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TOKIMEC » TOKYO KEIKI

The company name was changed to **TOKYO KEIKI INC.**

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Proportional Control & Servo Valves

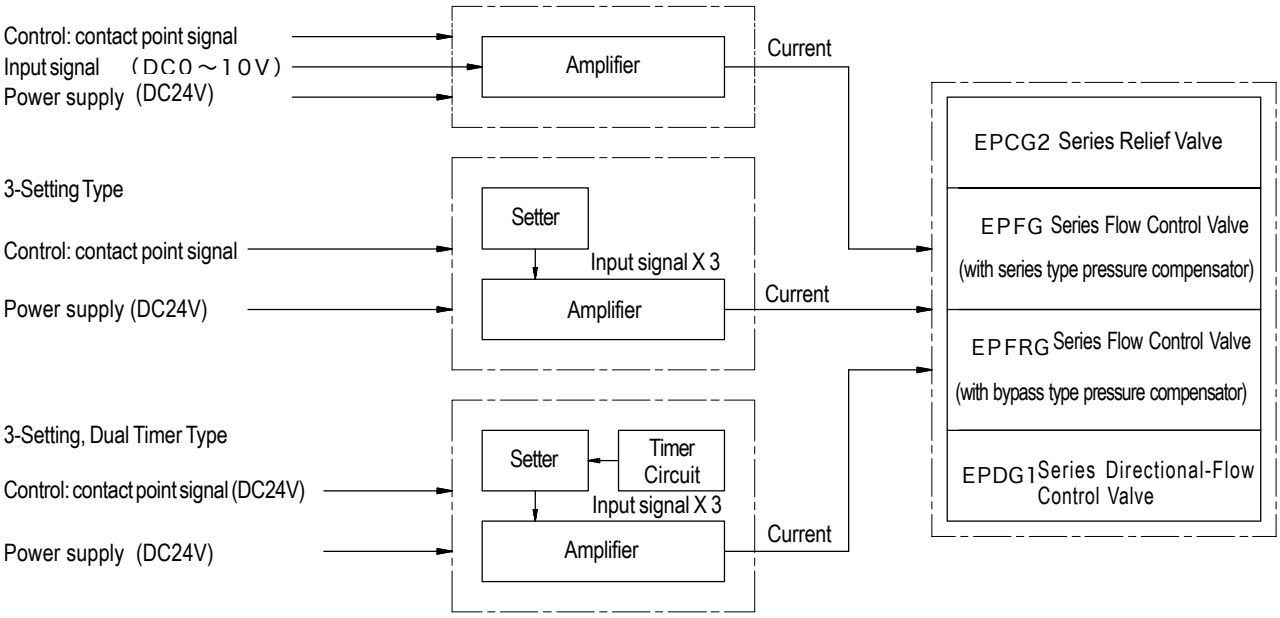
Proportional Control and Servo Valves

Description	Model	Maximum Operating Pressure MPa	Maximum Flow L/min (1 2 5 10 20 50 100 200 500 1000)	Page
Direct Acting Proportional Relief Valves	EPCG2-01	21	01	J5
Proportional Relief Valves	EPCG2	21	03 06 10	J8
Direct Acting Proportional Flow Control Valves	EPFG-01	21		J13
Proportional Flow Control Valves (Series Type)	EPFG	21 (17.5)	03 06 10	J16
Proportional Flow Control Valves (Bypass Type)	EPFRG	21	02 03 06 10	J16
Proportional Directional-Flow Control Valves (3-Position)	EPDG1-3	21		J25
Proportional Pressure Reducing Valve Modules	EPMX2	21	3 5	J28
Plug-On COntrollers for EP Series	EPAD	——		J32
Controllers for EP Series	P-X	——		J35
Board Type Controllers for EP Series	PB-X PB-Z	——		J37
Multi-Channel Controllers for EP Series	EPA	——		J38
Signal Controllers	EC-4S	——		J40
3-Way Servo Valves	ST3	21	7 H7	J42
Controllers for ST3 Servo Valves	STC-Y	——		J45

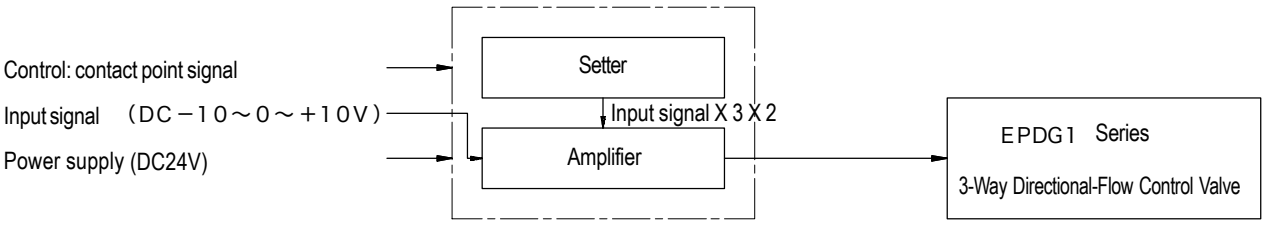
- By using proportional control valves, pressure and flow of hydraulic systems can be proportionally controlled for continuous and step control based on electrical signals.
- Proportional valves enable acceleration/deceleration speed control and shockless operation, and compared to conventional circuits which utilize a combination of various control valves, offer system simplification and space-savings.
- Various types of controllers are available, from valve mounted controllers units for 3 valve control.

EP Series Proportional Valves with Open Loop Controllers

Analog Type

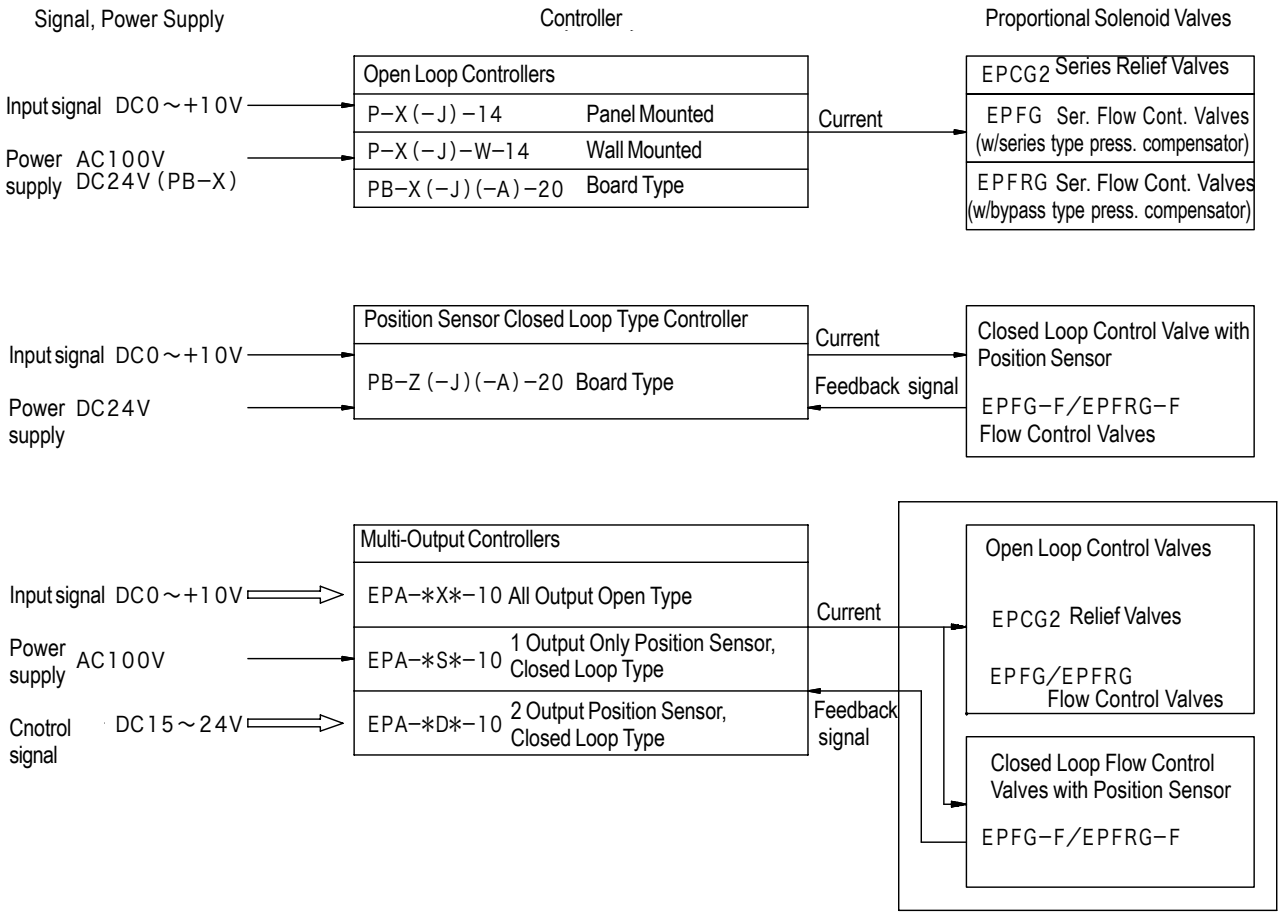


EPDG1 Proportional Directional-Flow Control Valves with Open Loop Controller

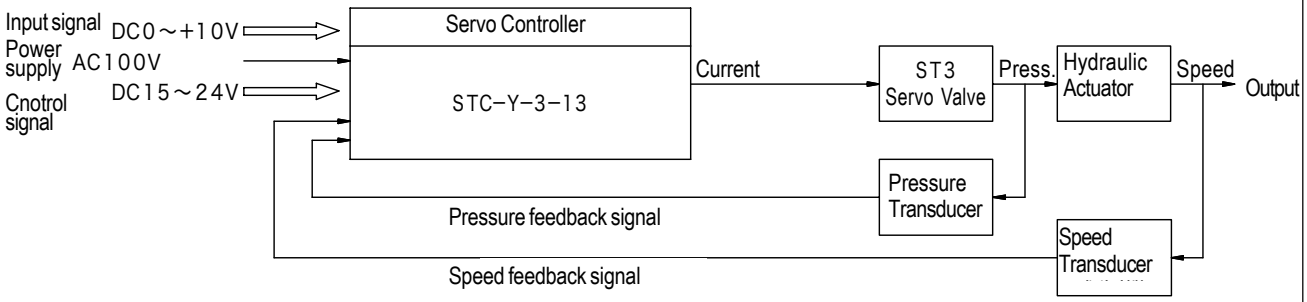


Controllers

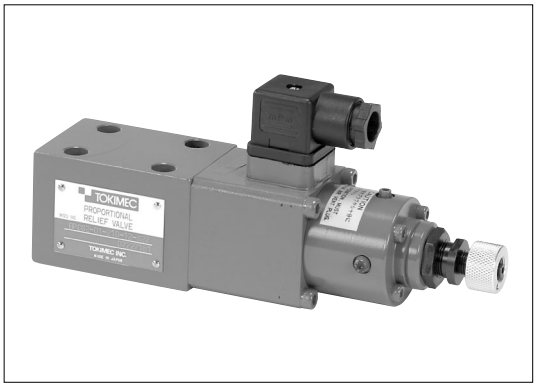
14Ω Load 1A Output Series

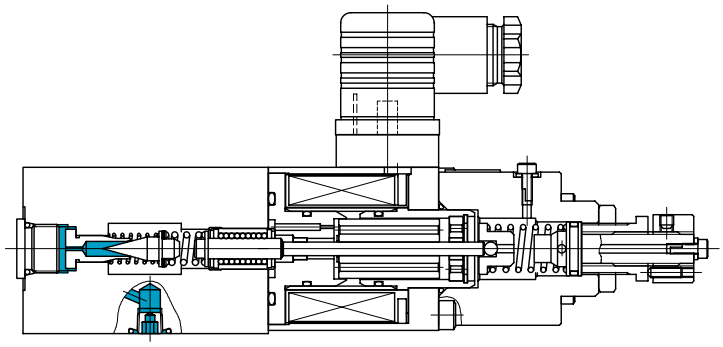


Pressure, Speed Control Servo System

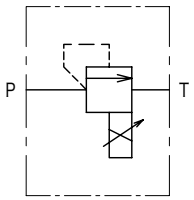


Proportional relief valves (direct operated type) EPCG2-01





Functional Symbol



- The EPCG2-01 utilizes a proportional solenoid actuator to provide proportional control of hydraulic circuit pressure.
- The valve provides pressure control proportional to input current as valve in small flow hydraulic systems, as a pilot for larger valves, and combined with variable displacement pumps.

Model Code

EPCG2 - 01 - 210 - 11

1	2	3	4

1 Proportional solenoid relief valve
2 Size
3 Pressure adjustment range
See 'Specifications'
4 Design no.

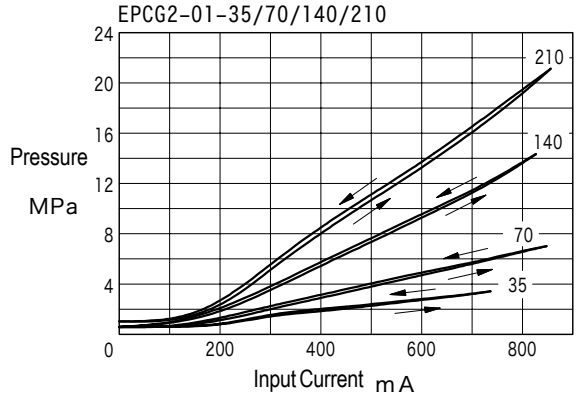
Specifications

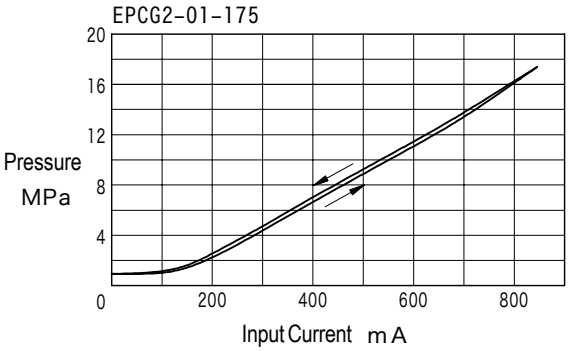
Model		EPCG2				
Size		01				
Maximum operating pressure	MPa	21				
Flow range	L/min	0. 3～1. 5				
Pressure adjustment range code		35	70	140	175	210
Pressure adjustment range	MPa	0. 7～3. 5	1～7	1～14	1～17. 5	1～21
Rated current	A	1				
Coil resistance	Ω	14				
Hysteresis		Less than 3 % (Note 1)				
Repeatability		Less than 1 % (Note 2)				
Weight	kg	2. 5				

Note 1: value when using controller P-X-14 or equivalent.
Note 2: valve unit value using special controller and with same working conditions

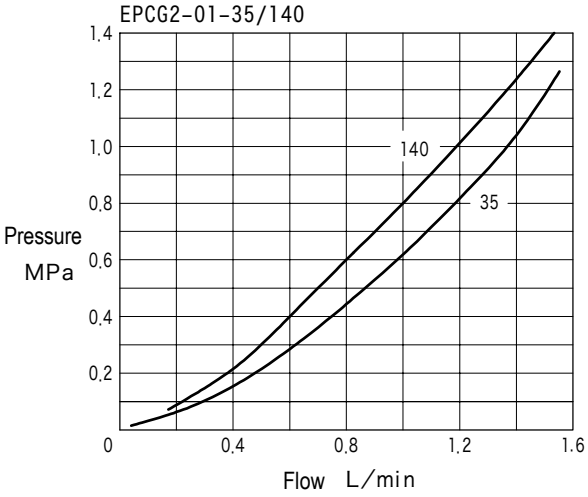
Performance Curve (at 20mm²/s)

Input Current - Pressure Characteristics

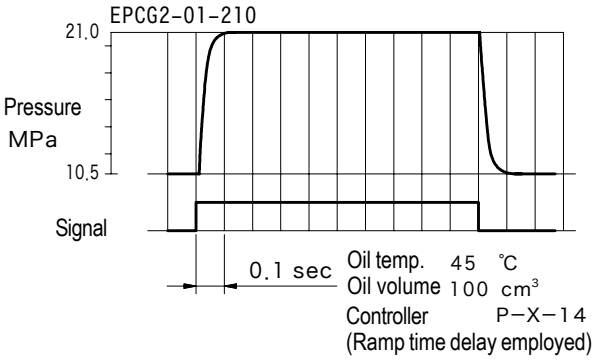




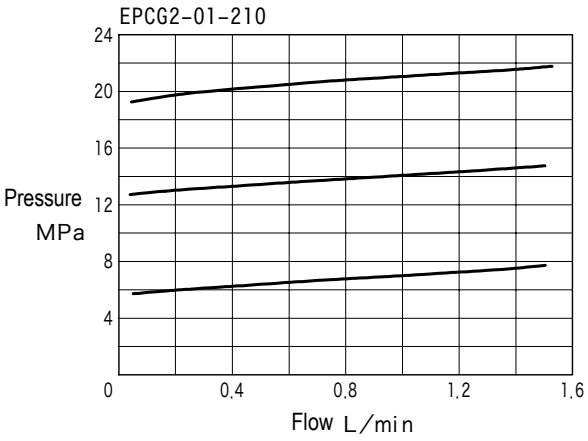
Minimum Control Pressure

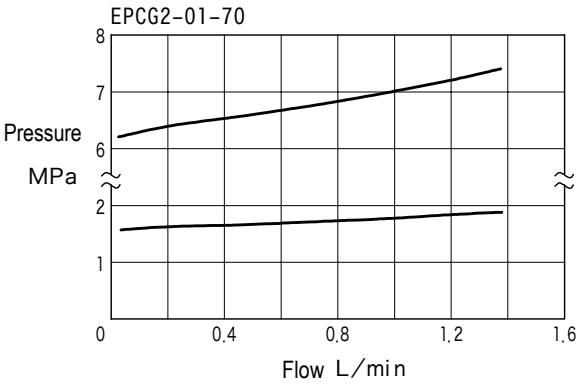


Step Response Characteristics (Example)



Flow Pressure Characteristics





Notes on Use

- Air bleed
  For stable pressure control, during the initial adjustment, loosening the air bleed plug and bleed air completely out of the valve prior to use.
- Manual adjustment
  In case of initial adjustment or during electrical failures, etc., when there is no input electrical current, pressure can be set manually with the pressure adjustment knob. Turn knob fully counterclockwise again for use during electro-magnetic control.
- Minimum control flow
  When flow is small, setting pressure may be unstable. Please maintain minimum flow above 0.3 L/min.
- T port piping
  Allowable back pressure is 0.2 MPa. T port piping should be returned directly to tank, and the end of the pipe should be below the lowest fluid level.

Mounting Bolts (JIS B1176, Strength Class 12.9)

Hex Socket Bolts	Quantity
M5 × 50	4

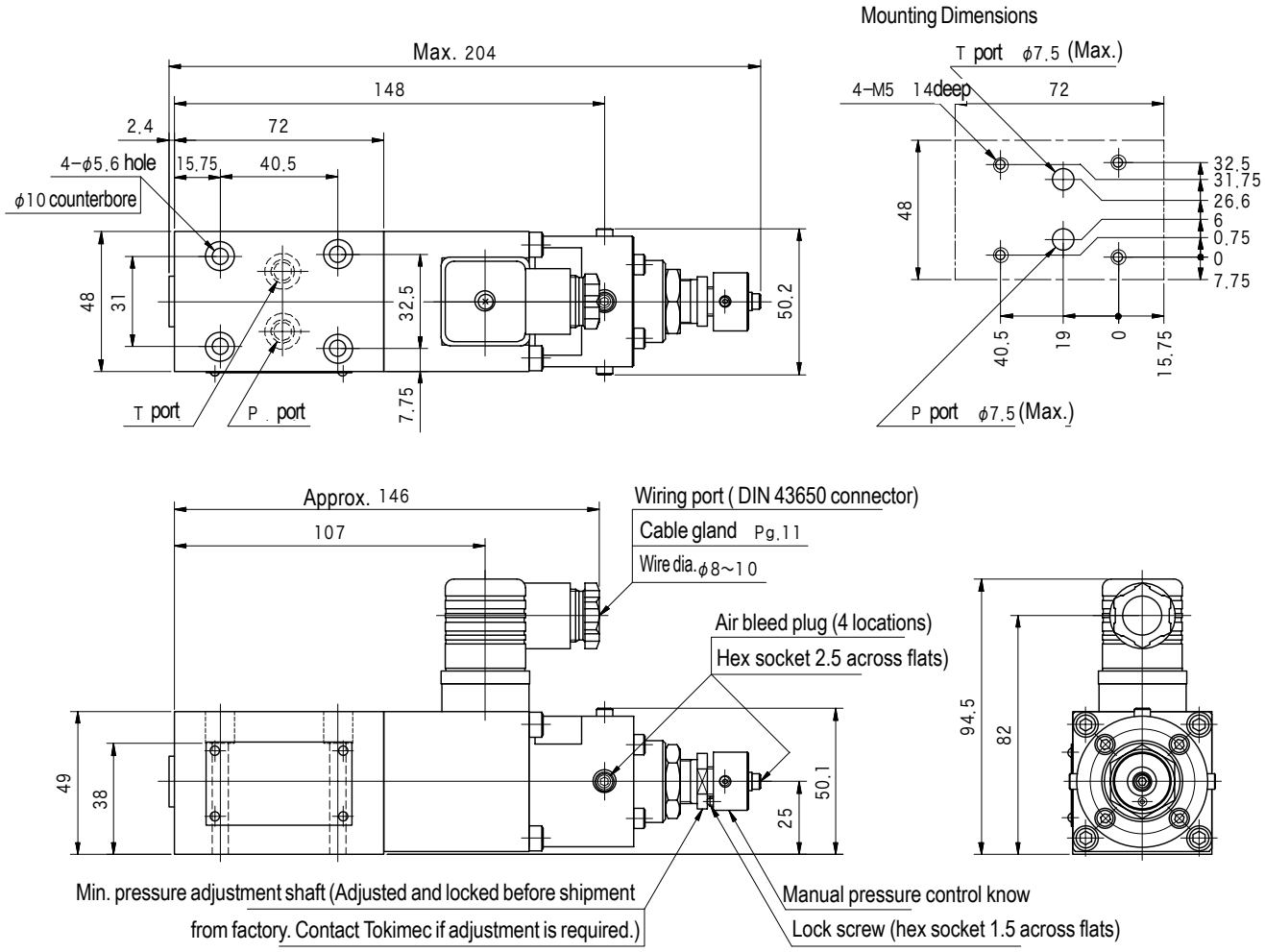
- Mounting bolts must be ordered separately.
- Mounting bolts tightening torque: 7~8 Nm

Subplate

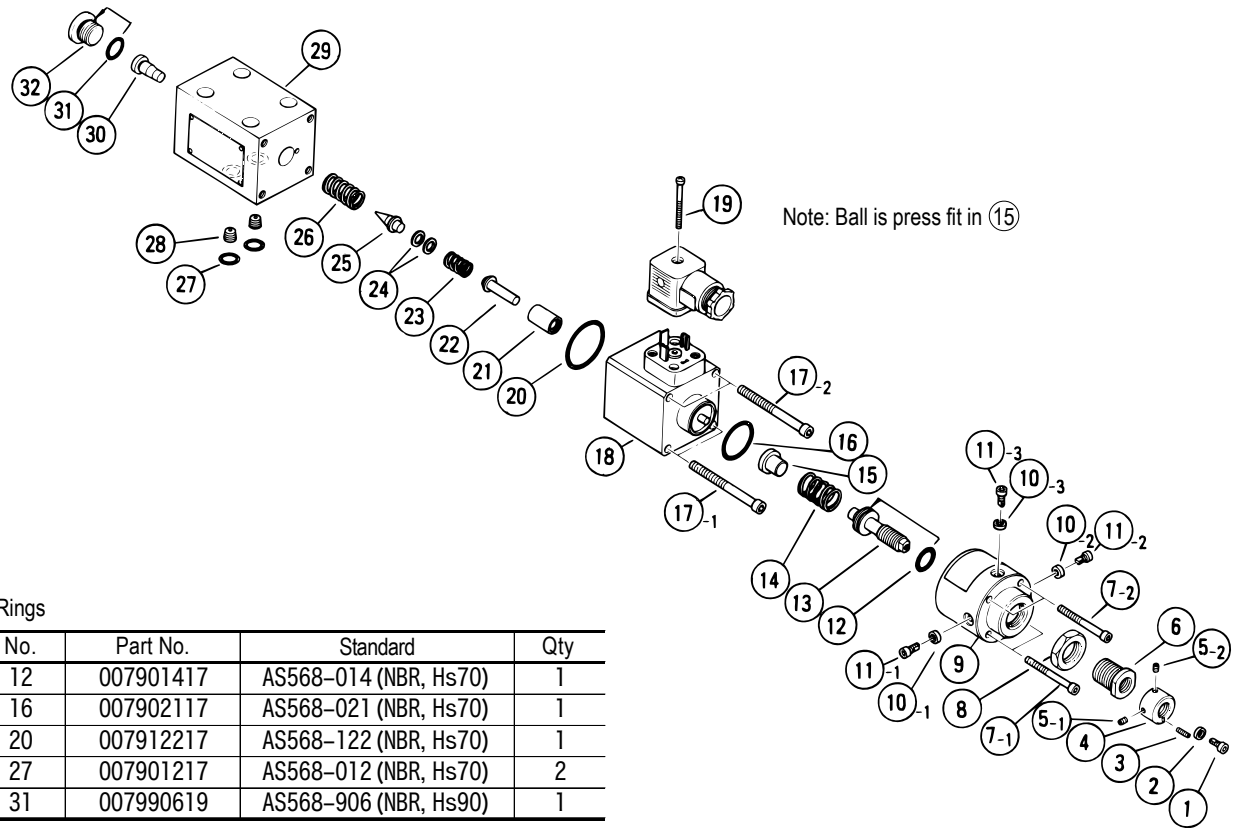
Subplate Model		Connection Port Dia. Rc
Side Porting	DGMS-3-1E-10-T-JA-J	3/8
Reverse Side Porting	DGVM-3-10-T-JA-J	

- Mounting bolts are not included.
- Subplates must be ordered separately.
- See page Q8 for dimensions.

