



PATRIOT

D03/D05 Directional Valves

PHD01 - PHD03

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Power Precision Performance
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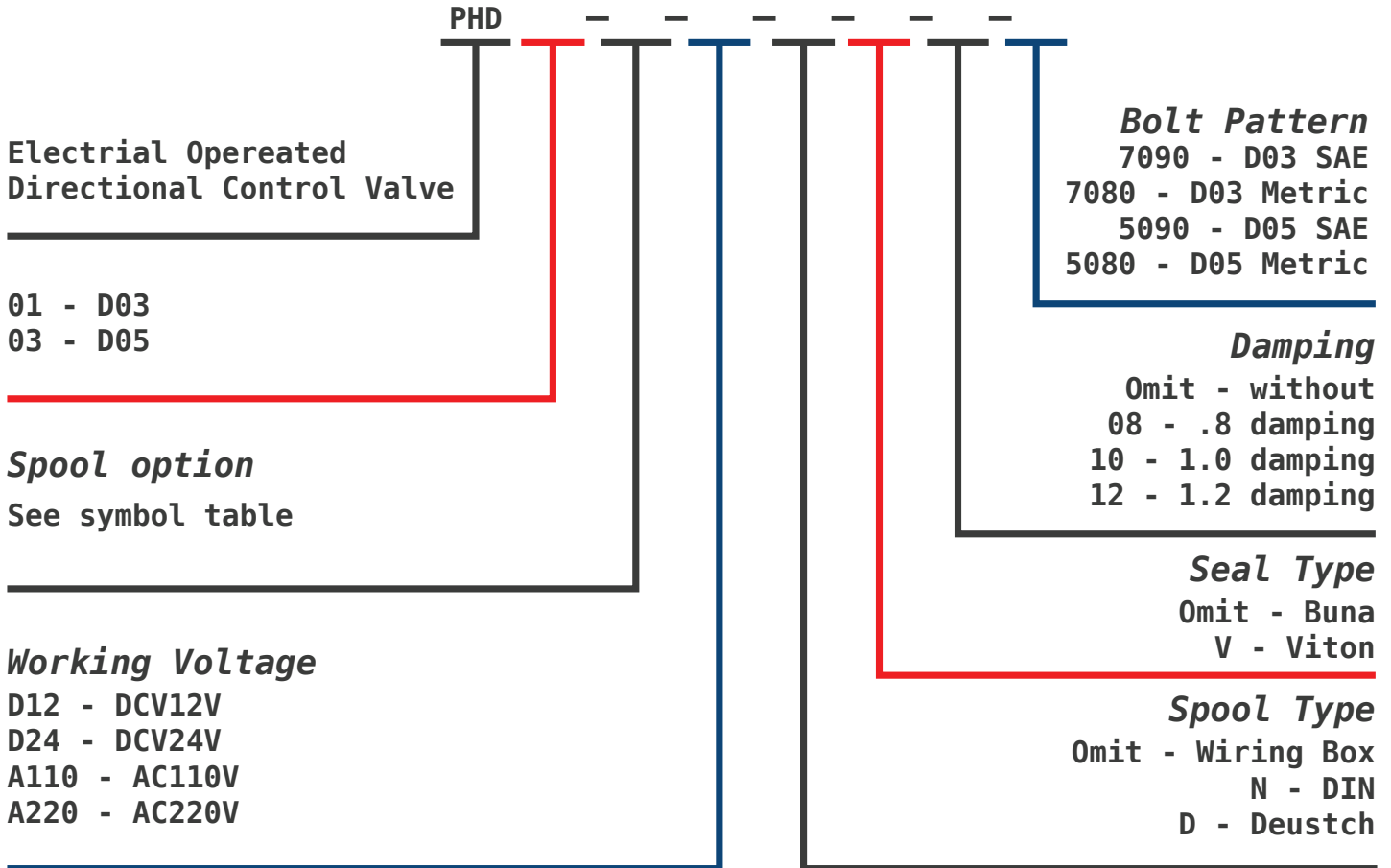
D03/D05 Technical Specification

