PXH Digital Controller

Easy configuration with pre-installed Application Templates

1/4 DIN (96×96mm)

c**UL**us **CE**

🔴 **High Speed control-50ms Input sampling**

🔴 **High Accuracy-0.1%**

🔴 **Extensive number of I/O points** (AI : 3 points, DI : 9 points, DO : 9 points, AO : 2 points)

🔴 **Enhanced Math Functions**

🔴 **RS-485 Modbus Communications and Transmitter Power Supply options available**

Fuji Electric Instruments Co., Ltd.
http://www.fic-net.co.jp/eng

ISO14001
JQA-EM2492

ISO9001
JQA-2275

ECNO:1152

HIGH SPEED, HIGH ACCURACY

50ms sampling cycle and 0.1% accuracy offer precise control.

Easy-to-view 5 digit display

0.01°C can be indicated.

input Universal-input
(max. 2 points)

Thermocouple, RTD, voltage or current input is switchable on the front panel keys.

input Digital-input (Max. 9 points)

Applicable to SV/PID set, AT Start/Stand-by, Remote/Auto/Manual switch, Alarm-latch clear, et. al.

input Auxiliary Analog input (1 point)

Applicable to flow compensation and remote SV setting.

output Control-output
(3 types)

Selectable as relay, SSR/SSC drive and current.

output Digital-output
(Max. 9 points)

Various event data as alarm and timer output are available.

output Auxiliary Analog output (Max. 2 points)

Max. two points out of PV/SV/MV/DV are available as analog output.

Transmitter Power Supply (Option)
24V DC, 23mA max.

RS485 Modbus communication function (option)

Math functions

Flow compensation, High/Low selector control, ratio, calorie calculation, et. al.

PC loader interface and software through RS-232C Communication

The loader software enables easy parameter setup.

PID Palette

Max. 7 combinations of SV, PID are available.

Quick PID

ensures precise control to prevent overshoot and improve response to disturbances.
Applicable to various process controls including flow control and pressure control.

User friendly, Easy-to-view

Mode indicator

displays status as stand-by, control mode, output, alarm, etc.

Status indicator

displays SV select No. (at operation) and parameter No. (at setting)

PV indicator

has 5 digit display. 0.01°C indication is possible.(Charactor height : 20mm)

Bargraph indicator

displays MV (12 segments)

SV/MV indicator

displays SV and MV. (Charactor height : 13mm)

Waterproof construction

is equipped on front panel as standard. NEMA4x (IEC standard IP66 equivalent)

User function keys

offer one touch operation for Remote/Auto switch, Stand-by, Alarm-latch clear, AT, etc. is definable by user.

Easy configuration with control application templates

Pre-installed programming templates allow easy configuration for various applications.

Just by selecting appropriate "Application Template", input/output setting and internal calculation blocks can be automatically configured.

Template (Control Type)
Position proportional control type
Position feedback control type
Dual control type (Heat/Cool)
2 position control type
Cascade control type
Ratio control type
2 inputs switching control type
2 inputs selection control type
Feed forward control type
Ex-MV balance bumpless switching type
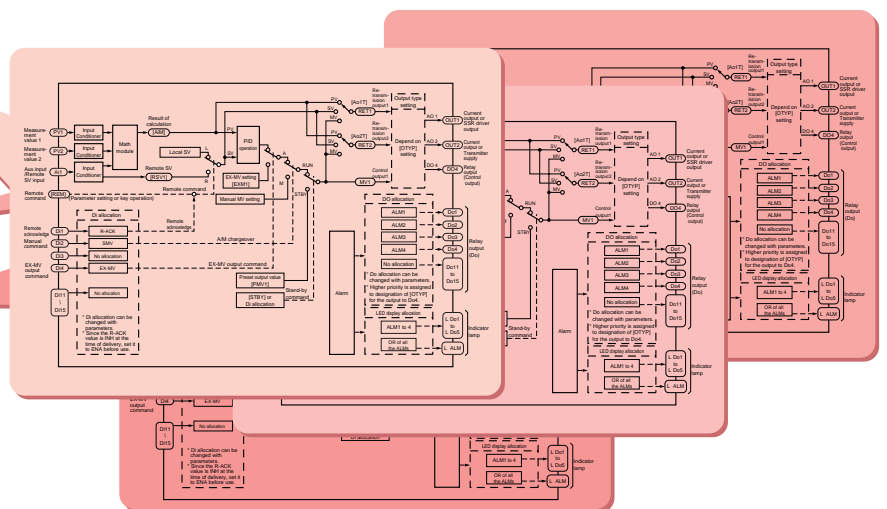
5 types of Basic "Application Templates" are pre-installed.

