

# Solenoid Valves F Series

## Serial Transmission Compatible Manifold

### Instruction Manual Ver. 8.0

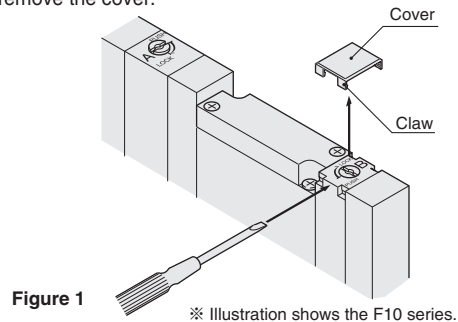
Thank you for purchasing this Koganei product.  
Before using it, be sure to read this manual and make sure you use it correctly.

#### Single and double solenoid switching procedure (Except 3-position valves and tandem 3-port valves)

By switching the manual override, model **F□T1** (2-position valve) can be used as either a single solenoid valve or a double solenoid valve (switching not possible with a 3-position valve and a tandem 3-port valve). Note that the **F□T1** is set to the single solenoid specification at shipping.

#### Switching from a single solenoid valve to a double solenoid valve

- As shown in Fig.1, insert the flatblade edge of a small screwdriver into the gap between the valve and the cover, and then peel it off and remove the cover.



※ Illustration shows the F10 series.

**Caution:** As shown in Fig.1, make sure to insert a small screwdriver from the side of the valve cover. The cover claw may be damaged when the cover is removed from the direction of the valve stem. Never remove the cover for any reason other than valve function switching.

- As shown in Fig.2, use a small screwdriver, etc. to turn the manual override on the B side by 90 degrees in the counterclockwise direction, so that the manual override button's slit is horizontal, as shown on the right side of the figure. Then the unit can be used as a double solenoid valve. When using it as a double solenoid valve, the button is used as the manual override button for the B side.

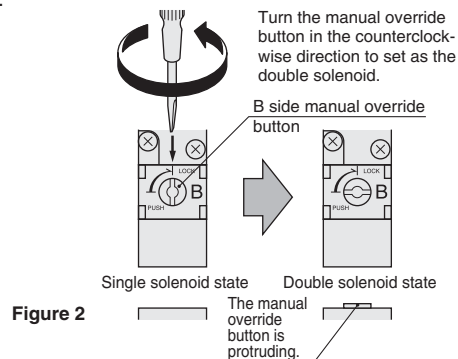


Figure 2

- Caution:**
- When using it as a double solenoid valve, do not attach the cover that was removed in Fig. 1.
  - Be aware that even if the valve has been switched to a double solenoid, no power will be supplied to the B side solenoid unless the valve base wiring is set to the double wiring

#### Switching from a double solenoid valve to a single solenoid valve

As shown in Fig.3, use a small screwdriver, etc. to push lightly against the manual override button, and then turn it by 90 degrees in the clockwise direction, so that the manual override button's slit is in the vertical direction, and then attach the cover.

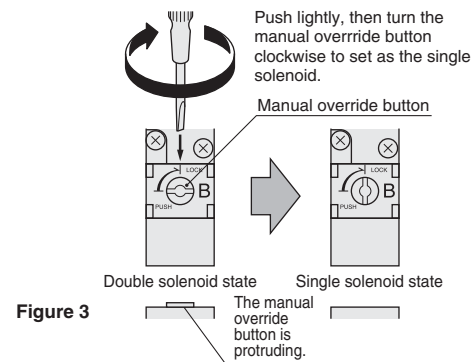


Figure 3

**Caution:** The cover has directionality (F15 and F18 series only). When attaching, always align the detent on the back of the cover with the manual override button's slit, as shown in Fig.4.

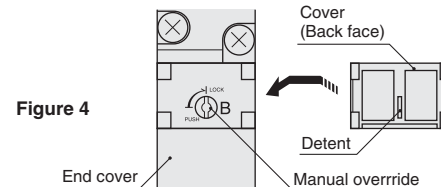


Figure 4

#### Precautions for use of the double solenoid

When using models **F□T1** or **F□T2** (2-position valve) as double solenoid valves, caution should be exercised as energizing the A side solenoid or pushing the manual override button on the A side, while pushing the B side manual override button or in a locked state, or energizing the solenoid on the B side, will cause the valve to switch over the valve position. (At that time, the valve will operate in the same state as the single solenoid valve.)

