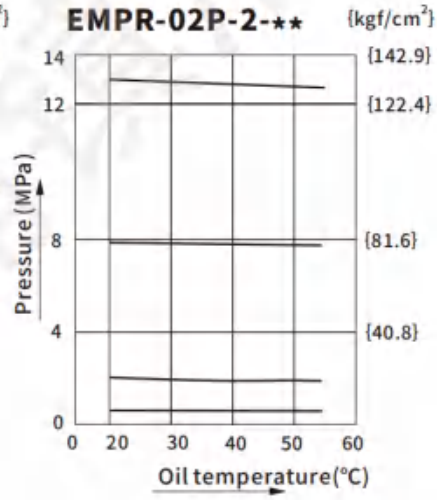




Oil temperature characteristic

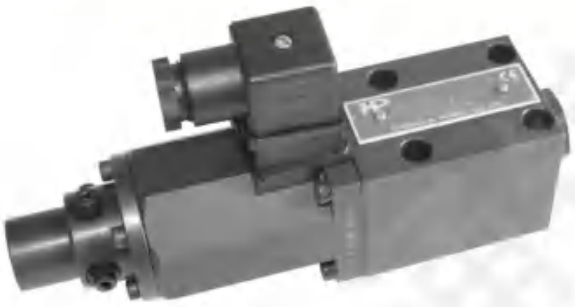






ER-G01 Series

1. It is composed of small DC proportional electromagnet and direct acting relief valve, which has the characteristics of sensitive response and high precision.
2. Suitable for high performance machines such as automatic systems with more pressure change stages and injection molding machines.



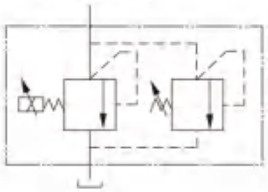
How to order

ER -G 01 -0 -L -11 -S016 -PN T15 -V

- Proportional pressure control valve
- Installation mode: Panel installation
- Nominal size: 01: NG 3
- Pressure range: 0: ★~50bar; 1: ★~70bar; 2: ★~160bar; 3: ★~250bar
- Coil position: L: body mounting hole distance 32.5 side (side b, standard); R: Valve body mounting hole distance 31 side (side a)
- Design code: 10: with safety valve; 11: No safety valve
- Application: Blank: standard; S016: Special valve for plastic machine
- P oil circuit damping hole: PN:no damping; P10:1.0mm damping
- Toil circuit damping hole: T20:2.0mm damping; T15:1.5mm damping
- Seal material: Blank: Nitrile rubber; V: Fluorine rubber

Symbols

With safety valve



No safety valve

Damping specification

Pressure grade	Poil circuit damping hole		Toil circuit damping hole	
ER-G01-0-★	PN	None	T20	2.0mm
ER-G01-1-★	PN	None	T15	1.5mm
ER-G01-2-★	P10	1.0mm	T15	1.5mm
ER-G01-3-★	P10	1.0mm	T15	1.5mm

Note:

1. The pressure regulation range of the special proportional valve (S016) for the plastic machine is only 0 and 1 to choose from;
2. If you need other damping specifications, please contact our technical department.
3. When used as a pilot valve, the damping hole may be different from the above.

Characteristic parameters and curves

Specification

Modle	Rated pressure (bar)	Max.flow (l/min)	Min. flow (l/min)	Pressure range	Rated current (mA)	Coil resistance(Ω)	Hysteresis	Repeatability	Weight (kg)
ER-G01-*	250	2	0.3	0/1	800	11.2±0.5	<3%	0.5%	2
				2/3		11.6±0.5			

Note :

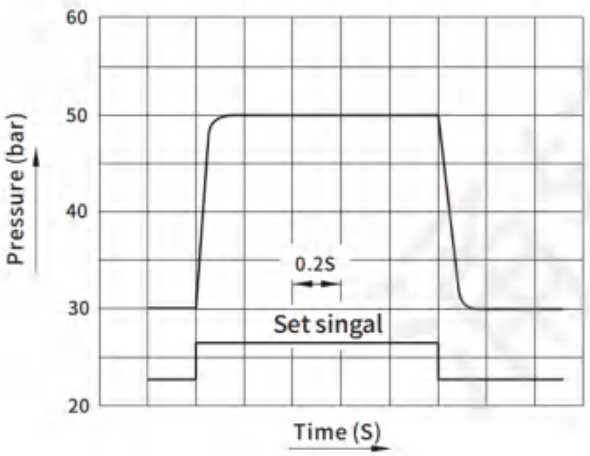
1: The correct valve installation position must make the vent hole face up, if the valve must be installed vertically, please contact the company to negotiate.
2: In order to make the pressure stable, it is necessary to loosen the upward vent screw to discharge the air until there is no bubble and then lock the screw.
3: When the electrical control fails, such as the temporary need for pressure supply, then adjust the manual pressure push rod clockwise, usually restore the original position.
4: The back pressure of the oil return is as low as possible, and the end of the tubing is directly inserted below the oil level of the oil tank.

Response characteristic curve

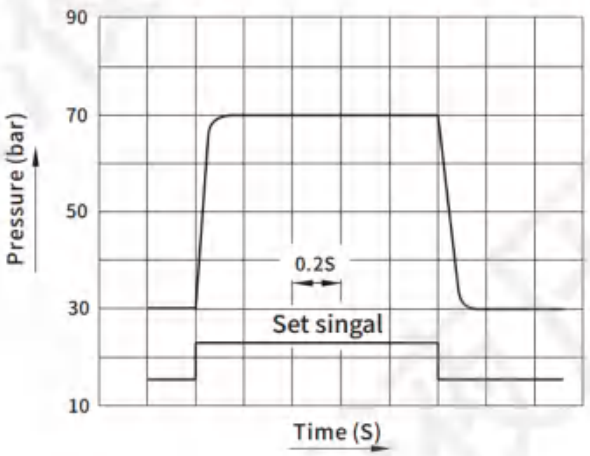
Test conditions:

Viscosity: 46cSt; Temperature: 45°C

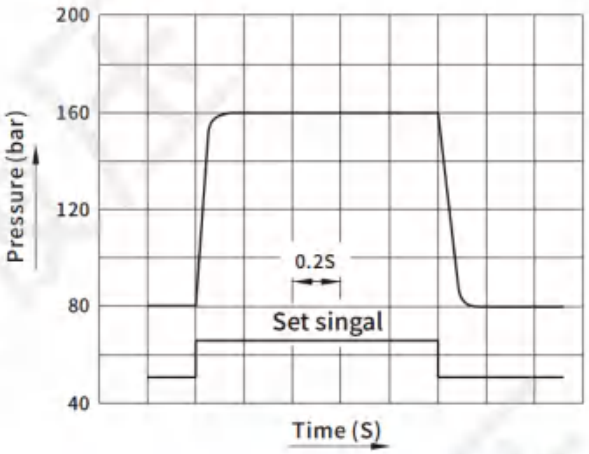
ER-G01-0-11



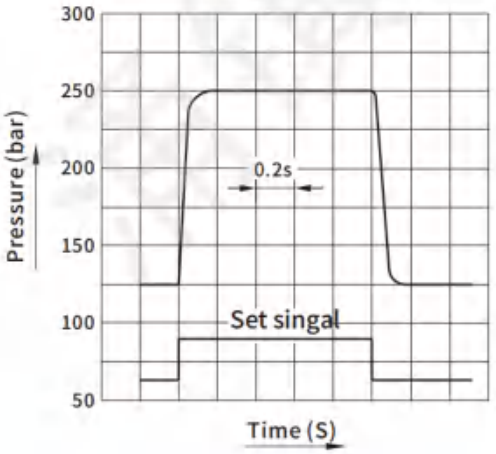
ER-G01-1-11



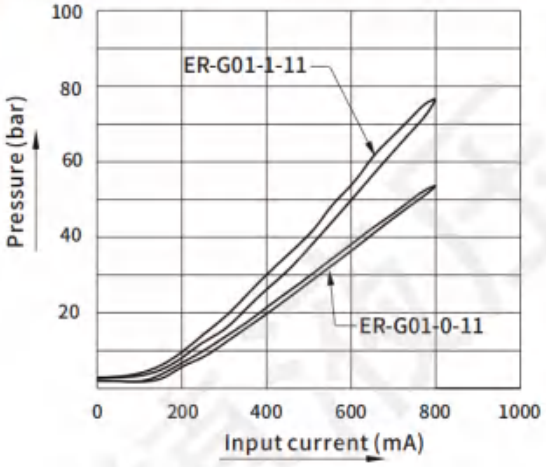
ER-G01-2-11

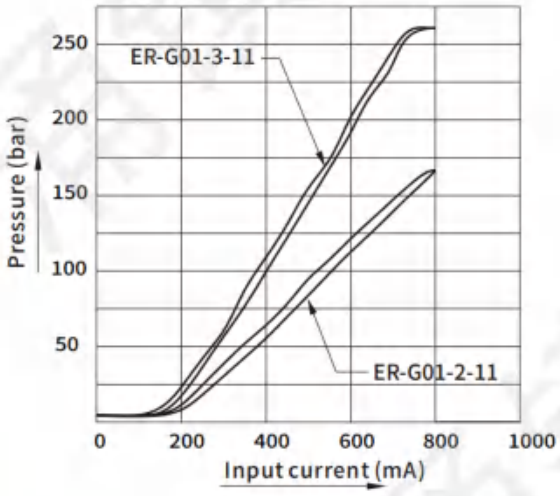


ER-G01-3-11

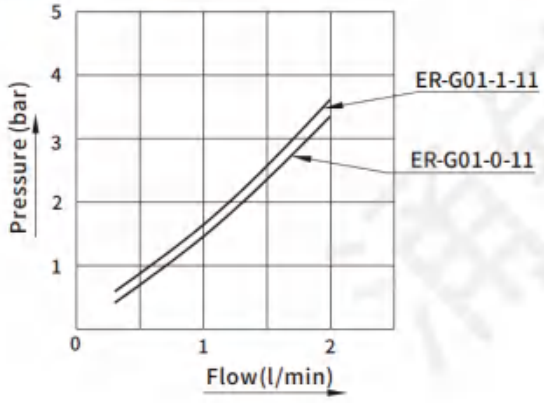


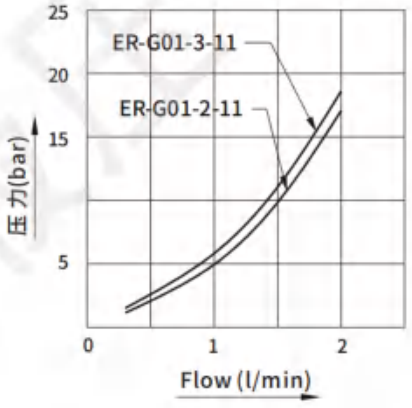
Input current-pressure characteristic curve