| Specification | | D03 | | D05 | |
|-----------------------------|---|------------------------------|---------|----------|---------|
| Model | | PHD01 | | PHD03 | |
| Max. Working Pressure (PSI) | Ports P, A, B | 5075 | | 4550 | |
| | Tank Port T | 1450 | | 1450 | |
| Max. Flow | (GPM) | 20 | | 30 | |
| Working Fluid | | Mineral oil: phosphate-ester | | | |
| Fluid temp. | (°F) | -4 ~ 160 | | | |
| Viscosity | (mm ² /s) | 2.8~100 | | | |
| Working Voltage (V) | DC | 12 | | 24 | |
| | AC | 110/50Hz | | 220/50Hz | |
| Max. Switch Frequency (T/h) | | 15000(DC) | | 7200(AC) | |
| Insulation grade | | IP65 | | | |
| Weight (kg) | Single Solenoid | 1.45(DC) | 1.4(AC) | 5.1(DC) | 4.3(AC) |
| | Double Solenoid | 1.95(DC) | 1.9(AC) | 6.7(DC) | 5.1(AC) |
| Cleanliness | The minimum allowable cleanliness of the oil should be according to 9th degree of standard NAS1638. It is suggested that the minimum filter rating should be $\beta_{10} \geq 75$ | | | | |





D03/D05 Model Description





Code Symbols

Electrical Operated Directional Control Valve

Stocked Spools:

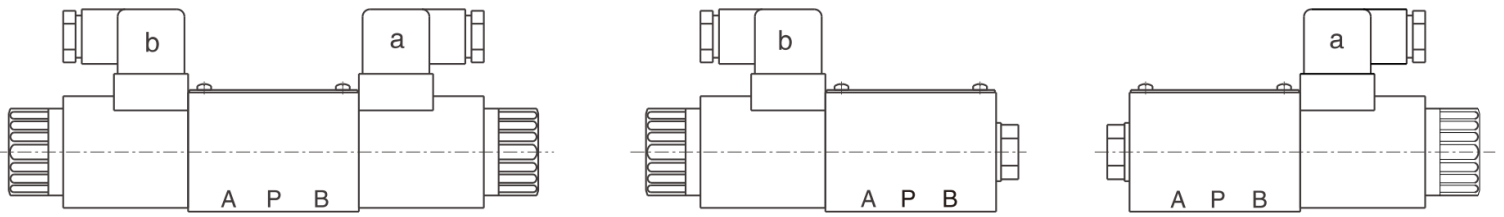
| | | | | | | | |
|------|--|-------|--|--------|--|---|--|
| 3C2 | | 2B2B | | 2B2BL | | 2B2 | |
| 3C3 | | 2B3B | | 2B3BL | | 2B3 | |
| 3C4 | | 2B4B | | 2B4BL | | 2B8 | |
| 3C5 | | 2B5B | | 2B5BL | | 2B2L | |
| 3C60 | | 2B6B | | 2B6BL | | 2B3L | |
| 3C7 | | 2B7B | | 2B7BL | | 2B8L | |
| 3C9 | | 2B9B | | 2B9BL | | With detent | |
| 3C10 | | 2B10B | | 2B10BL | | 2D2 | |
| 3C11 | | 2B11B | | 2B11BL | | 2D3 | |
| 3C12 | | 2B12B | | 2B12BL | | 2D8 | |
| 3C25 | | 2B25B | | 2B25BL | | No spring return and no detent mechanical positioning | |
| 3C29 | | 2B29B | | 2B29BL | | 2N2 | |
| | | | | | | 2N3 | |
| | | | | | | 2N8 | |

Note: *D* (No spring return mechanical positioning)
solenoid directional control valve should be installed horizontally.



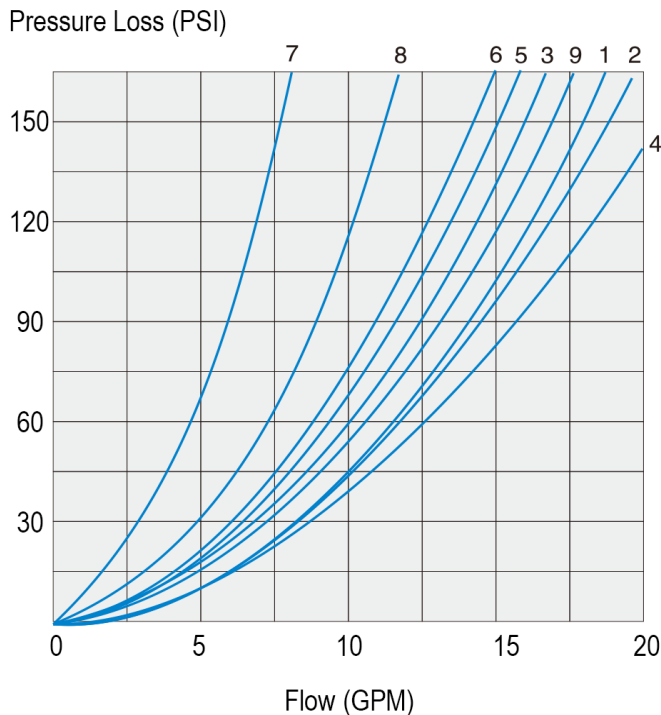


Solenoid Operation



1. a When movement a, P→A B→T
2. b When movement b, P→B A→T
3. Oil flow in the opposite direction with the above-mentioned movement for 3C5、3C6symbol Valve.