#### Dual use fittings (With dual use fitting blocks)

The F series dual use fitting blocks employ dual use fittings for different tube sizes, which can connect tubes of 2 different outer diameters. (Excluding ports 1(P) and 3, 5(R) of F18 series.)

#### Attaching and removing tubes

When connecting tubes, insert an appropriate size tube until it contacts the tube stopper, and then lightly pull it to check the connection. For tube removal, push the tube against the tube stopper, then for large tube sizes, push on the release ring and at the same time pull the tube out. For small tube sizes, push on the outer ring by pressing the release ring and simultaneously pull the tube out (see Fig. 5).

**Caution:** When attaching or removing tubes, always stop the air supply.

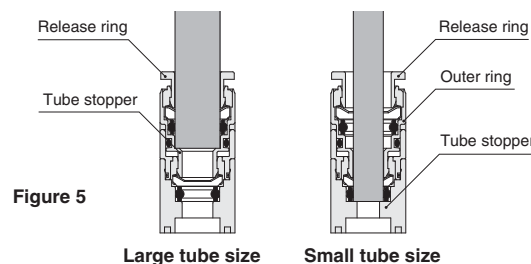


Figure 5

#### Usable tubes

Either a nylon or urethane tube can be used.  
Use tubes with an outer diameter tolerance within  $\pm 0.1$  mm of the nominal diameter, and ensure the ovalness (difference between the large diameter and small diameter) is 0.2 mm or less.  
(Using a Koganei tube is recommended.)

#### Piping

##### Procedure for switching between the base piping type and the direct piping type

Base piping and direct piping can be switched by replacing the plate with a fitting block or a female thread block (see Fig. 6).

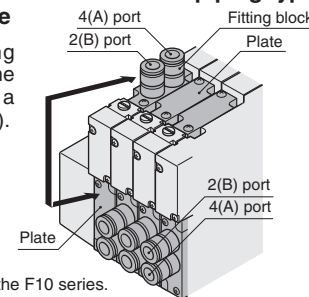


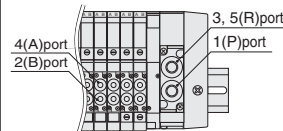
Figure 6

※ Illustration shows the F10 series.

- Caution:**
- Always stop the air supply before operation.
  - Firmly tighten the screws after completing a re-combination. Recommended tightening torques are shown below.
  - Perform piping carefully in regards to the locations of each connection port (see Figs. 7, 8).
  - Care should be taken not to lose the gaskets while changing plates.

Series	Recommended tightening torque N·cm
F10	17.6
F15	49.0
F18	49.0

##### Direct piping type For F10, F15 series



※ Diagram shows the F10 series.

##### For F18 series

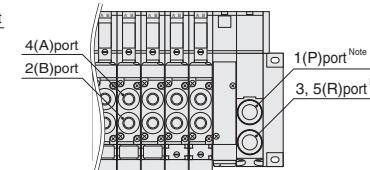


Figure 7

Note: Caution should be exercised that the positions of the 1(P) and 3, 5(R) ports are reversed from their positions in the F10 and F15 series.

##### Base piping type

Port locations for **F10, F15, F18** series are as shown in Fig. 8.

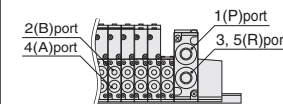


Figure 8

※ Diagram shows the F10 series.

##### Attaching fittings to female thread blocks

When attaching fittings to female thread blocks, secure with the tightening torques shown below or less.

Screw size	Tightening torque N·cm
Rc1/8	686
Rc1/4	882

※ For M5, tighten at the recommended torques for the fittings used.

##### Attaching fittings to piping blocks [F18(G)-PM(P)]

To attach fittings to the female thread type piping block of the F18 series, remove the piping block portion (the triangular-shaped block portion), screw the fittings into the 1(P) and 3, 5(R) ports while holding the piping block by applying a wrench to its metal portion. The tightening torque for the mounting (two M3 screws) of the piping block after the fittings have been attached should be 49.0 N·cm.

#### General Precautions

##### Mounting

- While any mounting direction is allowed, be sure to avoid strong shocks or vibrations applied directly to the body.
- Avoid using in the locations and environment listed below, as it could result in malfunction of the valve. If use in such conditions is unavoidable, always provide a cover or other adequate protective measures.
  - Location directly exposed to water drops or oil drops
  - Environment where a valve body is subject to dew condensation
  - Location directly exposed to machining chips, dust, etc
- In piping connection with valves, flush the tube completely (by blowing compressed air) before piping.  
Intrusion of machining chips or sealing tape, rust, etc., generated during plumbing could result in air leaks and other defective operations.
- Never use the valve with the 4(A) and 2(B) ports vented to the atmosphere.
- When mounting a valve inside a control panel, or when energizing time is long, make adequate consideration for ventilation and other heat dissipation measures.
- When adding or subtracting units in the manifold, or replacing a fitting block, be sure to tighten to within the specified tightening torque range.

