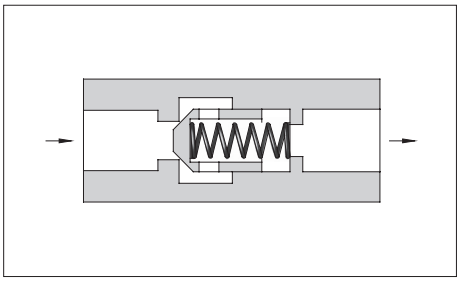
Check/Pilot Controlled Check Valves

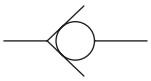
Valve Type	Graphic Symbols	Max. Operating Pressure MPa	Maximum Flow L/min (1 2 5 10 20 50 100 200 500 1000 2000 5000)	Page
Check Valves		25	In-Line (CIT) 02 03 06 10 Right Angle (CRT/CRG) 03 06 10 Right Angle, Flanged Connection (CRF) 10 16 24	E-137
Pilot Operated Check Valves		25	Threaded Connection (CP＊T) Sub-plate Mounting (CP＊G) 03 06 10 Flanged Connection (CP＊F) 10 16	E-143
In-Line Prefill Valves		25	PI＊F-40 50 63 80 100	E-148

In-Line Check Valves

These valves allow free flow in one direction and prevent flow in the reverse direction. Cracking pressure specified is the pressure required to open the valve and allow free flow.



Graphic Symbol



Specifications

Model Numbers	Rated Flow★ L/min	Max. Operating Pres. MPa	Cracking Pres. MPa	Approx. Mass kg
CIT-02-∗-50	16	25	0.04 0.35 0.5	0.1
CIT-03-∗-50	30			0.3
CIT-06-∗-50	85			0.8
CIT-10-∗-50	230			2.3

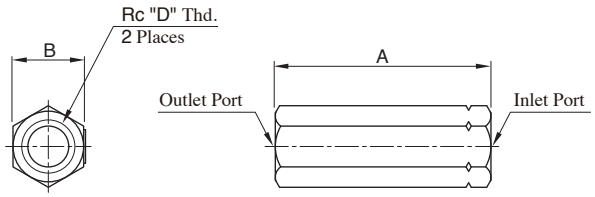
★Rated flow is the approximate flow rate, when there is a free flow pressure drop of maximum 0.3 MPa, the fluid has a specific gravity of 0.85 and a kinematic viscosity of 20 mm²/s, and the cracking pressure is 0.04 MPa.

Model Number Designation

CI	T	–03	–04	–50
Series Number	Type of Connection	Valve Size	Cracking Pressure MPa	Design Number
CI : In-Line Check Valve	T : Threaded Connection	02	04 : 0.04 35 : 0.35 50 : 0.5	50
		03		50
		06		50
		10		50

● For In-Line Check Valves, standard type (for petroleum base oils) can be used phosphate ester type fluid.

CIT–02, 03, 06, 10

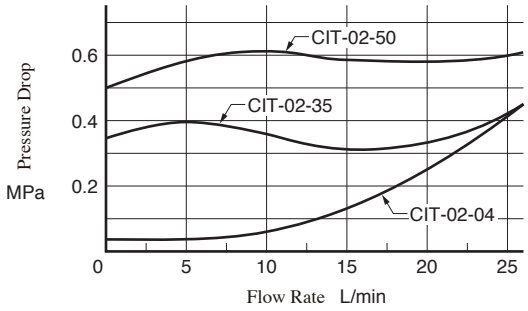


Model Numbers	A	B	D
CIT-02-∗-50	58	19	1/4
CIT-03-∗-50	76	27	3/8
CIT-06-∗-50	95	41	3/4
CIT-10-∗-50	133	60	1 1/4

