PXR3

FUJI ELECTRIC

THE MOST POWERFUL 1/32 DIN CONTROLLER ON THE MARKET

The PXR3 is Fuji Electric's powerful self-tuning 1/32 DIN temperature/process controller with low-cost communications option. The new PXR3 controller is packed with features, to meet a wide variety of needs in the process control industry. Low-cost options include RS485 communications, analog retransmission, digital input, timer function, dual outputs, programmable alarms, and 24 VAC/DC power supply.

One of the most impressive features is the large LED display — larger than most other 1/32 DIN controllers on the market. The faceplate, designed for NEMA 4X (IP66 equivalent), is watertight and corrosion-resistant. The easy-to-use 3-button keypad allows for programming similar to the popular PXR4/PXW controller.

The controller has all the standard features that were available in the PXV3 controller, and more. In addition to auto-tuning and fuzzy control, it now comes with self-tuning — an innovation in the control field. It automatically retunes the controller under certain conditions, without the need to revert to auto-tuning. The standard 8-segment ramp/soak feature has been expanded to include two patterns that can be linked to create a 16-step profile. The PXR3 accepts temperature and process inputs, and offers two control outputs and two programmable alarms.

Remote monitoring of up to 31 controllers at a time is possible with the RS485 option that uses the industry-standard Modbus™ protocol. Comes with free Windows®-based software, PXR-LITE™.

FEATURES

- **Large LED Display**
  - 4-digit, 11.5 mm-high display
  - Waterproof faceplate conforms to NEMA-4X/IP66
- **Digital Input**
  - Change between setpoints (SVO, SV1)
  - Change between ramp/soak and standby
  - Start/reset the ramp/soak
  - Start/stop the auto tuning
  - Cancel the alarm latch
  - Start the incorporated timer
- **PID with Self-Tuning and Fuzzy Control**
- **24V AC/DC Supply Voltage Option**
- **Timer Function**
  - On-delay or off-delay timer activated with digital input
  - Up to 2 timer outputs can be obtained
- **Heating/Cooling Control**
  - Obtain both heating and cooling control output
- **Ramp/Soak Function**
  - Up to 16 ramp/soak segments
  - Up to two 8-segment patterns
- **Analog Retransmission Option**
  - 4-20mA Retransmission of PV, SV, MV, DV
- **Communications Function**
  - RS485 (Modbus™ protocol) interface permits remote monitoring from a PC. Free Windows®-based software, PXR-LITE™
- **Warranty**
  - Manufactured in a ISO 9001 facility and backed by a 3-year warranty

PXR3 SPECIFICATIONS

GENERAL SPECIFICATIONS

POWER SUPPLY VOLTAGE	100 (-15%) to 240V (+10%) AC, 50/60Hz 24V ±10% AC/DC 50/60 Hz
POWER CONSUMPTION	6VA or less (100V AC) or 8VA or less (240V AC, 24V AC/DC)

INPUT SELECTION

INPUT SIGNAL	Thermocouple: J, K, R, B, S, T, E, N, PL2 RTD: Pt100 Voltage, current: 1 to 5V/4 to 20 mA DC, 0 to 5V/0 to 20 mA DC
INPUT FILTER	0 to 900.0 sec set in 0.5 sec steps

CONTROL OUTPUT 1

CONTROL OUTPUT 1	Select one type out of three below: Relay contact: SPST, 220V AC/30V DC, 3A (resistive load) Voltage pulse: ON–12 to 16V DC; OFF–0.5V DC or less; 20 mA or less 4 to 20 mA DC: allowable load resistance 500Ω or less

CONTROL FUNCTION

CONTROL ACTION	PID control (with auto-tuning, self-tuning) Fuzzy control (with auto-tuning)
PROPORTIONAL BAND (P)	0 to 999.9% of measuring range set in 0.1% steps
INTEGRAL TIME (L)	0 to 3200 sec set in 0.1 sec steps
DIFFERENTIAL TIME (D)	0 to 999.9 sec set in 1 sec steps
PROPORTIONAL CYCLE	1 to 150 sec set in 1 sec steps
HYSTERESIS WIDTH	0 to 50% of measuring range. For On/off action only
INPUT SAMPLING CYCLE	0.5 sec

CONTROL OUTPUT 2 (OPTION)

CONTROL OUTPUT 2	Select one type out of three below: Relay contact: SPST, 220V AC/30V DC, 3A (resistive load) Voltage pulse: ON–12 to 16V DC; OFF–0.5V DC or less; 20 mA or less 4 to 20 mA DC: allowable load resistance 500Ω or less

OPERATION AND DISPLAY SECTION

PARAMETER SETTING METHOD	Digital setting by 3 keys. Key lock function provided
DISPLAY UNIT	Process value/set value 4 digits, 11.5 mm high, 7-segment LED
STATUS DISPLAY LED	Control output, process alarm output
INDICATION ACCURACY (AT 23°C)	Thermocouple at ± (0.5% of measuring range) ± 1 digit ±1°C Thermocouple R at 0 to 500°C: ± (1% of measuring range) ±1 digit ±1°C Thermocouple B at 0 to 400°C: ± (5% of measuring range) ±1 digit ±1°C RTD, voltage/current: ± (0.5% of measuring range) ±1 digit