##### Media

- Use air for the media. For the use of any other media, consult us.
- Air used for the cylinder should be clean air that contains no deteriorated compressor oil, etc. Install an air filter (filtration of 40  $\mu$ m or less) near the valve to remove collected liquid or dust. In addition, drain the air filter periodically.
- When supply pressure is low, use piping for the 1(P) port with sufficient tube size.

##### Lubrication

Can be used without lubrication due to the factory lubricant (grease). When the pneumatic products require lubrication, use Turbine Oil Class 1 (ISO VG32) or the equivalent. In addition, cutting off oil feed while an operation is in progress could lead to malfunction due to the dissipation of the factory lubricant (grease). As a result, always keep the oil feed running continuously. However, use caution since excessive oil feed can also be a cause of malfunction. Avoid using spindle oil or machine oil.

##### Atmosphere

The product cannot be used when the media or ambient atmosphere contains any of the substances listed below.  
Organic solvents, phosphate ester type hydraulic oil, sulphur dioxide, chlorine gas, or acids, etc.

#### Specifications of Serial Transmission Compatible Manifolds

##### General Specifications

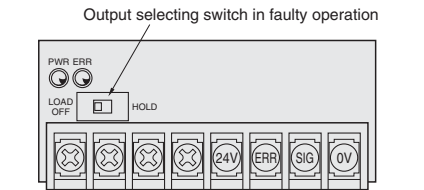
Voltage	24VDC $\pm 10\%$
Operating temperature range	5~50°C
Vibration resistance	49.0m/s <sup>2</sup>
Shock resistance	98.1m/s <sup>2</sup>

● For details about specifications, see each user's manual.

■ Serial Transmission Block, Terminal Block (LED) Part Names

● For OMRON B7A Link Terminal

Transmission block specification: -31 (standard type), -32 (high-speed type)



LED indicator

Indicator	Description
PWR	•Lights up when power is turned on
ERR	•Lights up during faulty transmission

Remarks

● Connection method: 1 to 1

(Transmission block spec.)	Standard type (-31)	High-speed type (-32)
Transmission delay time	Max. 31 ms	Max. 5 ms
Transmission distance	Max. 500 m [1640 ft]	Max. 100 m [328 ft]

※ For details of B7A Link Terminal, see the OMRON catalog, user's manual, etc.

● Number of outputs per block

Maximum of 16 solenoids

● Error output specifications

Output type: NPN open collector

Rated load voltage: 24VDC

Output current: Sink current MAX. 40 mA

● Related materials: User's manual, document No. BK-HV038

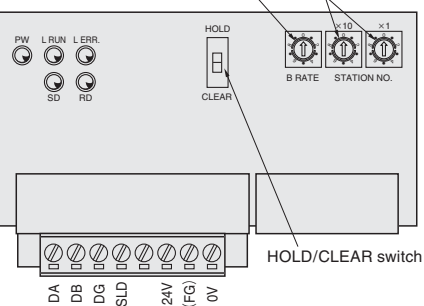
● F10 , F15 and F18 series are supported

● For CC-Link



Transmission block specification: -B3 (32 outputs)

Transmission speed setting switch



LED indicator

Indicator	Description
PW	•Lights up when power is turned on
L RUN	•Lights up when normal data is received from master station
SD	•Lights up during sending data
RD	•Lights up during receiving data
L ERR.	•Lights up during transmission errors, and shuts off when time is over Lights up due to station number setting error or transmission speed setting error

Remarks

※ Conforms to CC-Link.

● Number of outputs per block

32 solenoids (transmission block specification: -B3)

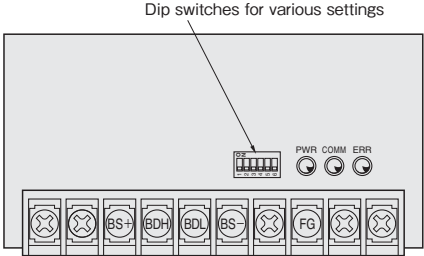
※ Since the block occupies 1 station, if remote I/O stations are entirely composed of the blocks, a maximum of 64 units can be connected to 1 master station.