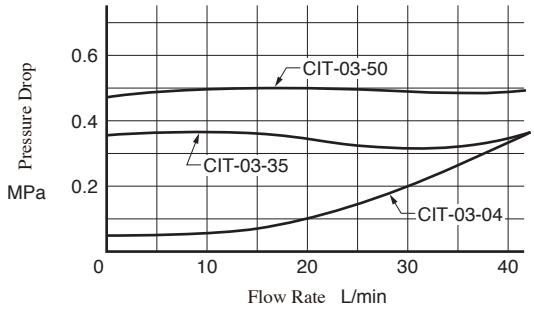
Pressure Drop

Hydraulic Fluid: Viscosity 30 mm²/s

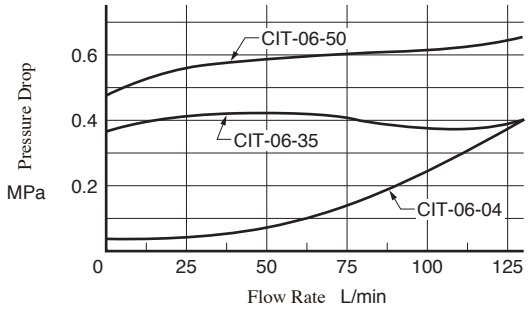
CIT-02



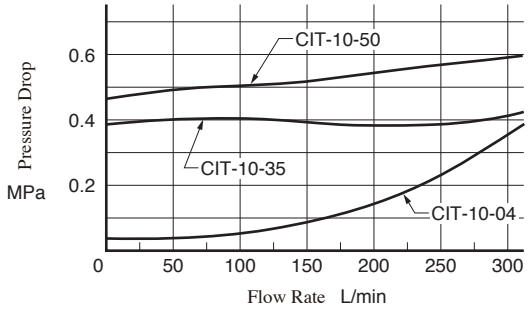
CIT-03



CIT-06

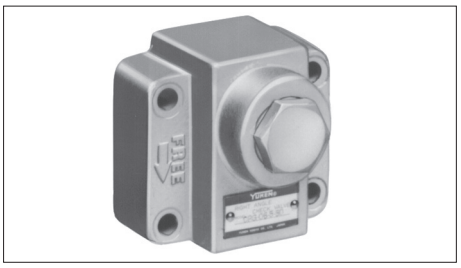


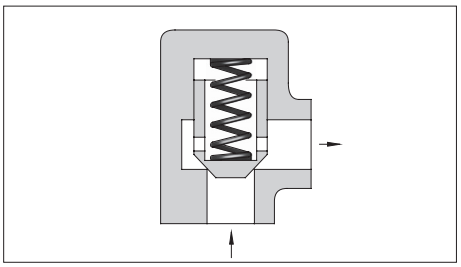
CIT-10



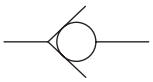
Right Angle Check Valves

These valves allow free flow in one direction and prevent flow in the reverse direction. Cracking pressure specified is the pressure required to open the valve and allow free flow.





Graphic Symbol



Specifications

Model Numbers		Rated Flow★ L/min	Max. Operating Pres. MPa	Cracking Pres. MPa	Approx. Mass kg
Threaded Connection	CRT-03-＊-50	40	25	0.04	0.9
	CRT-06-＊-50	125		0.35	1.7
	CRT-10-＊-50	250		0.5	5.6
Sub-plate Mounting	CRG-03-＊-50	40	25	0.04	1.7
	CRG-06-＊-50	125		0.35	2.9
	CRG-10-＊-50	250		0.5	5.5

★ Rated flow is the approximate flow rate, when there is a free flow pressure drop of maximum 0.3 MPa, the fluid has a specific gravity of 0.85 and a kinematic viscosity of 20 mm²/s, and the cracking pressure is 0.04 MPa.

Model Number Designation

CR	T	–03	–04	–50
Series Number	Type of Connection	Valve Size	Cracking Pressure MPa	Design Number
CR : Right Angle Check Valve	T : Threaded Connection	03	04 : 0.04 35 : 0.35 50 : 0.5	50
		06		50
		10		50
	G : Sub-plate Mounting	03		50
		06		50
		10		50

Note) Models for phosphate ester fluid are available. When phosphate ester fluid is used, prefix "F-" to the model number because the special seals (fluororubber) are required to be used.

Yuken can offer flanged connection valves described below.
For details, contact us.

Model No.	Rated Flow L/min	Max. Operating Pres. MPa
CRF-10-＊-50	300	25
CRF-16-＊-50	600	
CRF-24-＊-50	1300	

Sub-plates

Valve Model Numbers	Sub-plate Model Numbers	Thread Size Rc	Approx. Mass kg
CRG-03	CRGM-03-50	3/8	1.6
	CRGM-03X-50	1/2	1.6
CRG-06	CRGM-06-50	3/4	2.4
	CRGM-06X-50	1	3.0
CRG-10	CRGM-10-50	1 1/4	4.8
	CRGM-10X-50	1 1/2	5.7

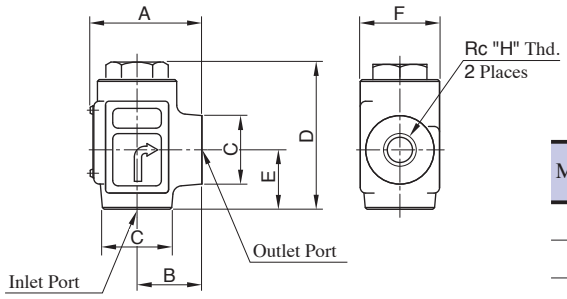
● Sub-plates are available. Specify the sub-plate model number from the table above. When sub-plates are not used, the mounting surface should have a good machined finish. (1.6▽)

Accessories

Mounting Bolts

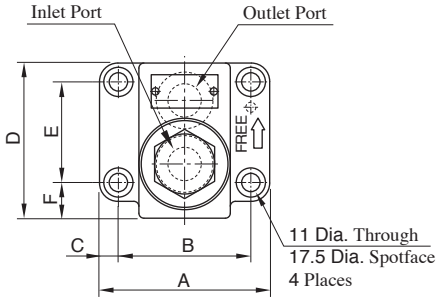
Valve Model Numbers	Socket Head Cap Screw	Qty.
CRG-03	M10 × 45L	4
CRG-06	M10 × 50L	4
CRG-10	M10 × 55L	6

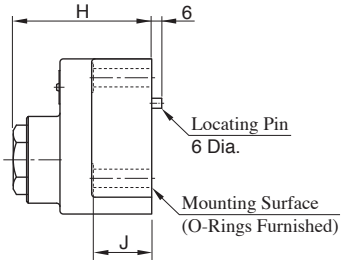
CRT-03, 06, 10



Model Numbers	A	B	C	D	E	F	H
CRT-03	62	36	38 Dia.	80.5	33	44	3/8
CRT-06	74	45	54 Dia.	104.5	49	54	3/4
CRT-10	107	65	80 SQ.	130	65	80	1 1/4

