HOYEA

Specialist In Electrohydraulics

NINGBO HOYEA MACHINERY MANUFACTURE CO., LTD.

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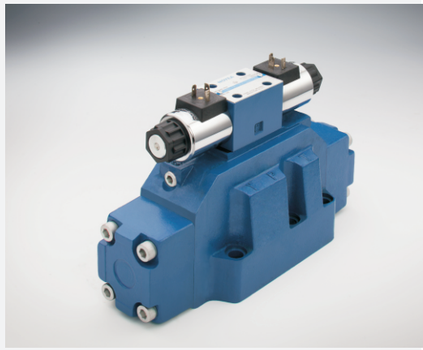
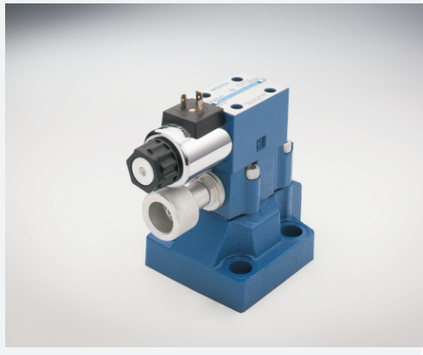
HOYEA

Industrial Hydraulics





NINGBO HOYEA MACHINERY MANUFACTURE CO., LTD.

Brief Introduction

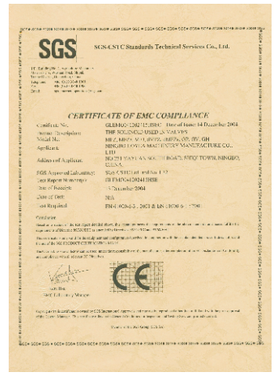
Hoyea, established in 1993, is an innovative modern enterprise, which is worthy of its name “fluid power transmission and control expert” and devotes itself to the development of Electro–hydraulic control technology.

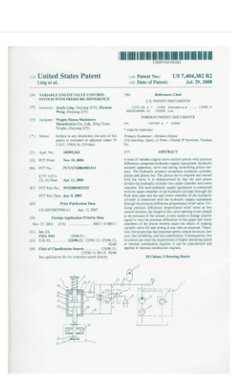
With strong technology basis and the advantage of hydromechatronics, Hoyea develops innovative ability, and at present has large quantities of independent technology, which fill the domestic blank market a lot. Multiple advanced patents, such as “differential pressure proportional pressure flow composite valve”, and “bidirectional different pressing feedback type of proportional pilot–operated slide valve” shape a high quality technical supporting system of HOYEA. The company won the title of “National High Technological Enterprise”, “Zhejiang Patent Demonstrating Firm”, “Zhejiang Excellent Technology Innovation Enterprise”. Various kinds of products win the 2nd and 3rd place of “Science and Technology Progress Prize of Zhejiang Province” and “Outstanding New Products Prize” awarded by the national industrial organization. Among them, the proportional electro–hydraulic relief and flow control valve is classified as the national key new product, national–level Torch program project, whereas the proportional hydraulic component of new electro–hydraulic valve and the other two products has won the innovative fund project of National Science and Technology Department for technology–based small and medium–size enterprises, moreover, the proportional hydraulic component of new electro–hydraulic valve has also win the “National Major Achievements Transformation Projects” issued by the National Industrial Information Department.

The company has passed through ISO9001 quality system authentication, CE certificate, explosion–proof safety certificate and typical certificate of mineral products safety. The company has advanced processing equipment and hardware facility. The products cover the whole fields of hydraulic components, and have already been widely applied in each field. There are routine hydraulic pressure valves, proportional valves, cartridge valves, restrictive valves, explosion isolation valves and proportional solenoid, internal gear pump and valve terminal.

Therefore, Hoyea can offer its customers with comprehensive and advanced electro–hydraulic solutions, high cost–effective products, help them face the high market competition, initiate its competitive ability, and create more value for the customers.

Certificates





Product Catalogue

Proportional valve series

Pressure control valves series

Flow control valve series

Directional control valves series

Product Catalogue

2–way cartridge valve series

Other valves series

Internal gear pump series

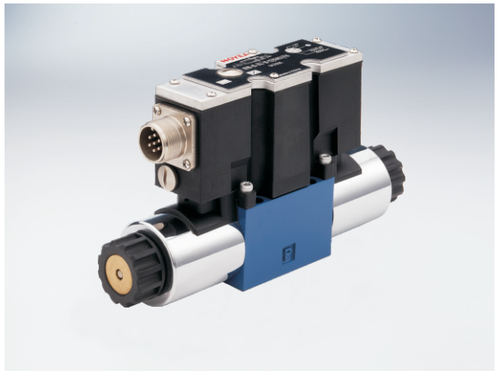
Product Catalogue

Manifolds

HOYEA

Proportional Valve Series

Proportional Directional Valve (BFW/BFWN)



The built–in 4/2–and 4/3–way directly operated
Proportional solenoid valves
Direct operated spool without electrical position feedback
Type BFW and BFWN
Nominal sizes 6 and 10
Series 2X
Maximum operating pressure 315bar
Maximum flow 42L/min (DN6)
Maximum flow 75L/min (DN10)

Technical data (Please consult with us when the application needs higher requirement than the parameter shown below)

Model		BFW	BFWN
Installation position		optional, preferably horizontal	
Storage temperature range	(℃)	–20~80	
Ambient temperature range	(℃)	–20~70	–20~50

Hydraulic

Operating pressure	(bar)	PortsA,B, P	315
		Port T	210
Nominal flow When q_{vnom} at △p=10 bar	(L/min)	DN6	7，15 and 26
		DN10	30，60
Flow (Max. Permissible)	(L/min)	DN6	42 (with double flow 42) 80
		DN10	75 (with double flow 75) 140
Pressure fluid			Mineral oil (HL, HLP) to DIN 51 524;For other fluid please consult with us.
Fluid temp. Range	(℃)		–20~80(+40~+50 is preference)
Viscosity range	(mm^2/s)		20~380(30~46 is preference)
Hysteresis	(%)		≤5
Reversal error	(%)		≤1
Response sensitivity	(%)		≤0.5
Cleanliness	Maximum permissible degree of pressure fluid contamination to NAS 1638 to class 9 Recommended filter $\beta_{10}\geqslant 75$ 。		

Electrical

Model			BFW[1)]	BFWN
Voltage type			Direct voltage	
BFWN Command signal	Voltage input "A1"	(V)	±10	±10
	Current input "F1"	(mA)	4~20	4~20
Max. current per solenoid		(A)	2.5	2.5
Solenoid coil Resistance		(Ω) Cold value at 20 ℃	6DN2	10DN2
		Max. warm value	6DN3	10DN3
Duty cycle		(%)	100	
Max.Coil temperature[2)]		(℃)	up to150	
Electrical connection			socket as per DIN EN 175 301–803 and ISO 4400 with component plug to DIN EN 175301–803 and ISO 4400	socket as per DIN EN 43 563–AM6–3 with component plug to DIN 43 563–BF6–3/Pg11
Insulation of valve to DIN 40 050			IP 65	

Proportional Directional Valve (BFW/BFWN)

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Control electronics

BFW (type)	Analogue amplifier in Eurocard format[3)]		Details refer to proportional amplifier	
	Digital amplifier in Eurocard format[3)]		Details refer to proportional amplifier	
BFWN (type)	Analogue command value module		Integrated into the valves	
Supply voltage	Nominal voltage	VDC	24	
	BFWN Lower limiting value	V	21/22	19
	BFW[1)] Upper limiting value	V	35	
Amplifier current consumption	I_{max}	A	1.8	1.8
	Max. impulse current	A	3	3

1) With HOYEA control amplifier. 2)Due to the occurring surface temperature of the solenoid coils, the European Standards DIN EN 563 and DIN EN 982. 3)separate order.

Model description

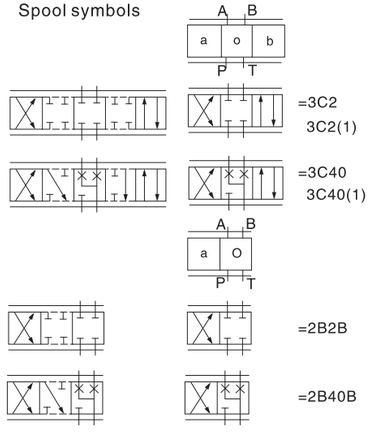
BFW – * – * – * – * – * – 2X – G24 – * – * – * – * – * * *

Directional proportional valve

No code Without integrated electronics
N With integrated electronics

02 DN 6
03 DN 10

Spool symbols



With spool symbols：3C2(1)and 3C40(1)
P → A：q_{vmax} B → T:$q_{vmax}/2$
P → B：$q_{vmax}/2$ A → T:q_{vmax}

Note:
With spools 3C40 and 2B40B, in the neutral position , there is a connection from A to T and B to T with approx. 3 % of the relevant nominal cross section.

Further details in clear text

V Omit Nitrile rubber sealing
NBR seals suitable for mineral oil (HL, HLP) to DIN 51 524

No code BFW(type)
BFWN(type)
A1 Command value input ± 10V
F1 Command value input4~20mA

Electrical connection For BFW (type)
[2)]K4 with plug component DIN EN 175301–803
See page A.1.3
BFWN (type)
[2)]K31 with plug component DIN 43 650–AM2
See page A.1.4

Special protection
No code Without special protection
[1)]J Seawater–resistant(only for DN6)

24V 24 VDC

2X Component series 20 to 29 (20 to 29 unchanged installation and connection dimensions)

Nominal flow at valve pressure differential □p = 10 bar

DN 6
07 7 L/min
15 15 L/min
30 26 L/min

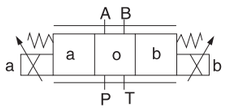
DN 10
30 30 L/min
60 60 L/min

1.Other types of electrical protection on request 2.Only for DN6：for versian "3C40" sea water resistant only state "K31"!

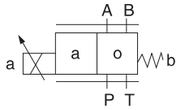
Proportional Directional Valve (BFW/BFWN)

Model description

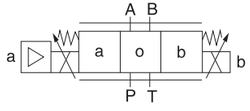
Model BFW···



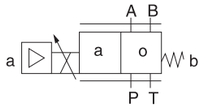
Model BFW···2B2B (2B40B)



Model BFWN···



Model BFWN···2B2B (2B40B)



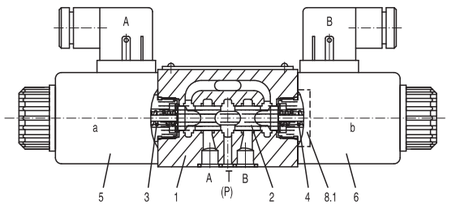
Structure and function description, section

The 4/2–way and 4/3–way proportional directional valves are designed as direct operated components for subplate mounting. They are actuated by means of proportional solenoid with central removable coil. The solenoid are controlled either by external control electronics (type BFW) or integrated control electronics (type BFWN).

Design:
The valves basically consist of:
—Body (1) with mounting surface
—Control spool (2) with compression springs (3 and 4)
—Solenoids (5 and 6) with central coil
—Optional integrated electronics (7)

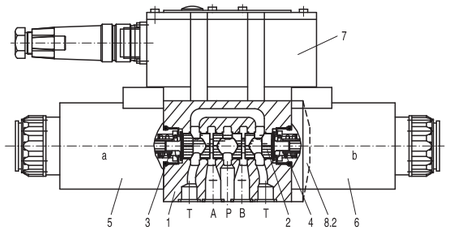
Function:
— When solenoids (5 and 6) do not work, the control spool (2) is held in the central position by compression springs (3 and 4)
— Direct actuation of the control spool (2) by energising a proportional solenoid E.g. When the solenoid "b" power is on (6)
→ The control spool (2) is moved to the left in proportion to the electrical input signal
→connection from P to A and B to T via orifice–like crosssections with progressive flow characteristics
— When the solenoid power is off (6)
→ The control spool (2) is returned to the central position by compression spring (3)

Model BFW–02···2x/···



In theory, the function of this valve is the same to the valve with 3 positions. However, the valves with 2 positions are only fitted with solenoid "a".
For DN6 valve, there is a plug (8.1) fixed in the second solenoid,but for DN10, it is a cover (8.2) instead.

Model BFWN–03···2x/···

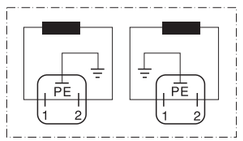


Note for type BFW–02···2X/···:
Draining of tank line is to be avoided. With the appropriate installation conditions, a back pressure valve is to be installed (back pressure approx. 2 bar).

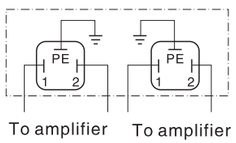
Electrical connection, plug–in connectors

BFW type (Without integrated electronics not for version "J"=sea water– resistant)

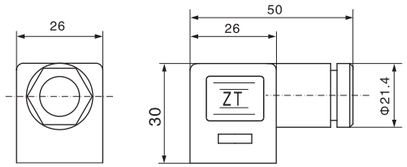
Connection on component plug



Connection on plug–in connector



Plug–in connector: CECC 75 301–803–A002FA–H3D08–G/DIN EN 175 301–803 and ISO 4400



Proportional Directional Valve (BFW/BFWN)

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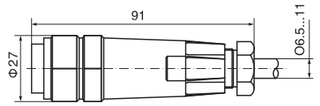
Electrical connection, plug–in connectors

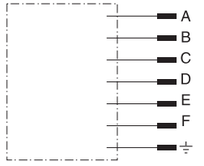
For type BFWN (with integrated electronics (OBE) and for version "J" = sea water–resistant) Plug–in connector see the block circuit diagram below



Plug–in connector:
DIN 43 563–BF6–3/Pg11

Integrated electronics for type BFWN

Pin allocation of the component plug

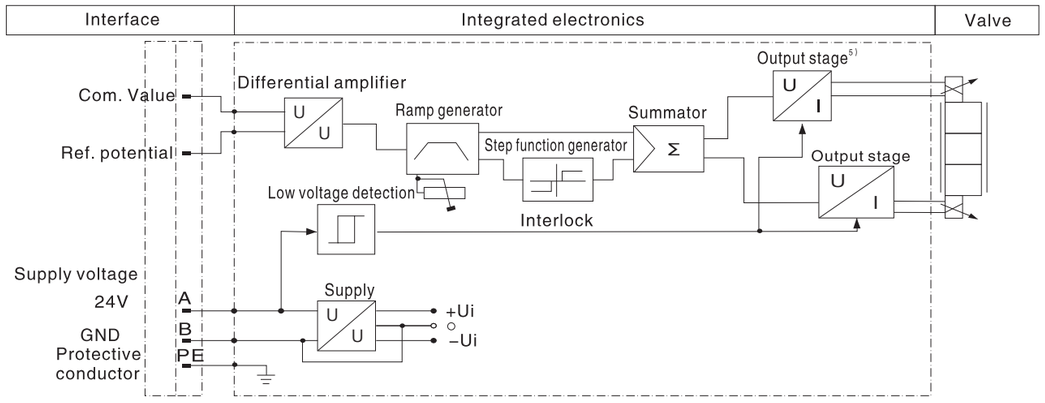


	Contact	Signal
Supply voltage	A B	24VDC(19~35VDC) GND
	C	n.c.(1)
Differential amplifier input	D E	Com. value (±10V/4–20mA) reference potential
	F	n.c.(1)

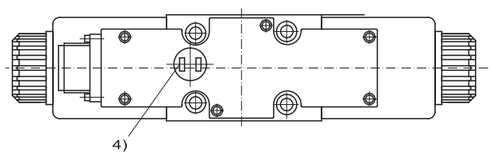
Com. value: Positive command value (0 to 10 V or 12 to 20 mA) at D and reference potential to E causes flow from P to A and B to T.
Negative command value (0 to 10 V or 12 to 4 mA) at D and reference potential to E causes flow from P to B and A to T.
For valves with a solenoid on side "a" (spool variants 2B2B and 2B40B) a positive command value at D and reference potential to E (NS 6: 4 to 20 mA and NS 10: 12 to 20 mA) causes flow from P to B and A to T.

Recommendation:
–up to 25 m cable length type LiYCY 5 x 0.75 mm^2
–up to 50 m cable length type LiYCY 5 x 1.0 mm^2
External diameter 6.5 to 11 mm
Connect screen to PE only on the supply side

Block circuit diagram / connection allocation



1) Contacts C and F must not be connected!
2) PE is connected to the cooling body and the valve housing
3) Protective conductor screwed to the valve housing and cover
4) Ramp can be externally adjusted from 0 to 2.5 s; the same applies for Tup and Tdown
5) Output stages current regulated
6) Low voltage detection is not carried out for component type BFWN–03–2X

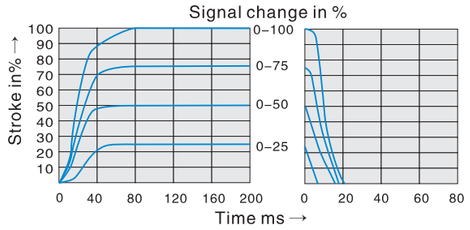


Proportional Directional Valve (BFW/BFWN)

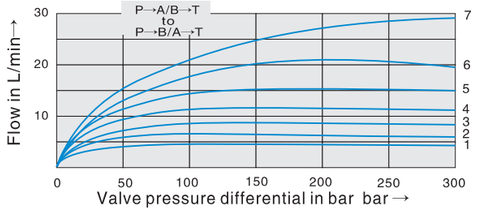
Characteristic curves

DN6

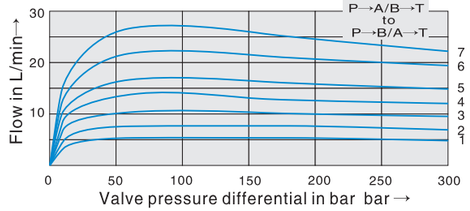
Transient functions with stepped form of electrical input signa



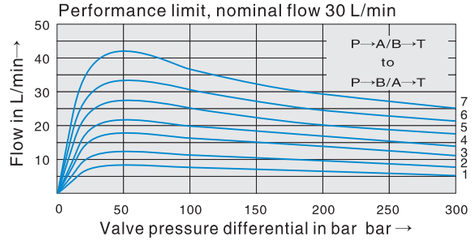
Performance limit, nominal flow 7 L/min



Performance limit, nominal flow 15 L/min



Performance limit, nominal flow 30 L/min

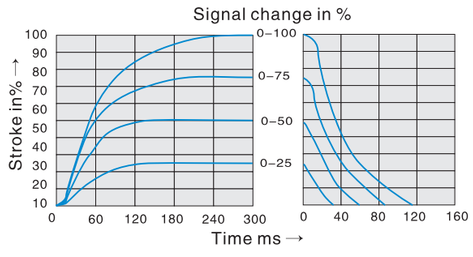


1 Com. Value=40%
2 Com. Value=50%
3 Com. Value=60%
4 Com. Value=70%
5 Com. Value=80%
6 Com. Value=90%
7 Com. Value=100%

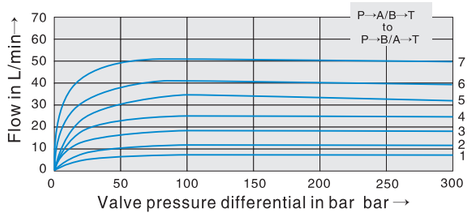
If the performance limits are exceeded, then the movement of spool will be unstable.

DN10

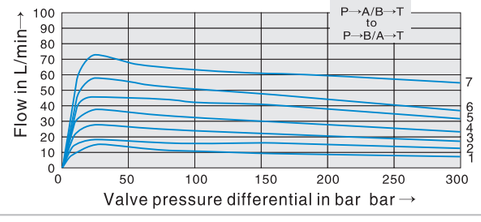
Transient functions with stepped form of electrical input signa



Performance limit, nominal flow 30 L/min



Performance limit, nominal flow 60 L/min



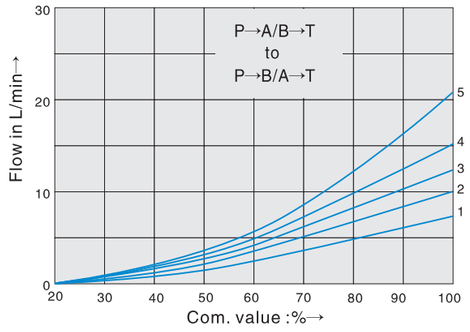
1 Com. Value=40%
2 Com. Value=50%
3 Com. Value=60%
4 Com. Value=70%
5 Com. Value=80%
6 Com. Value=90%
7 Com. Value=100%

If the performance limits are exceeded, then the movement of spool will be unstable.

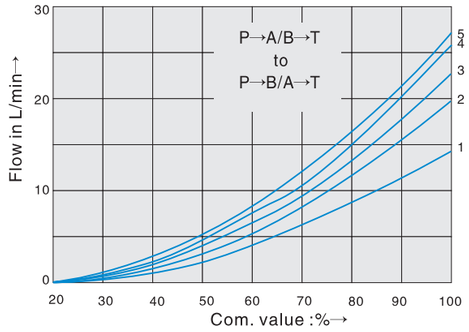
Proportional Directional Valve (BFW/BFWN)

Characteristic curves (measured with HLP46, Qoil = 40 ± 5℃) DN6

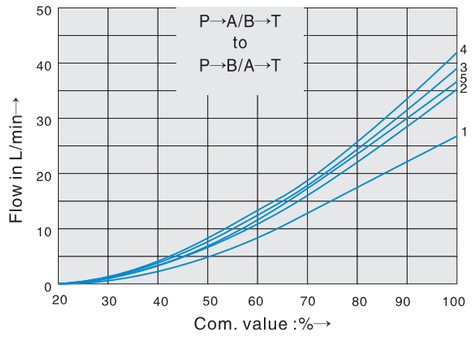
7 l/min nominal flow at differential pressure 10 bar



15 l/min nominal flow at differential pressure 10 bar



30 l/min nominal flow at differential pressure 10 bar

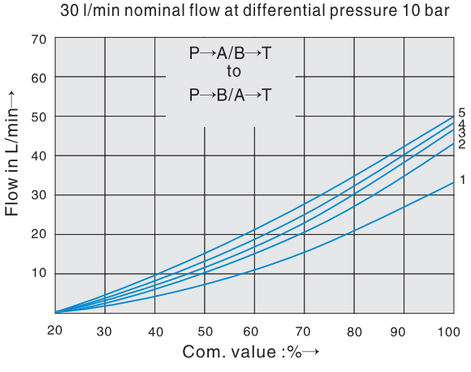


1 △p=10 bar Constant
2 △p=20 bar Constant
3 △p=30 bar Constant
4 △p=50 bar Constant
5 △p=100 bar Constant

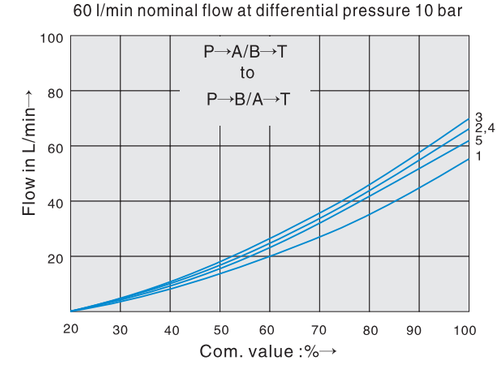
△p= Valve pressure differential
(inlet pressure P_p minus load
pressure P_L and minus return pressure P_T)

Characteristic curves (measured with HLP46, Qoil = 40 ± 5℃) DN10

30 l/min nominal flow at differential pressure 10 bar



60 l/min nominal flow at differential pressure 10 bar



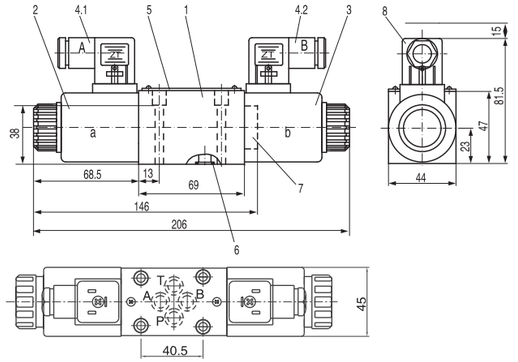
1 △p=10 bar Constant
2 △p=20 bar Constant
3 △p=30 bar Constant
4 △p=50 bar Constant
5 △p=100 bar Constant

△p= Valve pressure differential
(inlet pressure P_p minus load
pressure P_L and minus return pressure P_T)

Proportional Directional Valve (BFW/BFWN)

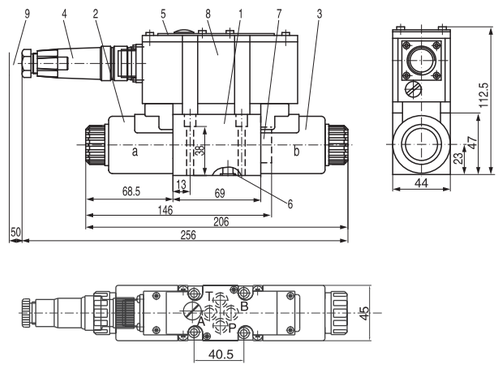
Unit dimensions

BFW–02 type



1 Valve body
2 Proportional solenoid “a”
3 Proportional solenoid “b”
4.1 4.2 Plug–in connector , colour black, separate order
5 Nameplate
6 8.73 x 1.78 I seal rings for ports A, B, P and T
7 Plug for valves with one solenoid (2 positions spool type 2B2B or 2B40B)
8 Space required to remove the plug–in connector
9 Machined valve mounting surface, connection location to DIN 24 340A，IS04401 (and) CETOP–RP 121 H

BFWN–02···/···K31···V type

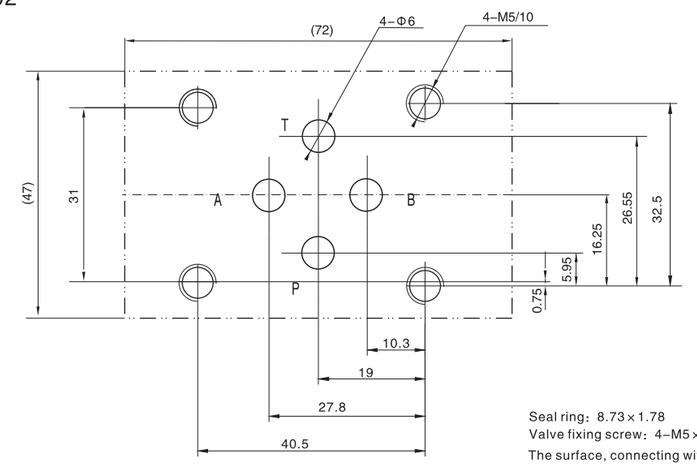


1 Valve body
2 Proportional solenoid “a”
3 Proportional solenoid “b”
4 Plug–in connector to E DIN 43 563–BF6–3/Pg11
5 Nameplate
6 8.73 x 1.78 O Identical seal rings for ports A, B, P and T
7 Plug for valves with one solenoid (2 switched positions, spool type 2B2B or 2B40B)
8 Integrated electronics
9 Space required for the connection cable and to remove the plug–in connector
10 Machined valve mounting surface, connection location DIN 24 340A，ISO 440 and CETOP–RP 121 H

Mounting plate: please refer to below drawing
Subplates: Valve fixing screws :4–M5x 45 DIN 912–12.9; M_A=8.9 Nm

Subplate size

BFW–02
BFWN–02



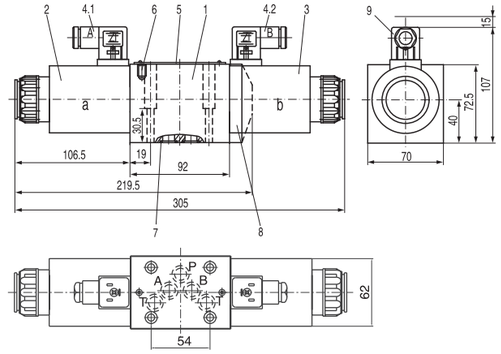
Seal ring：8.73×1.78
Valve fixing screw：4–M5×45–12.9(GB70–85)
The surface, connecting with the valve, should be Ra0.8 roughness, and 0.01/100mm flatness.

Proportional Directional Valve (BFW/BFWN)

HOYEA

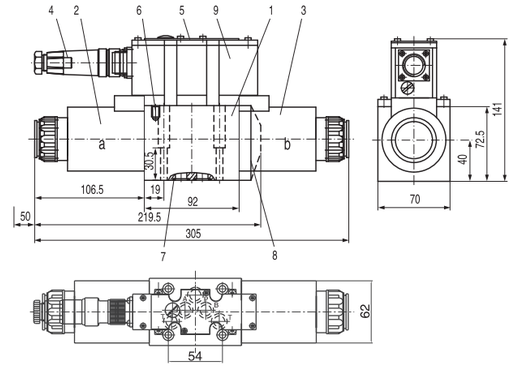
Unit dimensions

BFW–03 type



1 Valve body
2 Proportional solenoid “a”
3 Proportional solenoid “b”
4.1 4.2 Plug–in connector , colour black, separate order
5 Nameplate
6 Valve deflation screw
7 12 x 2 seal rings for ports A, B, P and T
8 Plug for valves with one solenoid (2 positions, spool type 2B2B or 2B40B)
9 Space required to remove the plug–in connector
10 Machined valve mounting surface, connection location to DIN 24 340A，IS04401 (and) CETOP–RP 121 H

BFWN–03 type

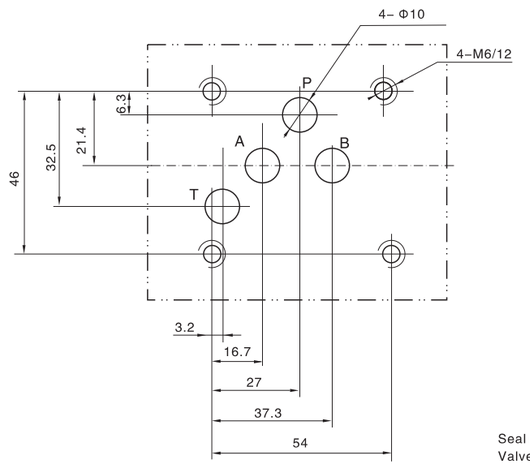


1 Valve body
2 Proportional solenoid “a”
3 Proportional solenoid “b”
4 Plug–in connector, to E DIN43563–BF6–3/Pg11
5 Nameplate
6 Valve deflation screw
7 12 x 2 I O dentical seal rings for ports A, B, P and T
8 Plug for valves with one solenoid (2 positions, spool type 2B2B or 2B40B)
9 Integrated electronics
10 Space required for theconnection cable and to remove the plug–in connector
11 Machined valve mounting surface, connection location to DIN 24 340A,IS04401(and)CETOP–RP 121 H

Mounting plate: please refer to below drawing
Subplates : Valve fixing screws：4 M6x 40 DIN 912–12.9; M_A=15.5 Nm

Subplate size

BFW–03
BFWN–03



Seal ring：8.73×1.78
Valve fixing screw：4–M5×45–12.9(GB70–85)
The surface, connecting with the valve, should be Ra0.8 roughness, and 0.01/100mm flatness.

Proportional Directional Valve (BFWE 2X)

The 4/2–and 4/3–way directly operated proportional directional valves,
Spool with electrical position feedback.
Type BFWE and BFWNE

Nominal size DN6 and DN10
Component series 2X
Maximum operating pressure 315bar
Maximum flow 80L/min DN 6 (DN6)
Maximum flow 180L/min DN 10 (DN10)

Technical data (For application outside these parameters please consult with us)

Specification		BFWE	BFWNE
Installation position		optional, preferably horizontal	
Storage temperature range	(℃)	–20~80	
Ambient temperature range	(℃)	–20~70	–20~50

Tested under the condition of (P=100bar, Mineral oil HLP4+,40C±5C)

Operating pressure (bar)	PortsA,B, P	315		
	Port T	100		
Nominal flow q_{vnom} Max at p=10 bar (L/min)	6DN	8	16	32
	10DN	25	50	75
Flow (Max. Permissible) (L/min)	6DN	80		
	10DN	180		
Pressure fluid		Mineral oil (HL, HLP) to DIN 51 524;For other fluid please consult with us.		
Fluid temp. Range	(°C)	–20~80(+40~+50 is preference)		
Viscosity range	(mm^2/s)	20~380(30~46is preference)		
Hysteresis	(%)	≤0.1		
Reversal span	(%)	≤0.05		
Response sensitivity	(%)	≤0.05		
Zero displacement will vary in pressure oil temperature and working temperature.	%/100 (K)	0.15		
	%/100 (bar)	0.1		
Cleanliness	Maximum permissible degree of pressure fluid contamination to NAS 1638 to class 9 Recommended filter β_{10}≥75 。			

Electrical

Voltage type			Direct voltage	
BFWN Command signal	Voltage input "A1"	(V)	±10	±10
	Current input "F1"	(mA)	4~20	4~20
Max. current per solenoid		(A)	2.5	2.5
Solenoid coil Resistance	Cold value at 20 ℃	(Ω)	6DN2.7	10DN3.7
	Max. warm value		6DN4.05	10DN5.55
Duty cycle		(%)	100	
Max.Coil temperature[2]		(℃)	up to150	
Electrical connection			socket as per DIN EN 175 301–803 and ISO 4400 with component plug to DIN EN 175301–803 and ISO 4400	socket as per DIN EN 43 563–AM6–3 with component plug to DIN 43 563–BF6–3/Pg11
Insulation of valve to DIN 40 050			IP 65	

Proportional Directional Valve (BFWE 2X)

HOYEA

Control electronics

BFW (type)		Analogue amplifier in Eurocard format[3]		Details refer to proportional amplifier	
		Digital amplifier in Eurocard format[3]		Details refer to proportional amplifier	
BFWN (type)		Analogue command value module		Integrated into the valvesA1.4	
Supply voltage	BFWE[1] BFWNE	Rated voltage	VDC	24	
		Lower limiting value	V	21/22	19.4
		Upper limiting value	V	35	
Amplifier current consumption		I_{Max}	A	2	2
		Max. impulse current	A	3	3

1) With HOYEA control amplifier. 2)Due to the occurring surface temperature of the solenoid coils, the European Standards DIN EN 563 and DIN EN 982. 3)separate order.

Model description

BFW – * – E – * – * – * – * – 2X – G24 – * – * – * *

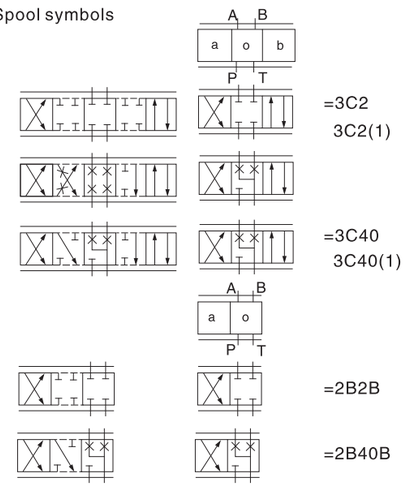
Proportional directional valve

No code Without integrated electronics
N With integrated electronics

Spool with displacement sensor

02 DN 6
03 DN 10

Spool symbols



With spool symbols：3C2(1)and 3C40(1)
P → A： q_{vmax} B →T:$q_{vmax}/2$
P → B： $q_{vmax}/2$ A →T:q_{vmax}

Note:
With spools 3C40 and 2B40B, in the neutral position , there is a connection from A to T and B to T with approx. 3 % of the relevant nominal cross section.

Further details in clear text

Omit NBR seal
V FPM seals suitable for mineral oil
Hydraulic oil
(HL, HLP) as per Din 51 524

No code BFW(type)
BFWN(type)
A1 Command value input ± 10V
F1 Command value input4~20mA

Electrical connection
BFW (type)
[2]K4 with plug component DIN EN 175301–803
BFWN(type)
[2]K31 with plug component DIN 43 650–AM2

2X= 24V 24 VDC

2X Component series 20 to 29 (20 to 29 unchanged installation and connection dimensions)

Nominal flow at valve differential pressure □p = 10 bar

DN 6
08 8 L/min
16 16 L/min
32 32 L/min
DN 10
25 25 L/min
50 50 L/min
75 75 L/min

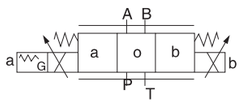
Proportional Directional Valve (BFWE 2X)

Model description

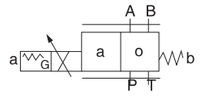
Directional Proportional valve without integrated electronics

Directional Proportional valve with integrated electronics

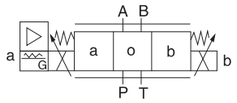
Model BFWE···



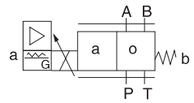
Model BFWE···2B2B (2B40B)



Model BFWNE···



Model BFWNE···2B2B (2B40B)



Structure and function description, section

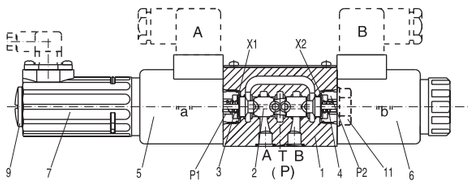
The 4/2–way and 4/3–way proportional directional valves are designed as direct–operated components for subplate mounting. They are actuated by means of proportional solenoid with central removable coil. The solenoid are controlled either by external control electronics (type BFWE) or integrated control electronics (type BFWNE)

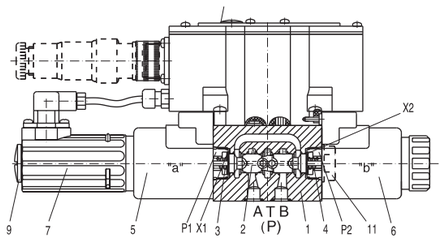
Design:

The valves basically consist of:
- — Body (1) with mounting surface
- — Control spool (2) with compression springs (3 and 4)
- — Solenoids (5 and 6) with central coil
- — Optional integrated electronics (7)
- — integrated amplifier(8) available
- — mechanical zero adjust via (9)
- — BFWNW electro zero adjust via (10)

Function:

- — When solenoids (5 and 6) do not work, the control spool (2) is held in the central position by compression springs (3 and 4)
- — Direct actuation of the control spool (2) by energising a proportional solenoid E.g. When the solenoid "b" power is on (6)
  - → The control spool (2) is moved to the left in proportion to the electrical input signal
  - →connection from P to A and B to T via orifice–like crosssections with progressive flow characteristics
- — When the solenoid power is off (6)
  - → The control spool (2) is returned to the central position by compression spring (3)





Valve with 2 spool positions:

In theory, the function of this valve is the same to the valve with 3 positions. However, the valves with 2 positions are onlyfitted with solenoid "a" (5) . Instead of the 2nd proportional solenoid a plug
(11) is fitted with a cover for DN 6 or for DN 10 (11).

Note for type BFW–02···2X/···:
Draining of tank line is to be avoided. With the appropriate installation conditions, a back pressure valve is to be installed (back pressure approx. 2 bar).

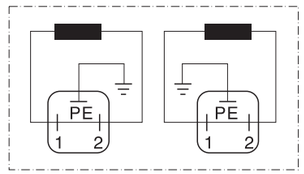
Proportional Directional Valve (BFWE 2X)

HOYEA

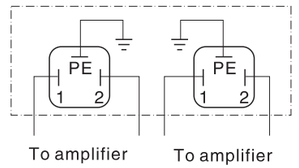
Electrical connection, plug–in connectors

BFWE type (Without integrated electronics not for version "J"=sea water resistant)
Plug–in connector: CECC 75 301–803–A002FA–H3D08–G/DIN EN 175 301–803 (and) ISO 4400

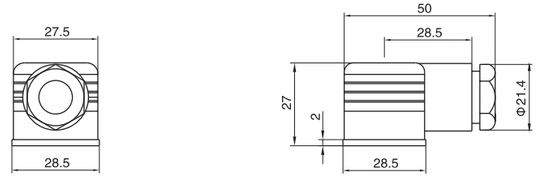
Connection on component plug



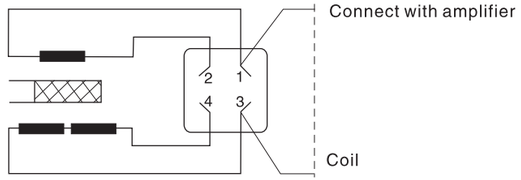
Connection on plug–in connector

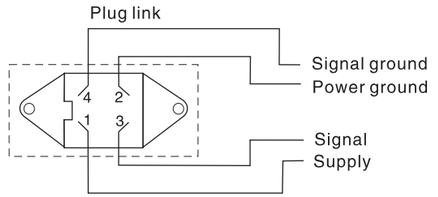


Outlook size of plug–in connector



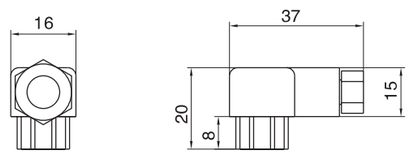
Inductive position transducer



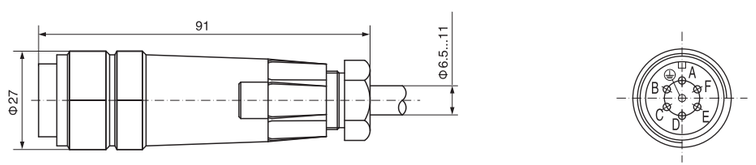


Mating connector 4–role
connector cable
Suggestion: the length of the wire is expected to be 50 meters,type LiYCY 4*0.25mm^2
Connect shield to PE only on the supply side.

Outlook size of plug–in connector



Plug–in connector: the plug–in connector should be met with the standard: DIN EN 175 201–804



Proportional Directional Valve (BFWE 2X)

Pin allocation of the component plug

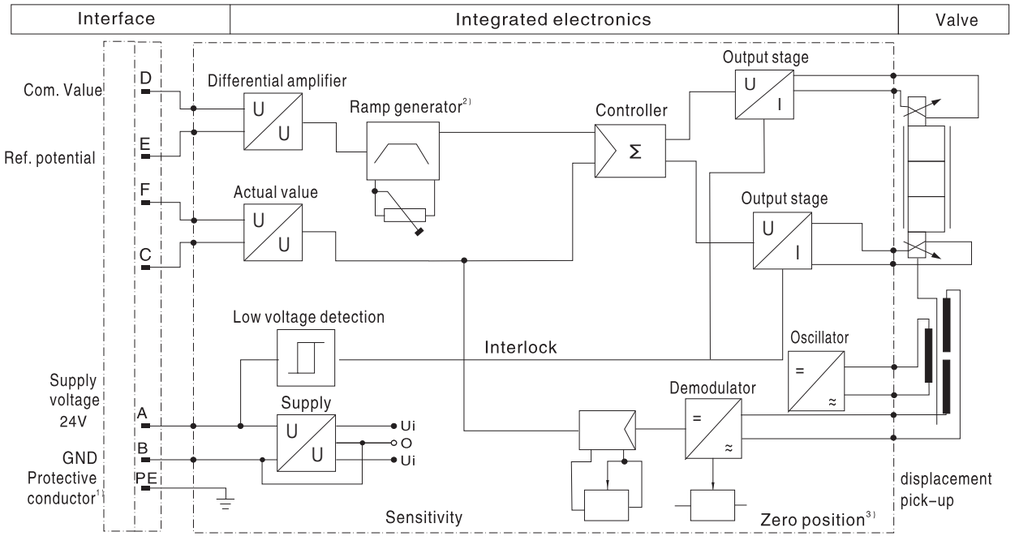
	Plug-in connector	A1 Connector type A1	Connector type F1
Supply	A	24VDC(u(t)=19.4~35V);I_{max}=2A	
voltage	B	0V	
Reference potential(actual value)	C	Link to F; R_e>50KΩ	Link to F; R_e<10Ω
Differential amplifier input	D	Com. Value ± 10V;R_e>50KΩ	Com. Value 4···20mA; R_e>100Ω
	E	Reference potential set value	
Measuring the output (actual value)	F	Actual value ± 10V, (Current limiter 5mA)	
	PE	Link to the valve body and low-temperature subjects	

Com. value : Positive command value (0 to 10 V or 12 to 20 mA) at D and reference potential to E causes flow from P to A and B to T. Negative command value (0 to 10 V or 12 to 4 mA) at D and reference potential to E causes flow from P to B and A to T. For valves with a solenoid on side "a" (spool variants EA and WA) a positive command value at D and reference potential to E (NS 6: 4 to 20 mA and NS 10: 12 to 20 mA) causes flow from P to B and A to T.

Actual value : The actual value (0~10V or 12mA) on the F.C enables the connection from port P to port A.

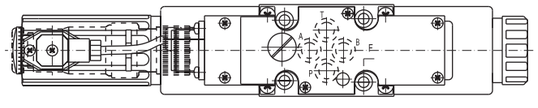
Connection cable : Recommendation:
-up to 25 m cable length type LiYCY 5 x 0.75 mm^2
-up to 50 m cable length type LiYCY 5 x 1.0 mm^2 External diameter 6.5 to 11 mm
Connect screen to PE only on the supply side

Block circuit diagram / connection allocation

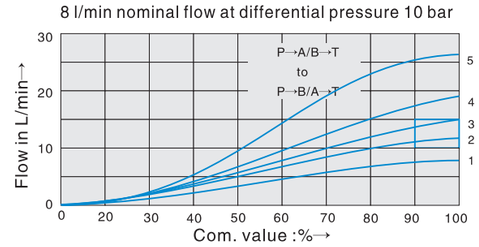


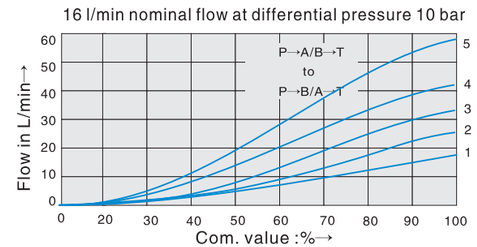
Introductions:
The electrical signal launched from controlled amplifier (e.g.actual value) must not be used for the safety protection of the switch device.

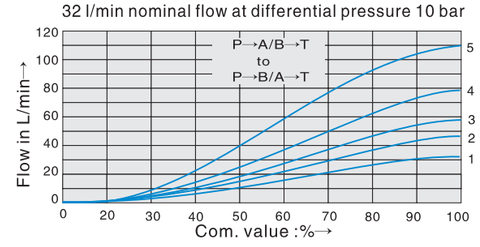
1.Contacts PE should be linked to the low-temperature subject and valve body.
2.Ramp time could be adjustable within the scope 0~02.5s outside, as well as T_{up} and T_{down}.
3.Zero point outside is adjustable.
4.output end is the current output
5.Zero point can be set from the outside

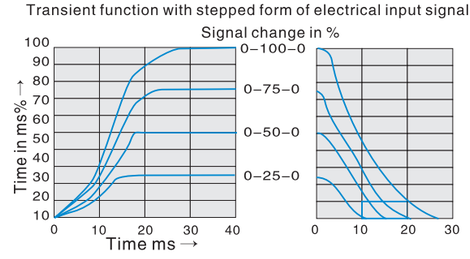


Characteristic curves (measured with HLP46, Qoil = 40 ± 5℃) DN6





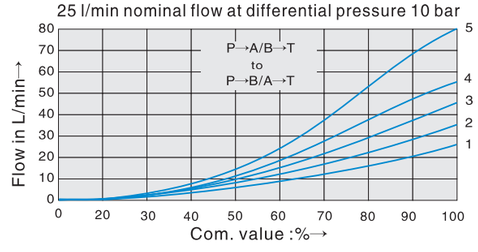


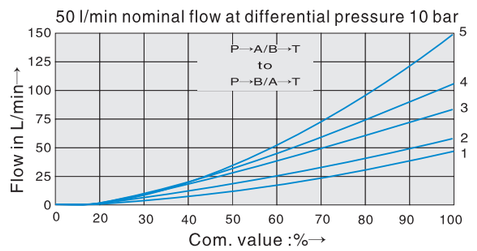


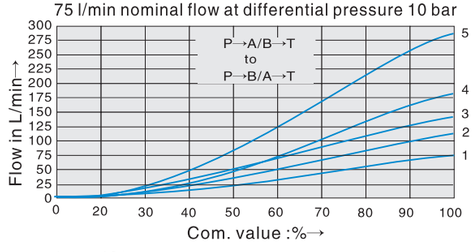
1 △p=10 bar Constant
2 △p=20 bar Constant
3 △p=30 bar Constant
4 △p=50 bar Constant
5 △p=100 bar Constant

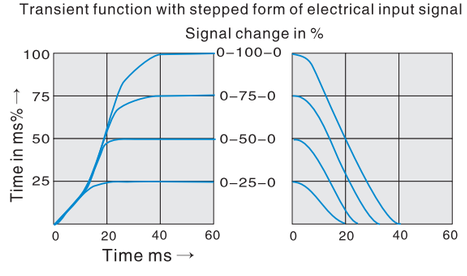
△p= Valve differential pressure
(inlet pressure P_p minus load
pressure P_L and minus return pressure P_T)

Characteristic curves (measured with HLP46, Qoil = 40 ± 5℃) DN10









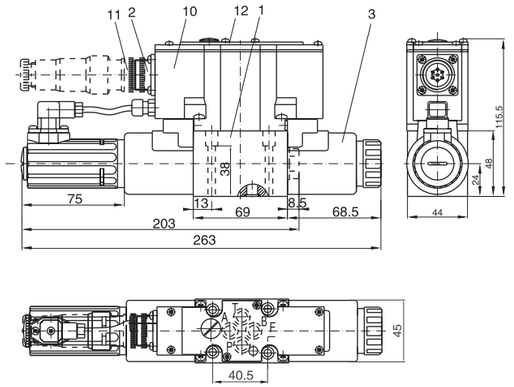
1 △p=10 bar Constant
2 △p=20 bar Constant
3 △p=30 bar Constant
4 △p=50 bar Constant
5 △p=100 bar Constant

△p= Valve differential pressure
(inlet pressure P_p minus load
pressure P_L and minus return pressure P_T)

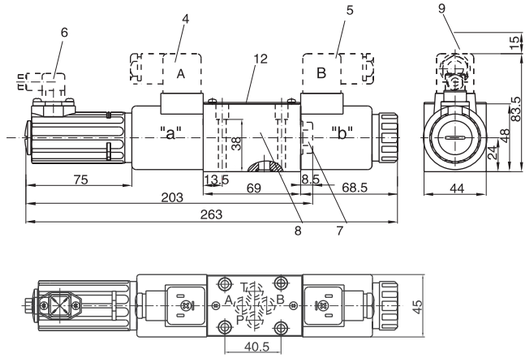
Proportional Directional Valve（BFWE 2X）

Unit dimensions

BFWNE–02

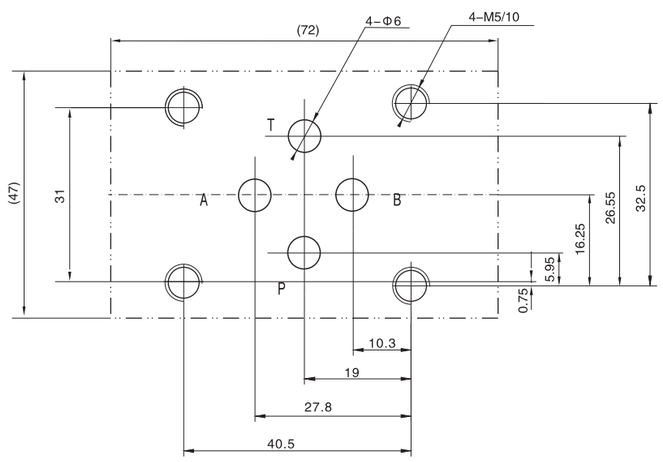


BFWE–02



1.Valve body
2.Proportional solenoid “a” with inductive displacement pick–up
3.Proportional solenoid “b”
4.Gray plug–in connector “A” according to the standard of DIN EN 175 301–803
5.Black plug–in connector “B” according to the standard of DIN EN 175 301–803
6.Socket with inductive displacement pick–up
7.For single–solenoid–controlled valve end lover, spool type 2B2B or 2B40B
8.Identical seal ring 8.73*1.78 (used for ports A, B, P, T)
9.Space for taking off the plug–in connector
10.Built–in amplifier
11.The socket corresponds with DIN EN 175 201–804
12.Nameplate
13.Machined valve mounting surface, Connection location to DIN 24 340A，IS04401(and)CETOP–RP 121 H

Subplate size



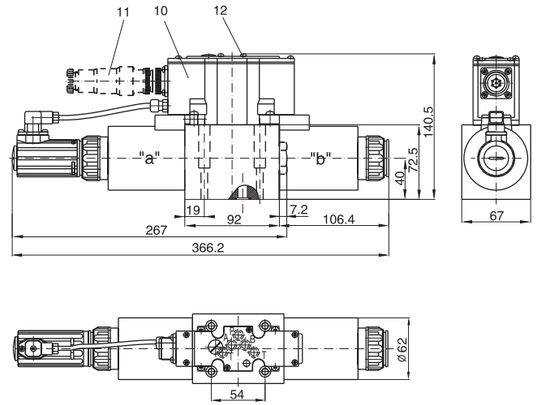
Subplates： G341/01(G1/4)　G342/01(G3/8)　G502/01(G1/2)
Valve fixing screws：4–M5x45 DIN 912–10.9；M_A=8.9 Nm
The surface, connecting with the valve, should be Ra0.8 roughness, and 0.01/100mm flatness.

Proportional Directional Valve（BFWE 2X）

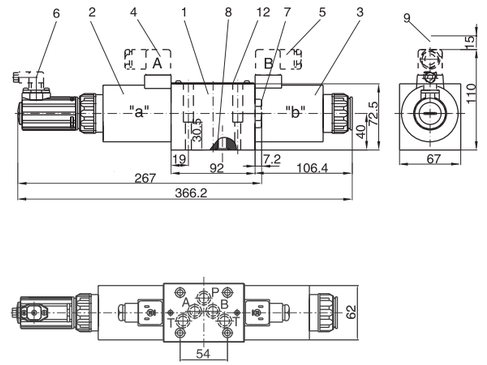
HOYEA

Unit dimensions

BFWNE–03

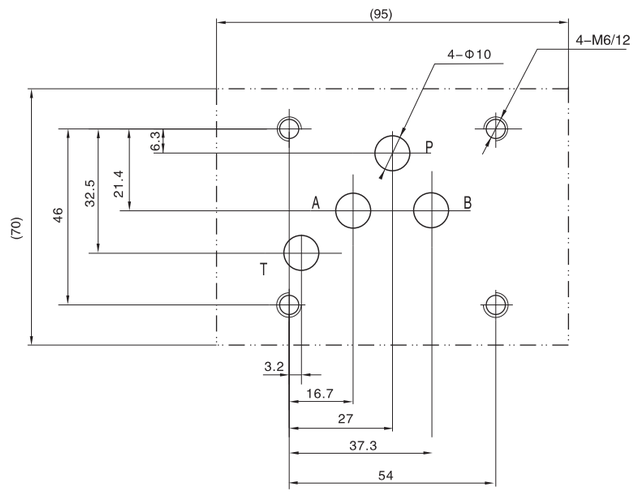


BFWE–03



1.Valve body
2.Proportional solenoid “a” with inductive displacement pick–up
3.Proportional solenoid “b”
4.Gray plug–in connector “A” according to the standard of DIN EN 175 301–803，place another order
5.Black plug–in connector “B” according to the standard of DIN EN 175 301–803，place another order
6.Socket with inductive displacement pick–up
7.For single–solenoid–controlled valve end lover，spool type 2B2B or 2B40B
8.Identical seal ring12*2(used for ports A, B, P, T)
9.Space for taking off the plug–in connector
10.Built–in amplifier
11.The socket corresponds with DIN EN 175 201–804
12.Nameplate
13.Machined valve mounting surface, Connection location to DIN 24 340A，IS04401(and)CETOP–RP 121 H

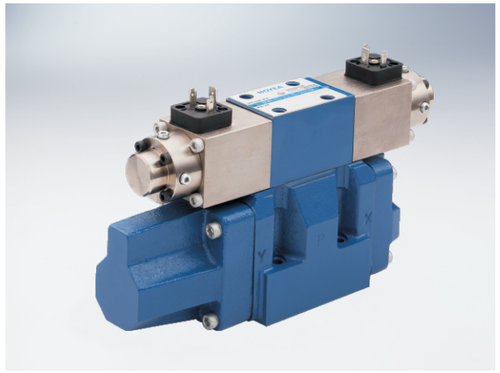
Subplate size



Valve fixing screws：4–M6x40 DIN 912–10.9；M_A=8.9 Nm
The surface, connecting with the valve, should be Ra0.8 roughness, and 0.01/100mm flatness.

Proportional Electro–hydraulic Directional Valve (BFWH)

Technical specification



BFWH electro–hydraulic proportional directional valve is a 2–stage valve with a pilot. It is controlled by a proportional solenoid and converts the electrical signal into a fuild pressure signal to control the flow rate and directions in the hydraulic system.

Specification		03	04	06
Maximum pressure (MPa)		31.5		
Return pressure (MPa)	T(For extl disch)	< 25		
	T(For intl disch)	< 3		
	Port Y	< 3		
Maximum flow	(l/min)	85	150	325
Hysteresis	(%)	< 6		
Repeatability	(%)	< 3		
Rated current	(mA)	800		
Hydraulic fluid		Mineral oil, phosphate–ester		
Viscosity	(mm^2/s)	2.8~100		
Fluid temp.	(^0C)	–20~70		
Coil resistance	(Ω)	19.5		
Cleanliness	Filter is recommended for the highest fluid pollution degree;the lowest specific filtration resistance according to ISO 4406 (C) 20/18/15.			

Model instruction

BFWH – * – * – * – * – 50 *

Proportional electro–hydraulic directional valve

Specification
03 DN 10
04 DN 16
06 DN 25

Symbol: (See BFW)

Control oil:
Omit Intl cntrl intl disch
X Extl cntrl intl disch
Y Intl cntrl extl disch
XY Extl cntrl extl disch

Nominal flow
(based on 1MPa pressure drop)
03 Specification
25 25 l/min
50 50 l/min
85 85 l/min
04 Specification
100 100 l/min
150 150 l/min
06 Specification
270 270 l/min
325 325 l/min

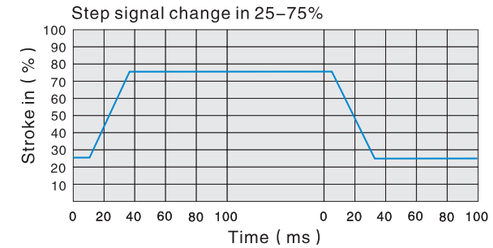
Design serial number

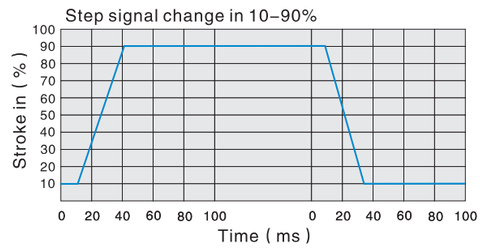
Remarks

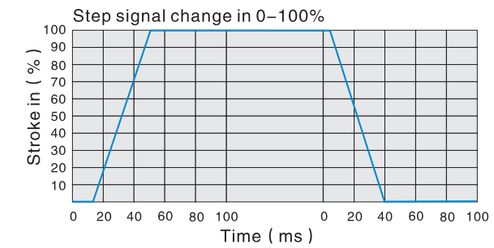
Proportional Electro–hydraulic Directional Valve (BFWH)

HOYEA

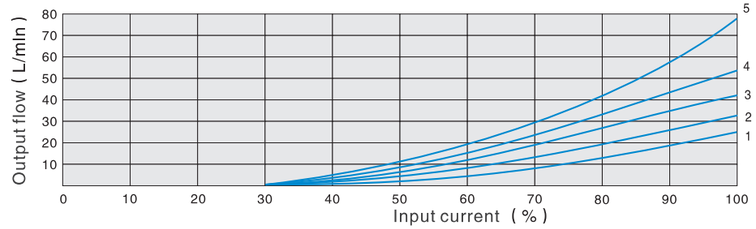
03 Model characteristic curves (Measured at ν =36X10^{-6}m^2/S t=50^{0}C)



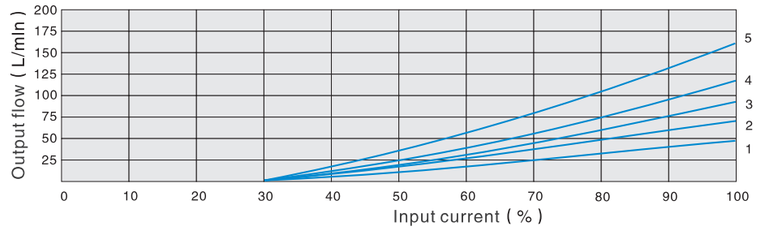




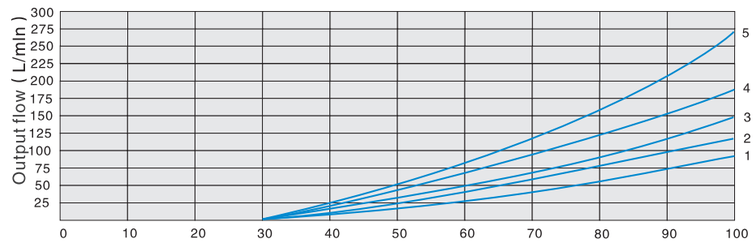
03 Model characteristic curves (Measured at ν =36X10^{-6}m^2/S t=50^{0}C)



25L/min nominal flow at differential pressure .
1 Pv=1MPa Constant
2 Pv=2MPa Constant
3 Pv=3MPa Constant
4 Pv=5MPa Constant
5 Pv=10MPa Constant



50L/min nominal flow at differential pressure.
1 Pv=1MPa Constant
2 Pv=2MPa Constant
3 Pv=3MPa Constant
4 Pv=5MPa Constant
5 Pv=10MPa Constant

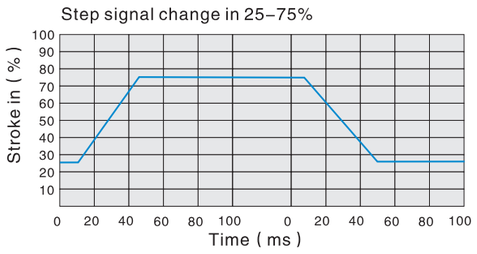


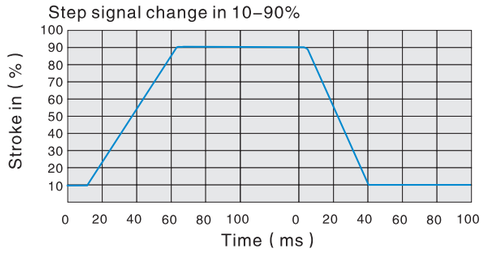
85L/min nominal flow at differential pressure.
1 Pv=1MPa Constant
2 Pv=2MPa Constant
3 Pv=3MPa Constant
4 Pv=5MPa Constant
5 Pv=10MPa Constant

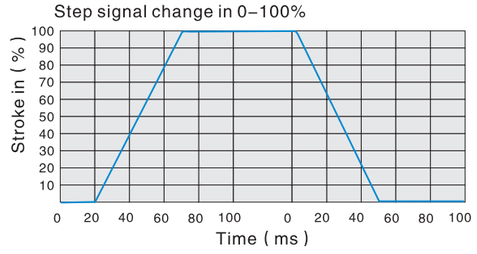
Pv=Valve differential pressure (input pressure minus load pressure and feedback pressure)

Proportional Electro-hydraulic Directional Valve (BFWH)

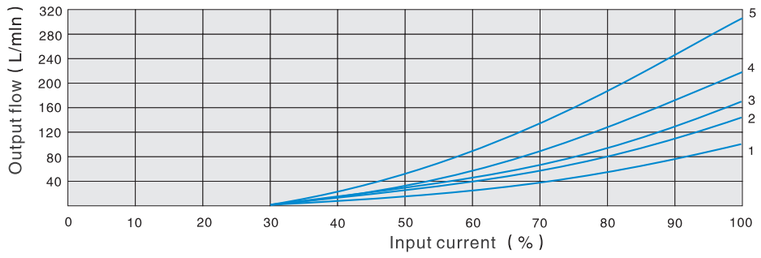
04 Model characteristic curves (Measured at ν =36X10^{-6}m^2/S t=50^{0}C)



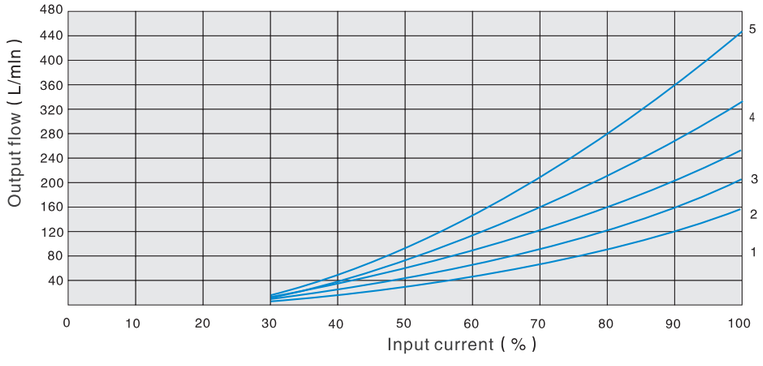




04 Model characteristic curves (Measured at ν =36X10^{-6}m^2/S t=50^{0}C)



100L/min nominal flow at differential pressure .
1 Pv=1MPa Constant
2 Pv=2MPa Constant
3 Pv=3MPa Constant
4 Pv=5MPa Constant
5 Pv=10MPa Constant

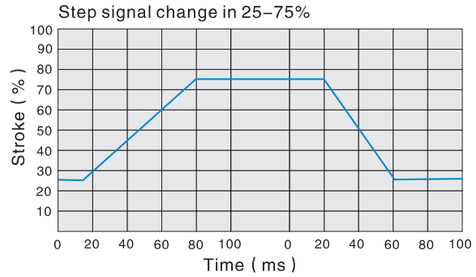


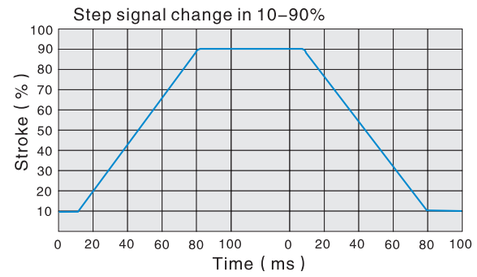
150L/min nominal flow at differential pressure.
1 Pv=1MPa Constant
2 Pv=2MPa Constant
3 Pv=3MPa Constant
4 Pv=5MPa Constant
5 Pv=10MPa Constant

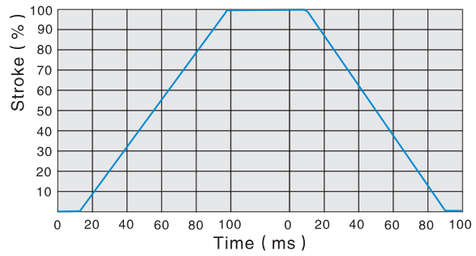
Pv=Valve differential pressure (input pressure minus load pressure and feedback pressure)

Proportional Electro-hydraulic Directional Valve (BFWH)

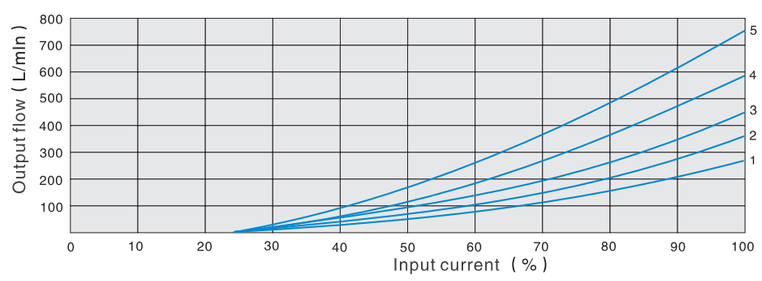
06 Model characteristic curves (Measured at ν =36X10^{-6}m^2/S t=50^{0}C)



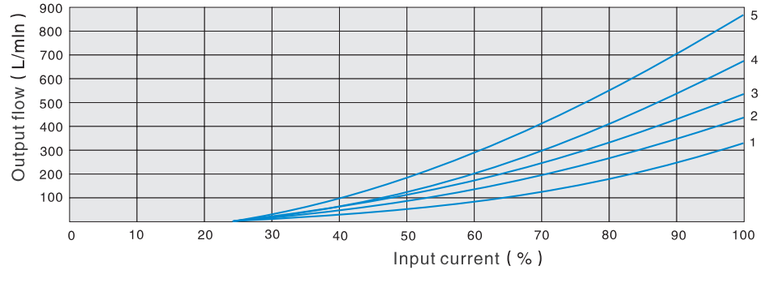




06 Model characteristic curves (Measured at ν =36X10^{-6}m^2/S t=50^{0}C)



270L/min nominal flow at differential pressure .
1 Pv=1MPa Constant
2 Pv=2MPa Constant
3 Pv=3MPa Constant
4 Pv=5MPa Constant
5 Pv=10MPa Constant

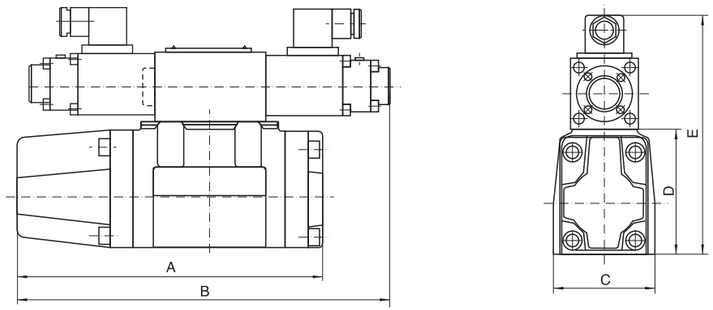


325L/min nominal flow at differential pressure.
1 Pv=1MPa Constant
2 Pv=2MPa Constant
3 Pv=3MPa Constant
4 Pv=5MPa Constant
5 Pv=10MPa Constant

Pv=Valve differential pressure (input pressure minus load pressure and feedback pressure)

Proportional Electro-hydraulic Directional Valve (BFWH)

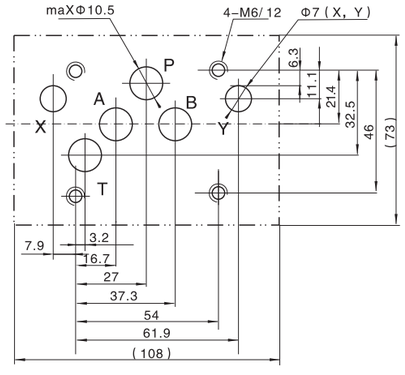
External dimensions



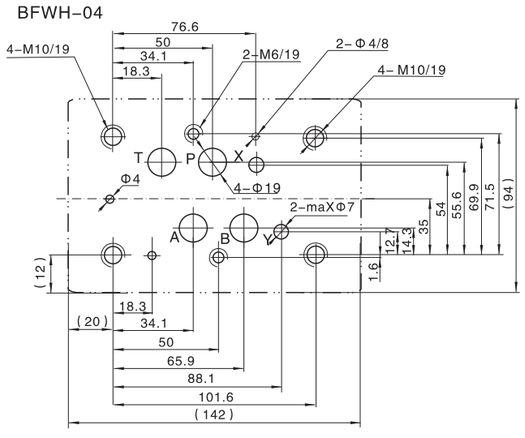
Specification	A	B	C	D	E
BFWH-03	216	250	70	86	171
BFWH-04	250	265	94	95	185
BFWH-06	280	290	120	117.5	202.5

Plate size

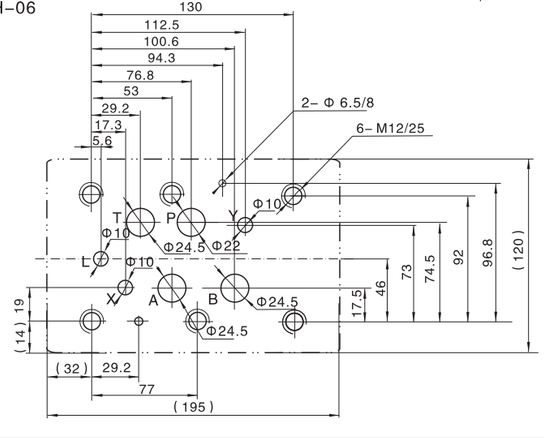
BFWH-03



BFWH-04



BFWH-06

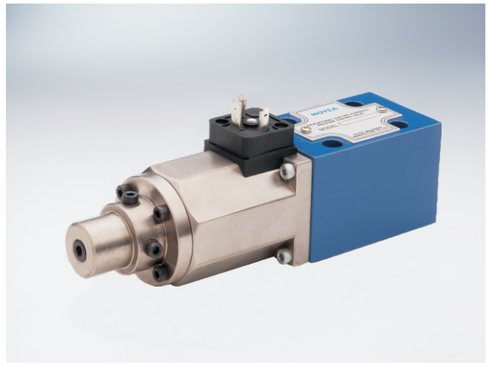


The surface, connecting with the valve, should be Ra0.8 roughness, and 0.01/100mm flatness.

