

# Marine Control Valve

Main valve

Counter balance valve

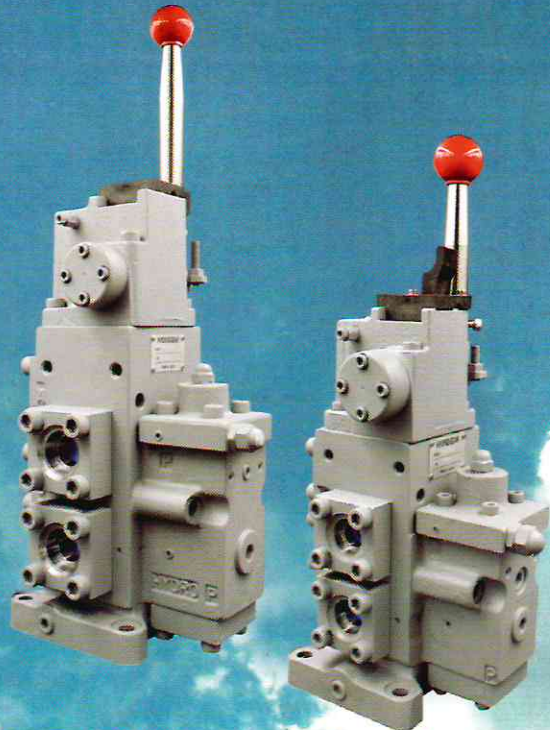
Other valves

## General

The marine-vessel conversion valve having excellent responsive property is a pressure compensation apparatus with a 3 position 4 direction (port).

The pressure compensation valve restrains load fluctuation, and supplies the actuator with the control flow free from fluctuations.

Flow direction and amount can be simultaneously controlled by shifting the control lever from the neutral position to desired direction.



## FDM for parallel circuit (Ring Main system)

In using the adjustable capacity hydraulic pump, the neutral position becomes P port block at the marine-vessel conversion valve with parallel circuit (Ring-Main) used to control pressure.

Marine-vessel conversion valve with parallel circuit adopts a meter-in compensator (pressure compensation type) which compensates the primary pressure thus does not have any shocks during conversion.

In addition, the valve has a compensator of highly responsive property ; counter-measuring to load fluctuation.

## FDS for series circuit

As this conversion valve employs the compensator by-pass mechanism, there are not any shocks during conversion.

In addition, the valve has a compensator with high responsive property ; thus, valve is counter-measuring load fluctuation.

**HYDRO GEAR**  
MARINE CONTROL VALVE

# Product Specification

Note : The size 16 of previous catalogue can not be supplied now.

No.	Size		04(15)			06(20)			08(25)			12(40)		
1	Flow range	ℓ/min	30	45	60	70	120	150	120	200	300	300	400	500
2	Adjustable range		90% ~ 105% of standard flow range											
3	Spool diameter	φ mm	30			30			40			50		
4	Compensator type		Meter in compensator (FDM), Bleed off compensator (FDS)											
5	Rated pressure	MPa kgf/cm <sup>2</sup>	27.4 (280) body material : FCD 450											
6	Internal test pressure		41.2 (420)											
7	Allowable back pressure		2.0 (20)											
8	Compensator pressure		0.4 ~ 0.5 (4 ~ 5)											
9	Lever operation angle	degree	±56°											
10	Lever operation position		Lever can be rotated with head cover in 0 and 180 degree											
11	Lever operation force	kgf	4 ~ 5 at top of standard lever											
12	Relief valve setting range	MPa	2.94 ~ 29.4 (30 ~ 300)											
13	Adjustment function of operating force		○											
14	Neutral stopper		○											
15	Function of neutral maintain		Detended type / Spring center type											
16	Max.lever stroke limiter		○											
17	Shape of main joint piping		Put-in welding flange (JIS B-2219)											
18	Weight	kgf	26			26			35			74		
19	Optional Valves	1. Single counter balance valve	○			○			○			○		
		2. Double counter balance valve	○			○			○			○		
		3. Brake release valve	○			○			○			○		
		4. Brake valve	○			○			○			○		
		5. Switch for detect of neutral position	○			○			○			○		

## • The overview explanation of the attachment valves

- 1) Single Counter Balance Valve (Type : CBC) :  
Fixation orifice + check valve in the CBC pilot line, relief valve with vent port. (Optional)
- 2) Double Counter Balance Valve (Type : CBCW) :  
Fixation orifice + check valve in the CBCW pilot line, relief valve with vent port at the A·B port.
- 3) Brake Release Valve (Type : BC & BO, BC is normally closed. BO is normally opened) :  
Possible to grapple with the head cover of the hydraulic control valve.
- 4) Brake Valve (Type : BV) :  
Possible to grapple with the head cover of the hydraulic control valve and it is possible to use by combining with the counter balance valve. Having a Relief Valve with anti-cavitation valve.
- 5) Proximity Switch of Neutral Position :  
Possible to grapple with the head cover of the hydraulic valve.



