Doc. no.DIT-69900-OM005

Operation Manual

PRODUCT NAME

IO-Link/ELECTRO-PNEUMATIC REGULATOR

MODEL / Series / Product Number

ITV*0*0-IO****-X395

This is the operation manual for the IO-Link compliant ITV.

For other contents which are not described in this manual, please refer to the operation manual for the standard product.

1.Product Specifications

Item	Specified value
Max. supply power	12 bars
Min. supply power	Set pressure + 1 bar (0.1 MPa)
Power supply voltage	24 VDC ±10% F.S.
Current consumption	0.12 ADC or less
Set pressure range	0.05 to 10 bar
Communication specifications	IO-Link communication
Output signal	Detects when reaching the set pressure. ±10% F.S.
Vendor ID	131(Dec)
Device ID	272(Dec)

Safety Instructions, precautions and other specifications are the same as the standard series.

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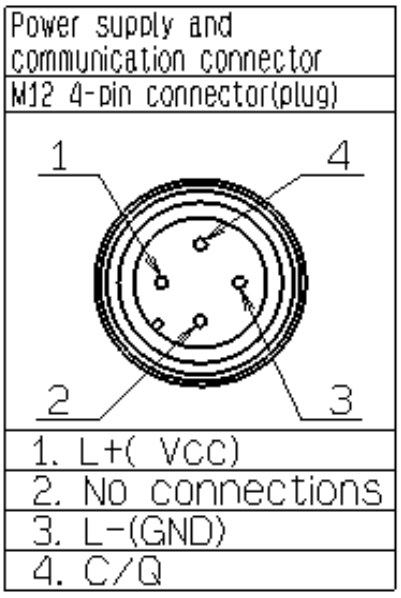
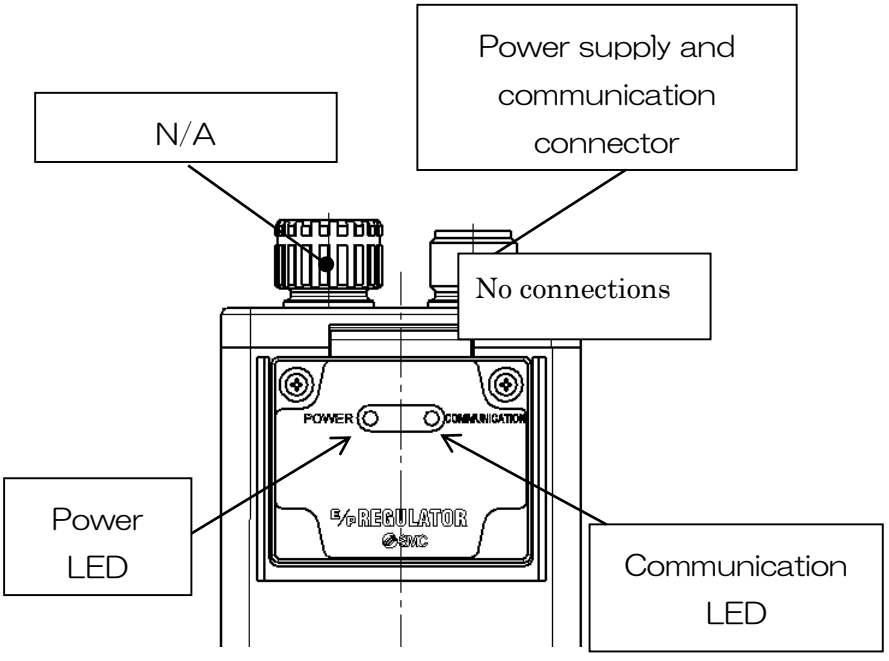
2.Wiring





3. Communication specifications

Item	Specification	Note
Protocol	IO-Link	
version	Version 1.1	
Communication speed	230.4 kbps (COM3)	
IO-Link port	Class A	
IO-Link type	Device	
Process data	2 bytes IN 2 bytes OUT	Resolution 12 BIT

4. Pressure setting method and output monitoring

Pressure can be set by sending input data from the master PLC to the regulator where the F.S is based on a 12 BIT resolution.

