

FC SERIES MANUAL LOADER (CONTINUOUS OUTPUT TYPE)

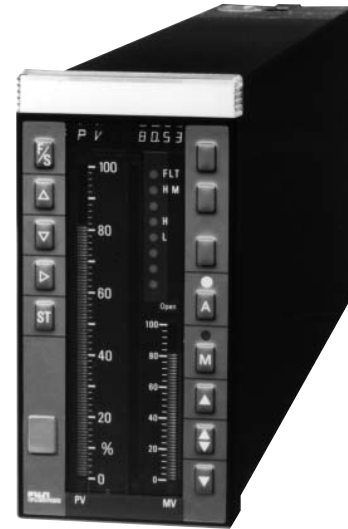
DATA SHEET

PNB3

The FC series manual loader is available in two types. One is used for remote control in combination with a compact controller, while the other is dedicated for manual operation.

This instrument is equipped with a solid state indicator and pushbutton operation circuit to provide easy readouts and handling for process operation by man-machine interface.

It can be directly connected to a 4 to 20mA input optionally.



FEATURES

1. High reliability

The manual loader is a solid state instrument having few mechanical parts. The indicator and other units which formerly consisted of mechanical parts are also designed with solid state circuits to provide high reliability.

2. Application of international standards

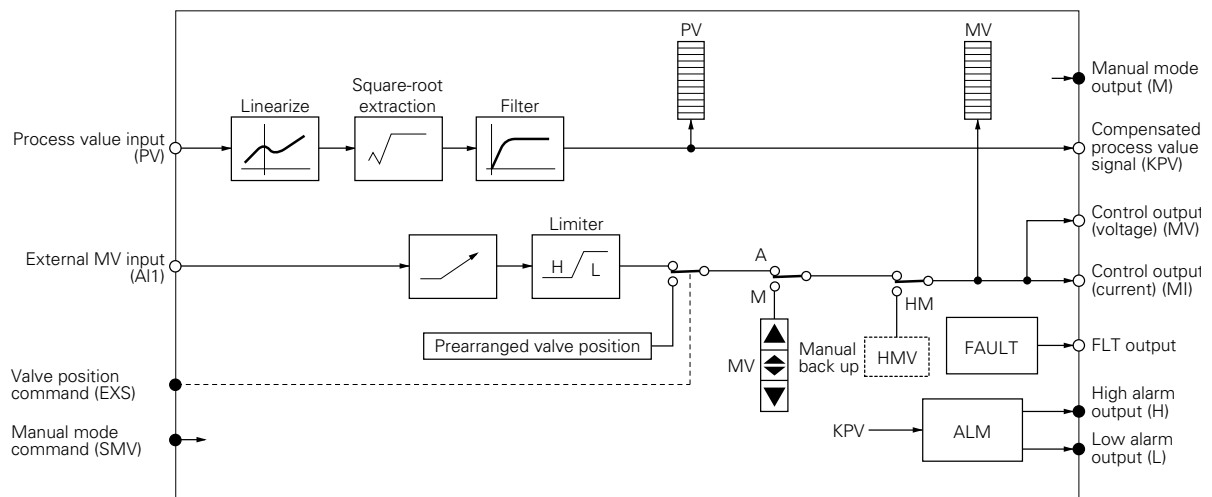
The instrument is compact, and the external dimensions comply with international IEC. The power supply and signal also comply with IEC standards (24V, 1 to 5V DC). Operation on 110V or 220V AC power supply is possible.

3. Front panel operation

Process values, valve position input, etc. can be read accurately from the digital display on the panel front.

Parameter setting and manual operation are also possible from the front of the panel.

FUNCTIONAL DIAGRAM



SPECIFICATIONS

1. Input signal

(1) Process value input signal:

One input selectable from the following.