CRG-03, 06

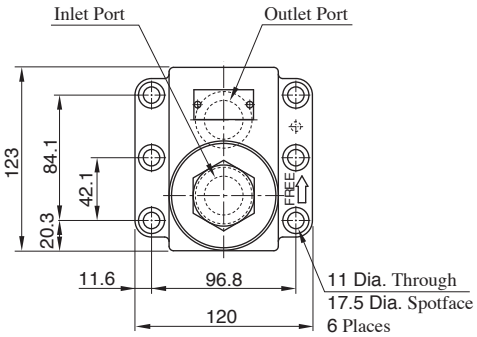


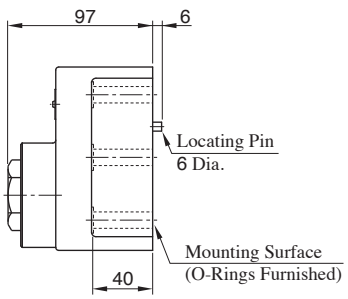


Model Numbers	A	B	C	D	E	F	H	J	Mounting surface conform to ISO standard below
CRG-03	90	66.7	11.7	72	42.9	17.5	72.5	30	ISO 5781-06-07-0-00
CRG-06	102	79.4	11.3	93	60.3	21.4	84.5	35	ISO 5781-08-10-0-00

CRG-10

Mounting Surface: ISO 5781-10-13-0-00

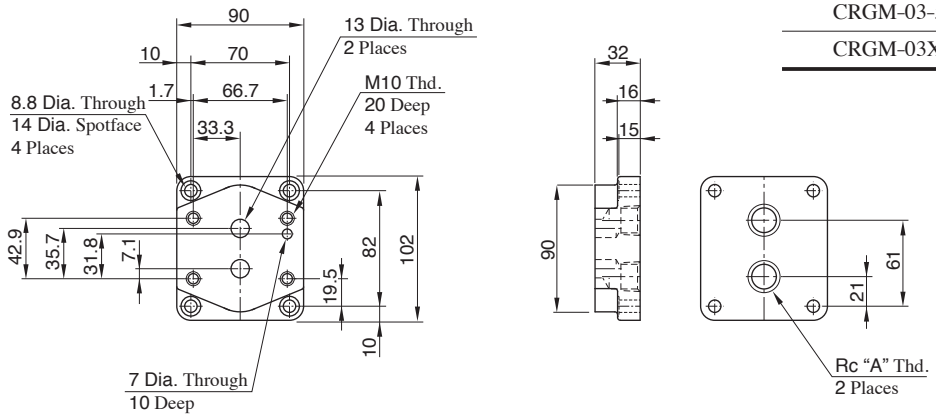




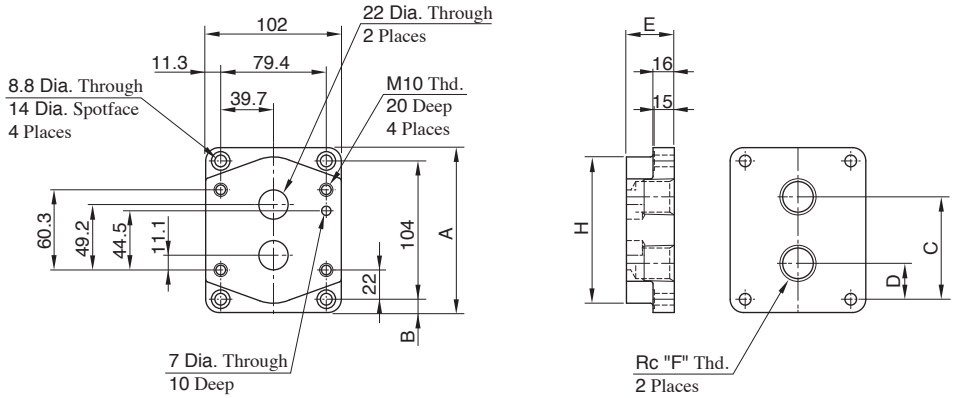
● Sub-plate

CRGM−03, 03X

Sub-plate Model Numbers	A
CRGM-03-50	3/8
CRGM-03X-50	1/2

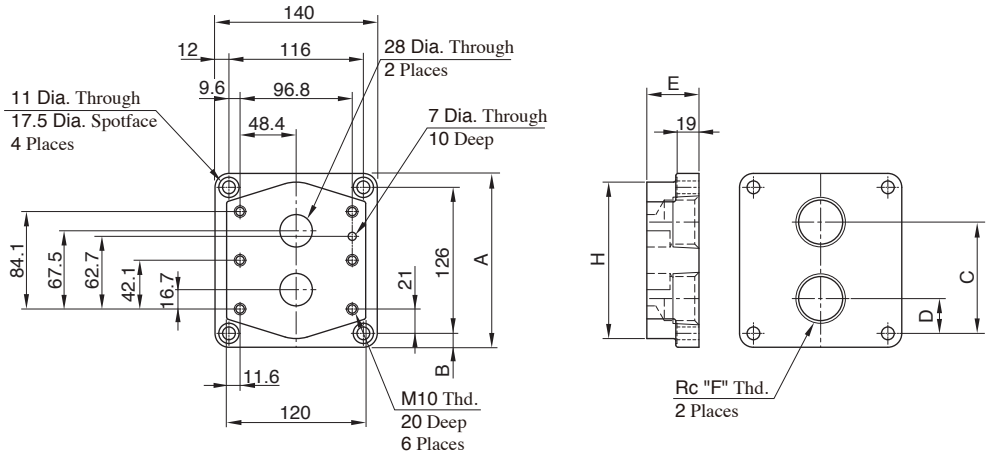


CRGM−06, 06X



Sub-plate Model Numbers	A	B	C	D	E	F	H
CRGM-06-50	124	10	77	27	36	3/4	110
CRGM-06X-50	136	16	82.3	22	45	1	130