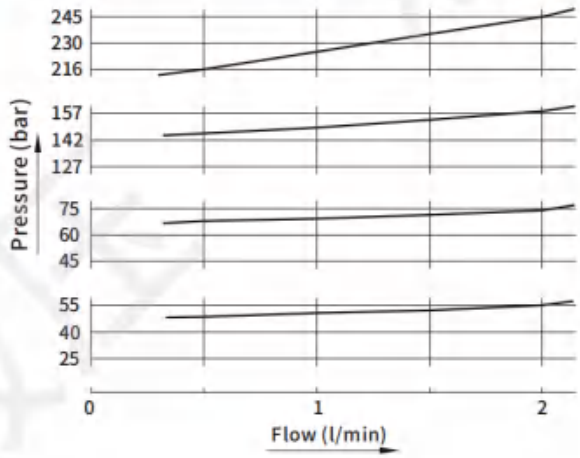


Minimum regulating pressure characteristics

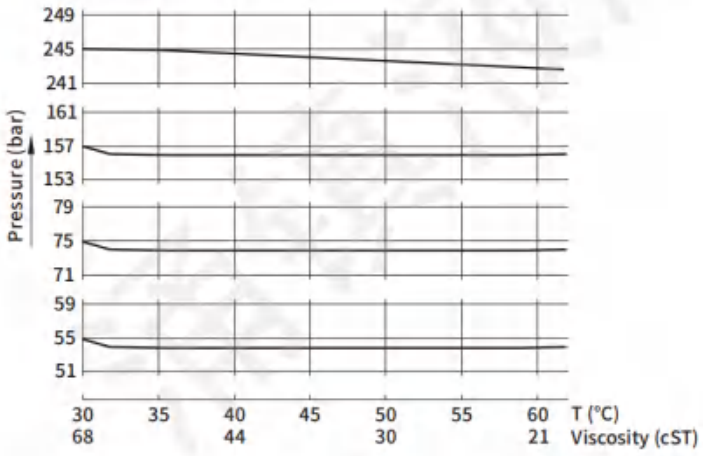




Overflow load characteristic curve



Viscosity-pressure characteristic curve

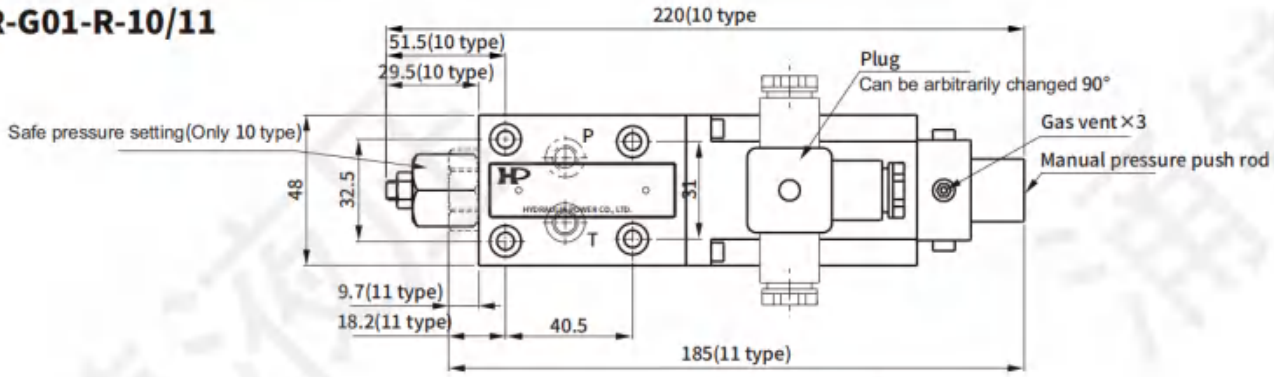


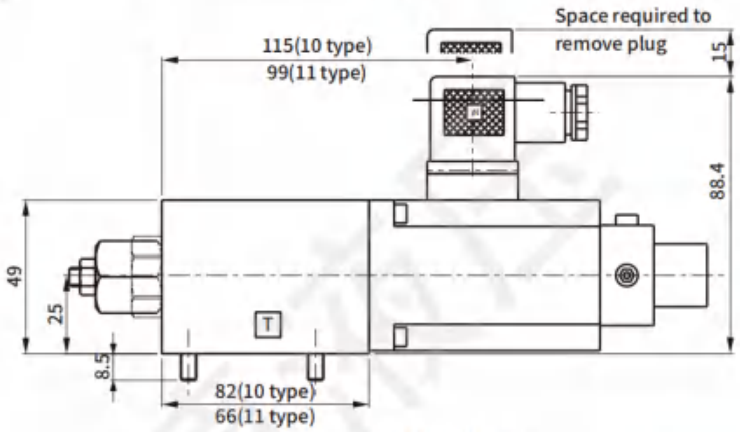
Flow: 2 l/min; Fluids: ISO VG46

Units: mm

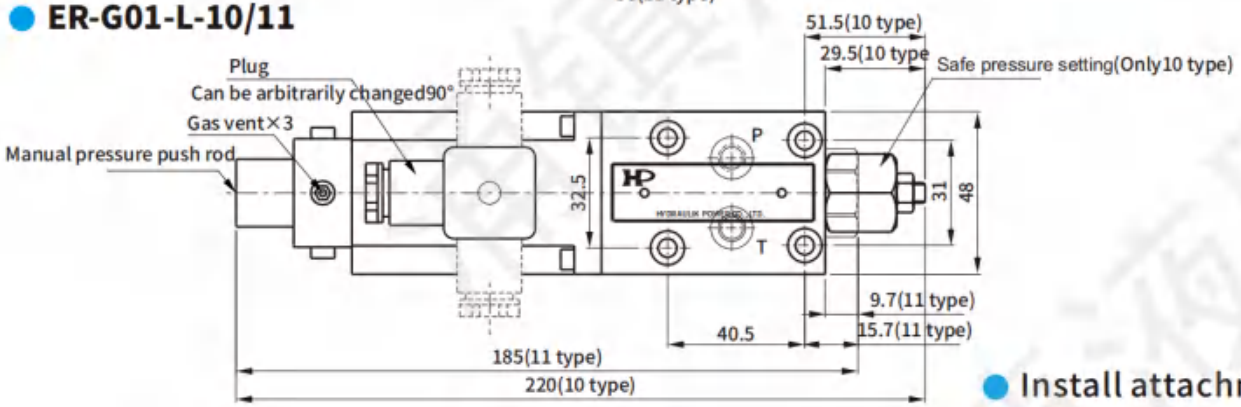
Dimensions

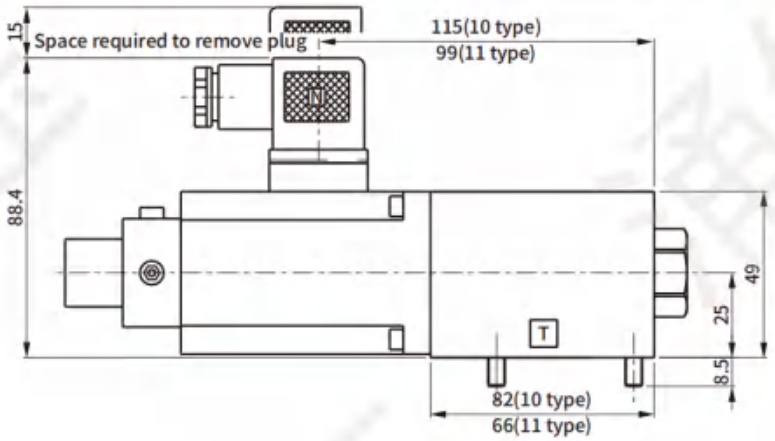
ER-G01-R-10/11





ER-G01-L-10/11





Install attachment

Modle	ER-G01-*
Hex socket screw	M5×45L 4PCS
Mounting O-ring face	AS 568-012 HS90°4PCS

EDR-G03/06 Series

This series of proportional pressure control valves has a low noise pressure adjustment control function, and a safety valve device.

How to order

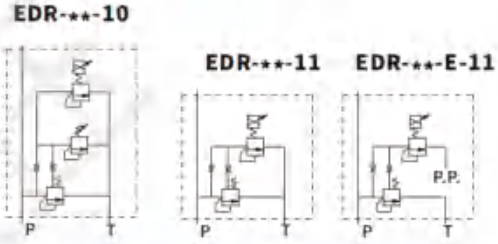
EDR -G 03 -0 -L -E -11 -S016 -V

- Proportional pressure control valve
- Installation mode: plate installation
- Nominal size: 03: NG 10; 06: NG 20
- Pressure range: 0: ⋆~50bar; 1: ⋆~70bar; 2: 8~160bar; 3: 10~250bar
- Coil position: L: Down body T side (standard); R: Downward valve body on P side
- Control mode: Blank: Standard; E: External pressure preservation
- Design code: 11: No safety valve; 10: With safety valve
- Blank: Standard; S016: Special valve for plastic machine
- Sealing material: Blank: Nitrile rubber; V: Fluorine rubber

Note:

1. The pressure regulation range of the special proportional valve (S016) for the plastic machine is only 0 and 1 to choose from;
2. Control mode E is only applicable to the proportional valve (S016) dedicated to the plastic machine.

Symbols



Specification

Modle	Rated pressure(bar)	Min. adjustable pressure(bar)	Flow (l/min)	Rated current(mA)	Pressure range(bar)	Coil resistance (Ω)
EDR-G03-0/1/2/3	250	Check the Min. adjustable pressure characteristics	100	800	0: ⋆~50bar 1: ⋆~70bar 2: 8~160bar 3: 10~250bar	11.2±0.5
EDR-G06-0/1/2/3			200			11.6±0.5

Note :1: The correct valve installation position must make the vent hole face up, if the valve must be installed vertically, please contact the company to negotiate.

2: In order to make the pressure stable, it is necessary to loosen the upward vent screw to discharge the air until there is no bubble and then lock the screw.

3: When the electrical control fails, such as the temporary need for pressure supply, then adjust the manual pressure push rod clockwise, usually restore the original position.

4: The back pressure of the oil return is as low as possible, and the end of the tubing is directly inserted below the oil level of the oil tank.

Characteristic

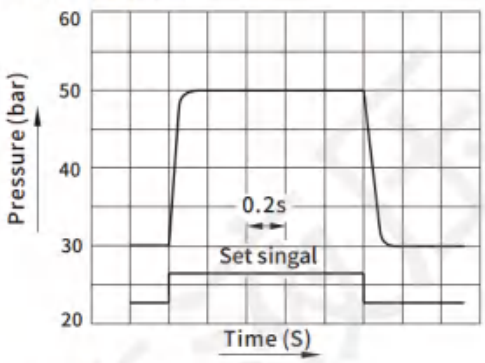
Modle	EDR-G03-⋆-11	EDR-G06-⋆-11
Max. operating pressure(bar)	250	250
Max. flow(l/min)	100	200
Pressure range(bar)	2:8~160 3:10~250	2:8~160 3:10~250
Rated current(mA)	770(at 8~160bar) 800(at 10~250bar)	780(at 8~160bar 800(at 10~250bar)
Coil resistance(Ω)	EDR-G03/G06-0/1	EDR-G03/G06-2/3
	11.2±0.5	11.6±0.5
Hysteresis	<3%	<3%
Repeatability	0.5%	0.5%
Weight(kg)	5.6	6.3

Note: To avoid instability at pre-set pressures, a flow rate greater than 3 l/min should be used.

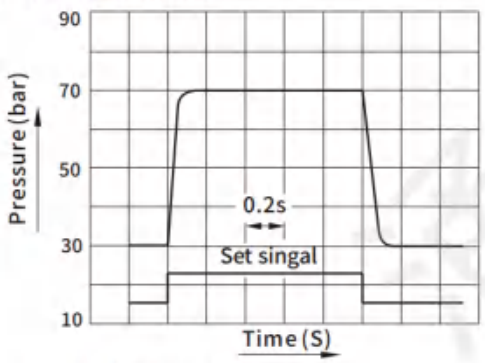
Response characteristic curve

Test conditions: Viscosity: 35cSt; Temperature: 50℃

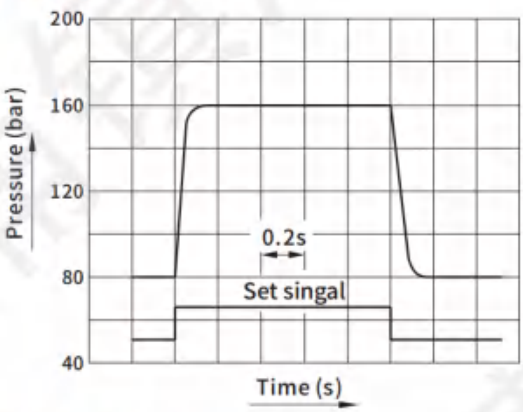
EDR-G03-0-11



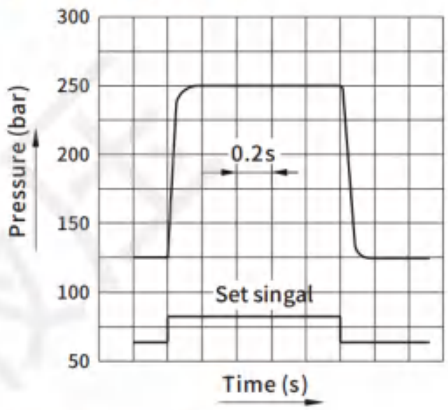
EDR-G03-1-11



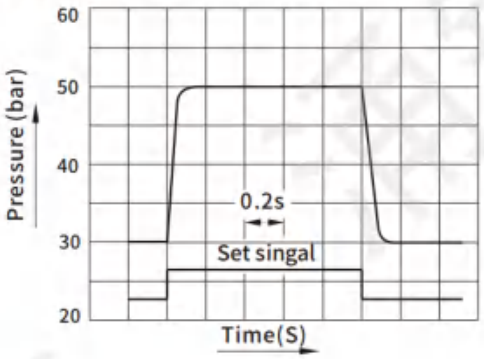
EDR-G03-2-11



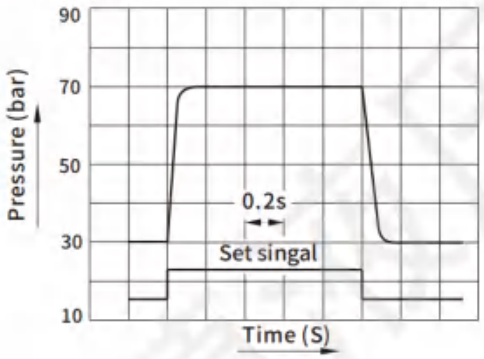
EDR-G03-3-11



EDR-G06-0-11



EDR-G06-1-11



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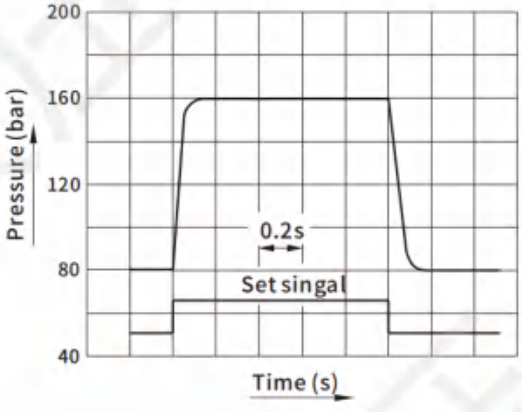