PHD01 Performance Curve



| Function code | Direction | | | |
|---------------|-----------|-----|-----|-----|
| | P→A | P→B | A→T | B→T |
| 2B8 2B8L | 3 | 3 | - | - |
| 2B3 | 1 | 1 | 3 | 1 |
| 2B2 2B2L | 5 | 5 | 3 | 3 |
| 3C2 | 3 | 3 | 1 | 1 |
| 3C5 | 1 | 3 | 1 | 1 |
| 3C6 | 6 | 6 | 9 | 9 |
| 3C3 | 2 | 4 | 2 | 2 |
| 3C4 | 1 | 1 | 2 | 1 |
| 3C10,3C12 | 3 | 3 | 4 | 9 |
| 3C9 | 2 | 3 | 3 | 3 |
| 3C25 | 3 | 1 | 1 | 1 |
| 3C29 | 5 | 5 | 4 | - |
| 3C7 | 1 | 2 | 1 | 1 |

7. Spool type "3C29" located in the control position A →B
 8. Spool symbol 3C6 in the neutral position P →T

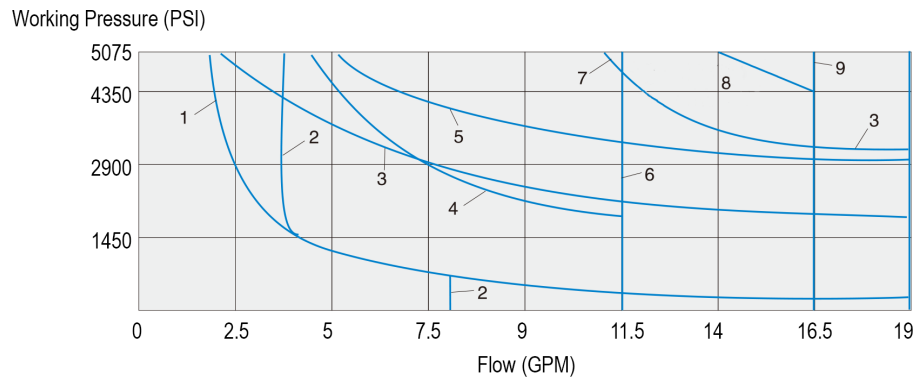




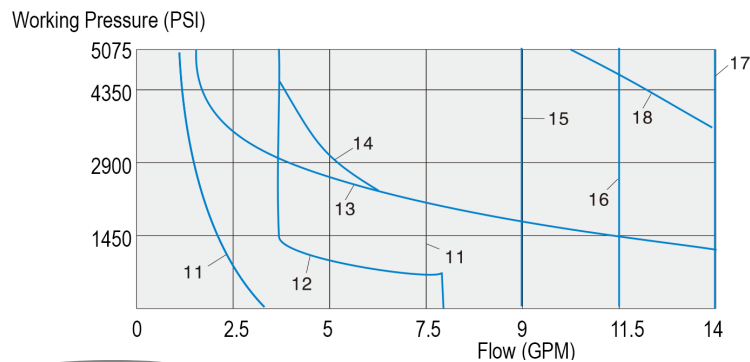
PHD01 Working Limits

With regard to the four-way valve, the normal flow data as shown is get from the regular use of two directions of the flow (e.g.P to A, and simultaneous return flow from B to T). See tables. If only one flow direction is needed, for example: When a four port valve which is closed up port A or port B, used as a three-way valve, the Maximum flow may be very small in the serious condition.

