PYX SERIES

FUJI ELECTRIC

FUZZY LOGIC CONTROLLERS WITH ADVANCED OPTIONS

Here's a process controller that uses past experience to make decisions that eliminate costly problems like overshoot. The Fuji PYX uses a type of artificial intelligence called "fuzzy logic" to learn your system's particular characteristics, and works with that knowledge to obtain the proper results.

During autotune (a procedure which automatically fine-tunes your controller) and during normal operation, the PYX is studying your system's responses to changing conditions. It remembers how the system responded at start-up and to disturbances (such as opening an oven door). Once it gets to know your process, the PYX actually anticipates the extent of the fluctuation and takes corrective action before a minor deviation becomes a major problem. That means an end to troublesome overshoot—even the minor overshoot associated with PID control. It also means a virtual lock on the target setpoint once it's been reached, without wandering.

The PYX also boasts a host of other indispensible features. Users can input an eight-segment program that leads a process smoothly through a predetermined series of thermal steps. And when it comes to communicating with a computer, the PYX is unsurpassed. Along with the RS-485 communications option, we provide free software that lets you monitor up to 31 controllers at the same time. As with our simple front panel keypad menu, the software can be installed and run easily even by first-time users.

FEATURES

- **True Fuzzy Logic Control**
  Uses artificial intelligence to learn your system
- **Auto/Manual Operation**
  Manual override allows you to take control of the process at any time
- **PID Autotuning**
  Automatically calculates PID control settings for you, thereby optimizing system performance
- **Universal Input**
  J, K, R, T, S, B, E, PL-II, 0 to 5 VDC, 1 to 5 VDC, 4 to 20mA, RTD
- **RS485 Communications Option with Free Software**
  Monitors up to 31 Controllers
- **Analog Retransmission Option**
  PV, setpoint or percent output as 1-5V DC
- **Remote Setpoint Option**
  Permits operation from a remote device
- **Dual Setpoints Option**
  Switch between two setpoints using an external contact
- **Transmitter Power Supply Option**
  Provides 24V DC for loop-powered devices
- **8-Segment Ramp/Soak Program Option**
  Program ramp time and dwell time for four distinct setpoints
- **Heater-Break Option Detects Heater Burnout**
- **Up to Two Outputs Available**
  Relay, SSR driver, 4-20 mA, 0-10V
- **Up to Two Programmable Alarms**
  Allows user to customize alarm outputs as absolute, deviation, zone or combination alarms as well as heater-break and loop-break alarms
- **Three-Year Warranty**
  Against manufacturing defects

PYX SPECIFICATIONS

GENERAL SPECIFICATIONS

POWER SOURCE	85 to 264 VAC, 50/60Hz

INPUT

PROCESS VARIABLE INPUT SIGNAL	Thermocouple: J, K, R, B, T, E, S, N, U, WRe5-26, PL-II RTD: 3-wire Pt100Ω. Allowable wiring resistance 10Ω max. (per wire) Voltage Input: DC 1 to 5V; DC 0 to 5V Input resistance 1MΩ min. Current Input: DC 4 to 20mA
INPUT ACCURACY	±0.5% FS, ±1 digit
COLD JUNCTION COMPENSATION ERROR	±1°C
INPUT SAMPLING CYCLE	500ms
DIGITAL INPUT (OPTION)	Number of Input Points: 1 pt. DC 16V, 15mA

CONTROL FUNCTION

OPERATION MODE	Auto or manual operation
FUZZY CONTROL	Fuji's original fuzzy control
PID CONTROL WITH AUTOTUNING	Proportional Band (P): 0 to 999.9% Integral Time (I): 0 to 3,200 seconds Rate Time (D): 0 to 999.9 seconds (Fuzzy control action or PID action with autotuning is selectable by using the front panel key)
PROPORTIONAL CYCLE TIME	1 to 120 seconds
INPUT SAMPLING CYCLE TIME	0.5 seconds

