# High frequency response valve with integrated digital axis controller (IAC-R) and fieldbus interface

## Type 4WRPEHN

Size 6 and 10
Component series 2X
Maximum operating pressure 315 bar
Rated flow 40 l/min (Δp = 35 bar)

### Features

-Direct controlled control valves NG6 and NG10 with Servo quality control piston and sleeve
- one-sided operation, 4/4 fail-safe position in switched off Condition
- Integrated digital axis control functionality (IAC-R) for:
• Volume flow control
• Position control
• Pressure control
• p/Q function
• Release position/pressure and position/ Power regulations
• NC functionality (stand-alone operation possible)
- Analog and digital interfaces for target and actual values
• 4 x analog sensors (+/-10 V or 4..20 mA) or
• 1 x length measuring system (1Vss or SSI) and 2 analog Sensors
- setpoint preset/actual value feedback analog (current or voltage) or via fieldbus
- Analog/digital inputs/outputs configurable
- Optional CANopen, MODBUS, EtherNET/IP, EtherCAT, and PROFINET and other bus protocols can be used with mainstream PLCs, controllers, orUpper computer communication

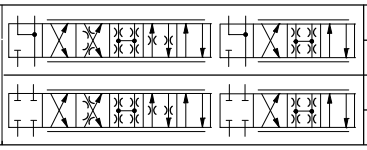
### Contents

## Bestellangaben

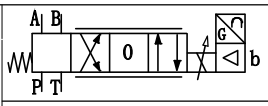
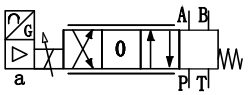
| 01 | 02 | 03 | 04 | 05 | 06 | 07 | 08 | 09 | 10 | 11 | 12 | 13 | 14 | 15 | 16 | | 17 | 18 |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| HD | + 4WPEH | NS | | | | | / | D24 | / | | / | | | | − | 20 | / | V | * |

| | | |
|---|---|---|
| 01 | Beijing Huade Hydraulic Technology | HD |
| 02 | Direct acting, valve core, valve sleeve structure, with safety station | 4WRPEH |
| 03 | Integrated digital electronic controller with digital axis controller for position and speed control | NS |
| | Integrated digital electronic controller with digital axis controller for pressure (force) control | NP |
| | Integrated digital electronic controller with digital axis controller for position pressure (force) composite control | ND |
| 04 | NG 6 | 6 |
| | NG 10 | 10 |

Kolbensymbole

| | | | |
|---|---|---|---|
| 05 |  | P→A, B→T, P→B, A→T: $q_{vmax}$ | C3 |
| | | P→A: $q_{vmax}$ B→T: $q_v/2$; P→B: $q_v/2$ A→T: $q_{vmax}$ | C5 |
| |  | P→A, B→T, P→B, A→T: $q_{vmax}$ | C4 |
| | | P→A: $q_{vmax}$ B→T: $q_v/2$; P→B: $q_v/2$ A→T: $q_{vmax}$ | C1 |

Montageseite des induktiven Wegaufnehmers

| | | | |
|---|---|---|---|
| 06 |  | The electromagnet and displacement sensor are not in port B | B |
| |  | The electromagnet and displacement sensor are not in port A | A |

Rated flow at 70 bar pressure differential (35 bar/control edge) NG 6

| | | |
|---|---|---|
| 07 | 2 L/min | 02 |
| | 4 L/min | 04 |
| | 12 L/min | 12 |
| | 24 L/min | 24 |
| | 40 L/min | 40 |

Rated flow at 70 bar pressure differential (35 bar/control edge) NG 10

| | | |
|---|---|---|
| 07 | 50 L/min | 50 |
| | 100 L/min | 100 |

Flow characteristic

| | | |
|---|---|---|
| 08 | Linear | L |
| | Inflected characteristic curve(For DN06 valve, limited to 40L/min valve core) | P |
| 09 | Supply voltage 24 V | D24 |

Bus

| | | |
|---|---|---|
| 10 | No bus interface | Empty, unmarked |
| | MODBUS RTU | M |
| | MODBUS TCP | T |
| | CANopen | C |
| | EtherCAT | E |
| | PROFINET | P |
| | EtherNET/IP | I |

## Order details

| 01 | 02 | | 03 | 04 | 05 | 06 | 07 | 08 | 09 | 10 | 11 | 12 | 13 | 14 | 15 | | 16 | | 17 | 18 |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| HDV | PE | – | NS | | | | | / | D24 | / | | / | | | | – | 20 | / | V | * |

Position command signal and actual value signal

| | | |
|---|---|---|
| 11 | No position control (for type "NP", only pressure (force) control) | N |
| | Bus | B |
| | Instruction value/actual value0—+10 V | AV1 |
| | Instruction value/actual value0-±10 V | AV2 |
| | Instruction value/actual value - 20 mA | AI |

Displacement sensor signal type

| | | |
|---|---|---|
| 12 | No position sensor (for "NP" type, only pressure (force) control) | Unmarked |
| | SSI,Gray code | S |
| | Absolute encoder | J |
| | 0-10V | AV1 |
| | 0-±10V | AV2 |
| | 4-20mA | AI |
| | Other | R(Explain with text) |

Pressure (force) command and pressure (force) actual value signal types

| | | |
|---|---|---|
| 13 | No pressure (force) control (for the "NS" type, only position and speed control) | N |
| | Bus | B |
| | Analog quantity 0-10V | AV1 |
| | Analog quantity 4-20mA | AI |

Installation position of pressure (force) sensor

| | | |
|---|---|---|
| 14 | No pressure (force) sensor | Unmarked |
| | Install both rod and non rod cavities | P11 |
| | Installation without rod chamber only | P10 |
| | Installation with rod chamber only | P01 |
| | force sensor | F |

Pressure/force sensor signal (only applicable to "... NP" and "... ND" valves)

| | | |
|---|---|---|
| 15 | None | Unmarked |
| | 0-10V | AV |
| | 4—20mA | AI |

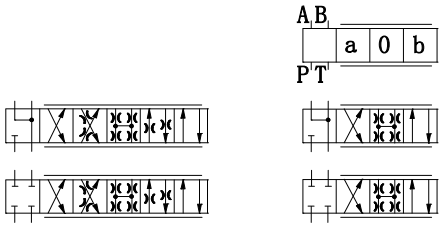
| | | |
|---|---|---|
| 16 | Product series number | 20 |

Sealing material

| | | |
|---|---|---|
| 17 | FKM | V |
| | NBR | N |
| | HNBR | H |

| | | |
|---|---|---|
| 18 | Other required information should be explained in text | |

## Valve core function

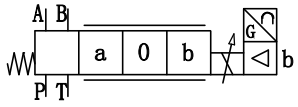



= C3, C5

= C4, C1

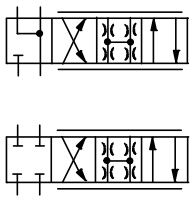
For valve core functions C5 and C1
P→A: $q_{vmax}$ B→T: $q_v/2$
P→B: $q_v/2$ A→T: $q_{vmax}$

## NG 6



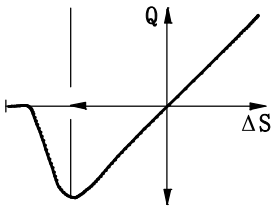

linear

P:Turning point40%
Rated flow rate of valve: 40 l/min

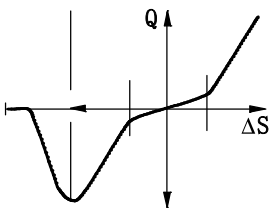


C3, C5

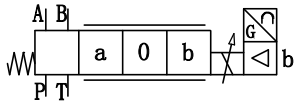
C4, C1




C3, C5, C4, C1

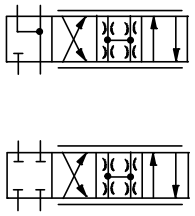



## NG 10



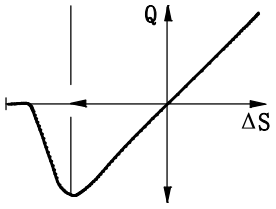

linear

P:Turning point40%

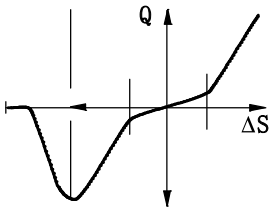


C3, C5

C4, C1

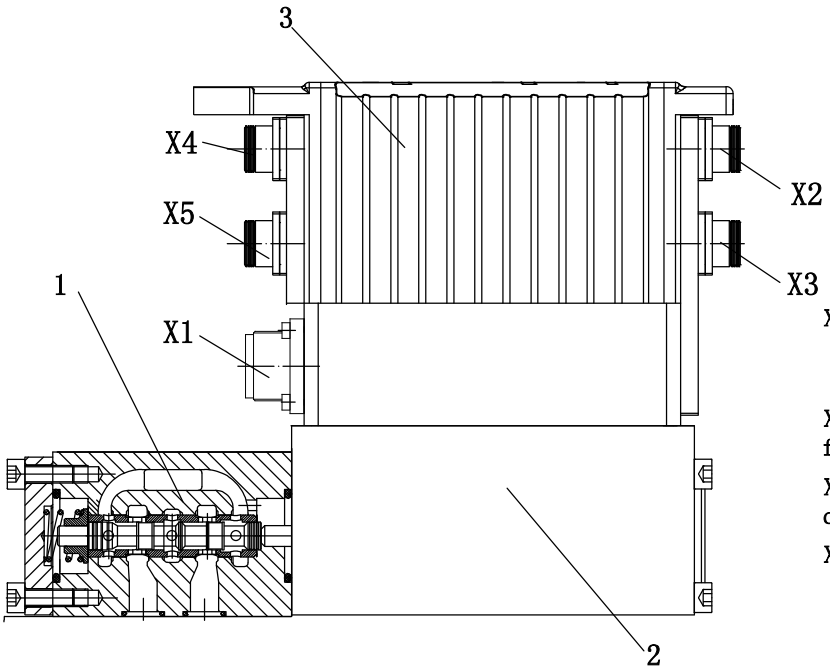



C3, C5, C4, C1




C3, C5, C4, C1

## Function




X1: Input connector, used to connect DC24V power supply, analog command input, actual value output, alarm output, etc.

X2: Analog displacement sensors, pressure or force sensors Signal input connector;

X3: Digital displacement sensor signal input connector

X4 and X5: Bus connector

Structure:

Valves mainly include:

- ▶ Direct controlled control valve with control piston and Servo quality sleeve (1)
- ▶ Proportional electromagnet with valve core displacement feedback (2)
- ▶ Integrated digital axis controller with analog and digital sensor interfaces and fieldbus connection (3)

Valve function:

Integrated electronic components compare specified control values with actual position values. In the case of control deviation, the coil is activated. Due to changes in the magnetic force of the coil The control valve core will resist the spring for adjustment. Valve spool stroke and overcurrent cross-sectional area. Directly proportional to the instruction signal. When the preset control value is 0, the electronic element. Adjust the control valve core to resist spring force and move it to the center position. In an inactive state, The spring drives the valve core to put it in a fail safe position.

— The motion axis controller implements the following control functions

- Volume flow control
- Position control
- Pressure/force control
- Release position/pressure and position/force control

— The command value can be input through the analog interface (X1) or Input via bus interface X4

—The actual value can be read through the analog interface (X1) or Obtained through bus interface X4

— Control parameters can be set through the bus

— Fault diagnosis

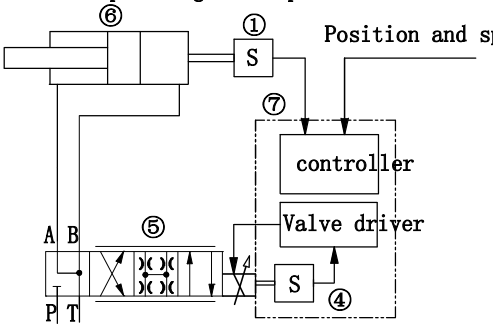
Integrated electronic components enable control in the following fault conditions, the coil loses power and the control valve core returns to the fail safe position.