Do not operate the product outside of the specifications.

<Relationship between set data and pressure>

Set data	0x0000	0x7FF8
Output pressure	0 bars	10 bars

From the 16 BIT process data (2byte), input the 12BIT resolution starting from 3rd BIT to the 14th BIT.

Refer to the communication data for further details.

5. Communication data

5.1 Process data map

PD OUT (to ITV)

15*	14	13	12	11	10	9	8	7	6	5	4	3	2	1	0	Bit
Set pressure value.(13 BIT)													Disabled			**Value**

100% F.S.is indicated using 12 BITs, from the 3rd BIT to the 14th BIT.

*Setting up to 120% F.S is possible by using the 15th BIT (However this is out of warranty).

PD IN (from ITV)

15*	14	13	12	11	10	9	8	7	6	5	4	3	2	1	0	Bit
Output pressure (13BIT)													On hold		BDC1	**Value**

100% F.S. is indicated using 12 BITs, from the 3rd BIT to the 14th BIT.

*Setting up to 120% F.S is possible by using the 15th BIT (However this is out of warranty).

■ Detection of the set pressure

BDC1	**1**	When set pressure is reached
	0	When set pressure is not reached

5.2 List of parameters

INDEX	Name:	Function
0x42	Gain tuning function	Sets the response time.
0x43	Sensitivity tuning function	Sets the sensitivity.
0x41	HOLD/CLEAR setting	Sets the operation in response to a communication error.
0x44	Initialization	Resets the settings to the default value.
0x46	Zero adjustment	Sets the minimum pressure.
0x47	Span adjustment	Sets the maximum pressure.

Parameter index	**0x42**						
Parameter name	**Gain tuning function**						
Function	The response time can be changed by tuning the gain. When the gain is increased, the response time tends to be faster, but stability will be lost, which may cause hunting (unstable pressure). Default: 9						
Bit	**Bit 3, 2, 1, 0**						
Value	**Bit**	**3**	**2**	**1**	**0**	**Setting**	
		0	**0**	**0**	**0**	**Gain 0**	
		0	**0**	**0**	**1**	**Gain 1**	
		0	**0**	**1**	**0**	**Gain 2**	
		0	**0**	**1**	**1**	**Gain 3**	
		0	**1**	**0**	**0**	**Gain 4**	
		0	**1**	**0**	**1**	**Gain 5**	
		0	**1**	**1**	**0**	**Gain 6**	
		0	**1**	**1**	**1**	**Gain 7**	
		1	**0**	**0**	**0**	**Gain 8**	
		1	**0**	**0**	**1**	**Gain 9**	
		1	**0**	**1**	**0**	**Gain A**	
		1	**0**	**1**	**1**	**Gain B**	
		1	**1**	**0**	**0**	**Gain C**	
		1	**1**	**0**	**1**	**Gain D**	
		1	**1**	**1**	**0**	**Gain E**	
		1	**1**	**1**	**1**	**Gain F**	

Parameter index	**0x43**
Parameter name	**Sensitivity tuning function**
Function	Changing the sensitivity will change the pressure correction operation near the set pressure point. When the sensitivity is increased, hunting may occur. When the sensitivity is decreased, hunting will be reduced, but the pressure correction will be reduced, so there may be a moderate pressure instability. Default value ：0
Bit	**Bit 2, 1, 0**

Value

Bit	**2**	**1**	**0**	**Setting**
	0	**0**	**0**	**Sensitivity -**
	0	**0**	**1**	**Sensitivity**
	0	**1**	**0**	**Sensitivity 0**
	0	**1**	**1**	**Sensitivity 1**
	1	**0**	**0**	**Sensitivity 2**
	1	**0**	**1**	**Sensitivity 3**
	1	**1**	**0**	**Sensitivity 4**
	1	**1**	**1**	**Sensitivity 5**

