

MRV Modular Relief Valves



The valve can control flow for positive direction pass oil port. Big and small can be adjusted by handle. It passes to check valve for reverse flow.

Max.Pressure 21MPa
Max.Flow :
Size 02 up to 35L/min
Size 03 up to 70L/min

Ordering details

MRV	-02	-P	-3	-A
Sort	Size	Port number	Pressure adj.range MPa	Direction of knob
MRV: Modular Relief Valves	02	P: P port A: A port	1: 0.7-7.0 2: 3.5-14.0	A: A port side B: B port side
	03	B: B port	3: 7.0-21.0	standard type

Symbols

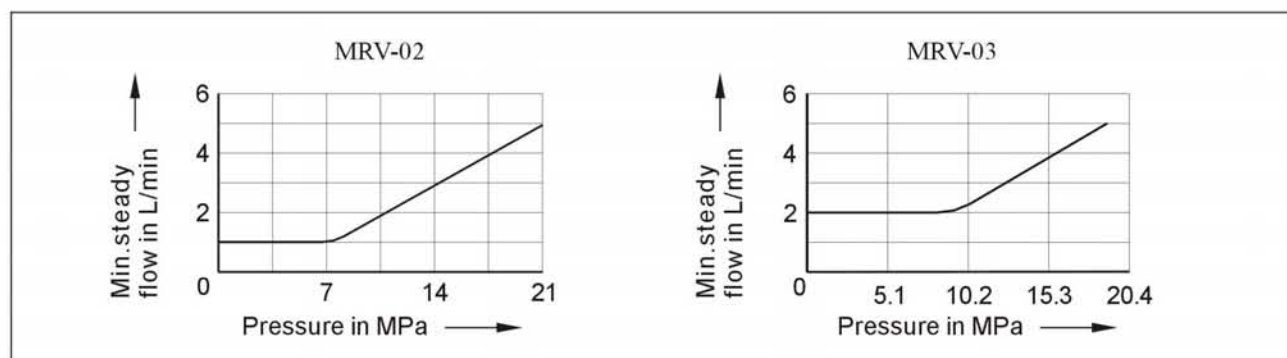
Type	MRV-※-P	MRV-※-A	MRV-※-B
Symbols			

Technical data

Type	Max.pressure MPa	Pressure adj.range MPa	Max.flow L/min	Weight Kg
MRV-02	21	See ordering details	35	1.2
MRV-03			70	2.7

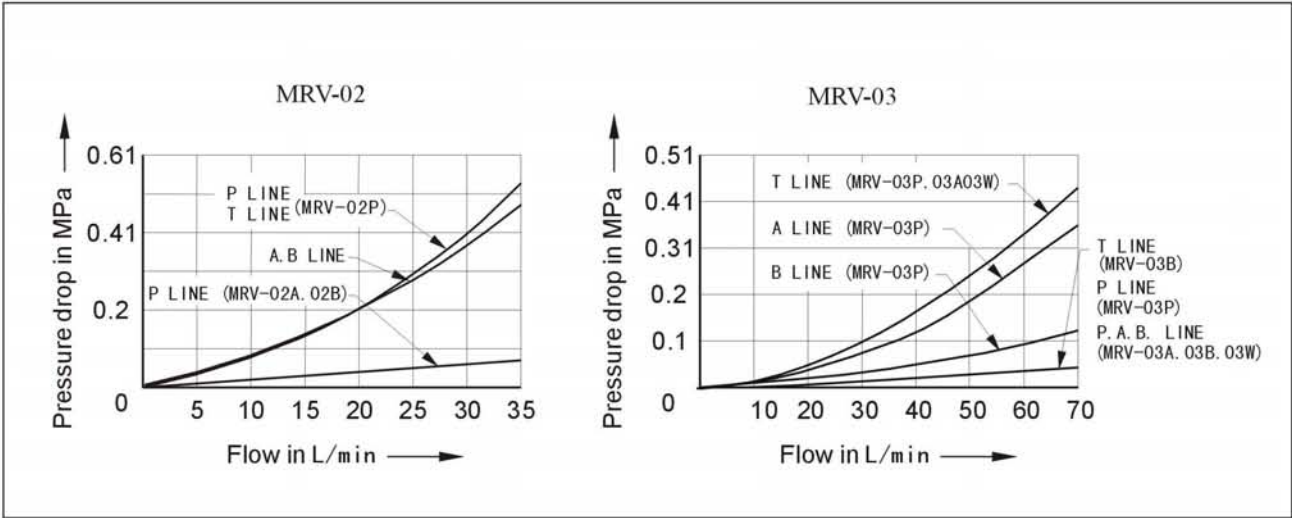
Characteristic Curves : Min.steady flow

(measured at $v=35\text{mm}^2/\text{s}$ and $t=50^\circ\text{C}$)



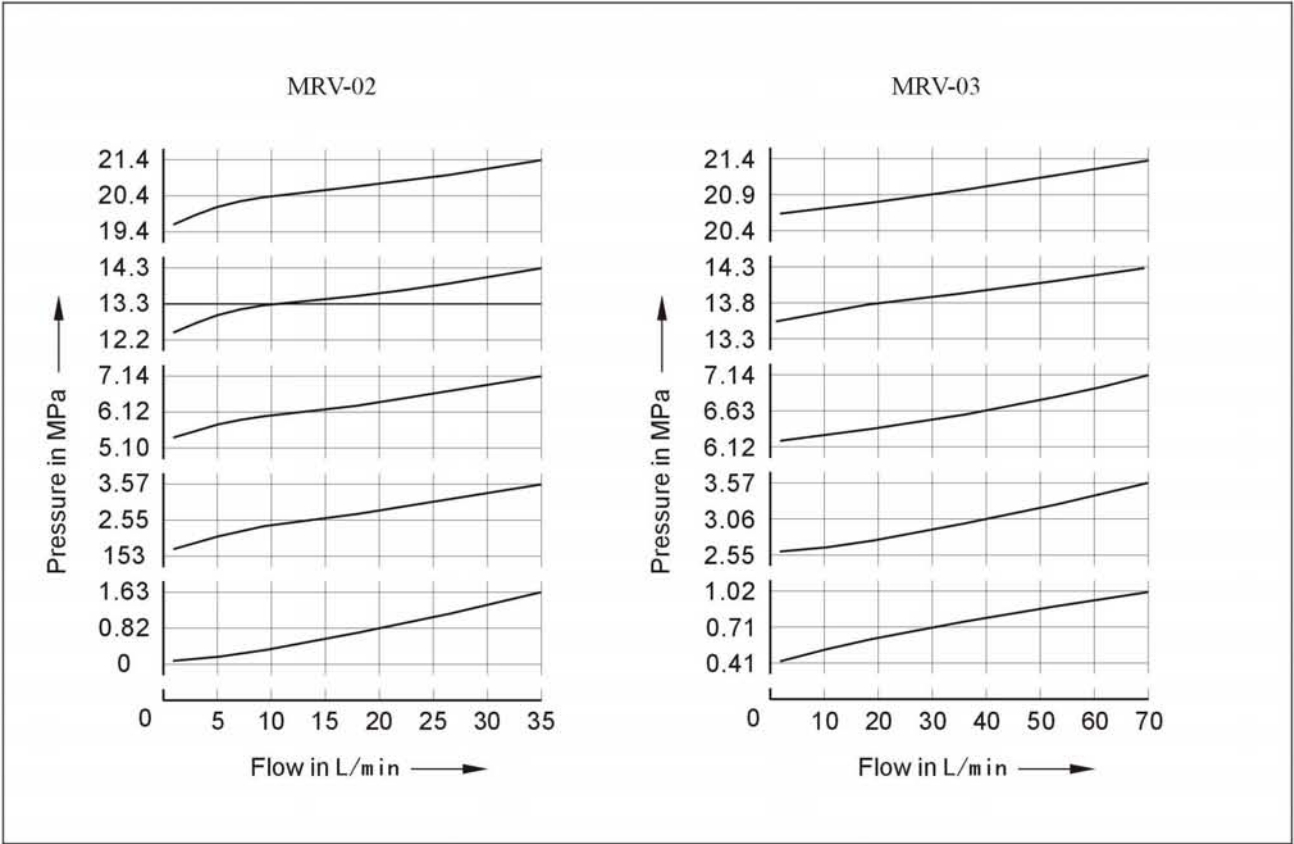
Characteristic Curves : Pressure drop

(measured at $v=35\text{mm}^2/\text{s}$ and $t=50^\circ\text{C}$)



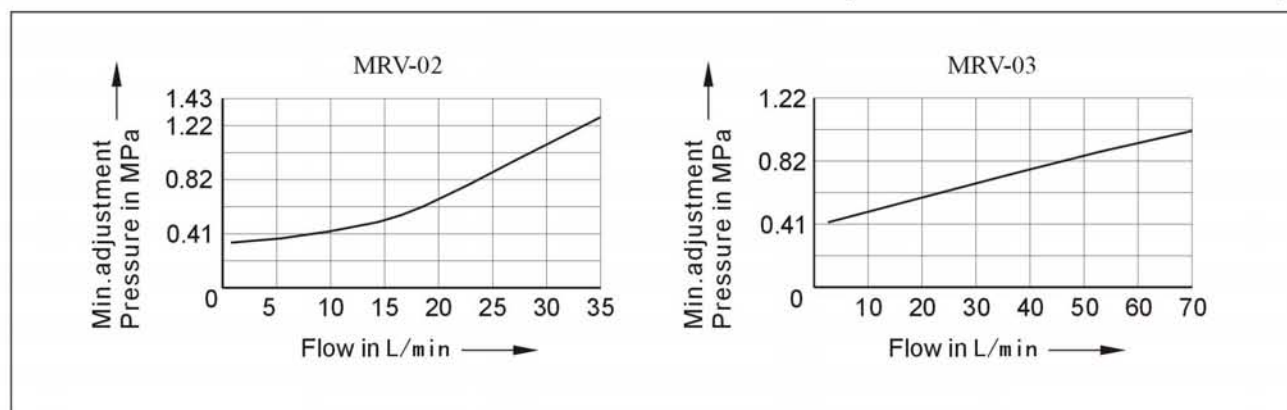
Characteristic Curves : Nominal override

(measured at $v=35\text{mm}^2/\text{s}$ and $t=50^\circ\text{C}$)



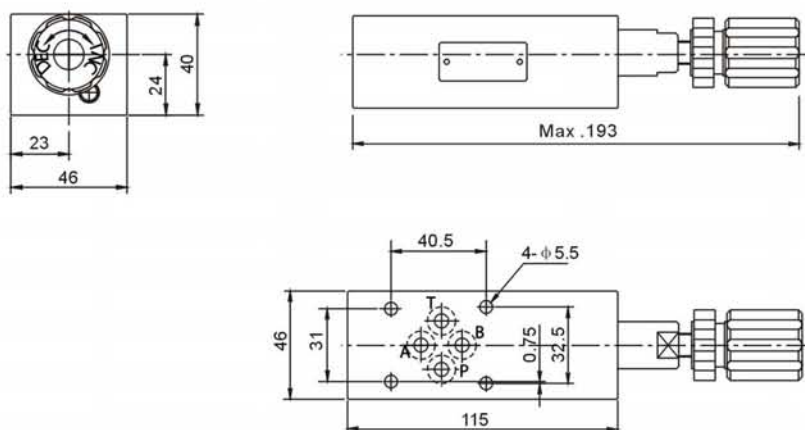
Characteristic Curves : Min.adj.pressure

(measured at $v=35\text{mm}^2/\text{s}$ and $t=50^\circ\text{C}$)

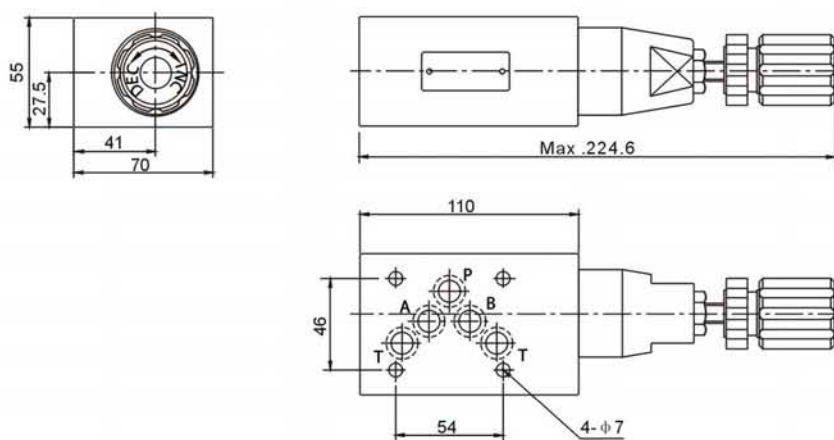


Installation dimensions

● MRV-02



● MRV-03



MBRV Modular Reducing Valves



The valve can reduce pressure valve of one return road in system.
There are three kinds pressure adjustment range.

Max.Pressure 21MPa
Max.Flow :
Size 02 up to 35L/min
Size 03 up to 50L/min

Ordering details

MBRV	-02	-P	-3	-A
Sort	Size	Port number	Pressure adj.range MPa	Direction of knob
MBRV: Modular Reducing Valves	02	P: P port A: A port	1: 0.7-7.0 2: 3.5-14.0	A: A port side B: B port side
	03	B: B port	3: 7.0-21.0	standard type

Symbols

Type	MBRV-※-P	MBRV-※-A	MBRV-※-B
Symbols			

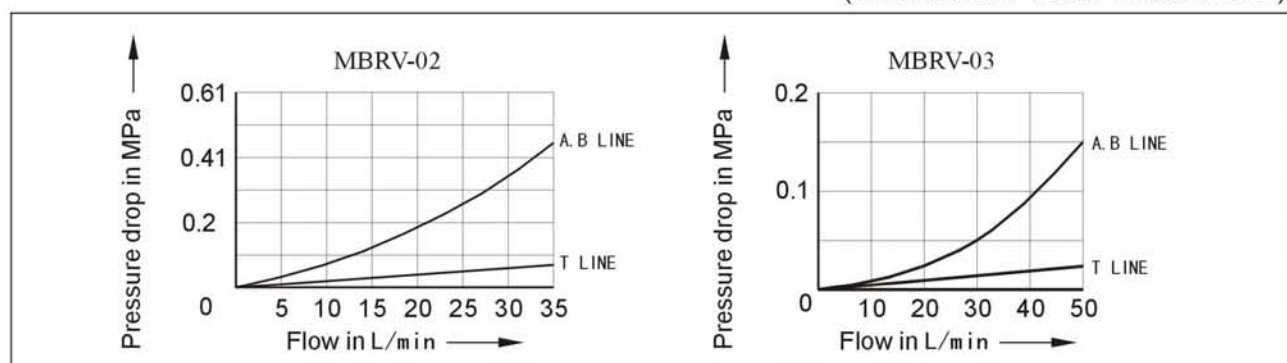
Technical data

Type	Max.pressure MPa	Pressure adj.range MPa	Max.flow L/min	Weight Kg
MBRV-02	21	See ordering details	35	1.3
MBRV-03			50	2.8

Note: If outlet port pressure is less than 1.5MPa and inlet port pressure more than 7MPa,max.flow must be limited 40L/min .

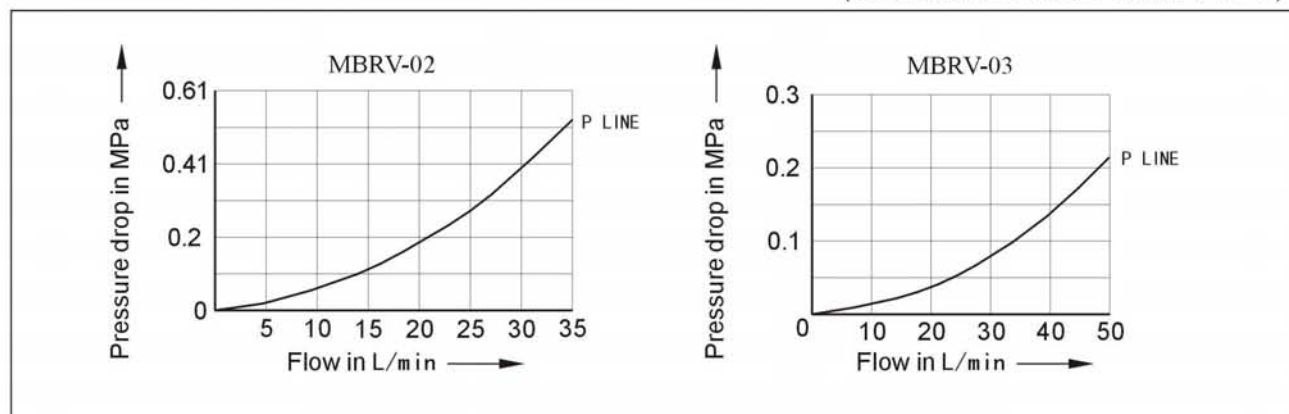
Characteristic Curves : Pressure drop

(measured at $v=35\text{mm}^2/\text{s}$ and $t=50^\circ\text{C}$)

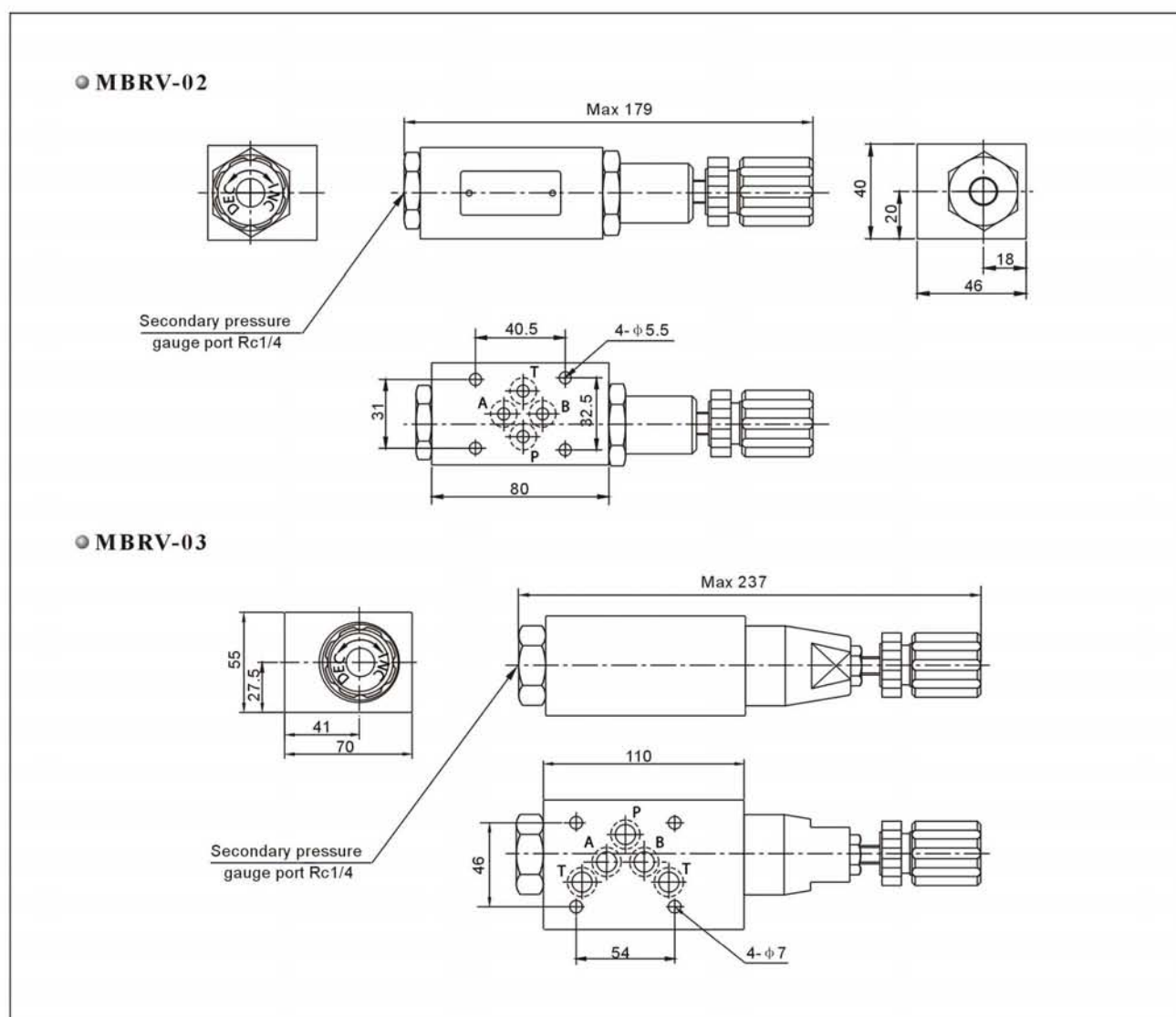


Characteristic Curves : Pressure drop

(measured at $v=35\text{mm}^2/\text{s}$ and $t=50^\circ\text{C}$)



Installation dimensions



MSCV Modular Counterbalance Valves



The valve can clear up impact which is caused by quick drop of performing componet because of gravity action. There are three kinds pressure adjustment range.

Max.Pressure 21MPa
Max.Flow :
Size 02 up to 35L/min
Size 03 up to 70L/min

Ordering details

MSCV	-02	-P	-3	-A
Sort	Size	Port number	Pressure adj.range MPa	Direction of knob
MSCV: Modular Counterbalance Valves	02	P: P port A: A port	1: 0.7-7.0 2: 3.5-14.0	A: A port side B: B port side standard type
	03	B: B port	3: 7.0-21.0	

Symbols

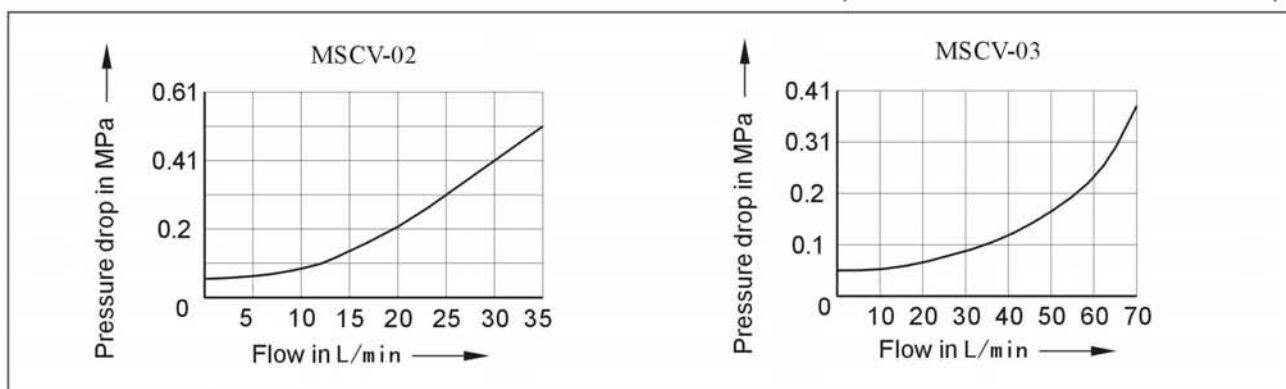
Type	MSCV-※-A	MSCV-※-B
Symbols		

Technical data

Type	Max.pressure MPa	Pressure adj.range MPa	Max.flow L/min	Weight Kg
MSCV-02	21	See ordering details	35	1.6
MSCV-03			70	4.0

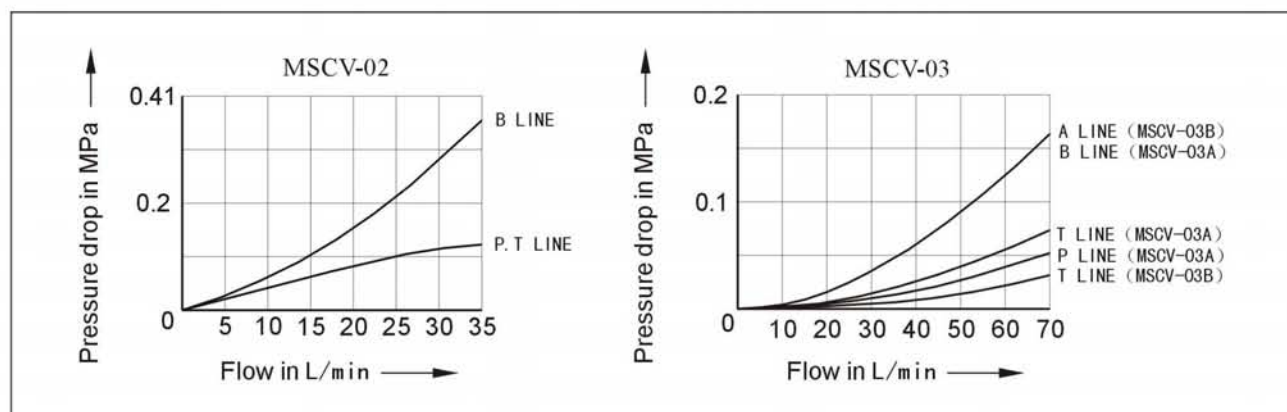
Characteristic Curves : Pressure drop for free flow

(measured at $v=35\text{mm}^2/\text{s}$ and $t=50^\circ\text{C}$)



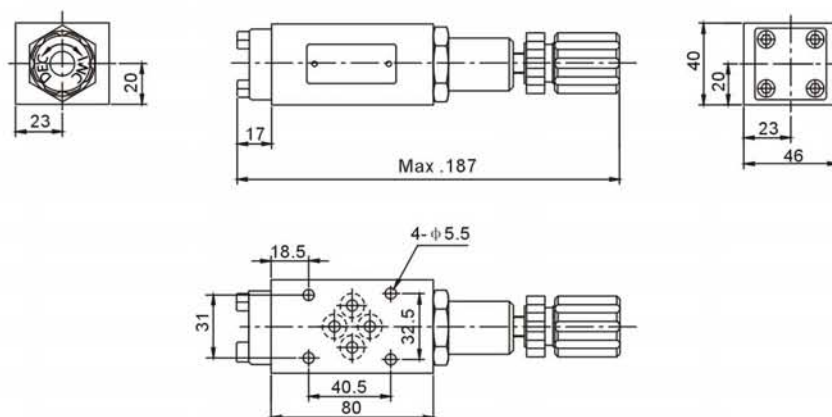
Characteristic Curves : Pressure drop

(measured at $v=35\text{mm}^2/\text{s}$ and $t=50^\circ\text{C}$)

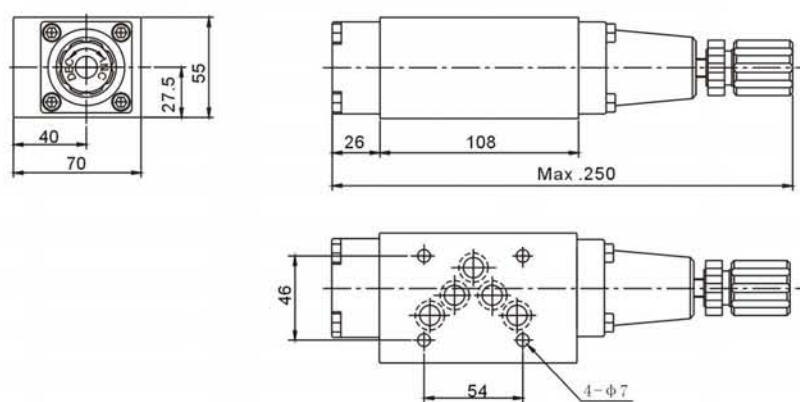


Installation dimensions

● MSCV-02



● MSCV-03



MTCV Module Throttle And Check Valves



The valve can control pressure value of one oil road in system.
Manifold pressure can be come trued by adjustment handle.

Max.Pressure 21MPa
Max.Flow :
Size 02 up to 35L/min
Size 03 up to 70L/min

Ordering details

MTCV	-02	-A	-O
Sort	Size	Port number	Control type
MTCV: Module Throttle And Check Valves	02	A: A port B: B port W: A、B port	O: Meter out I: Meter in
	03		

Symbols

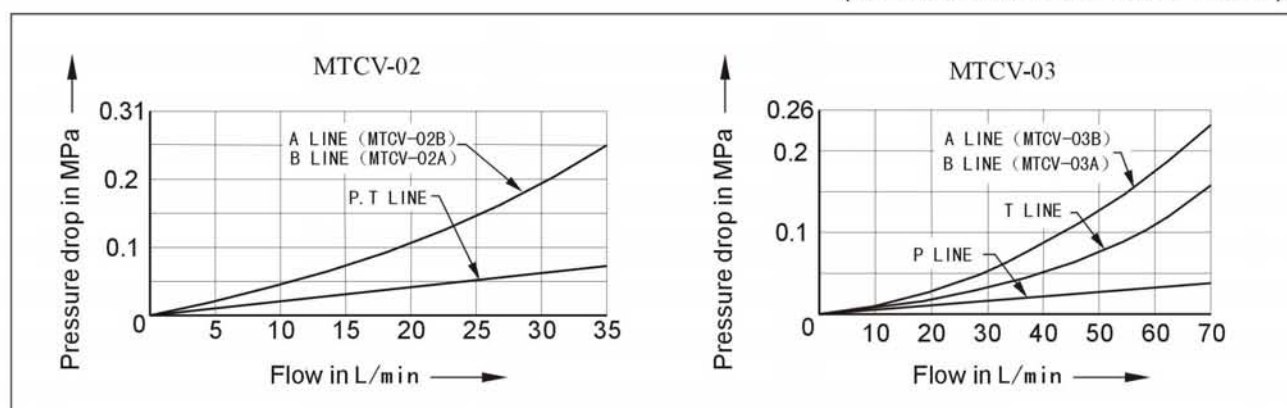
Type	MTCV-※-A-O	MTCV-※-B-I	MTCV-※-W-I
Meter out			
Type	MTCV-※-A-I	MTCV-※-B-O	MTCV-※-W-O
Meter in			

Technical data

Type	Max.pressure MPa	Max.flow L/min	Weight Kg
MTCV-02	21	35	1.3
MTCV-03		70	2.8

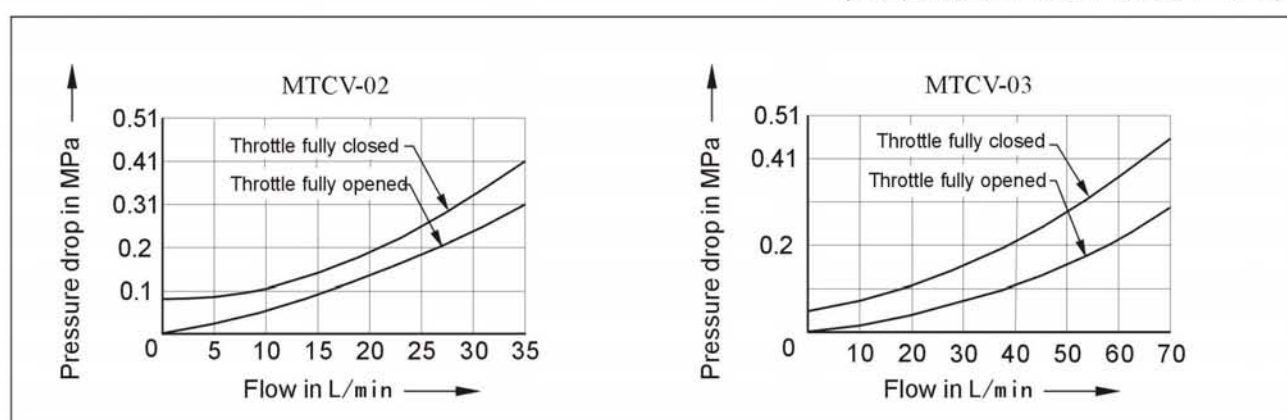
Characteristic Curves : Pressure drop

(measured at $v=35\text{mm}^2/\text{s}$ and $t=50^\circ\text{C}$)



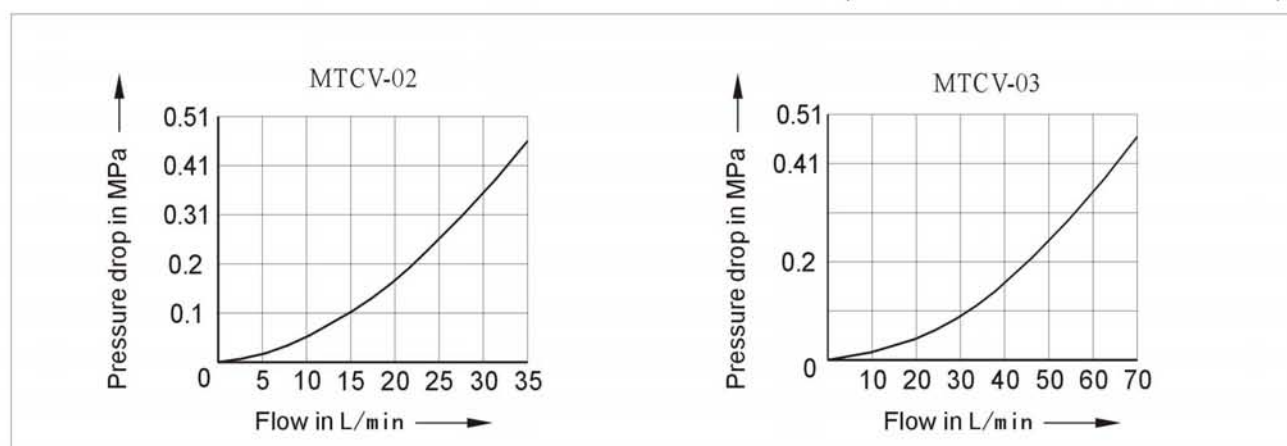
Characteristic Curves : Pressure drop for free flow

(measured at $v=35\text{mm}^2/\text{s}$ and $t=50^\circ\text{C}$)

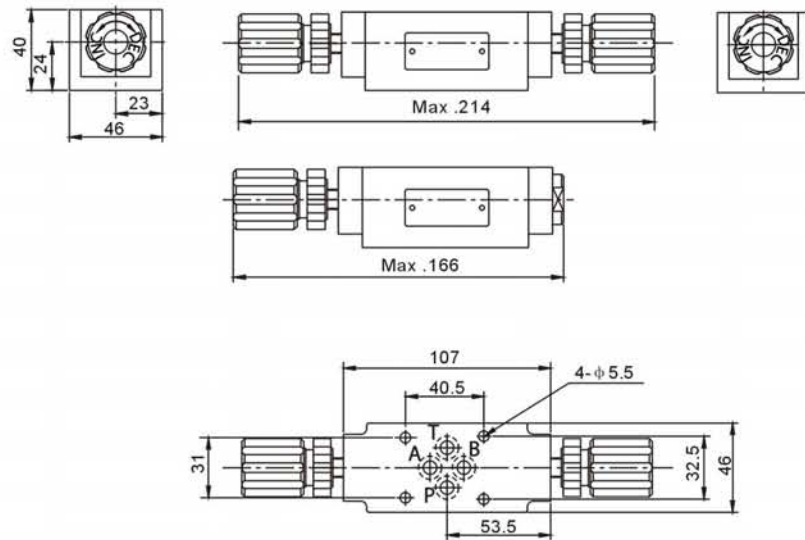


Characteristic Curves : Pressure drop at throttle fully opened

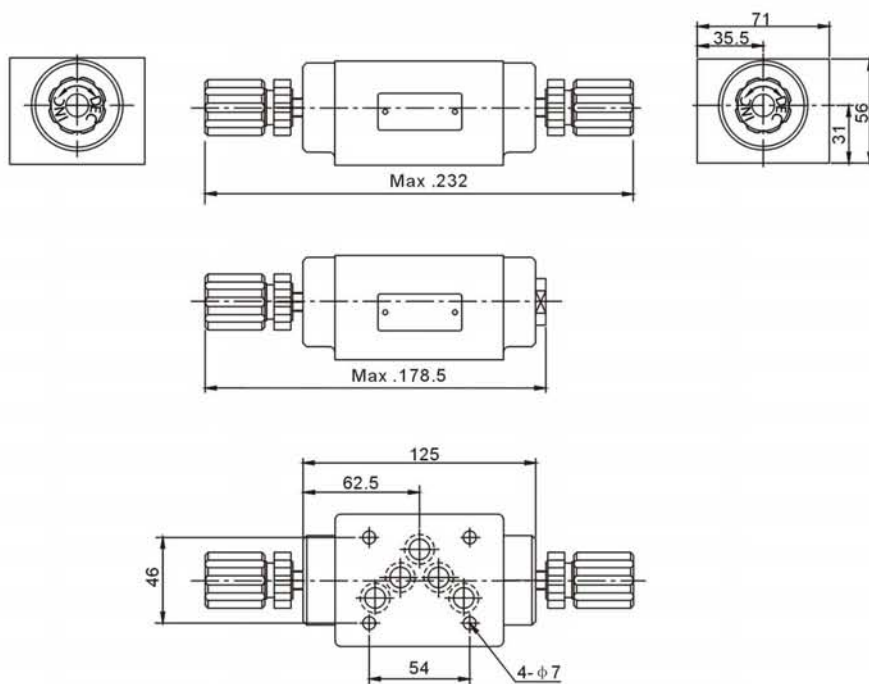
(measured at $v=35\text{mm}^2/\text{s}$ and $t=50^\circ\text{C}$)



● MTCV-02



● MTCV-03



MTV Module Throttle Valves



The passing one work oil port's flow can be controled by installing the valve in system. Big and small can be fine adjusted by adjustment handle.

Max.Pressure 21MPa
Max.Flow :
Size 02 up to 35L/min
Size 03 up to 70L/min

Ordering details

MTV	-02	-P
Sort	Size	Port number
MTV: Module Throttle valves	02	P: P port
	03	T: T port

Symbols

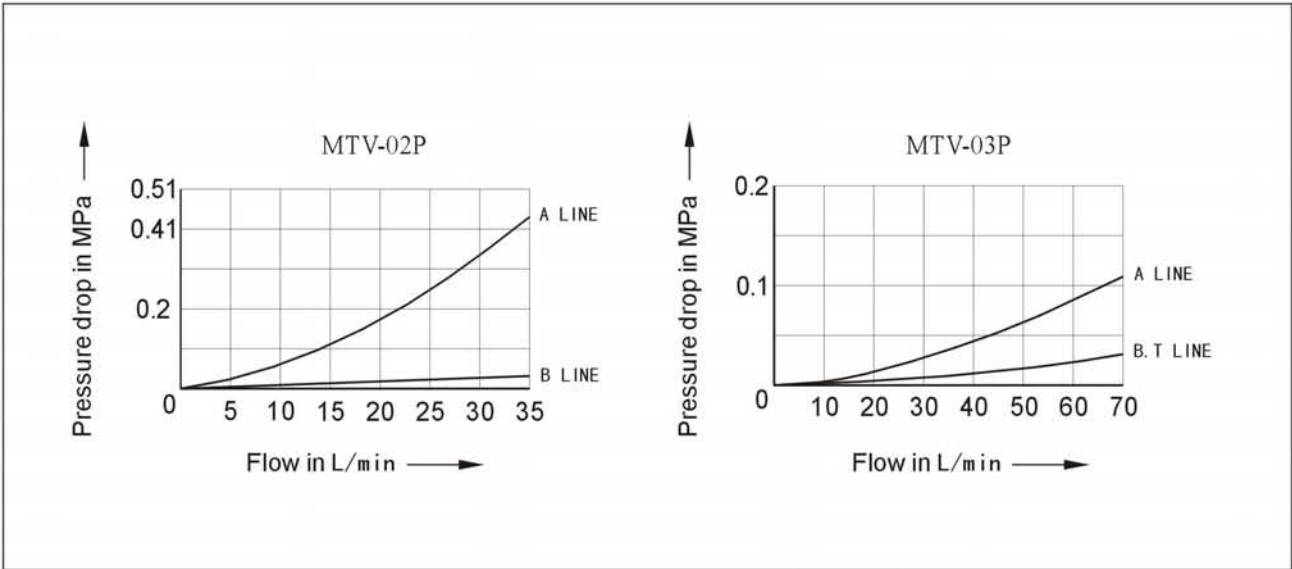
Type	MTV-※-P	MTV-※-T
Symbols		

Technical data

Type	Max.pressure MPa	Max.flow L/min	Weight Kg
MTV-02	21	35	1.2
MTV-03		70	2.7

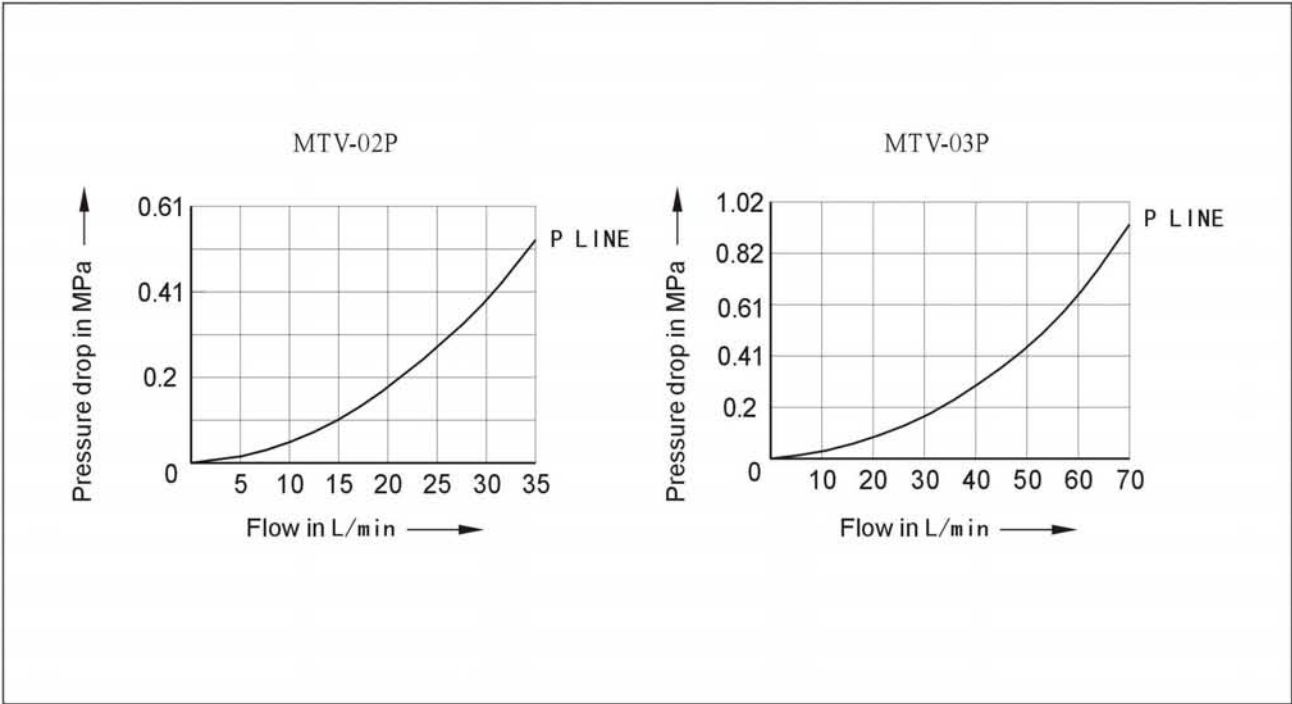
Characteristic Curves : Pressure drop

(measured at $v=35\text{mm}^2/\text{s}$ and $t=50^\circ\text{C}$)

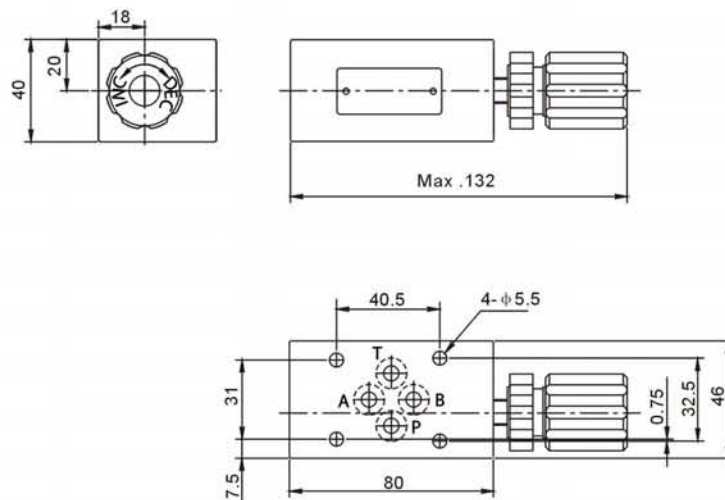


Characteristic Curves : Pressure drop at throttle fully opened

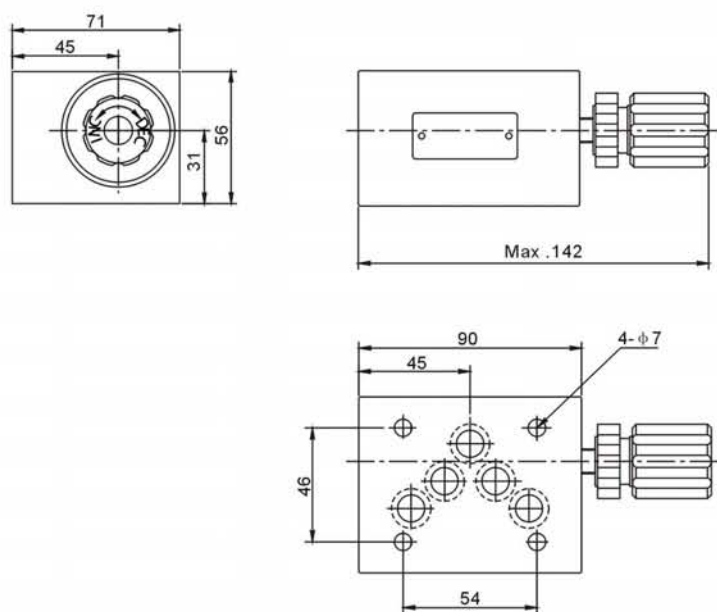
(measured at $v=35\text{mm}^2/\text{s}$ and $t=50^\circ\text{C}$)



● MTV-02



● MTV-03



MCV Modular Check Valve



The valve can come true single flow of fluid. For reverse, it's closed of without leaking.

