FC SERIES RATIO SETTER

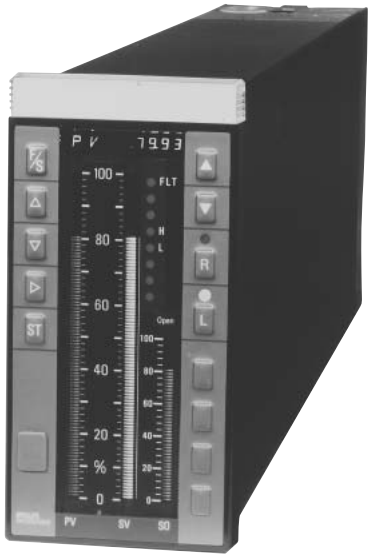
DATA SHEET

PNG1

The FC series ratio setter is used to set ratio for ratio control, and its set point signal is transmitted to a controller.

This instrument uses a solid state indicator and a push-button operation system to provide reliable monitoring and operating functions.

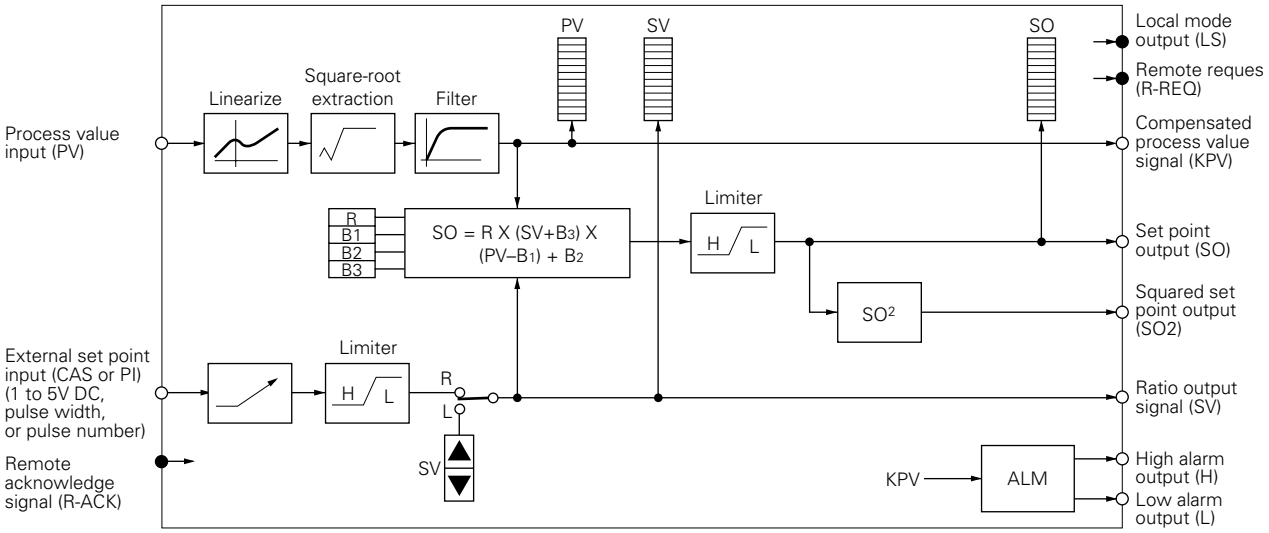
It also accepts a thermocouple, a resistance bulb and a 4 to 20mA DC input optionally.



FEATURES

1. High reliability
   This instrument is designed with few mechanical parts. It is mainly composed of electronic parts such as a solid state indicator which was formerly consisted of mechanical parts.
2. International standards
   This instrument is compact in size, conforming to international standards IEC. It operates on 24V DC power to deliver 1 to 5V DC signals as recommended by IEC standards.
   100 and 200V AC power are also available for convenience of operation.
3. Front panel operation
   Process values and set points can be read accurately with digital indications on panel front. Various parameter settings and setting operations are also possible from the front panel of the instrument.

FUNCTIONAL DIAGRAM



SPECIFICATIONS

1. Ratio computing function

Computing formula

$$SO = R(SV + B3)(PV - B1) + B2$$

- SO: Computation output
- R: Ratio factor
- SV: Ratio set point
- B3: Bias 3
- PV: Process value
- B1: Bias 1
- B2: Bias 2

Ratio factor and ratio bias:
Setting range; –327.6 to 327.67%

Computation cycle:
0.1 sec.