Proportional Directly Operated Relief Valve (BYZ)

HOYEA

Technical specification



Maximum pressure (MPa)		31.5
Maximum flow	(l/min)	2
Minimum flow	(l/min)	0.7
Rated current	(mA)	800
Coil resistance	(Ω)	10~19.5
Hysteresis	(%)	< ±1.5
Repeatability	(%)	±1
Cleanliness	Filter is recommended for the highest fluid pollution degree;the lowest specific filtration resistance according to ISO 4406 (C) 20/18/15.	

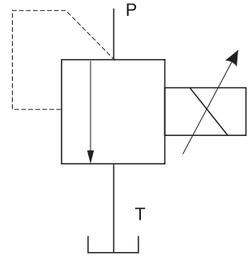
The valve is a direct operated valve controlled by proportional solenoid, it is mainly used for small hydraulic system according to input current, and always is used to be taken as the pilot relief valve of a second pressure valve.

Model instruction

BYZ - 02 - * - 70 - *

- BYZ: Proportional directly operated relief valve
- 02: Specification 02 DN 6
- *: Working pressure
  - 7 7MPa
  - 16 16MPa
  - 25 25MPa
  - 31.5 31.5MPa
- 70: Design serial number
- *: Remarks

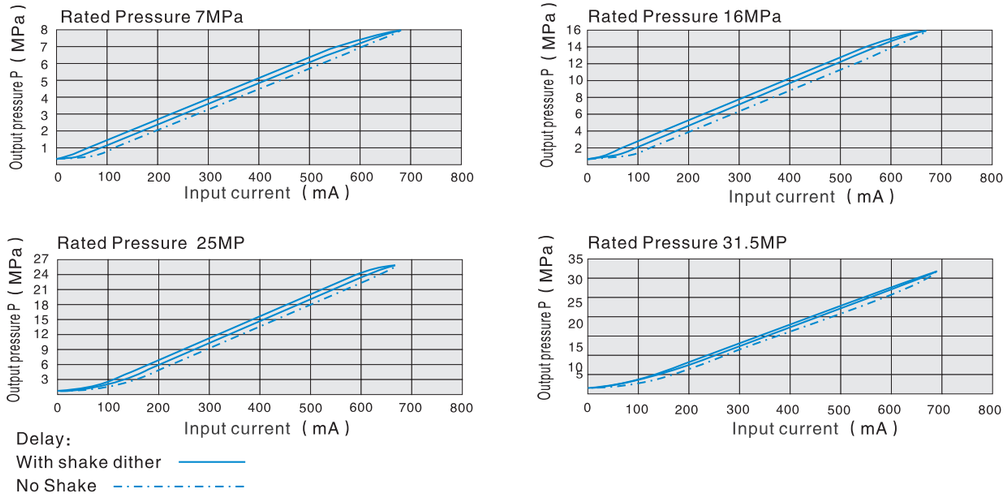
Code symbol



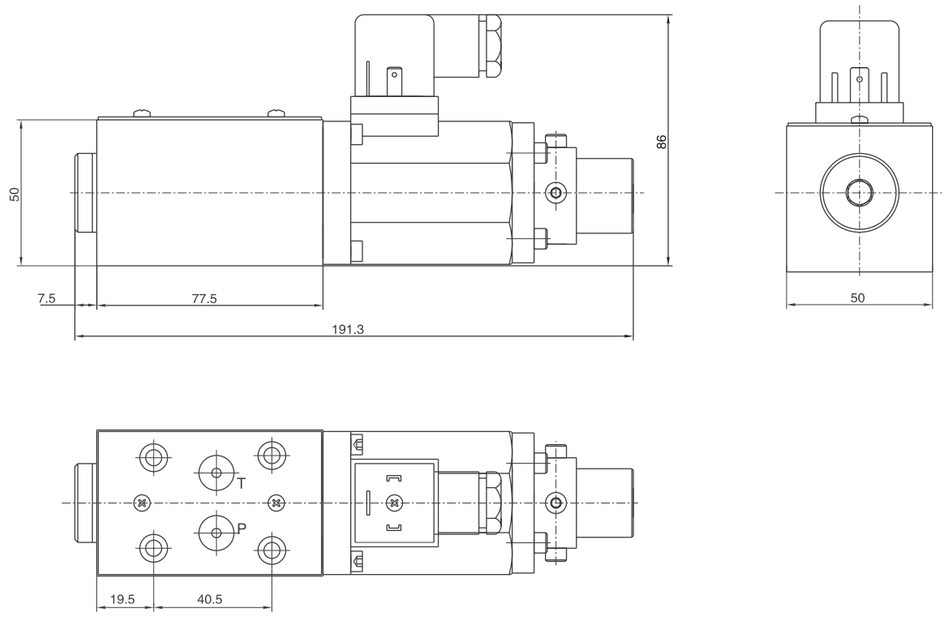
Proportional directly operated Relief Valve (BYZ)

02 Model Characteristic Curves (Measured at ν =36X10^{-6}m^2/S t=50°C)

Output Pressure/Input Current Curves



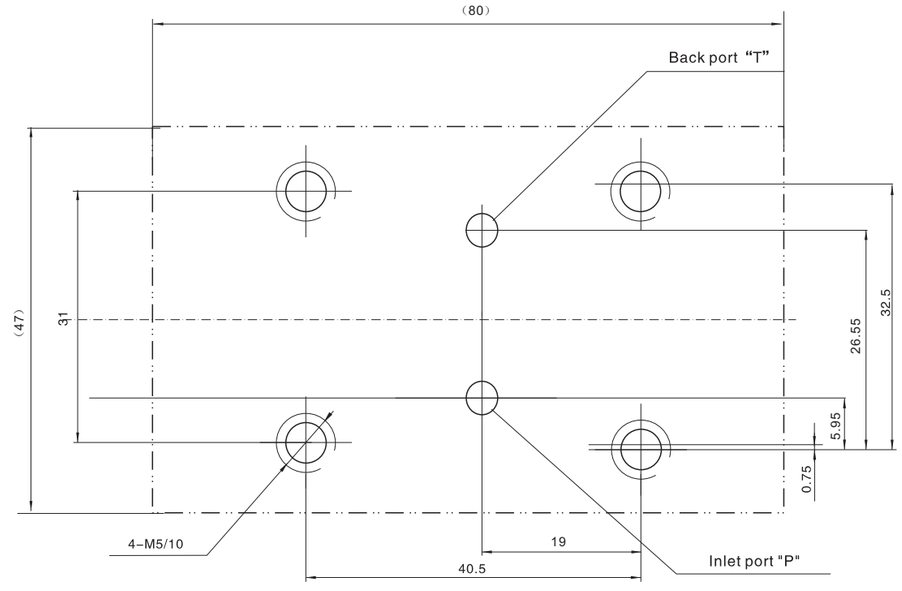
70 External dimensions



Proportional Directly Operated Relief Valve (BYZ)

HOYEA

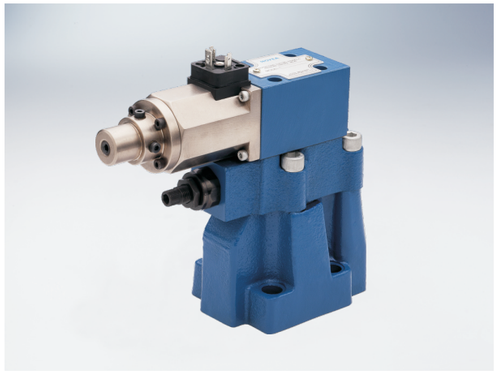
Plate size



The surface, connecting with the valve, should be Ra0.8 roughness, and 0.01/100mm flatness.

Proportional Pilot–operated Relief Valve (BY)

Technical specification



Specification	03	06	10
Maximum pressure (MPa)	31.5	31.5	31.5
Maximum flow (L/min)	100	200	400
Minimum flow (L/min)	3		
Rated current (mA)	800		
Coil resistance (Ω)	10~19.5		
Hysteresis (%)	<±1.5		
Repeatability (%)	< ±2		
Cleanliness	Filter is recommended for the highest fluid pollution degree;the lowest specific filtration resistance according to ISO 4406 (C) 20/18/15.		

Comprised of proportional directly–operated relief valve, pressure limiting valve and low–noise relief valve.

Model instruction

By – * – * * – 70 *

Proportional pilot–operated relief valve

Specification
03 DN10
06 DN20
10 DN30

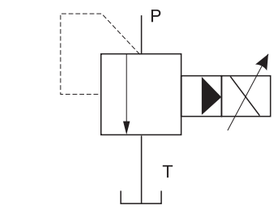
Working pressure:
7 7 MPa
16 16 MPa
25 25 MPa

Remarks

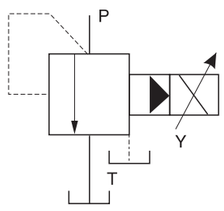
Design serial number

Control oil
Omit intl cntrl intnl disch
Y intl cntrl extl disch

Code symbol

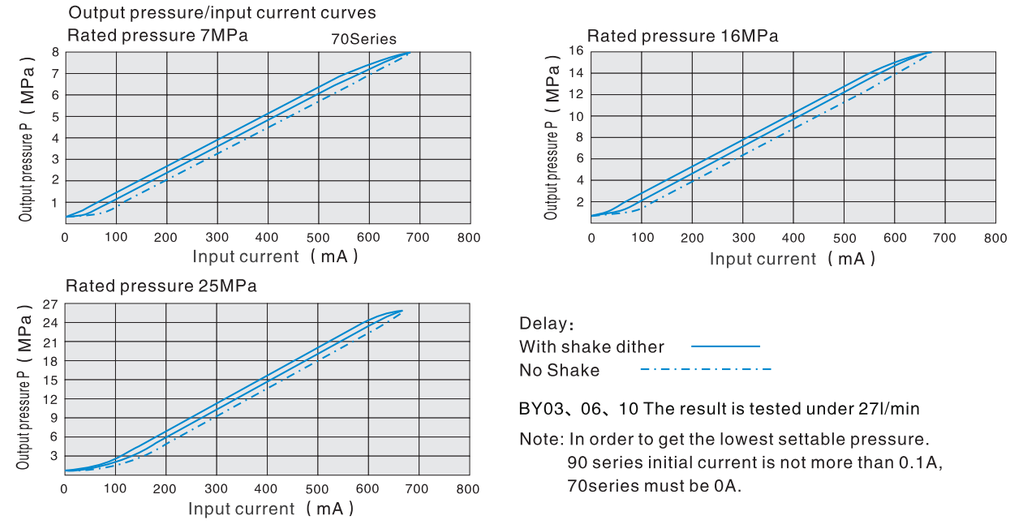


Internal control, internal discharge

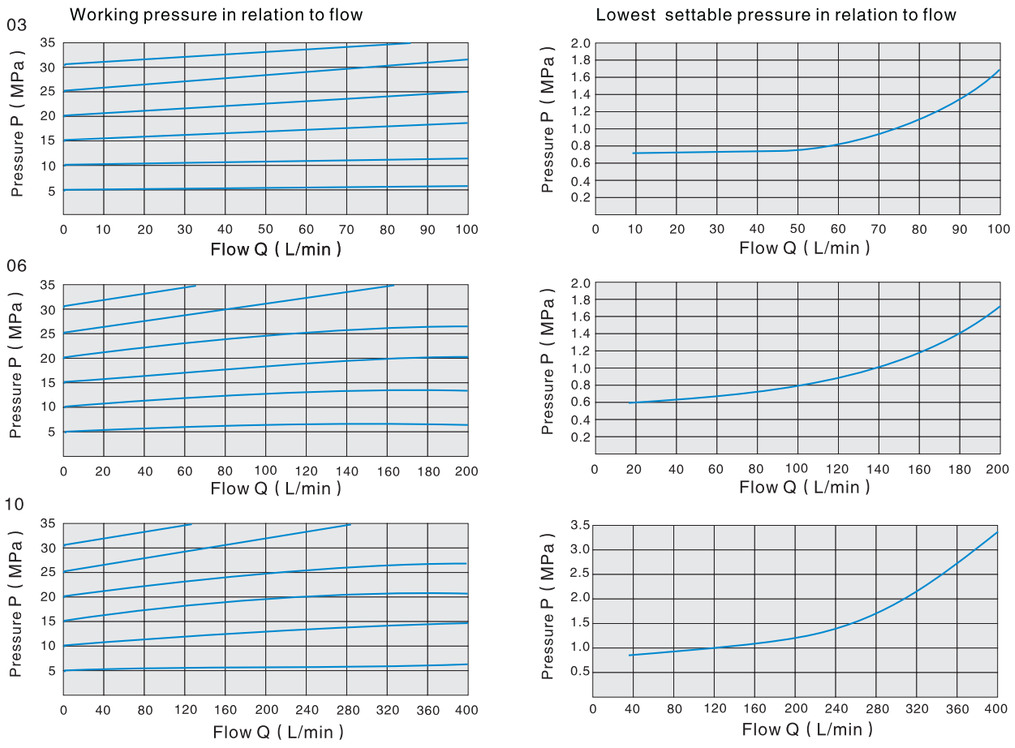


Internal control, external discharge

03、06、10 Model characteristic curves (Testing Condition ν =36X10^{-6}m^2/S t=50°C)

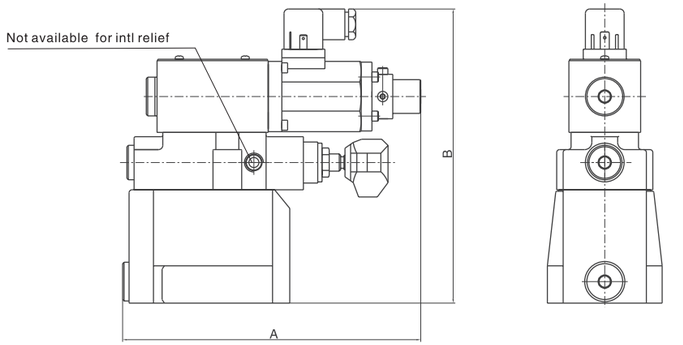


Characteristic curves (Testing Condition ν =36X10^{-6}m^2/S t=50°C)



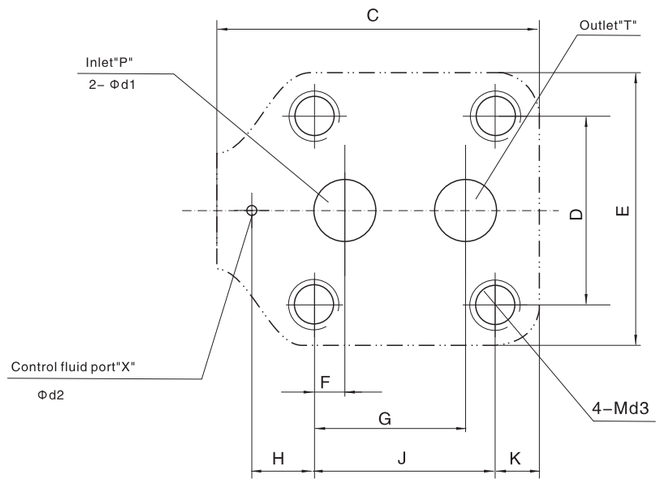
Proportional Pilot–operated Relief Valve (BY)

External dimensions



Note: The outlet of 70 series valve is in the safety valve, and the outlet of 90 series valve is in the proportional pilot valve.

Plate size



The surface, connecting with the valve, should be Ra0.8 roughness, and 0.01/100mm flatness.

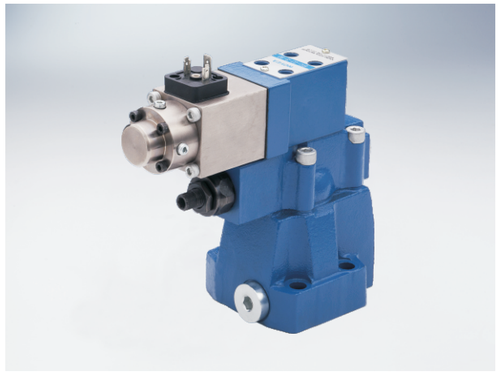
Specification	A	B	C	D	E	F	G	H	J	K	d1	d2	d3
BY–03	197	193	112	54	80	22.2	47.6	0	54	25.8	12	6	12
BY–06	197	197	119	69.8	102	11.1	55.6	23.8	66.7	16.3	25	6	16
BY–10	197	200	150	82.5	116	12.7	76.2	31.7	89	18	32	6	18

Attention：set the deflate hole upward to exhaust air from the pipe

Proportional Pilot–operated Pressure Reducing Valve (BYJ)

HOYEA

Technical specification



Specification		03	06
Maximum pressure (MPa)		31.5	31.5
Maximum flow (l/min)		80	200
Secondary pressure Regulating range	(MPa)	See model description	
Rated current	(mA)	800	
Coil resistance	(Ω)	19.5	
Hysteresis	(%)	< ±2.5	
Repeatability	(%)	< ±2	
Cleanliness		Filter is recommended for the highest fluid pollution degree;the lowest specific filtration resistance according to ISO 4406 (C) 20/18/15.	

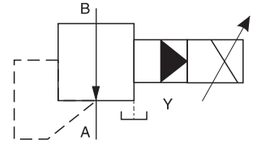
Comprised of proportional directly–operated relief valve, pressure limiting valve and reducing valve, this product controls a secondary pressure from the system pressure according to value of input current.

Model instruction

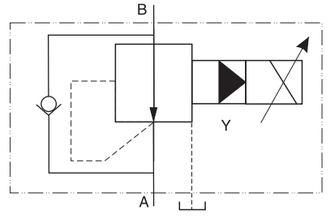
BYJ – * – * *Y– 90 *

- BYJ: Proportional pilot–operated pressure reducing valve
- Specification: 03 DN10; 06 DN20
- Secondary pressure regulating range: 7 7MPa; 16 16MPa; 25 25MPa
- Control oil: Y intl cntrl extl disch
- Default: Without check valve; D: With check valve
- 90: Design serial number
- *: Remarks

Code symbol



BYJ···Y

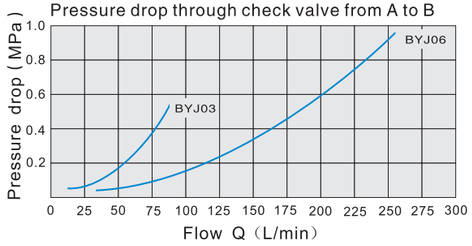


BYJ···DY

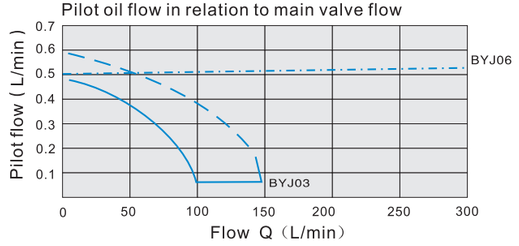
Proportional Pilot-operated Pressure Reducing Valve (BYJ)

03、06、10 Model characteristic curves (Measured at ν =36X10^{-6}m^2/S t=50°C)

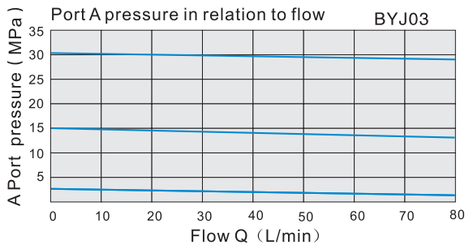
Pressure drop through check valve from A to B



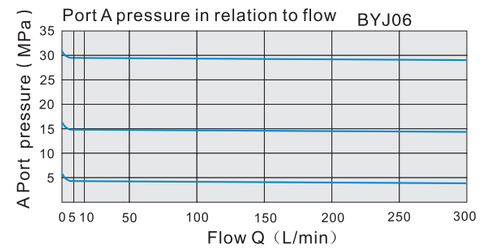
Pilot oil flow in relation to main valve flow



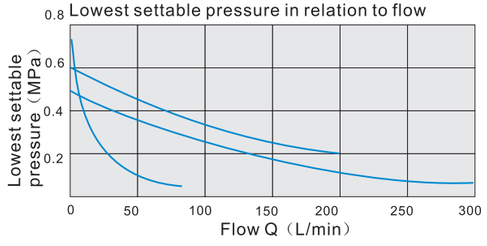
Port A pressure in relation to flow BYJ03



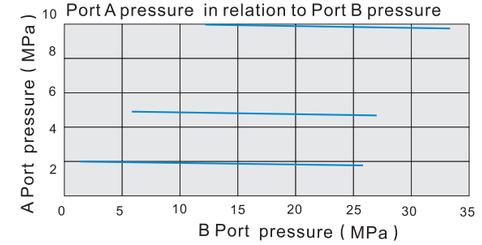
Port A pressure in relation to flow BYJ06



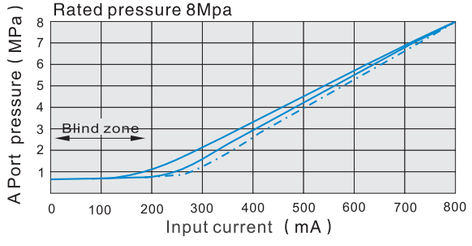
Lowest settable pressure in relation to flow



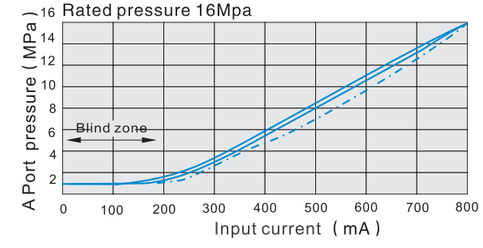
Port A pressure in relation to Port B pressure



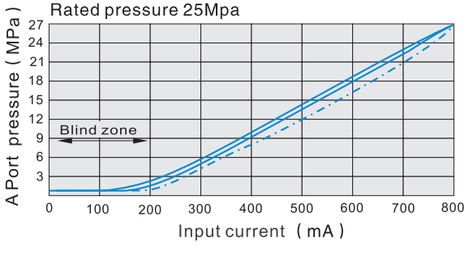
Port A pressure in relation to input current
Rated pressure 8Mpa



Port A pressure in relation to input current
Rated pressure 16Mpa



Port A pressure in relation to input current
Rated pressure 25Mpa

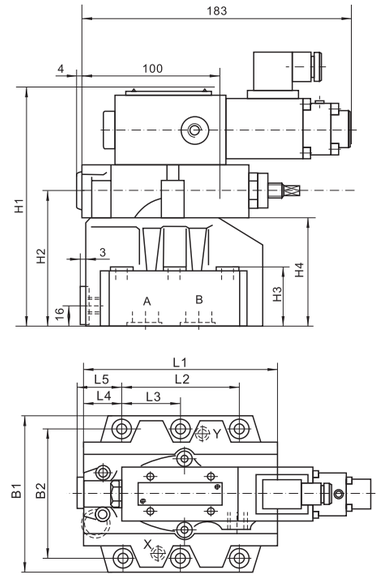


Delay:
With shake dither
No Shake

BYJ03、06 Model are tested under 27L/min.

Note: In order to get the lowest rated pressure, pilot initial current is not more than 0.1A

External dimensions



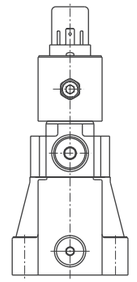
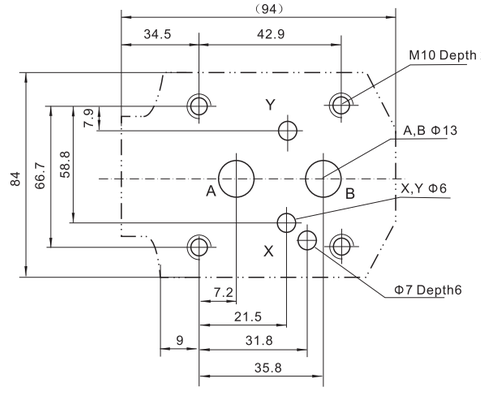
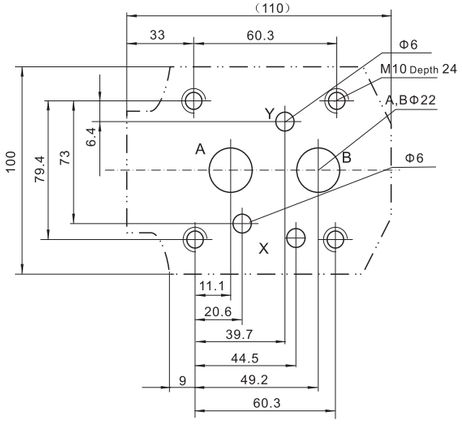


Plate size

BYJ-03



BYJ-06



The surface, connecting with the valve, should be Ra0.8 roughness, and 0.01/100mm flatness.

Specification	B1	B2	H1	H2	H3	H4	L1	L2	L3	L4	L5
BYJ-03	85	66.7	190	92	28	72	90	42.9	-	35.5	34.5
BYJ-06	102	79.4	200	102	38	82	112	60.3	-	33.5	37

Proportional Electro-hydraulic Control P-Q Valve (BYLZ)

Technical specification

This proportional valve adopts two electrical loops to control pressure and flow of hydraulic system respectively. Using very small pressure drop to track load pressure and control the pump pressure, it is an energy-saving valve.

Model		BYLZ-02-*-*	BYLZ-03-*-*	BYLZ-06-250-*
Maximum pressure (MPa)		31.5		
Maximum flow (l/min)		40	160	250
Flow range (l/min)		1-40	2-160	3-250
Pressure control	Rated current (mA)	800		
	Coil resistance (Ω)	19.5	43.5	43.5
	P Differential(MPa)	0.6	0.6	0.7
	Hysteresis (%)	< 5	< 7	< 7
	Repeatability (%)	< 1		
Flow control	Pressure Range (Mpa)	16:1.5-16 25:1.5-25 31.5:1.5-31.5	16:1.5-16 25:1.5-25 31.5:1.5-31.5	16:1.5-16 25:1.5-25 31.5:1.5-31.5
	Rated current (mA)	800		
	Coil resistance (Ω)	10	10	10
	Hysteresis (%)	< 3		
	Repeatability (%)	< 1		
Cleanliness		Filter is recommended for the highest fluid pollution degree;the lowest specific filtration resistance according to ISO 4406 (C) 20/18/15.		

Model instruction

BYL Z - * /* - * - 90 - *

Proportional electro-hydraulic control P-Q valve

Z directly operated

Specification
02 DN 6
03 DN 10
06 DN 25

Working pressure
1 6 16MPa
25 25MPa
31.5 31.5MPa

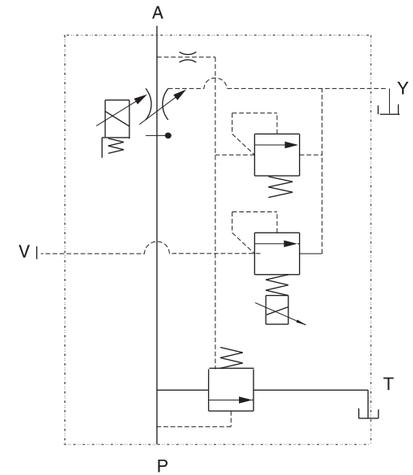
Flow range:
02 Specification
20 20 l/min
40 40l/min
03 Specification
125 125l/min
160 160l/min
06 Specification
250 250l/min

Remarks

Design serial number

HOYEA

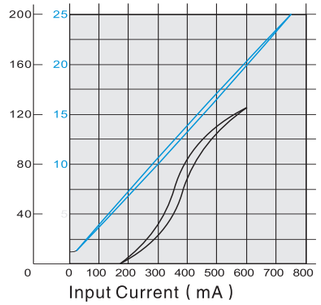
Code symbol



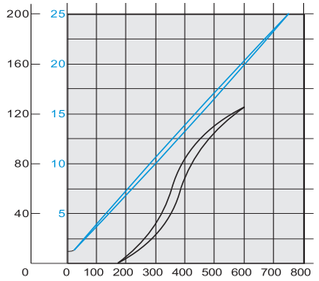
02, 03, 06 Characteristic curves (Measured at $\nu = 36X10^{-6}m^2/S$ t=50°C)

Output flow, output pressure/input current curves

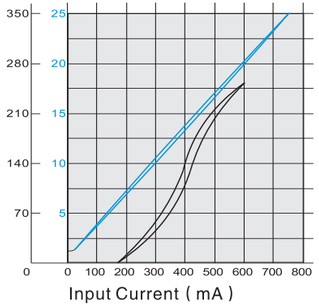
Output flow (L/min) —— Output pressure (MPa) ——



BYLZ-02/40-25



BYL-03/160-25

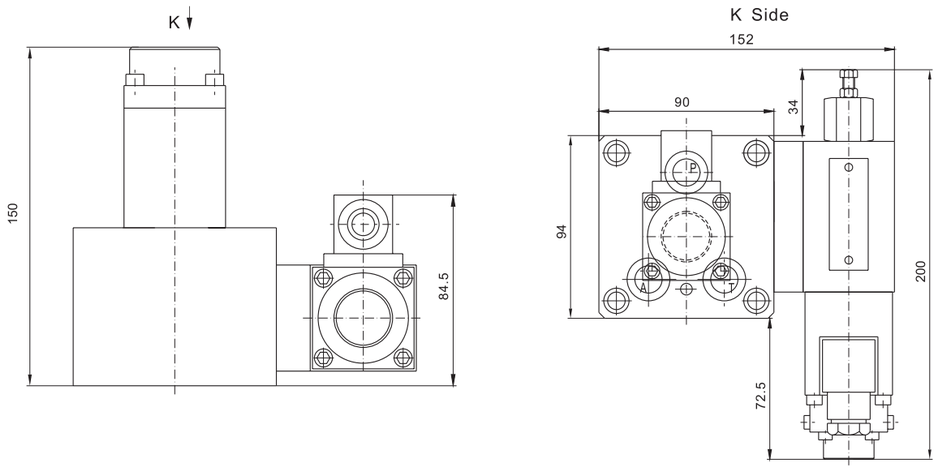


BYLZ-06/250-25

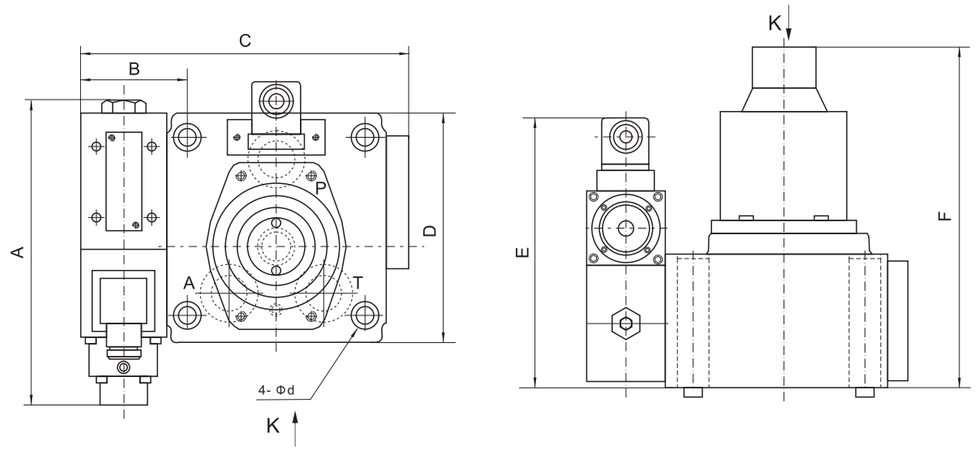
Proportional Electro-hydraulic Control P-Q Valve (BYLZ)

External dimensions

BYLZ-02



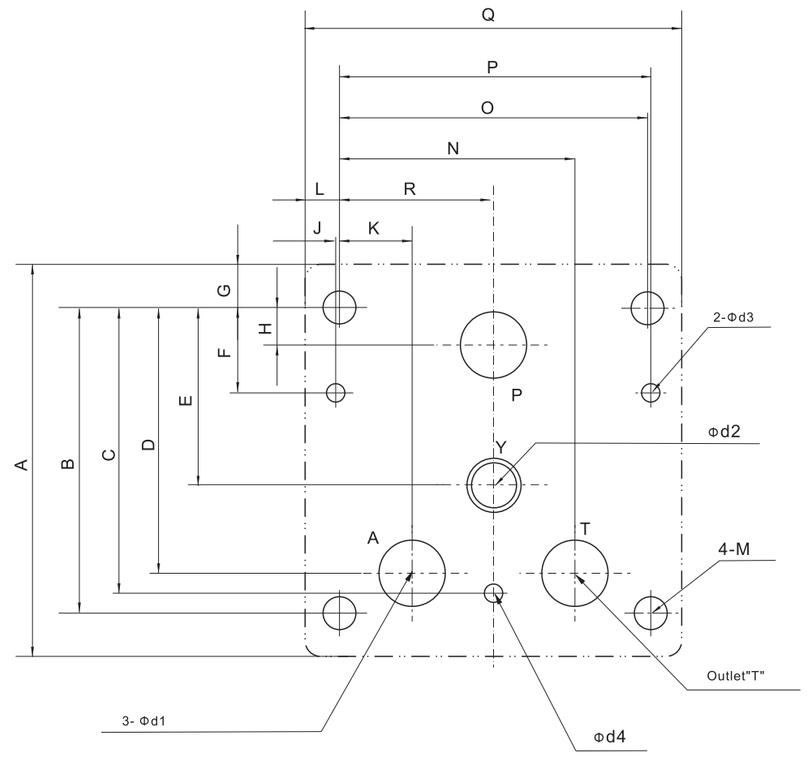
BYLZ-03、06



Model	A	B	C	D	E	F	d
BYLZ-03	171	61.7	188	130	171	216	11
BYLZ-06	171	67	247	174	199.5	248	17.5

Proportional Electro-hydraulic Control P-Q Valve (BYLZ)

Plate size



The surface, connecting with the valve, should be Ra0.8 roughness, and 0.01/100mm flatness.

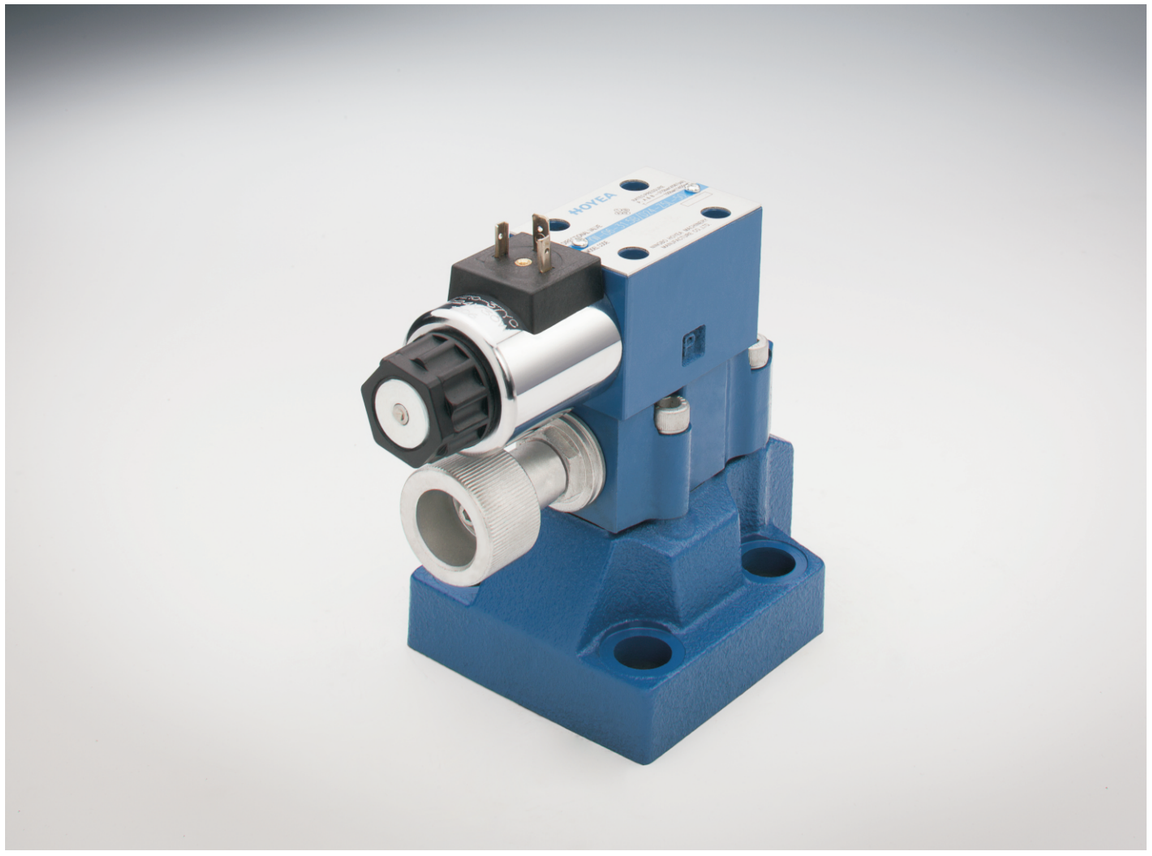
Model	A	B	C	D	E	F	G	H	J	K	L	R	N	O	P	Q	M	d_1	d_2	d_3	d_4
BYLZ-02	84	76	70	65	43	21.5	9	10	1	16.5	9	36	55.5	72	73	90	M8/14	14	10	7×7L	6
BYLZ-03	130	101.6	95.3	88.9	59	28.6	14.2	12.7	0.8	23.8	11.7	50.8	77.8	101.6	102.4	124	M10/19	23	11	7×7L	6
BYLZ-06	174	133.4	133.4	107	82.2	41.3	24	12.7	1.6	28.1	17	73.1	118.1	146.1	144.5	180	M16/30	29	14	17×10L	6.2

Note in use

- Discharge back press≤0.2MPa
  Return back press≤0.5MPa
- Minimum stable flow under controlled pressure
  Nominal size03，06≥10 l/min
  Nominal size10≥15 l/min
- Vent hole orientation can be adjusted freely：Put it upward to vent off the air from the piping.

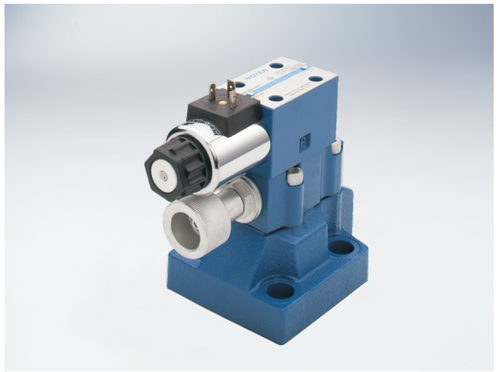
HOYEA

Pressure Control Valves Series



Relief Valve

Technical specification



Specification		03		06		10
		10	15	20	25	30
Max. Flow	(L/min)	250	500	500	500	650
Max. working pressure	(MPa)	35				
Working fluid		Mineral oil;phosphate-ester				
Fluid temp.	(℃)	-20~70				
Viscosity	(mm^2/s)	12~380				
Working press	(MPa)	5	10	20	31.5	35
Cleanliness	The maximum allowable cleanliness of the oil should be according to 9th degree of Standard NAS1638.It is suggested that the minimum filter rating should be β 10≥75.					

The relief valve is a pressure control valve. It maintains constant pressure at inlet by discharging excess fluid in the system.Solenoids relief valve is a combination of electromagnetic directional valve and pilot-operated pressure relief valve, it is used to control or unload multi-stage pressure in hydraulic system.

Model description

Y * *-* *-* *-* *-* * /* * * * /* /* * 50 *

Relief valve

Omit without solenoids directional valve
W With solenoids directional valve

Omit Pilot operated valve
C Pilot operated without main cartridge (not marked diameter)
Pilot operated with main cartridge (marked diameter)

Specification

Subplate	Pipeline	DN	Screw thread connector
03	10	10	G1/2"orM22x1.5
	15	15	G3/4"orM27x2
06	20	20	G1"orM33x2
	25	25	G1 1/4"orM42x2
10	30	30	G1 1/2"orM48x2

Omit Subplate connection
G Pipe type connection-G Scew
G2 Pipe type connection-M Scew

Working pressure
5 to5MPa
10 to10MPa
20 to20MPa
31.5 to 31.5MPa
35 to 35MPa

A Always close [1)]
B Always open

1 Rotary knob
2 Sleeve with hehagon and protective cap

Remarks

Serial number

Seal material
Omit NBR Seals
V FPM Seals

Pilot operated drainage port thread
Omit G1/4"
2 M14X1.5

Omit No damping[2)]
08 Φ0.8 Damping
10 Φ1.0 Damping
12 Φ1.2 Damping

Omit without push rod emergency[3)]
N9 with concealed push rod emergency

Z5L Square connector with light[4)]

Working voltage[5)]
D12 DC12V
D24 DC24V
A110 AC110V
A220 AC220V
B110 (B110V Rectified)
B220 (B220V Rectified)

Omit Standard Type[6)]
U minimum setting pressure is lower type

Omit Intl cntrl intl disch
X Extl cntrl intl disch
Y Intl cntrl extl disch
XY Extl cntrl extl disch

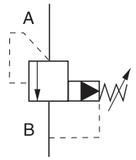
Relief Valve

Notice explaination

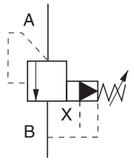
1. Item 1),2),3),4),5)is used in YW solenoid relief valves
2. Item 2) damping is fixed at port B of solenoid directional valves
3. 6) Type U characteristic refer to the curve

Code symbol

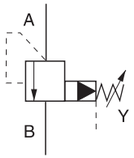
Y..



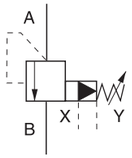
Y..X/..



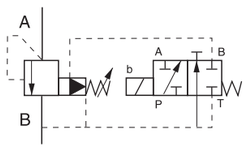
Y..Y/..



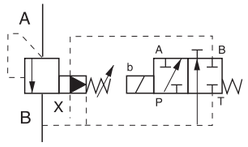
Y..XY/..



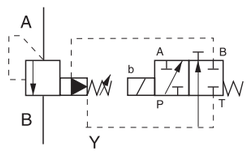
YW..
Always close



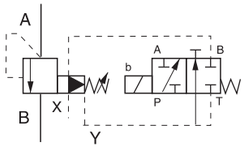
YW..X/
Always close



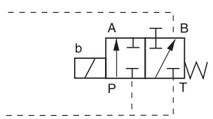
YW..Y/
Always close



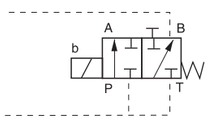
YW..XY/
Always close



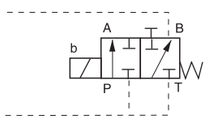
Always open



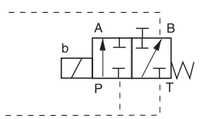
Always open



Always open



Always open

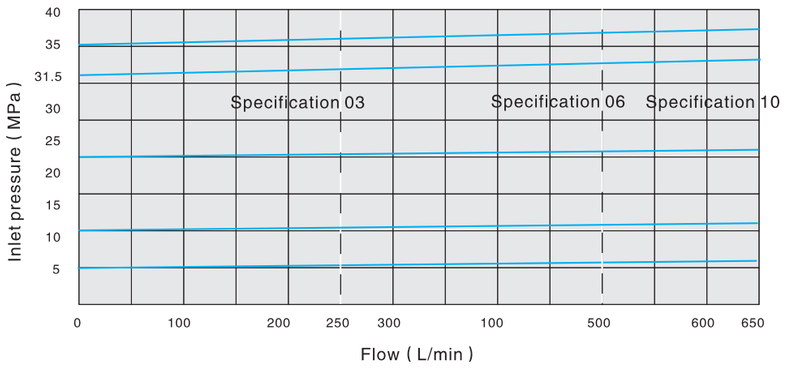


Relief Valve

Performance curve (Measured at υ=41mm²/s and t=50℃)

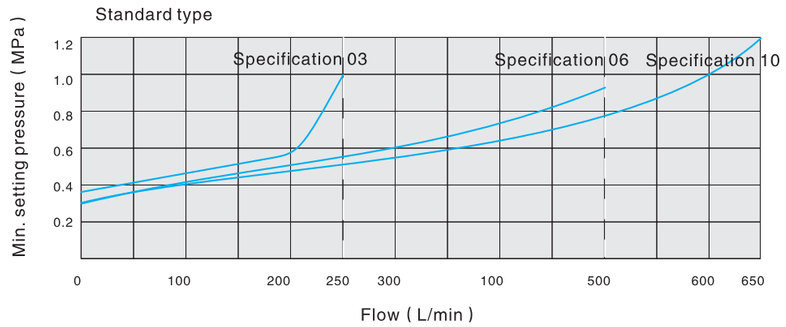
1) The characteristic curves were measured with external, pressureless, pilot oil drain.
2) In the case of internal pilot oil drain, the inlet pressure increases by the outlet pressure in port T.

Working Pressure in relation to flow



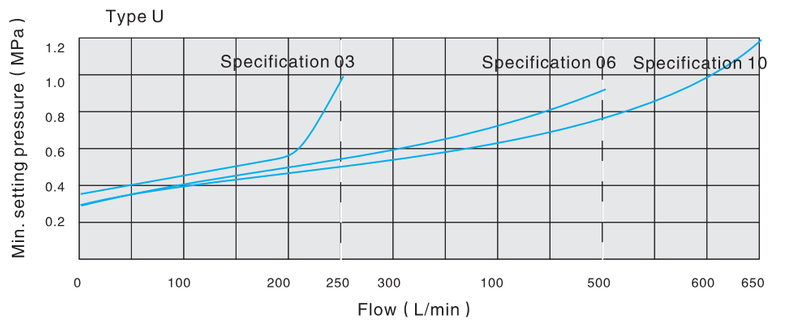
Minimum set pressure and circulation pressure in dependence upon the flow standard version.

Standard type



Minimum set pressure and circulation pressure in dependence upon the flow version "u"

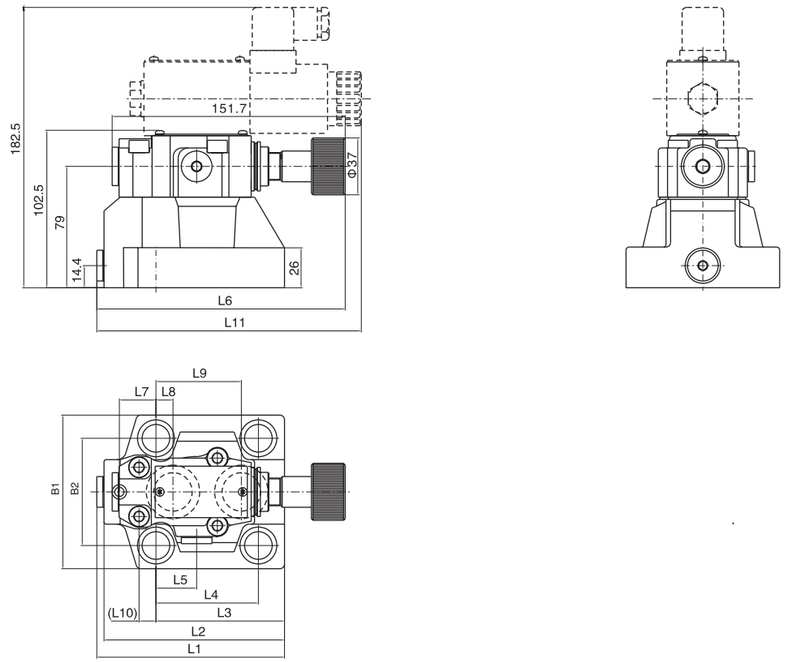
Type U



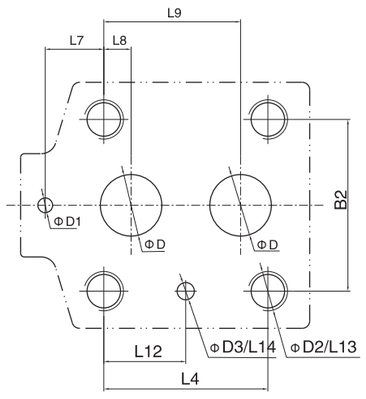
The characteristic curves are valid for outlet pressure B:0 over the entire flow range.

Relief Valve

External dimensions



Subplate mounting size



Specification	Mounting screw	Tighten torque
Y/YW-03	M12x45-10.9	130Nm
Y/YW-06	M16x50-10.9	310Nm
Y/YW-10	M18x50-10.9	430Nm

Notice: The surface, connecting with the valve, should be Ra0.8 roughness, and 0.01/100mm flatness.

Specification	B1	B2	L1	L2	L3	L4	L5	L6	L7	L8	L9	L10	L11	L12	L13	L14	D	D1	D2	D3
Y/YW-03	78	54	98.5	91.5	67	54	23.5	149.3	0	22.1	47.5	14	159.7	22.1	20	5	12	6	M12	7
Y/YW-06	100	69.8	122.2	117.5	83.7	66.7	26.5	161.8	23.8	11.1	55.6	11	172.2	33.3	25	6	25	6	M16	7
Y/YW-10	115	82.6	154.5	149.5	106.9	88.9	28.1	172.5	31.8	12.7	76.2	9.4	182.9	44.4	30	6	32	6	M18	7

Sequence Valve

Technical specification

Specification		03	06	10
Max. working pressure	(MPa)	31.5		
Max. Flow	(L/min)	250	500	600
Working fluid		Mineral oil;phosphate-ester		
Fluid temp.	(℃)	-20~70		
Viscosity	(mm^2/s)	12~380		
Working press	(MPa)	5 10 20 31.5		
Cleanliness		The maximum allowable cleanliness of the oil should be according to 9th degree of Standard NAS1638.It is suggested that the minimum filter rating should be β 10≥75.		

YS pilot-operated sequence valve is used to control action sequence of actuators in hydraulic systems so as to achieve automatic control. By changing the control mode, it can serve as back pressure valve, unload valve, bypass valve and sequence valve. In addition, an internal supply internal discharge or an external supply internal discharge sequence valve can also be used as a balance valve if it includes a check valve.

Model description

YS ＊-＊-＊ ＊-＊ ＊/＊ ＊50＊

Sequence valve

Pilot operated valve
Omit Pilot operated without main cartridge (not marked diameter)
C Pilot operated with main cartridge (marked diameter)

Specification
03 DN10
06 DN20
10 DN30

Working press
5 to5MPa
10 to10MPa
20 to20MPa
31.5 to 31.5MPa
35 to 35MPa

Omit Without check valve
D With check valve

Omit Intl cntrl intl disch
X Extl cntrl intl disch
Y Intl cntrl extl disch
XY Extl cntrl extl disch

Pilot operated drainage port thread
Omit G1/4"
M M14X1.5

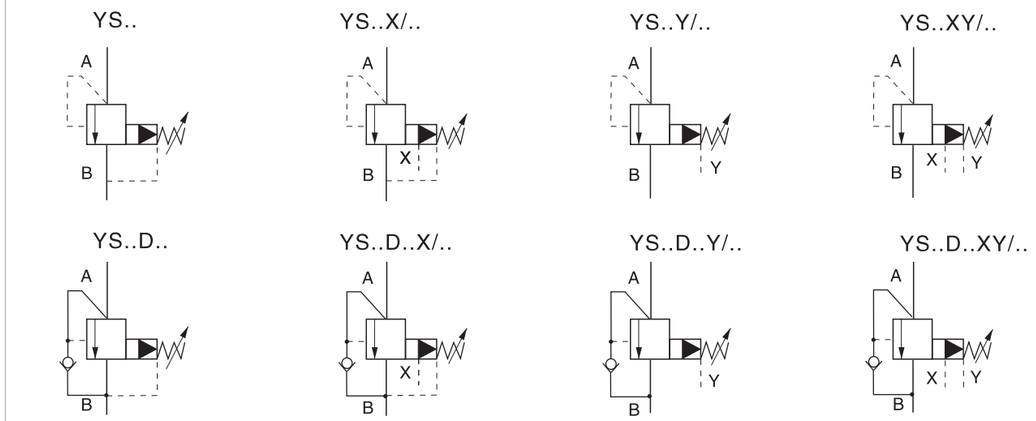
Seal material
Omit NBR Seals
V FPM Seals

Serial number

Remarks
1 Rotary knob
2 Sleeve with hexagon and protective cap

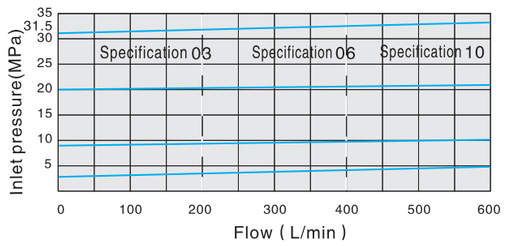
Sequence Valve

Code symbol

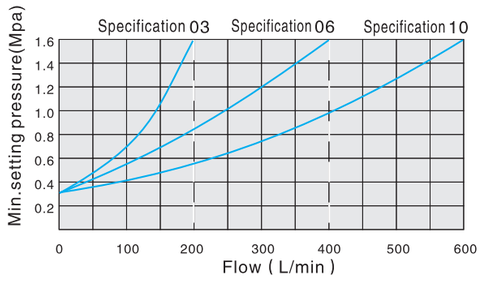


Performance curve (Measured at: Test under υ=41mm^2/s and t=50℃)

Inlet pressure in relation to the flow (A→B)

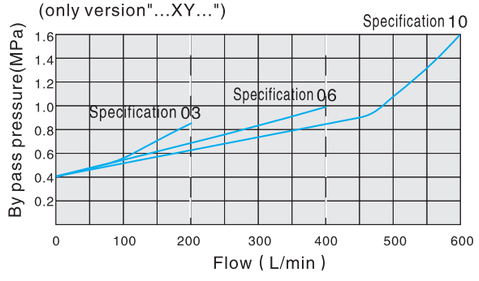


Minimum settable pressure in relation to the flow (A→B)
(=bypass pressure version "...X...")



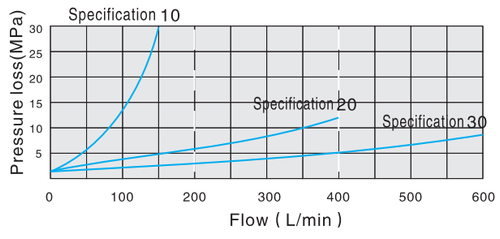
The characteristic curves are valid for the complete flow range

Bypass pressure in relation to (A→B)
(only version"...XY...")



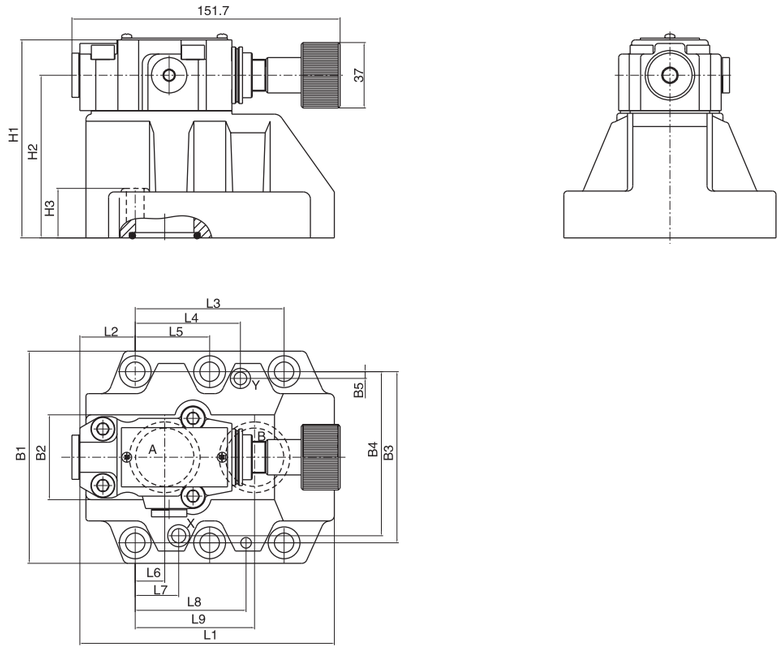
The characteristic curves are valid for outlet pressure P_B=0 for the complete flow range

The curve △P-Q pass through the check valve

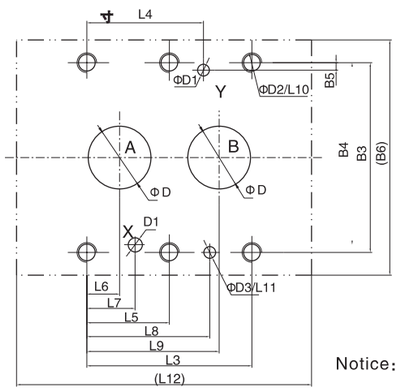


Sequence Valve

External dimensions



Subplate mounting size



Specification	Mounting screw	Tighten torque
YS-03	4-M10x50-10.9	75Nm
YS-06	4-M10x60-10.9	75Nm
YS-10	6-M10x70-10.9	75Nm

Notice: The surface, connecting with the valve, should be Ra0.8 roughness, and 0.01/100mm flatness.

Model	L1	L2	L3	L4	L5	L6	L7	L8	L9	L10	L11	L12	B1	B2	B3	B4	B5	B6	H1	H2	H3	D	D1	D2	D3
YS-03	96	35.5	42.9	21.5	–	7.2	21.5	31.5	35.8	23	6	98	85	80	66.7	58.8	7.9	87	112	92	28	12	6	M10	7
YS-06	116	37.5	60.3	39.7	–	11.1	20.6	44.5	49.2	24	6	118	102	59.5	79.4	73	6.4	104	122	102	38	25	6	M10	7
YS-10	145	33	84.2	59.5	42.1	16.7	24.6	62.7	67.5	25	6	147	120	76	96.8	92.8	3.8	149	130	110	46	32	6	M10	7

Unloading Relief Valve

Technical specification

Specification		03	06	10
Max. working pressure (MPa)		31.5		
Max. Flow (L/min)	10%	40	80	120
	7%	60	120	240
Working fluid		Mineral oil;phosphate-ester		
Fluid temp.	(℃)	-20~70		
Viscosity	(mm^2/s)	12~380		
Working press	(MPa)	5	10	20	31.5
Cleanliness	The maximum allowable cleanliness of the oil should be according to 9th degree of Standard NAS1638.It is suggested that the minimum filter rating should be β 10≥75.			

YX/YXW valve is a pilot-operated unloading valve. Its function is to switch two situations in hydraulic system, by adjusting handle to set the working pressure or unloading pressure. Pump will be unloading automatically by controlling electrical magnetic.

Model description

YX * *-*-* *-* * /* * * * /* /* * 50 *

Unloading Relief Valve

Omint without solenoids directional valve
W With solenoids directional valve

Pilot operated valve
Omit Pilot operated without main cartridge (not marked diameter)
C Pilot operated with main cartridge (marked diameter)

Specification
03 DN10
06 DN20
10 DN30

Working pressure
5 to5MPa
10 to10MPa
20 to20MPa
31.5 to 31.5MPa

A Always closed[1)]
B Always open

1 Rotary knob
2 Sleeve with hexagon and protective cap

Omit Intl cntrl intl disch
Y Intl cntrl extl disch

Remarks

Serial number

Seal material
Omit NBR Seals
V FPM Seals

Pilot operated drainage port thread
Omit G1/4"
M M14X1.5

Omit No damping[2)]
08 Φ0.8 Damping
10 Φ1.0 Damping
12 Φ1.2 Damping

Omit without push rod emergency[3)]
N9 with concealed push rod emergency

Z5L Square connector with light[4)]

Working voltage[5)]
D12 DC12V
D24 DC24V
A110 AC110V
A220 AC220V
B110 (A110V Rectified)
B220 (A220V Rectified)

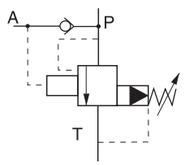
Switching differential pressure (P→A)
10 on average
17 on average

Explaination: 1.1),2),3),4),5)is used in YXW solenoids relief valves
2. 2) damping is fixed at the B oil port of the solenoids directional valves

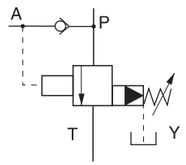
Unloading Relief Valve

Code symbol

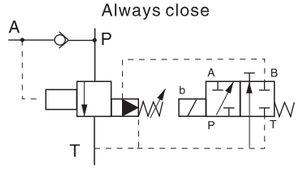
YX..



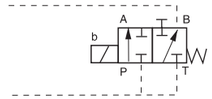
YX..Y..



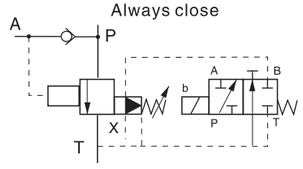
YXW..
Always close



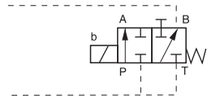
Always open



YXW..Y..
Always close



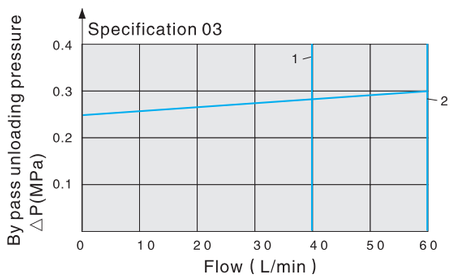
Always open



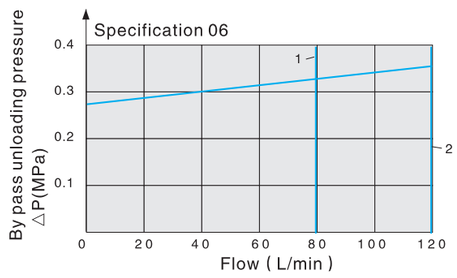
Performance curve (Measured at υ=41mm²/s and t=50℃)

Qp (P→T)Unloading (by pass) pressure depends on the flow of the pump

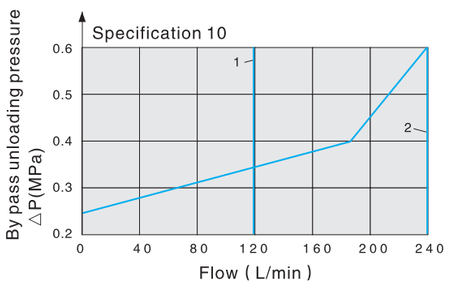
Specification 03



Specification 06



Specification 10



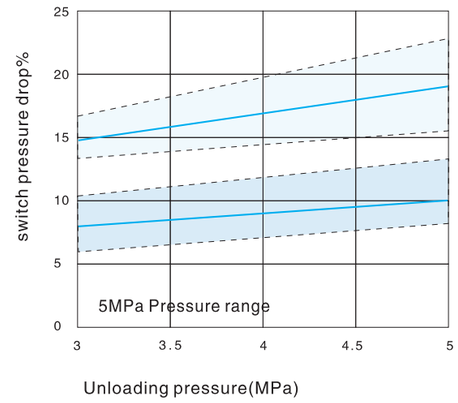
1.Q_{pmax} is used in type 10%
2.Q_{pmax} is used in type 17%

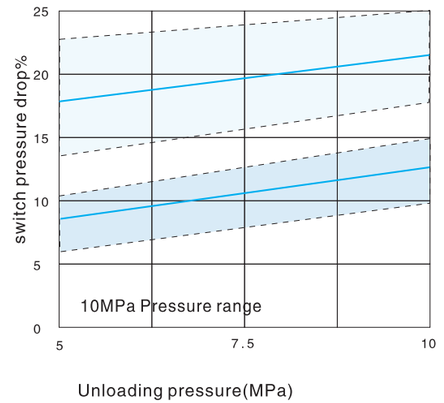
The characteristic curves are valid for outlet pressure P_T=0 for complete flow range.