## • Features

- 1) It is easy to make hydraulic control valve in plumbing because of two in two P port T port.
- 2) Difference diameter elbow flange can be installed in A · B · P · T port with JIS B-2219 of the SSA-type. Difference diameter welding type of flange Option.
- 3) Hydraulic control valve size 04, 06, 08, 12 can be directly mounted to the Low Speed High Torque Motor (KYB Hydrostar) through the plate.
- 4) Double counter balance valve mono-block type of light-weight and compact.
- 5) Inside drain and outside drain can be easily rearranged from outside.
- 6) Rust proof material for the part which is easy for the long experience to corrode. (Operation lever : SUS, Lever and Spool axis : SUS, Lever shaft bush : BC)
- 7) Hydraulic control valve having the "P1" (RC 1/4) port which measures the secondary side pressure. (load pressure)
- 8) Venting plug on the head cover.

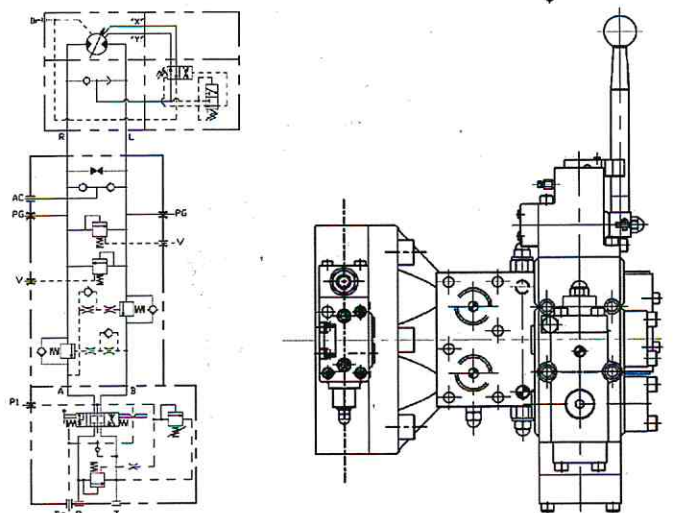
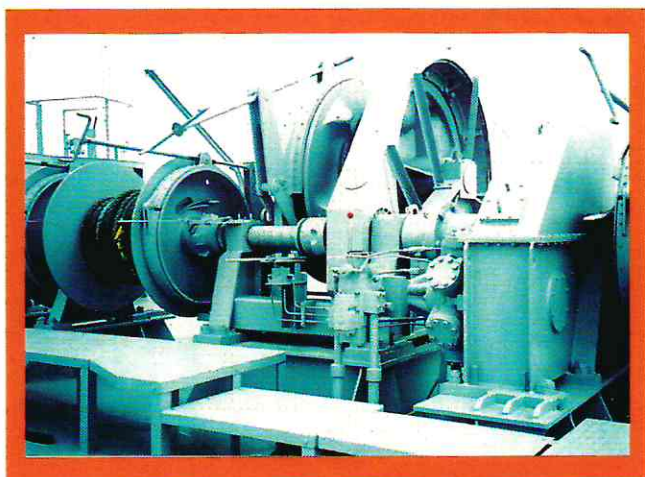
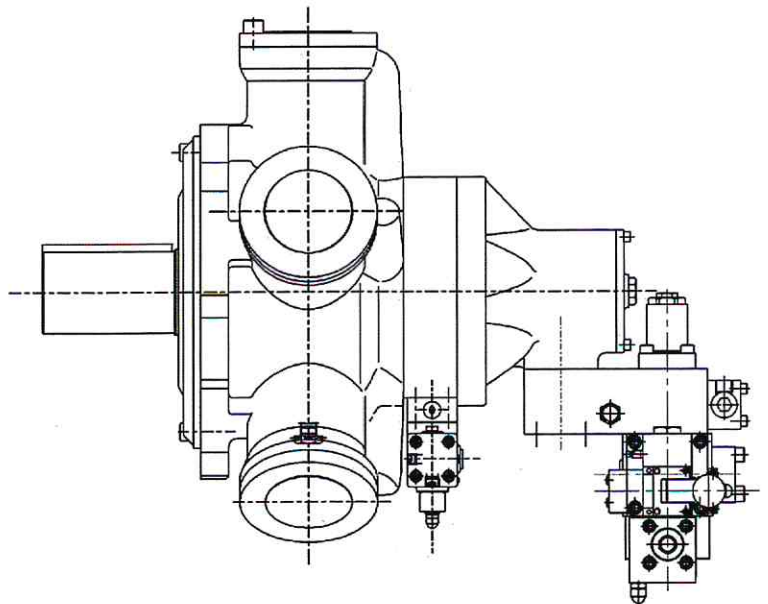
## • The remote control system