CRGM−10, 10X

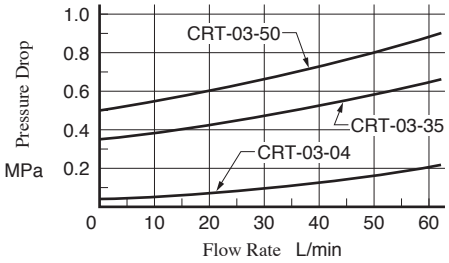


Sub-plate Model Numbers	A	B	C	D	E	F	H
CRGM-10-50	150	12	96	30	45	1 1/4	135
CRGM-10X-50	177	25.5	104	22	50	1 1/2	167

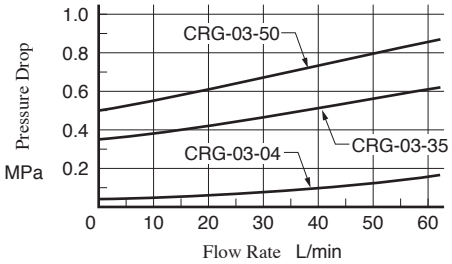
Pressure Drop

Hydraulic Fluid: Viscosity 30mm²/s

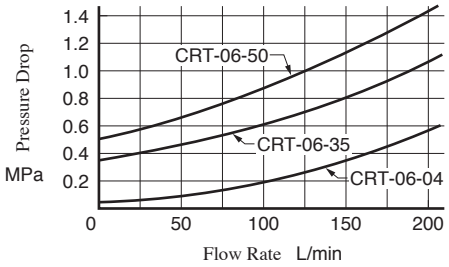
CRT-03



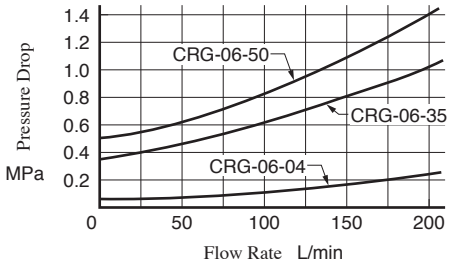
CRG-03



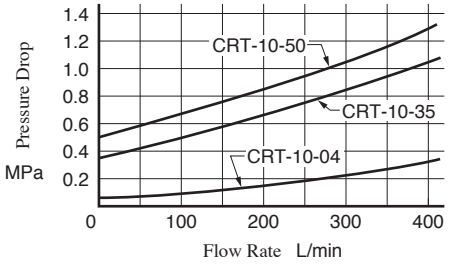
CRT-06



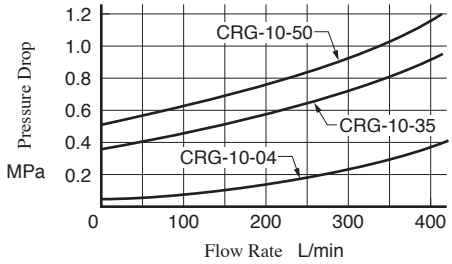
CRG-06



CRT-10

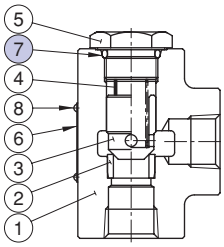


CRG-10



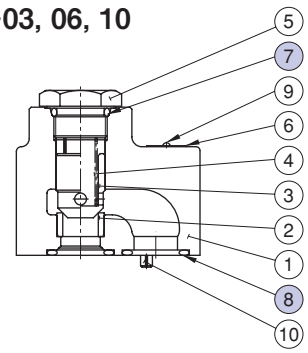
List of Seals

CRT-03, 06, 10



Item	Name of Parts	Part Numbers			Qty.
		CRT-03	CRT-06	CRT-10	
7	O-Ring	OR NBR-90 P21-N	OR NBR-90 P24-N	OR NBR-90 P32-N	1

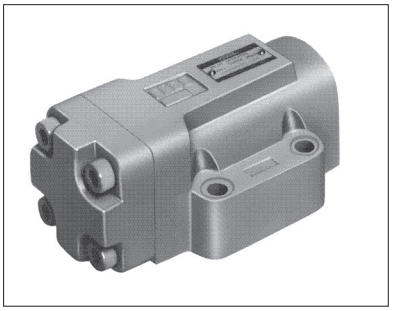
CRG-03, 06, 10

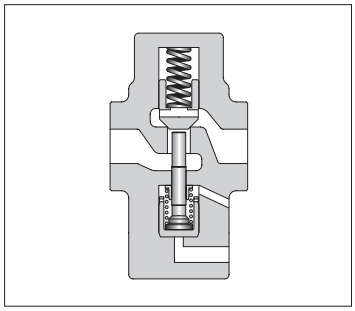


Item	Name of Parts	Part Numbers			Qty.
		CRG–03	CRG–06	CRG–10	
7	O-Ring	OR NBR-90 P21-N	OR NBR-90 P24-N	OR NBR-90 P32-N	1
8	O-Ring	OR NBR-90 P18-N	OR NBR-90 P28-N	OR NBR-90 P32-N	2

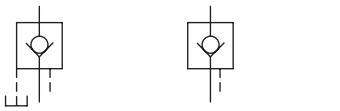
Pilot Controlled Check Valves

These check valves allow flow in one direction and prevent flow in the reverse direction, until operated by pilot pressure to allow free reverse flow.