Dimensions



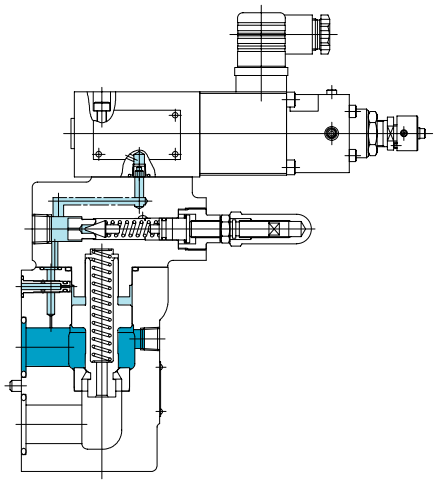
Construction



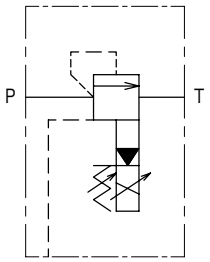
O-Rings

No.	Part No.	Standard	Qty
12	007901417	AS568–014 (NBR, Hs70)	1
16	007902117	AS568–021 (NBR, Hs70)	1
20	007912217	AS568–122 (NBR, Hs70)	1
27	007901217	AS568–012 (NBR, Hs70)	2
31	007990619	AS568–906 (NBR, Hs90)	1

Proportional relief valves EPCG2-03/06/10



Functional Symbol



EPCG2

This valve utilizes a proportional solenoid actuator to provide proportional control of hydraulic circuit pressure.

Model Code

EPCG2 - 06 - 210 - Y - L -13

1	2	3	4	5	6

1 Proportional solenoid relief valve
2 Size
3 Pressure adjustment range
See 'Specifications'

4 Drain
Y: external drain (standard)
5 Manual adjustment knob
Omit for front, L: left
6 Design no.

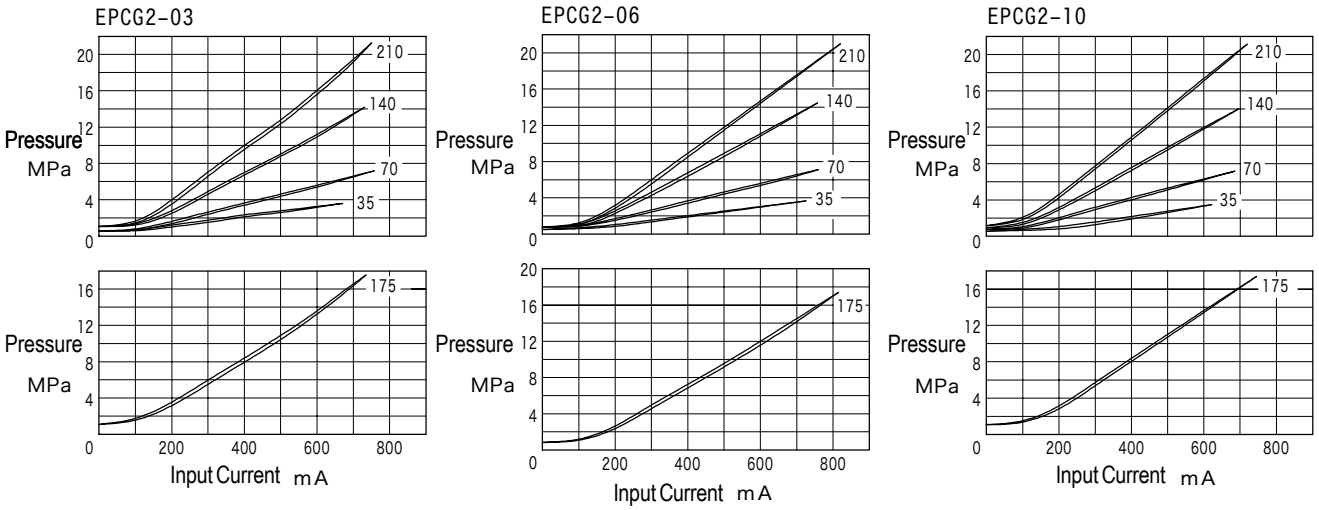
Specifications

Model			EPCG2		
Size			03	06	10
Max. operating pressure		MPa	21		
Max. flow		L/min	80	200	400
Max. adjustable pressure (Note 3)	MPa	Press. adj. range 35	3. 5		
		Press. adj. range 70	7		
		Press. adj. range 140	14		
		Press. adj. range 175	17. 5		
		Press. adj. range 210	21		
Rated current		A	1		
Coil resistance		Ω	14		
Hysteresis			Less than 3% (Note 1)		
Repeatability			Less than 1% (Note 2)		
Weight		kg	7	10	15

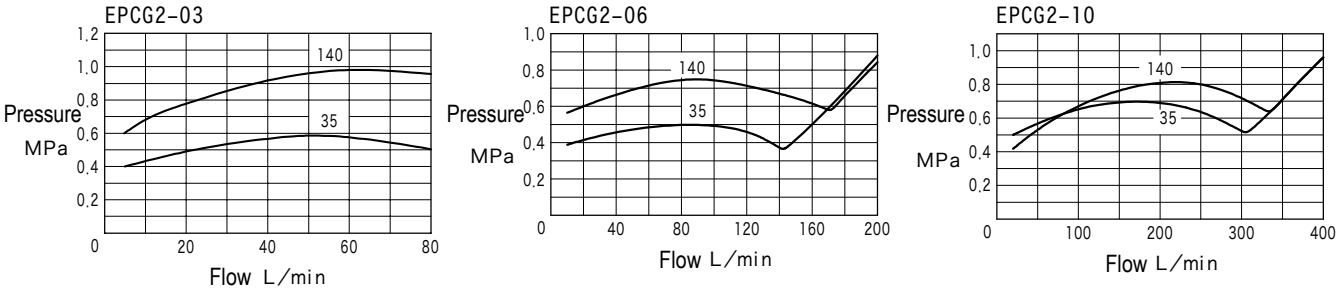
Note 1: Value when using P-X-14 controller or equivalent.
Note 2: Valve value based on use of special controller under same using conditions.
Note 3: Min. control pressure will vary with flow.
See 'Performance Curves'.

Performance Curve (at 20mm²/s)

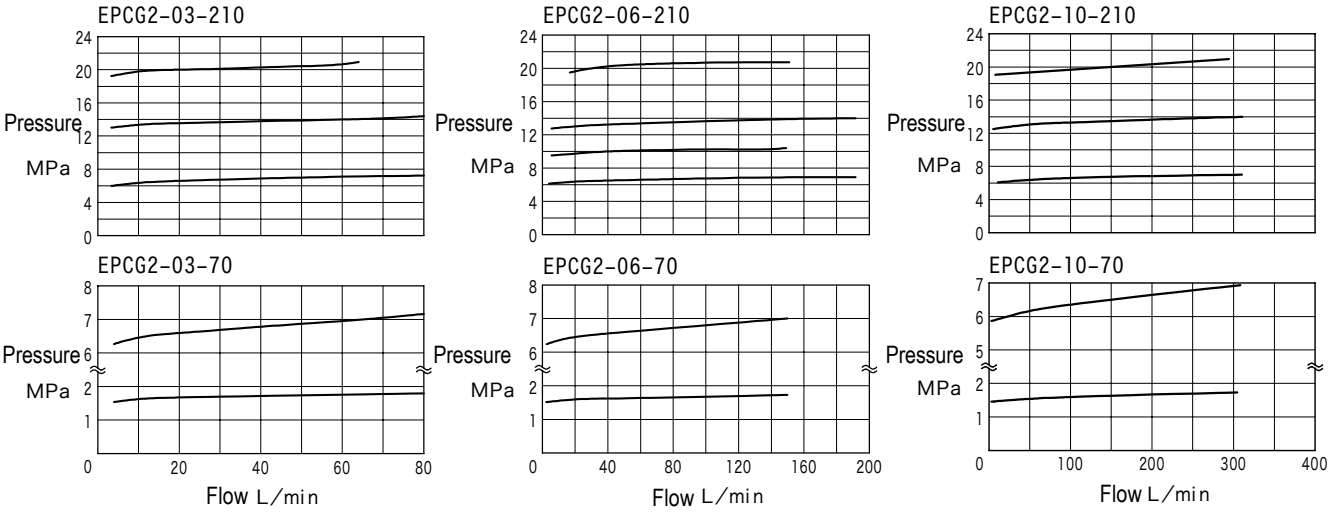
Input Current - Pressure Characteristics (Example)



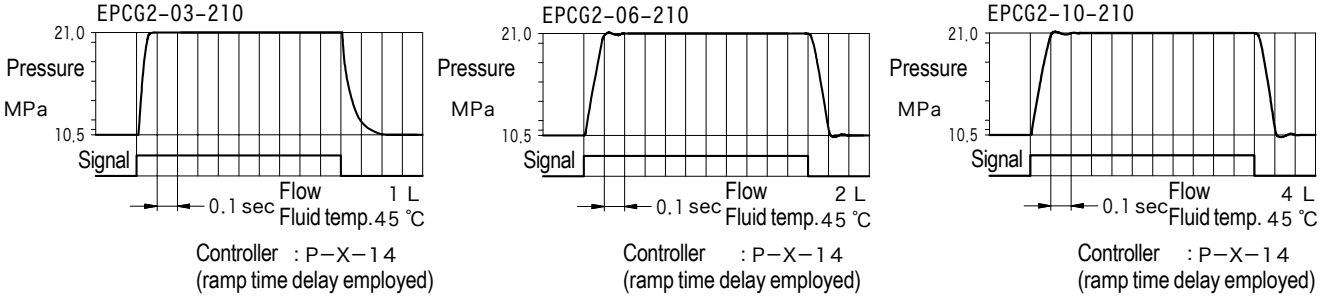
Minimum Control Pressure (Example)



Flow - Pressure Characteristics



Step Response Characteristics (Example)



Controller : P-X-14
(ramp time delay employed)

Controller : P-X-14
(ramp time delay employed)

Controller : P-X-14
(ramp time delay employed)

Notes on Use

- Air bleed
  For stable pressure control, during the initial adjustment, loosening the air bleed plug and bleed air completely out of the valve prior to use.
- Manual adjustment
  In case of initial adjustment or during electrical failures, etc., when there is no input electrical current, pressure can be set manually with the pressure adjustment knob. Turn knob fully counterclockwise again for use during electro-magnetic control.

Model	Minimum Control Flow L/min
EPCG2–03	2. 5
EPCG2–06	5
EPCG2–10	10

- Minimum control flow
  When flow is small, setting pressure may be unstable. Please maintain minimum flow above values shown in the table below.
- Tank piping
  Allowable back pressure is 0.2 MPa. T port piping should be returned directly to tank, and the end of the pipe should be below the lowest fluid level.
- Vent piping
  Care should be paid when the vent line piping is long as the large volume of fluid in the pipes may cause instability in pressure control.
- Zero adjustment
  This is adjusted at factory before shipment. Readjustment is not necessary.
- Main valve setting pressure
  The main valve is set at the maximum adjustable pressure plus 2.5MPa as safety valve (flow is set at 1/2 of max. flow).
- Subplate.
  For subplate mounting, drain should be piped from main valve cover Y-port (Rc 1/4).

Mounting Bolts (JIS B1176, Strength Class 12.9)

Model	Hex Socket Bolts		Qty
	Metric	Unified	
EPCG2–03	M12×80	1/2–13UNC×82. 5	4
EPCG2–06	M16×85	5/8–11UNC×82. 5	4
EPCG2–10	M20×100	3/4–10UNC×101. 6	4

- Mounting bolts must be ordered separately.
- Mounting bolt tightening torque.
  EPCG2-03: 72~88Nm
  EPCG2-06: 90~110Nm
  EPCG2-10: 180~220Nm

Subplate

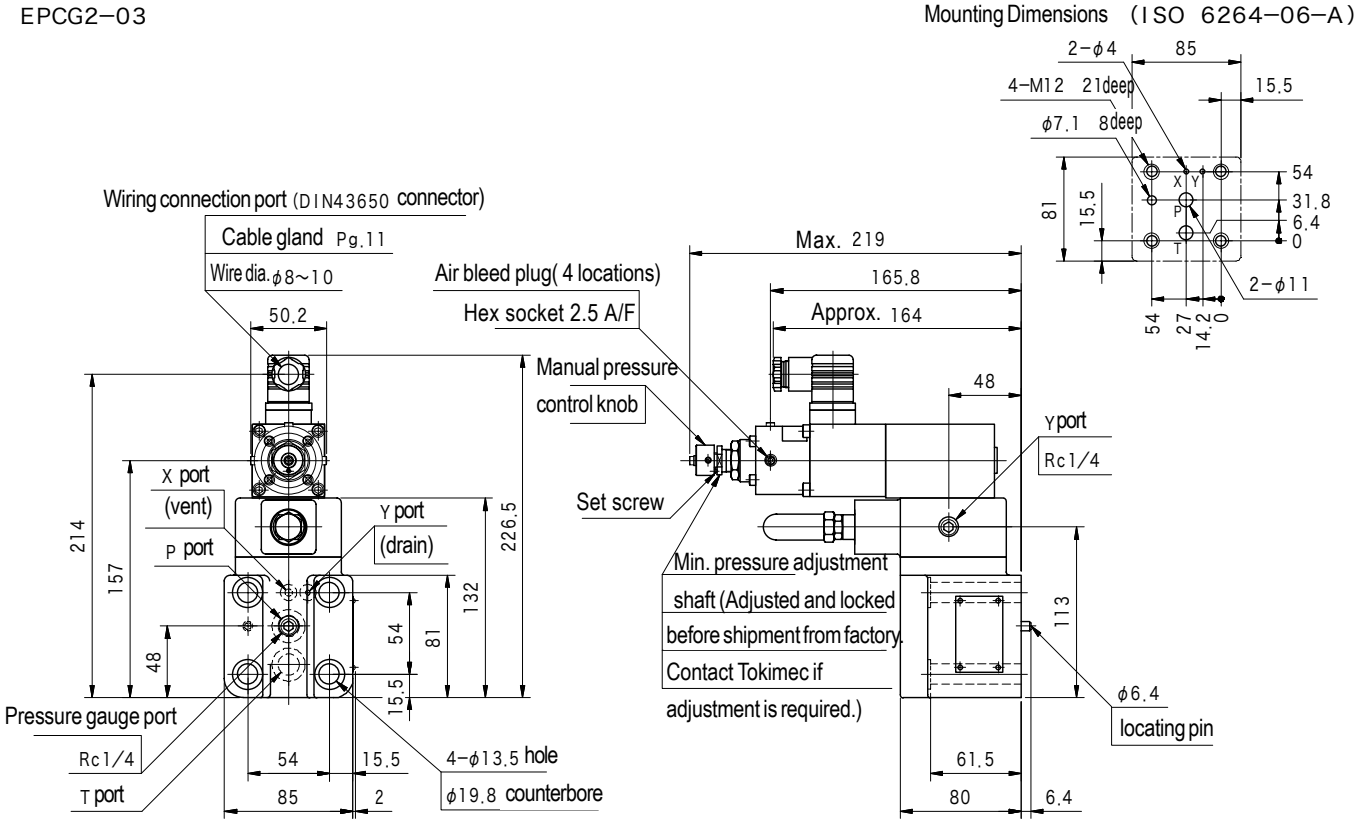
Model	Subplate Model	Port Diameter Rc
EPCG2–03	TCGMT–03–10–JA–J	3/8
EPCG2–06	CGM–06–10–JA–J	3/4
EPCG2–10	CGM–10–10–JA–J	1–1/4

- Subplates must be ordered separately.
- Hex socket bolts for valve mounting are provided (unified thread)
- See page Q3 for dimensions.

Note: When using subplate, care should be paid to working flow and piping resistance in order to avoid high minimum pressures and poor flow-pressure override characteristics.

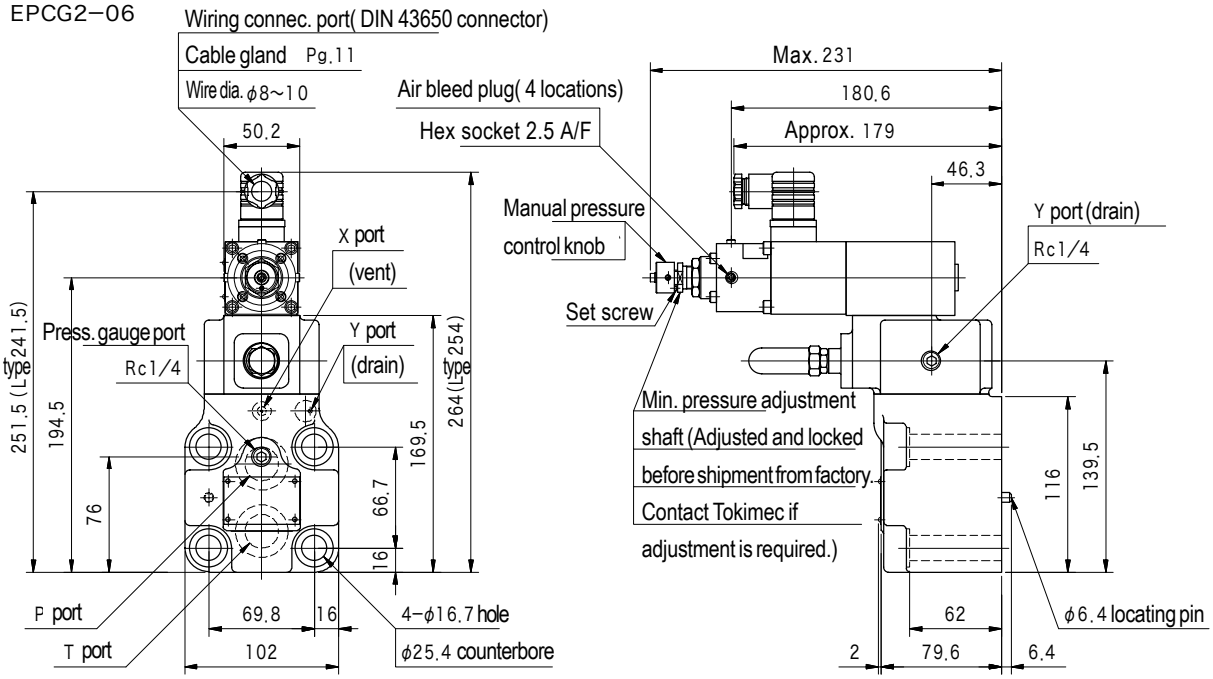
Dimensions

EPCG2–03

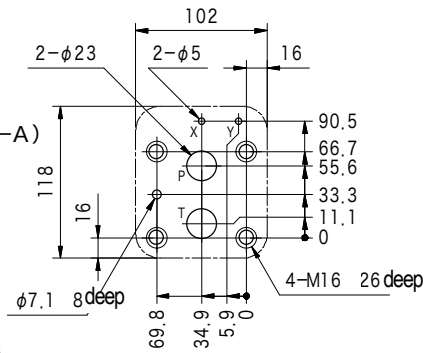


Dimensions

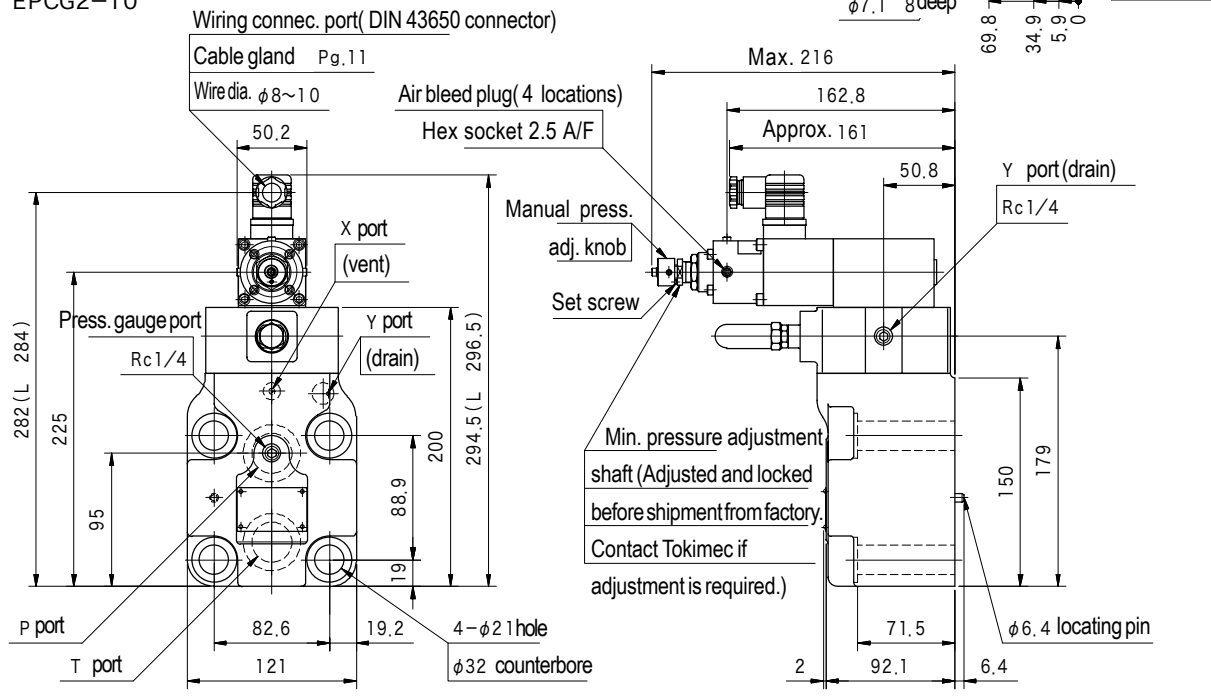
EPCG2−06



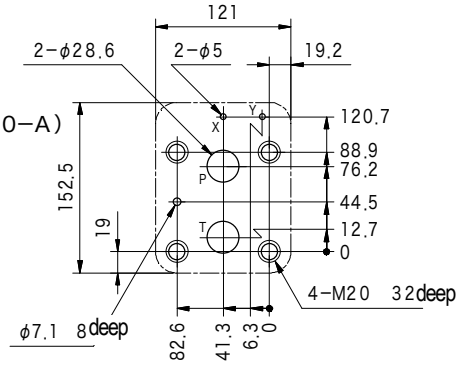
Mounting Dimensions (ISO 6264−08−A)



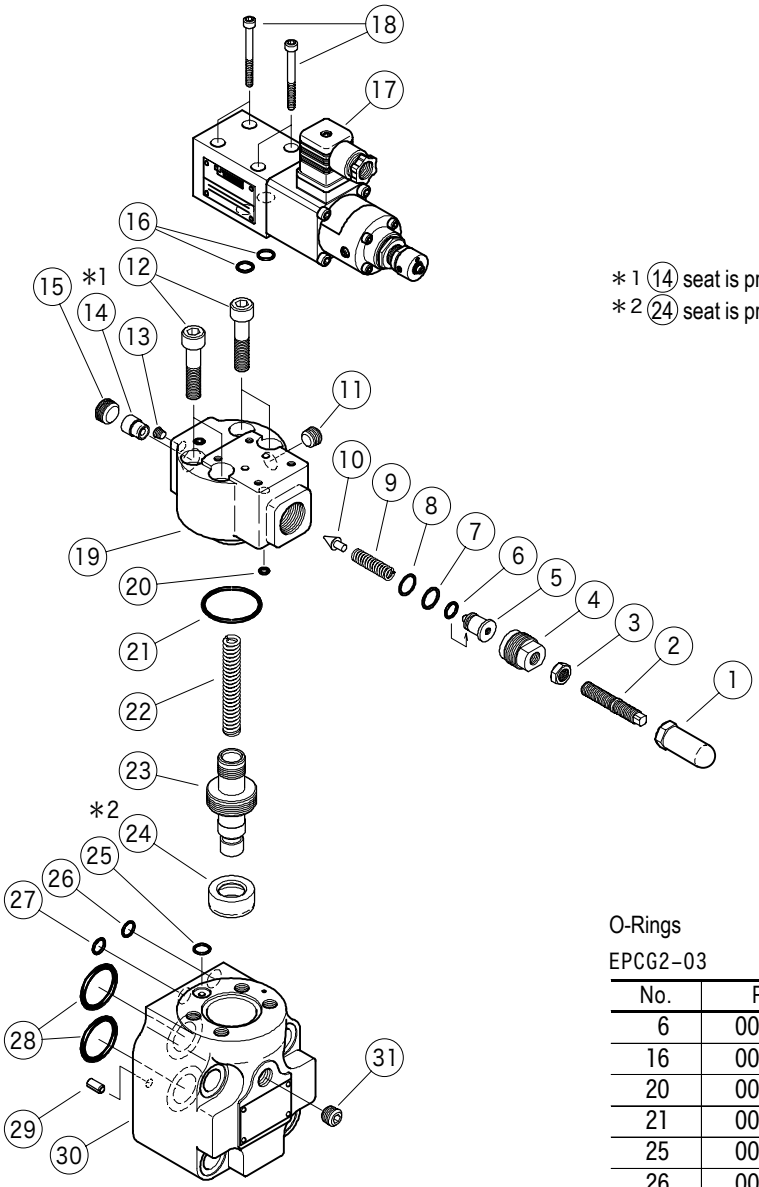
EPCG2−10



Mounting Dimensions (ISO 6264−10−A)



Note: Contact Tokimec for dimensional details in case of left orientation (type "L") manual adjustment knob.