| DC solenoid operation DC D24, D1 2, B220, B110 | | AC solenoid operation AC A110, A220, 50HZ | |
|---|-----------------------------|--|----------------------|
| Curve | Symbol | Curve | Symbol |
| 1 | 2B8 2B8L1) | 11 | 2B8 2B8L1 |
| 2 | 3C7 | 12 | 3C7 |
| 3 | 2B8 2B8L | 13 | 2B8 2B8L |
| 4 | 3C5 3C25 | 14 | 3C5 3C25 |
| 5 | 3C4 | 15 | 3C6 |
| 6 | 3C6 3C3 | 16 | 3C3 |
| 7 | 2N8 2D8 3C10 3C12 | 17 | 2N8 2D8 2N3 2D3 |
| 8 | 2B3 2B2 2B2L | | 2N2 2D2 3C2 3C4 3C10 |
| 9 | 3C9 | | 3C9 3C29 3C12 |
| 10 | 3C2 3C29 2N3 2D3 2N2 2D2 | 18 | 2B3 2B2 2B2L |

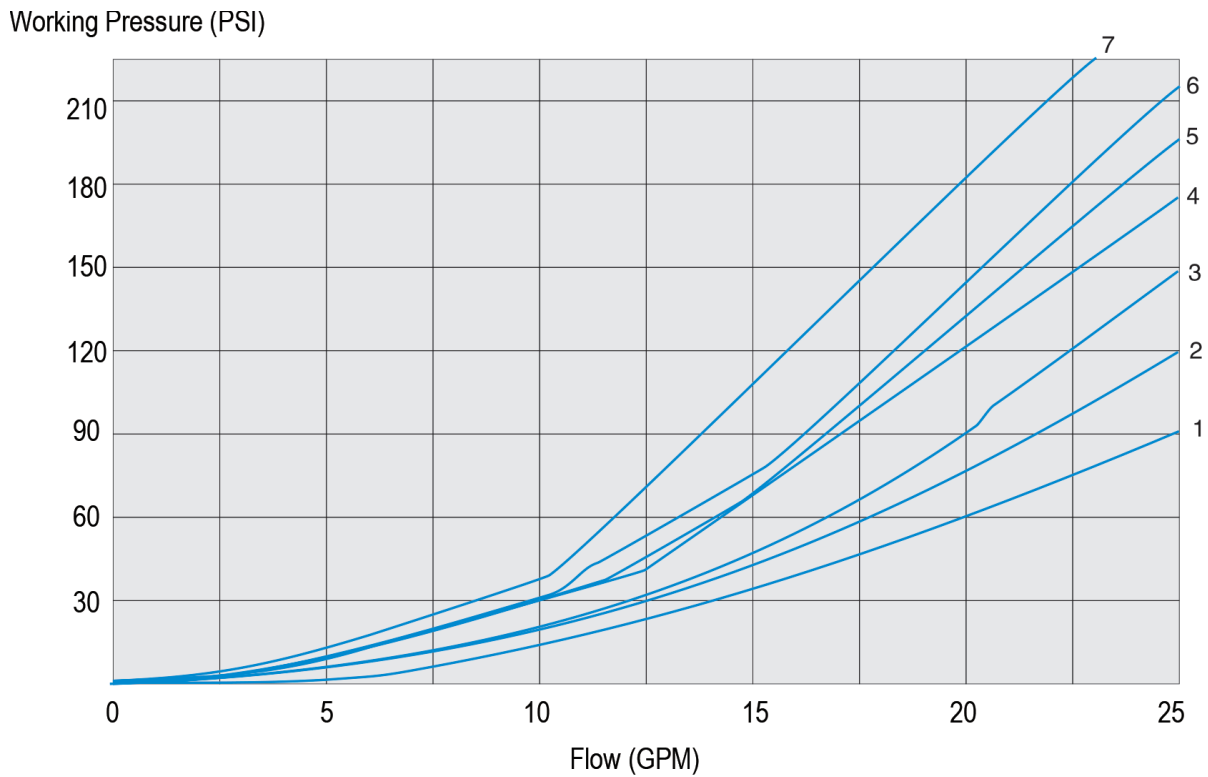


- 1) No manual emergency operation
- 2) Oil return from actuator to oil tank





PHD03 Performance Curve



| Function code | Direction | | | |
|---------------|-----------|-----|-----|-----|
| | P→A | P→B | A→T | B→T |
| 2B8 2B8L | 2 | 2 | - | - |
| 2B3 2B2 2B2L | 2 | 2 | 3 | 3 |
| 3C2 3C7 | 2 | 2 | 4 | 4 |
| 3C5 | 2 | 3 | 3 | 5 |
| 3C6 | 3 | 3 | 4 | 6 |
| 3C3 | 1 | 1 | 4 | 5 |
| 3C10 3C12 | 2 | 2 | 3 | 5 |
| 3C9 | 1 | 1 | 5 | 1 |
| 3C25 | 3 | 2 | 5 | 3 |
| 3C29 | 2 | 4 | 3 | - |