OUTPUT

CONTROL OUTPUT	Relay contact, voltage pulse output (for SSR drive) and current and voltage output
STANDARD OUTPUT TYPE	Of the following types, any one could be specified Relay: 220V AC, 3A (resistive load) SSR/SSC Drive: ON – 20mA, 24V max. OFF – 0.5V or less Current: 4 to 20mA DC. Allowable load resistance 600Ω or less Voltage: 0-10V DC
DUAL OUTPUT OPTION	Of the following output types, any one could be specified for each of the heating and cooling sides Relay 220V AC, 3A (resistive load) SSR/SSC Drive Output: ON – 24V 20mA max. OFF – 0.5V or less. Current: 4 to 20mA DC (n/a PYX-4). Allowable load resistance 600Ω or less. Voltage: 0-10V DC (n/a PYX4)
AUXILIARY ANALOG OUTPUT (RETRANSMISSION OPTION)	Number of Output Points: 1 point Output Data: Selectable between PV, SV, and MV Output Accuracy: ±0.5% FS Kind of Output: 1 to 5 VDC

ALARM (OPTIONAL)

UPPER/LOWER LIMIT ALARM	Desired alarm type is selectable by using the front panel key. Alarm output: 2 points
HEATER BREAK ALARM	A break is detectable only when a single-phase heater is used. (Only available on time proportioned outputs.) Primary input of current detector (CT): 1 to 50A. (The current detector (CT) needs to be ordered separately from this controller. CT is installed outside the controller.) Output: use ALM1 or ALM2 output
HEATER POWER VOLTAGE CORRECTING	This function is effective when the heater and this controller share the same power supply.
RELAY CONTACT OUTPUT	Normally open SPST contact, 220 VAC, 3A (resistive load)
ALARM OUTPUT	2 SPST contacts max. (ALM1, ALM2)

OPERATION AND DISPLAY SECTION

SETTING AND INDICATION	Accuracy: ±0.5% FS, ±1 digit

OPERATING AND STORAGE CONDITIONS

ALLOWABLE AMBIENT TEMPERATURE	-10 to 50°C (14 to 122°F)
STORAGE TEMPERATURE	-20 to 60°C (-4 to 140°F)

STRUCTURE

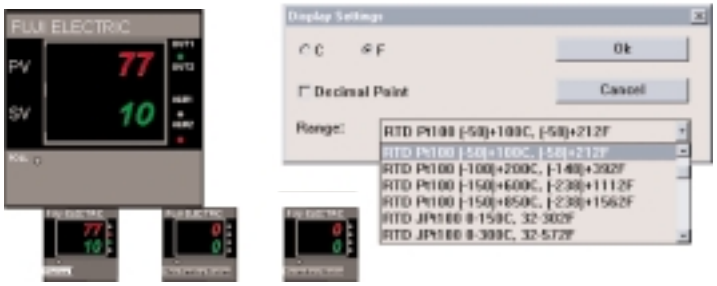
MOUNTING METHOD	Panel mount
EXTERNAL DIMENSIONS (HxWxD)	PYX-4: 1.89 x 1.89 x 4.52 in. (48 x 48 x 115mm) PYX-5: 3.78 x 1.89 x 3.94 in. (96 x 48 x 100mm)
EXTERNAL TERMINAL	Screw terminal M3.5

ADDITIONAL OPTIONS

ANALOG RETRANSMISSION	1-5V DC
COMMUNICATIONS	RS-485 (see below)
PROGRAMMABLE ALARMS	2 points max.
DUAL OUTPUTS	RLY, SSR, 4-20mA
REMOTE SETPOINT INPUT	1 to 5 VDC
HEATER BREAK ALARM	1 point
RAMP/SOAK FUNCTION	8 ramp/soak segments
DUAL SETPOINT (DI)	1 point
TRANSMITTER POWER SUPPLY	24 VDC

FREE PYX-LITE DATA LOGGING SOFTWARE

Windows™-based PYX-LITE supports Windows DDE (Dynamic Data Exchange) and provides data logging output in an easy-to-use comma-delimited format.



It supports up to 31 PYX controllers from a single workstation and is capable of displaying all 31 controllers simultaneously. PYX-LITE offers both Supervisory Mode for viewing the entire network at a glance, and Single Station Master Mode for viewing all parameters for one controller on a single screen. It allows personnel to set-up, monitor, and control the entire PYX network from a single workstation on only two wires (RS-485 communication).

Information subject to change without notice. Prices in USD.

PYX ORDERING INFORMATION

P	Y	X	A	–	B	C	D	1	–	E	F	F	G	H

To create a part number fill in the boxes above with the appropriate number and/or letter from the corresponding box below.