*1 (14) seat is press fit into cover (19)
*2 (24) seat is press fit into body (30)

Springs

EPCG2-03

Code	⑨	㉒
35	VP2280	VA24150
70	VA15049	VA15401
140～210	VP2281	VA15401

EPCG2-06

Code	⑨	㉒
35	VP2280	VA29663
70	VA15049	VA14894
140～210	VP2281	VA14894

EPCG2-10

Code	⑨	㉒
35	VP2280	VA28580
70	VA15049	VA15105
140～210	VP2281	VA15105

O-Rings

EPCG2-03

No.	Part No.	Standard	Qty
6	007901217	AS568-012 (NBR, Hs70)	1
16	007901217	AS568-012 (NBR, Hs70)	2
20	007900919	AS568-009 (NBR, Hs90)	1
21	007912219	AS568-122 (NBR, Hs90)	1
25	007900919	AS568-009 (NBR, Hs90)	1
26	007901119	AS568-011 (NBR, Hs90)	1
27	007901119	AS568-011 (NBR, Hs90)	1
28	007911519	AS568-115 (NBR, Hs90)	2

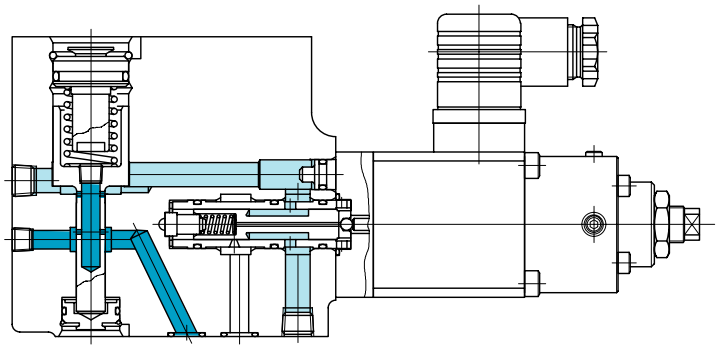
EPCG2-06

No.	Part No.	Standard	Qty
6	007901217	AS568-012 (NBR, Hs70)	1
16	007901217	AS568-012 (NBR, Hs70)	2
20	007900819	AS568-008 (NBR, Hs90)	1
21	VA11168	————	1
25	007901219	AS568-012 (NBR, Hs90)	1
26	007911019	AS568-110 (NBR, Hs90)	1
27	007901219	AS568-012 (NBR, Hs90)	1
28	007921619	AS568-216 (NBR, Hs90)	2

EPCG2-10

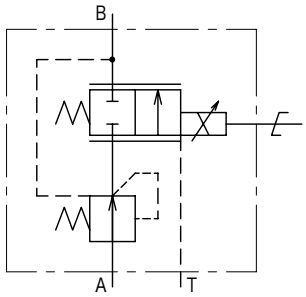
No.	Part No.	Standard	Qty
6	007901217	AS568-012 (NBR, Hs70)	1
16	007901217	AS568-012 (NBR, Hs70)	2
20	007901219	AS568-012 (NBR, Hs90)	1
21	007922419	AS568-224 (NBR, Hs90)	1
25	007901219	AS568-012 (NBR, Hs90)	1
26	007901419	AS568-014 (NBR, Hs90)	1
27	007901219	AS568-012 (NBR, Hs90)	1
28	007922019	AS568-220 (NBR, Hs90)	2

Proportional flow control valves (direct operated type) EPFG-01



- This valve is a directly activated flow control valve which utilizes a proportional solenoid actuator. A proprietary flow adjustment design is incorporated to allow fine flow control.

Functional Symbol



Model Code

EPFG - 01 - 5 - 15 - 10

1	2	3	4

1 Proportional solenoid flow control valve (gasket mounted) with series type pressure compensator
2 Size
3 Maximum control flow See 'Specifications'
4 Design no.

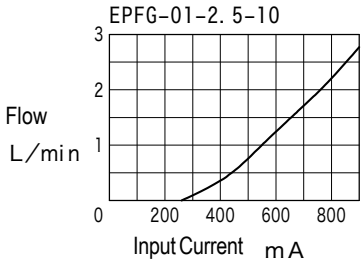
Specifications

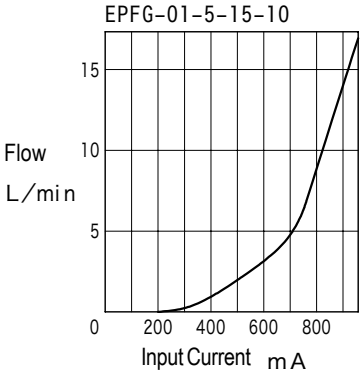
Model		EPFG			
Size		01			
Max. operating pressure	MPa	21			
Max. control flow code		2. 5	10	5–15	15
Min. control flow	L/min	0. 03			
Max. control flow	L/min	2. 5	10	15	15
Rated current	A	1			
Coil resistance	Ω	14			
Hysteresis		Less than 4% (Note 1)			
Repeatability		Less than 1% (Note 2)			
Pressure compensator		Series type			
Weight	kg	5			

Note 1: value when using controller P-X-14 or equivalent.
Note 2: valve unit value using special controller and with same working conditions

Performance Curve (at 20mm²/s)

Input Current - Flow Characteristics (Example)





Notes on Use

- Mounting direction
  Valve can be mounting in any direction. However if valve is mounted on manifold block, if none of the 3 air bleed plugs do not face the ceiling, rotate the proportional solenoid 90° to orient an air bleed plug to the ceiling Current-flow characteristics may vary slightly according to the mounting direction.
- Air bleed
  For stable pressure control, during the initial adjustment, loosen the air bleed plug and bleed air completely out of the valve prior to use.
- Manual adjustment
  In case of initial adjustment or during electrical failures, etc., when there is no input electrical current, the manual operation pin can be pushed for inching, etc., flow control.
- Zero adjustment
  This is adjusted at factory before shipment. Readjustment is not necessary.
- Drain piping
  Allowable back pressure is 0.2 MPa. T port piping should be returned directly to tank, and the end of the pipe should be below the lowest fluid level.
- Valve and actuator piping
  Care should be paid when the vent line piping is long as the large volume of fluid in the pipes may cause instability(resonation). Piping should be as short as possible.
- Valve is direct operated. A line filter of less than 10μm should be positioned upstream of the valve.
- For optimum flow control, valve differential pressure should be above 1 MPa. If control flow is above 10 L/min, differential pressure should be above 2 MPa.

Mounting Bolts (JIS B1176, Strength Class 12.9)

Hex Socket Bolts	Quantity
M5 × 100	4

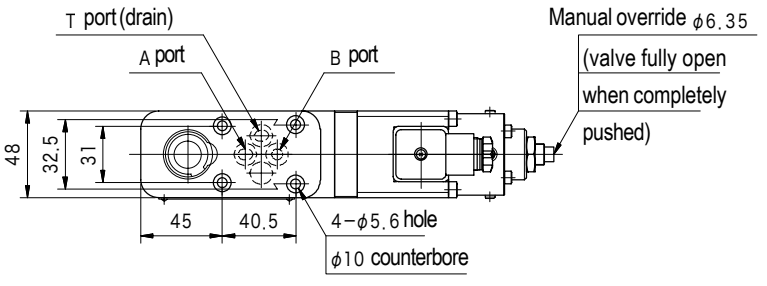
- Mounting bolts must be ordered separately.
- Mounting bolt tightening torque: 7~8 Nm

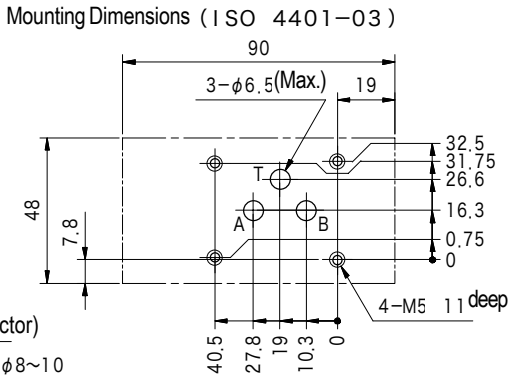
Subplate

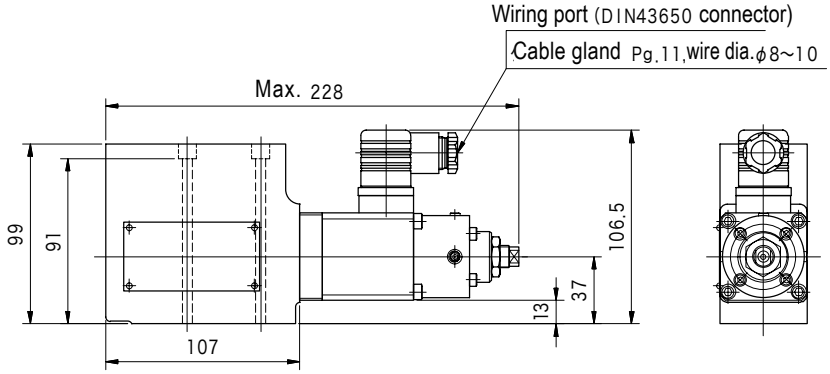
Subplate Model		Connection Port Rc
Side porting	DGMS-3-1E-10-T-JA-J	3/8
Reverse side porting	DGVM-3-10-T-JA-J	

- Mounting bolts must be ordered separately and are not supplied with valve.
- Subplates must be ordered separately.
- See page Q8 for dimensions.

Dimensions

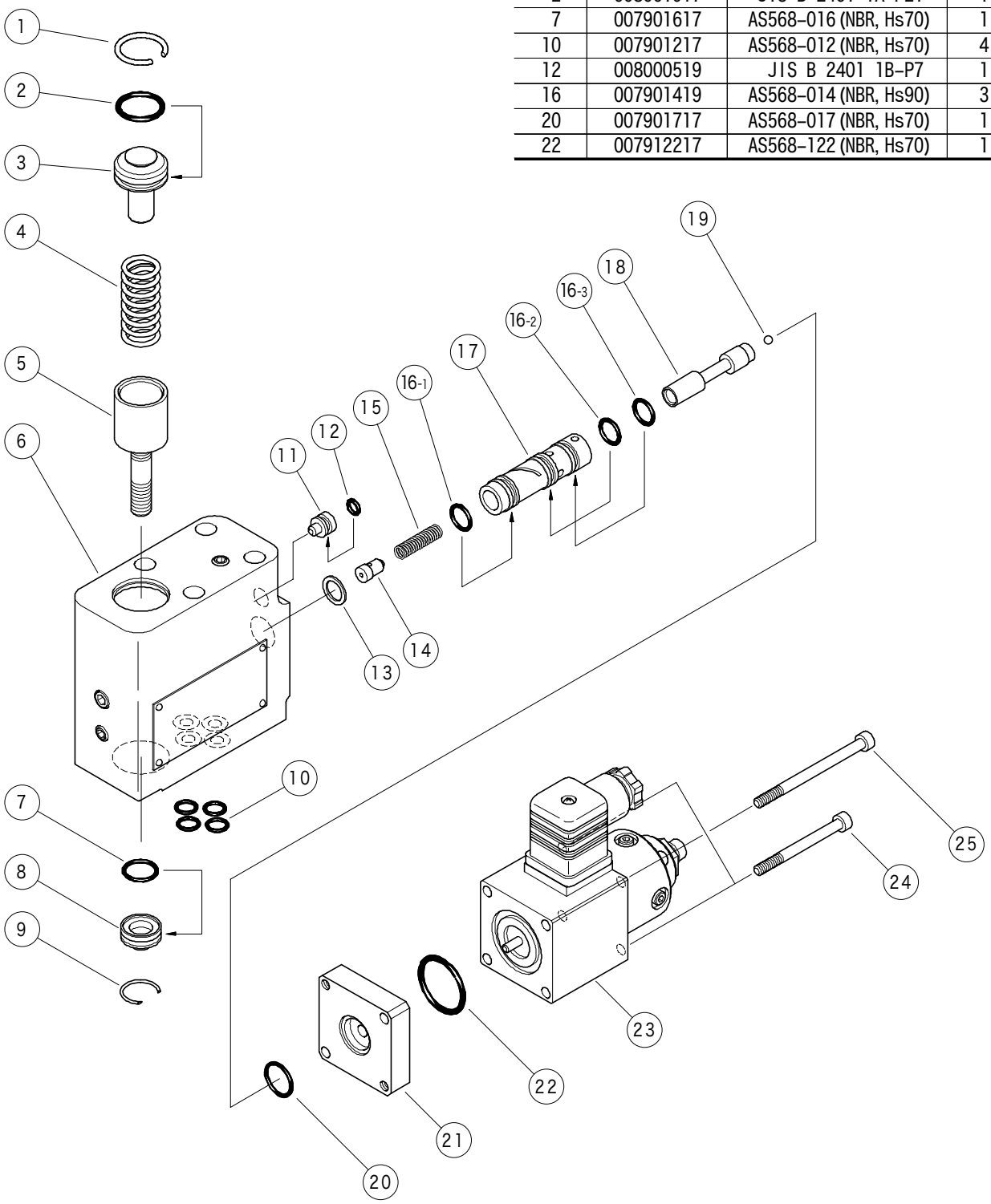




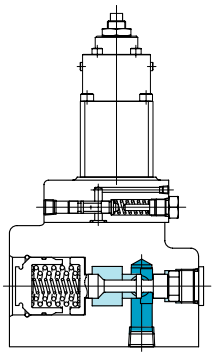


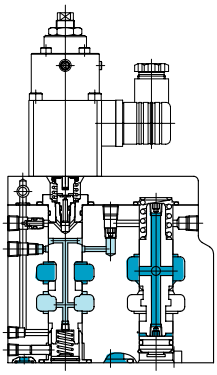
O-Rings

No.	Part No.	Standard	Qty
2	008001917	JIS B 2401 1A-P21	1
7	007901617	AS568-016 (NBR, Hs70)	1
10	007901217	AS568-012 (NBR, Hs70)	4
12	008000519	JIS B 2401 1B-P7	1
16	007901419	AS568-014 (NBR, Hs90)	3
20	007901717	AS568-017 (NBR, Hs70)	1
22	007912217	AS568-122 (NBR, Hs70)	1



Proportional flow control valves EPF(R)G

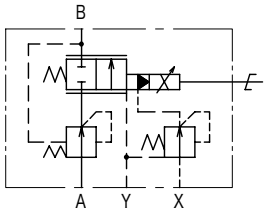




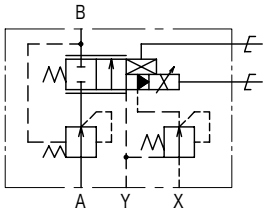
• This flow control valve utilizes a proportional solenoids. A proprietary flow adjustment design is incorporated to allow very precise positioning of the main spool. This flow control valve is pilot operated, and the main spool is impervious to affects of flow forces and other disturbances. The EPFRG valve utilizes a bypass type pressure compensator load sensing function which contributes to energy saving hydraulic circuits.

Functional Symbols

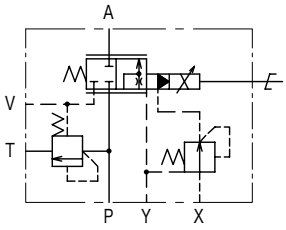
EPFG–**



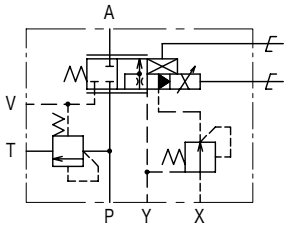
EPFG–**–F



EPFRG–**–S1



EPFRG–**–F–S1



Note: EPFRG-06/10 do not have V (vent) ports.

Model Code

EPF(R)G - 03 - 130 - (F) - (EX)- 10 - (S1)

1	2	3	4	5	6	7

1 Proportional solenoid flow control valve (gasket mounted)
EPFG: with series type pressure compensator
EPFRG: with bypass type pressure compensator

2 Size
See 'Specifications'

3 Max. controllable flow
See 'Specifications'

4 Position sensor
Omit for no position sensor
F: with position sensor

5 Pilot
Omit for internal pilot with reducing valve
EX: external pilot with reducing valve

6 Design no.
10: all except EPFRG-06
11: EPFRG-06

7 Control code
Omit for EPFG
S1: for EPFRG

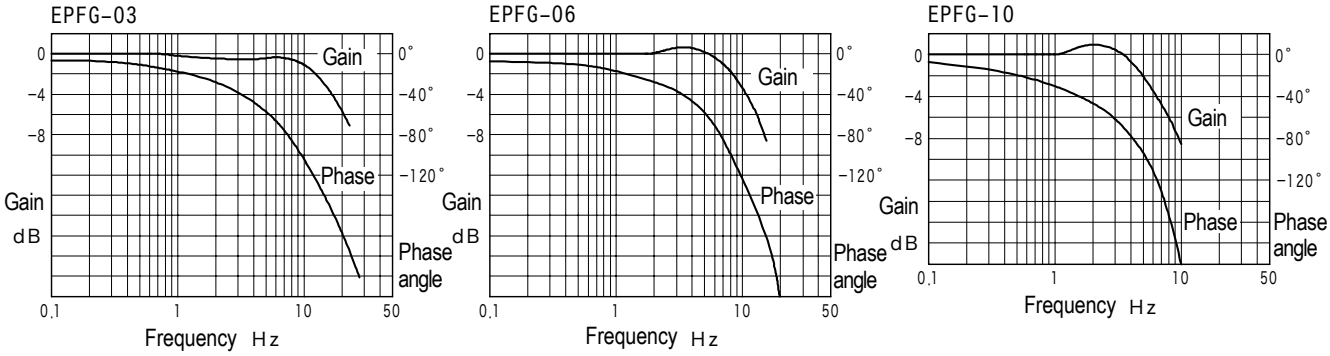
Specifications

Model		EPFG							EPFRG								
Size		03			06		10		02				03		06		10
Max.operating pressure	MPa	21					17.5		21								
Max.control flow code		30	65	130	170	250	375	500	30	65	130	150	250	290	375	500	1000
Min.control flow	L/min	0.7	1.0	1.3	1.7	2.5	4	5	1	1.5	2	2	3	4	5	6	10
Max.control flow	L/min	30	65	130	170	250	375	500	30	65	130	150	250	290	375	500	1000
Pilot pressure	MPa	1.5～21															
Pilot flow	L/min	1.5			1.5		2.5		1.5				2.0		2.5		3
Rated voltage	A	1															
Coil resistance	Ω	14															15
Dither frequency	Hz	100～110															
Dither voltage	mA rms	42															90
Current control solenoid	Hysteresis	Less than (Note 1)															
	Repeatability	Less than (Note 3)															
Position control solenoid	Hysteresis	Less than (Note 2)															—
	Repeatability	Less than (Note 3)															—
Pressure compensator		Series type (Note 5)							Bypass type (Note 4)								
Weight	kg	10			24		50		10				18		33		68

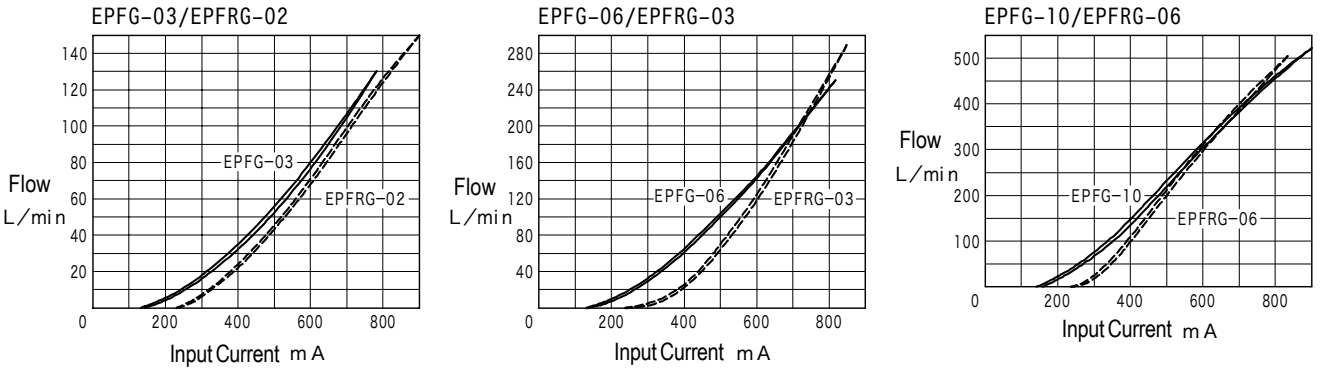
Note 1: Values when using P-X-14 controller or similar.
Note 2: Values when using P-Z-14 controller or similar.
Note 3: Value of valve operating under same working conditions as special controller used.
Note 4: Capacity of EPFRG-10 pressure compensator is 600 L/min. For flow control above 600 L/min. pressure compensator function will deteriorate if load pressure is below 2 MPa.
Note 5: For good flow control, maintain valve pressure differentail over 1 MPa for 03, over 1.5 MPa for 06, and over 2 MPa for 10 size.

Performance Curve (at 20mm²/s)

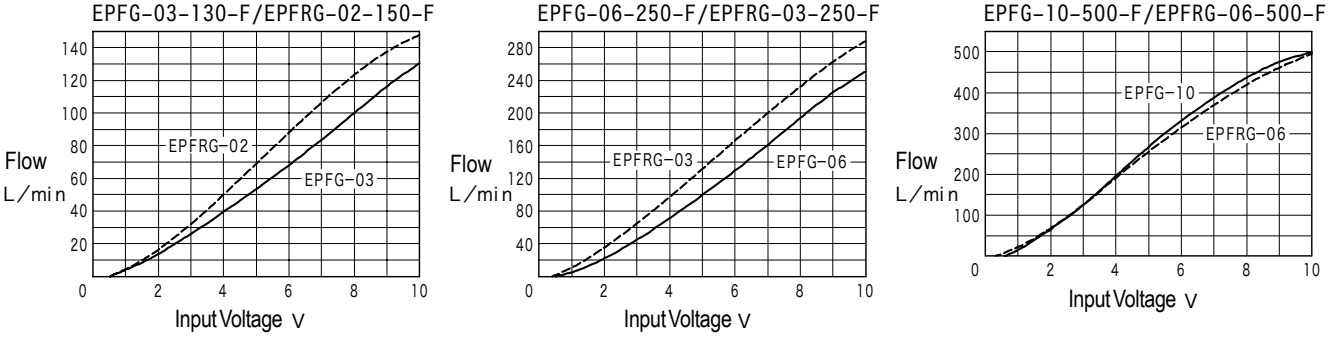
Frequency Response Characteristics



Input Current - Flow Characteristics (Example)

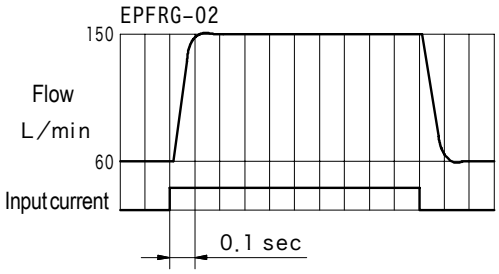


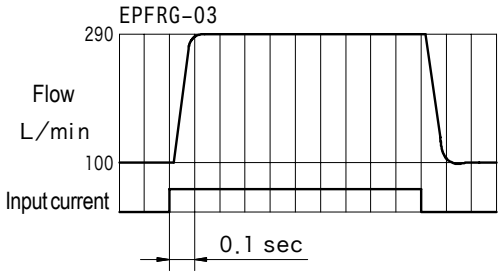
Input Voltage - Flow Characteristics (Example)

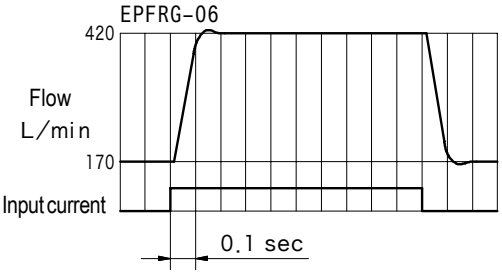


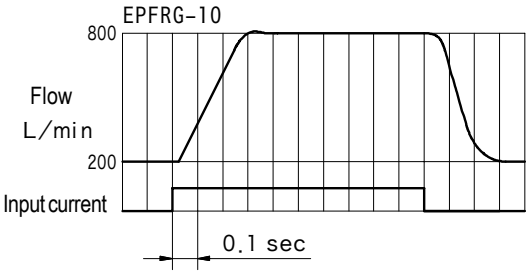
Performance Curve

Step Response Characteristics (Example)









Notes on Use

- Mounting direction
  Valve can be mounting in any direction. However if valve is mounted on manifold block, if none of the 3 air bleed plugs do not face the ceiling, rotate the proportional solenoid 90° to orient an air bleed plug to the ceiling Current-flow characteristics may vary slightly (1.5%) according to the mounting direction.
- Air bleed
  For stable pressure control, during the initial adjustment, loosening the air bleed plug and bleed air completely out of the valve prior to use.
- Manual adjustment
  In case of initial adjustment or during electrical failures, etc., when there is no input electrical current, the manual operation pin can be pushed for inching, etc., flow control.
- Zero adjustment
  This is adjusted at factory before shipment. Readjustment is not necessary.
- Drain piping
  Allowable back pressure is 0.2 MPa. T port piping should be returned directly to tank, and the end of the pipe should be below the lowest fluid level.
- Valve and actuator piping
  Care should be paid when the vent line piping is long as the large volume of fluid in the pipes may cause instability(resonation). Piping should be as short as possible.
- For optimum flow control, differential pressure should be below the values shown in the below table.

Size	Diff. Pressure MPa
03	1
06	1. 5
10	2

Mounting Bolts (JIS B1176, Strength Class 12.9)

Model	Hex Socket Bolts		Qty
	Metric	Unified	
EPFG-03	M10×60	3/8-16UNC×63. 5	4
EPFG-06	M16×105	5/8-11UNC×101. 6	4
EPFG-10	M20×145	3/4-10UNC×146. 1	4
EPFRG-02	M10×70	3/8-16UNC×69. 8	4
EPFRG-03	M12×110	1/2-13UNC×114. 3	2
	M12×90	1/2-13UNC×95. 2	2
EPFRG-06	M20×150	———	2
	M20×110	———	2
EPFRG-10	M20×190	———	2
	M20×130	———	2

- Mounting bolts must be ordered separately.
- Mounting bolt tightening torque.

EPFG-03, EPFRG-02 : 50～60 N·m
EPFRG-03 : 75～81 N·m
EPFG-06 : 90～110 N·m
EPFRG-06, EPF(R)G-10 : 230～290 N·m

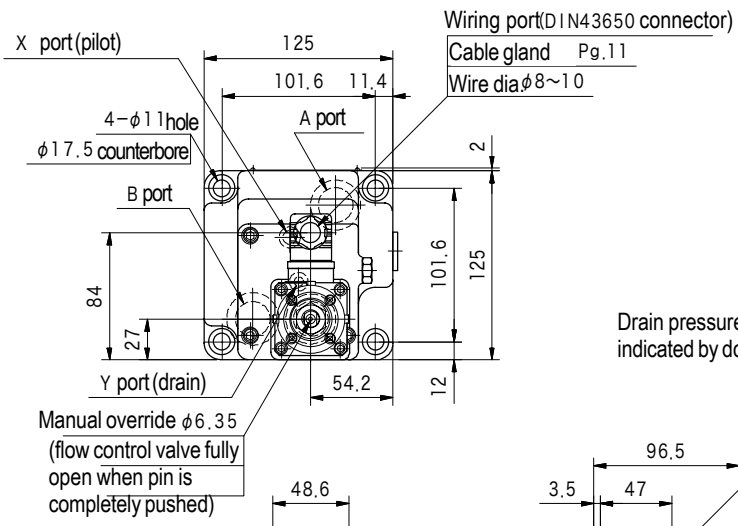
Subplate

Model	Subplate Model	Port Dia. Rc	Thread
EPFG-03	EPFGM-03Y-20	3/4	Unified
	EPFGM-03Z-20	1	
EPFG-06	EPFGM-06X-20	1	
	EPFGM-06Y-20	1-1/4	
	EPFGM-06Z-20	1-1/2	
EPFG-10	TFGTM-10X-10	1-1/2	
	TFGTM-10Y-10	2	
EPFRG-02	D-FRGM-02-10	3/4	Metric
EPFRG-03	D-FRGM-03-10	1-1/4	
EPFRG-06	D-FRGM-06-10	1-1/2	

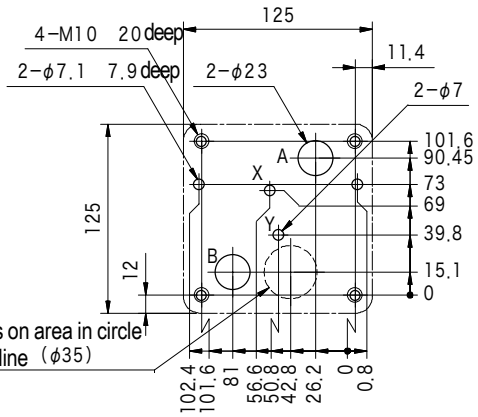
- Subplates must be ordered separately.
- Hex socket bolts for valve mounting are provided (see above table for thread types)
- See page Q9, Q10 for dimensions.