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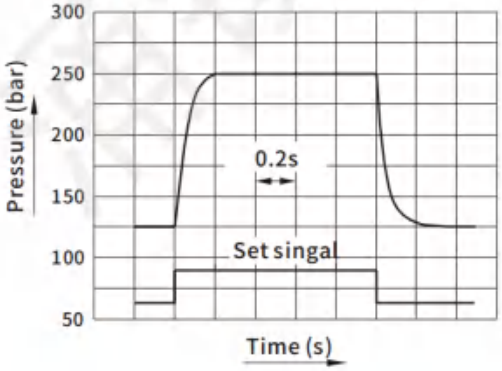
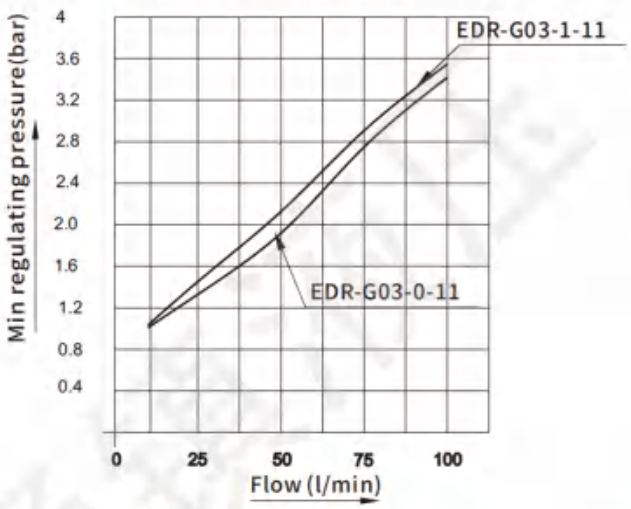


Minimum adjustable pressure characteristics

EDR-G03-0/1-11



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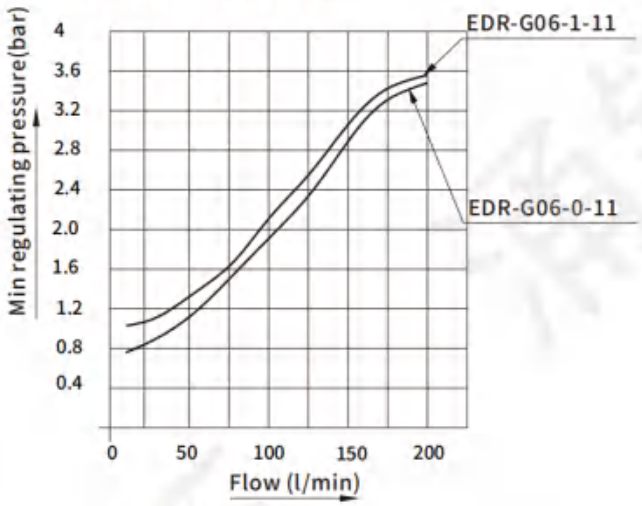

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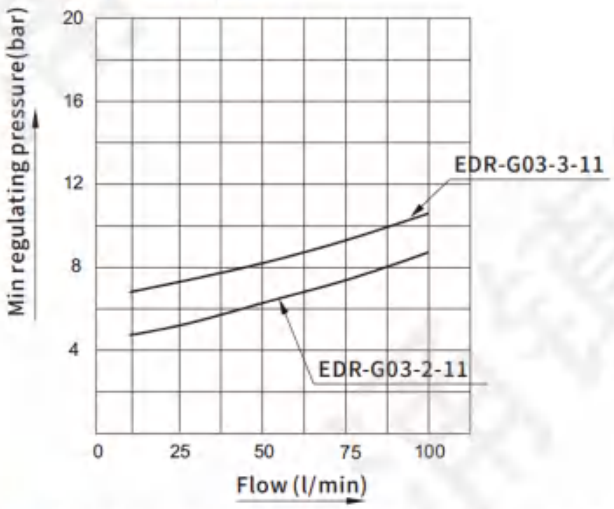
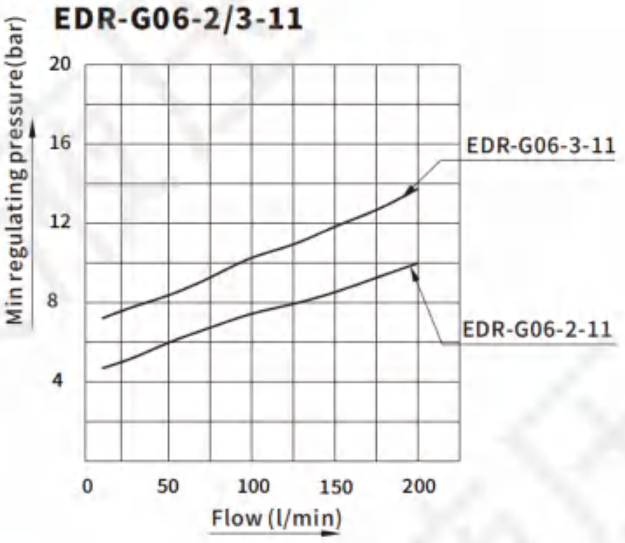
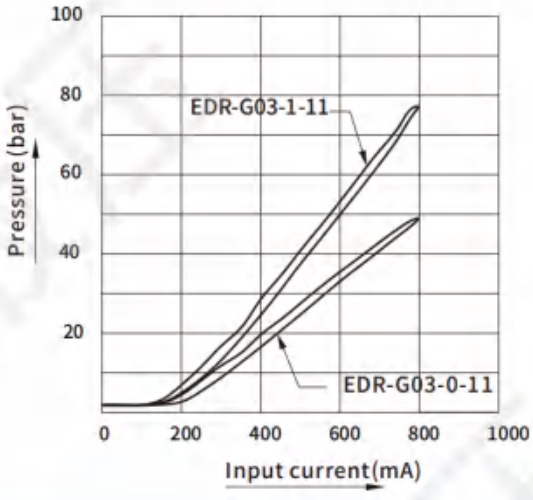


EDR-G06-2/3-11



Input current-pressure characteristics

EDR-G03-0/1-11



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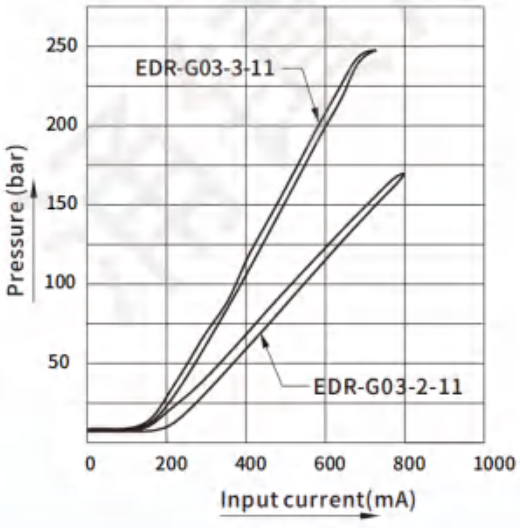

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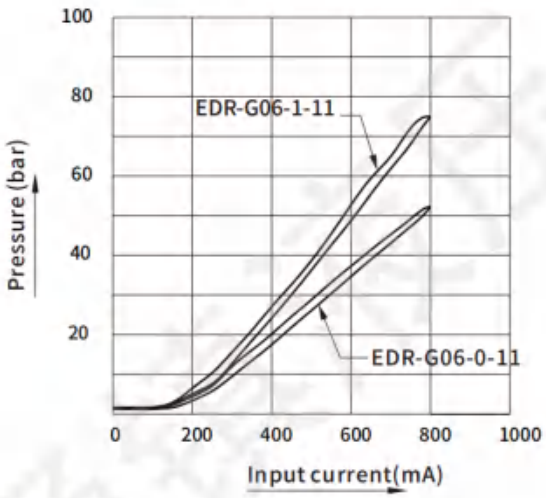
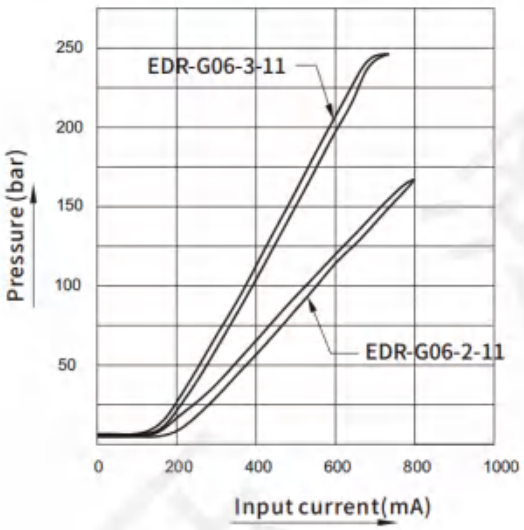