Max.Pressure 21MPa
Max.Flow :
Size 02 up to 35L/min
Size 03 up to 70L/min

Ordering details

MCV	-02	-A	-05
Sort	Size	Port number	Cracking pressure
MCV: Modular check valves	02	A: A port P: P port	05: 0.035MPa
	03	B: B port T: T port	50: 0.35MPa

Symbols

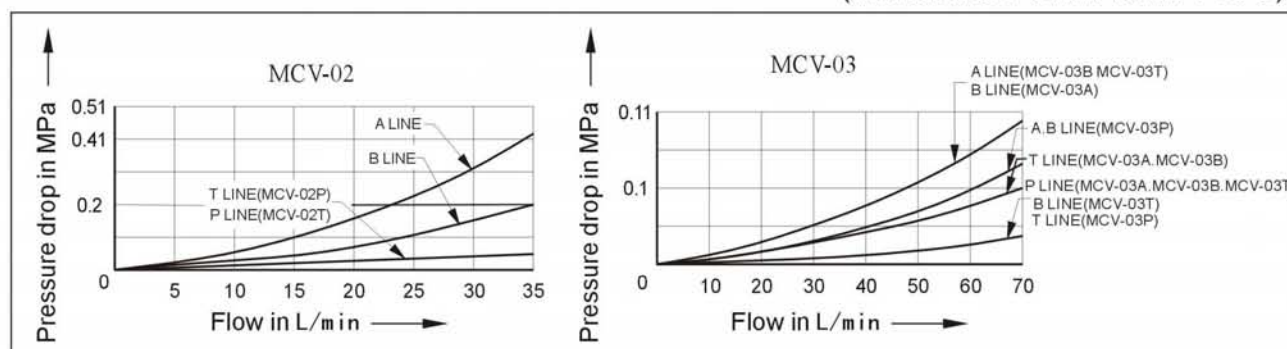
Type	MCV-※-A	MCV-※-B	MCV-※-P	MCV-※-T
Symbols				

Technical data

Type	Max.pressure MPa	Pressure adj.range MPa	Max.flow L/min	Weight Kg
MCV-02	21	See ordering details	35	1.1
MCV-03			70	2.5

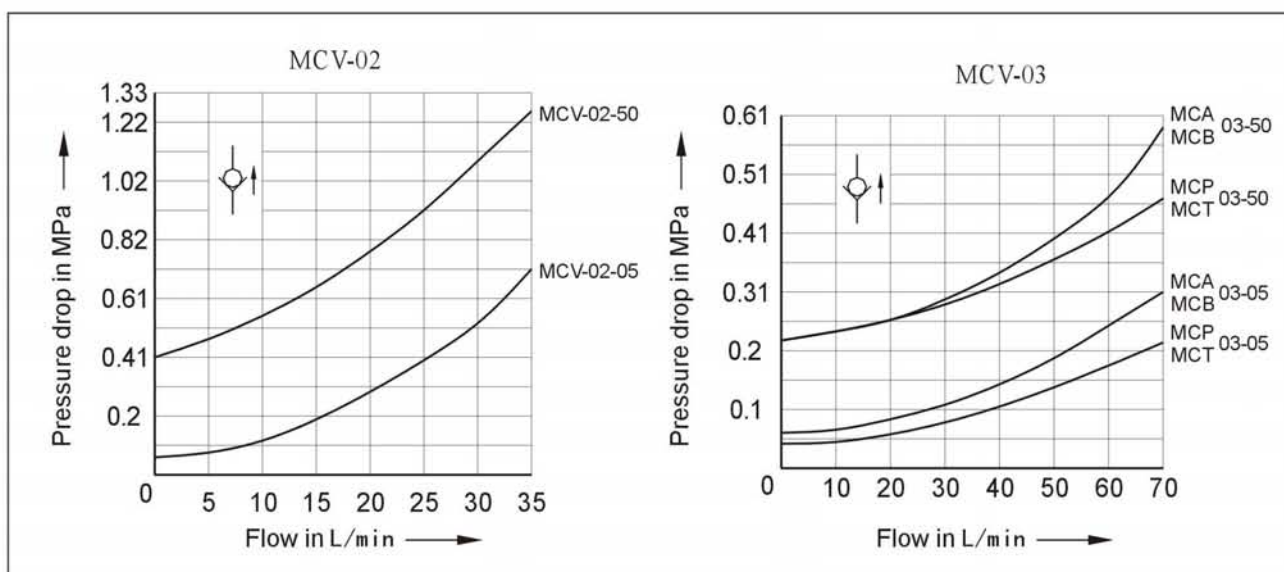
Characteristic Curves : Pressure drop

(measured at $v=35\text{mm}^2/\text{s}$ and $t=50^\circ\text{C}$)

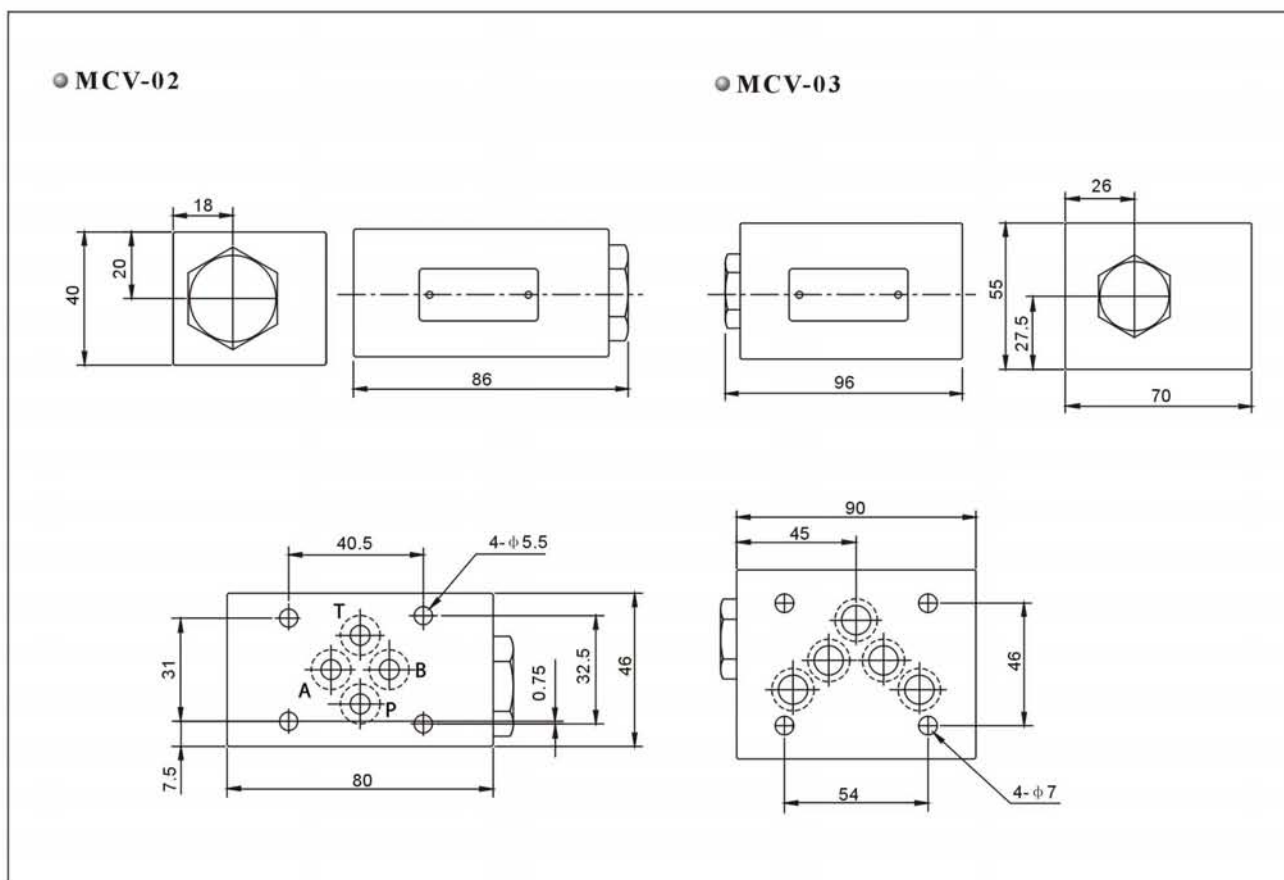


Characteristic Curves : Pressure drop for free flow

(measured at $v=35\text{mm}^2/\text{s}$ and $t=50^\circ\text{C}$)



Installation dimensions



DCG Cam Operated Directional Valves



The cam move space operated directional valve can drive slide spool to move in valve body by cam's moving. Then it changes fluid direction in return road.

Max.Pressure 21MPa
Max.Flow 30L/min

Ordering details

DC	G	-02	-2	B	2	No code	R	-32
Sort	Mounting	Size	Symbols			Roller position		Series
			Position	Return mode	Spool type	Installation	Direction	
DC: Cam operated directional valves	G: Sub-plate mounting	02	2	B: Spring return	2	No code: Port A side with roller	R	-32
					3		Y	
					8		S	

Roller position and flow direction

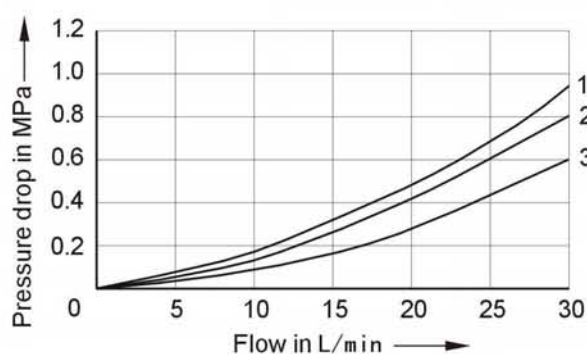
Code	Symbol	Roller position and flow direction		
		Return position	Roller distance from return position (mm)	End position
2B2				
2B3				
2B8				
2B2S				
2B3S				
2B8S				

Technical data

Type	Data	Max.pressure MPa	Max.back pressure MPa	Max.flow L/min	Weight Kg
DCG-02-2B※R-32		21	7	30	1.3

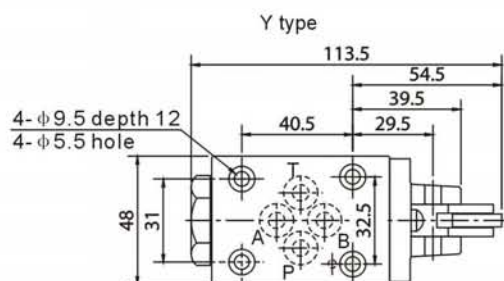
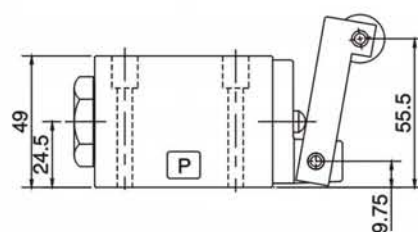
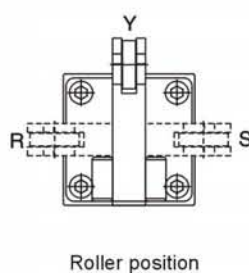
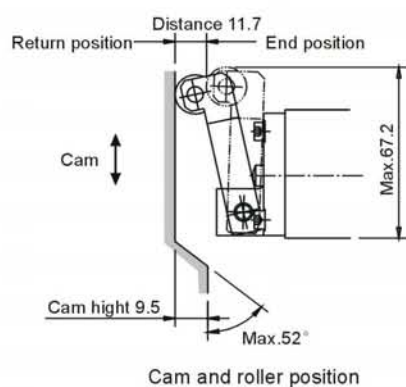
Characteristic Curves

(measured at $v=35\text{mm}^2/\text{s}$ and $t=50^\circ\text{C}$)



Symbols	Flow direction			
	P-A	B-T	P-B	A-T
2B2	2	2	3	3
2B3	2	2	2	2
2B8	3	—	3	—

Installation Dimensions



Installation and application attentions:

- 1.Fixed bolts size, 4-M5×45, GB/T70.1-2000;
- 2.O Rings size, 4-8.8×1.9;
- 3.Please see page 187 about Subplate Installation Dimensions.

CRG Right Angle Check Valves



The straight corner type check valve allows fluid flow from one direction under unlock pressure and checks reverse flow completely.

Max. Pressure 25MPa
Max. Flow :
Size 03 up to 40L/min
Size 06 up to 125L/min
Size 10 up to 250L/min

Ordering details

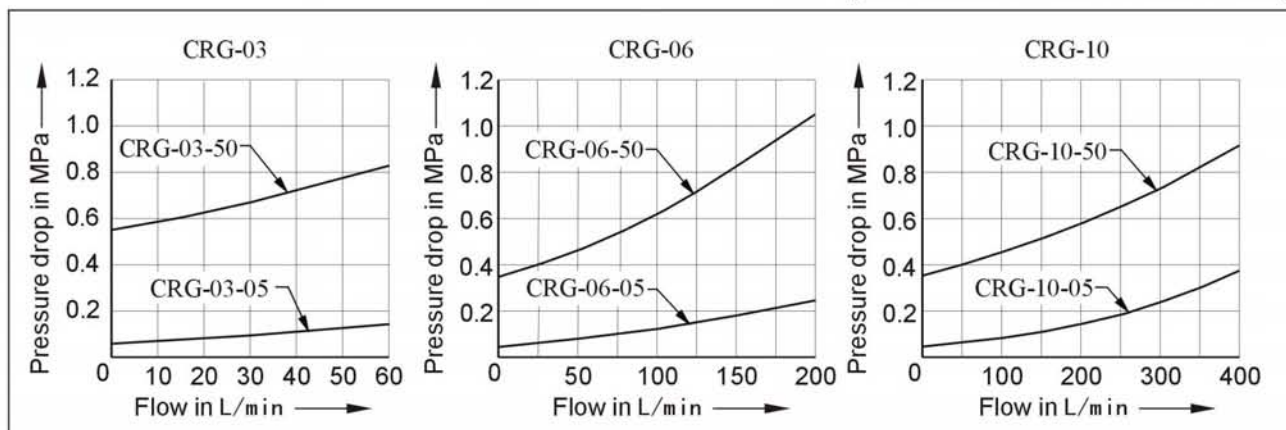
CR	G	-03	-05	-10
Sort	Mounting	Size	Cracking pressure MPa	Series
CR: Right Angle Check Valves	G: sub-plate mounting	03	05: 0.035 50: 0.35	10: No-ISO standard 20: ISO standard
		06		
		10		

Technical data

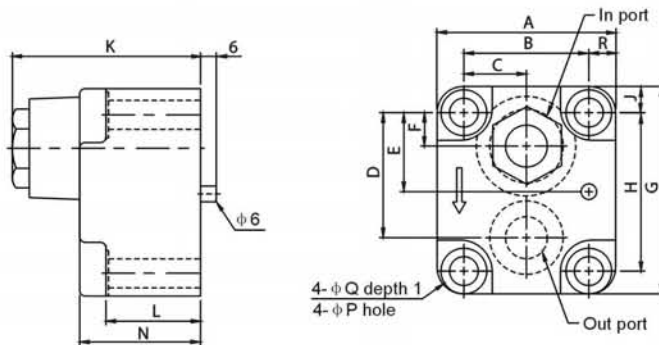
Type	Max. flow L/min	Max. pressure MPa	Weight Kg	Symbol
CRG-03-※-50	40	25	1.7	
CRG-06-※-50	125		4.1	
CRG-10-※-50	250		6.6	

Characteristic Curves

(measured at $v=35\text{mm}^2/\text{s}$ and $t=50^\circ\text{C}$)



● CRG-03.06.10-※-10



Installation and application attentions:

1.Fixed bolts size and amout

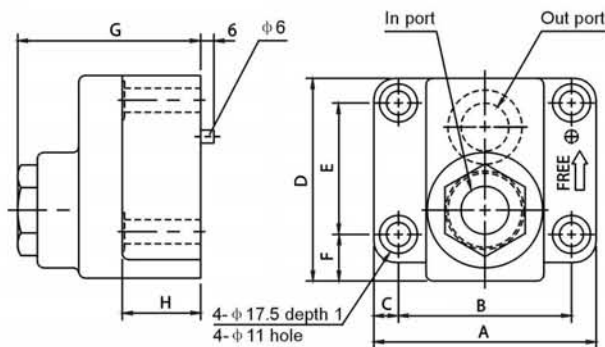
Type	Size	Amout
CRG-03-10	M10×50L	4
CRG-06-10	M6×60L	4
CRG-10-10	M20×75L	4

2.O Rings size and amout

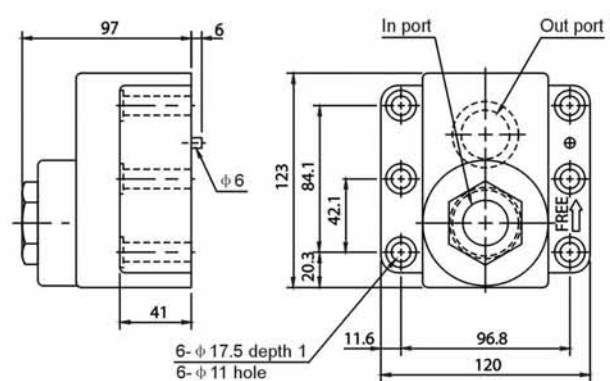
Type	Size	Amout
CRG-03-10	21.7×3.5	2
CRG-06-10	27.7×3.5	2
CRG-10-10	31.7×3.5	2

Type	A	B	C	D	E	F	G	H	J	K	L	N	P	Q	R
CRG-03-※-10	68	47.6	23.8	47.6	30.1	12.7	80	60.3	10	70	36	46	11	17.5	10.2
CRG-06-※-10	101	65.2	32.6	68.2	40.5	22.2	114	80.9	16.5	81	38	54	17.5	26	16.45
CRG-10-※-10	130	92.1	46.1	71.4	46.0	20.6	130	92.1	19	100	50	67	21.5	30	18.95

● CRG-03.06-※-20



● CRG-10-※-20



Installation and application attentions:

1.Fixed bolts size and amout

Type	Size	Amout
CRG-03-20	M10×45L	4
CRG-06-20	M10×50L	4
CRG-10-20	M10×55L	6

2.O Rings size and amout

Type	Size	Amout
CRG-03-20	17.8×2.4	2
CRG-06-20	27.7×3.5	2
CRG-10-20	31.7×3.5	2

3.Porting pattern to ISO standard

G03:ISO5781-AG-06-2-A
G06:ISO5781-AH-08-2-A
G10:ISO5781-AJ-10-2-A

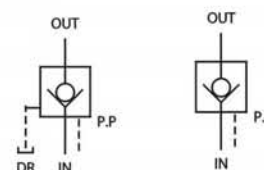
Type	A	B	C	D	E	F	G	H
CRG-03-※-20	90	66.7	11.7	72	42.9	17.5	72.5	31
CRG-06-※-20	102	79.4	11.3	93	60.3	21.4	84	36

CPDG、CPDT Pilot Controlled Check Valves



The pilot controlled check valve allows fluid to flow from one direction under unlock pressure. Fluid can be reverse flow freely when control pressure pushes out closed spool for outlet side pressure action.

Symbols



Ordering details

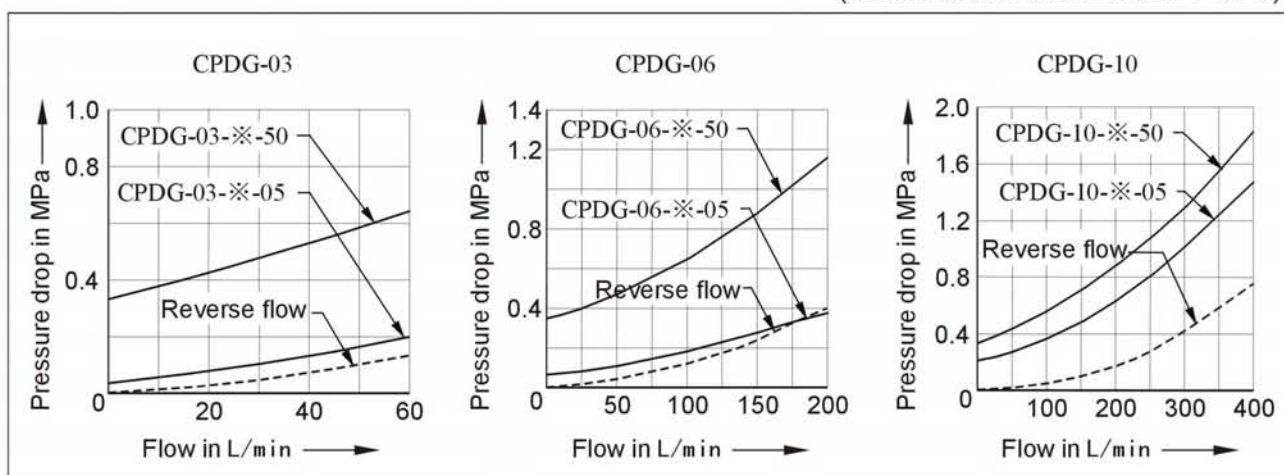
CPD	T	-03	-E	-05	-10
Sort	Mounting	Size	Control type	Cracking pressure Mpa	Series
CPD: Decompression Type Pilot Controlled Check Valves	G: Sub-plate mounting T: Threaded mounting	03 06 10	E: External pilot, internal drain; ET: External pilot, external drain;	05: 0.035 50: 0.35	10: No-ISO standard

Technical data

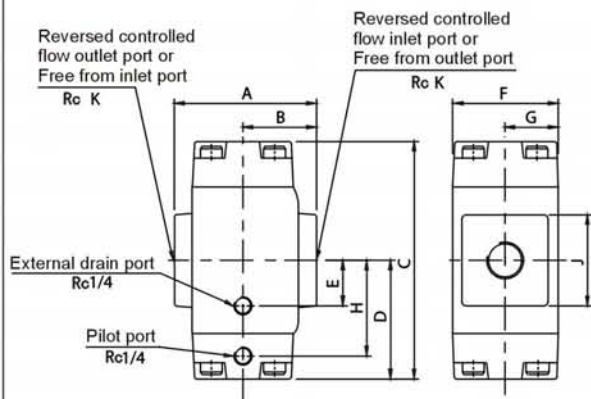
Type	Max.pressure Mpa	Max.flow L/min	Weight Kg	
CPTS-03	25	40	8.0	
CPDT-03 CPDG-03		40	3.4	4.5
CPDT-06 CPDG-06		125	6.0	7.0
CPDT-10 CPDG-10		250	11.6	12.0

Characteristic Curves

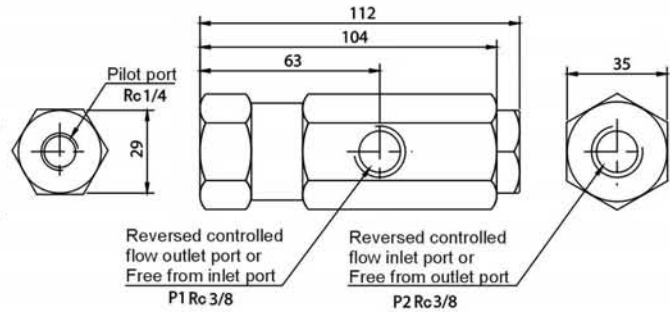
(measured at $v=35\text{mm}^2/\text{s}$ and $t=50^\circ\text{C}$)



● CPDT-03.06.10-※-10

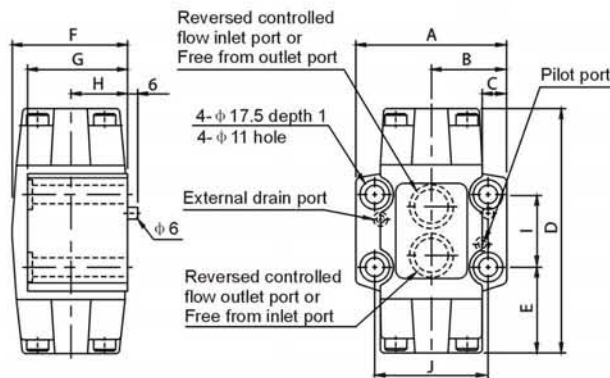


● CPTS-03

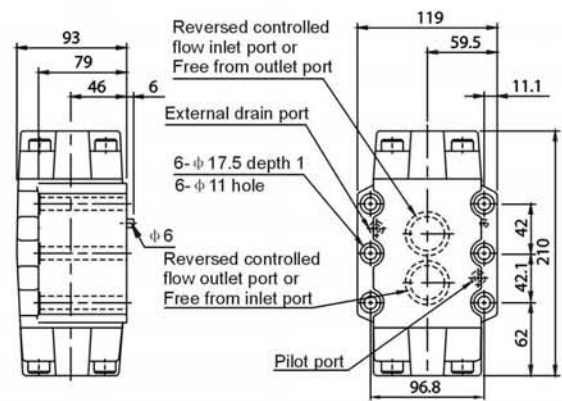


Type	A	B	C	D	E	F	G	H	J	K
CPDT-03	80	40	150.5	75	21	64	35.5	58	41	3/8
CPDT-06	99.6	49.8	174	84	26	73	38	68	65	3/4
CPDT-10	140	70	208	104	35	92	45	84	79	1-1/4

● CPDG-03.06-10



● CPDG-10-10



Installation and application attentions:

1.Fixed bolts size and amout

Type	Size	Amout
CPDG-03-10	M10×70L	4
CPDG-06-10	M10×80L	4
CPDG-10-10	M10×90L	6

2.O Rings size and amout

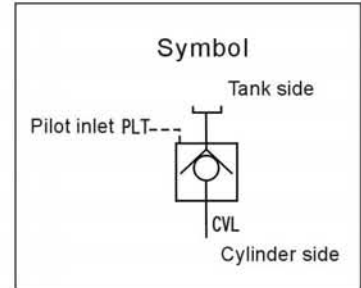
Type	Size	Amout	Size	Amout
CPDG-03-10	17.8×2.4	2	8.8×1.9	2
CPDG-06-10	27.7×3.5	2	8.8×1.9	2
CPDG-10-10	33.5×3.55	2	8.8×1.9	2

Type	A	B	C	D	E	F	G	H	I	J
CPDG-03	87.5	44.5	10	144	50.6	68	60	35	42.8	66.7
CPDG-06	102	51.0	11.3	174	57	80	70.5	40	60.3	79.4

CPDF Prefill Valves



The prefill valve inputs vast fluid from oil box to oil vat when oil vat enters quickly. It can cut down return flow from oil vat to oil box during increasing pressure process. Pilot control pressure oil opens prefill valve and makes fluid which is at oil vat inside vent back to oil box when oil vat returns.



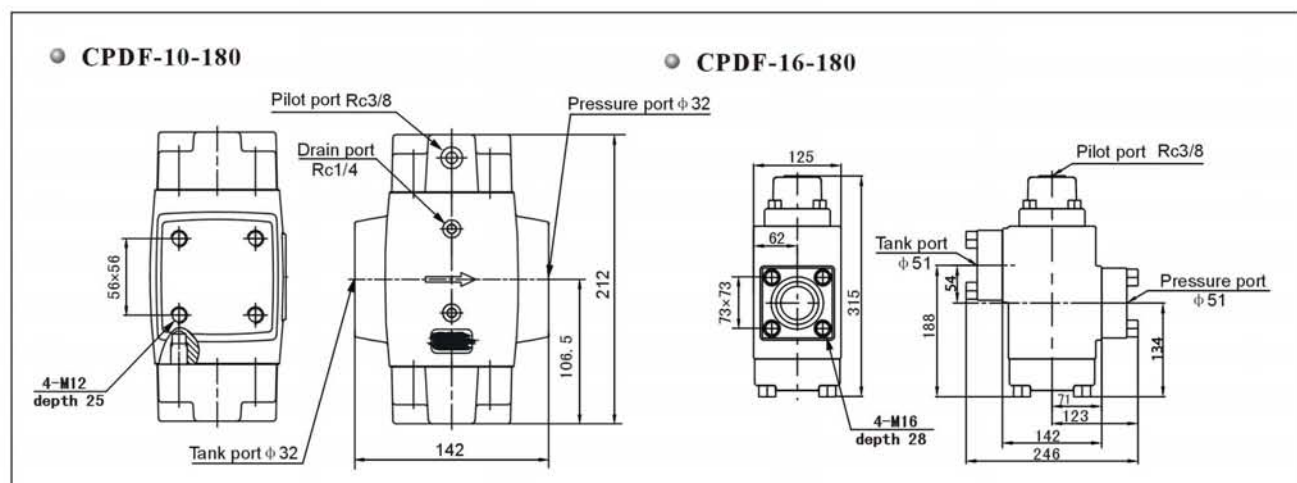
Ordering details

CPD	F	-24	-180	-R
Sort	Flang type	Size		Port direction
CPD: Prefill Valves	F	10: 1"	180: Inline type 90: Angle type	R: Pressure port at right side from tank port ; L: Pressure port at left side from tank port
		16: 2"		
		24: 3"		

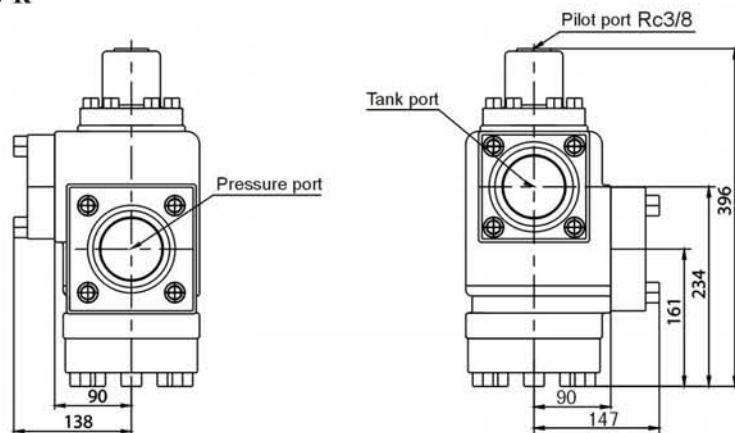
Technical data

Type	Max.pressure MPa	Max.flow L/min	Cracking pressure MPa	Weight Kg
CPDF-10	25	300	0.15	12.5
CPDF-16		400	0.012	30.2
CPDF-24		900	0.014	55

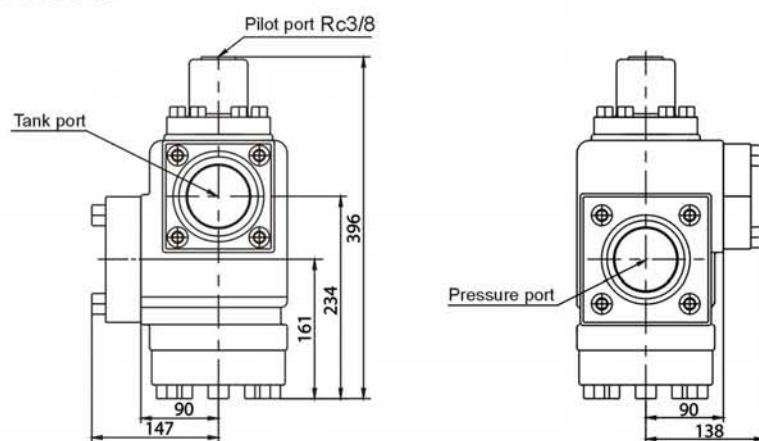
Installation Dimensions



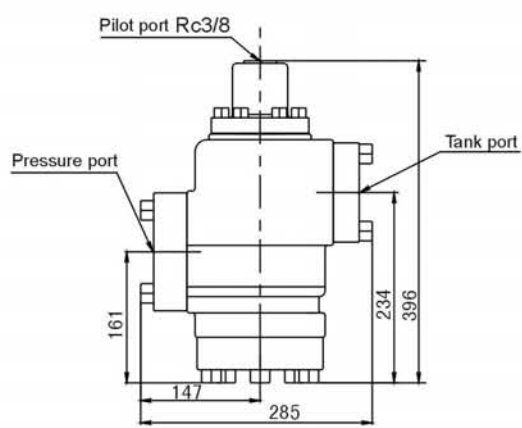
● CPDF-24-90-R



● CPDF-24-90-L



● CPDF-24-180



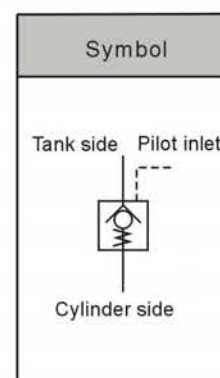
PF Prefill Valves



The prefill valve inputs vast fluid from oil box to oil vat when oil vat enters quickly . It can cut down return flow from oil vat to oil box during increasing pressure process. Pilot control pressure oil opens prefill valve and makes fluid which is at oil vat inside vent back to oil box when oil vat returns.

Ordering details

PF	-80	-FT	-20
Sort	Size	Flang type	Series
PF	80	FP: P port flang	20
	90		
	100	FT: T port flang	
	125	FPT: P, T port flang	
	150		



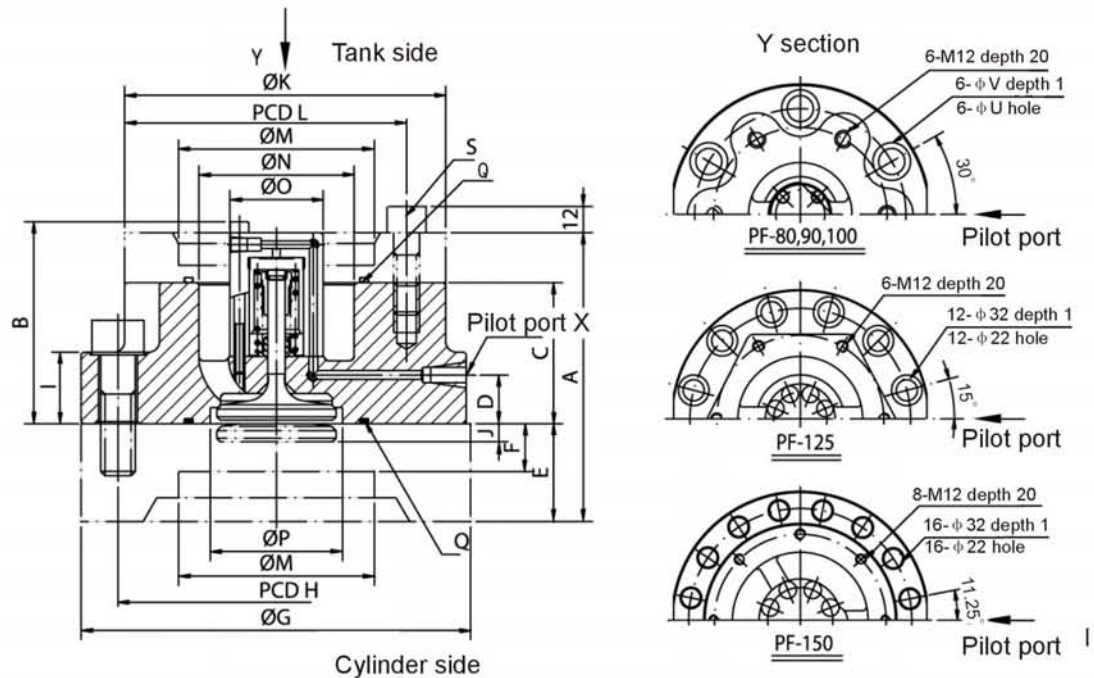
Technical data

Type	Size	Max.flow L/min	Max.pressure MPa	Cracking pressure MPa	Weight Kg
PF-80-※-20	3"	400	25	0.012	8
PF-90-※-20	3-1/2"	630		0.012	11.3
PF-100-※-20	4"	1000		0.012	14.5
PF-125-※-20	5"	1600		0.012	23
PF-150-※-20	6"	2500		0.013	37

Type	Size	Amount
PF-80	M16×55	6
PF-90	M18×65	6
PF-100	M20×70	6
PF-120	M20×80	12
PF-150	M20×95	16

Type	FP flang Kg	FT flang Kg
PF-80	6.6	2.2
PF-90	8.8	2.6
PF-100	14.2	2.6
PF-120	25.2	4.0
PF-150	28.0	8.0

● PF-※-※-20



Type	Size	A	B	C	D	E	F	G	H	I	J	K
PF-80	3	133	94	65	22.5	45	22	180	146	33	10	142
PF-90	3-1/2	145	119	72	27	50	30	200	165	41.5	13	160
PF-100	4	157	132.5	74	31.5	60	32	230	191	44	18	170
PF-125	5	196	165	85	43	80	50	270	230	52	23.5	200
PF-150	6	216	204	105	45	80	40	300	260	64	25	225

Type	L	M	N	O	P	Q	S	U	V	X
PF-80	120	90.2	71.5	43	71	G80	6-M12×40	17.5	26	Rc1/4
PF-90	135	101.6	89	50	88	G100	6-M12×40	20	28	Rc1/4
PF-100	148	115.5	108	56	106	G115	6-M12×40	22	32	Rc1/4
PF-125	175	141.2	130.5	69	130	G140	6-M12×50	—	—	Rc1/4
PF-150	200	167	155	96	168	G180	6-M12×50	—	—	Rc3/8

SRG、SRT Throttle Valves



The valve is used to adjust performing component's speed in return road. Pipe road pressure almost be invariableness and fluid's flow allows potty fluctuating because of pressure changing.

Max.Pressure 25MPa
Max.Flow :
Size 03 up to 30L/min
Size 06 up to 80L/min
Size 10 up to 200L/min

Ordering details

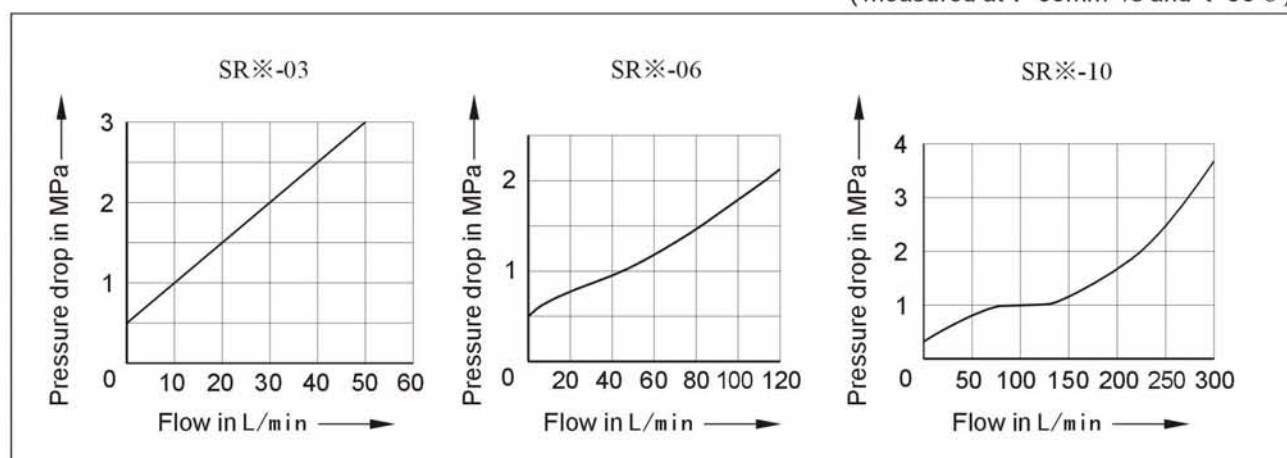
SR	-G	-03	-10	Symbol
Sort	Mounting	Size	Series	
SR: Throttle valves	G:sub-plate mounting T: threaded mounting	03: 3/8 06: 3/4 10: 1-1/4	No-ISO standard	

Technical data

Type		Max.pressure MPa	Max.flow L/min	Weight Kg	
Threaded mounting	Sub-plate mounting				
SRT-03	SRG-03	25	30	1.1	1.2
SRT-06	SRG-06		80	2.3	2.4
SRT-10	SRG-10		200	5.8	4.9

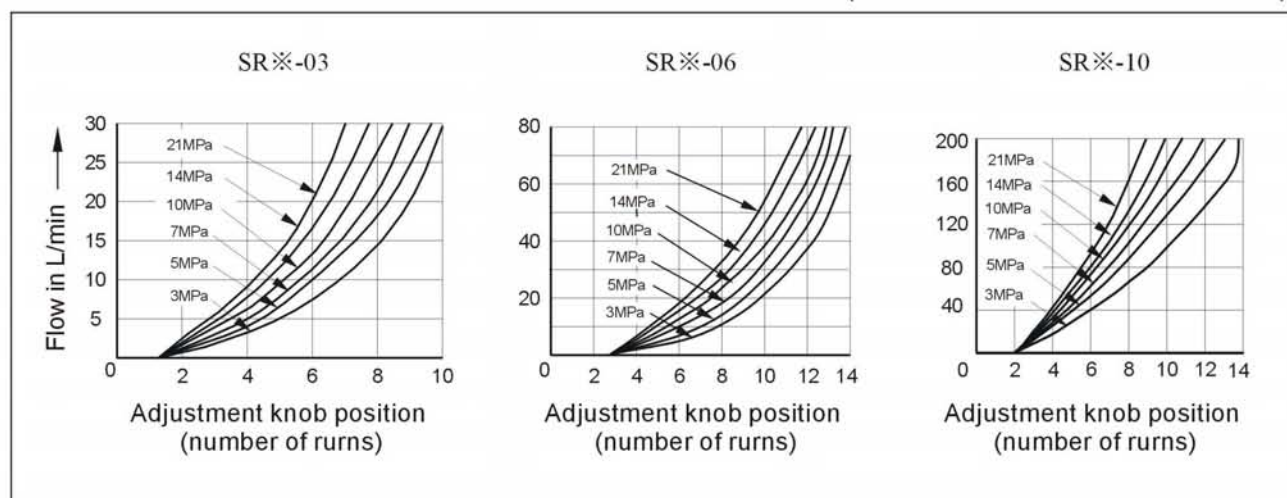
Characteristic Curves

(measured at $v=35\text{mm}^2/\text{s}$ and $t=50^\circ\text{C}$)

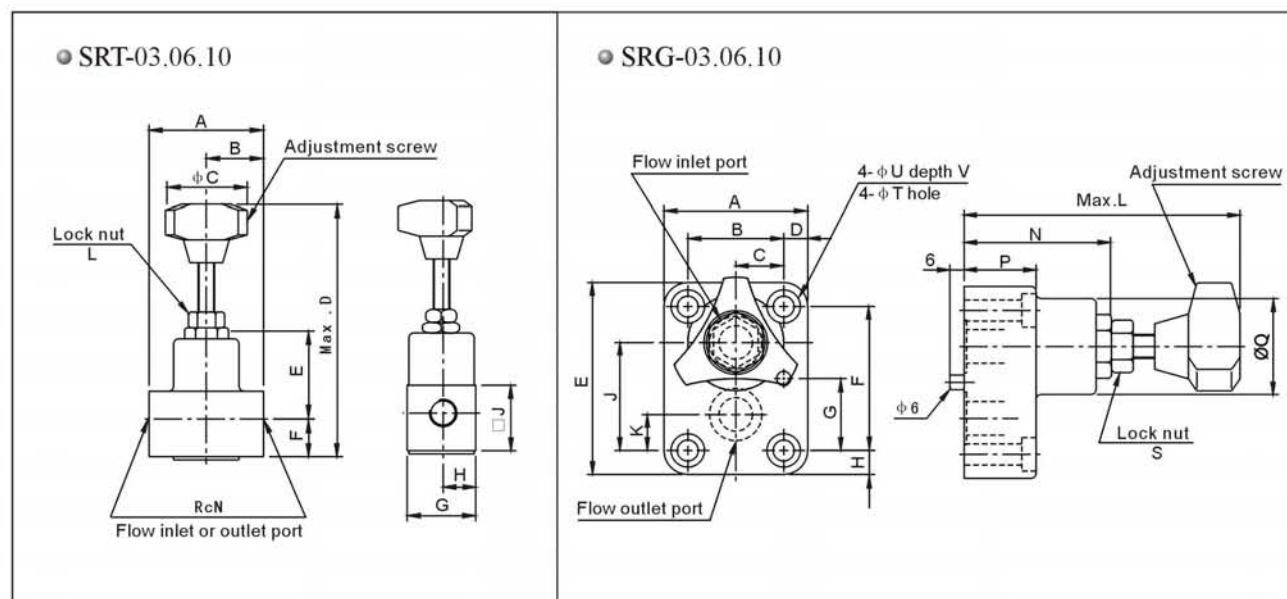


Characteristic Curves

(measured at $v=35\text{mm}^2/\text{s}$ and $t=50^\circ\text{C}$)



Installation Dimensions



Type	A	B	C	D	E	F	G	H	J	L	N
SRT-03	70	35	40	143	54	23	42	20	40	19	3/8
SRT-06	100	50	40	136.5	62	30	62	30	60	19	3/4
SRT-10	130	65	56	173	73	40	82	40	80	22	1-1/4

Type	A	B	C	D	E	F	G	H	J
SRG-03	60	40	20	10	80	60	30	10	45
SRG-06	80	58	29	11	92	70	35	11	54
SRG-10	100	72	36	14	120	92	46	14	71

Type	K	L	N	P	Q	S	T	U	V
SRG-03	15	128	65	30	44	19	9	14	8.6
SRG-06	16	133	73	42	41.5	23	11	17.5	10.8
SRG-10	21	145	100	55	56	23	13.5	21	1.0

SRCG、SRCT Throttle And Check Valves

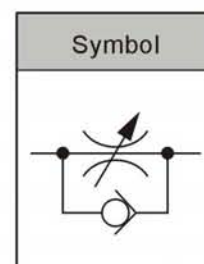


The valve is used to adjust performing component's speed in return road. Pipe road pressure almost be invariablenes and fluid's flow allows potty fluctuating because of pressure changing. Check valve which is installed inside allows fluid to flow from outlet to inlet reverse.

Max.Pressure 25MPa
Max.Flow :
Size 03 up to 30L/min
Size 06 up to 80L/min
Size 10 up to 200L/min

Ordering details

SRC	-G	-03	-10
Sort	Mounting	Size	Series
SRC: Throttle And Check Valves	G: Sub-plate mounting T: Threaded mounting	03: 3/8 06: 3/4 10: 1-1/4	10: No-ISO standard 20: ISO standard

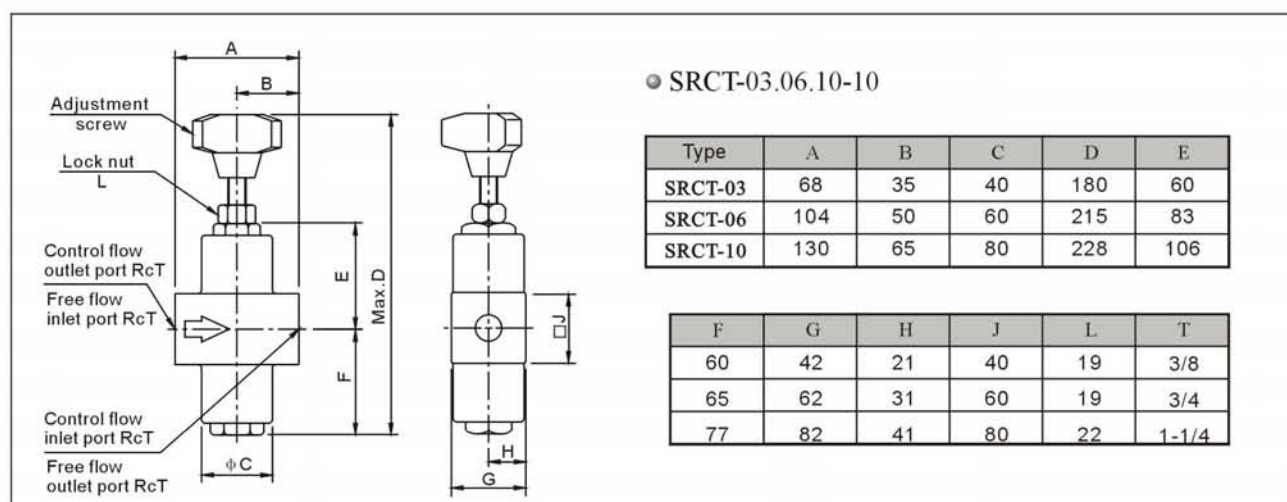


Technical data

Note : Characteristic curves see page 134/135 .

