

Manual operated directional control valve

Technical Data

Technical Specification

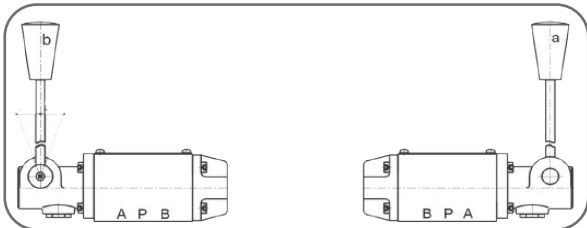


| Specification | | 02 | 03 | 04 | 06 |
|--------------------------------|------------|---|-----------|---------|----------|
| Working pressure (MPa) | Port P,A,B | 31.5 | | | |
| | Port T | 10 | | | |
| Max.Flow (L/min) | | 60 | 100 | 300 | 450 |
| Working fluid | | Mineral oil ; phosphate-ester | | | |
| Fluid temp. (°C) | | -20 - 70 | | | |
| Viscosity (mm ² /s) | | 2.8 - 380 | | | |
| Weight (kg) | | About 1.4 | About 3.3 | About 8 | About 17 |
| Cleanliness | | The maximum allowable cleanliness of the oil should be according to 9th degree of Standart NAS 1638.It is suggested that the minimum filter rating should be $\beta_{10} \geq 75$. | | | |

Manual operated directional control valve is a directional control valve,by operating the handle,the spool moves in the axial direction to achieve oil loop switching.

Manual operated directional control valve and electrical operated directional control valve are played the same role in the hydraulic system. Easy operation, reliable work, and without the need for electricity.

The relationship between the location of the handle and the direction of the oil flow



- 1.The name of the handle as shown in the picture
- 2.When the handle is on position b P A B T
- 3.When the handle is on position a P B A T
- 4.Oil flow in the opposite direction with the above - mentioned movement for 02/03:3C5,3C6.
Oil flow in the opposite direction with the above - mentioned movement for 04/06:3C6.
- 5.The location of the handle is different according to the function.It may be at A or B.Details outline for 03/04/06.

Model description

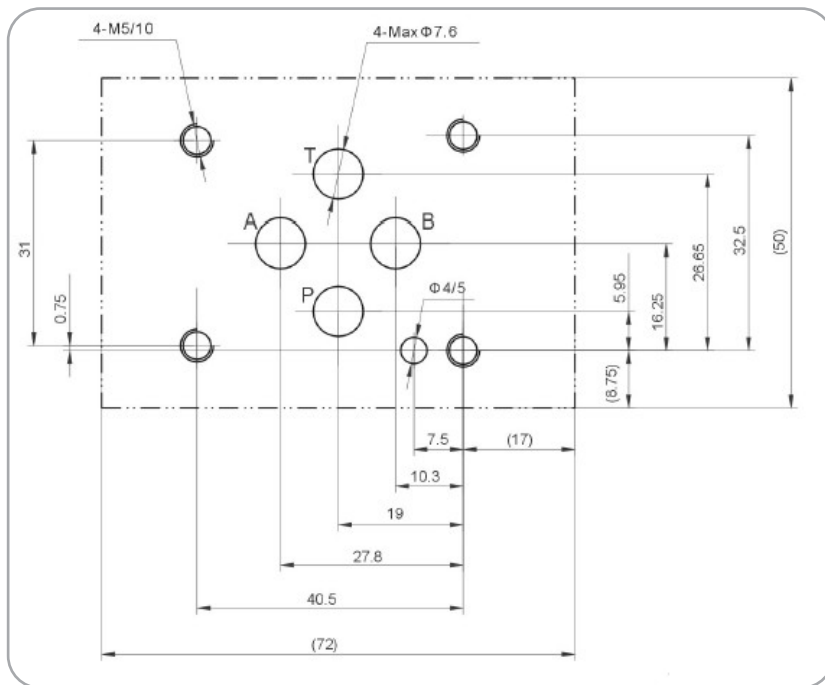
FS - * - * / * * * 50 *

| | |
|--|--|
| <p>Manual operated directional control valve</p> <p>Specification 02 NS 6 03 NS 10 04 NS 16 06 NS 25</p> <p>Function code Details as following symbol table</p> <p>Omit Spring return OF With detent</p> | <p>Remarks</p> <p>Serial number</p> <p>Serial material Omit NBR Seals V FPM Seals</p> <p>Omit without damping 08 $\phi 0.8$ Damping 10 $\phi 1.0$ Damping 12 $\phi 1.2$ Damping</p> |
|--|--|

Manual operated directional control valve is a directional control valve, by operating the handle, the spool moves in the axial direction to achieve oil loop switching.Manual operated directional control valve and electrical operated directional control valve are played same role in the hydraulic system. Easy operation, reliable work,and without the need for electricity.