2. Input signal

(1) Process value input signal:
One input selectable from the following

Voltage input signal	I_+ I_0 I_-	1 to 5V DC	Input resistance, 1MΩ or more	Allow. error ±0.2%/FS*
Current input signal		4 to 20mA DC	24V ±2V DC can be supplied to transmitter in case of AC power supply approx. 35mA	Allow. error ±0.2%/FS*
Thermocouple input		Type J: 0 to 600°C K: 0 to 1200°C E: 0 to 800°C R: 0 to 1600°C	10mV DC span or more cold junction compensation comprised	Allow. error ±0.5%/FS*
Resistance bulb input		JPt100/Pt100 –50 to 500°C	50°C span or more	Allow. error ±0.5%/FS*

Note: *FS: Full scale

(2) Analog input signal: 1 point

External set point	CAS	1 to 5V DC	Input resistance, 1MΩ or more Allow. error ±0.2%/FS

(3) Digital input signal: 1 point

Remote acknowledge signal	R-ACK	Contact input (photo-coupler insulation)	ON 0V, OFF 24V (input current, approx. 11mA/24V DC)

(4) Pulse width or pulse number input signal:
1 set (eithre one)

Pulse width input signal	PI_+ PI_-	Contact input (photo-coupler insulation)	ON 0V, OFF 24V (input current, approx. 11mA/24V DC)
Pulse number input signal			ON 0V, OFF 24V (approx. 11mA/24V DC), max. input frequency 500Hz

3. Output signal

(1) Analog output signal: 4 points

Compensated process value signal	KPV	1 to 5V DC	Output resistance, 1Ω or less Allow. error ±0.2%/FS
Ratio output signal	SV		
Set point output	SO		
Squared set point output	SO2		

(2) Digital output signal: 5 points

Fault output	FLT	Open-collector output (photo-coupler insulation)	Output rating, 30V x 0.1A DC max.
High alarm output	H		
Low alarm output	L		
Local mode output	LS		
Remote request	R-REQ		

4. Indication, setting, operating functions

(1) Bargraph indication

	PV indicator	SV indicator	SO indicator
Indication method	LED (red)	LED (green)	LED (red)
No. of segments	101 + 2		51 + 2
Range	0 to 100%, linear		
Resolution	1 %/FS		2%/FS
Scale length	100mm		50mm
Indicating mode	0 to 100% bargraph indication, 0 to 100% reverse bargraph indication, dot indication, –50 to +50% deviation indication		

(2) Operation mode indication
Indicating method:
LED (green)
Green: L, R

(3) Numerical value indication, setting
Indication method:
LED (red), name in 3 digits + numerical value in 5 digits (negative sign included)

Contents of indication:
Process value (industrial value), set point (industrial value), high/low alarm, etc. Indication contents are selectable by F/S, △, ▽ keys on front panel.

Setting method: By using F/S, △, ▽, ▷, ST keys on front panel

(4) Setting functions
Fixed value setting method:
By using of ▲, ▼ pushbuttons on front panel.
Setting speed, approx. 40 sec/FS

Remote setting method:
By use of external set point signal (voltage or pulse input)
Tracking speed setting range; 0 to 900 sec/FS

(5) Operation mode changeover
By using of R/L pushbutton on front panel.

R ➡ L changeover		Balanceless bumpless
R ⬅ L changeover	Voltage signal*	Balance bumpless
	Pulse width signal	Balanceless bumpless

Note: * Balanceless bumpless by setting tracking speed

5. Power failure processing function

Power failure detection:
Setting output held at power failure detection.

During power failure:
Operating parameters backed up by capacitor up to 5 minutes. Initial value of set point is stored in non-volatile memory (lasts 10 years expected at ambient temperature of 50° C or less).

Power failure recovery:
Initial or continuous start mode can be set within 5 minutes of power failure. Recovery from power failure lasting longer than 5 minutes is done by initial.
Note: ** Control mode at initialzation can be registered
L: Local mode or R: Remote mode

6. Self-diagnosis functions

Computing circuit abnormality:
FLT lamp lights, FLT contact output "ON". Manual operation output possible

Input/output signal abnormality:
FLT lamp lights, FLT contact output "ON", computation stops, operating output held

Fault contents indication:
Cause of fault is indicated numerically on numerical indicator on front panel

7. Transmission functions

(1) Transmission items

Supervisory items:
PNG ➡ host
Process value, set point, control output, operation mode, alarm information, fault information, various limiter values, constants, etc.