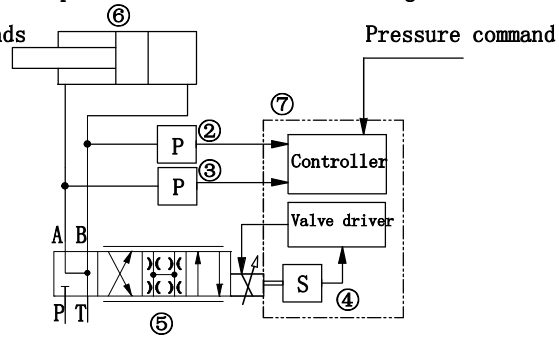
- Power Failure
- Valve core displacement sensor open circuit fault
- Communication Failure
- 4-20mA command signal open circuit fault
- External displacement sensor malfunction
- External displacement sensor malfunction

## Control schematic diagram

Example of schematic diagram for position and speed control

Principle diagram of pressure control - feedback from pressure sensor in the working chamber of the oil cylinder




① Cylinder displacement sensor

④ Valve core displacement sensor

⑤ High frequency response servo proportional valve

⑥ Servo cylinder

⑦ Integrated motion axis controller on valve

② Pressure sensor

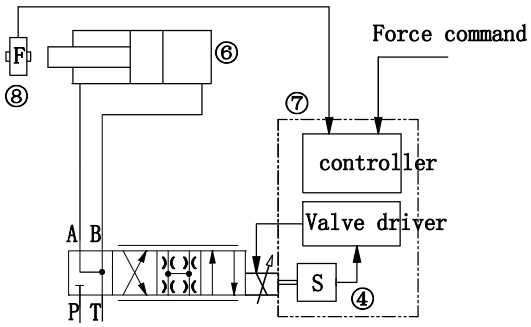
③ Pressure sensor ④ Valve core displacement sensor

⑤ High frequency response servo proportional valve

⑥ Servo cylinder

⑦ Integrated motion axis controller on valve

Force Control Principle Diagram - Force Sensor Feedback




④ Valve core displacement sensor

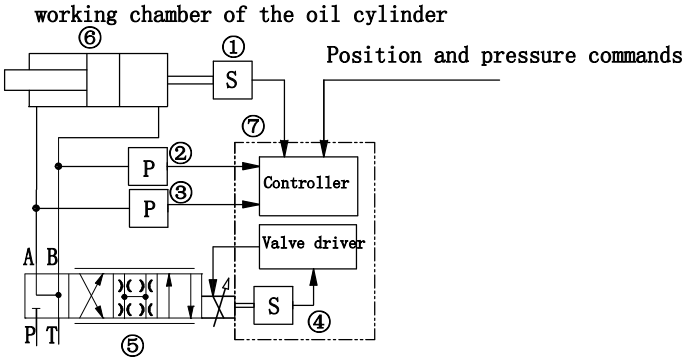
⑤ High frequency response servo proportional valve

⑥ Servo cylinder

⑦ Integrated motion axis controller on valve

⑧ Force sensor

Principle diagram of position pressure composite control - Feedback of pressure sensor in the working chamber of the oil cylinder



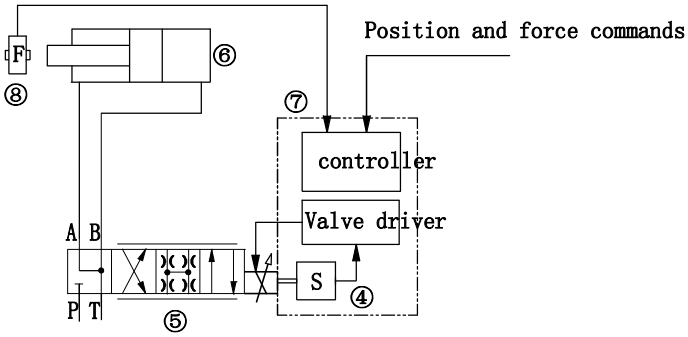

① Cylinder displacement sensor ② Pressure sensor

③ Pressure sensor ④ Valve core displacement sensor

⑤ High frequency response servo proportional valve ⑥ servo cylinder

⑦ Integrated motion axis controller on valve

Principle diagram of position force composite control - force sensor feedback




① Cylinder displacement sensor

④ Valve core displacement sensor

⑤ High frequency response servo proportional valve ⑥ servo cylinder

⑦ Integrated motion axis controller on valve

⑧ force sensor

## Technical data (For use outside the specified values please inquire!)

| General | | | NG 6 | NG 10 |
|---|---|---|---|---|
| Installation position | | | Any, it is recommended to prioritize horizontal installation | |
| Porting pattern | | | ISO 4401-03-02-0-05 | |
| Working temperature range | | ° C | -20...+80 | |
| Ambient temperature range | | ° C | -20...+60 | |
| Weight | | kg | 3.0 | 7.8 |

Hydraulic (measured using HLP46, $\vartheta_{oil}$=40℃± 5℃)

| | | | |
|---|---|---|---|
| Hydraulic fluid | | | Complies with DIN51524... 535 standards and can provide other media upon request |
| Viscosity range | Recommended | $mm^2/s$ | 20...80 |
| | Maximum admissible | $mm^2/s$ | 10...800 |
| Hydraulic oil temperature range | | ° C | -20...+60 |
| Maximum allowable contamination level of hydraulic oil - cleanliness level in accordance with ISO4406 (c) | | | Class 18/16/13 |
| Flow direction | | | Complex Symbols |

Hydraulic NG 6

| | | | | | | | |
|---|---|---|---|---|---|---|---|
| Rated flow (Δp = 35 bar per control edge) | | L/min | 2 | 4 | 12 | 24 | 40 |
| Maximum operating pressure | Ports P, A, B | bar | 315 | | | | |
| | Ports T | bar | 250 | | | | |
| Limitation of use (Δp) with regard to the transition to failsafe (values apply to summated edge) | Symbols C3, C5 | bar | 315 | 315 | 315 | 315 | 160 |
| | Symbols C4, C1 | bar | 315 | 315 | 315 | 250 | 100 |
| Leakage at 100bar | Linear | $cm^3/min$ | < 150 | < 180 | < 300 | < 500 | < 900 |
| | Inflected characteristic curve | $cm^3/min$ | - | - | - | < 300 | < 450 |

Hydraulic NG10

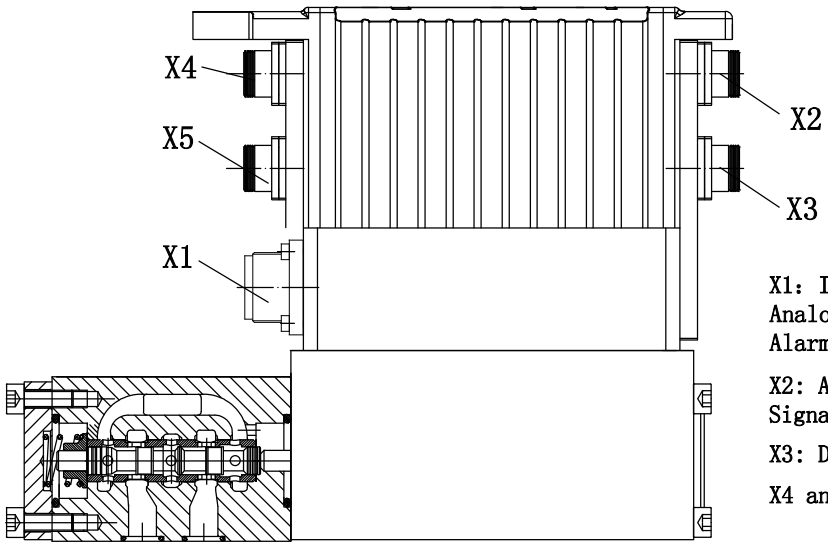
| | | | | | | |
|---|---|---|---|---|---|---|
| | | L/min | 50 (1:1) | 50 (2:1) | 100 (1:1) | 100 (2:1) |
| Maximum operating pressure | Ports P, A, B | bar | 315 | | | |
| | Ports T | bar | 250 | | | |
| Limitation of use (Δp) with regard to the transition to failsafe (values apply to summated edge) | Symbols C3, C5 | | 315 | 315 | 160 | 160 |
| | Symbols C4, C1 | | 250 | 250 | 100 | 100 |
| Leakage at 100bar | Linear | $cm^3/min$ | < 1200 | < 1200 | < 1500 | < 1500 |
| | Inflected characteristic curve | $cm^3/min$ | < 600 | < 500 | < 600 | < 600 |

| | | | | |
|---|---|---|---|---|
| Static/Dynamic | | | NG 6 | NG 10 |
| Hysteresis | | % | ≤0.2 | |
| Manufacturing tolerance for $q_{max}$ | | % | < 10 | |
| Responce time for signal change 0...100% | | ms | ≤10 | ≤20 |
| Thermal drift(Δ v=40℃) | | % | ≤1% | |
| Zero adjustment | | % | Factory-set ±1% | |

## Technical data (For use outside the specified values please inquire!)

| Technical data | | | | |
|---|---|---|---|---|
| Cyclic duration factor | | | % | 100(Continuous operation) |
| Protection class according to EN 60529 | | | | IP65 (if suitable and correctly mounted mating connectors are used) |
| Supply voltage | Nominal value | | VDC | 24 |
| | Minimum | | VDC | 21 |
| | Maximum | | VDC | 36 |
| | Maximum residual ripple | | Vss | 2 (The power supply voltage is 23V At 34V) |
| Consumption | | NG 6 | W | MAX 40 |
| | | NG 10 | W | MAX 60 |
| Analog command input X1 connector | | Voltage input | | |
| | | — Range | V | 0...+10 |
| | | — Impedance | KΩ | 200±2% |
| | | — Temperature drift | | < 14 mV / 10 K |
| | | Current input | | |
| | | — Range | mA | 4...20 |
| | | — Impedance | Ω | 100 |
| | | — Temperature drift | | < 25 μA / 10 K |
| Analog output X1 connector | | Voltage Output | | |
| | | — Range | V | -10...+10, 0...+10V |
| | | — Minimum Load Impedance | KΩ | 10 |
| | | — Temperature drift | | < 10 mV / 10 K |
| | | Current output | | |
| | | — Range | mA | 4...20 |
| | | — Maximum Load | Ω | 500 |
| Pressure sensor input X2 connector | | Voltage input | | |
| | | — Range | V | 0...+10V, 0-5V |
| | | — Impedance | KΩ | 80 |
| | | — Temperature drift | | < 14 mV / 10 K |
| | | Current input | | |
| | | — Range | mA | 4...20 |
| | | — Impedance | Ω | 200 |
| | | — Temperature drift | | < 25 μA / 10 K |
| Digital sensor input X3 connector | | Power supply | DCV | 24 |
| | | Maximum power supply current | mA | 350 |
| | | SSI displacement sensor | | |
| | | — Data format | | Gray Code |
| | | — Data length | | 24 bits, 25 bits, 26 bits, 28 bits |
| | | — Signal Level | | EIA RS485 |
| Digital input X1 connector | | High level | V | 15...$U_B$ |
| | | Low Level | V | -3...2 |
| | | High level current loss | mA | 2mA |
| Digital output X1 connector | | High level | V | 15...$U_B$ |
| | | Low Level | V | 0...2 |
| | | With load capacity | mA | $I_{max}$=50mA |

## Electrical connection and distribution




X1: Input connector, used to connect DC24V power supply Analog command input, actual value output, reporting Alarm output, etc.