Structure and Function Description

02 Size of subplate oil port

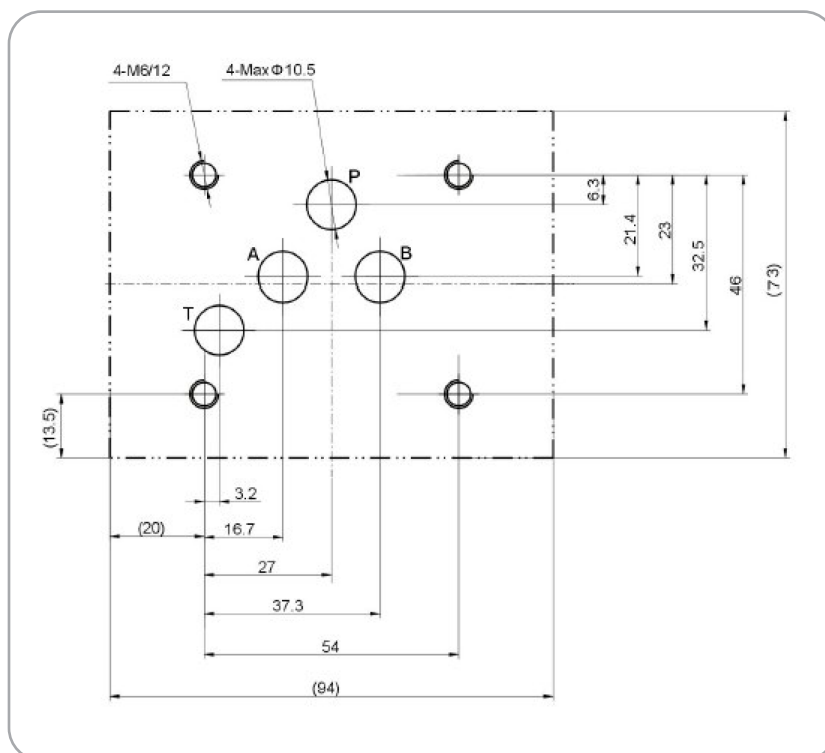


Supplementary explanation

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 20μ m.
3. Screw should be according to the parameters in catalogue.
4. The surface, connecting with the valve, should be Ra 0.8 roughness, and 0.01/100mm flatness.

| Mounting screw | Amount | Tighten torque |
|----------------|--------|----------------|
| M5x50-10.9 | 4 | 9Nm |

03 Size of subplate oil port



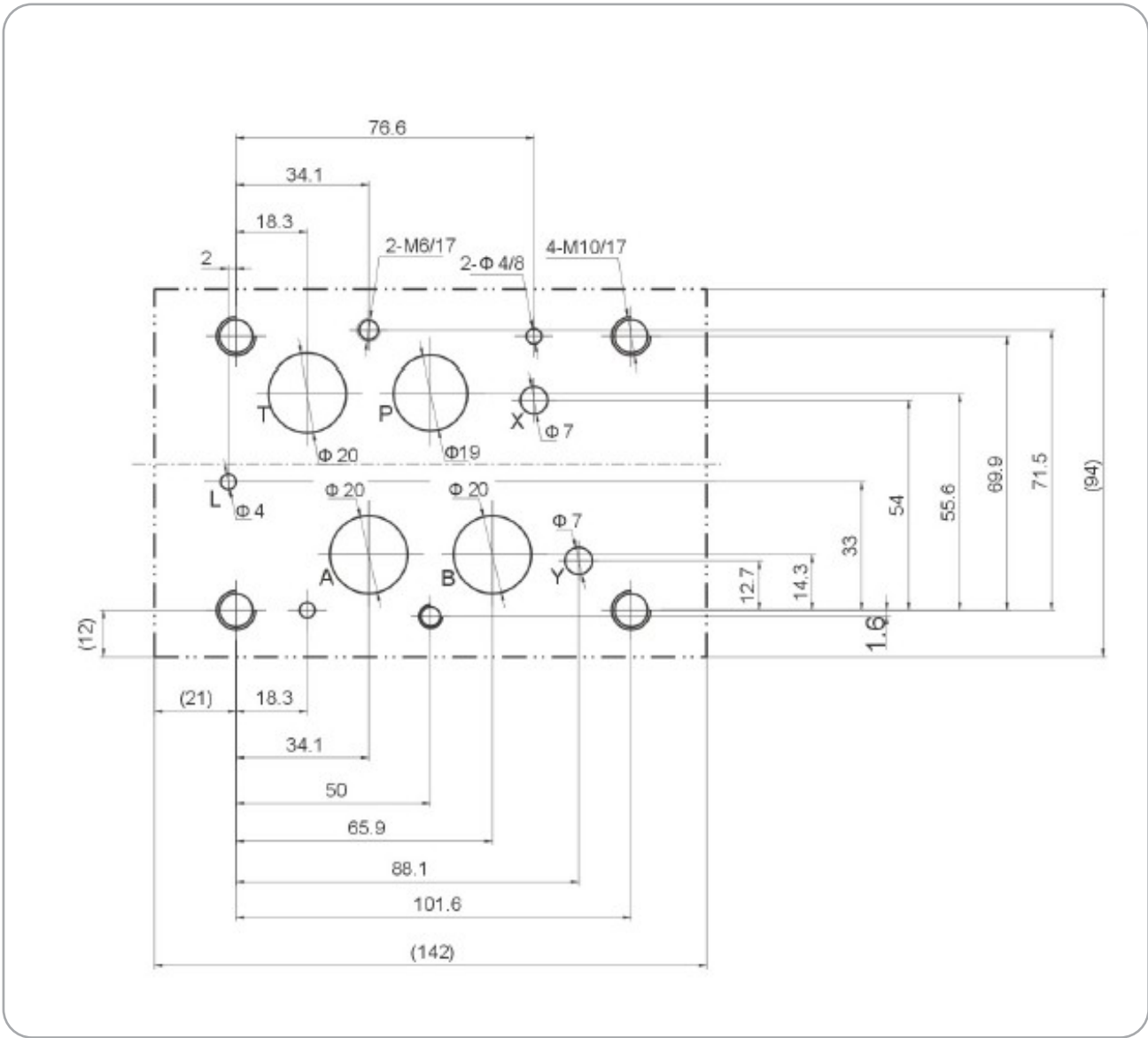
Supplementary explanation

1. When installing the product, considering horizontal position firstly.
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3. Screw should be according to the parameters in catalogue.
4. The surface, connecting with the valve, should be Ra 0.8 roughness, and 0.01/100mm flatness.

| Mounting screw | Amount | Tighten torque |
|----------------|--------|----------------|
| M6x50-10.9 | 4 | 15Nm |