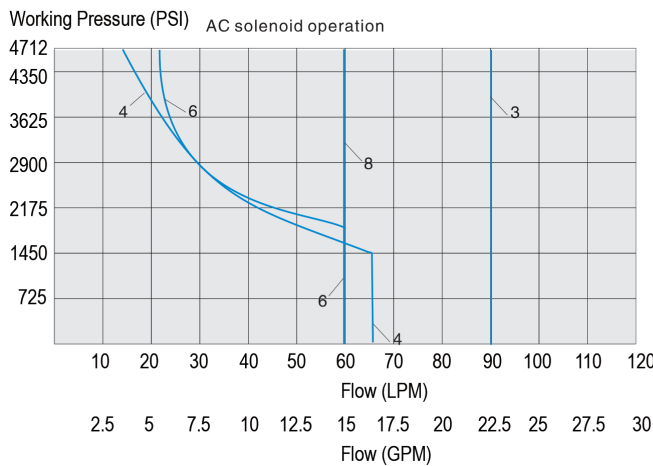
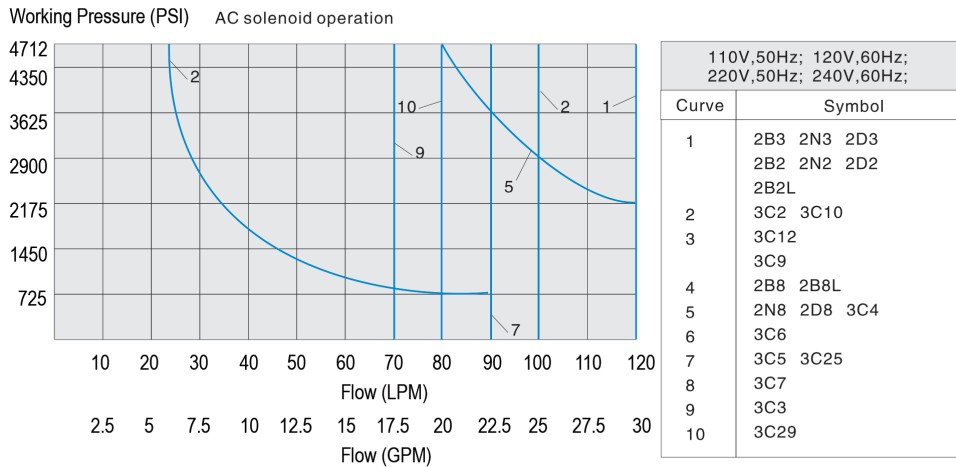
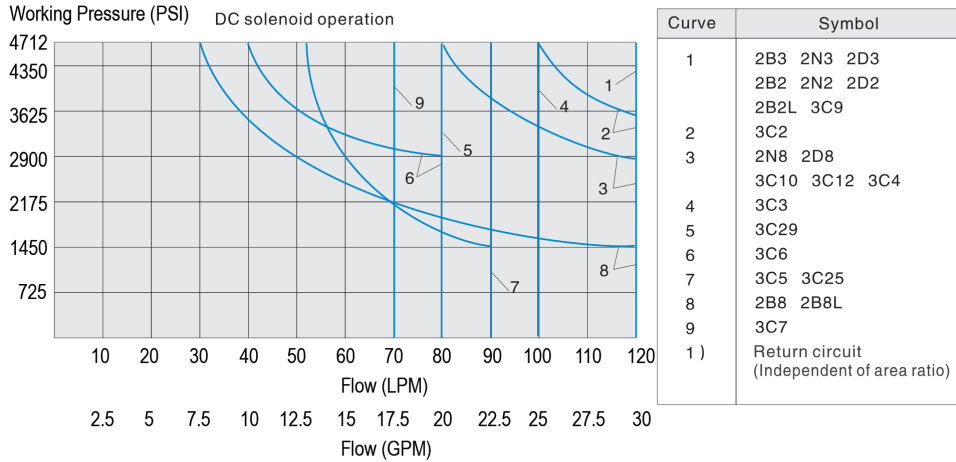
7. Spool symbol "3C29" in the shifting position A → B
 4. Spool symbol 3C6 in neutral position P → T