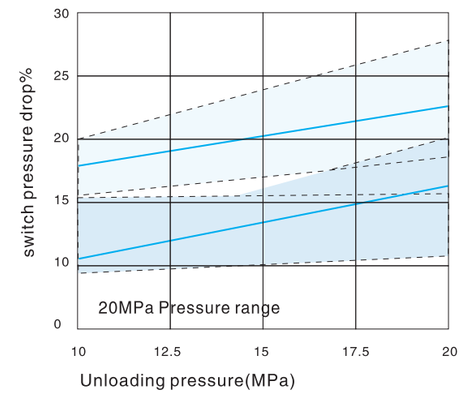
Unloading Relief Valve

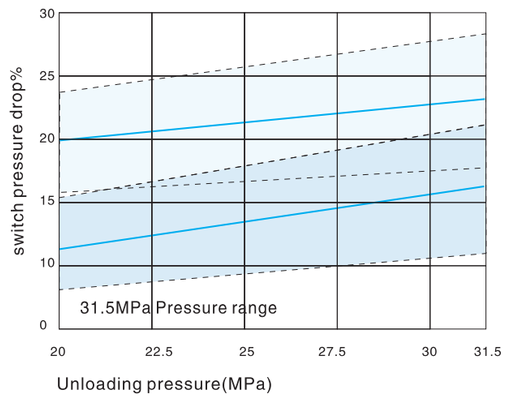
Performance curve (Measured at υ=41mm²/s and t=50℃)

Switching differential pressure (P→A) depending on cut–off pressure P_c(Type DA)







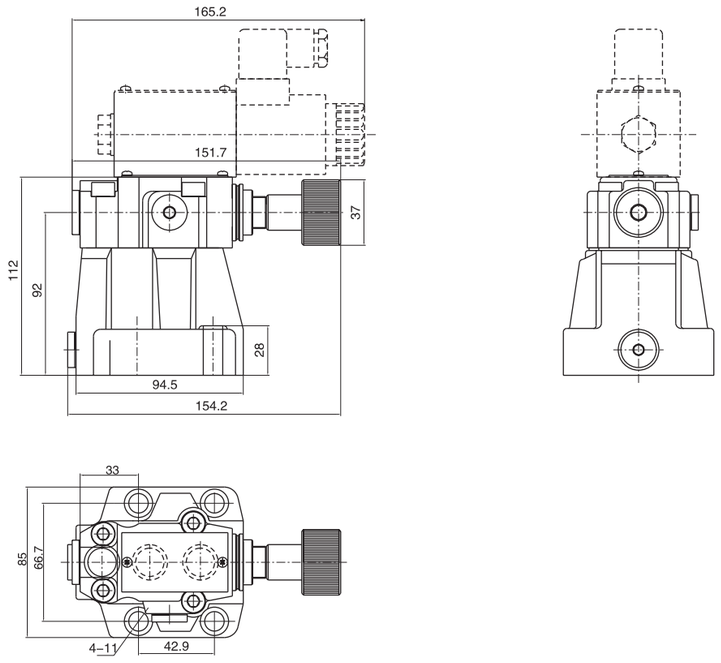


Scatter range of type 17%

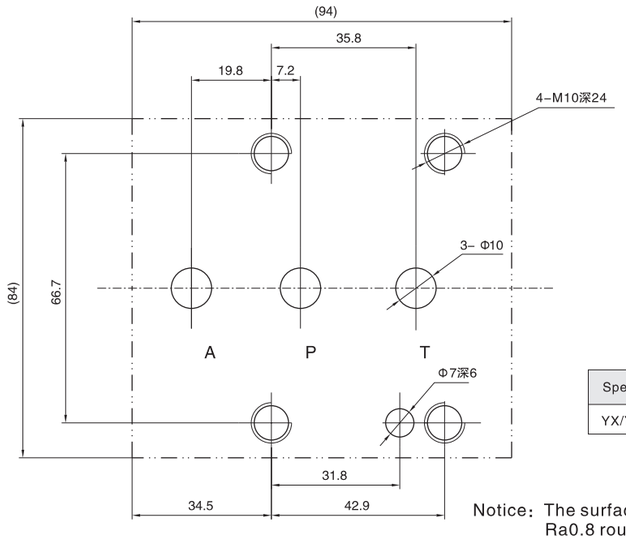
Scatter range of type 10%

Unloading Relief Valve

03 External dimensions



03 Subplate mounting size

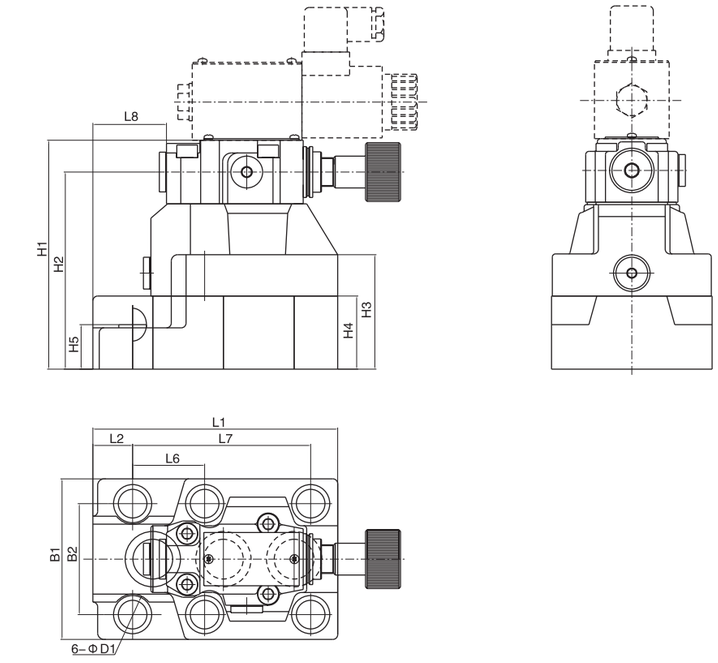


Specification	Mounting screw	Tighten torque
YX/YXW–03	4–M10x50–10.9	130Nm

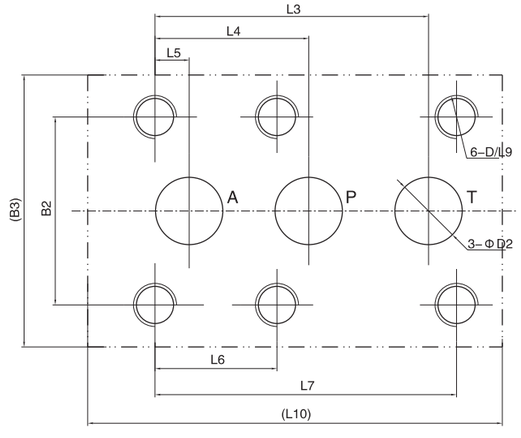
Notice：The surface, connecting with the valve, should be Ra0.8 roughness, and 0.01/100mm flatness.

Unloading Relief Valve

06、10 External dimensions



06、10 Subplate mounting size



Specification	Mounting screw	Tighten torque
YX/YXW–06	4–M16x100–10.9 2–M16x60–10.9	310Nm
YX/YXW–10	4–M18x120–10.9 2–M18x80–10.9	430Nm

Notice：The surface, connecting with the valve, should be Ra0.8 roughness, and 0.01/100mm flatness.

Specification	L1	L2	L3	L4	L5	L6	L7	L8	L9	L10	B1	B2	B3	H1	H2	H3	H4	H5	D	D1	D2
YX/YXW–06	154	25	101.6	57.1	12.7	46	112.7	46.3	34	156	101	69.9	103	144	124	72	46	28	M16	18	25
YX/YXW–10	199	42	127	63.5	12.7	50.8	139.7	67.9	37	201	118.5	82.5	118.5	165	145	93	87	45	M18	20	32

Direct–operated Reducing Valve

Technical specification

Specification		05
Max. working pressure (MPa)		31.5
Max. Flow	(L/min)	15
Working fluid		Mineral oil;phosphate–ester
Fluid temp.	(℃)	–20~80
Viscosity	(mm^2/s)	–2.8~500
Cleanliness	The maximum allowable cleanliness of the oil should be according to 9th degree of Standard NAS1638.It is suggested that the minimum filter rating should be β 10≥75.	

HYDR5DP is direct–operated reducing valve for pressure relief in rninor circuit,
used to reducing pressure in some circuit of the system

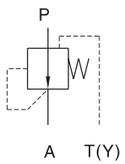
Model description

HY ＊ DR5DP – ＊ – ＊ ＊ / 50 ＊

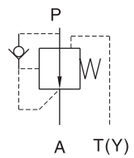
- Omit: Subplate mounting
- F: Front flange mounting
- Direct–opevated reducing valve
- Working press
  - 2.5 upto 2.5MPa
  - 7.5 upto 7.5MPa
  - 15 upto15MPa
  - 21 upto 21MPa
  - 31.5 to 31.5MPa
- Omit: With check volve
- M: Without check volve
- Y: Intl cntrl extl disch
- XY: Ext cntrl ext disch
- Serial number
- Remarks

Code symbol

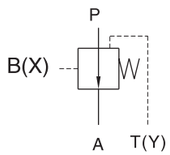
Without check valve
YM type internal pilot
External drain



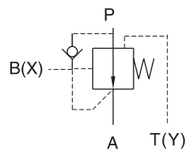
With check valve
Y type internal pilot
External drain



Without check valve
XYM type internal pilot
External drain

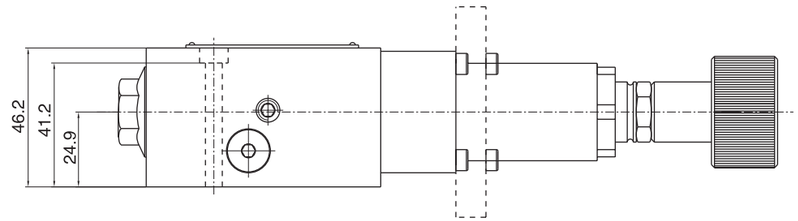


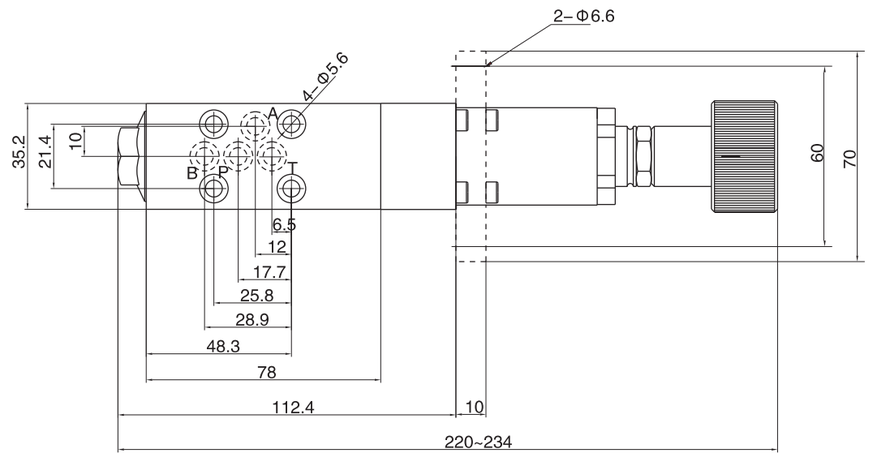
With check valve
XY type internal pilot
External drain



Pressure Reducing Valve

External dimensions





Specification	Mounting screw	Tighten torque
DR5DP–15	4–M5x30–10.9	9Nm

Pressure Reducing Valve

Technical specification

Specification		03	06
Max. working pressure (MPa)		31.5	
Max. Flow	(L/min)	150	300
Working fluid		Mineral oil;phosphate-ester	
Fluid temp.	(℃)	-20~70	
Viscosity	(mm^2/s)	12~380	
Working pressure	(MPa)	5 10 20 31.5	
Cleanliness		The maximum allowable cleanliness of the oil should be according to 9th degree of Standard NAS1638.It is suggested that the minimum filter rating should be β 10≥75.	

The YJ pilot-operated reducing valve is controlled by the pilot and mainly used to reduce the pressure of a certain loop in the hydraulic system. It is suitable for hydraulic systems with a large flow rate.

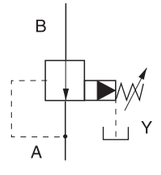
Model description

YJ ＊-＊-＊ ＊-＊ Y/＊ ＊ 50 ＊

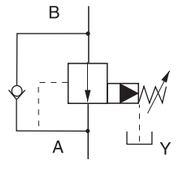
- YJ: Pressure Reducing Valve
- ＊: Pilot operated valve
  - Omit Pilot operated without main cartridge (not marked diameter)
  - C Pilot operated with main cartridge (marked diameter)
- ＊: Specification
  - 03 DN10
  - 06 DN20
- ＊: Omit Subplate type connection
- ＊: Working press
  - 5 to5MPa
  - 10 to10MPa
  - 20 to20MPa
- ＊: Pilot operated drainage port thread
  - Omit G1/4"
  - M M14X1.5
- Y: 1 Rotary knob 2 Sleeve with hexagon and protective cap
- 50: Serial number
- ＊: Seal material
  - Omit NBR Seals
  - V FPM Seals
- ＊: Remarks
  - Omit Without check valve
  - D With check valve

Code symbol

YJ..



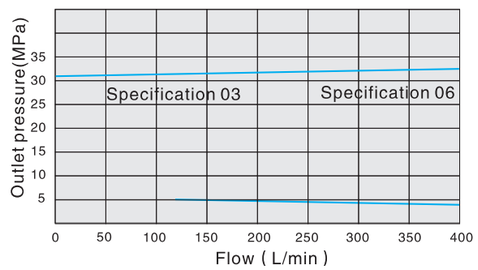
YJ..D..



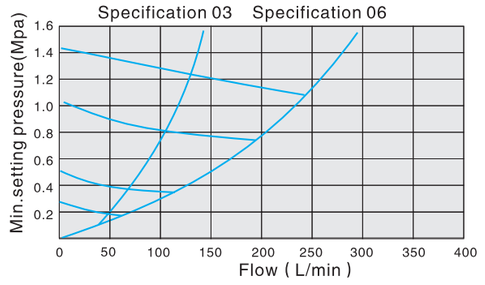
Pressure Reducing Valve

Performance curve (Test condition：Test under υ =41mm^2/s and t=50℃)

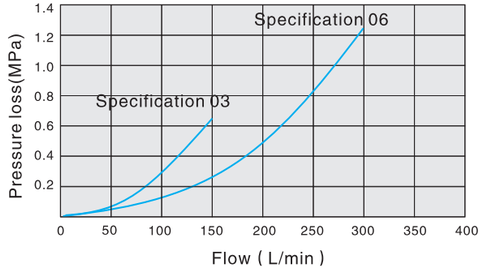
Inlet pressure in relation to the flow



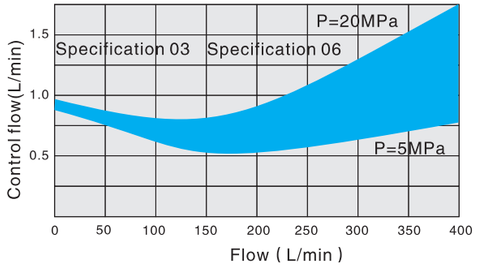
Minimum settable pressure in relation to the flow (A→B)
(=bypass pressure version "...X...")



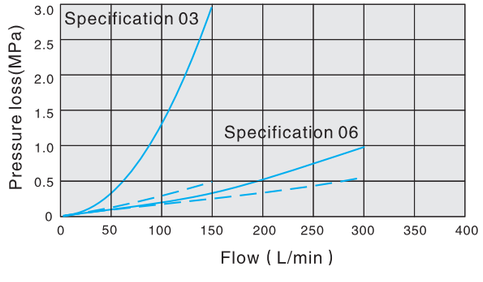
Inlet pressure in relation to the flow



Inlet pressure in relation to the flow



The curve△ P-Q pass through the check valve

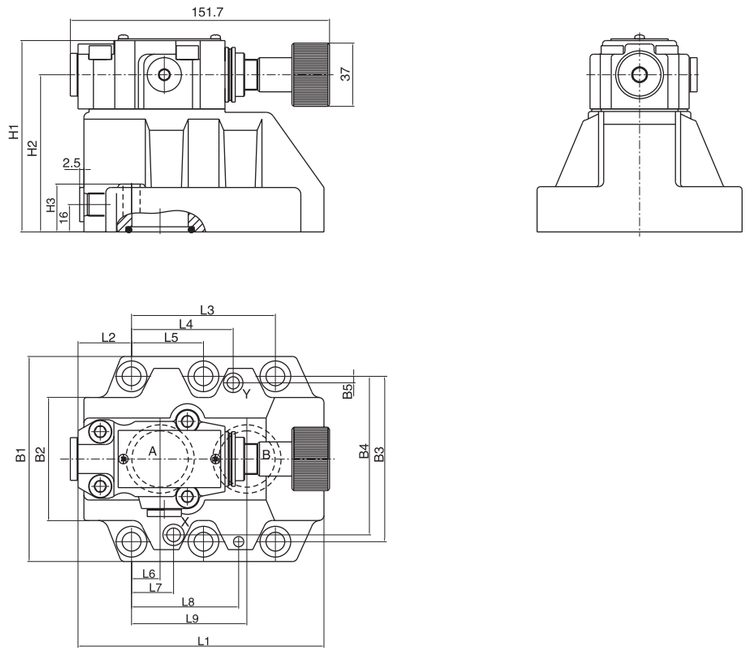


The flow resistence through the check valve, when the main valve is closed

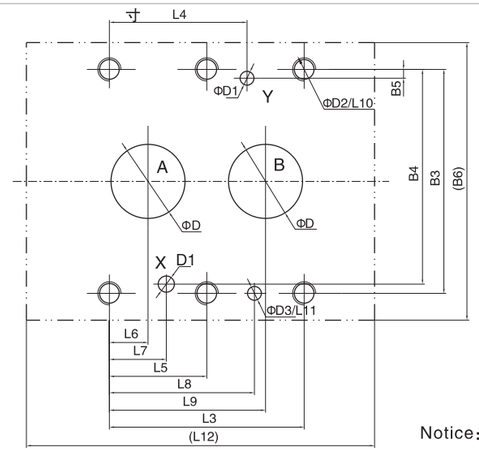
The flow friction through the check valve, when the main valve is open

Pressure Reducing Valve

External dimensions



Subplate mounting size



Specification	Mounting screw	Tighten torque
YJ-03	4-M10X50-10.9	75Nm
YJ-06	4-M10X60-10.9	75Nm

Notice: The surface, connecting with the valve, should be Ra0.8 roughness, and 0.01/100mm flatness.

Model	L1	L2	L3	L4	L5	L6	L7	L8	L9	L10	L11	L12	B1	B2	B3	B4	B5	B6	H1	H2	H3	D	D1	D2	D3
YJ-03	96	35.5	42.9	21.5	–	7.2	21.5	31.5	35.8	23	6	98	85	50	66.7	58.8	7.9	87	112	92	28	12	6	M10	7
YJ-06	116	37.5	60.3	39.7	–	11.1	20.6	44.5	49.2	24	6	118	102	59.5	79.4	73	6.4	104	122	102	38	25	6	M10	7

Modular Relief Valve

Technical specification

Specification		02	03
Max. working pressure (MPa)		31.5	
Max. Flow	(L/min)	35	70
Working fluid		Mineral oil;phosphate-ester	
Fluid temp.	(℃)	-20~70	
Viscosity	(mm^2/s)	12~380	
Working press	(MPa)	7 14 21 31.5	
Cleanliness		The maximum allowable cleanliness of the oil should be according to 9th degree of Standard NAS1638.It is suggested that the minimum filter rating should be β 10≥75.	

Model description

DY – * * – * – * / * 70 *

Modular relief valve

Specification
02 DN 6
03 DN 10

P P Pipeline relief
A A Pipeline relief
B B Pipeline relief
W A B Pipeline relief

Working pressure
5 to5MPa
10 to10MPa
20 to20MPa
31.5 to 31.5MPa

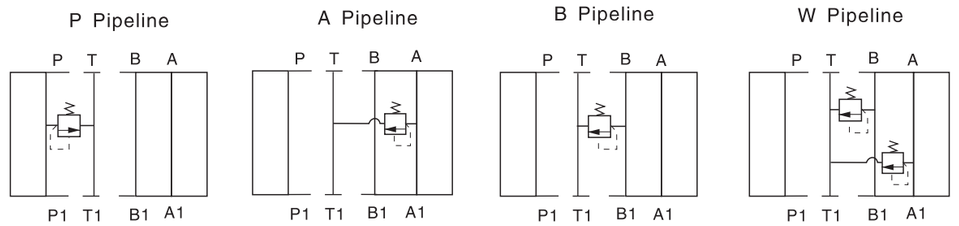
Remarks

Serial number

Seal material
Omit NBR Seals
V FPM Seals

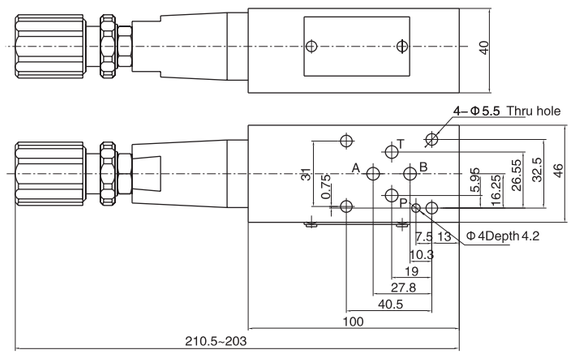
8 Handle

Code symbol

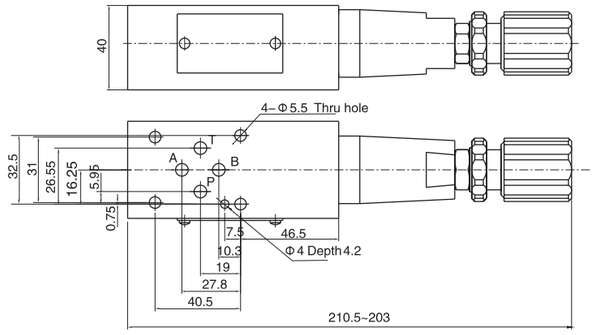


02 External dimensions

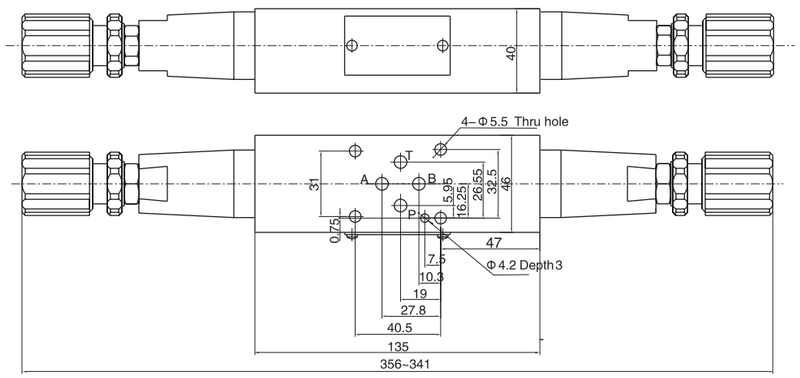
DY–02–A



DY–02–B,P

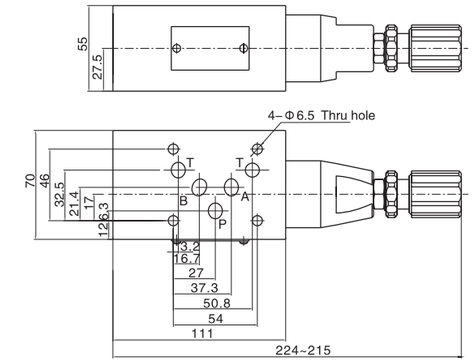


DY–02–W

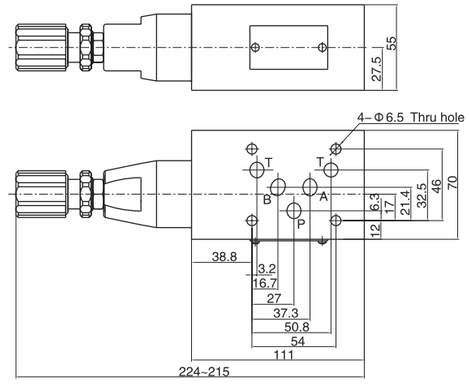


03 External dimensions

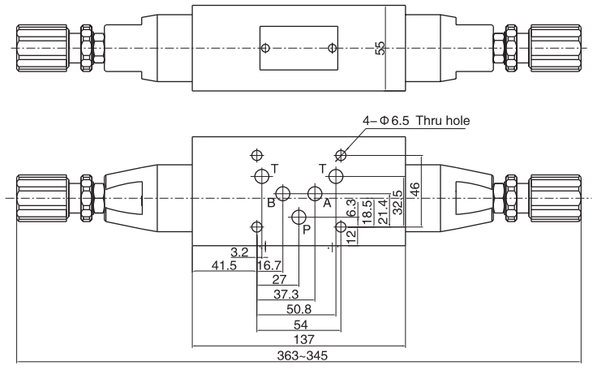
DY–03–A ···



DY–03–B,P ···



DY–03–W ···



Modular Reducing Valve

Technical specification

Specification	02	03
Max. working pressure (MPa)	31.5	
Max. Flow (L/min)	35	70
Working fluid	Mineral oil;phosphate-ester	
Fluid temp. (℃)	-20~70	
Viscosity (mm^2/s)	12~380	
Working press (MPa)	7 14 21	
Cleanliness	The maximum allowable cleanliness of the oil should be according to 9th degree of Standard NAS1638.It is suggested that the minimum filter rating should be β 10≥75.	

Model description

DYJ – ＊ ＊ – ＊ – ＊ / ＊ 70 ＊

Modular reducing valve

Specification
02 DN 6
03 DN 10

P P Pipeline relief
A A Pipeline relief
B B Pipeline relief

Working pressure
7 to7MPa
14 to14MPa
21 to21MPa

Remarks

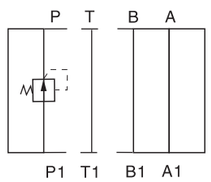
Serial number

Seal material
Omit NBR Seals
V FPM Seals

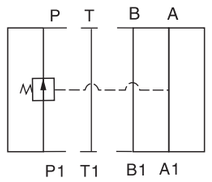
8 Handle

Code symbol

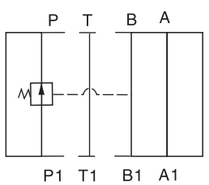
P Pipeline



A Pipeline



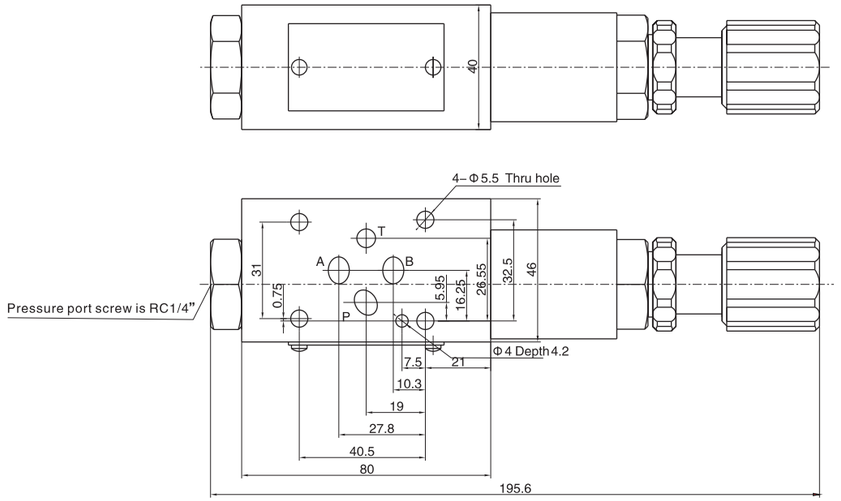
B Pipeline



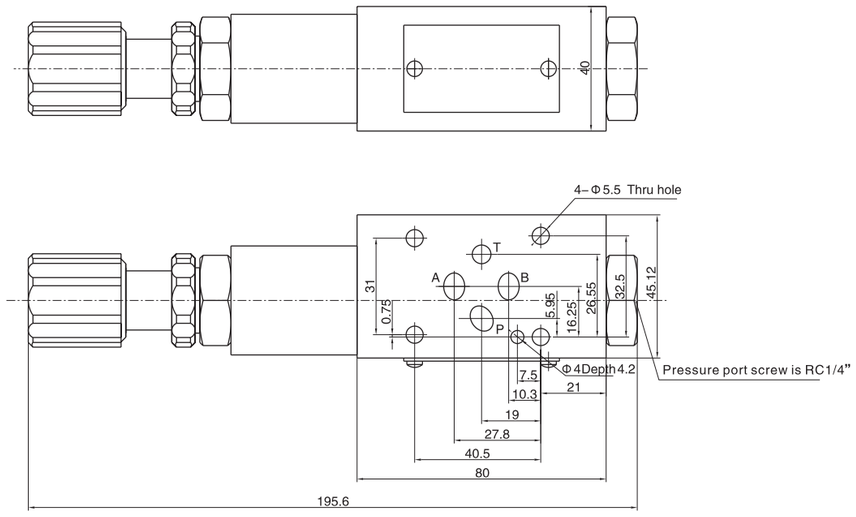
Modular Reducing Valve

02 External dimensions

DYJ–02–A , P ···



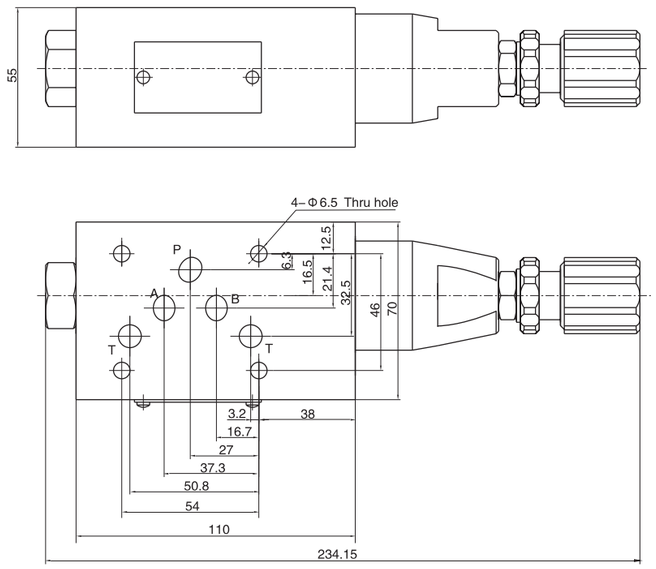
DYJ–02–B ···



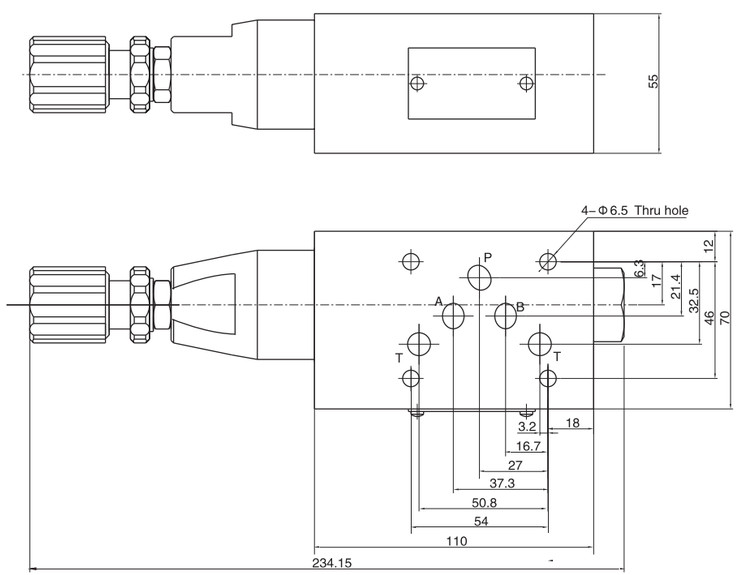
Modular Reducing Valve

03 External dimensions

DYJ–03–A， P …



DYJ–03–B



Modular Counter–balance Valve

HOYEA

Technical specification

Specification	02	03
Max. working pressure (MPa)	31.5	
Max. Flow (L/min)	35	70
Working fluid	Mineral oil;phosphate–ester	
Fluid temp. (℃)	–20~70	
Viscosity (mm^2/s)	12~380	
Adjusting pressure (MPa)	7, 14, 21	
Cleanliness	The maximum allowable cleanliness of the oil should be according to 9th degree of Standard NAS1638.It is suggested that the minimum filter rating should be β 10≥75.	

Model description

DYP – ＊ ＊ – ＊ – ＊ / ＊ 70 ＊

Modular counter–balance valve

Specification
02 DN 6
03 DN 10

A A Pipeline relief
B B Pipeline relief

Adjusting pressure
7 to7MPa
14 to14MPa
21 to21MPa

Remarks

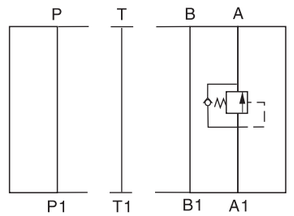
Serial number

Seal material
Omit NBR Seals
V FPM Seals

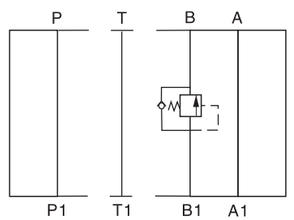
8 Handle

Code symbol

A Pipeline

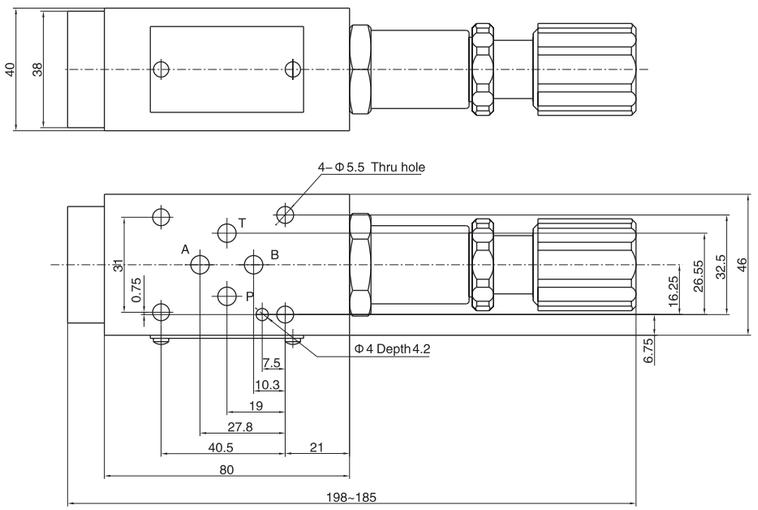


B Pipeline

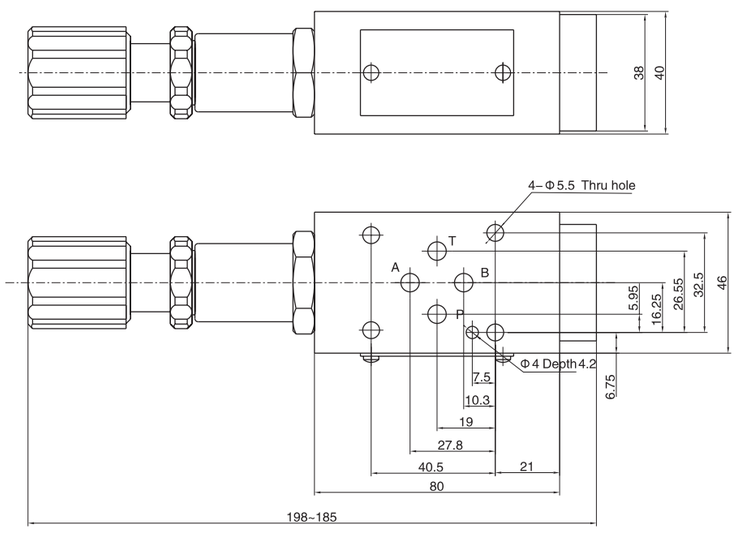


02 External dimensions

DYP–02–A ···

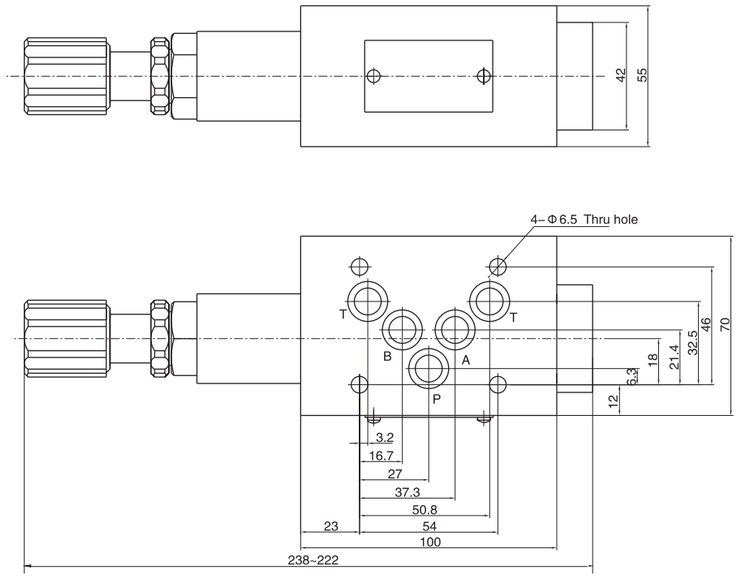


DYP–02–B ···

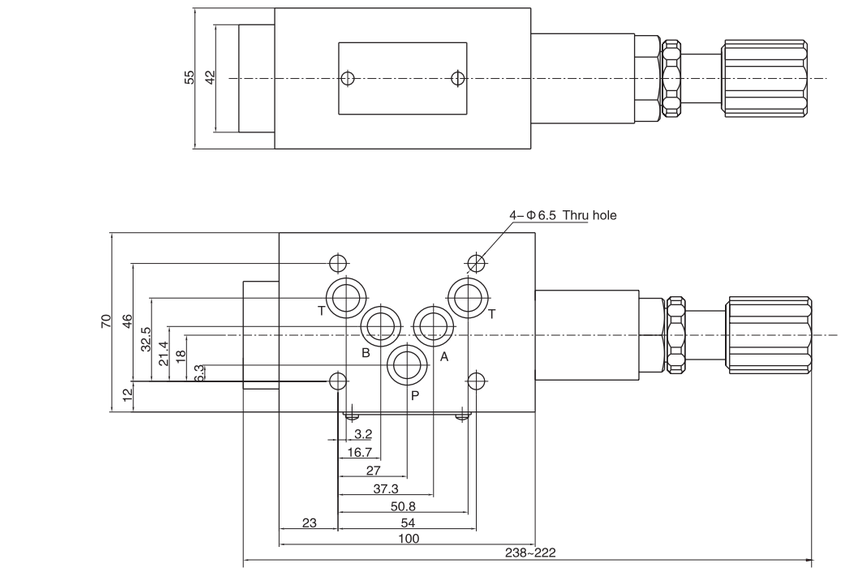


03 External dimensions

DYP–03–A ···



DYP–03–B ···



Piston–type Pressure Switch

Technical specification

The hydro–electric pressure switch type HED 8 is a piston type pressure switch. It basically comprises of housing ,installation kit with piston,compression spring, adjustment element and micro switch. If the pressure to be monitored is below the set pressure, the micro switch is operated. The pressure to be monitored is applied via the nozzle at the piston . The piston is supported by the spring plate and acts against the continuously adjustable force of the compression spring. The spring plate transmits the movement of the piston onto the micro switch and releases the latter when the set pressure is reached. This switches the electric circuit on or off,depending on the circuit set–up. The mechanical positive stop of the spring plate protects the micro switch in case of a sudden pressure drop from mechanical destruction and, in case of over–pressure, prevents solid compression of the compression spring .

Model		HED 8	
		Max working pressure	Pressure setting range (Mpa)
Pressure range (Mpa) (Max setting pressure)	5	35	0.2–5
	10	35	0.4–10
	20	35	0.5–20
	35	50	0.8–35
working fluid		Mineral oil according to standard Din 51524 (HL, HLP)	
Fluid temp (℃)		–20~+80 (recommended +40~+50)	
Fluid viscosity (mm?/s)		20–380 (recommended 30–46)	
Cleanliness		According to NAS1638 class9, recommended filter fineness (20≤ δ ≤50)	
Switching accuracy (repetition accuracy)		<±1% of the set pressure	
Max switching frequency (1/h)		4800	
Electrical connection		Din 43650, type A, 3–pole + PE	
Max connection cross sectional area mm^2		0.5	
Max contact loading	–AC	250V; 5A	
	–DC	50V/1A; 125V/0.03A; 250V/0.02A	
protection class as per Din 40 050		IP65	
If it is direct–current inductive load, it is necessary to use arc extinguisher for longer serve life purpose.			

(For applications outside these parameters, please consult us!)

Ordering code

HED 8 – * –L1*–/– * * / * *

Piston–type pressure switch

Flange mounting OH
Subplate mounting OP
Pipe mounting OA

L10–L19series L1X
L10–L19series unchanged mounting size

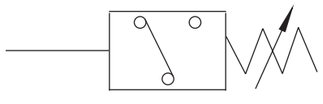
5 Max setting pressure 5MPa
10 Max setting pressure10MPa
20 Max setting pressure20MPa
30 Max setting pressure35MPa

Omit NBR
V FPM

For pipe mounting
Omit G1/4
2 M14x1.5

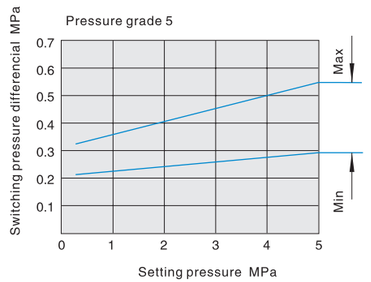
Electrical connection
Din plug Z14
Din plug with LED (DC24V) L24

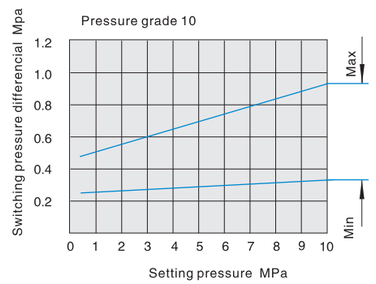
Code symbol

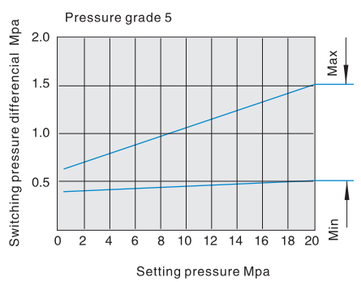


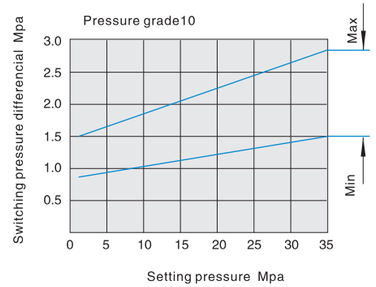
Piston–type Pressure Switch

Performance curve

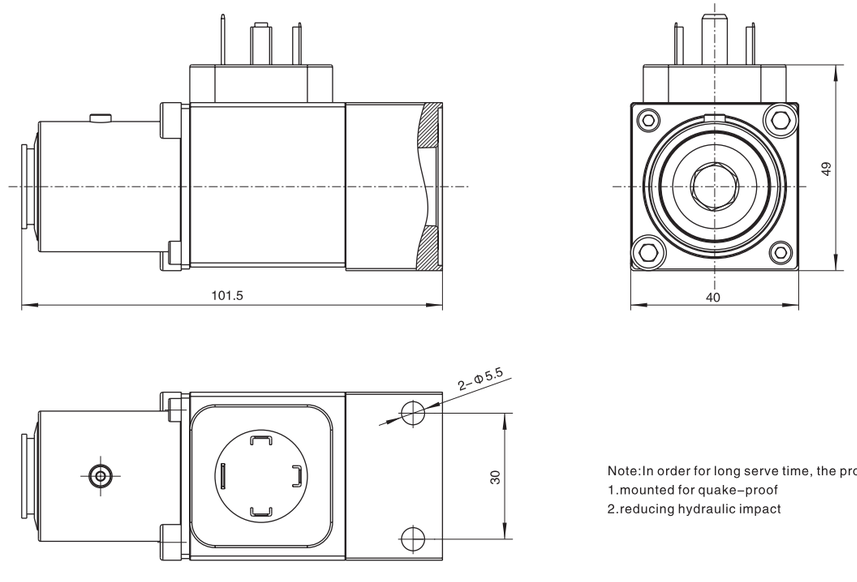








Dimension (HED 8 OA L1X/ pipe type)



Note:In order for long serve time, the product shall be
1.mounted for quake–proof
2.reducing hydraulic impact

HOYEA

Flow Control Valve Series

Needle Valve

Technical specification

Specification		6	8	10	12	16	20	25	30	40
Max.pressure(MPa)	(MPa)	31.5								
Max.flow	(L/min)	14	40	60	85	175	200	300	400	600
Hydraulic fluid		Mineral oil;phosphate-ester								
Fluid temp	(℃)	-20~70								
Viscosity	(mm^2/s)	2.8~380								
Cleanliness		The maximum allowable cleanliness of the oil should be according to 9th degree of Standard NAS1638.It is suggested that the minimum filter rating should be β 10≥75.								

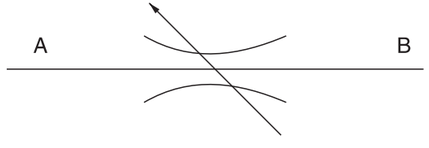
Needle valve is used to control the flow by changing the throttle section or length.
Needle valve is a simple flow control valve, which can constitute the throttle system with other components.

Model instruction

L-* * - * /50 * *

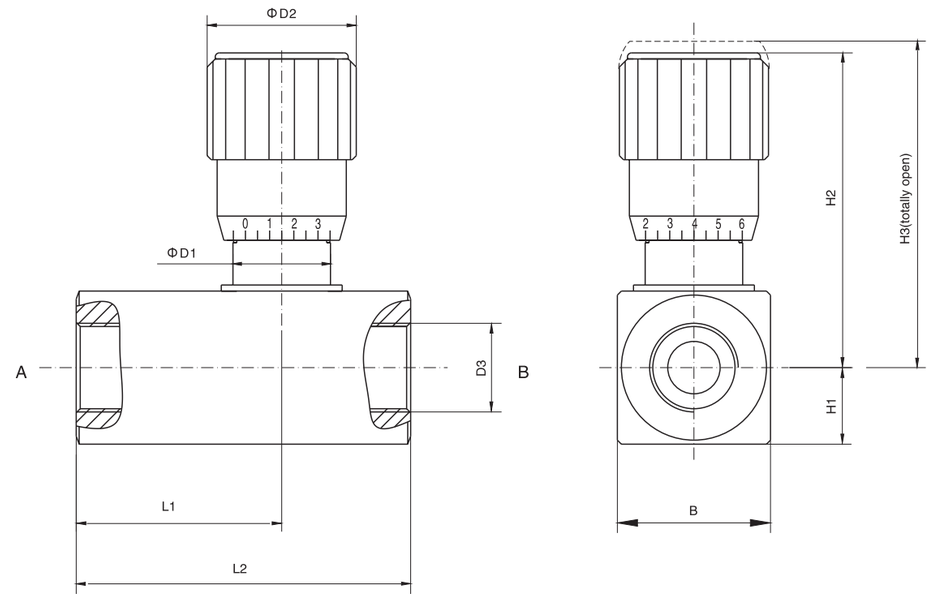
- Needle valve
- Omit sub-plate type
  G G pipe type
- Specification
  6 DN6
  8 DN8
  10 DN10
  12 DN12
  16 DN16
  20 DN20
  25 DN25
  30 DN30
  40 DN40
- Remarks
- Omit A type
  B B type
- Serial number
- Screw thread type
  M thread
  G thread
  NPT thread

Code symbol -



Needle Valve

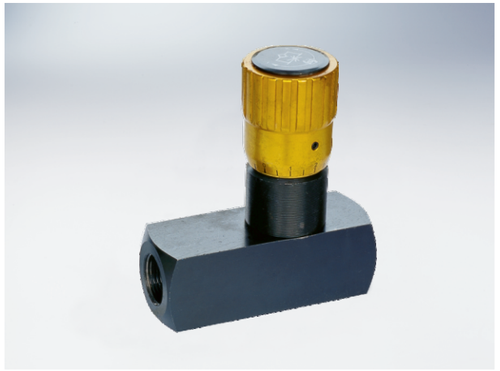
External dimensions



Model	B	D1	D2	D3			H1	H2	H3	L1	L2
G6	28	19.3	30	M10X1	G1/8"	NPT1/8"	14	59.3	64.8	26	48
G8	28	19.3	30	M14X1.5	G1/4"	NPT1/4"	14	61.3	67.9	28	54
G10	28	19.3	30	M18X1.5	G3/8"	NPT3/8"	14	61.5	67.5	28	54
G12	38	24.2	37	M22X1.5	G1/2"	NPT1/2"	19	78.1	86.5	34	68
G16	38	24.2	37	M27X2	G3/4"	NPT3/4"	19	78.3	86.5	39	78
G20	48	35	48	M33X2	G1"	NPT1"	24	102.3	114.4	45.8	92
G25	60	50	48	M42X2	G1 1/4"	NPT1 1/4"	30	134.68	148.1	57	114
G30	70	70	80	M48X2	G1 1/2"	NPT1 1/2"	35	161.5	181.5	61	122
G40	90	71	80	M60X2	G2"	NPT2"	45	171.5	191.5	61	122

Check Restrictive Valve

Technical specification



Specification		6	8	10	12	16	20	25	30	40
Max.pressure	(MPa)	31.5								
Max.flow	(L/min)	14	40	60	85	175	200	300	400	600
Hydraulic fluid		Mineral oil;phosphate-ester								
Fluid temp	(℃)	-20~70								
Viscosity	(mm^2/s)	2.8~380								
Opening pressure	(MPa)	a: 0.05 b:0.4								
Cleanliness		The maximum allowable cleanliness of the oil should be according to 9th degree of Standard NAS1638.It is suggested that the minimum filter rating should be β 10≥75.								

1-way restrictive valve consists of needle valve and 1-way valve in parallel. It is used to adjust the flow in one way, and reverse back freely.

Model instruction

LA-＊ ＊- ＊ ＊ /50 ＊ ＊

Check restrictive valve

Omit sub-plate type
G G pipe type

Specification
6 DN6
8 DN8
10 DN10
12 DN12
16 DN16
20 DN20
25 DN25
30 DN30
40 DN40

Remarks

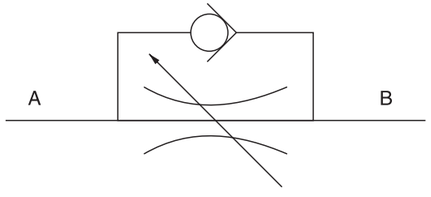
Omit A type
B B type

Serial number

Screw thread type
M thread
G thread
NPT thread

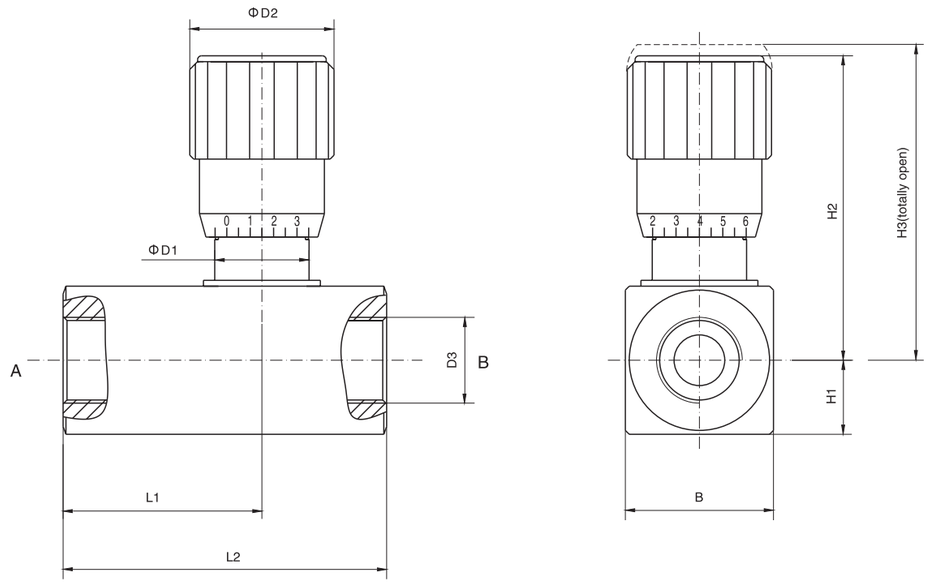
Opening pressure
a 0.05MPa b 0.4MPa

Code symbol



Check Restrictive Valve

External dimensions



Model	B	D1	D2	D3			H1	H2	H3	L1	L2
G6	28	19.3	30	M10X1	G1/8"	NPT1/8"	14	59.3	64.8	36	58
G8	28	19.3	30	M14X1.5	G1/4"	NPT1/4"	14	61.3	67.9	39	64
G10	28	19.3	30	M18X1.5	G3/8"	NPT3/8"	14	61.5	67.5	43	70
G12	38	24.2	37	M22X1.5	G1/2"	NPT1/2"	19	78.1	86.5	52	83
G16	38	24.2	37	M27X2	G3/4"	NPT3/4"	19	78.3	86.5	55.5	89
G20	48	35	48	M33X2	G1"	NPT1"	24	102.3	114.4	70.8	117
G25	60	50	48	M42X2	G1 1/4"	NPT1 1/4"	30	134.68	148.1	97	154
G30	70	70	80	M48X2	G1 1/2"	NPT1 1/2"	35	161.5	181.5	111	172
G40	90	71	80	M60X2	G2"	NPT2"	45	171.5	191.5	129	190

Restrictive Check Valve

Technical specification

Specification		10	12	16	20
Max.pressure	(MPa)	31.5			
Max.flow	(L/min)	60	85	175	200
Hydraulic fluid		Mineral oil;phosphate-ester			
Fluid temp	(℃)	-20~70			
Viscosity	(mm^2/s)	2.8~380			
Opening pressure	(MPa)	a: 0.05 b:0.4			
Cleanliness		The maximum allowable cleanliness of the oil should be according to 9th degree of Standard NAS1638.It is suggested that the minimum filter rating should be β 10≥75.			

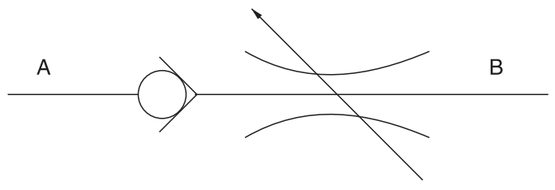
Restrictive check valve consists of restrictive valve and 1-way valve in series.
It can control the flow and only allows the flow in one way. Flow will be shut off in the opposite direction.

Model instruction

AL-* * - * * * / 50 *

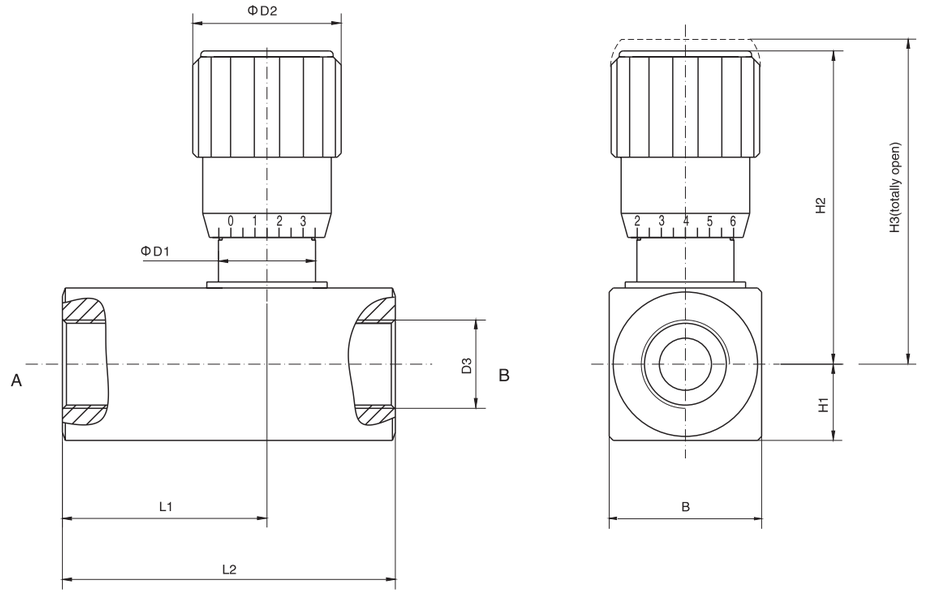
- AL: Restrictive check valve
- *: Omit sub-plate type; G G pipe type
- *: Specification; 10 DN10; 12 DN12; 16 DN16; 20 DN20
- *: Opening pressure; a 0.05MPa; b 0.4MPa
- *: Screw thread type; M thread; G thread; NPT thread
- *: Serial number
- /50: Remarks

Code symbol



Restrictive Check Valve

External dimensions



Model	B	D1	D2	D3			H1	H2	H3	L1	L2
G10	28	19.3	30	M18X1.5	G3/8"	NPT 3/8"	14	61.5	67.5	45.5	73
G12	38	24.2	37	M22X1.5	G1/2"	NPT 1/2"	19	78.1	86.5	54	86
G16	38	24.2	37	M27X2	G3/4"	NPT 3/4"	19	78.3	86.5	59	94
G20	48	35	48	M33X2	G1"	NPT 1"	24	102.3	114.4	74.8	123

Modular Restrictive Valve

Technical specification

Specification		02	03
Max.pressure	(MPa)	31.5	
Max.flow	(L/min)	30	50
Hydraulic fluid		Mineral oil;phosphate-ester	
Fluid temp	(℃)	-20~70	
Viscosity	(mm^2/s)	2.8~380	
Cleanliness		The maximum allowable cleanliness of the oil should be according to 9th degree of Standard NAS1638.It is suggested that the minimum filter rating should be β 10≥75.	

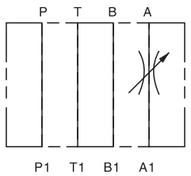
Model instruction

DL-* * / * 70 *

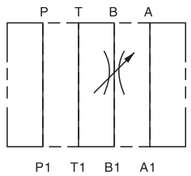
- Modular restrictive valve
- Specification
  - 02 DN6
  - 03 Dn10
- P P Pipeline
- T T Pipeline
- A A Pipeline
- B B Pipeline
- W AB Pipeline
- Remarks
- Serial number
- Seal material
  - Omit NBR Seals
  - V FPM Seals

Code symbol

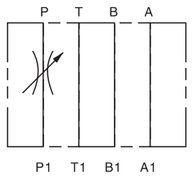
DL-*-A



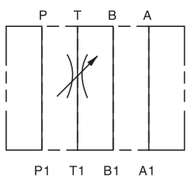
DL-*-B



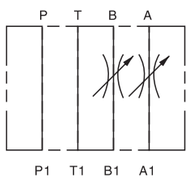
DL-*-P



DL-*-T



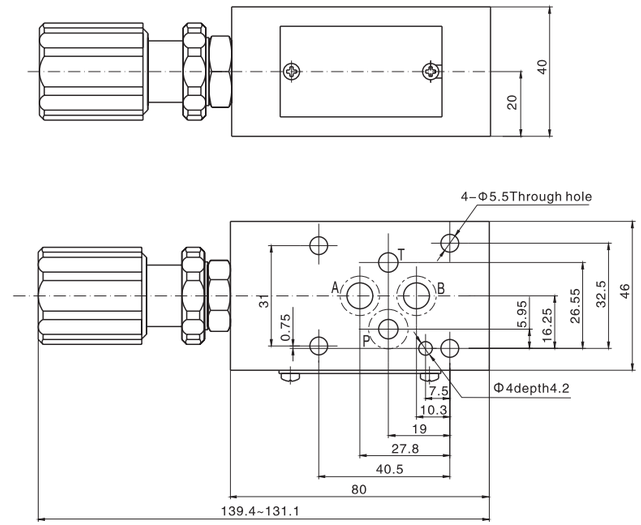
DL-*-W



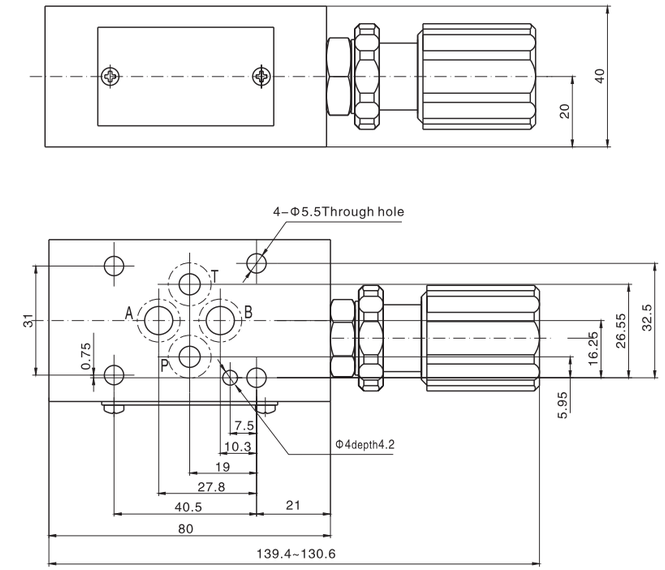
Modular Restrictive Valve

External dimensions

DL-02-A/ ···



DL-02-P,B,T/ ···

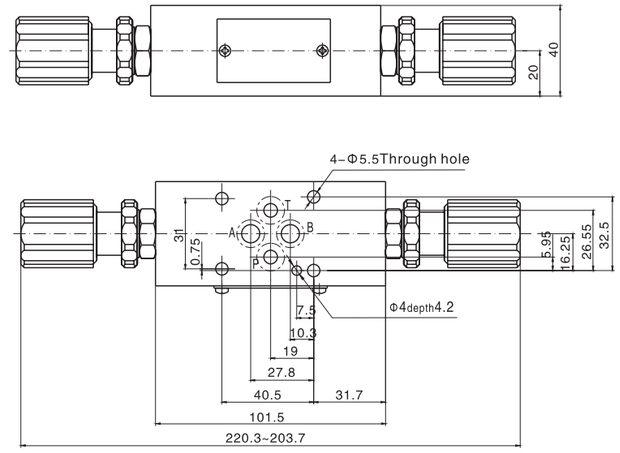


Notice：The surface, connecting with the valve, should be Ra0.8 roughness, and 0.01/100mm flatness.

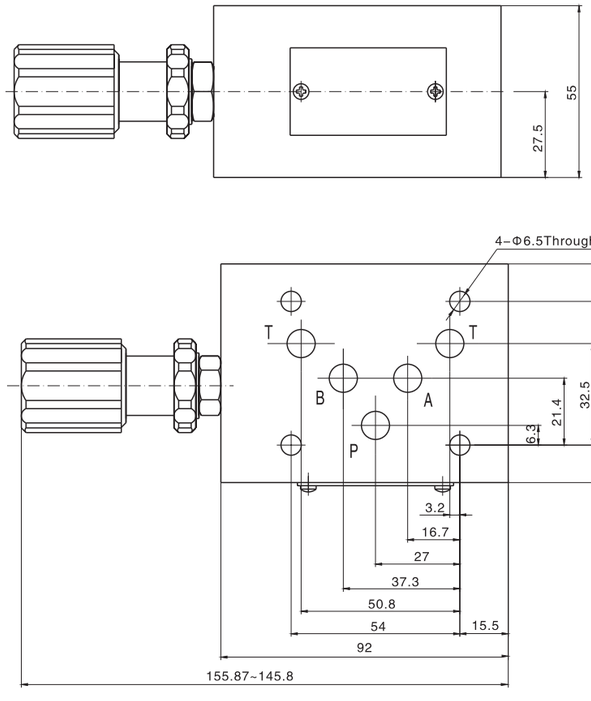
Modular Restrictive Valve

External dimensions

DL–02–W/ ···



DL–03–A/ ···

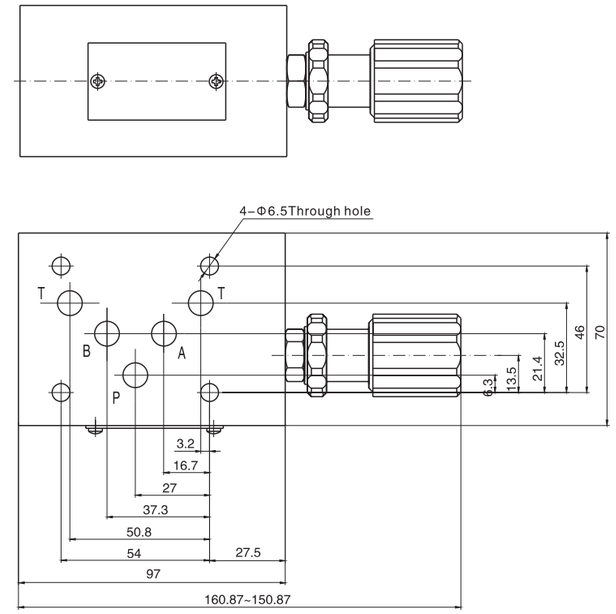


Notice：The surface, connecting with the valve, should be Ra0.8 roughness, and 0.01/100mm flatness.

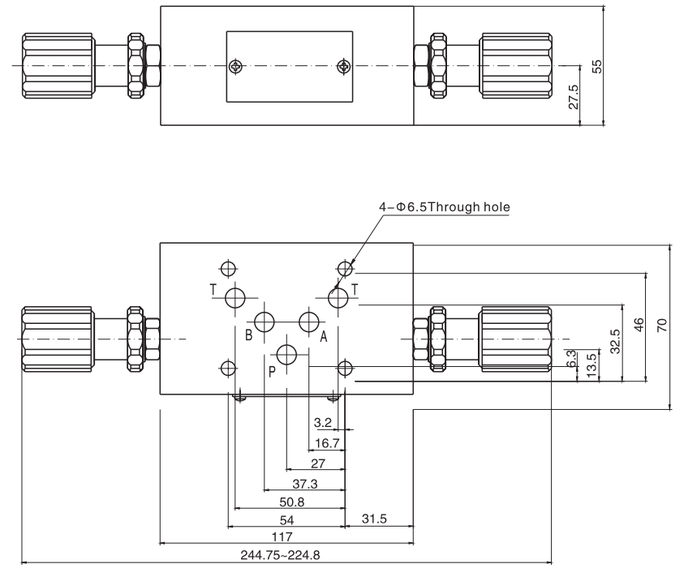
Modular Restrictive Valve

External dimensions

DL–03–P,B,T/ ···



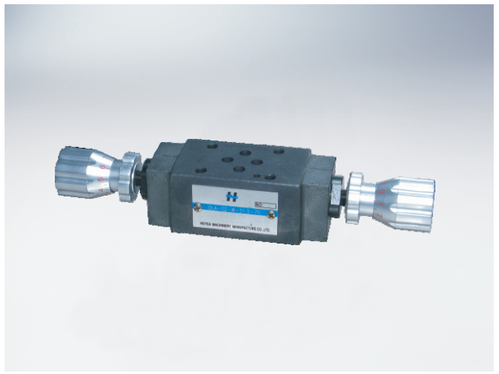
DL–03–W/ ···



Notice：The surface, connecting with the valve, should be Ra0.8 roughness, and 0.01/100mm flatness.

Modular Flow Control Valve

Technical specification



Specification		02	03
Max.pressure	(MPa)	31.5	
Max.flow	(L/min)	30	50
Hydraulic fluid		Mineral oil;phosphate-ester	
Fluid temp	(℃)	-20~70	
Viscosity	(mm^2/s)	2.8~380	
Opening pressure	(MPa)	a：0.05	
Cleanliness		The maximum allowable cleanliness of the oil should be according to 9th degree of Standard NAS1638.It is suggested that the minimum filter rating should be β 10≥75.	

Model instruction

DLA-＊ ＊-＊ ＊ / ＊ 70 ＊

Modular flow control valve

Specification
02 DN6
03 DN10

A A Pipeline
B B Pipeline
W AB Pipeline

Opening pressure
a 0.05MPa

Remarks

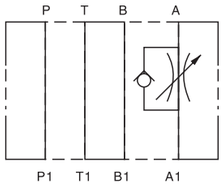
Serial number

Seal material
Omit NBR Seals
V FPM Seals

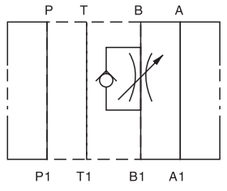
Throttle direction
Omit meter out
1 meter in

Code symbol

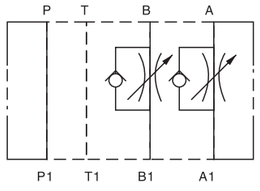
DLA-*-A



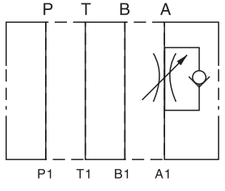
DLA-*-B



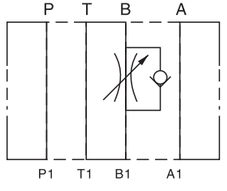
DLA-*-W



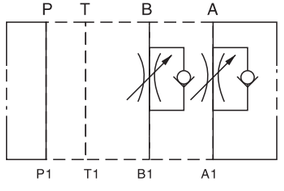
DLA-*-A…1



DLA-*-B…1



DLA-*-W…1

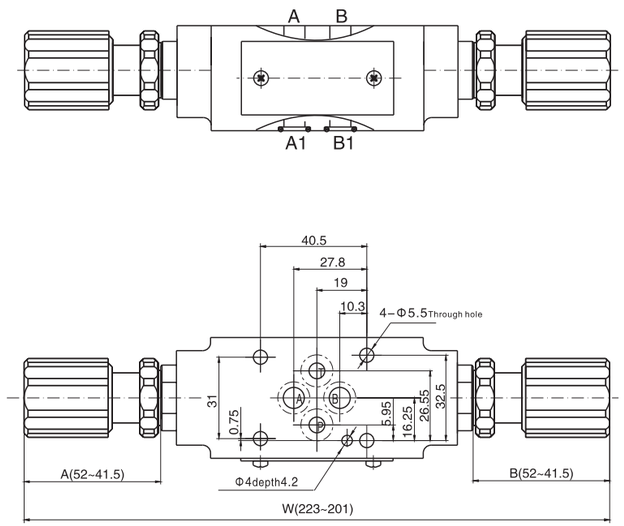


Modular Flow Control Valve

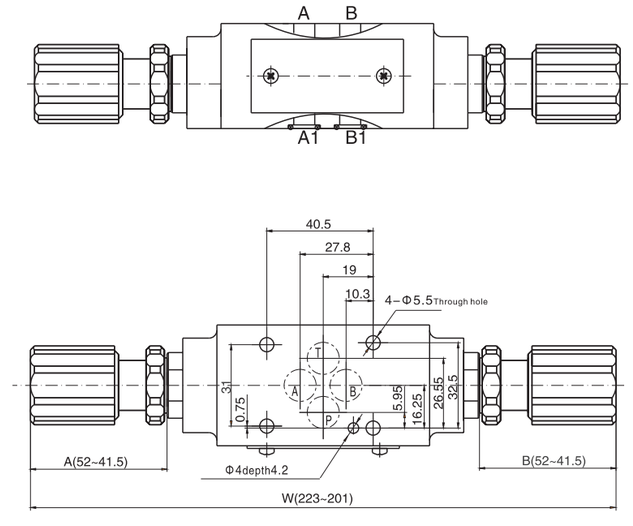
HOYEA

External dimensions

DLA-02-…



DLA-02-… 1/…

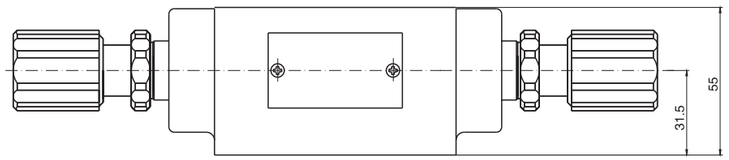


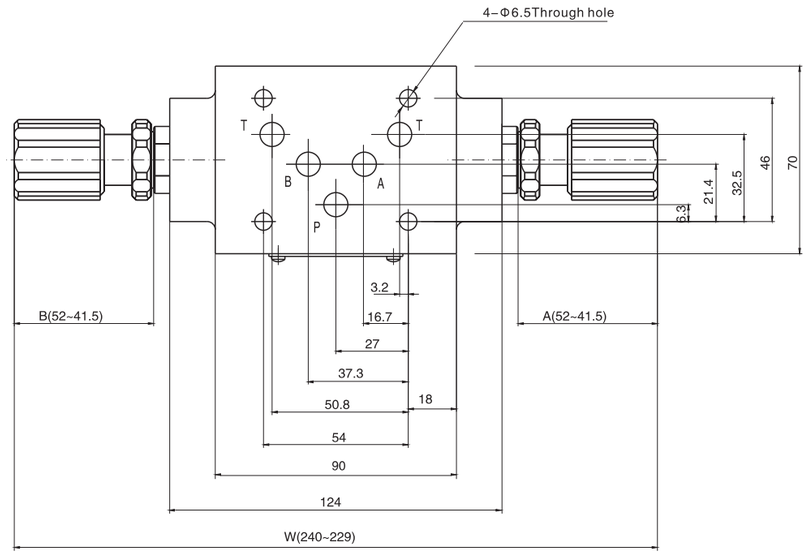
Notice：The surface, connecting with the valve, should be Ra0.8 roughness, and 0.01/100mm flatness.