● Related materials: User's manual, document No.BK-HV041

● F10 and F15 series are supported

● For OMRON CompoBus/S

Transmission block specification: -A1 (16 outputs)



LED indicator

Indicator	State	Color	Description
PWR	Lights up	Green	•During power supply
	Shuts off		•Power not supplied
COMM	Lights up	Yellow	•During normal communication
	Shuts off		•Communication fault, or standby
ERR	Lights up	Red	•Communication fault occurred
	Shuts off		•During normal communication, or standby

Remarks

※ For details of CompoBus/S, see the OMRON catalog, user's manual, etc.

● Number of outputs per block

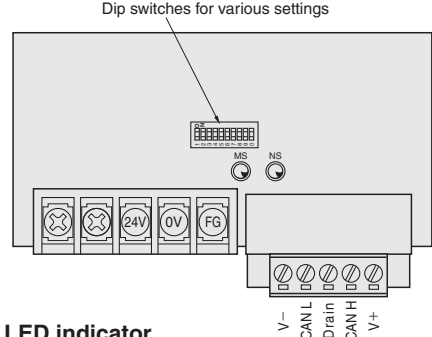
16 solenoids (transmission block specification: -A1)

● Related materials: User's manual, document No.BK-HV040

● F10 and F15 series are supported

● For DeviceNet

Transmission block specification: -D1 (16 outputs), -D3 (32 outputs)



LED indicator

Indicator	State	Color	Description
MS	Lights up	Green	• Normal state
	Flashing		• No setting state
	Lights up	Red	• Serious breakdown
	Flashing		• Minor breakdown
NS	Shuts off	—	• No power supply
	Lights up	Green	• Communication connection completed
	Flashing		• No communication connection
	Lights up	Red	• Serious communication fault
	Flashing		• Minor communication fault
Shuts off	Shuts off	—	• No power supply

Remarks

※Conforms to DeviceNet.

●Number of outputs per block

A maximum of 16 solenoids (transmission block specification: -D1)

A maximum of 32 solenoids (transmission block specification: -D3)

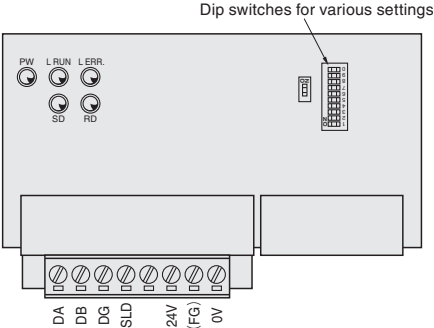
● Related materials: User's manual, document No. BK-HV042

● F10 and F15 series are supported

● For CC-Link



Transmission block specification: -B1 (16 outputs)



LED indicator

Indicator	Description
PW	•Lights up when power is turned on
L RUN	•Lights up when normal data is received from master station
SD	•Lights up during sending data
RD	•Lights up during receiving data
L ERR.	•Lights up during transmission errors, and shuts off when time is over Lights up due to station number setting error or transmission speed setting error

Remarks

※ Conforms to CC-Link.

● Number of outputs per block

16 solenoids (transmission block specification: -B1)

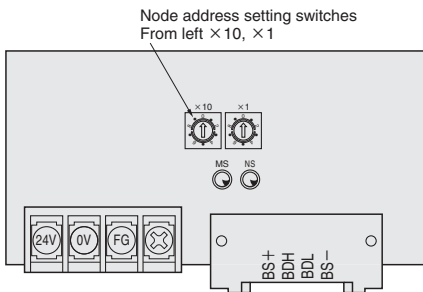
※ Since the block occupies 1 station, if remote I/O stations are entirely composed of the blocks, a maximum of 64 units can be connected to 1 master station.

● Related materials: User's manual, document No.BK-HV041

● F10 and F15 series are supported

●For CompoNet

Transmission block specification: -H1 (16 outputs)



LED indicator

Indicator	State	Color	Description
MS	Lights up	Green	• Normal state
	Lights up	Red	• Serious breakdown
	Flashing	Red	• Minor breakdown
	Shuts off	—	• Power OFF/In preparation
NS	Lights up	Green	• Online/Access state
	Flashing	Green	• Online/No-access state
	Lights up	Red	• Serious communication fault
	Flashing	Red	• Minor communication fault
Shuts off	Shuts off	—	• Power OFF/In preparation

Remarks

※Conforms to CompoNet.