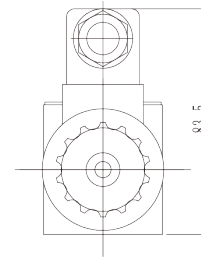
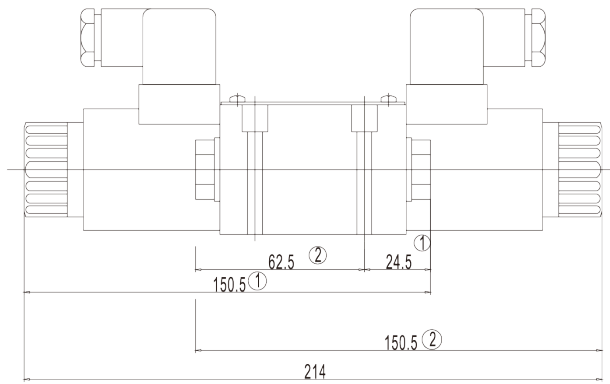


PHD03 Working Limits

With regard to the four-way valve, the normal flow data as shown is get from the regular use of two directions of the flow (e.g. P to A, and simultaneous return flow from B to T). See tables. If only one flow direction is needed, for example: When a four port valve which is closed up port A or port B, used as a three-way valve, the Maximum flow may be very small in the serious condition.

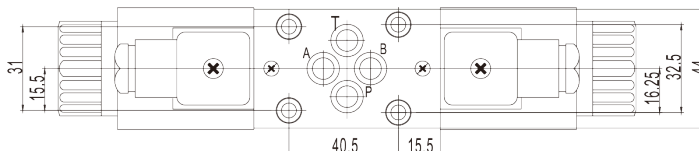


PHD01 DC Plug type

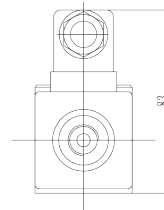
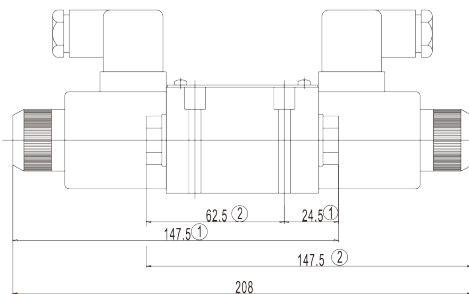


① ②

Two positions Electrical operated directional control valve

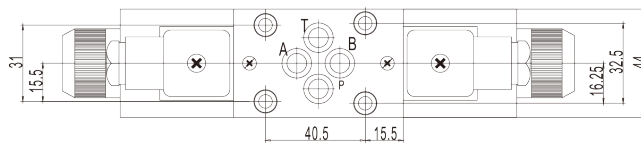


PHD01 DC Wire Box



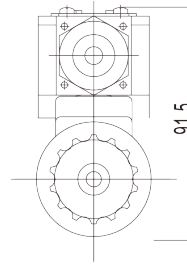
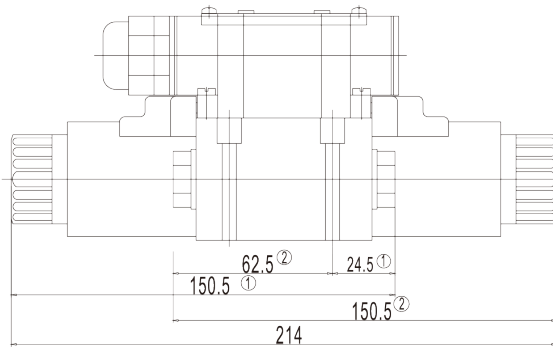
① ②

Two positions Electrical operated directional control valve



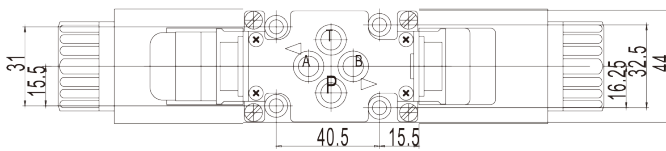


PHD01 AC Plug Type

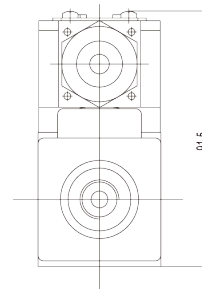
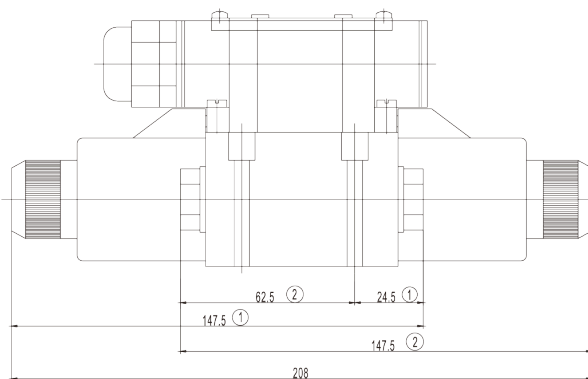