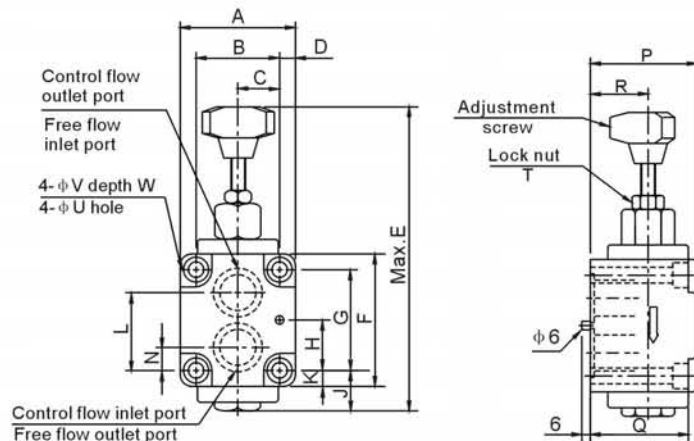
Type		Max.pressure MPa	Max.flow L/min	Weight Kg	
Threaded mounting	Sub-plate mounting				
SRCT-03	SRCG-03	25	30	1.2	2.1
SRCT-06	SRCG-06		80	3.2	4.0
SRCT-10	SRCG-10		200	7.1	8.1

Installation Dimensions



Installation Dimensions

● SRCG-03.06.10-10



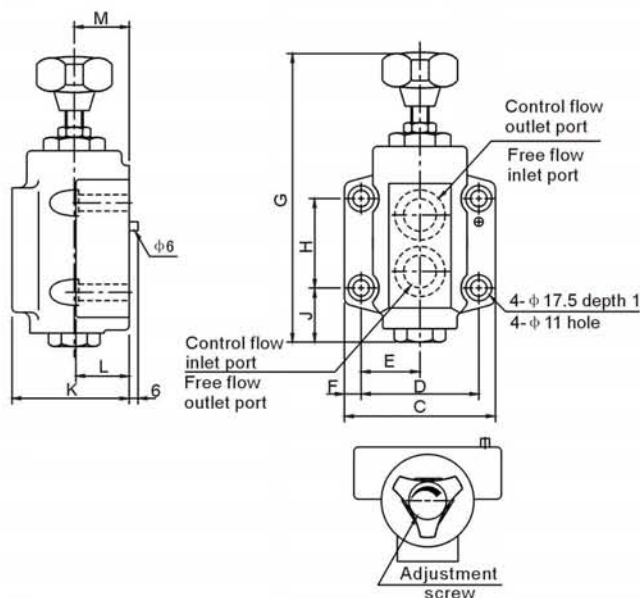
Fixed bolts size and amount

Type	Size	Amount
SRCG-03-10	M8×60L	4
SRCG-06-10	M10×70L	4
SRCG-10-10	M12×100L	4
SRCG-03-20	M10×45L	4
SRCG-06-20	M10×50L	4
SRCG-10-20	M10×55L	6

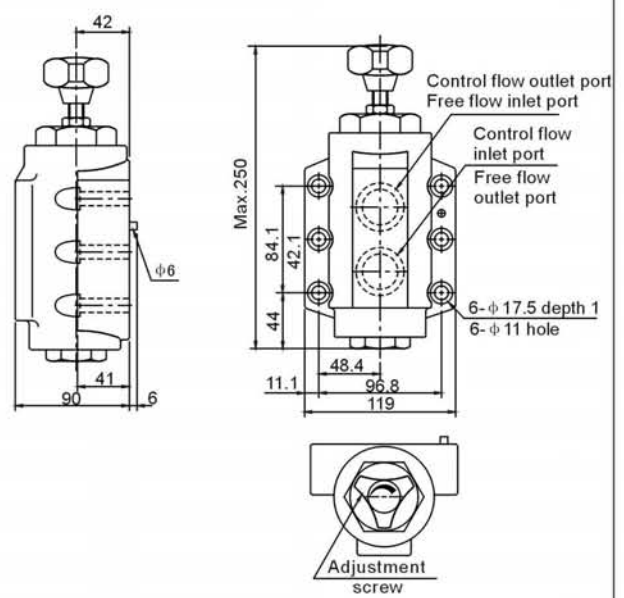
Type	A	B	C	D	E	F	G	H	J
SRCG-03-10	60	40	20	10	179	80	60	30	28
SRCG-06-10	80	58	29	11	213	95	70	35	32.5
SRCG-10-10	100	72	36	14	228	120	92	46	31

Type	K	L	N	P	Q	R	T	U	V	W
SRCG-03-10	10	45	15	60	55	35	19	8.8	14	8.6
SRCG-06-10	11	54	16	74	68	40	19	11	17.5	10.8
SRCG-10-10	14	71	21	97	82	50	22	13.5	21	1

● SRCG-03.06-20



● SRCG-10-20



Type	C	D	E	F	G	H	J	K	L	M
SRCG-03-20	90	66.7	33.3	11.7	173	42.9	32	64	31	31
SRCG-06-20	102	79.4	39.7	11.3	203	60.3	36.5	79	36	37

DG、DT Remote Control Relief Valves



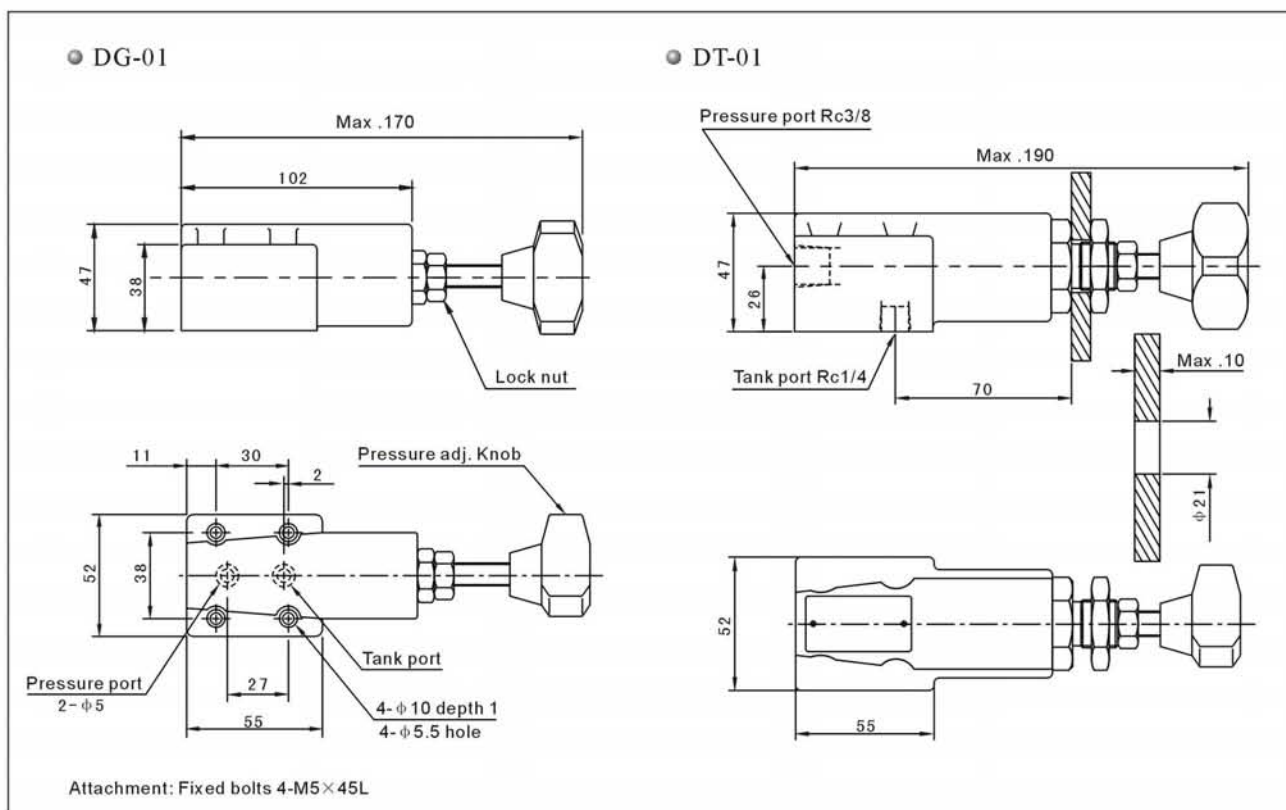
The valve can do remote control and double pressure or three pressure control. Because it connects remote control pressure valve's control port. Three sects pressure adjustment range can be choosed and makes adjustment pressure precision better.

Max. Pressure 25MPa
Max. Flow up to 2L/min
DG weight 1.5Kg
DT weight 1.6Kg

Ordering details

D	G	-01	-1	-31	Symbol
Sort	Mounting	Size	Pressure adj. range	Series	
D: Remote Control Relief Valves	G: Subplate mounting T: Threaded mounting	01	1: 0.7-7.0 2: 3.5-14.0 3: 7.0-21.0	31	

Installation dimensions



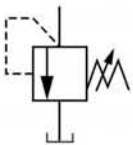
DG、DT Direct Type Relief Valves



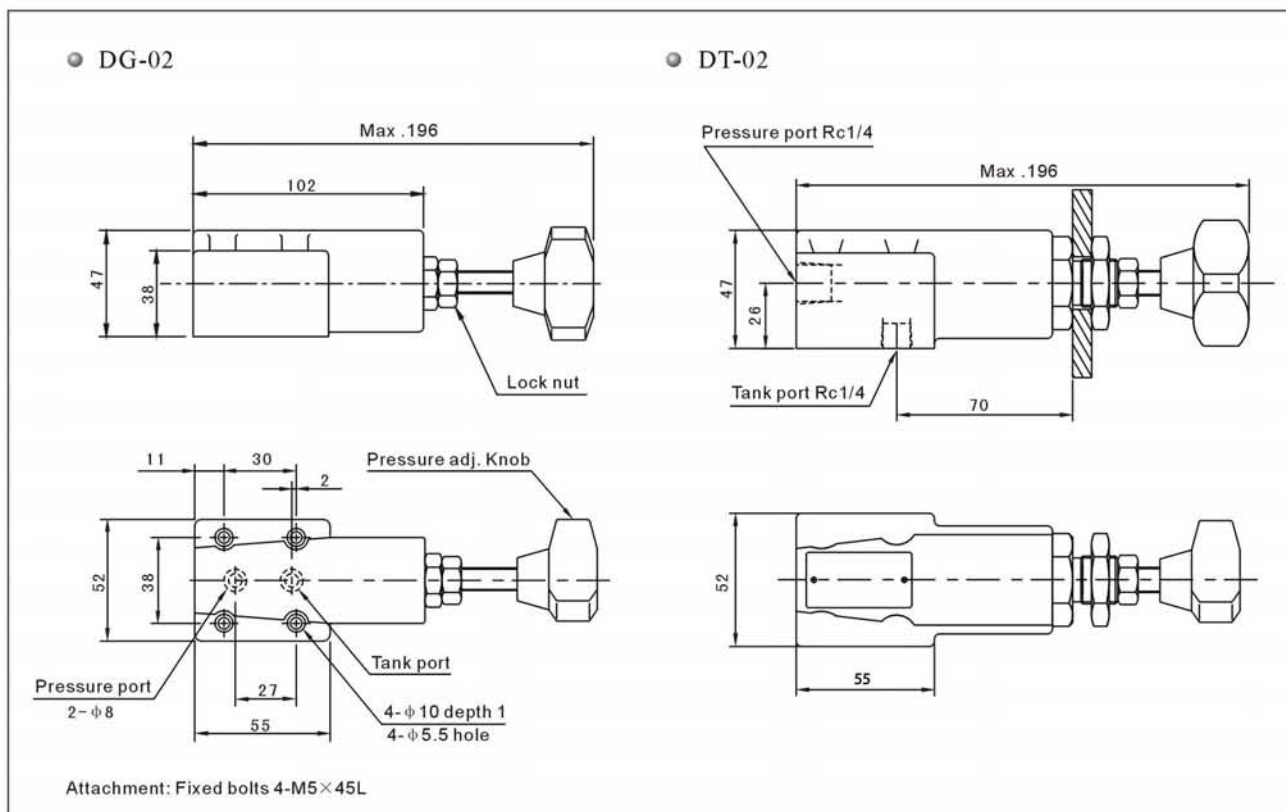
The valve is used to max.Pressure adjustment of small flow return road or as safe valve. Three sects pressure adjustment range can be choosed and makes pressure precision better.

Max.Pressure 25MPa
Max.Flow up to 16L/min
DG weight 1.5Kg
DT weight 1.6Kg

Ordering details

D	G	-02	-1	-31	Symbol
Sort	Mounting	Size	Pressure adj.range	Series	
D: Direct type Relief Valves	G: Subplate mounting T: Threaded mounting	02	1: 0.7-7.0 2: 3.5-14.0 3: 7.0-21.0	31	

Installation dimensions



BG Pilot Operated Relief Valves



This kind valve can protect pump and control valve to avoid to exceed pressure and keep invariablenes pressure for hydraulic system.It can be carried out remote control and unloading to use unloading (remote control).

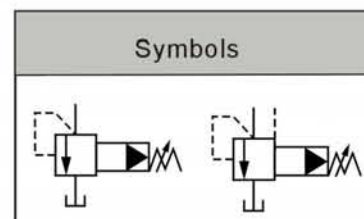
Max.Pressure 25MPa
Max.Flow :
Size 03 up to 100L/min
Size 06 up to 200L/min
Size 10 up to 400L/min

Ordering details

B	G	-03	-1	-T	-31
Sort	Mounting	Size	Pressure adj.range MPa	Drain type	Series
B: Pilot Operated Relief Valves	G: Subplate mounting	03	1: 0.7-7.0	No code : Internal drain T: External drain	31: Adlusting direct type 30: Standard type
		06	2: 3.5-14.0		
		10	3: 7.0-25.0		

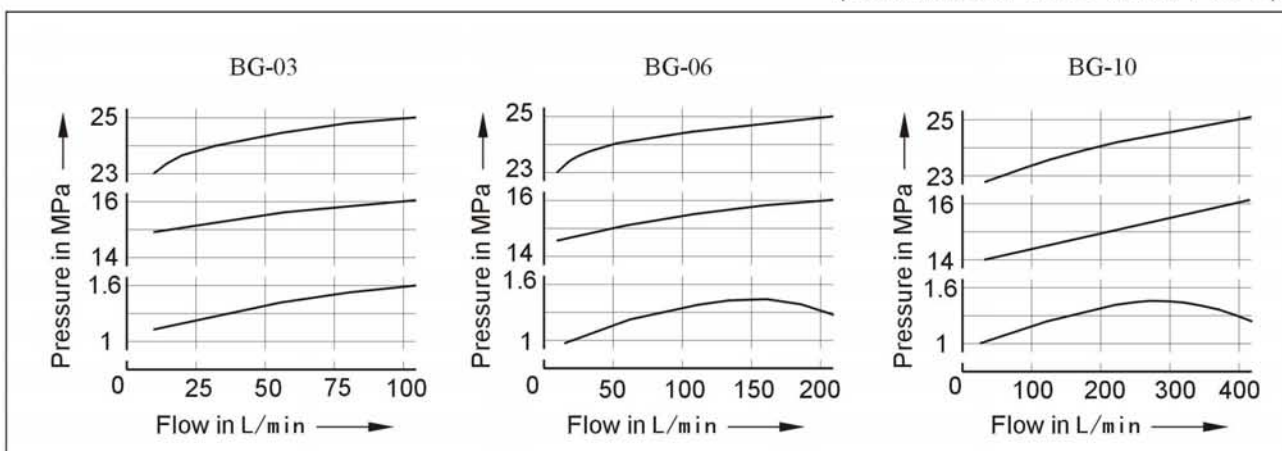
Technical data

Type	Max.pressure MPa	Max.flow L/min	Weight Kg
BG-03	25	100	5.4
BG-06		200	6.8
BG-10		400	10.5



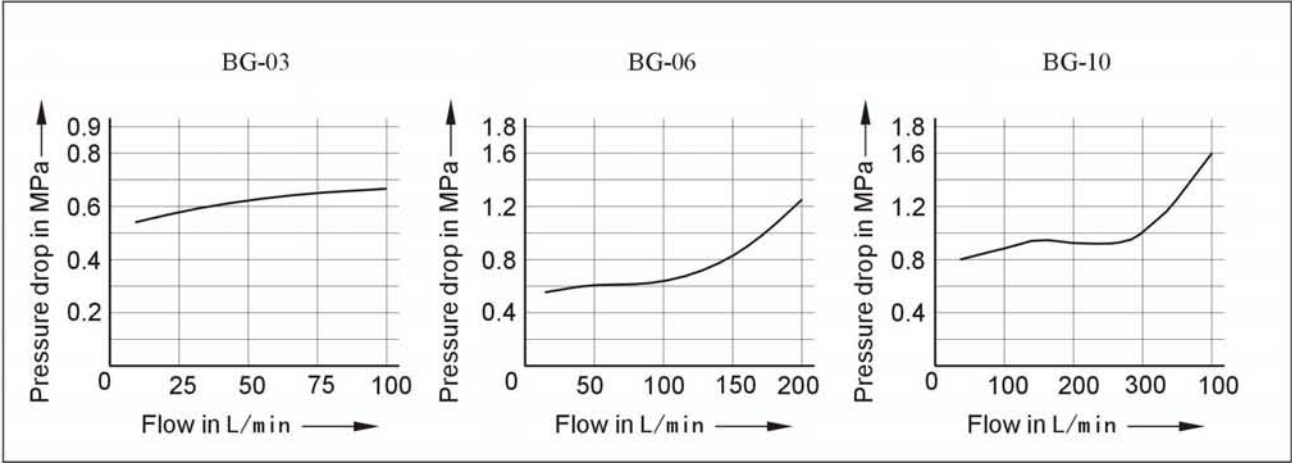
Characteristic Curves : Nominal override

(measured at $v=35\text{mm}^2/\text{s}$ and $t=50^\circ\text{C}$)

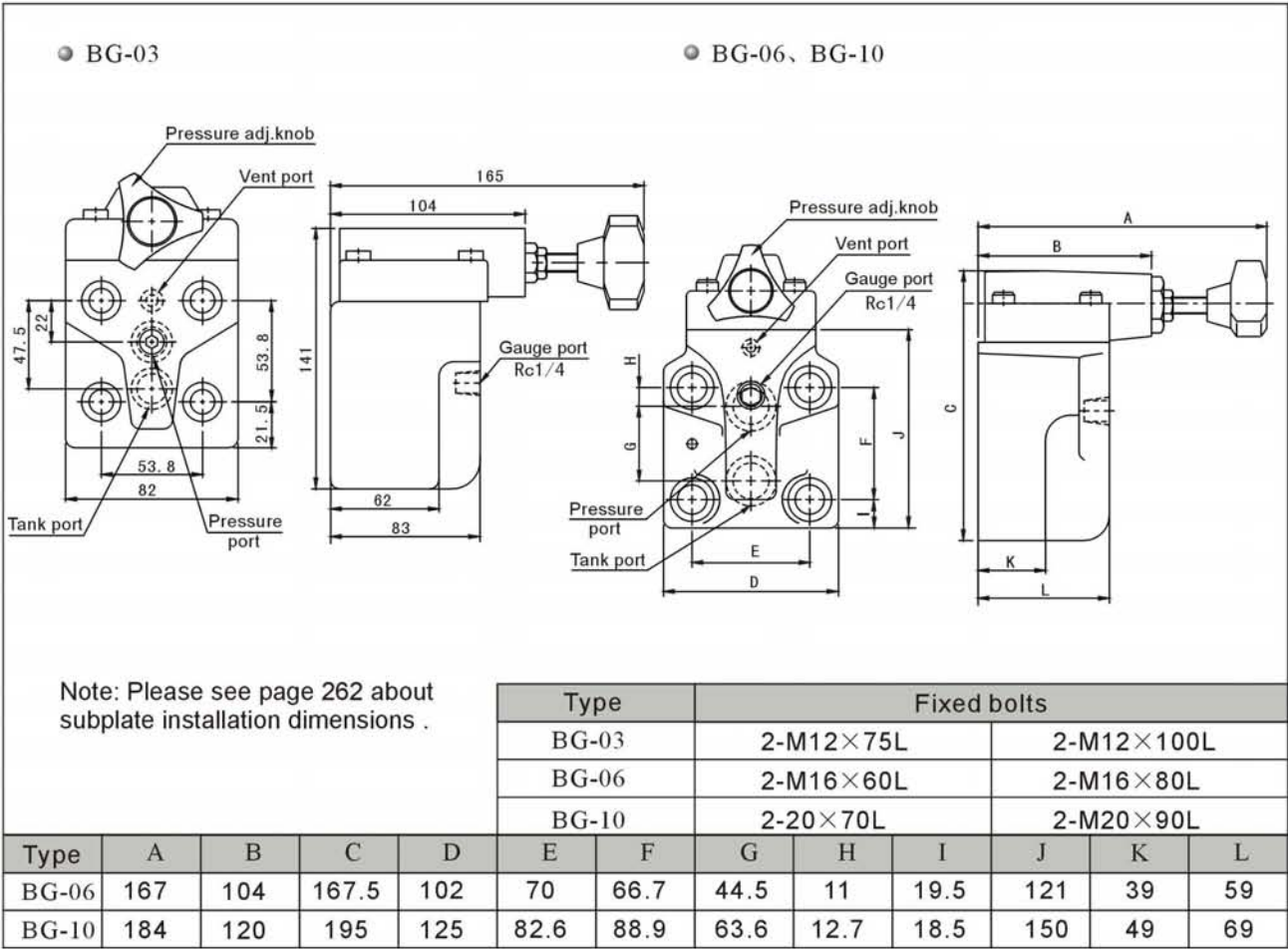


Characteristic Curves : Min.steady flow

(measured at $v=35\text{mm}^2/\text{s}$ and $t=50^\circ\text{C}$)



Installation dimensions



S-BG Low Noise Type Pilot Operated Relief Valves



The valve is low noise type valve by special development. It can protect pump and control valve to avoid to exceed pressure and keep invariableness pressure for hydraulic system. Remote control and unloading can be come trued by unloading port.

Max. Pressure 25MPa
Max. Flow :
Size 03 up to 100L/min
Size 06 up to 200L/min
Size 10 up to 400L/min

Ordering details

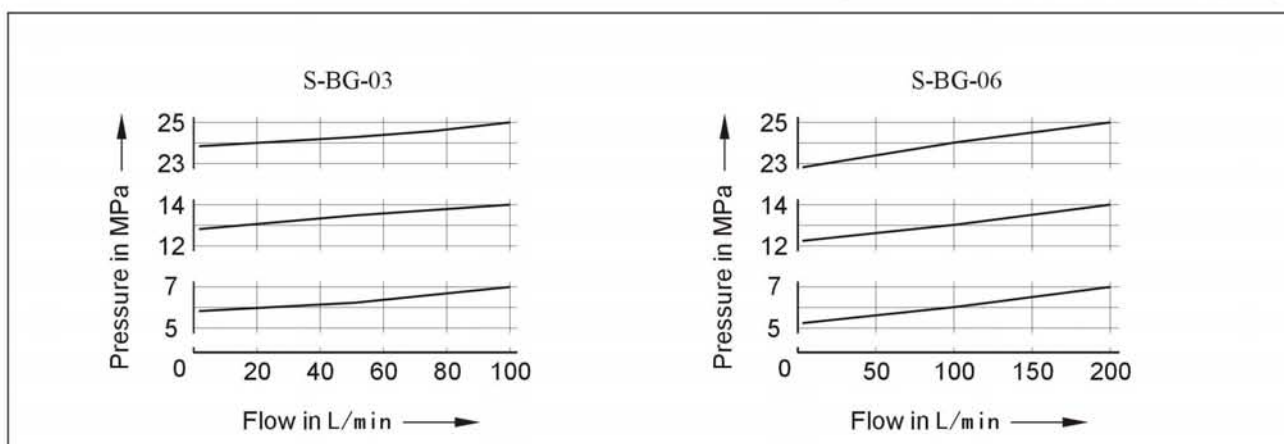
S-	-B	G	-03	-1	-R	-31
	Sort	Mounting	Size	Pressure adj. range MPa	Direction of knob	Series
S: Low noise type	B: Pilot Operated Relief Valves	G: Subplate mounting	03	1: 0.7-7.0	View from gauge port : R: Right (P port side standard) L: Left (T port side) —————	31: Adjusting direct type
			06	2: 3.5-14.0		30: Standard type
			10	3: 7.0-25.0		

Technical data

Type	Max. pressure MPa	Max. flow L/min	Weight Kg	Symbols	
S-BG-03	25	100	4.8		
S-BG-06		200	5.9		
S-BG-10		400	11.3		

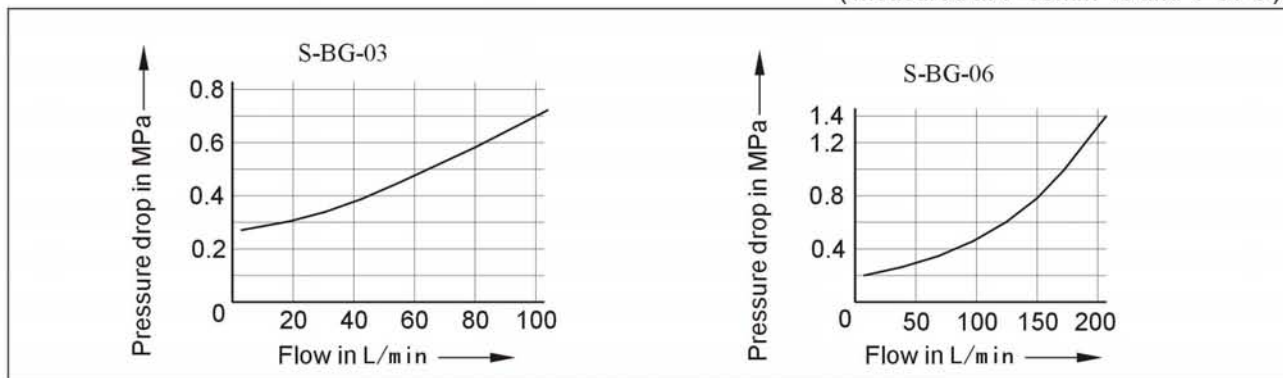
Characteristic Curves : Nominal override

(measured at $v=35\text{mm}^2/\text{s}$ and $t=50^\circ\text{C}$)



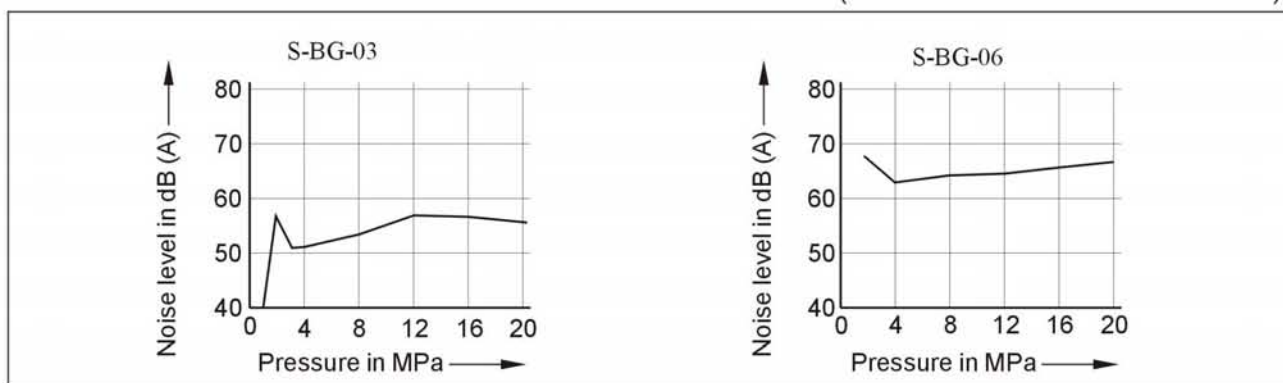
Characteristic Curves : Pressure drop

(measured at $v=35\text{mm}^2/\text{s}$ and $t=50^\circ\text{C}$)



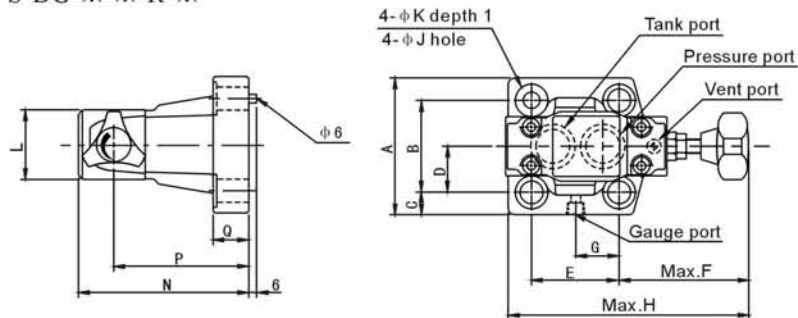
Characteristic Curves : Noise level

(measured at $v=35\text{mm}^2/\text{s}$ and $t=50^\circ\text{C}$)



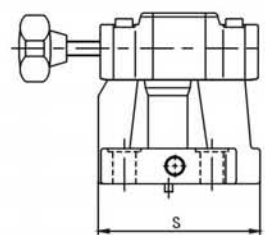
Installation dimensions

● S-BG-※-※-R-※



Note: Please see page 262 about subplate installation dimensions .

● S-BG-※-※-L-※



Type											Fixed bolts				
S-BG-03											4-M12×40L				
S-BG-06											4-M16×45L				
S-BG-10											4-M20×60L				
Type	A	B	C	D	E	F	G	H	J	K	L	N	P	Q	S
SBG-03	77	53.8	11.6	26.9	53.8	98.7	27	187	13.5	21	51	130.5	103	22	106
SBG-06	106	70	15	35	66.7	88.3	33.7	191	17.5	25	51	130	102.5	27	123
SBG-10	120	82.6	18.7	41.3	88.9	58.6	44.9	188	21.5	32	65	167	135	33.5	155

BSG、BST Solenoid Control Relief Valves



The valve is assembled by relief valve and solenoid valve. It can use electricity signal to unload pump or use pilot control relief valve to get double pressure or three pressure control for system.

Max. Pressure 25MPa
Max. Flow :
Size 03 up to 100L/min
Size 06 up to 200L/min
Size 10 up to 400L/min

Ordering details

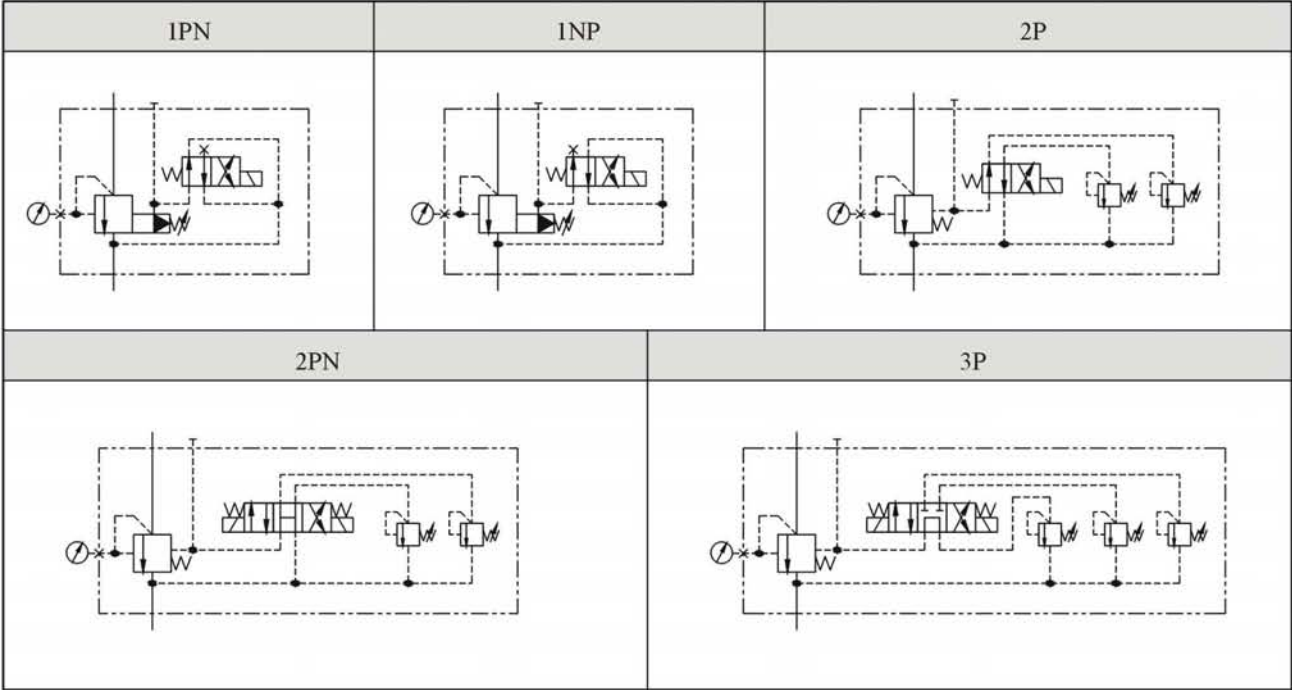
BS	G	-03	-1PN	-1	-U	-L	-G	-31
Sort	Mounting	Size	Normally states	Pressure adj. range Mpa	Electrical connections	Plug-in connector	Input voltage ^①	Series
BS: Solenoid Control Relief Valves	G: Subplate mounting	03	1PN: Normally vented 1NP: Energized to vent	1: 0.7-7.0	U: Individual connections with component plug ISO4400 without plug-in connector FW: Central connections Terminal box with cable connector, with indicator light	No Code: Without plug-in connector	A	31: Adjusting direct type
		06	2P: Dual pressure adj. ranges 2PN: Dual pressure and vent	2: 3.5-14.0		L: With quadrate plug-in connector	B AJ BJ	
		10	3P: Three pressure adj. ranges	3: 7.0-25.0		N: Quadrate plug-in connector with indicator light	G H	
	T: Threaded mounting	03	1PN: Normally vented 1NP: Energized to vent	1: 0.7-7.0	U: Individual connections with component plug ISO4400 without plug-in connector FW: Central connections Terminal box with cable connector, with indicator light	No Code: Without plug-in connector	A	31: Adjusting direct type
		06	2P: Dual pressure adj. ranges 2PN: Dual pressure and vent	2: 3.5-14.0		L: With quadrate plug-in connector	B AJ BJ	
		10	3P: Three pressure adj. ranges	3: 7.0-25.0		N: Quadrate plug-in connector with indicator light	G H	

Note : ① B (AC Type) and BJ (AC To DC Type) input voltage : AC 240V 60Hz and 220V 50Hz;
A (AC Type) and AJ (AC To DC Type) input voltage : AC 120V 60Hz and 110V 50Hz;
G and H (DC Type) input voltage : DC 12V and 24V.

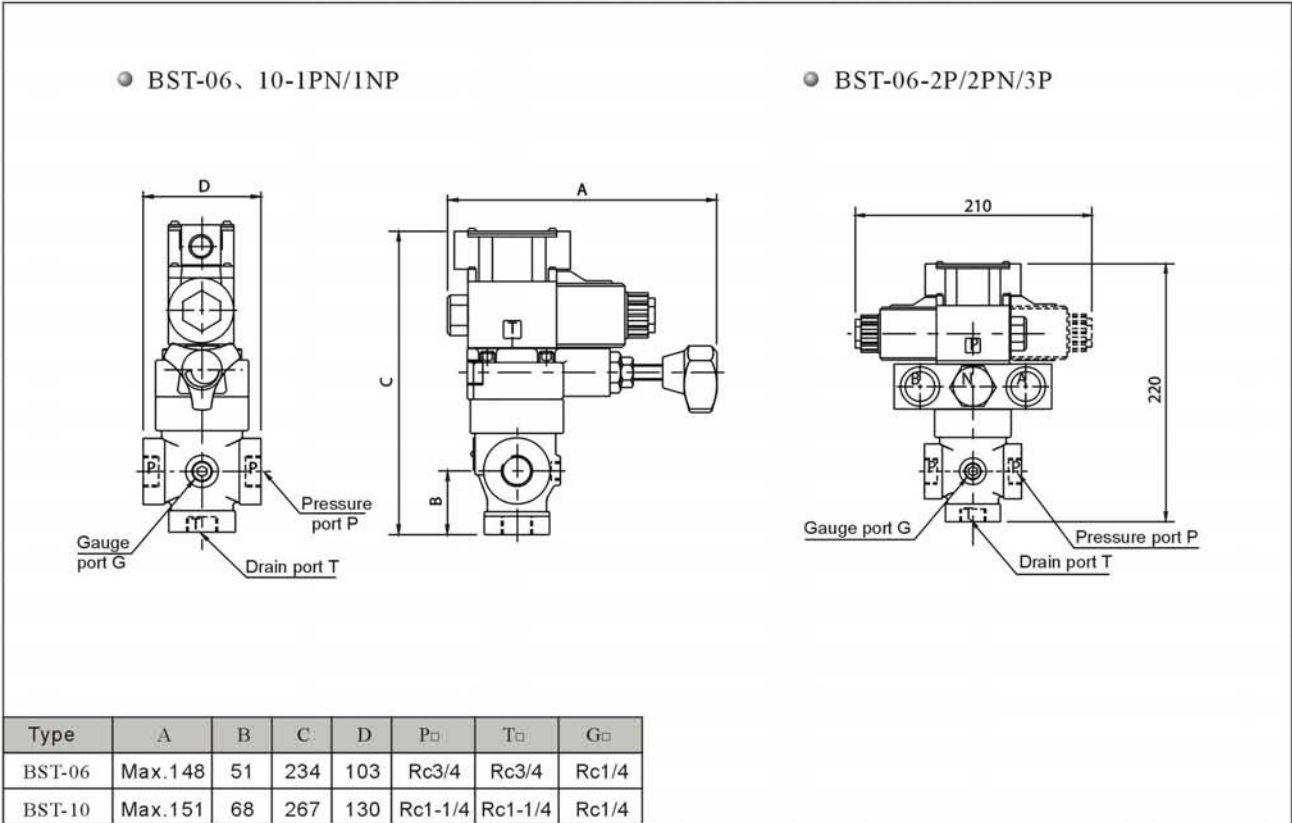
Technical data

Type	Max. pressure MPa	Max. flow L/min	Weight Kg	
BSG-03	25	100	8.9	
BSG-06 BST-06		200	9.1	7
BSG-10 BST-10		400	14.0	7.9

Symbols

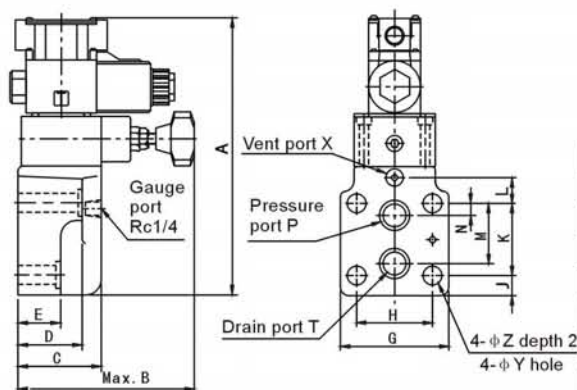


Installation dimensions



Installation dimensions

● BSG-※-1PN/1NP



Note: Please see page 262 about subplate installation dimensions .

Type	Fixed bolts	
BSG-03	2-M12×75L	2-M12×100L
BSG-06	2-M16×60L	2-M16×80L
BSG-10	2-M20×70L	2-M20×90L

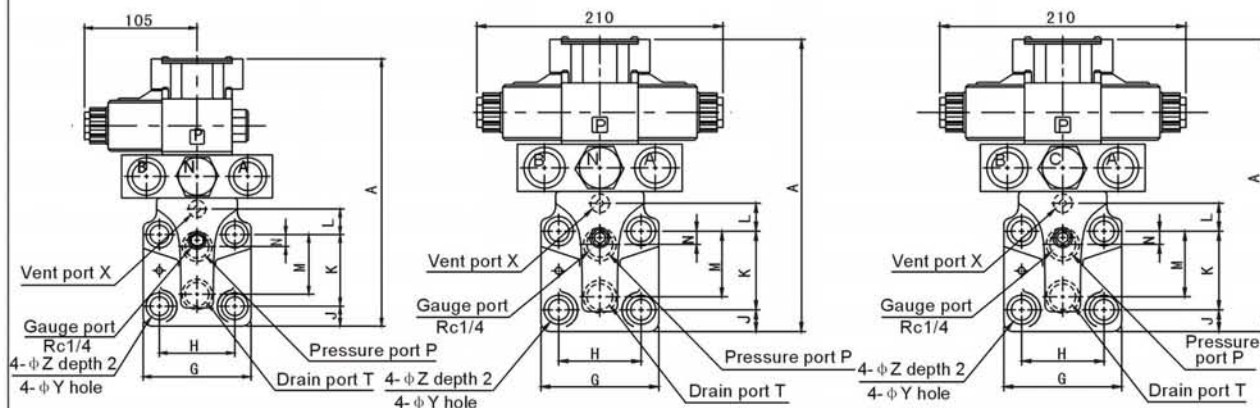
Type	A	B	C	D	E	G	H
BSG-03	228.5	175	78	78	57	82	53.8
BSG-06	254	175	78	60	40	104	70
BSG-10	281	184	87.5	67	47	125	82.6

Type	J	K	L	M	N	Y	Z
BSG-03	21.5	53.8	0	47.5	22	13.5	21
BSG-06	19.5	66.7	23.8	55.5	11	17.5	26
BSG-10	18.5	88.9	31.8	76.2	12.7	22	32

● BSG-※-2P

● BSG-※-2PN

● BSG-※-3P



Note: Please see page 262 about subplate installation dimensions .

Type	A	G	H	J	K	L	M	N	Y	Z
BSG-03 ^{-2P} BSG-03 ^{-2PN} BSG-03 ^{-3P}	218.5	82	53.8	21.5	53.8	0	47.5	22	13.5	21
BSG-06 ^{-2P} BSG-06 ^{-2PN} BSG-06 ^{-3P}	244	104	70	19.5	66.7	23.8	55.5	11	17.5	26
BSG-10 ^{-2P} BSG-10 ^{-2PN} BSG-10 ^{-3P}	281	125	82.6	18.5	88.9	31.8	76.2	12.7	21.5	32

S-BSG LOW Noise Type Pilot Operated Relief Valves



The valve can protect pump and control valve to avoid to exceed pressure and keep invariableness pressure for hydraulic system. It can be carried out remote control and unloading to use unloading (remote control).

Max. Pressure 25MPa
Max. Flow :
Size 03 up to 100L/min
Size 06 up to 200L/min
Size 10 up to 400L/min

Ordering details

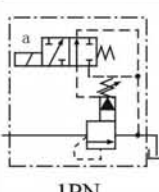
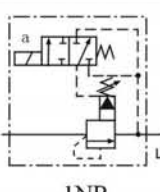
S-	BS	G	-03	-1PN	-1	-U	-L	-G	-R	-31
	Sort	Mounting	Size	Normally states	Pressure adj. range MPa	Electrical connections	Plug-in connector	Input ① voltage	Direction of konb	Series
S-: Low noise type	BS: Solencid Controllde Relief Valves	G: Subplate mounting	03	IPN: Normally vented	1: 0.7-7	U: Individual connections with component plug ISO4400 without plug-in connector FW: Central connections Terminal box with cable connector, with indicator light	No Code: Without plug-in connector L: With guadrte plug-in connector N: Guadrte plug-in connector with indicator light	A	R: Right (P port side) Standard	31: Adlusting direct type
			06		2: 3.5-14			B AJ BJ		
			10	INP: Energized to vent	3: 7.0-25			G H	L: Left (T port side)	30: Standard type

Note : ① B (AC Type) and BJ (AC To DC Type) input voltage : AC 240V 60Hz and 220V 50Hz;
A (AC Type) and AJ (AC To DC Type) input voltage : AC 120V 60Hz and 110V 50Hz;
G and H (DC Type) input voltage : DC 12V and 24V.

Technical data

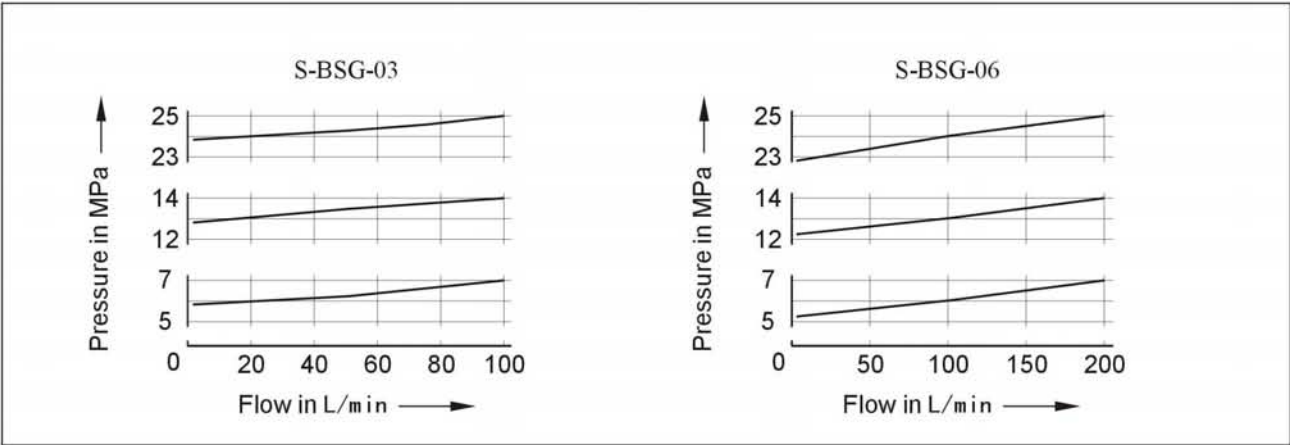
Type	Max.pressure MPa	Max.flow L/min	Weight Kg
S-BSG-03	25	100	5.4
S-BSG-06		200	6.8
S-BSG-10		400	10.5

Symbols

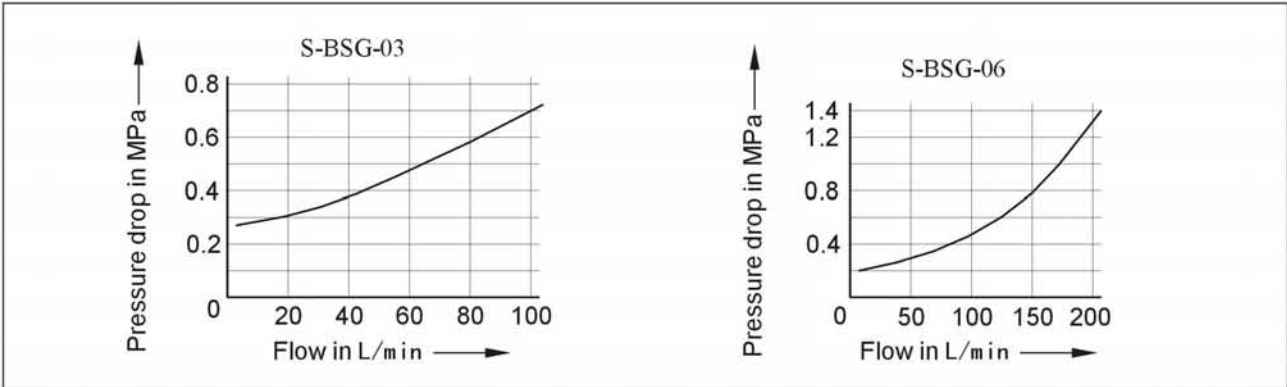
Characteristic Curves : Nominal override

(measured at $v=35\text{mm}^2/\text{s}$ and $t=50^\circ\text{C}$)



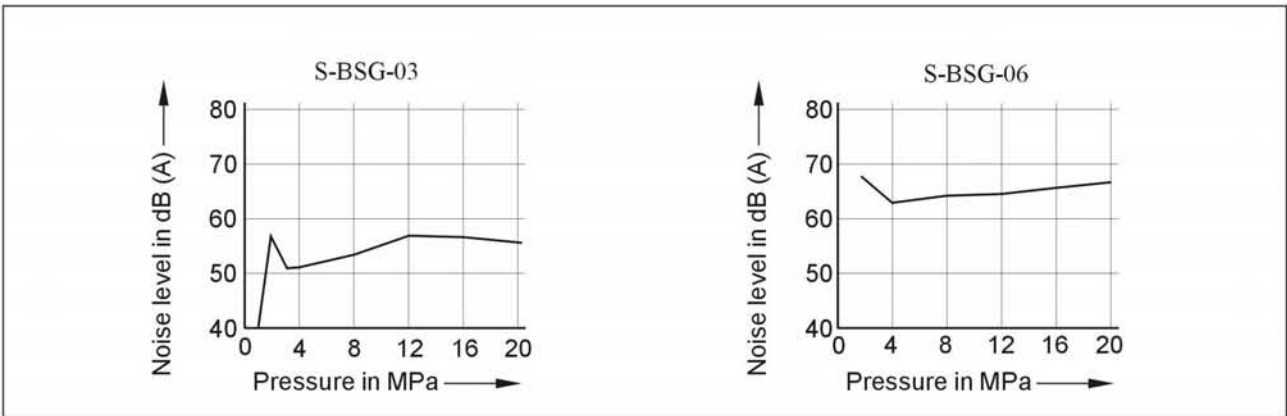
Characteristic Curves : Pressure drop

(measured at $v=35\text{mm}^2/\text{s}$ and $t=50^\circ\text{C}$)



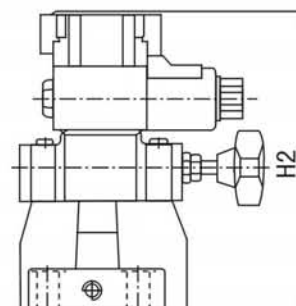
Characteristic Curves : Noise level

(measured at $v=35\text{mm}^2/\text{s}$ and $t=50^\circ\text{C}$)



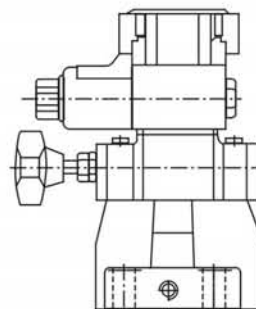
152

● S-BSG-※-※-※-※- B-R-※



Note: Please see page 262 about subplate installation dimensions .