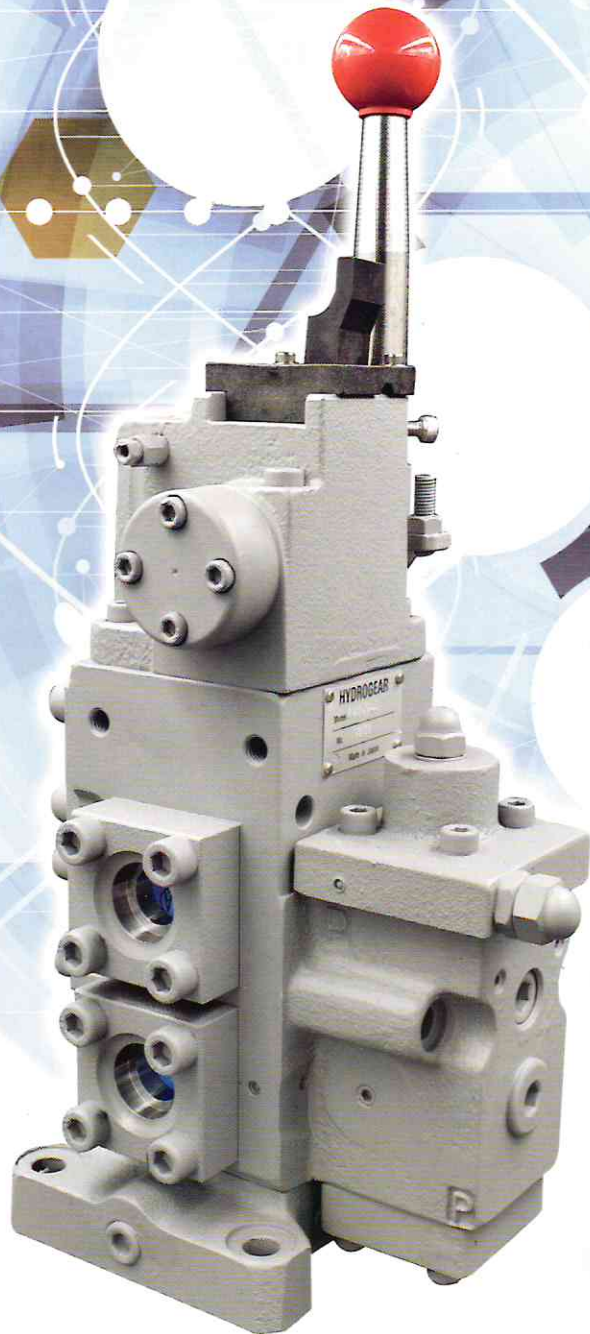
- 1) Hydraulic Control Type :  
Hydraulic pressure pilot control : Excellent responsiveness of controllable up to 100m. Adopting the original mechanism of hydraulics and mechanical feedback.
- 2) Electro-proportional Directional Valve Type :  
It loads the passive part of the hydraulic control type with the Electro-Proportional directional valve and it can be controlled with the electronic joystick controller being remote. Responsiveness is excellent compared with the torque motor type.

# Ordering Code

Model	Valve size	Spool symbol	Max. flow	Lever operation position	Motor direct mounting (with Counter balance valve)																									
FDM Parallel circuit	04 = 15A 06 = 20A	A=  FDM: All block FDS: Center by pass	<table border="1"> <thead> <tr> <th colspan="2"></th> <th colspan="3">L/min</th> </tr> <tr> <th></th> <th>A</th> <th>B</th> <th>C</th> </tr> </thead> <tbody> <tr> <td>04</td> <td>30</td> <td>45</td> <td>60</td> </tr> <tr> <td>06</td> <td>70</td> <td>120</td> <td>150</td> </tr> <tr> <td>08</td> <td>120</td> <td>200</td> <td>300</td> </tr> <tr> <td>12</td> <td>300</td> <td>400</td> <td>500</td> </tr> </tbody> </table>			L/min				A	B	C	04	30	45	60	06	70	120	150	08	120	200	300	12	300	400	500	No design = Right hand  L = Left hand	No design = None  M* = Direct mounting MR : R port Single counter balance valve ML : L port Single counter balance valve MW: Double counter balance valve
		L/min																												
	A	B		C																										
04	30	45		60																										
06	70	120	150																											
08	120	200	300																											
12	300	400	500																											
FDS Series circuit	08 = 25A 12 = 40A	C=  FDM: P port block FDS: All port open																												