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Two positions Electrical operated directional control valve

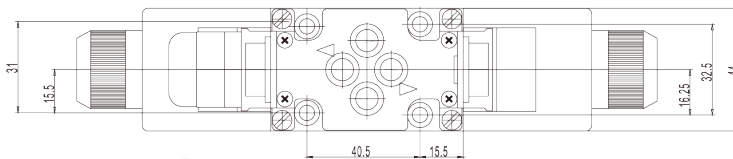


PHD01 AC Wire Box

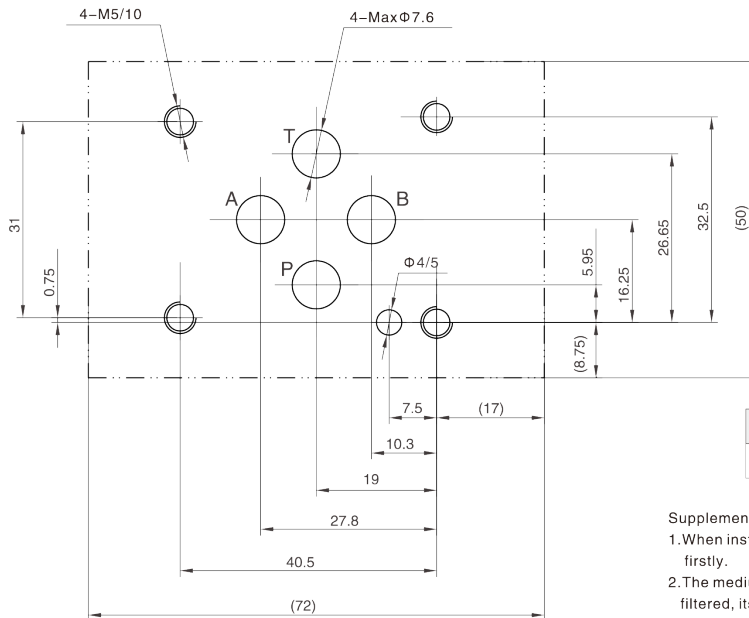


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Two positions Electrical operated directional control valve