Parameter index	**0x41**
Parameter name	**Hold/Clear setting**
Function	Sets the output setting when communication error occurs. 0: Exhaust completely (Clear). 1: Output pressure is maintained (Hold). Default value: 0
Bit	**Bit 0**

Value

Bit	**0**	**Setting**
	0	**Clear**
	1	**Hold**

Parameter name	**0x44**
Parameter name	**Initialization**
Function	All of the setup including the internal control constant is initialized with this function. Perform this function only when the product is completely stopped due to error.
Bit	**BIT 0 to 7**
Value	**Any value between 0 to 11111111**

Parameter index	**0x46**(Zero adjusting)**, 0x47**(Span adjusting)
Parameter name	**Zero adjusting , Span adjusting**
Function	Zero adjusting (hereinafter referred to as F_1) corresponds to set the minimum pressure, Span adjusting (hereinafter referred to as F_2) to set the maximum pressure. F_1 and F_2 have setting ranges of 0-90%F.S. and 10-120%F.S., respectively. However, the set pressure exceed rated output; 100%F.S. is out of warranty. (refer to Fig.2,3) The values are necessary to satisfy "F_1 + 10%F.S. < F2". If not, the previous values are reflected in this function. **Default of Zero adjusting: 0x0000** **Default of Span adjusting: 0x0FFF**
Bit	**BIT 12**
Value	Relationship between F1/F2 and the set pressure

	Zero adjusting F_1		Span adjusting F_2	
	Minimum	Maximum	Minimum	Maximum
Input value	0x0000	0x0E66	0x019A	0x1332
Set pressure	0%F.S. 0 Bar	90%F.S. 9 Bar	10%F.S. 1 Bar	120%F.S. 12 Bar