Graphic Symbols



External Drain Type　　Internal Drain Type

Specifications

Model Numbers		Rated Flow★ L/min	Max. Operating Pres. MPa	Cracking Pres. MPa	Approx. Mass kg
Threaded Connection	CP∗T-03-∗-∗-50	40	25	0.04 0.2 0.35 0.5	3.0
	CP∗T-06-∗-∗-50	125			5.5
	CP∗T-10-∗-∗-50	250			9.6
Sub-plate Mounting	CP∗G-03-∗-∗-50	40	25	0.04 0.2 0.35 0.5	3.3
	CP∗G-06-∗-∗-50	125			5.4
	CP∗G-10-∗-∗-50	250			8.5

★ Rated flow is the approximate flow rate, when there is a free flow pressure drop of maximum 0.3 MPa, the fluid has a specific gravity of 0.85 and a kinematic viscosity of 20 mm²/s, and the cracking pressure is 0.04 MPa.

Model Number Designatioin

CP	T	–03	–E	–04	–50
Series Number	Type of Connection	Valve Size	Drain Connection	Cracking Pres. MPa	Design Number
CP : Pilot Operated Check Valve CPD : Decompression Type Pilot Operated Check Valve	T : Threaded Connection	03	None : Internal Drain	04 : 0.04 20 : 0.2 35 : 0.35 50 : 0.5	50
		06			50
		10			50
	G : Sub-plate Mounting	03	E : External Drain		50
		06			50
		10			50

Note) Models for phosphate ester fluid are available. When phosphate ester fluid is used, prefix "F-" to the model number because the special seals (fluororubber) are required to be used.

Accessories

Mounting Bolts

Valve Model Numbers	Socket Head Cap Screw	Qty.
CP∗G-03	M10 × 45L	4
CP∗G-06	M10 × 50L	4
CP∗G-10	M10 × 55L	6

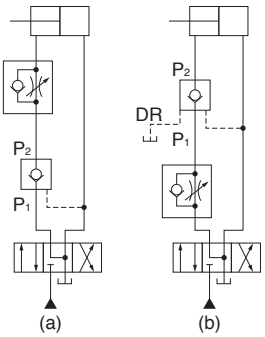
Yuken can offer flanged connection valves described below.
For details, contact us

Model Numbers	Rated Flow L/min	Max. Operating Pres. MPa
CP∗F-10-∗-∗-50	250	25
CP∗F-16-∗-∗-50	600	25

Instructions

Operation of internal and external drain types

When the outlet side P_1 is directly connected to the tank in reversed free flow (Fig. a), the internal drain type is normally used. When the back pressure is applied to the outlet side P_1 (Fig. b), be sure to use the external drain type.



Minimum pilot pressure characteristics

That depends on the pressure of the inlet side P_2 in the reversed free flow.

This value can be determined from the characteristics chart on page E-146.

Sub-plates

Valve Model Numbers	Sub-plate Model Numbers	Thread Size Rc	Approx. Mass kg
CP＊G-03	HGM-03-20	3/8	1.6
	HGM-03X-20	1/2	
CP＊G-06	HGM-06-20	3/4	2.4
	HGM-06X-20	1	3.0
CP＊G-10	HGM-10-20	1 1/4	4.8
	HGM-10X-20	1 1/2	5.7

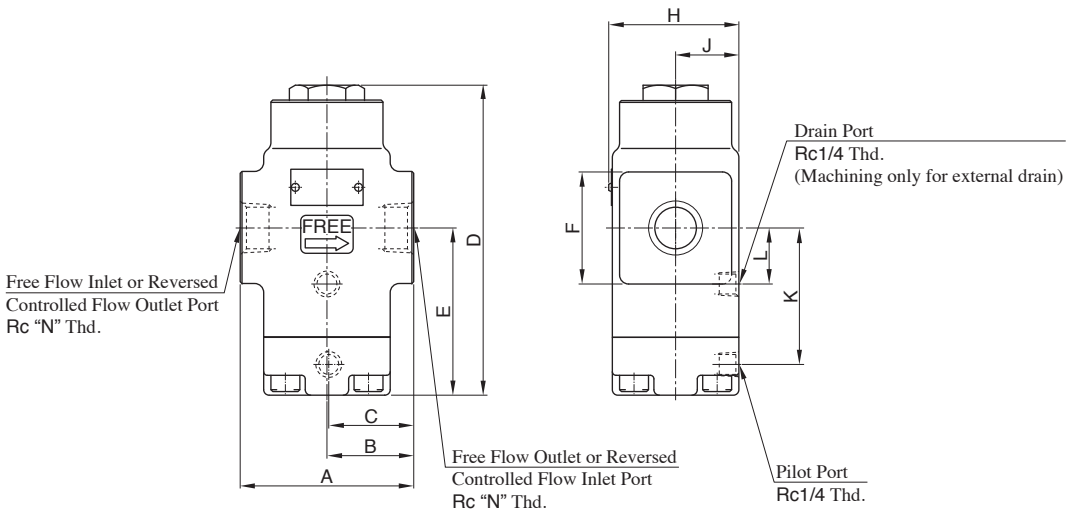
- Sub-plates are available, specify the sub-plate model number from the table above. When sub-plates are not used, the mounting surface should have a good machined finish. ($\frac{1.6}{\nabla}$)
- Sub-plates are shared with those for H Type Pressure Control Valves. Refer to pages E-149 for dimensions.

Cautions on replacement of 20 design low cracking pressure type valves with 50 design valves.

In 20 design valve with cracking pressure of 0.035 MPa (Code "5"), for closing the valve completely and certainly, it was necessary to introduce the pressurized oil into the drain port to push down the piston compulsory.