EDR-G06-2/3-11



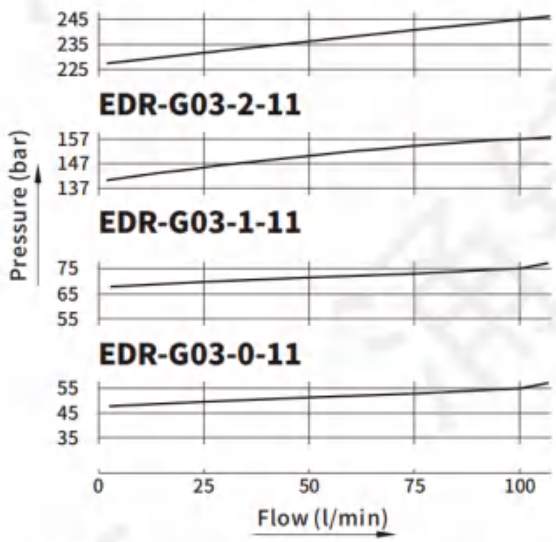
Overflow load characteristic curve

EDR-G03-3-11

EDR-G03-2-11

EDR-G03-1-11

EDR-G03-0-11

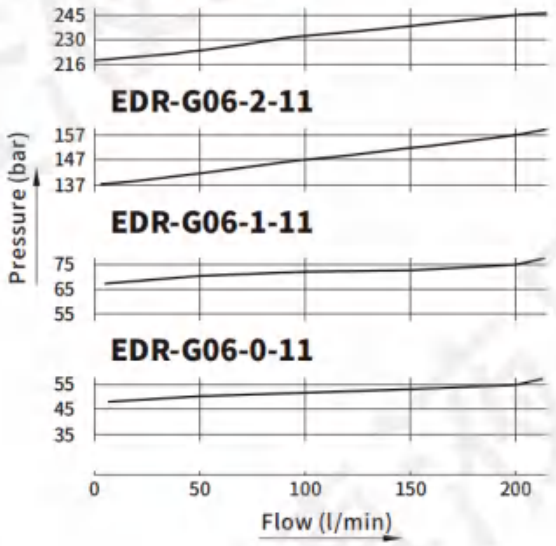


EDR-G06-3-11

EDR-G06-2-11

EDR-G06-1-11

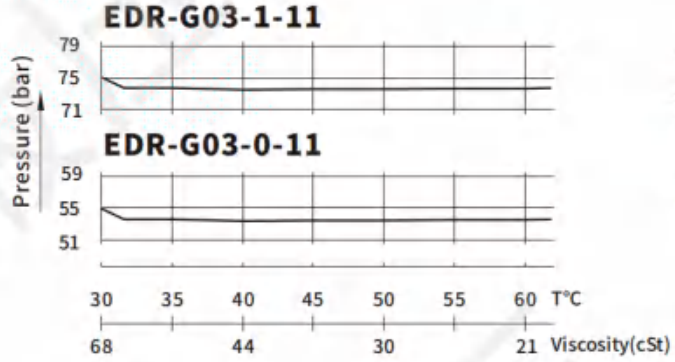
EDR-G06-0-11



Viscosity - pressure characteristics

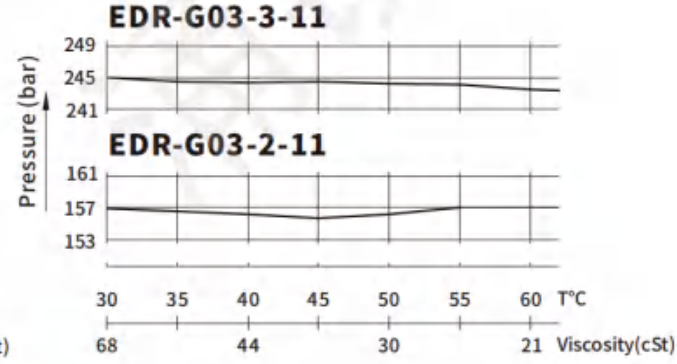
EDR-G03-1-11

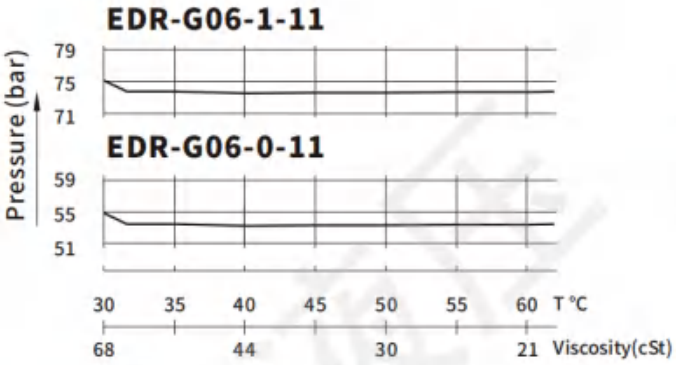
EDR-G03-0-11

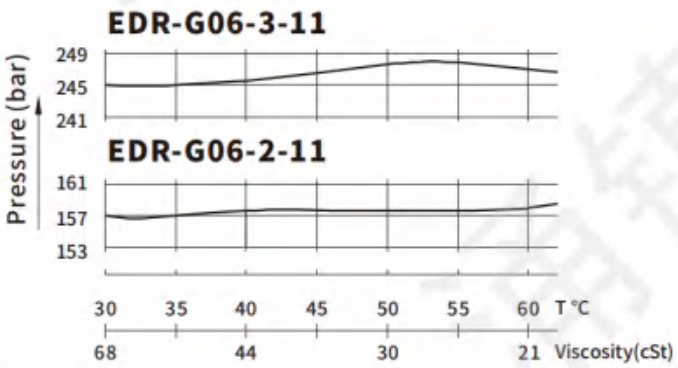


EDR-G03-3-11

EDR-G03-2-11





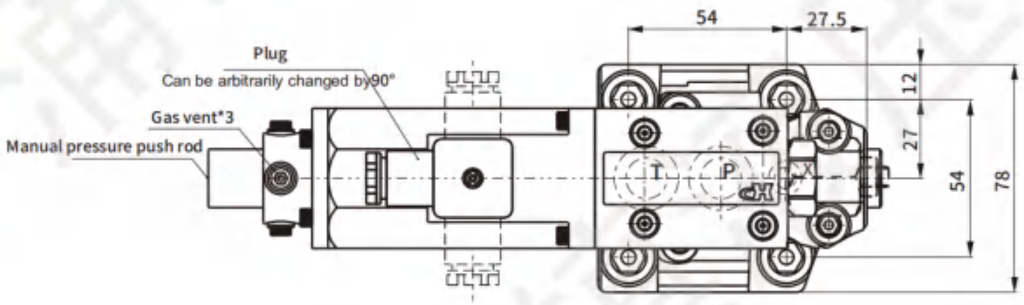


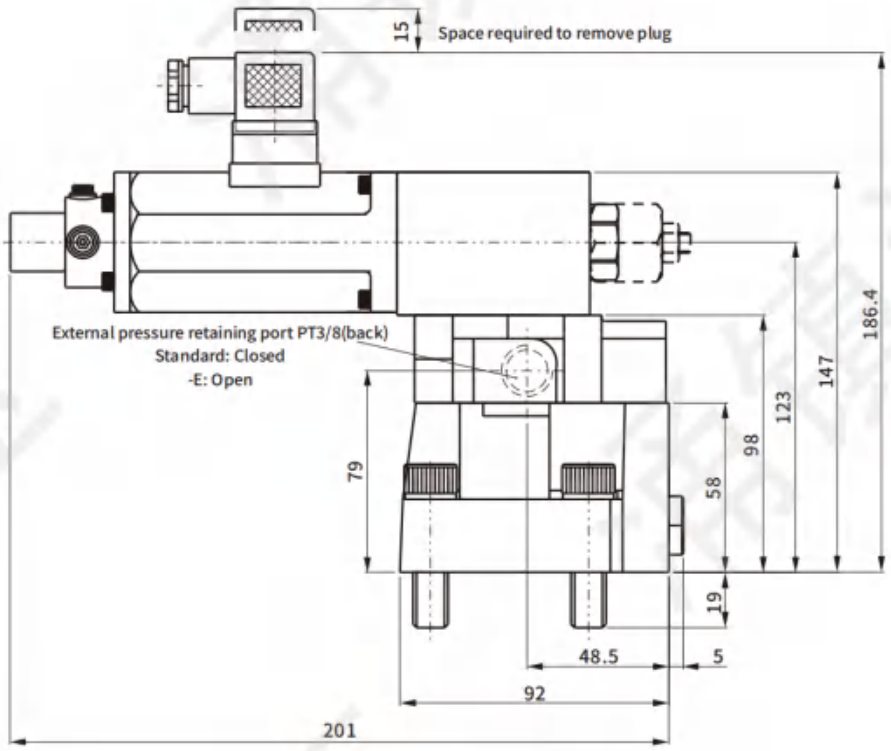
Dimensions

Units: mm

EDR-G03 series valve mounting surface: ISO 6264-AR-06-2-A

EDR-G03-L-11/10



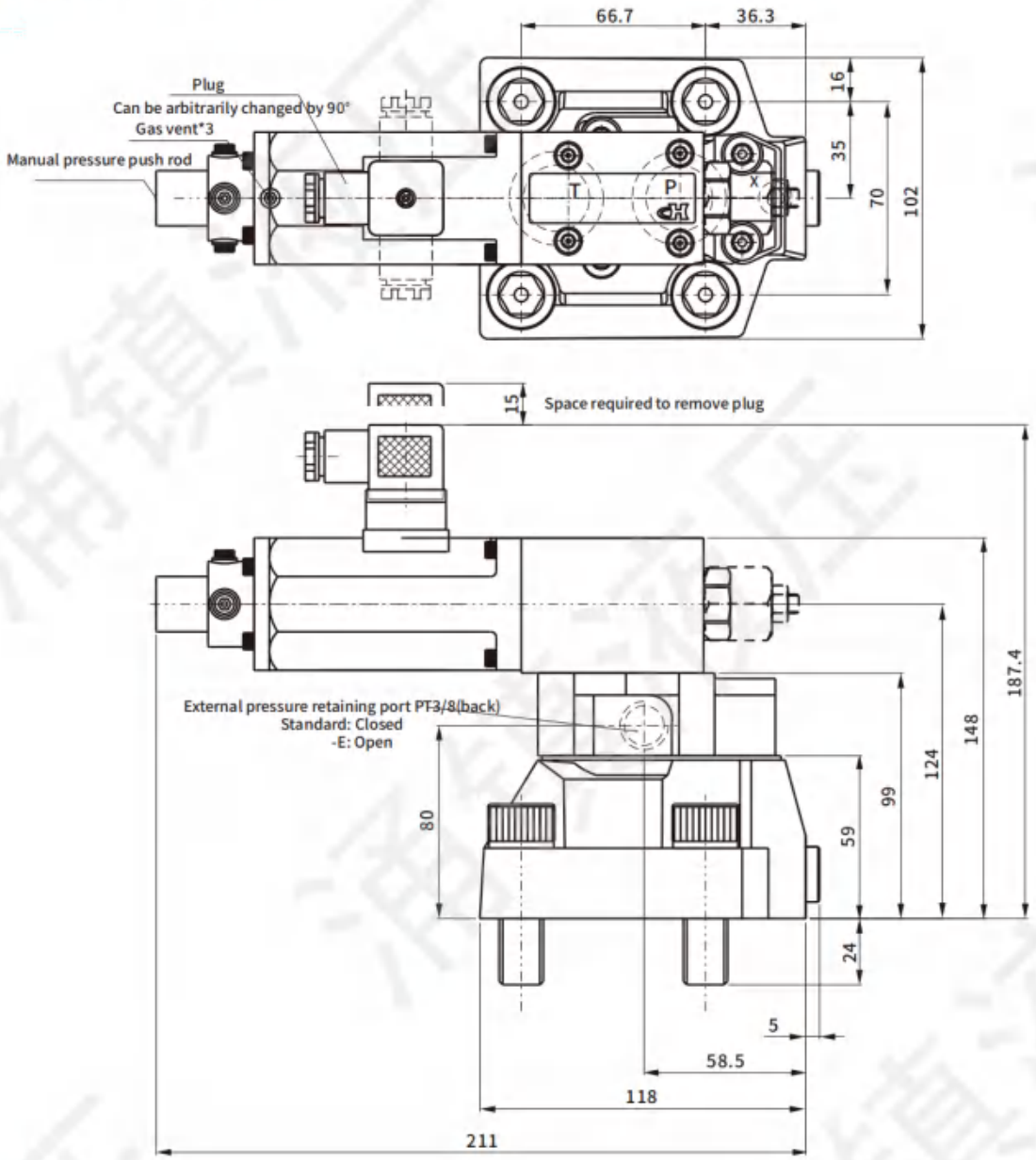


Dimensions

Units: mm

EDR-G06 series valve mounting surface: ISO 6264-AS-08-2-A

EDR-G06-L-11/10

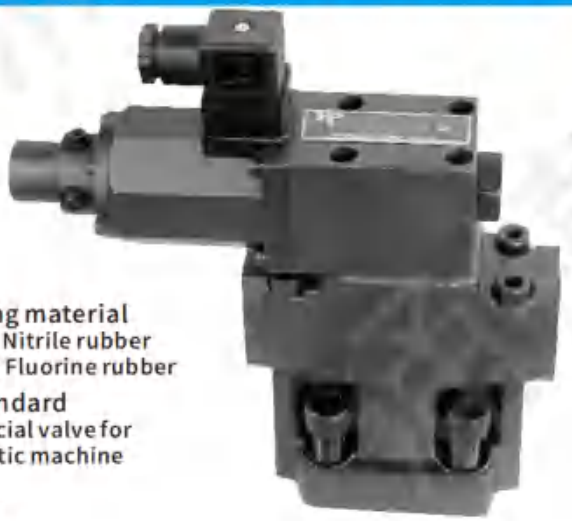


Install attachment

Parts	EDR-G03-**-11	EDR-G06-**-11	Amount
Hex socket screw	M12×45L	M16×50L	4
Mounting O-ring surface	AS568-012 Hs90	AS568-012 Hs90	1
	AS568-115 Hs90	AS568-216 Hs90	2
Mounting valve plate	MF-04Series	MF-06 Series	

ER-G03/06 Series

This series of proportional pressure control valves has a low noise pressure adjustment control function, and a safety valve device.



How to order

ER -G 03 -0 -L -E -10 -S016 -V

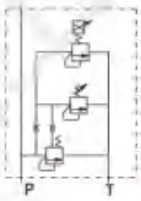
- Proportional pressure control valve
- Installation mode: Plate mounting
- Nominal size: 03: NG 10; 06: NG 20
- Pressure range: 0: *~50 bar; 1: *~70 bar; 2: *~160 bar; 3: *~250 bar
- Coil has adjustment knob position: L: Down body T side (standard); R: Downward valve body on P side
- Control mode: Blank: Standard; E: External pressure preservation
- Design code: 11: No safety valve; 10: With safety valve
- Blank: Standard; S016: Special valve for plastic machine
- Sealing material: Blank: Nitrile rubber; V: Fluorine rubber

Note:

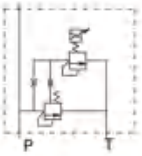
1. The pressure regulation range of the special proportional valve (S016) for the plastic machine is only 0 and 1 to choose from;
2. Control mode E is only applicable to the proportional valve (S016) dedicated to the plastic machine.

Symbols

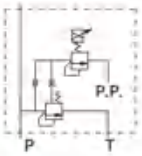
ER-★★-10



ER-★★-11



ER-★★-E-11



Specification

Modle	Rated pressure(bar)	Min pressure(bar)	Flow (l/min)	Rated current (mA)	Pressure range (bar)	Coil resistance (Ω)
ER-G03-0/1/2/3	250	Check the minimum adjustable pressure characteristics	100	800	0: *~50bar 1: *~70bar	11.2±0.5
ER-G06-0/1/2/3			200		2: 8~160bar 3: 10~250bar	11.6±0.5

Note:

1: The correct valve installation position must make the vent hole face up, if the valve must be installed vertically, please contact the company to negotiate.
2: In order to make the pressure stable, it is necessary to loosen the upward vent screw to discharge the air until there is no bubble and then lock the screw.
3: When the electrical control fails, such as the temporary need for pressure supply, then adjust the manual pressure push rod clockwise, usually restore the original position.
4: The back pressure of the oil return is as low as possible, and the end of the tubing is irectly inserted below the oil level of the oil tank.

Characteristic

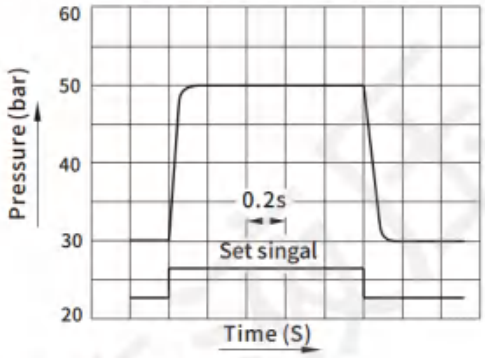
Modle	ER-G03-★-10	ER-G06-★-10
Max. operating pressure(bar)	250	250
Max. flow(l/min)	100	200
Pressure range (bar)	2:★~160 3:★~250	2:★~160 3:★~250
Rated current(mA)	770(★~160bar) 820(★~250bar)	750(★~160bar) 800(★~250bar)
Coil resistance(Ω)	ER-G03/G06-0/1	ER-G03/G06-2/3
	11.2±0.5	11.6±0.5
Hysteresis	<3%	<3%
Repeatability	0.5%	0.5%
Weight(kg)	5.6	6.3

Note: To avoid instability at pre-set pressures, a flow rate greater than 3 l/min should be used.