Structure and Function Description

04 Size of subplate oil port

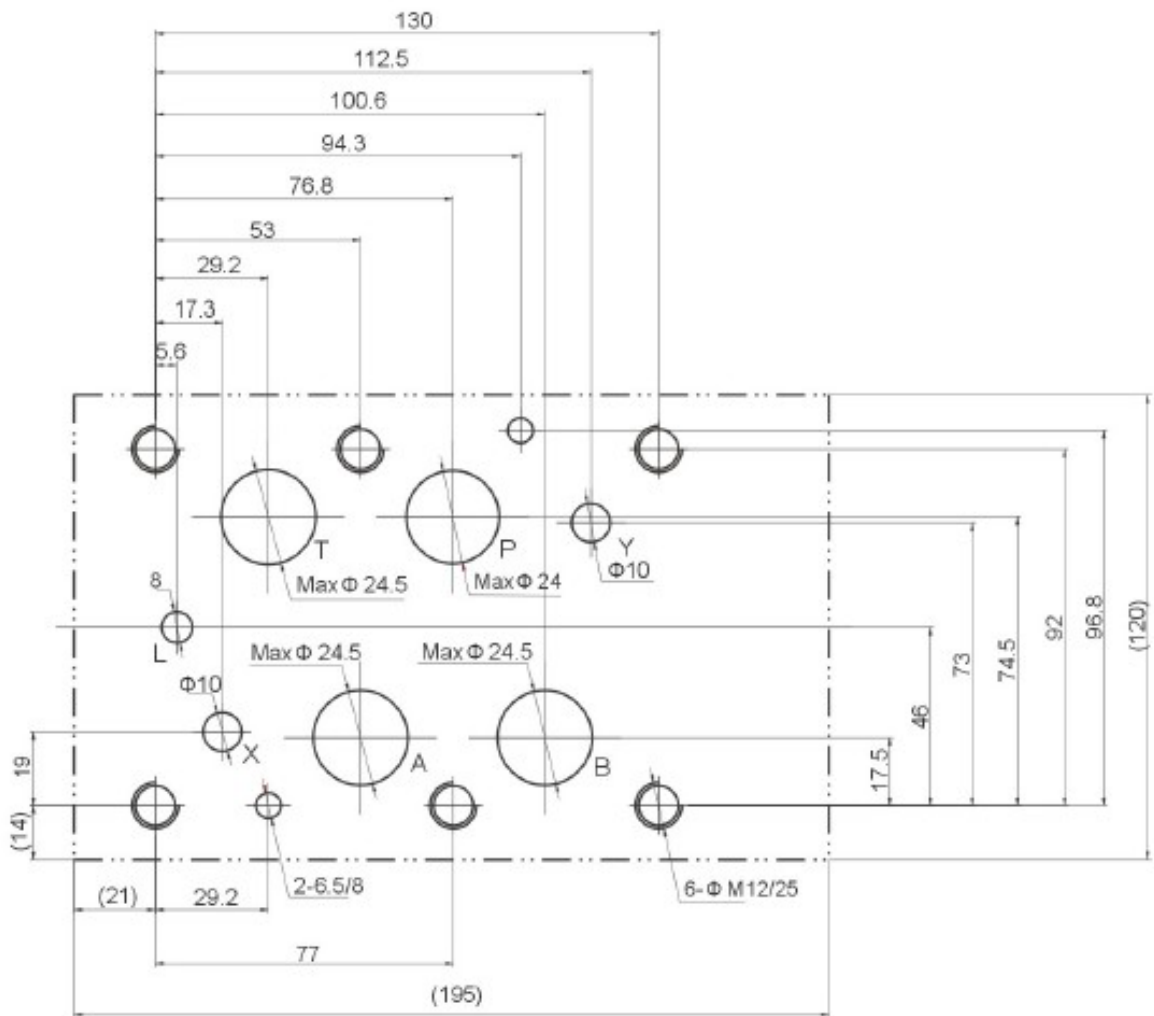


- Supplementary explanation
1. When installing the product, considering horizontal position firstly.
 2. The medium used in the hydraulic system must be filtered, its accuracy is at least 20 μm.
 3. Screw should be according to the parameters in catalogue.
 4. The surface, connecting with the valve, should be Ra 0.8 roughness, and 0.01/100mm flatness.

| Mounting screw | Amount | Tighten torque |
|----------------|--------|----------------|
| M6x55-10.9 | 2 | 15Nm |
| M10x60-10.9 | 4 | 75Nm |

Structure and Function Description

06 Size of subplate oil port



Supplementary explanation

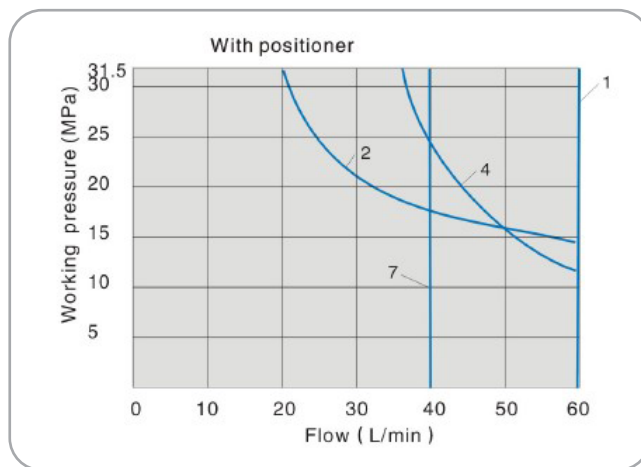
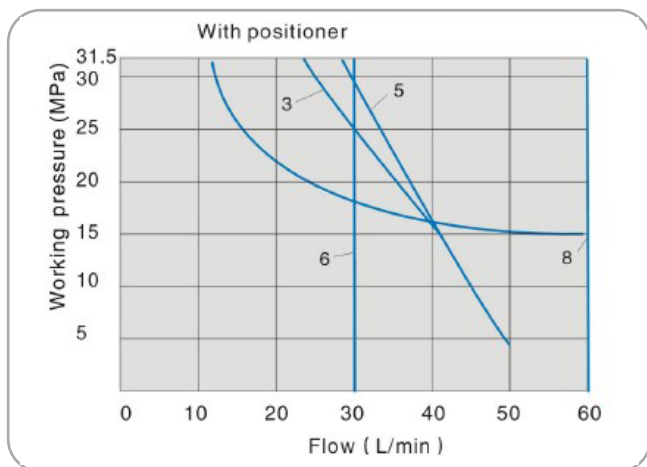
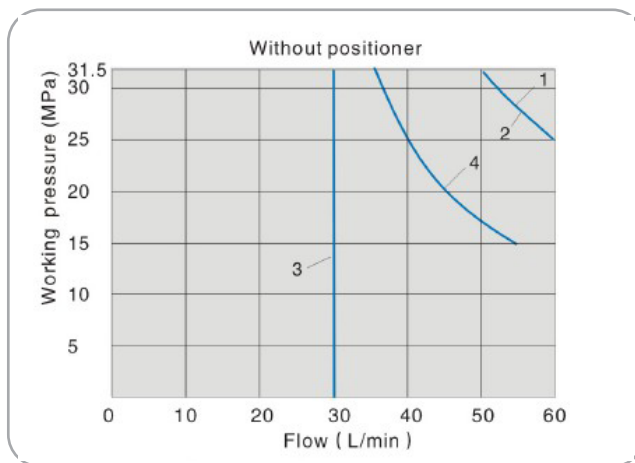
1. When installing the product, considering horizontal position firstly.
2. The medium used in the hydraulic system must be filtered, its accuracy is at least 20 μ m.
3. Screw should be according to the parameters in catalogue.
4. The surface, connecting with the valve, should be Ra 0.8 roughness, and 0.01/100mm flatness.