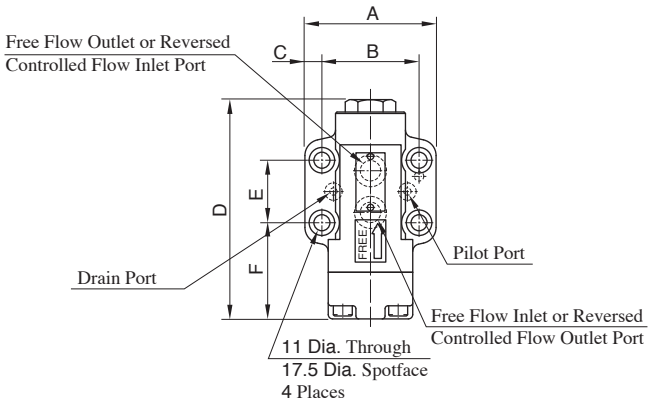
While in 50 design valve with cracking pressure of 0.04 MPa (Code "6"), it has such structure that the valve can be closed completely and certainly without introducing the pressurized oil into the drain port. On the contrary , what is worse is that if the pressurized oil is introduced into the drain port, the oil acts towards the direction of opening the valve, which is very dangerous and has to be absolutely avoided. Therefore, please do not supply any pressurized oil into the drain port in case of using 50 design valve.

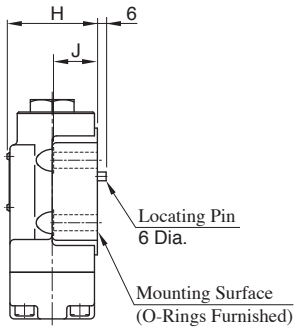
CPT CPDT -03, 06, 10



Model Numbers	A	B	C	D	E	F	H	J	K	L	N
CP＊T-03	80	40	39	150.5	84.5	38 Dia.	60	29	67.5	26.5	3/8
CP＊T-06	96	48	47	171.5	92.5	62 SQ.	72	35	75.5	31	3/4
CP＊T-10	140	70	64	203.5	113	80 SQ.	82	40	96	43	1 1/4

CPG CPDG -03, 06

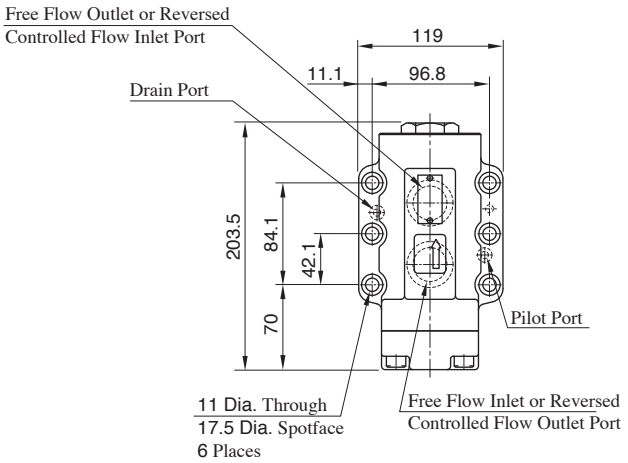


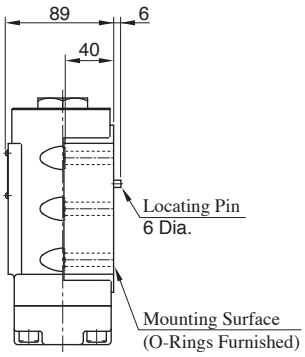


Model Numbers	A	B	C	D	E	F	H	J	Mounting Surface
CP*G-03	90	66.7	11.7	150.5	42.9	66	62	30	ISO 5781-06-07-0-00
CP*G-06	102	79.4	11.3	171.5	60.3	67.5	74	35	ISO 5781-08-10-0-00