● S-BSG-※-※-※-※-※-※-※



									Type				Fixed bolts			
									S-BSG-03				4-M10×100L			
									S-BSG-06				4-M16×130L			
									S-BSG-10				4-M20×130L			
Type	A	B	C	D	E	F	G	J	K	N	P	Q	S	T	H ₁	H ₂
S-BSG-03	77	53.8	11.6	26.9	53.8	98.7	27	13.5	21	154	103	22	107	26.2	212	215.5
S-BSG-06	100	70	15	35	66.7	88.3	33.7	17.5	25	153.5	102.5	27	123	45	211.5	215.5
S-BSG-10	120	82.6	18.7	41.3	88.9	58.6	44.9	21.5	32	188	135	33.5	155	45	243.5	247.5

RG、RT Pressure Reducing Valves



The valve is used to enact hydraulic return road's pressure which is lower than main return road pressure. Moreover, it can remote control port to do remote control.

Max. Pressure 25MPa
Max. Flow :
Size 03 up to 50L/min
Size 06 up to 125L/min
Size 10 up to 250L/min

Ordering details

R	G	-06	-1	-31
Sort	Mounting	Size	Pressure adj. range MPa	Series
R: Pressure Reducing Valves	G: Subplate mounting	03	1: 0.7-7.0	31: Adjusting direct type 30: Standard type
	T: Threaded mounting	06	2: 3.5-14.0	
		10	3: 7.0-25.0	

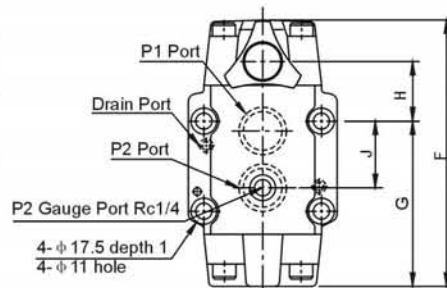
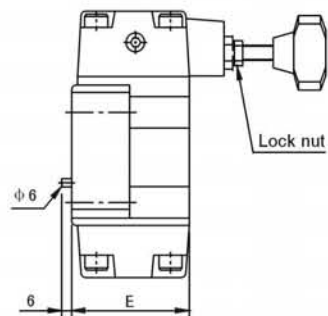
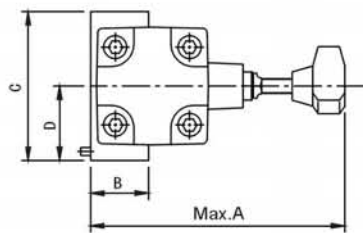
Symbols	

Installation dimensions

● RT-03											
● RT-06、RT-10											
Type	A	B	C	D	E	F	G	H	K	N	P
RT-06	94.8	48	150	42	157	97	53.5	33	39	62	3/4
RT-10	132	66	167	52	216	124	64	40	50	79	1-1/4

Installation Dimensions

● RG-03 RG-06

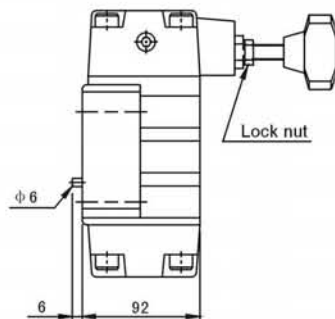
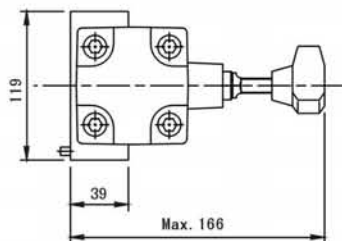


Type		Weight Kg	
RT-03	RG-03	4.3	4.5
RT-06	RG-06	6.0	6.8
RT-10	RG-10	12.0	11.0

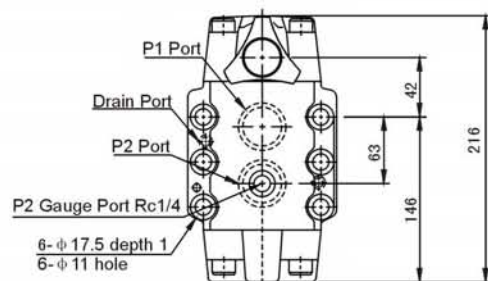
Type	Fixed bolts
RG-03	4-M10×55L
RG-06	4-M10×55L

Type	A	B	C	D	E	F	G	H	J
RG-03	174	42	89	44.5	67	159	92.4	40.6	35
RG-06	165.8	42	100	50	79	182	111	40	48

● RG-10



Fixed bolts 6-M10×55L



RCG、RCT Pressure Reducing And Check Valves



The valve is used to enact hydraulic return road's pressure which is lower than main return road pressure. Moreover, it can remote control port to do remote control. Check valve allows fluid to flow from two times side to one time side freely reverse.

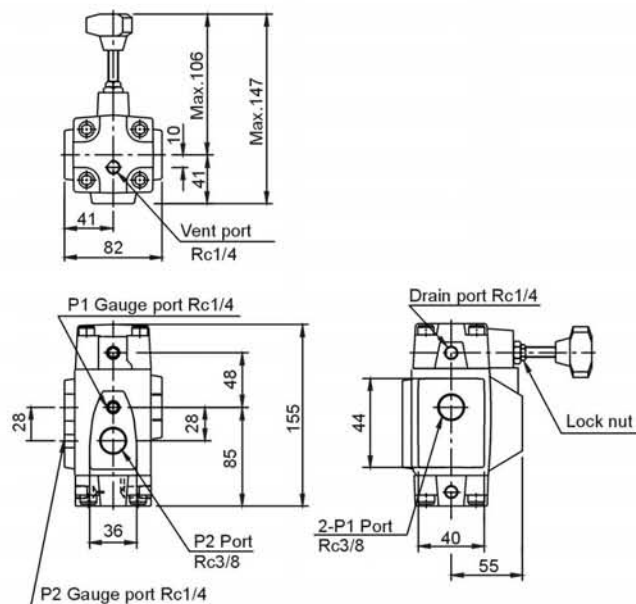
Max. Pressure 25MPa
Max. Flow :
Size 03 up to 50L/min
Size 06 up to 125L/min
Size 10 up to 250L/min

Ordering details

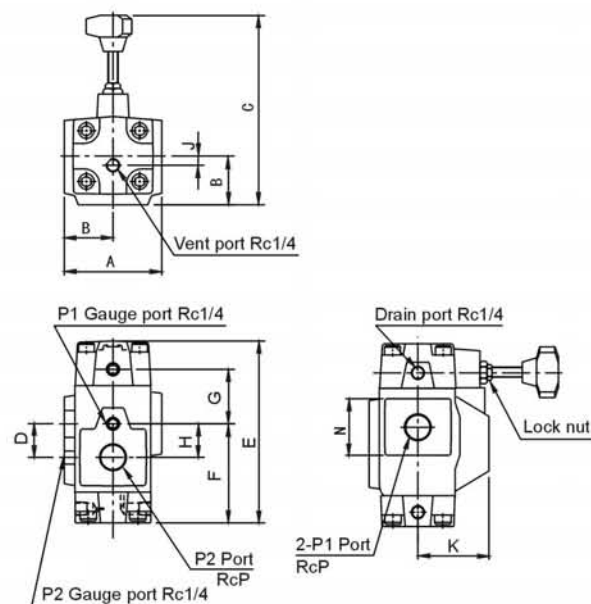
RC	G	-06	-1	-31	Symbols	
Sort	Mounting	Size	Pressure adj. range MPa	Series		
RC: Pressure Reducing And Check Valves	G: Subplate mounting	03	1: 0.7-7.0	31: Adjusting direct type		
	T: Threaded mounting	06	2: 3.5-14.0	30: Standard type		
		10	3: 7.0-25.0			

Installation dimensions

● RCT-03



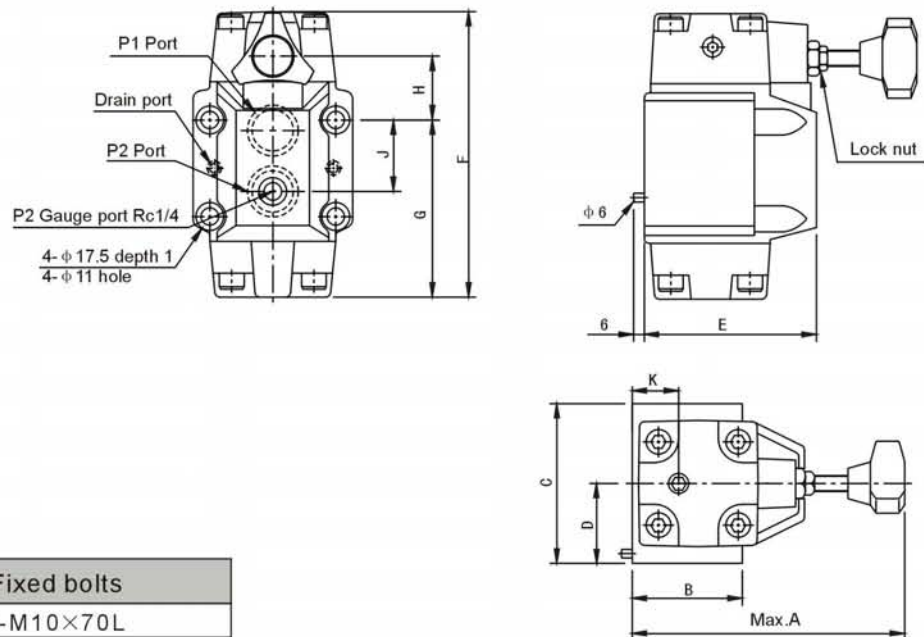
● RCT-06、RCT-10



Type	A	B	C	D	E	F	G	H	J	K	N	P
RCT-06	94	48	150	42	179	97.5	44.5	42	9	66	62	3/4
RCT-10	137	68.5	167	52	216	124	52	52	12	84	79	1-1/4

Installation Dimensions

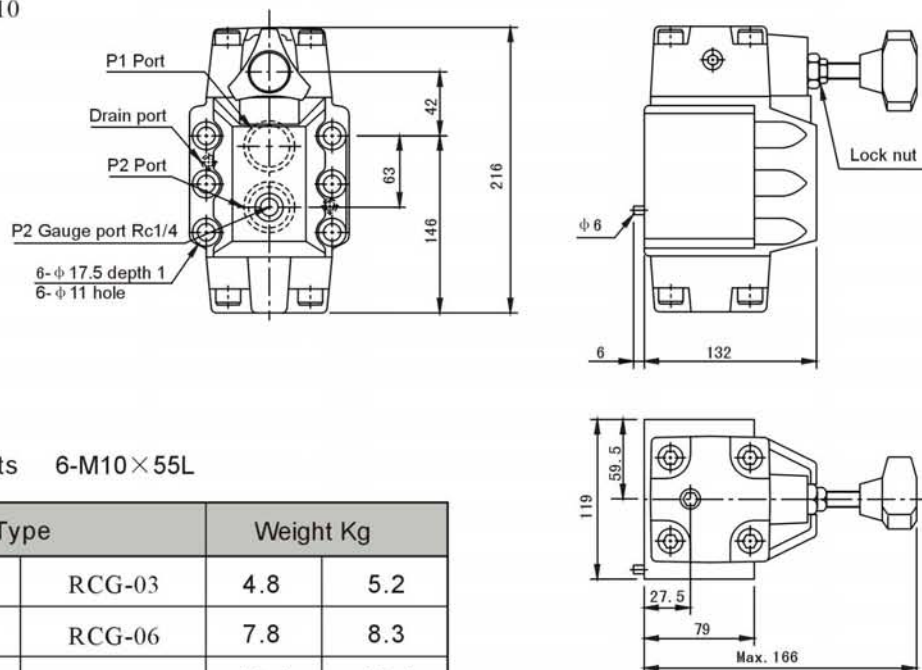
● RCG-03、RCG-06



Type	Fixed bolts
RCG-03	4-M10×70L
RCG-06	4-M10×80L

Type	A	B	C	D	E	F	G	H	J	K
RCG-03	172	61	90	45	88	155	92.4	45	34.9	25
RCG-06	172	70	103	52	109	182	111	40	48	21.5

● RCG-10



Fixed bolts 6-M10×55L

Type	Weight Kg
RCT-03 RCG-03	4.8 5.2
RCT-06 RCG-06	7.8 8.3
RCT-10 RCG-10	14.4 13.4

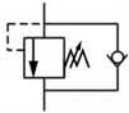
MCA Counterbalance Valves



This kind valve can load or provide back pressure for system. It can used for hydraulic set which needs to avoid dead weight descent and hydraulic boodle with back pressure.

Max.Pressure 25MPa
Max.Flow :
Size 03 up to 100L/min
Size 06 up to 200L/min
Size 10 up to 400L/min

Ordering details

MCA	-06	-1	-10	-31	Symbol
Sort	Size	Pressure adj.range MPa	Valve type	Series	
MCA: Counterbalance Valves	03	1: 0.7-7.0	10: Pilot operated type	31: Adlusting direct type	
	06	2: 3.5-14.0		30: Standard type	
	10	3: 7.0-25.0			

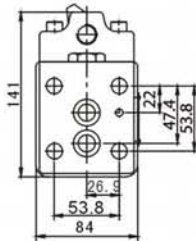
Technical data

Type	Max.pressure MPa	Max.flow L/min	Weight Kg	
MCA-03	25	100	7	6.9
MCA-06		200	11.2	10.5
MCA-10		400	18.6	17.9

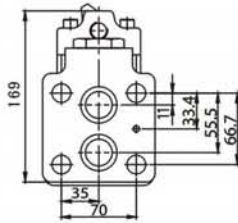
Attachment

Type	Fixed bolts
MCA-03	2-M12×110L 2-M12×135L
MCA-06	2-M16×120L 2-M16×140L
MCA-10	2-M20×145L 2-M20×165L

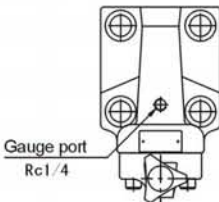
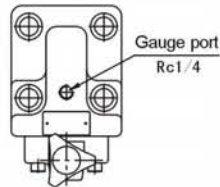
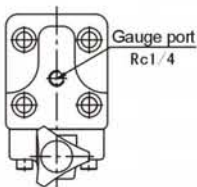
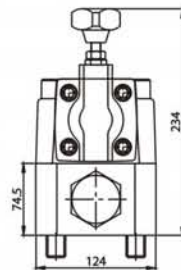
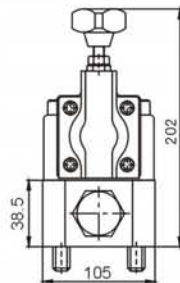
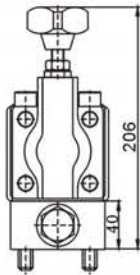
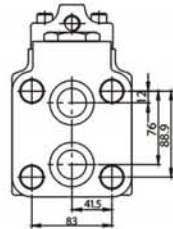
● MCA-03-※-10



● MCA-06-※-10



● MCA-10-※-10



MPCV Modular Pilot Operated Check Valve



The valve can come true single flow of fluid. For reverse, it's closed of without leaking. Control plunger can push out check valve and come true converse flow. The valve usually be used to carry out to protect pressure of component for oil vat.

Max.Pressure 21MPa
Max.Flow :
Size 02 up to 35L/min
Size 03 up to 70L/min

Ordering details

MPCV	-02	-A	-05
Sort	Size	Port number	Cracking pressure
MPCV: Modular pilot operated check valves	02	A: A port B: B port W: A、B port	05: 0.035MPa
	03		50: 0.35MPa

Symbols

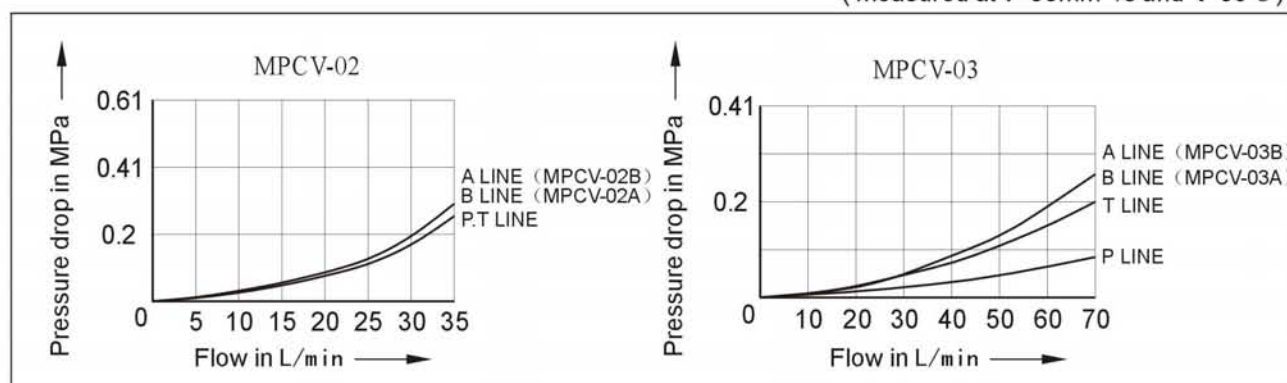
Type	MPCV-※-A	MPCV-※-B	MPCV-※-W
Symbols			

Technical data

Type	Max.pressure MPa	Max.flow L/min	Weight Kg
MPCV-02	21	35	1.1
MPCV-03		70	2.8

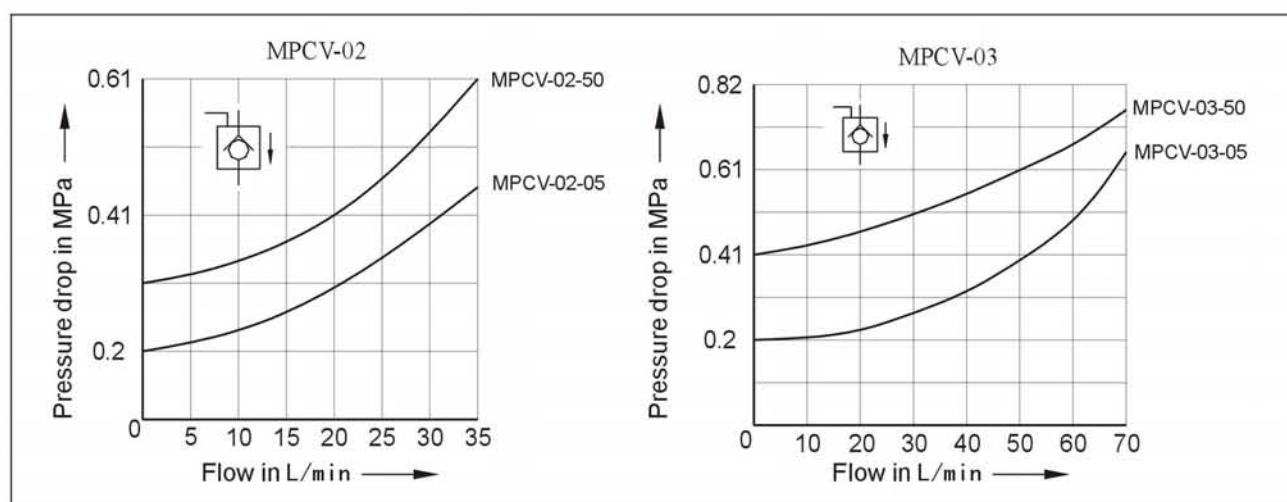
Characteristic Curves : Pressure drop

(measured at $v=35\text{mm}^2/\text{s}$ and $t=50^\circ\text{C}$)



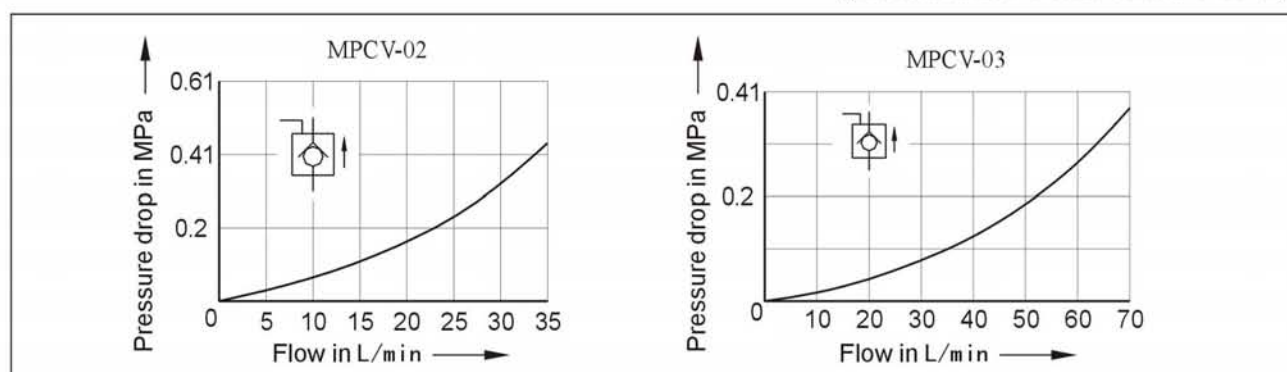
Characteristic Curves : Pressure drop free flow

(measured at $v=35\text{mm}^2/\text{s}$ and $t=50^\circ\text{C}$)



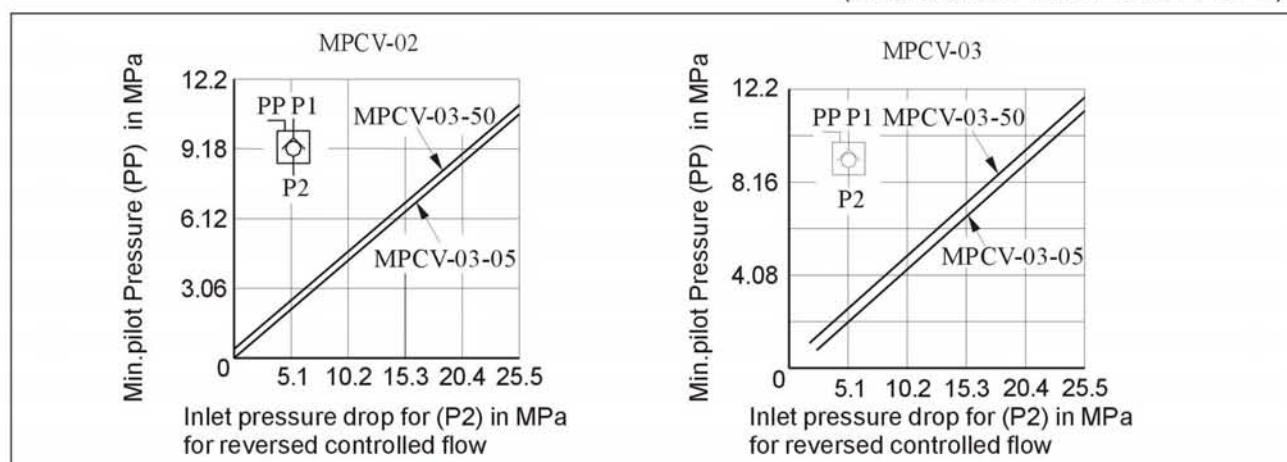
Characteristic Curves : Pressure drop for reverse controlled flow

(measured at $v=35\text{mm}^2/\text{s}$ and $t=50^\circ\text{C}$)

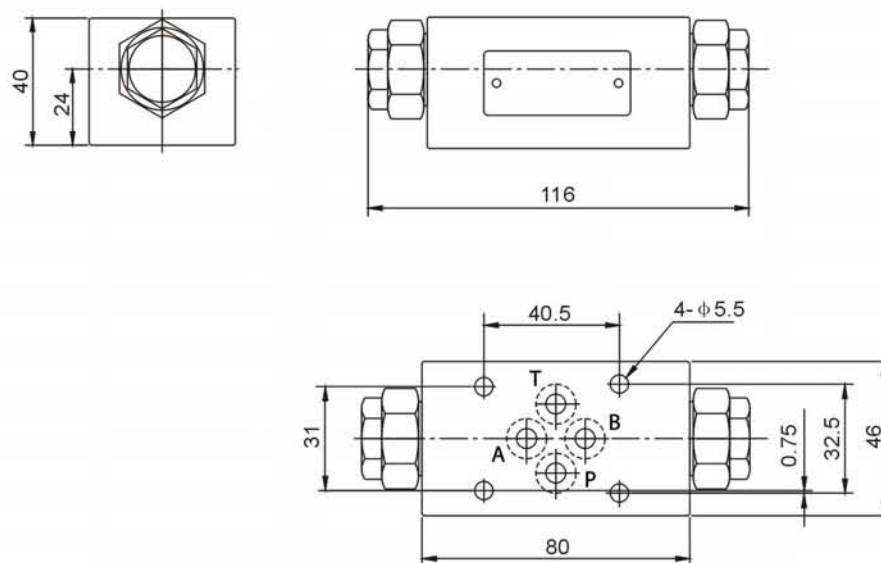


Characteristic Curves : Pressure drop free flow

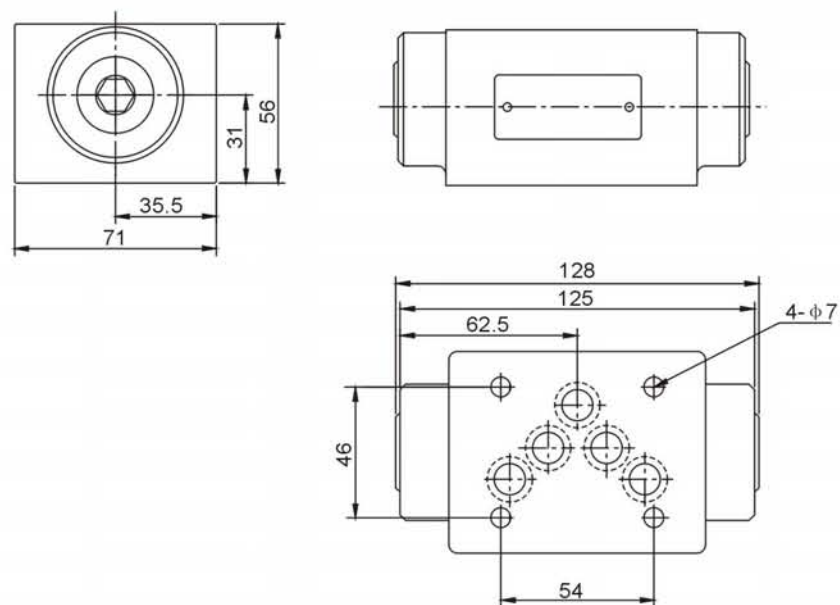
(measured at $v=35\text{mm}^2/\text{s}$ and $t=50^\circ\text{C}$)



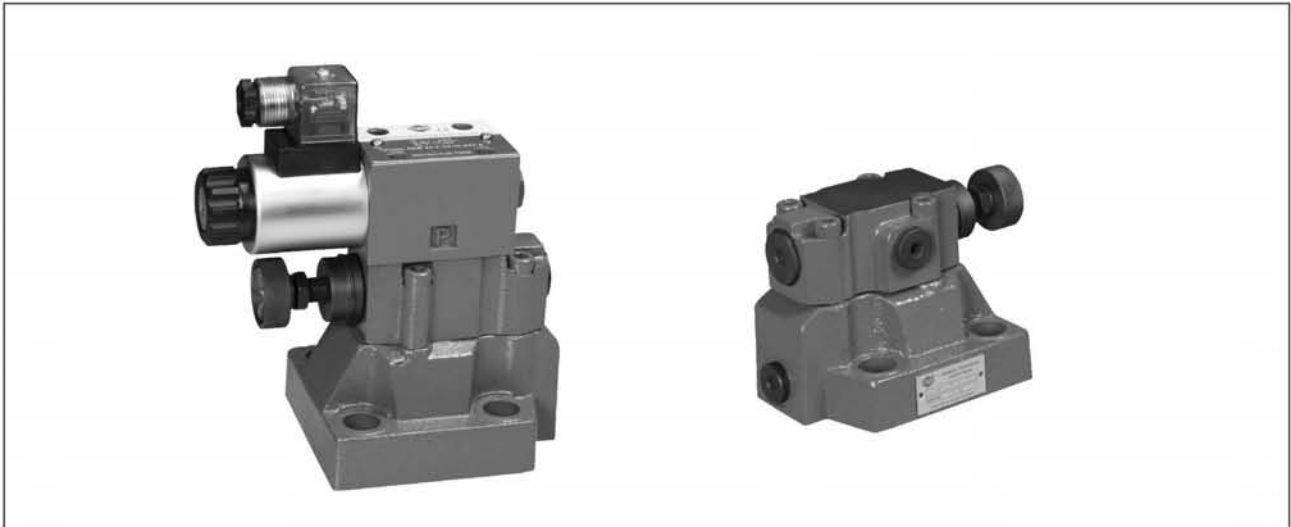
● MPCV-02



● MPCV-03



Pressure relief valve , pilot operated , Type DB;DBW



Introduction and Characteristic

- They are used for the limitation (DB) or limitation and solenoid actuated unloading (DBW) of the control pressure .
- Main valve's unloading can be done by installing solenoid operated directional valve.
- It also can be reduced impact when unloading by installing delay valve.

Ordering details

1	2	3	4	5	6	7	8	9	10
DB						— 5X /			

NO.	Version	Code	Explanation
1	Sort	DB	Pilot operated relief valve
2	Direction valve	No Code	Without direction valve
		W	With built-on directional spool valve
3		No Code	Pilot operated valve (complete)
		C	Pilot operated valve without main spool assembly (do not enter nominal size)
		C	Pilot operated valve with main spool assembly (enter valve size 10, 20, or 30)
		T	Pilot operated valve without main spool assembly for subplate mounting (do not enter nominal size)
4	Nominal size	10	Nominal size 10
		20	Nominal size 25
		30	Nominal size 32
5	Work state ^①	A	Normally closed
		B	Normally open
6	Adjustment elements	1	Rotary knob
		2★	Sleeve with hexagon and protective cap
		3★	Lockable rotary knob with scale
		7★	Rotary knob with scale
7	Series	5X	
8	Settable pressure	50	Settable pressure up to 5MPa
		100	Settable pressure up to 10MPa
		200	Settable pressure up to 20MPa
		315	Settable pressure up to 31.5MPa
		350	Settable pressure up to 35MPa
9	Pilot oil supply and drain line ^①	No Code	Pilot oil supply internal , pilot oil drain internal
		X	Pilot oil supply external , pilot oil drain internal
		Y	Pilot oil supply internal , pilot oil drain external
		XY	Pilot oil supply external , pilot oil drain external

Note :

- ① Only fit for pilot operated relief valve with solenoid controlled ;
- ② Waterproof degree of plug-in connector is above IP65;
- ★ Please consult us when you choose this application.

Ordering details

11	12	13	14	15	16	17	18	19	20
								S	

NO.	Version	Code	Explanation
10	Cracking pressure	No Code	Standard version
		U	Valve for minimum cracking pressure
11	Switching shock damping	No Code	Switching , without switching shock damping
		S	With switching shock damping
12 ^①	Input voltage	W220	220V/50Hz、240V/60Hz
		W110	110V/50Hz、120V/60Hz
		RAC220	220V/50Hz、240V/60Hz
		RAC110	110V/50Hz、120V/60Hz
		G12	12V
		G24	24V
		G48	48V
13 ^①	Hand override	N9	With protected hand override (standard)
		N★	With hand override
14 ^①	Electrical connections	K4	Individual connection with component plug ISO4400 without plug-in connector
		DL	Terminal box with cable connector,with indicator light
15 ^①	Plug-in connector	No Code	Without plug-in connector
		Z4	With quadrate plug-in connector
		Z5L	Quadrate plug-in connector with indicator light
		F6L	With waterproof plug-in connector ^②
16 ^①	Throttle position	No Code	Without cartridge throttle
		P	Active in the P line
		A	Active in the A line
17 ^①	Throttle diameter	No Code	Without cartridge throttle
		08	Throttle Φ 0.8 mm
		10	Throttle Φ 1.0 mm
		12	Throttle Φ 1.2 mm
18	Seal material	No Code	NBR seals
		V	FKM seals
19		S	SUNNY fluid power technic
20			Futher details in clear text

Symbols

Type	...-...	...X...	...Y...	...XY...
DB				
DBW	Normally open 			
	Normally closed 			

Function

Functional description (Type: DB 10 15X/100)

Pass way P's pressure is on main spool 2. At the same time, pressure oil via throttle hole 11 to control pass way 10 and 8 on main spool 2's spring and pilot valve 9's ball 7. If pass way P's pressure is bigger than pilot valve spring's pressure, control oil reflows to oil box. (For internal drain type, control oil via pilot valve's spring cavity to main valve T port to oil box from pass way 4. For external drain type, pass way 4 installs screw plug 3. Control oil via pilot valve's drain port 6 to reflow oil box.) Then there is pressure difference between main spool up and down two sides. The pressure becomes up hydraulic power to drive spool 2 to move up. P port pressure oil start to relief to return oil port T and reflow oil box then. But P port pressure keeps fix.

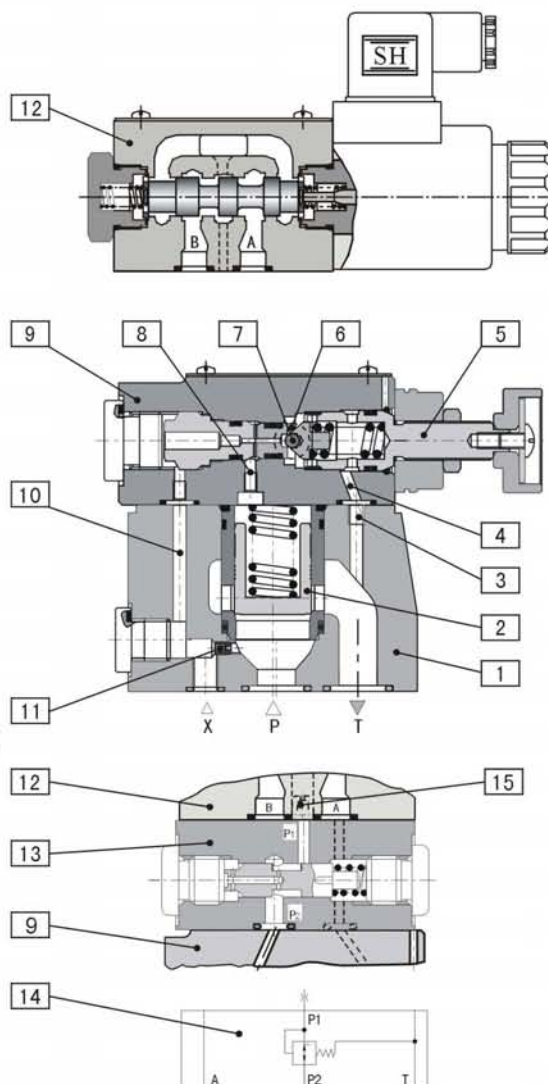
Type: DBW...

Control oil road's switch can be come true by installing 2-position solenoid operated directional valve on DB series valve's pilot valve for DBW series valve.

Switching shock damping (Type: DBW...5X/...S...P10...S)

Control oil from P2 to P1's continuous delay is unlocked by installing shifting time delay valve 13 between pressure pilot valve 9 and solenoid operated directional valve 12 (See section and theory photo 14). So return oil road's pressure max. no. and unloading cushion can be reduced.

For unloading impact's cushion degree, it can be adjusted by installing different dimension's throttle is at solenoid operated directional valve's P port.



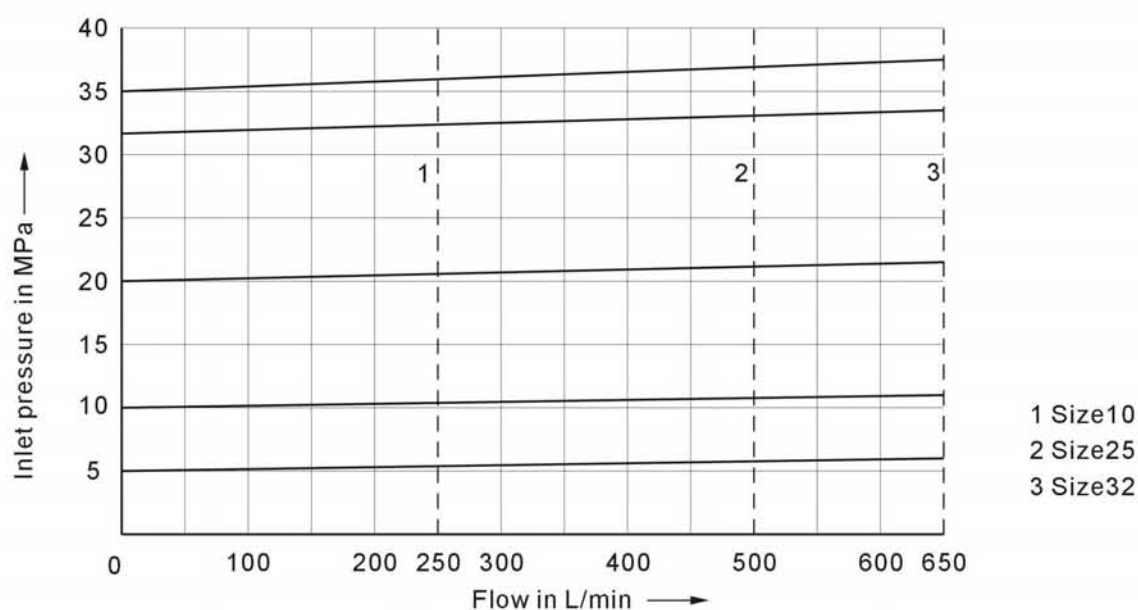
Technical data

General				Nominal size 10	Nominal size 25	Nominal size 32
Weight	DB...		Kg	2.60	3.50	4.40
	DBW...		Kg	4.05	4.95	5.85
	DBC...		Kg	1.20		
	DBWC...		Kg	2.65		
	DBC10/20/30...		Kg	1.50		
	DBWC10/20/30...		Kg	2.95		
Ambient temperature	DB...	NBR seals	°C	-30 to +80		
		FKM seals	°C	-15 to +50		
	DBW...	NBR seals	°C	-30 to +50		
		FKM seals	°C	-15 to +50		
Installation				optional		

Hydraulic				Nominal size 10	Nominal size 25	Nominal size 32
Max. Flow		L/min		250	500	650
Max. Operating pressure	Port P	MPa		35		
	Port T	MPa		31.5		
Max. Back pressure	Port Y DB...	MPa		31.5		
	Port Y (DBW.../...Y)	MPa		21 (=DC solenoids)		
	or Port T (DBW.../...)	MPa		16 (~AC solenoids)		
Settable pressure	Min.	MPa		Flow dependent (see characteristic curves)		
	Max.	MPa		5、10、20、31.5、35		
Pressure fluid: ① suitable for NBR and FPM seals; ② only suitable for FKM seals.				Mineral oil (HL,HLP) to DIN 51524 ^① Fast bio-degradable pressure fluids to VDMA 24568; HETG(rape seed oil) ^① HEPG(Polyglycol);HEES(Synthetic ester) ^② ; Other fluids on request		
Pressure fluid temperature range	NBR seals	°C		-30 to +80		
	FKM Seals	°C		-20 to +80		
Viscosity range		mm ² /s		10 to 800		
Degree of contamination				Maximum permissible degree of contamination of fluid is to NAS 1638 class 9.We,therefore,recommend a filter with a minmunetention rate of $\beta_{10} \geq 75$.		

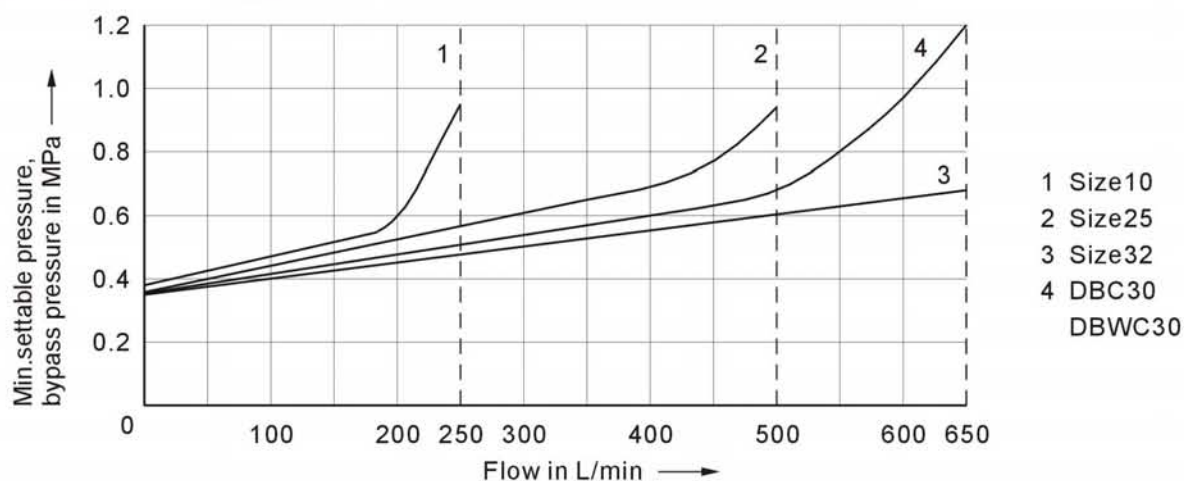
Electrical	See 4WE6/10 type valves on page 181
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● Inlet pressure in relation to the flow

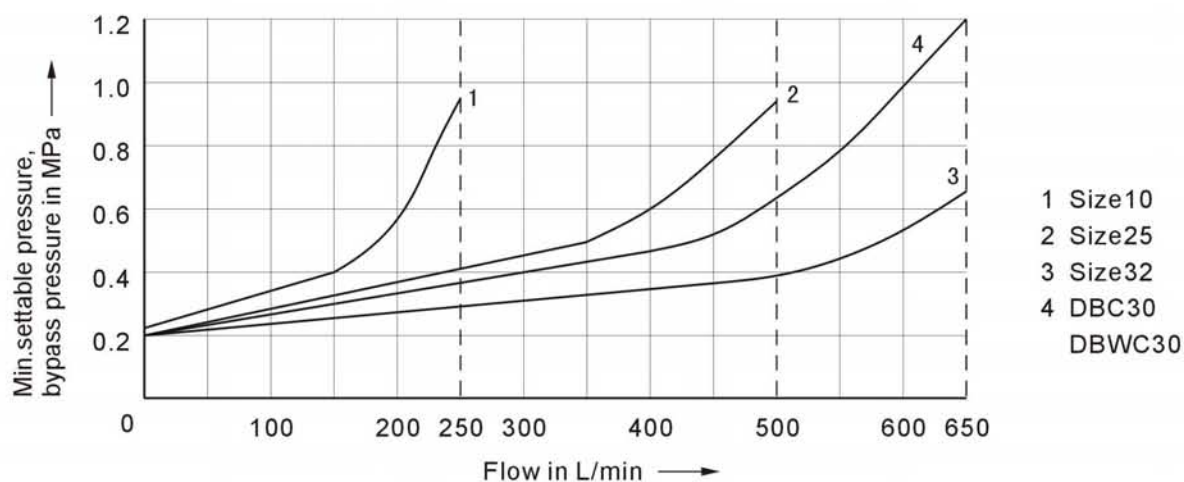


● Minimum settable pressure and bypass pressure in relation to the flow

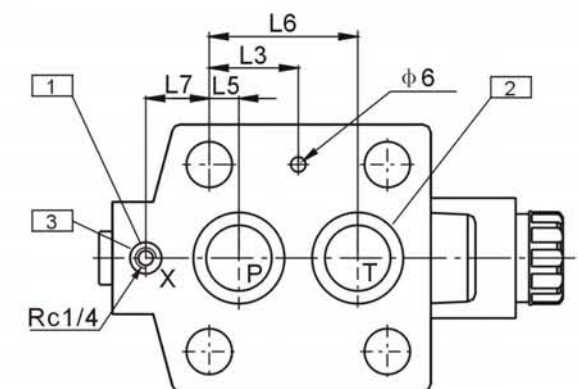
Standard version (Type: DB...5X/...S)



Minimum cracking pressure (Type: DB...5X/...U...S)



Installation Dimensions : for subplate mounting



Item Explanation

- 1、O Ring 8.8x1.9 (DB.10、DB.20、DB.30) ;
- 2、DB.10: O Ring 2-17x2.5 ;
DB.20: O Ring 2-27.7x3.5 ;
DB.30: O Ring 2-33.7x3.5 ;
- 3、X Port for external pilot ;
- 4、Space for pulling out plug ;
- 5、with shifting shock damping , optional ;
- 6、Y Port (G1/4) for external pilot reflow ;
- 7、Adjustment component with cap.bolts (S=10) ;
- 8、Handwheel adjustment component ;
- 9、Adjustment component with scale ;
- 10、Adjustment component with scale and lock ;
- 11、No installation when internal pilot reflow ;
- 12、space for pulling out key ;

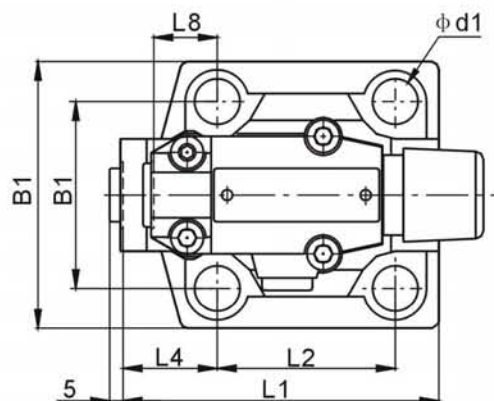
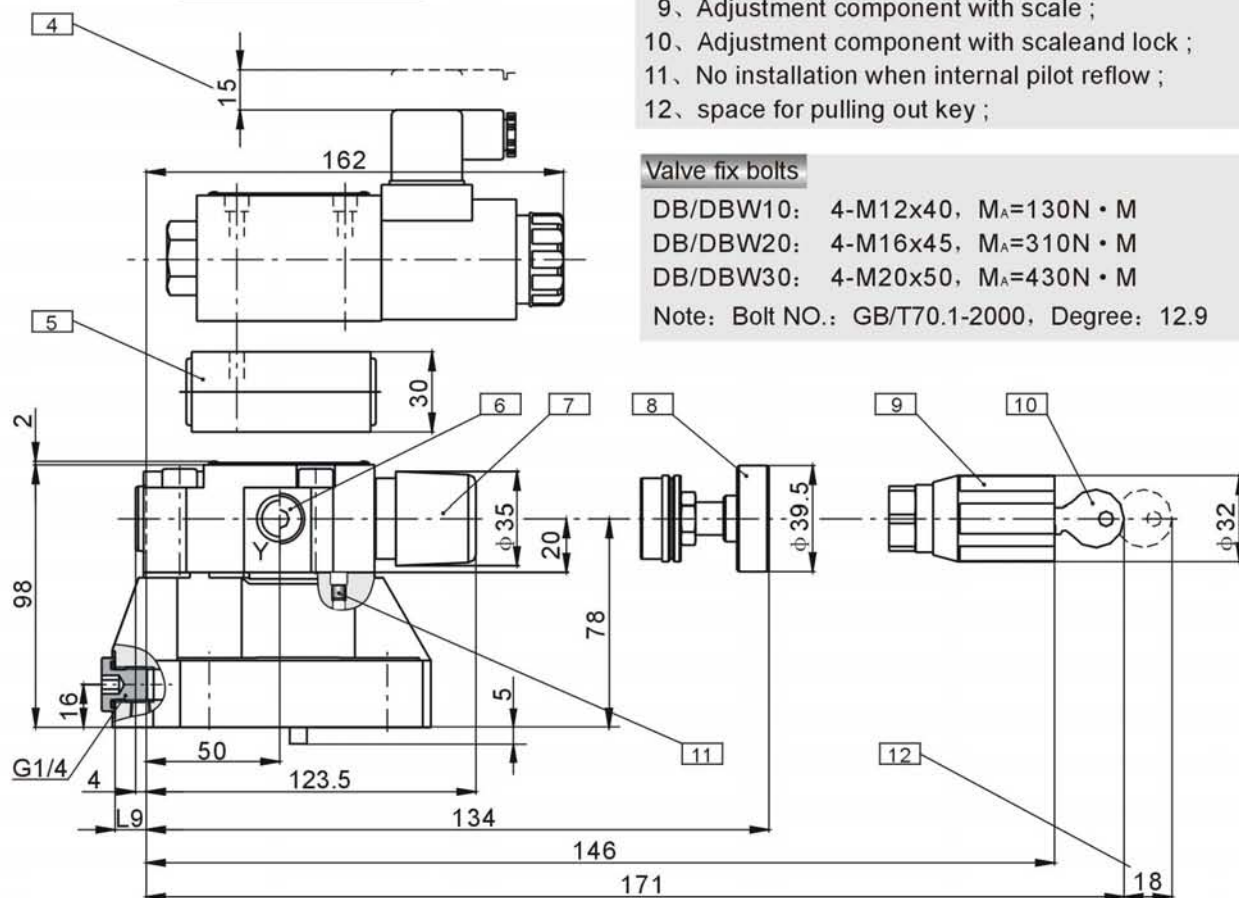
Valve fix bolts

DB/DBW10: 4-M12x40, $M_A=130N \cdot M$

DB/DBW20: 4-M16x45, $M_A=310N \cdot M$

DB/DBW30: 4-M20x50, $M_A=430N \cdot M$

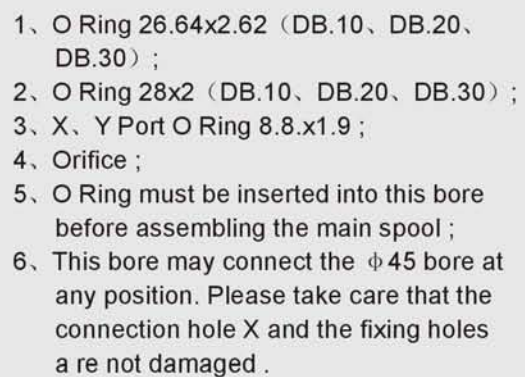
Note: Bolt NO.: GB/T70.1-2000, Degree: 12.9



Type	L1	L2	L3	L4	L5	L6	L7
DB.10	91	53.8	22.1	27.5	22.1	47.5	0
DB.20	116	66.7	33.4	33.3	11.1	55.6	23.8
DB.30	147.5	88.9	44.5	41	12.7	76.2	31.8

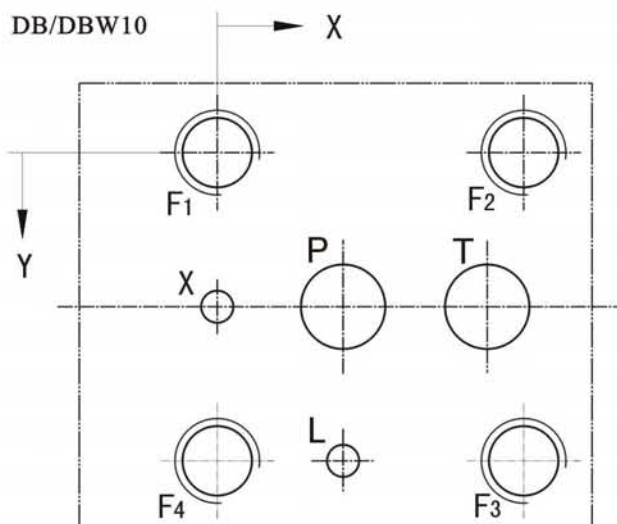
Type	L8	L9	B1	B2	d1
DB.10	25.5	2	78	53.8	14
DB.20	22.8	10.5	100	70	18
DB.30	20	21	115	82.6	20

DBC10/20/30... 、 DBC...And DBT...