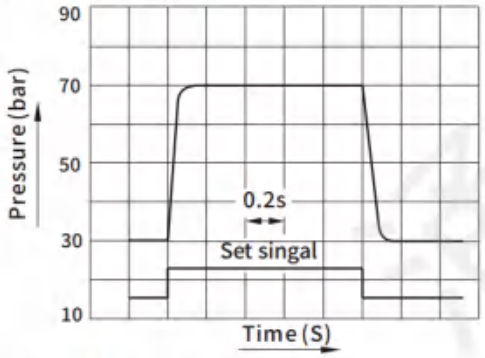
Response characteristic curve

Test conditions: Viscosity: 35cSt; Temperature: 50°C

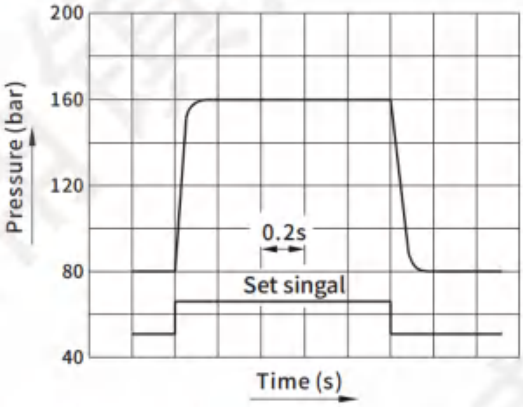
ER-G03-0-11



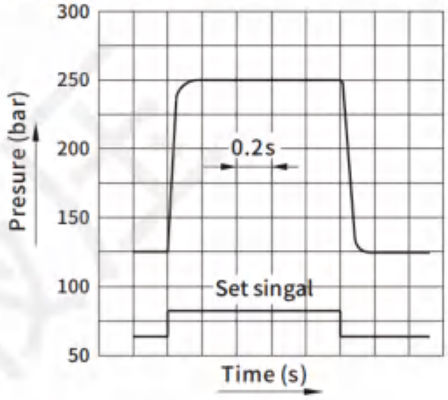
ER-G03-1-11



ER-G03-2-11



ER-G03-3-11



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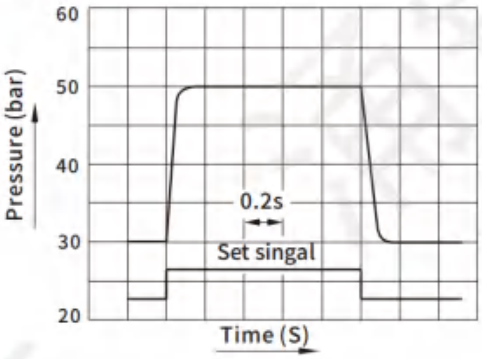

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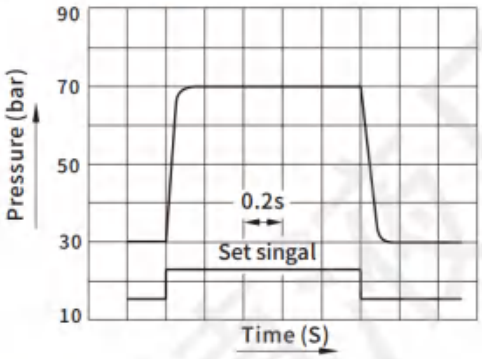

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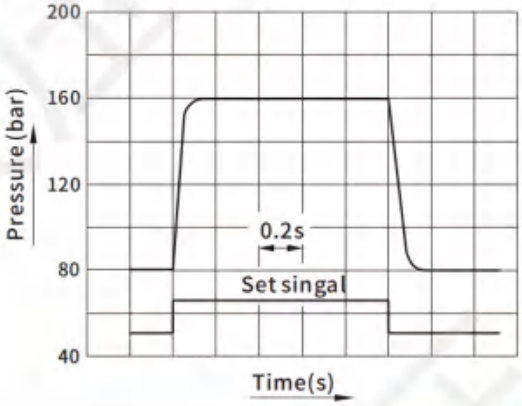

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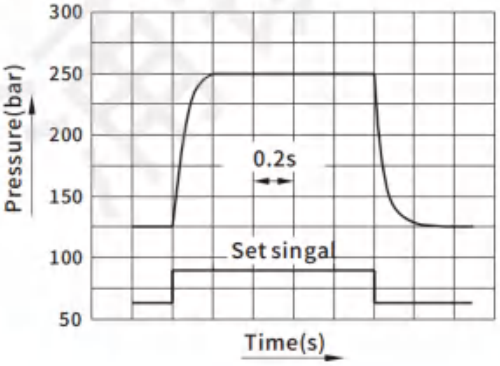
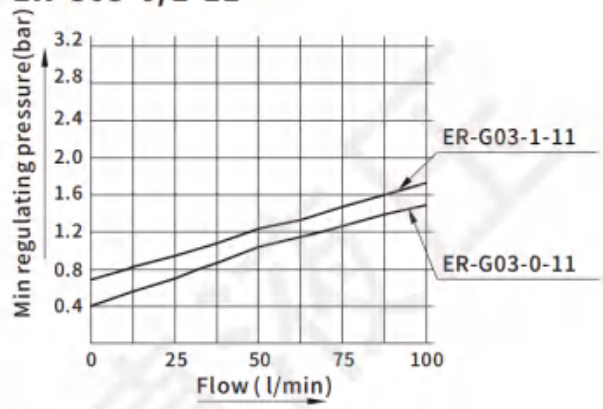
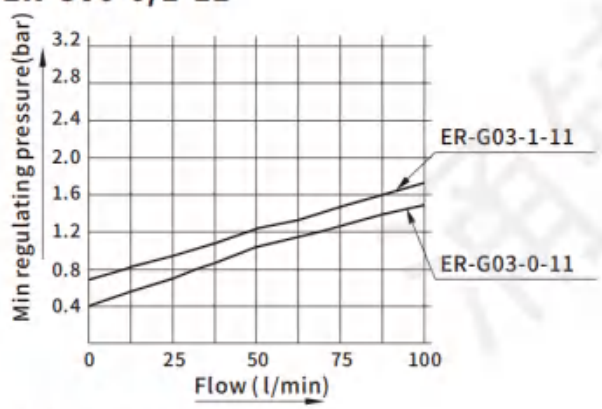


Min. adjustable pressure characteristics

ER-G03-0/1-11



ER-G06-0/1-11



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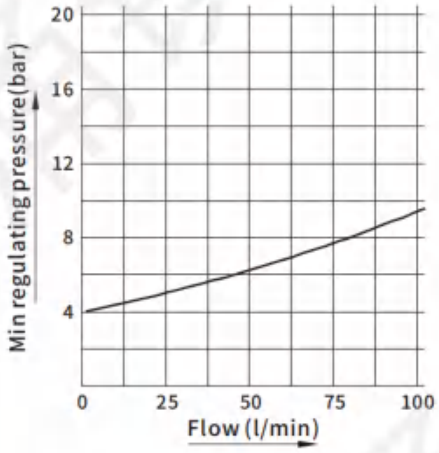

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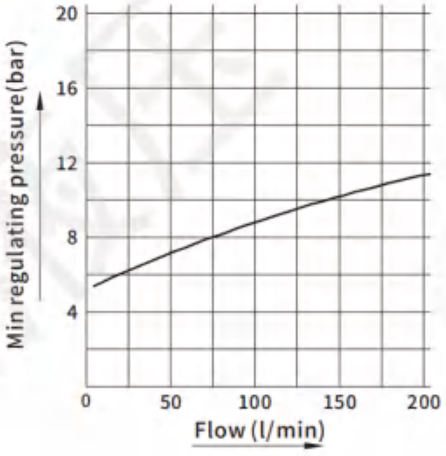
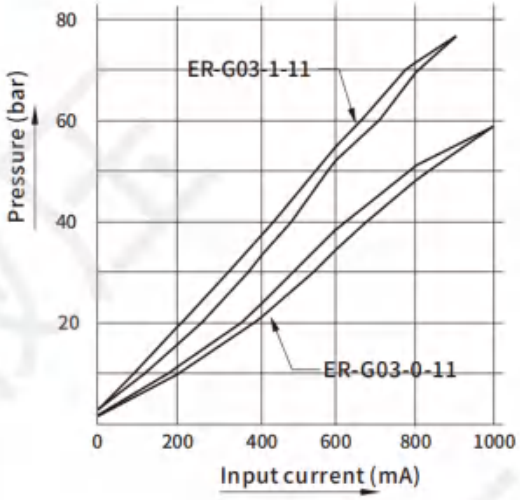


Input current-pressure characteristics

ER-G03-0/1-11



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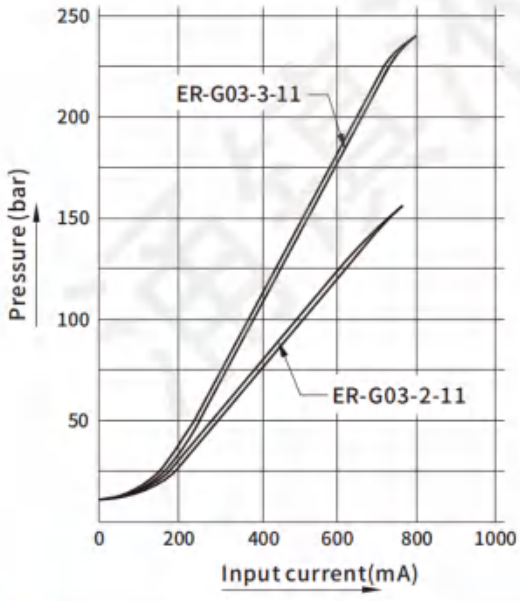

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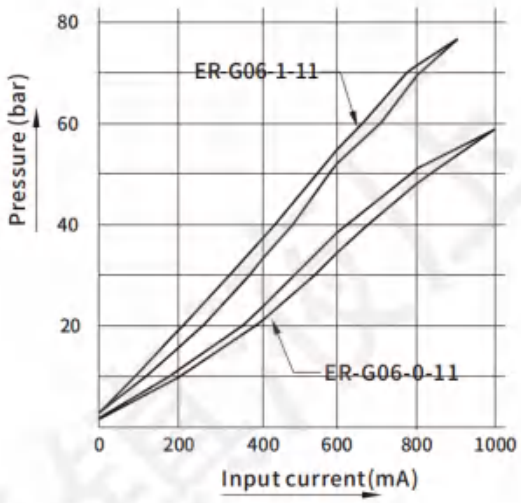

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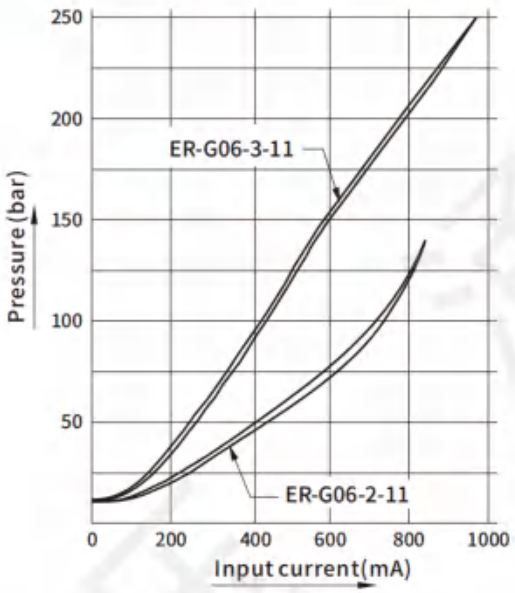


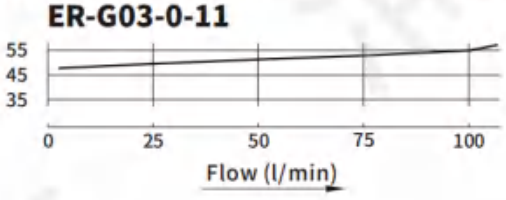
Overflow load characteristic curve

ER-G03-3-11

ER-G03-2-11

ER-G03-1-11

ER-G03-0-11



ER-G06-3-11

ER-G06-2-11

ER-G06-1-11

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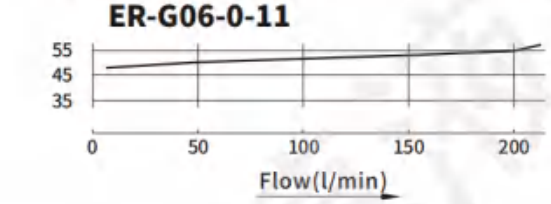
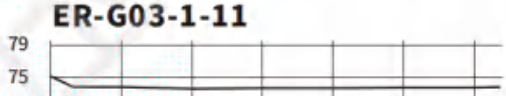


Viscosity - pressure characteristics

ER-G03-1-11



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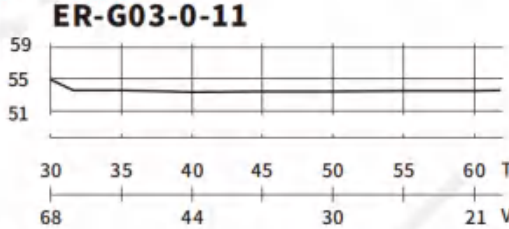

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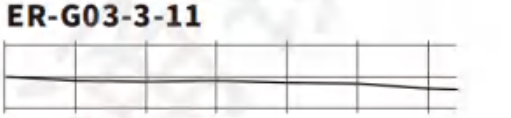

