OPTICAL SIGNAL CONVERTER

DATA SHEET FRK

The optical signal converter performs conversion between optical and electrical signals of FFI system specifications, and serves as an interface when connecting a detector or controlled element of an electronic instrumentation system to the FFI system.

This is a high-precision intelligent instrument with a built-in microcomputer for digital processing of signals.

Optical fiber is used in the signal transmission section which enables forming an optical fiber type field instrumentation system (FFI system) together with optical star coupler and master station.

FEATURES

1. Bidirectional transmission system
   Transmission of measured data and fault diagnosis data to the host computer and remote settings etc. from the host is done bidirectionally via a signal optical fiber cable.
2. Easy adjustment and setting operation
   Adjustment and settings can be made easily via remote operation from the host computer or by key switches on the indicating unit (option).
3. Self-diagnosis function
   A number of self-diagnoses are possible by the built-in microcomputer.
4. Digital display type field indicator available at option.
5. Flame-proof structure (d2G4) can be provided at option.

SPECIFICATIONS

Functional Specifications

Optical/electrical conversion output signal:
4 to 20mA DC (allowable load 600Ω)

Electrical/optical conversion input signal:
1 to 5V DC (input resistance 1MΩ or more)
4 to 20mA DC (input resistance 150Ω or less) (None)
10 to 50mA DC (input resistance 80Ω or less)
Note) The power for a 2-wire type transmitter and converter for 4 to 20mA DC can also be supplied (supply voltage about 20V DC).

Power supply: 24V DC (20 to 30V) or 24, 100, 115, 220V AC (±10%), 50/60Hz

Power consumption:
About 4W (DC power supply) or about 8VA (AC power supply)

Setting:
- Damping time constant up to 17 sec
- Optical/electrical conversion output 0% and 100% calibration, readback 0% and 100% calibration
- Electrical/optical conversion output 0% and 100% calibration

Self-diagnosis:
- Input overflow/underflow, microcomputer fault, battery down (for memory backup)
- Optical/electrical D/A converter fault
- External line disconnection fault

Display (option):
- Optical/electrical converter readback value (0 to 100%)
- Electrical/optical conversion input value (0 to 100%)
- Symbols and numerals for above setting items
- Symbols for above diagnosis items ... only at fault occurrence
  But microcomputer fault is not displayed since it is normalized through auto reset action.

Ambient temperature:
–20 to 60°C

Ambient humidity:
95% R.H. or less

Transmission: Half-duplex bidirectional transmission with one-fiber system
Transmission distance; 1.2 km max.

Other: Optical output alone can be provided by combining the electrical/optical converter with an optical receiving converter (type PRN).
In this case the transmission distance is 4 km max.

Performance Specifications

Accuracy rating: ±0.2%
Repeatability: ±0.1%
Ripple content: 1% P–P (optical electrical converter output current)
Insulation: (in arrester exclusion status)
Between power supply and signals
Insulation resistance; 500MΩ or more (with 500V DC megger)
Withstand voltage; 1000V AC for 1 minute
Between power supply and ground
Insulation resistance; 500MΩ or more (with 500V DC megger)
Withstand voltage; 1000V AC for 1 minute
Between signals and ground
Insulation resistance; 500MΩ or more (with 500V DC megger)
Withstand voltage; 500V AC for 1 minute

Structure and Material

Finish: Epoxy/polyurethane double coating, silver (cover; blue)
Enclosure: JIS C 0920 immersion-proof (equivalent to IEC IP65 or NEMA 4)
Outer dimensions (H x W x D) and Mass (weight):
161 x 172 x 212 (240) mm, about 4.0 kg
Parenthesized dimension is when display unit equipped.
Mounting method:
Mounted by U bolt on horizontal or vertical 50A (2B) pipe, or wall mounted
Cable and connection method:
JIS G1/2 internal thread
(Terminals: M4 screw)
Optical fiber cable is Fuji-specified one (prepare separately)
Connection is made by optical connector.