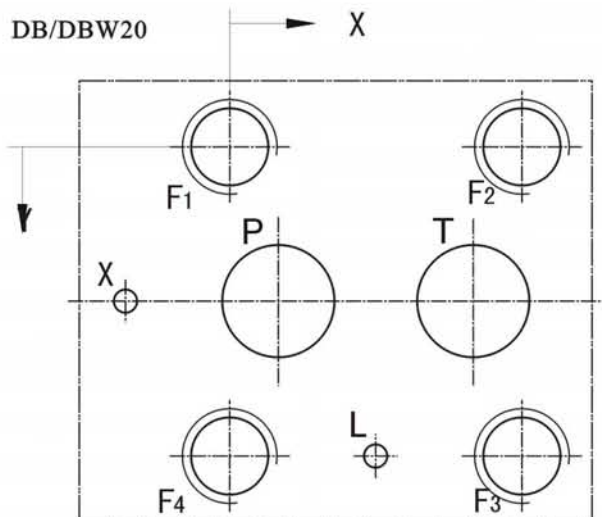
Subplate Installation Dimensions

DB/DBW10



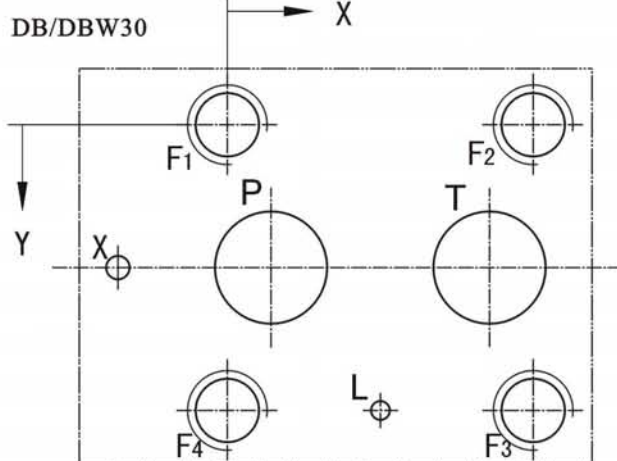
Type	Des. Code	Position		Character	
		X	Y		Deep
DB/DBW10	F ₁	0	0	M12	26
	F ₂	53.8	0	M12	26
	F ₃	53.8	53.8	M12	26
	F ₄	0	53.8	M12	26
	X	0	26.9	φ 4.8	—
	P	22.1	26.9	φ 14.7	—
	T	47.5	26.9	φ 14.7	—
	L	22.1	53.8	φ 4.8	7

DB/DBW20

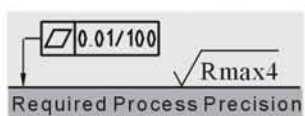


Type	Des. Code	Position		Character	
		X	Y		Deep
DB/DBW20	F ₁	0	0	M16	26
	F ₂	66.7	0	M16	26
	F ₃	66.7	70	M16	26
	F ₄	0	70	M16	26
	X	-23.8	35	φ 6.3	—
	P	11.1	35	φ 25	—
	T	55.6	35	φ 25	—
	L	33.4	70	φ 6.3	7

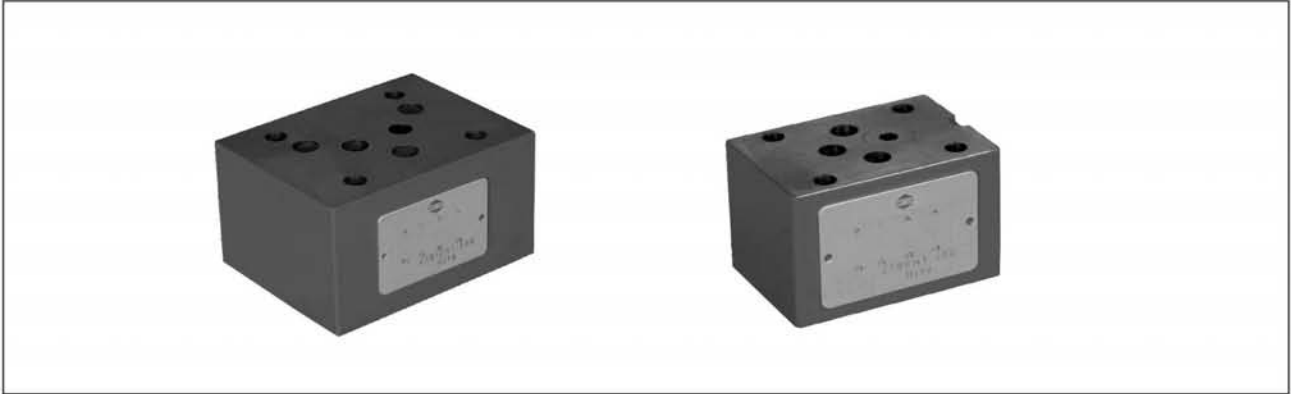
DB/DBW30



Type	Des. Code	Position		Character	
		X	Y		Deep
DB/DBW30	F ₁	0	0	M18	26
	F ₂	88.9	0	M18	26
	F ₃	88.9	82.6	M18	26
	F ₄	0	82.6	M18	26
	X	-31.8	41.3	φ 6.3	19
	P	12.7	41.3	φ 32	—
	T	76.2	41.3	φ 32	—
	L	44.5	82.6	φ 6.3	7



Check Valves , Sandwich plate , Type Z1S6 or 10



Introduction and Characteristic

- Z1S type modular check valve is assembled by valve body and check valve insert file .
- The valve can come true single direction flow for fluid. For reverse, it's closed of without leak.
- The valve uses metal seal duri NG spool and valve body. So it's special fit for the condition that work pressure is higher than 10MPa and flow speed is bigger than 4m/s.

OrderiNominal size details

1	2	3	4	5	6	7	8
Z1S			—	30	/	S	

Item	Collocation	Code	Explanation
1	Sort	Z1S	Modular Check Valves
2	Size	6	NG 6
		10	NG 10
3	Symbols		See symbols list
4	Unlock Pressure	1	0.05MPa
		2	0.3MPa
		3	0.5MPa

Item	Collocation	Code	Explanation
5	Series	30	Design series number
6	Seal Material	NO Code	NBR seals
		V	FKM seals
7		S	SUNNY hydraulic technical
8			Other especial demand

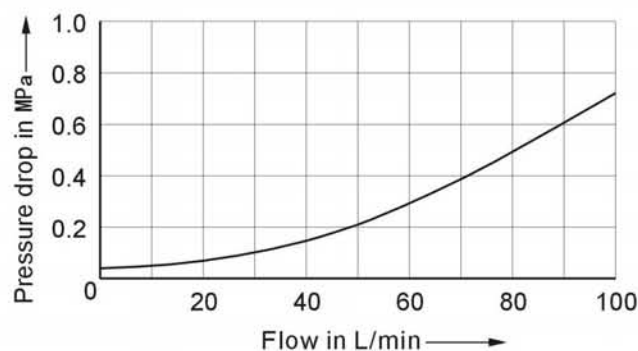
Symbols

A	B	C	D
E	F	P	T

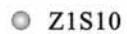
Technical data

Data Size	Max. Pressure MPa	Unlock pressure MPa	Flow speed m/s	Max. Flow L/min	Weight Kg
06	31.5	Choice from OrderiNominal size details	≥ 4	40	0.8
10				100	2.3

Characteristic curves



● Z1S6



Check Valves , Hydraulic Pilot Operated , Type Z2S6~22



Introduction and Characteristic

- Z2S type modular pilot operated check valve is assembled by valve body , check valve insert file and control plunger.
- The valve can come true single direction flow for fluid.
For reverse, it's closed of without leak.
- Control plunger can pull out check valve and converse flow.
- The valve usually be used to keep pressure for oil vat and other component.

Ordering details

1	2	3	4	5	6	7	8
Z2S			—	/		S	

Item	Collocation	Code	Explanation
1	Sort	Z2S	Modular Pilet Operated Check Valves
2	Nominal Size	6	Nominal size 6
		10	Nominal size 10
		16	Nominal size 16
		22	Nominal size 22
3	Symbols		Choice base on symbols list
4	Unlock Pressure	1	0.15MPa
		2	0.3MPa
		3	0.6MPa
5	Series	20	Fit for Nominal Size 10
		30	Fit for Nominal Size 16 and Nominal Size 22
		40	Fit for Nominal Size 6
6	Seal Material	NO	NBR seals
		V	FKM seals
7		S	SUNNY hydraulic technical
8			Explanation other especial demand

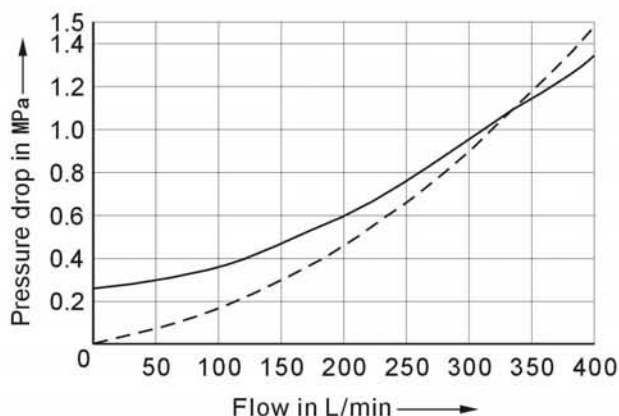
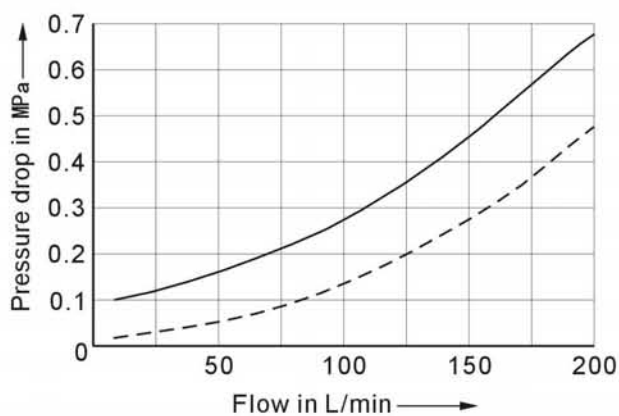
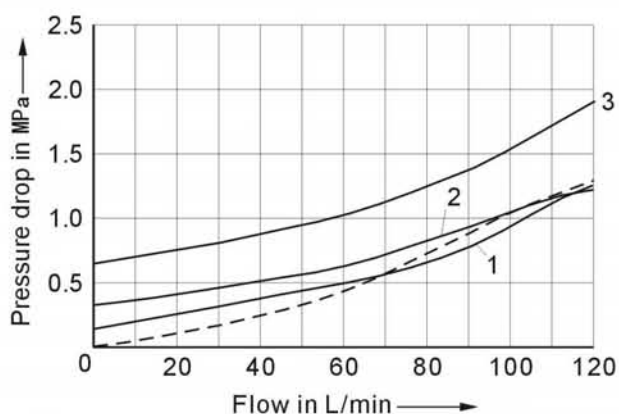
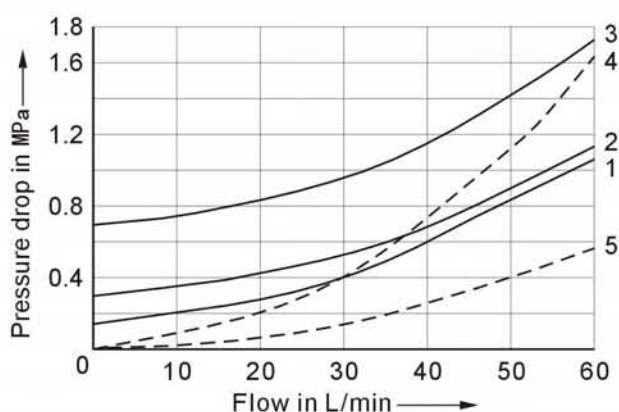
Symbols

No Code	A	B	Return road example

Technical data

Data Size	Max. Pressure MPa	Unlock pressure MPa	Max. Flow L/min	Hydraulic medium		Flow Direction	Weight Kg
				Tem.	Viscose		
06	31.5	Choice from ordering details	60	-20~+80	2.8~500	A→A1 or B→B1	0.8
10			120				2
16			200			Pilot operate. B1→B or A1→A	7
22			360				11.7

Characteristic curves



Z2S6

— = A → A1; B → B1
- - - = A1 → B; B1 → B

- 1、Normal unlock;
 - 2、Check valve insert file;
 - 3、Free flow (without check valve);
 - 4、Flow via check valve insert file;
 - 5、Free flow;
- (Without check valve insert file. "a" type and "b" type.)

Z2S10

— = A → A1; B → B1
- - - = A1 → B; B1 → B

- 1、Unlock pressure 1=0.15 MPa;
- 2、Unlock pressure 2=0.3 MPa;
- 3、Unlock pressure 3=0.6 MPa

Z2S16

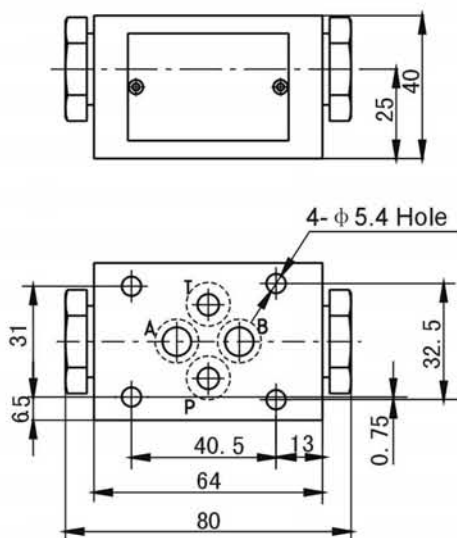
— = A → A1; B → B1
- - - = A1 → B; B1 → B

Z2S22

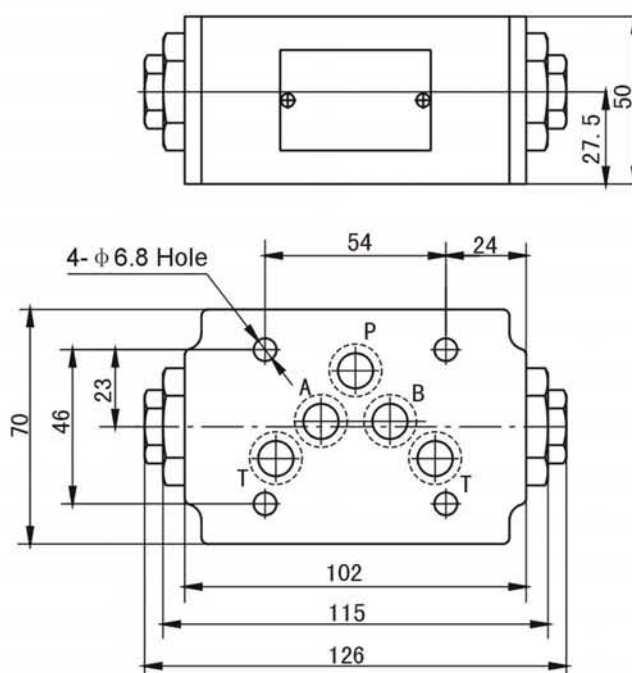
— = A → A1; B → B1
- - - = A1 → B; B1 → B

Installation dimensions

● Z2S6



● Z2S10



● Z2S16

Seal component

Z2S6:

O Ring 4-8.8×1.9;

Z2S10:

O Ring 5-12×2;

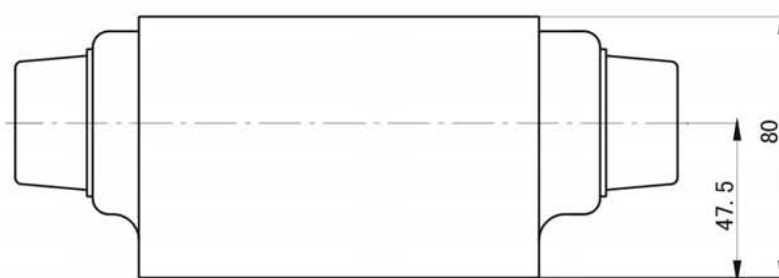
Z2S16:

Port X、Y、L、

O Ring 10×2;

Port P、A、B、T、

O Ring 22×2.5;



Valve fixed bolts

Z2S6:

4-M5, $M_A=8.9N \cdot M$;

Z2S10:

4-M6, $M_A=15.5N \cdot M$;

Z2S16:

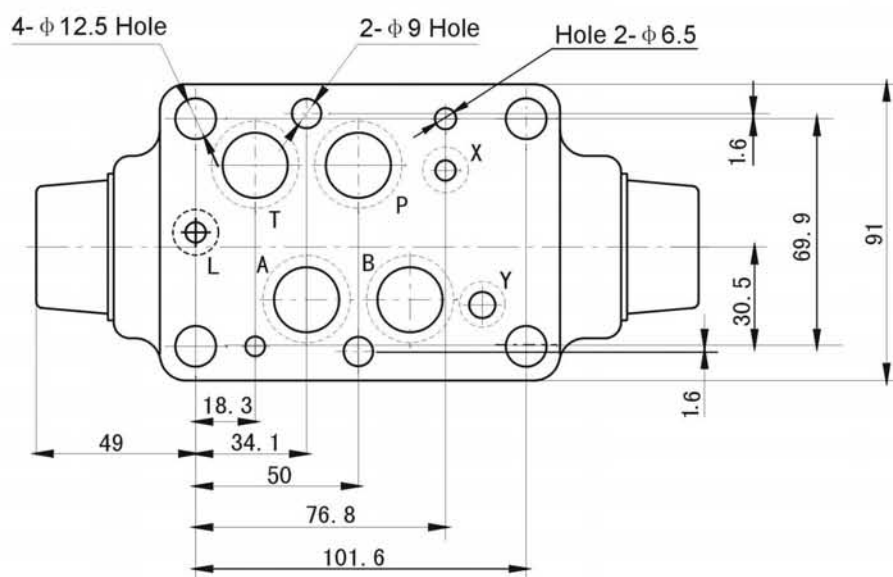
4-M10, $M_A=75N \cdot M$;

2-M6, $M_A=15.5N \cdot M$;

Note:

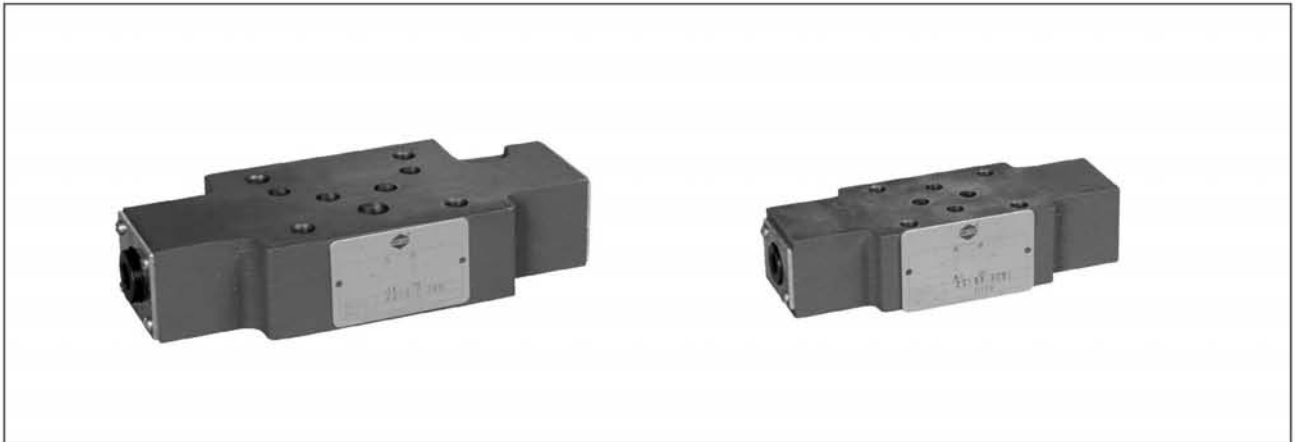
Bolt NO.: GB/T70.1-2000,

Performance grade: 12.9



● Z2S22

Double Throttle And Check Valves , Sandwich plate , Type Z2FS 6 ~ 22



Introduction and Characteristic

- Z2FS type modular double throttle and check valve is used to control main flow or pilot fluid flow for one or two work oil port.
- The valve can control system's main flow which is installed during direction valve and bottom.
- It also can control pilot fluid flow which is installed during pilot valve and main valve . For example, it usually be applied to electro-hydraulic operated directional valve.

Ordering details

1	2	3	4	5	6	7
Z2FS		—	/		S	

Item	Collocation	Code	Explanation
1	Sort	Z2FS	Modular Double Throttle And Check Valves
2	Nominal Size	6	Nominal size 6
		10	Nominal size 10
		16	Nominal size 16
		22	Nominal size 22
3	Series	30	For Nominal size 6,16,22
		20	For Nominal size 10

Item	Collocation	Code	Explanation
4	Throttle Position ^①	S	Inlet throttle
		S2	Outlet throttle
		S3	A outlet throttle ; B inlet t throttle
		S4	A inlet throttle ; B outlet throttle
5	Seal Material	NO Code	NBR seals
		V	FKM seals
6		S	SUNNY hydraulic technical
7			Other especial demand

Note :

① Outlet throttle is gotten by inlet throttle circumgyrating for Nominal size 6. So the code for both Nominal size 6 Inlet throttle and outlet throttle is S. S4 can gotten by S3 circumgyrating. So the code for both two kinds throttle type is S3.

Symbols and application

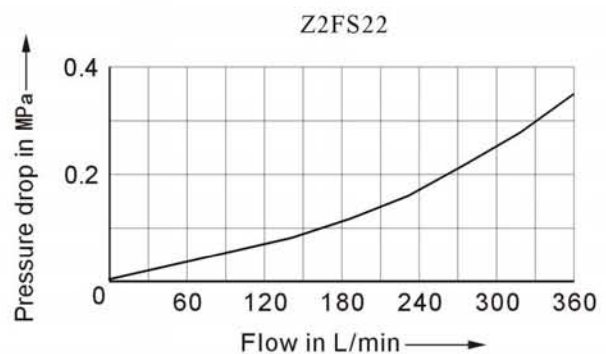
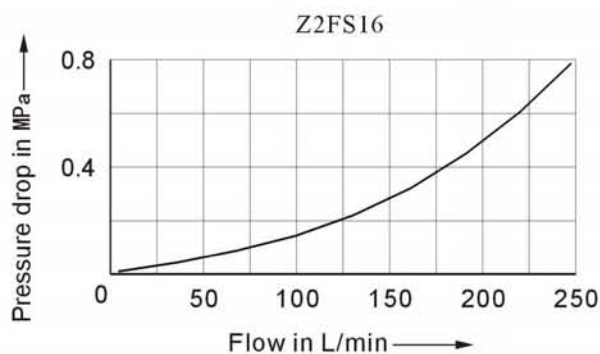
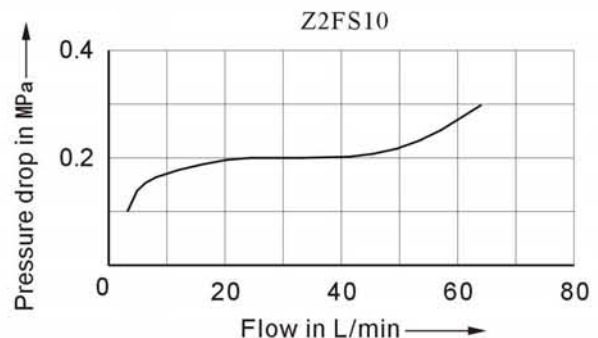
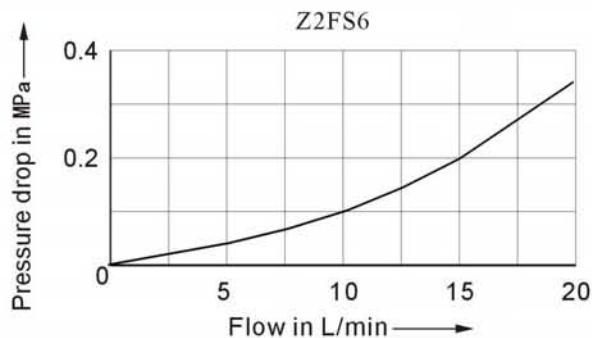
Use for oil vat adjustment			
Inlet throttle : S	Outlet throttle : S2	A outlet throttle 、 B inlet throttle : S3	A outlet throttle 、 B inlet throttle : S4
Use for switching time adjustment			
Inlet throttle : S	Outlet throttle : S2	A outlet throttle 、 B inlet throttle : S3	A outlet throttle 、 B inlet throttle : S4

Technical data

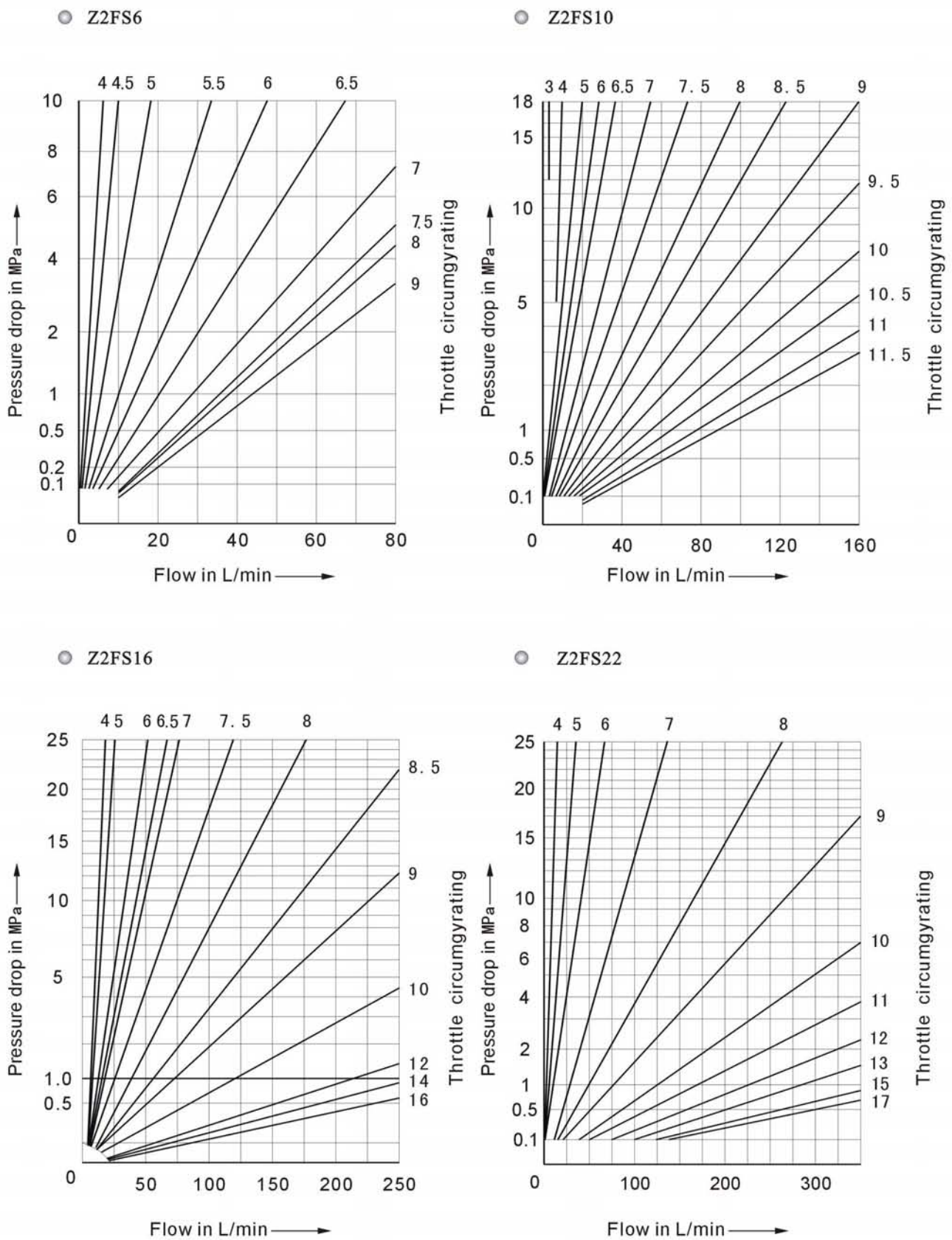
General			Z2FS6	Z2FS10	Z2FS16	Z2FS22
Weight (only for reference)	Kg		0.8	3.1	4.7	8
Environment Temperature Range	NBR seals	°C	-30 to +80	-30 to +80	-30 to +80	-30 to +50
	FKM seals	°C	-20 to +80	-20 to +80	-20 to +80	-20 to +50
Installation position			Optional			

Hydraulic data			Z2FS6	Z2FS10	Z2FS16	Z2FS22
Max. Flow	L/min		80	160	250	360
Max. Pressure	MPa		31.5	31.5	35	35
Hydraulic medium :			Mineral oil (HL,HLP) to DIN 51524 ^① Fast bio-degradable pressure fluids to VDMA 24568; HETG(rape seed oil) ^① HEPG(Polyglycol);HEES(Synthetic ester) ^② ; Other fluids on request			
Oil temperature Range	NBR seals	℃	-30 To +80			
	FKM seals	℃	-20 To +80			
Viscose range	mm ² /s		2.8 To 500			
Fluid pollute			Highest pollute grade is follow nas1638 ninth grade commend filtrate precision≥75			

Characteristic curves

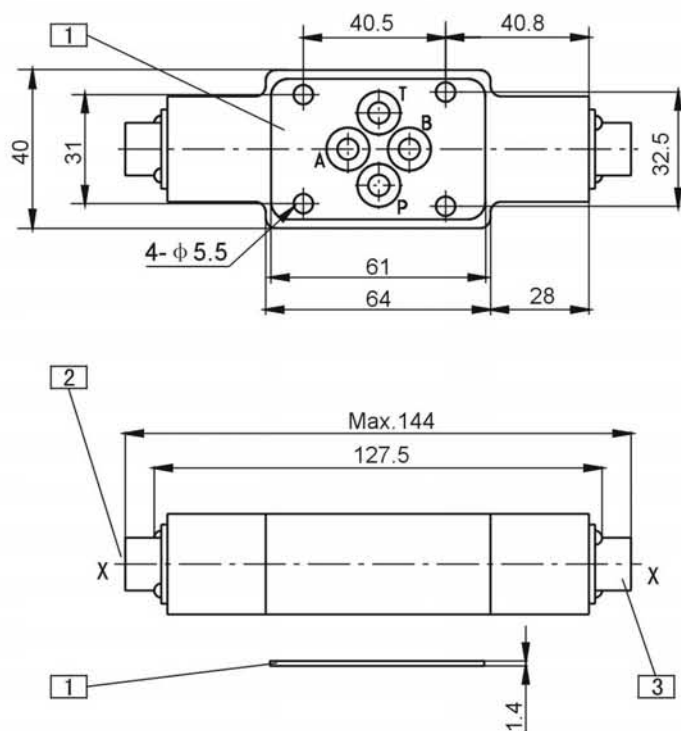


Characteristic curves



Installation dimensions

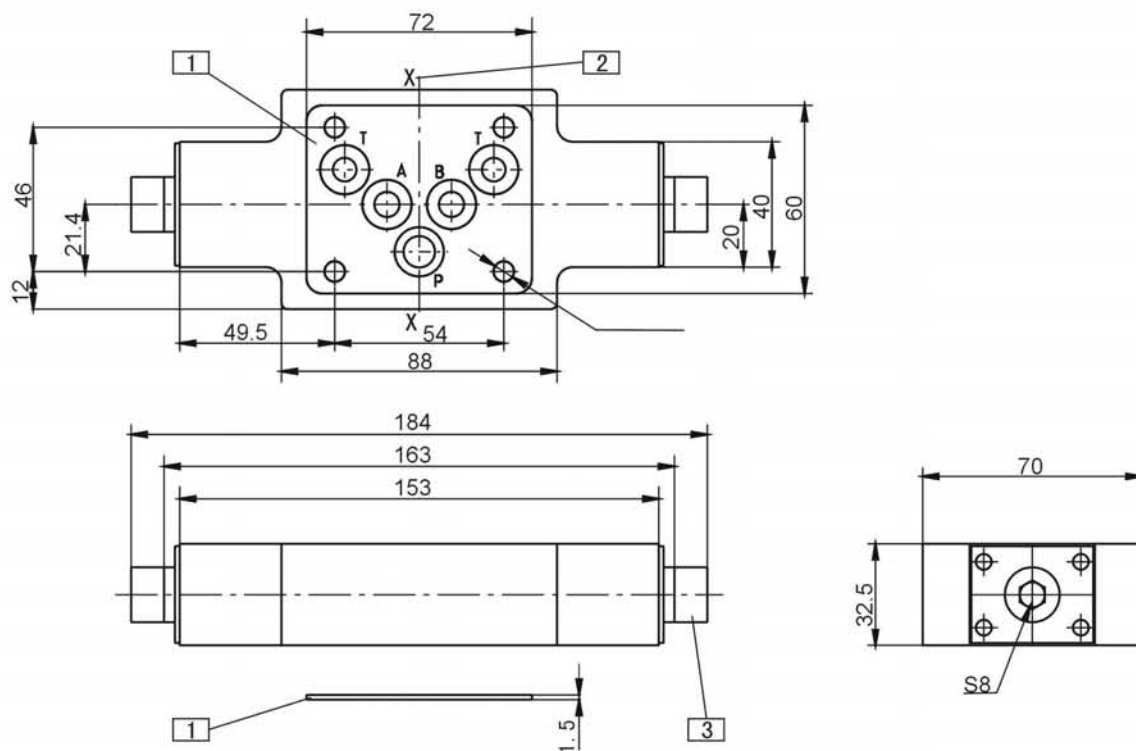
● Z2FS6



Explanation

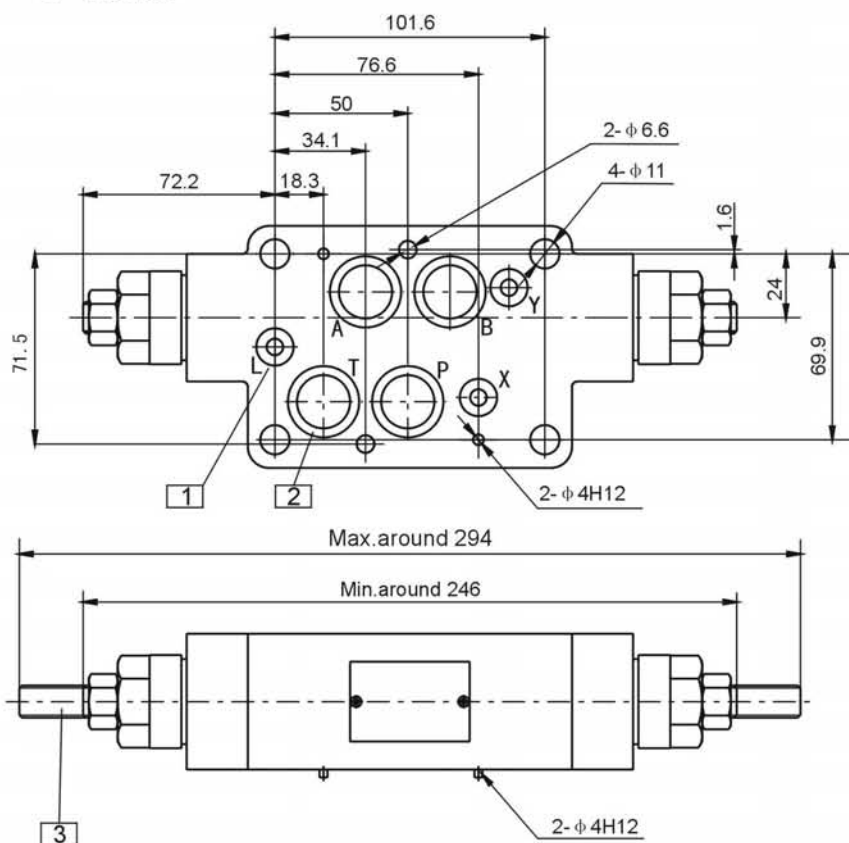
- 1、o ring clapboard;
- 2、inlet throttle is changed to outlet throttle can be come true by circling Valve follow x-x shaft 180 degree.
- 3、Bolts adjustment
Circling follow clockwise:
throttle port opens big
Circling counter clockwise:
throttle port closes small

● Z2FS10



Installation dimensions

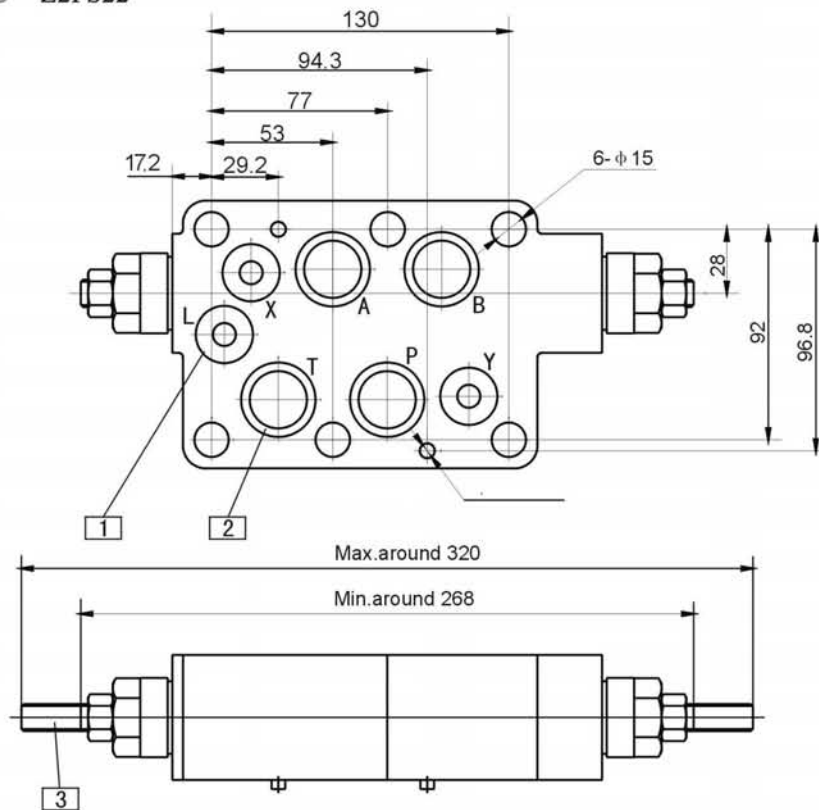
● Z2FS16



Explanation

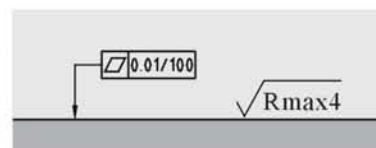
- 1、O Ring is used to seal L、X、Y ports.
- 2、O Ring is used to seal A、B、P、T ports
- 3、Bolt adjustment
Circling follow clockwise:
throttle port opens big
Circling counter clockwise:
throttle port closes small

● Z2FS22

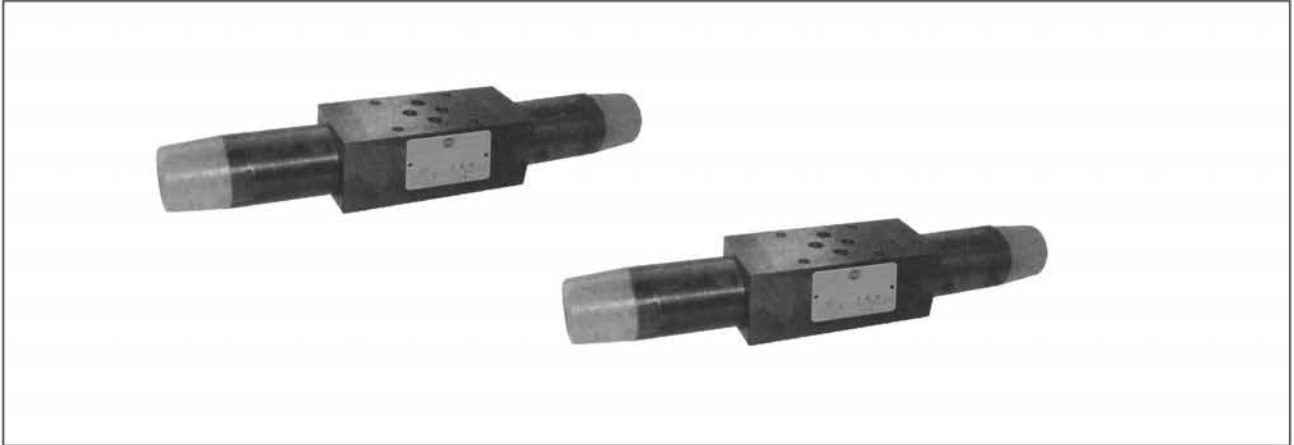


Subplate Installation dimensions

Subplate Installation dimensions is fit for ISO 4401. Please see page 187 and 207.



Direct Operated Pressure Relief Valves , Sandwich plate , Type Z2DBD6



Introduction and Characteristic

- Z2DBD6 type modular direct operated pressure relief valve has volume small, configuration tighten, flow character good , noise small, pressure stabilization`s characteristic.
- It`s applied to adjust for small flow system`s pressure abroad.

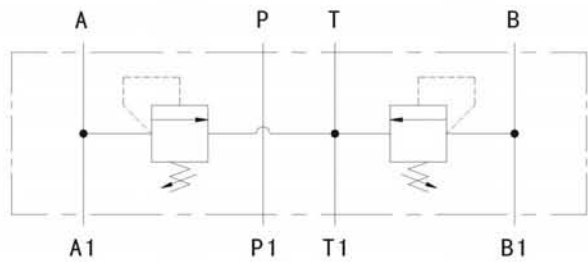
Ordering details

1	2	3	4	5	6	7	8	9
Z2DBD	6		—	/			S	

Item	Collocation	Code	Explanation
1	Sort	Z2DBD	Modular Direct Operated Pressure Relief Valves
2	Size	6	Nominal size 6
3	Control type	VC	A to T、B to T
4	Adjustment	1	Handwheel
		2	Inside six corner bolt with protection cover
		3	Handwheel with lock
5	Series	10	

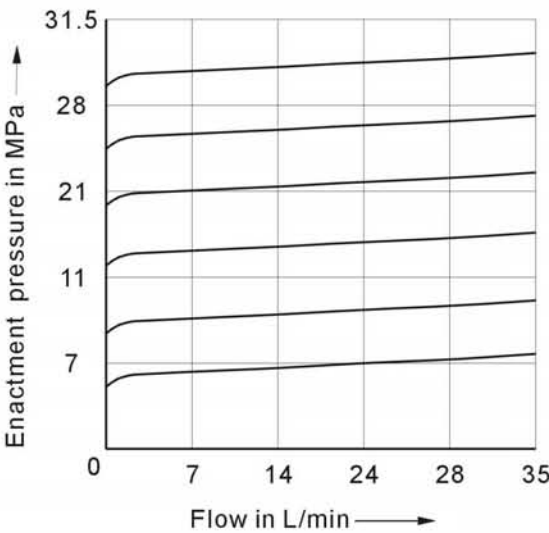
Item	Collocation	Code	Explanation
6	Pressure	315	Up to 31.5MPa
		200	Up to 20MPa
		100	Up to 10MPa
7	Seal Material	No Code	NBR seals
		V	FKM seals
8		S	SUNNY hydraulic technical
9			Other especial demand

Symbols

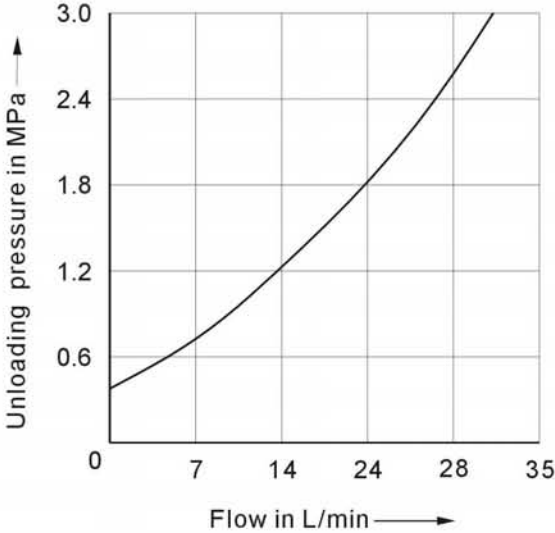


Characteristic curves

● Rank Pressure



● Flow-Unloading Pressure

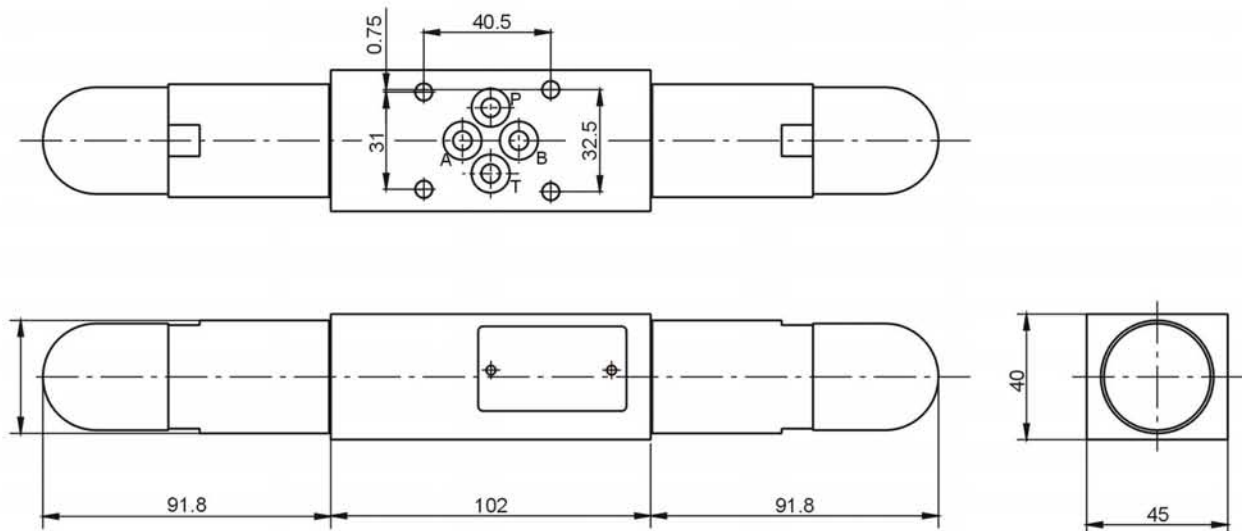


Technical data

General		Z2DBD6
Weight (only for reference)	Kg	1.2
Installation position		Optional

Hydraulic data			Z2DBD6
Max. Flow	L/min		35
Max. Pressure	MPa		31.5
Hydraulic medium : ① Fit for NBR and FKM; ② Only fit for FKM			Mineral oil (HL,HLP) to DIN 51524 ^① Fast bio-degradable pressure fluids to VDMA 24568; HETG(rape seed oil) ^① HEPG(Polyglycol);HEES(Synthetic ester) ^② ; Other fluids on request
Oil temperature Range	NBR seals	℃	-30 To +80
	FKM seals	℃	-20 To +80
Viscose range	mm ² /s		2.8 To 500
Fluid pollute			Highest pollute grade is follow nas1638 ninth grade commend filtrate precision≥75

Installation dimensions

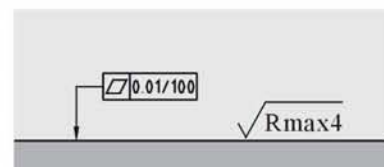


Seal component

O Ring 4-9.25X1.78

Subplate Installation dimensions

Subplate Installation dimensions is fit for ISO 4401. Please see page 187.