● PID
● PID + SV select
● PID + Mathematical Module
● PID + SV select + Mathematical Module
● PID + Input select + Mathematical Module

Additional templates will be available.

Cascade, Heat/Cool, Dual Loop, Totalization, Position feedback, Servo control
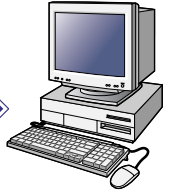(Note : Under development)

software

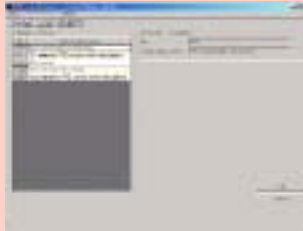# Loader software enables easy parameter-settings

With standard loader software, Parameters can be easily uploaded/downloaded. PID tuning status can be easily viewed on PC.
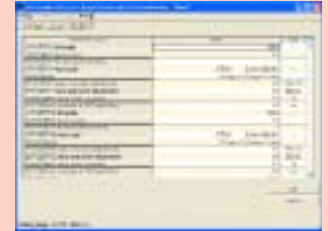
Connection from standard loader port or from optional RS-485 communication.
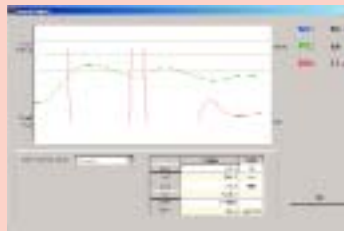

Menu

Template selection

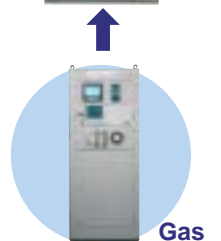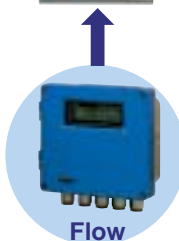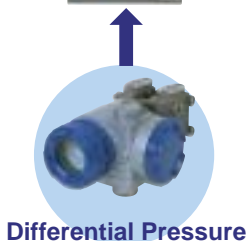Parameter settings/changes

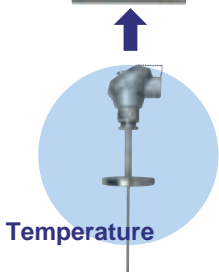Preview for Parameter print

tuning status

Small instrumentation system is easily configurable

RS-485 (MODBUS) communication allows for connecting up to 31 units using any general-purpose SCADA software.

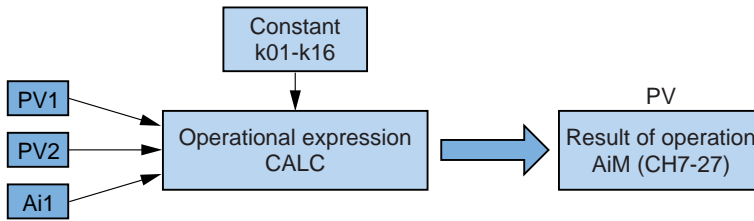Max. 31 units can be connected by RS-485 (Modbus)

Temperature　　**Differential Pressure**　　**Pressure**　　**Flow**　　**Level**　　**Gas**

Other powerful features and functions

Mathematical Module (standard feature)

Useful for various applications involving process manipulation, input switching, etc. by the numeric operation between two or three inputs. User defined formulas can be applied to process and analog inputs.
(Data type : Engineering unit with floating decimal point)

Flow compensation, Average, High/Low selector, Input selector and etc.