Function of neutral	Counter balance valve (with Relief valve)	Brake valve	Brake release valve / Switch of neutral position (Only either can be chosen)	Design No.
No design = Detent	No design = Without	No design = Without	No design = Without	Design number can be changed without any notice. But, Installation and connection places remain same.
S = Spring center	1 = A port Single counter balance valve 2 = B port Single counter balance valve 3 = Double counter balance valve	B = with Brake valve	BC = with Brake release valve (Normally closed) BO = with Brake release valve (Normally open )  or E = with Switch of neutral position	



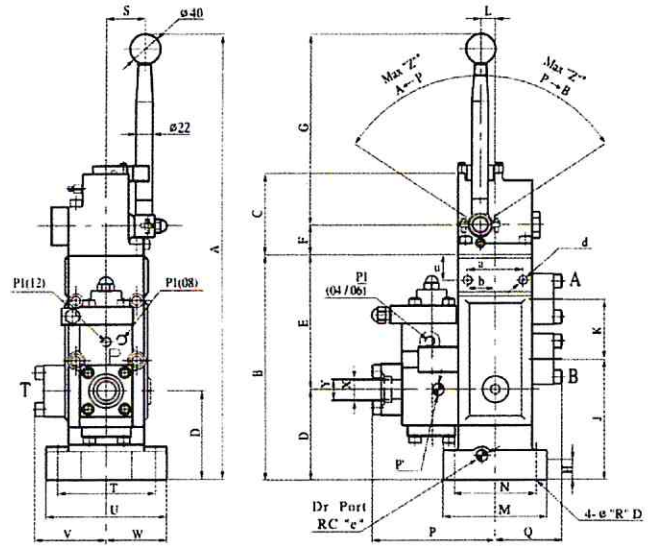
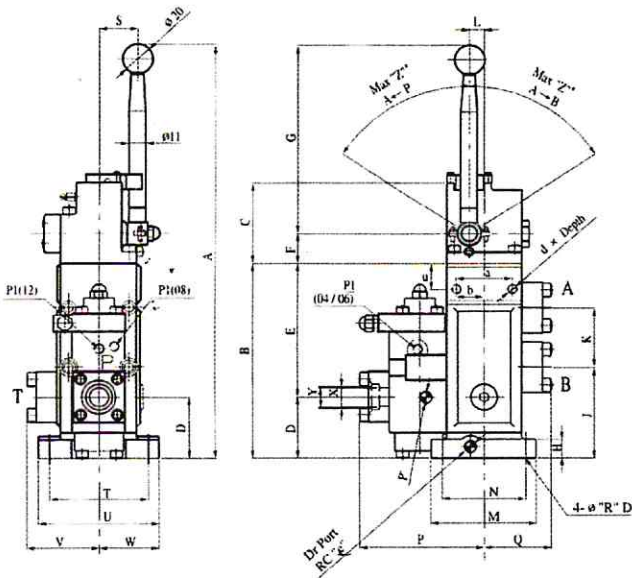




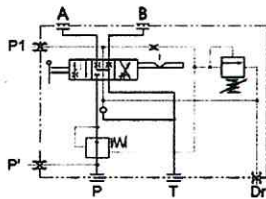
# Installation Dimension

● **DETEND** Type

● **SPRING** Type

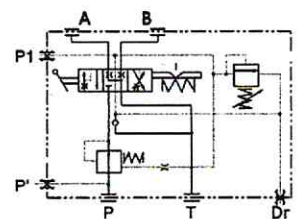


● **Symbol**



TYPE	A	B	B
<b>FDM-04</b>	30~60 ℓ/min	15A	25kg
<b>FDM-06</b>	70~150 ℓ/min	20A	26kg
<b>FDM-08</b>	120~300 ℓ/min	25A	35kg
<b>FDM-12</b>	300~500 ℓ/min	40A	74kg