Voltage input signal	I ₊ I _o I ₋	1 to 5V DC	Input resistance 1MΩ or more Allowable error ±0.2%/FS*
Current input signal		4 to 20mA DC	Allowable error +0.2%/FS* 24V ±2V DC can be supplied to transmitter in case of AC power supply (approx. 35mA max)
Thermocouple input		Types 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 Allowable error ±0.5%/FS*
Resistance bulb input		Pt100Ω (0°C) -50 to 500°C	50°C span or more Allowable error ±0.5%/FS*

Note *: FS: Full scale

(2) Analog input signal: 1 point

External MV input signal	AI 1	1 to 5V DC	Input resistance, 1MΩ or more Allow. error ±0.2%/FS
--------------------------	------	------------	--

(3) Digital input signal: 2 point

Manual mode command	SMV	Contact input (photo-coupler insulation)	ON 0V, OFF 24V (input current, approx. 11mA/24V DC)
Valve position command	EXS		

2. Output signal

(1) Manipulated output signal: 1 point

Current output	MI ₊ MI ₋	4 to 20mA DC	Allow. load resistance, 600Ω or less Allow error ±0.2%/FS
----------------	------------------------------------	--------------	--

(2) Analog output signal: 2 points

Compensated process value signal	KPV	1 to 5V DC	Output resistance, 1Ω or less Allow error ±0.2%/FS
Control output	MV		

(3) Digital output signal: 4 points

Fault output	FLT	Open-collector output (photo-coupler insulation)	Output rating, 30V x 0.1A DC, max.
Manual mode output	M		
High alarm output	H		
Low alarm output	L		

3. Indication, setting, operating functions

(1) Bargraph indication

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

(2) Operation mode indication

Indicating method:

LED (red and green)
Red: M, HM
Green: A

(3) Numerical indication, setting

Indication method:

LED (red), name in 3 digits + number in 5 digits (negative sign included)

Indication contents:

Process variable (industrial value), high/low alarm, limiter value, etc.
Indication contents are selected with **[F/S]**, **[△]**, **[▽]** keys on front panel.

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

(4) Operating functions

Manual operating method:

By using of **[▲]**, **[◆]**, **[▼]** pushbuttons on front of the panel
Setting speed, approx. 40 sec/FS
Simultaneous press of **[◆]** button, approx. 8 sec/FS

Auto operating method:

By using external MV input signal
Output limiter:
High limit setting range, -25 to 125%
Low limit setting range, -25 to 125%
Tracking speed setting range; 0 to 900 sec/FS

Hard manual operating method:

By using control knob on front panel of HMV unit

(5) Operation mode selection

By using A/M pushbutton and HM switch on front of the panel

M → HM selection	Balance bumpless
M ← HM selection	
A ← M selection*	
A → HM selection	
A ← HM selection*	
A → M selection	Balanceless bumpless

Note: * Balanceless bumpless by setting tracking speed

(6) Alarm function

High/low alarm can be set in industrial values for process value input signal.

4. Power failure processing functions

Power failure detection:

Control output holds at power failure detection.

During power failure:

Operating parameters backed up by capacitor when power failure occurs within 5 minutes.

Initial value of control output is stored in non-volatile memory (lasts for 10 years expected at ambient temperature of 50°C or less).

Power failure recovery time:

Initial or continuous start mode can be set for power failure within 5 minutes.
Recovery from power failure lasting longer than 5 minutes is done by initial.

Note: Control mode at initialization can be registered
M: Manual mode or A: Auto mode

5. Self-diagnosis functions

Process value input signal abnormality:

FLT indicator lights and FLT contact output turns "ON"

Control output abnormality:

FLT lamp lights and FLT contact output goes "ON"
Other function is processed at all times.

Fault contents indication:

Cause of fault is indicated numerically on numerical indicator on the front panel.

6. Transmission functions

(1) Transmission items

Supervisory items:

PNB → host
Process value, control output, operation mode, alarm information, fault information, various limiter values, constants, etc.