Setting operation items:
Host ➡ PNG
Set point, control output, operation mode, various limiter values, constants, etc.

(2) Transmission setting inhibit:
Parameter setting enable/inhibit can be designated by transmission from the host. Designation is done by keys on the front panel.

(3) Communication interface

(a) T-link: Private interface
Transmission speed: 500Kbps
No. of units connectable: 32 max.
Transmission distance: 1km max.
Transmission form: Multi-drop
Control method: I/O transmission and message

(b) RS-422A/485: Universal interface
Transmission speed: 2400, 4800, 9600 or 19200bps configurable
No. of units connectable: 31 max.
Transmission distance: 1km max.
Transmission form: Multi-drop
Control method: Polling/selecting

(c) CC data line: Private interface
Transmission speed: 19.2Kbps (fixed)
No. of units connectable: 15 max.
Transmission distance: 500m max.
Transmission form: Multi-drop
Control method: Polling/selecting

8. Other functions

Data protective function by pass code

9. Operating conditions

Power supply: Select from 3 types
24V DC (20 to 30V DC)
100V AC (85 to 132/47 to 63Hz AC)
200V AC (187 to 264V/47 to 63Hz AC)

Power consumption:
Approx. 11W (DC)
Approx. 20VA (AC)

Dielectric strength:
1500V AC, 1 min.

Insulation resistance:
500V DC, 100MΩ or more

Ambient temperature:
0 to 50°C

Ambient humidity:
90% RH or less

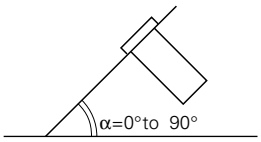
Enclosure: Steel case

Rating plate (Name plate):
100 (H) x 70 (W) mm, white acryl

Dimensions: 144 (H) x 72 (W) x 391 (D) mm, IEC (DIN) standard

Mass {weight}: Approx. 2.9kg

Mounting method:
Flush with indoor mounting; vertical mounting.
Mountable on tilted surface, angle "α"



Finish color: Munsell N 1.5 for both front panel and case

Scope of delivery: Setter and mounting bracket

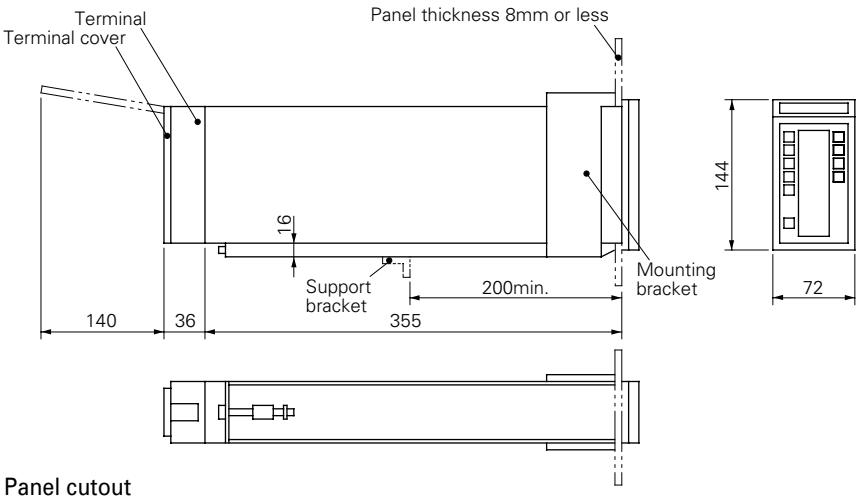
Item to be ordered separately:
Communication cable (type PNZ)

CODE SYMBOLS

1	2	3	4	5	6	7	8		9	10	Description
P	N	G	1				5	-	0		
				A							**Process value input signal** 1 to 5V DC
				B							4 to 20mA DC
				C							J thermocouple (10mV DC span or more, with cold junction compensation)
				D							K thermocouple (10mV DC span or more, with cold junction compensation)
				E							E thermocouple (10mV DC span or more, with cold junction compensation)
				F							R thermocouple (10mV DC span or more, with cold junction compensation)
				G							Resistance bulb, JPt 100, 3-wire, 50 °C span or more
				W							Resitance bulb, Pt100, 3-wire, 50 °C span or more
					A						**Setting method** L type
					B						R-L type
						1					**Power supply** 24V DC (20 to 30V DC)
						2					100V AC (85 to 132V/47 to 63Hz AC)
						3					200V AC (187 to 264V/47 to 63Hz AC)
									Y		**Transmission function** None
									T		T-link
									R		RS-422A
									S		RS-485
									C		CC data line