● **Symbol**



TYPE	A	B	C	D	E	F	G	H	J	K	L	M	N	P	Q	R	S
<b>FDM-04</b>	455(490)	215(250)	96	74(109)	141	40	200	25	108(143)	64	18	130	100	147.5	82	13	49
<b>FDM-06</b>	455(490)	215(250)	96	74(109)	141	40	200	25	108(143)	64	18	130	100	147.5	82	13	49
<b>FDM-08</b>	557(597)	262(302)	110	82(122)	180	40	255	25	122(162)	80	20	140	110	165.5	90	13	50.8
<b>FDM-12</b>	695(745)	320(370)	135	95(145)	225	45	330	30	147.5(197.5)	95	28	200	160	217	122	17	62

TYPE	T	U	V	W	X	Y	Z	a	b	c	d	e	P1	P'
<b>FDM-04</b>	130	160	82	80	∅16	∅22.2 <sup>+0.2</sup> <sub>0</sub>	56°	70	35	20	M10x15	RC 3/8'	RC 1/4'	RC 3/8'
<b>FDM-06</b>	130	160	82	80	∅20	∅27.7 <sup>+0.2</sup> <sub>0</sub>	56°	70	35	20	M10x15	RC 3/8'	RC 1/4'	RC 3/8'
<b>FDM-08</b>	130	160	95	80	∅25	∅34.5 <sup>+0.2</sup> <sub>0</sub>	56°	74	37	35	M12x15	RC 3/8'	RC 1/4'	RC 3/8'
<b>FDM-12</b>	180	220	127	110	∅37.5	∅49.5 <sup>+0.2</sup> <sub>0</sub>	56°	74	45	30	M12x20	RC 3/8'	RC 1/4'	RC 3/8'

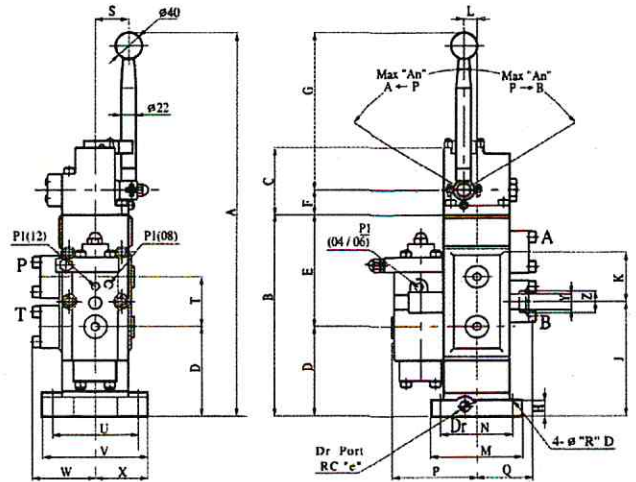
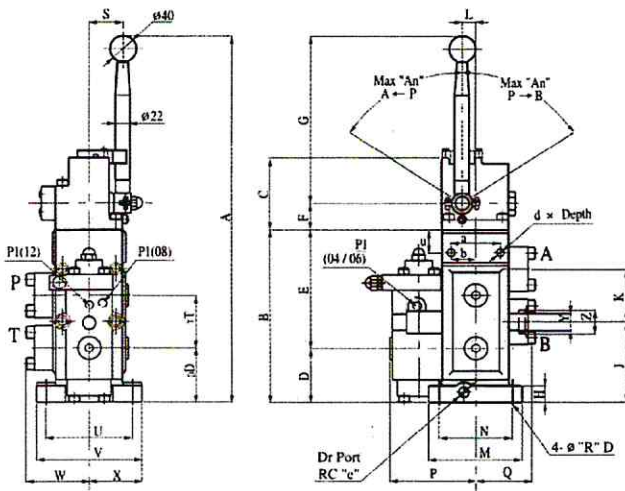
Numbers in ( ) are applicable to a spring-type



# Installation Dimension

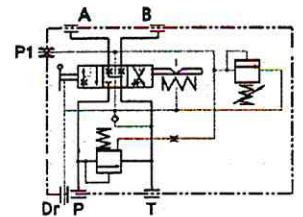
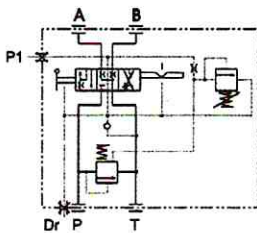
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TYPE	T	U	V	W	X	Y	Z	An	a	b	c	d	e	P1
<b>FDS-04</b>	66	130	160	82	80	∅16	∅22.2 <sup>+2</sup> <sub>0</sub>	56°	70	35	20	M10x15	RC 3/8'	RC 1/4'
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