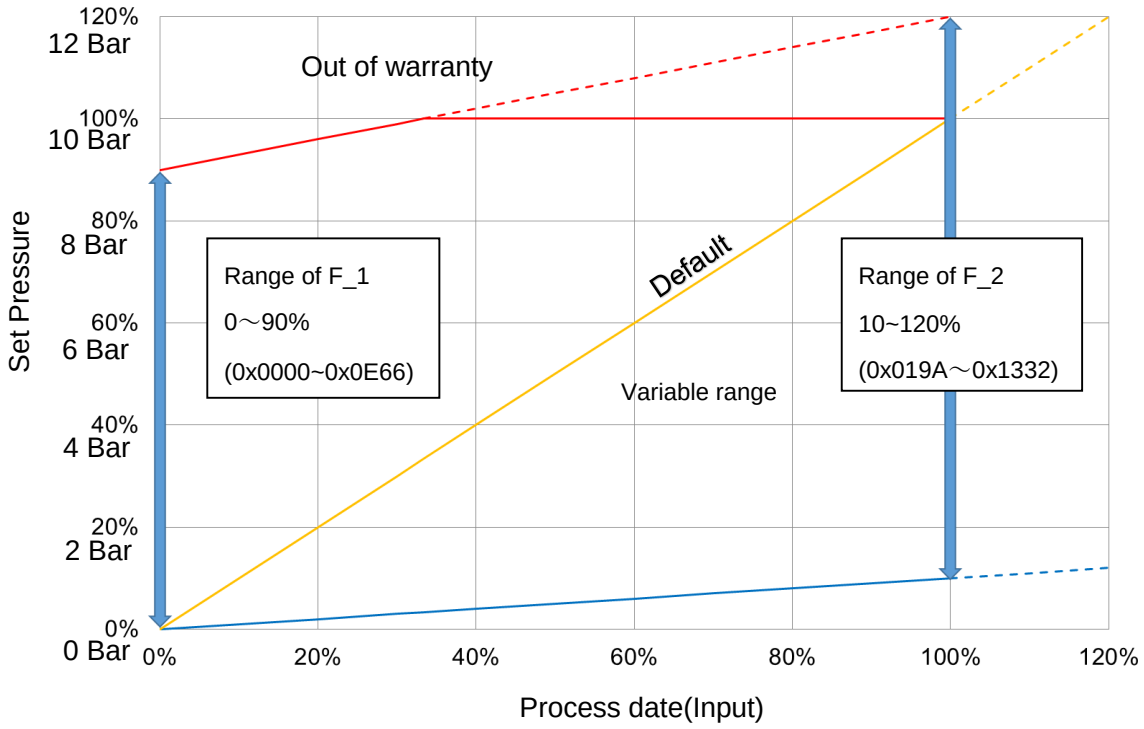
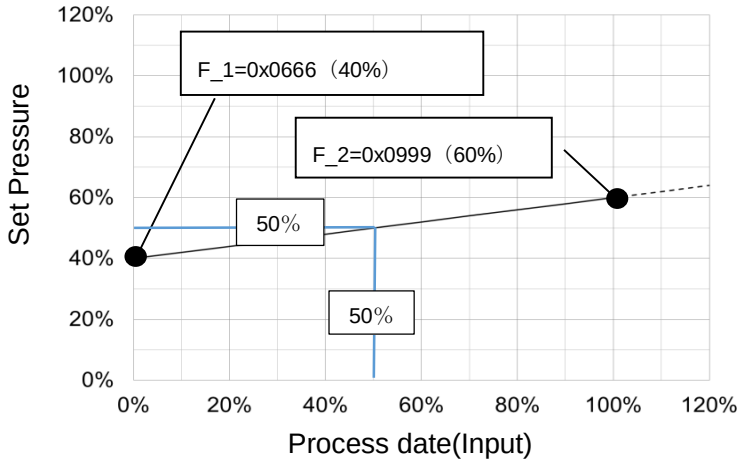
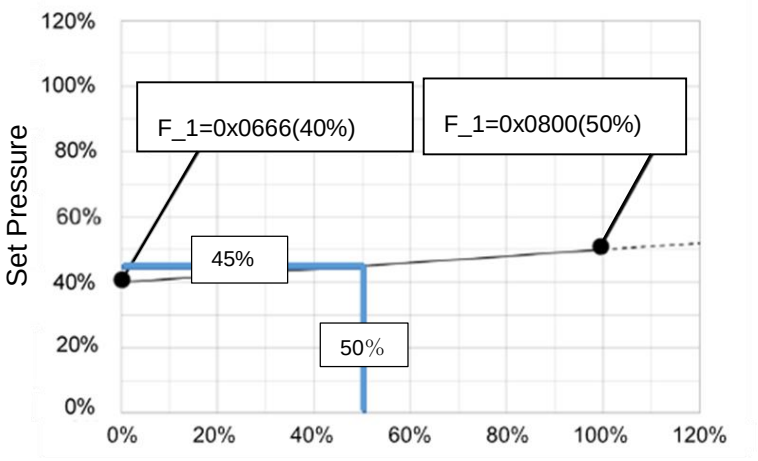


Fig.2 Range of F_1 and F_2



The set pressure output 50% when the process date input 50%



The set pressure output 45% when the process date input 50%

Fig.3 Configuration examples

5.3 Error Message

LED

Item	ON	OFF	Flashing
Power	Power is supplied (Green) Internal diagnosis error (Red)	Power supply is not connected	-
Communication	Communication in stand-by mode	Communication disconnected	Communication exchange (Green)

Error code

Error No.	Name:	Description
0X5000	Internal diagnosis error	ROM read / write error Control depends on the Hold/Clear setting. Power LED turned ON Red. If the error is not corrected even after disconnecting the power supply, perform "Initialization".
0X6320	Target value over range error	The data of the target value has exceeded the specification (120% F.S. is exceeded). Input a target value within the specification.
0X8C20	Output pressure value over range error	The data of the output pressure value has exceeded the specification (120% F.S. is exceeded). Adjust the output pressure to within the specification.

End of report

Revision history
A: Function addition of F_1 and F_2
B: Vender ID and device ID addition

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