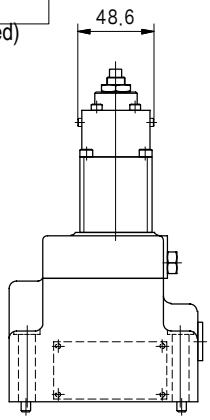
Dimensions

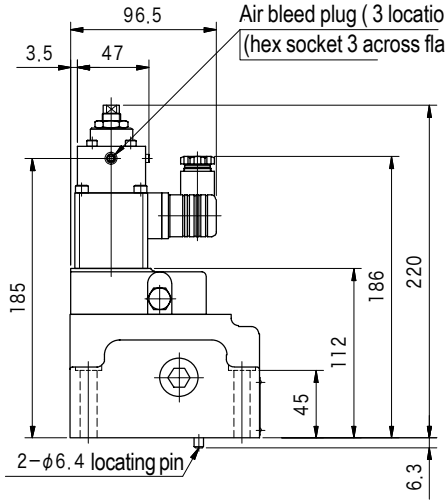
EPFG–03



Mounting Dimensions

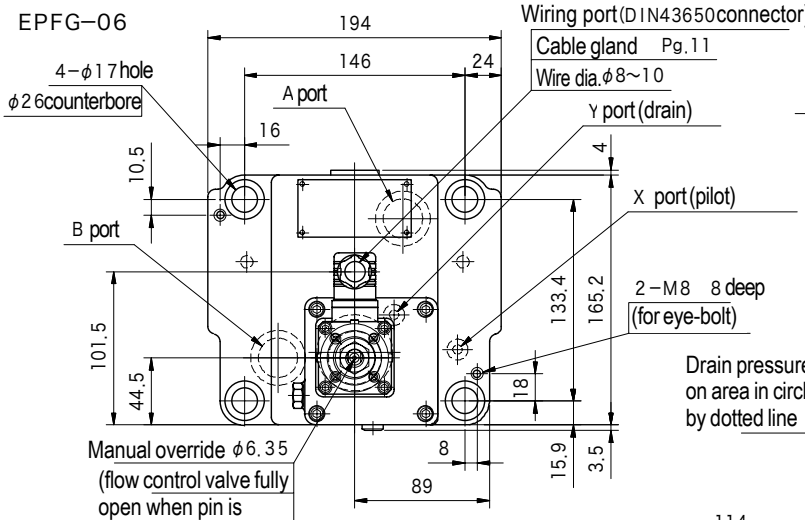


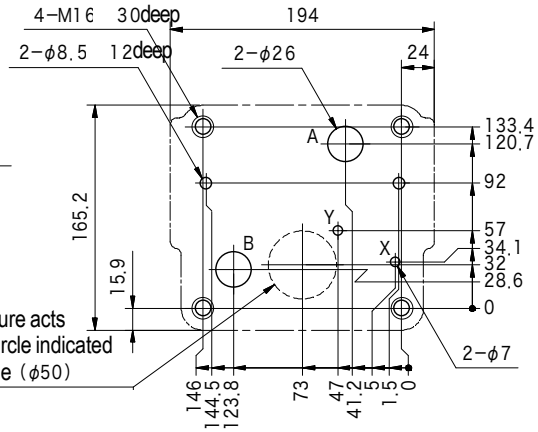


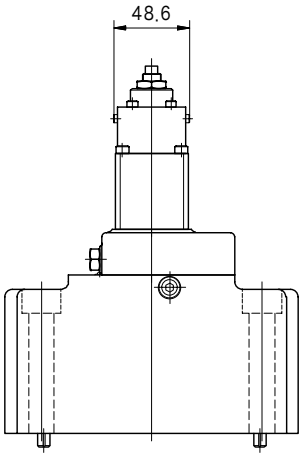


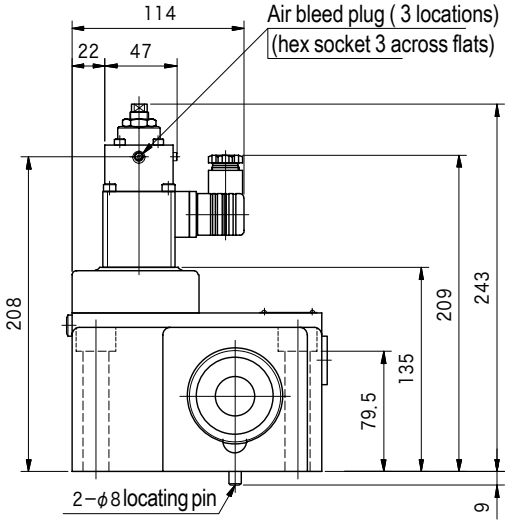
Mounting Dimensions

EPFG–06



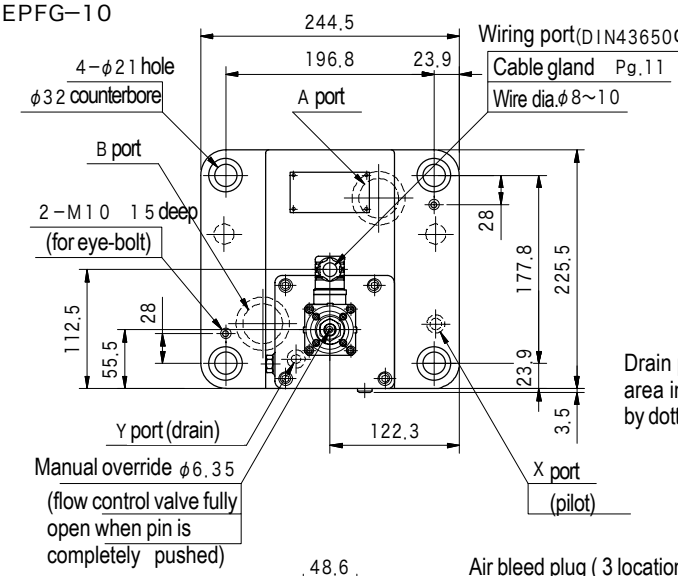




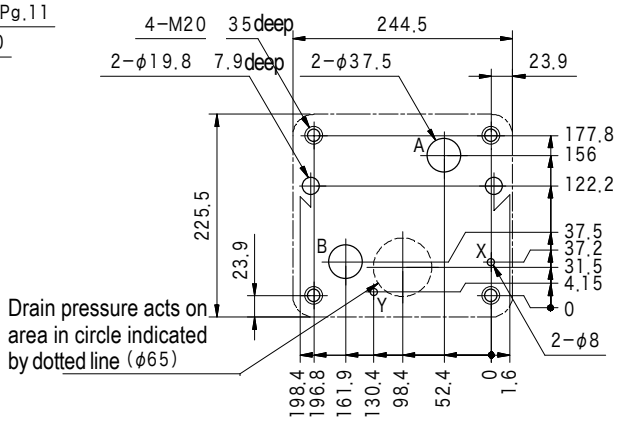


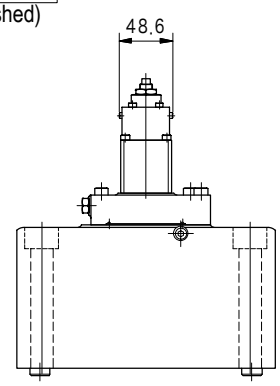
Dimensions

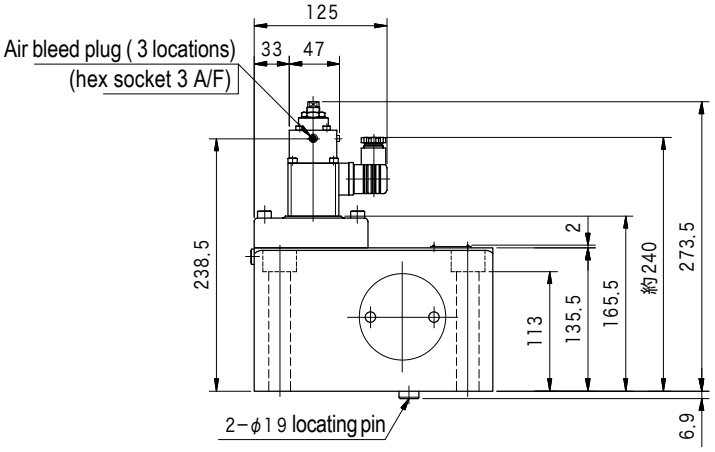
EPFG−10



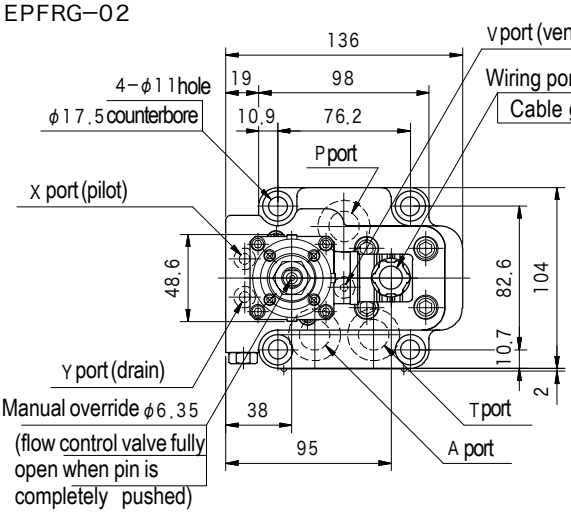
Mounting Dimensions



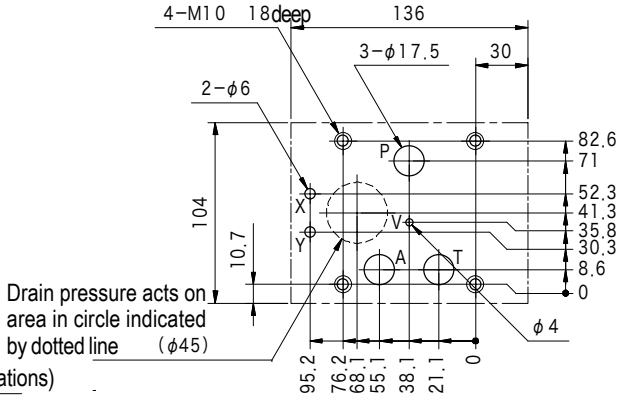


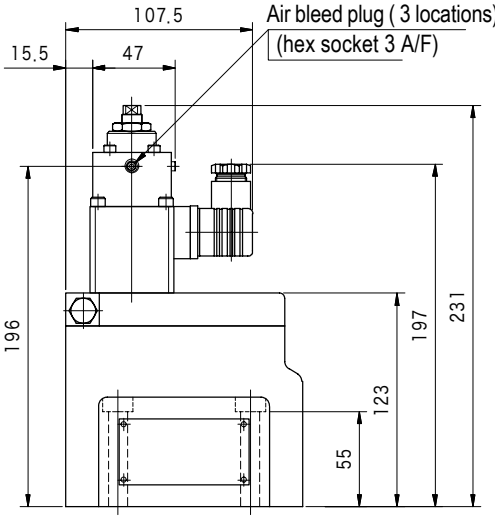


EPFRG−02



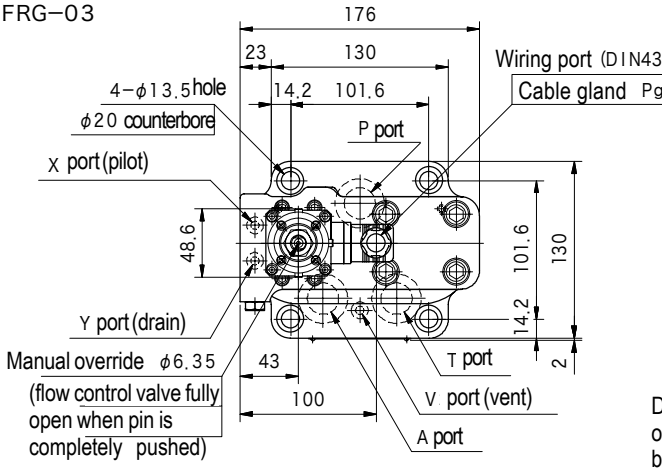
Mounting Dimensions



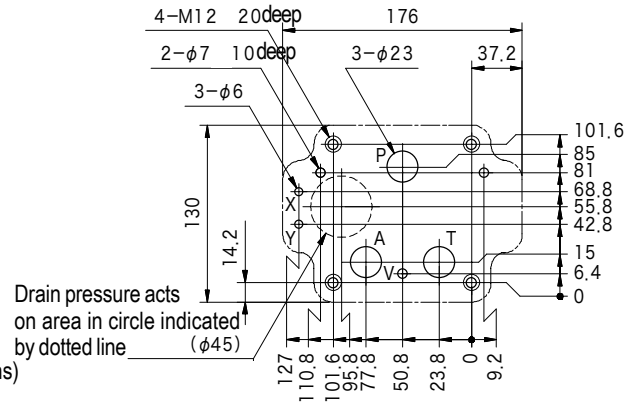


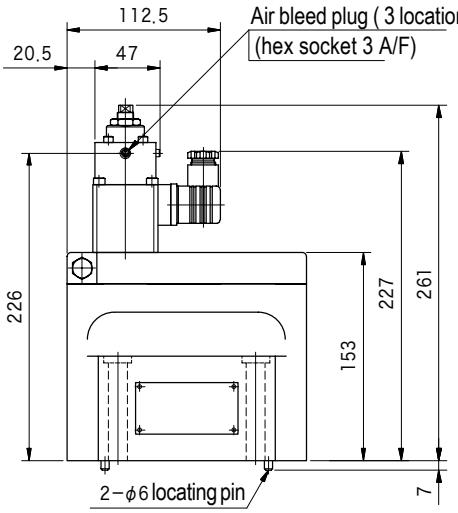
Dimensions

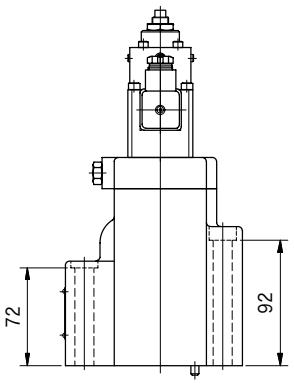
EPFRG–03



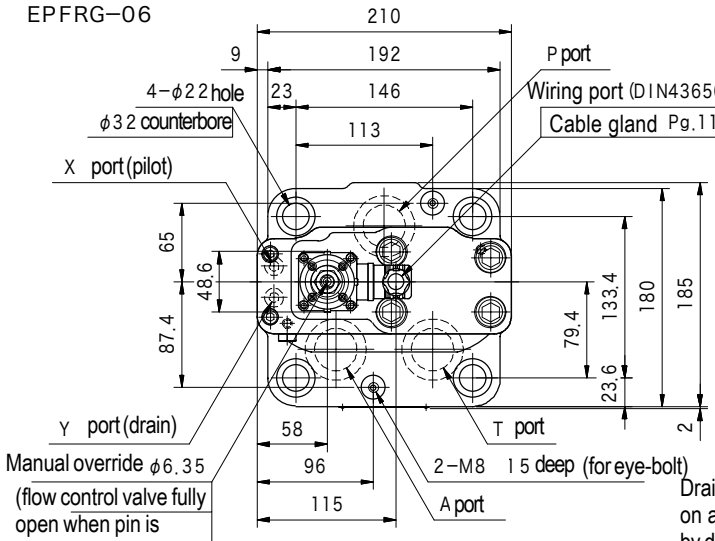
Mounting Dimensions



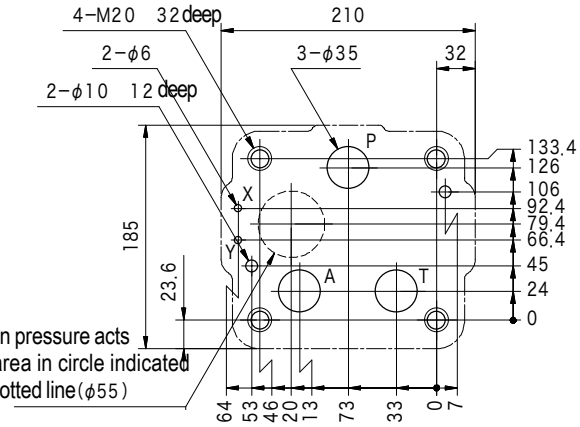


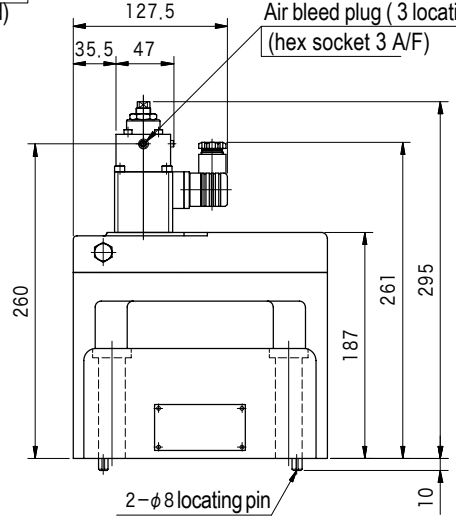


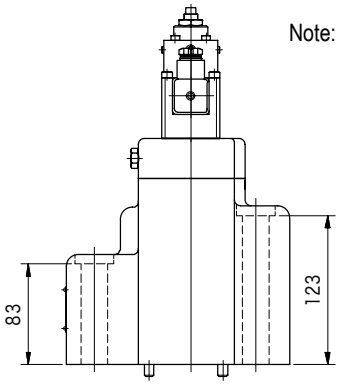
EPFRG–06



Mounting Dimensions



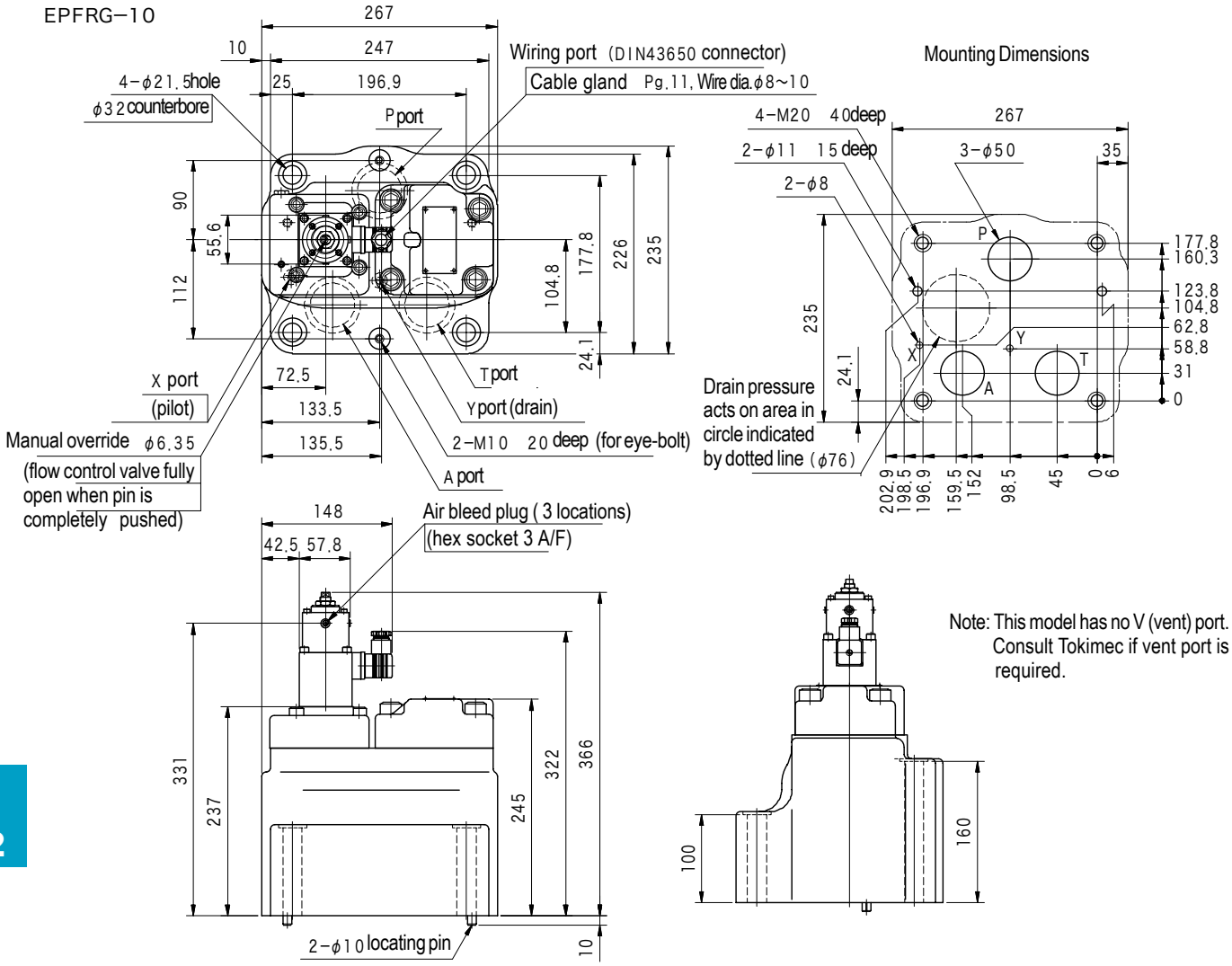




Note: This model has no V (vent) port. Consult Tokimec if vent port is required.

Dimensions

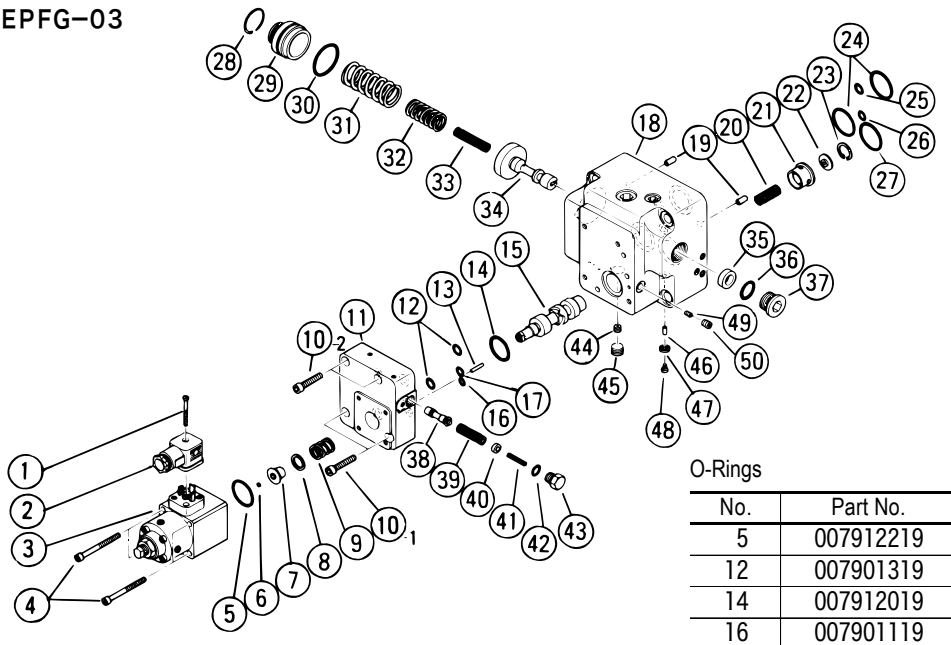
EPFRG–10



Note: This model has no V (vent) port.
Consult Tokimec if vent port is
required.