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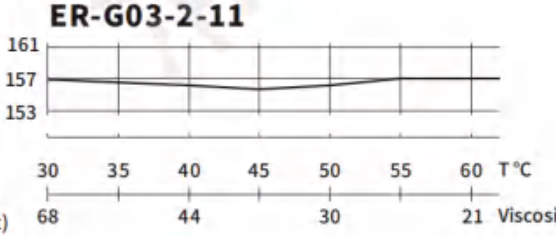
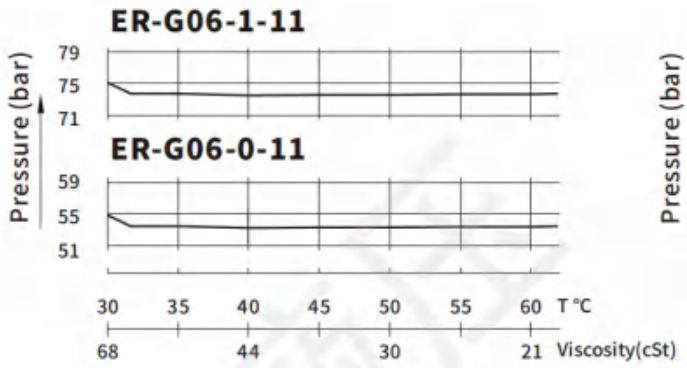
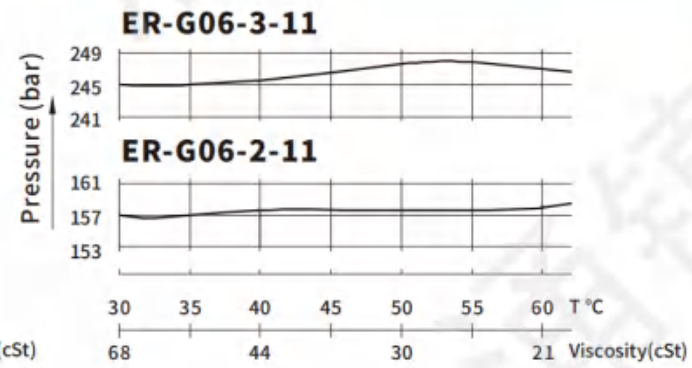




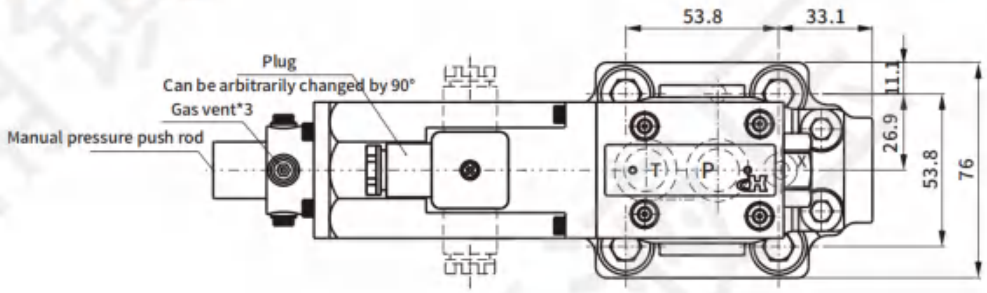


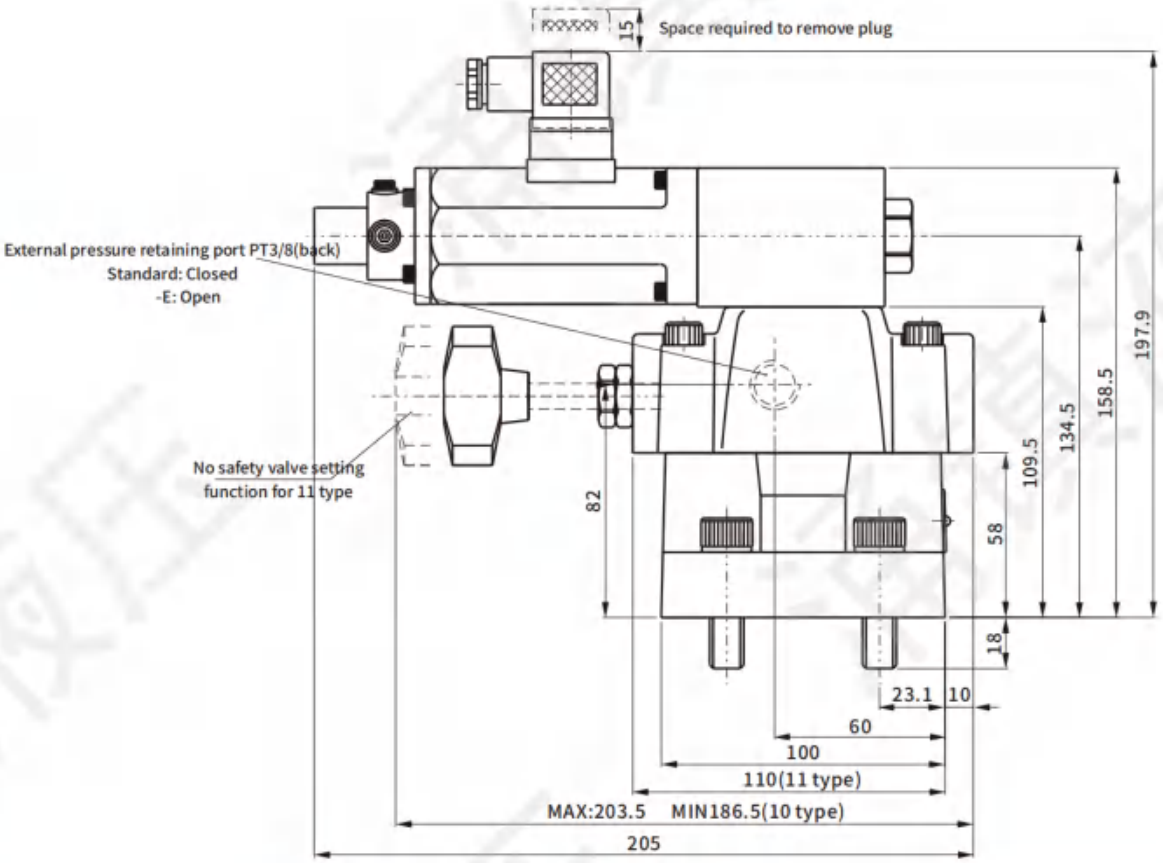
Dimensions

Units: mm

ER-G03 series valve mounting surface: ISO 6264-AR-06-2-A

ER-G03-L-10/11



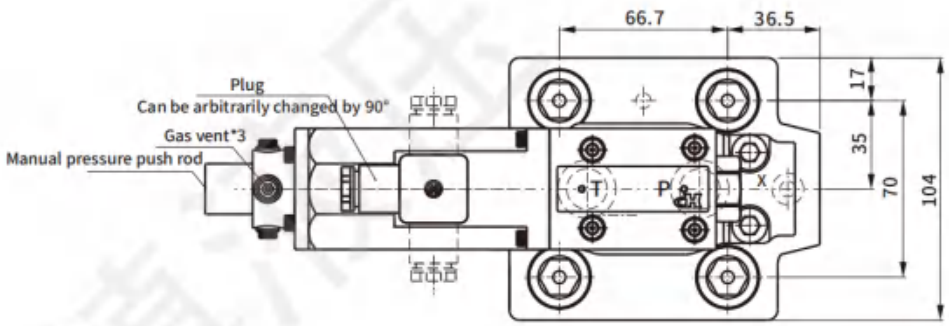


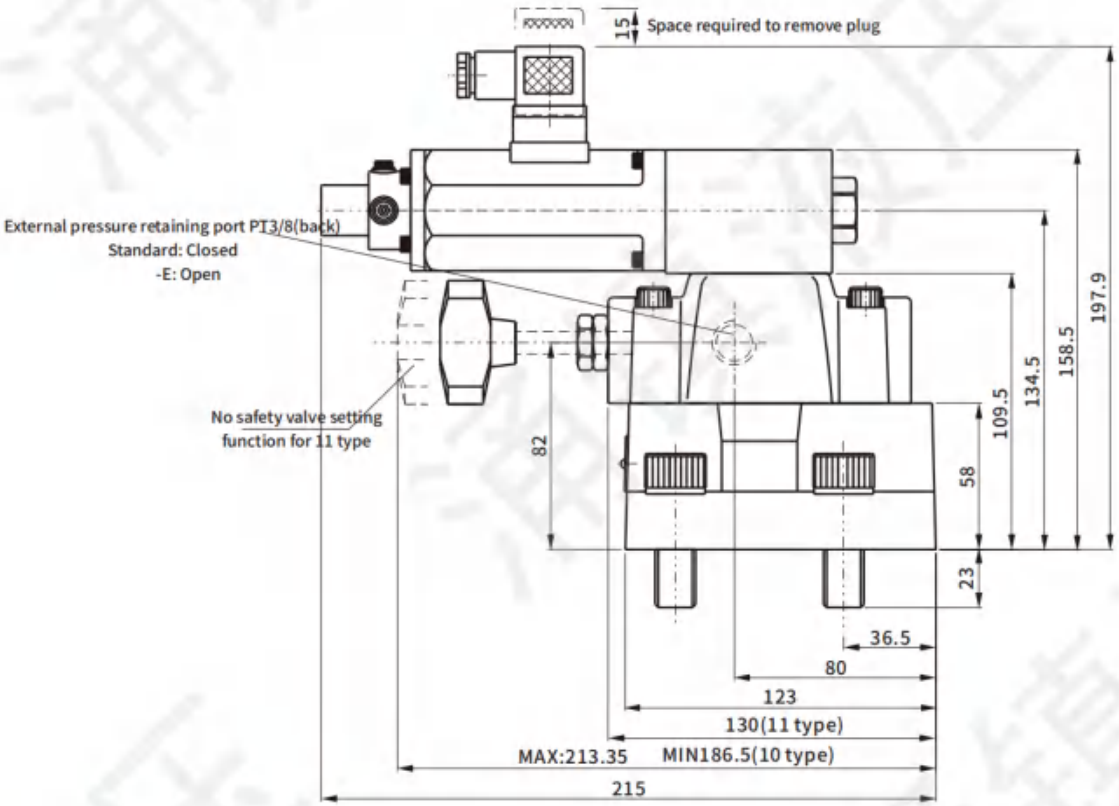
Dimensions

Units: mm

ER-G06 series valve mounting surface: ISO 6264-AS-08-2-A

ER-G06-L-10/11





Install attachment

Parts	ER-G03-★★-10/11	ER-G06-★★-10/11	Amount
Hex socket screw	M12×40L	M16×50L	4
Mounting O-ring surface	JIS B 2401-1B-P9	JIS B 2401-1B-P9	1
	JIS B 2401-1B-P18	JIS B 2401-1B-P32	2
Mounting valve plate	MF-04 Series	MF-06 Series	

LFA Series

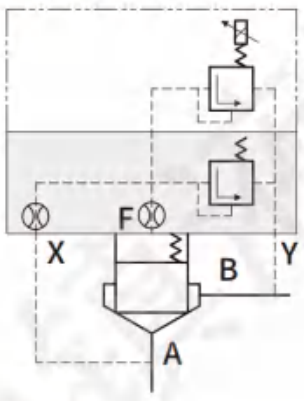
1. LFA cartridge proportional pressure valve, using logic valve group as the main oil line control, through large flow and reduce the system space.
2. Using small DC proportional electromagnet and direct acting relief valve to control, with sensitive response, high precision characteristics.

How to order

LFA 16 DBE M -10 /3 -S016 -X 10 F 20

- **LFA** — Logic valve group with cover
- **16** — Nominal size: 16: NG16; 25: NG25; 32: NG32; 40: NG40; 50: NG50;
- **DBE** — Proportional relief valve
- **M** — Blank: No maximum pressure regulator (Standard product); M: With maximum pressure regulator
- **-10** — 10: design code
- **/3** — Pressure range: 0: ⋆~50bar 1: ⋆~70bar 2: 8~160bar 3: 10~250bar
- **-S016** — Special for plastic machine
- **-X** — Cavity hole: X: X cavity
- **10** — Damping hole diameter: 10: Φ1.0; 12: Φ1.2;
- **F** — Cavity hole: F: F cavity
- **20** — Damping hole diameter: 20: Φ2.0

Symbols



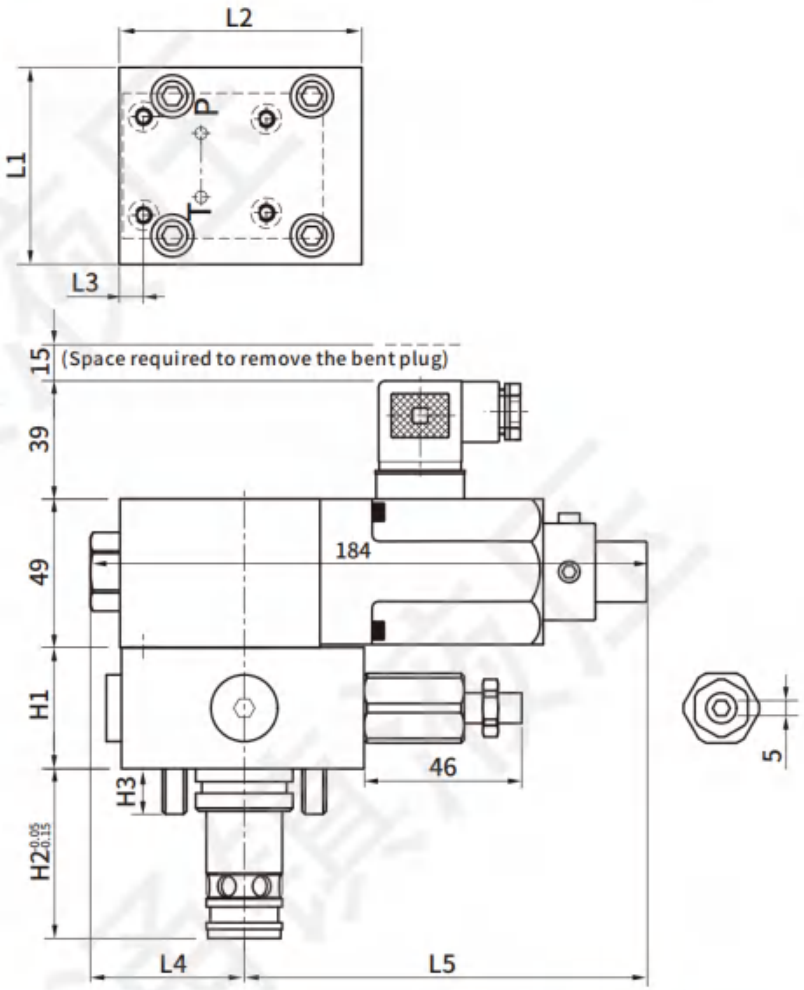
Specification

Modle	Rated pressure(bar)	Max. flow (l/min)	Rated current (mA)	Coil resistance (Ω)	Hysteresis	Repeatability	Mounting cavity
LFA16DBEM-**	250	130	950	11.6±0.5	<3%	0.5%	ISO7368
LFA25DBEM-**		350					
LFA32DBEM-**		500					
LFA40DBEM-**		850					
LFA50DBEM-**		1400					