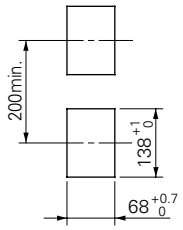
Note: Symbols for resistance bulb are as follows.
JPt100.....JIS C 1604-1981
Pt100.....IEC Pub 751-1983
(Selection of JPt100/Pt100 possible by front key operation)

OUTLINE DIAGRAM (Unit:mm)

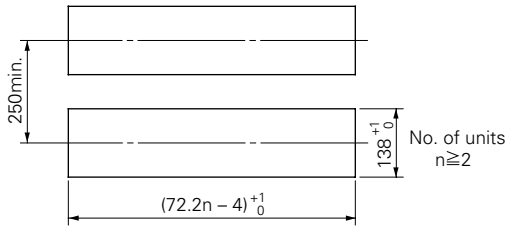


Panel cutout

When mounting 1 unit

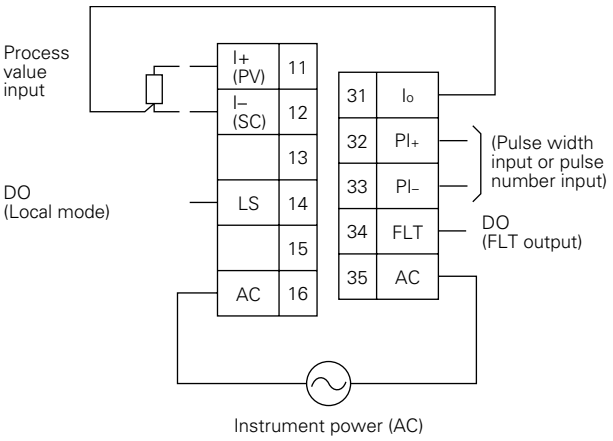


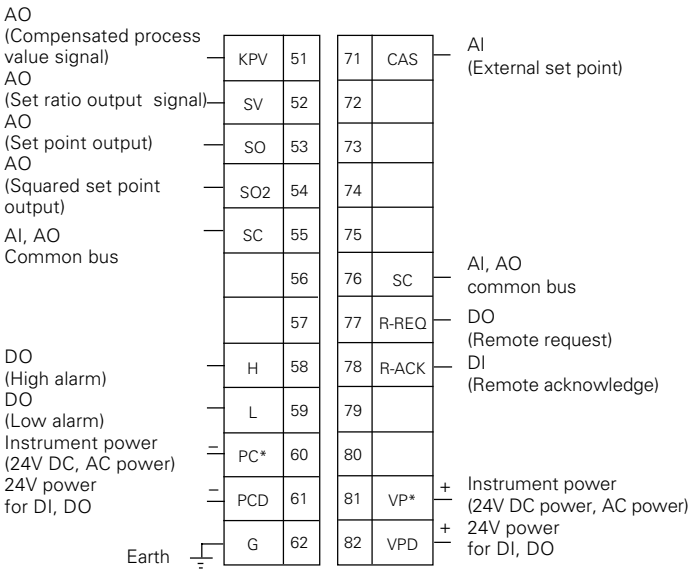
When mounting "n" units



CONNECTION DIAGRAM

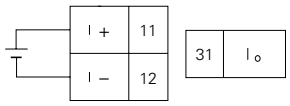
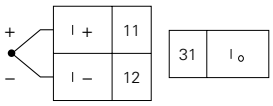
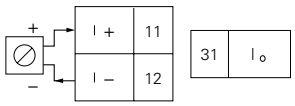
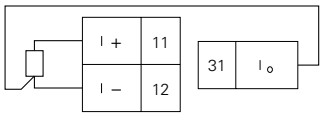
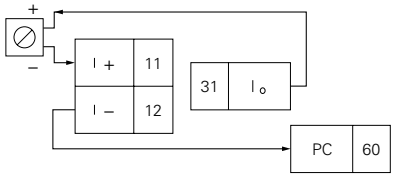
Block terminals (M4 screw)