| Mounting screw | Amount | Tighten torque |
|----------------|--------|----------------|
| M12x60-10.9 | 6 | 130Nm |

02 Specification Working limits

(The working limits for directional valve have determined by using solenoids at the irorparating temperature,10% under voltage and with no pre-loading of the tank.)

As the plug,the switch function of the valve is determined by the filter.In order to reach the largest the flow as shown,we suggest to use full-flow filter 20 μ m.Every force on the valve can also affect the flow.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 as a three-way valve,thee Maximum flow may be very small in the serious condition.

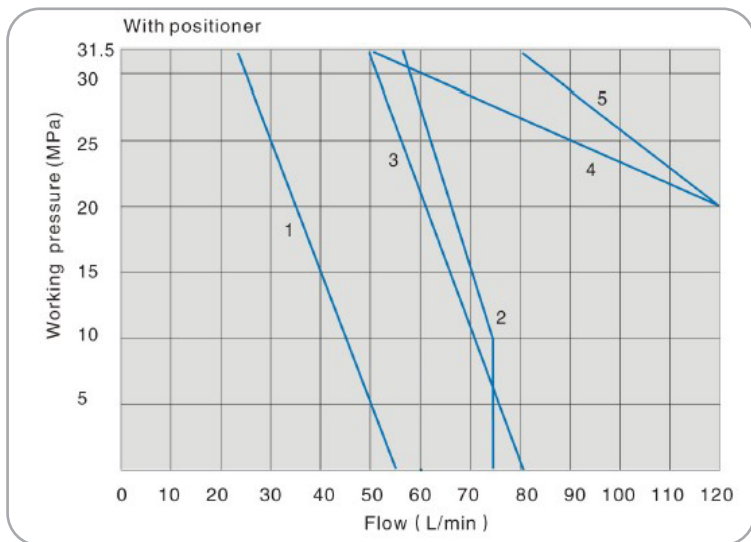


- 4.Spool symbol "3C6" in the median position P to T
- 7.Spool symbol "3C29" in the control position A to B

| Performance curve | Function code | Performance curve | Function code | |
|-------------------|---------------|-------------------|---------------|---|
| With positioner | 1 | With positioner | 1 | |
| | 2 | | 2 | |
| | 3 | | 3 | |
| | 4 | | 4 | |
| | | | | 5 |
| | | | | 6 |
| | | | | 7 |
| | | | | 8 |

03 Specification Working limits

(The working limits for directional valve have determined by using solenoids at the iroparing temperature,10% under voltage and with no pre-loading of the tank.)



| Performance curve | Function code |
|-------------------|--------------------------|
| 1 | 2B8 2B8L |
| 2 | 3C3 |
| 3 | 3C5 3C6 3C25 3C29 |
| 4 | 3C4 3C12 3C10 |
| 5 | 2B2 2B3 3C2 3C9 3C7 2B2L |

04 Specification Working limits

(The working limits for directional valve have determined by using solenoids at the iroparing temperature,10% under voltage and with no pre-loading of the tank.)

| two-way valve With positioner | | | | | |
|----------------------------------|------------------------|-----|-----|-----|-----|
| Function code | Working pressure (MPa) | | | | |
| | 7 | 14 | 21 | 28 | 35 |
| | Flow (L/min) | | | | |
| 2B3 | 300 | 300 | 300 | 260 | 220 |
| 2B2 | 300 | 300 | 210 | 190 | 160 |

| two-way valve With positioner | | | | | |
|----------------------------------|------------------------|-----|-----|-----|-----|
| Function code | Working pressure (MPa) | | | | |
| | 7 | 14 | 21 | 28 | 35 |
| | Flow (L/min) | | | | |
| 2B3 | 300 | 300 | 300 | 260 | 220 |
| 2B2 | 300 | 300 | 210 | 190 | 160 |

| two-way valve With positioner | | | | | |
|-----------------------------------|------------------------|-----|-----|-----|-----|
| Function code | Working pressure (MPa) | | | | |
| | 7 | 14 | 21 | 28 | 35 |
| | Flow (L/min) | | | | |
| 3C2 3C3 3C4 3C12 3C9 3C29 3C10 | 300 | 300 | 300 | 300 | 300 |
| 3C5 3C25 | 300 | 300 | 210 | 190 | 170 |
| 3C6 | 300 | 300 | 220 | 210 | 180 |
| 3C7 | 300 | 260 | 200 | 180 | 170 |

| two-way valve With positioner | | | | | |
|-----------------------------------|------------------------|-----|-----|-----|-----|
| Function code | Working pressure (MPa) | | | | |
| | 7 | 14 | 21 | 28 | 35 |
| | Flow (L/min) | | | | |
| 3C2 3C3 3C4 3C12 3C9 3C29 3C10 | 300 | 300 | 300 | 300 | 300 |
| 3C5 3C25 | 300 | 300 | 280 | 230 | 230 |
| 3C6 | 300 | 300 | 230 | 230 | 230 |
| 3C7 | 300 | 300 | 250 | 230 | 230 |