Dimensions

The cavity holes comply with ISO7368

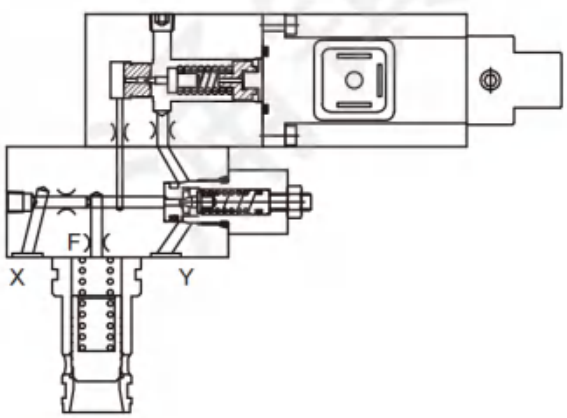
LFA16/25DBEM



Specification

Type	L1	L2	L3	L4	L5	H1	H2	H3	Mounting bolt	Tightening torque (N.M)
LFA-16	65	80	8	50.7	132.7	40	56	15	M8	38
LFA-25	85	85	7	53.7	129.7	40	72	24	M12	100

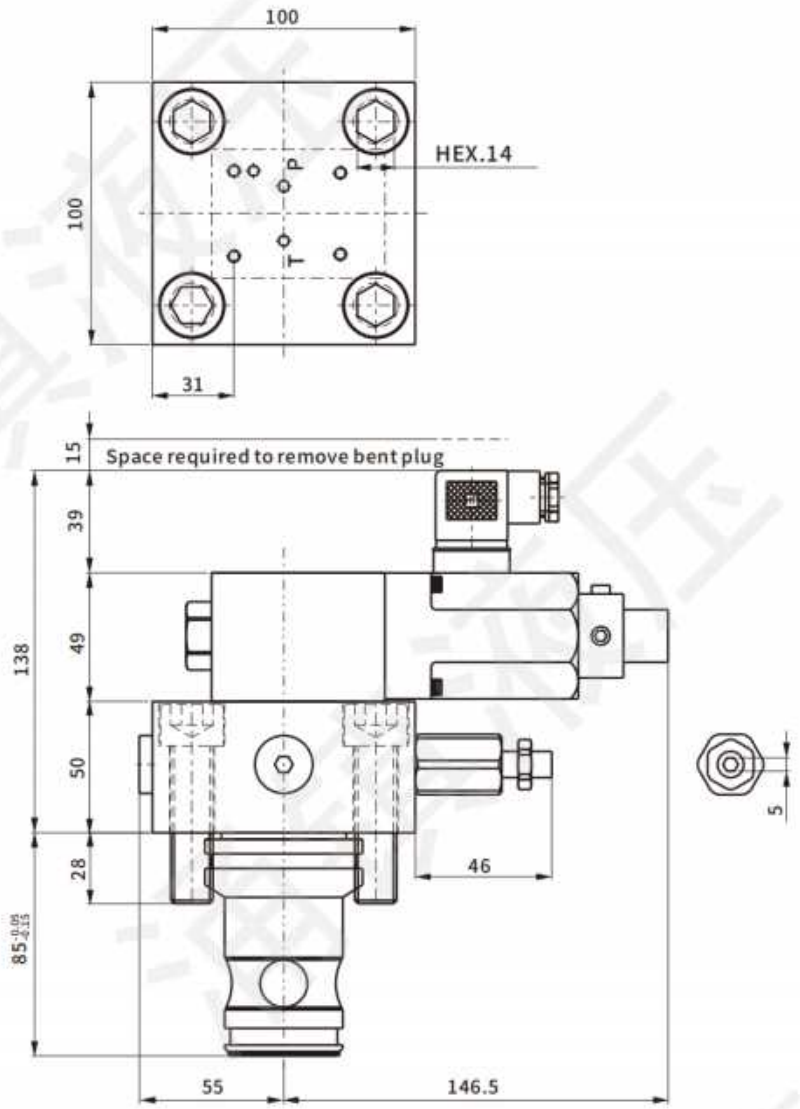
Bolts (included in the scope of supply)



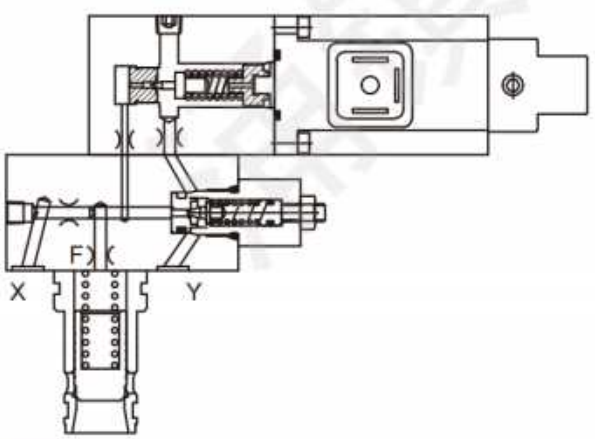
Dimensions

The cavity holes comply with ISO7368

LFA32DBEM



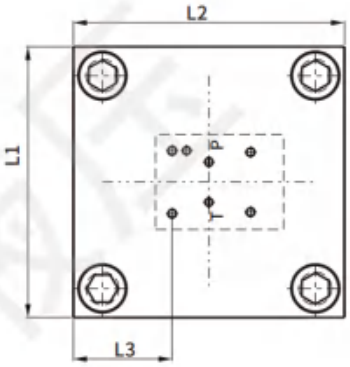
Bolt M16(included in the scope of supply)

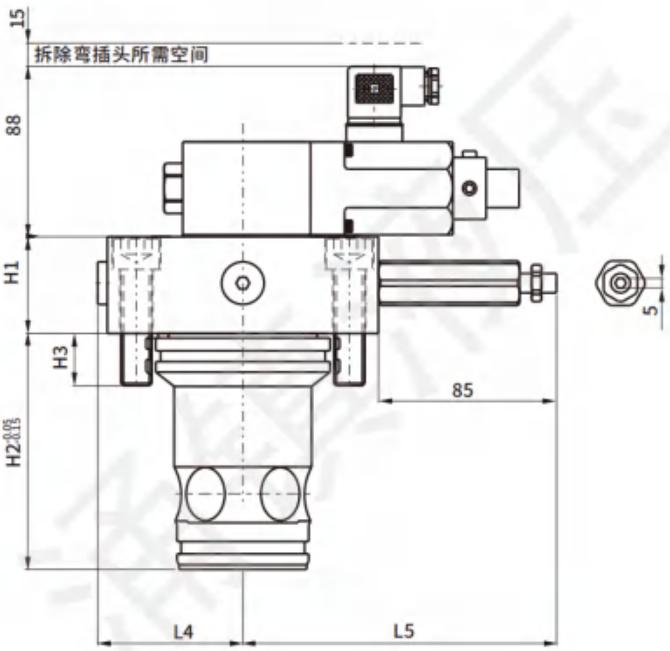


Dimensions

The cavity holes comply with ISO7368

LFA40/50DBEM

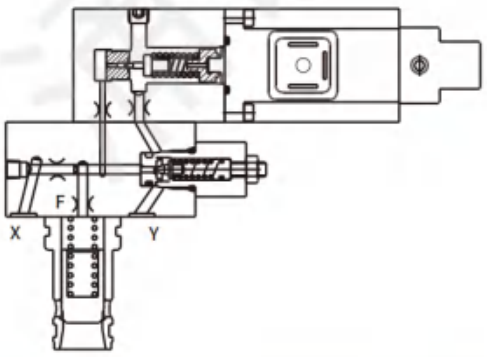




Specification

Type	L1	L2	L3	L4	L5	H1	H2	H3	Mounting bolt	Tightening torque (N.M)
LFA-40	125	125	33.5	67.5	147	60	105	32	M20	635
LFA-50	140	140	34	75	155	68	122	34	M20	635

Bolts (included in the scope of supply)



SWE/SWED Series

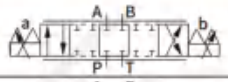
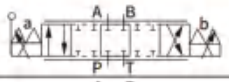
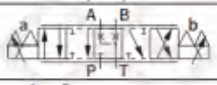
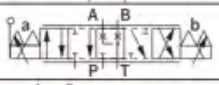
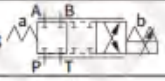
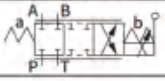
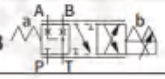
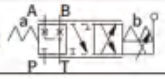
1. Realize real-time feedback stepless proportional control.
2. Small size, space saving, light weight.
3. Each spool can be arbitrarily combined.
4. With hydraulic lock function option.
5. With emergency handle function.

How to order

					1 unit				2 units										
SWED	/	2	-	T02	-	A4	-	B	/	C2	-	30A	-	A	-	C1	/C4-15A-A/	2	/	M1	/	K4	-	V	-	0.8A	-	NC	-	51S	-	D
1		2		3		4		5		6		7		8		9		10		11		12		13		14		15		16		17

1	Specification	SWE-T02	Proportional sectional directional valve (External amplifier plate)
		SWED-T02	Proportional sectional directional valve with emergency handle (External amplifier plate)
2	Number of spools	2	1-7 units
3	Nominal size	T02	6 diameter
4	Main safety valve	Blank	No main safty valve
		A*	Safety valve on side A, A1:70bar, A2:160bar, A3:250bar, A4:315bar
		B*	Safety valve on side B, B1:70bar, B2:160bar, B3:250bar, B4:315bar
5	Oil circuit connection	B	Parallel
6	Spool function		See slide function table for details
7	Nominal flow	07A	7L/min
		15A	15L/min
		30A	30L/min
8	Emergency handle direction	Blank	No emergency handle
		A	On the A side of the body (C2B/C4B function only option)
		B	On the body B side (B2S function only option)
9	Hydraulic lock	Blank	No hydraulic lock
		C1	Oil port A with hydraulic lock
		C2	Oil port B with hydraulic lock
		C3	Oil port AB with hydraulic lock
10	Oil port position	1	P/T on the side, same side, A/B up (standard)
		2	P/T on the same side, P/T/A/B up
		3	P/T on the side, different sides, A/B up
		4	P/T on different sides, P/T/A/B up
11	Specification of oil thread	G1	The P/T/A/B oil port thread is G3/8
		G2	The P/T oil port thread is G1/2 and the AB oil port thread is G3/8
		M1	P/T port thread M22, A/B port thread M18
12	Electrical connection	Blank	With coil plug (Pg11)
		K4	Unplugged
13	Sealing element	Blank	Nitrile rubber
		V	Fluoror ubber
14	Solenoid current	0.8A	0.8A
15	Unloading valve	Blank	No unloading valve
		NC	Normal close
		NO	Normal open
16	Mode of connection	20S	DIN43650
		51S	DT04-2P
17	Mounting	Blank	Right-angle mounting
		D	Bottom mounting

Slide function

Application	SWE Hydraulic symbol	SWED Hydraulic symbol
Three position Spring centered	C2 	C2 
	C4 	C4 
Two position Spring centered	C2B 	C2B 
	C4B 	C4B 

Specification (Measured at P=100bar, VG46, 40±5°C)

Specification	Max. operating pressure (bar)	Nominal flow (l/min)(△p=10bar)	Max. permissible flow(l/min)	Hysteresis(%)	Reverse error (%)	Sensitivity (%)
SWE/SWED-T02	P A B: 315; T:210	7,15,26	42	≤5	≤1	≤0.5
Hydraulic fluid	Mineral fluid (HL, HLP) to DIN51524, other fluid please consult our company!					
Oil temperature(℃)	-20~ +80(preferably +40 ~ +50)					
Viscosity range	20~380mm²/s(preferably 30~46mm²/s)					
Degree of contamination	NAS1638 Class 9 or ISO4406 Class 20/18/15					

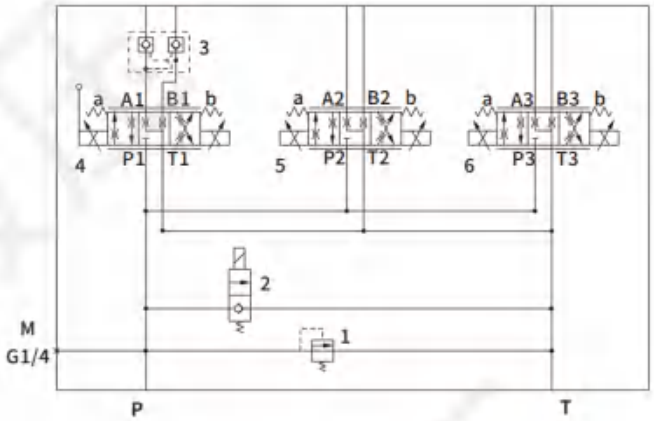
Coil characteristic

Specification	Rated current(A)	Rated resistance(Ω)	Level crossing rate	Level of protection	Insulation grade	Max. power(W)
SWE/SWED-T02	0.8	19.5	ED100%	IP65	H	18.7