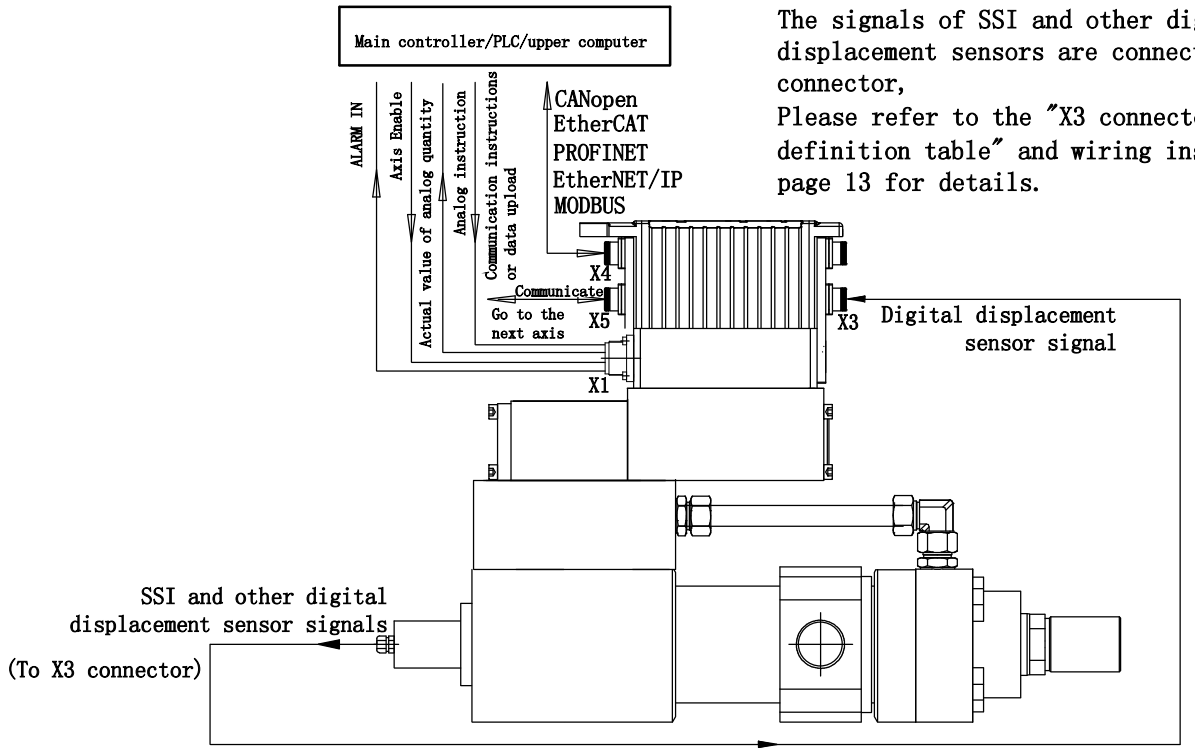
X2: Analog displacement sensor pressure or force sensor Signal input connector;

X3: Digital displacement sensor signal input connector

X4 and X5: bus connector

## Wiring Instructions

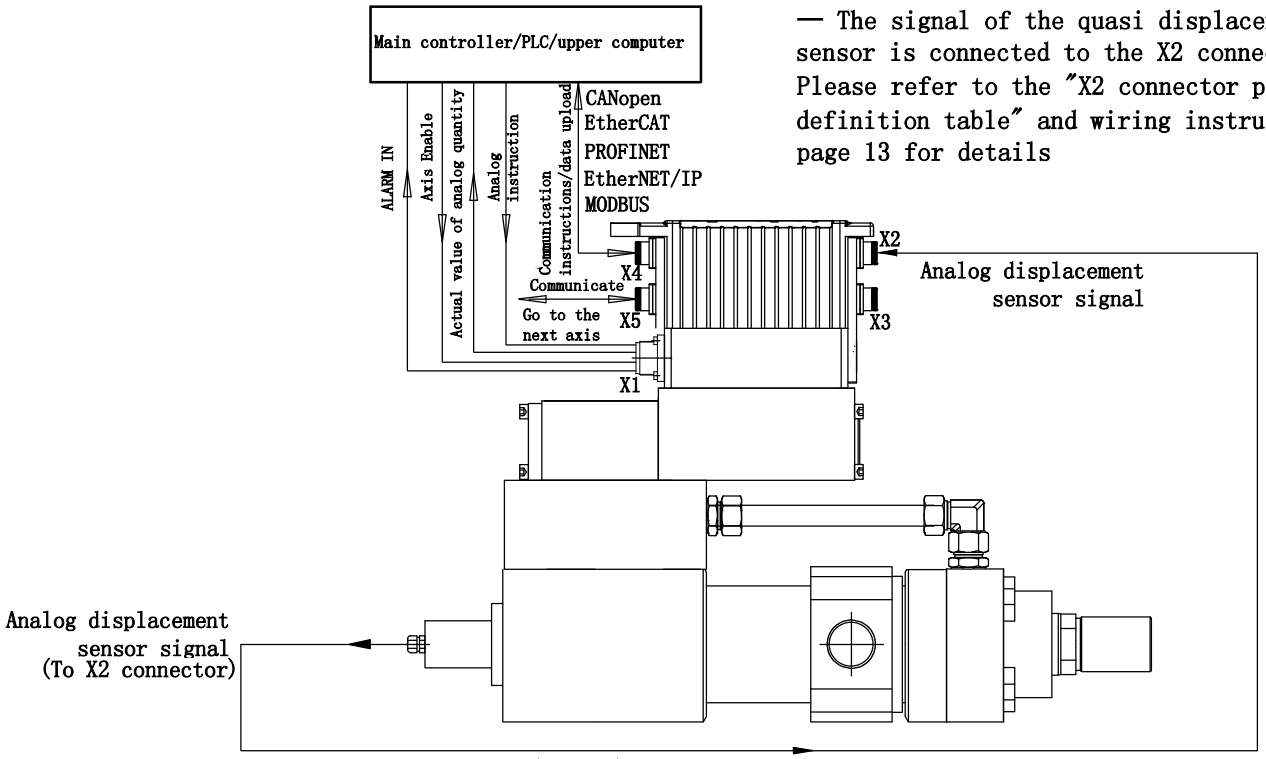
Wiring example - position and speed control, using digital displacement sensors such as SSI




The signals of SSI and other digital displacement sensors are connected by the X3 connector,
Please refer to the "X3 connector pin definition table" and wiring instructions on page 13 for details.

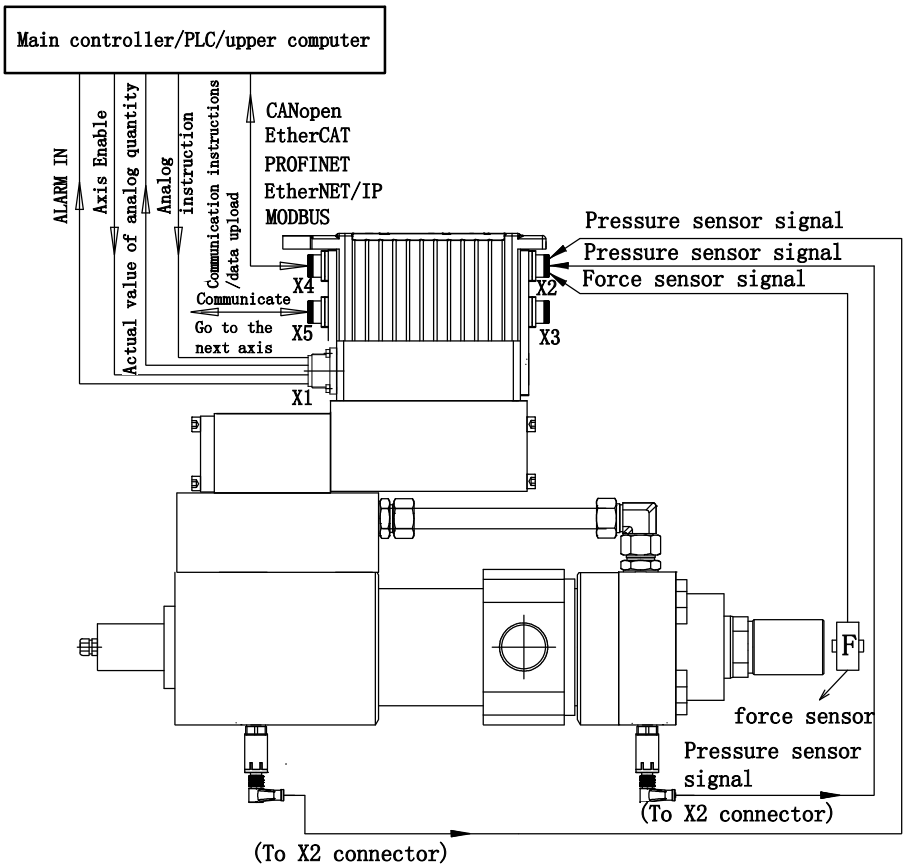
## Electrical connection and distribution

### Wiring example - position and speed control, using analog displacement sensors




— The signal of the quasi displacement sensor is connected to the X2 connector, Please refer to the "X2 connector pin definition table" and wiring instructions on page 13 for details

### Wiring Example - Pressure (Force) Control, Pressure (Force) Sensor Feedback



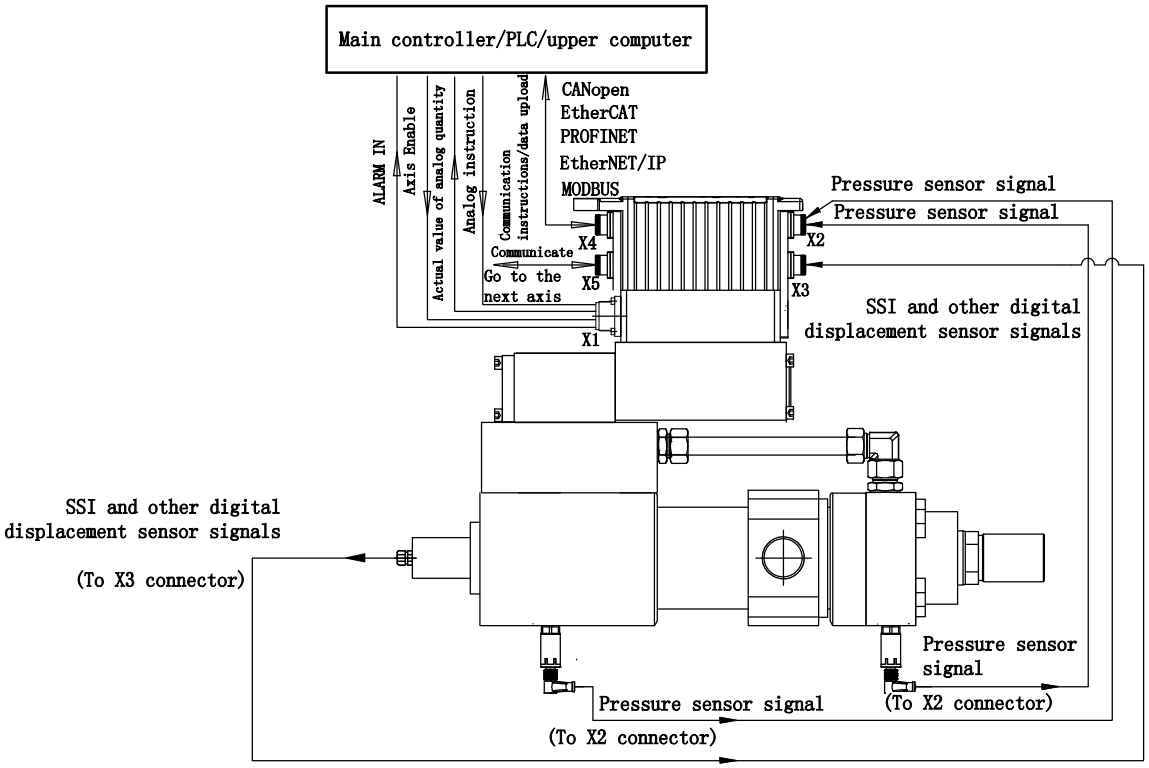

▲ For force testing, there are three situations as follows. According to actual needs, choose one of the three situations

1. Install a pressure sensor as a pressure (force) feedback element in the single working chamber of the oil cylinder;
2. Both working chambers of the oil cylinder are equipped with pressure sensors as pressure (force) feedback elements;
3. Using force sensors as feedback components.