●Number of outputs per block

16 solenoids (transmission block specification: -H1)

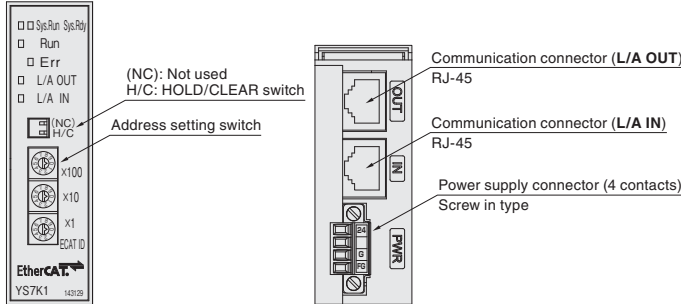
● Related materials: User's manual, document No.BK-HV043

※The communication connector is sold by Omron Corporation. Direct your inquiries to Omron.

● F10 , F15 and F18 series are supported

●EtherCAT Compliant

Transmission block specifications: -K1 (16 outputs), -K3 (32 outputs)



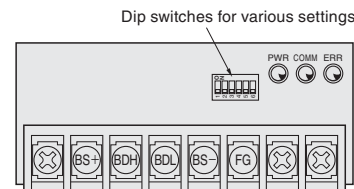
LED indicator

Indicator	State	Color	Description
Sys.Run/Sys.Rdy	Lit/Not lit	Green/yellow	• Transmission block operation normal
	Flashing/flashing	Green/yellow	• Transmission block initialization
	Not lit/lit or flashing	Green/yellow	• Transmission block error
	Not lit/Not lit	Green/yellow	• Transmission block power OFF
Run	Off	Green	• INIT
	Flashing (blinking)	Green	• PRE-OPERATIONAL
	Flashing (single flash)	Green	• SAFE-OPERATIONAL
	Lighted	Green	• OPERATIONAL
Err	Off	Red	• No error
	Flashing (blinking)	Red	• Invalid setting
	Flashing (single flash)	Red	• Unrequested change in status
	Flashing (double flash)	Red	• Communication disconnect
L/A OUT L/A IN	Lighted	Green	• Normal communication
	Flashing	Green	• EtherCAT frame sending/receiving
	Off	Green	• Not connected

EtherCAT® is a registered trademark and patented technology,licensed by Beckhoff Automation GmbH,Germany.

● For OMRON CompoBus/S

Transmission block specification: -A1 (16 outputs)



LED indicator

Indicator	State	Color	Description
PWR	Lights up	Green	•During power supply
	Shuts off		•Power not supplied
COMM	Lights up	Yellow	•During normal communication
	Shuts off		•Communication fault, or standby
ERR	Lights up	Red	•Communication fault occurred
	Shuts off		•During normal communication, or standby

Remarks

※For details of CompoBus/S, see the OMRON catalog, user's manual, etc.

● Number of outputs per block

16 solenoids (transmission block specification: -A1)

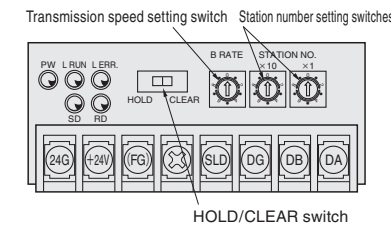
● Related materials: User's manual, document No.BK-HV040

● F18 series are supported

● F10 and F15 series (previous model) are supported

● For CC-Link

Transmission block specification: -B1 (16 outputs)



LED indicator

Indicator	Description
PW	•Lights up when power is turned on
L RUN	•Lights up when normal data is received from master station
SD	•Lights up during sending data
RD	•Lights up during receiving data
L ERR.	•Lights up during transmission errors, and shuts off when time is over Lights up due to station number setting error or transmission speed setting error

Remarks

※Conforms to CC-Link.

● Number of outputs per block

16 solenoids (transmission block specification: -B1)

※Since the block occupies 1 station, if remote I/O stations are entirely composed of the blocks, a maximum of 64 units can be connected to 1 master station.

● Related materials: User's manual, document No.BK-HV041

● F18 series are supported

● F10 and F15 series (previous model) are supported

■Target Products for CE Marking

The serial transmission block models which are listed below are compliant to CE Marking.

●For CC-Link -B1(F10,F15 Series)

●For CC-Link -B3(F10,F15 Series)

\* For other details about specifications and precautions, see the catalog.

\* For inquiries about the product, contact the Koganei overseas department at the number below.



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