Pilot Operated Pressure Relief Valves , Sandwich plate , Type ZDB/Z2DB 6~10



Introduction and Characteristic

- ZDB/Z2DB type modular pilot relief valve is assembled by valve body and one or two insert type pilot relief valve.
- The valve has six kinds control type and four pressure grades. It can adjust and limit system pressure.

Ordering details

1	2	3	4	5	6	7	8	9	10	11
Z		DB				— 40 /			S	

Item	Collocation	Code	Explanation
1	Sort	Z	Modular
2	Sort	No Code	Single direction relief
		2	Double direction relief
3	Sort	DB	Pilot relief valve
4	Nominal Size	6	Nominal size 6
		10	Nominal size 10
5	Control Type	VA	A→T
		VB	B→T
		VP	P→T
		VC	A→T and B→T
		VD	A→B and B→A
		VT	TB1→TA2 Only for nominal size 10

Item	Collocation	Code	Explanation
6	Adjustment	1	Handwheel
		2	Inside six corner bolt With protection cover
		3	Lock knob with graduate
		7	Knob with graduate
7	Series	40	
8	Adjusting Pressure	50	Up to 5MPa
		100	Up to 10MPa
		200	Up to 20MPa
		315	Up to 31.5MPa
9		No Code	NBR seals
		V	FKM seals
10		S	SUNNY hydraulic technical
11			Other especial demand

SYMBOLS

ZDB 6VA...	ZDB 6VB...	ZDB 6VP...	Z2DB.6VC...	Z2DB 6VD...

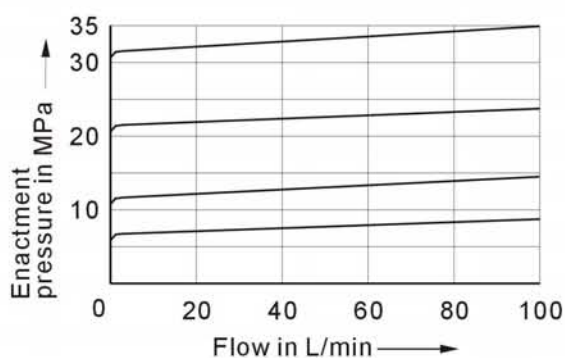
ZDB 10VA...	ZDB 10VB...	ZDB 10VP...	ZDB 10VT...
Z2DB 10VC...		Z2DB 10VD...	

Technical data

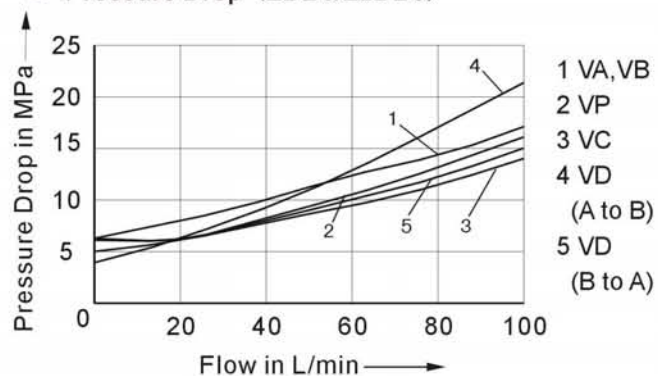
General		ZDB6	Z2DB6	ZDB10	Z2DB10
Weight (only for reference) Kg		1.0	1.2	2.4	2.6
Installation position		Optional			
Hydraulic data		ZDB6/Z2DB6		ZDB10/Z2DB10	
Max. Flow L/min		60		100	
Max. Pressure MPa		31.5			
Adjustment pressure range MPa		5、10、20、31.5			
Hydraulic medium : ① Fit for NBR and FKM; ② Only fit for FKM		Mineral oil (HL,HLP) to DIN 51524 ^① Fast bio-degradable pressure fluids to VDMA 24568; HETG(rape seed oil) ^① HEPG(Polyglycol);HEES(Synthetic ester) ^② ; Other fluids on request			
Oil temperature Range	NBR seals °C	-30 To +80			
	FKM seals °C	-20 To +80			
Viscose range mm²/s		10 to 800			
Fluid pollute		Highest pollute grade is follow nas1638 ninth grade commend filtrate precision≥75			

Characteristic curves

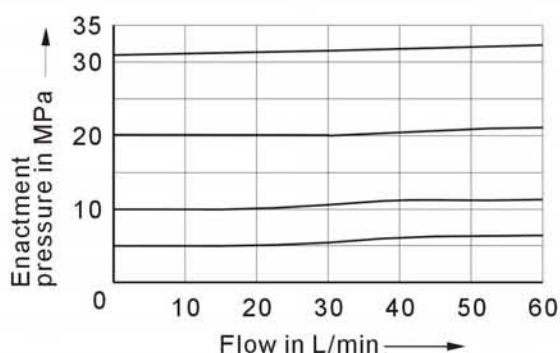
● Rank Pressure (ZDB6/Z2DB6)



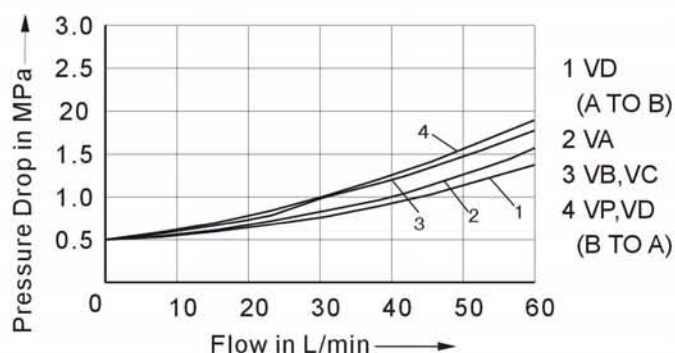
● Pressure Drop (ZDB6/Z2DB6)



● Rank Pressure (ZDB10/Z2DB10)

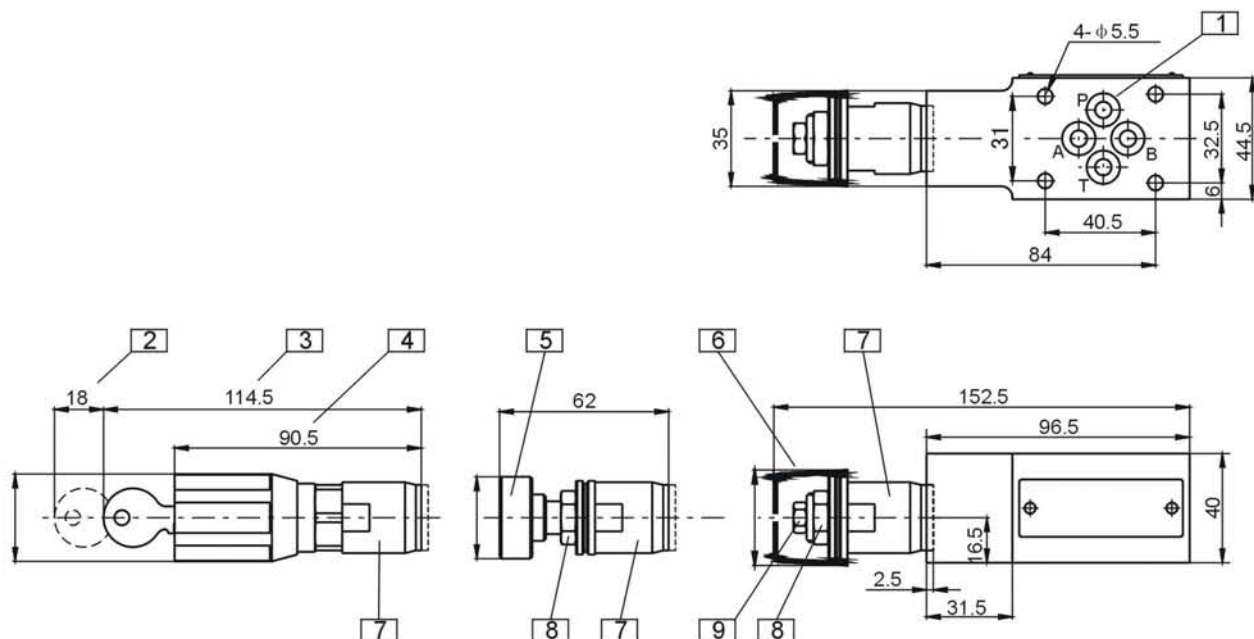


● Pressure Drop (ZDB10/Z2DB10)

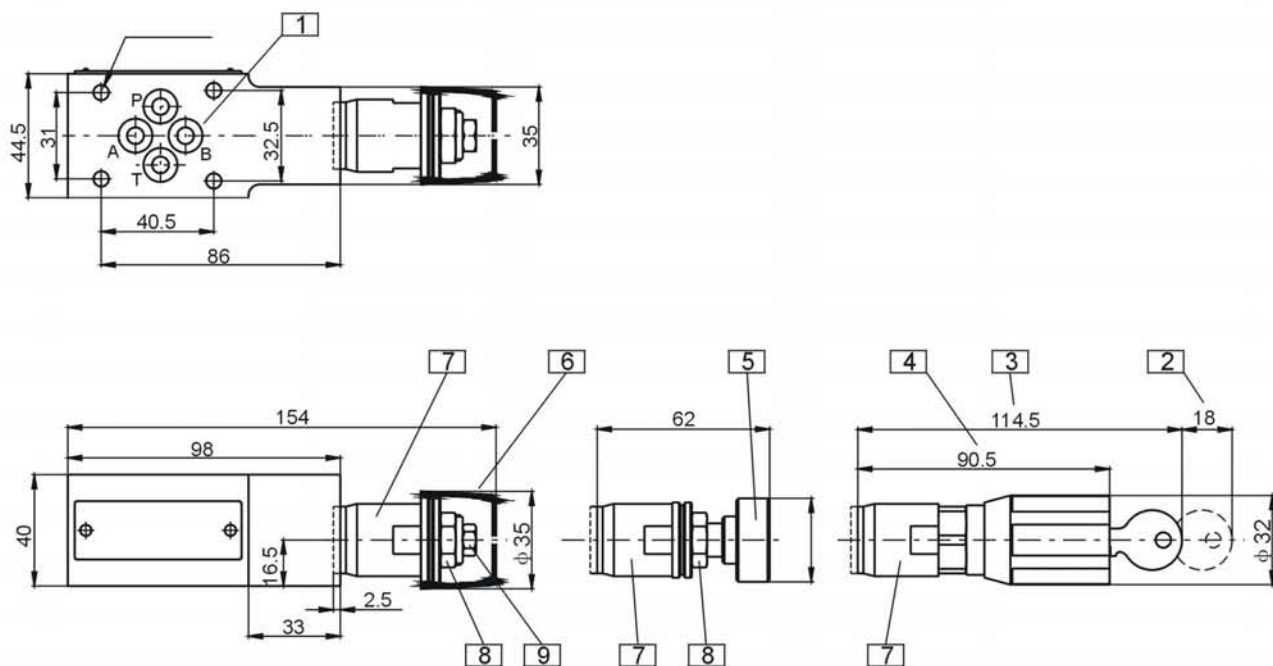


Installation dimensions

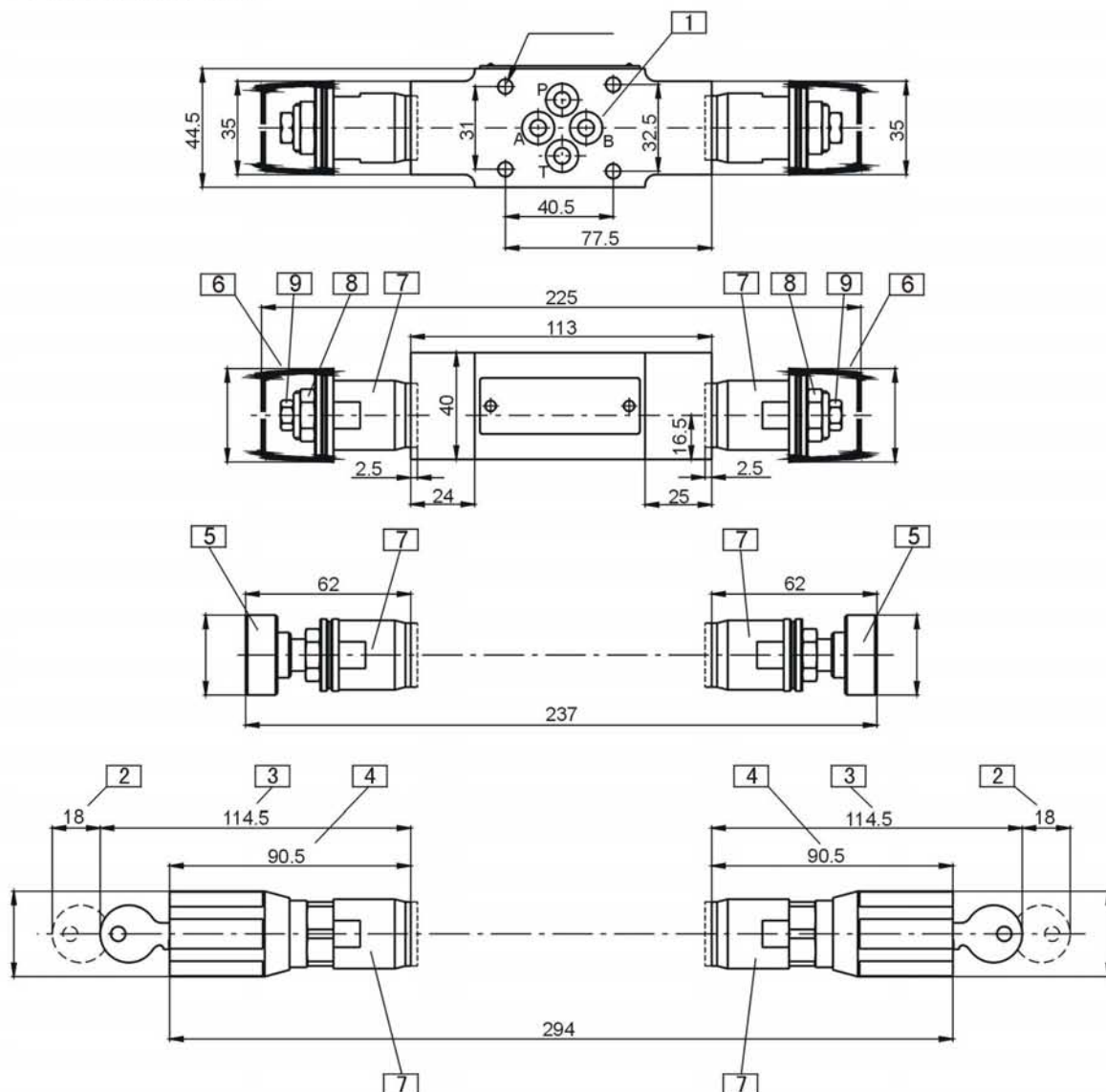
● ZDB 6 VA...



● ZDB 6 VB... / VP...



● ZDB 6 VC .../VD...

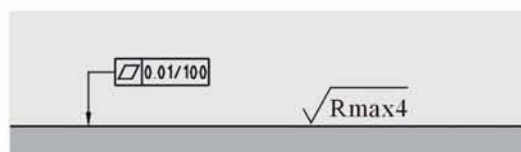


Explanation

- 1、O Ring 9.25x1.78 (P、A、B、T) ;
- 2、Space for pulling out key ;
- 3、Lock knob adjustment with graduate ;
- 4、Knob adjustment with graduate
- 5、Handwheel adjustment ;
- 6、Inside six corner adjustment with protection cover ;
- 7、bolt screw gnarl square Ma=50N • m ;
- 8、Lock nut S24 ;
- 9、Six corner adjustment nut S10

Subplate Installation dimensions

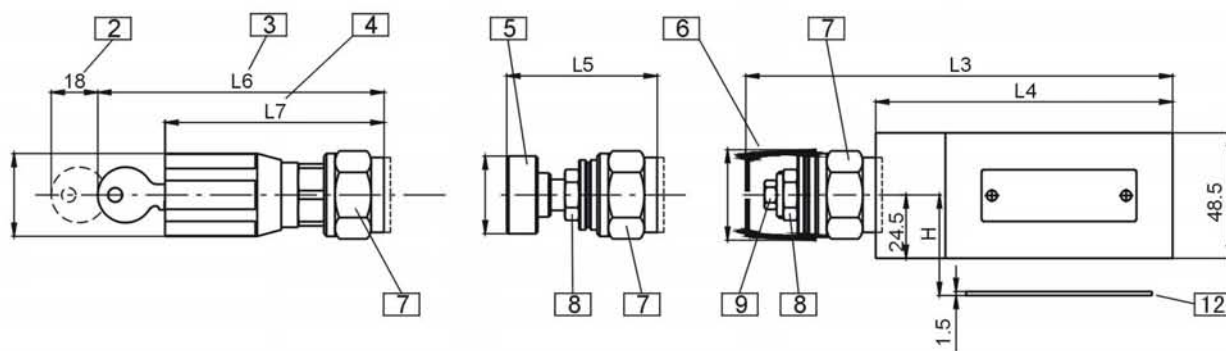
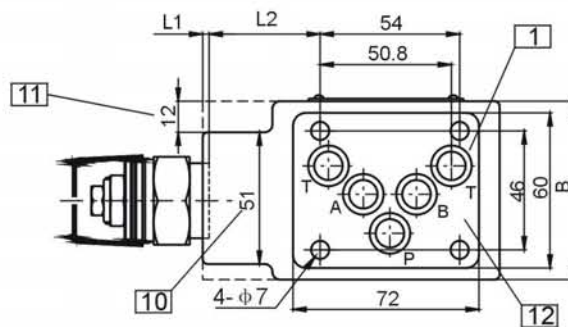
Subplate Installation dimensions is fit for ISO 4401. Please see page 187.



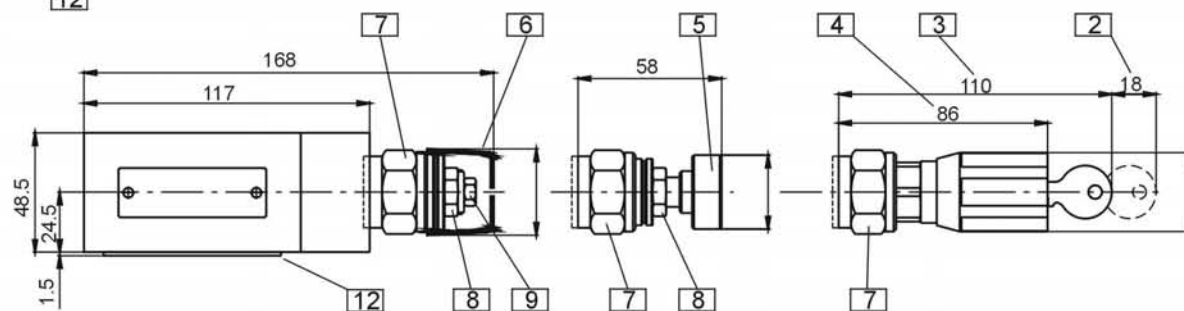
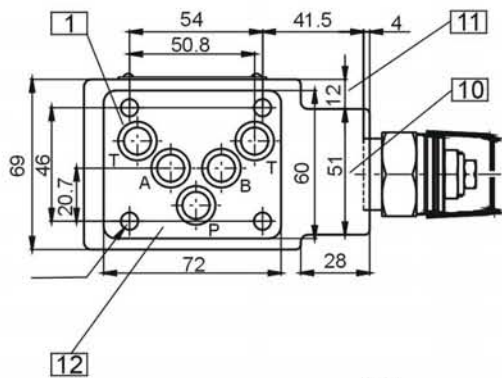
Installation dimensions

● ZDB 10 VA... / VP... / VT...

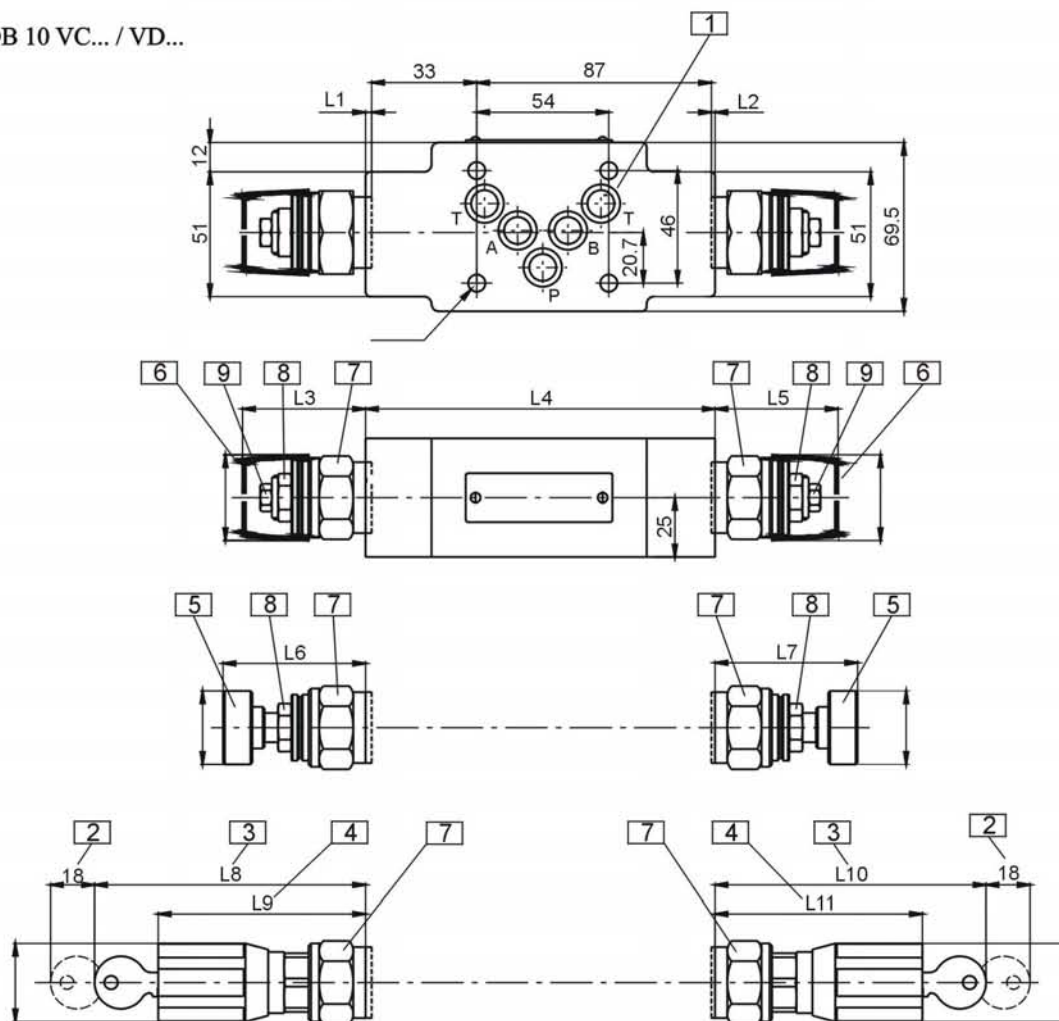
Type	Dim.	B	H	L1	L2	L3	L4	L5	L6	L7
ZDB10	VA	69	26	4	41.5	165.3	115	57.6	112	88
	VP	69	26	4	41.5	165.3	115	57.6	112	88
	VT	70	25	0.7	31.8	158.6	105	60.9	113	89



● ZDB 10 VB...



● ZDB 10 VC... / VD...



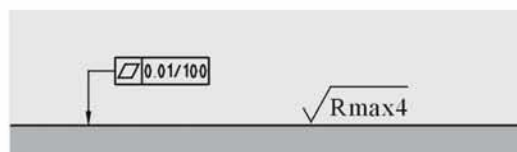
Type	Dim.	Dim.										
		L1	L2	L3	L4	L5	L6	L7	L8	L9	L10	L11
ZDB10	VC	2	1	52	123	53	59	60	111	89	112	90
	VD	6	6	49	132	49	56	56	107	85	112	90

Explanation

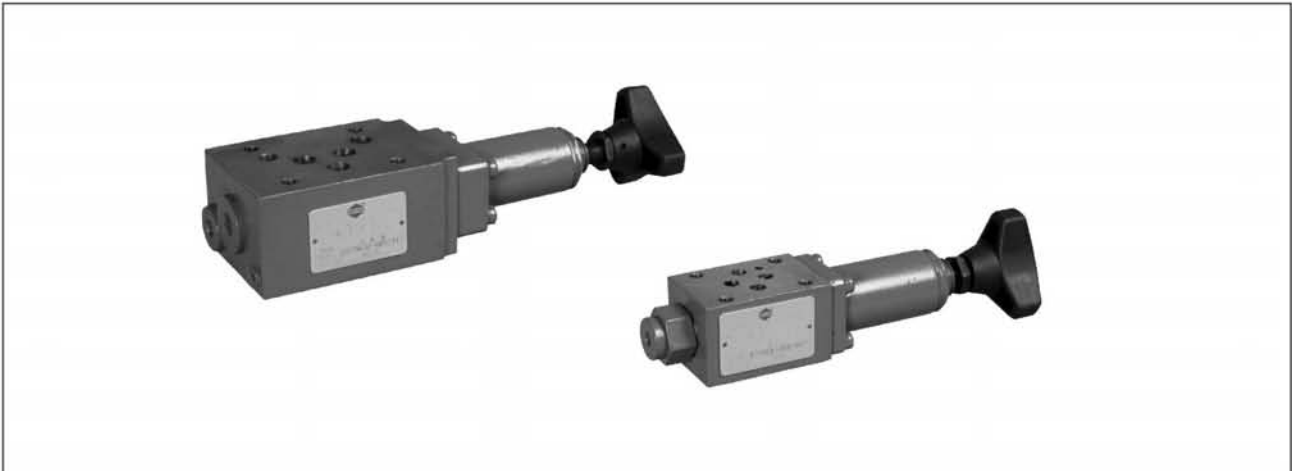
- 1、O Ring 12 x 2 (P、A、B、T) ;
- 2、Space for pulling out key ;
- 3、Lock knob adjustment with graduate ;
- 4、Knob adjustment with graduate
- 5、Handwheel adjustment ;
- 6、Inside six corner adjustment with protection cover ;
- 7、bolt screw gnarl square $M_a=50N \cdot m$;
- 8、Lock nut S24 ;
- 9、Six corner adjustment nut S10

Subplate Installation dimensions

Subplate Installation dimensions is fit for ISO 4401. Please see page 187.



Pressure Reducing Valves , Direct Operated ,Sandwich plate , Type ZDR 6 / 10 D



Introduction and Characteristic

- ZDR6/10D type modular direct operated pressure reducing valve is three passways`configuration and has two times protection.
- It`s main function is drop one return road`s pressure in system.
- There are four kinds pressure grade , three kinds pressure adjustment types and could choose to install check valve.

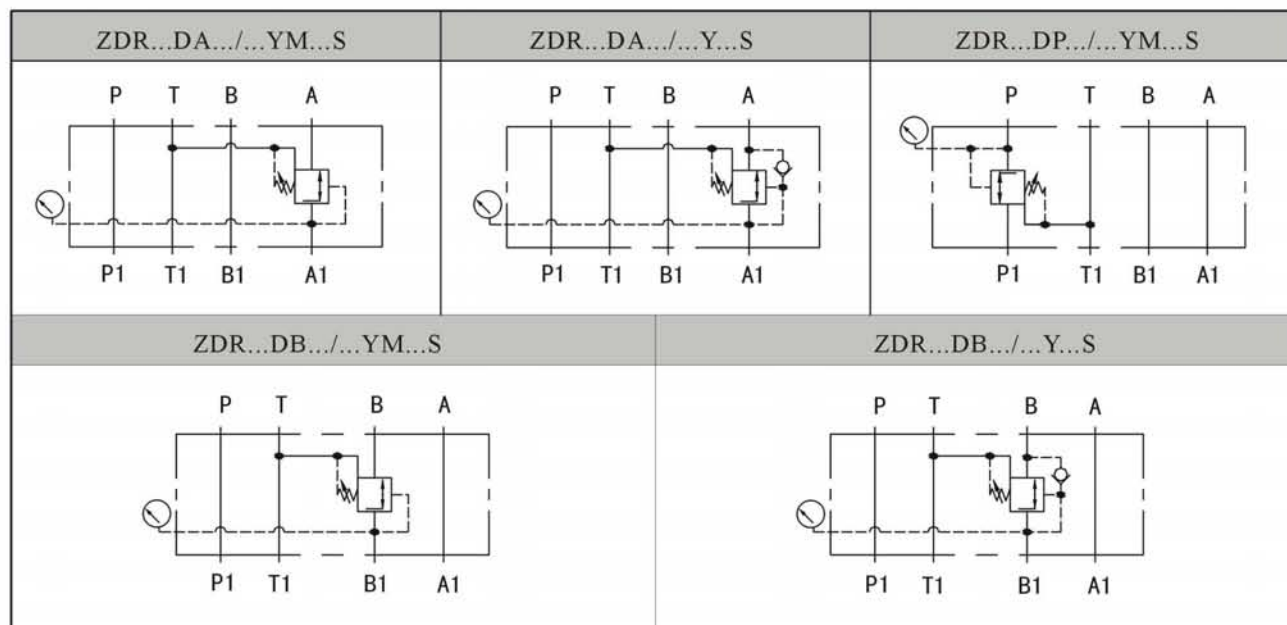
Ordering details

1	2	3	4	5	6	7	8	9	10	11	12	13
Z	DR		D		—	/		Y			S	

Item	Collocation	Code	Explanation
1	Sort	Z	Modular
2	Sort	DR	Pressure Reducing Valve
3	Nominal Size	6	Nominal size 6
		10	Nominal size 10
4	Sort	D	Direct Operated
5	Reducing Position	A	Port A
		B	Port B, Only for nominal size 10
		P	Port P
6	Adjustment	1	Handwheel
		2	Bolt with protection cover
		3	Handwheel with lock
7	Series	30	Only for nominal size 6
		40	Only for nominal size 10

Item	Collocation	Code	Explanation
8	Secondary Pressure	25	Up to 2.5MPa
		75	Up to 7.5MPa
		150	Up to 15MPa
		210	Up to 21MPa
9	Control Type	Y	Pilot oil supply internal ; Leakage oil drain external
10	Check Valve	No Code	With check valve, only A port or B port reducing
		M	Without check valve
11		No Code	NBR seals
		V	FKM seals
12		S	SUNNY hydraulic technical
13			Other especial demand

Symbols



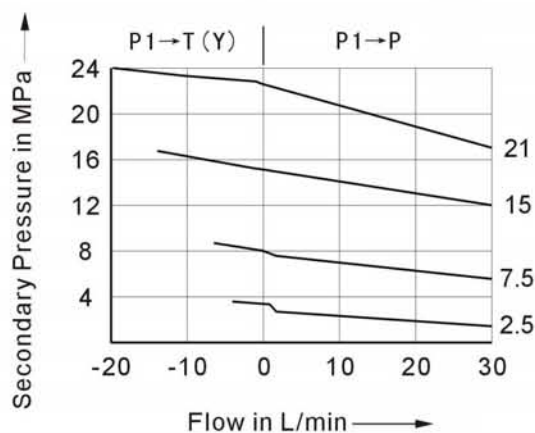
Technical data

General		ZDR6D	ZDR10D
Weight (only for reference)	Kg	1.2	2.8
Installation position		Optional	

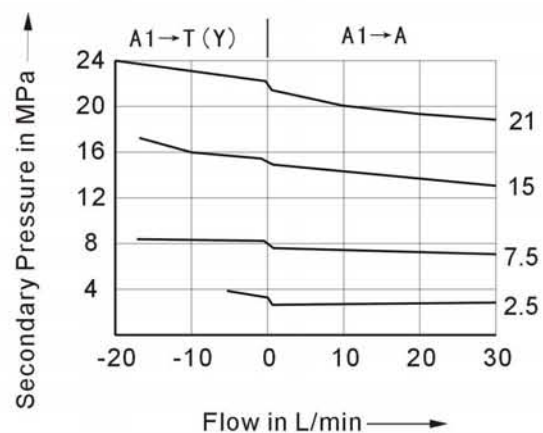
Hydraulic data		ZDR6D	ZDR10D
Max. Flow	L/min	30	50
Max. Pressure (Inlet)	MPa	31.5	
Max. Secondary Pressure (Outlet)	MPa	2.5、7.5、15、21	
Max. Allow Back Pressure (T Port)	MPa	16	
Hydraulic medium :		Mineral oil (HL,HLP) to DIN 51524 ^① Fast bio-degradable pressure fluids to VDMA 24568; HETG(rape seed oil) ^① HEPG(Polyglycol);HEES(Synthetic ester) ^② ; Other fluids on request	
Oil temperature Range	NBR seals	°C	-30 to +80
	FKM seals	°C	-20 to +80
Viscose range	mm ² /s		10 to 800
Fluid pollute		Highest pollute grade is follow nas1638 ninth grade commend filtrate precision≥75	

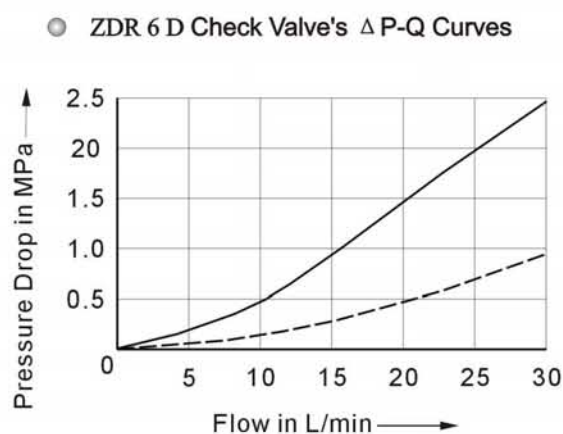
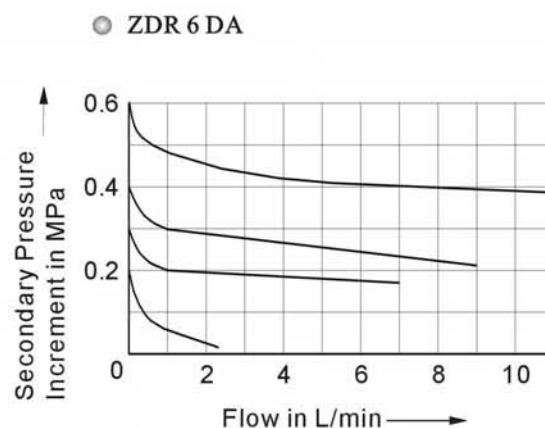
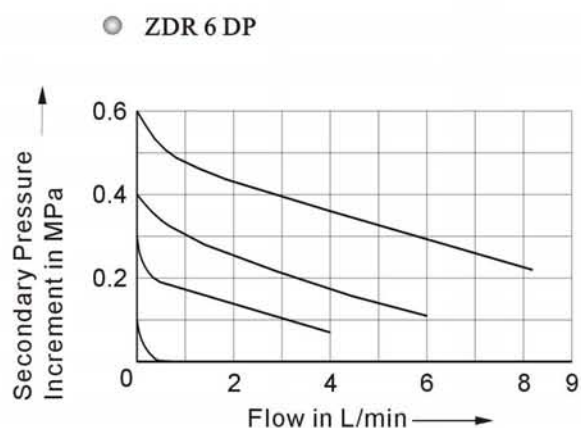
Characteristic curves

● ZDR 6 DP



● ZDR 6 DA

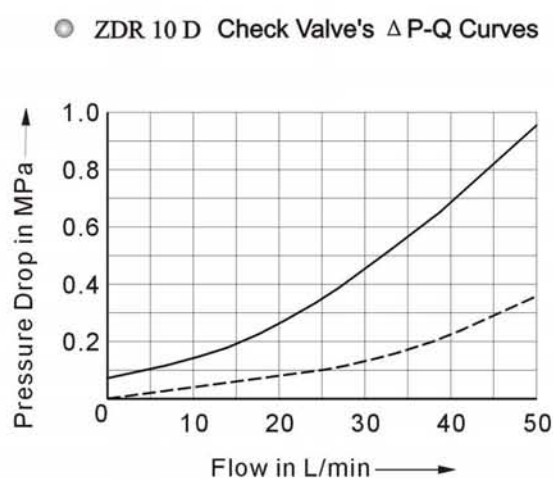
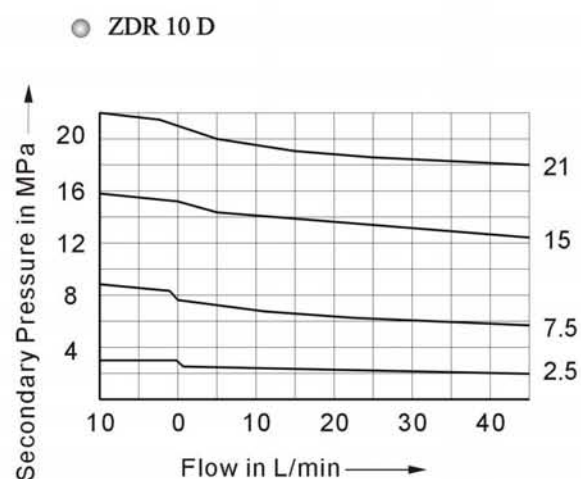




NOTE:

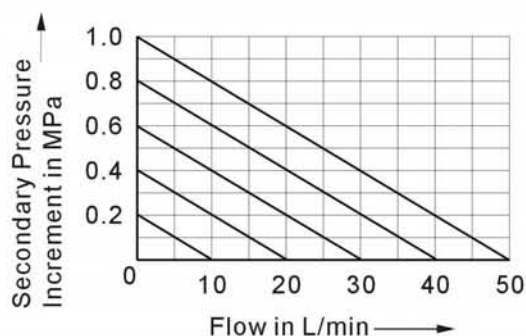
For example, it's A1 when flow is 10L/min or P's fix pressure is 3MPa and hypo-grade pressure increases to 3.6MPa when flow reduces to 0.

— Fix Pressure < 1.0MPa
 - - - Fix Pressure > 1.0MPa



Characteristic curves

● ZDR 10 D



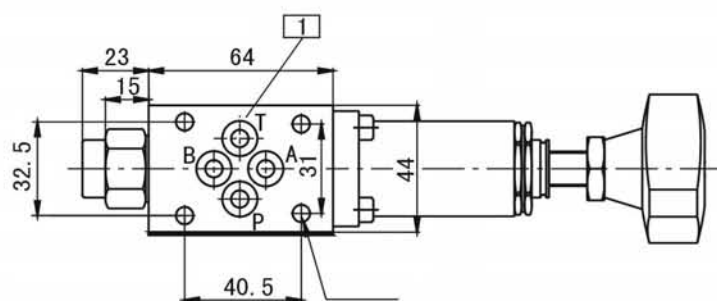
Note :

Pamin-q characteristic curve photo example is 2.5 MPa pressure grade's situation.

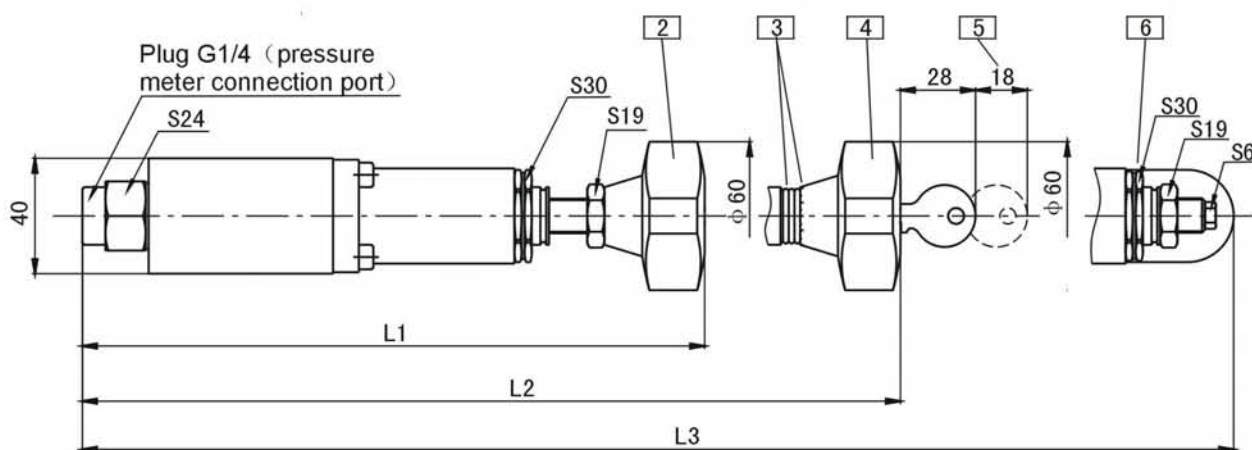
Min.adjustment pressure is connected with A-A1,B-B1 and P-P1. If P=3MPa, A1 or P1 cavity's output flow is 20L/min. Flow drops to zero when pressure increases to P=3.4MPa.

Installation dimensions

● ZDR 6 DA... / DP...



Type	Dim.	L1 Max.	L2 Max.	L3
ZDR6DA		208	203	182
ZDR6DP		196	191	170

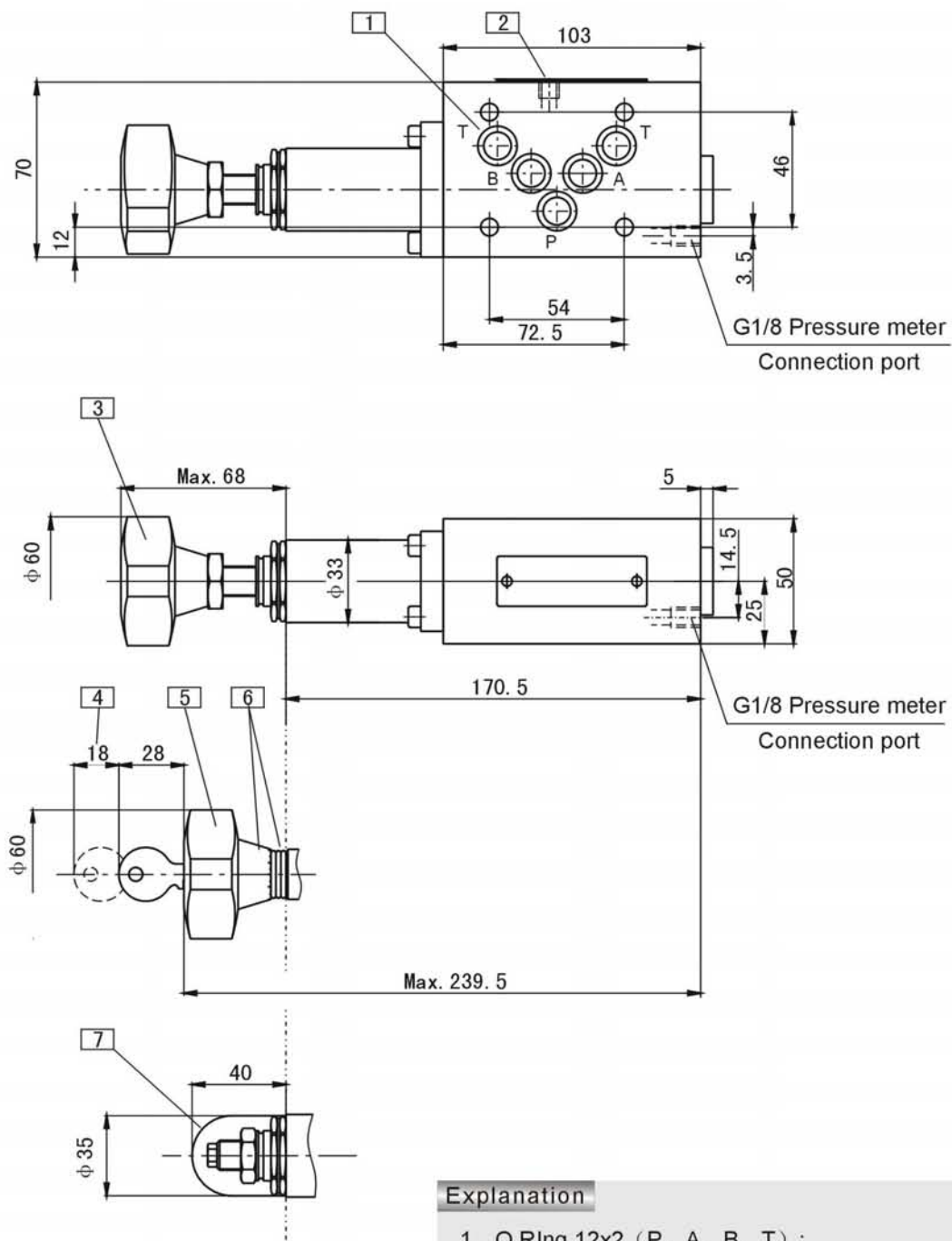


Explanation

- 1、O Ring 9.25x1.78 (P、A、B、T) ;
- 2、Handwheel adjustment ;
- 3、Repeat adjustment graduate cover ;
- 4、Lock knob adjustment with graduate ;
- 5、Space for pulling out key ;
- 6、Inside six corner adjustment with protection cover

Installation dimensions

● ZDR 10 DB...