Setting operation items:

Host → PNB
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

7. Other functions

Data protective function by use of pass code

8. Additional functions (options)

(1) Hard manual unit (HMV)

Control output: 4 to 20mA DC
Allowable load resistance: 600Ω or less (24V DC power supply)

9. Operating conditions

Power supply: Selected from the following 3 types
24V DC (20 to 30V DC)
110V AC (85 to 132V/47 to 63Hz AC)
220V AC (187 to 264V/47 to 63Hz AC)

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

Dielectric strength: 1500V AC, 1 min.

Insulation resistance: 100MΩ or more at 50V DC

Ambient temperature: 0 to 50°C

Ambient humidity:

90% RH or less

Enclosure: Steel case

Rating plate (Name plate):

100 (H) x 72 (W) mm, white acryl

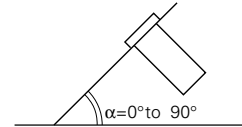
Dimensions: 144 (H) x 72 (W) x 407 (D) mm, IEC (DIN) standards

Mass {weight}: Approx. 2.9kg

Mounting method:

Flush with indoor panel; vertical mounting is standard.

Mounting on tilted surface possible (angle "α")



Finish color: Munsell N 1.5 for front panel and case

Scope of delivery: Manual loader 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	B	3					5		Process value input signal
A										1 to 5V DC
B										4 to 20mA DC with 24V DC power supply
C										J thermocouple
D										K thermocouple
E										E thermocouple
F										R thermocouple
G										RTD Pt100Ω 3-wire type, 50°C span or more
A										External MV inputs
B										one 1 to 5V DC
										one 4 to 20mA DC
1										Power supply
2										24V DC (20 to 30V DC)
3										110V AC (85 to 132V/47 to 63Hz AC)
										220V AC (187 to 264V/47 to 63Hz AC)
										Hard manual back-up unit
0										Without
1										With
										Transmission function
Y										Without
T										T-link
R										RS-422A
S										RS-485

Note: Front scale and temperature range are to be selected and specified from the "STANDARD FRONT SCALE" and "STANDARD TEMPERATURE RANGE" stated hereafter, when order being placed.

STANDARD TEMPERATURE RANGE

Followings are standard input temperature ranges to be selected and to be specified with the ordering code.

Detector	Measurement range
J type thermocouple	0 to 200, 0 to 300, 0 to 400, 0 to 500, <u>0 to 600</u> , 200 to 400, 300 to 600 deg C
K type thermocouple	0 to 300, 0 to 400, 0 to 500, 0 to 600, 0 to 800, 0 to 1000, <u>0 to 1200</u> , 300 to 600, 400 to 800, 500 to 1000, 600 to 1200 deg C
E type thermocouple	0 to 200, 0 to 300, 0 to 400, 0 to 500, 0 to 600, <u>0 to 800</u> , 200 to 400, 300 to 600 deg C
R type thermocouple	0 to 1000, 0 to 1200, 0 to 1600, 400 to 1400, 600 to 1600, 800 to 1600 deg C
Platinum resistor temperature detector	0 to 50, 0 to 100, 0 to 150, 0 to 200, 0 to 300, 0 to 400, 100 to 300, 200 to 400, -50 to 100, <u>-50 to 500</u> deg C

Note: The underlined temperature range will be selected and delivered when input temperature range is not specified in the ordering code.