Construction

EPFG–03

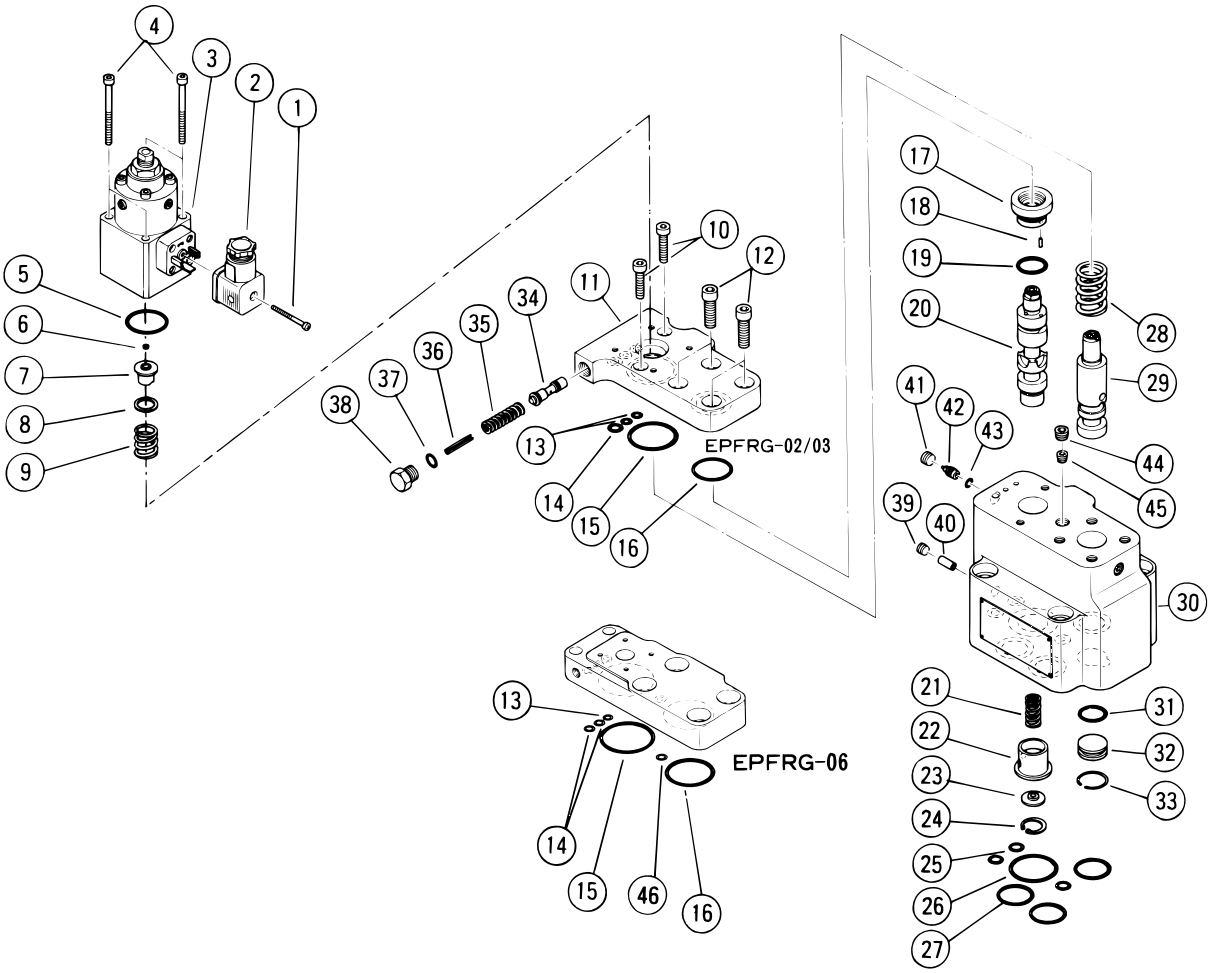


O-Rings

No.	Part No.	Standard	Qty
5	007912219	AS568–122 (NBR, Hs90)	1
12	007901319	AS568–013 (NBR, Hs90)	2
14	007912019	AS568–120 (NBR, Hs90)	1
16	007901119	AS568–011 (NBR, Hs90)	2
17	007901219	AS568–012 (NBR, Hs90)	1
24	007921519	AS568–215 (NBR, Hs90)	2
25	007901319	AS568–013 (NBR, Hs90)	1
26	007901219	AS568–012 (NBR, Hs90)	1
27	007912319	AS568–123 (NBR, Hs90)	1
30	007902819	AS568–028 (NBR, Hs90)	1
36	007991019	AS568–910 (NBR, Hs90)	1
42	007901219	AS568–012 (NBR, Hs90)	1

Construction

EPFRG-02/03/06



O-Rings

EPFRG-02

No.	Part No.	Standard	Qty
5	007912219	AS568-122 (NBR, Hs90)	1
13	007901019	AS568-010 (NBR, Hs90)	2
14	007901119	AS568-011 (NBR, Hs90)	1
15	007912519	AS568-125 (NBR, Hs90)	1
16	007912019	AS568-120 (NBR, Hs90)	1
19	007901819	AS568-018 (NBR, Hs90)	1
25	007901219	AS568-012 (NBR, Hs90)	3
26	007912319	AS568-123 (NBR, Hs90)	1
27	007921319	AS568-213 (NBR, Hs90)	3
31	007911519	AS568-115 (NBR, Hs90)	1
37	007901219	AS568-012 (NBR, Hs90)	1
43	007900719	AS568-007 (NBR, Hs90)	1

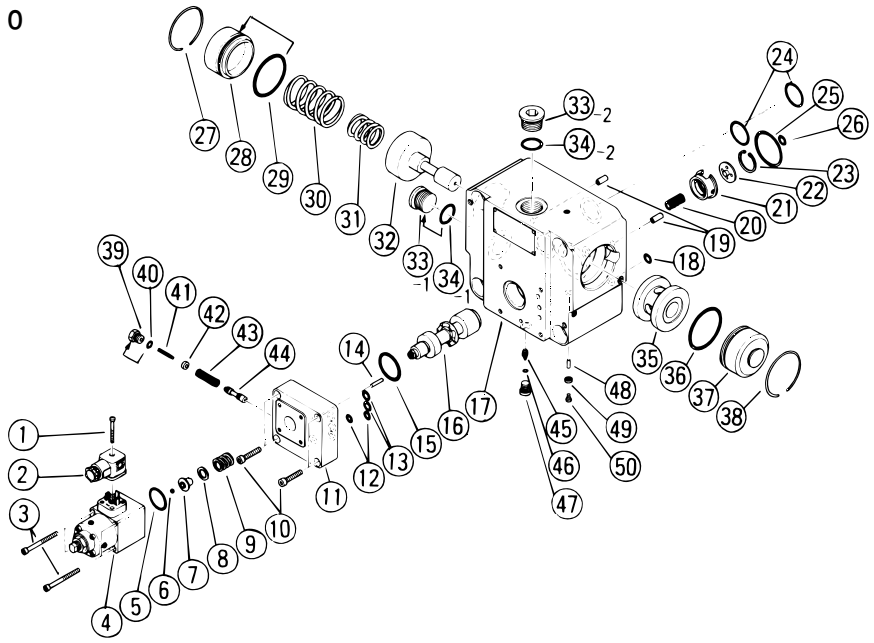
EPFRG-03

No.	Part No.	Standard	Qty
5	007912219	AS568-122 (NBR, Hs90)	1
13	007901019	AS568-010 (NBR, Hs90)	2
14	007901119	AS568-011 (NBR, Hs90)	1
15	007913119	AS568-131 (NBR, Hs90)	1
16	007912719	AS568-127 (NBR, Hs90)	1
19	007912119	AS568-121 (NBR, Hs90)	1
25	007901219	AS568-012 (NBR, Hs90)	3
26	007912919	AS568-129 (NBR, Hs90)	1
27	007921719	AS568-217 (NBR, Hs90)	3
31	007912119	AS568-121 (NBR, Hs90)	1
37	007901219	AS568-012 (NBR, Hs90)	1
43	007900719	AS568-007 (NBR, Hs90)	1

EPFRG-06

No.	Part No.	Standard	Qty
5	007912219	AS568-122 (NBR, Hs90)	1
13	007901119	AS568-011 (NBR, Hs90)	1
14	007901219	AS568-012 (NBR, Hs90)	2
15	007913919	AS568-139 (NBR, Hs90)	1
16	007922819	AS568-228 (NBR, Hs90)	1
19	007912919	AS568-129 (NBR, Hs90)	1
25	007911119	AS568-111 (NBR, Hs90)	2
26	008050619	JIS B 2401 1B-G50	1
27	007922419	AS568-224 (NBR, Hs90)	3
31	007912919	AS568-129 (NBR, Hs90)	1
37	007901219	AS568-012 (NBR, Hs90)	1
46	007901219	AS568-012 (NBR, Hs90)	1

EPFG-06/10



O-Rings

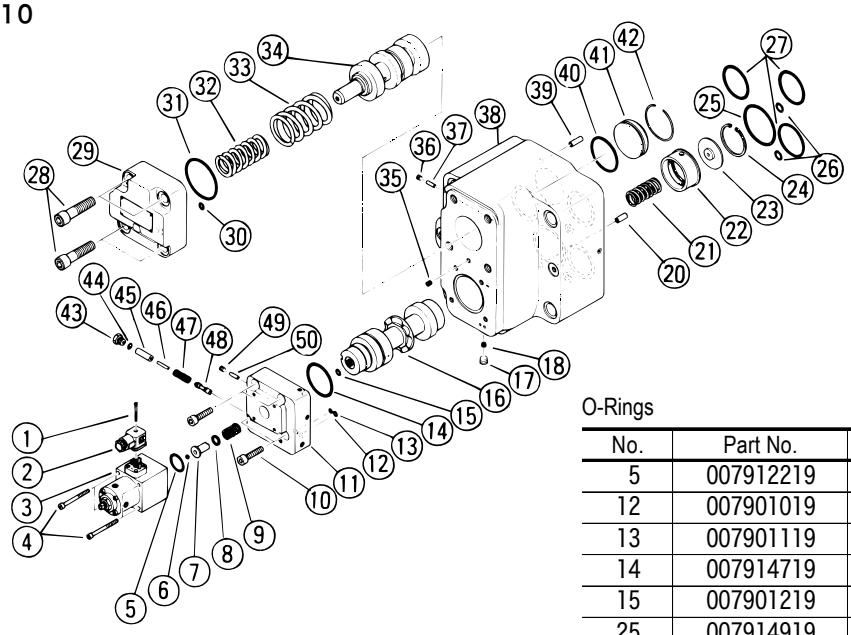
EPFG-06

No.	Part No.	Standard	Qty
5	007912219	AS568-122 (NBR, Hs90)	1
12	007901219	AS568-012 (NBR, Hs90)	2
13	007901319	AS568-013 (NBR, Hs90)	2
15	007912619	AS568-126 (NBR, Hs90)	1
18	007901319	AS568-013 (NBR, Hs90)	1
24	007921719	AS568-217 (NBR, Hs90)	2
25	007913319	AS568-133 (NBR, Hs90)	1
26	007901319	AS568-013 (NBR, Hs90)	1
29	007922619	AS568-226 (NBR, Hs90)	1
34	007991219	AS568-912 (NBR, Hs90)	2
36	007922719	AS568-227 (NBR, Hs90)	1
40	007901219	AS568-012 (NBR, Hs90)	1
46	007900717	AS568-007 (NBR, Hs70)	1

EPFG-10

No.	Part No.	Standard	Qty
5	007912219	AS568-122 (NBR, Hs90)	1
12	007901219	AS568-012 (NBR, Hs90)	2
13	007901319	AS568-013 (NBR, Hs90)	2
15	007913719	AS568-137 (NBR, Hs90)	1
18	007911219	AS568-112 (NBR, Hs90)	1
24	007922419	AS568-224 (NBR, Hs90)	2
25	007914119	AS568-141 (NBR, Hs90)	1
26	007911219	AS568-112 (NBR, Hs90)	1
29	007923219	AS568-232 (NBR, Hs90)	1
34	007921819	AS568-218 (NBR, Hs90)	2
36	007923419	AS568-234 (NBR, Hs90)	1
40	007901219	AS568-012 (NBR, Hs90)	1

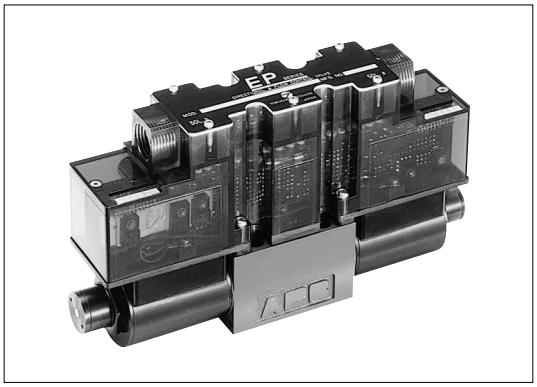
EPFRG-10

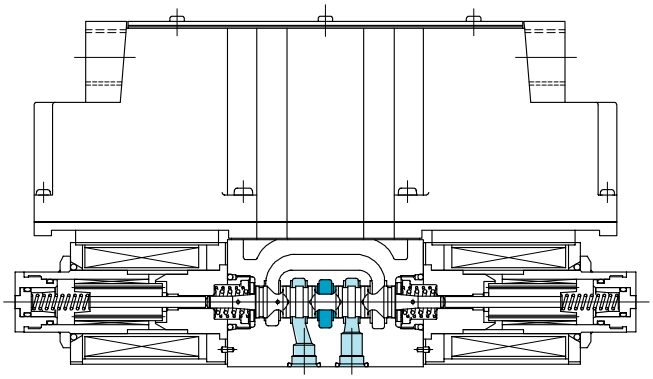


O-Rings

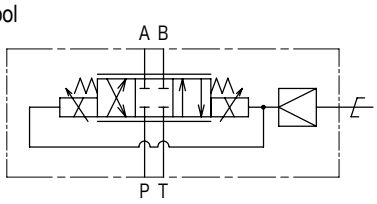
No.	Part No.	Standard	Qty
5	007912219	AS568-122 (NBR, Hs90)	1
12	007901019	AS568-010 (NBR, Hs90)	1
13	007901119	AS568-011 (NBR, Hs90)	1
14	007914719	AS568-147 (NBR, Hs90)	1
15	007901219	AS568-012 (NBR, Hs90)	1
25	007914919	AS568-149 (NBR, Hs90)	1
26	007911219	AS568-112 (NBR, Hs90)	2
27	007922819	AS568-228 (NBR, Hs90)	3
30	007901319	AS568-013 (NBR, Hs90)	1
31	007923219	AS568-232 (NBR, Hs90)	1
40	007922819	AS568-228 (NBR, Hs90)	1
44	007901219	AS568-012 (NBR, Hs90)	1

Proportional directional and flow control valves (direct operated type) EPDG1-3





Functional Symbol



- This valve provides great space saving and shockless operation compared to conventional systems employing 2 or 3 solenoid valves and throttle valves. Onboard amplifier with setting function allows control only with contact signals from sequencers, etc.

Model Code

EPDG1 - 3 - 33 C - 20 -(DA) - 31

1 2 3 4 5 6 7 8

1 Direct acting proportional directional flow control valve
2 Mounting: 3:ISO 4401-03
3 Spool type
2: type 2 33: type 33
4 Spring set C: spring center (3 position)
5 Max. control flow (P to A/B, diff. press. 0.7MPa)
10: 10 L/min 20: 20 L/min
6 Controller
Omit for no controller
A1:Onboard controller (w/setting device)
D:Onboard controller w/DIN connector
7 DIN connector type controllers
A:Analog input
SC:Integrated setting device (3 settings)
8 Design no.
31:Controller A1
21:Except for controller A1

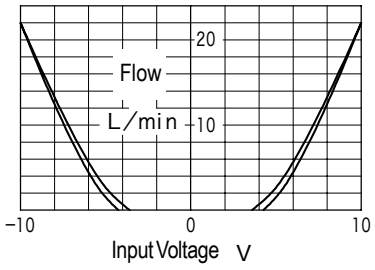
Specifications

Model		EPDG1－3	
Max. operating press.	MPa	21	
Allowable T port back press.	MPa	14	
Max. control flow code		10	20
Min. control flow	L/min (Note 1)	0. 5	1
Max. control flow	L/min (Note 1)	10	20
Rated current	A	1	
Coil resistance	Ω	13 (20 ˚C)	
Dither frequency	Hz	100～110	
Dither current	mA (p-p)	200	
Hysteresis		7 %	
Repeatability		2 %	
Weight	kg	Valve : 2. 4 Amp : 0. 5	

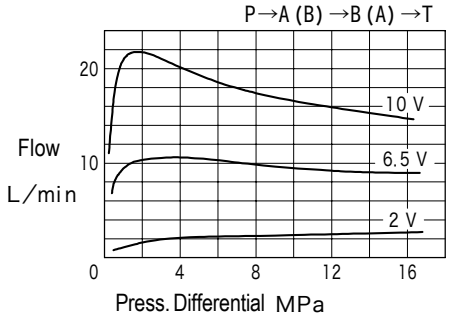
Note 1: P to A/B differential pressure approx. 0.7 MPa.
2: With onboard controller

Performance Curve (at 20mm²/s)

Input Voltage - Flow Characteristics (Example)

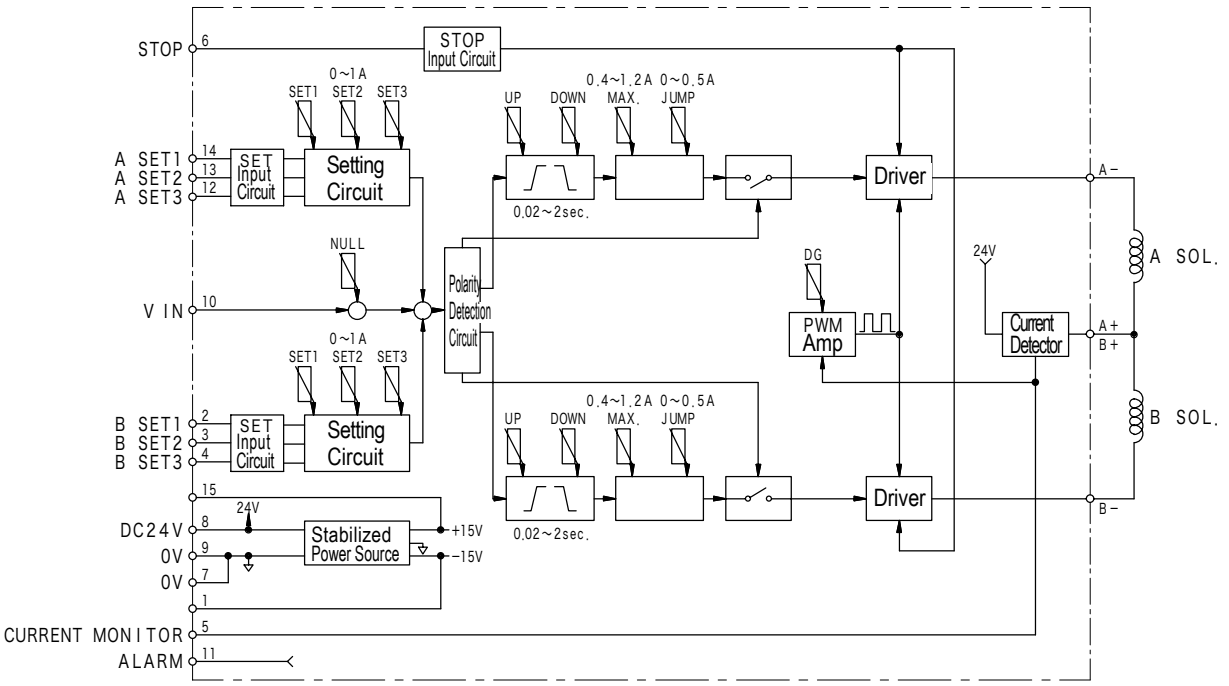


Pressure Differential-Flow Characteristics (Example)

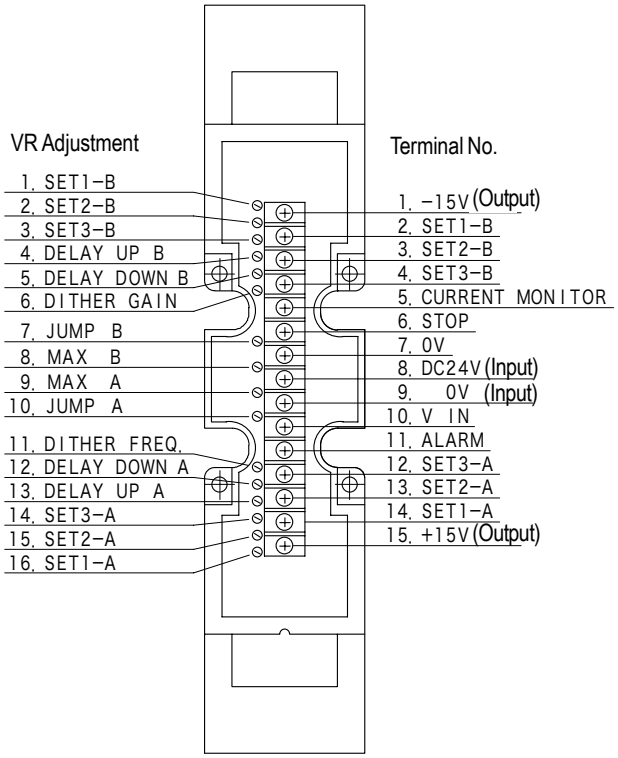


Specifications

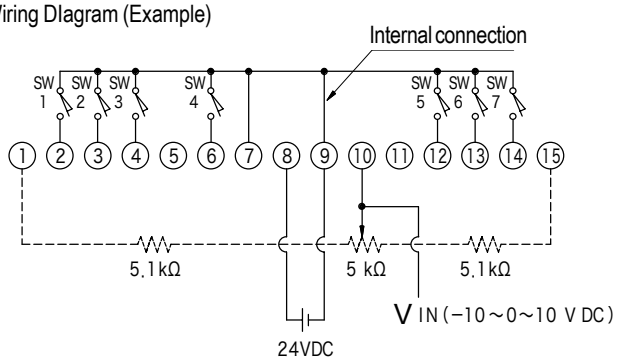
A1 Controller Block Diagram



Terminal Connections, Trimmer Description



Wiring DIagram (Example)



- output of set flow corresponding to SET1-B VR.
- output of set flow corresponding to SET2-B VR.
- output of set flow corresponding to SET3-B VR.
- compulsory input cancellation condition
- output of set flow corresponding to SET3-A VR.
- output of set flow corresponding to SET2-A VR.
- output of set flow corresponding to SET1-A VR.

V IN
Solid line is example of external signal input.
Dotted line is example of signal input utilizing internal current.

Notes on Use

• T Port
Oil should always be filled in T port (tank). Use, for example, of a 0.035MPa cracking pressure check valve is recommended. End of piping should always be below oil level.

Mounting Bolts (JIS B1176, Strength Class 12.9)

Hex Socket Bolts	Qty
M5 × 50	4

• Mounting bolts should be ordered separately.
• Mounting bolt tightening torque: 7~8 Nm

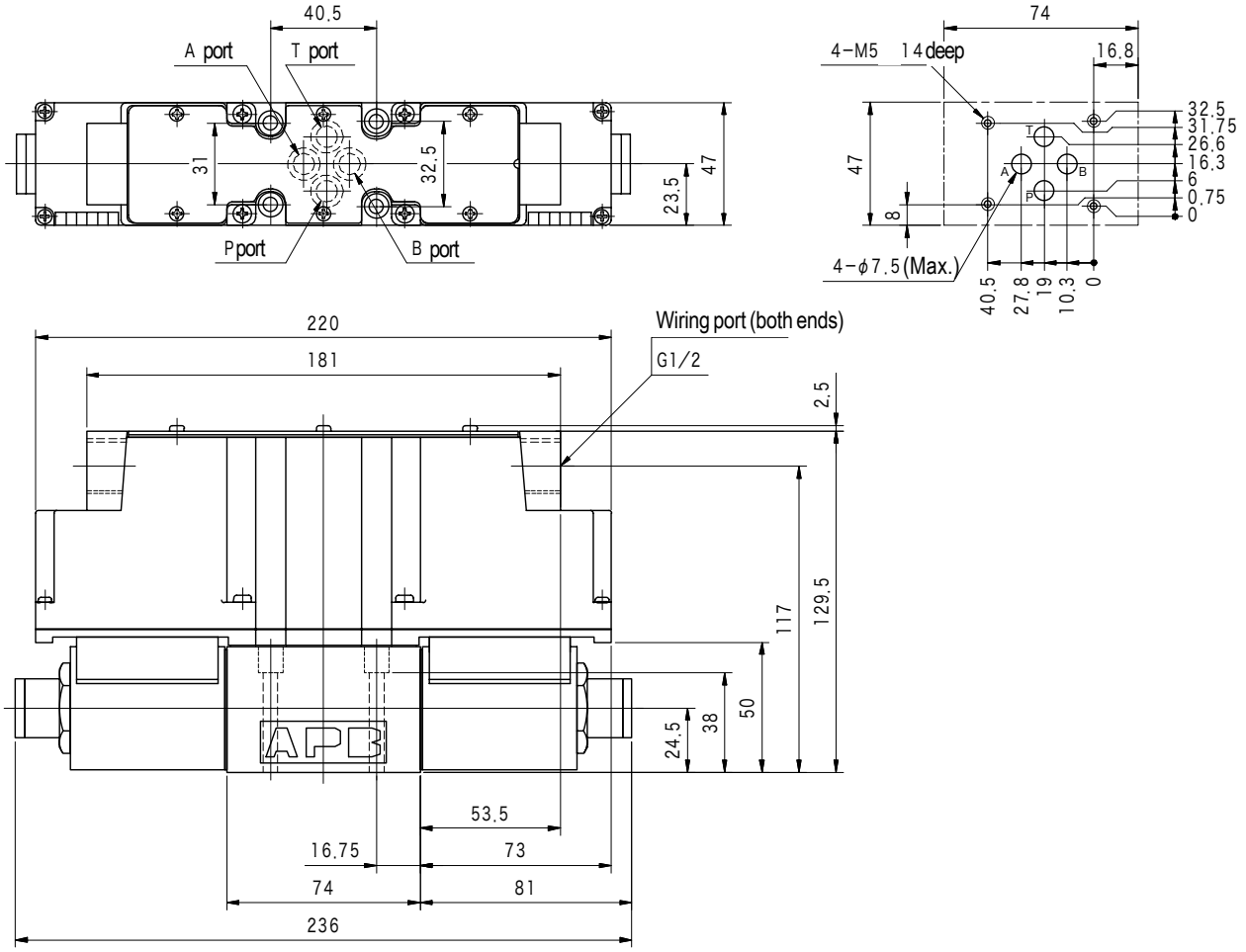
Subplate

Subplate Model		Port Dia. Rc
Side porting	DGMS−3−1E−10−T−JA−J	3/8
Reverse side port'g	DGVM−3−10−T−JA−J	

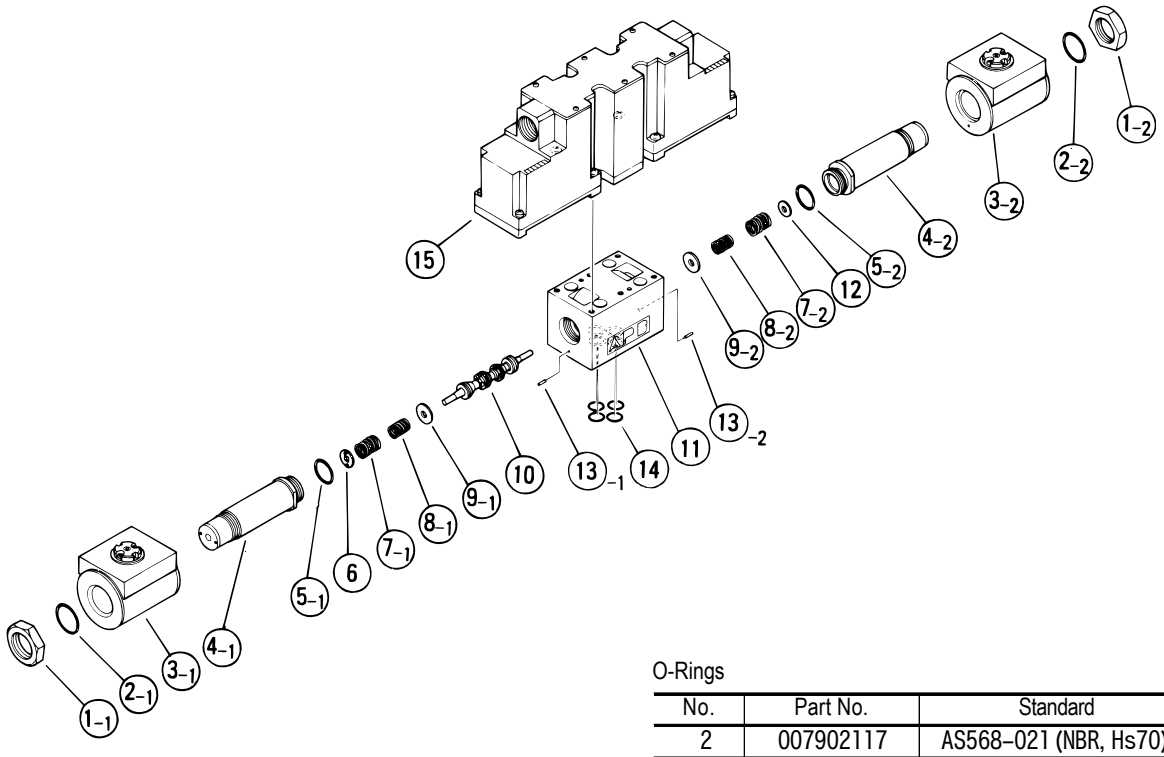
• Mounting bolts are not included.
• Subplate should be ordered separately.
• See page Q8 for dimensions.