The signal is connected by the X2 connector, please refer to the "X2 connector pin definition table" and wiring instructions on page 13 for details

## Electrical wiring instructions

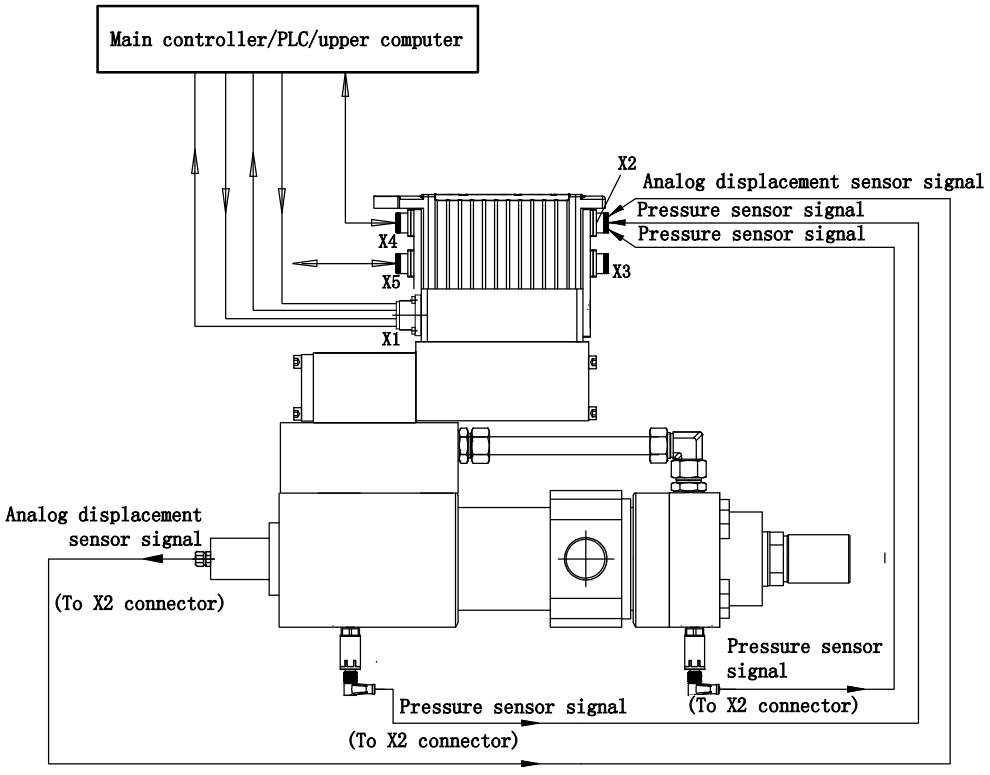
Wiring example - position/pressure (force) composite control, using digital displacement sensors and pressure sensors with and without rod chambers as force sensors Feedback element.




— The pressure sensor signal is connected to the X2 connector, see page 13 for details "X2 connector pin definition table"

— The signals from digital displacement sensors such as SSI are connected to the X3 connector,
Please refer to the "X3 connector pin definition table" on page 13 for details

Wiring example - position/pressure (force) composite control, using analog displacement sensors, with and without rod cavity pressure sensors as force feedback components.



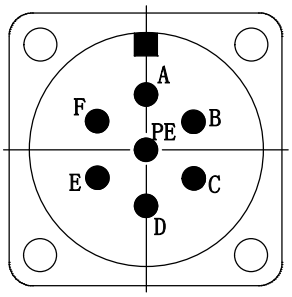

—The pressure sensor signal is connected to the X2 connector,
Please refer to "X2 connector pin definition table" on page 14 for details

—The analog displacement sensor signal is connected to the X3 connector,
Please refer to the "X3 connector pin definition table" on page 14 for details

## Electrical connections and assignment

X1 connector pin allocation -6 pin+PE connector, can be used for valves with single analog commands (such as... NS and... NP... types) or bus commands
Complies with DIN43563. Socket contact surface: pin type;
Matching plug contact surface: socket

| Contact | Interface allocation | | |
|---|---|---|---|
| | Simulated instructions: "AV1" and "AV2" | Simulated instruction: "AI" | Bus instruction "B" |
| A | Supply voltage | | Supply voltage |
| B | 24V power ground (GND), actual value and enable signal reference ground | | 24V power ground (GND), enabling signal reference ground |
| C | Enable signal input (reference potential: 24V power supply ground, pin B) | | |
| D | Control command value ± 10V (or 0-10V) (Re＞100kΩ) | Control value 4... 20mA (Re=200Ω) | Empty |
| E | Reference potential of command value | Reference potential of command value | Empty |
| F | Actual value ± 10V (or 0-10V) (Ri≈1kΩ) | Actual value 4... 20mA (Maximum load 500 Ω) | Empty |
| FE | Functional ground (directly connected to the valve housing) | | |



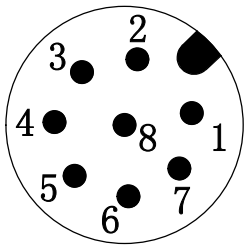

X1 socket pin bitmap
(6+PE)

## Instructions for electrical wiring

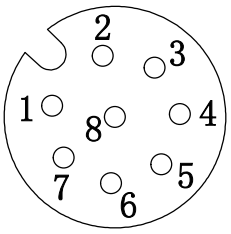
X2 connector pin assignment, M12X1, 8 pins, A-coded. Socket contact surface: pin; Plug contact surface: jack
(For connecting the analog pressure (force) sensor input signal and the displacement sensor signal)

| Pins | Signal definition | Illustrate | |
|---|---|---|---|
| 1 | AI1+ | 0-10V, 4-20mA, analog displacement sensor input signal | |
| 2 | AI1- | | |
| 3 | AI2+ | 0-10V,4-20mA | Rodless cavity pressure sensor or a force sensor input signal |
| 4 | AI2- | | |
| 5 | AI3+ | 0-10V,4-20mA | There is a rod cavity pressure sensor Enter the signal |
| 6 | AI3- | | |
| 7 | 24V | External power output of the sensor | |
| 8 | 0V | | |

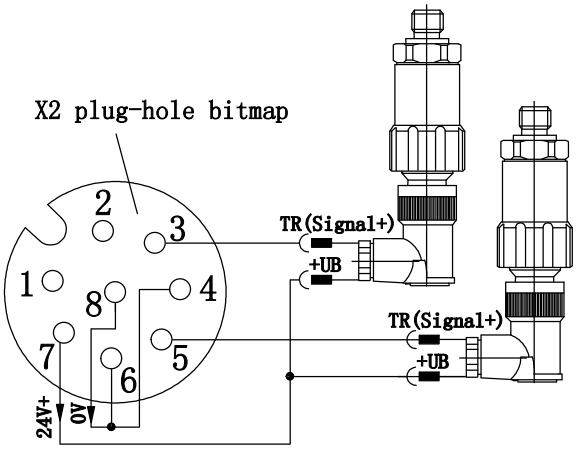
X2 socket-pin diagram (A code)



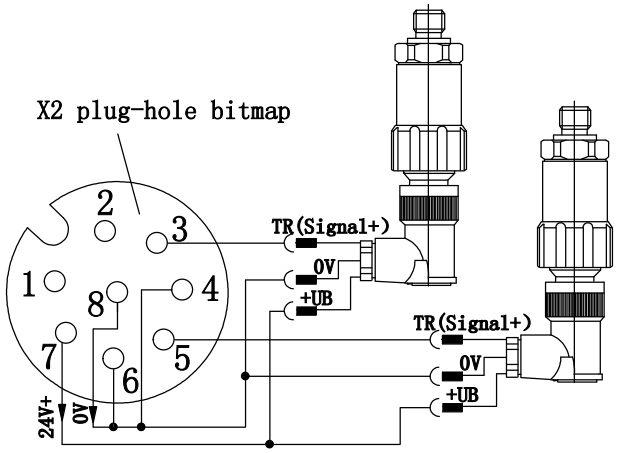

X2 plug-hole bitmap (A code)




**Wiring diagram of 2-wire pressure sensor (4-20mA).**



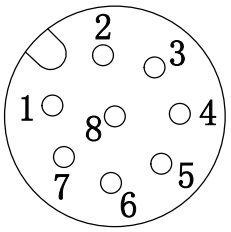

**Wiring diagram of 3-wire pressure sensor (0-10V).**



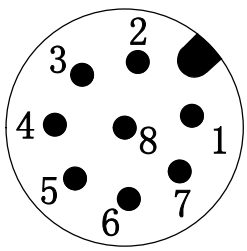

X3 connector pin assignment, M12X1, 8-pin, A-coded. Socket contact surface: jack, matching plug: pin
(For connecting digital displacement sensor signals)

| Pins | Signal definition | |
|---|---|---|
| | SSI Signal Absolute Displacement Sensor | Absolute encoder signal |
| 1 | PGND | PGND |
| 2 | 24V | 5V+ |
| 3 | Date+ | 5V- |
| 4 | Date- | Date+ |
| 5 | 0V | Date- |
| 6 | Clock- | 空 |
| 7 | Clock+ | 空 |
| 8 | 空 | 空 |

X3 socket - hole map (A code)



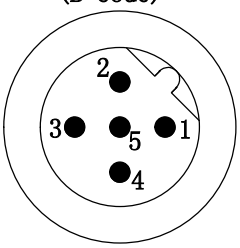

X3 plug-pin bit diagram (A code)



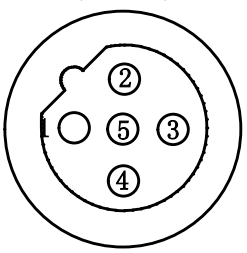

X4 & X5 connectors: M12X1, 5-pin, B-coded, socket contact surface: pins; Matching plug contact surface: jack

| Pins | definition | | |
|---|---|---|---|
| | Ethernet interface EtherNET/IP, EtherCAT, PROFINET and TCP | CANopen | MODBUS RTU |
| 1 | TxD + | Unused | 485A(MODBUS) |
| 2 | RxD + | Unused | 485B(MODBUS) |
| 3 | TxD - | CAN_H(CANopen) | Unused |
| 4 | RxD - | CAN_L(CANopen) | Unused |
| 5 | Unused | GND | GND |

X4 & X5 Sockets - Pin Diagram (B code)



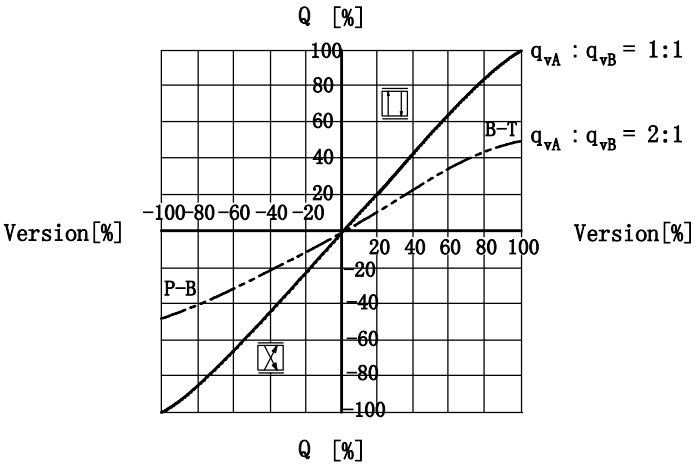

X4 and X5 plug-hole bitmaps (B code)