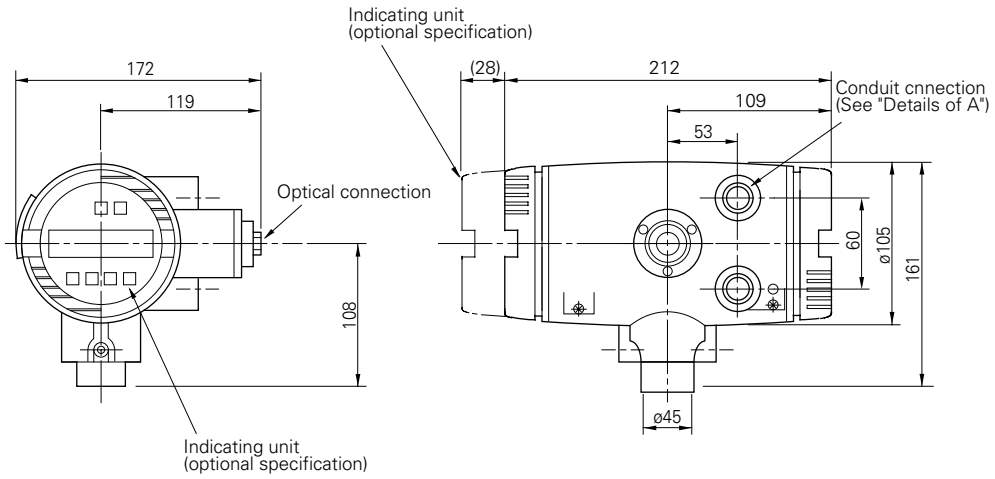
Optical Specifications

Indication unit: 6-digit LCD unit with setting key (4 pushbutton switches)
Acid and alkali-proof treatment:
Mounting U bolt and nuts material: SUS304

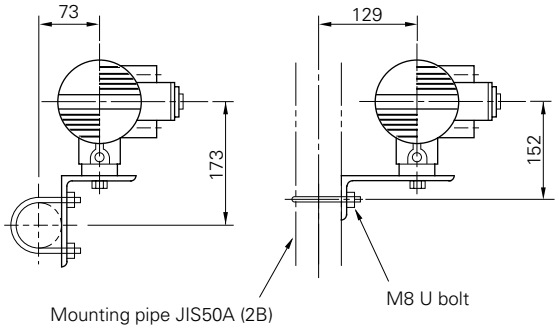
CODE SYMBOLS

1 2 3 4 5 6 7 8 9 10 11	Description
F R K 1 -	
	Kind
1	Optical/electrical conversion
2	Electrical/optical conversion
3	Electrical/optical conversion transmitter power supply built in
	Input/output signals
Y	FFI optical signal/4 to 20mA DC (unusable with 2, 3 in 4th digit)
A	1 to 5V DC/ FFI optical signal (unusable with 1, 3 in 4th digit)
B	4 to 20mA DC/ FFI optical signal (unusable with 1 in 4th digit)
C	10 to 50mA DC/ FFI optical signal (unusable with 1, 3 in 4th digit)
	Indicating unit
A	None
B	Equipped
	Power supply
1	24V DC
2	24V AC, 50/60Hz
3	100V AC, 50/60Hz
4	115V AC, 50/60Hz
5	220V AC, 50/60Hz
	Arrester
0	None
2	Equipped
	Enclosure
1	Immersion-proof case, non-explosion-proof
3	Flame-proof case (conduit flame-proof screw coupling type)
4	Flame-proof case (flame-proof packing type)
	Treatment
Y	None
B	Acid/alkali-proof processing

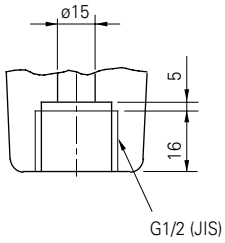
OUTLINE DIAGRAM (Unit : mm)