06 Specification Working limits

(The working limits for directional valve have determined by using solenoids at the irparingating temperature,10% under voltage and with no pre-loading of the tank.)

| two-way valve With positioner | | | | | |
|----------------------------------|------------------------|-----|-----|-----|-----|
| Function code | Working pressure (MPa) | | | | |
| | 7 | 14 | 21 | 28 | 35 |
| | Flow (L/min) | | | | |
| 2B3 | 450 | 300 | 250 | 200 | 180 |
| 2B2 | 350 | 300 | 275 | 250 | 200 |

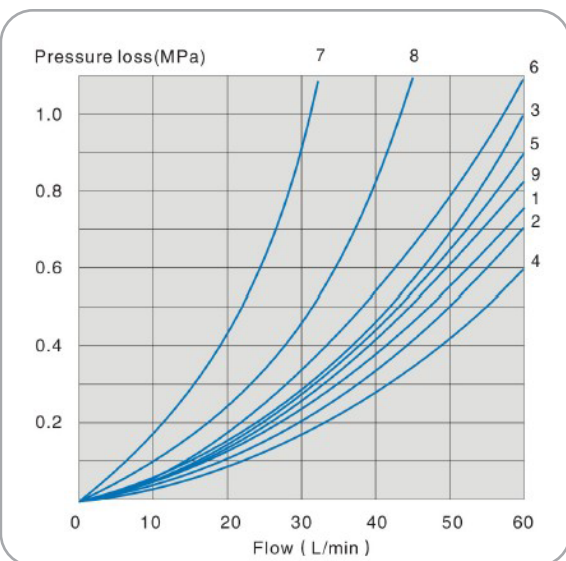
| two-way valve With positioner | | | | | |
|----------------------------------|------------------------|-----|-----|-----|-----|
| Function code | Working pressure (MPa) | | | | |
| | 7 | 14 | 21 | 28 | 35 |
| | Flow (L/min) | | | | |
| 2B3 2B2 | 450 | 450 | 450 | 450 | 450 |

| two-way valve With positioner | | | | | |
|-----------------------------------|------------------------|-----|-----|-----|-----|
| Function code | Working pressure (MPa) | | | | |
| | 7 | 14 | 21 | 28 | 35 |
| | Flow (L/min) | | | | |
| 3C2 3C3 3C4 3C12 3C9 3C29 3C10 | 450 | 450 | 450 | 450 | 450 |
| 3C5 | 450 | 250 | 200 | 135 | 110 |
| 3C6 | 450 | 330 | 290 | 230 | 180 |
| 3C3 | 450 | 450 | 400 | 400 | 350 |
| 3C25 | 450 | 310 | 240 | 215 | 150 |
| 3C7 | 450 | 310 | 280 | 270 | 200 |

| two-way valve With positioner | | | | | |
|---|------------------------|-----|-----|-----|-----|
| Function code | Working pressure (MPa) | | | | |
| | 7 | 14 | 21 | 28 | 35 |
| | Flow (L/min) | | | | |
| 3C2 3C5 3C6 3C3 3C4 3C10 3C9 3C25 3C29 3C12 | 450 | 450 | 450 | 450 | 450 |
| 3C7 | 450 | 450 | 400 | 350 | 300 |

Characteristic Curves

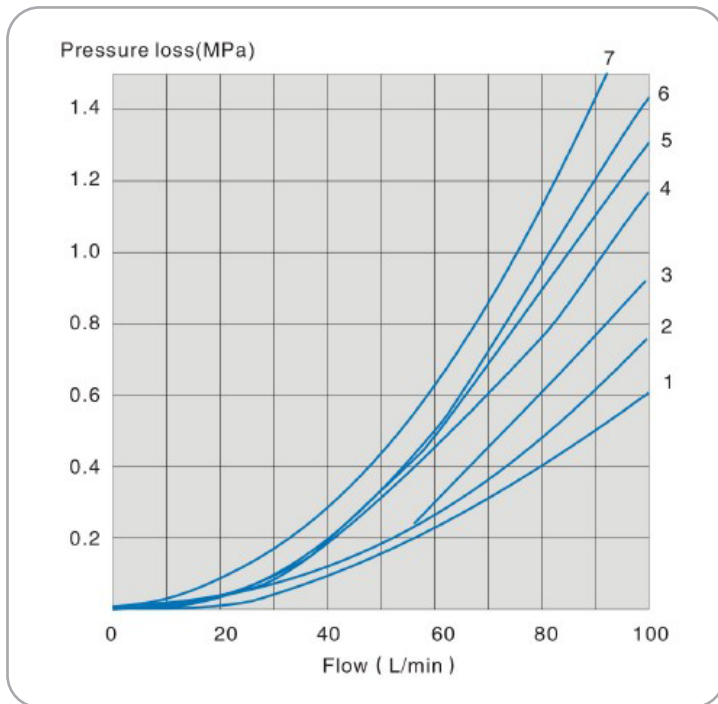
02 Specification Performance curve (Measured at $u=41 \text{ mm}^2/\text{s}$ and $t=50^\circ\text{C}$)



| Function code | Direction | | | |
|---------------|-----------|---|-------|-------|
| | P | A | P → B | A → 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 |
| 3C8 | 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