Dimensions

Valve Integrated A1 Controller



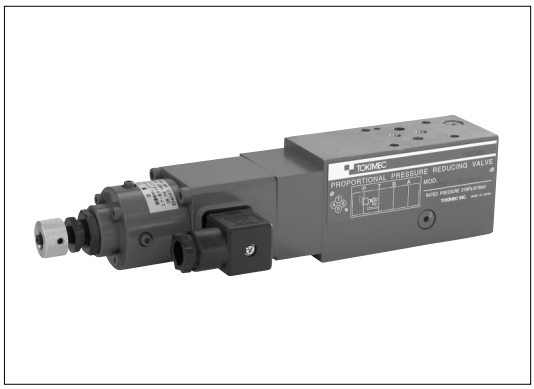
Construction

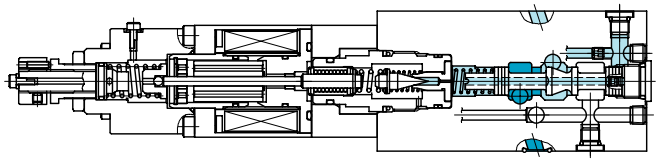


O-Rings

No.	Part No.	Standard	Qty
2	007902117	AS568-021 (NBR, Hs70)	2
5	007911429	AS568-114 (FKM, Hs90)	2
14	007901219	AS568-012 (NBR, Hs90)	4

Proportional pressure reducing modules EPMX2-3/5

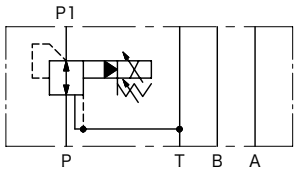




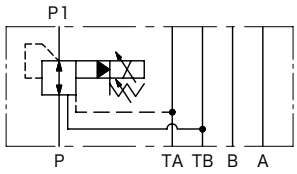
• The EPMX2-3 valve utilizes a proportional solenoid electro-magnetic actuator to provide proportional pressure reducing control in hydraulic circuits.

Functional Symbols

EPMX2−3−PP



EPMX2−5−PP



Model Code

EPMX2 - 3 - PP - 140 - 10

1	2	3	4	5	6

1 Proportional pressure reducing module
2 Mounting
3:ISO 4401-03
5:ISO 4401-05

3 Control port
P:P port
4 Pilot line
P:P line

5 Pressure adjustment range
See 'Specifications' port
6 Design no.
10:EPMX2-3
11:EPMX2-5

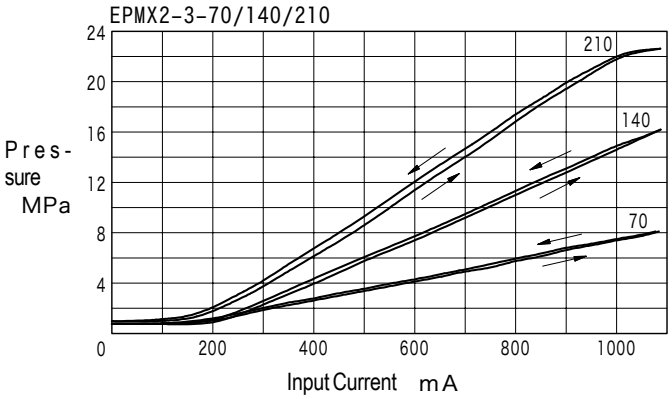
Specifications

Model		EPMX2		
Size/Mounting		3	5	
Max. operating pressure	MPa	21		
Allowable tank port back press.	MPa	7		
Maximum flow	L/min	45	120	
Pressure adjustment range code		70	140	210
Press. adjustment range	MPa	0. 8～7	1～14	1. 5～21
Rated current	A	1		
Coil resistance	Ω	14		
Hysteresis		Less than 3% (Note 1)		
Repeatability		Less than 1% (Note 2)		
Weight	kg	4. 2	5. 2	

Note 1) Value based on P-X-14 controller or equivalent.
Note 2) Value of valve used under identical operating conditions, using special controller.

Performance Curve (at 20mm²/s)

Input Current - Pressure Characteristics



Notes on Use

- Air bleed
  For stable pressure control, during the initial adjustment, loosen the air bleed plug and bleed air completely out of the valve prior to use.
- Manual adjustment
  In case of initial adjustment or during electrical failures, etc., when there is no input electrical current, the manual operation knob can be used to set pressuress. During control by solenoid, operate valve after returning knob fully to the left.

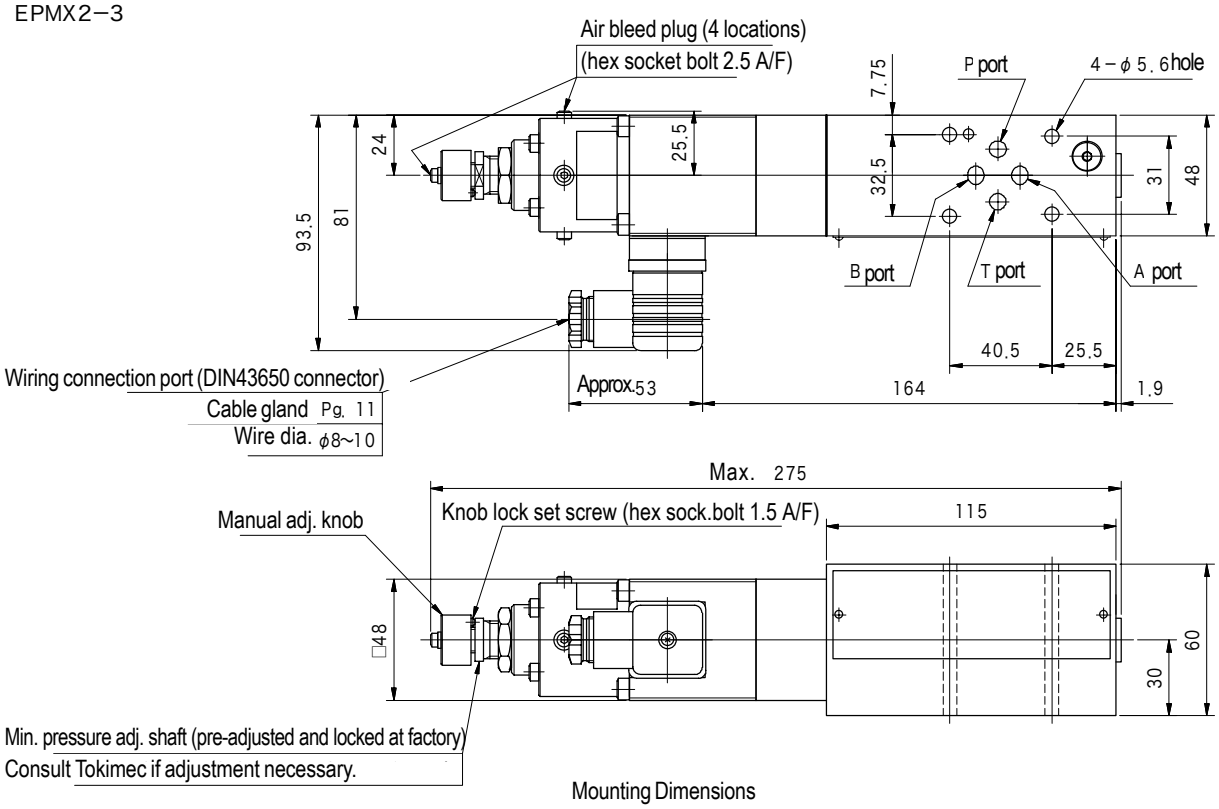
Mounting Bolts (JIS B1176, Strength Class 12.9)

Model	Hex Socket Bolt	Qty
EPMX2-3	M5	4
EPMX2-5	M6	4

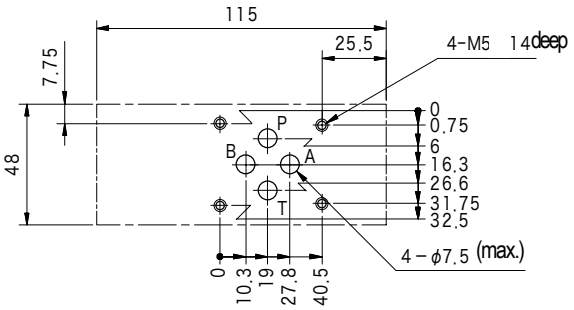
- Mounting bolts must be ordered separately.
- For mounting bolt lengths, see page G34 (EPMX2-3) or G64 (EPMX2-5).
- Mounting bolt tightening torque
  M5:7~8N·m
  M6:12~15N·m

Dimensions

EPMX2-3

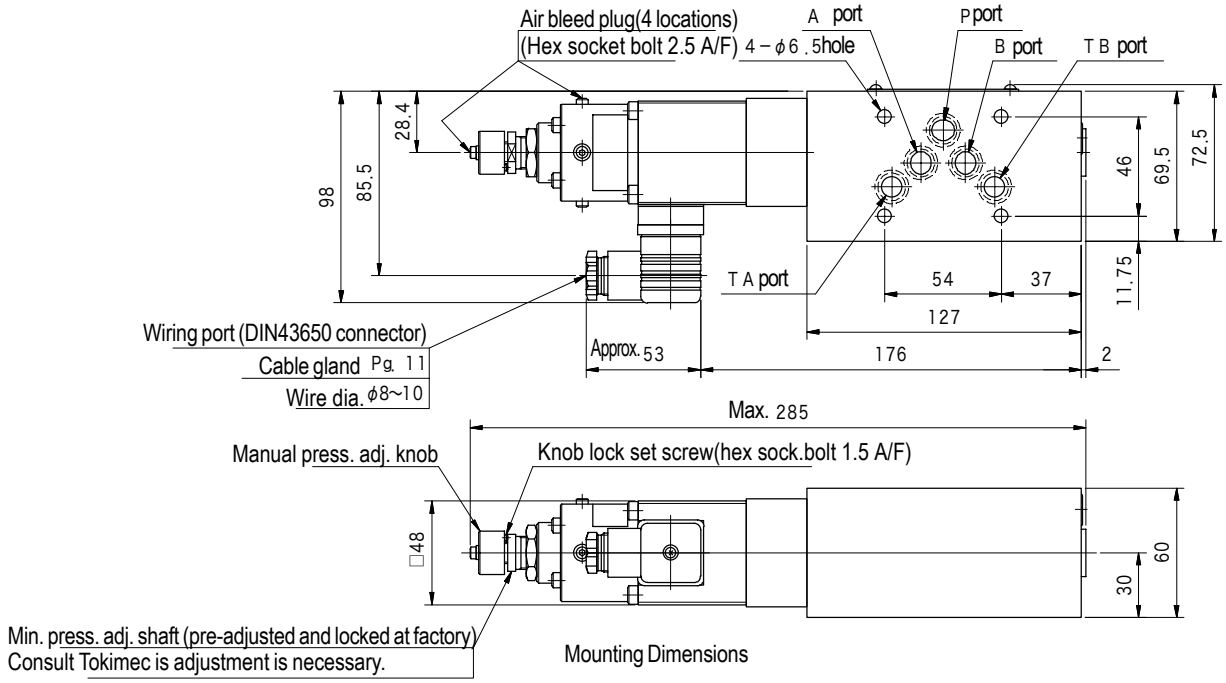


Mounting Dimensions

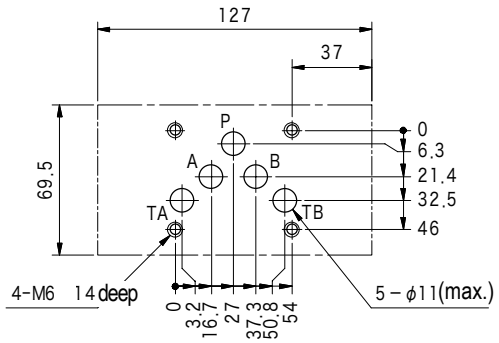


Dimensions

EPMX2−5



Mounting Dimensions



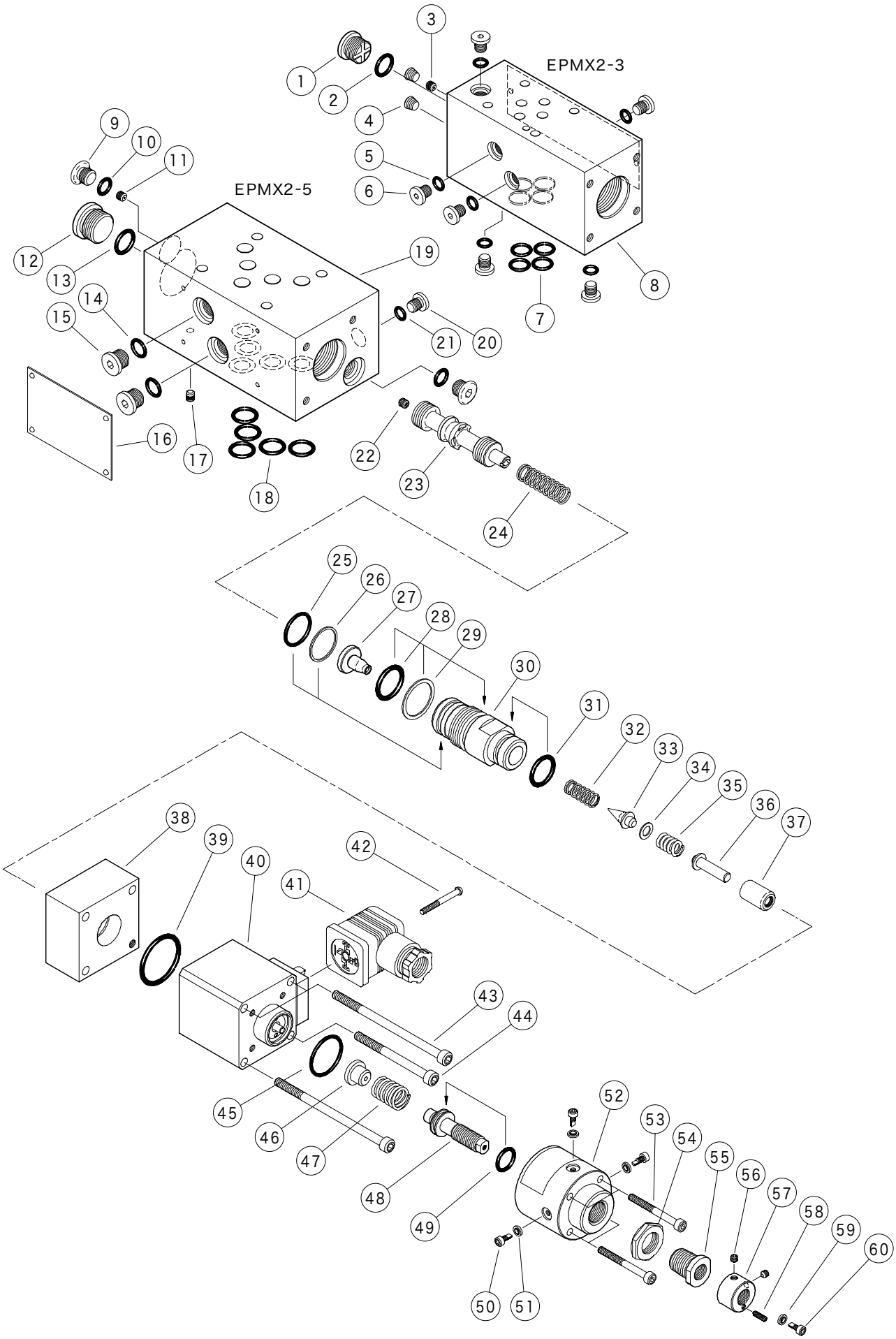
Construction

EPMX2−3

No.	Description	Part No.	Standard	Qty
2	O-Ring	007990619	AS568−906 (NBR, Hs90)	1
5	O-Ring	007990219	AS568−902 (NBR, Hs90)	6
7	O-Ring	007901219	AS568−012 (NBR, Hs90)	4
25	O-Ring	007901829	AS568−018 (FKM, Hs90)	1
26	Backup Ring	40026367	———	1
28	O-Ring	007911729	AS568−117 (FKM, Hs90)	1
29	Backup Ring	40026368	———	1
31	O-Ring	008001617	JIS B 2401−1A−P16	1
39	O-Ring	007912217	AS568−122 (NBR, Hs70)	1
45	O-Ring	007902117	AS568−021 (NBR, Hs70)	1
49	O-Ring	007901417	AS568−014 (NBR, Hs70)	1

EPMX2−5

No.	Description	Part No.	Standard	Qty
10	O-Ring	008000619	JIS B 2401−1B−P8	2
13	O-Ring	007990819	AS568−908 (NBR, Hs90)	1
14	O-Ring	007990419	AS568−904 (NBR, Hs90)	2
18	O-Ring	007901419	AS568−014 (NBR, Hs90)	5
21	O-Ring	007990219	AS568−902 (NBR, Hs90)	1
25	O-Ring	007901829	AS568−018 (FKM, Hs90)	1
26	Backup Ring	40026367	———	1
28	O-Ring	007911729	AS568−117 (FKM, Hs90)	1
29	Backup Ring	40026368	———	1
31	O-Ring	008001617	JIS B 2401−1A−P16	1
39	O-Ring	007912217	AS568−122 (NBR, Hs70)	1
45	O-Ring	007902117	AS568−021 (NBR, Hs70)	1
49	O-Ring	007901417	AS568−014 (NBR, Hs70)	1


EPMX2-3
EPMX2-5
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EP series proportional valve controllers (valve mounted type) EPAD

• The EPAD should be used with EP series proportional solenoid valves with DIN connectors (DIN43650).
• Compared to conventional onboard controllers, the EPAD is very compact and can be mounted and removed easily.
• Because of direct mounting on proportional solenoid control valves, the controller itself is designed for minimum heat generation.
• Two types of EPAD (analog input type, 3 settings type) are offered to meet various system needs.

Model Code

EPAD- A -1A- 12

1 2 3 4

1 Plug on DIN connector type controller J32
2 Functions
Analog input type
A: LAG function control possible
AL: LAG function in constant operation
Internal setting (3-setting type)
SC: LAG function in constant operation

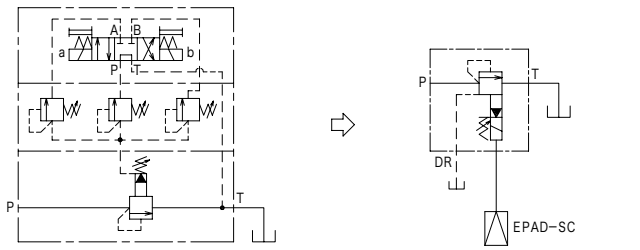
3 Output signal
1A:0~1A
1A6:0~1.6A
4 Design no.

Specifications

Model	EPAD-＊＊-1A-12	EPAD-＊＊-1A6-12	Model	EPAD-＊＊-1A-12	EPAD-＊＊-1A6-12
Power supply	DC21～28 V	DC19～28 V	＊2 ST1～3 adj. range	0～0. 99 A	0～1. 65 A
Rated output current	1 A	1. 6 A	＊2 NULL adj. range	0～0. 47 A	0～0. 78 A
＊1 Input impedance	20 kΩ	20 kΩ	Operating temp. range	−20 ℃～+70 ℃	−20 ℃～+70 ℃
Dither adj. range	90～300 Hz	90～300 Hz	Environmental	IP65 (valve mounted)	IP65 (valve mounted)
＊1 Max. adj. range	36～105 mA/V	60～176 mA/V	Weight	120 g	120 g
＊1 Jump adj. range	0～0. 47 A	0～0. 83 A			
LAG adj. range	5～1100 ms (時定数)	5～1100 ms			

＊1：Applicable to EPAD-A(L)-**-12 time constant
＊2：Applicable to EPAD-SC-**-12 time constant

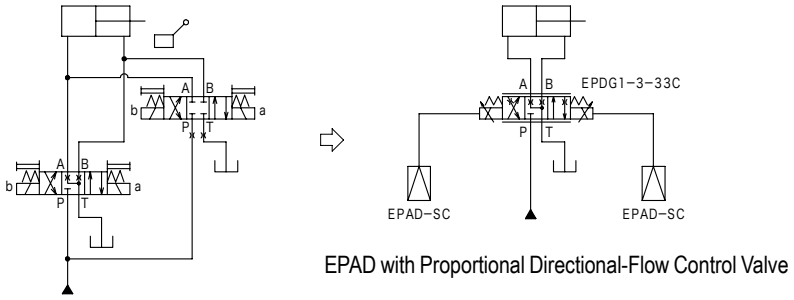
• 1A output type suitable for solenoid coil resistance 10 ~14Ω (20°C), 1.6A output type is suitable for solenoid coil resistance 6~10Ω (20°C).
• Three settings type incorporates 3 setting trimmers. These can be used to set pressure and flow with analog input unnecessary, for direct drive by commercially available sequencers. Mounting the EPAD on proportional solenoid relief valves provides 4 stage pressure control and also independent control of pressure rise and fall response profiles.



Conventional Circuit　　EPAD with Proportional Relief Valve

Proportional Solenoid Relief Valve Application

Specifications



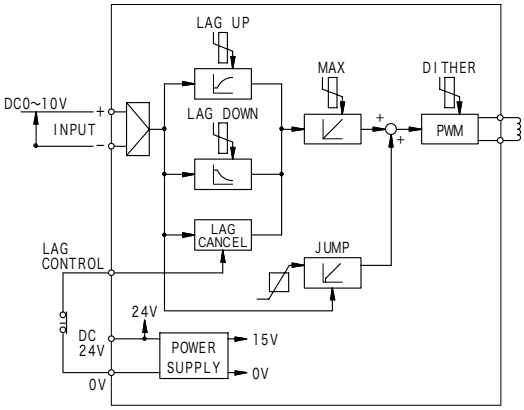
Conventional Circuit

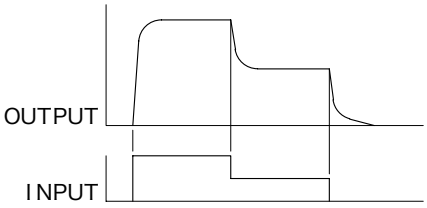
EPAD with Proportional Directional-Flow Control Valve

Proportional Solenoid Directional-Flow Control Valve Application

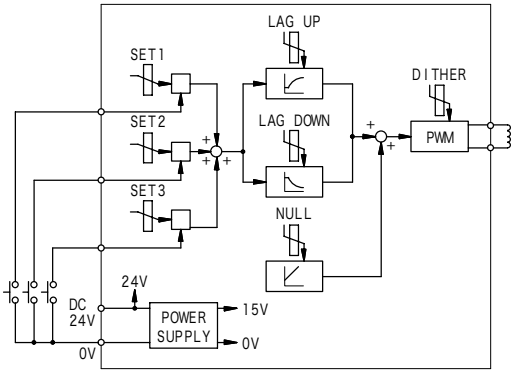
Block Diagram

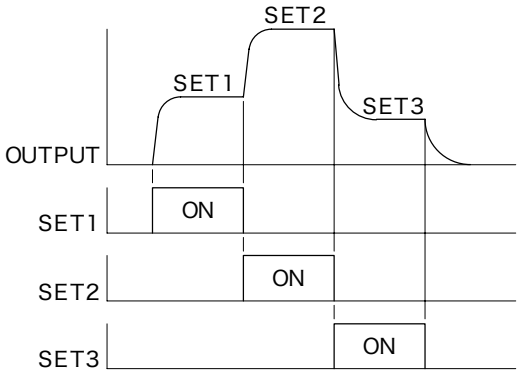
●EPAD-A(L)





●EPAD-SC





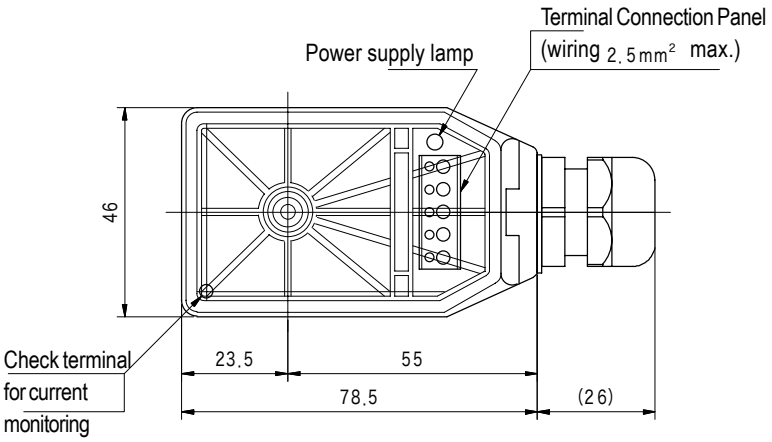
Notes on Use

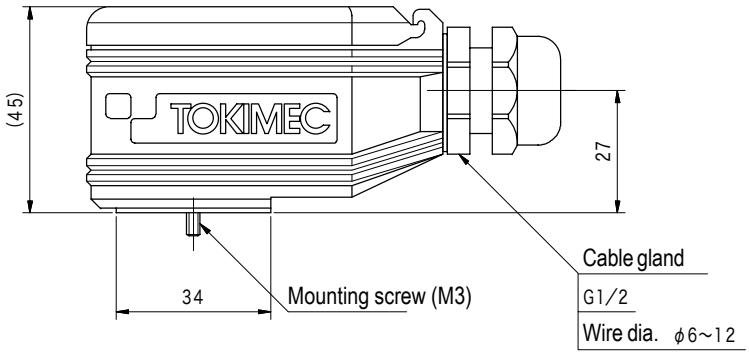
• Input signal cables are shielded, grounding should be done on signal generator side.
• Settings prior to shipment from manufacturer.