Modular Flow Control Valve

External dimensions

DLA–03– ···



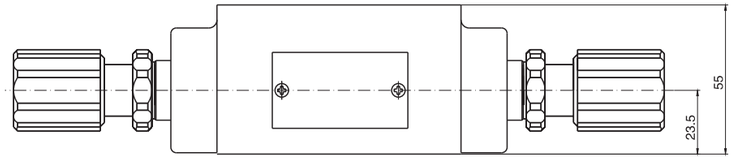


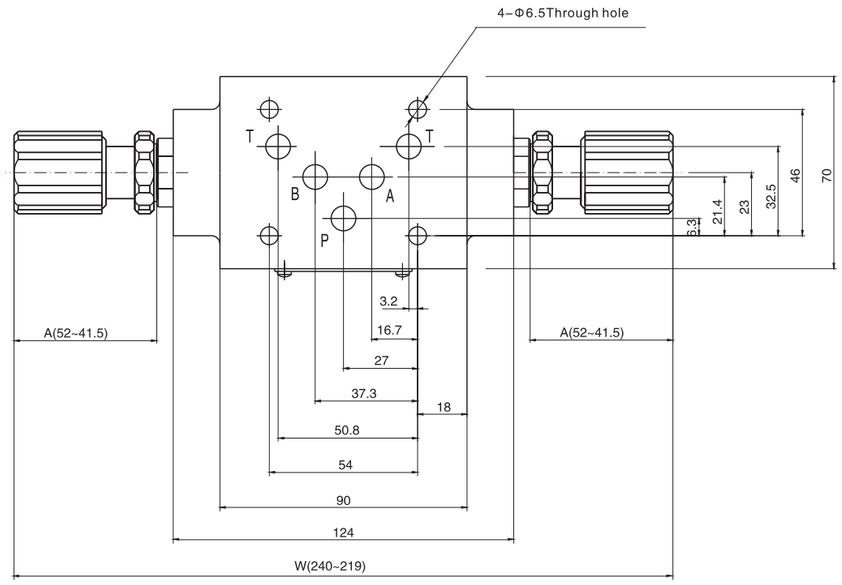
Notice：The surface, connecting with the valve, should be Ra0.8 roughness, and 0.01/100mm flatness.

Modular Flow Control Valve

External dimensions

DLA–03– ··· 1/ ···

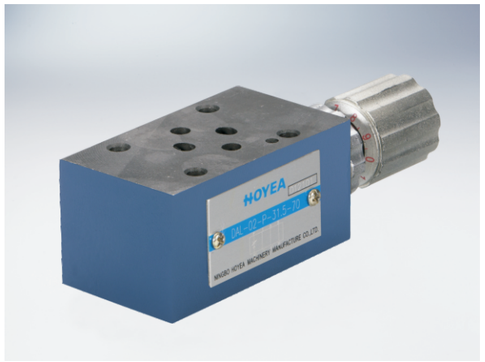




Notice：The surface, connecting with the valve, should be Ra0.8 roughness, and 0.01/100mm flatness.

Modular Restrictive Check Valve

Technical specification



Specification		02	03
Max.pressure	(MPa)	31.5	
Max.flow	(L/min)	30	50
Hydraulic fluid		Mineral oil;phosphate-ester	
Fluid temp	(℃)	-20~70	
Viscosity	(mm^2/s)	2.8~380	
Opening pressure	(MPa)	a：0.05	
Cleanliness		The maximum allowable cleanliness of the oil should be according to 9th degree of Standard NAS1638.It is suggested that the minimum filter rating should be β 10≥75.	

Model instruction

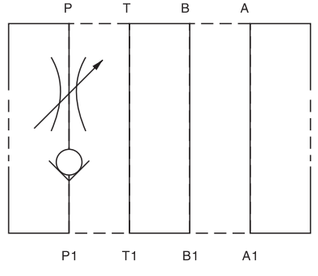
DAL -* * -* / * 70 *

- Modular restrictive check valve
- Specification
  - 02 DN6
  - 03 DN10
- P P Pipeline
- Opening pressure
  - a 0.05MPa
- Remarks
- Serial number
- Seal material
  - Omit NBR Seals
  - V FPM Seals

Notice: only P pipeline available

Code symbol

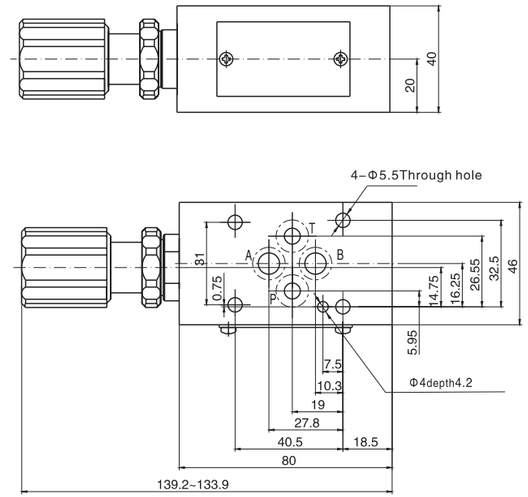
DAL-*-P



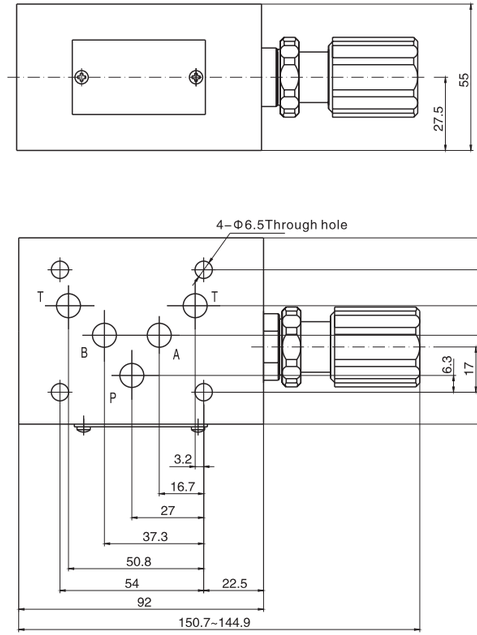
Modular Restrictive Check Valve

External dimensions

DAL-02-P ···



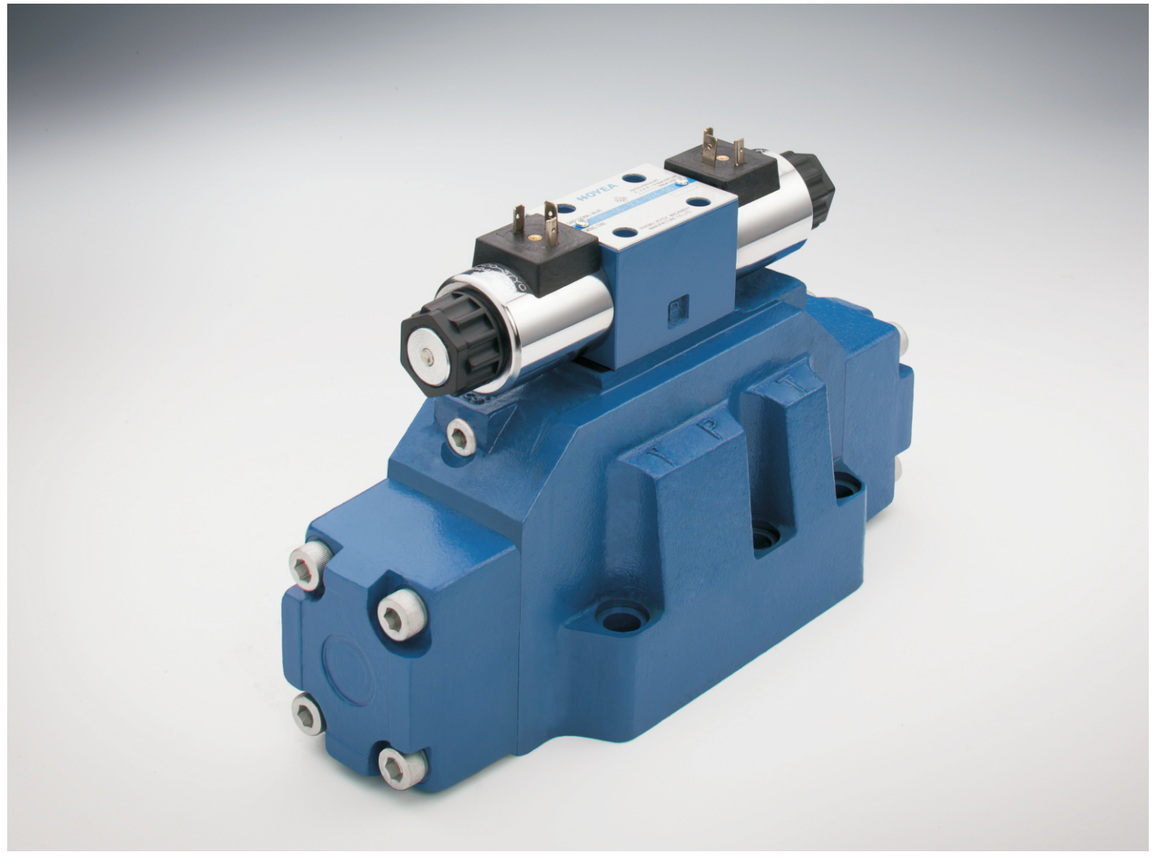
DAL-03-P ···



Notice：The surface, connecting with the valve, should be Ra0.8 roughness, and 0.01/100mm flatness.

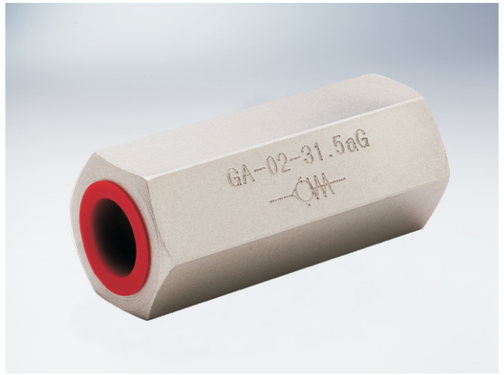
HOYEA

Directional Control Valves Series



In–line Check Valve

Technical specification



Specification		02	03	04	06	10	12
Max. working pressure (MPa)		31.5					
Max. Flow	(L/min)	30	50	140	220	320	430
Working fluid		Mineral oil;phosphate–ester					
Fluid temp.	(℃)	–20~70					
Viscosity	(mm^2/s)	2.8~380					
Opening pressure	(MPa)	a0.05 b0.4					
Cleanliness	The maximum allowable cleanliness of the oil should be according to 9th degree of Standard NAS1638.It is suggested that the minimum filter rating should be β 10≥75.						

Check valve allows the fluid to flow only in one direction and prevents it from flowing in the opposite direction.

Check valve could be used at the outlet of hydraulic pressure pump to avoid the oil flow backwards. It can also separate the oil lines to avoid the oil lines mutual interference.
It can be used as by–pass valve.

Model description

GA – * – * * / 50 *

In–Line check valve

SPECIFICATION
02 DN6
03 DN10
04 DN15
06 DN20
10 DND25
12 DN30

Opening pressure
a 0.05MPa
b 0.4MPa

Screw thread connector
Omit G Screw thread
M M Screw thread

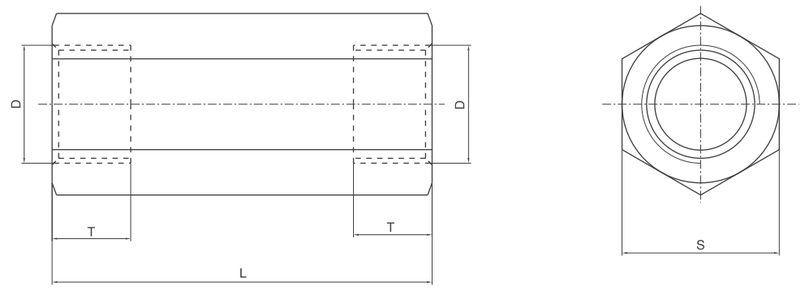
Serial number

Remarks

In–line Check Valve

Code symbol

External dimensions



Specification	D		L(mm)	S(mm)	T(mm)
	British System	Metric System			
02	G3/8"	M18X1.5	58	24	12
03	G1/2"	M22X1.5	72	30	15
04	G3/4"	M27X2	85	36	17
06	G1"	M33X2	98	46	20
10	G1 1/4"	M42X2	120	60	22
12	G1 1/2"	M48X2	138	65	24

Orthogonal Check Valve

Technical specification

Specification		03	06	10
Max. working pressure (MPa)		31.5		
Max. Flow(L/min)		80	220	430
Working fluid		Mineral oil;phosphate-ester		
Fluid temp.	(℃)	-20~70		
Viscosity	(mm^2/s)	2.8~380		
Opening pressure	(MPa)	a0.05 b0.4		
Cleanliness	The maximum allowable cleanliness of the oil should be according to 9th degree of Standard NAS1638.It is suggested that the minimum filter rating should be β 10≥75.			

Check valve allows the fluid to flow only in one direction and prevents it from flowing in the opposite direction.

Check valve could be used at the outlet of hydraulic pressure pump to avoid the oil flow backwards. It can also separate the oil lines to avoid the oil lines mutual interference.
It can be used as by-pass valve.

Model description

AJ - * - * / * 50 *

Orthogonal check valve

Specification
03 DN10
06 DN20
10 DN25

Opening pressure
a 0.05MPa
b 0.4MPa

Seal material
Omit NBR Seals
V FPM Seals

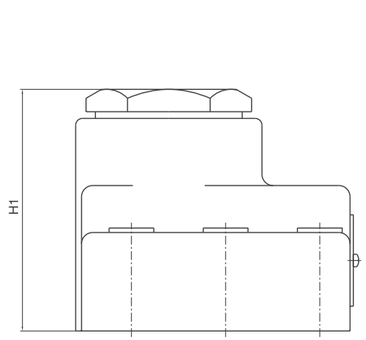
Remarks

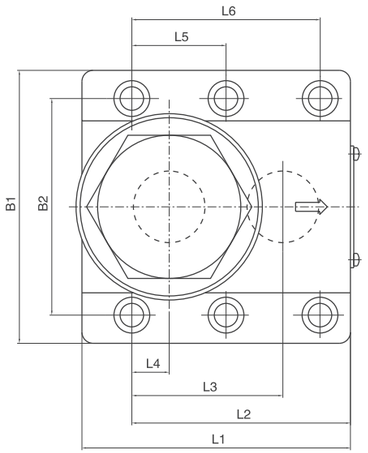
Serial number

Code symbol

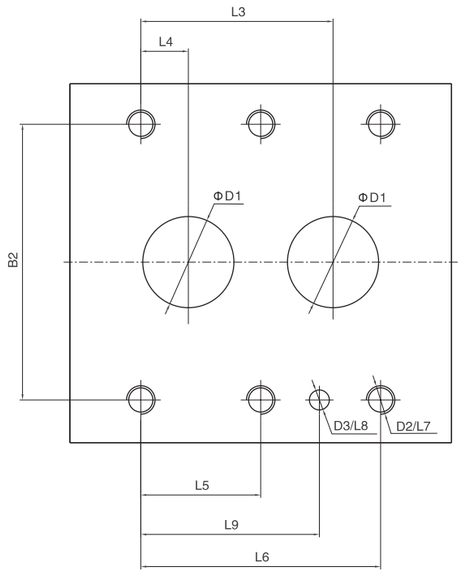
Orthogonal Check Valve

External dimensions





Size of subplate oil port



Specification	Mounting screw	Amount	Tighten torque
03	M10x40-10.9	4	75Nm
06	M10x50-10.9	4	75Nm
10	M10x70-10.9	6	75Nm

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 Ra0.8 roughness, and 0.01/100mm flatness.

Specification	B1	B2	L1	L2	L3	L4	L5	L6	L7	L8	L9	D1	D2	D3	H1
03	90	66.7	67	55	35.8	7.25	–	42.9	23	6	31.8	13	M10	7	67
06	103.5	79.4	84.3	72.3	49.2	11.1	–	60.3	24	6	44.5	22	M10	7	79
10	122	96.8	112	98	67.5	16.7	42.1	84.2	25	6	62.7	32	M10	7	105

Hydraulic–operated Check Valve

Technical specification

Specification		03	06	10
Max. working pressure	(Mpa)	31.5		
Control pressure	(Mpa)	0.5~31.5		
Max. Flow	(L/min)	100	350	550
Working fluid		Mineral oil; phosphate–ester		
Fluid temp.	(℃)	–20~70		
Viscosity	(mm^2/s)	2.8~380		
Opening pressure	(Mpa)	a:0.15 b:0.3 c:0.6 d:1.0		
Cleanliness		The maximum allowable cleanliness of the oil should be according to 9th degree of Standard NAS1638.It is suggested that the minimum filter rating should be β 10≥75.		

Hydraulic–operated check valve allows oil to flow in only one direction, and it can not allow the oil to flow in the opposite direction unless it uses the hydraulic control.

Hydraulic–operated check valve can be used as two way on–off valve, and also can be seen as a pressure retaining valve or a sustaining valve of the standing fluid cylinders.

Model description

AY – * * * – * / * 50 *

Hydraulic–operated check valve
A1Y Internal discharge type
A2Y External discharge type

Specification

Plate connecting type	Pipe connecting type	Screw thread connector
03 NS10	10 DN10	G1/2"orM22x1.5
	15 DN15	G3/4"orM27x2
06 NS20	20 DN20	G1"orM33x2
	25 DN25	G1 1/4"orM42x2
10 NS30	30 DN30	G1 1/2"orM48x2

Omit Plate connecting type
G Pipe connecting type–G Screw
G2 Pipe connecting type–M Screw

A with unloading function
B Without unloading function

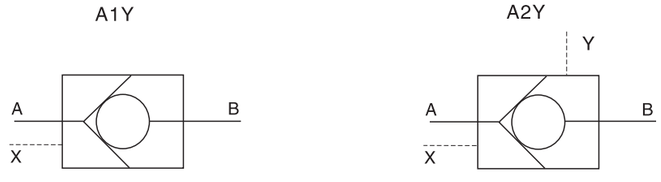
Seal material
Omit NBR Seals
V FPM Seals

Opening pressure
a 0.15
b 0.3
c 0.6
d 1.0

Remarks

Serial number

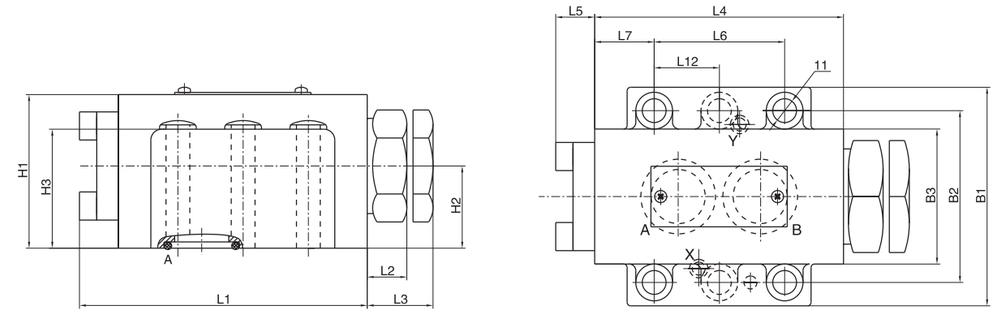
Code symbol



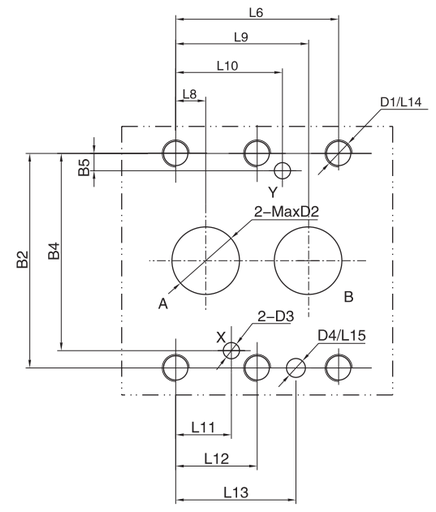
Hydraulic–operated Check Valve

HOYEA

External dimensions



Size of subplate



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 Ra0.8 roughness, and 0.01/100mm flatness.

Model	Specification	L1	L2	L3	L4	L5	L6	L7	L8	L9	L10		L11	L12	L13	L14	L15
											A1Y	A2Y					
A1Y A2Y	03	102	14.3	15.5	89	13	42.9	18.5	7.2	35.8	–	21.5	21.5	–	31.8	23	6
	06	133	18.3	47.7	115	18	60.3	27.5	11.1	49.2	–	39.5	20.6	–	44.5	24	6
	10	156	35.6	46.1	134	22.1	84.2	39	16.7	67.5	–	42.1	24.6	42.1	62.7	25	6

Model	Specification	B1	B2	B3	B4	B5		H1	H2	H3	D1	D2	D3	D4
						A1Y	A2Y							
A1Y A2Y	03	84	66.7	44	58.8	–	7.9	51	29	36	M10	13	6	7
	06	101	79.4	62.4	73	–	6.4	71	38	55	M10	22	6	7
	10	117	96.8	77	92.8	–	3.8	85	42.5	70	M10	32	6	7

Prefill Valve

Technical specification

Specification		50	80
Max. working pressure (Mpa)	A	1.6	
	B	31.5	
	C	31.5	
(L/min)		–	
Working fluid		Mineral oil;phosphate-ester	
(℃)		-20~70	
Viscosity	(mm^2/s)	2.8~380	
(MPa)		a:0.02	
Weight	(kg)	14	32
Cleanliness	The maximum allowable cleanliness of the oil should be according to 9th degree of Standard NAS1638.It is suggested that the minimum filter rating should be β 10≥75.		

Model description

AF – F ＊ ＊ – ＊ / ＊ 50 ＊

Prefill valve

Flange connections

Specification
50 DN50
80 DN80

A With unloading function
B No With unloading function

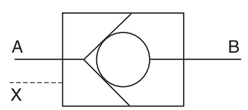
Opening pressure
a 0.02

Seal material
Omit NBR Seals
V FPM Seals

Serial number

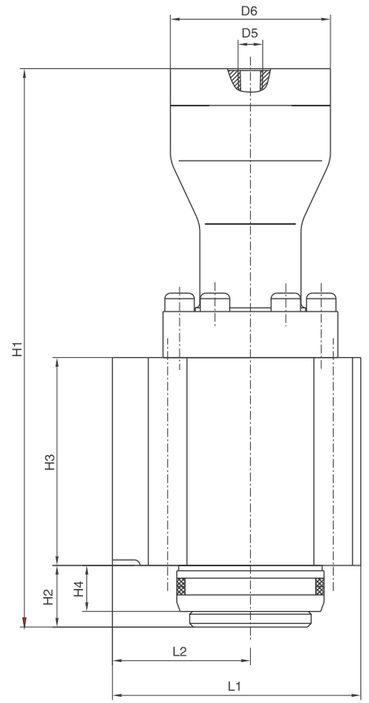
Remarks

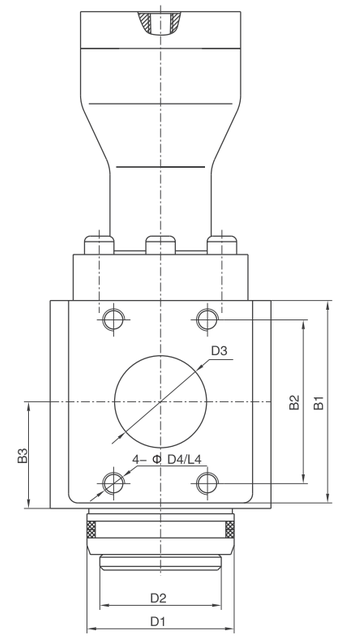
Code symbol

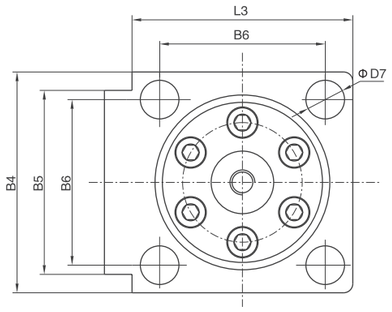


Prefill Valve

External dimensions





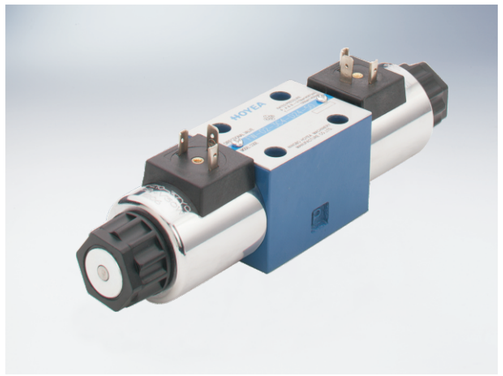


Specification	Mounting screw	Tighten torque
AF-50	4-M20X140-10.9	430Nm
AF-80	4-M30X200-10.9	1640Nm

Specification	L1	L2	L3	L4	B1	B2	B3	B4	B5	B6	H1	H2	H3	H4	D1	D2	D3	D4	D5	D6	D7
AF-50	135	75	120	16	110	89	58	120	100	90	303.5	33.5	113	25	80f7	66	50	M12	NPT /4"	87	21
AF-80	192	102	180	20	157	106.5	77.5	180	115	130	357.5	40.5	160	30	115f7	97	76	M16	NPT /4"	87	31

Electrical Operated Directional Control Valve

Technical specification



Specification		02	03
Working pressure (MPa)	Oil ports P、A、B	35	31.5
	Oil port T	10	10
Max. Flow (L/min)		80	120
Working fluid		Mineral oil;phosphate-ester	
Fluid temp. (℃)		-20~70	
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 solenoids	1.95(DC)	1.9(AC)	6.7(DC)	5.1(AC)

Cleanliness	The maximum allowable cleanliness of the oil should be according to 9th degree of Standard NAS1638.It is suggested that the minimum filter rating should be β 10≥75.

Model description

FW - * - * - * * * / * * 50 *

Electrical Operated
Directional Control Valve

Specification
02 DN6
03 DN10

Function code
Details as following symbol table

Working voltage
D12 DC12V
D24 DC24V
A110 AC110V
A220 AC220V
B110 AC110V Rectified
B220 AC220V Rectified

Z5L Square connector with light
Z6 Wire box type

Omit without damping
08 Φ0.8 Damping
10 Φ1.0 Damping
12 Φ1.2 Damping

Omit without hand emergency
N9 with concealed hand emergency

Remarks

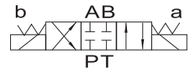
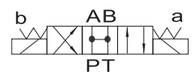
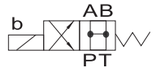
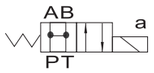
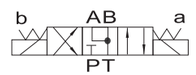
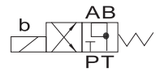
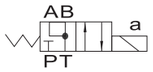
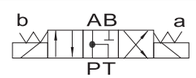
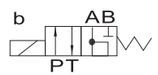
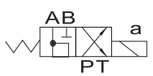
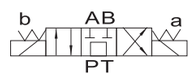
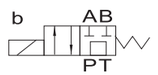
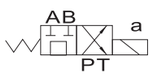
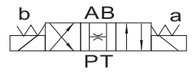
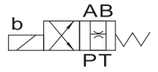
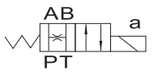
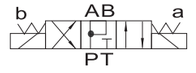
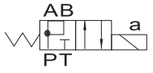
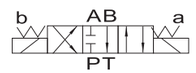
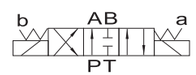
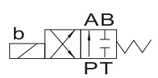
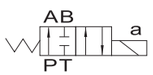
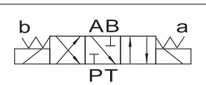
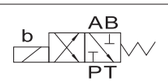
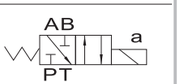
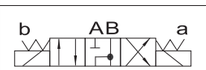
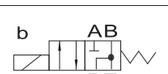
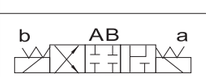
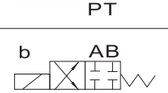
Serial number

50
60
70
Seal material
Omit NBR Seals
V FPM Seals

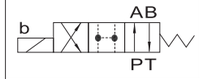
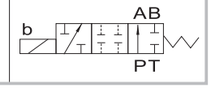
HOYEA

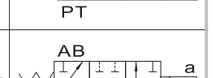
Code symbol

Spring return

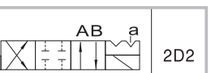
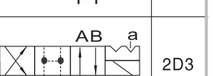
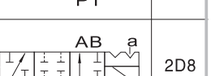
3C2		2B2B		2B2BL	
3C3		2B3B		2B3BL	
3C4		2B4B		2B4BL	
3C5		2B5B		2B5BL	
3C6		2B6B		2B6BL	
3C7		2B7B		2B7BL	
3C9		2B9B		2B9BL	
3C10		2B10B		2B10BL	
3C11		2B11B		2B11BL	
3C12		2B12B		2B12BL	
3C25		2B25B		2B25BL	
3C29		2B29B		2B29BL	

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

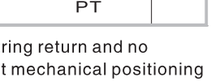
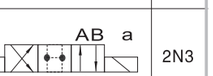
2B2	
2B3	
2B8	

2B2L	
2B3L	
2B8L	

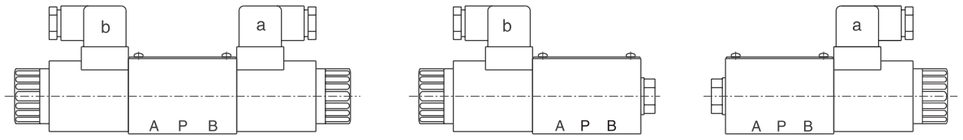
With detent

2D2	
2D3	
2D8	

No spring return and no
detent mechanical positioning

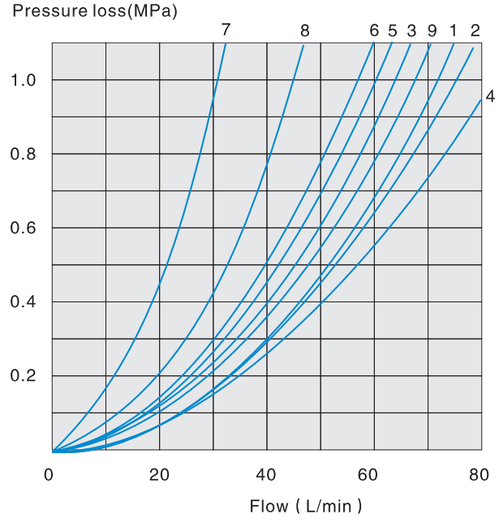
2N2	
2N3	
2N8	

Name of solenoid



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.

02 Specification Performance curve (Measured at υ=41mm²/s and t=50℃)



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

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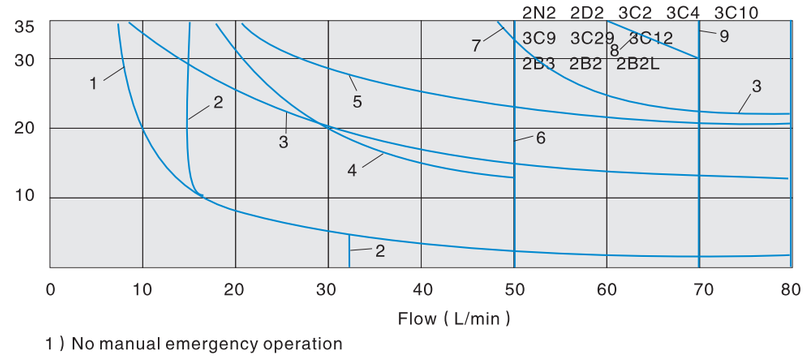
02 Specification Working limits (The working limits for directional valves have determined by using solenoids at their operating temperature, 10% under voltage and with no pre-loading of the tank)

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.

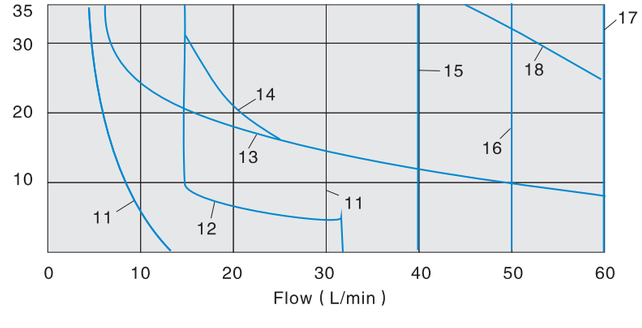
DC solenoid operation DC D24, D1 2, B220, B110		AC solenoid operation AC A110, A220, 50HZ	
Curve	Symbol	Curve	Symbol
1	2B8 2B8L1)	11	
2	3C7	12	
3	2B8 2B8L	13	
4	3C5 3C25	14	
5	3C4	15	
6	3C6 3C3	16	
7	2N8 2D8 3C10 3C12	17	
8	2B3 2B2 2B2L		2B8 2B8L1)
9	3C9		3C7
10	3C2 3C29 2N3	18	2B8 2B8L
	2D3 2N2 2D2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

Working pressure(MPa)

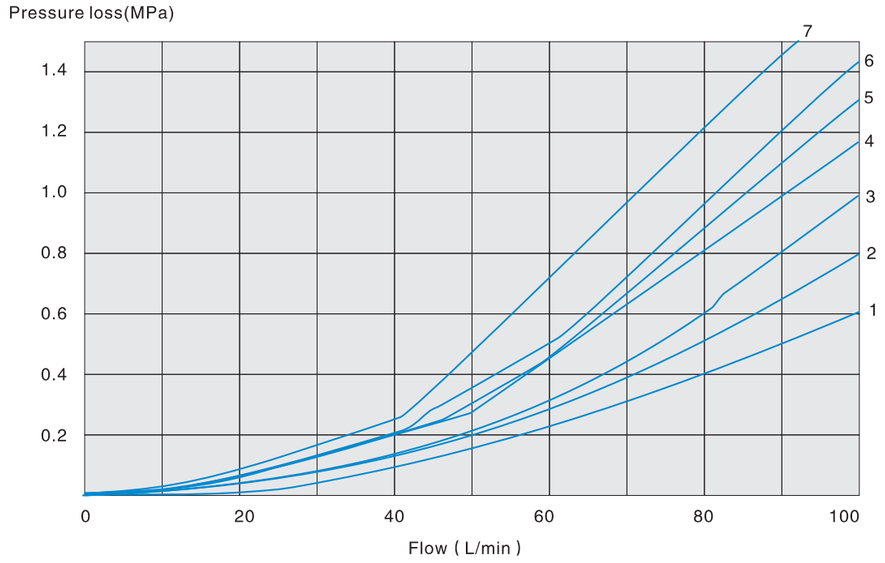


1) No manual emergency operation
2) Oil return from actuator to oil tank

Working pressure(MPa)



03 Specification Performance curve (Measured at υ=41mm²/s and t=50℃)



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	–

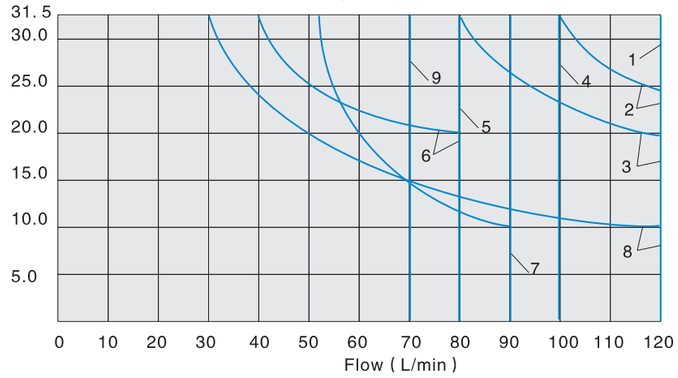
7.Spool symbol "3C29" in the shifting position A → B
4. Spool symbol 3C6 in neutral position P → T

HOYEA

03 Specification Working limits (The working limits for directional valves have determined by using solenoids at their operating temperature, 10% under voltage and with no pre-loading of the tank)

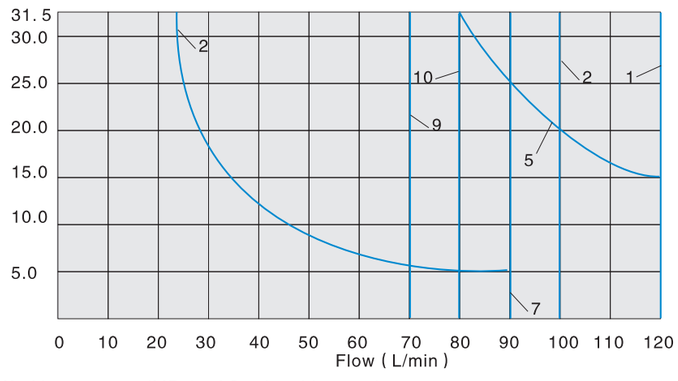
With regard to the four-way valve, the normal flow data as shown is get from the regular use of two directions of the flow (e.g.P to A, and simultaneous return flow from B to T). See tables. If only one flow direction is needed, for example: When a four port valve which is closed up port A or port B,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

Working pressure(MPa) DC solenoid operation



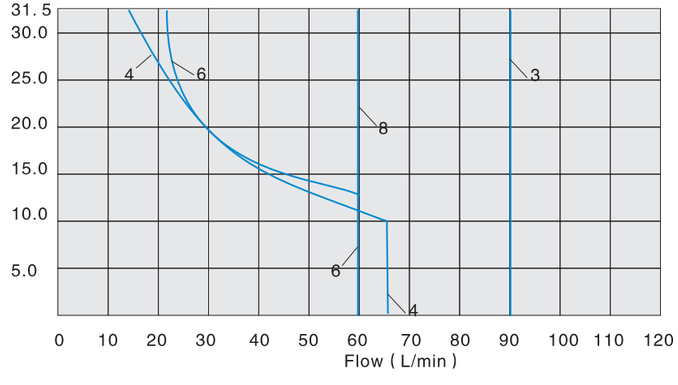
Curve	Symbol
1	2B3 2N3 2D3 2B2 2N2 2D2 2B2L 3C9
2	3C2
3	2N8 2D8 3C10 3C12 3C4
4	3C3
5	3C29
6	3C6
7	3C5 3C25
8	2B8 2B8L
9	3C7
1)	Return circuit (Independent of area ratio)

Working pressure(MPa) AC solenoid operation



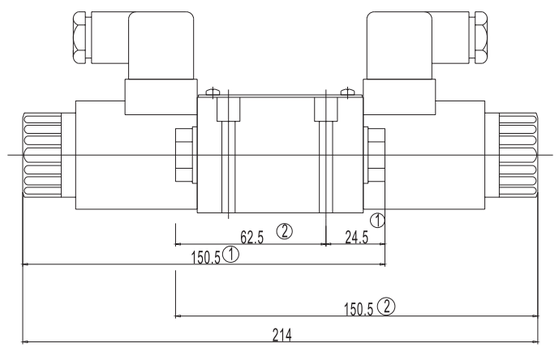
110V,50Hz; 120V,60Hz; 220V,50Hz; 240V,60Hz;	
Curve	Symbol
1	2B3 2N3 2D3 2B2 2N2 2D2 2B2L
2	3C2 3C10
3	3C12 3C9
4	2B8 2B8L
5	2N8 2D8 3C4
6	3C6
7	3C5 3C25
8	3C7
9	3C3
10	3C29

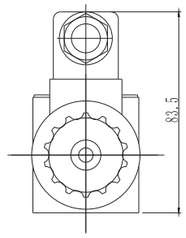
Working pressure(MPa) AC solenoid operation



Electrical Operated Directional Control Valve

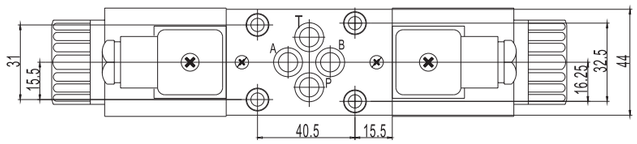
External dimensions (02 Direct current plug type)



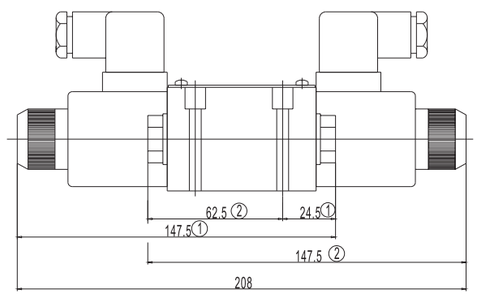


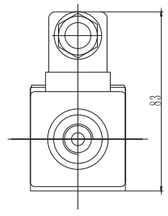
① ②

Two positions Electrical
operated directional control valve



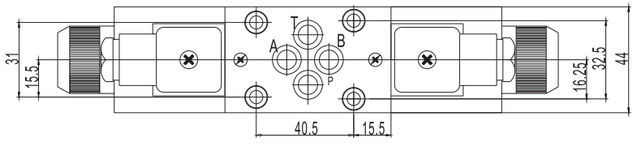
External dimensions (02 Direct current wire box type)





① ②

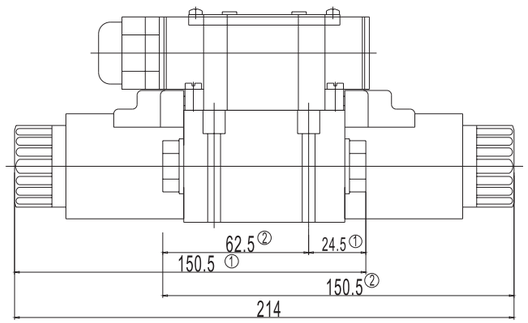
Two positions Electrical
operated directional control valve

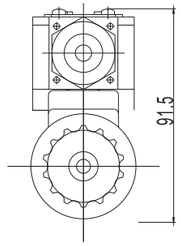


Electrical Operated Directional Control Valve

HOYEA

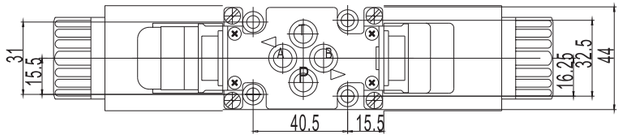
External dimensions (02 Alternating current plug type)



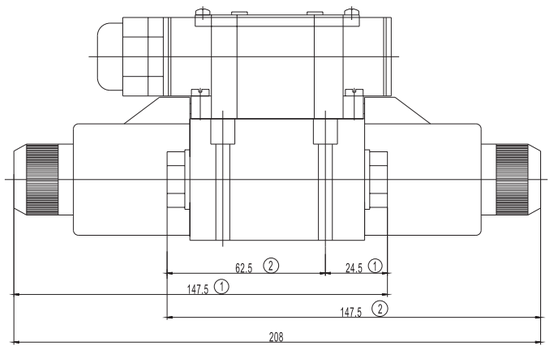


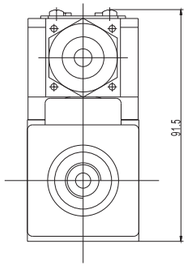
① ②

Two positions Electrical
operated directional control valve



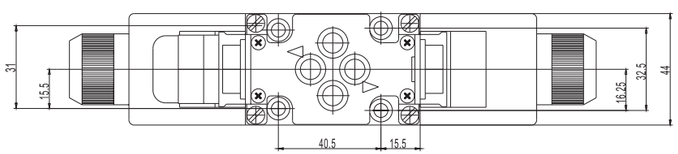
External dimensions (02 Alternating current wire box type)





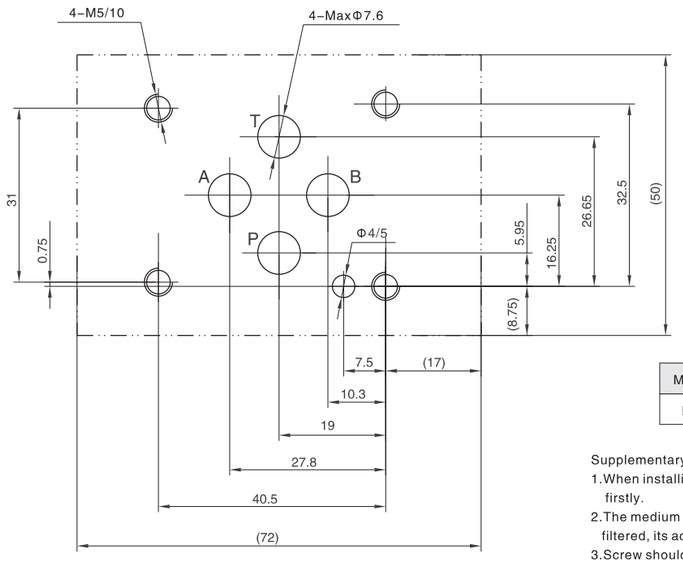
① ②

Two positions Electrical
operated directional control valve



Electrical Operated Directional Control Valve

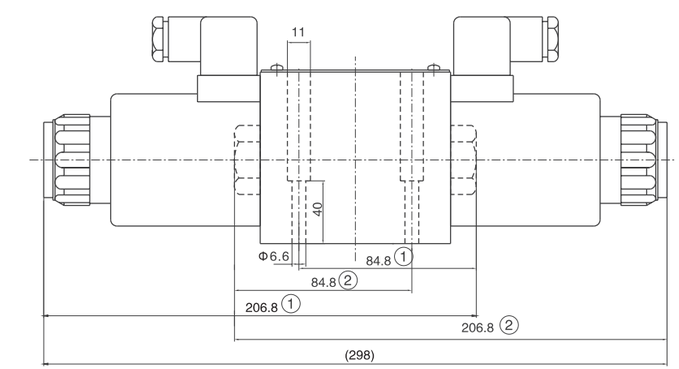
02 Size of subplate oil port

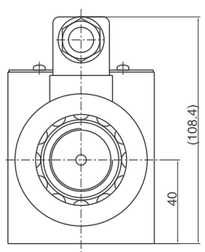


Mounting screw	Amount	Tighten torque
M5x45–10.9	4	9Nm

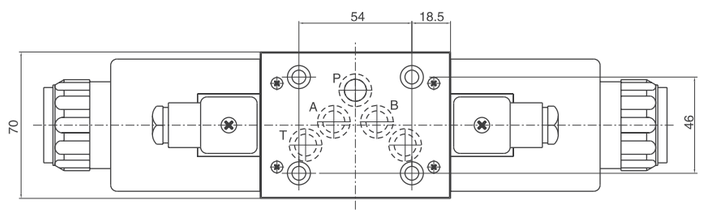
Supplementary explanation
1.When installing the product, considering horizontal position firstly.
2.The medium used in the hydraulic system must be filtered, its accuracy at least 20 μ m.
3.Screw should be according to the parameters in catalogue.
4.The surface, connecting with the valve, should be Ra0.8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

External dimensions (03 Direct current plug type)





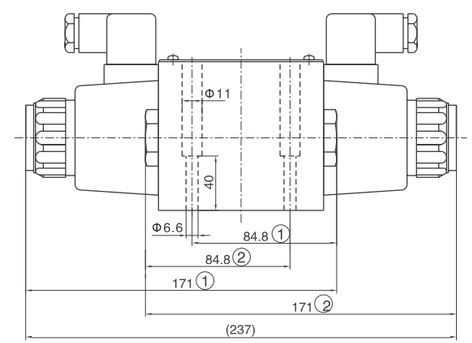
① ②
Two positions Electrical operated directional control valve

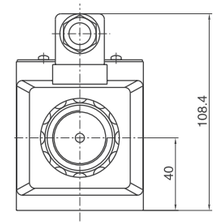


Electrical Operated Directional Control Valve

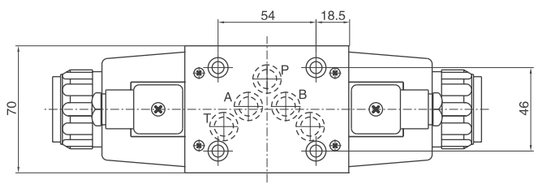
HOYEA

External dimensions (03 Alternating current plug type)

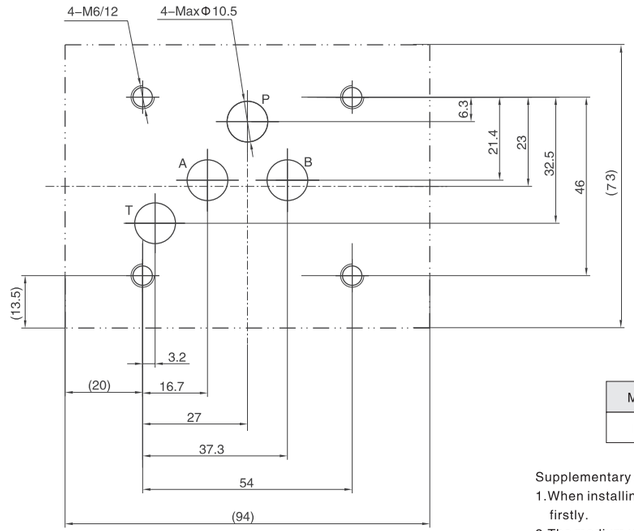




① ②
Two positions Electrical operated directional control valve



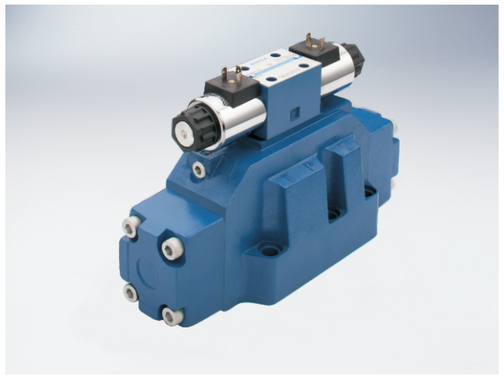
03 Size of subplate oil port



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 μ 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.

Electro–hydraulic Directional Control Valve



Electro–hydraulic directional control valve is a control valve which can use the pressure of the hydraulic circuit to pull the spool and change the hydraulic oil direction.

Electro–hydraulic directional control valve is the combination of the electrical operated directional control valve and the hydraulic operated directional control valve. It uses the electrical operated directional control valve to control the hydraulic operated directional control valve, and change the hydraulic oil direction.

Electro–hydraulic directional control valve and hydraulic operated directional control valve are used mostly in hydraulic systems when electrical operated directional control valve can not afford the flow. It may control the movement of the power elements, or control the direction of the flowing oil.

Technical specification

Specification		03		04		06		10	
Model		FWH–03	HFWH–03	FWH–04	HFWH–04	FWH–06	HFWH–06	FWH–16	HFWH–16
Max. Working pressure (MPa)	P、A、B Port	28	35	28	35	28	35	28	35
	T port (internal leakage of control oil)	10		10		10		10	
	Y port (external leakage of control oil)	10		10		10		10	
Minimum control pressure (MPa)		1.0 Spring–Return 4/3 valve 4/2 valve		1.2 Spring–Return 4/3 valve 4/2 valve		1.3 Spring–Return 4/3 valve 4/2 valve		0.8 Spring–Return 4/3 valve 4/2 valve	
Maximum control pressure (MPa)		to25							
Max. Flow (L/min)		160		300		650		1100	
Working fluid		Mineral oil;phosphate–ester							
Fluid temp. (℃)		–20~70							
Viscosity (mm^2/s)		2.8~380							
Cleanliness	The maximum allowable cleanliness of the oil should be according to 9th degree of Standard NAS1638.It is suggested that the minimum filter rating should be β 10≥75.								

Electro–hydraulic Directional Control Valve

HOYEA

Model description

＊FWH/FH–＊ ＊–＊–＊ ＊ ＊ ＊/＊ ＊ ＊ ＊ ＊ ＊ 50 ＊

Working pressure
Omit 28MPa
H 35MPa

FWH Electro–hydraulic directional control valve
FH Hydraulic operated directional control valve

Specification
03 DN10
04 DN16
06 DN25
10 DN32

Main valve return type
Omit Spring return
H Hydraulic centration

Function code
Details as following symbol table

Working voltage
D12 DC12V
D24 DC24V
A110 AC110V
A220 AC220V
B110 AC110V Rectified
B220 AC220V Rectified

Z5L Square connector with light
Z6 Wire box type

Omit without hand emergency
N9 with concealed hand emergency

Omit without stroke adjusting device
A Head A of main valve with stroke adjustment
B Head B of main valve with stroke adjustment
W Both heads with stroke adjustment

Omit without shifting time adjustment
S With shifting time adjustment: Inlet flow control
S1 shifting time adjustment: Outlet flow control

Omit without damping
08 Φ0.8 Damping
10 Φ1.0 Damping
12 Φ1.2 Damping

Omit Intl cntrl intl disch
XY Extl cntrl extl disch
X Extl cntrl intl disch
Y Intl cntrl extl disch

[1] Omit Without pre–load valve
P4.5 With pre–load valve

[2] Omit No reducing valve
D3 With reducing valve

Seal material
Omit NBR Seals
V FPM Seals

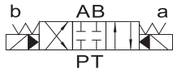
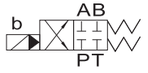
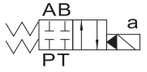
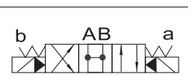
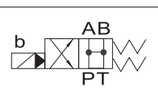
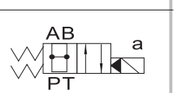
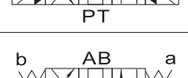
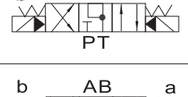
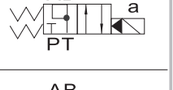
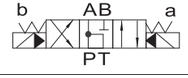
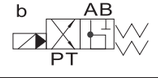
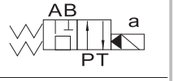
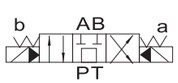
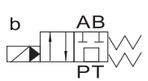
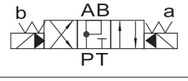
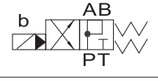
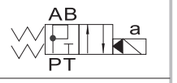
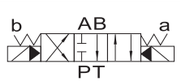
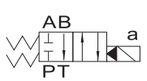
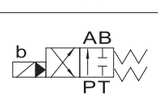
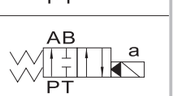
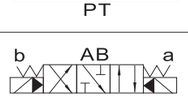
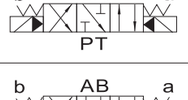
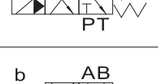
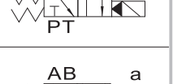
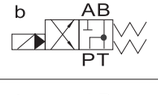
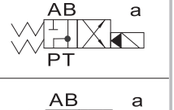
Serial number

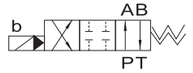
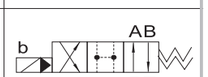
Remarks

Explaination
1.For neutral unloaded directional control valve it must be ordered separately.
There is no model (FWH–03)Electro–hydraulic directional control valve NS10.
2.Only applied when the controlling pressure is higher than 25MPa

Code symbol

Spring return

3C2		2B2B		2B2BL	
3C3		2B3B		2B3BL	
3C4		2B4B		2B4BL	
3C5		2B5B		2B5BL	
3C6		2B6B		2B6BL	
3C7		2B7B		2B7BL	
3C9		2B9B		2B9BL	
3C10		2B10B		2B10BL	
3C11		2B11B		2B11BL	
3C12		2B12B		2B12BL	
3C25		2B25B		2B25BL	
3C29		2B29B		2B29BL	

2B2	
2B3	
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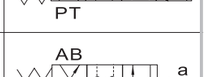
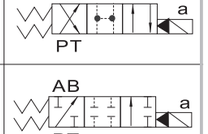
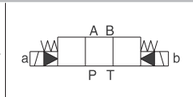
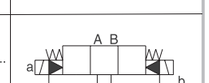
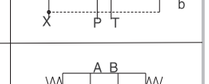
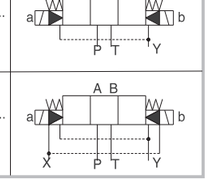
2B2L	
2B3L	
2B8L	

FWH–...	
FWH–... X/...	
FWH–... Y/...	
FWH–... XY/...	

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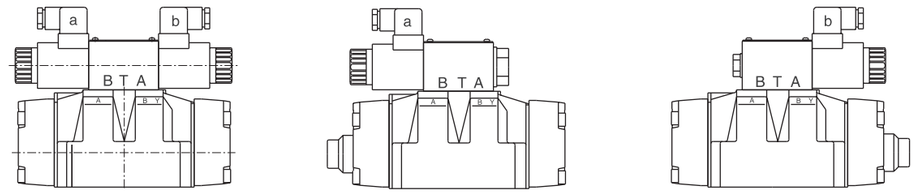
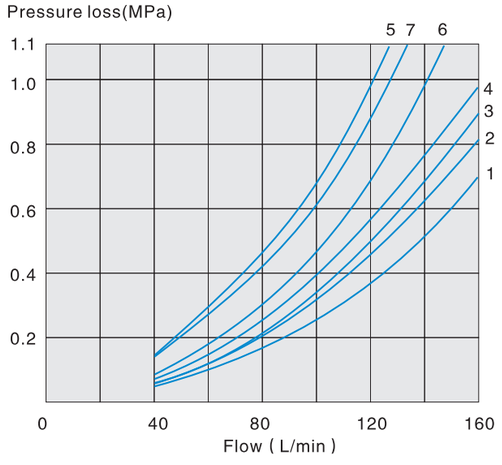
Name of solenoid



1. aWhen movement a, P→A B→T
2. bWhen movement b, P→B A→T
3. 3C6 Oil flow in the opposite direction with the above–mentioned movement.
   Foor 3C29, when solenoid "a" works , P → A,B

03 Specification Performance curve (Measured at υ =41mm²/s and t=50℃)



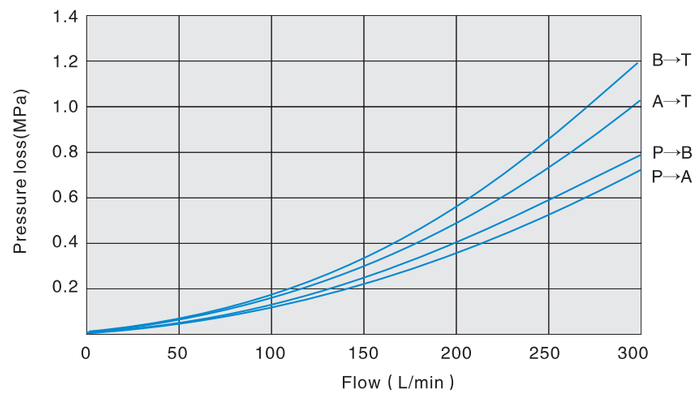
Function	Switching position			
Symbol	P→A	P→B	A→T	B→T
3C2	1	2	4	5
3C5	1	4	1	1
3C6	4	2	2	6
3C3	4	4	1	4
3C4	1	2	1	3
3C12	2	3	1	4
3C9	4	4	3	4
3C25	4	1	3	4
3C29	2	3	3	5
3C10	3	3	3	4
3C7	2	2	3	5

Function	Neutral		
	A→T	B→T	P→T
3C5	3	–	6
3C6	–	–	7
3C3	1	3	5
3C25	–	7	5

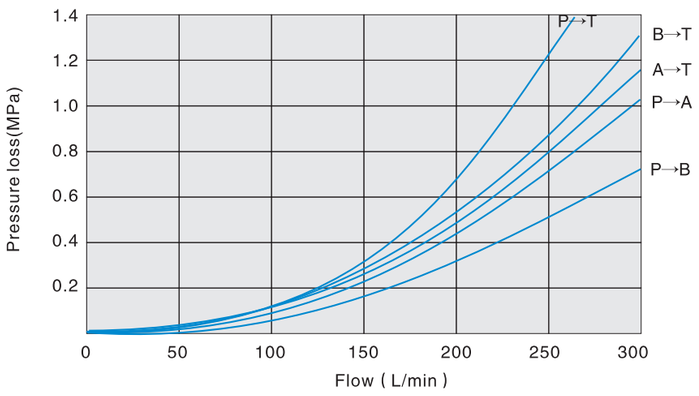
Function	Neutral		
	A→T	B→T	P→T
3C12	3	–	–
3C10	–	4	–

04 Specification Performance curve (Measured at υ =41mm²/s and t=50℃)

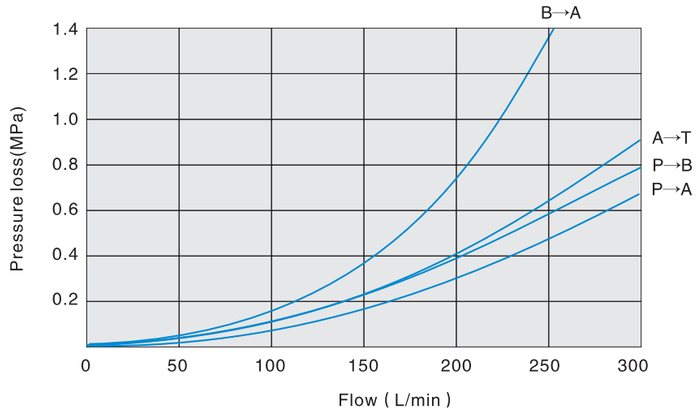
3C2



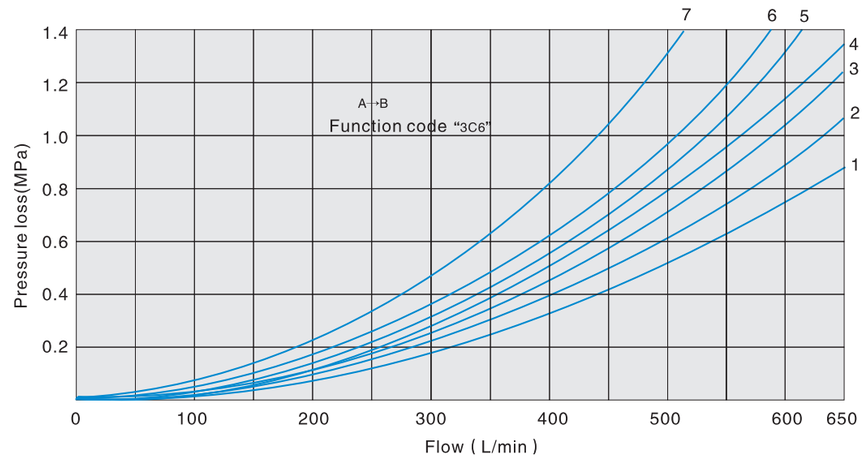
3C6



3C29



06 Specification Performance curve (Measured at υ =41mm²/s and t=50℃)



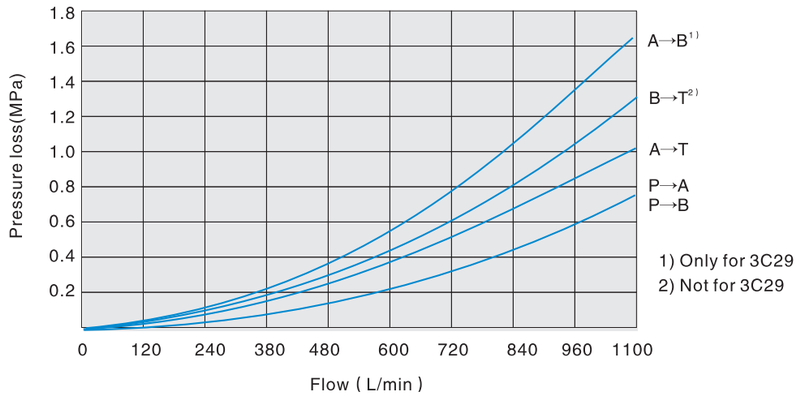
Function	Switching position			
	P→A	P→B	A→T	B→T
3C2	1	1	1	3
3C5	1	4	3	3
3C6	3	1	2	4
3C3	4	4	3	4
3C4	2	2	3	5
3C12	2	2	3	3
3C9	4	4	1	4
3C25	4	1	1	5
3C29	2	1	1	–
3C10	2	1	1	6
3C7	4	4	3	6

7.Function code "3C6" type, neutral position P→T
8.Function code "3C29" type, control position A→B

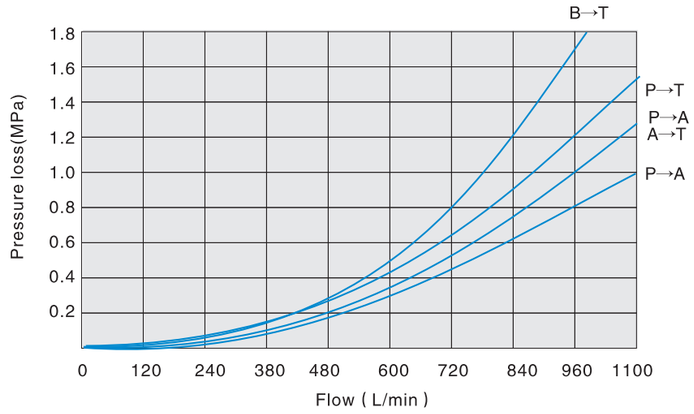
Electro–hydraulic Directional Control Valve

10 Specification Performance curve (Measured at υ=41mm²/s and t=50℃)

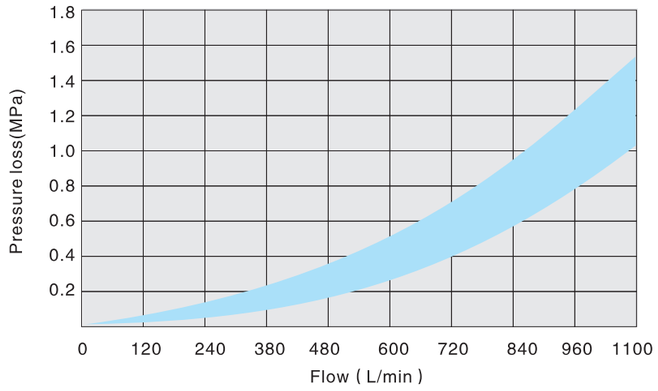
3C2、3C4、3C29



3C6



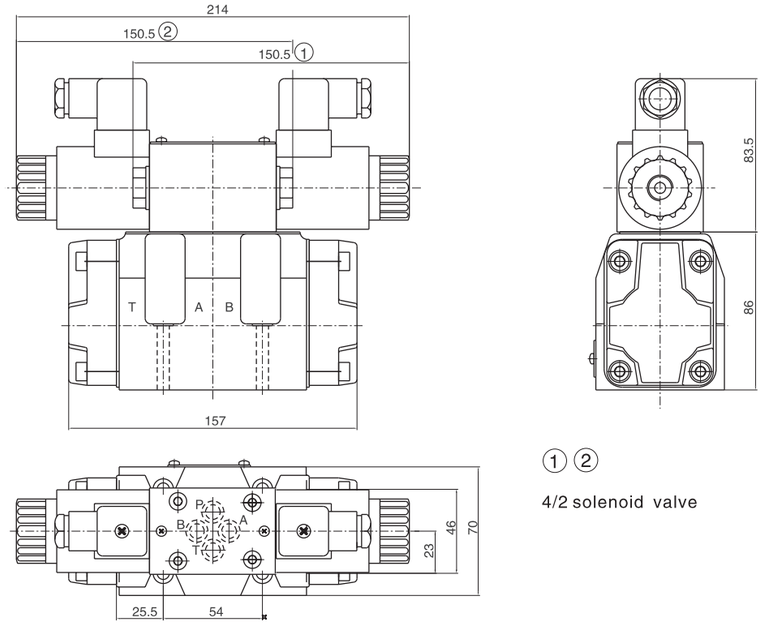
Other spool types



Electro–hydraulic Directional Control Valve

HOYEA

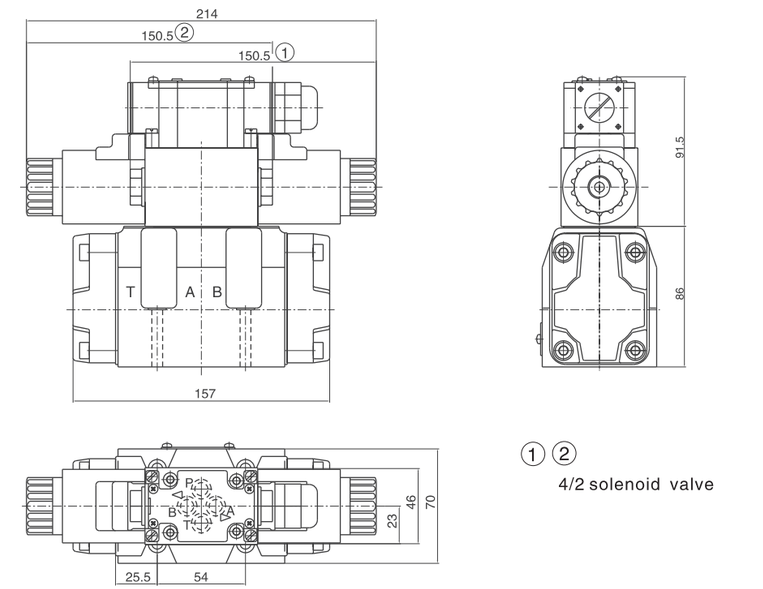
External dimensions (03 Direct current plug type)



① ②

4/2 solenoid valve

External dimensions (03 Direct current wire box type)

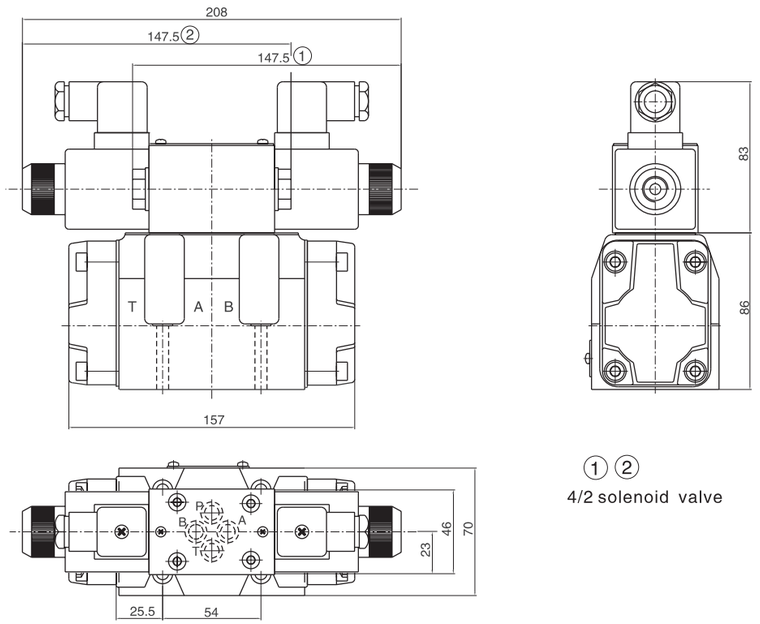


① ②

4/2 solenoid valve

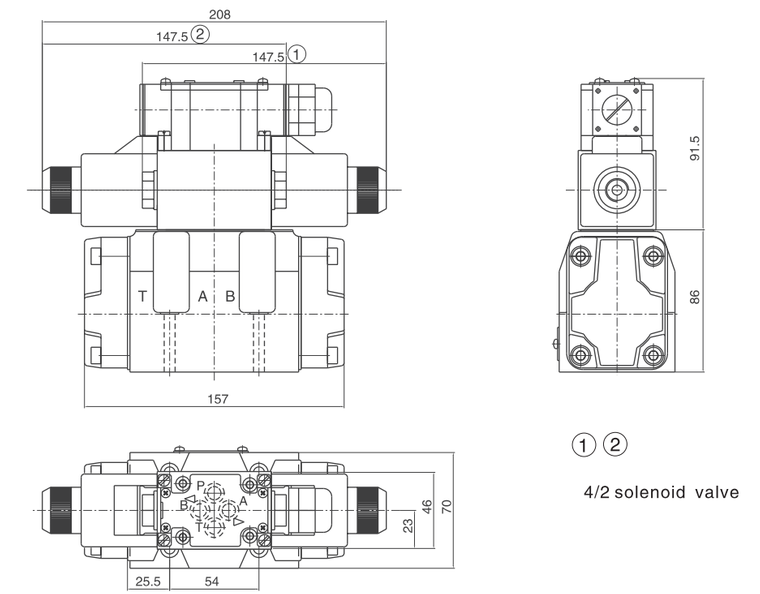
Electro–hydraulic Directional Control Valve

External dimensions (03 Alternating current plug type)



① ②
4/2 solenoid valve

External dimensions (03 Alternating current wire box type)

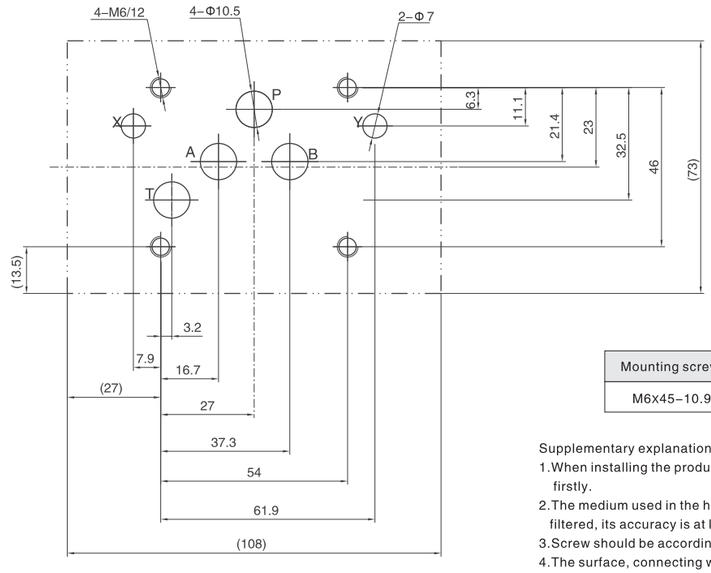


① ②
4/2 solenoid valve

Electro–hydraulic Directional Control Valve

HOYEA

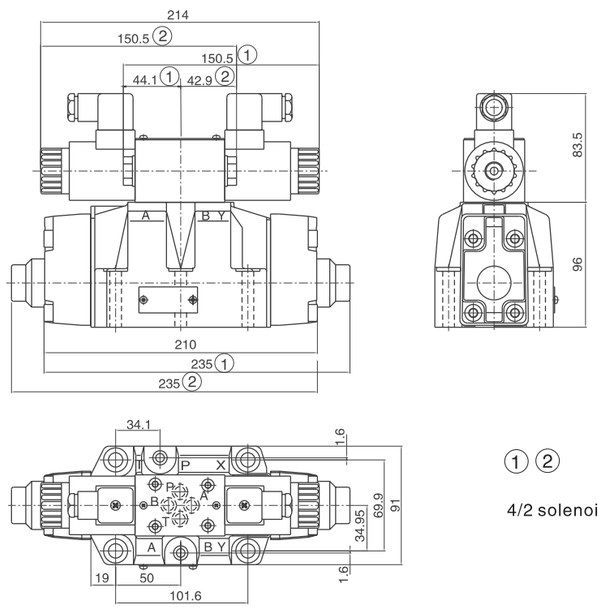
03 Size of subplate oil port



Mounting screw	Amount	Tighten torque
M6x45–10.9	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 μ 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.