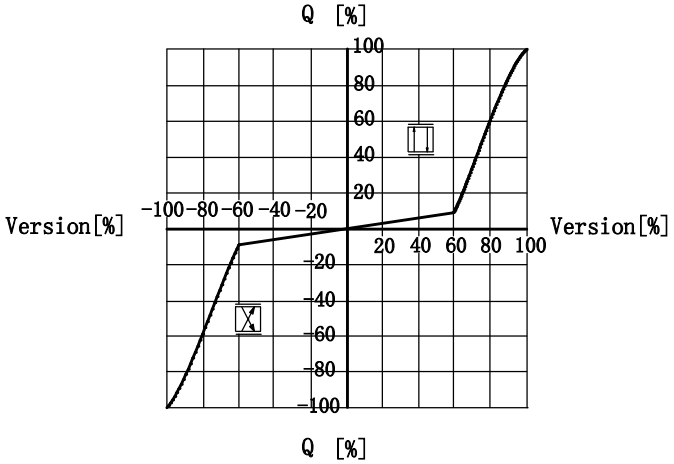
## Performance curves NG 6

(measured with HLP46, $\vartheta$oil = 40° C ±5° C)

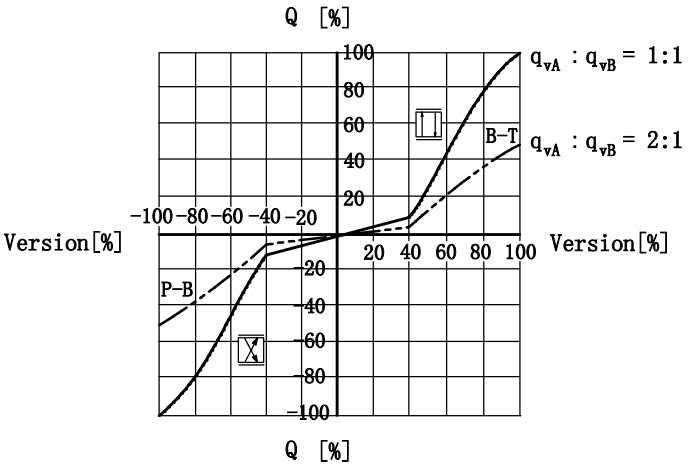
L: Linear

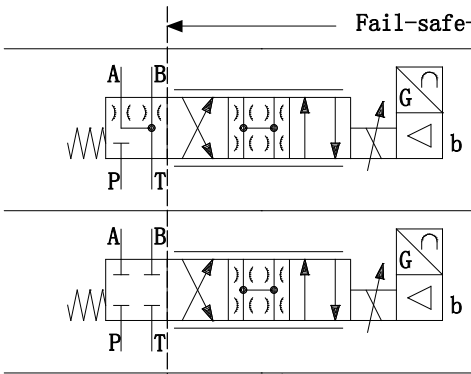



P: (kink 60%)




P: (kink 40%)




| | | | |
|---|---|---|---|
| Leakage at | 100 bar | P → A | 50cm³/min |
| | | P → B | 70cm³/min |
| Flow rate at | Δ P= 35 bar | A → T | 10…20L/min |
| | | B → T | 7…20L/min |



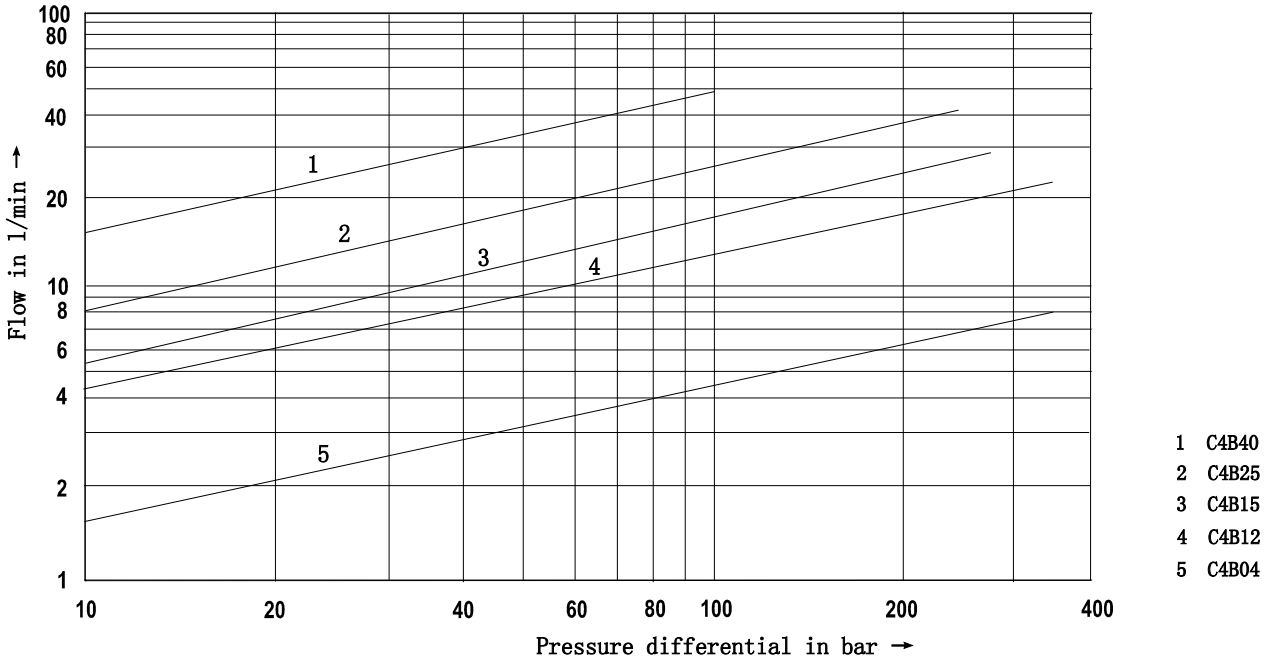

| | | | |
|---|---|---|---|
| Leakage at | 100 bar | P → A | 50cm³/min |
| | | P → B | 70cm³/min |
| | | A → T | 70cm³/min |
| | | B → T | 50cm³/min |

| | | |
|---|---|---|
| Fail-safe | P=0 bar => 7ms | Enable "close" or internal shutdown when an error occurs |
| | P=100bar =>10 ms | $U_B \leqslant$ 18V or ID-E $\leqslant$ 2mA (at 4... 20mA signals) |

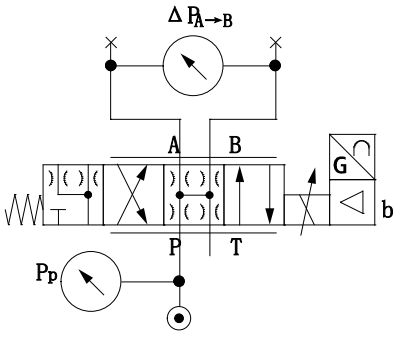
## Performance curves NG 6

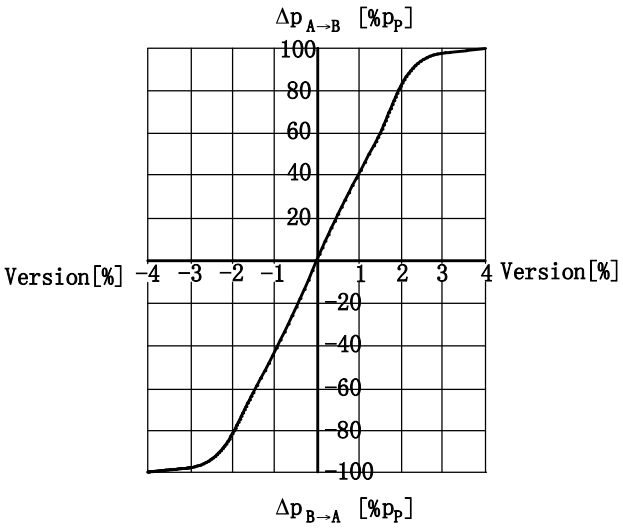
(measured with HLP46, ϑoil = 40° C ±5° C)

Flow/load function with maximum valve opening




Pressure gain

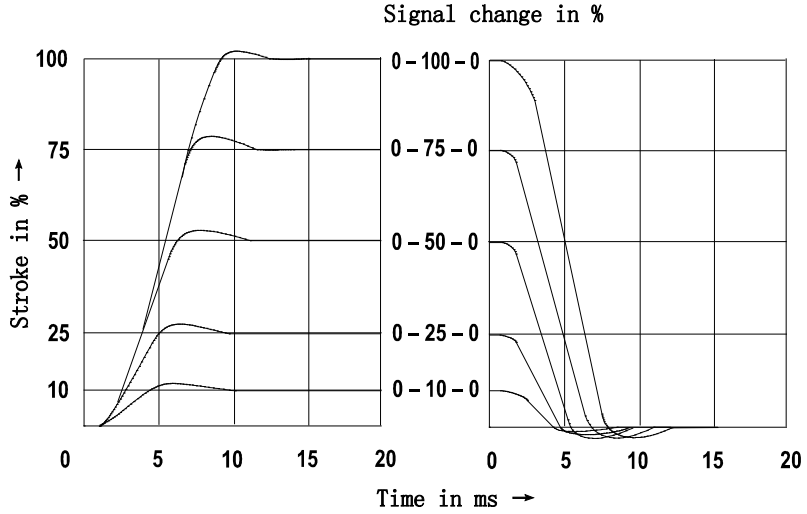


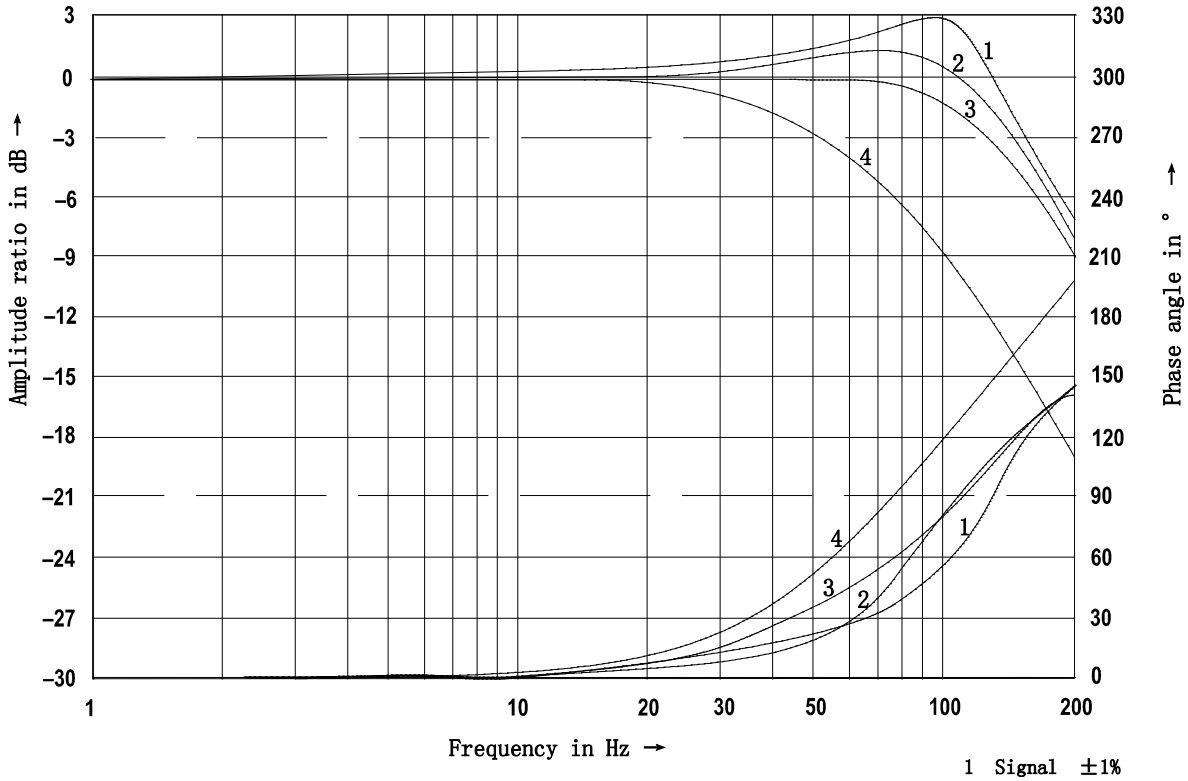
## Performance curves NG 6

(measured with HLP46, ϑoil = 40° C ±5° C)