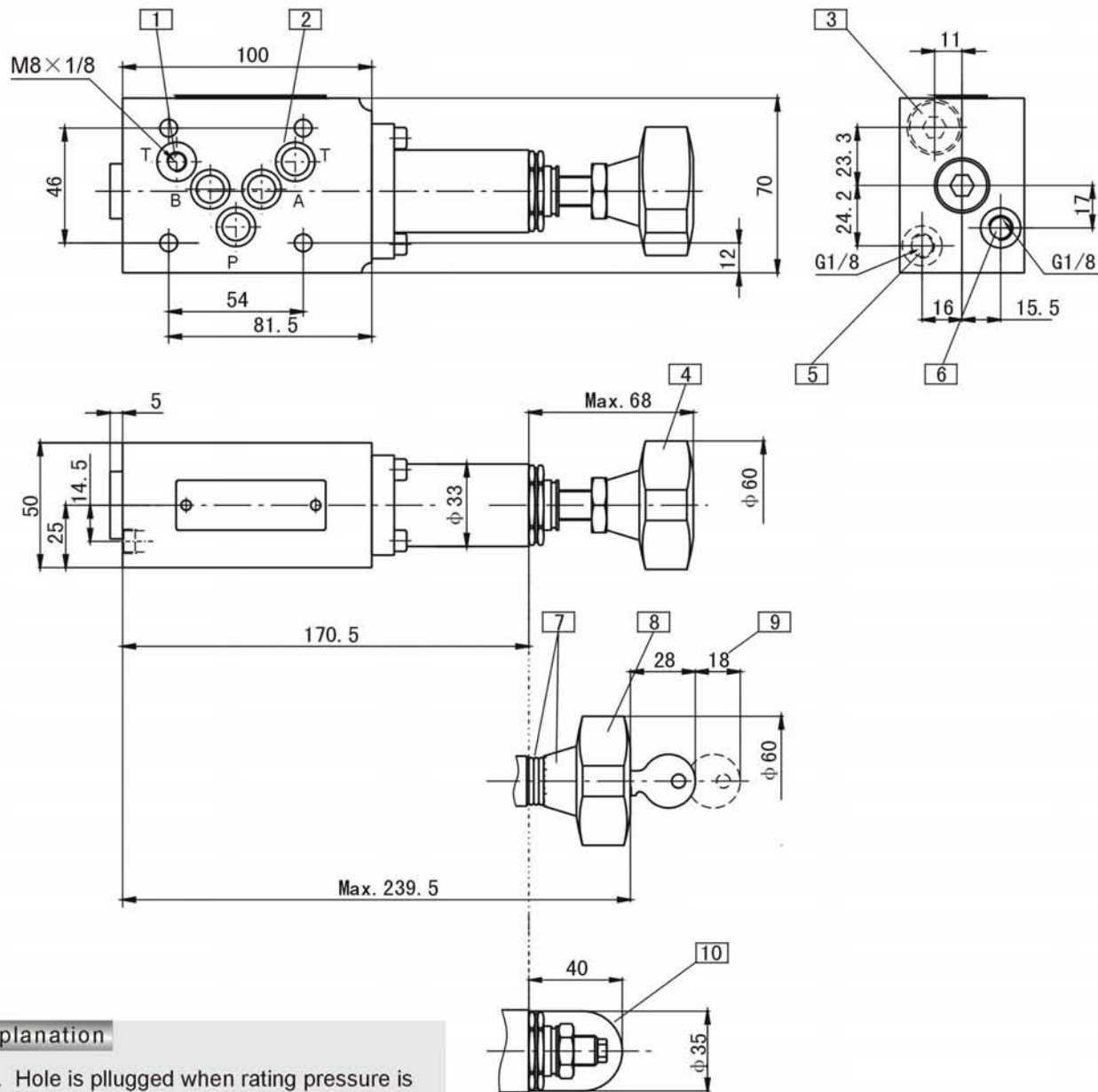


Explanation

- 1、O Ring 12x2 (P、A、B、T) ;
- 2、Prepare choosing check valve ;
- 3、Handwheel adjustment ;
- 4、Space for pulling out key ;
- 5、Lock knob adjustment with graduate ;
- 6、Repeat adjustment graduate cover ;
- 7、Inside six corner adjustment with protection cover

Installation dimensions

● ZDR 10 DA... / DP...

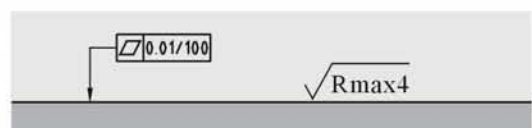


Explanation

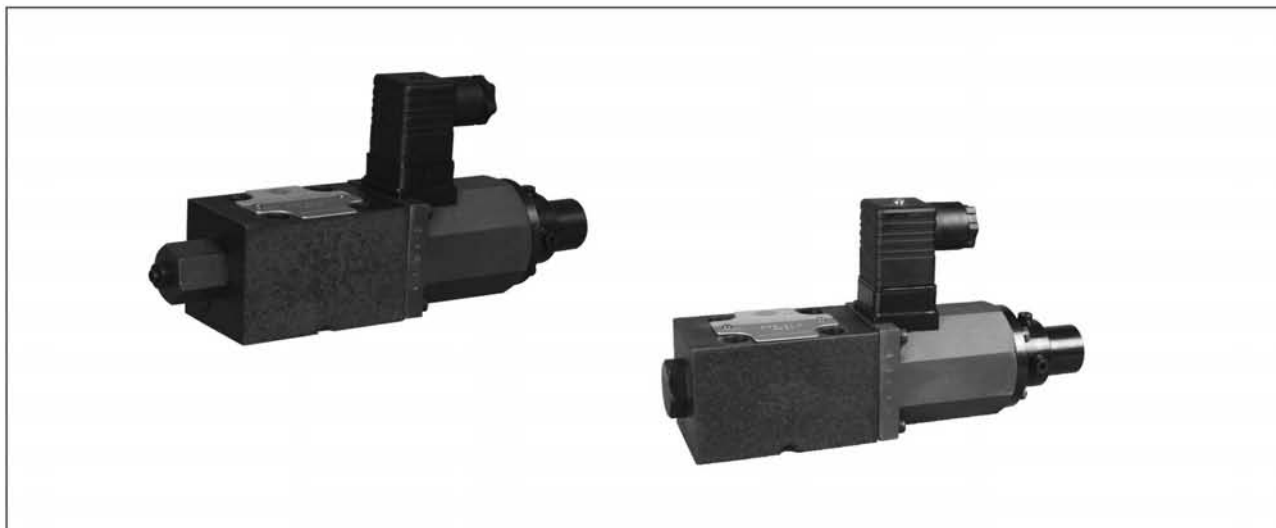
- 1、Hole is plugged when rating pressure is 2.5MPa. The hole can use as t cavity as vent hole when rating pressure is 7.5、15、21MPa ;
- 2、O Ring 12x2 (P、A、B、T) ;
- 3、ZDR10 DA prepare choosing check valve;
- 4、Handwheel adjustment ;
- 5、ZDR10 DA pressure meter connection port ;
- 6、ZDR10 DP pressure meter connection port ;
- 7、Repeat adjustment graduate cover ;
- 8、Lock knob adjustment with graduate ;
- 9、Space for pulling out key ;
- 10、Inside six corner adjustment with protection cover

Subplate Installation dimensions

Subplate Installation dimensions is fit for ISO 4401. Please see page 187.



Proportional Pressure Relief Valves Direct Operated Type EDG...



Introduction and Characteristic

- They can adjust system pressure proportionally base on input electricity of proportional solenoids.
- It's flow is small nad usually is used as pilot valve for system pressure telecontrol valve and other valves.
- The unloading when pressure is over loading can be come true by installing safe insert file ,then it can protect proportional solenoid and system .

Ordering details

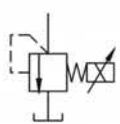
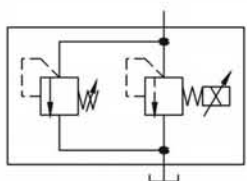
1	2	3	4	5	6	7	8	9
EDG	-	01	-	-	-	-	-	-

Item	Collocate	Code	Explanation
1	Sort	EDG	Direct operated proportional pressure relief valve
2	Size	01	
3	Pressure Adjustment Range	B	0.5~6.9MPa
		C	1.0~15.7MPa
		H	1.2~24.5MPa
4	Over loading Protection	NO	No safe valve
		1	With safe valve
5	Inlet ^① Throttle	NO	P port without throttle
		P08	P port with ϕ 0.8mm throttle
		P10	P port with ϕ 1.0mm throttle
		P12	P port with ϕ 1.2mm throttle
6	Outlet ^① Throttle	NO	T port without throttle
		T10	T port with ϕ 1.0mm throttle
		T12	T port with ϕ 1.2mm throttle
		T14	T port with ϕ 1.4mm throttle
7	Design Series	10	Could't install safe valve
		20	Could with safe valve
8	Seal ^② Material	NO	NBR
		V	FKM
9			Describe other especial demand

Note:

- ① For other dimensions throttle controller ,please contact with our company's technical dep. .
- ② Please see page 6 on catalog for hydraulic fluid and seal material .

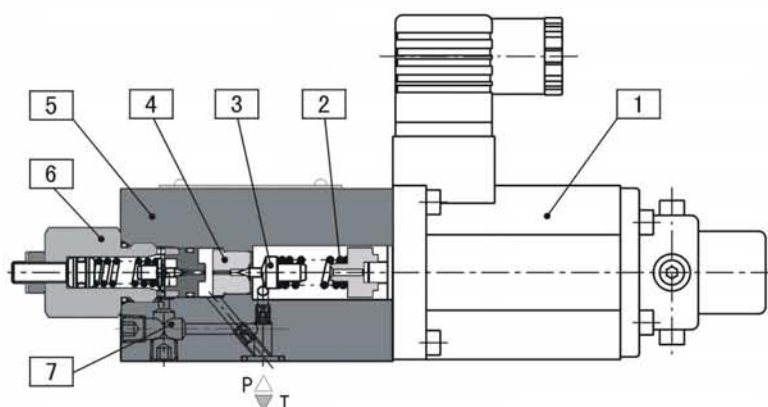
Symbols

No safe valve	With safe valve
	

Work theory

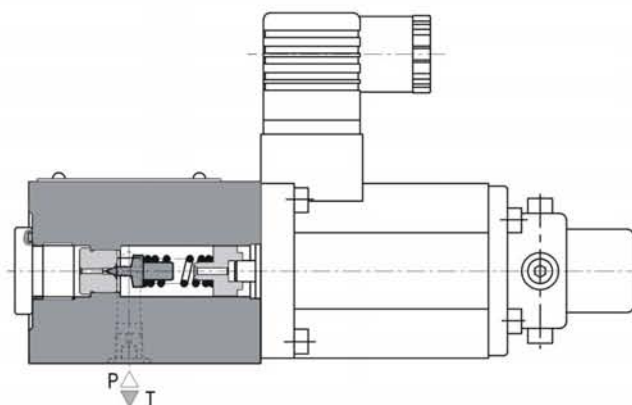
EDG-01-.....-20

Input control electricity into proportional solenoid coil, output power passes to spool 3 from compress spring 2. To compare hydraulic power on spool, it starts to relief after daff spool when hydraulic power bigger than solenoid power. Otherwise, the valve port will be closed.



EDG-01-.....-10;

The valve can be installed safe valve insert file 6 (only for 20 design number type). Oil via pass road 7 to T port and reflow to oil box after opening safe valve's spool when oil pressure bigger than enactment value of safe vavle. There is production when system pressure over load rating.



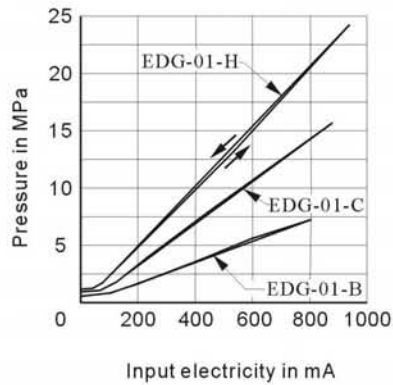
Technical data

Data		EDG-01-B	EDG-01-C	EDG-01-H
Rating electricity	mA	800	900	950
Max. Pressure	MPa	24.5		
Max. flow	L/min	2		
Min. flow	L/min	0.3		
Pressure adjustment range	MPa	See model code		
Coil resistance	Ω	10		
Stagnant loop		<3%		
Repeat precision		1%		
weight	Kg	2.0		

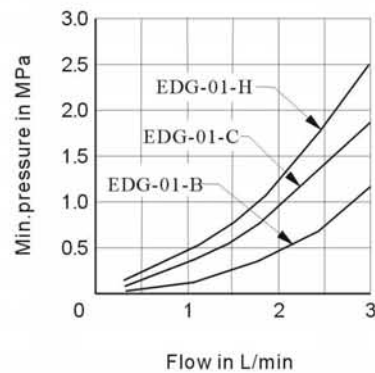
Characteristic curves

Measure condition for below curves: flow 2l/min
Obturation fluid vol. 40cm³ viscoce 30mm²/s

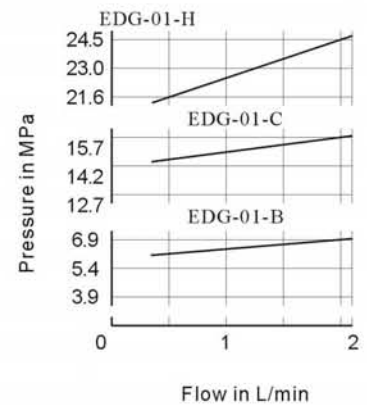
Input electricity-pressure
Characteristic curve



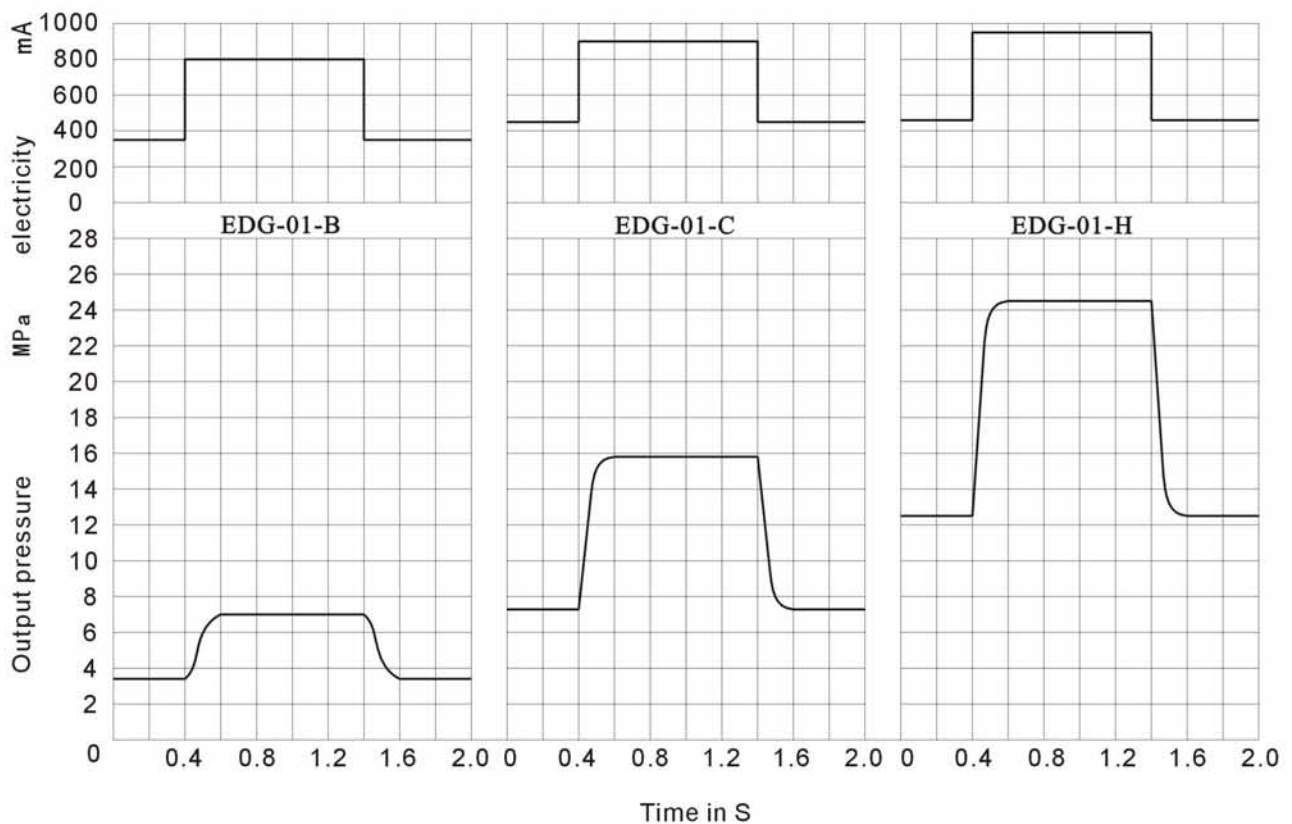
Min. Enactment pressure
Characteristic curve

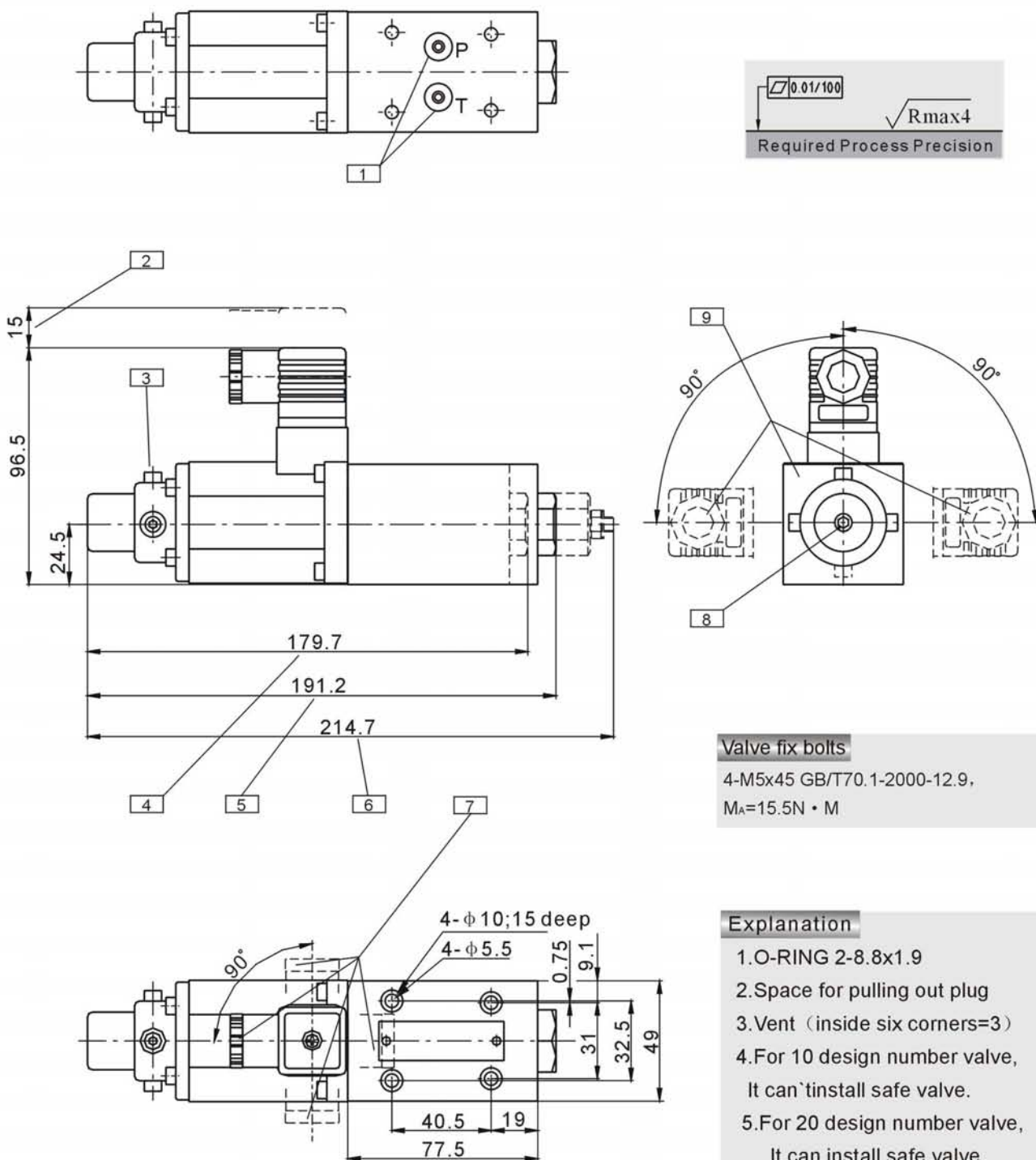


Flow-pressure
Characteristic curve

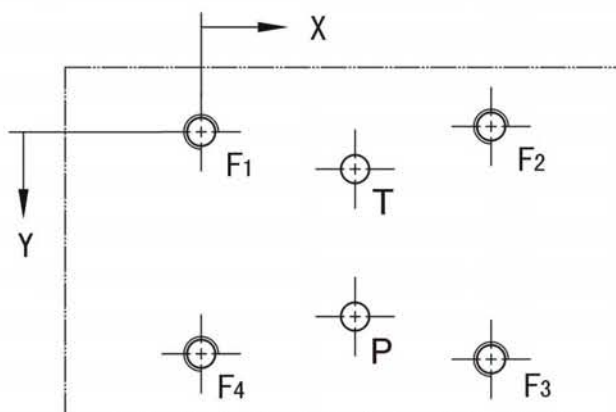


Pressure jumping response characteristic curves

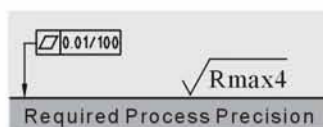




Installation surface process dimensions



Size	DES. Code	Position		Character	
		X	Y		Deep
EDG01	F ₁	0	0	M5	10
	F ₂	40.5	-0.75	M5	10
	F ₃	40.5	31.75	M5	10
	F ₄	0	31	M5	10
	P	21.5	25.8	φ 4	—
	T	21.5	5.2	φ 4	—



Note !

The installation surface should be bigger Than valve bottom figure when process Valve's installation surface.

Installation and using notice

1.Unloading control

It needs connection pipe which inside dia.is 6mm and length is 300mm or more short when using the valve as relief valve to control unloading .If pressure isn't steady ,it needs to add φ 1.0-1.5 throttle at oil outlet.

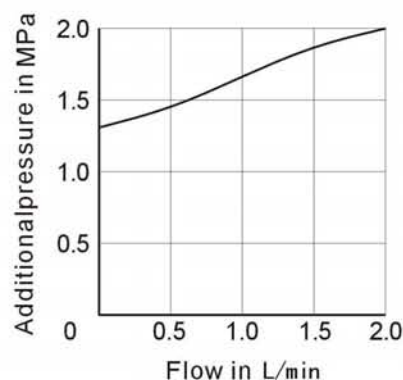
2.Return road pressure control

It needs to ensure that loading vol.(obturation fluid vol.) Is bigger than 40cm³ when using the valve to control return road pressure directly. Return oil pipe's back pressure should be smaller than 0.2MPa.

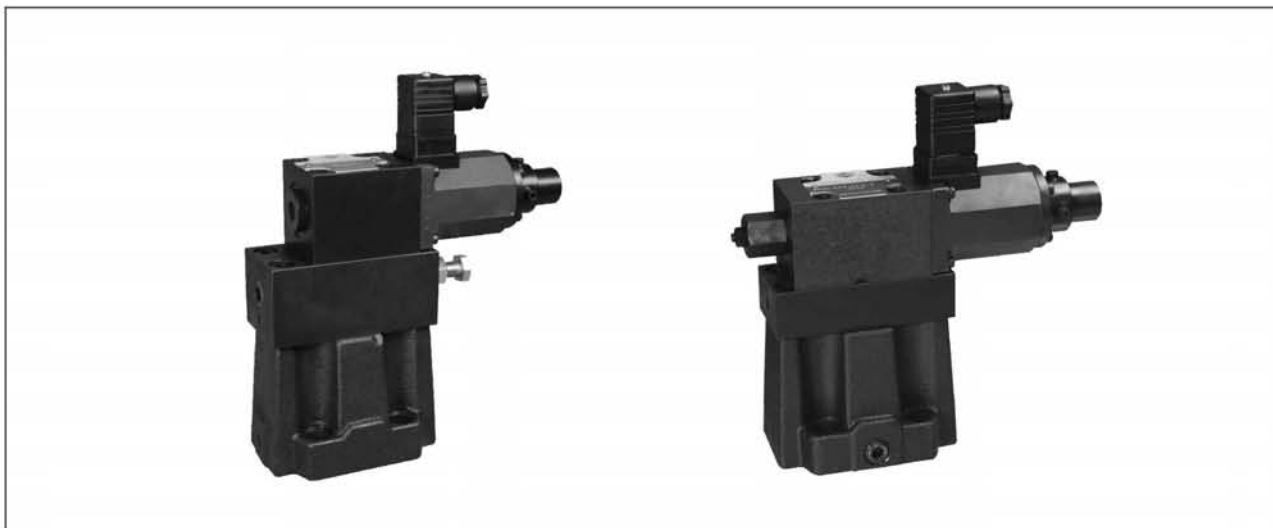
3.Safe valve's enactment pressure

Under max.flow, safe valve pressure is 2MPa (20.4kgf/cm) higher than max pressure adjustment range. If max work pressure is lower or using different max flow, it needs to adjust after working out safe valve's pressure enactment follow below formula. Pressure enactment value= (work pressure upper limit) + (additional pressure for right photo show)

Additional pressure-flow curve



Proportional Pressure Relief Valves Pilot Operated Type EBG...



Introduction and Characteristic

- The pilot operated proportional pressure relief valve controls main spool's move and adjusts system pressure pass proportional pilot valve.
- They can proportional adjustment base on pilot valve's input electricity.
- Unloading is come true by installing safe valve insert file when pressure over load rating , there is protection forproportional solenoid and system.

Ordering details

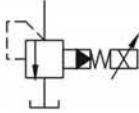
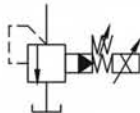
1	2	3	4	5	6	7	8
EBG	-	-	-	-	-	-	-

Item	Collocate	Code	Explanation
1	Sort	EBG	Pilot proportional relief valve
2	Size	03	
		06	
		10	
3	Pressure adjustment range	B	0.5~6.9MPa
		C	1.0~15.7MPa
		H	1.2~24.5MPa
4	Unloading pressure	NO	Standard
		S	Low unloading pressure type

Item	Collocate	Code	Explanation
5	Solenoid installation direction	L	Solenoid near main valve t port
		R	Solenoid near main valve p port
6	Design series ①	10	
		20	
7	Seal material	NO	NBR
		V	FKM
8			Describe other especial demand

Note: ① 10 series uses 10 series straight move type proportional relief valve as pilot valve . its safe valve is installed on transition block. 20 series uses 20 series straight move type proportional relief valve as pilot valve .

Symbols

No safe valve	With safe valve
	

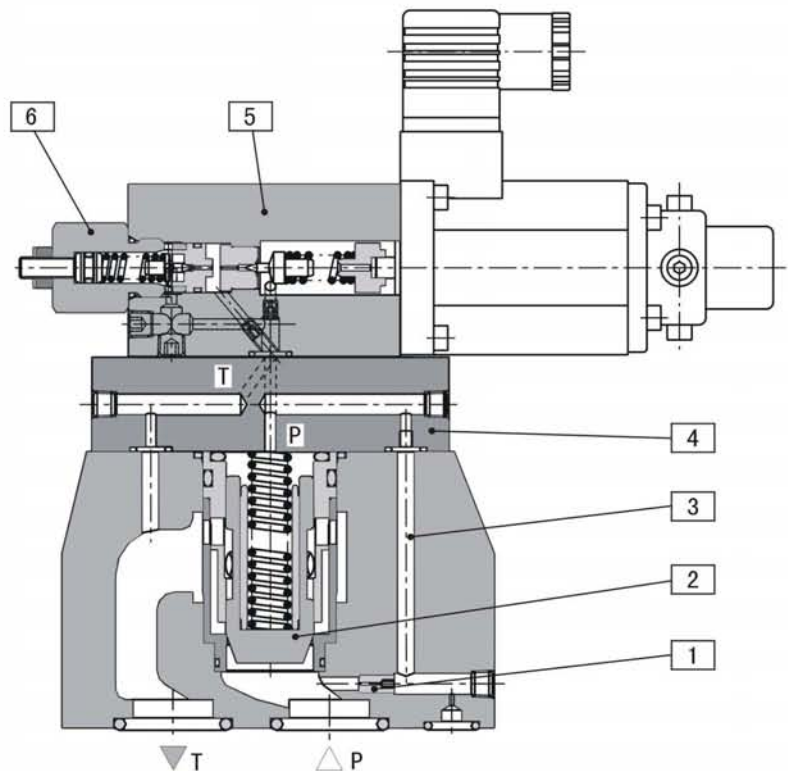
Technical data

Data	EBG-03	EBG-06	EBG-10
Rating electricity mA	720 770 820	700 750 800	680 730 780
Max. pressure MPa	24.5		
Max.flow L/min	100	200	400
Min.flow L/min	3		
Pressure adjustment range MPa	See model code		
Coil resistance Ω	10		
Stagnant loop	<2%		
Repeat precision	1%		
weight Kg	5.6	6.3	10

Work theory

CODE: EBG-03-...-R-20

Pass way P's pressure is on main valve 2. At the same time, pressure oil via throttle hole 1, control pass way 3 and transition block 4's P pass way work on main spool 2's spring cavity and proportional pilot valve 5 (20 series with safe valve)'s spool. If control pass way's pressure is bigger than proportional pilot's enactment value, proportional pilot relief valve relieves. Control oil via transition block T pass way and main valve T port to reflow oil box. Then there is pressure difference on up and below side for main spool 2. P port pressure oil starts to relief to return oil port T. After that, it reflows to oil box. Because pressure difference causes up hydraulic power to conquer main valve spring power and drive spool 2 move up.

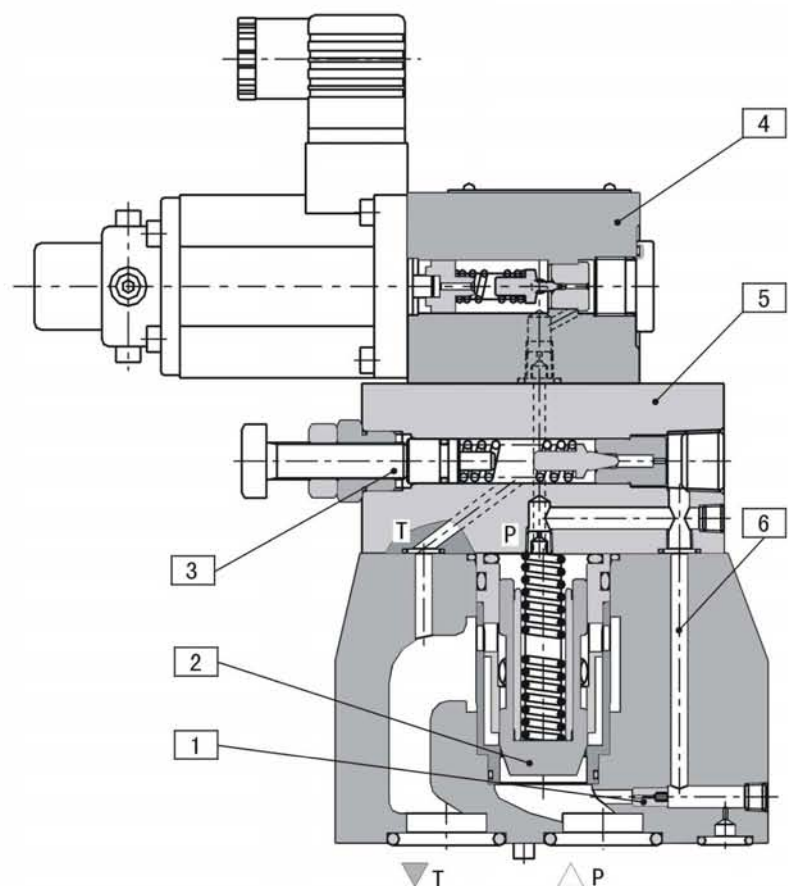


Proportional pilot valve and main valve's unlock pressure will increase proportionally when proportional solenoid's input electricity increasing. So the proportional adjustment is come true for hydraulic system pressure.

Control oil via transition block to main valve T port to reflow oil box after opening safe valve's spool when oil pressure is bigger than safe valve's enactment value. Then main spool unlock and main valve unloading. Pressure keeps upon safe valve's enactment pressure value.

CODE: EBG-03-...-L-10

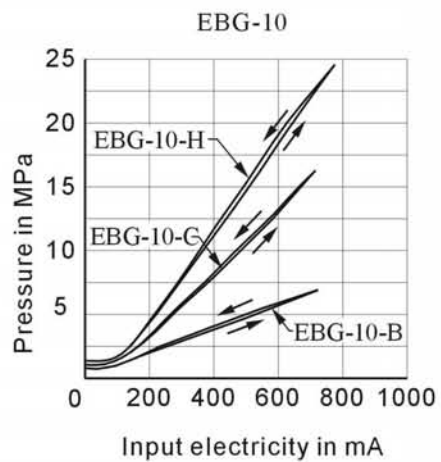
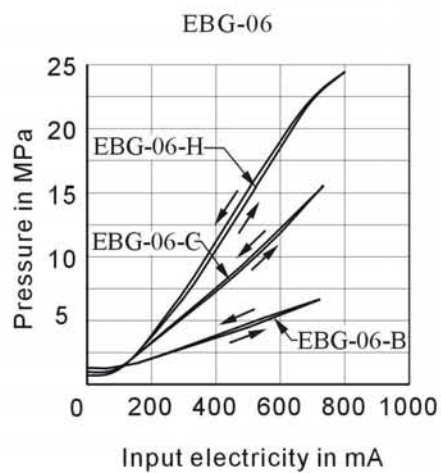
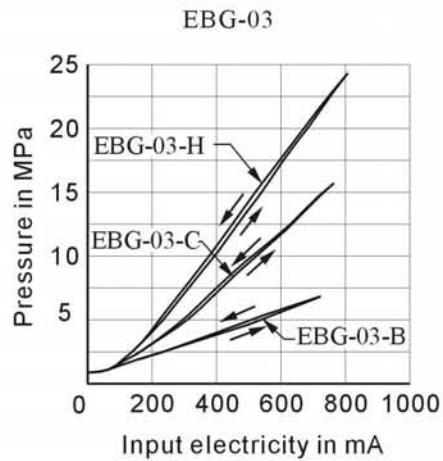
The valve's work theory is similar with 20 series. The difference is safe valve which was on pilot relief valve is moved on transition block.



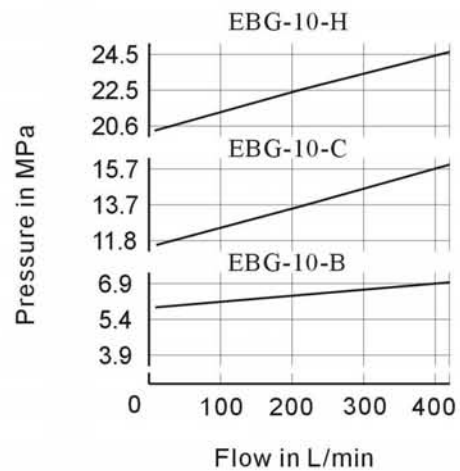
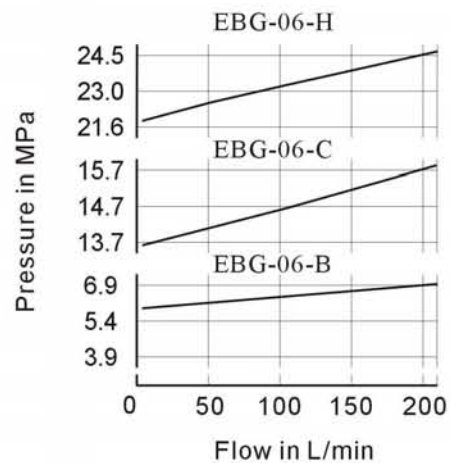
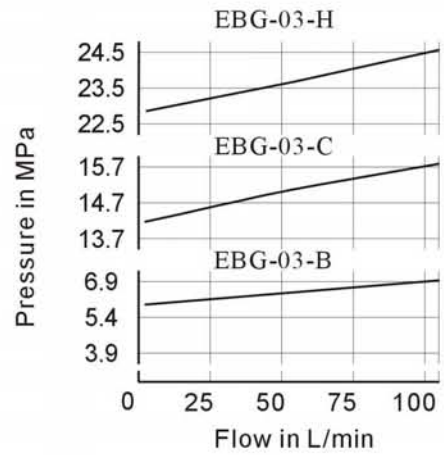
Characteristic curves

Below curves' measure conditon: obturation fluid vol. 1L viscoce 30mm²/s

Input electricity-pressure
characteristic curves



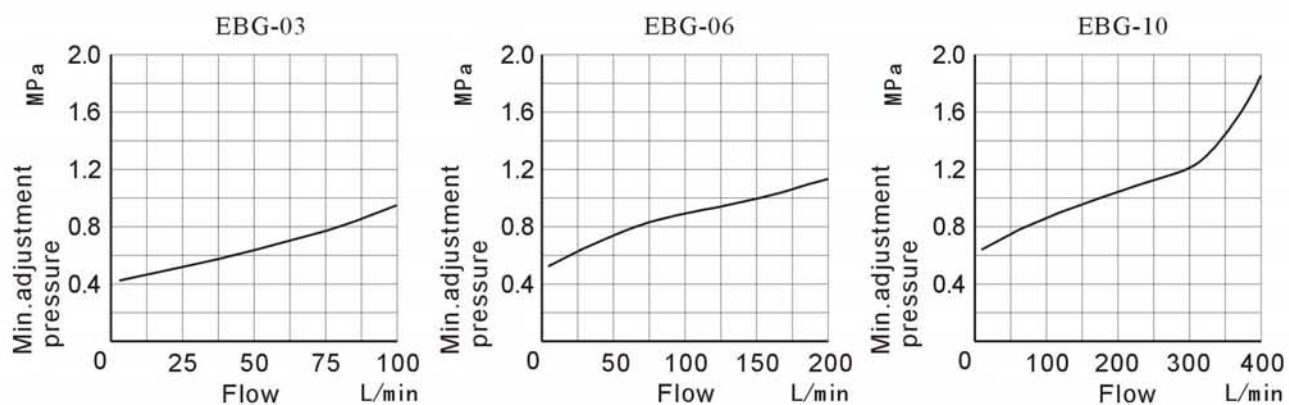
Flow-pressure
characteristic curves



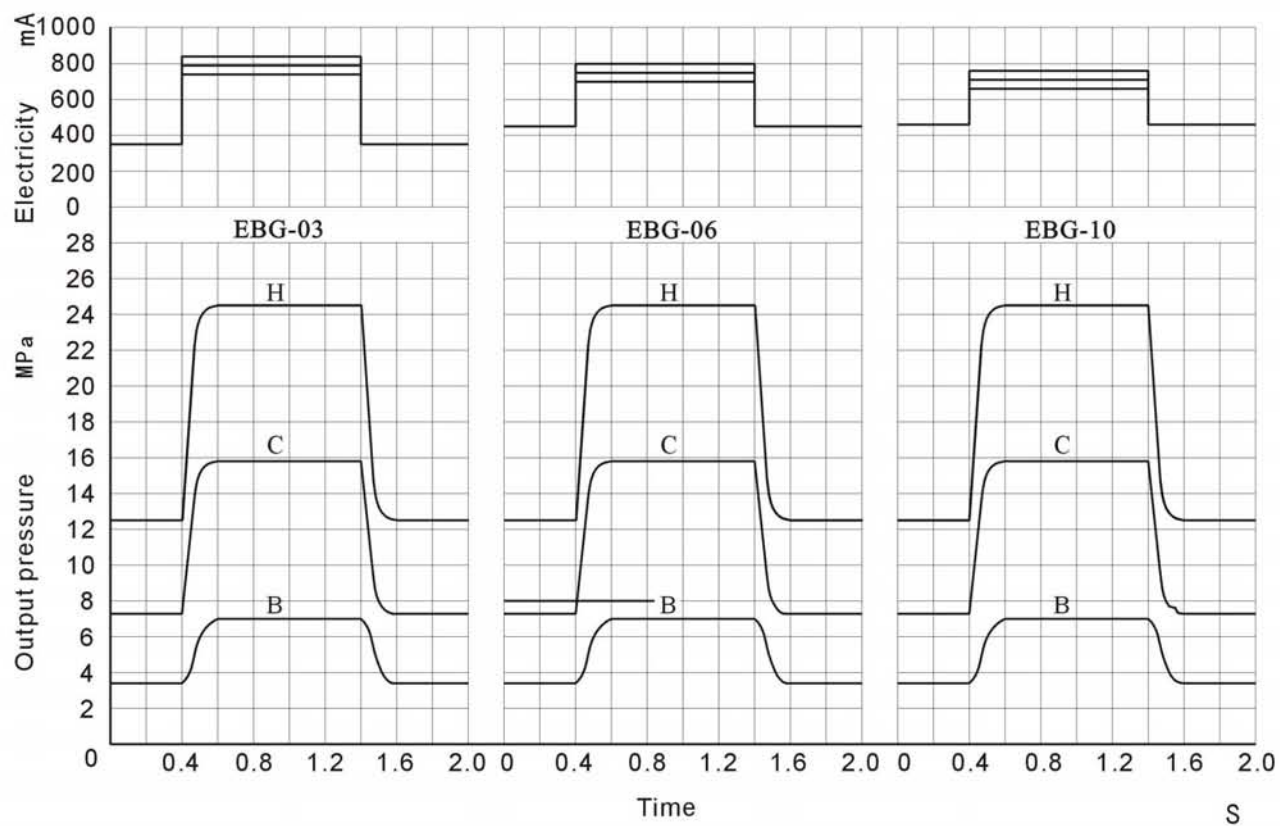
Characteristic curves

Below curves' measure conditon: obturation fluid vol. 1L viscoce 30mm²/s

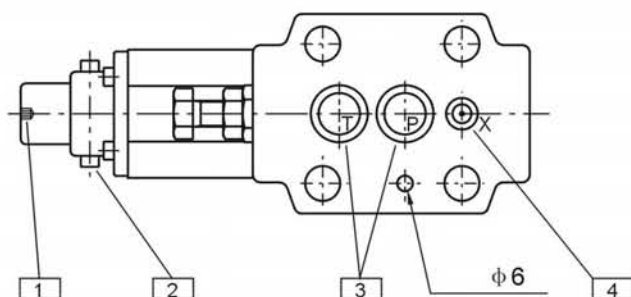
Min. Enactment pressure characteristic curves



Jumping response characteristic curves



Installation dimensions: 10 series

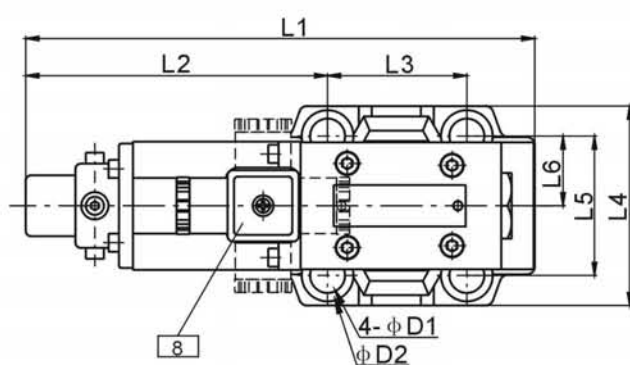
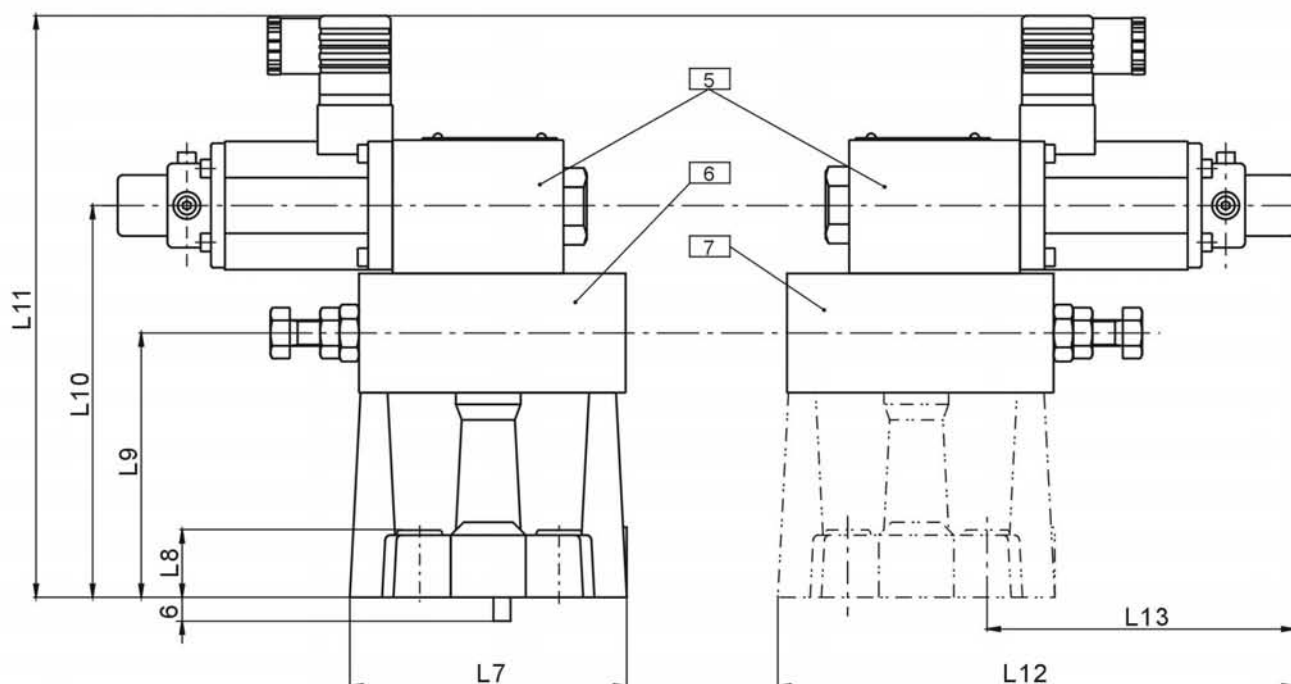


Valve fix bolts

EBG-03: 4-M12x40 GB/T70.1-2000-12.9,
M_A=130N • M

EBG-06: 4-M16x50 GB/T70.1-2000-12.9,
M_A=310N • M

EBG-10: 4-M20x60 GB/T70.1-2000-12.9,
M_A=430N • M



EXPLANATION

1.Manual pressure adjustment bolts (inside six corners=3)

2.Vent (inside six corner s=3)

3.P、T port o-rings,
03: 17x2.5, 06: 27.7x3.5,
10: 31.7x3.5

4.X port o-rings,
03: 8.8x1.9, 06: 11x2.5,
10: 8.8x1.9

5.Electro-hydraulic proportional pilot relief valve without safe valve.

6.Transition block for l type

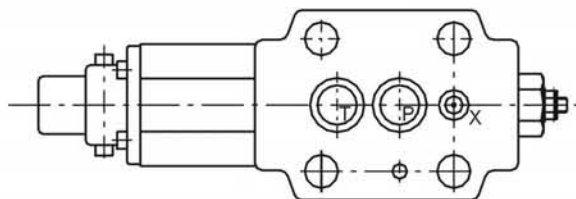
7.Transition block for r type

8.Pulling out plug needs space.