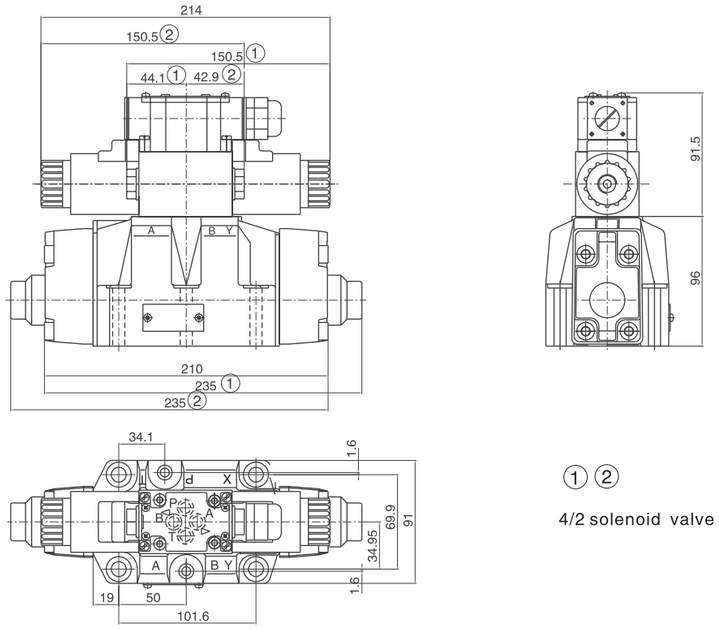
External dimensions (04 Direct current plug type)



① ②
4/2 solenoid valve

Electro–hydraulic Directional Control Valve

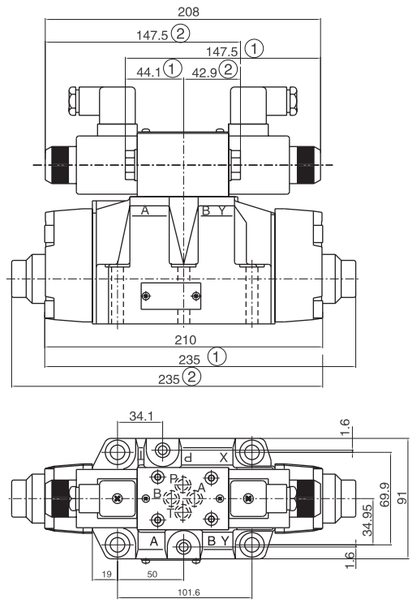
External dimensions (04 Direct current wire box type)



① ②

4/2 solenoid valve

External dimensions (04 Alternating current plug type)



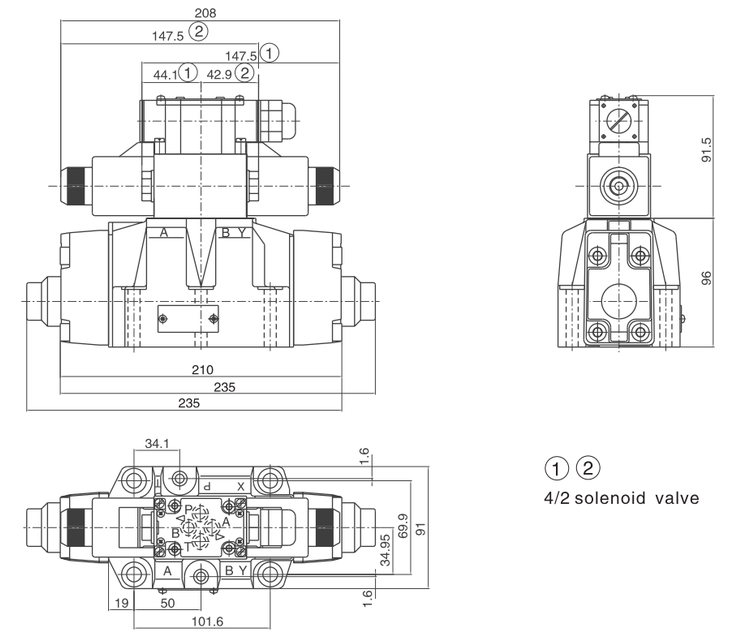
① ②

4/2 solenoid valve

Electro–hydraulic Directional Control Valve

HOYEA

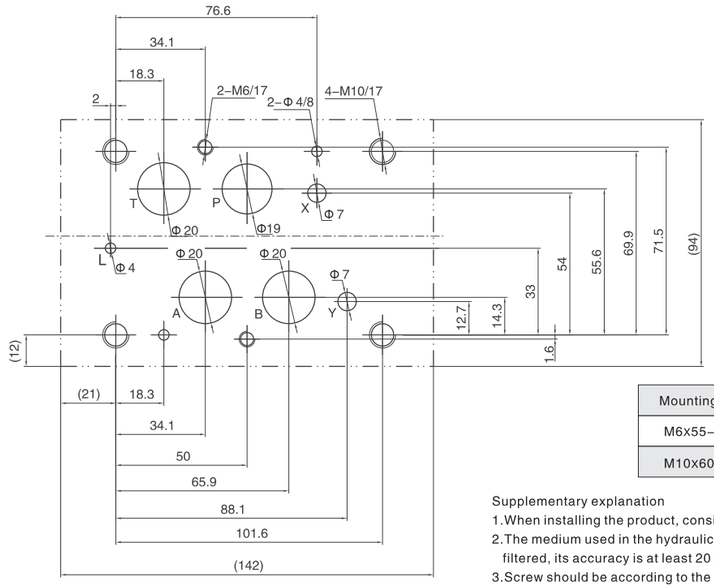
External dimensions (04 Alternating current wire box type)



① ②

4/2 solenoid valve

04 Size of subplate oil port

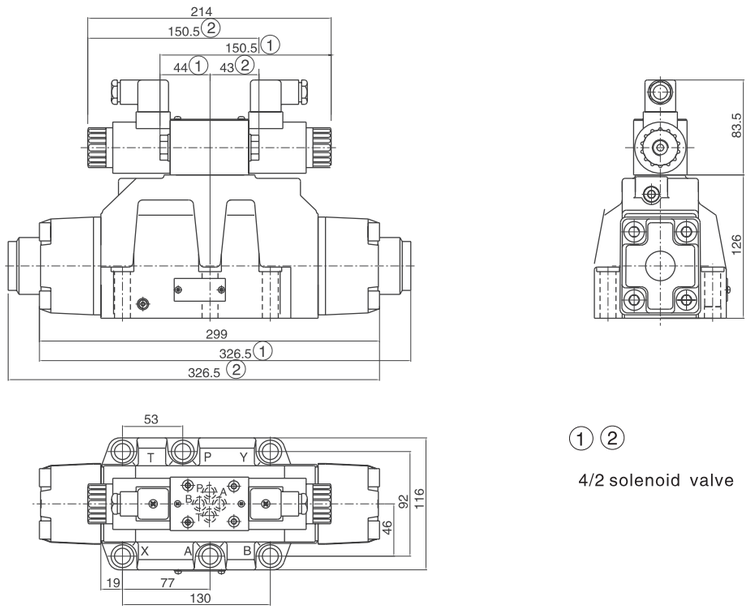


Mounting screw	Amount	Tighten torque
M6X55–10.9	2	15Nm
M10X60–10.9	4	75Nm

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 Ra0.8 roughness, and 0.01/100mm flatness.

Electro–hydraulic Directional Control Valve

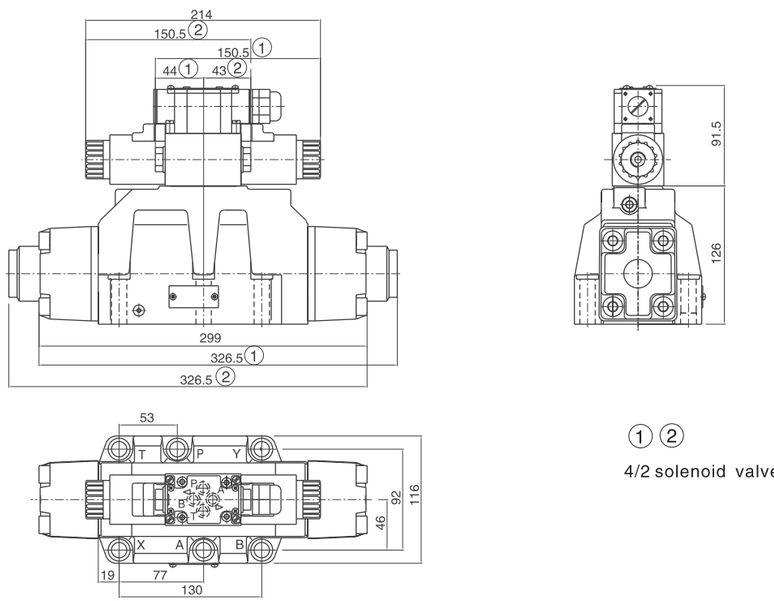
External dimensions (06 Direct current plug type)



① ②

4/2 solenoid valve

External dimensions (06 Direct current wire box type)



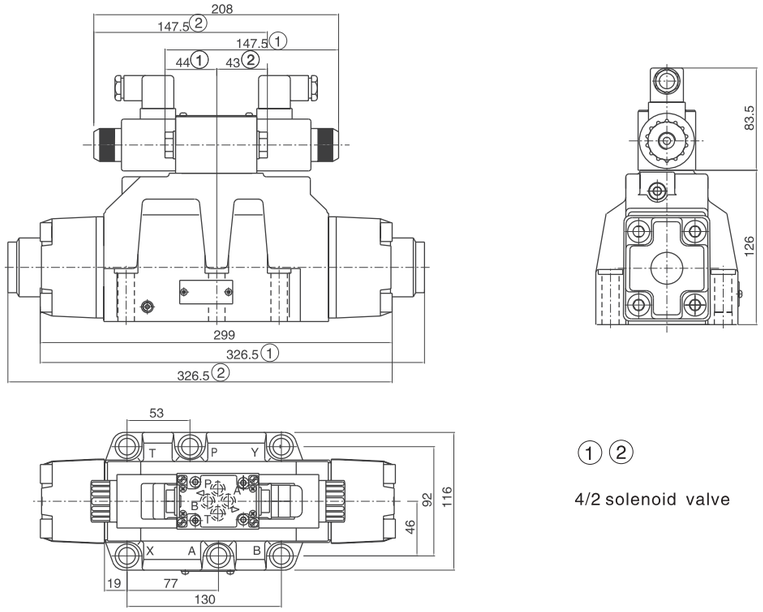
① ②

4/2 solenoid valve

Electro–hydraulic Directional Control Valve

HOYEA

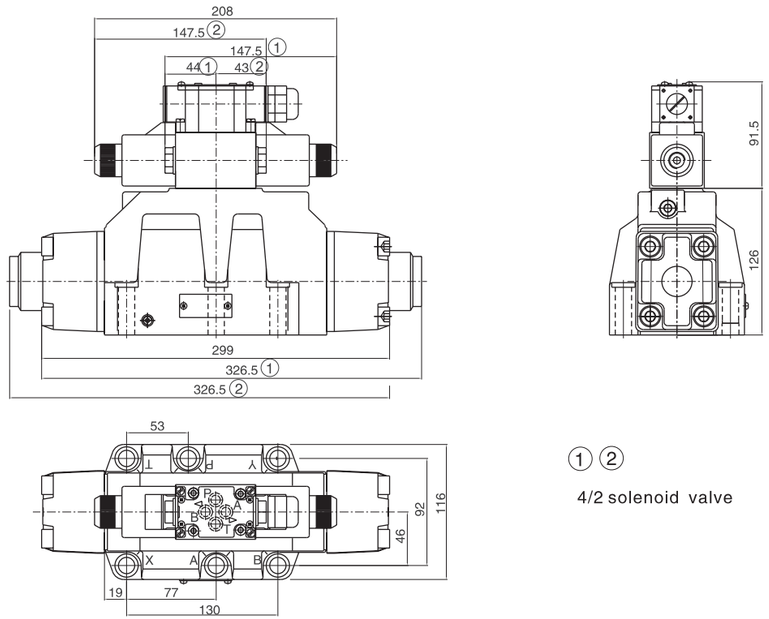
External dimensions (06 Alternating current plug type)



① ②

4/2 solenoid valve

External dimensions (06 Alternating current wire box type)

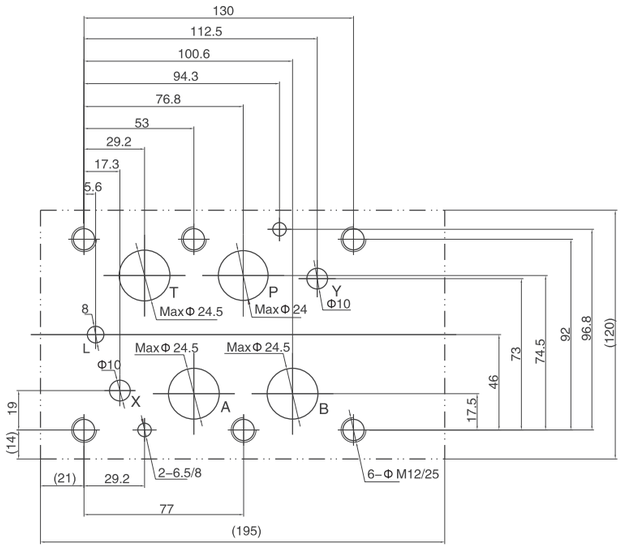


① ②

4/2 solenoid valve

Electro–hydraulic Directional Control Valve

06 Size of subplate oil port

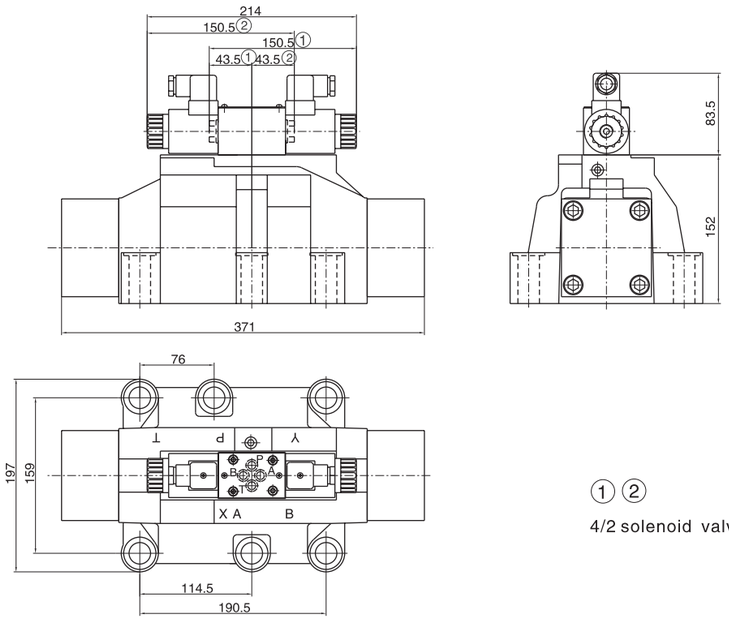


Mounting screw	Amount	Tighten torque
M12x60–10.9	6	130Nm

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 Ra0.8 roughness, and 0.01/100mm flatness.

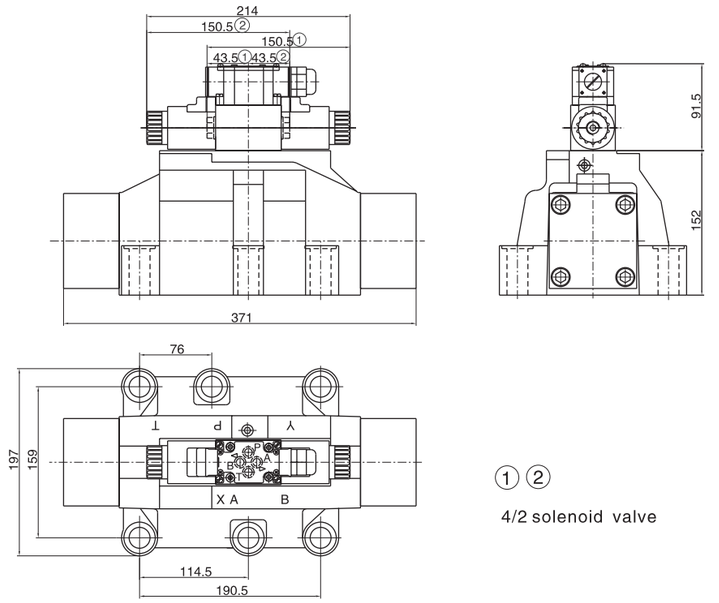
External dimensions (10 Direct current plug type)



①②
4/2 solenoid valve

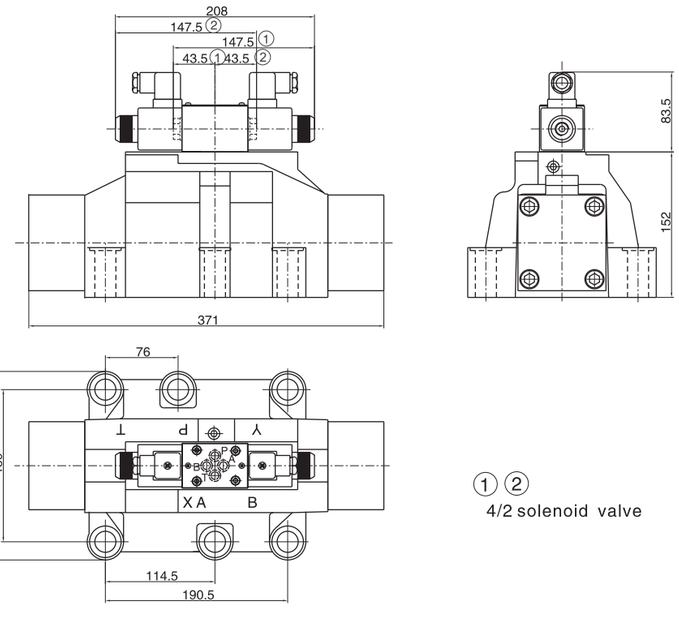
Electro–hydraulic Directional Control Valve

External dimensions (10 Direct current wire box type)



①②
4/2 solenoid valve

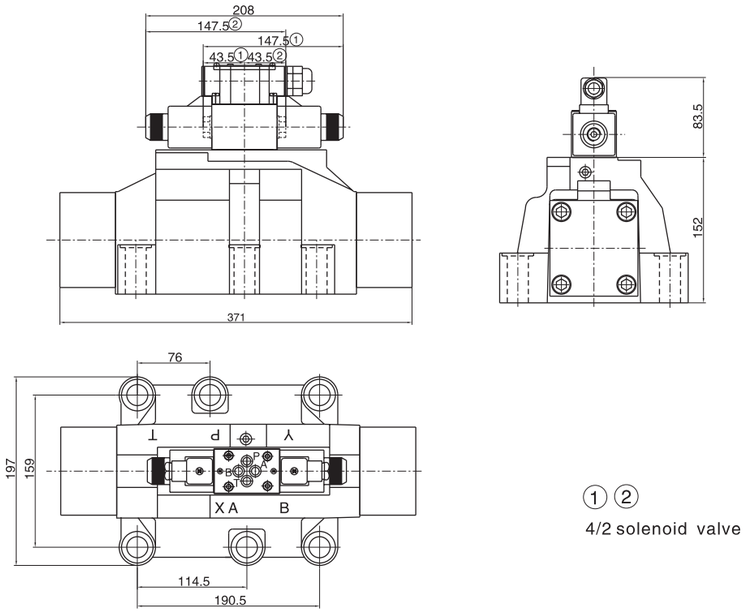
External dimensions (10 Alternating current plug type)



①②
4/2 solenoid valve

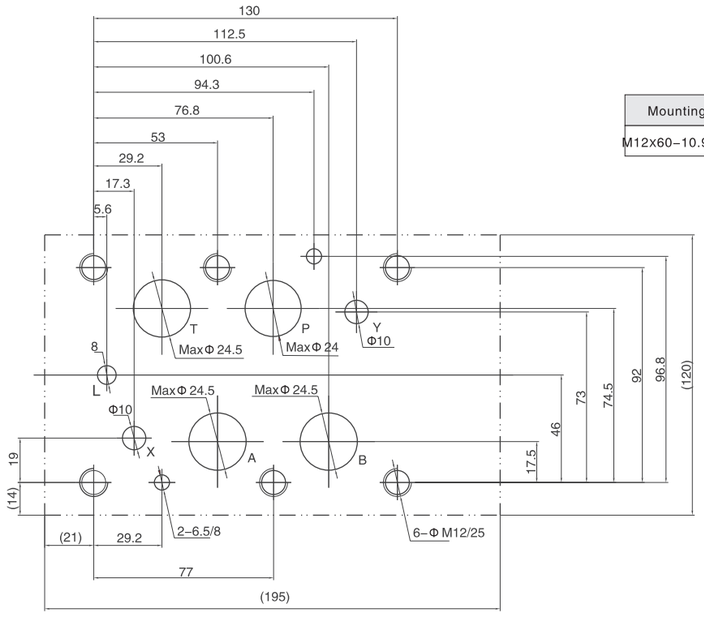
Electro–hydraulic Directional Control Valve

External dimensions (10 Alternating current wire box type)



① ②
4/2 solenoid valve

10 Size of subplate oil port



Mounting screw	Amount	Tighten torque
M12x60–10.9	6	130Nm

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 Ra0.8 roughness, and 0.01/100mm flatness.

Manual operated Directional Control Valve

HOYEA

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.	(℃)	–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 Standard NAS1638.It is suggested that the minimum filter rating should be β 10≥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.

Model description

FS – * – * / * * * 50 *

Manual operated directional control valve

Specification
02 DN6
03 DN10
04 DN16
06 DN25

Function code
Details as following symbol table

Omit Spring return
OF With detent

Seal material
Omit NBR Seals
V FPM Seals

Serial number

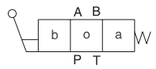
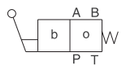
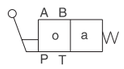
Remarks

Omit without damping
08 Φ0.8 Damping
10 Φ1.0 Damping
12 Φ1.2 Damping

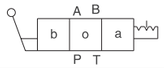
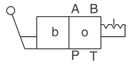
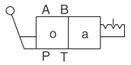
Manual Operated Directional Control Valve

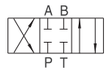
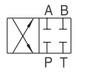
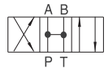
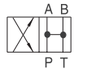
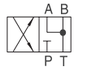
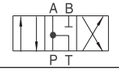
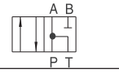
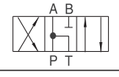
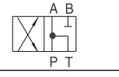
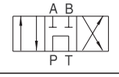
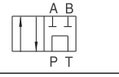
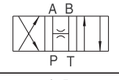
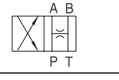
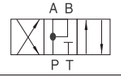
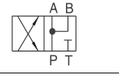
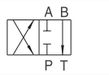
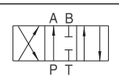
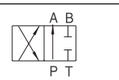
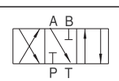
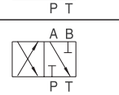
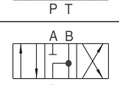
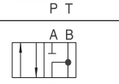
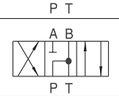
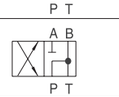
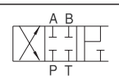
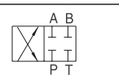
Code symbol

Spring return

With detent

3C2		2B2B		2B2BL	
3C3		2B3B		2B3BL	
3C4		2B4B		2B4BL	
3C5 (02/03)		2B5B (02/03)		2B5BL (02/03)	
3C5 (04/06)		2B5B (04/06)		2B5BL (04/06)	
3C6		2B6B		2B6BL	
3C7		2B7B		2B7BL	
3C9		2B9B		2B9BL	
3C10		2B10B		2B10BL	
3C11		2B11B		2B11BL	
3C12		2B12B		2B12BL	
3C25 (02/03)		2B25B (02/03)		2B25BL (02/03)	
3C25 (04/06)		2B25B (04/06)		2B25BL (04/06)	
3C29		2B29B		2B29BL	

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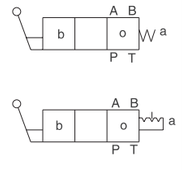

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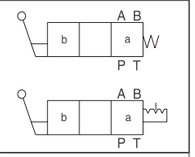
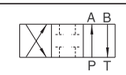
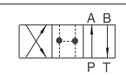
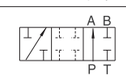


2B2	
2B3	
2B8	

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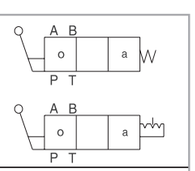
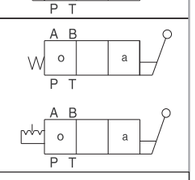
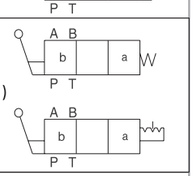
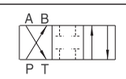
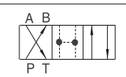
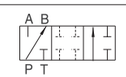


(03)



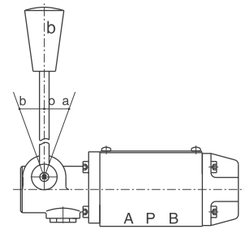
(04/06)

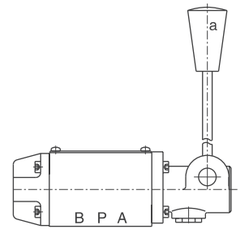


2B2L	
2B3L	
2B8L	

Manual Operated Directional Control Valve

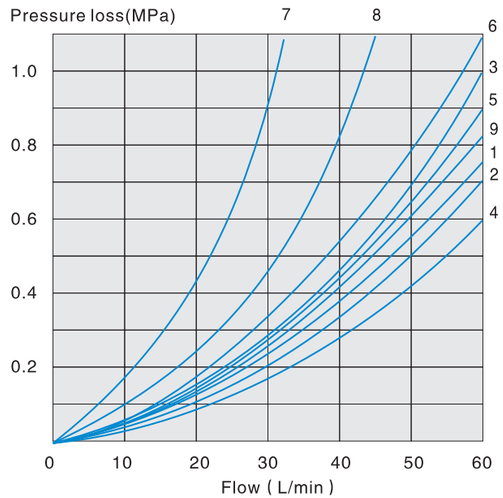
The relationship between the location of the handle and the direction of the oil flow





1. The name of the handle as shown in the picture
2. When the handle is on position b P→B A→T
3. When the handle is on position a P→A B→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. For specification 03 spool type 2B2L,2B3L, 2B8L, the handle is at the side of port B,
   detials refer to the external dimension

02 Specification Performance curve (Measured at υ=41mm²/s and t=50℃)



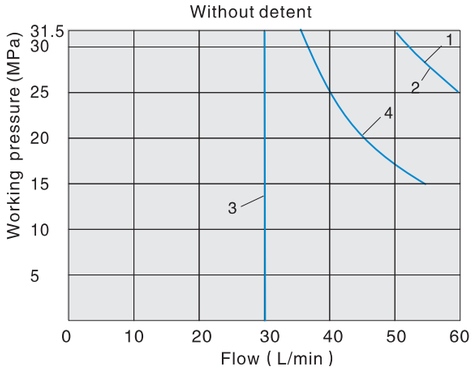
Function code	Direction			
	P→A	P→B	A→T	B→T
2B8 2B8L	3	3	–	–
2B3	1	1	3	1
2B2 2B2L	5	5	3	3
3C2	3	3	1	1
3C5	1	3	1	1
3C6	6	6	9	9
3C3	2	4	2	2
3C4	1	1	2	1
3C10,3C12	3	3	4	9
3C9	2	3	3	3
3C25	3	1	1	1
3C29	5	5	4	–
3C7	1	2	1	1

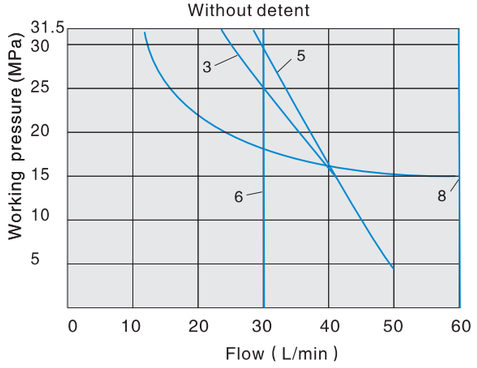
7.Spool type “3C29” located in the control position A → B
8.Spool symbol 3C6 in the neutral position P → T

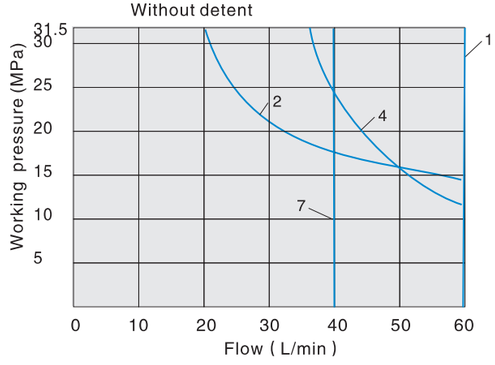
Manual Operated Directional Control Valve

02 Specification Working limits (The working limits for directional valve have determined by using solenoids at theiroperating 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 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, used as a three-way valve, the Maximum flow may be very small in the serious condition.







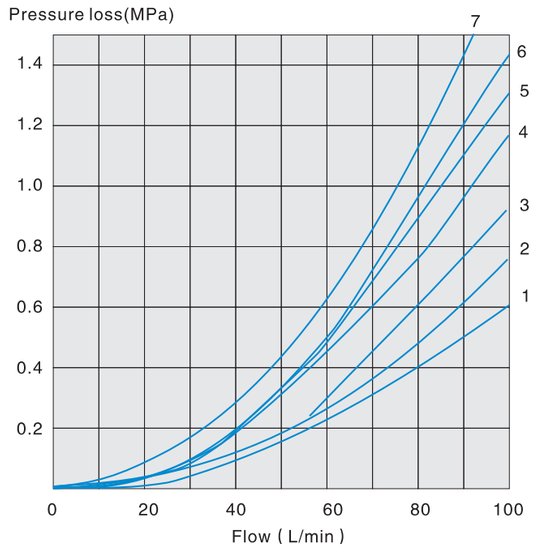
4.Spool symbol "3C6" in the median position P to T
7.Spool symbol "3C29" in the control position A to B

Performance curve		Function code	Performance curve		Function code
Without detent	1	3C2 3C3 2B3 2B2 3C9 3C10 3C6 3C4 3C12 3C29 2B2L	With detent	1	3C9 3C3 2B3 2B2 2B2L
	2	2B8 2B8L		2	3C2 3C4 3C12 3C10
	3	3C7		3	2B8 2B8L
	4	3C5 3C25		4	3C6
				5	3C5
				6	3C7
				7	3C25
				8	3C29

Manual Operated Directional Control Valve

HOYEA

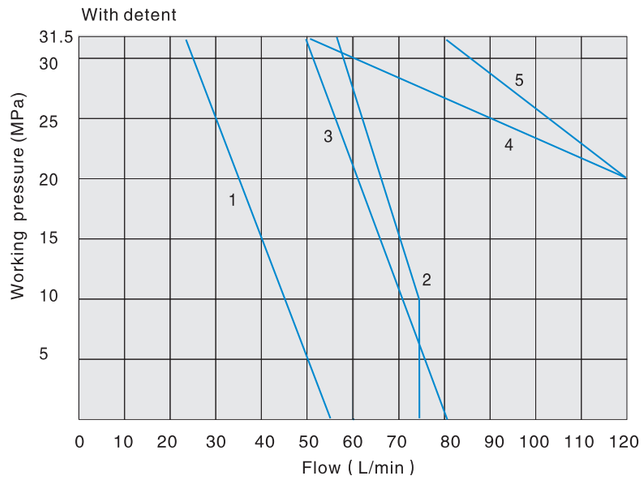
03 Specification Performance curve (Measured at υ=41mm²/s and t=50℃)



	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

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

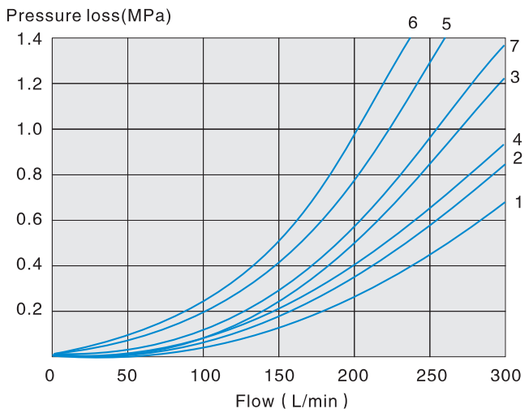
Working limits (The working limits for directional valves have determined by using solenoids attheir operating temperature, 10% under voltage and with no pre-loading of the tank.)



1	2B8 2B8L
2	3C3
3	3C5 3C6 3C25 3C29
4	3C4 3C12 3C10
5	2B2 2B3 3C2 3C9 3C7 2B2L

Manual Operated Directional Control Valve

04 Specification Performance curve (Measured at υ=41mm²/s and t=50℃)



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

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

04 Specification Working limits (The working limits for directional valves have determined by using solenoids attheir operating temperature, 10% under voltage and with no pre-loading of the tank.)

4/2 valve Without detent					
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

4/2 valve With detent					
Function code	Working pressure (MPa)				
	7	14	21	28	35
	Flow (L/min)				
2B2 2B3	300	300	300	260	220

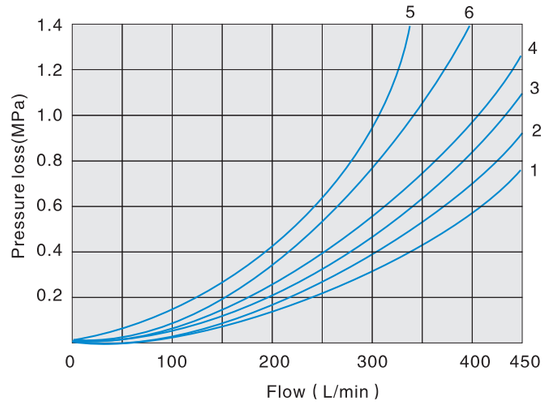
4/3 valve Without detent					
Function code	Working pressure (MPa)				
	7	14	21	28	35
	Flow (L/min)				
3C2 3C3 3C4 3C12 3C9 3C29 3C10	300	300	300	300	300
3C5 3C25	300	300	210	190	170
3C6	300	300	220	210	180
3C7	300	260	200	180	170

4/3 valve With detent					
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

Manual Operated Directional Control Valve

HOYEA

06 Specification Performance curve (Measured at υ=41mm²/s and t=50℃)



	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	2	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

4. Spool symbol "3C12" in the neutral position A → T
6. Spool symbol "3C10" in the neutral position B → T

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

4/2 valve Without detent					
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

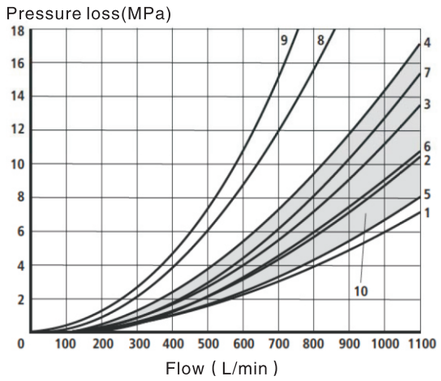
4/2 valve With detent					
Function code	Working pressure (MPa)				
	7	14	21	28	35
	Flow (L/min)				
2B3 2B2	450	450	450	450	450

4/3 valve Without detent					
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

4/3 valve With detent					
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

Manual Operated Directional Control Valve

10 Specification Performance curve (Measured at υ=41mm²/s and t=50℃)



Function code	Direction				
	P→A	P→B	A→T	B→T	P→T
3C2	1	1	2	3	–
3C6	6	5	6	7	7
3C29	1	1	2	–	4

10 All other spool types

10 Specification Working limits (The working limits for directional valves have determined by using solenoids attheir operating temperature, 10% under voltage and with no pre-loading of the tank.)

4/2 valve Without detent					
Function code	Working pressure (MPa)				
	7	14	21	28	35
	Flow (L/min)				
2B3	1100	1040	860	800	700
2B2	1100	1040	540	480	420

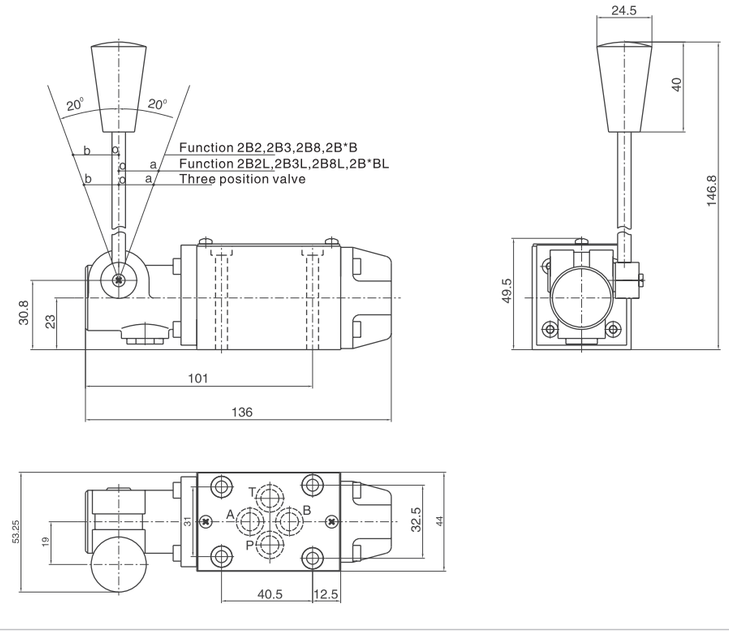
4/2 valve With detent					
Function code	Working pressure (MPa)				
	7	14	21	28	35
	Flow (L/min)				
2B3 2B2	1100	1040	860	750	680

4/3 valve Without detent					
Function code	Working pressure (MPa)				
	7	14	21	28	35
	Flow (L/min)				
3C2 3C3 3C4 3C12 3C9 3C29 3C10	1100	1040	860	750	680
3C5	900	900	800	650	450
3C6	900	900	800	650	450
3C3	900	900	800	650	450
3C25	900	900	800	650	450
3C7	1100	1100	680	500	450

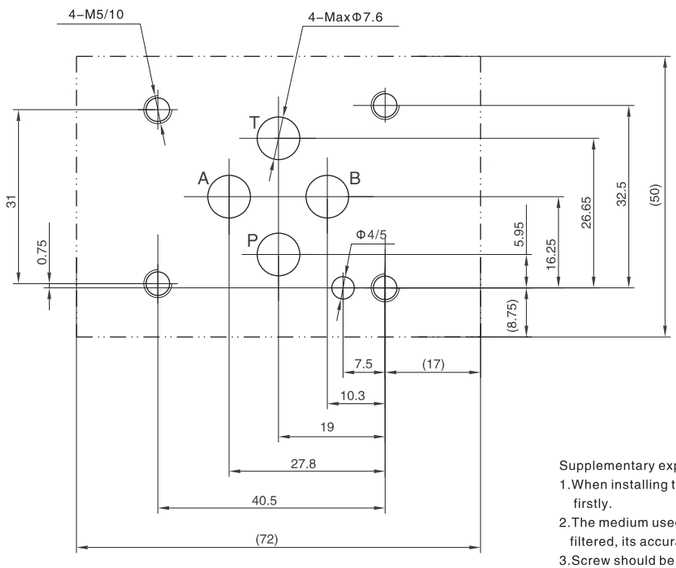
4/3 valve With detent					
Function code	Working pressure (MPa)				
	7	14	21	28	35
	Flow (L/min)				
3C2 3C5 3C6 3C3 3C4 3C10 3C9 3C25 3C12	1100	1040	860	750	680
3C7	1100	1040	860	750	680

Manual Operated Directional Control Valve

02 External dimensions



02 Size of subplate oil port

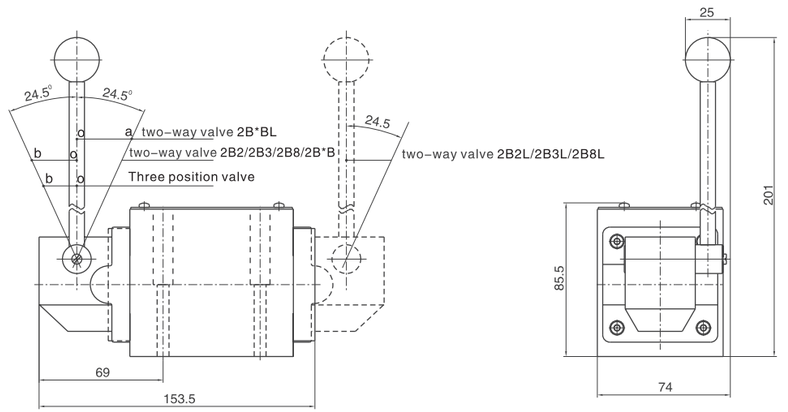


Mounting screw	Amount	Tighten torque
M5x50–10.9	4	9Nm

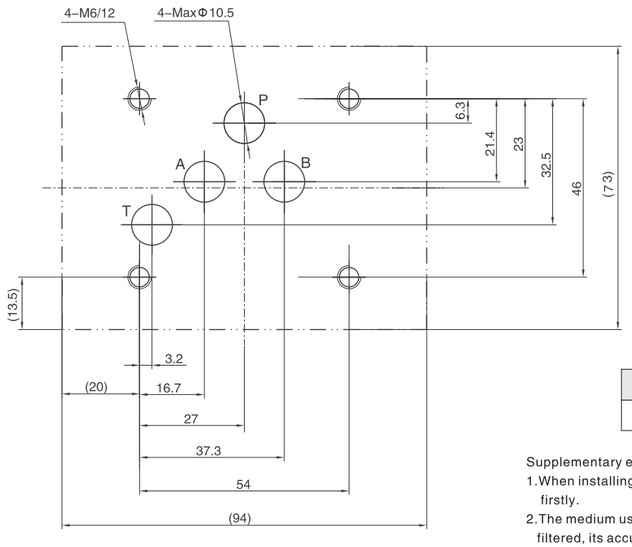
Supplementary explanation
1.When installing the product, considering horizontal position firstly.
2.The medium used in the hydraulic system must be filtered, its accuracy is at least 20 μ m.
3.Screw should be according to the parameters in catalogue.
4.The surface, connecting with the valve, should be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

Manual Operated Directional Control Valve

03 Spring type external dimensions



03 Spring type size of subplate oil port

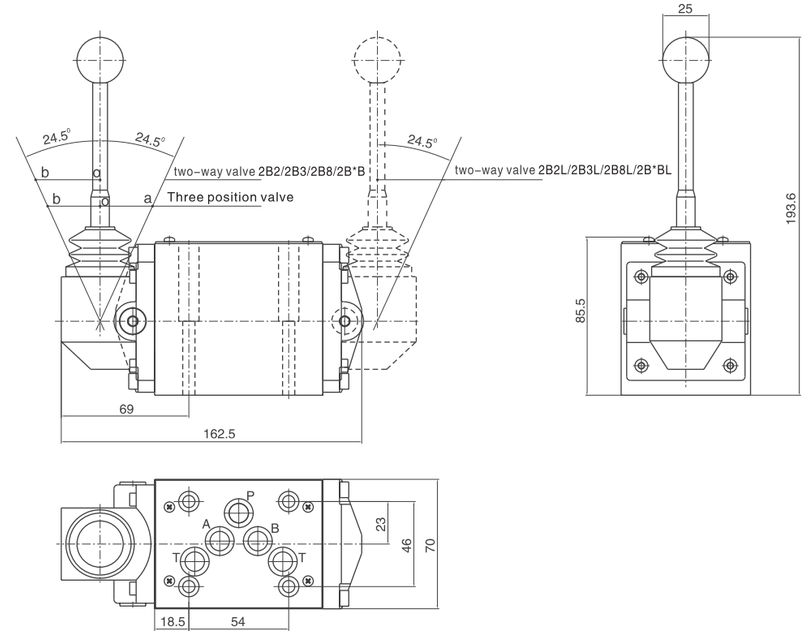


Mounting screw	Amount	Tighten torque
M6x50–10.9	4	15Nm

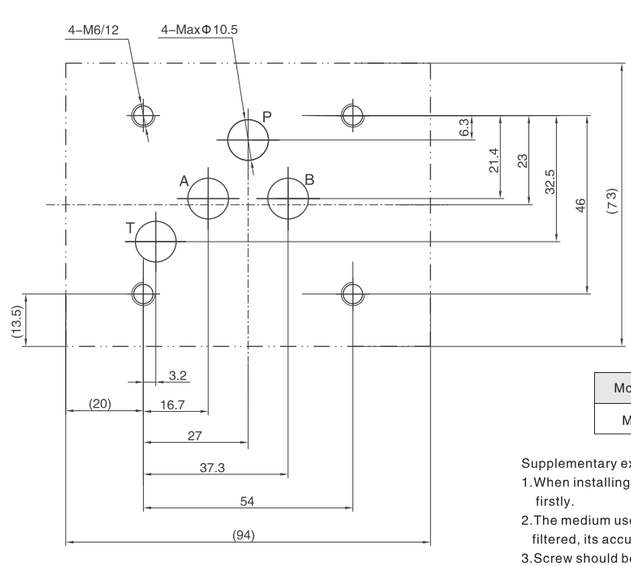
Supplementary explanation
1.When installing the product, considering horizontal position firstly.
2.The medium used in the hydraulic system must be filtered, its accuracy is at least 20 μ m.
3.Screw should be according to the parameters in catalogue.
4.The surface, connecting with the valve, should be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

Manual Operated Directional Control Valve

03 With detent type external dimensions



03 With detent type size of subplate oil port

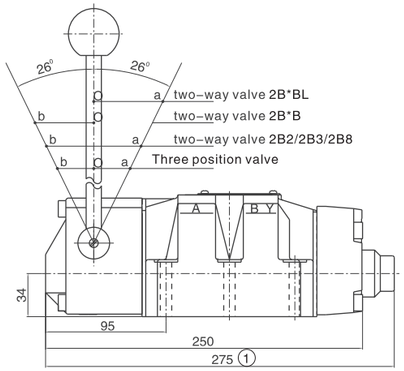


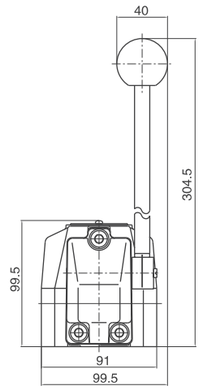
Mounting screw	Amount	Tighten torque
M6x50–10.9	4	15Nm

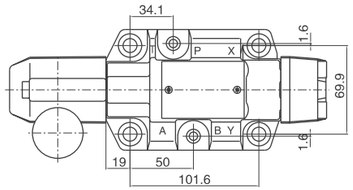
Supplementary explanation
1.When installing the product, considering horizontal position firstly.
2.The medium used in the hydraulic system must be filtered, its accuracy is at least 20 μ m.
3.Screw should be according to the parameters in catalogue.
4.The surface, connecting with the valve, should be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

Manual Operated Directional Control Valve

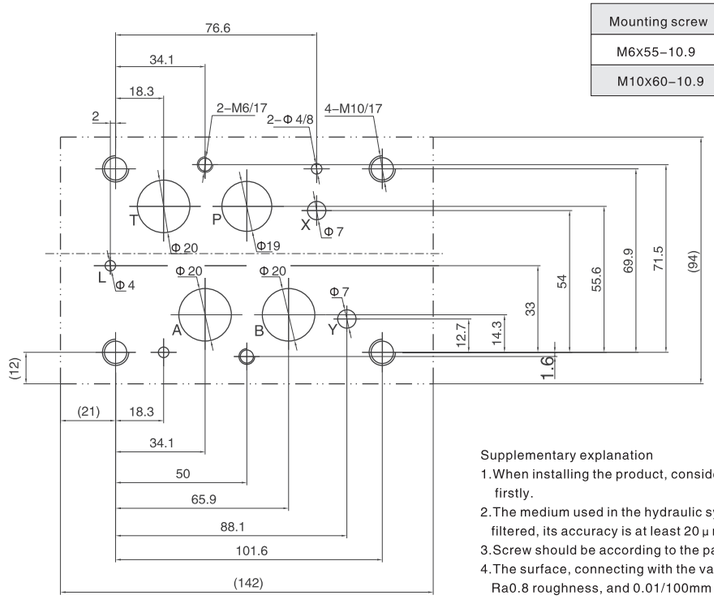
04 External dimensions







04 Size of subplate oil port



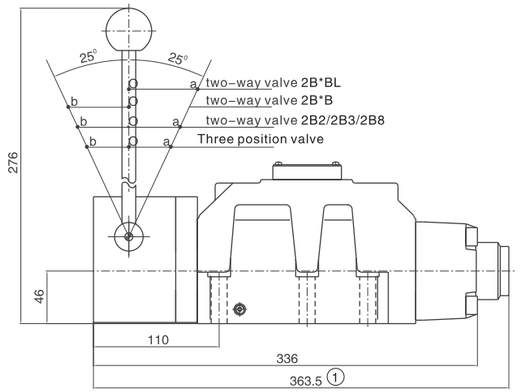
Mounting screw	Amount	Tighten torque
M6X55–10.9	2	15Nm
M10X60–10.9	4	75Nm

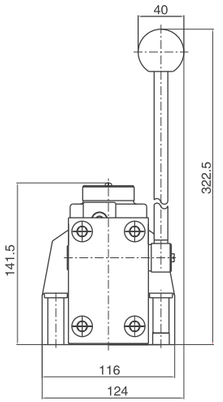
Supplementary explanation

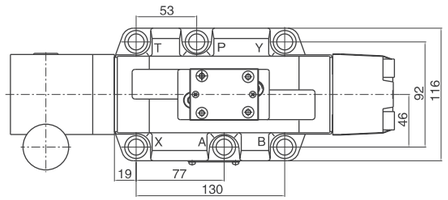
1. When installing the product, considering horizontal position firstly.
2. The medium used in the hydraulic system must be filtered, its accuracy is at least 20 μ m.
3. Screw should be according to the parameters in catalogue.
4. The surface, connecting with the valve, should be Ra0.8 roughness, and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

Manual Operated Directional Control Valve

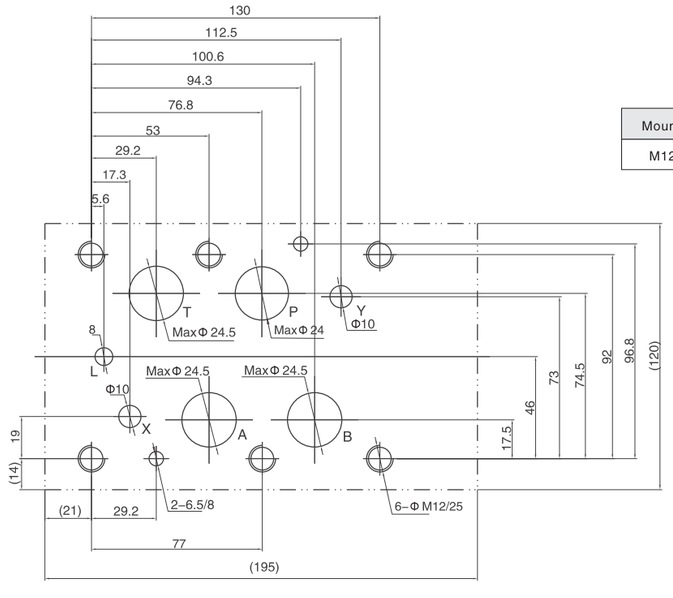
06 External dimensions







06 Size of subplate oil port



Mounting screw	Amount	Tighten torque
M12x60–10.9	6	130Nm

Supplementary explanation

1. When installing the product, considering horizontal position firstly.
2. The medium used in the hydraulic system must be filtered, its accuracy isat least 20 μ 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.

Hydraulic–operated Directional Control Valve

Parameter

Model		02
Working pressure (MPa)	Oil port P、A、B	31.5
	Oil port T	16
Max flow rate (L/min)		60
Working fluid		Mineral oil；Phosphate oil
Fluid temp (℃)		–20~70
Cleanliness		NAS1638 Class 9, recommended filtration precision Min $\beta_{10}\geqslant 75$

(Please consult us if your application is over above data)

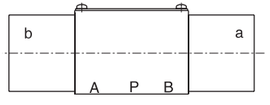
The spool inside the valve FH–02 is driven by hydraulic control oil, so that to change the fluid direction.

Ordering code

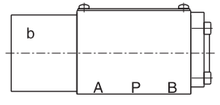
FH – * – * – * / * * * 50 *

- Hydraulic–operated directional control valve
- specification
  - 02 DN6
- Spool type
- Port size
  - G1/8 BSP1/8
- Return type
  - omit spring return
  - H hydraulic centred
  - OF detend
- Remark
- Series number
- omit NBR
  - V FPM
- omit without damping
  - 08 Φ0.8
  - 10 Φ1.0
  - 12 Φ1.2

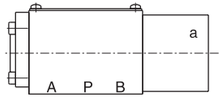
The name of control oil port



1.when control oil flows into end a, P→A B→T



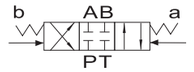
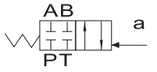
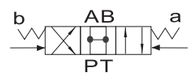
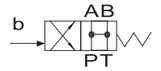
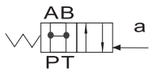
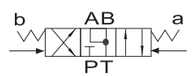
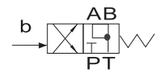
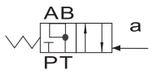
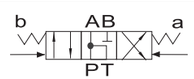
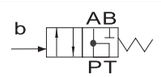
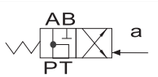
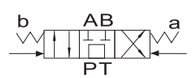
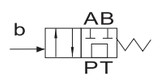
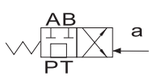
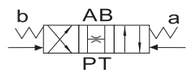
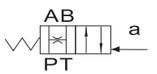
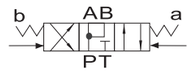
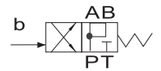
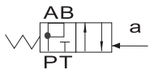
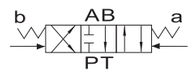
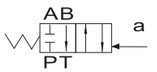
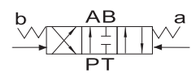
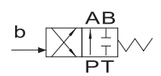
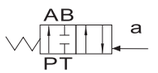
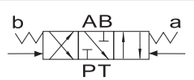
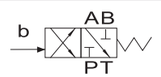
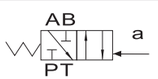
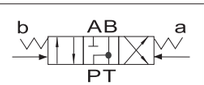
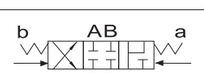
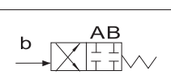
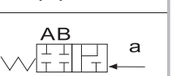
2.When control oil flows into end b



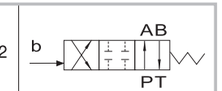
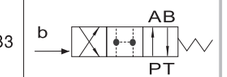
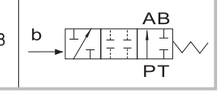
3. The fluid flow direction 3C5 3C6 is opposite against above mentioned.

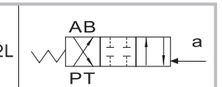
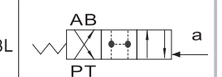
Spool type

Spring–return

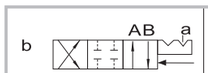
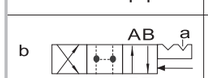
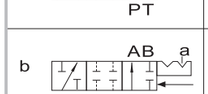
3C2		2B2B		2B2BL	
3C3		2B3B		2B3BL	
3C4		2B4B		2B4BL	
3C5		2B5B		2B5BL	
3C6		2B6B		2B6BL	
3C7		2B7B		2B7BL	
3C9		2B9B		2B9BL	
3C10		2B10B		2B10BL	
3C11		2B11B		2B11BL	
3C12		2B12B		2B12BL	
3C25		2B25B		2B25BL	
3C29		2B29B		2B29BL	

Note: *D* (without spring–return without detent) ,the valve shall be mounted in horizontal direction.

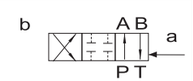
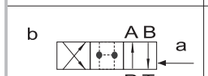
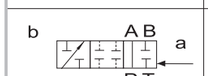
2B2	
2B3	
2B8	

2B2L	
2B3L	
2B8L	

With detent

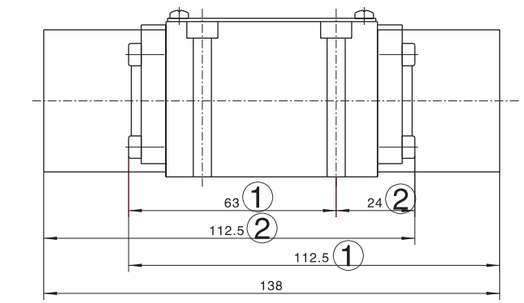
	2D2
	2D3
	2D8

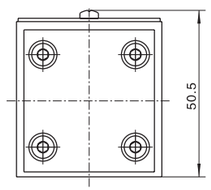
Without spring–return without detent

	2N2
	2N3
	2N8

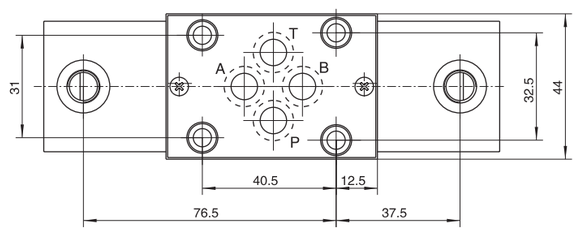
Hydraulic–operated Directional Control Valve

Dimension

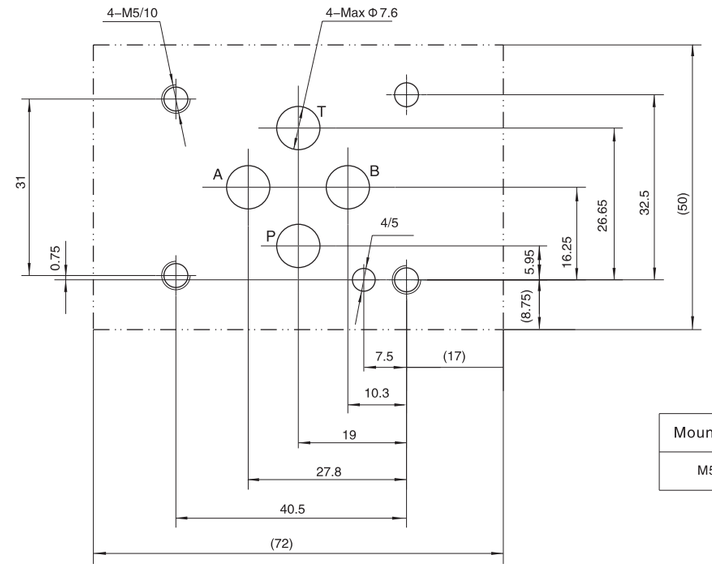




①②2–station valve



Subplate size



Mounting bolt	Qty	Tightening torque
M5X45	4	9Nm

Note:The surface, connecting with the valve, should be Ra0.8 roughness, and 0.01/100mm flatness.

Water–proof Electrical Operated Directional Control Valve

HOYEA

Technical specification

Specification		02
Working pressure (MPa)	Oil ports P, A, B	31.5
	Oil port T	10
Max. Flow (L/min)		80
Working fluid		Mineral oil; phosphate–ester
Fluid temp. (℃)		–20~70
Viscosity (mm^2/s)		2.8~380
Working voltage (V)		DC 12 24
Max.Switch frequency (T/h)		15000
Insulation grade		Ip65
Cleanliness	The maximum allowable cleanliness of the oil should be according to 9th degree of Standard NAS1638.It is suggested that the minimum filter rating should be β 10≥75.	

Water–proof electrical operated directional control valve uses solenoid to pull the spool and change the direction of the hydraulic oil.

Water–proof electrical operated directional control valve can directly control the start, stop and direction of a fluid flow. It also can be used as the pilot–operated valve, which could operate other valves.

Supplement: Water–proof electrical operated directional control valve is usually used at damp environment such as garbage trucks.

Model description

WPF W – * – * – * * / * * 51 *

Water–proof electrical operated directional control valve

Specification
02 DN6
03 DN10

Function code
Details as following symbol table

Working voltage
D12 DC12V
D24 DC24V

Omit without hand emergency
N9 with concealed hand emergency

Seal material
Omit NBR Seals
V FPM Seals

Omit without damping
08 Φ0.8 Damping
10 Φ1.0 Damping
12 Φ1.2 Damping

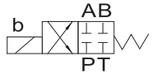
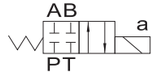
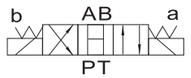
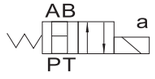
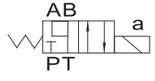
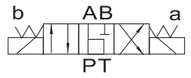
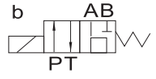
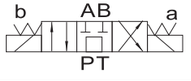
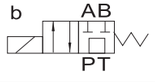
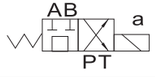
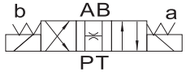
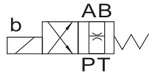
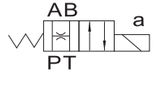
Serial number

Remarks

Water-proof Electrical Operated Directional Control Valve

Code symbol

Spring return

3C2		2B2B		2B2BL	
3C3		2B3B		2B3BL	
3C4		2B4B		2B4BL	
3C5		2B5B		2B5BL	
3C6		2B6B		2B6BL	
3C7		2B7B		2B7BL	
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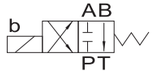
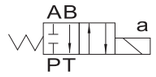
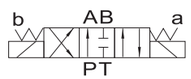
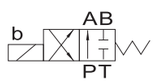
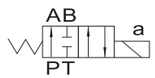
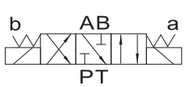
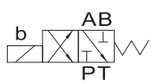
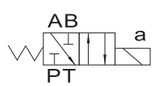
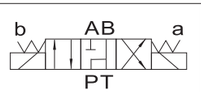
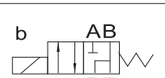
3C10		2B10B		2B10BL	
3C11		2B11B		2B11BL	
3C12		2B12B		2B12BL	
3C25		2B25B		2B25BL	
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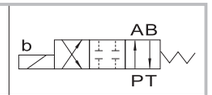
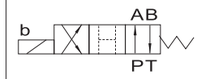
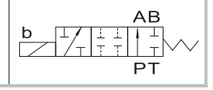
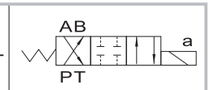
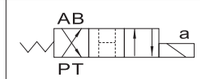
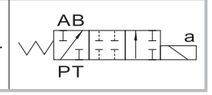
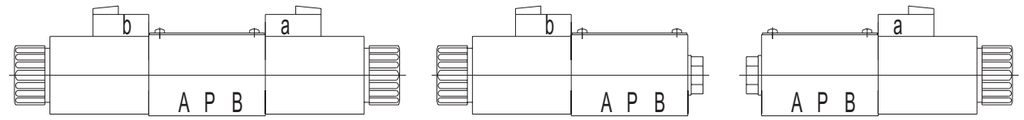
2B2	
2B3	
2B8	

2B2L	
2B3L	
2B8L	

Water-proof Electrical Operated Directional Control Valve

HOYEA

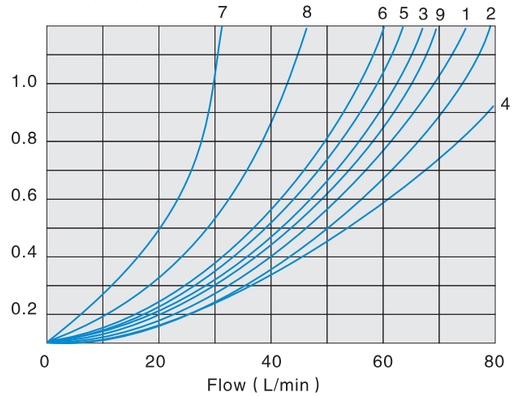
Name of solenoid



1. a When movement a, P→A B→T
2. b When movement b, P→B A→T
3. 3C5,3C6Oil flow in the opposite direction with the above-mentioned movement.