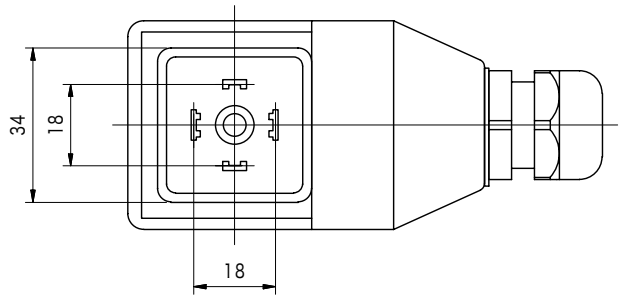
MAX	set at rated output current (at input signal 10V)
NULL, JUMP	set at minimum
Input and LAG setters	set at minimum
DITHER	adjusted to 160Hz

• Appropriate wire size should be max. 2.5mm^2 for wiring to terminal panel.

Dimensions

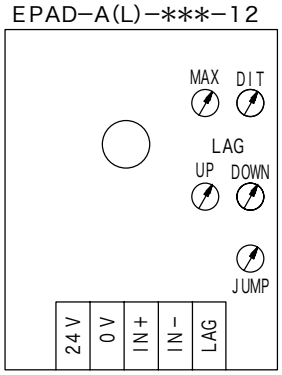




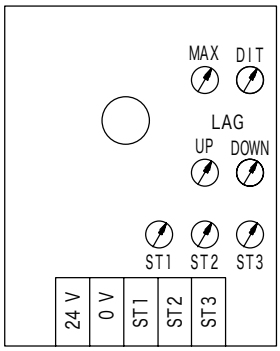


Terminal Connection, Trimmer Placement

EPAD−A(L)−∗∗∗−12



EPAD−SC−∗∗∗−12



Note: "DIT" indicates DITHER.

Note: Gasket for DIN connector mounting not included and must be ordered separately.

EP series proportional valve controllers P-X

Model Code

P-X - (J)-(W) -14

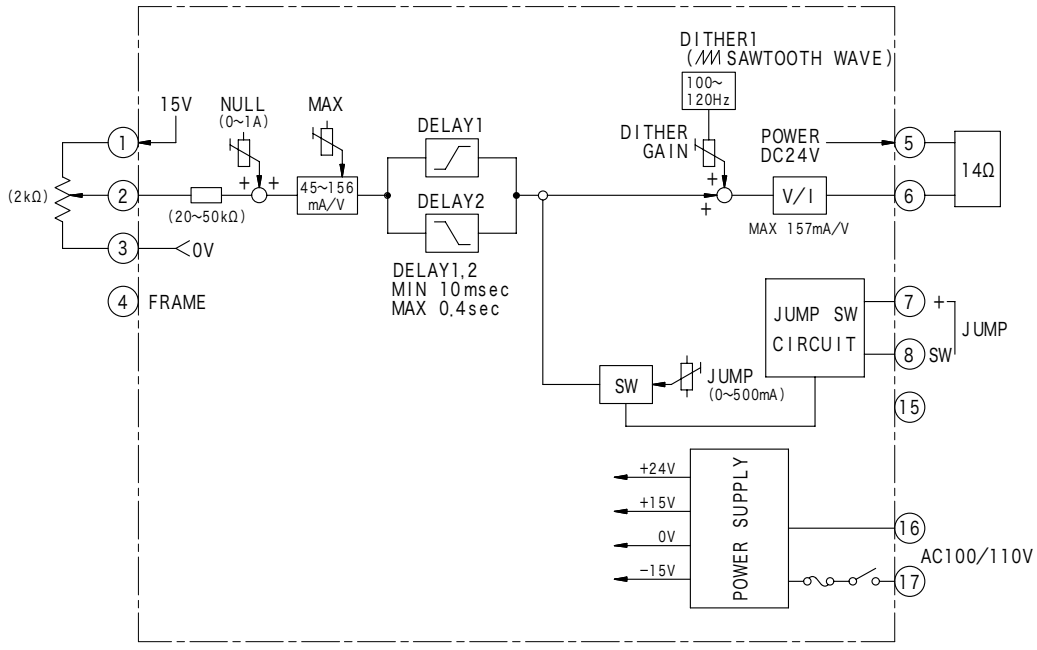
1 2 3 4 5

1 Controller for EP Series
2 Control method
X:Open loop
3 Deadband adjustment
Omit for external contact point switching
J:Internal contact point switching
4 Mounting
Omit forpanel mounting
W:Wall mounting
5 Design no.

Specifications

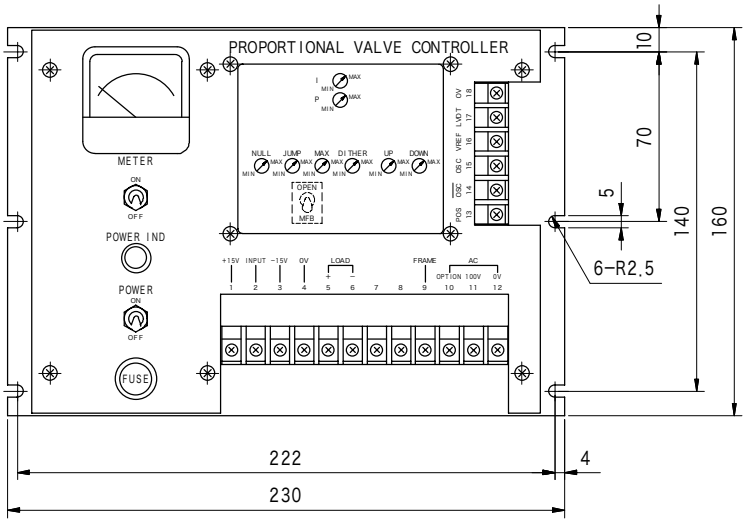
Power supply	AC100/110 V 50/60 Hz
Max. pwr. consumption	45 VA
Input signal voltage	0～10 V
Input impedance	24 kΩ (at input 10V, output 1A)
Output current J35	0～1 A
Load resistance	14～19 Ω
Dither frequency	100～120 Hz
Dither current	0～400 mA (P-P)
Linearity	Less than 1%
Operating temp.	0～50 ℃
Storage temp.	−10～+75 ℃
Relative humidity	30～90 %

Block Diagram (Example of P-X-14)

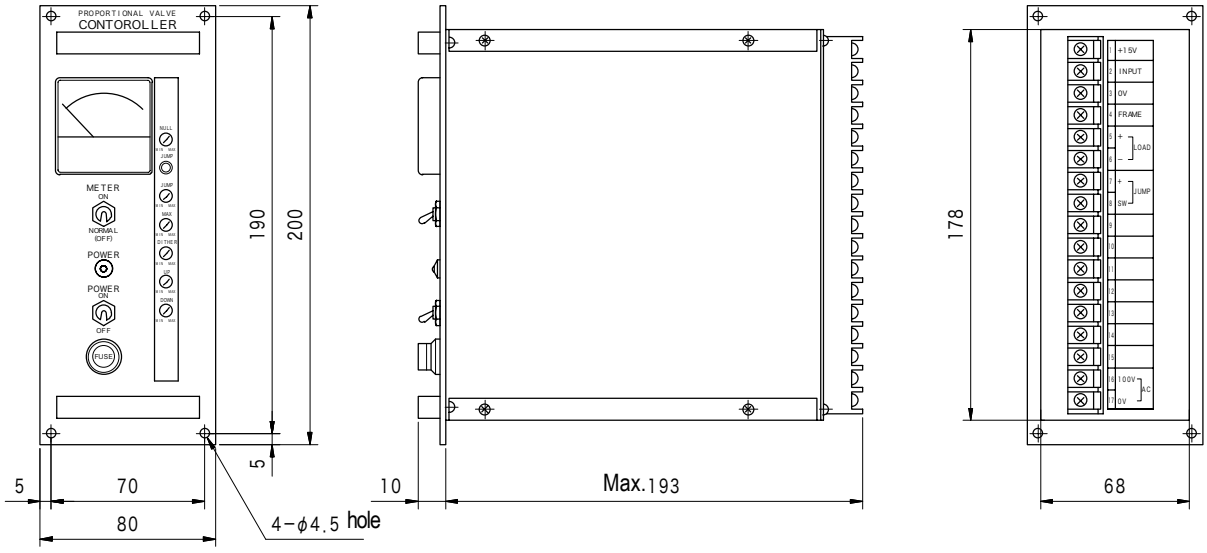


Dimensions

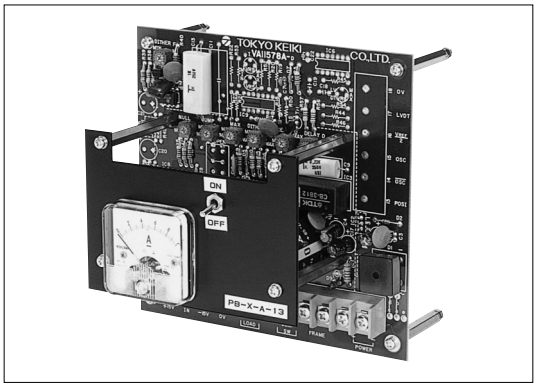
P−X−(J)−W−14



P−X−(J)−14



EP series proportional valve controllers (PCB type) PB-X/Z



Model Code

PB- X -(J)- (A) - 14

1 2 3 4 5

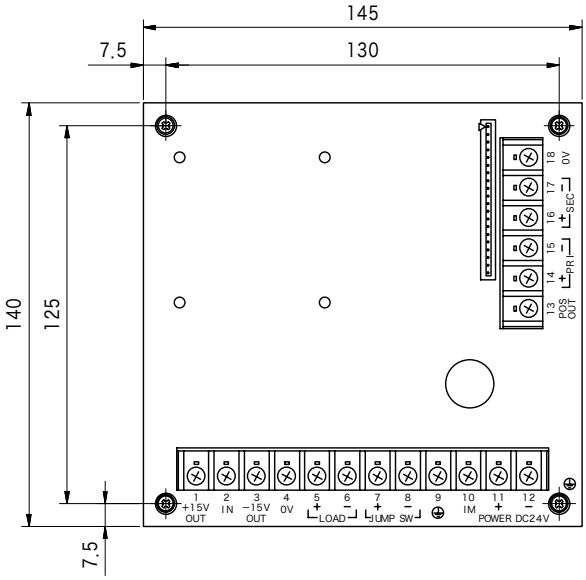
1 Controller board for EP Series
2 Control method
X: open loop
Z: position sensor(LVDT) closed loop
3 Deadband adjustment
Omit for external setting
J: internal setting switch
4 Ammeter
Omit for no meter
A: w/meter
5 Design no.

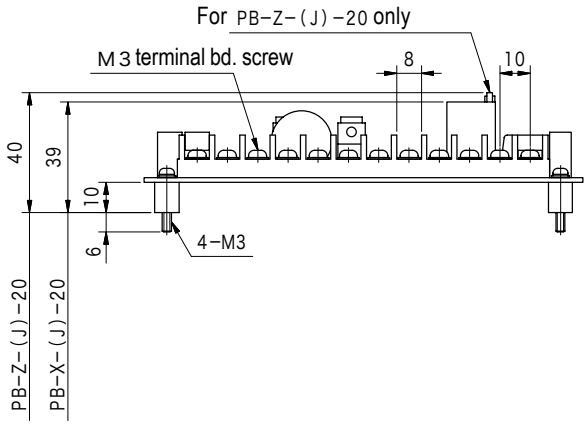
Specifications

Power supply	DC24 V±5 % 1.1 A
Input signal voltage	DC0～10 V
Input impedance	24 kΩ (at input 10V, output 1A)
Output current	0～1 A
Load resistance	14～19 Ω
Dither current	0～400 mA (p-p)
Dither frequency	100～120 Hz
Operating temp.	0～50 ℃

Dimensions

PB−X−(J)−20／PB−Z−(J)−20





EP series proportional valve controllers (multi-channel type) EPA

- One output for 2 input design with 2 stage switching on input signal. Three circuits are in parallel allowing simultaneous drive of 3 proportional valves.
- Output section provides fixed current control so output current always remains fixed even with changes in load resistance.
- 6S3, 6D3 types incorporate feedback circuits to drive flow control valves with position sensors providing accurate flow control compared to open loop systems.

Model Code

EPA - 6 X 3 -A- 10

1 2 3 4 5 6

1 EP Series multi-channel controller
2 Input no.
6: 2 input/1 output X 3 channel
3 Control modes

Code	Open Loop	Closed Loop w/ Position Sensor (LVDT)
X	All channel	—
S	Channel 2, 3,	Channel 1
D	Channel 3	Channel 1, 2

4 Output no.
3:3 Output
5 Output waveform

Waveform	Integral Waveform			First Order Lag Waveform		
Channel No.	1	2	3	1	2	3
Omitted	○	○	○	—	—	—
A	—	—	—	○	○	○
B	○	—	—	—	○	○
C	—	○	—	○	—	○
D	—	—	○	○	○	—

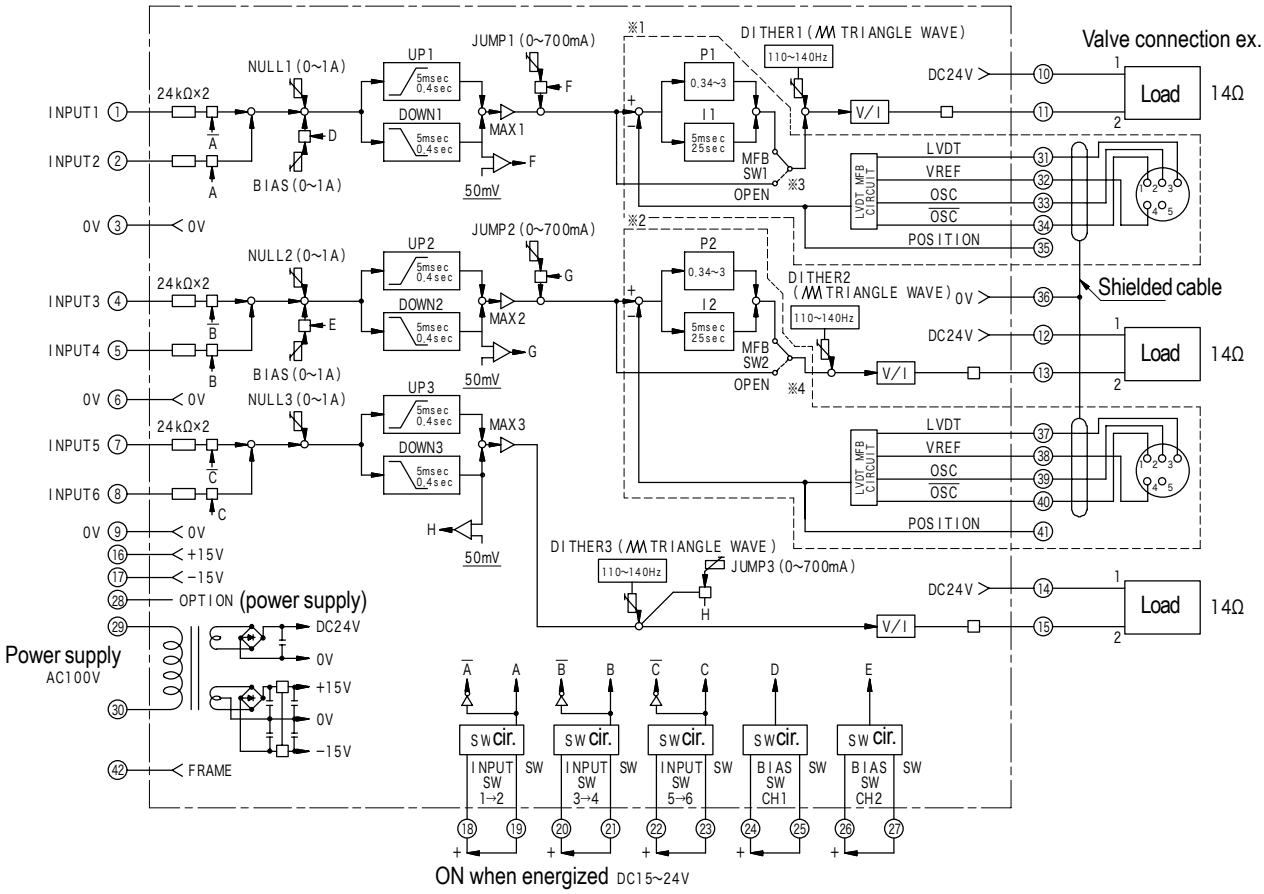
6 Design no.

Specifications

Power supply	AC100/110 V 50/60 Hz
Max. power consumption	80 VA
Input signal voltage	DC0～10 V
Input impedance	22 kΩ
Output current	0～1 A/1ch
Load resistance	14 Ω (at20 ˚C)
Dither frequency	110～140 Hz
Dither current	Channel : 0～400 mAp-p (triangle wave) Channel : 0～300 mAp-p (triangle wave)
Linearity	Less than 1% (command voltage vs. current)
Operating temp.	0～50 ˚C
Storage temp.	−10～+75 ˚C
Relative humidity	30～90 %
Weight	4 kg

Specifications

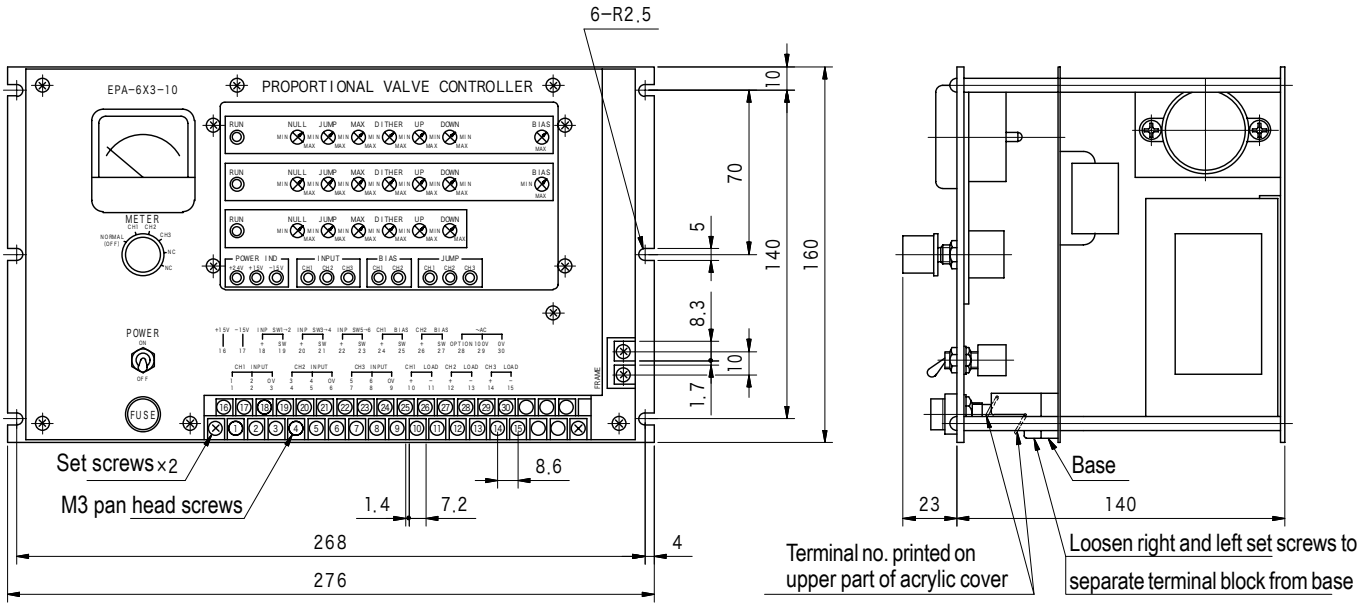
Block Diagram



Model Code	With/Without Circuit		With/Without Switch	
	※1	※2	SW1	SW2
EPA−6X3−(*)−10	W/O	W/O	W/O ※3 connec.	W/O ※4 connec.
EPA−6S3−(*)−10	With	W/O	With	W/O ※4 connec.
EPA−6D3−(*)−10	With	With	With	With

According to the model code, configuration of unit bordered by the dotted line is shown in the above table.

Dimensions



Note: Drawing above is for EPA-6×3-(*)-10
Dimensions of EPA-6S3-(*)-10, EPA-6D3-(*)-10 are same as above drawing but appearance of terminal block section differs.

Signal controllers EC-4S

Model Code

EC-4S - 100 - 12

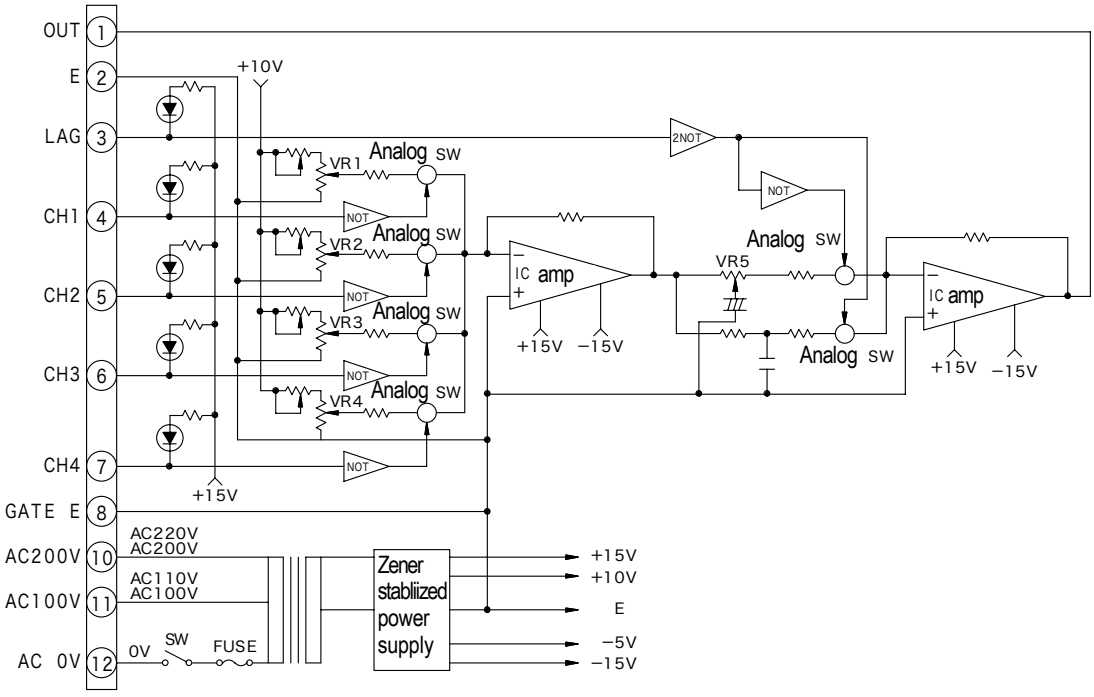
1	2	3

1 4 Channel signal controller
2 Lag time
100:Max. 5 sec.
22:Max. 1 sec.
3 Design no.

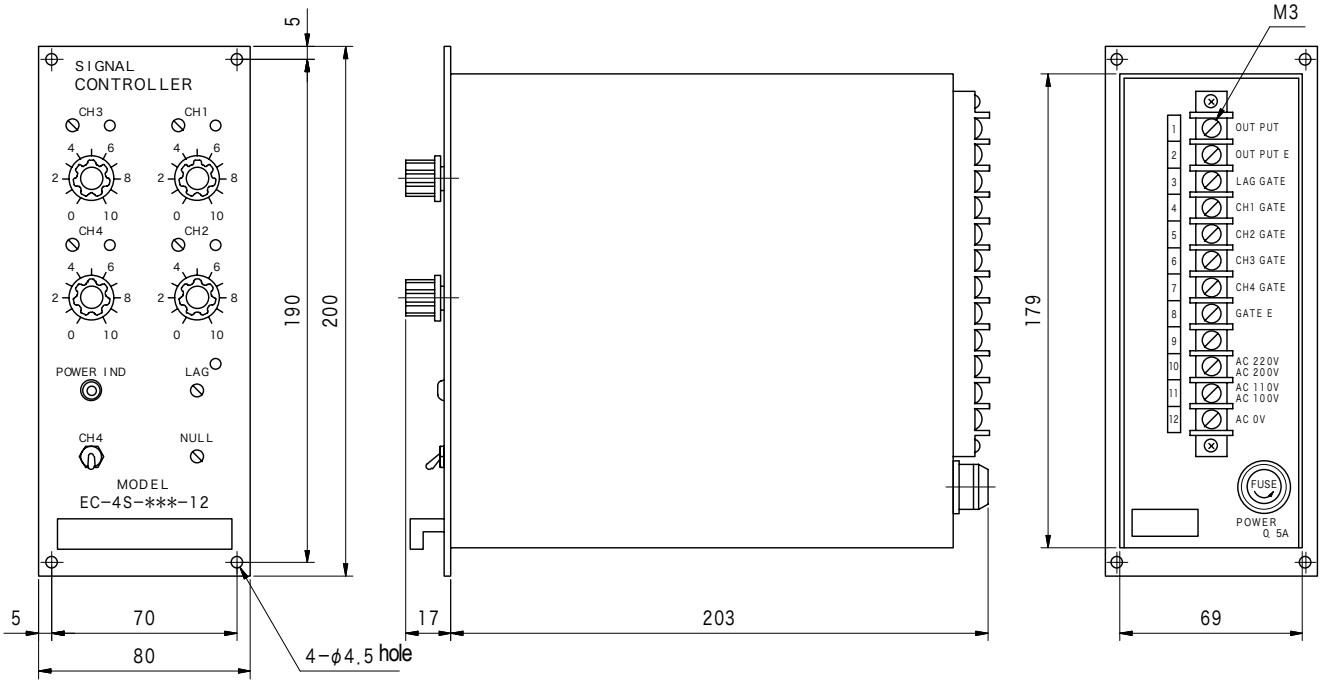
Specificatons

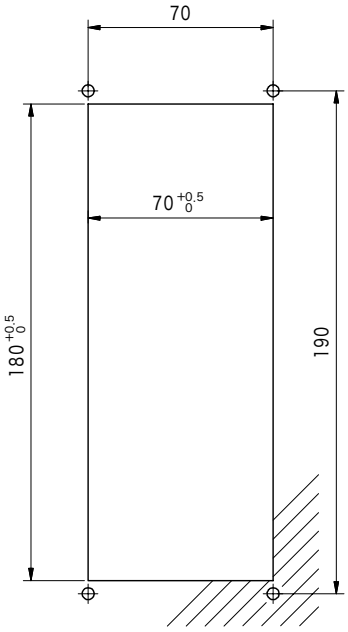
Power supply	AC100/110, AC200/220 V 50/60 Hz 20 VA
Input cont. pt. capacity	DC24 V 20 mA
Output signal	DC0～＋10 V
Linearity	Less than0.5% (FULL SCALE)
NULL adjustment	±2 % (FULL SCALE)
LAG adjustment	0. 5～5 sec.—EC-4S-100-12 0. 1～1 sec.—EC-4S-22-12
Drift	Less than 0.5% (FULL SCALE)
Temp. drift	Less than 1.0% (FULL SCALE)
Operating temp.	0～50 ℃
Storage temp.	－10～80 ℃
Relative humidity	25～95 %
Weight	Approx.2.5Kg

Block Diagram



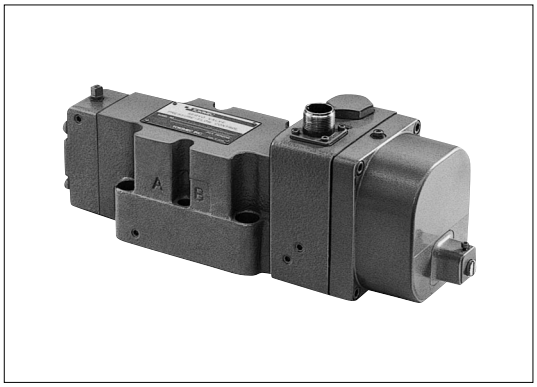
Dimensions

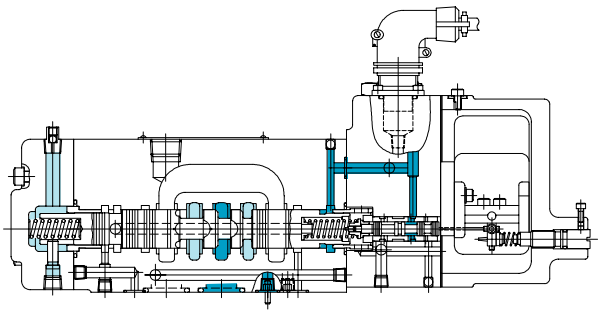




Panel Cut Dimensions

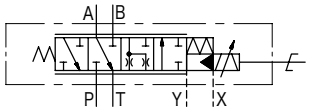
3way servo valves ST3



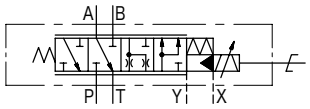


- Simple constructions allows easy maintenance and adjustment.
- This valve is particularly suitable for multifunction control on injection molding machines with functions including injection speed control, back pressure control, and dwell pressure control.