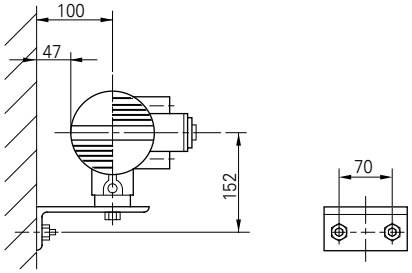
Pipe mouting



Details of A

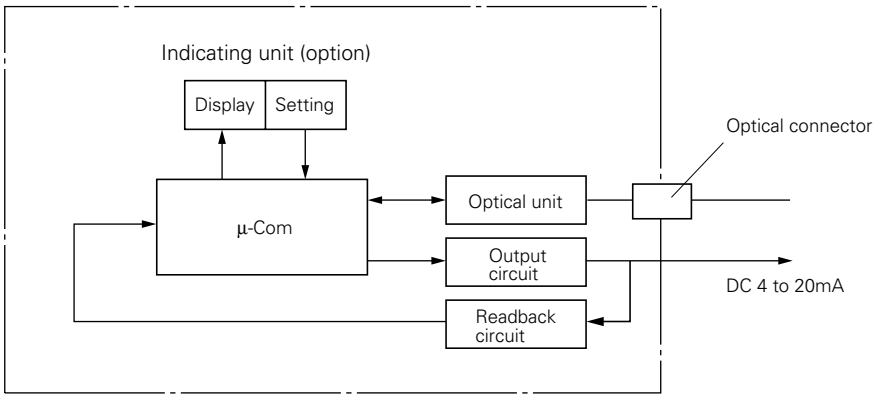


Wall mouting

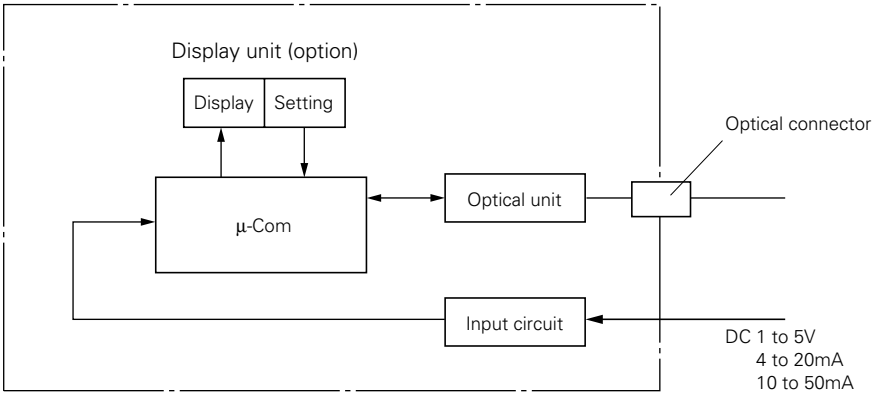


OPERATING PRINCIPLE DIAGRAM

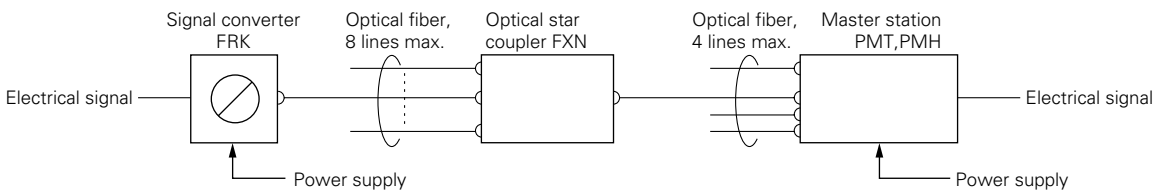
Optical/electrical converter

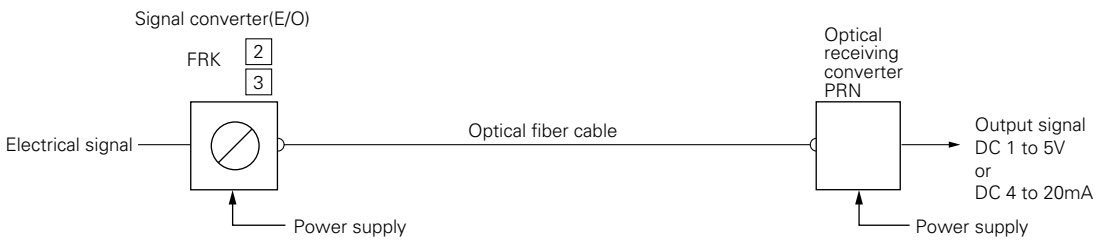


Electrical/optical converter

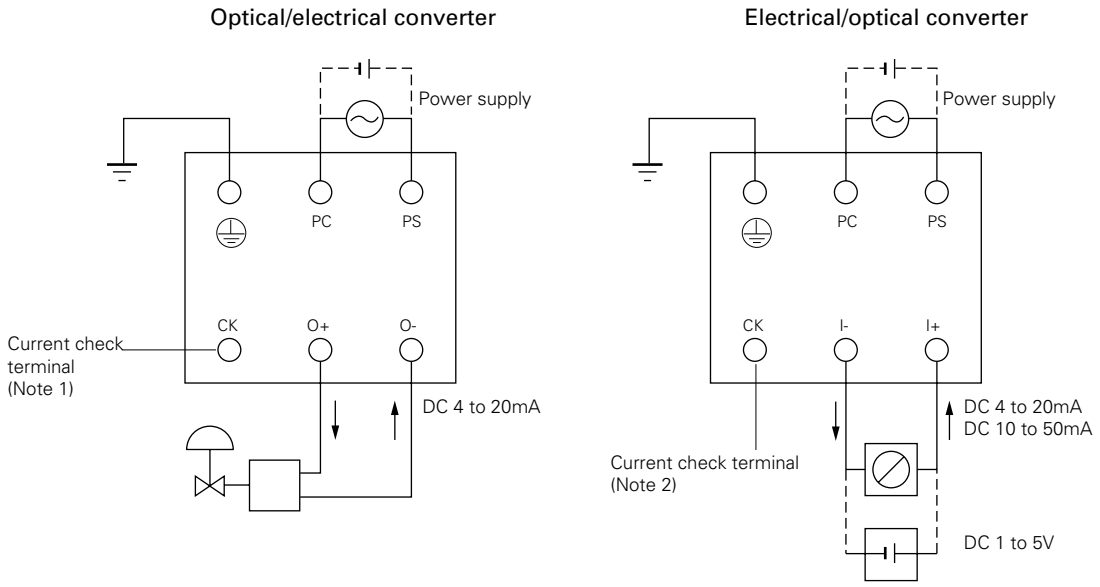


SYSTEM BLOCK DIAGRAM





EXTERNAL CONNECTION DIAGRAM



Note 1. O/E converter current can be checked at the CK (check) terminal and "0+" terminal
Connect the "+" side of the check current ammeter (Internal resistance is less than 10Ω) to CK and the "–" side to "+0".

2. E/O converter current input can be checked at CK and I – terminals. Connect the "+" side of the check current ammeter to CK and the "–" side to I –.
(Internal resistance of 4 to 20mA check current ammeter is less than 10Ω and that of 10 to 50mA check current ammeter is less than 4Ω).

SCOPE OF DELIVERY

Converter and mounting bracket

RELATED DEVICES

- Master station (Data sheet No. EDS11-86)
- Optical star coupler (Data sheet No. EDS8-43)
- Optical receiving converter (Data sheet No. EDS9-43)
- Optical connector
- Optical fiber cable
- Optical connector assembling tools

⚠ Caution on Safety

*Before using this product, be sure to read its instruction manual in advance.

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