Transition function with stepped electric input signals




Frequency response



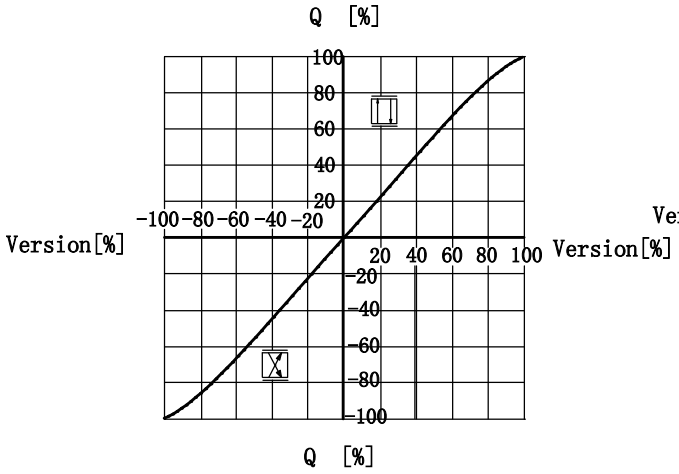

1 Signal ±1%
2 Signal ±5%
3 Signal ±25%
4 Signal ±100%

## Performance curves NG 10

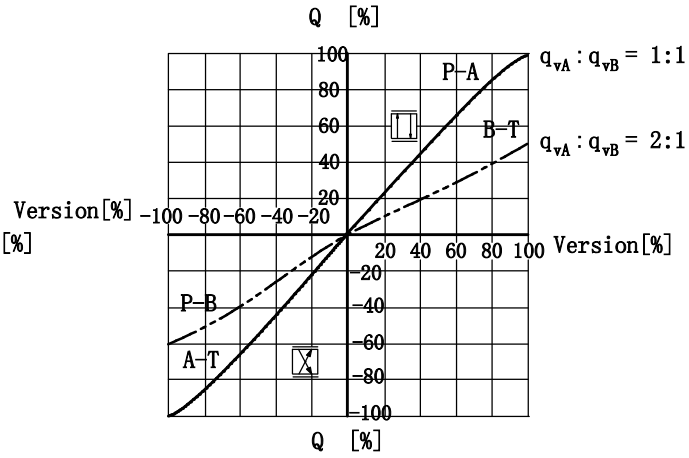
(measured with HLP46, ϑoil = 40° C ±5° C)

### Flow rate/Signal function

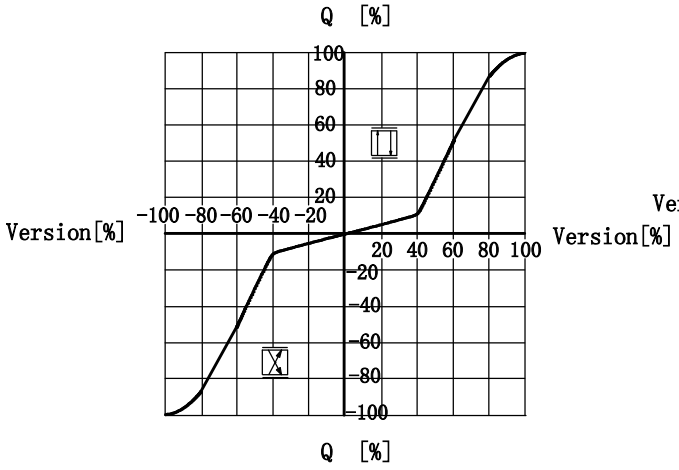
L: Linear1:1



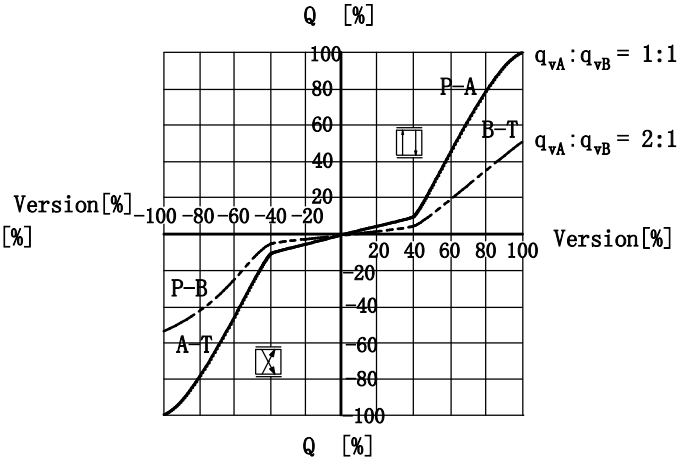

L: Linear2:1

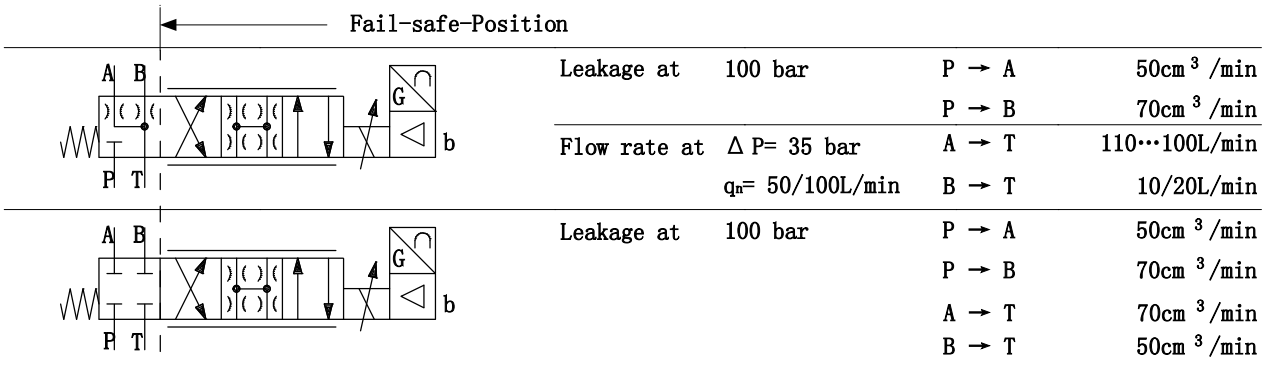



P: kink40% 1:1




P: kink40% 2:1



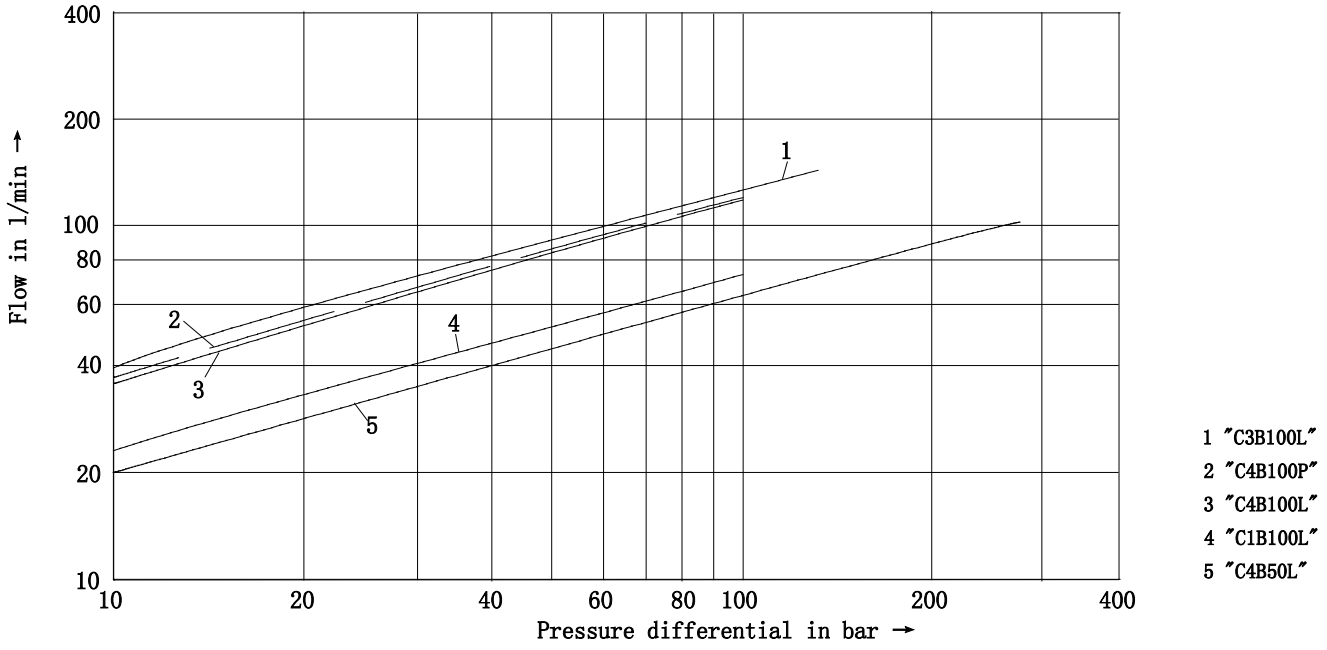

| | | | |
|---|---|---|---|
| Leakage at | 100 bar | P → A | 50cm³/min |
| | | P → B | 70cm³/min |
| Flow rate at | Δ P= 35 bar | A → T | 110…100L/min |
| | $q_n$= 50/100L/min | B → T | 10/20L/min |
| Leakage at | 100 bar | P → A | 50cm³/min |
| | | P → B | 70cm³/min |
| | | A → T | 70cm³/min |
| | | B → T | 50cm³/min |

| | | |
|---|---|---|
| Fail-safe | P=0 bar => 12ms | Enable "close" or internal shutdown when an error occurs |
| | P=100bar =>16 ms | $U_B \leqslant$ 18V or ID-E $\leqslant$ 2mA (at 4... 20mA signals) |

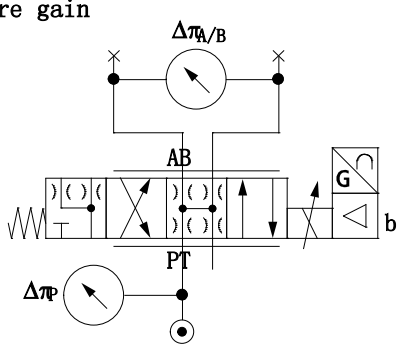
## Performance curves NG 10

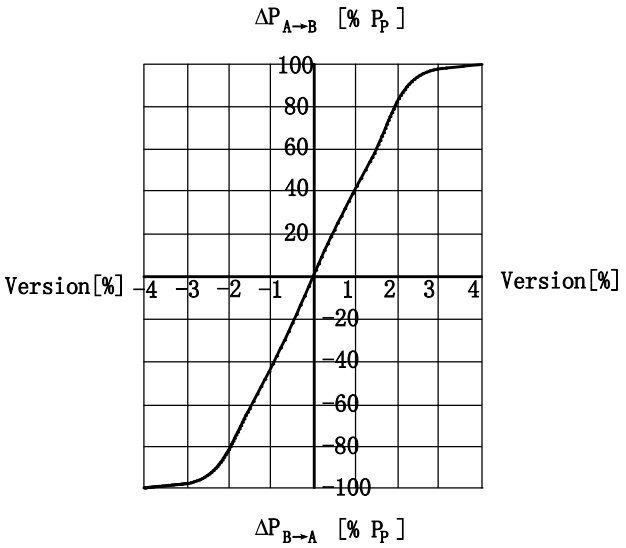
(measured with HLP46, ϑoil = 40° C ±5° C)