CPG CPDG -10

Mounting Surface: ISO 5781-10-13-0-00

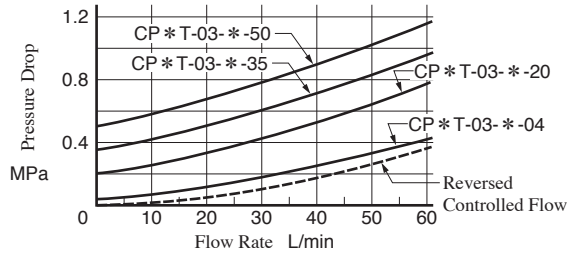




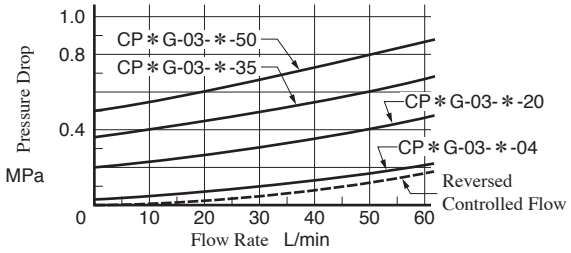
Pressure Drop

Hydraulic Fluid: Viscosity 30 mm²/s

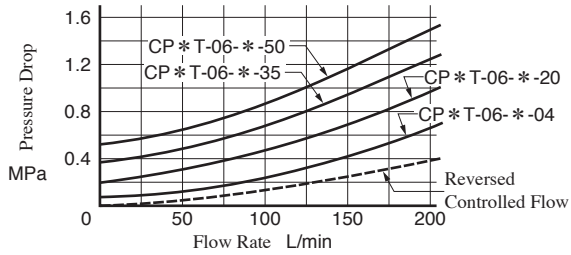
CPT-03, CPDT-03



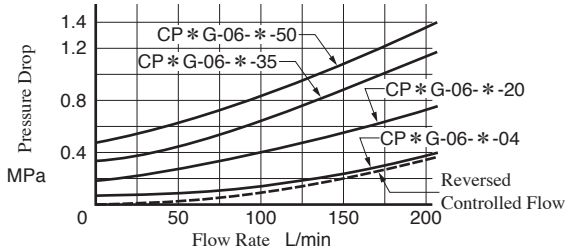
CPG-03, CPDG-03



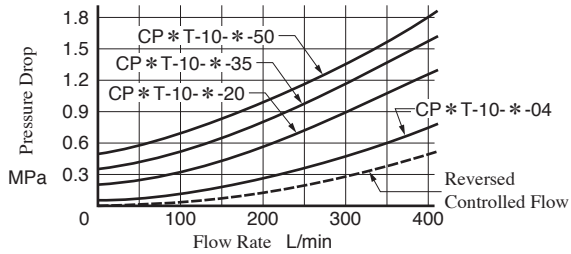
CPT-06, CPDT-06



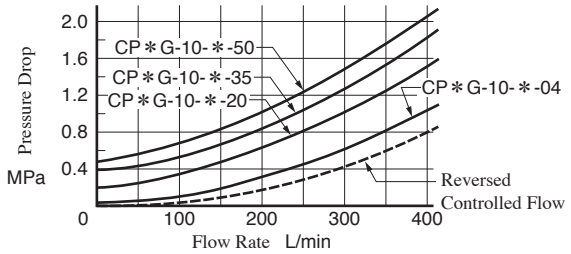
CPG-06, CPDG-06



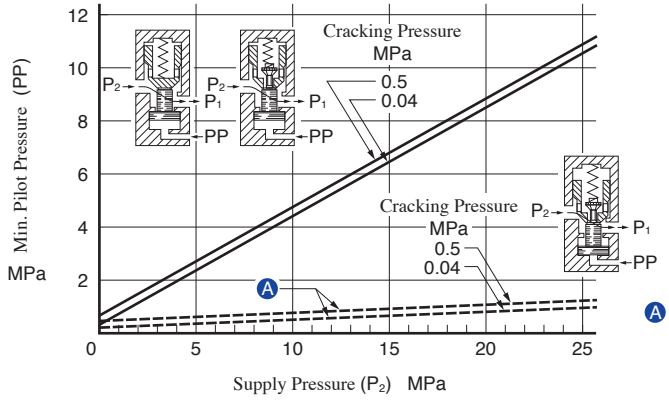
CPT-10, CPDT-10



CPG-10, CPDG-10



Min. Pilot Pressure Chart

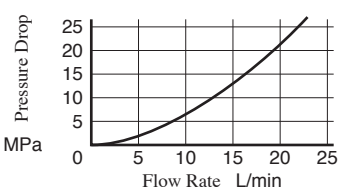


A : Min. Pilot Pressure to open the Decompression Valve (CPD : Decompression Type)

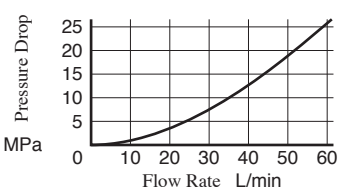
Pressure Drop for Reversed Controlled Flow Only when Decompression Valve is Opened

Hydraulic Fluid: Viscosity 30 mm²/s

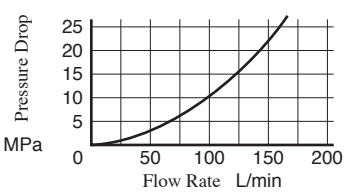
CPDT-03, CPDG-03



CPDT-06, CPDG-06

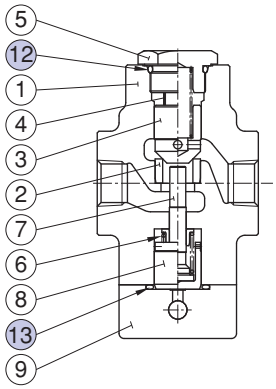


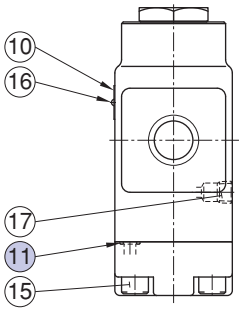
CPDT-10, CPDG-10



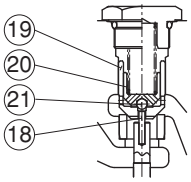
List of Seals

CPT-03, 06, 10



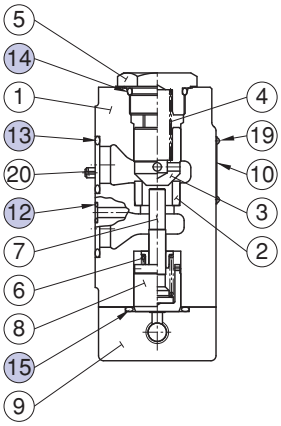


CPDT-03, 06, 10

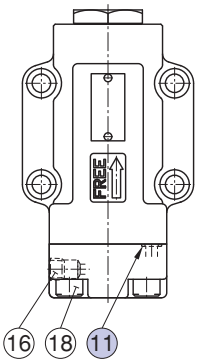


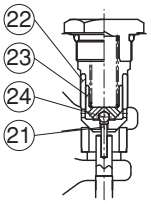
Item	Name of Parts	Part Numbers			Qty.
		CP＊T-03	CP＊T-06	CP＊T-10	
11	O-Ring	OR NBR-90 P7-N	OR NBR-90 P9-N	OR NBR-90 P9-N	1
12	O-Ring	OR NBR-90 P21-N	OR NBR-90 P29-N	OR NBR-90 P36-N	1
13	O-Ring	OR NBR-90 G25-N	OR NBR-90 P32-N	OR NBR-90 P42-N	1