CALC set value	Name of operation	Math function
0	No operation	AiM= PV1
1	Expression 1 (Flow rate compensation calculation)	$AiM = k01 \times \sqrt[*1]{PV1} \times \sqrt[*2]{\dfrac{Ai1+k02}{k03} \times \dfrac{k04}{PV2+k05}}$ PV1 : Flow rate (Differential pressure), PV2 : Temperature, Ai1 : Pressure
2	Expression 2 (Flow rate compensation calculation)	$AiM = k01 \times PV1 \times \sqrt[*1]{\dfrac{Ai1+k02}{k03} \times \dfrac{k04}{PV2+k05}}$ PV1 : Flow rate (Differential pressure), PV2 : Temperature, Ai1 : Pressure
3	Expression 3 (Flow rate compensation calculation)	$AiM = k01 \times PV1 \times \dfrac{Ai1+k02}{k03} \times \dfrac{k04}{PV2+k05}$ PV1 : Flow rate (Differential pressure), PV2 : Temperature, Ai1 : Pressure
4	Expression 4	$AiM = \dfrac{(k01\times(k02\times PV1+k03\times PV2+k04\times Ai1)+k05)}{(k06\times(k07\times PV1+k08\times PV2+k09\times Ai1)+k10)}$
5	Expression 5	$AiM = \dfrac{(k01\times((k02\times PV1+k03)\times(k04\times PV2+k05)\times(k06\times Ai1+k07))+k08)}{(k09\times((k10\times PV1+k11)\times(k12\times PV2+k13)\times(k14\times Ai1+k15))+k16)}$
6	Expression 6	$AiM = k01\times PV1\times(k02\times PV2+k03\times Ai1)+k04\times Ai1+k05$
7	H selector, 2 points	AiM= Max (PV1, PV2) Use either PV1 or PV2 input, whichever is larger, as PV.
8	L selector, 2 points	AiM= Min (PV1, PV2) Use either PV1 or PV2 input, whichever is smaller, as PV.
9	H selector, 3 points	AiM= Max (PV1, PV2, Ai1) Use one out of PV1, PV2, or Ai1 input, whichever is largest, as PV.
10	L selector, 3 points	AiM= Min (PV1, PV2, Ai1) Use one out of PV1, PV2, or Ai1 input, whichever is smallest, as PV.
11	Input switching, 2 points	AiM= PV1 when PV1<= k01, PV2 when PV1>k01

*1 Square root extraction cut point can be set at k06.
*2 Square root extraction cut point can be set at k07.

Specifications

General	Size and Mass	96(W)×96(H)×81.5(L)mm, 500g	Output	Control output	One point to be selected from the followings
	Power supply	AC100 (-15%) - 240V (+10%), 50/60Hz			1. Relay contact output
	Power consumption	15VA or less (for AC100V) 20VA or less (for AC220V)			Contact structure : 1c (SPDT) contact (DO4 is used)
	External terminals	Screw terminal (M3)			Contact rating : AC220V/DC30V, 3A (Resistive load)
Input	Measuring value input	Sampling cycle : 50ms Input type : Thermocouple, resistance bulb, DC Voltage/Current			AC220V/DC30V, 1A (Inductive load) 2. SSR/SSC drive output
	Auxiliary analog input (option)	Sampling cycle : 100ms Input type DC Voltage (DC1-5V, 0-5V, 0-10V)			DC12V (DC10-15V)/Max. current 20mA Load resistance : 600Ω or more
	Digital input	Number of input : 4 or 9 points Specification : Contact or transistor input Contact rating : DC12V, ca.2mA per point			3. DC4-20mA output Accuracy : ±0.2% FS Linearity : ±0.2% FS Load resistance : 600Ω or less
Function	Control method	2-degree-of-freedom PID control with Auto tuning		Analog re-transmission output	Max. 2 points Current output (DC4-20mA) Output type : PV, SV, MV, DV
	Controller type selection	with application templates		Digital output	Number of output : 2, 4, or 9 points Contact structure :
	Control mode	Auto/Manual Auto/Manual/Remote			1c (SPDT) contact (DO4) 1a (SPST) contact (other than DO4)
	Alarm output	Max. 9 points as digital output			Contact rating : AC220V/DC30V, 1A (Resistive load)
	Memory back-up	by nonvolatile memory		Transmitter power supply	DC24V (DC17-30V) Max. current 23mA
Indication	Accuracy	±0.1%±1digit of full scale	RS232C communication	Protocol	Modbus-RTU
	PV indicator	LED 7 segments 5 digits (red color), charactoer height: 20mm		Speed	9600bps, 19200bps, 38400bps
	SV indicator	LED 7 segments 5 digits (orange color), character height: 13mm	RS485 communication (Option)	Protocol	Modbus-RTU
	Status indicator	LED 7 segments 2 digits (orange color), character height: 12mm		Speed	9600bps, 19200bps, 38400bps
	Bargraph	LED 12 segments (orange color)	Applied standards		UL, CE Mark
	Mode indicator	Stand-by, Control mode, output, alarm			