Specification Performance curve (Measured at υ=41mm²/s and t=50℃)

Pressure loss(MPa)



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
C25	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 median position P→ T

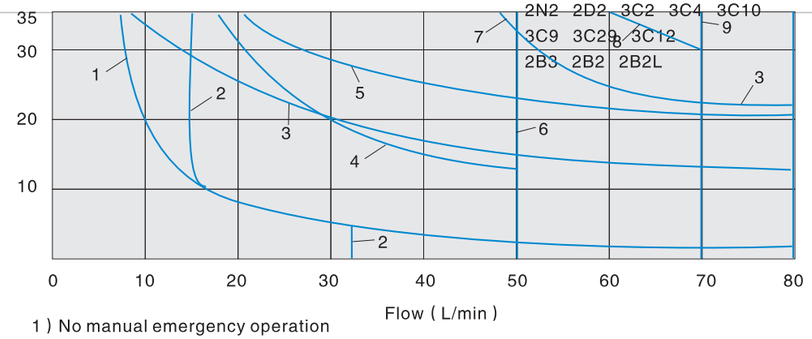
Water–proof Electrical Operated Directional Control Valve

Specification Working limits (The working limits for directional valve have determined by using solenoids attheir operating temperature, 10% under voltage and with no pre–loading of the tank.)

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.

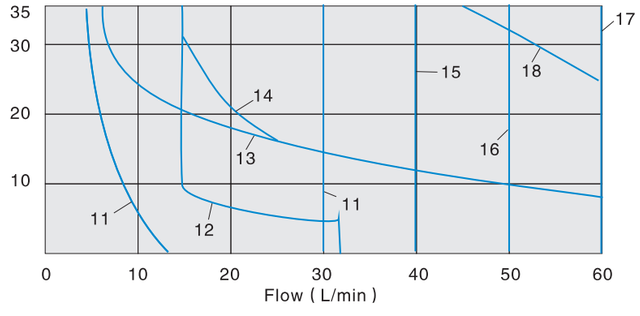
DC solenoid operation DC D24, D1 2, B220, B110		AC solenoid operation AC A110, A220, 50HZ	
Curve	Symbol	Curve	Symbol
1	2B8 2B8L1)	11	
2	3C7	12	
3	2B8 2B8L	13	
4	3C5 3C25	14	
5	3C4	15	
6	3C6 3C3	16	
7	2N8 2D8 3C10 3C12	17	
8	2B3 2B2 2B2L		2B8 2B8L1)
9	3C9		3C7
10	3C2 3C29 2N3	18	2B8 2B8L
	2D3 2N2 2D2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

Working pressure(MPa)



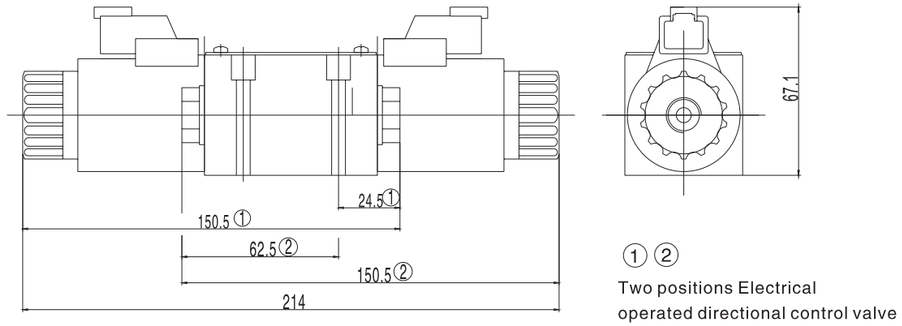
1) No manual emergency operation
2) Oil return from actuator to oil tank

Working pressure(MPa)

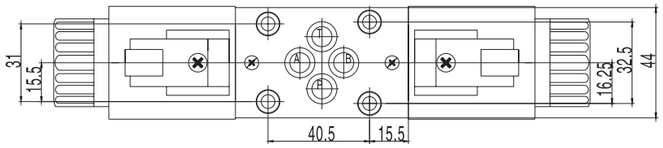


Water–proof Electrical Operated Directional Control Valve

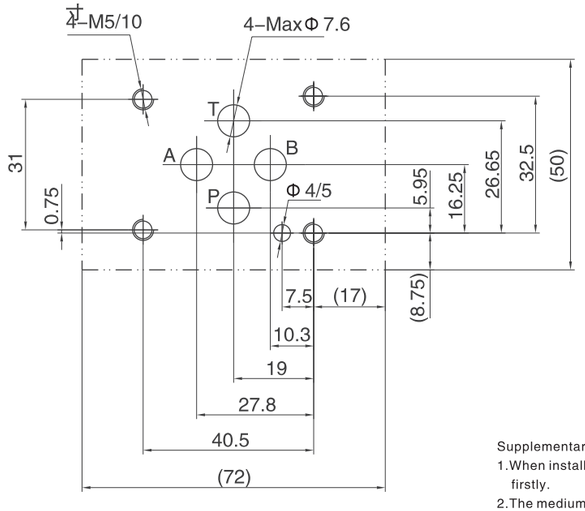
External dimensions



Two positions Electrical operated directional control valve



Size of subplate oil port

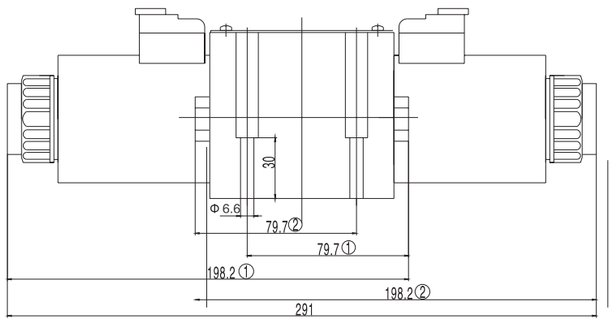


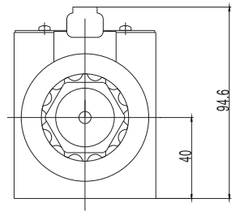
Mounting screw	Amount	Tighten torque
M5X45–10.9	4	9Nm

Supplementary explanation
1.When installing the product, considering horizontal position firstly.
2.The medium used in the hydraulic system must be filtered, its accuracy is at least 20μm.
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.

Water-proof Electrical Operated Directional Control Valve

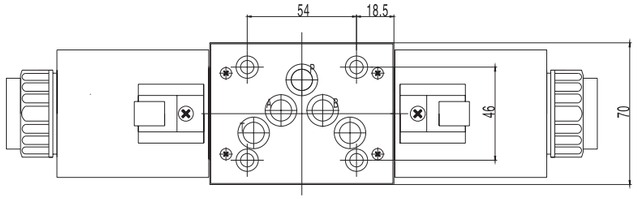
External dimensions



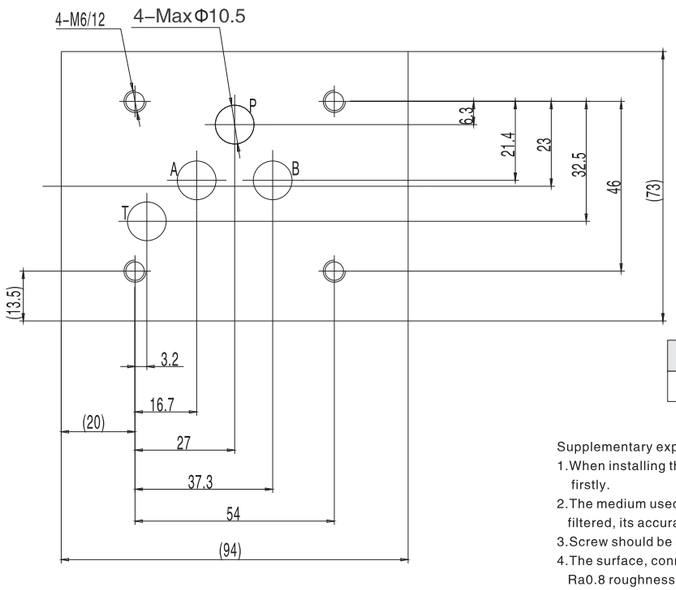


① ②

Two positions Electrical operated directional control valve



Size of subplate oil port



Mounting screw	Amount	Tighten torque
M6X40–10.9	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 μ 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.

Modular Check Valve

Technical specification

Specification	02	03
Max. working pressure (MPa)	31.5	
Max. Flow (L/min)	40	100
Working fluid	Mineral oil; phosphate-ester	
Fluid temp. (℃)	–20~70	
Viscosity (mm^2/s)	2.8~380	
O pening pressure (MPa)	a:0.05 b:0.25 c:0.4	
Cleanliness	The maximum allowable cleanliness of the oil should be according to 9th degree of Standard NAS1638.It is suggested that the minimum filter rating should be β 10≥75.	

Model description

DA – * * – * / * 70 *

Modular check valve

Specification
02 DN 6
03 DN10

P P Pipeline
T T Pipeline
A A Pipeline
B B Pipeline
W AB Pipeline

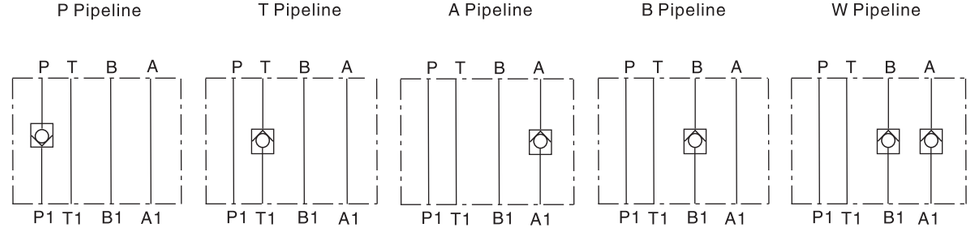
Remarks

Serial number

Seal material
Omit NBR Seals
V FPM Seals

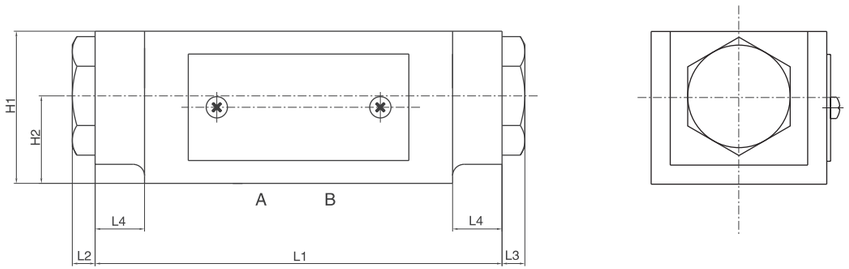
O pening pressure
a 0.05
b 0.25
c 0.4

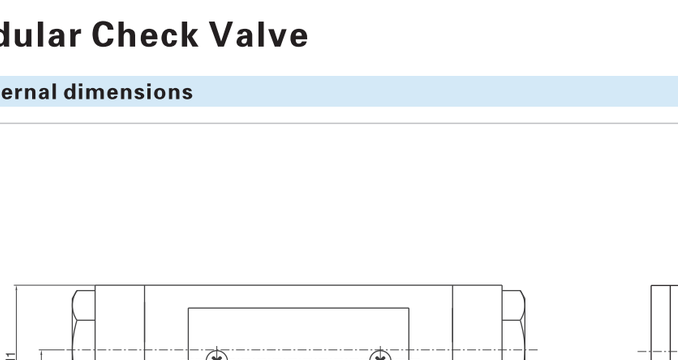
Code symbol



Modular Check Valve

02 External dimensions

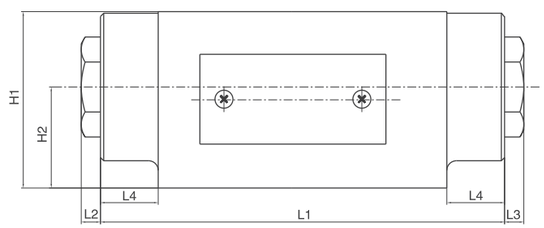


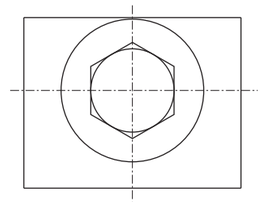


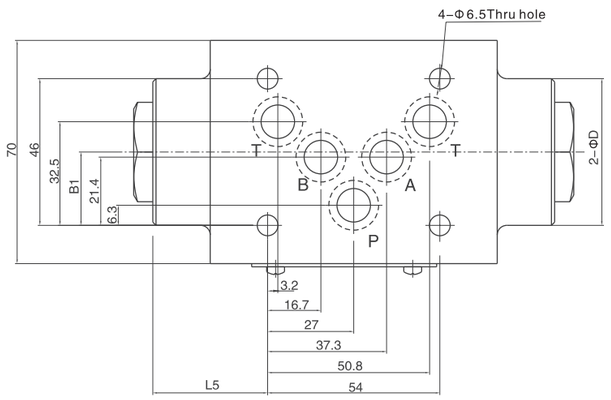
Specification	B1	B2	H1	H2	L1	L2	L3	L4	L5
DA-02-A	46	–	40	20	80	6	–	–	20
DA-02-B	46	–	40	20	80	–	6	–	20
DA-02-P	46	–	40	20	80	–	6	–	20
DA-02-T	46	–	40	20	80	–	6	–	20
DA-02-W	46	36	40	23	107	6	6	13	34.5

Modular Check Valve

03 External dimensions







Specification	D	B1	H1	H2	L1	L2	L3	L4	L5
DA-03-A	–	18.5	55	27.5	80	–	6	–	10
DA-03-B	–	18.5	55	27.5	80	6	–	–	16
DA-03-P	–	15.8	55	27.5	80	–	6	–	16
DA-03-T	–	23	55	27.5	100	–	6	–	19.5
DA-03-W	46	23	55	31.5	126	6	6	18	36
DA-03-WT	–	32.5	55	27.5	150	6	6	–	48

Modular Pilot–operated Check Valve

Technical specification

Specification	02	03	04	06
Max. working pressure (Mpa)	31.5			
Max. Flow (L/min)	60	100	200	360
Working fluid	Mineral oil;phosphate–ester			
Fluid temp. (℃)	–20~70			
Viscosity (mm^2/s)	2.8~500			
Opening pressure (MPa)	a0.05 b0.25 c0.4			
Cleanliness	The maximum allowable cleanliness of the oil should be according to 9th degree of Standard NAS1638.It is suggested that the minimum filter rating should be β 10≥75.			

Model description

DAY– ＊ ＊ – ＊ / ＊ 50 ＊

Modular Pilot–Operated Check Valve

Specification
02 DN6
03 DN10
04 DN16
06 DN22

A A Pipeline
B B Pipeline
W AB Pipeline

Remarks

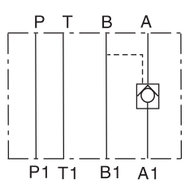
Serial number

Seal material
Omit NBR Seals
V FPM Seals

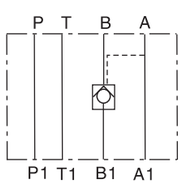
Opening pressure
a 0.05
b 0.25
c 0.4

Code symbol

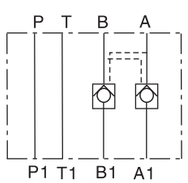
A Pipeline



B Pipeline



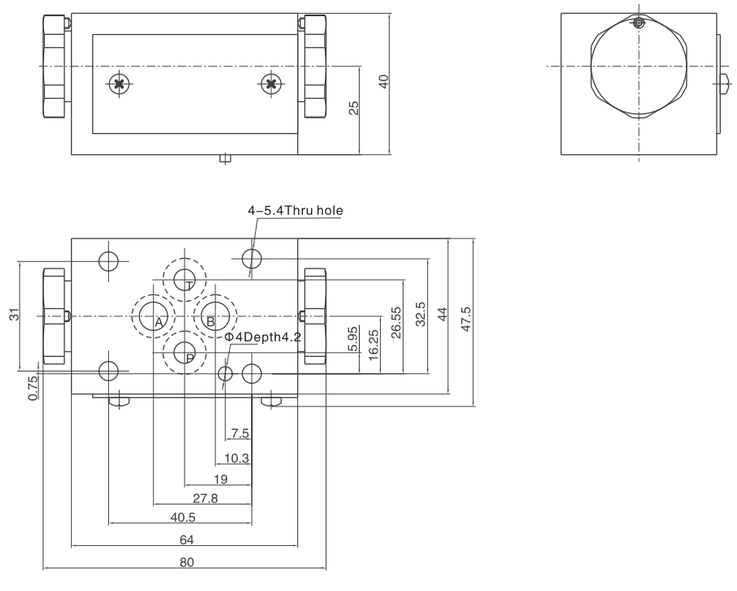
W Pipeline



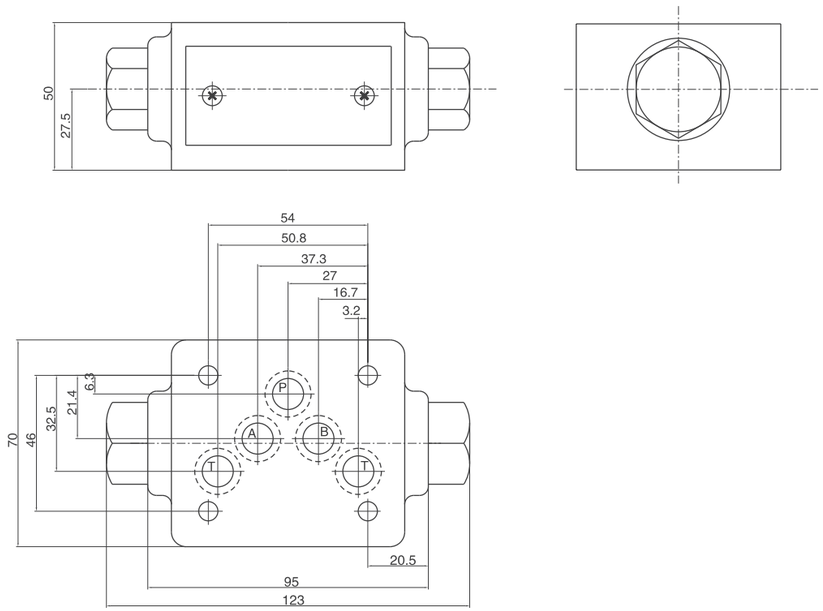
Modular Pilot–operated Check Valve

HOYEA

02 External dimensions

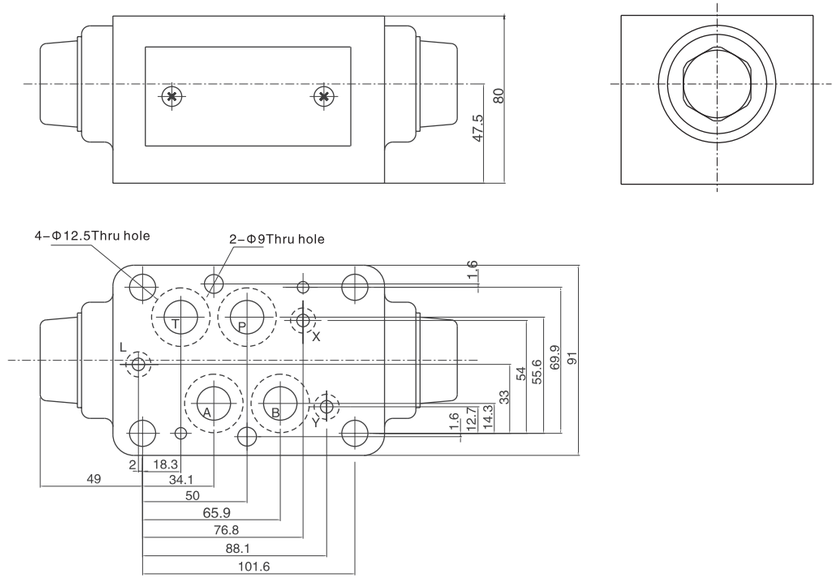


03 External dimensions

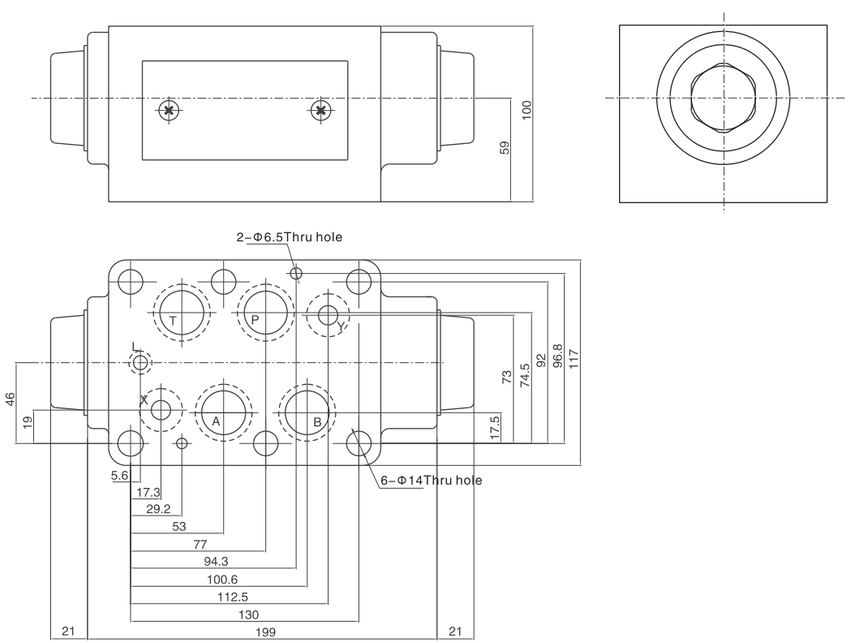


Modular Pilot–operated Check Valve

04 External dimensions



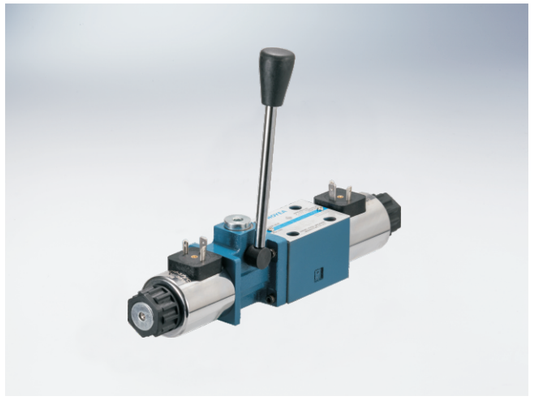
06 External dimensions



Solenoid Valve With Hand Control

HOYEA

Technical data



Model		02	03
Pressure range (MPa)	Oil port P, A,B	35	31.5
	Oil port T	10	
Max flow rate(L/min)		80	120
Installation		Any, recommended horizontal installation	
Working fluid		Mineral hydraulic oil; phosphate ester hydraulic oil	
Fluid temp (℃)		–20~70	
Fluid viscosity (mm^2/s)		2.8~100	
Working voltage (V)	DC	12	24
	AC	110/50Hz	220/50Hz
Protection grade		IP65	
Cleanliness		NAS1638 Class 9, recommended filtration precision Min $\beta_{10} \geqslant 75$	

FWS can work as standard solenoid directional valve,
also can control the spool movement with hand level on power–off condition.

Model description

FWS – * – * – * * * / * * 50 *

Solenoid valve with hand control

Specification
02 DN6
03 DN10

Spool type
refer to spool list below

Working pressure
D12 DC 12V
D24 DC 24V
A110 AC 110V
A220 AC 220V
B110 RAC 110Vrectified
B220 RAC 220Vrectified

Z5L Dinconnector with LED

Remark

Serial number

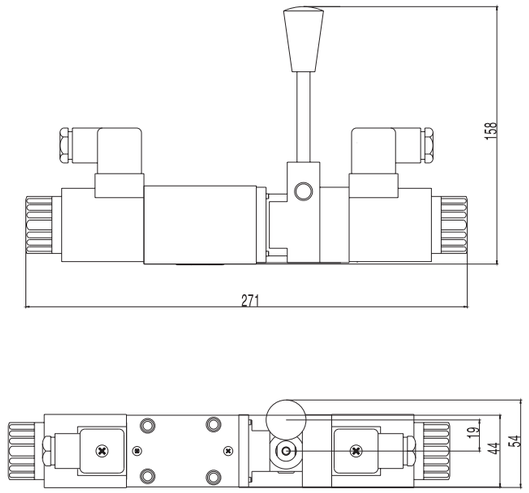
Seal material
omit NBR
V FPM

Omit without damping
08 Φ0.8 Damping
10 Φ1.0 Damping
12 Φ1.2 Damping

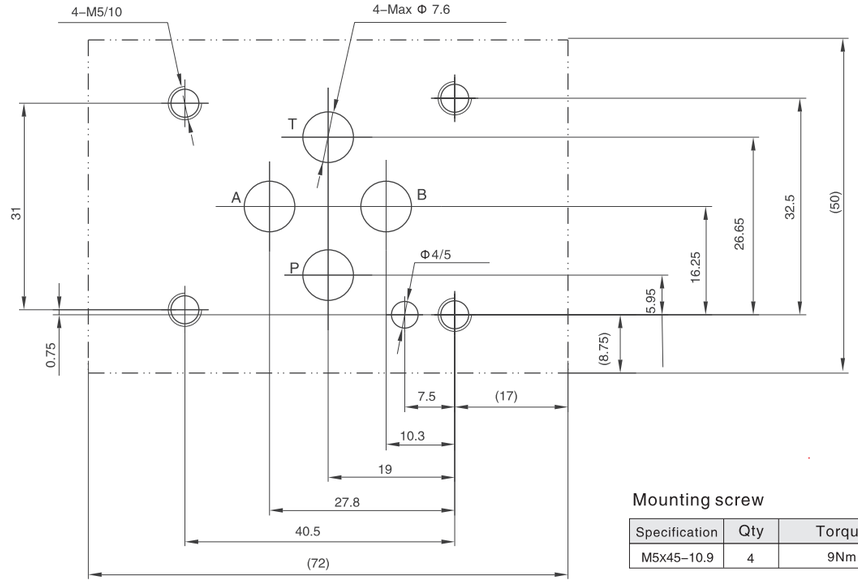
Omit with concealed
emergency push rod

Solenoid Valve With Hand Control

02 Dimension



02 Subplate mounting size

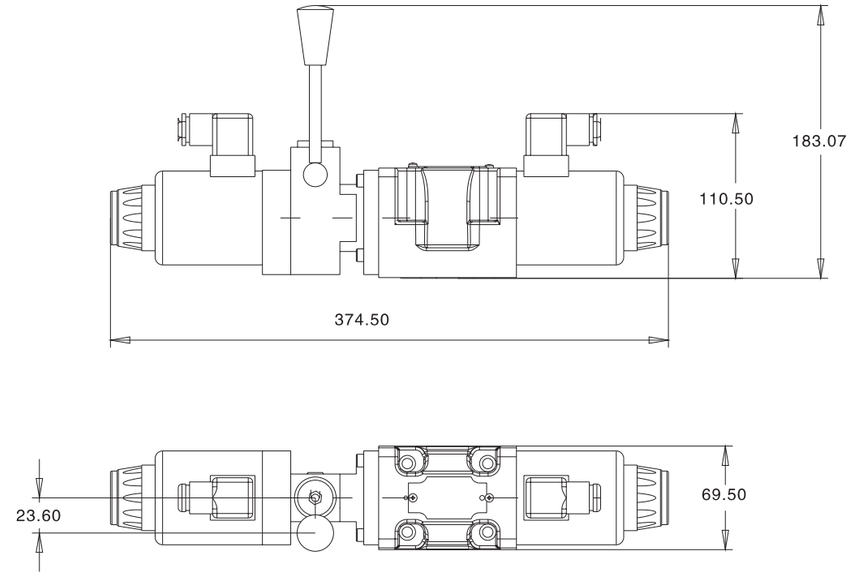


Mounting screw

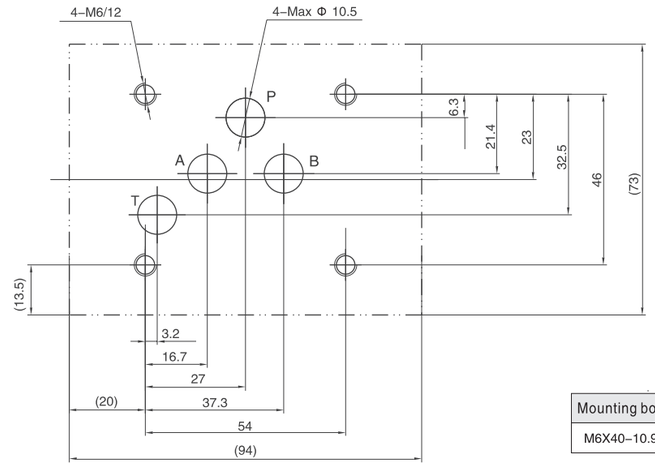
Specification	Qty	Torque
M5x45–10.9	4	9Nm

Solenoid Valve With Hand Control

03 Dimension



03 Subplate mounting size



Mounting bolt	Qty	Tightening torque
M6X40–10.9	4	15Nm

Notice:

1. Please refer to "user's guide" before mounting .
2. .When installing the product, considering horizontal position firstly.
3. The medium used in the hydraulic system must be filtered, its accuracy is at least 20 μ m.
4. Screw should be according to the parameters in catalogue.
5. The surface, connecting with the valve, should be Ra0.8 roughness, and 0.01/100mm flatness.

HOYEA

2–way Cartridge Valve Series

Brief

2–way cartridge valves are elements that have been designed for a compact block design. In most cases, the cover is simultaneously the connection from the control side of the power section to the pilot control valves.

By control with respective pilot control valves, the power section can be applied for pressure, directional and throttle functions or a combination of these functions.

Particularly efficient solutions are realized by adjustment of the size to various flows of the individual ways of an actuator.

The power section with connections A and B is installed into the control block in a receiving hole standardized according to ISO 7368 and closed with a cover.

The application of power sections of elements for multiple functions is very cost–effective a hydraulically controlled directional seat valve or a shuttle valve according to the required overall function.

2–way cartridge valves generally consist of control cover and installation kit.

The control cover contains the control bores and optionally a stroke limitation function,

Additionally, electrically operated directional spool or seat valves can be installed at a control cover.

The installation kit consists of a bushing , ring (only up to NG32), valve poppet, optionally with damping nose or without damping nose as well as closing spring .

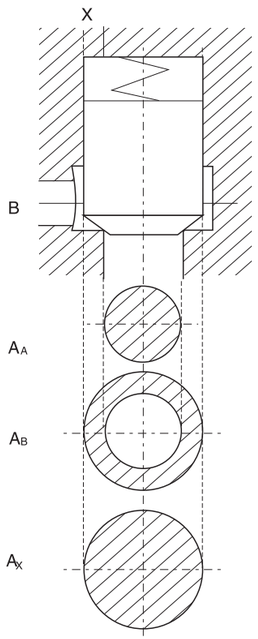
The function of 2–way cartridge valves is pressure–dependent. This way, three crucial pressurized areas A_A, A_B, Ax are realized for the function.

The area at the valve seat A_A is considered as 100%. Depending on the version, the annulus area A_B realized by grading is 7% or 50% of area A_A.

The area ratio A_A : A_B is respectively either 14.3 : 1 or 2 : 1. The area A_X is identical to the sum of areas A_A + A_B.

Due to the different area ratios A_A : A_B and the resulting different annulus areas (A_B),

The area A_X is one time 107% and another time 150% of the area A_A at the seat, which is observed as 100%



E.1.1

2–way Cartridge Valve (Direction Function)

HOYEA

Technical data

Sise	16	25	32	40	50	63
Max working pressure(Mpa)	31.5					
Max flow rate (L/min)	160	460	800	1200	1800	2700
Working fluid	Mineral hydraulic oil; phosphate ester hydraulic oil					
Fluid temp (℃)	–20~70					
Fluid viscosity(mm^2/s)	–2.8~500					
Cleanliness	NAS1638 Class 9, recommended filtration precision Min β ≥75.					

HYLC is a high–flow rate and high–pressure logic valve mainly to control the oil on/off, shall work together with the coverplate.

Model description

HYLC – * – * – * – * – * – * / * *

2–way cartridge valve (direction function)

Specification
16 DN16
25 DN25
32 DN32
40 DN40
50 DN50
63 DN63

50 series
A area ratio 2:1 (annular area=50%)
B area ratio 14.3:1 (annular area=7%)
90series
area ratio 3:1 (annular area=33%)

E Valve poppet without damping nose
D Valve poppet with damping nose

00 Cracking pressure 0 bar (without spring)
05 Cracking pressure approx. 0.05Mpa
10 Cracking pressure approx. 0.1Mpa
20 Cracking pressure approx. 0.2Mpa
40 Cracking pressure approx. 0.4Mpa

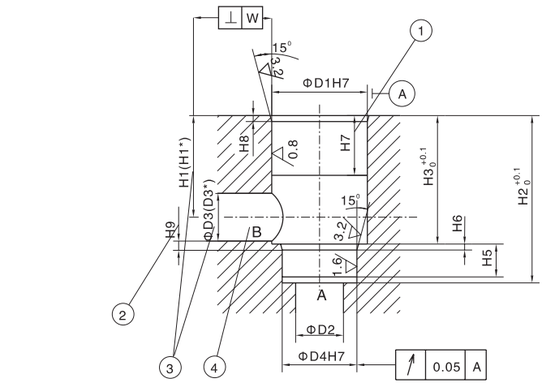
Seal material
omit NBR
V FPM

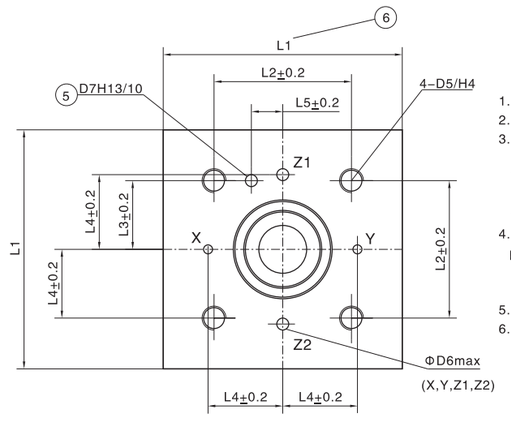
Serial number
50
51

Remark

2–way Cartridge Valve (Direction Function)

Dimension





1. depth of fit
2.Reference size
3. Due to the use of a bore with ϕD3*, port B protrudes over the upper limit of the area intended in ISO 7368 This is, however, possible due to the sealing concept and reduces the pressure loss during flow through the valve. Thus, we recommend a bore with ϕD3
4.Port B can be positioned around the central axis of port A.
However, it must be observed that the mounting bores and the control bores are not damaged
5. Bore for locating pin
6. 80 mm only with control cover for directional valve set–up NG16 (axis X–Y bores)

规格	ΦD1H7	ΦD2H7	ΦD3H7	(ΦD3*)	ΦD4	ΦD5	ΦD6H7	ΦD7	H1	(H1*)	H2	H3
16	32	16	16	25	25	M8	4	4	34	29.5	56	43
25	45	25	25	32	34	M12	6	6	44	40.5	72	58
32	60	32	32	40	45	M16	8	6	52	48	85	70
40	75	40	40	50	55	M20	10	6	64	59	105	87
50	90	50	50	63	68	M20	10	8	72	65.5	122	100
63	120	63	63	80	90	M30	12	8	95	86.5	155	130

规格	H4	H5	H6	H7	H8	H9	L1	L2	L3	L4	L5	W
16	20	11	2	20	2	0.5	65/80	46	23	25	10.5	0.05
25	25	12	2.5	30	2.5	1	85	58	29	33	16	0.05
32	35	13	2.5	30	2.5	1.5	102	70	35	41	17	0.1
40	45	15	3	30	3	2.5	125	85	42.5	50	23	0.1
50	45	17	3	35	4	2.5	140	100	50	58	30	0.1
63	65	20	4	40	4	3	180	125	62.5	75	38	0.2

Coverplate(Direction Function)

HOYEA

Technical data

Sise	16	25	32	40	50	63
Max working pressure (MPa)	31.5					
	Mineral hydraulic oil；phosphate ester hydraulic oil					
Working fluid (℃)	–20~70					
Fluid temp (mm^2/s)	–2.8~500					
Cleanliness	NAS1638 Class 9, recommended filtration precision Min β ≥75.					

HYLFA is controlthe logicvalve on/off. Different coverplates can realize diverse flow rates and direction of the hydraulic fluid.

Model description

HYLFA – ＊ – ＊ – ＊ / 50 ＊

Coverplate (direction function)

Specification
16 DN16
25 DN25
32 DN32
40 DN40
50 DN50
63 DN63

Model
Refer to code details

Seal material
omit NBR
V FPM

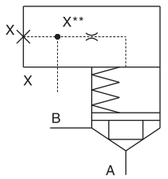
Serial number

Remark

Model description

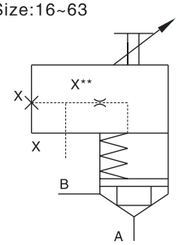
LFA...D.../F

Control cover with remote control port
Size:16~63



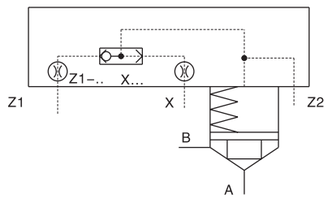
LFA...H2.../F

Control cover with stroke limitation and remote control port
Size:16~63



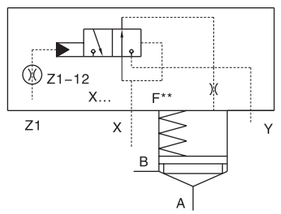
LFA...G.../...

Control cover with integrated shuttle valve
Size:16~63



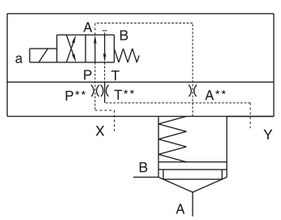
LFA...R.../...

Control cover with integrated pilot operated pilot control valve (directional seat valve)
Size:16~63



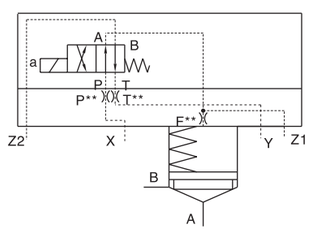
LFA...WEA.../...

Control cover for set-up of a directional valve
Size:16~63



LFA...WEA8-60/...

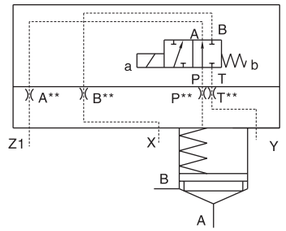
Control cover for set-up of a directional valve; additional control port
Size:16~63



Model description

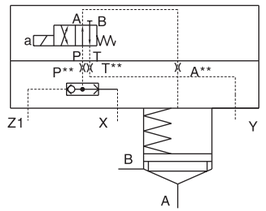
LFA...WEA9-60/...

Control cover for set-up of a directional spool valve as check valve circuit
Size:16~63



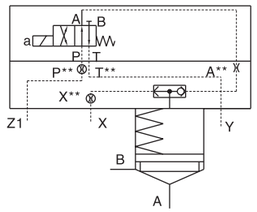
LFA...GWA.../...

Control cover for set-up of a directional spool or seat valve, with integrated shuttle valve
Size:16~63



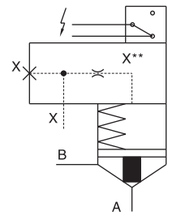
LFA...KWA.../...

Cntrol cover with shuttle valve and for set-up of a directional valve (check valve circuit)
Size:16~63



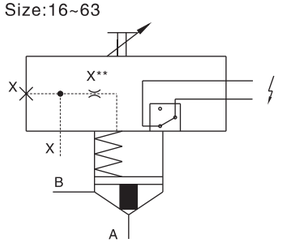
LFA...E60/...DQ.G24F

Control cover with electric close position monitoring, incl. installation kit
Size:16~63



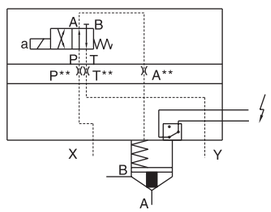
LFA...EH2-60/...DQ.G24F

Control cover with electric close position and stroke limitation monitoring, incl. installation kit
Size:16~63



LFA...EWA60/...DQOG24

Control cover with electric monitoring of the close position, for mounting a directional spool valve
Size:16~63



2–way Cartridge Valve (Pressure Function)

Technical data

Sise	16	25	32	40	50	63
Max working pressure (MPa)	31.5					
Max flow rate (L/min)	250	400	600	1000	2000	2500
Working fluid	Mineral hydraulic oil; phosphate ester hydraulic oil					
Fluid temp (℃)	–20~70					
Fluid viscosity (mm^2/s)	–2.8~500					
Cleanliness	NAS1638 Class 9, recommended filtration precision Min β ⩾75.					

HYLCis a high–flow high–pressure logic valve, mainly to control the hydraulic oil on/off shall work together the coverplate

Model description

HYLC – ＊ – DB – ＊– ＊– ＊ / 50 ＊

pressure relief cartridge valve

Specification
16 DN16
25 DN25
32 DN32
40 DN40
50 DN50
63 DN63

00 Opening pressure approx. 0 Mpa (without spring)
20 Opening pressure approx. 0.2 Mpa
40 Opening pressure approx. 0.4 Mpa

E Poppet valve
D Spool poppet valv
A Poppet valve with orifice
B Spool poppet valve with orifice

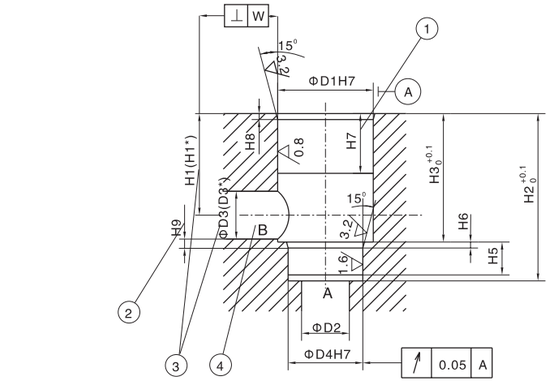
Serial number

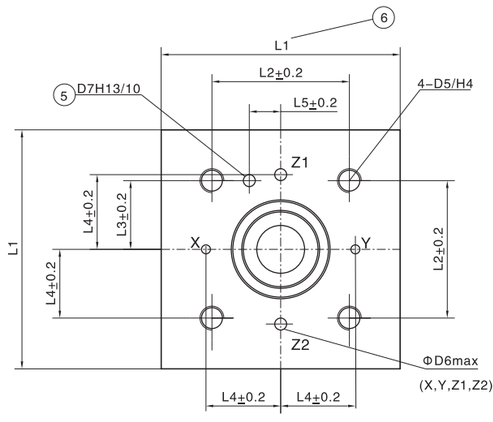
Seal material
omit NBR
V FPM

Remark

HOYEA

Dimension





1. depth of fit
2. Reference size
3. Due to the use of a bore with ϕD3*, port B protrudes over the upper limit of the area in tended in ISO 7368.This is, however, possible due to the sealing concept and reduces the pressure loss during flow through the valve. Thus, we recommend a bore with ϕD3.
4. Port B can be positioned around the central axis of port A.
   However, it must be observed that the mounting bores and the control bores are not damaged.
5. Bore for locating pin
6. 80 mm only with control cover for directional valve set–up NG16 (axis X–Y bores)

Specification	ΦD1H7	ΦD2H7	ΦD3H7	(ΦD3*)	ΦD4	ΦD5	ΦD6H7	ΦD7	H1	(H1*)	H2	H3
16	32	16	16	25	25	M8	4	4	34	29.5	56	43
25	45	25	25	32	34	M12	6	6	44	40.5	72	58
32	60	32	32	40	45	M16	8	6	52	48	85	70
40	75	40	40	50	55	M20	10	6	64	59	105	87
50	90	50	50	63	68	M20	10	8	72	65.5	122	100
63	120	63	63	80	90	M30	12	8	95	86.5	155	130

规格	H4	H5	H6	H7	H8	H9	L1	L2	L3	L4	L5	W
16	20	11	2	20	2	0.5	65/80	46	23	25	10.5	0.0
25	25	12	2.5	30	2.5	1	85	58	29	33	16	0.05
32	35	13	2.5	30	2.5	1.5	102	70	35	41	17	0.1
40	45	15	3	30	3	2.5	125	85	42.5	50	23	0.1
50	45	17	3	35	4	2.5	140	100	50	58	30	0.1
63	65	20	4	40	4	3	180	125	62.5	75	38	0.2

Coverplate(Pressure Function)

Technical data

Sise	16	25	32	40	50	63
Max working pressure (MPa)	31.5					
Working fluid	Mineral hydraulic oil；phosphate ester hydraulic oil					
Fluid temp (℃)	–20~70					
Fluid viscosity (mm^2/s)	–2.8~500					
Cleanliness	NAS1638 Class 9, recommended filtration precision Min β ⩾75.					

HYLFA is to control the logic valve on/off, different coverplate can realize different fluid pressure.

Ordering code

HYLFA – ＊ – ＊ – ＊ / ＊ ＊

Coverplate(pressure function)

Specification
16 DN16
25 DN25
32 DN32
40 DN40
50 DN50
63 DN63

Model
Refer to code details

Serial number
50
90

Remark

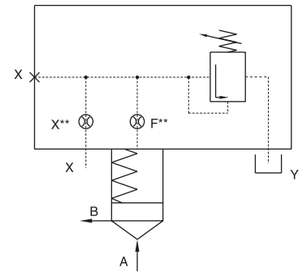
Seal material
omit NBR
V FPM

E.5.1

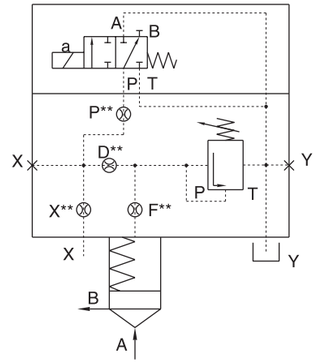
Coverplate(Pressure Function)

Ordering code

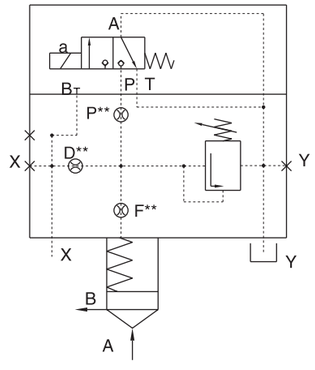
LFA...DB.–/..16...63
Control cover with manual pressure adjustment



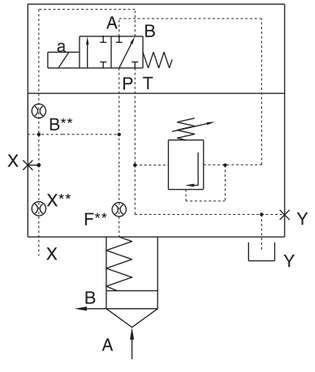
LFA...DBW.–/..16...63
Control cover with manual pressure adjustment, for electrical unloading
For mounting a directional spool or directional poppet valve



LFA...DBS.–/..16...63
Control cover with manual pressure adjustment, for electrical unloading
For mounting a directional poppet valve



LFA...DBWD.–/..16...63
Control cover with manual pressure adjustment, for isolation functions

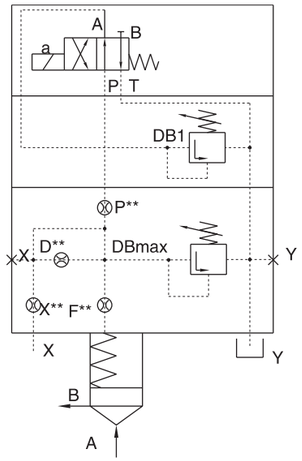


Coverplate (Pressure Function)

Function code

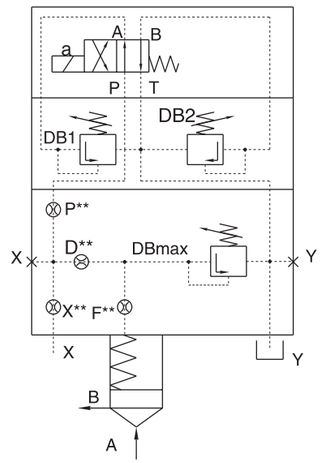
LFA...DBU 2A.–/..16...63

Control cover with 2 manual pressure adjusters, electrically selectable



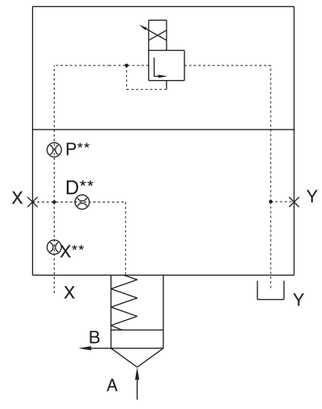
LFA...DBU 3D.–/..16...63

Control cover with 3 manual manual pressure adjusters, electrically selectable



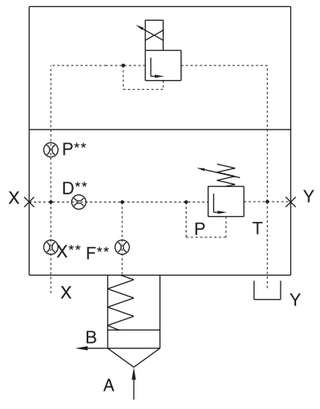
LFA...DBU(TR).–/..16...63

Control cover for electrical–proportional pressure adjustment



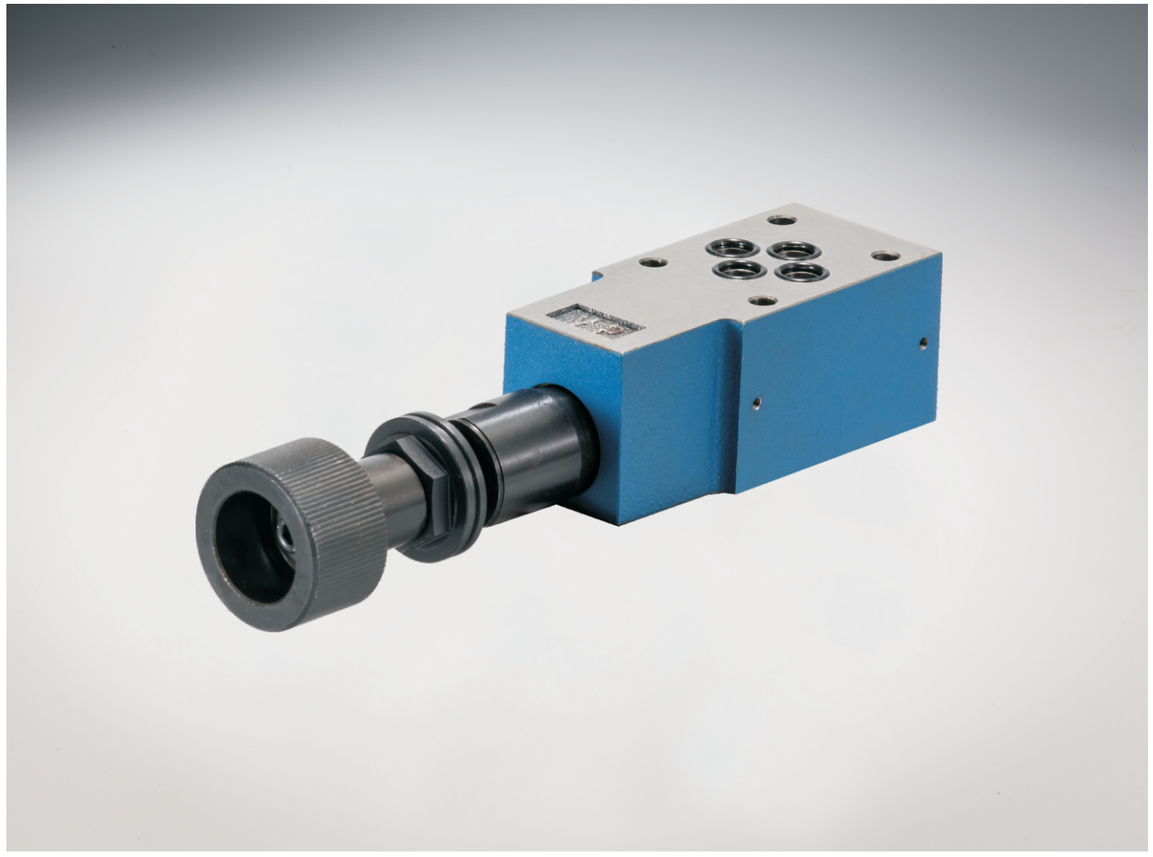
LFA...DBEM(TR).–/..16...63

Control cover for electrical–proportional pressure adjustment, with maximum pressure limitation



HOYEA

Other Valves Series



DN04 Modular Pilot Check Valve

Technical specification

DN		4
Max. working pressure	(MPa)	31.5
Max. Flow	(L/min)	30
Working fluid		Mineral oil;phosphate-ester
Fluid temp.	(℃)	-20~70
Viscosity	(mm^2/s)	2.8~500
Opening pressure	(MPa)	a 0.2 b 0.4
Cleanliness	The maximum allowable cleanliness of the oil should be according to 9th degree of Standard NAS1638.It is suggested that the minimum filter rating should be $\beta_{10} \geqslant 75$.	

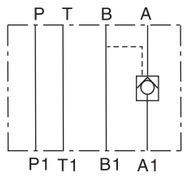
Model description

HYAM2CP - * - * / * 10 *

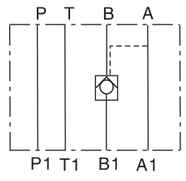
- Dn04 Modular pilot check valve
- A A Pipeline; B B Pipeline; W AB Pipeline
- Opening pressure: a 0.2MPa; b 0.4MPa
- Remarks
- Serial number
- Seal material: Omit NBR Seals; V FPM Seals

Code symbol

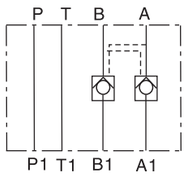
A Pipeline



B Pipeline

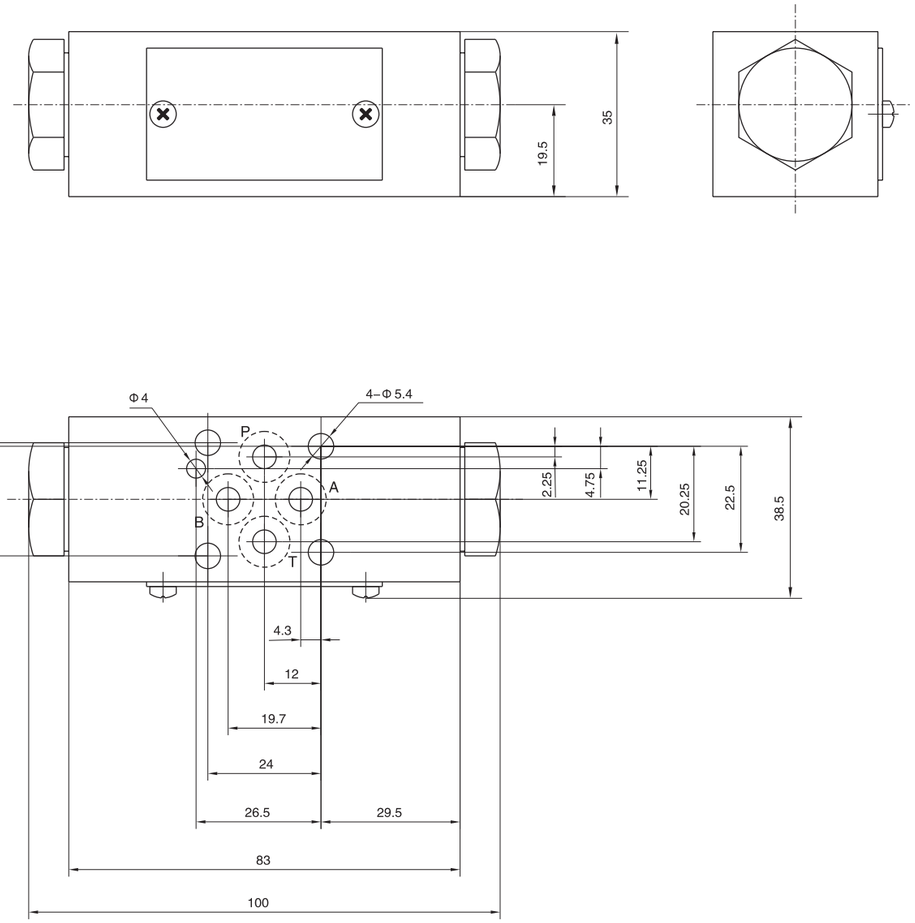


W Pipeline



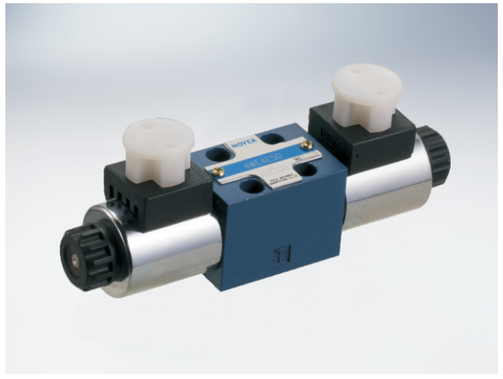
DN04 Modular Pilot Check Valve

External dimensions



DN04 Solenoid Valve

Technical specification



Specification		04
Max. working pressure (MPa)	Port P、A、B	25
	Port T	10
Max. Flow	(L/min)	25
Working fluid		Mineral oil;phosphate-ester
Fluid temp.	(℃)	-20~70
Viscosity	(mm^2/s)	2.8~100
Working voltage	(V)	DC 12 DC 24
Insulation grade		IP55
Cleanliness		The maximum allowable cleanliness of the oil should be according to 9th degree of Standard NAS1638.It is suggested that the minimum filter rating should be $\beta_{10} \geqslant 75$.

Solenoid valve is controlled by the solenoid to move the spool, so as to control the oil flow direction.
It could be used in hydraulic system directly, control the oil on/off; also could be used as pilot valve,
to control other valves.

Model description

4 HYWE4 - * - * * * / * * 50 *

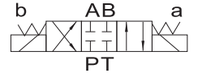
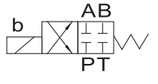
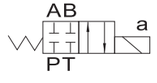
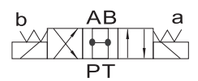
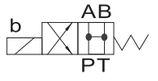
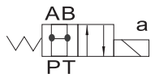
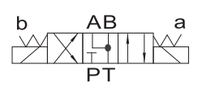
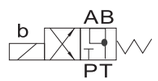
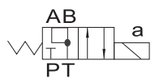
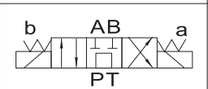
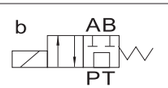
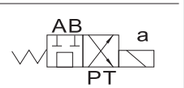
- 4 4Port
- DN04 Solenoid valve
- Spool type
  Details refer to symbol list
- Vdtage
  D12 DC12V
  D24 DC24V
- Z5L Square connector with light
  Z6 Wire box type
- Omit without hand emergency
  N9 with concealed hand emergency
- Omit without damping
  08 Φ0.8 Damping
  10 Φ1.0 Damping
  12 Φ1.2 Damping
- Seal material
  Omit NBR Seals
  V FPM Seals
- Serial number
- Remarks

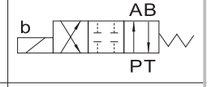
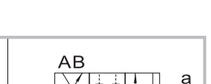
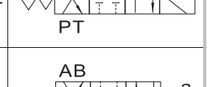
DN04 Solenoid Valve

HOYEA

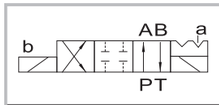
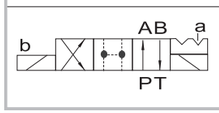
Code symbol

Spring return

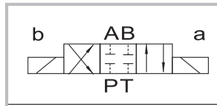
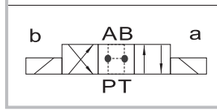
3C2		2B2B		2B2BL	
3C3		2B3B		2B3BL	
3C4		2B4B		2B4BL	
3C6		2B6B		2B6BL	

2B2	
2B3	
2B2L	
2B3L	

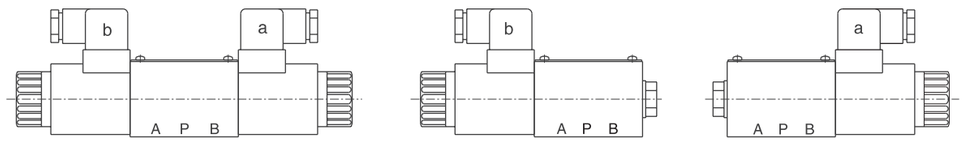
With detent

2D2	
2D3	

No spring return and no detent mechanical positioning

2N2	
2N3	

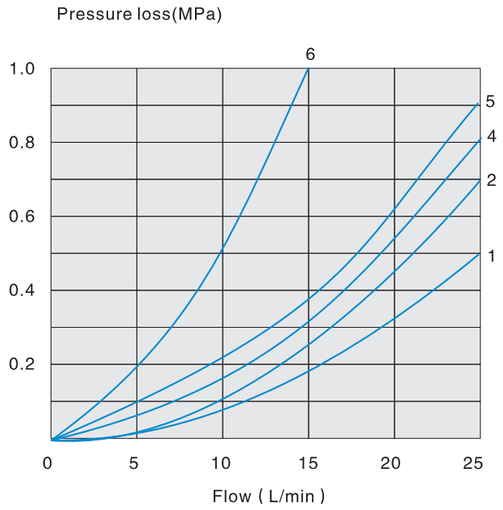
Name of solenoid



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.

DN04 Solenoid Valve

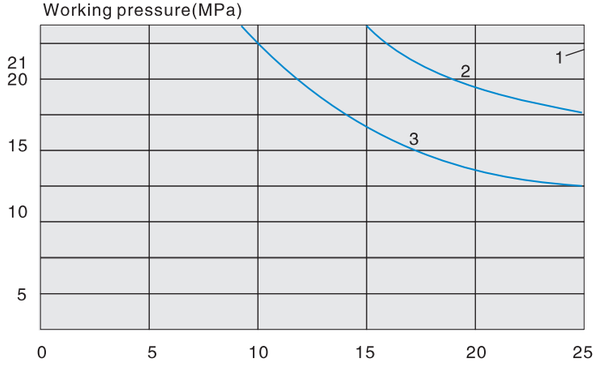
Specification Performance curve (Measured at υ=41mm²/s and t=50℃)



Function code	Direction				
	P→A	P→B	A→T	B→T	P→T
2B2 2B2L	5	5	4	4	–
3C2	4	4	3	3	–
3C6	3	3	4	4	6
3C3	1	1	1	1	–
3C4	5	5	3	3	–

Specification Working limits

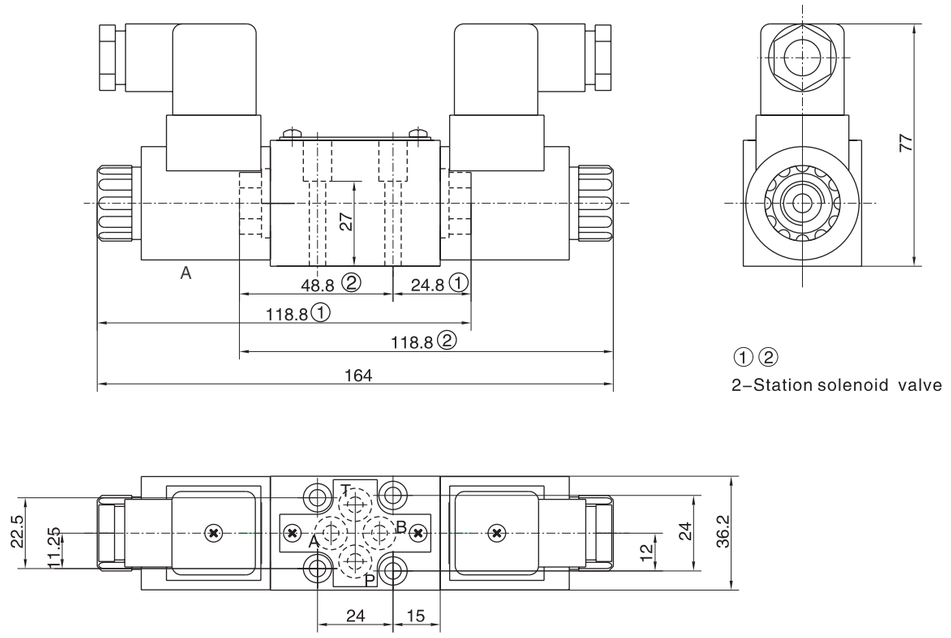
With regard to the four–way valve, the normal flow data as shown is get from the regular use of two directions of the flow (e.g.P to A,and simultaneous return flow from B to T). See tables. If only one flow direction is needed, for example: When a four port valve which is closed up port A or port B, used as a three–way valve, the Maximum flow may be very small in the serious condition.
(The working limits for directional valves have determined by using solenoids at their operating temperature, 10% under voltage and with no pre–loading of the tank)



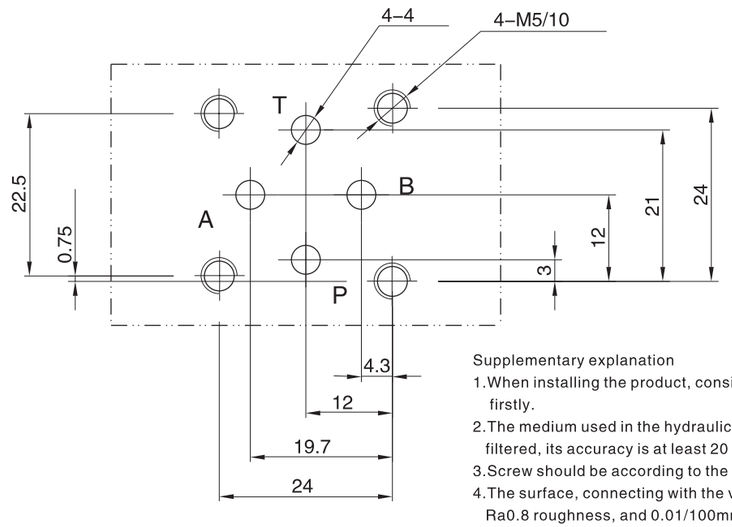
Cunoe	Spool
1	2B2 2D2 2N2 2B2L
2	3C2 3C4
3	3C6

DN04 Solenoid Valve

External dimensions



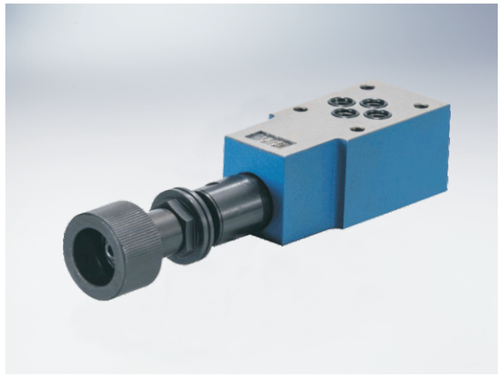
Size of subplate



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 Ra0.8 roughness, and 0.01/100mm flatness.

Modular Relief Valve

Technical specification



Specification	02	03
Max working pressure (MPa)	31.5	
Max Flow (L/min)	60	100
Working fluid	Mineral hydraulic oil；phosphate ester hydraulic oil	
Fluid temp.(℃)	–20~70	
Viscosity (Mm^2/s)	10~800	
Working voltage (MPa)	5，10，20，31.5	
Cleanliness	NAS1638 Class 9, recommended filtration precision Min β ≥75.	