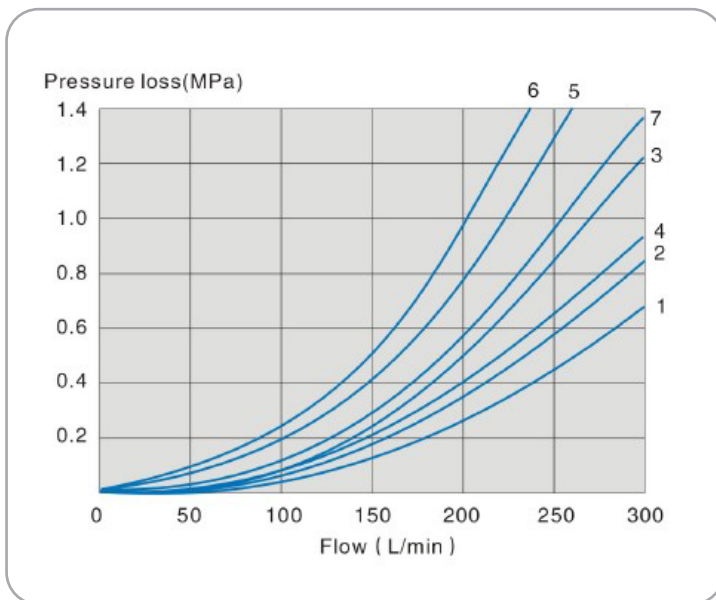
03 Specification Performance curve (Measured at $u=41 \text{ mm}^2/\text{s}$ and $t=50^\circ\text{C}$)



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

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

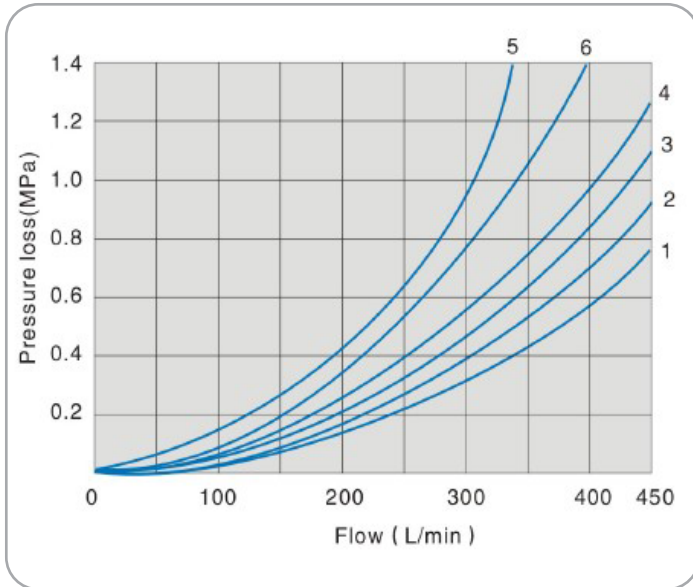
04 Specification Performance curve (Measured at $u=41 \text{ mm}^2/\text{s}$ and $t=50^\circ\text{C}$)



| Function code | Direction | | | |
|---------------|-----------|-----|-----|-----|
| | P→A | P→B | A→T | B→T |
| 3C2 2B2 2B2L | 1 | 1 | 1 | 3 |
| 3C5 | 2 | 2 | 3 | 3 |
| 3C6 | 5 | 1 | 3 | 7 |
| 3C3 2B3 | 2 | 2 | 3 | 3 |
| 3C7 | 2 | 2 | 3 | 3 |
| 3C4 3C12 | 1 | 1 | 3 | 3 |
| 3C29 | 2 | 2 | 4 | - |
| 3C10 | 2 | 2 | 4 | - |
| 3C | 1 | 1 | 4 | 7 |