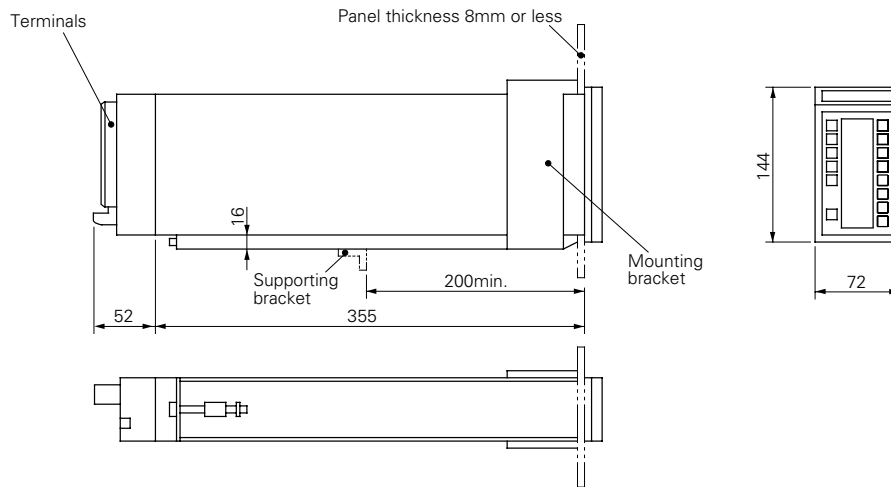
STANDARD SCALE

Followings are standard scales to be selected and to be specified with the ordering code.

On condition that PV is of the same scale each other, following standard scale plates are prepared as standard.

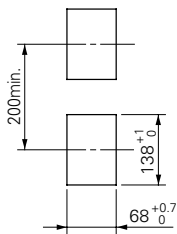
Detector	PV scale
J type thermocouple	0 to 200, 0 to 300, 0 to 400, 0 to 500, <u>0 to 600</u> , 200 to 400, 300 to 600 deg C, 0 to 100%
K type thermocouple	0 to 300, 0 to 400, 0 to 500, 0 to 600, 0 to 800, 0 to 1000, <u>0 to 1200</u> , 300 to 600, 400 to 800, 500 to 1000, 600 to 1200 deg C, 0 to 100%
E type thermocouple	0 to 200, 0 to 300, 0 to 400, 0 to 500, 0 to 600, <u>0 to 800</u> , 200 to 400, 300 to 600 deg C, 0 to 100%
R type thermocouple	0 to 1000, 0 to 1200, <u>0 to 1600</u> , 400 to 1400, 600 to 1600, 800 to 1600 deg C, 0 to 100%
Platinum resistor temperature detector	0 to 50, 0 to 100, 0 to 150, 0 to 200, 0 to 300, 0 to 400, 100 to 300, 200 to 400, -50 to 100, <u>-50 to 500</u> deg C, 0 to 100%
1 to 5 VDC input	0 to 10, 0 to 20, 0 to 30, 0 to 40, 0 to 50, 0 to 60, 0 to 80, 0 to 100, 0 to 200, 0 to 300, 0 to 400, 0 to 500, 0 to 600, 0 to 800, 0 to 1000 unit. <u>0 to 100%</u>
MV	0 to 100%

OUTLINE DIAGRAM (Unit:mm)