PHD01 Subplate Oil Port

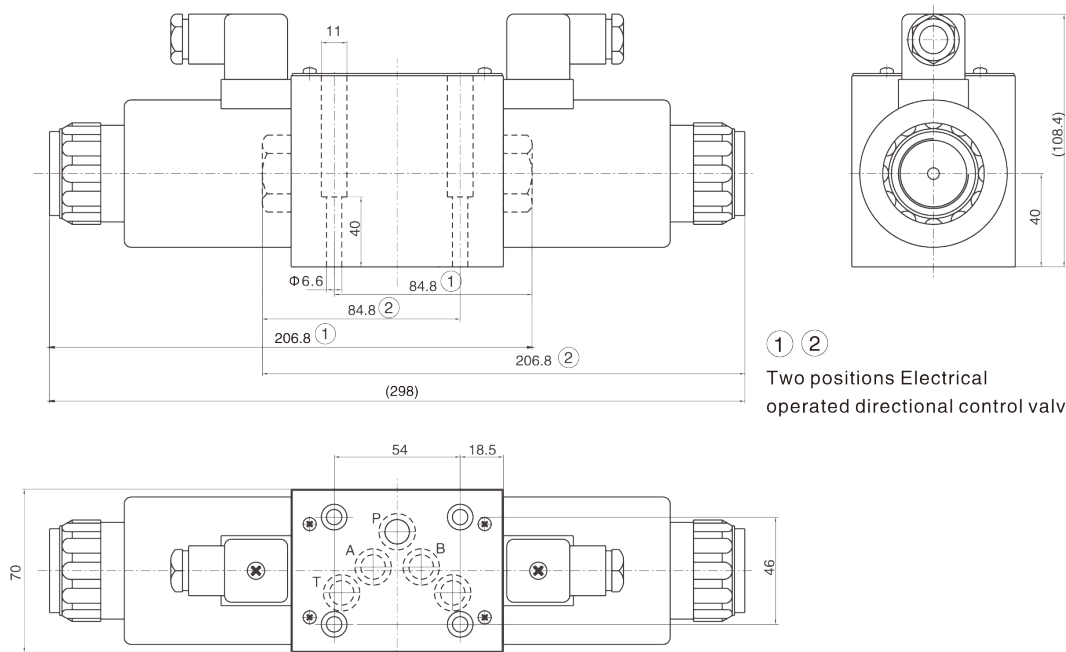


| Mounting screw | Amount | Tighten torque |
|----------------|--------|----------------|
| M5x45-10.9 | 4 | 9Nm |

Supplementary explanation

1. When installing the product, considering horizontal position firstly.
2. The medium used in the hydraulic system must be filtered, its accuracy at least $20 \mu\text{m}$.
3. Screw should be according to the parameters in catalogue.
4. The surface, connecting with the valve, should be Ra0.8 roughness, and 0.01/100mm flatness.

PHD03 DC Plug Type

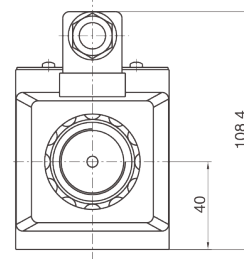
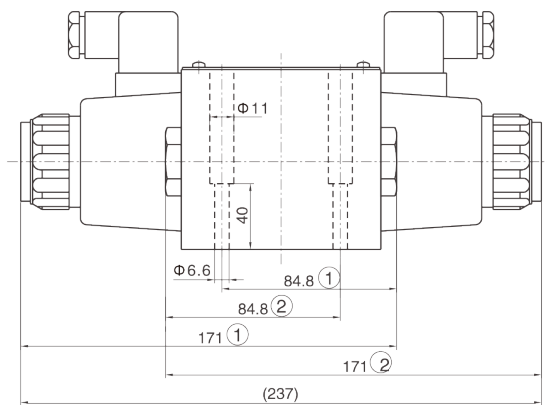


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Two positions Electrical operated directional control valve

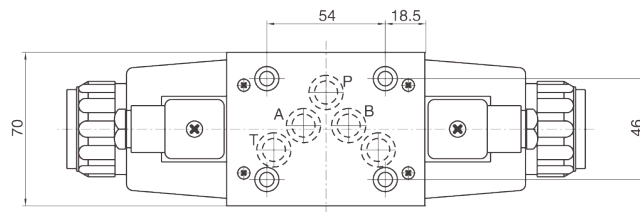


PHD03 AC Plug Type

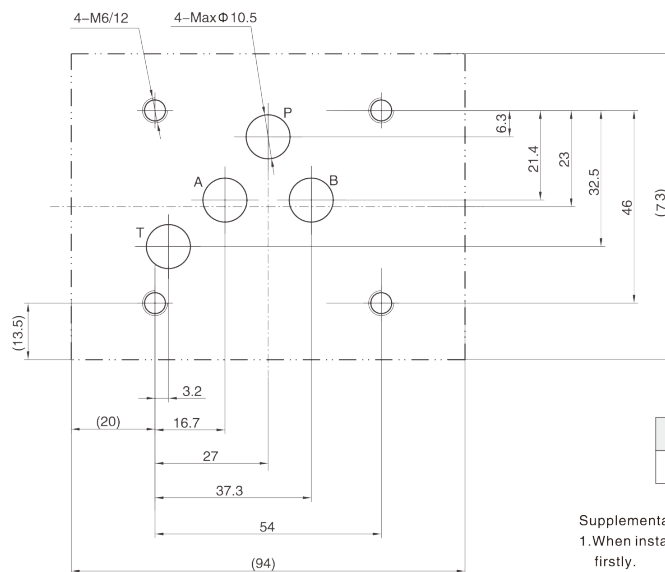


① ②

Two positions Electrical operated directional control valve



PHD03 Subplate oil port



| Mounting screw | Amount | Tighten torque |
|----------------|--------|----------------|
| M6X50-10.9 | 4 | 15Nm |

Supplementary explanation

1. When installing the product, considering horizontal position firstly.
2. The medium used in the hydraulic system must be filtered, its accuracy is at least $20\ \mu\text{m}$.
3. Screw should be according to the parameters in catalogue.
4. The surface, connecting with the valve, should be Ra0.8 roughness, and 0.01/100mm flatness.

Wiring Diagram