Applicable thread specifications

Modle	P	A/B	T	M
SWE/SWED-T02	G3/8	G3/8	G3/8	G1/4
	G1/2	G3/8	G1/2	G1/4

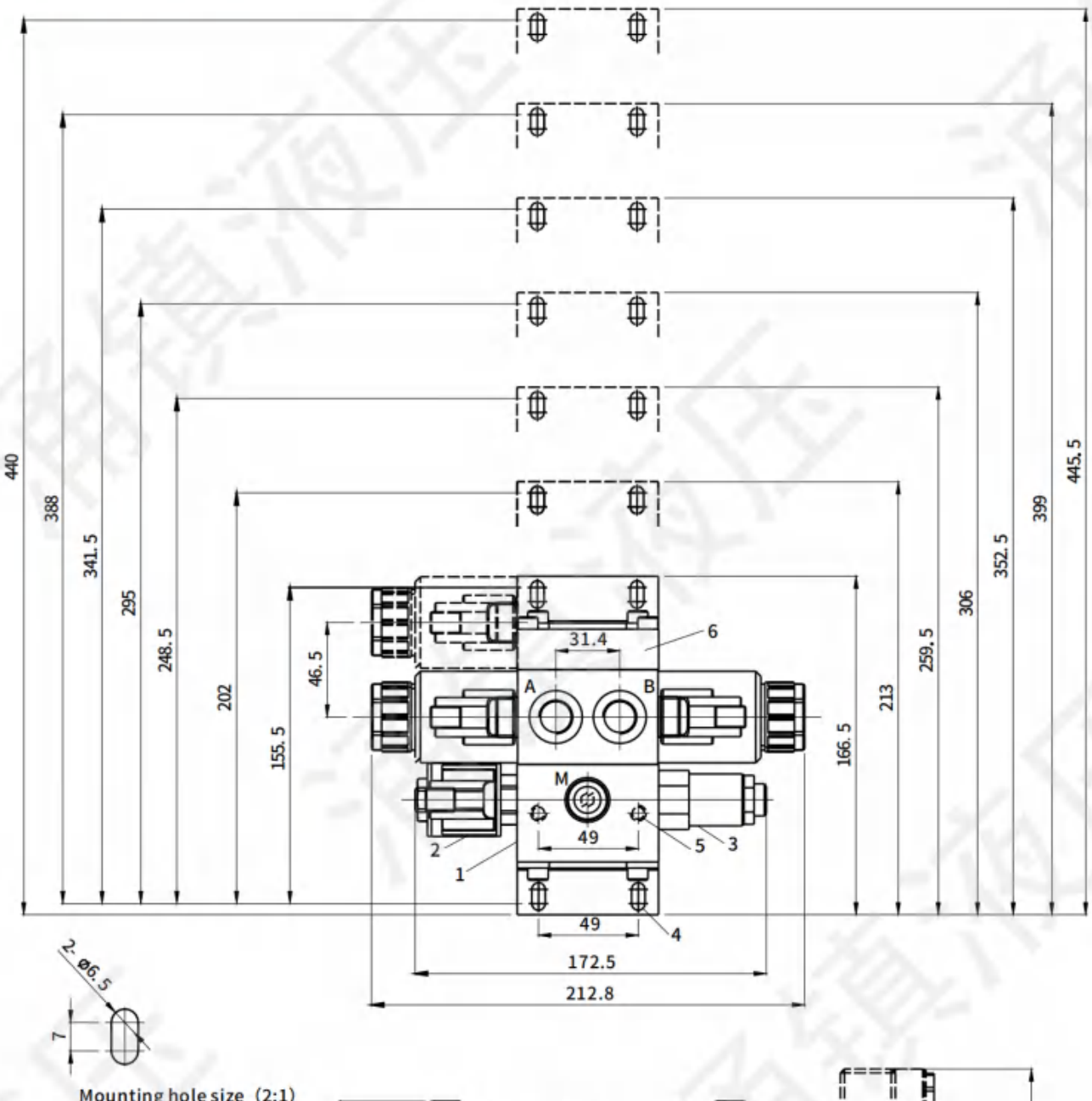
Principle of parallel oil circuit



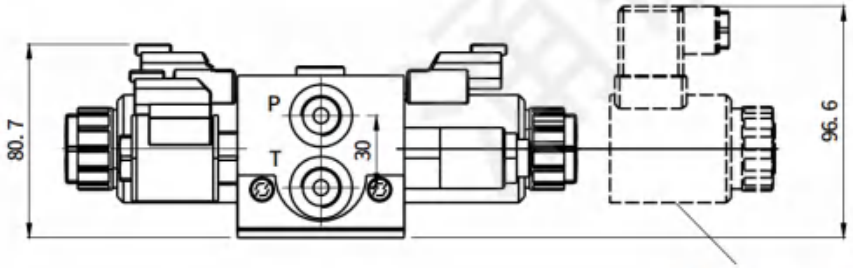
1. Relief valve.
2. Solenoid pressure relief valve.
3. Hydraulic control check valve.
4/5/6. Proportional directional valve with auxiliary handle.

Dimensions

SWE/2-T02-*-20-*



Mounting hole size (2:1)

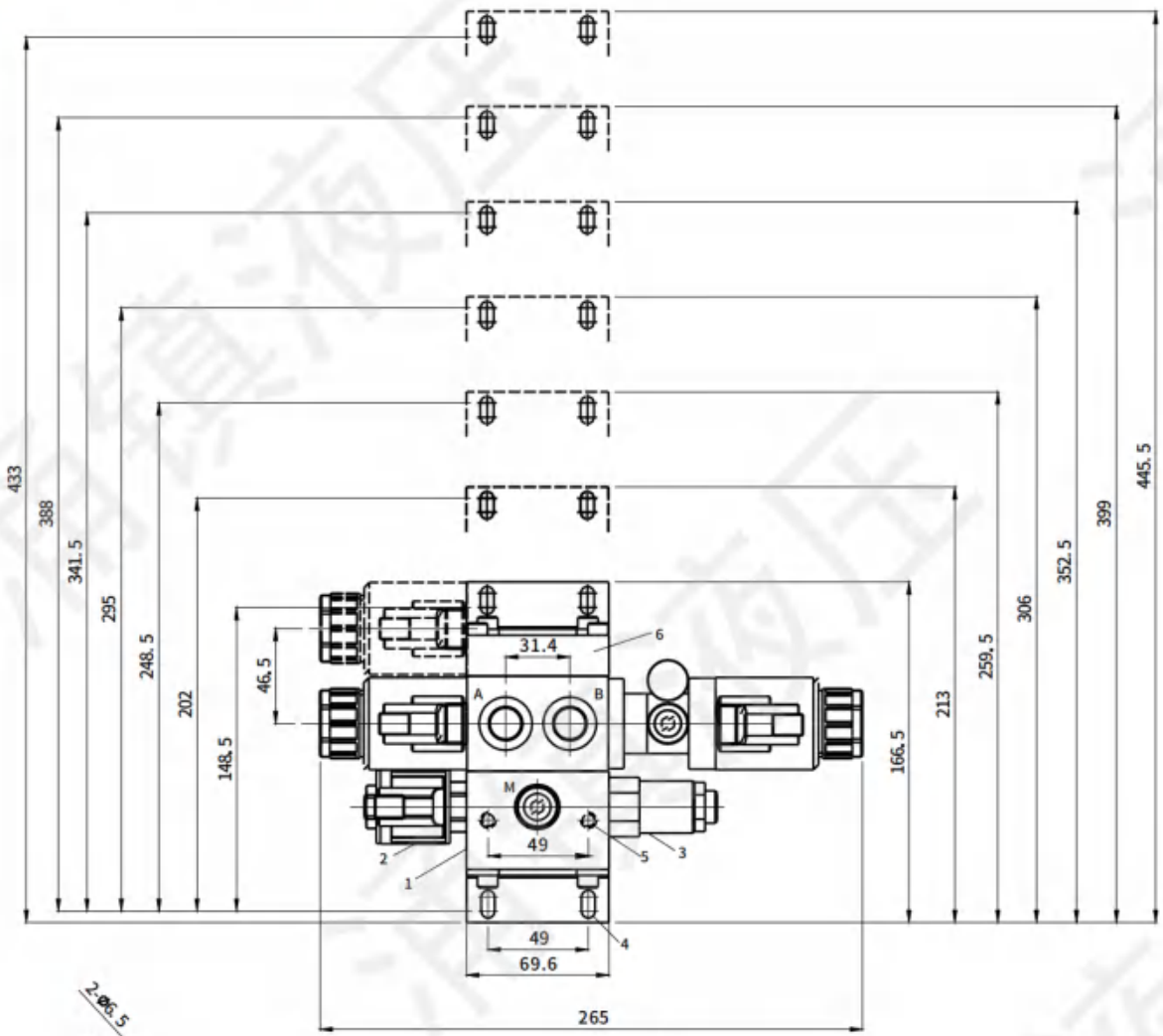


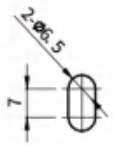
1. Oil inlet unit
2. Soleniod Pressure Relief valve (optional)
3. Relief valve (optional)
4. Right Angle installation (M6)
5. Bottom mounting (M6)(optional)
6. End cover

20S Plug socket

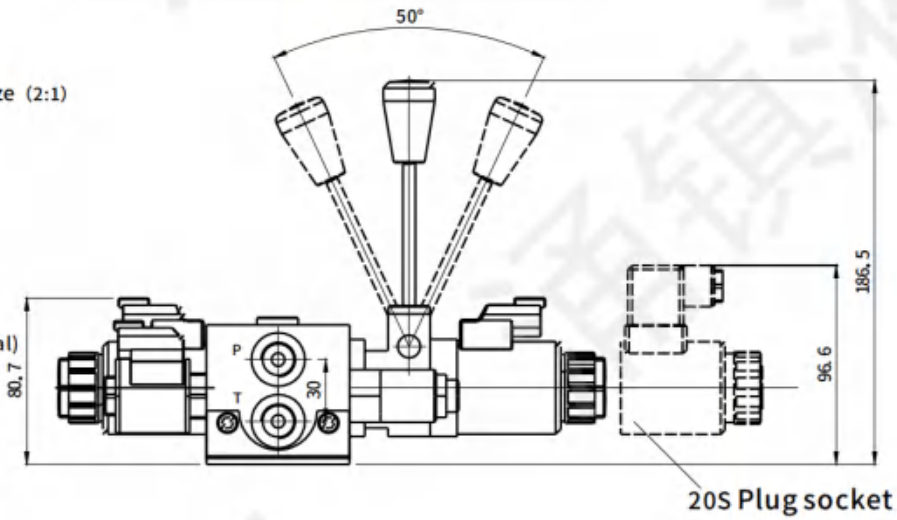
Dimensions

SWED /2 -T02 -*-20-*





Mounting hole size (2:1)

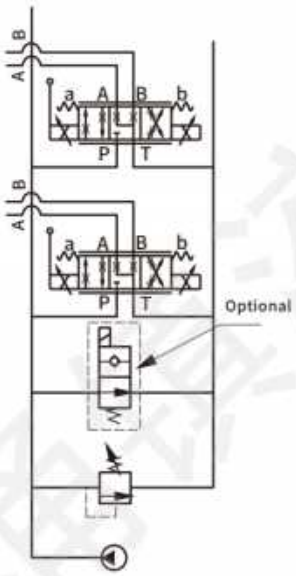


20S Plug socket

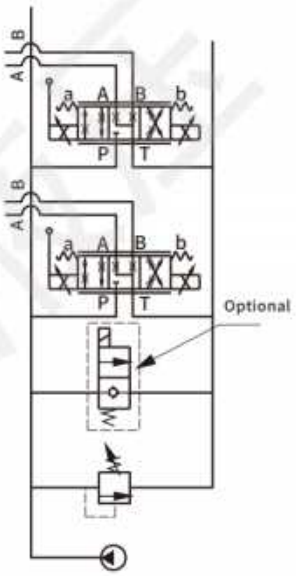
1. Oil inlet unit
2. Soleniod Pressure Relief valve (optional)
3. Relief valve (optional)
4. Right Angle installation (M6)
5. Bottom mounting (M6)(optional)
6. End cover

SWED Oil inlet with pressure relief valve - action mode

Normally open

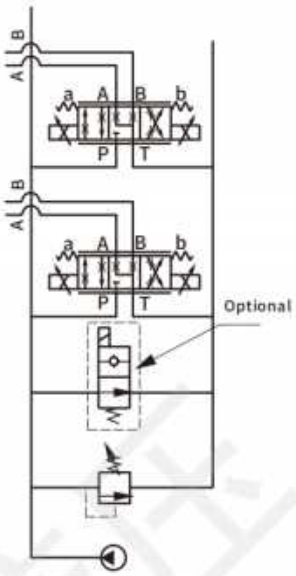


Normally close



SWE Oil inlet with pressure relief valve - action mode

Normally open



Normally close