Ordering code

DY – ＊ ＊ – ＊ – ＊ / ＊ 50 ＊

Modular relief valve

Size
02 DN 6
03 DN10

Relief method
P P→T
A A→T
B B→T
C A→T,B→T
D A→B,B→A

Remark

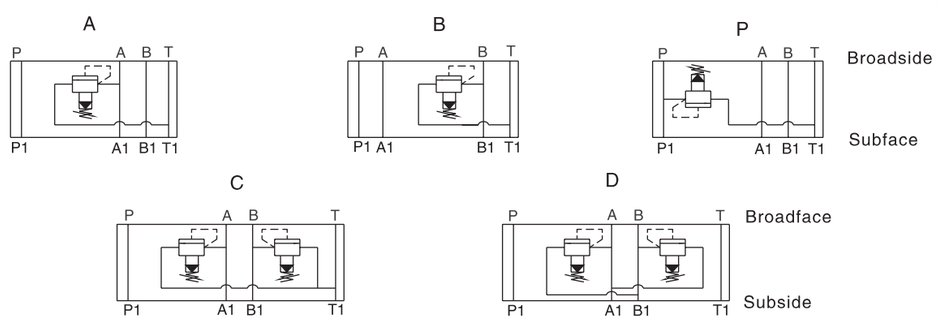
Serial number

Seal material
omit NBR
V FPM

1 handle
2 with hexagon and protective cap

Pressure range
5 upto 5MPa
10 upto10MPa
20 upto20MPa
31.5 upto31.5MPa

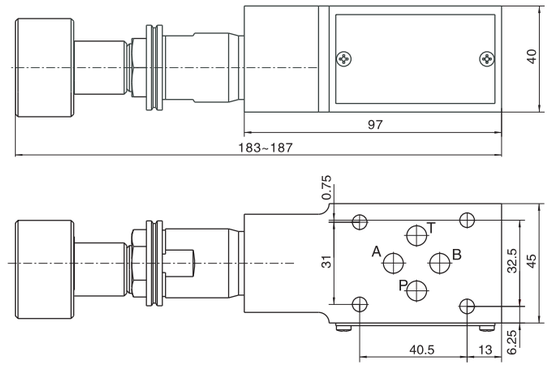
Hydraulic symbol



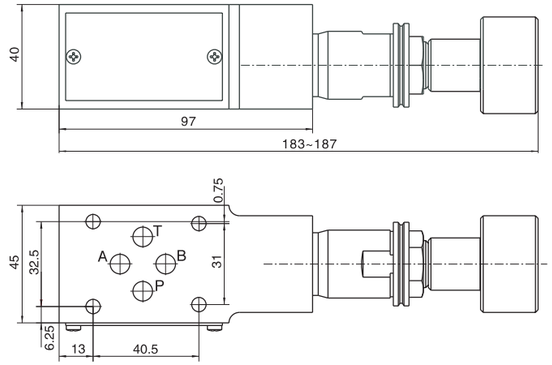
HOYEA

External dimensions

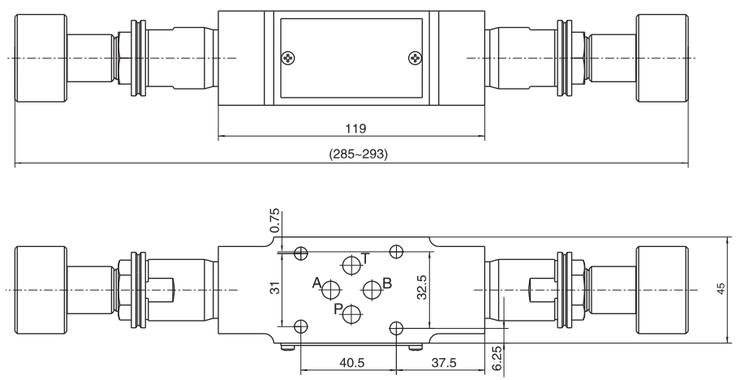
DY–02A



DY–02B,P



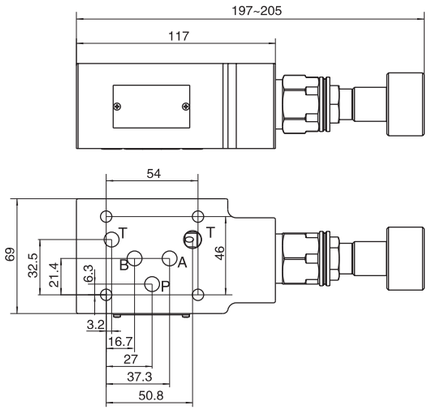
DY–02C，D



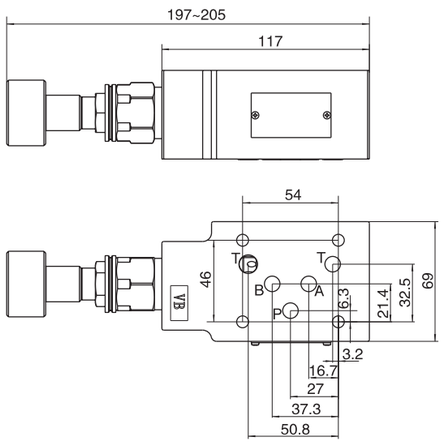
Modular Relief Valve

External dimensions

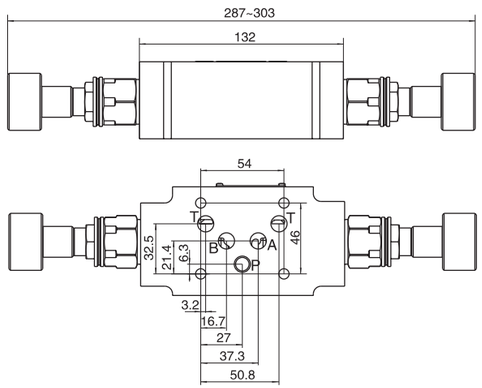
DY–03A,P



DY–03B



DY–03C， D

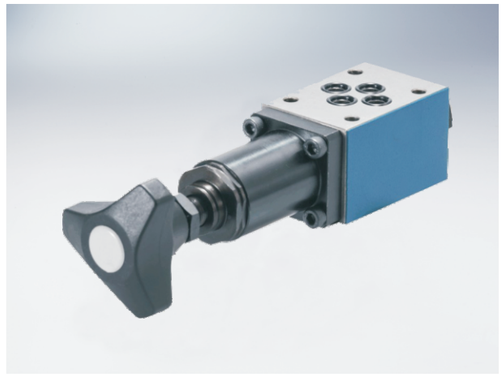


Note:.The surface, connecting with the valve, should be Ra0.8 roughness, and 0.01/100mm flatness.

Modular Reducing Valve

HOYEA

Technical specification



Specification		6	10
Max working pressure (MPa)	working pressure	31.5	
	Secondary pressure	To21	
	Port T	To15	
Max Flow (L/min)		50	
Mounting location		Any	
Working fluid		Mineral hydraulic oil; phosphate ester hydraulic oil	
Fluid temp (℃)		–20~70	
Viscosity (Mm^2/s)		10~800	
Cleanliness		NAS1638 Class 9, recommended filtration precision Min β ≥75.	

Ordering code

DYJ – * * – * * – * / * 50 *

Modular reducing valve

Specification
02 DN6
03 DN10

P P pipeline reducing
A A pipeline reducing
B B pipeline reducing (only for DN10)

2.5 upto 2.5MPa
7.5 upto 7.5MPa
15 upto 15MPa
21 upto 21MPa

Remark

Serial number

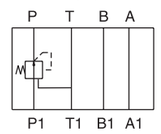
Seal material
omit NBR
V FPM

1 plastic handle
2 steel handle

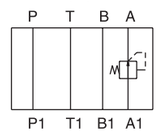
Omit none
D check valve

Hydraulic symbol

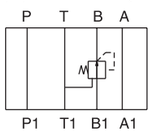
P pipeline



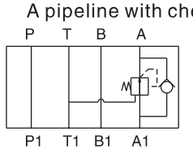
A pipeline



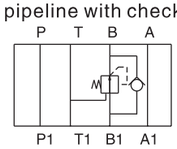
B pipeline (only for Dn10)



A pipeline with check valve

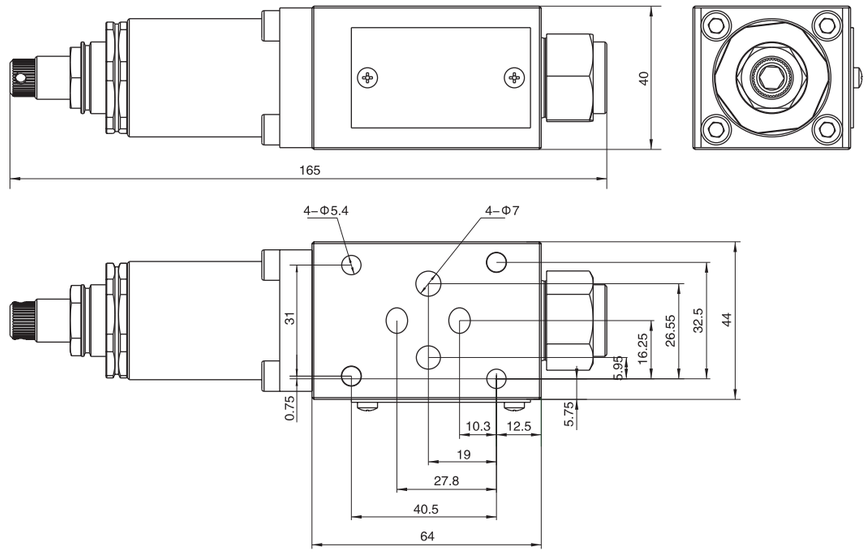


B pipeline with check valve (only for Dn10)

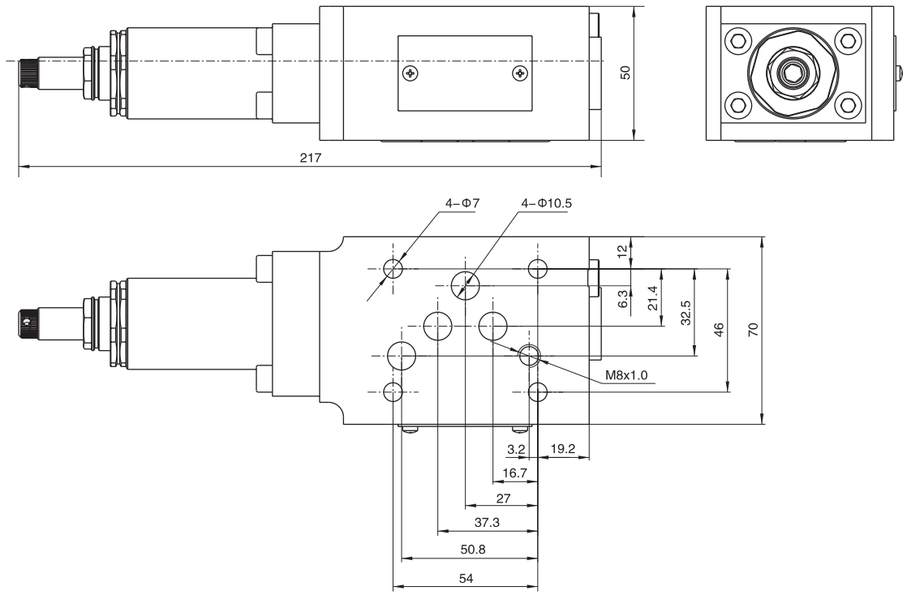


Dimension

DYJ-02P、A



DYJ-03P、A



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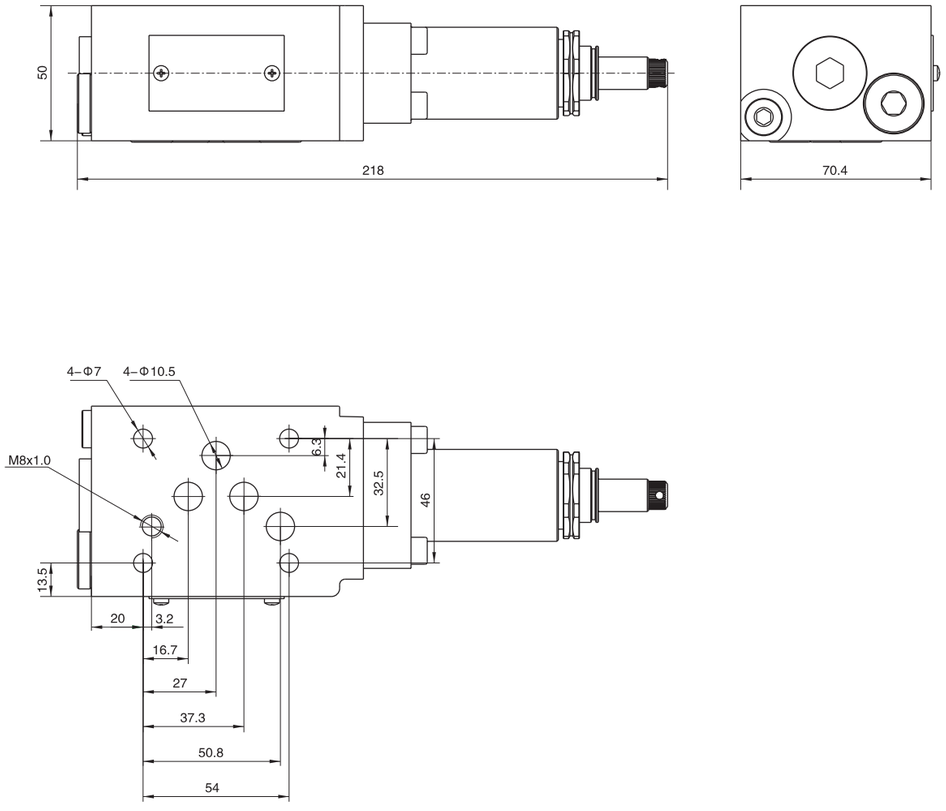
Dimension

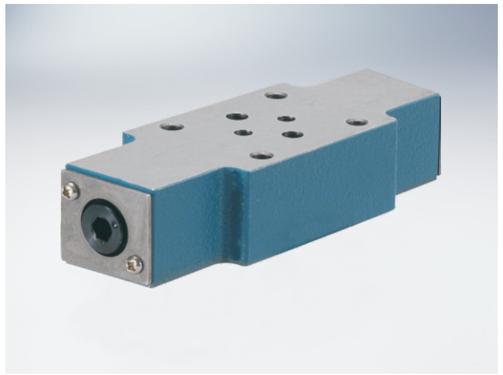
DYJ-03B



Note: The surface, connecting with the valve, should be Ra0.8 roughness, and 0.01/100mm flatness.

Modular Flow Control Valve

Technical data



Specification	6	10	16	25
Max working pressure (MPa)	31.5			
Max Flow (L/min)	80	160	250	360
Mounting location	Any			
Working fluid	Mineral hydraulic oil; phosphate ester hydraulic oil			
Fluid temp (℃)	−20~70			
Viscosity (Mm^2/s)	10~800			
Cleanliness	NAS1638 Class 9, recommended filtration precision Min β ≥75.			

Please consult us if your application is over above−mentioned data.
DLAis to adjust the flow rate of the two working ports or the pilot flow.

Ordering code

DLA − * − a * / * 50 *

Modular flow control valve

Specification
02 Dn6
03 Dn10
04 Dn16
06 Dn25

Opening pressure
a 0.5MPa

Seal material
omit NBR
V FPM

Serial number

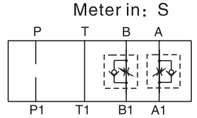
Remark

S meter in
S2 meter out
S3 Ameter out, Bmeter in
S4 Ameter in, Bmeter out

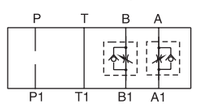
Note: For Dn6 and 10, meter in and meter out can be available by changing the valve body 180° so all these 2 types are marked with "S".;
For Dn6, S4 is converted from S3, so these 2 types are marked with S3.

Hydraulic symbol

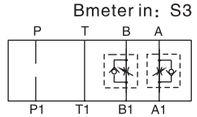
Meter in: S



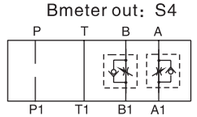
Meter out: S2



Ameter out
Bmeter in: S3



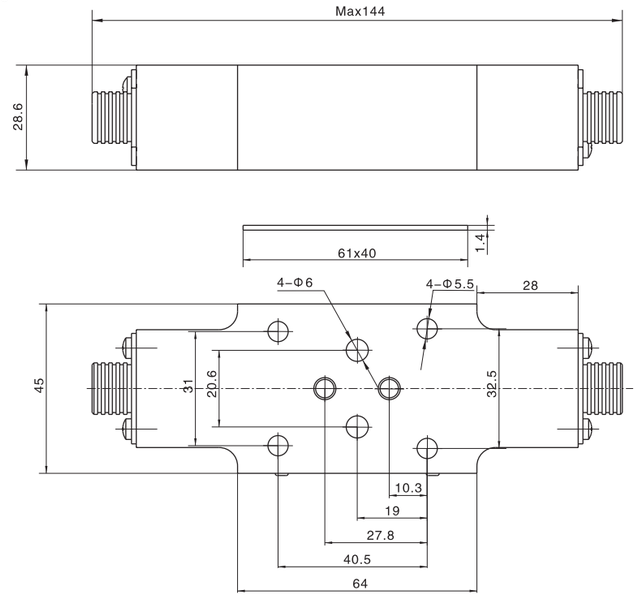
Ameter in
Bmeter out: S4



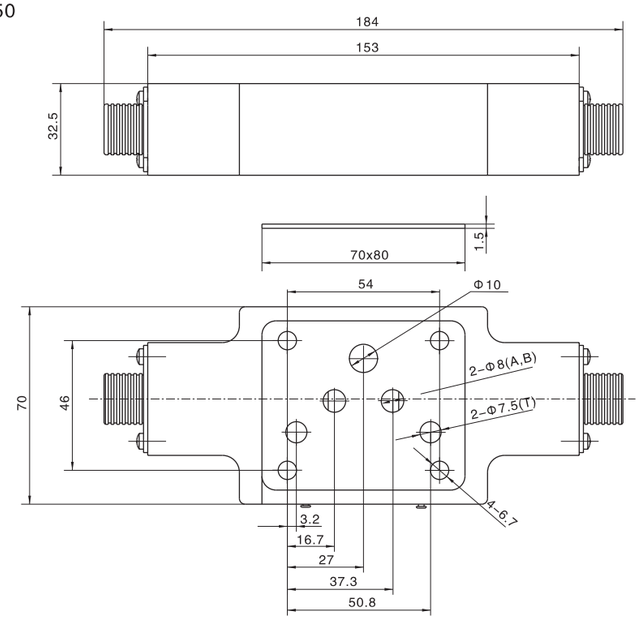
HOYEA

Dimension

DLA−02−a*/50



DLA−03−a*/50

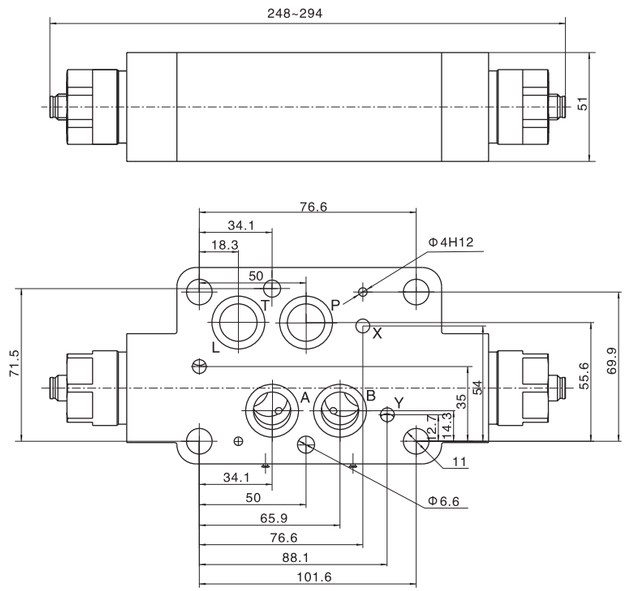


Note: The surface, connecting with the valve, should be Ra0.8 roughness, and 0.01/100mm flatness.

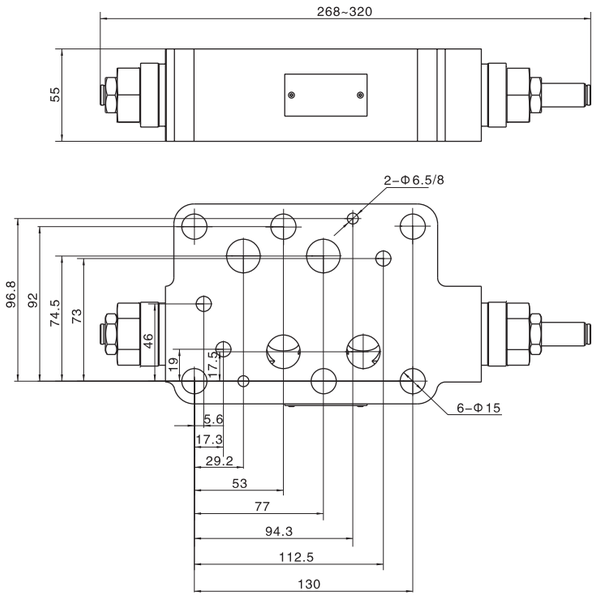
Modular Flow Control Valve

Dimension

DLA–04–a*/50



DLA–06–a*/50



Flow Control Valve

HOYEA

Technical data

Model	RUF–X 192AT
Rated pressure (MPa)	31.5
Min opening pressure (MPa)	2
Max flow rate (L/min)	175
Installation	Any
Working fluid	Mineral oil, Phosphate
Storage temp (℃)	–20~80
Working temp (℃)	–10~60
Cleanliness	NAS1638 Class 9, recommended filtration precision Min β ⩾75.

Application:
pipeline type flow control valve is made of a restrictive valve and a check valve, used to adjust the flow rate.

Ordering code

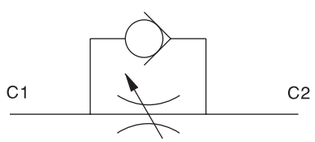
RUF – * – 192AT

Fow control valve

Port size
G 3/4 A
NPT 3/4 B
SAE 12 C

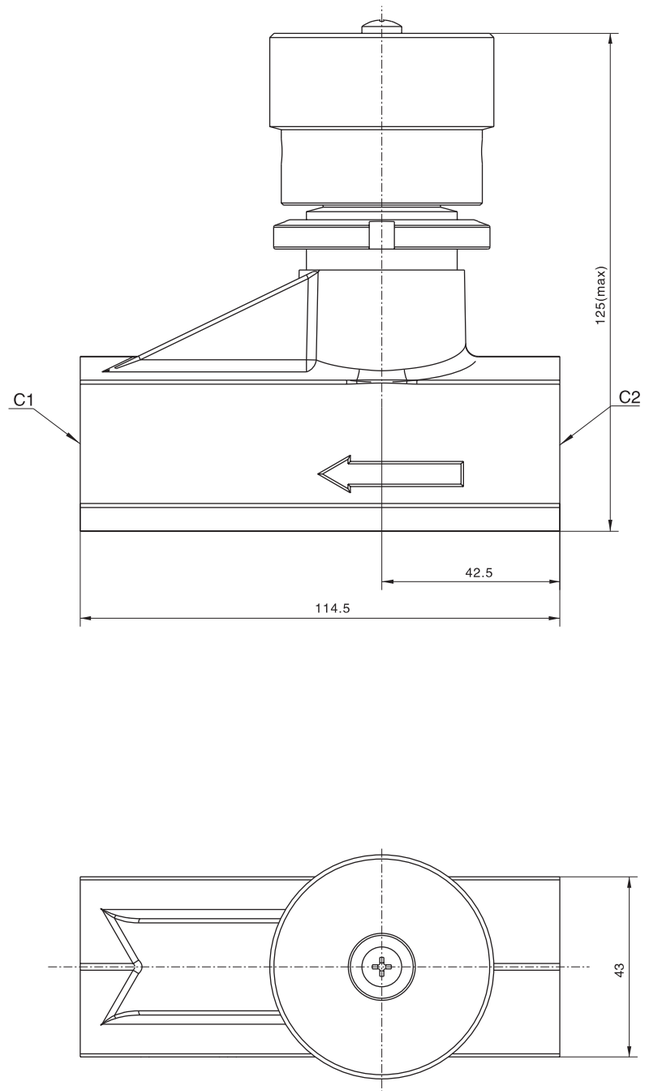
Serial no.

Hydraulic symbol



Fow Control Valve

Dimension



HOYEA

Internal Gear Pumpseries

Brief Introduction Of the IGP Pump

The internal gear pump invented independently by HOYEA Machinery Manufacture CO.,Ltd is a sort of low noise, high efficiency, and high pressure hydraulic pump, whose main structure is composed of a pair of inner involute gears.

When the gear pair revolves, the oil is sucked into the pump. The big and little sickle–shaped segment divide the pump inside into high pressure and low pressure areas, meanwhile they form pressure compensation in a radial direction, so that shape a gapless seal between internal–external gear top and sickle–shaped segment assembly. Axial direction compensation disc ensures superb seal in axial direction backlash, which minimizes the internal discharge loss of the pump. Entraning oil outputs from high pressure chamber via sprocket holes.

Due to compact structure, low pulsation, and without closed chamber, oil–trap phenomenon will never occur, thereby acquiring excellent low–noise level. Axial direction and radial direction full compensation structure ensure high volumetric efficiency from low pressure to high pressure. Gear ring adopts hydrostatic bearing, gear shaft adopts maintenance–free plain bearing, which enhance the bearing capacity of the pump greatly, enabling the pump to work stably and effectively in high pressure circumstance. It also posseses good low–speed steadily.

So far this product has had 3 series,14 specifications, discharge capacity ranged from 3.6mL/r to 64.9 mL/r, rated pressure 25MPa~31.5MPa,Their combined dyad or triplet are also available. It can be extensively applied in engineering machinery, metallurgical machinery, plastic machinery, vessel device, metal finishing, engineering vehicle, rubber machinery, hydraulic engineering, and aero–space fields, to name but a few. In particular it serves for proportional–control system, servo–control system, variable frequency–control system and other high–end oil source circumstances.

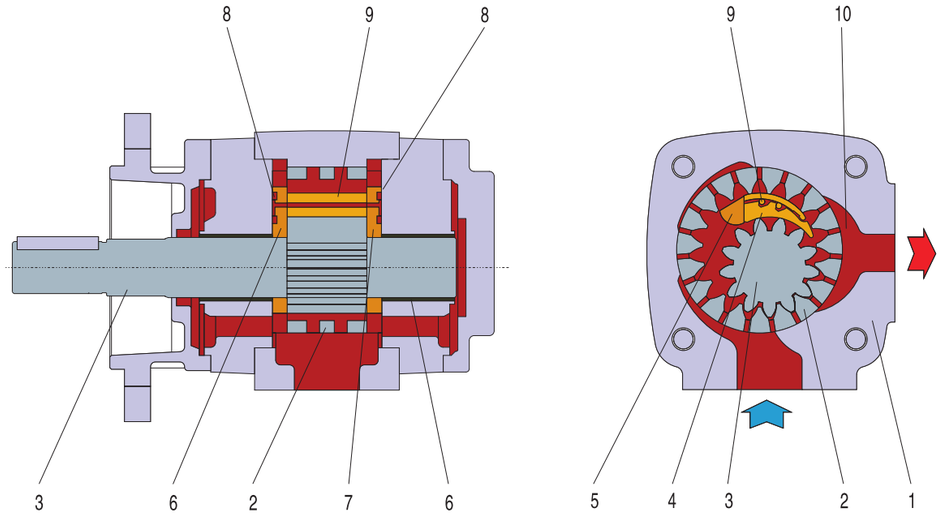
Inner gear pair, plain bearing, axialdirection and radialdirection automatic compensation, these key technologies ensure high pressure, high efficiency, low pulsation, and low noise.

Application field

Brief Introduction Of the IGP Pump

HOYEA

Application fields structure of the pump



1.Body
2.Internal gear ring
3.Gear shaft
4.Sickle–shaped segment assembly
5.Crescent locator
6.Sliding bearing
7.Axial compensation disc
8.Axial compensation pressure area
9.Radial direction compensation crescent accessories
10.Hydrostatic bearing chamber

Performance

Structure	internal gear pump
Installation means	flange
Revolution direction	clockwise or counter–clockwise
Oil–sucking pressure	absolute pressure0.08~0.3MPa
Installation	optional
Oil viscosity	10~100cst,2000cst is also allowed
Temperature of the medium	–20°C~80°C
Cleanliness	ISO4406/1986 code 18/15 or clearner
Environmental temperature	–10°C~60°C

Notice：[1] When special requirement is needed in using temperature scope, please contact us, so as to ensure using temperature scope.

Brief Introduction Of the IGP Pump

Structure features:

Structure features:

Involute gear pair

Axial direction and radical direction full compensation

Maintenance–free plain bearing

Gear ring static bearing

Performance features:

Low operating noise

High pressure

High performance

Long service life

Units of measurement

Flow calculating

$Q=V_{g\,th}\cdot n\eta_v\cdot 10^{-3}[l/min]$

power calculating

$Q=\dfrac{Q\ \triangle P}{600\cdot \eta_g}$

Q=flow capacity L/min

V_{ght}=discharge capacity cm^3

n=revolution speed r/min

η_v=Volumetric efficiency

η_g=Overall power

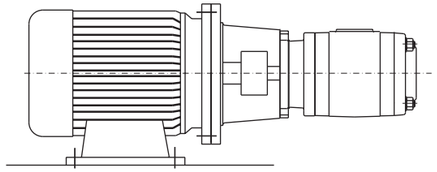
P=power

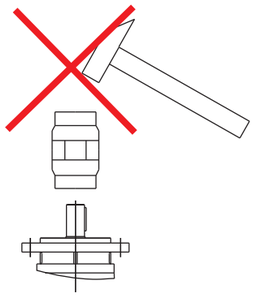
ΔP=pressure(bar)

Installation guide

Driving system

Electrical machine+Pump bracket+Coupling+Pump





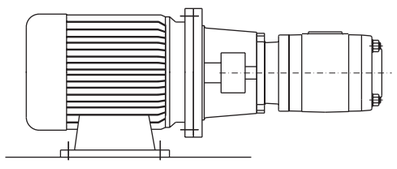
The drive shaft cannot afford any pressure from radial direction or axial direction.

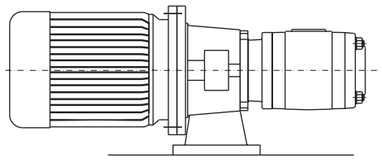
The concentricity of the motor shaft and pump must be adjusted carefully. (The eccentricity error should no more than 0.05mm)

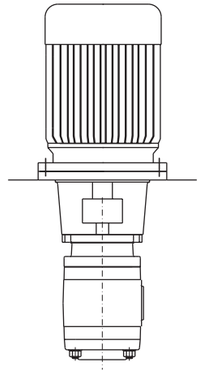
It can use the eccentricity of flexible coupling and chain coupling.

In order to avoid the pressure from axial direction, it is forbidden to use stroking or forcing way of installation.

Installation position







Brief Introduction Of the IGP Pump

HOYEA

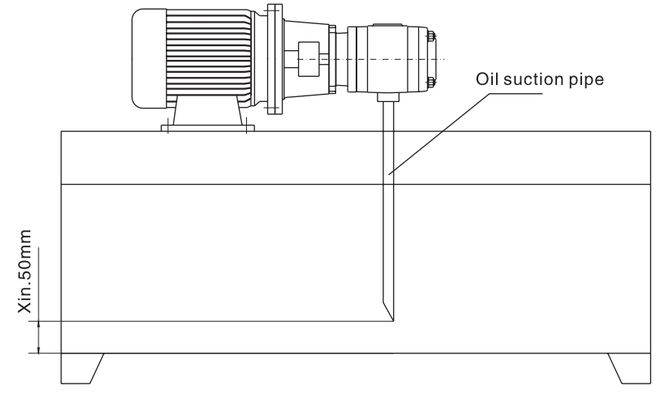
Installation guide

Tank:

Adjust the quantity of oil, in order to satisfy the system action.

The oil temperature must be controlled at the range that required, the cooler can be added if it is needed.

Recommended pipeline layout



Filter:

It is suggested to use return oil filter, please add differential pressure indicator or pollution load indicator if using the oil suction filter.

Hydraulic oil:

It is suggested to use 46# or 68# hydraulic oil.

Never use the mixture of different kinds of hydraulic oil, because it may cause oil decomposition and lower the lubricating effects.

The hydraulic oil must be renewed on time in accordance with the usage frequency of the system, and the inside of the tank need to be cleaned.

Notice for use

In preparation:

Please check the hydraulic unit, and ensure it to be correctly and carefully installed.

The filter screen must be used correctly according to the request when filling the hydraulic oil.

Please check the direction of rotation of the main shaft.

Fill full of the pump with oil by using oil suction pipe or pressure oil pipe.

Release the air in the system totally before loading.

Release the air:

Manually open the air relief of the equipment, during the process of releasing the air, assuring that the sealing air must be relieved under the situation of no pressure.

In order to free the air of the pump, start the electrical machine at short time, and shut off immediately (inching operation), repeat this process, until the air within the pump is relived totally.

Notice:

All the pumps have already been tested for performance and function, any change of the pump should not be the responsibility of our company, all the maintenance of the pump are only offered by our company and the agency that our company authorized, and finally, any maintenance that not authorized by our company should not be regarded as the responsibility of us.

Tips:

The installation, maintenance and repair of the pump, must be dealt by the professional person.

The pump should be operated only under the correct setting.

Before it works, make sure that there is no pressure of the system.

Check the screw often; make sure that it locks following the standard.

Ensure the protection of the general safety and accident

IGP–1 Series Internal Gear Pump

Technical parameter

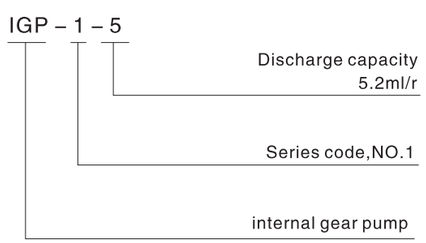
Series–type	Discharge capacity[2] (ml/r)	Revolution speed (r/min)		Continuous working pressure (MPa)	η_{Max} Max surge press (MPa)
		min[3]	max		
IGP–1–3.5	3.6	400	3000	31.5	33
IGP–1–5	5.2	400	3000	31.5	33
IGP–1–6.3	6.4	400	3000	31.5	33
IGP–1–8	8.2	400	3000	31.5	33
IGP–1–10	10.2	400	3000	31.5	33

This parameter is indicated on the condition that mineral oil viscosity is 20~40cst and pump suction oil pressure is 0.8bar(minimum)and 3bar(maximum).

The parameter shown in the table is listed according to the discharge capacity unit as cubic centimeter/r in order.

Notice: so–called allowed surge pressure is indicated that within one minute as working cycle, of which 15% is the allowed pressure peak.Because of manufacturing error, the actual discharge capacity of the pump may be lower than that of ideal valve about 1.5%.When revolution speed is lower than 400r/min or between 1500r/min and n Max, please contact us, so as to ensure surge pressure.

Model instruction

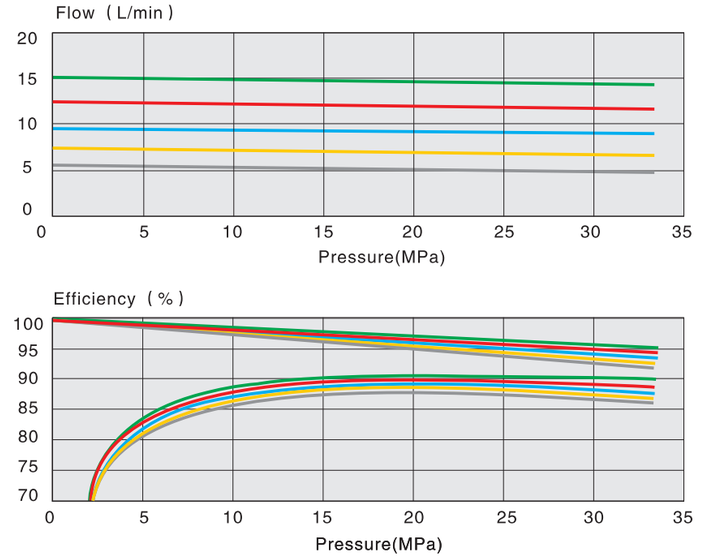


HOYEA

IGP–1 performance curves

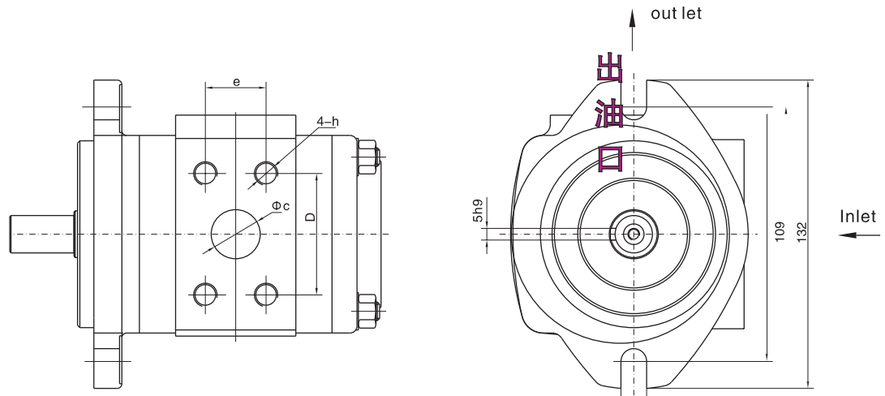
Measuring working condition 1450
Revolution speed n=1500r/min
Viscosity v=46cSt
Oil temperature t=40℃

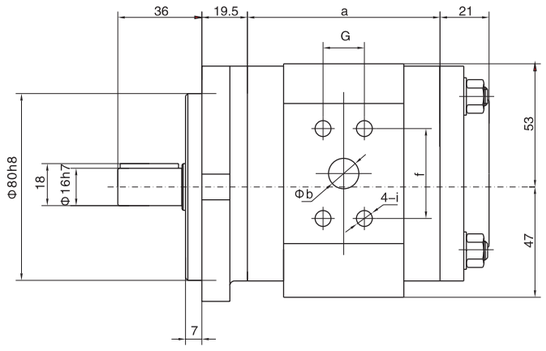
IGP –1 (3.5)
IGP –1 (5)
IGP –1 (6.3)
IGP –1 (8)
IGP –1 (10)



IGP–1 Series Internal Gear Pump

External dimensions





Series–type	a	Φb	Φc	d	e	f	g	h	i	kg
IGP–1–3.5	66	9	14	38.1	17.5	38.1	17.5	M8X13	M8X13	4.8
IGP–1–5	70	11	14	38.1	17.5	38.1	17.5	M8X13	M8X13	5.0
IGP–1–6.3	73	11	19	47.5	22	38.1	17.5	M10X15	M8X13	5.2
IGP–1–8	77.5	13	19	47.5	22	38.1	17.5	M10X15	M8X13	5.4
IGP–1–10	82.5	13	21	52.4	26.2	38.1	17.5	M10X15	M8X13	5.6

IGP–2 Series Internal Gear Pump

HOYEA

Technical parameter

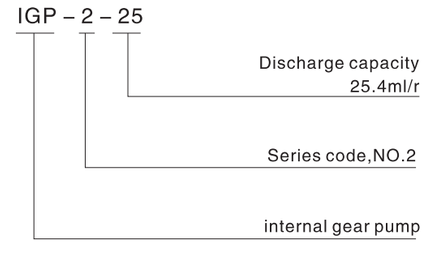
Series–type	Discharge capacity[2] (ml/r)	Revolution speed (r/min)		Continuous working pressure (MPa)	η_{Max} Max surge press (MPa)
		min[3]	max		
IGP–2–13	13.3	400	3000	31.5	33
IGP–2–16	16.3	400	3000	31.5	33
IGP–2–20	20.7	400	3000	31.5	33
IGP–2–25	25.4	400	3000	25	28
IGP–2–32	32.3	400	3000	25	28

This parameter is indicated on the condition that mineral oil viscosity is 20~40cst and pump suction oil pressure is 0.8bar(minimum)and 3bar(maximum).

The parameter shown in the table is listed according to the discharge capacity unit as cubic centimeter/r in order.

Notice: so–called allowed surge pressure is indicated that within one minute as working cycle, of which 15% is the allowed pressure peak.Because of manufacturing error, the actual discharge capacity of the pump may be lower than that of ideal valve about 1.5%.When revolution speed is lower than 400r/min and n Max, please contact us, so as to ensure surge pressure.

Model instruction

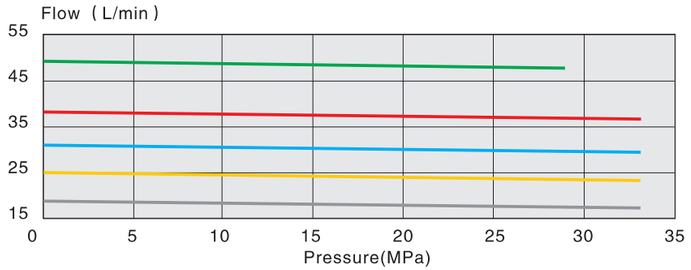


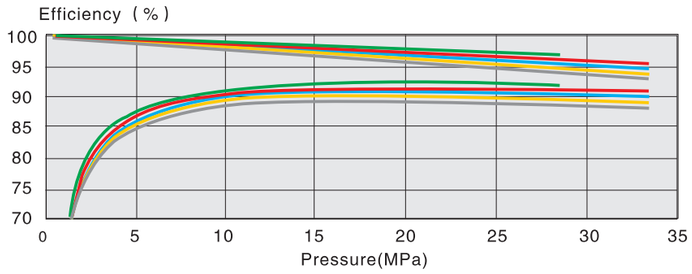
IGP–2 Series Internal Gear Pump

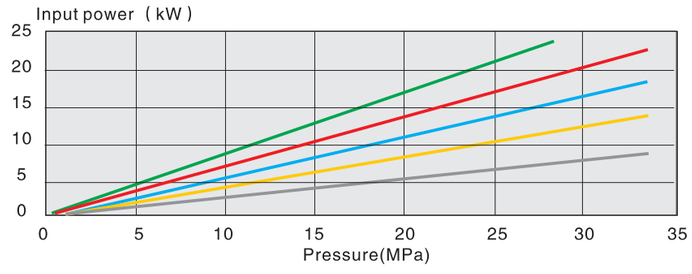
IGP–1 performance curves

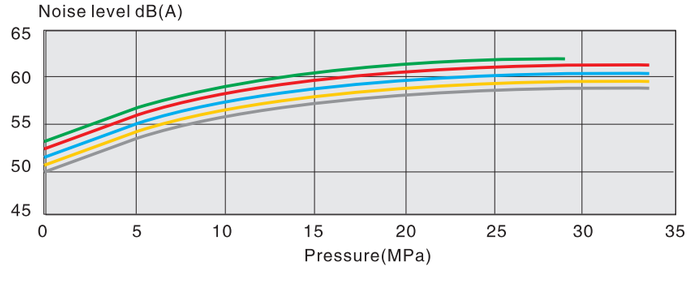
Measuring working condition 1450
Revolution speed n=1500r/min
Viscosity v=46cSt
Oil temperature t=40℃

IGP –2 (13)
IGP –2 (16)
IGP –2 (20)
IGP –2 (25)
IGP –2 (32)





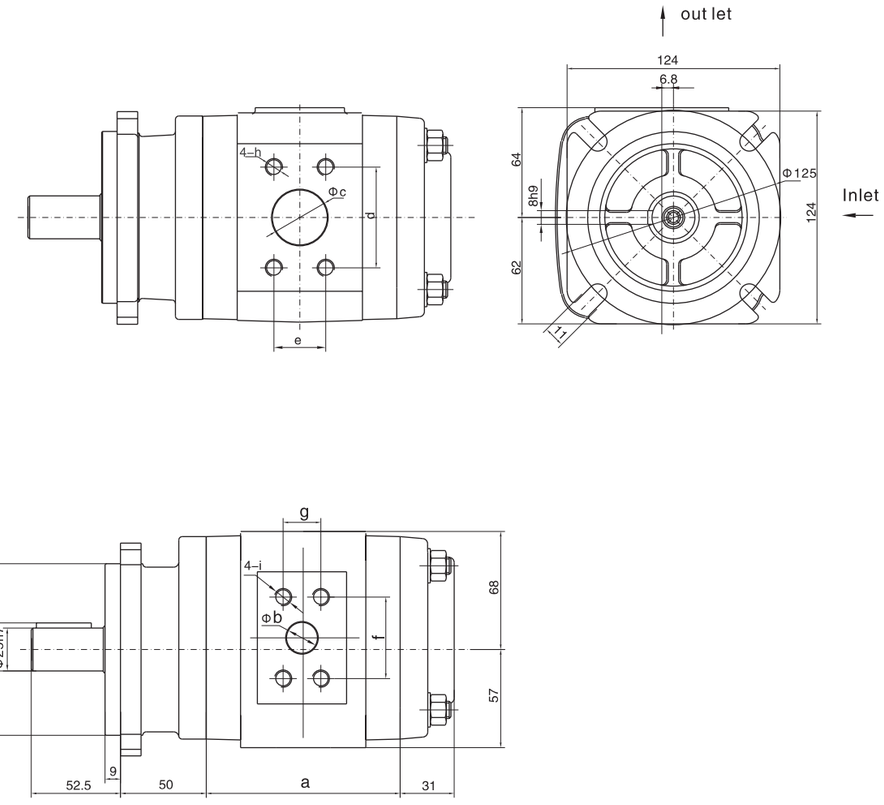




IGP–2 Series Internal Gear Pump

HOYEA

External dimensions



Series–type	a	ϕb	ϕc	d	e	f	g	h	i	kg
IGP–2–13	88.5	13	23	52.4	26.2	38.1	17.5	M10X15	M8X13	9.6
IGP–2–16	92.5	14	25	52.4	26.2	38.1	17.5	M10X15	M8X13	10.0
IGP–2–20	98	18	27	58.7	30.2	47.5	22	M10X15	M10X15	10.6
IGP–2–25	104	18	30	58.7	30.2	47.5	22	M10X15	M10X15	11.2
IGP–2–32	113	18	32	58.7	30.2	47.5	22	M10X15	M10X15	12.0

IGP–3 Series Internal Gear Pump

Technical parameter

Series–type	Discharge capacity (ml/r)	Revolution speed (r/min)		Continuous working pressure (MPa)	η_{Max} Max surge press (MPa)
		min[3]	max		
IGP–3–32	33.1	400	3000	31.5	33
IGP–3–40	41.0	400	2800	31.5	33
IGP–3–50	50.3	400	2500	25	28
IGP–3–64	64.9	400	2200	25	28

This parameter is indicated on the condition that mineral oil viscosity is 20~40cst and pump suction oil pressure is 0.8bar(minimum)and 3bar(maximum).

The parameter shown in the table is listed according to the discharge capacity unit as cubic centimeter/r in order.

Notice: so–called allowed surge pressure is indicated that within one minute as working cycle, of which 15% is the allowed pressure peak.Because of manufacturing error, the actual discharge capacity of the pump may be lower than that of ideal valve about 1.5%.When revolution speed is lower than 400r/min or between 1500r/min and n Max, please contact us, so as to ensure surge pressure.

Model instruction

IGP – 3 – 50

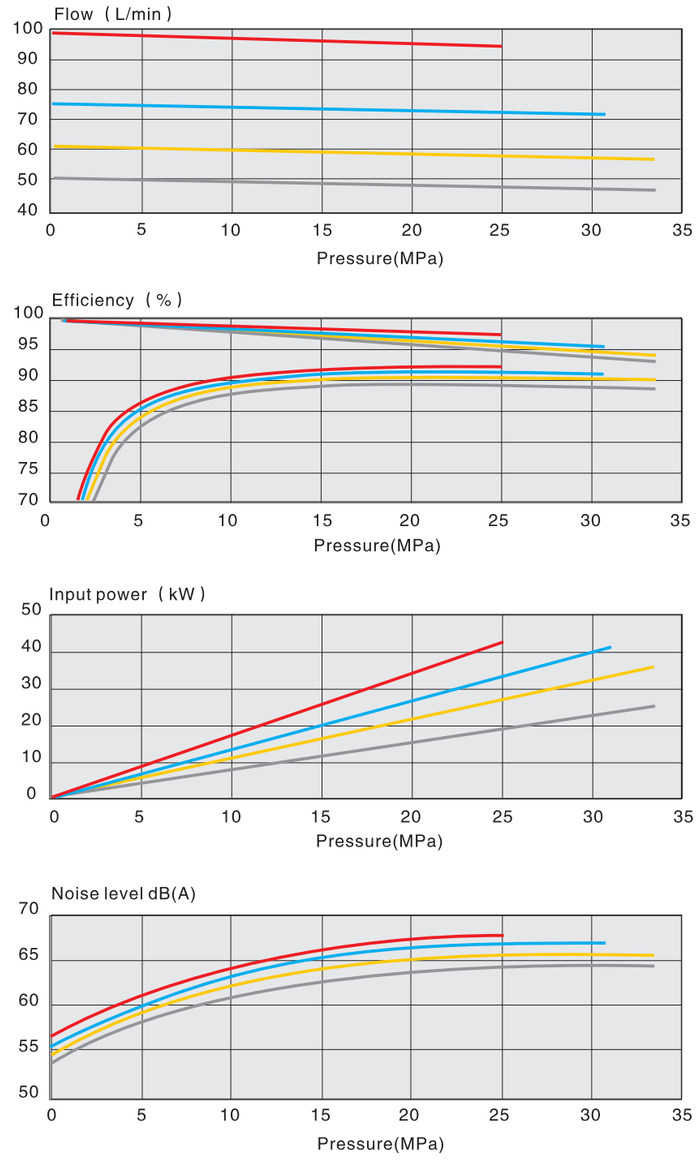
- 50 — Discharge capacity 50.3ml/r
- 3 — Series code,NO.3
- IGP — internal gear pump

IGP–3 Series Internal Gear Pump

IGP–3 performance curves

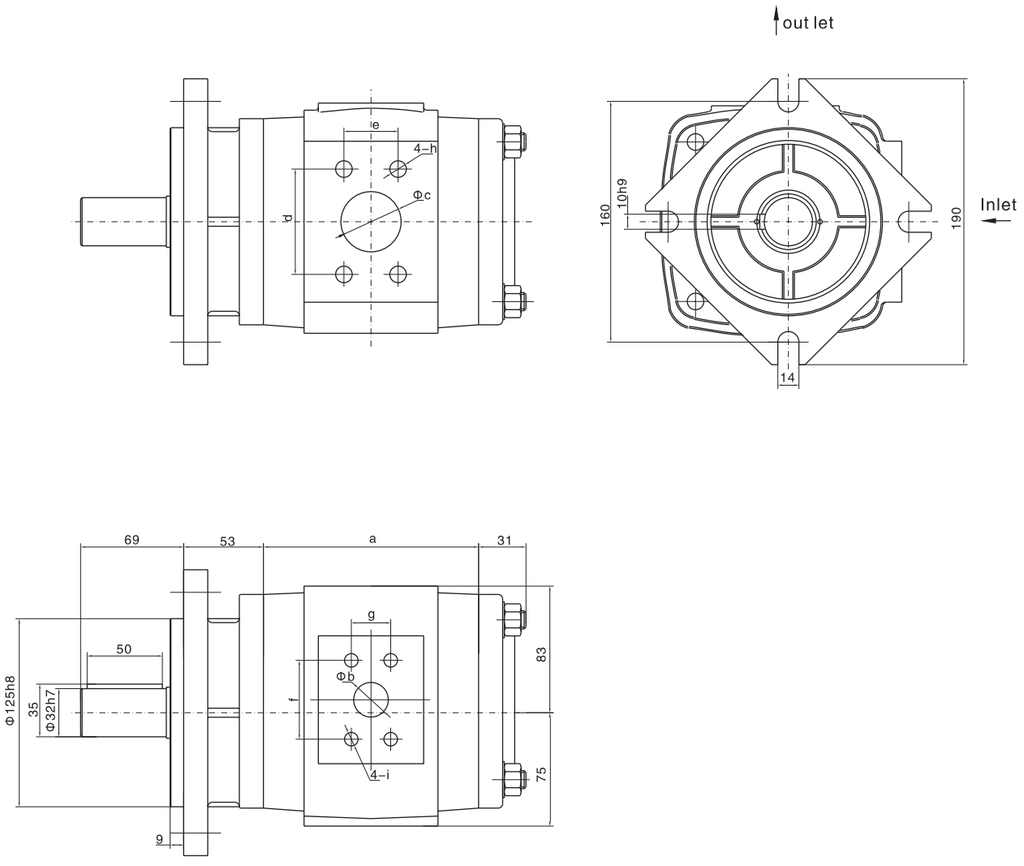
Measuring working condition 1450
Revolution speed n=1500r/min
Viscosity v=46cSt
Oil temperature t=40℃

IGP –3 (32)
IGP –3 (40)
IGP –3 (50)
IGP –3 (64)



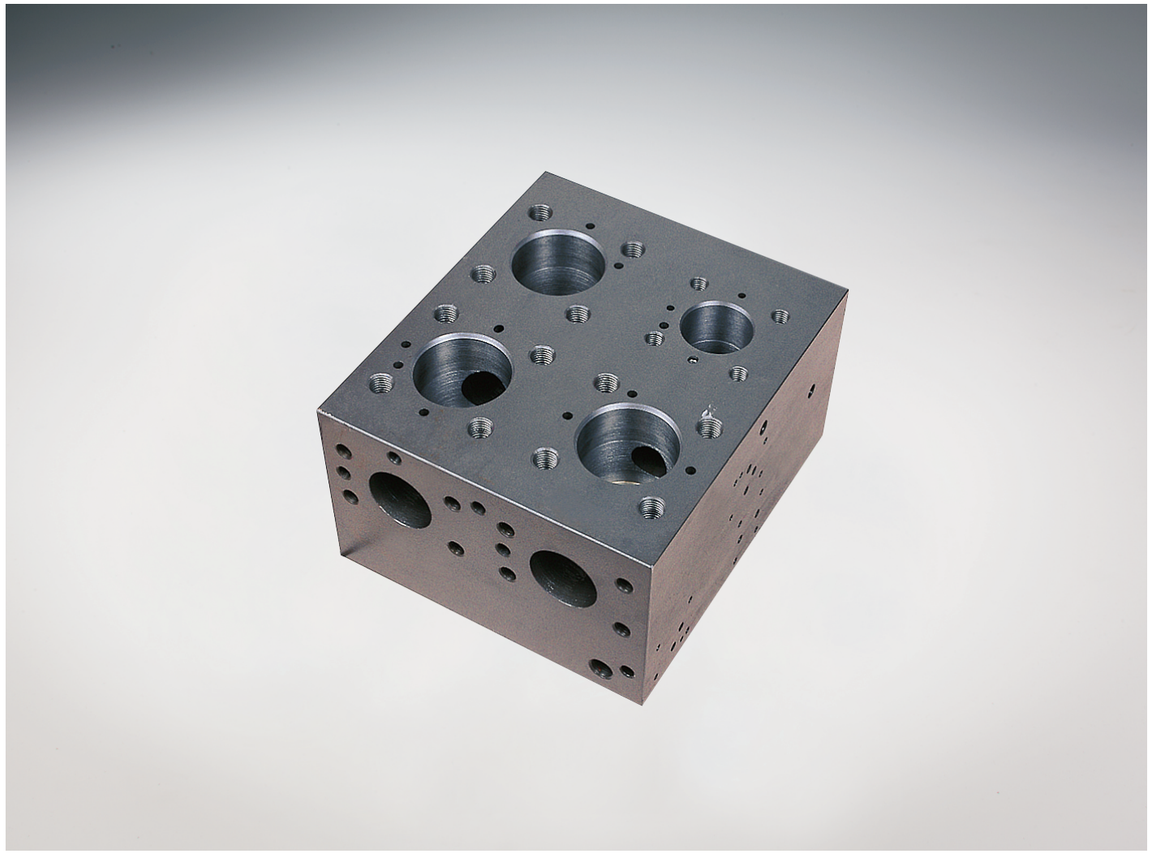
IGP–3 Series Internal Gear Pump

External dimensions

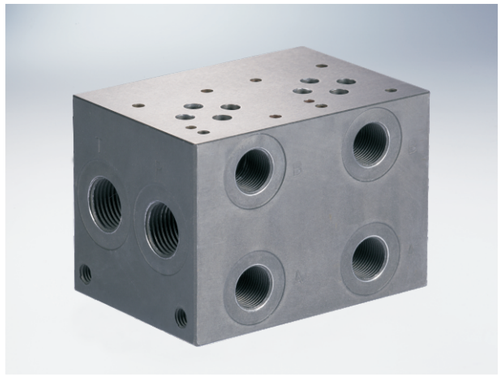


Series–type	a	ϕb	ϕc	d	e	f	g	h	i	kg
IGP–3–32	119	18	32	58.7	30.2	47.5	22	M10X15	M10X15	17.5
IGP–3–40	125	19	35	70	36	52.4	26.2	M12X20	M10X15	18.3
IGP–3–50	132	21	40	70	36	52.4	26.2	M12X20	M10X15	19.4
IGP–3–64	143	23	40	70	36	52.4	26.2	M12X20	M10X15	20.7

Manifolds



D03 Standard Flow Parallel Circuit Manifold



Ordering information

HY* D03 P * 2 * / * / 10

Serial number

A Aluminum 7A04 max. working pressure 20.7Mpa

D Ductile Iron 45# max. working pressure 31.5Mpa

Valve Pattern 03 NG 6

Parallel Circuit Standard Flow

No. of Stations

01–16

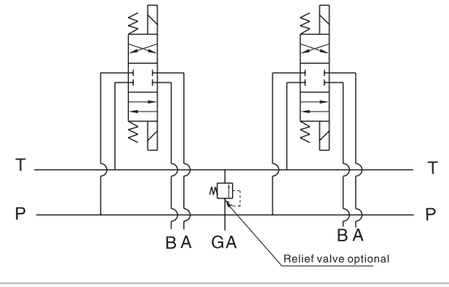
Valve Spacing

2.13 inch [54.0 mm]

Omit	cavities not required
C	One Common cavity: C–10–2 (P in nose)
S	One Sun Cavity: T–10A (P in nose)

Port Threads		P, T	A, B	GA
P	NPT(Z)	0.5	0.38	0.25
S	SAE	–10	–8	–6
B	BSP(G)	0.5	0.38	None
M	M	M22x1.5	M18x1.5	None

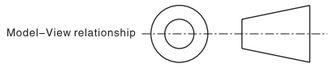
Code Symbol

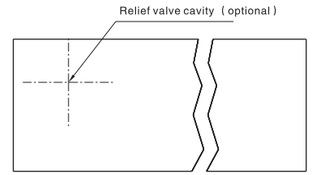


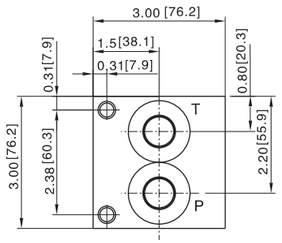
D03 Standard Flow Parallel Circuit Manifold

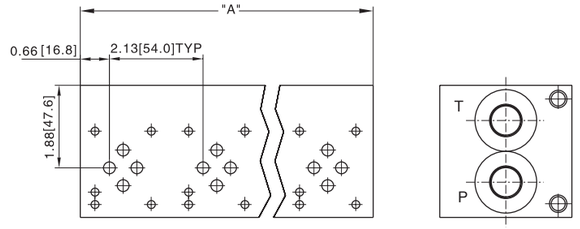
HOYEA

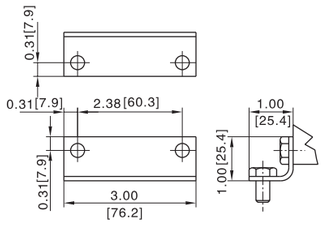
External dimensions

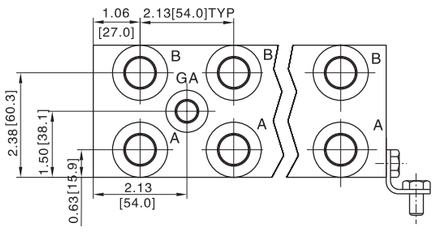










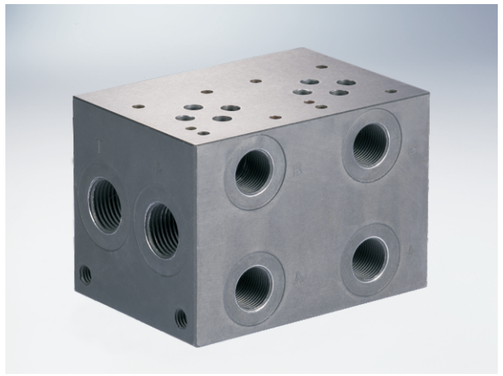


Port code	Valve mounting thread.	Manifold mounting thread.
P,S	#10–24 UNCx 0.63[16]DP	0.31–18 UNCx 0.44[11.1] DP
B,M	M5 ISO 6Hx 0.63[16]DP	M8 ISO 6Hx 0.44[11.1] DP

No. of stations	* 01	02	03	04	05	06	07	08	09	10	11	12	13	14	15	16
"A" length inch (mm)	2.13	4.25	6.38	8.50	10.63	12.75	14.88	17.00	19.13	21.25	23.38	25.5	27.63	29.75	31.88	34.00
	[54.0]	[108.0]	[162.1]	[215.9]	[270.0]	[323.9]	[378.0]	[431.8]	[485.9]	[539.8]	[593.9]	[647.7]	[701.8]	[755.7]	[809.8]	[853.6]
apx. Weight alum (KG)	3	4	6	8	9	11	12	14	16	18	20	21	22	24	26	27
	[1]	[2]	[3]	[4]	[4]	[5]	[5]	[6]	[7]	[8]	[9]	[10]	[10]	[11]	[12]	[12]
apx. Weight ferrous (KG)	5	9	13	17	21	26	30	34	38	42	47	51	55	59	63	68
	[2]	[4]	[6]	[8]	[10]	[12]	[14]	[15]	[17]	[19]	[21]	[23]	[25]	[27]	[29]	[31]

* 1 Length of 01 station with relief cavity is 3 (76.2) . Gauge port not available on 01 station

D03 Series Circuit Manifold



Ordering information

HY* D03 S * 2 * / * / 10

A Aluminum 7A04 max. working pressure 20.7Mpa
D Ductile Iron 45# max. working pressure 31.5Mpa

Valve Pattern 03 NG 6

Parallel Circuit Standard Flow

No. of Stations
02–08

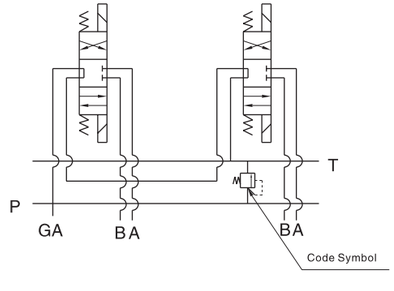
Valve Spacing
2.13 inch [54.0 mm]

Serial number

Omit	cavities not required
C	One Common cavity: C–10–2 (P in nose)
S	One Sun Cavity: T–10A (P in nose)

Port Threads		P, T	A, B	GA
P	NPT(Z)	0.5	0.38	0.25
S	SAE	–10	–8	–6
B	BSP(G)	0.5	0.38	None
M	M	M22x1.5	M18x1.5	None

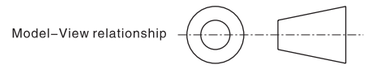
Code Symbol

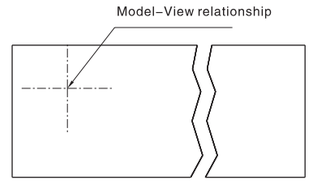


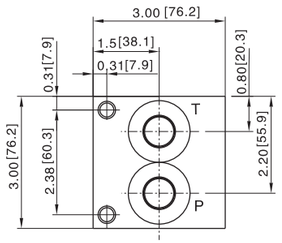
D03 Series Circuit Manifold

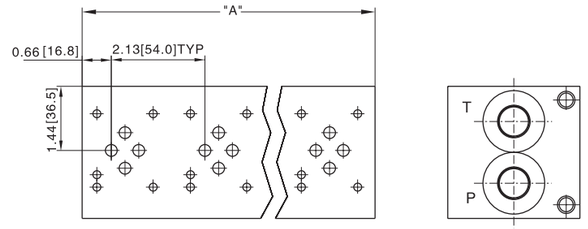
HOYEA

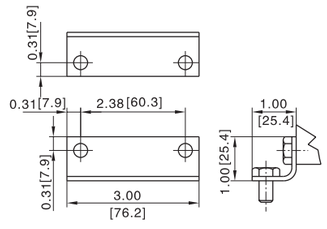
External dimensions

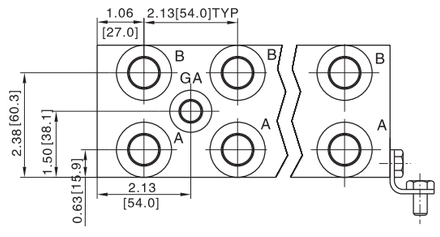












Port code	Valve mounting thread	Manifold mounting thread
P,S	#10–24 UNCx 0.63[16]DP	0.31–18 UNCx 0.44[11.1] DP
B,M	M5 ISO 6Hx 0.63[16]DP	M8 ISO 6Hx 0.44[11.1] DP

No. of stations	02	03	04	05	06	07	08
"A" length inch (mm)	4.25	6.38	8.50	10.63	12.75	14.88	17.00
	[108.0]	[162.1]	[215.9]	[270.0]	[323.9]	[378.0]	[431.8]
apx. Weight alum (KG)	4	6	8	9	11	12	14
	[2]	[3]	[4]	[4]	[5]	[5]	[6]
apx. Weight ferrous (KG)	9	13	17	23	26	-	-
	[4]	[6]	[8]	[10]	[12]	-	-

D05 Standard Flow Parallel Manifold

D05 Standard flow parallel manifold

HY* D05 P * 3 * / * / 10

Serial number

A Aluminum 7A04 max. working pressure 20.7Mpa
D Ductile Iron 45# max. working pressure 31.5Mpa

Valve Pattern 05 NG 10

Parallel Circuit Standard Flow

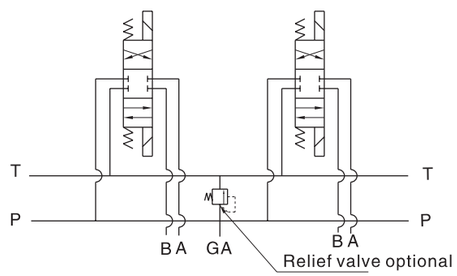
Parallel Circuit Standard Flow
01~21

Valve Spacing
3.25 inch [82.6 mm]

Omit	cavities not required
C	One Common cavity: C–10–2 (P in nose)
S	One Sun Cavity: T–3A (P in nose)

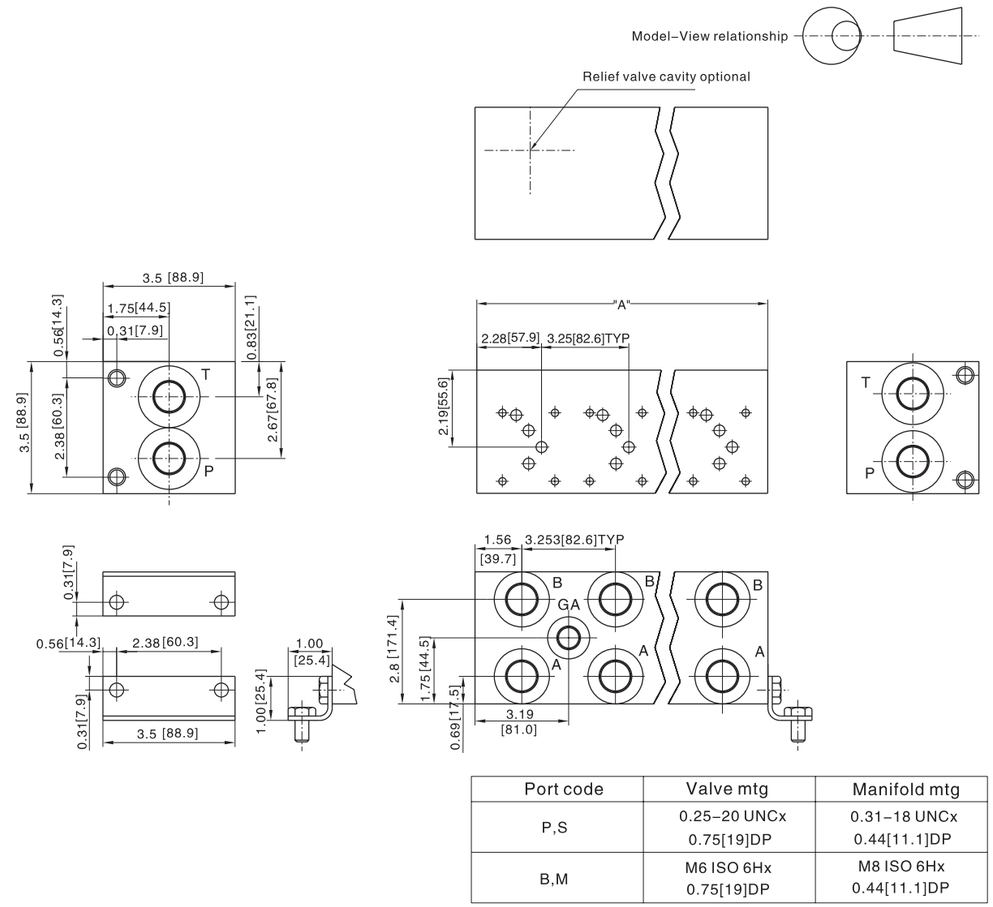
Port Threads		P, T	A, B	GA
P	NPT(Z)	0.75	0.5	0.25
S	SAE	–12	–8	–6
B	BSP(G)	0.75	0.5	None
M	M	M27x2	M18x1.5	None