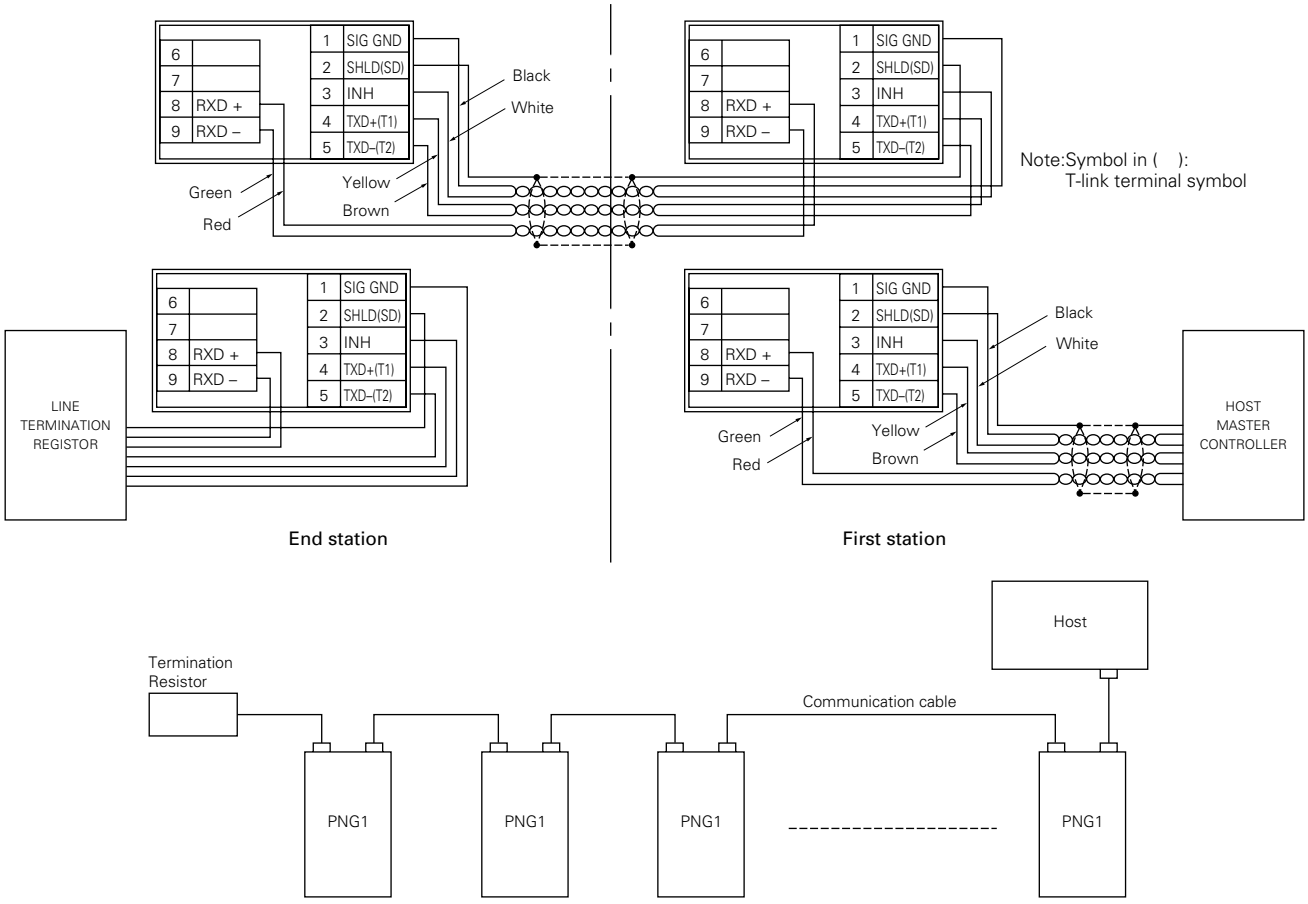


Note: * Symbols for AC instrument power are VPO, PCO, approx. 24V DC (0.1A max.) output.

Connections for process value input terminal block

1 to 5V DC The 5th digit of code symbols A		Thermocouple The 5th digit of code symbols C,D,E,F	
4 to 20mA DC The 5th digit of code symbols B		Resistance bulb The 5th digit of code symbols G,W	
4 to 20mA DC with inner DC power supply of CC-S The 5th digit of code symbols B			

COMMUNICATION CONNECTOR



⚠ Caution on Safety

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

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