Box A: Front Panel Size

4	1/16 DIN	$ 229
5	1/8 DIN	320

Box B: Kinds of Input

M	TC/RTD/voltage/current	N/C

Box C: Control Output 1

A	Relay (reverse action)	N/C
B	Relay (direct action)	N/C
C	SSR drive (reverse action)	N/C
D	SSR drive (direct action)	N/C
E	4–20mA DC (reverse action)	45
F	4–20mA DC (direct action)	45
P	0-10 VDC (reverse action)*	45
Q	0-10 VDC (direct action)*	45

** Agency approvals not available for this option*

Box D: Control Output 2

Y	None	N/C
A	Relay (reverse action)	60
B	Relay (direct action)	60
C	SSR drive (reverse action)	60
D	SSR drive (direct action)	60
E	4–20mA DC (reverse action)*†	60
F	4–20mA DC (direct action)*†	60
P	0-10 VDC (reverse action)*†	60
Q	0-10 VDC (direct action)*†	60

** Only on PYX-5 and PYX-9*

† Agency approvals not available for this option

Box E: Alarm Function

0	None	N/C
1	1-point process alarm (1 SPST contact)	35
2	2-point process alarm (2 SPST contacts)	70
3	HB detection* + 1-point process alarm	77
4	HB detection* + 2-point process alarm	112

** Additional Functions other than "Q" not available when HB detection is selected. Heater break option requires current transformers. Please specify part # (see accessories below).*

Box F: Input Code

00 = RTD (Pt100)	32 to 302°F (0 to 150°C)	N/C
01 = RTD (Pt100)	32 to 527°F (0 to 300°C)	N/C
02 = RTD (Pt100)	32 to 932°F (0 to 500°C)	N/C
03 = RTD (Pt100)	32 to 1112°F (0 to 600°C)	N/C
04 = RTD (Pt100)	-58 to 212°F (-50 to 100°C)	N/C
05 = RTD (Pt100)	-148 to 392°F (-100 to 200°C)	N/C
06 = RTD (Pt100)	-238 to 1112°F (-150 to 600°C)	N/C
07 = RTD (Pt100)	-238 to 1562°F (-150 to 850°C)	N/C
20 = TC J	32 to 752°F (0 to 400°C)	N/C
21 = TC J	32 to 1472°F (0 to 800°C)	N/C
22 = TC K	32 to 752°F (0 to 400°C)	N/C
23 = TC K	32 to 1472°F (0 to 800°C)	N/C
24 = TC K	32 to 2192°F (0 to 1200°C)	N/C
25 = TC R	32 to 2912°F (0 to 1600°C)	N/C
26 = TC B	32 to 3272°F (0 to 1800°C)	N/C
27 = TC T	-328 to 392°F (-199.9 to 200°C)	N/C
28 = TC T	-238 to 752°F (-150 to 400°C)	N/C
29 = TC E	32 to 1472°F (0 to 800°C)	N/C
2A = TC E	-328 to 1472°F (-199.9 to 800°C)	N/C
2B = TC S	32 to 2912°F (0 to 1600°C)	N/C
2C = TC N	32 to 2372°F (0 to 1300°C)	N/C
2D = TC U	-328 to 752°F (-199.9 to 400°C)	N/C
2E = WRe 5-26	32 to 4172°F (0 to 2300°C)	N/C
2F = PL-II	32 to 2372°F (0 to 1300°C)	N/C
40 = Voltage 1-5V DC Current 4-20mA DC	Scale set between -1999 to 9999 E.U.	N/C
41 = Voltage 0-5V DC	Scale set between -1999 to 9999 E.U.	N/C

Box G: Additional Function

Y	None	N/C
P	Dual setpoints (DI)	$ 35
Q	Ramp/soak 8 segments	120
R	RS-485*	125
S	RS-485* + 8 ramp/soak	245
A	Re-transmission	135
B	Re-transmission + 8 ramp/soak	255
C	Remote Setpoint	125
T	Transmitter power supply 24 VDC	75

** Requires RS-485 to RS-232 converter, Part No. RSFC24 recommended. Option comes with FREE software.*

Box H: Front Panel Label

C	°C	N/C
F	°F	N/C
E	Engineering units	N/C

ACCESSORIES

CTL-6-S	1–30A Current Transformer	$ 23
CTL-12	20–50A Current Transformer	40
RSFC24	RS485 to RS232 Signal Converter	135