Flow/load function with maximum valve opening




Pressure gain

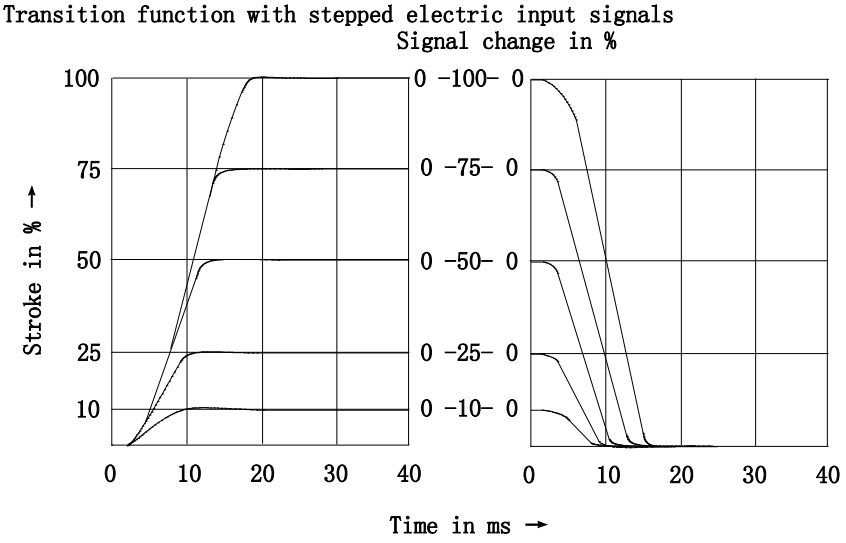


## Performance curves NG 10

(measured with HLP46, ϑoil = 40° C ±5° C)

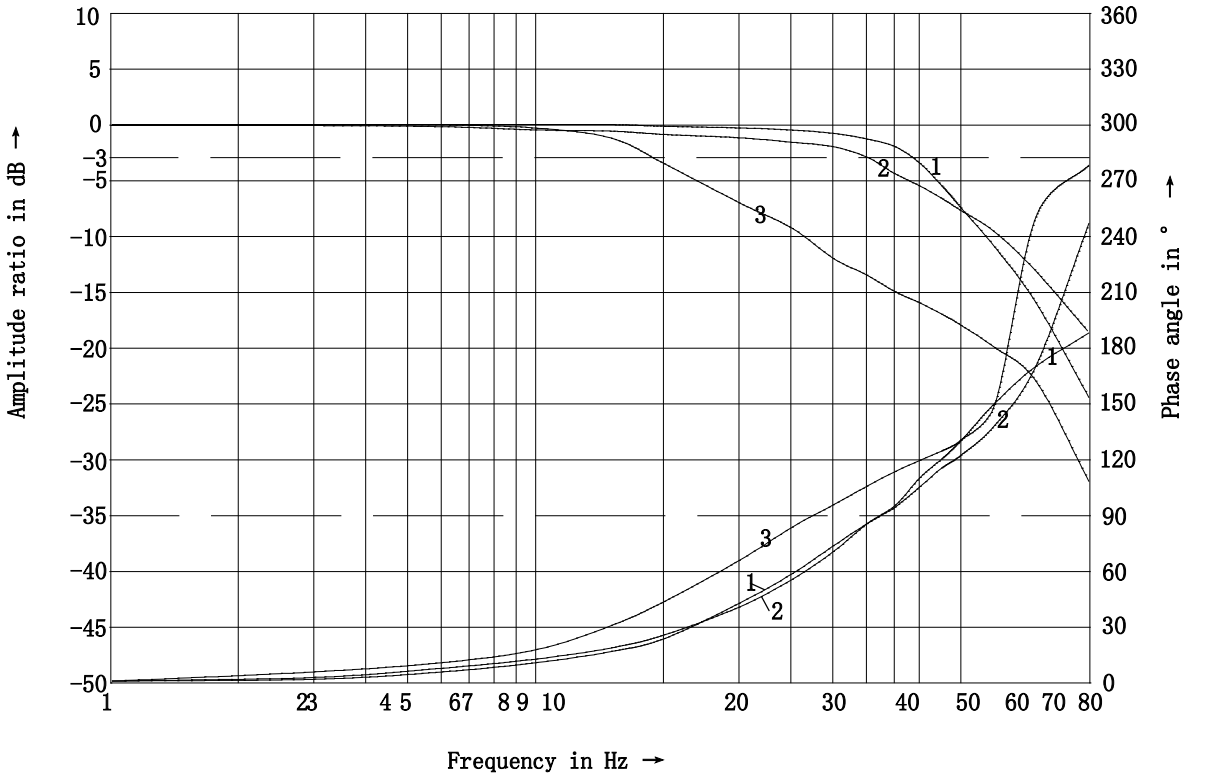
Transition function with stepped electric input signals



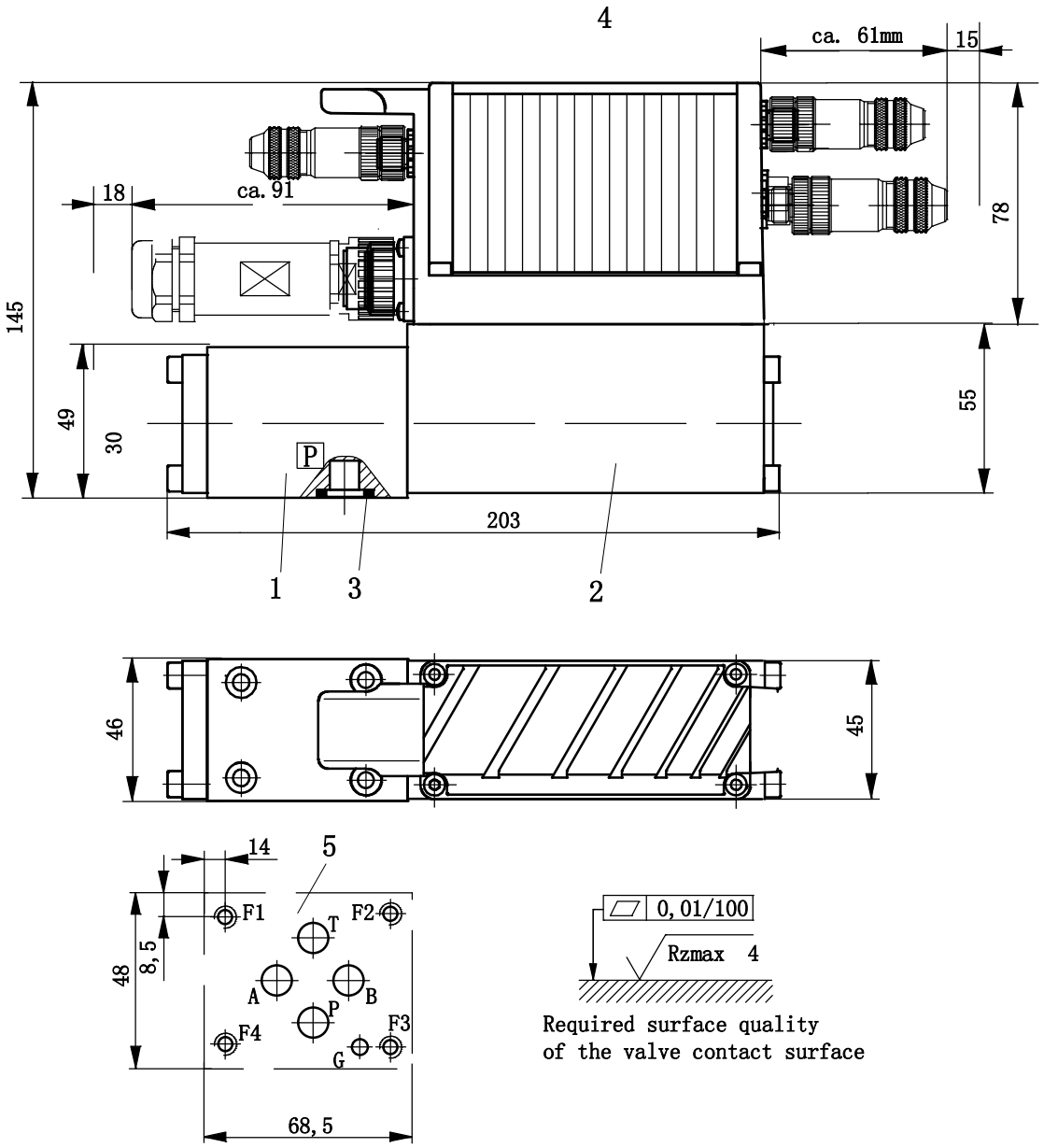

1 Signal ±5 %

2 Signal ±25 %

3 Signal ±100 %



(Dimensions in mm) NG 6



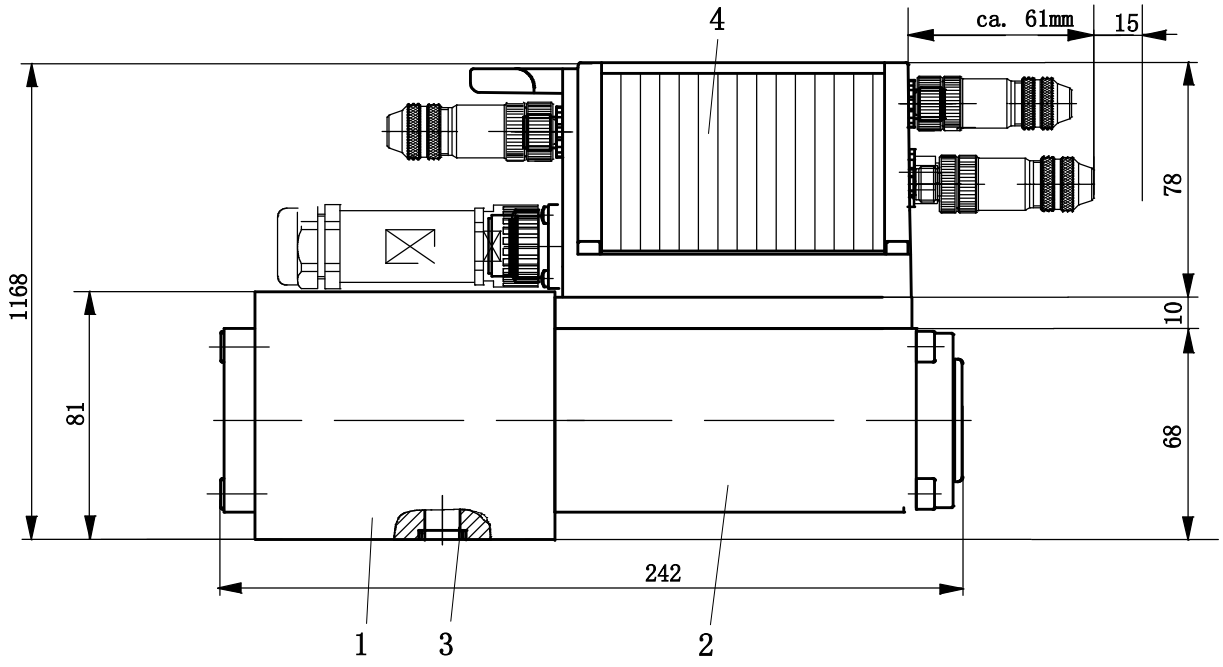

Required surface quality
of the valve contact surface

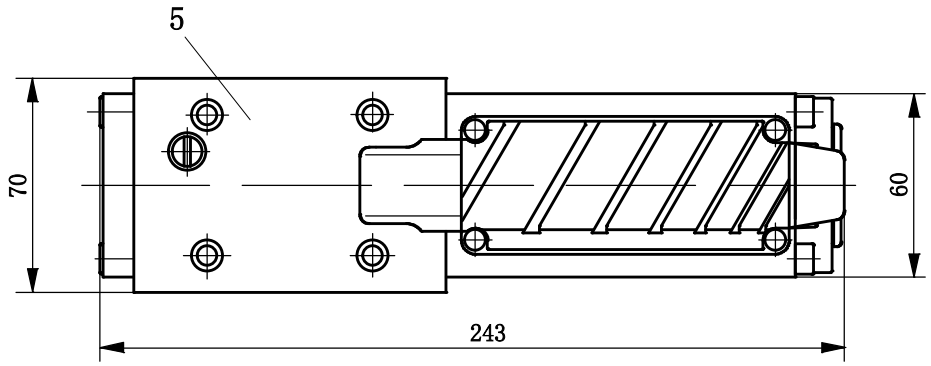
1 Valve body
2 Control coil with position sensor
3 O-ring 9.25X1.78 (oil ports P, A, B, T)
4 Integrated digital controller
5 Machined installation surface, oil port size meets ISO 4401-03-02-0-05