4.Spool symbol 3C6 in the neutral position P→T

06 Specification Performance curve (Measured at $u=41 \text{ mm}^2/\text{s}$ and $t=50^\circ\text{C}$)

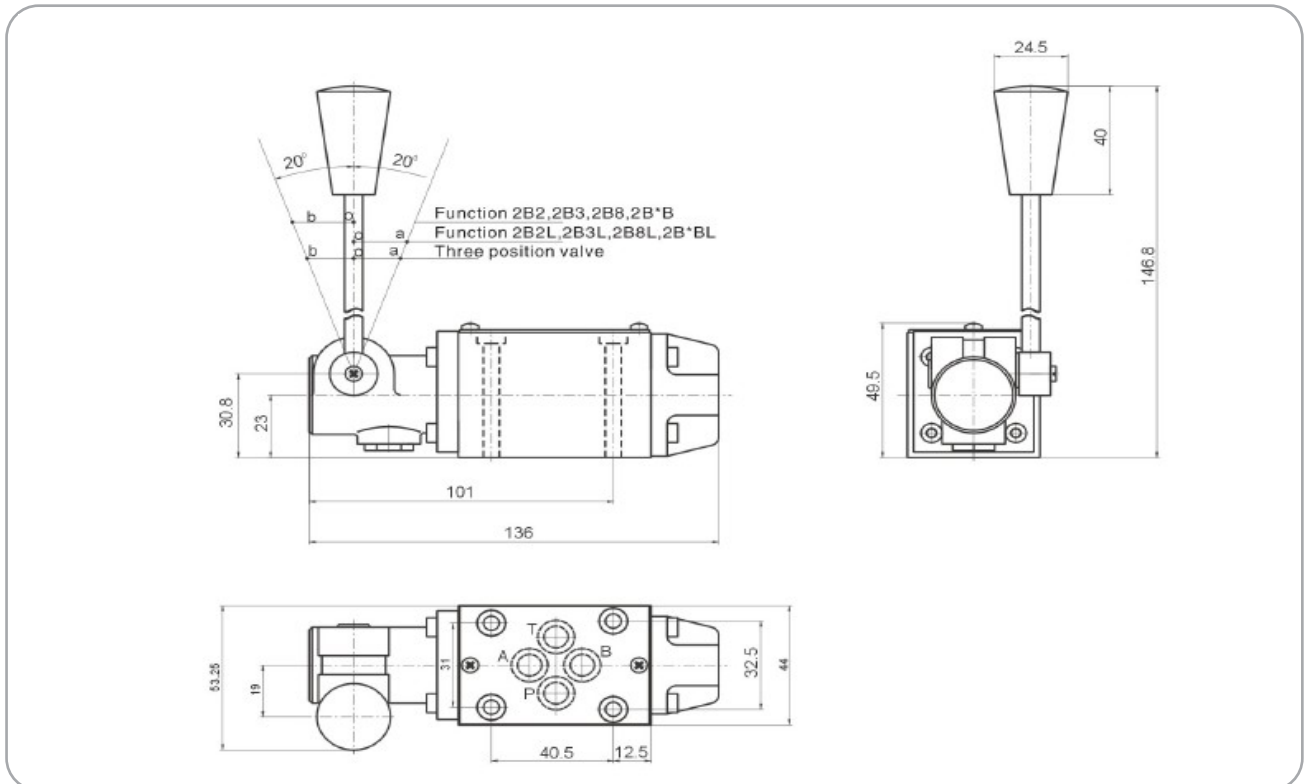


7.Spool type "3C12" located in the control positon A→T.
4.Spool symbol "3C10" in the neutral position B→T

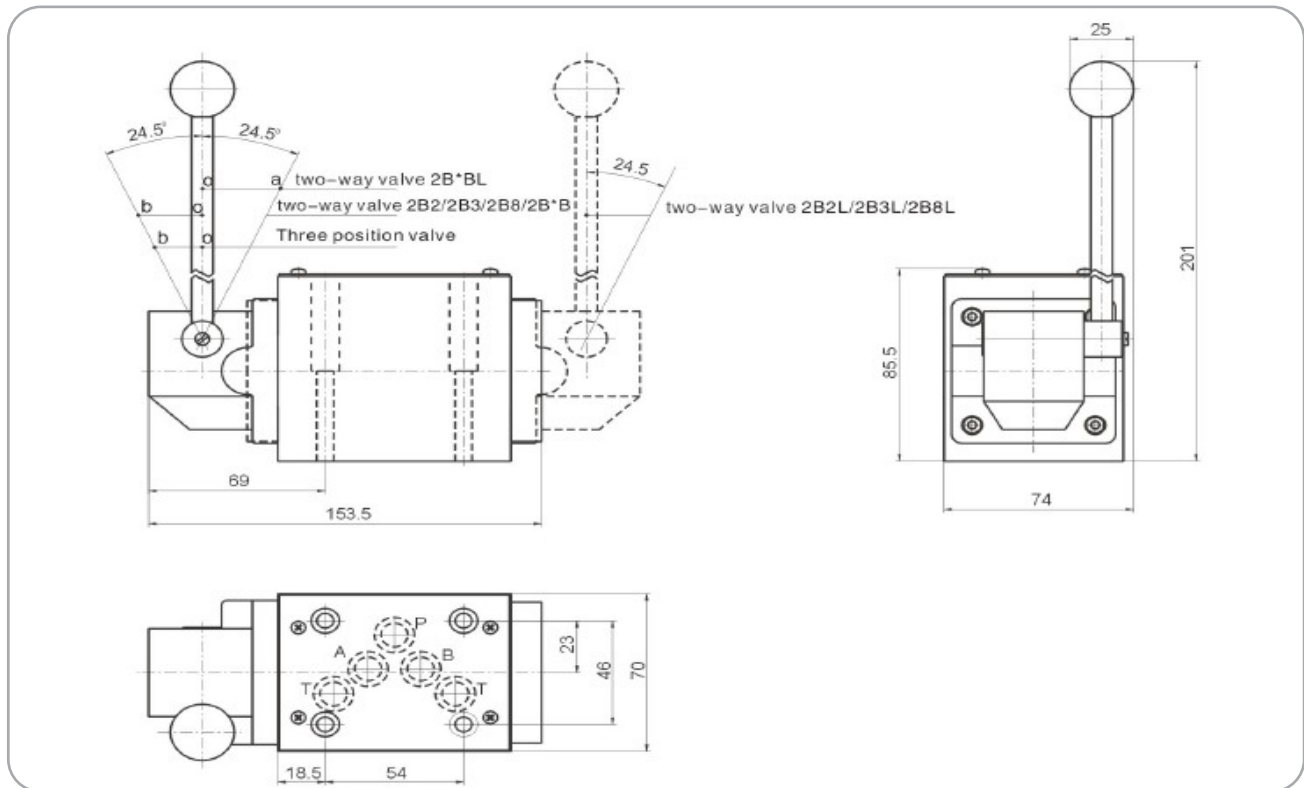
| Function code | Direction | | | |
|---------------|-----------|-----|-----|-----|
| | P→A | P→B | A→T | B→T |
| 3C2 | 2 | 2 | 1 | 4 |
| 3C5 | 1 | 2 | 1 | 2 |
| 3C6 | 2 | 2 | 2 | 4 |
| 3C3 | 2 | 2 | 1 | 3 |
| 3C4 | 2 | 2 | 1 | 3 |
| 3C12 | 1 | 2 | 1 | 2 |
| 3C9 | 2 | 2 | 1 | 4 |
| 3C25 | 2 | 2 | 1 | 4 |
| 3C29 | 1 | 2 | 1 | - |
| 3C10 | 2 | 2 | 1 | 4 |
| 3C7 | 2 | 2 | 1 | 4 |