Code symbol



HOYEA

External dimensions



Port code	Valve mtg	Manifold mtg
P,S	0.25–20 UNCx 0.75[19]DP	0.31–18 UNCx 0.44[11.1]DP
B,M	M6 ISO 6Hx 0.75[19]DP	M8 ISO 6Hx 0.44[11.1]DP

No. of stations	* 01	02	03	04	05	06	07	08	09	10	11
"A" length inch (mm)	3.25	6.50	9.75	13.00	16.25	19.50	22.75	26.00	29.25	32.50	35.75
	[82.6]	[165.1]	[247.7]	[330.2]	[412.8]	[495.3]	[577.9]	[660.4]	[743.0]	[825.5]	[908.1]
apx. Weight alum (KG)	4	8	11	14	17	21	24	27	30	34	37
	[2]	[4]	[5]	[7]	[8]	[10]	[11]	[12]	[14]	[15]	[17]
apx. Weight ferrous (KG)	9	17	26	34	43	51	60	68	77	85	94
	[4]	[8]	[12]	[15]	[20]	[23]	[27]	[31]	[35]	[39]	[43]

No. of stations	12	13	14	15	16	17	18	19	20	21	
"A" length inch (mm)	39.00	42.25	45.50	48.75	52.00	55.25	58.50	61.75	65.00	68.25	
	[990.6]	[1073.2]	[1155.7]	[1238.3]	[1320.8]	[1403.4]	[1485.9]	[1568.5]	[1651.0]	[1733.6]	
apx. Weight alum (KG)	41	44	47	51	55	58	61	64	67	71	
	[19]	[20]	[21]	[23]	[25]	[26]	[28]	[29]	[30]	[32]	
apx. Weight ferrous (KG)	102	--	--	--	--	--	--	--	--	--	
	[46]	--	--	--	--	--	--	--	--	--	

*1 Length of 01 station with relief cavity is 3 (76.2) . Gauge port not available on 01 station

D05 Series Circuit Manifold

Ordering information

HY* D05 S * 3 * / * / 10

A Aluminum 7A04 max. working pressure 20.7Mpa
D Ductile Iron45# max. working pressure 31.5Mpa

Valve Pattern 05 NS 10

Parallel Circuit Standard Flow

No. of Stations
02~04

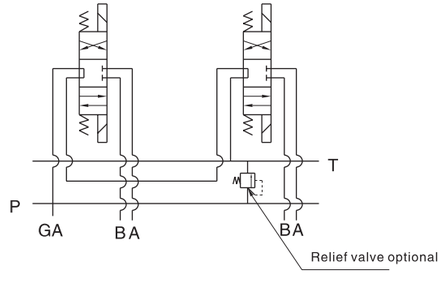
No. of Stations
3.25 inch [82.6 mm]

Serial number

Omit	Cavities not required
C	One Common cavity: C–10–2 (P in nose)
S	One Sun Cavity: T–3A (P in nose)

Port Threads		P, T	A, B	GA
P	NPT(Z)	0.75	0.5	0.25
S	SAE	–12	–8	–6
B	BSP(G)	0.75	0.5	None
M	M	M27x2	M18x1.5	None

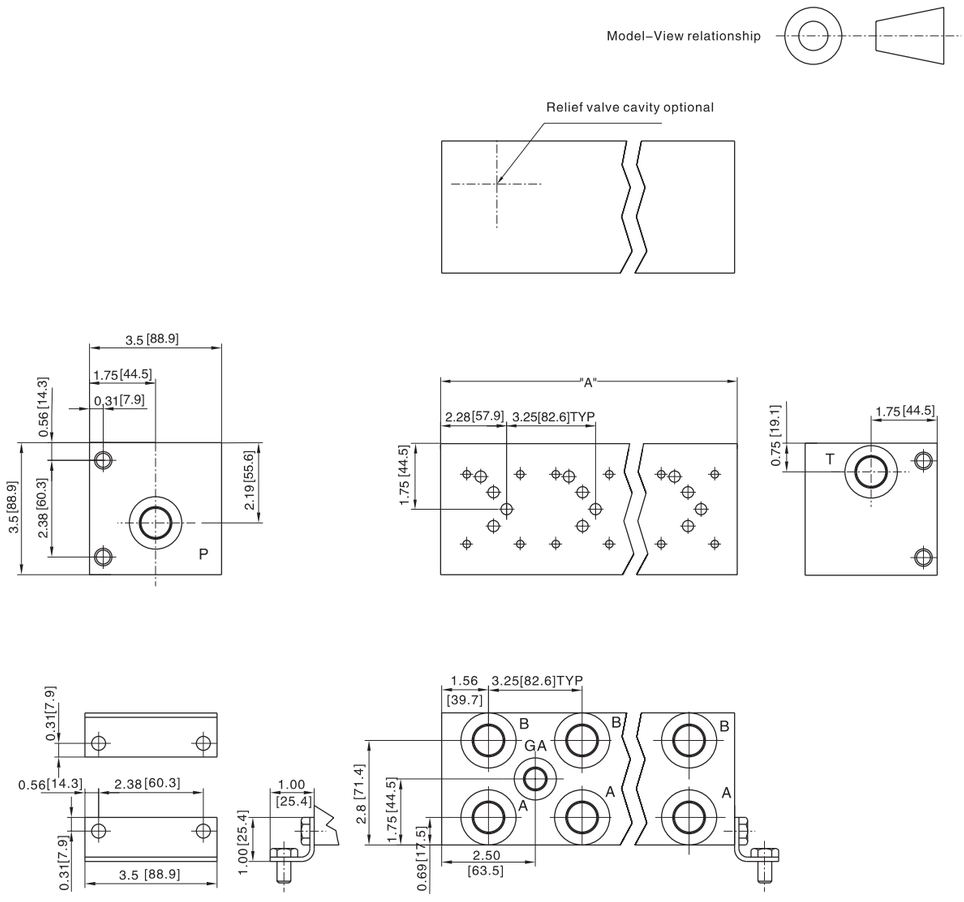
Code symbol



D05 Series Circuit Manifold

HOYEA

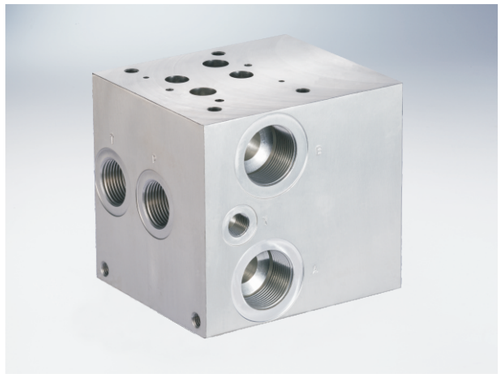
D05 Series circuit manifold



Port code	Valve mtg	Manifold mtg
P,S	0.25–20 UNCx 0.75[19]DP	0.31–18 UNCx 0.44[11.1]DP
B,M	M6 ISO 6Hx 0.75[19]DP	M8 ISO 6Hx 0.44[11.1]DP

No. of stations	02	03	04
No. of stations	6.50	9.75	13.00
	[165.1]	[247.7]	[330.2]
apx. Weight alum (KG)	8	11	14
	[4]	[5]	[7]
apx. Weight ferrous (KG)	17	26	34
	[8]	[12]	[15]

D07 Standard Flow Parallel Circuit Manifold



Ordering information

HY* D07 P * 4 * / * / 10

A Aluminum 7A04 max. working pressure 20.7Mpa
D Ductile Iron45# max. working pressure 31.5Mpa

Valve Pattern 07 NS 16

Parallel Circuit Standard Flow

No. of Stations
01~08

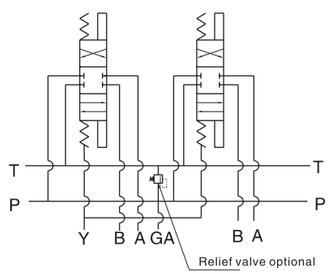
valve spacing
4 inch [101.6 mm]

Serial number

Omit	cavities not required
C	One Common cavity: C–10–2 (P in nose)
S	One Sun Cavity: T–3A (P in nose)

Port Threads		P, A, B	T	Y	GA
P	NPT(Z)	0.75	1	0.38	0.25
S	SAE	–12	–16	–6	–6
B	BSP(G)	0.75	1	0.38	None
M	M	M27x2	M33x2	M14x1.5	None

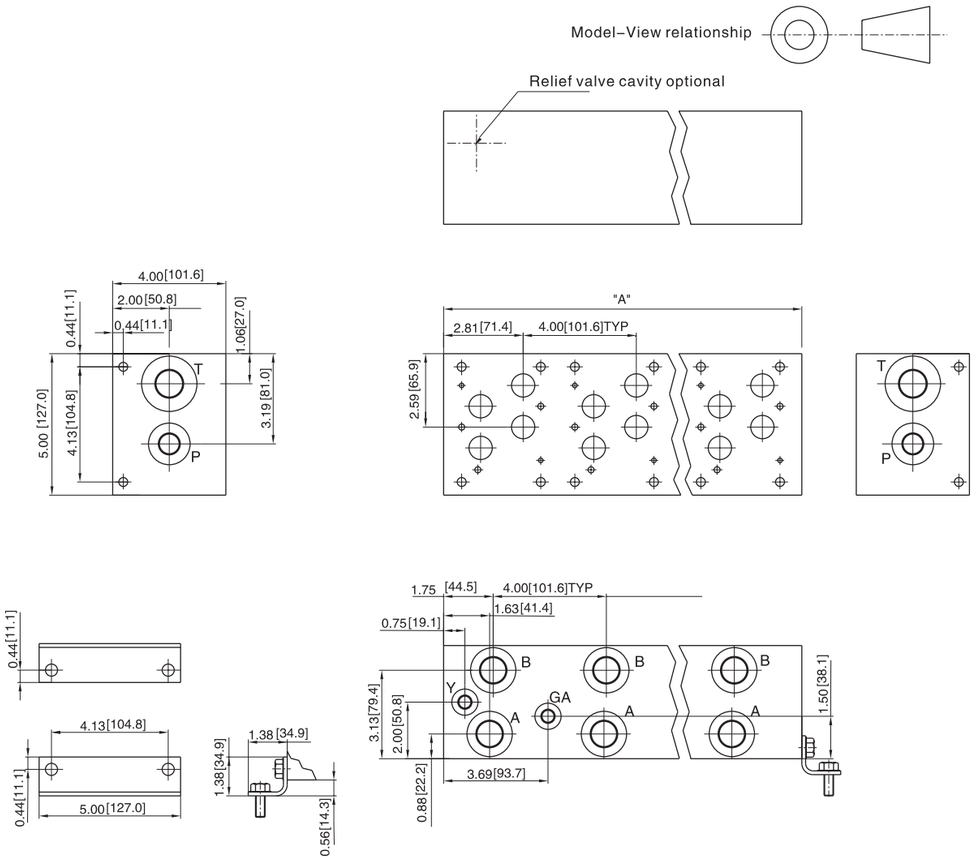
Code symbol



D07 Standard Flow Parallel Circuit Manifold

HOYEA

External dimensions

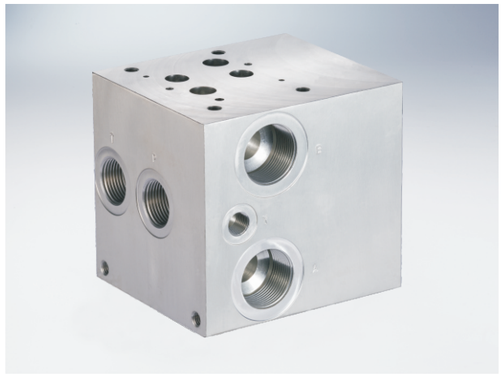


Port code	Valve mtg	Manifold mtg
P,S	0.38–16 UNCx1.00[25]DP 0.25–20 UNCx0.75[19]DP	0.38–16 UNCx 0.75[19]DP
B,M	M10 ISO 6Hx1.00[25]DP M6 ISO 6Hx0.75[19]DP	M10 ISO 6Hx 0.75[19]DP

No. of stations	* 01	02	03	04	05	06	07	08
"A" length inch (mm)	4.00	8.00	12.00	16.00	20.00	24.00	28.00	32.00
	[101.6]	[203.2]	[304.8]	[406.4]	[508.0]	[609.6]	[711.2]	[812.8]
apx. Weight alum (KG)	6	14	22	30	38	46	52	60
	[3]	[6]	[10]	[14]	[17]	[21]	[24]	[27]
apx. Weight ferrous (KG)	24	46	69	90	114	135	158	180
	[11]	[21]	[31]	[41]	[52]	[61]	[72]	[82]

* 1 Length of 01 station with relief cavity is 5.5 (139.7) . Gauge port not available on 01 station

D07 Series Circuit Manifold



Ordering information

HY* D07 S * 4 * / * / 10

A Aluminum 7A04 max. working pressure 20.7Mpa
D Ductile Iron45# max. working pressure 31.5Mpa

Valve Pattern 07 NG 16

Series Circuit Standard Flow

No. of Stations
02~04

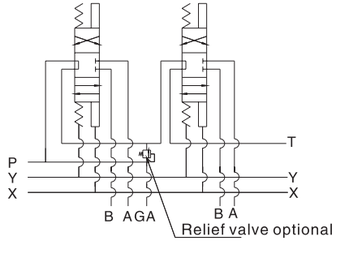
Valve Spacing
4 inch [101.6 mm]

Serial number

Omit	cavities not required
C	One Common cavity: C–10–2 (P in nose)
S	One Sun Cavity: T–3A (P in nose)

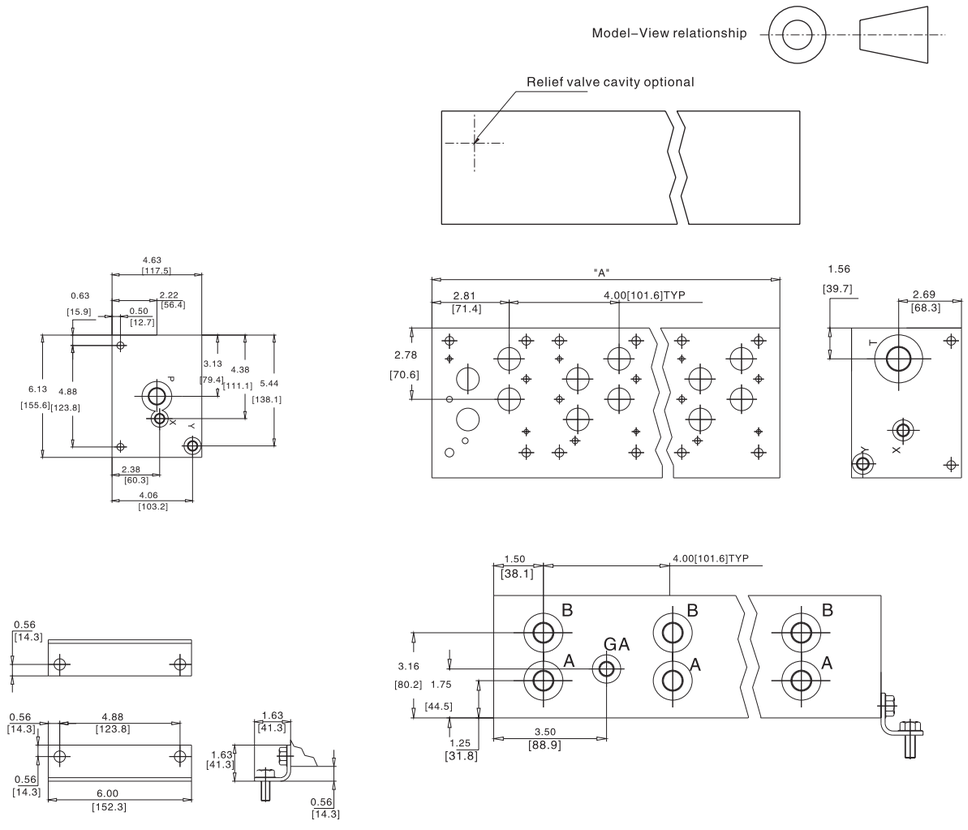
Port Threads		P, A, B	T	Y	GA
P	NPT(Z)	0.75	1	0.38	0.25
S	SAE	–12	–16	–6	–6
B	BSP(G)	0.75	1	0.38	None
M	M	M27x2	M33x2	M14x1.5	None

Code symbol



HOYEA

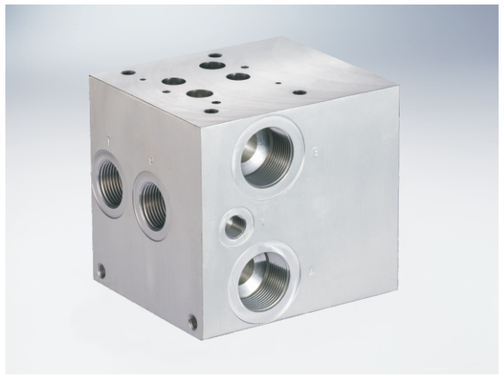
External dimensions



Port code	Valve mtg	Manifold mtg
P,S	0.38–16 UNCx1.00[25]DP 0.25–20 UNCx0.75[19]DP	0.50–13UNCx 0.88[22.3]DP
B,M	M10 ISO 6Hx1.00[25]DP M6 ISO 6Hx0.75[19]DP	M12 ISO 6Hx 0.88[22.3]DP

No. of stations	02	03	04
No. of stations	8.0	12	16.00
	[203.2]	[304.8]	[406.4]
apx. Weight alum (KG)	14	22	30
	[6]	[10]	[14]
apx. Weight ferrous (KG)	46	69	90
	[21]	[31]	[41]

D08 Standard Flow Parallel Manifold



Ordering information

HY* D08 P * 5 * / * / 10

A Aluminum 7A04 max. working pressure 20.7Mpa
D Ductile Iron 45# max. working pressure 31.5Mpa

Valve Pattern 08 NS 25

Parallel Circuit Standard Flow

No. of Stations
01~07

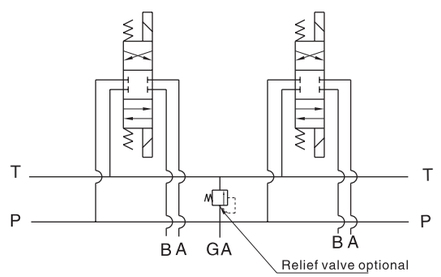
Valve Spacing
5.25 inch [133.4 mm]

Serial number

Omit	cavities not required
C	One Common cavity: C–10–2 (P in nose)
S	One Sun Cavity: T–3A (P in nose)

Port Threads		P, A, B	T	Y	GA
P	NPT(Z)	1	1.25	0.38	0.25
S	SAE	–16	–20	–8	–6
B	BSP(G)	1	1.25	0.38	None
M	M	M33x2	M42x2	M14x1.5	None

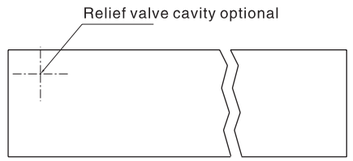
Code symbol

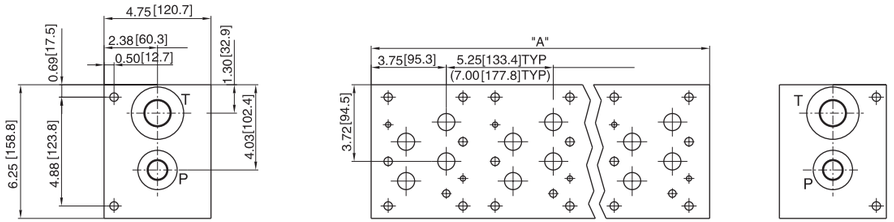


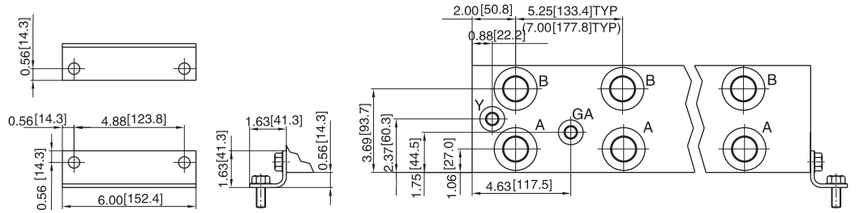
D08 Standard Flow Parallel Manifold

HOYEA

External dimensions





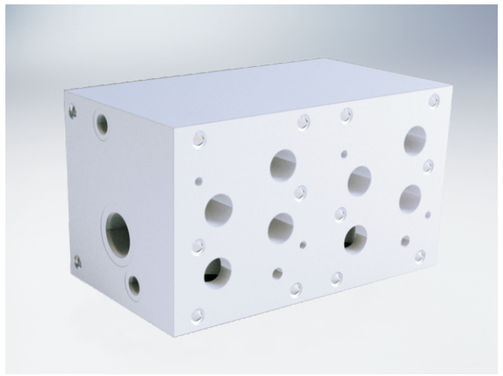


Port code	Valve mtg	Manifold mtg
P,S	0.50–13 UNCx1.19[30]DP	0.50–13 UNCx 0.88[22.3]DP
B,M	M12 ISO 6Hx1.19[30]DP	M12 ISO 6Hx 0.88[22.3]DP

No. of stations	* 01	02	03	04	05	06	07
"A" length inch (mm)	5.25	10.50	15.75	21.00	26.25	31.50	36.75
	[133.4]	[266.7]	[400.1]	[533.4]	[666.8]	[800.1]	[933.5]
apx. Weight alum (KG)	12	24	35	49	61	75	89
	[5]	[11]	[16]	[22]	[28]	[34]	[40]
apx. Weight ferrous (KG)	45	90	136	181	226	271	356
	[20]	[41]	[62]	[82]	[103]	[123]	[162]

* Gauge port not available on 01 station

D08 Series Circuit Manifold



Ordering information

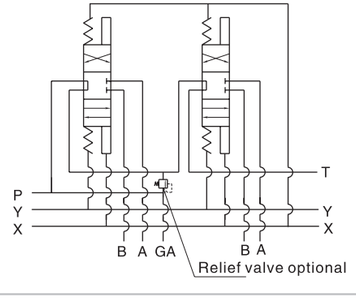
HY* D08 S * * * / * / 10

- A Aluminum 7A04 max. working pressure 20.7Mpa
  D Ductile Iron 45# max. working pressure 31.5Mpa
- Valve Pattern 08 NS 25
- Parallel Circuit Standard Flow
- No. of Stations
  02~03
- Valve Spacing
  4 inch [101.6 mm]
- Serial number

Omit	cavities not required
C	One Common cavity: C-10-2 (P in nose)
S	One Sun Cavity: T-3A (P in nose)

Port Threads		P, A, B	T	Y	GA
P	NPT(Z)	1	1.25	0.38	0.25
S	SAE	-16	-20	-8	-6
B	BSP(G)	1	1.25	0.38	None
M	M	M33x2	M42x2	M14x1.5	None

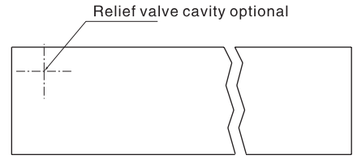
Code symbol

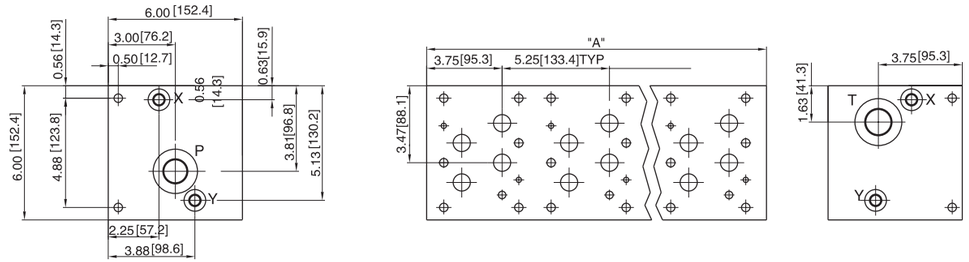


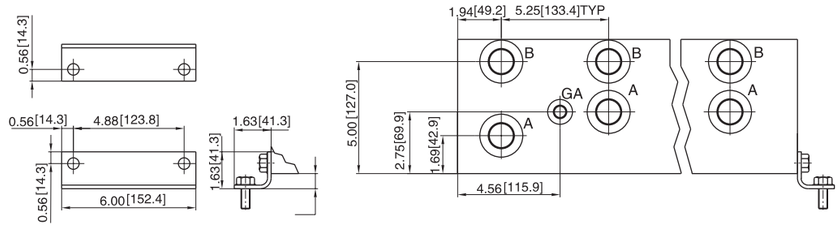
D08 Series Circuit Manifold

HOYEA

External dimensions



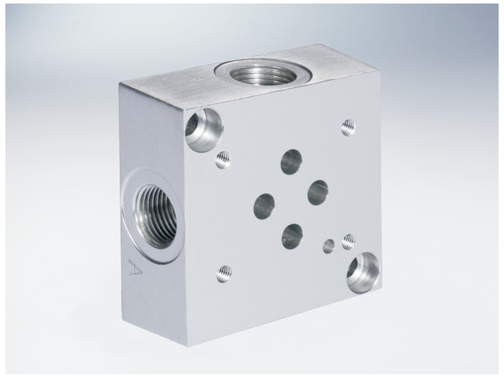




Port code	Valve mounting thread	Manifold mounting thread
P,S	0.50-13 UNCx1.19[30]DP	0.50-13 UNCx 0.88[22.3]DP
B,M	M12 ISO 6Hx1.19[30]DP	M12 ISO 6Hx 0.88[22.3]DP

No. of stations	02	03
"A" length inch (mm)	10.50	15.75
	[266.7]	[400.1]
apx. Weight alum (KG)	24	35
	[11]	[16]
apx. Weight ferrous (KG)	90	136
	[41]	[62]

D03 Subplates



Ordering information

HY* D03 SP * * / 10

A Aluminum 7A04 max. working pressure 20.7Mpa
D Ductile Iron 45# max. working pressure 31.5Mpa

Valve Pattern 03 NG 6

Product Type: Subplate

Port Location
S Side ported
B Back ported

Serial number

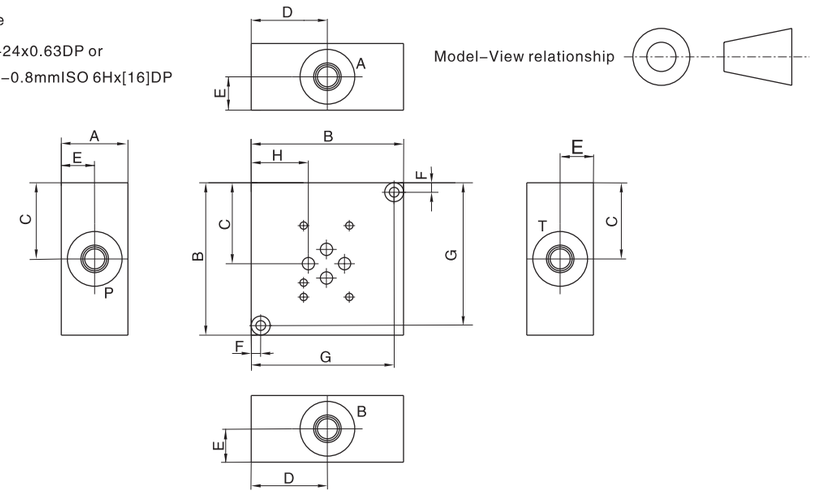
Port Threads					
4P	1/4"NPT(Z)				
6P	3/8"NPT(Z)	8P	1/2"NPT(Z)	12P	3/4"NPT(Z)
6S	SAE-6	8S	SAE-8	12S	SAE-12
6B	3/8"BSP(G)	8B	1/2"BSP(G)	12B	3/4"BSP(G)
6M	M14X1.5	8M	M18X1.5	12M	M27X2

D03 Subplates

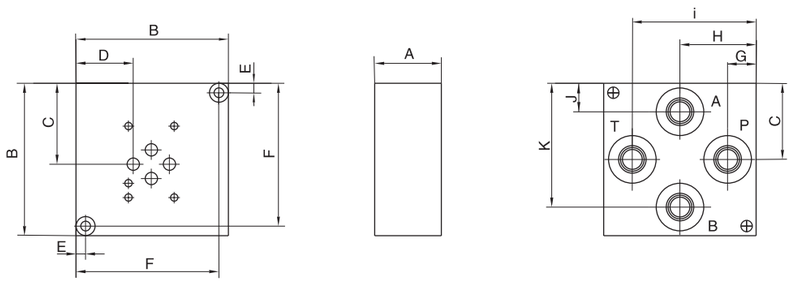
External dimensions

Side Ported Subplate
Valve mtg: UNC#10-24x0.63DP or
Metric M5-0.8mmISO 6Hx[16]DP

Model-View relationship

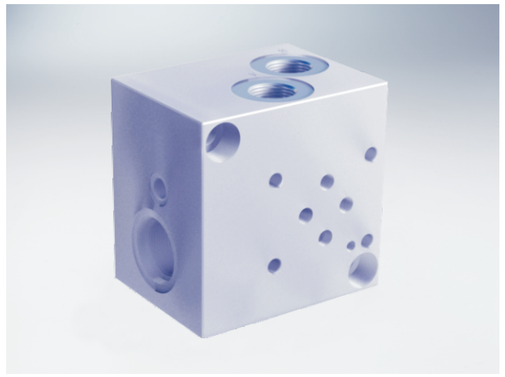


Dimension	A	B	C	D	E	F	G	H
*D03SPS4P *D03SPS6*	1.00	2.50	1.31	1.25	0.50	0.25	2.25	0.88
	[25.4]	[63.5]	[33.3]	[31.8]	[12.7]	[6.4]	[57.2]	[22.4]
D03SPS8	1.50	3.50	1.81	1.78	0.75	0.25	3.25	1.38
	[38.1]	[88.9]	[46.0]	[45.2]	[19.1]	[6.4]	[82.6]	[34.9]
D03SPS12	1.75	4.00	2.06	2.03	0.88	0.38	3.63	1.63
	[44.5]	[101.6]	[52.4]	[51.6]	[22.4]	[9.5]	[92.1]	[41.3]



Dimension	A	B	C	D	E	F	G	H	I	J	K
*D03SPB4P	1.00	2.50	1.31	0.88	0.25	2.25	0.66	1.28	1.91	0.75	1.88
	[25.4]	[63.5]	[33.3]	[22.4]	[6.4]	[57.2]	[16.7]	[32.5]	[48.4]	[19.1]	[47.6]
*D03SPB6B	1.00	2.50	1.25	0.84	0.25	2.25	0.51	1.25	1.98	0.52	1.97
	[25.4]	[63.5]	[31.8]	[21.4]	[6.4]	[57.2]	[13.0]	[31.8]	[50.4]	[13.2]	[50.0]
*D03SPB6[M,P,S,T]	1.00	2.50	1.31	0.88	0.25	2.25	0.59	1.28	1.97	0.69	1.94
	[25.4]	[63.5]	[33.3]	[22.4]	[6.4]	[57.2]	[15.1]	[32.5]	[50.0]	[17.5]	[49.2]
D03SPB8	1.50	3.50	1.81	1.38	0.25	3.25	0.69	1.78	2.81	0.75	2.81
	[38.1]	[88.9]	[46.0]	[34.9]	[6.4]	[82.6]	[17.5]	[45.2]	[71.4]	[19.1]	[71.4]
D03SPB12	1.50	4.50	2.31	1.88	0.38	4.13	0.94	2.28	3.56	0.94	3.56
	[38.1]	[114.3]	[58.8]	[47.6]	[9.5]	[104.8]	[23.8]	[57.9]	[90.5]	[23.8]	[90.5]

D03 Subplates With Relief Cavirty



Ordering information

HY* D03 SP * * * / 10

A Aluminum 7A04 max. working pressure 20.7Mpa
D Ductile Iron 45# max. working pressure 31.5Mpa

Valve Pattern 03 NG 6

Subplate

RV Main Relief P to T

Serial number

Port Threads					
6P	3/8"NPT(Z)	8P	1/2"NPT(Z)	12P	3/4"NPT(Z)
6S	SAE–6	8S	SAE–8	12S	SAE–12
6B	3/8"BSP(G)	8B	1/2"BSP(G)	12B	3/4"BSP(G)
6M	M14X1.5	8M	M18X1.5	12M	M27X2

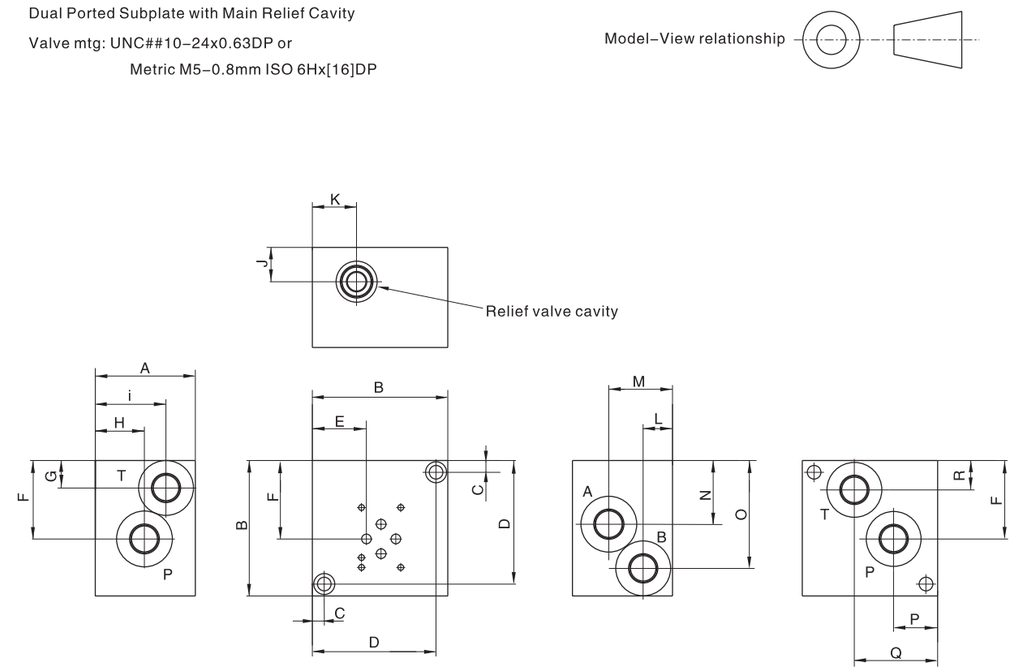
Relief Cavity	
C	Common cavity: C–10–2 (P in nose)
S	Sun cavity: T–10A (P in nose)

HOYEA

External dimensions

Dual Ported Subplate with Main Relief Cavity
Valve mtg: UNC##10–24x0.63DP or
Metric M5–0.8mm ISO 6Hx[16]DP

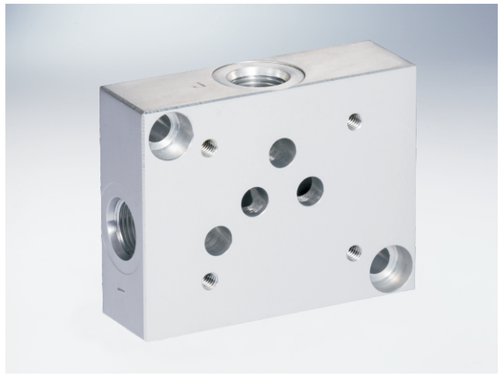
Model–View relationship



Dimension	A	B	C	D	E	F	G	H	I
*D03SPRV*6*	2.25	3.00	0.31	2.69	0.97	2.00	0.69	1.66	1.66
	[57.2]	[76.2]	[7.9]	[68.3]	[24.6]	[50.8]	[17.5]	[42.1]	[42.1]
*D03SPRV*8*	3.00	3.50	0.38	3.12	1.34	2.19	0.81	1.50	2.00
	[76.2]	[88.9]	[9.5]	[79.4]	[34.1]	[55.6]	[20.6]	[38.1]	[50.8]
*D03SPRV*12*	3.00	4.00	0.38	3.63	1.59	2.38	0.84	1.50	2.13
	[76.2]	[101.6]	[9.5]	[92.1]	[40.5]	[60.3]	[21.4]	[38.1]	[54.0]

Dimension	J	K	L	M	N	O	P	Q	R
*D03SPRV*6*	0.88	0.84	0.88	1.63	1.53	2.37	0.97	1.69	0.69
	[22.4]	[21.3]	[22.4]	[41.3]	[38.9]	[60.2]	[24.6]	[42.9]	[17.5]
*D03SPRV*8*	1.00	1.09	0.84	1.91	1.72	2.53	1.09	2.25	0.81
	[25.4]	[22.8]	[21.4]	[48.4]	[43.6]	[64.3]	[22.8]	[57.2]	[20.6]
*D03SPRV*12*	1.00	1.34	0.84	1.91	1.91	3.19	1.34	2.50	0.88
	[25.4]	[34.1]	[21.4]	[48.4]	[48.4]	[81.0]	[34.1]	[63.5]	[22.2]

D05 Subplates



Ordering information

HY* D05 SP * * / 10

A Aluminum 7A04 max. working pressure 20.7Mpa
D Ductile Iron 45# max. working pressure 31.5Mpa

Valve Pattern 05 NG 10

Subplate

Port Location
S Side ported
B Back Ported

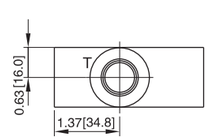
Serial number

Port Threads	
6P	3/8"NPT(Z)
8P	1/2"NPT(Z)
8S	SAE–8
8B	1/2"BSP(G)
8M	M18X1.5

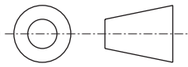
D05 Subplates

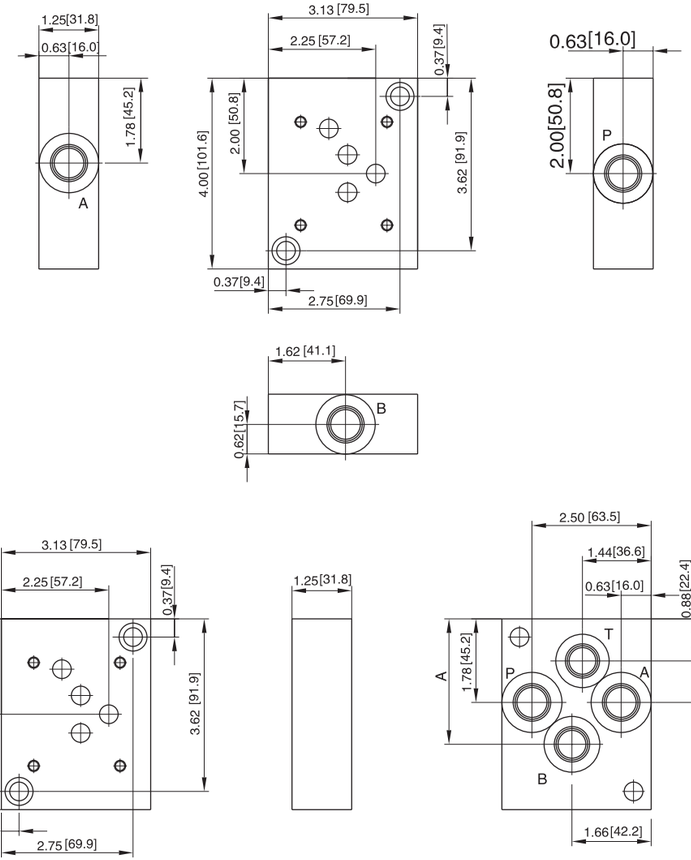
External dimensions

Back Ported Subplate
Valve mtg:UNC 0.25–20x0.75DP or
Metric M6–1.0mm ISO 6Hx[19.1]DP



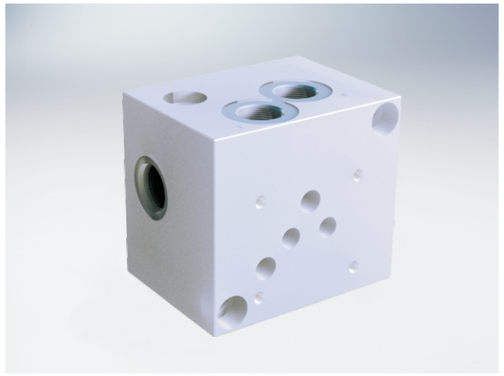
Model–View relationship





Dimension	A	B
*D05SPB6P	2.63	1.75
	[66.8]	[44.5]
*D05SPB8B	2.94	2.00
	[74.6]	[50.8]
*D05SPB8[M,P,S,T]	2.63	1.75
	[66.8]	[44.5]

D05 Subplates With Relief Cavity



Ordering information

HY* D05 SP * * * / 10

Serial number

A Aluminum 7A04 max. working pressure 20.7Mpa
D Ductile Iron 45# max. working pressure 31.5Mpa

Port Threads	
8P	1/2"NPT(Z)
8S	SAE–8
8B	1/2"BSP(G)
8M	M18X1.5

Valve Pattern 05 NG 10

Subplate

Relief Cavity	
C	Common cavity: C–10–2 (P in nose)
S	Sun cavity: T–10A (P in nose)

RV Main Relief P to T

D05 Subplates With Relief Cavity

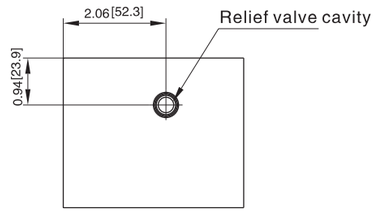
HOYEA

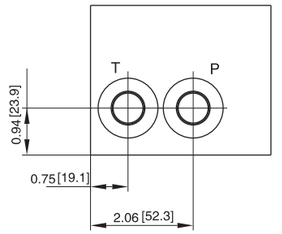
External dimensions

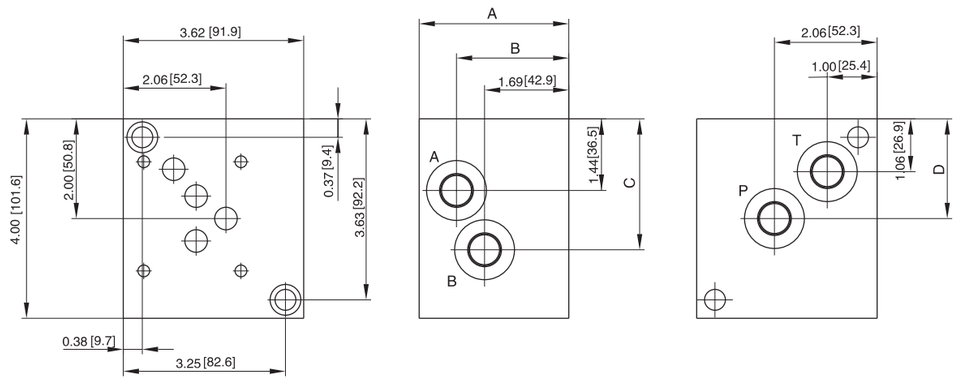
Dual Ported Subplate with Main Relief Cavity

Valve mtg: UNC 0.25–20x0.75DP or
Metric M6–1.0mm ISO 6Hx[19.1]DP

Model–View relationship

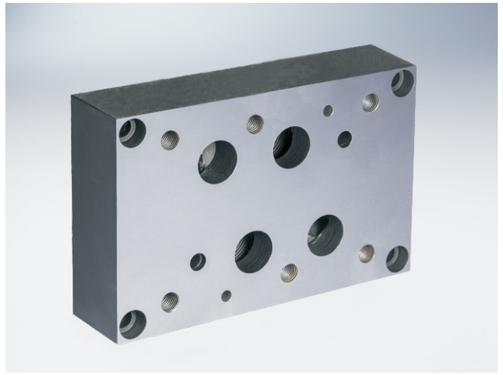






Dimension	A	B	C	D
*D05SPRVC8B	3.00	2.25	2.63	2.00
	[76.2]	[57.2]	[66.7]	[50.8]
*D05SPRVS8B	3.00	2.25	2.63	2.06
	[76.2]	[57.2]	[66.7]	[52.4]
*D05SPRV*8[M,P,S,T]	2.50	1.69	2.56	2.00
	[63.5]	[42.9]	[65.1]	[50.8]

D07 Subplates



Ordering information

HY* D07 SP * * / 10

A Aluminum 7A04 max. working pressure 20.7Mpa
D Ductile Iron 45# max. working pressure 31.5Mpa

Valve Pattern 07 NG 16

Subplate

Port Location
SO Side ported
B Back ported

Serial number

P,A,B,T Port Threads				X & Y port size
12P	3/4"NPT(Z)	16P	1"NPT(Z)	1/4"NPT(Z)
12S	SAE–12	16S	SAE–16	SAE–6
12B	3/4"BSP(G)	16B	1"BSP(G)	1/4"BSP(G)
12M	M27X2	16M	M33X2	M14X1.5

External dimensions

Dimension	A	B	C	D	E	F	G	H	I
D07SPSO12	1.75	3.75	4.75	2.34	0.38	4.38	1.88	2.69	0.81
	[44.5]	[95.3]	[120.7]	[59.4]	[9.5]	[111.3]	[47.8]	[68.3]	[20.6]
D07SPST12	1.75	3.75	4.75	2.34	0.38	4.38	1.88	2.69	0.81
	[44.5]	[95.3]	[120.7]	[59.4]	[9.5]	[111.3]	[47.8]	[68.3]	[20.6]
D07SPSO16	3.00	5.00	5.50	2.97	0.50	5.00	2.50	3.31	1.19
	[76.2]	[127.0]	[139.7]	[75.4]	[12.7]	[127.0]	[63.5]	[84.2]	[30.2]
*D07SPB12B	1.50	4.00	4.75	2.34	0.38	4.37	2.00	2.81	1.09
	[38.1]	[101.6]	[120.7]	[59.4]	[9.5]	[111.0]	[50.8]	[71.4]	[27.7]
*D07SPB12[M,P,S,T]	1.50	4.00	4.75	2.34	0.38	4.37	2.00	2.81	1.09
	[38.1]	[101.6]	[120.7]	[59.4]	[9.5]	[111.0]	[50.8]	[71.4]	[27.7]
D07SPB16	2.75	5.00	6.00	2.97	0.50	5.50	2.50	3.31	1.25
	[69.9]	[101.6]	[152.4]	[75.4]	[12.7]	[139.7]	[63.5]	[84.2]	[31.8]

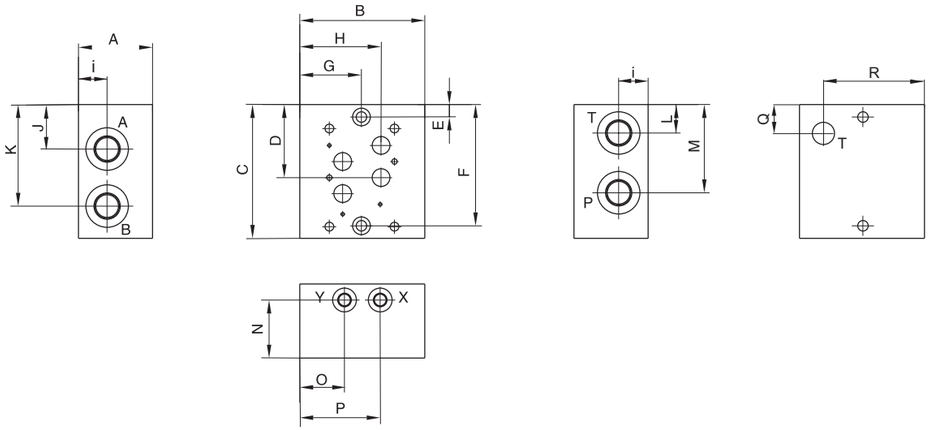
D07 Subplates

External dimensions

Side Ported Subplate

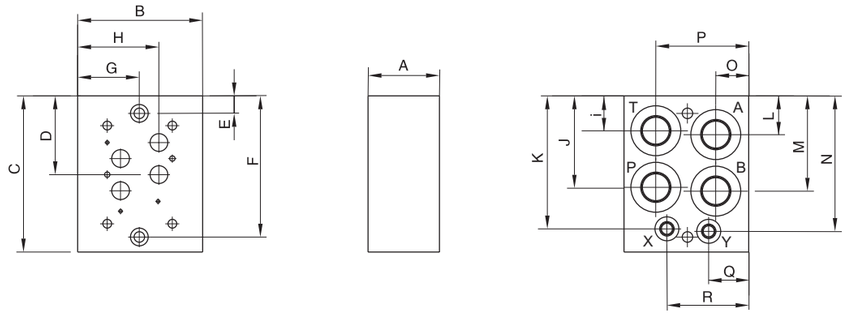
Valve mtg: UNC 0.25–20x0.75DP and UNC 0.38–16x1.00DP or
Metric M6–1.0mm ISO 6Hx[19.1]DP and M10–1.5mm ISO 6Hx[25.4]DP

Model–View relationship



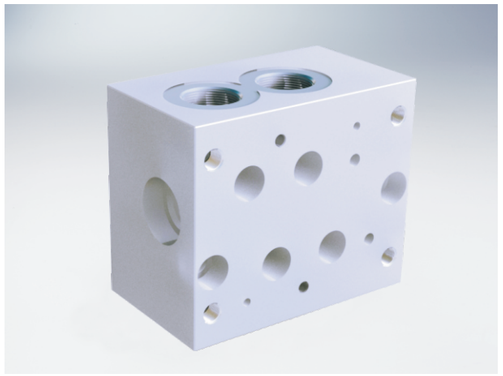
Back Ported Subplate

Valve mtg: UNC 0.25–20x0.75DP and UNC 0.38–16x1.00DP or
Metric M6–1.0mm ISO 6Hx[19.1]DP and M10–1.5mm ISO 6Hx[25.4]DP



Dimension	J	K	L	M	N	O	P	Q	R
D07SPSO12	1.50	3.13	1.19	2.78	1.25	1.12	2.62	––	––
	[38.1]	[79.5]	[30.2]	[70.6]	[31.8]	[28.4]	[66.5]	––	––
D07SPST12	1.50	3.13	––	2.78	1.25	1.12	2.62	1.09	2.69
	[38.1]	[79.5]	––	[70.6]	[31.8]	[28.4]	[66.5]	[27.7]	[68.3]
D07SPSO16	1.81	4.13	1.19	3.50	2.38	1.75	3.25	––	––
	[46.0]	[104.8]	[30.2]	[88.9]	[60.3]	[44.5]	[82.6]	––	––
*D07SPB12B	2.75	4.00	1.19	2.81	4.09	1.13	2.94	1.13	2.94
	[69.9]	[101.6]	[30.2]	[71.4]	[103.9]	[28.7]	[74.7]	[28.7]	[74.7]
*D07SPB12[M,P,S,T]	2.81	4.00	1.25	2.91	4.09	1.13	2.94	1.13	2.94
	[71.4]	[101.6]	[31.8]	[73.9]	[103.9]	[28.7]	[74.7]	[28.7]	[74.7]
D07SPB16	3.50	5.31	1.38	3.63	5.31	1.38	3.63	1.63	3.44
	[88.9]	[134.9]	[34.9]	[92.1]	[134.9]	[34.9]	[92.1]	[41.3]	[87.3]

D07 Subplates With Relief Cavity



Ordering information

HY* D07 SP * * * / 10

- A Aluminum 7A04 max. working pressure 20.7Mpa
  D Ductile Iron 45# max. working pressure 31.5Mpa
- Valve Pattern 07 NG 16
- Subplate
- RV Main Relief P to T
- Serial number

P,A,B,T Port Threads				X & Y port size
12P	3/4"NPT(Z)	16P	1"NPT(Z)	1/4"NPT(Z)
12S	SAE–12	16S	SAE–16	SAE–6
12B	3/4"BSP(G)	16B	1"BSP(G)	1/4"BSP(G)
12M	M27X2	16M	M33X2	M14X1.5

Relief Cavity	
C	C–10–2 w/12* ports C–16–2 w/16* ports
S	T–3A w/12* ports T–16A w/16* ports

HOYEA

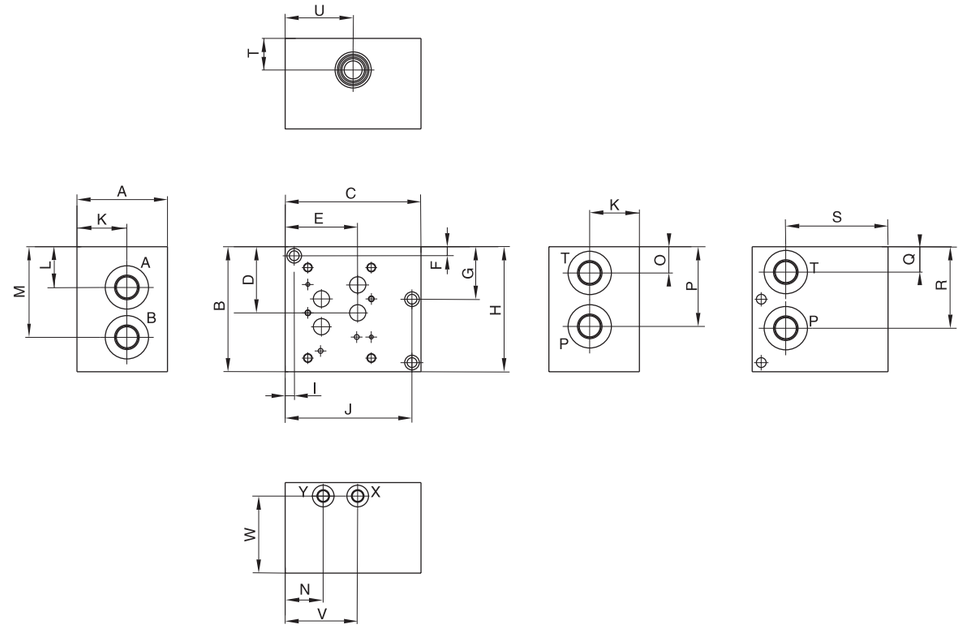
External dimensions

Dual Ported Subplate with Main Relief Cavity

Valve mtg: UNC 0.25–20x0.50DP and 0.38–16x0.75DP or

Metric M6–1.0mm ISO 6Hx[12.7]DP and M10–1.5mm ISO 6Hx[19.1]DP

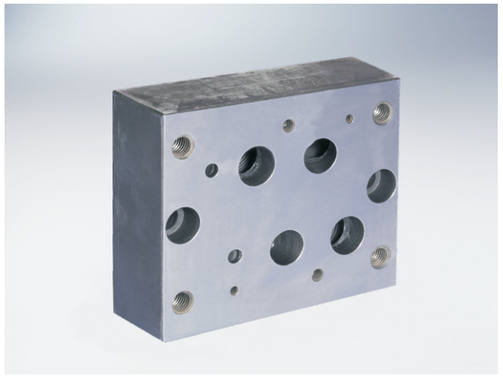
Model–View relationship



Dimension	A	B	C	D	E	F	G	H	I	J	K	L
D07SPRVC12	2.75	4.75	4.00	2.34	2.81	0.38	––	4.37	1.38	2.00	1.50	1.50
	[69.9]	[120.7]	[101.6]	[59.4]	[71.4]	[9.5]	––	[111.0]	[35.1]	[50.8]	[38.1]	[38.1]
D07SPRVS12	2.50	4.75	4.00	2.34	2.81	0.38	––	4.37	1.38	2.00	1.25	1.50
	[63.5]	[120.7]	[101.6]	[59.4]	[71.4]	[9.5]	––	[111.0]	[35.1]	[50.8]	[31.8]	[38.1]
D07SPRVC16	4.00	5.50	6.00	2.97	3.31	0.38	2.25	5.13	0.38	5.63	2.19	1.81
	[101.6]	[139.7]	[152.4]	[75.4]	[84.2]	[9.5]	[57.2]	[130.2]	[9.5]	[142.9]	[55.6]	[46.0]
D07SPRVS16	4.00	5.50	6.00	2.97	3.31	0.38	2.25	5.13	0.38	5.63	2.19	1.81
	[101.6]	[139.7]	[152.4]	[75.4]	[84.2]	[9.5]	[57.2]	[130.2]	[9.5]	[142.9]	[55.6]	[46.0]

Dimension	M	N	O	P	Q	R	S	T	U	V	W
D07SPRVC12	3.12	1.19	1.19	2.78	1.13	2.75	2.81	1.75	2.22	2.81	2.25
	[79.2]	[30.2]	[30.2]	[70.6]	[28.6]	[69.9]	[71.4]	[44.5]	[56.4]	[71.4]	[57.2]
D07SPRVS12	3.12	1.19	1.19	2.78	1.13	2.75	2.81	1.25	2.31	2.81	2.00
	[79.2]	[30.2]	[30.2]	[70.6]	[28.6]	[69.9]	[71.4]	[31.8]	[28.7]	[71.4]	[50.8]
D07SPRVC16	4.13	1.75	1.00	3.50	1.13	3.69	4.50	1.50	3.00	3.25	3.38
	[104.8]	[44.5]	[25.4]	[88.9]	[28.6]	[93.7]	[114.3]	[38.1]	[76.2]	[82.6]	[85.7]
D07SPRVS16	4.13	1.75	1.13	3.50	1.13	3.69	4.50	1.50	3.00	3.25	3.38
	[104.8]	[44.5]	[28.6]	[88.9]	[28.6]	[93.7]	[114.3]	[38.1]	[76.2]	[82.6]	[85.7]

D08 Subplates



Model description

HY* D08 SP * * / 10

- A Aluminum 7A04 max. working pressure 20.7Mpa
  D Ductile Iron 45# max. working pressure 31.5Mpa
- Valve Pattern 08 NS 25
- Subplate
- Port Location
  SO Side ported
  B Back ported
- Serial number

P,A,B,T Port Threads				X & Y port size
12P	3/4"NPT(Z)			1/4"NPT(Z)
16P	1"NPT(Z)	20P	1–1/4"NPT(Z)	1/4"NPT(Z)
16S	SAE–16	20S	SAE–20	SAE–6
16B	1"BSP(G)	20B	1–1/4"BSP(G)	1/4"BSP(G)
16M	M33X2	20M	M42X2	M14X1.5

External dimensions

Dimension	A	B	C	D	E	F	G	H	I	J	K
*D08SPSO12P, *D08SPSO16*	2.00	6.13	4.50	1.19	2.53	4.53	1.00	1.00	0.50	3.53	5.62
	[50.8]	[155.7]	[114.3]	[30.2]	[64.3]	[115.1]	[25.4]	[25.4]	[12.7]	[89.7]	[142.7]
*D08SPST12P, *D08SPST16*	2.00	6.13	4.50	1.19	2.53	4.53	1.00	1.00	0.50	3.53	5.62
	[50.8]	[155.7]	[114.3]	[30.2]	[64.3]	[115.1]	[25.4]	[25.4]	[12.7]	[89.7]	[142.7]
D08SPSO20	3.00	6.50	5.00	1.31	2.33	4.77	1.13	2.38	0.50	3.72	6.00
	[76.2]	[165.1]	[127.0]	[33.3]	[59.2]	[121.2]	[28.6]	[60.3]	[12.7]	[94.5]	[152.4]
*D08SPSO20M	4.00	6.50	5.00	1.38	2.33	4.77	1.63	3.13	0.50	3.72	6.00
	[101.6]	[165.1]	[127.0]	[34.9]	[59.2]	[121.2]	[41.3]	[79.4]	[12.7]	[94.5]	[152.4]
*D08SPB16B	1.50	6.13	4.63	0.50	3.53	5.62	2.31	3.44	––	1.19	1.19
	[38.1]	[155.7]	[117.6]	[12.7]	[89.7]	[142.7]	[58.7]	[87.4]	––	[30.2]	[30.2]
*D08SPB12P, *D08SPB16[M,P,S,T]	1.50	6.13	4.63	0.50	3.53	5.62	2.31	3.44	––	1.19	1.19
	[38.1]	[155.7]	[117.6]	[12.7]	[89.7]	[142.7]	[58.7]	[87.4]	––	[30.2]	[30.2]
D08SPB20	2.00	7.63	5.00	0.38	4.28	7.25	0.38	3.63	4.63	1.44	1.75
	[50.8]	[193.8]	[127.0]	[9.7]	[108.7]	[184.2]	[9.7]	[92.2]	[117.6]	[36.6]	[44.5]

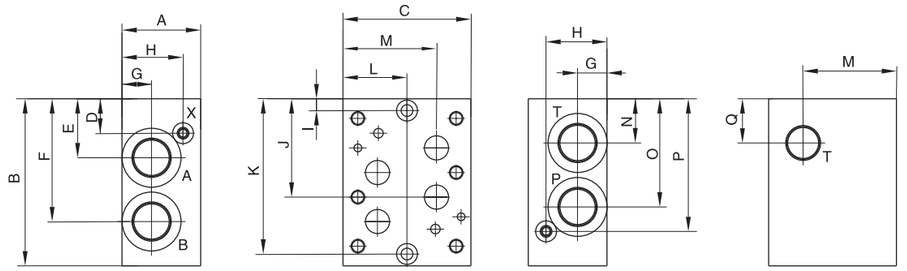
Dimension

HOYEA

External dimensions

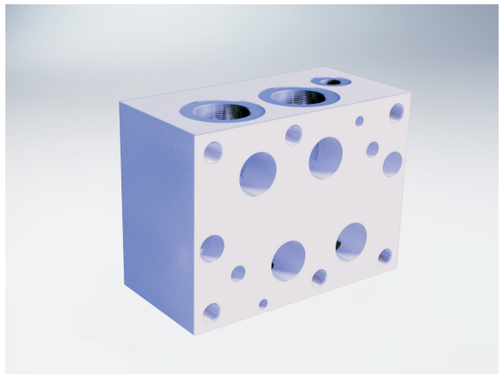
Side Ported Subplate
Valve mtg: UNC 0.50–13x1.19DP or
Metric M12–1.75mm ISO 6Hx[30.2]DP

Model–View relationship



Dimension	L	M	N	O	P	Q	R	S	T	U
*D08SPSO12P, *D08SPSO16*	2.25	3.38	1.56	3.59	4.94	––	––	––	––	––
	[57.2]	[85.9]	[39.7]	[91.2]	[125.5]	––	––	––	––	––
*D08SPST12P, *D08SPST16*	2.25	3.38	––	3.59	4.94	1.66	3.38	––	––	––
	[57.2]	[85.9]	––	[91.2]	[125.5]	[42.1]	[85.9]	––	––	––
D08SPSO20	2.50	3.63	1.73	4.17	5.19	––	––	––	––	––
	[63.5]	[92.2]	[43.9]	[105.9]	[131.8]	––	––	––	––	––
*D08SPSO20M	2.50	3.63	1.73	4.17	5.13	––	––	––	––	––
	[63.5]	[92.2]	[43.9]	[105.9]	[130.2]	––	––	––	––	––
*D08SPB16B	3.44	3.44	1.53	5.16	0.97	2.47	3.66	4.59	1.25	3.38
	[87.4]	[87.4]	[38.9]	[131.0]	[24.6]	[62.7]	[92.9]	[116.7]	[31.8]	[85.9]
*D08SPB12P, *D08SPB16[M,P,S,T]	3.44	3.44	1.66	4.94	1.19	2.59	3.53	4.47	1.25	3.38
	[87.4]	[87.4]	[42.2]	[125.5]	[30.2]	[65.8]	[89.7]	[113.5]	[31.8]	[85.9]
D08SPB20	3.25	3.56	1.84	6.00	1.63	3.31	4.31	5.78	1.44	3.56
	[82.6]	[90.4]	[46.7]	[152.4]	[41.3]	[84.1]	[109.5]	[146.8]	[36.6]	[90.4]

D08 Subplates With Relief Cavity



Model description

HY* D08 SP * * * / 10

A Aluminum 7A04 max. working pressure 20.7Mpa
D Ductile Iron 5# max. working pressure 31.5Mpa

Serial number

Valve Pattern 08 NS 25

Subplate

RV Main Relief P to T

P,A,B,T Port Threads				X &Y port size
16P	1"NPT(Z)	20P	1–1/4"NPT(Z)	1/4"NPT(Z)
16S	SAE–16	20S	SAE–20	SAE–6
16B	1"BSP(G)	20B	1–1/4"BSP(G)	1/4"BSP(G)
16M	M33X2	20M	M42X2	M14X1.5

Relief Cavity	
C	C–10–2 w/16* ports C–16–2 w/20* ports
S	T–3A w/16* ports T–16A w/20* ports

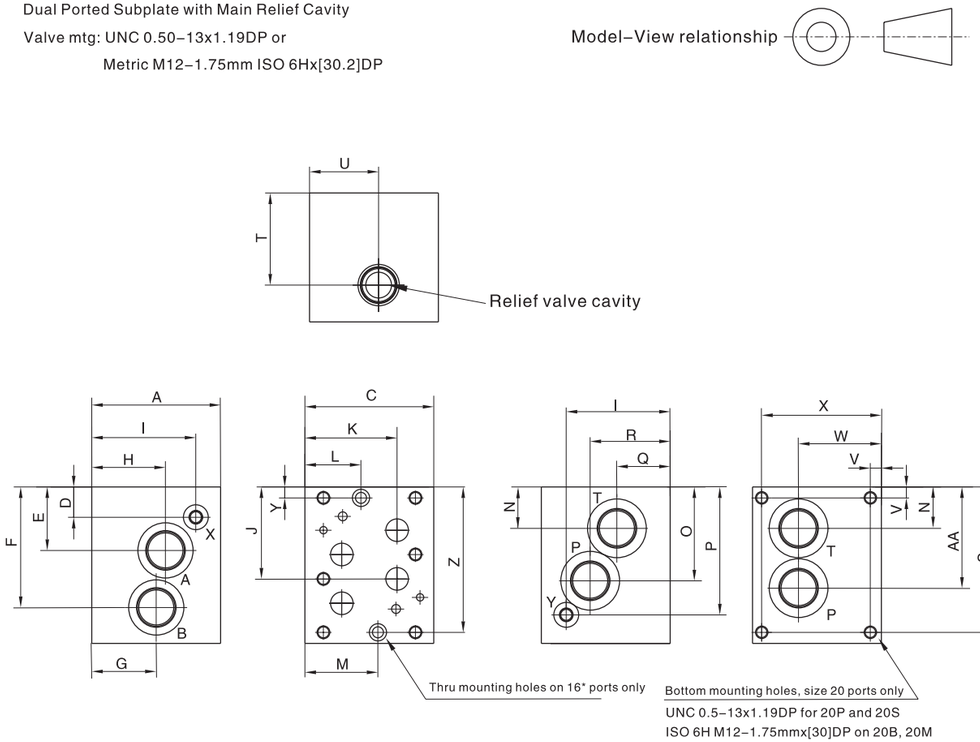
D08 Subplates With Relief Cavity

HOYEA

External dimensions

Dual Ported Subplate with Main Relief Cavity
Valve mtg: UNC 0.50–13x1.19DP or
Metric M12–1.75mm ISO 6Hx[30.2]DP

Model–View relationship



Dimension	A	B	C	D	E	F	G	H	I	J	K	L	M	N
D08SPRVC16	3.00	6.00	4.50	0.91	2.41	4.53	1.87	1.87	1.25	3.47	3.38	1.68	2.56	1.47
	[76.2]	[152.4]	[114.3]	[23.1]	[61.2]	[115.1]	[47.5]	[47.5]	[31.8]	[88.1]	[85.9]	[42.7]	[65.0]	[37.3]
D08SPRVS16	3.00	6.00	4.50	0.91	2.41	4.53	1.87	1.87	1.25	3.47	3.38	1.68	2.56	1.47
	[76.2]	[152.4]	[114.3]	[23.1]	[61.2]	[115.1]	[47.5]	[47.5]	[31.8]	[88.1]	[85.9]	[42.7]	[65.0]	[37.3]
D08SPRV20	4.88	6.00	4.88	1.19	2.41	4.69	2.75	2.75	4.00	3.47	3.56	––	––	1.59
	[124.0]	[152.4]	[124.0]	[30.2]	[61.2]	[119.1]	[69.9]	[69.9]	[101.6]	[88.1]	[90.4]	––	––	[40.4]
*D08SPRV*20M	4.88	6.00	4.88	1.19	2.41	4.69	2.00	2.75	4.00	3.47	3.56	––	––	1.59
	[124.0]	[152.4]	[124.0]	[30.2]	[61.2]	[119.1]	[50.8]	[69.9]	[101.6]	[88.1]	[90.4]	––	––	[40.4]

Dimension	O	P	Q	R	S	T	U	V	W	X	Y	Z	AA
D08SPRVC16	3.59	5.09	1.87	1.87	––	1.25	2.47	––	3.50	––	0.44	5.56	3.59
	[91.2]	[129.3]	[47.5]	[47.5]	––	[31.8]	[62.7]	––	[88.9]	––	[11.2]	[141.2]	[91.2]
D08SPRVS16	3.59	5.09	1.87	1.87	––	1.87	2.81	––	3.50	––	0.44	5.56	3.59
	[91.2]	[129.3]	[47.5]	[47.5]	––	[47.5]	[71.4]	––	[88.9]	––	[11.2]	[141.2]	[91.2]
D08SPRV20	3.60	4.88	2.00	3.00	5.56	3.50	2.63	0.44	3.13	4.44	––	––	3.84
	[91.4]	[124.0]	[50.8]	[76.2]	[141.2]	[88.9]	[66.7]	[11.2]	[79.5]	[112.8]	––	––	[97.6]
*D08SPRV*20M	4.00	4.88	2.00	2.38	5.56	3.50	2.63	0.44	3.13	4.44	––	––	4.00
	[101.6]	[124.0]	[50.8]	[60.3]	[141.2]	[88.9]	[66.7]	[11.2]	[79.5]	[112.8]	––	––	[101.6]