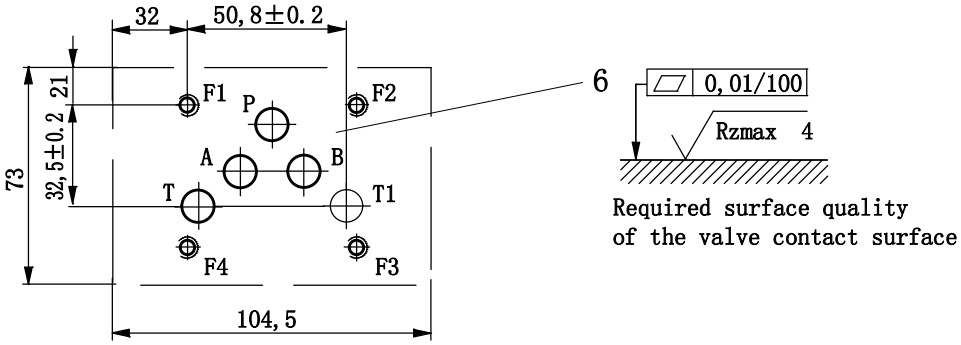
Valve mounting screws

4XISO4762-M5X30-10.9-flzn-240h-L
Tightening torque: $M_A$=7Nm±10%
or
4XISO4762-M5X30-10.9
Tightening torque: $M_A$=8.9Nm±10%

(Dimensions in mm) NG 10




1 Valve body

2 Control coil with position sensor

3 O-ring 12X2 (oil ports P, A, B, T)

4 Integrated digital controller

5 Machined installation surface, oil port size meets ISO 4401-03-02-0-05

Valve mounting screws

4XISO4762-M6X40-10.9-flzn-240h-L

Tightening torque: $M_A$=12.5Nm±10%

or

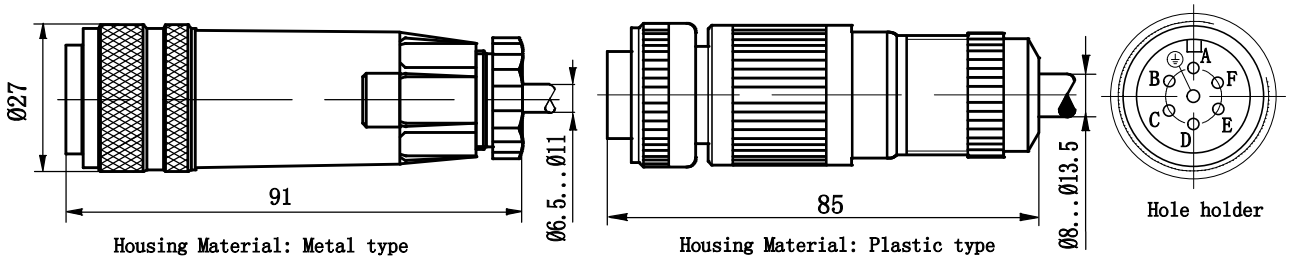
4XISO4762-M6X40-10.9

Tightening torque: $M_A$=15.5Nm±10%

# Accessories: Electrical connector matching plug (ordered separately)

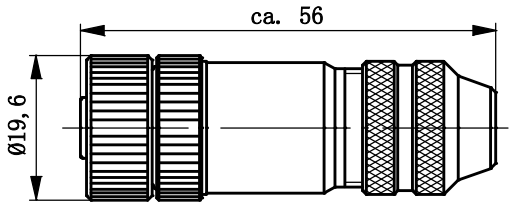
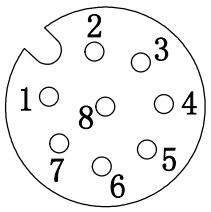
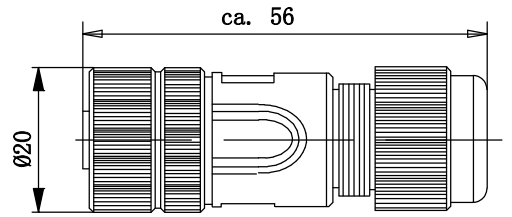
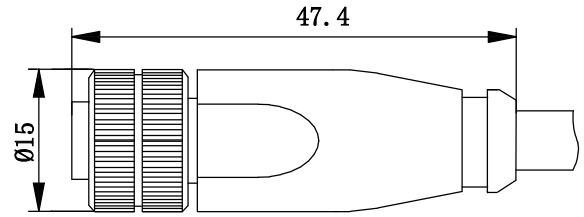
## Electrical connector X1 matching plug

According to DIN EN 175201-804, number of pins: 6+1, hole holders



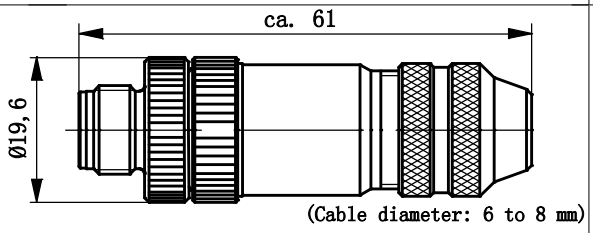
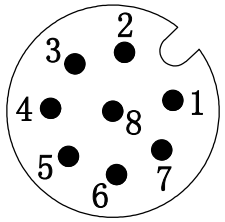
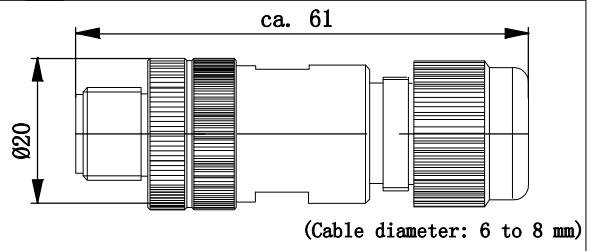
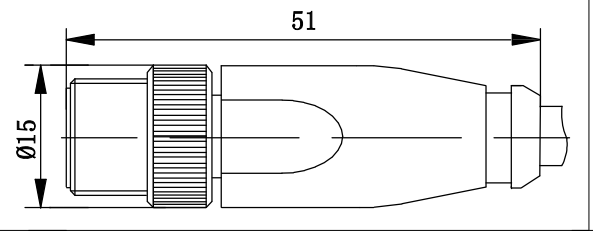

## X2 connector mating plug:

It is used to connect the input signal of analog sensors (e.g., pressure sensors, analog displacement sensors);

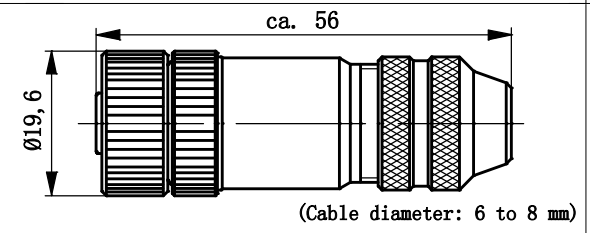
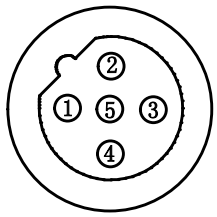
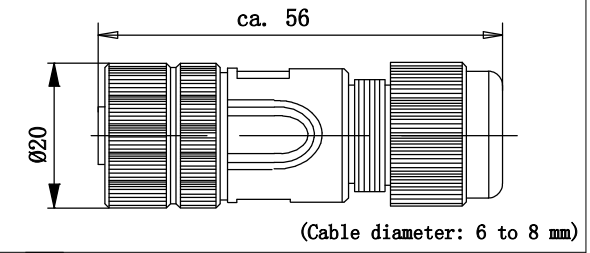
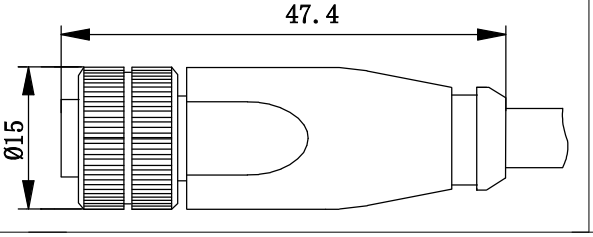
| Description | View, Dimensions (mm) | Pin distribution |
|---|---|---|
| X2 all-metal shielded, field screw crimping,<br><br>Circular connector, 8-pin, M12X1, A-coded, feed-through, Plug contact surface: jack |  <br>(Cable diameter: 6 to 8 mm) | Plug hole bitmap (A-coded)<br>  <br>Hole holder |
| X2 metal locking in plastic housing, field screw crimping,<br><br>Circular connector, 8-pin, M12X1, A-coded, feed-through, Plug contact surface: jack |  <br>(Cable diameter: 6 to 8 mm) | |
| X2 cast cable, threaded, shielded<br><br>Circular connector, 8-pin, M12X1, A-coded, feed-through, Plug contact surface: jack |  | |

# Accessories: Electrical connector matching plug (ordered separately)

The X3 connector is supplied with a plug (ordered separately) for connecting the input signal of the digital displacement sensor.

| Description | View, Dimensions (mm) | Pin distribution |
|---|---|---|
| X3 full metal shielded,<br>field screw crimping,<br><br>Circular connector, 8-pin, M12X1;<br>A-coded, straight-through;<br>Plug contact surface: Pin |  | Plug pin bit diagram (A-coded)<br>  <br>Headers |
| X3 metal locking in plastic housing,<br>field screw crimping,<br><br>Circular connector, 8-pin, M12X1,<br>A-coded, feed-through,<br>Plug contact surface: Pin |  | |
| X3 cast cable type, threaded, shielded<br><br>Circular connector, 8-pin, M12X1,<br>A-coded, feed-through,<br>Plug contact surface: Pin |  | |

Plugs for X4 and X5 connectors (ordered separately) for CAN, MODBUS, EtherNET/IP, EtherCAT and PROFINET bus connections (B-coded).

| description | View, Dimensions (mm) | Pin distribution |
|---|---|---|
| X4 and X5 all-metal shielded,<br>field screw crimping<br><br>Circular connector, 5-pin, M12X1,<br>B-coded, feed-through,<br>Plug contact surface: jack |  | Plug hole bitmap (B-coded)<br>  |
| X4 and X5 Metal locking in plastic housing, field screws crimping.<br><br>Circular connector, 5-pin, M12X1,<br>B-coded, feed-through,<br>Plug contact surface: jack |  | |
| X4 and X5 cast cables,<br>threaded, shielded<br><br>Circular connector, 5-pin, M12X1,<br>B-coded, feed-through,<br>Plug contact surface: jack |  | |