Unit Dimension

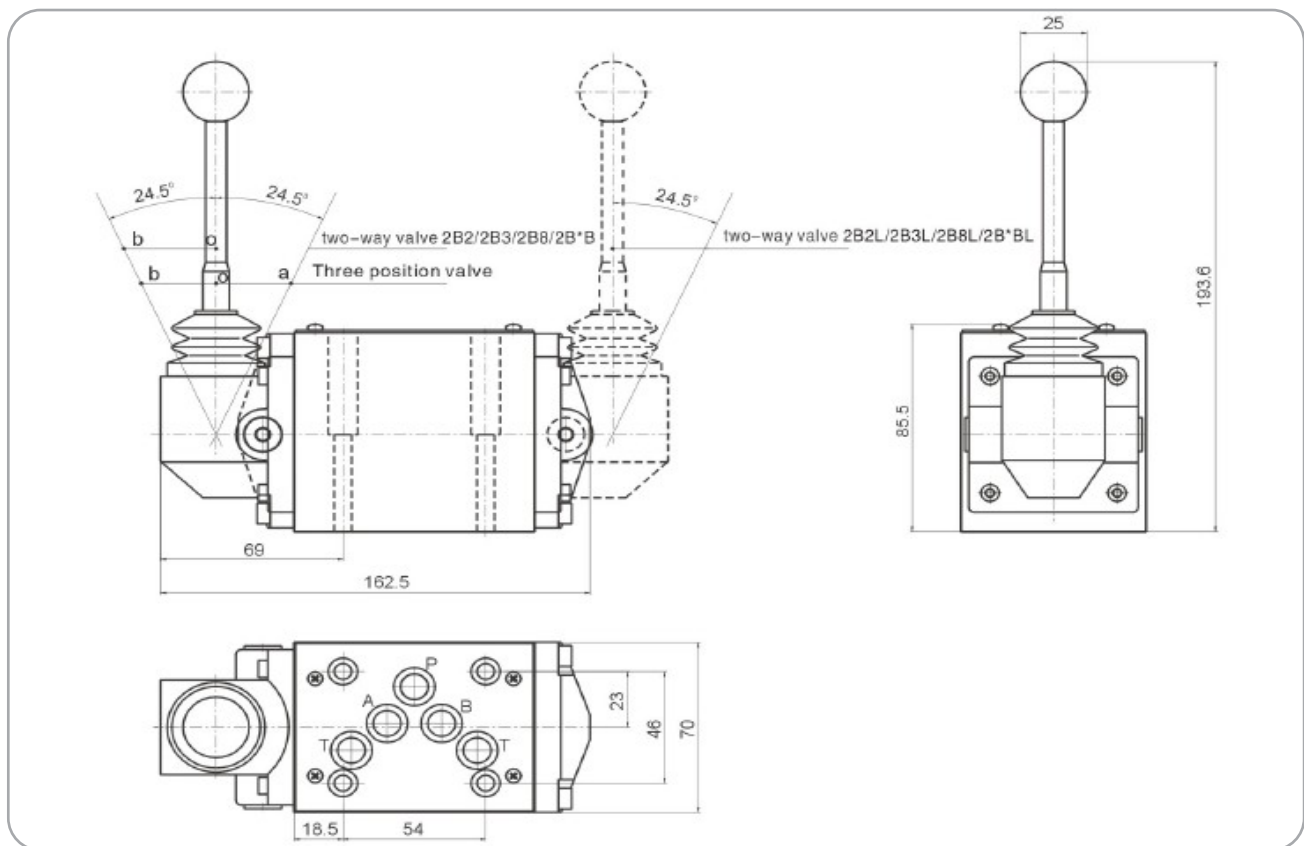
02 External dimensions



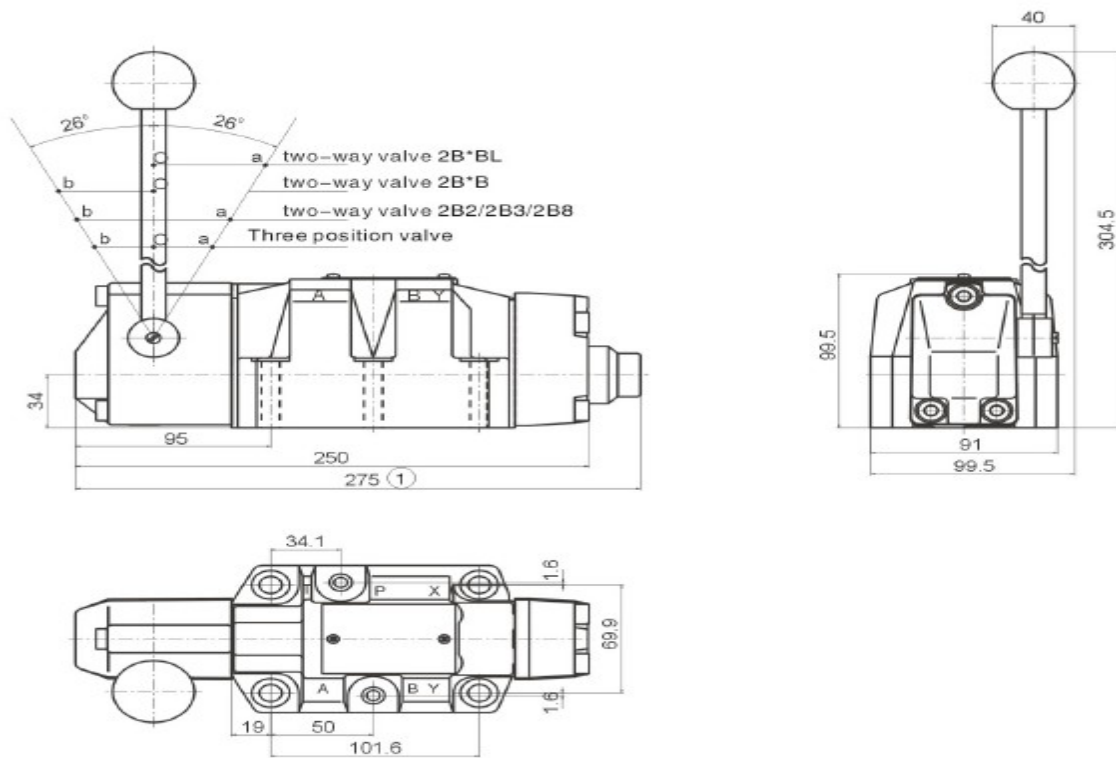
03 Spring type External dimensions



03 With detent type External dimensions



04 External dimensions



06 External dimensions

