INSTRUCTION MANUAL

FLOW DIVIDER VALVE

●TYPE FDT5

●TYPE FDT3

TAKAMI SEIKI CO., LTD.

1. PRODUCT PROFILE

This is a one-way, synchronization valve that controls (synchronizes) forward flow. It does not handle reverse flow (collection).

2. EXPLANATION ON PERFORMANCE

Flow divider consists of body, main spool, fixation orifice internally installed in the spool, both side cover and springs in the cover.

P is inlet and A&B are outlet. At first, oil flows into room a, then it flows into room *d* and *e* through the orifice *b* and *c*, and further to outlet A&B through the adjust throttles *f* and *g*. End chamber *h* and i open to *d* and *e* through a small hole. This spool is accurate size and symmetric. The resistance at circuit A and B is perfectly same when spool locates in the middle. If resistance at circuit A is increased, pressure will also increase accordingly and the pressure difference between *a* and *d* will decrease. Consequently, flow speed at orifice *b* will be slowed down and pressure at chamber *h* will increase. Therefore, spool stop at *a* position where the pressure difference between *a* and *d*, and a and e are balanced. Consequently, same quantity of oil flows to outlets A and B.

Internal Structure (simplified schematic)

3. ADVANTAGES

(1) Can simply be installed by connecting it between popes. No adjustment is required.
(2) Synchronization is possible even under large concentrated loads (pressure difference).
(3) The division or collection rate (set rate) may be changed, depending on the type, up to a ratio of 1:3.
(4) Viscosity has little effect on the valve function.
(5) Can be used with high pressure of 29.4Mpa.

4. CAUTION

(1) Keep the internal spool horizontal when mounting the valve.
(2) Make sure the flatness of the part which valve will be connected.
(3) Hexagonal bolts are not attached.

★ ***Recommended*** ★

Type of body	Type of bolt	Qty.	Remarks
FDT5	PT SCREW	3	M6X35
	GASKET MOUNTING	4	M8X35
FDT3-03, 04	PT SCREW	3	M8X50
	GASKET MOUNTING	4	M8X50
FDT3-08	PT SCREW & FLANGE CONNECTION	3	M8X55
	GASKET MOUNTING	4	M12X65
FDT3-12	PT SCREW & FLANGE CONNECTION	3	M8X65
	GASKET MOUNTING	4	M14X80

(4) Mixing of dust and foreign matter into the operation oil shall be avoided when pipes are connected. It may cause some errors.

- Mixing of a piece of thread-sealing tape, painting, sand or dust into the operation oil shall be avoided when assembling in windy.
- Please make sure that operation oil shall be clean and non-degraded.

(5) Please expel air properly when trial operations after pipes are connected. It may cause some errors in some cases.

(6) Flow rate shall be kept within standard range.

(7) If one of either port A or B is closed, the other port is automatically closed and the flow of oil will stop. (This may cause a leak.)

(8) In the case of cylinder synchronization, the adjustment of errors is made at the stroke end, and air pressure should be applied normally.

(9) Both left and right pipes from the valve to the actuator should be the same length.

(10) Appropriate tightening torque of pipe taper thread

Size	Appropriate torque	Size	Appropriate torque
Rc 1/4"	25~35 N·m	Rc 1"	160~180N·m
Rc 3/8"	45~55 N·m	Rc 1·1/4"	220~250N·m
Rc 1/2"	25~37 N·m	Rc 1·1/2"	290~320N·m
Rc 3/4"	25~38 N·m		

★ Please wind thread-sealing tape on the screw two or three times with leaving one or two groove of tip.

5. INSPECTIONS AND REPAIRE

●Causes and remedies for trouble

In starting up and operation

(1) Actuator does not start working.
(2) Large measurement errors.
(3) Only one side of the valve functions.
(4) Fails to reach the specified speed.
(5) Pressure goes down excessively.
(6) The valve makes abnormal noise.

Pleases check below items when having above trouble.

(a) Is pump output normal?
(b) Is pressure normal? Is the relationship between pressure and weight normal?
(c) Is the oil viscosity and temperature normal?
(d) Is there any bubble in oil?
(e) Are the attachments functioning properly?
(f) Is the specified amount of oil flowing into the valve?

If a failure in the valve is found, that may be caused by lack of spring and o-ring, spool slide, or mixing of dusts and foreign matters. In that case, please disassemble and inspect each part.

●Points to be noted when disassembling

(1) Do not damage a part.
(2) Do not contaminate the parts (clean the surface where the parts are put on).
(3) Put a cover on openings in the removed parts to prevent foreign matters from entering through them.
(4) Prepare clean oil for washing (kerosene or light oil).

See the illustration carefully and disassemble the valve in the order.

●Inspection point

Part	Inspection
Body	**Check for scratches or burrs on rotation section and wearing.**
Sub-spool	**Check for working in the body or spool. If it doesn't work well, clean with washing oil properly and check again.**
Spool	**Same as above**
Spring	**Check elasticity of the spring.**
O-ring	**Check elasticity of stop ring and scratches.**

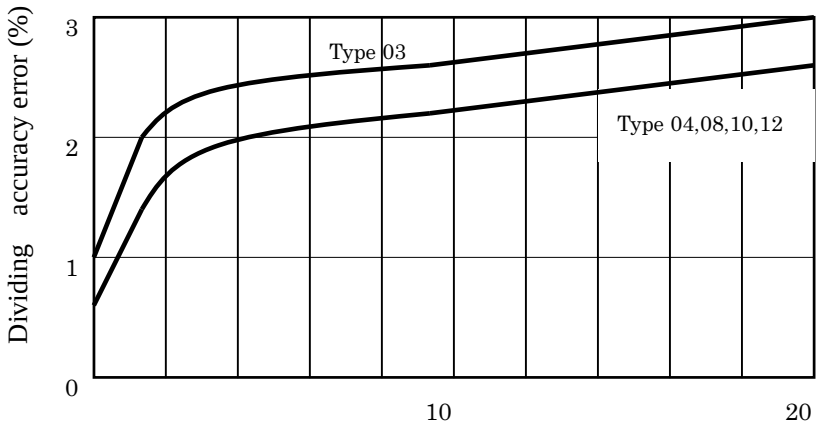
Please remove foreign matters and burrs in other parts, if any.