CPG-03, 06, 10



CPDG-03, 06, 10

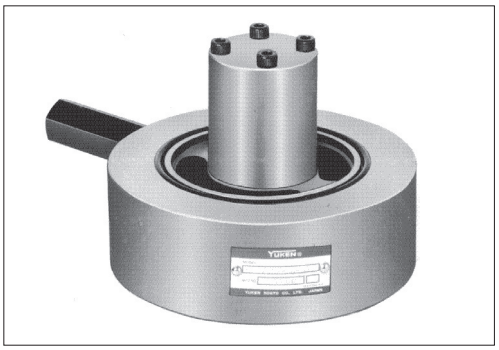




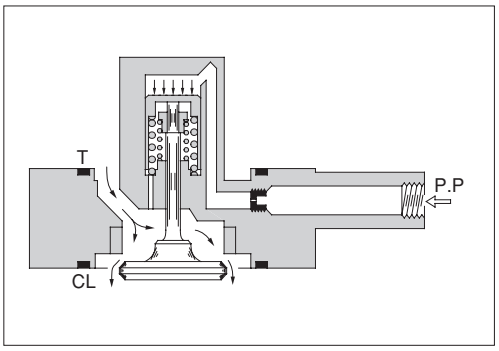
Item	Name of Parts	Part Numbers			Qty.
		CP＊G-03	CP＊G-06	CP＊G-10	
11	O-Ring	OR NBR-90 P7-N	OR NBR-90 P9-N	OR NBR-90 P9-N	1
12	O-Ring	OR NBR-90 P9-N	OR NBR-90 P9-N	OR NBR-90 P9-N	2
13	O-Ring	OR NBR-90 P18-N	OR NBR-90 P28-N	OR NBR-90 P32-N	2
14	O-Ring	OR NBR-90 P21-N	OR NBR-90 P29-N	OR NBR-90 P36-N	1
15	O-Ring	OR NBR-90 G25-N	OR NBR-90 P32-N	OR NBR-90 P42-N	1

In-Line Prefill Valves

Prefill valves can be used by putting them between cylinder and reservoir in such a hydraulic system for large presses and injection molding machines where a high-speed operation is required with a small capacity pump.
In a high-speed forward stroke of the cylinder, the prefill valve sucks large amount of oil from the reservoir and feeds it into the cylinder.
In pressurizing process, the valves prevent a reserve flow from the reservoir to the cylinder, and in return stroke of the cylinder, the valve has a function of discharging the oil into the reservoir by opening the valve with a pilot pressure.

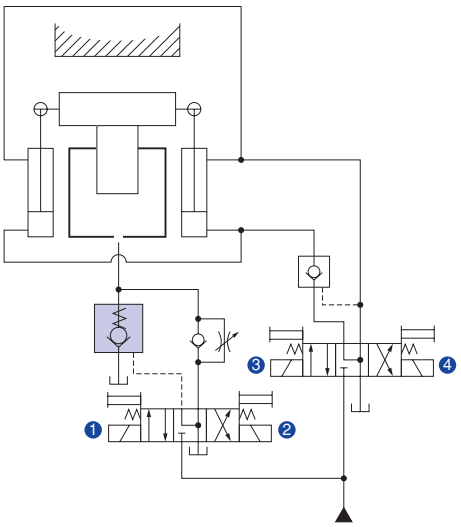


- Simple structure and high durability
- Low pressure drop and large flow
- Direct and decompression types are available for all sizes.
- Slow return valves are optionally available for pilot ports.



(Example Diagram)

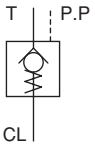
● Ram Cylinder System (with auxiliary cylinder)



〔Solenoid Shifting and Operation〕

Solenoid	Rapid Increase	Pressure	Rapid Decrease
❶	ON	OFF	ON
❷	OFF	ON	OFF
❸	ON	ON	OFF
❹	OFF	OFF	ON

Graphic Symbol



Specifications

Model Numbers	Piping Size	Max. Flow★1 L/min	Max. Operating Pressure MPa	Cracking Pressure MPa	Min. Pilot Pressure Ratio★2 (Direct Type)		Pilot Volume cm^3
					P-Line Pressure	C-Line Pressure	
PI＊F- 40-10	65A	200	25	0.011	3.4 : 1		2.5
PI＊F- 50-10	80A	400		0.012	4.0 : 1		4.9
PI＊F- 63-10	90A	630			4.0 : 1		8.5
PI＊F- 80-10	100A	1000			4.3 : 1		16.3
PI＊F-100-10	125A	1600			4.3 : 1		31.8

★1. Each maximum flow rate is an approximate value when the pressure drop at free flow is ⊿P≒0.03 MPa.
★2. The minimum pilot pressure ratio is determined by the area ratio between the seat and pressured part of the pilot. The decompression type is also available.

——— For details about In-Line Prefill Valves, refer to the model catalogues. ———

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Россия +7(495)268-04-**70** **Казахстан +7(7172)727-132** **Киргизия +996(312)96**-26-47

yne@nt-rt.ru || https://yuken.nt-rt.ru