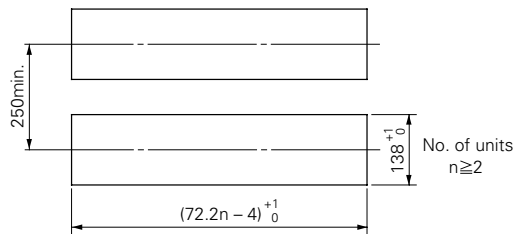


Panel cutout

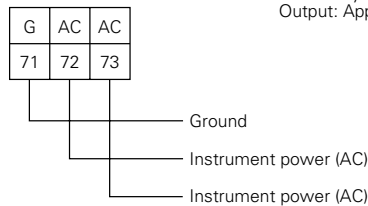
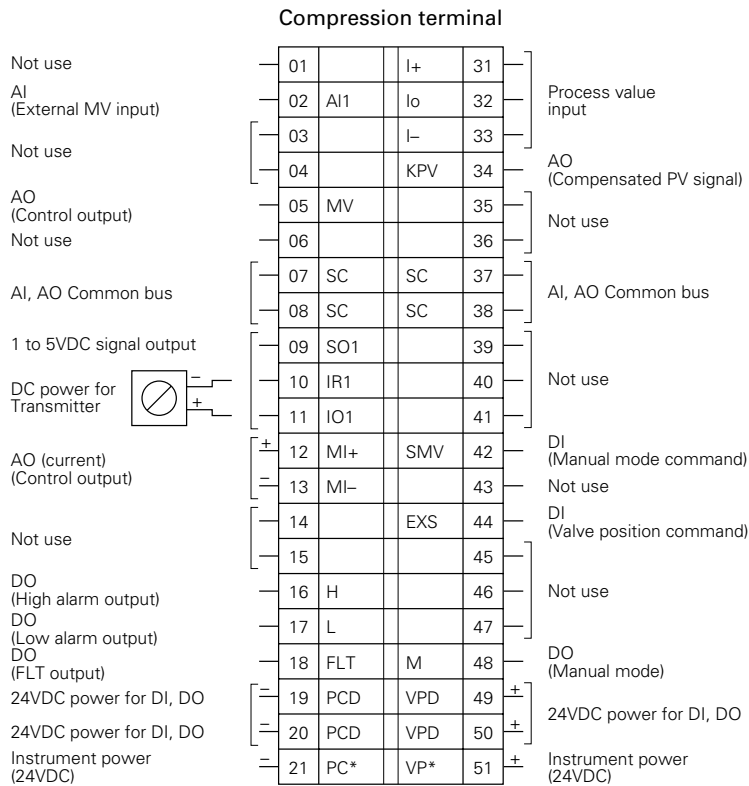
When mounting one unit