6. FLOW DIVIDING AND COLLECTING ACCURACY

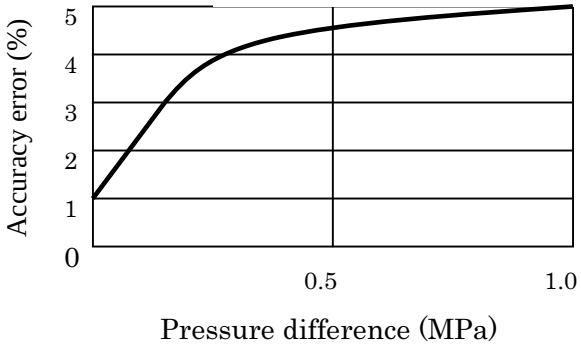
Synchronization takes place accurately even when the pressure difference (concentrated load) between ports A and B is as high as 19.6MPa (200kgf/cm2). *(Refer to 'Accuracy Table' as below)*

All units have been tested.

Type FDT3



Type FDT5-02



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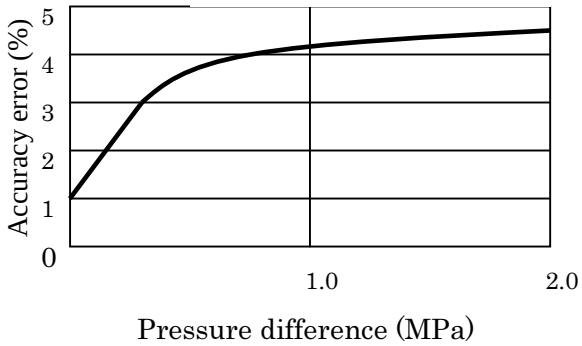
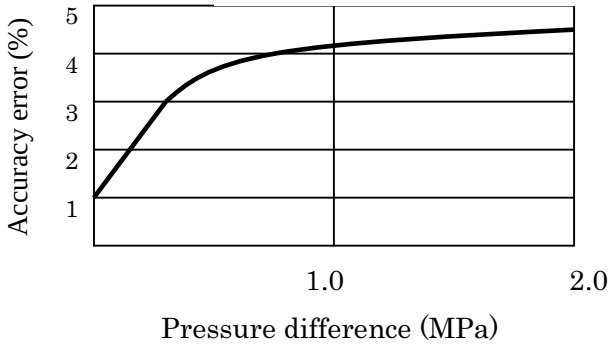


Type FDT5-04



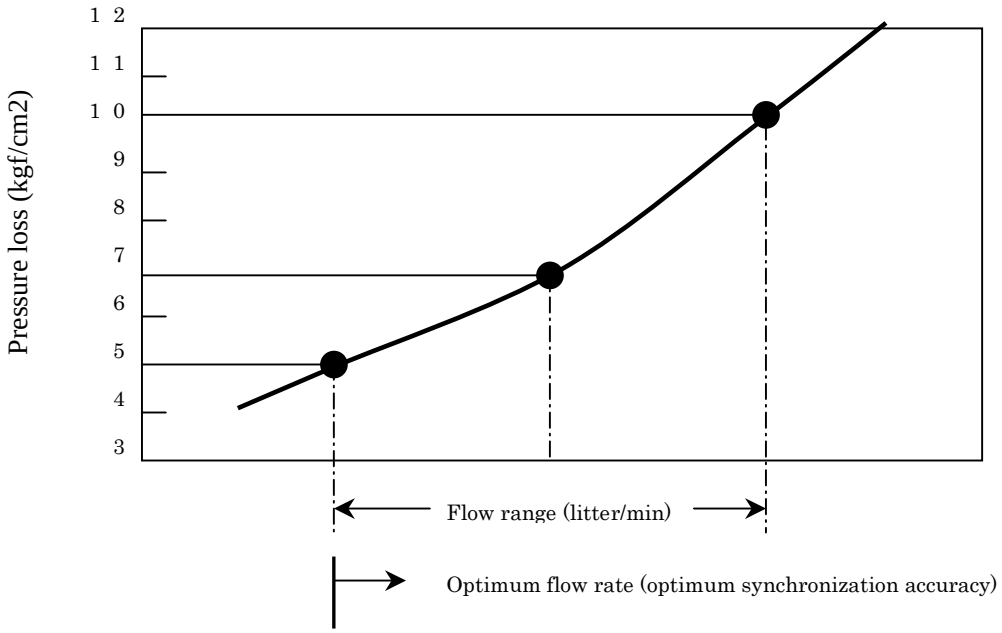
7. PRESSURE LOSS

Pressure loss calculation is below.

$$\triangle P = \left(\frac{\text{Flow rate}}{\text{Port P standard flow rate}} \right)^2 \text{X } 0.7\text{MPa (7kgf/cm2)}$$

At port P standard flow rate $\triangle P \Rightarrow$ 0.7MPa (7kg/cm2)

Pressure loss diagram



■Please contact us if you have any questions or need further information.

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