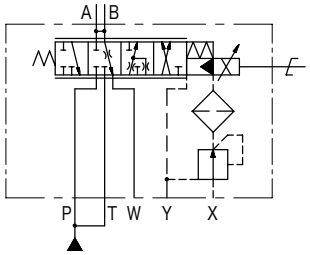
Functional Symbols



ST3−7−A



ST3−7−B



ST3−H7

Model Code

ST3 - 7 -(B)- 350 - 10 - 12

1	2	3	4	5	6

1 Three-Way Servo Valve
2 Mounting
7:ISO 4401-07
H7:ISO 4401-07with W port
3 Spool (see Functional Symbols, for ST3-7)
4 Rated flow (see Specifications)
5 Flow under press. control (see Specifications)
6 Design no.
12:ST3-7
11:ST3-H7

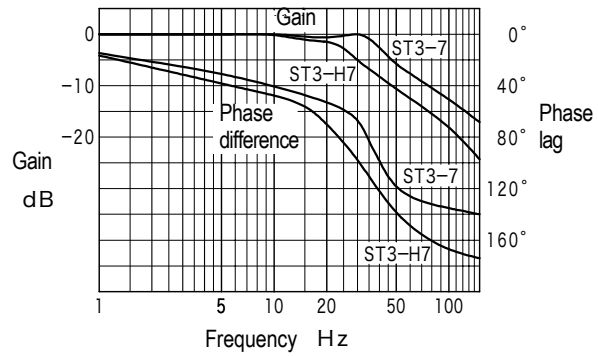
Specifications

Model	ST3−7	ST3−H7
Max. operating pressure	20 MPa (Y port 0.1 MPa)	
Rated flow	(Differential pressure, 3.5MPa) 100 : 100 L/min (Type A) ※ 200 : 200 L/min (Type B) ※ 350 : 350 L/min (Type B) ※	(Differential pressure, 1MPa) 700 : 700 L/min
Pressure adj. range	0〜20 MPa	
Required flow in pressure control model	10 : 10 L/min 20 : 20 L/min	20 : 20 L/min 40 : 40 L/min
Pilot pressure	5〜7 MPa	Above 7 MPa
Pilot flow (steady state, 7MPa)	Approx. 3 L/min	Approx. 5 L/min
Hysteresis	Less than 2 %	
Frequency response	Approx. 36 Hz (−3 dB)	25 Hz (−3 dB)
Operating termperature	0〜60 ℃ (fluid temperature)	
Fluid viscosity	32〜68 mm^2/s (40 ℃)	
Operating method	Flow control method, hydraulic pilot operated with force feedback control	
Electro-magnetic actuator	Torque motor 40 Ω (20 ℃) coil × 2	
Input current	−400〜+400 mA (parallel connection)	
Dither input	50〜70 mA rms/coil, approx.350 Hz	
Power consumtion	3.2 W (1.6 W/w/coil), 20 ℃	
Filtration (nominal)	P, A, B, T port : 25 μm X (pilot port) : 10 μm	
Weight	12.5 kg	21 kg

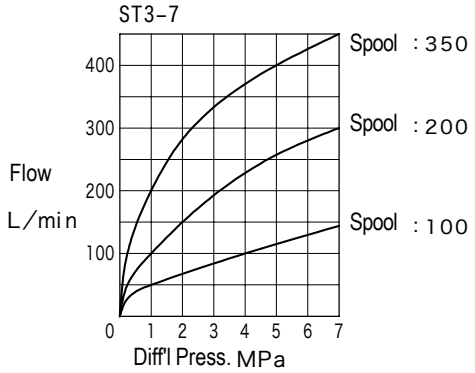
※ Type A: A port connection to actuator.
Type B: A or B port connection to actuator.
(For ST3-H7, A or B port connection to actuator)

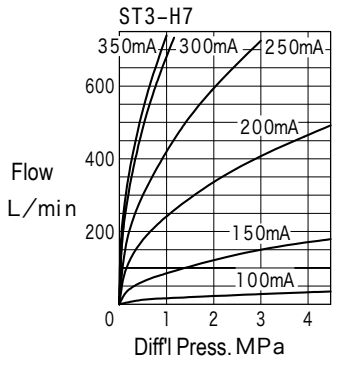
Characteristics Curves

Frequency Response (Example)

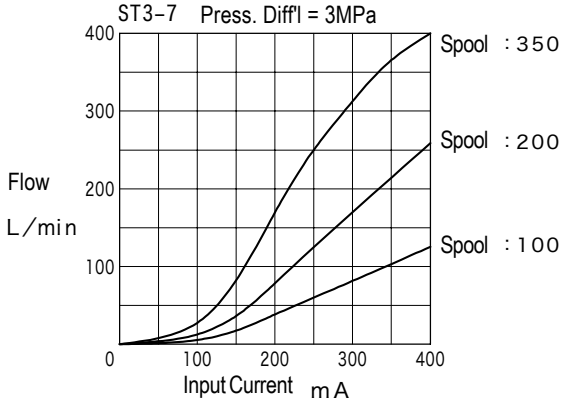


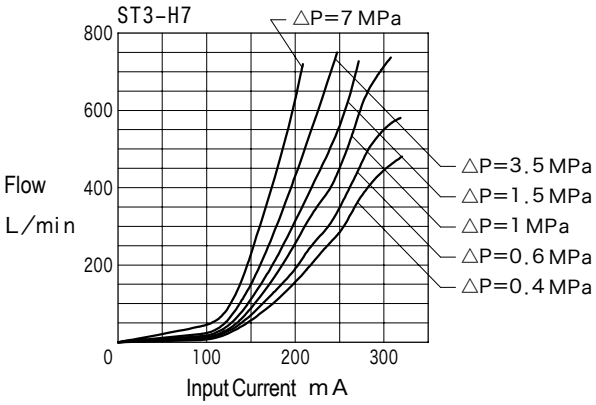
Press. DIfferential - Flow Characteristics (Ex.)



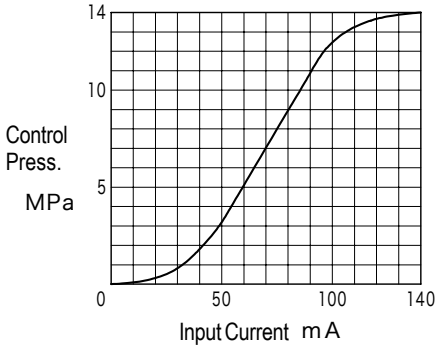


Input Current - Flow Characteristics (Example)





Input Current - Press. Characteristics (Ex.)

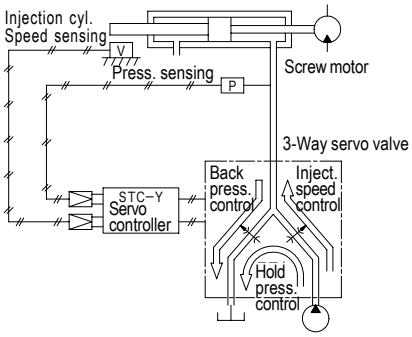


Notes on Use

- Zero adjustment screw
  Zero adjustment is done prior to shipment from factory so no further adjustment is necessary.
- Drain piping
  Allowable back pressure in Y port (drain) is 0.1 MPa. Piping is returned directly to tank and end of pipe should always be below oil level.
- Piping between valve and actuator
  Valve should be installed on the actuator side and piping between valve and actuator should be a short as possible.
- A filter of 10im or better should be installed in the pilot line.
- Pilot pressure
  Fixed pressure of 6~7 MPa should be supplied to ST3-7.

Typical system example

Typical System Application



- Air bleed
  Bleed air from valve by removing the air bleed plugs (2).

Mounting Bolts (JIS B1176, Strength Class 12.9)

Valve Model	Hex Socket Bolts		Qty
	Metric	Unified	
ST3-H7	M6×90	1/4-20UNC×88.9	2
	M10×95	3/8-16UNC×95.2	4
ST3-7	M6×45	1/4-20UNC×44.5	2
	M10×50	3/8-16UNC×50.8	4

- Mounting bolts should be ordered separately.
- Bolt tightening torque
  M6, 1/4-20UNC: 12~15Nm
  M10, 3/8-16UNC: 50~60 Nm

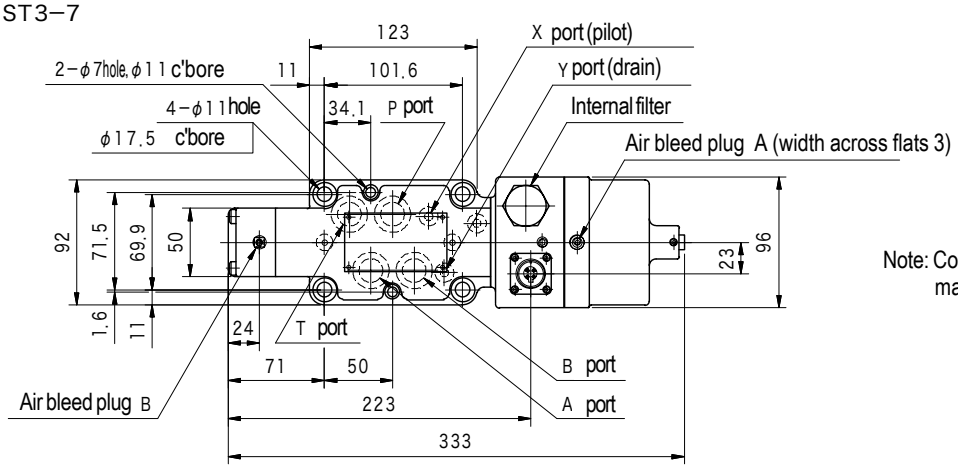
Subplate

Valve Model	Subplate Model	Connec. Port Rc
ST3-7	DGSM-04-10-JA-M	1/2
	DGSM-04X-20-JA-M	3/4

- Subplates and mounting bolts should be ordered separately.
- See page Q6 for dimensions.

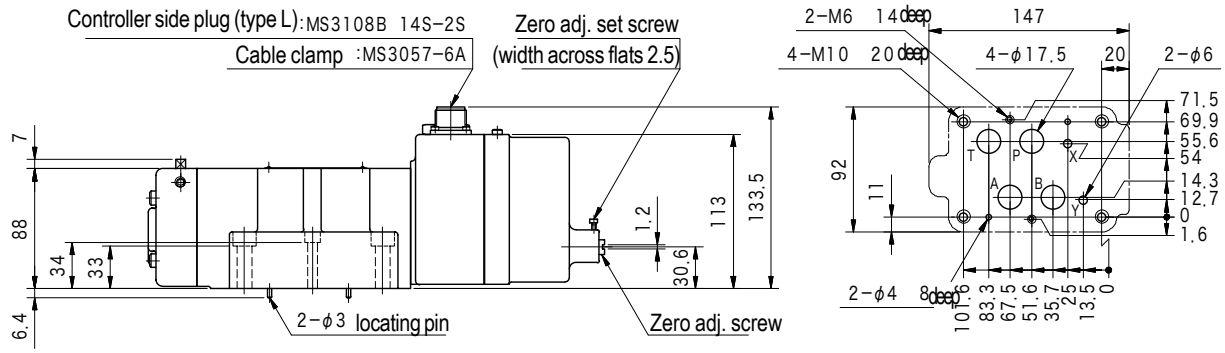
Dimensions

ST3−7

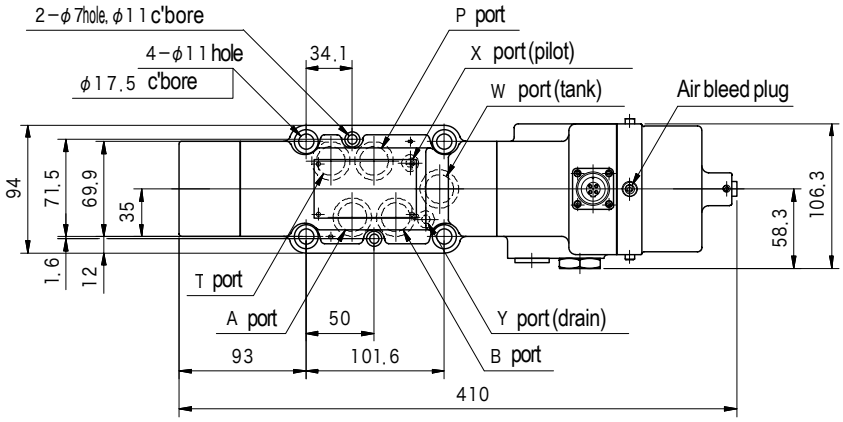


Note: Controller side plug and cable clamp are main valve accessories.

Mounting Dimensions

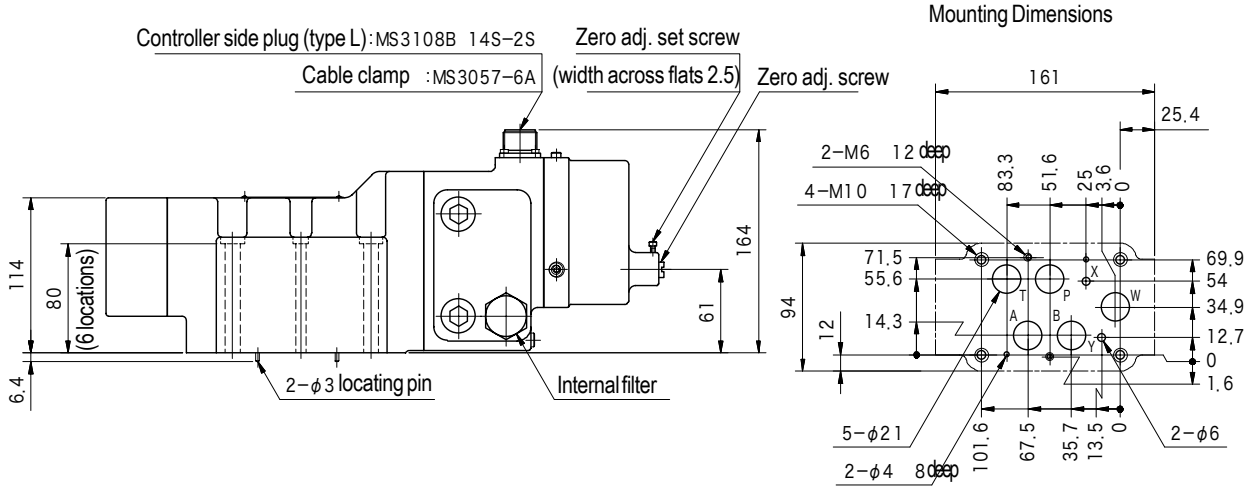


ST3−H7

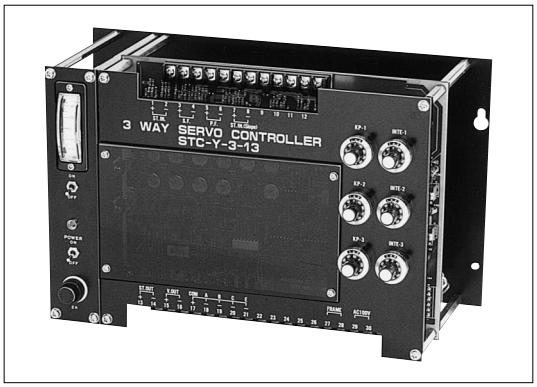


Note: Controller side plug and cable clamp must be ordered separately.
TOKIMEC p/n's,
Plug: VA27615
Cable clamp: VA27616

Mounting Dimensions



3 way servo valve controllers STC-Y



- The STC-Y is a special controller for the ST3 series, 3 way servo valve. It provides compensating circuit for injection speed, dwell pressure, and back pressure control.
- The compensation circuit incorporates PI operation which combines proportional and integral movement. This prevents deviation between setting input and output for stable response.
- Digital display knob on PI compensator adjuster enables easy adjustment.
- Switching from injection speed control to dwell control is smooth.

Model Code

STC - Y - 3 - 13

1 2 3 4

1 ST3 Series servo controller
2 Control method
Y:Closed loop
3 Compensator circuit
3:3 Channel (2 press. channels, 1 speed channel)
4 Design no.

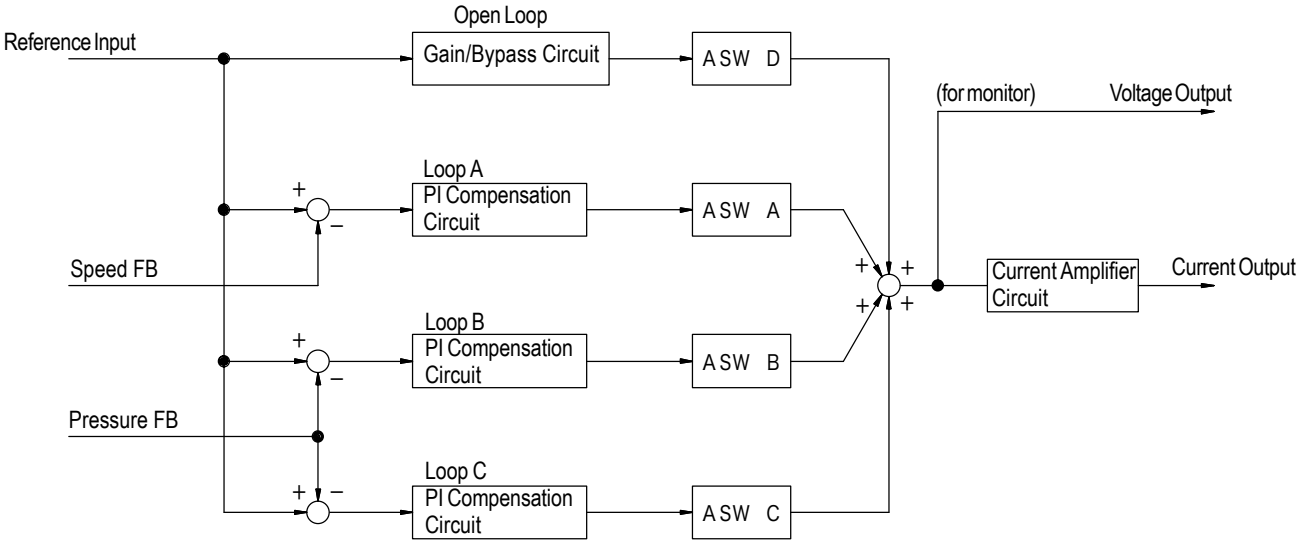
Basic Configuration
(1) Loop A: Injection speed control
Also applicable for general speed control
(2) Loop B: Dwell pressure control
Also applicable for general pressure control
(3) Loop C: Back pressure control
Also applicable for low pressure control, low response pressure control

Specifications

Power supply	AC100 V±10 %, 50/60 Hz
Power	12 VA
Rated output current	±400 mA
Reference input Input impedance	DC0～10 V (Loop A, B, C) 20 kΩ (①–② input) 16 kΩ (⑦–⑧ input)
Speed FB (Loop A) Input impedance	DC1. 6～10 V (relative to 10V ref. input) 10 kΩ (③–④ input)
Pressure FB (Loop B) (Loop C) Input impedance	DC3. 5～10 V (relative to 10V ref. input) DC 1～7 V (relative to 10V ref. input) 10 kΩ (⑤–⑥ input)
Switching input	SWA, SWB, SWC, SWE is ON when each switch (-terminal) and COM (+terminal) is energized with DC15-24V. Reduce voltage to less than 1V to turn off.
Load resistance	18～26 Ω (⑬—⑭ terminals, DC resistance)
Operating temp.	0～55 ℃
Storage temp.	−10～+80 ℃
Operating humidity	30～90 % (non-condensation)
Weight	2. 5 kg

Note: numbers refer to terminal no.

Basic Structural Diagram

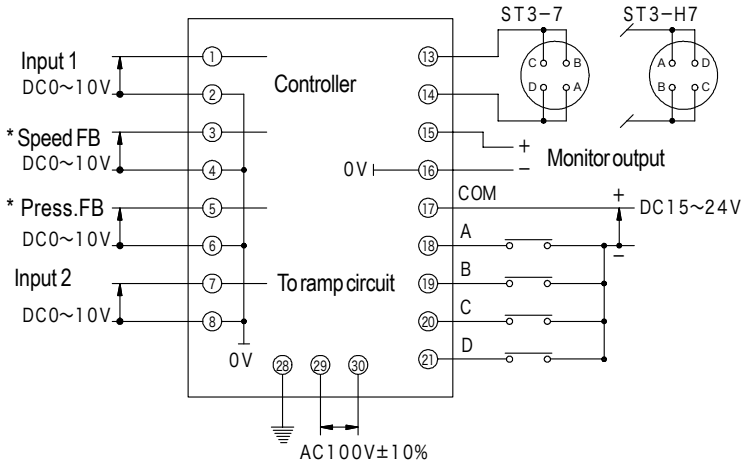


Note: "ASW" in diagram refers to analog switch.

Specifications

Wiring

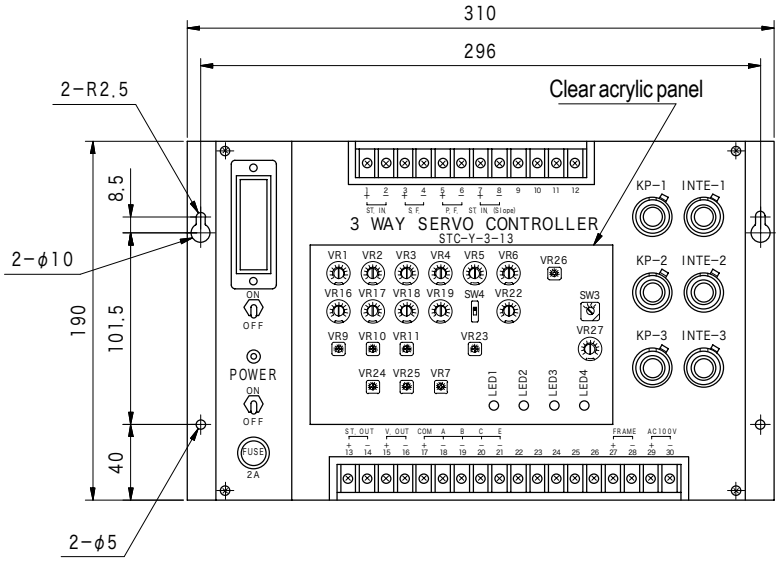
Refer to basic configuration for details.
Only terminals used are shown.

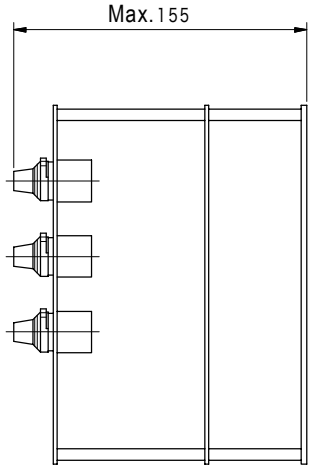


Function	Terminal
①—②	① : Input 1, plus terminal ② : Input 1, minus terminal
③—④	③ : Speed feedback input, plus terminal ④ : Speed feedback input, minus terminal
⑤—⑥	⑤ : Pressure feedback input, plus terminal ⑥ : Pressure feedback input, minus terminal
⑦—⑧	⑦ : Input 2, plus terminal ⑧ : Input 2, minus terminal
⑬—⑭	⑬ : Servo valve connection terminal ⑭ : Servo valve connection terminal
⑮—⑯	⑮ : Monitor output, plus terminal ⑯ : Monitor output, plus terminal
⑰	: Switch input, plus terminal
⑱	: Injection speed switching terminal
⑲	: Dwell switching terminal
⑳	: Back pressure switching terminal
㉑	: Injection speed gain switching terminal

Note: Select one of input 1 or input 2.
Terminal 28, is FRAME terminal and is connected to frame.
* Refer to specifications.

Dimensions





Mounting Dimensions

Controller is wall mounted type. Mounting hole sizes and dimensions are shown in the diagram below.