When mounting "n" units

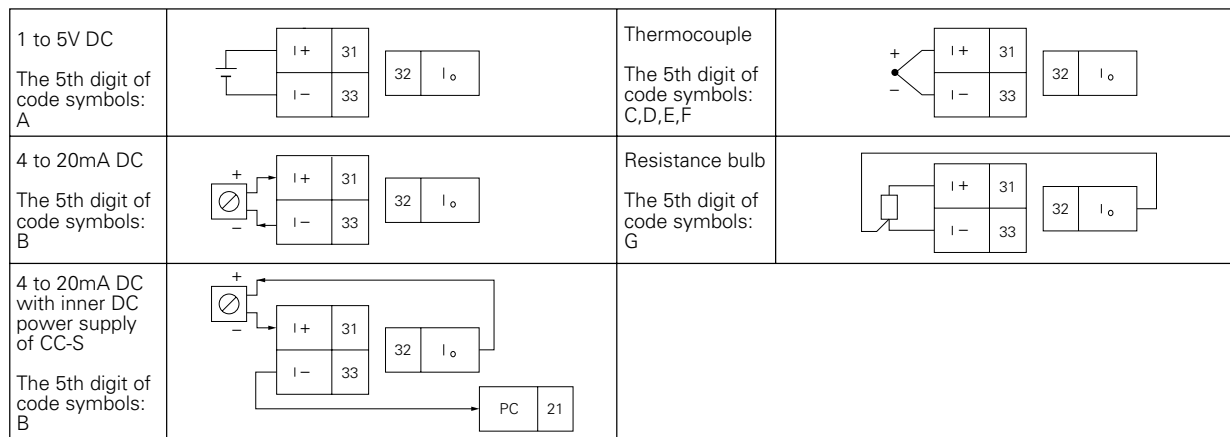


CONNECTION DIAGRAM

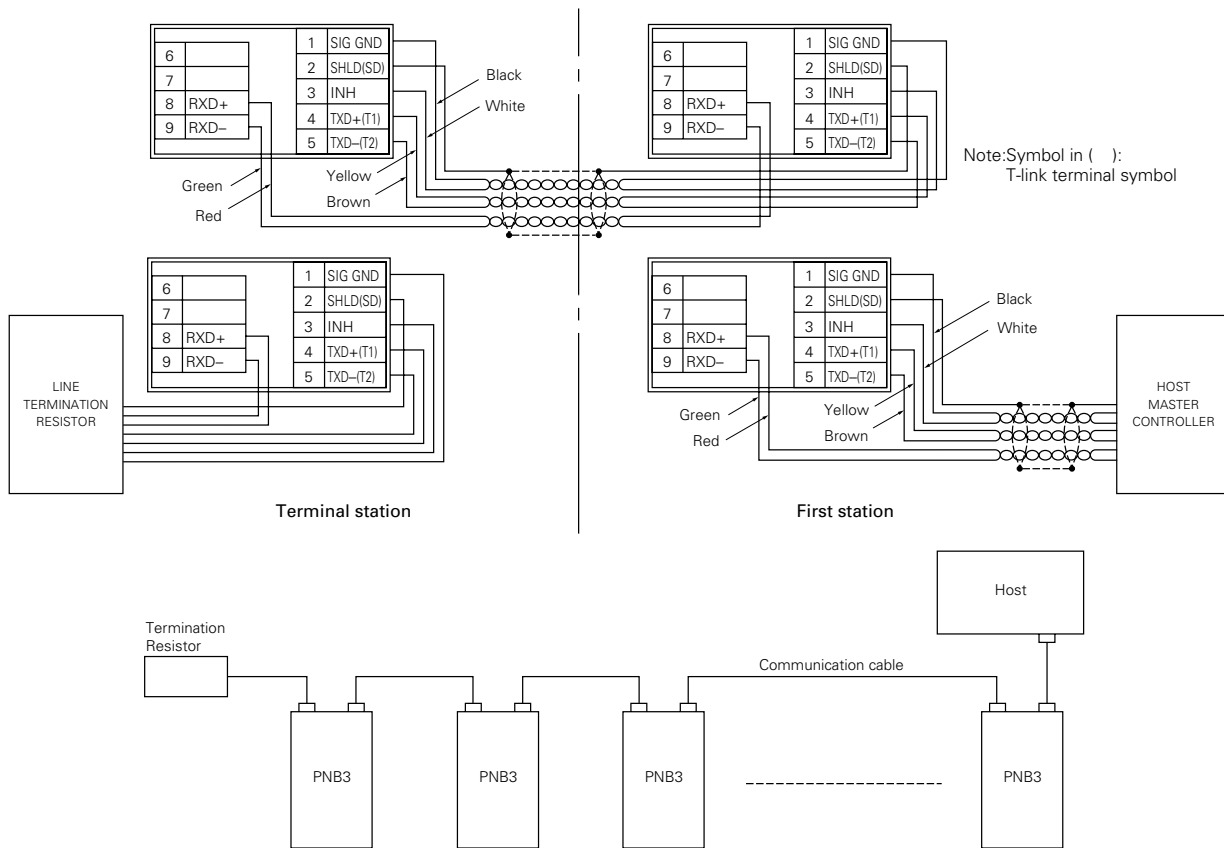


Note: * Symbols for AC instrument power are VPO, PCC
Output: Approx. 24V DC (0.1A, max.)

Process value input terminals connections



COMMUNICATION CONNECTOR



The product conforms to the requirements of the Electromagnetic compatibility Directive 89/336/EEC as detailed within the technical construction file number TN510402. The applicable standards used to demonstrate compliance are :-

EN 55011 : 1991 CLASS A Conducted and Radiated emissions

EN 50082-1 :-1992 Radiated immunity, ESD and FBT

⚠ Caution on Safety

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

Fuji Electric Systems Co., Ltd.

Head Office

6-17, Sanbancho, Chiyoda-ku, Tokyo 102-0075, Japan
<http://www.fesys.co.jp/eng>

Sales Div.

International Sales Dept.

No.1, Fuji-machi, Hino-city, Tokyo, 191-8502 Japan
 Phone: 81-42-585-6201, 6202 Fax: 81-42-585-6187
<http://www.fic-net.jp/eng>