ALARM (OPTION)

ALARM TYPE	Absolute alarm, deviation alarm, zone alarm with upper and lower limits for each. Hold function available. Alarm latch function provided
ALARM ON-DELAY	Delay setting 0 to 9999 sec set in 1 sec steps
PROCESS ALARM OUTPUT	Relay contact: SPST, 220V AC/30V DC, 1A (resistive load) 1 or 2 output points, output cycle 0.5 sec

DIGITAL INPUT (OPTION)

POINTS	1 or 2; Contact closure
FUNCTION (1 OF THE 6 FUNCTIONS IS SELECTED)	Set value (SV0, SV1) changeover Start/stop control action Start/reset ramp/soak action Start/stop auto-tuning Cancel alarm latch Start incorporated timer

RETRANSMISSION OUTPUT (OPTION)

OUTPUT SIGNAL	4-20 mA DC
LOAD RESISTANCE	500Ω or less
OUTPUT ACCURACY	±0.3% FS
OUTPUT SELECTION	PV, SV, MV, DV (SV-PV)

TIMER FUNCTION

START	By digital input option
SETTING	0 to 9999 sec set in 1 sec steps
ACTION	Event ON-delay or OFF-delay
SIGNAL OUTPUT	Alarm output relay used. Up to 2 points available

COMMUNICATION FUNCTION (OPTION)

PHYSICAL SPECIFICATIONS	EIA RS485
COMMUNICATION PROTOCOL	Modbus (RTU). Free Windows®-based software, PXR-LITE™
COMMUNICATION METHOD	2-wire method. Half-duplex bit serial, start-stop sync type
DATA TYPE	8 bits. Parity: odd/even/none
COMMUNICATION RATE	9600 bps
CONNECTION ASPECT	Multi-drop up to 31 controllers
COMMUNICATION DISTANCE	Total extension 500m or less
RS232C/RS485 SIGNAL CONVERTER	For connection to PC. RSFC24 (recommended)

OTHER FUNCTIONS

PARAMETER MASK FUNCTION	Parameter display is disabled from keypad
RAMP/SOAK FUNCTION	Totally 8 ramps/8 soaks. 1 or 2 program patterns. Digital input allows start/reset of the action
APPLIED STANDARDS	UL, c-UL recognized (file no. E131280), CE approved. CSA approved (file no. LR92761)

OPERATING AND STORAGE CONDITIONS

AMBIENT OPERATING TEMP.	14 to 122°F (-10 to 50°C)
AMBIENT OPERATING HUMIDITY	Less than 90% RH (no condensation)

STRUCTURE

MOUNTING METHOD	Panel flush mounting
EXTERNAL TERMINAL	Screw terminal (M3 screw)
DIMENSIONS	Approx. 24 x 48 x 98 mm (1 x 2 x 4 in.)
PROTECTIVE STRUCTURE	Front panel waterproof, NEMA4X (IEC standard IP66 equivalent) (when mounted on panel with supplied gasket) Rear case: IEC IP20

OPTIONAL ITEM

SIGNAL CONVERTER FOR COMMUNICATION FUNCTION	RSFC24

PXR3 ORDERING INFORMATION

P	X	R	A	–	B	C	D	1	–	E	V	–	F	G

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
3 = 1/32 DIN (24 x 48mm)

Box B: Input Signal
T = Thermocouple °C
R = Thermocouple °F
N = RTD (Pt100) °C
S = RTD (Pt100) °F
B = 4–20mA DC, 1-5V DC
A = 0–20mA DC, 0-5V DC

Box C: Control Output 1
A = Relay (reverse action)
B = Relay (direct action)
C = SSR driver 12V DC (reverse action)
D = SSR driver 12V DC (direct action)
E = 4–20mA DC (reverse action)
F = 4–20mA DC (direct action)

Box D: Control Output 2
Y = None
A = Relay (reverse action)
B = Relay (direct action)
C = SSR driver 12V DC (reverse action)
D = SSR driver 12V DC (direct action)
E = 4–20mA DC (reverse action)
F = 4–20mA DC (direct action)

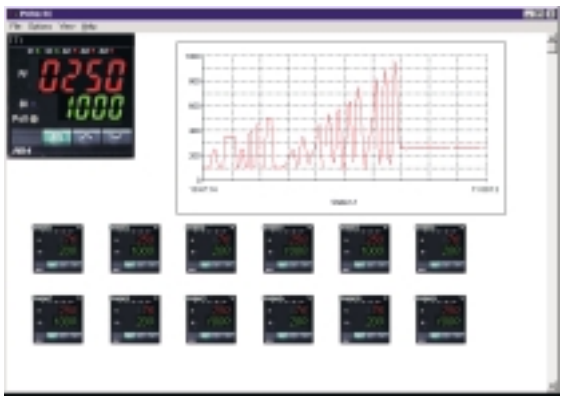
Box E: Alarm Options
4 = None
5 = Process alarm (1 point)
6 = Process alarm (2 points)*
** 2-point process alarm only available with single output (Control Output 2 = Y). Not available with Retransmission option*

Box F: Additional Options
– = None *(comes standard, no code necessary)*
R = RS485 (Modbus)
DI = Digital input (1 point)
DI-R = RS485 (Modbus) + digital input (1 point)
A = Retransmission output*
DI-A = Retransmission + digital input (1 point)*
** 2-Point process alarm not available with this option.*
RS485 option comes with Free Software, PXR-LITE. Requires signal converter to connect to PC, P/N RSFC24 recommended.