Type	L1	L2	L3	L4	L5	L6	L7
EBG-03	196	115	53.8	77	53.8	26.9	107
EBG-06	210	117	66.7	104	70	35	123
EBG-10	217	102	88.9	120	82.6	41.3	155

L8	L9	L10	L11	L12	L13	D1	D2
26	104	129	216	200	119	13.5	20
27.5	104	129	216	200	115.5	17.5	26
33.5	135	160	231	221	98	22	32

Installation dimensions: 20 series

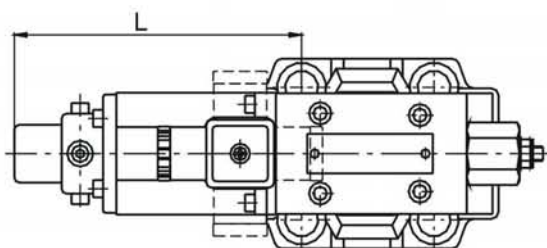
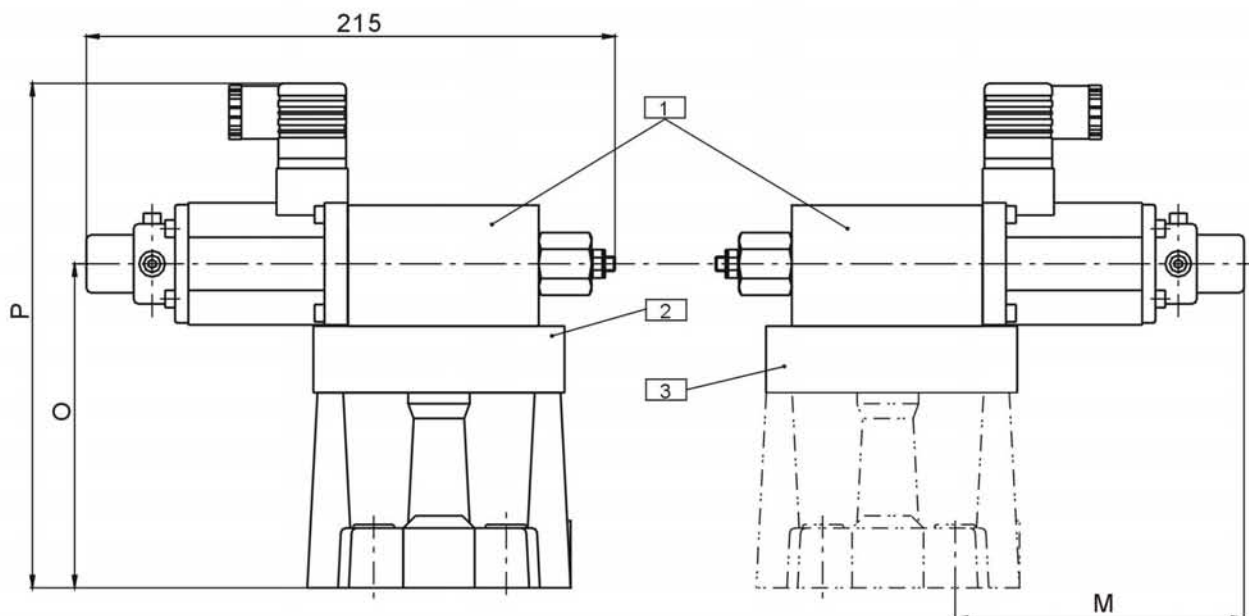


Valve fix bolts

EBG-03: 4-M12x40 GB/T70.1-2000-12.9,
M_A=130N • M

EBG-06: 4-M16x50 GB/T70.1-2000-12.9,
M_A=310N • M

EBG-10: 4-M20x60 GB/T70.1-2000-12.9,
M_A=430N • M



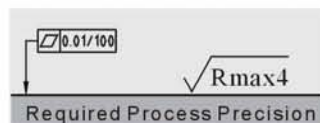
Type	L	M	O	P
EBG-03	115	117.5	109	196
EBG-06	104.5	115	109	196
EBG-10	102	98	140	211

See without safe valve type
for other dimensions

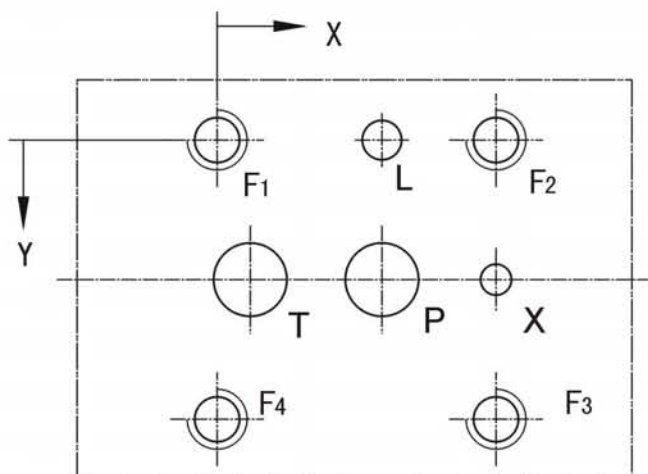
Explanation

1. Electro-hydraulic proportional pilot relief valve with safe valve .
2. Transition block for I type
3. Transition block for r type

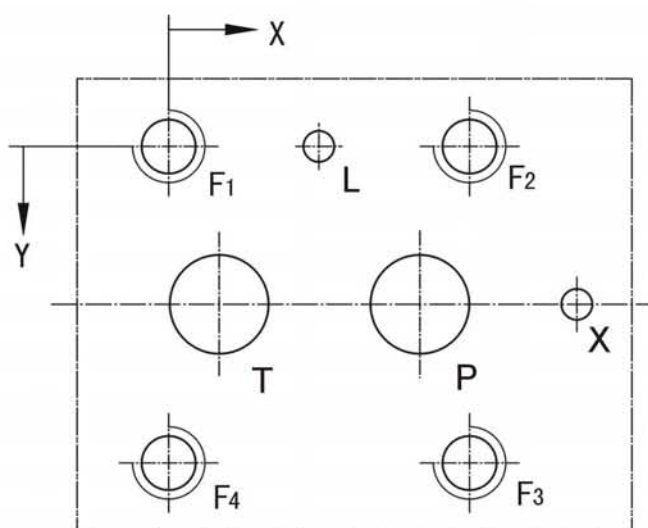
Please see without safe
valve type for other
explanation



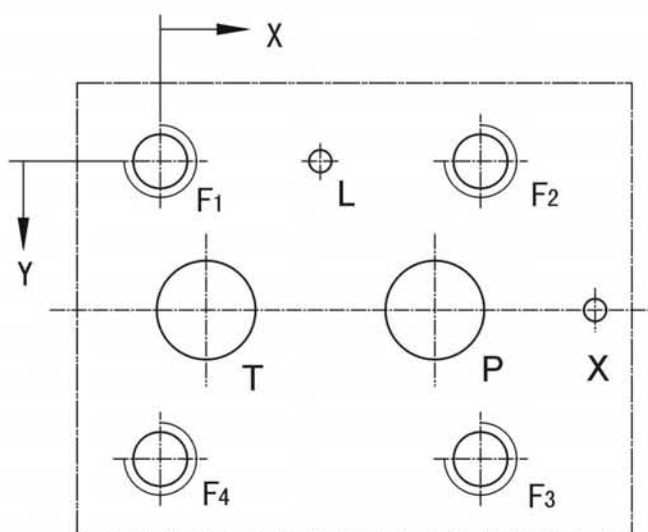
Installation surface process dimensions



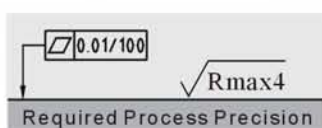
Size	DES. Code	Position		Character	
		X	Y		Deep
EBG-03	F ₁	0	0	M12	20
	F ₂	53.8	0	M12	20
	F ₃	53.8	53.8	M12	20
	F ₄	0	53.8	M12	20
	P	31.8	26.9	φ 14.5	—
	T	6.4	26.9	φ 14.5	—
	X	53.8	26.9	φ 6.2	—
	L	31.8	0	φ 7	10



Size	DES. Code	Position		Character	
		X	Y		Deep
EBG-06	F ₁	0	0	M16	25
	F ₂	66.7	0	M16	25
	F ₃	66.7	70	M16	25
	F ₄	0	70	M16	25
	P	44.5	35	φ 23	—
	T	11.2	35	φ 23	—
	X	90.5	35	φ 6.2	—
	L	33.3	0	φ 7	10



Size	DES. Code	Position		Character	
		X	Y		Deep
EBG-10	F ₁	0	0	M20	28
	F ₂	88.9	0	M20	28
	F ₃	88.9	82.6	M20	28
	F ₄	0	82.6	M20	28
	P	76.2	41.3	φ 28	—
	T	12.7	41.3	φ 28	—
	X	120.7	41.3	φ 6.2	—
	L	44.4	0	φ 7	10



Note !

The installation surface should be bigger than valve bottom figure when process valve's installation surface.

Installation and using notice

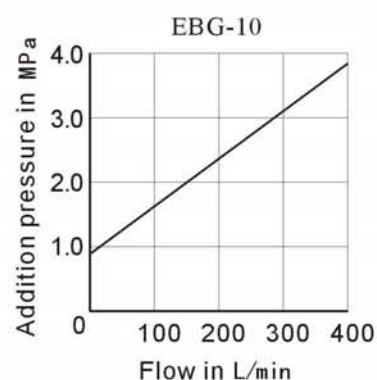
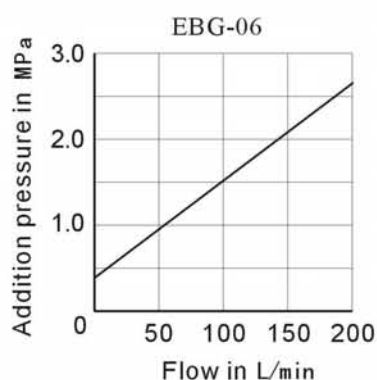
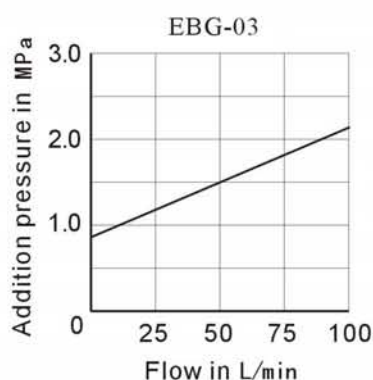
Safe valve's enactment pressure

Right table is safe valve's additional pressure when leaving factory. Safe valve's enactment pressure should be pressure adjustment range's upper limit add addition pressure value on table.

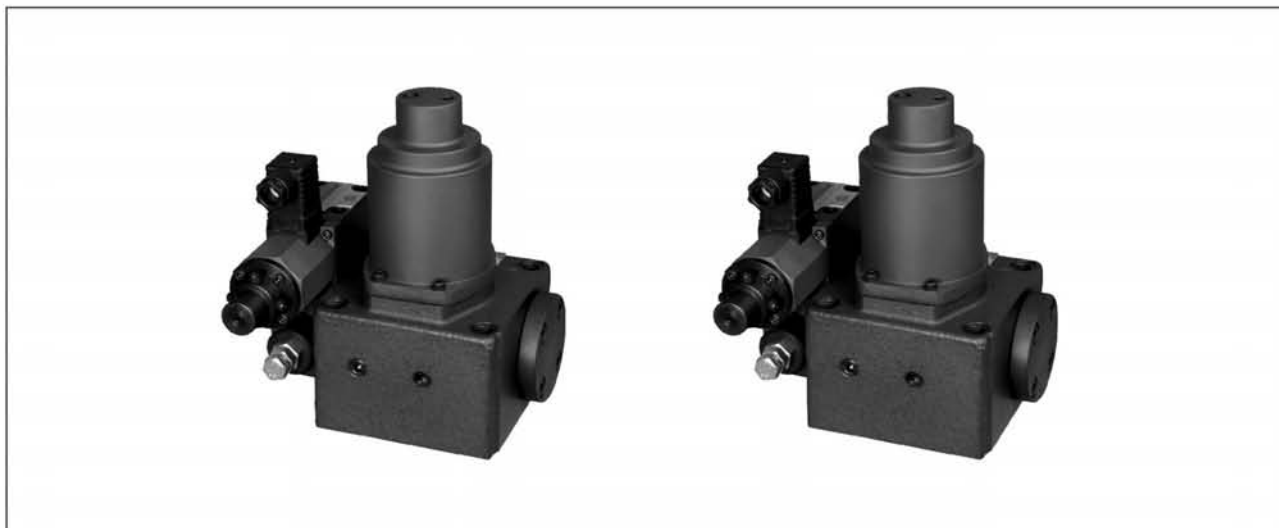
Note:

Work pressure's upper limit is lower or using different flow upper limit, the adjustment should be done after working out safe valve's pressure enactment value follow below formula. Pressure enactment value = work pressure upper limit + addition pressure for below photo show.

Code	Pressure MPa	Flow to L/min
EBG-03	1.5	50
EBG-06	1.5	100
EBG-10	2.5	200



Proportional Pressure Relief And Flow Valves Pilot Operated Type EFBG...



Introduction and Characteristic

- The proportional relief timing valve is connected by proportion relief valve and proportional throttle valve.
- It controls flow by inlet throttle control type to reduce system power waste.
- Because inlet pressure follow loading pressure for small pressure difference. System pressure and output flow can be proportional control quickly by input electricity signal on valveproportional solenoid.

Ordering details

1	2	3	4	5	6	7
EFBG	-	-	-	-	-	-

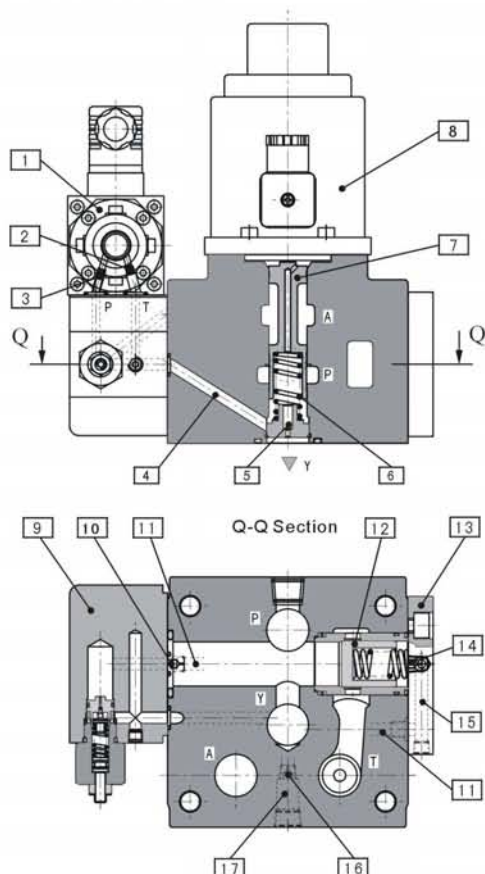
Item	Collocate	Code	Expanation
1	Sort	EFBG	Proportional relief timing valve
2	Size	03	
		06	
		10	
3	Flow adjustment range	60	Fit for size: 03
		125	
		160	
		250	Fit for size: 06
		500	Fit for size: 10

Item	Collocate	Code	Expanation
4	Pressure adjustment range	B	0.5~6.9MPa
		C	1.0~15.7MPa
		H	1.2~24.5MPa
5	Design series	20	Fit for size:03
		10	Fit for size:03,06,10
6	Seal material	NO	NBR
		V	FKM
7			Describe other especial demand

Technical data

Name			Code	EFBG-03	EFBG-06	EFBG-10
Max. pressure			MPa	24.5	24.5	24.5
Max. flow			L/min	125	250	500
Flow control	Flow adjustment range		L/min	1~125	2.5~250	5~500
	Rating electricity		mA	540	750	900
	Coil resistance		Ω	10	10	10
	Pressure difference		MPa	0.6	0.7	0.9
	Stagnant loop			<3%	<3%	<3%
	Repeat			1%	1%	1%
Pressure control	Pressure adjustment range	B	MPa	0.5~6.9	0.5~6.9	0.5~6.9
		C	MPa	1.2~15.7	1.4~15.7	1.5~15.7
		H	MPa	1.4~24.5	1.4~24.5	1.5~24.5
	Rating electricity	B	mA	750	820	900
		C	mA			
		H	mA			
	Coil resistance		Ω	10	10	10
	Stagnant loop			<2%	<2%	<2%
	Repeat			1%	1%	1%
Weight			Kg	18	33	58

CODE: EFBG-03-...-20



EFBG-03-...-20

Pass way P's pressure is on main spool 12. At the same time, pressure oil via oil road 17, throttle hole 16 to oil road 11. After that, it divides into two ways. One way via throttle hole 10 into safe valve 9 and proportional pressure pilot valve 1. Another way via end cover 13's oil road 15 and throttle hole 14 into main spool's spring side.

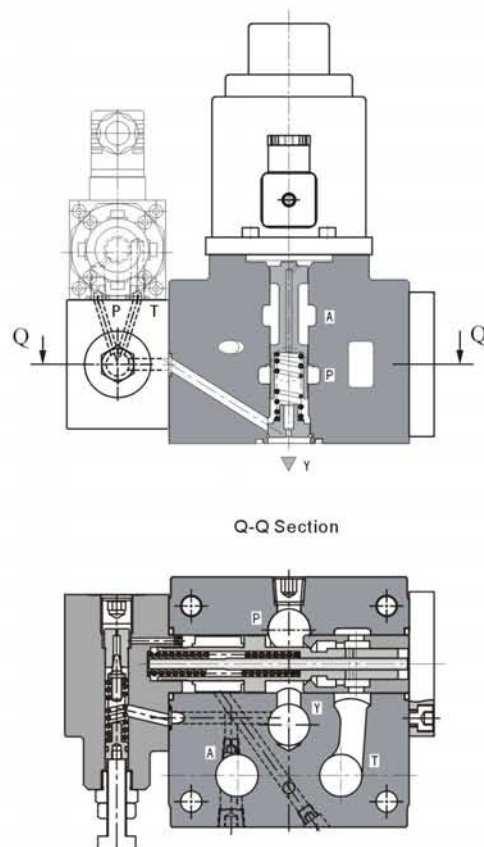
Pilot valve 1's spool is opened when above control oil pressure bigger than proportional pressure pilot valve 1's enactment value. Control oil via pilot T port, oil road 4 to main valve Y port to reflow to oil box. Then it caused pressure difference between main spool 12's left and right sides to conquer spring power. The power makes main spool move to right to open main valve to relief. So pass way P's pressure keep same for enactment value.

Pass way P's pressure value can be adjusted proportionally by changing proportional solenoid's input electricity on proportional pressure pilot valve 1.

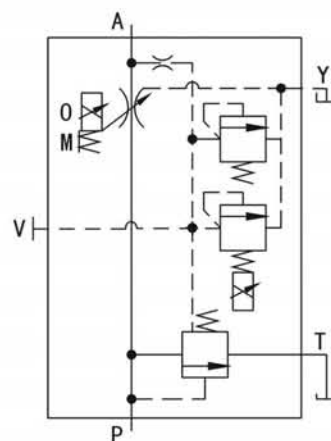
Throttle port is opened by proportional solenoid 8 controls main flow spool 7 to conquer spring 6 to move down. Then the fluid from pass way P flow into A port.

Pass way PA's flow can be controlled proportionally by changing proportional solenoid 8's input electricity.

CODE: EFBG-03-...-10



Symbols



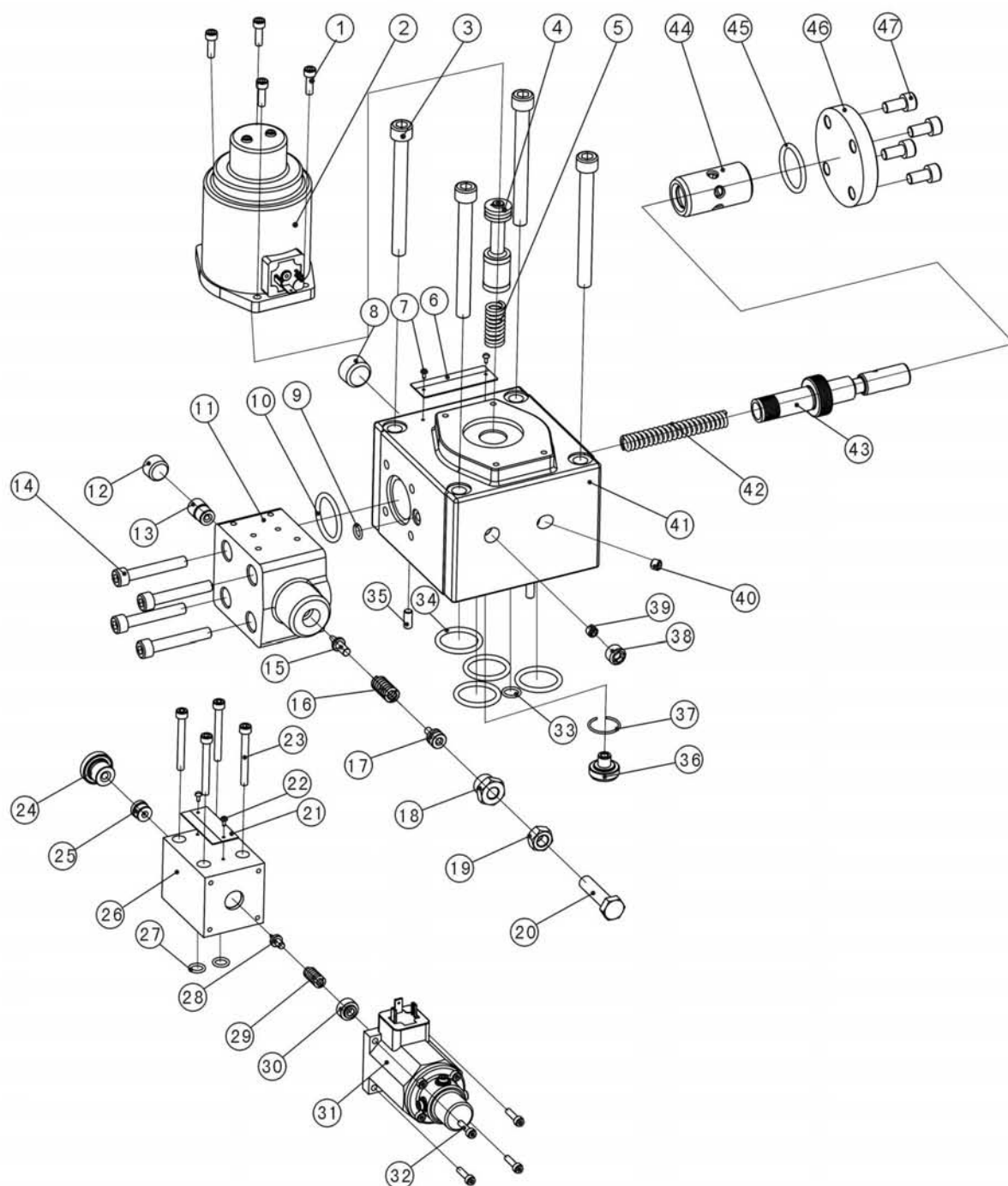
At the same time, A port passes to oil road 17. It comes true pass way P's pressure to change follow loading pressure (A port pressure) to reduce system power waste.

EFBG-03-...-10

The valve's work theory is similar with 20 series.

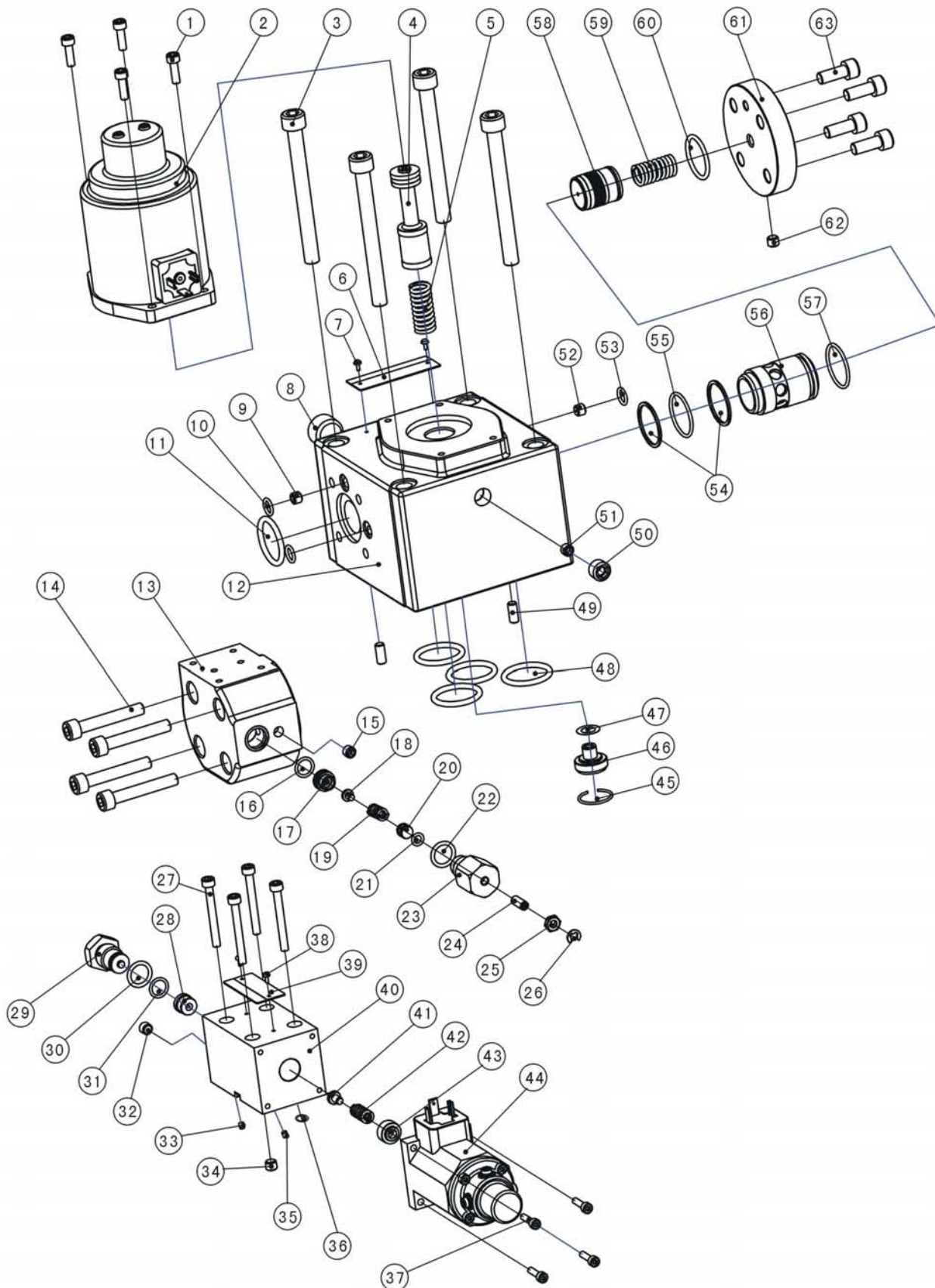
Three Dimensional Analyse Photo

CODE: EFBG-03-...-20



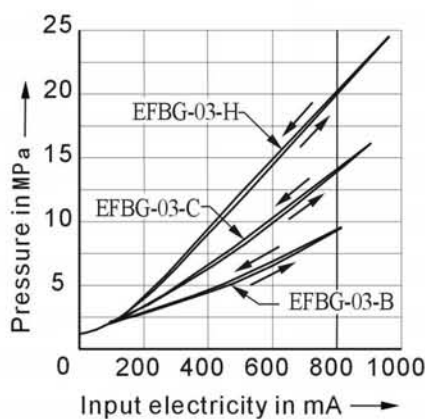
Three Dimensional Analyse Photo

CODE: EFBG-03-...-10

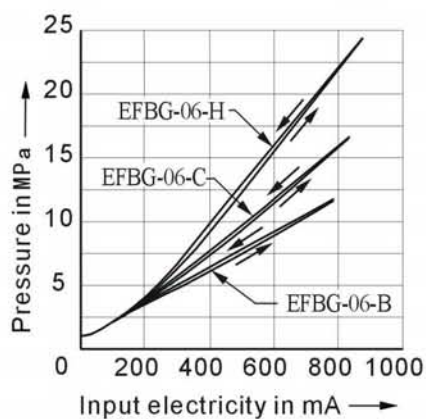


Characteristic curves

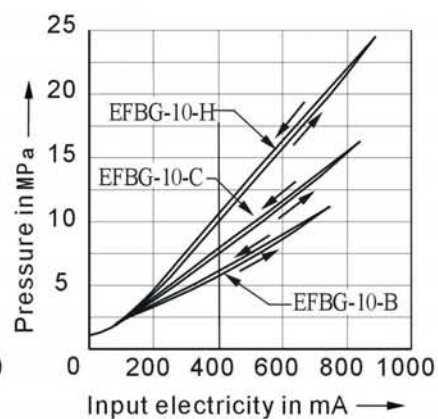
EFBG-03...10



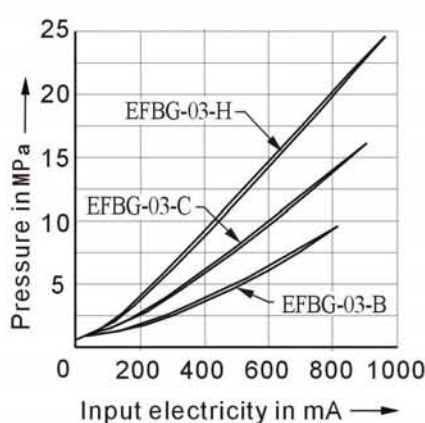
EFBG-06...10



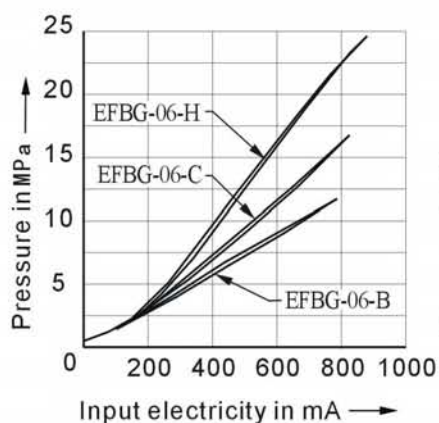
EFBG-10...10



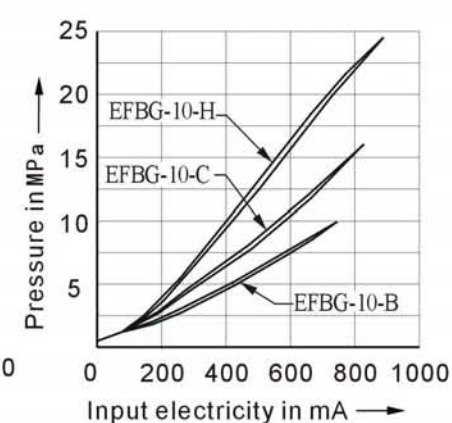
EFBG-03...20



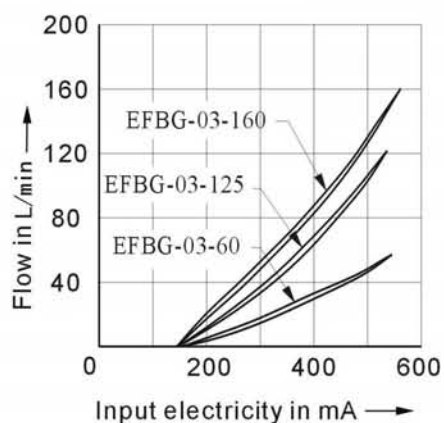
EFBG-06...20



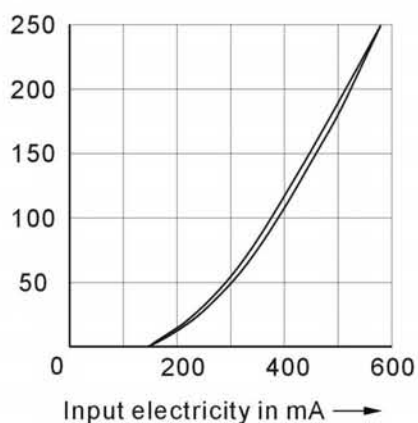
EFBG-10...20



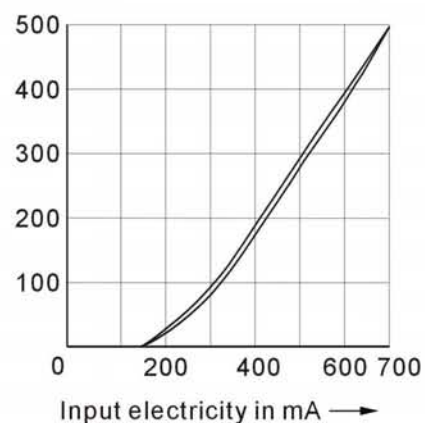
EFBG-03



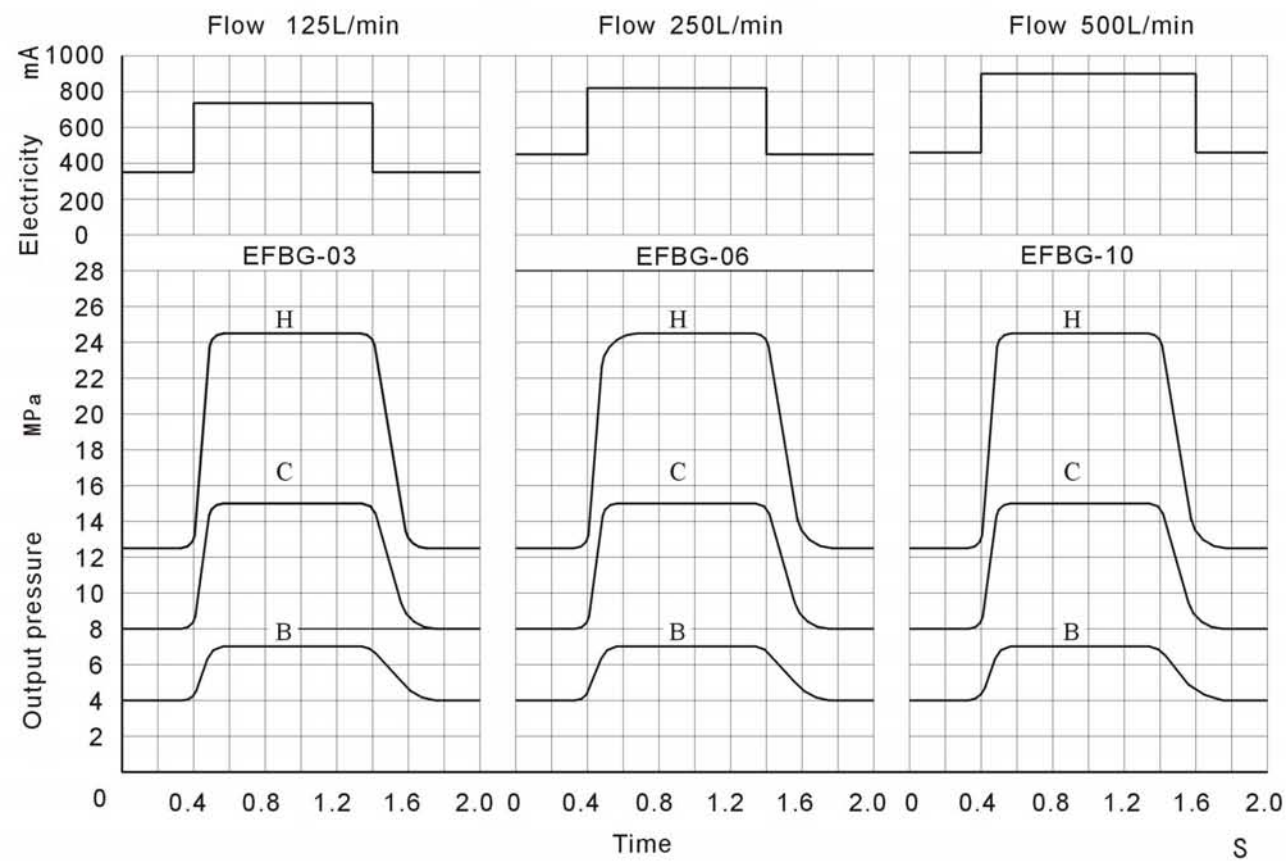
EFBG-06



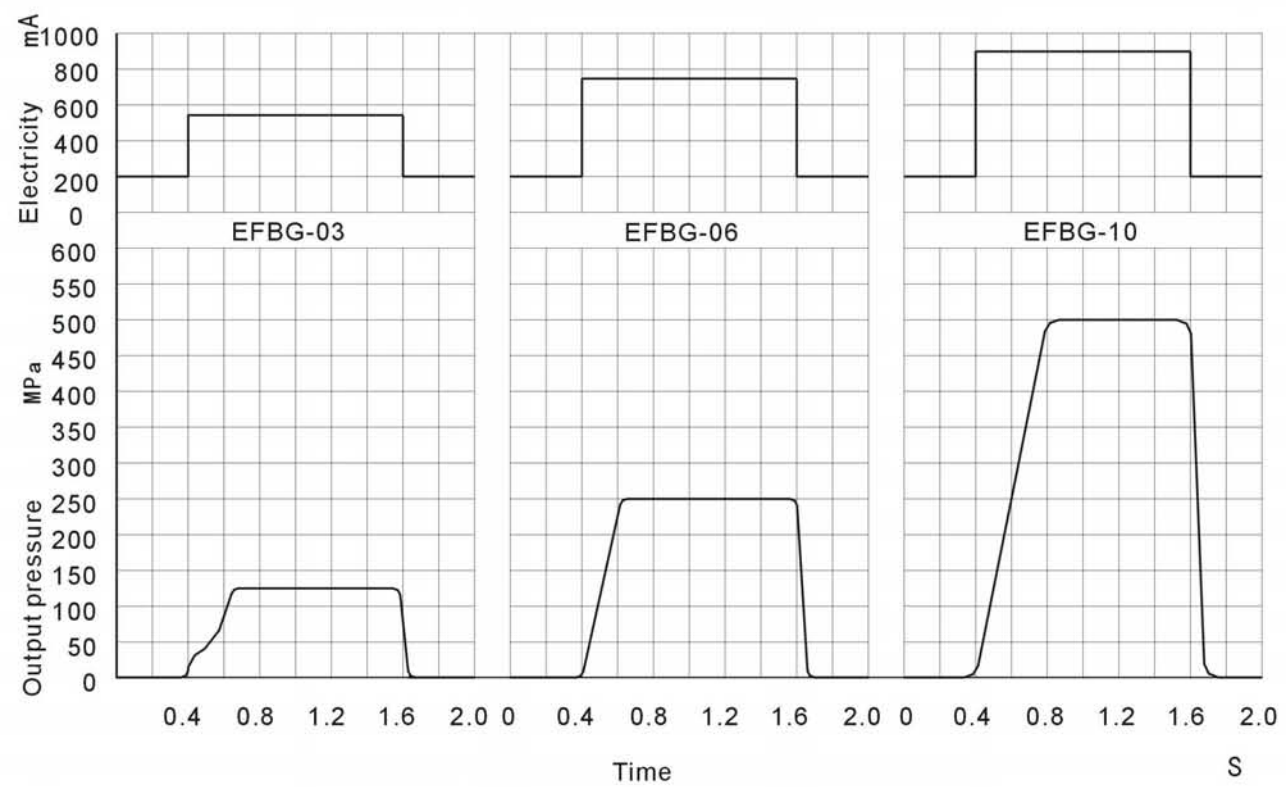
EFBG-10



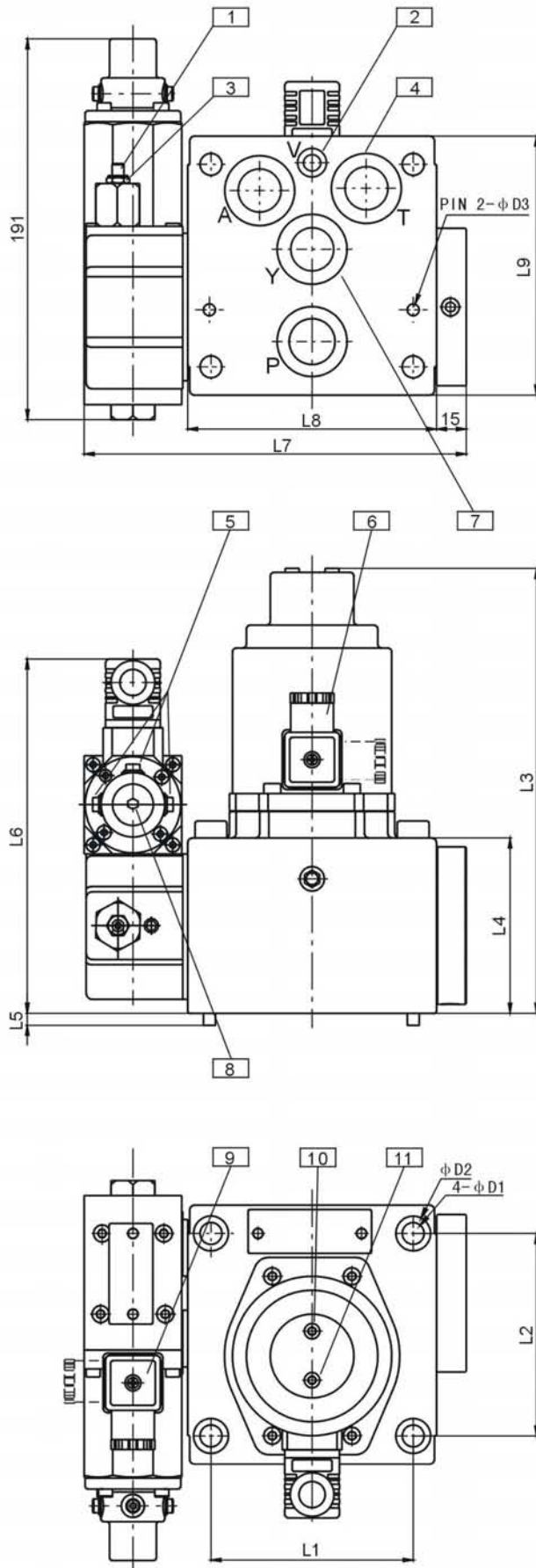
Pressure control jumping response characteristic curves



Flow control jumping response characteristic curves



Installation dimensions



Valve fix bolts

EFBG-03: 4-M10x100 GB/T70.1-2000-12.9,
 $M_A=130N \cdot M$

EFBG-06: 4-M16x130 GB/T70.1-2000-12.9,
 $M_A=310N \cdot M$

EFBG-10: 4-M20x150 GB/T70.1-2000-12.9,
 $M_A=430N \cdot M$

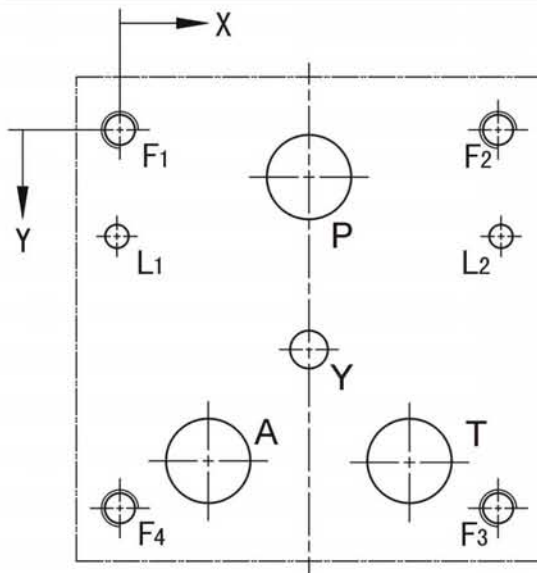
Explanation

- 1.Safe valve pressure adjustment bolts
 (Inside six corner $s=3$)
- 2.Installation o-rings for telecontrol
 port v.03: without the port:
 06: 10.8.x2.4; 10: 10.8x2.4
- 3.Lock nut (six corner $s=10$)
- 4.A、T、P Ports installation o-rings.
 03: 28x3.55; 06: 30.8x3.6; 10: 47.7x3.5
- 5.Vent (inside six corner $s=3$)
- 6.Space for pulling out plug is 15mm.
 Installation can be changed . each
 time for 90°
- 7.Y Port installation o-rings,
 03: 28x3.55; 06: 43x3.5; 10: 59.4x3.1
- 8.Manual pressure adjustment bolts
 (inside six corner $s=3$)
- 9.Space for pulling out is 15mm.please
 see page xx for installation direction.
- 10.Manual flow adjustment bolts
 (inside six corner $s=3$)
- 11.Vent (inside six corner $s=3$)

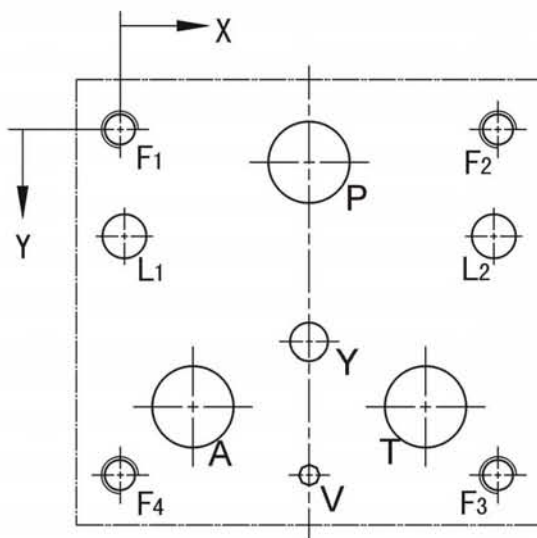
Code	L1	L2	L3	L4	L5
EFBG-03	101.6	101.6	218	85	6
EFBG-06	146.1	133.4	248	107	8
EFBG-10	196.9	177.8	275	124	10

L6	L7	L8	L9	D1	D2
171	191	125	130	11	17.5
206	247	180	174	17.5	26
220	315	244	244	22	32

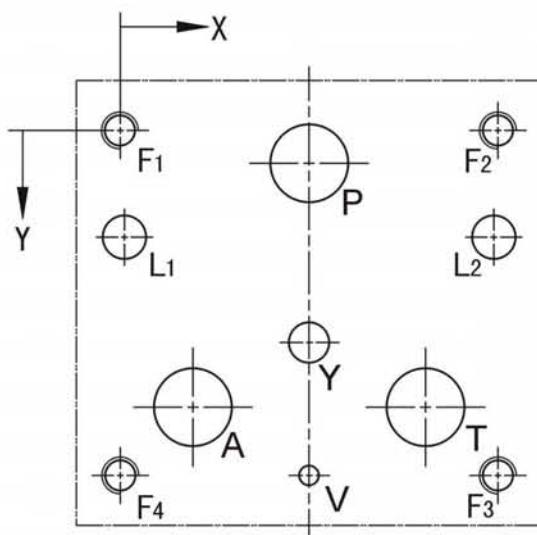
Installation surface process dimensions



Size	DES. Code	Position		Character	
		X	Y		DEEP
EFBG03	F ₁	0	0	M10	18
	F ₂	101.6	0	M10	18
	F ₃	101.6	101.6	M10	18
	F ₄	0	101.6	M10	18
	P	50.8	12.7	φ 23	–
	T	77.8	88.9	φ 23	–
	A	23.8	88.9	φ 23	–
	Y	50.8	59	φ 11	–
	L ₁	-0.8	28.6	φ 7	7
	L ₂	102.4	28.6	φ 7	7



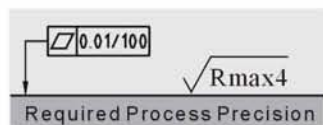
Size	DES. Code	Position		Character	
		X	Y		Deep
EFBG06	F ₁	0	0	M16	30
	F ₂	146.1	0	M16	30
	F ₃	146.1	133.4	M16	30
	F ₄	0	133.4	M16	30
	P	73.1	12.7	φ 29	–
	T	118.1	107	φ 29	–
	A	28.1	107	φ 29	–
	Y	73.1	82	φ 14	–
	L ₁	1.6	32.2	φ 17.5	10
	L ₂	144.5	32.2	φ 17.5	10



Size	DES. Code	Position		Character	
		X	Y		Deep
EFBG10	F ₁	0	0	M20	35
	F ₂	196.9	0	M20	35
	F ₃	196.9	177.8	M20	35
	F ₄	0	177.8	M20	35
	P	98.45	17.5	φ 43.5	–
	T	161.95	144.5	φ 43.5	–
	A	34.95	144.5	φ 43.5	–
	Y	98.45	115	φ 14	–
	L ₁	1.6	55.5	φ 20	15
	L ₂	195.3	55.5	φ 20	15

Note!

The installation surface should be bigger than valve bottom figure when process valve's installation surface.



Installation and using notice

1. Vent

Before using, please vent out air inside valve and immit full fluid into solenoid. In order to vent air easily, vent hole position should be up. Vent hole direction can be changed by circumgyrating solenoid vent.

2. Manual enactment

Before using or coming out electric fault, it can adjust manual adjustment bolts to enact valve's pressure and flow. Manual adjustment bolts should return to original position when without using manual enactment.

3. Return oil and vent oil back pressure

The back pressure effects valve's min. adjustment pressure and control flow directly. So two pipe road should be collocated alone to reduce back pressure. At the same time, end of pipe road should immerge oil. Return oil back pressure isn't bigger than 0.5MPa. Vent oil back pressre isn't bigger than 0.2MPa.

4. Small flow limit

Control pressure will be unsteadiness when relief valve's pass flow is small. So using flow should over than 10L/min for 03,06 size. For 10 size valve, using flow should over than 15L/min.

5. Safe valve pressure enactment

Enacting safe valve pressure 2MPa higher than max. adjustment pressure. After adjusting pressure, lock nut must be screwed down.

6. See below photo for installation type.