Ordering code

		4	5	6	7	8		9	10	11	12	13
	PXH	9	A			1	—		V			0

Digit	Description			Code
4	<Size>			
	96x96mm			9
5	<Control loop function>			
	1 loop, PID controller			A
6	<PV input>			
	Universal input, 1 point			1
	Universal input, 2 points		Note 1	2
7	<Auxiliary input>			
	None			0
	DC voltage			1
8	<Version>			1
9	<Output 1>	<Output 2>		
	Current	None		1
	Current	Current		2
	Current	Transmitter power supply		5
	SSR/SSC drive	None		A
	SSR/SSC drive	Current		B
10	<Power supply>			
	100 to 240 V AC 50/60Hz			V
11	<Communication interface>			
	None			0
	RS-485 (Modbus)			R
12	<Digital input>	<Digital output> including control output relay output		
	4 points (DI1 to 4)	2 points (DO3, 4)	Note 2	0
	4 points (DI1 to 4)	4 points (DO1 to 4)		A
	9 points (DI1 to 4, 11 to 15)	9 points (DO1 to 4, 11 to 15)	Note 1	B

Note 1) The 6th digit "2" is not available with 12th digit "B".
　　　2) DO4 is used for Relay contact as control output.

External dimensions (Unit : mm)

● Front　　● Side　　● Rear　　● Panel cut
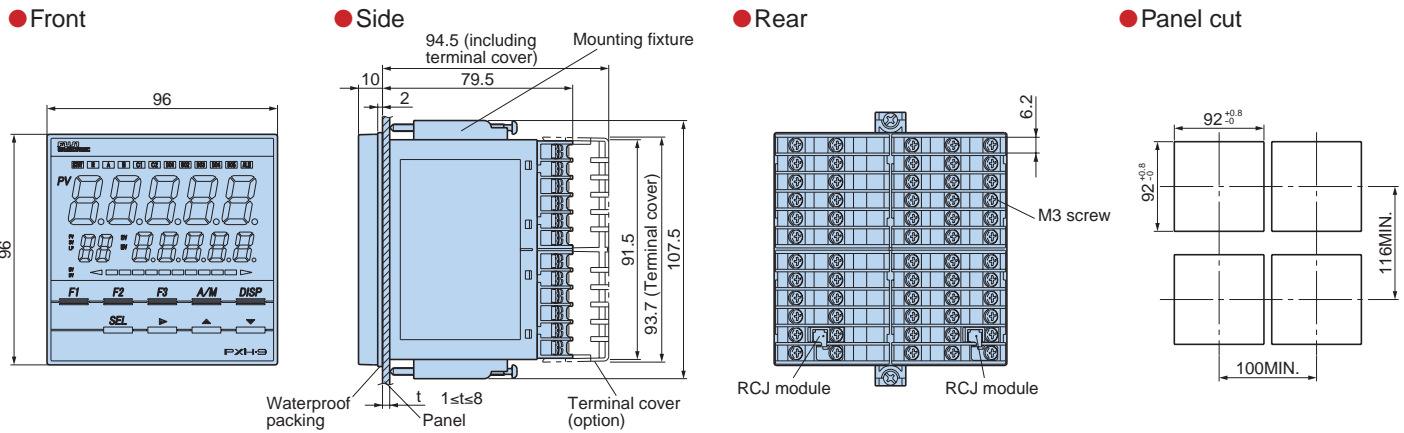
Scope of supply

Controller PXH, mounting fixture, waterproof packing for front face, engineering unit sheet, instruction manual, CD-ROM (includes PC loader, communication-manual, inst. manual, user-manual) and termination resistor in case communication interface is ordered.

⚠ Precautions for use

To ensure temperature process safety in case of PXH's failure, fit a separate over-temperature protection unit to isolate the heating circuit. Uncontrollability due to such failure may cause major accident.