Box G: Power Supply Options
– = 85-264V AC
D = 24V AC/DC

PXR-LITE COMMUNICATIONS SOFTWARE

PXR-LITE© is a free Windows-based software that is supplied with the communications option on a PXR controller. It is the latest in control and monitoring of Fuji Electric's PXR series controllers. It provides continuous remote monitoring of single or multiple controllers using a single half-duplex RS-485 line.



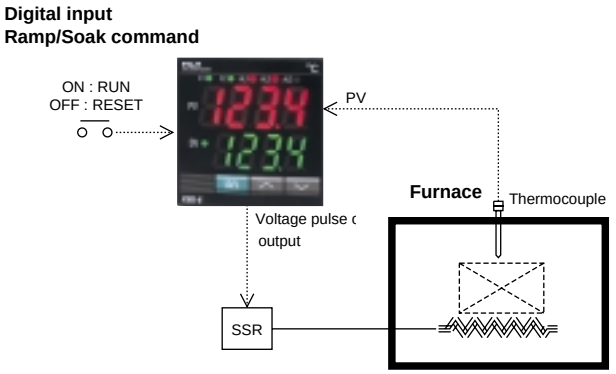
FEATURES

- **Monitor and Control Up to 31 Controllers from a PC via RS485-RS232 Signal Converter**
- **Real-Time Charting and Data-Logging**
- **Remote Setpoint Adjustment**
- **Set Control Modes, Alarms and Other Control Parameters**
- **Remote Auto-Tuning and Ramp-Soak Programming**
- **Live Display of Process and Setpoint Values, Alarm Annunciators**
- **View Single-Station or Multi-Station Data**
- **Comprehensive Help File Included**
- **Runs on Windows Environment, 3.1 or Later**

PXR APPLICATION EXAMPLES

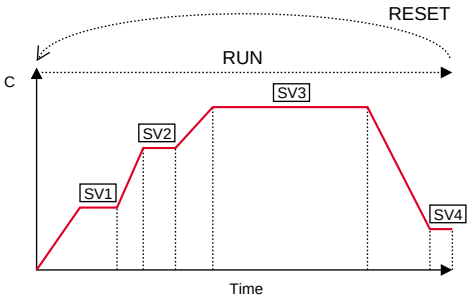
FURNACE / HEAT PATTERN CONTROL

Heat Pattern Control — Ramp/Soak Function



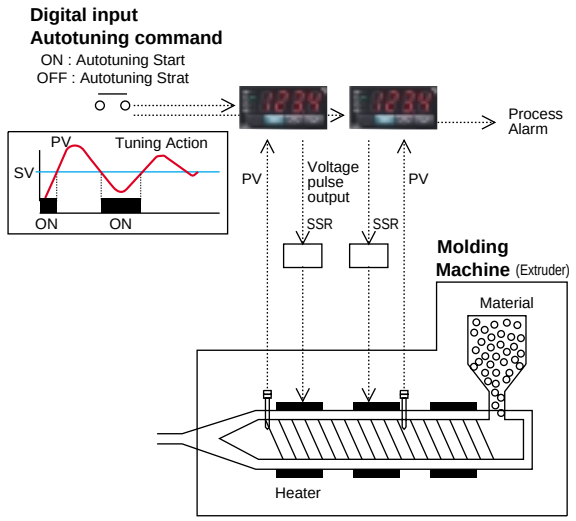
Ramp/Soak Function

- Control temperature according to “Heat pattern with ramp”
- Keep temperature stable for a certain period with "Heat pattern" and then cool down
- "Heat pattern" can be Started (RUN) /Reset by an external digital input.



PLASTIC MOLDING MACHINE

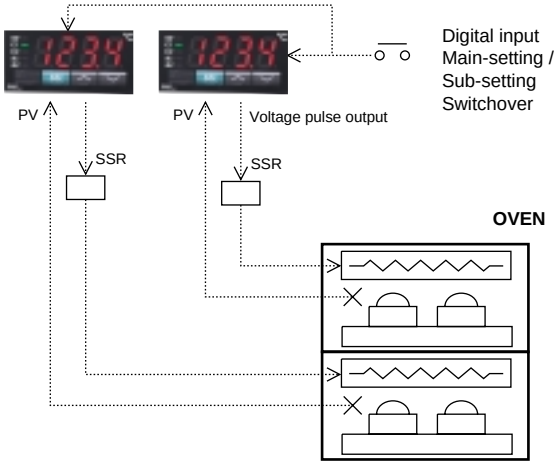
Stable temperature control required — Fuzzy + PID Control



Auto-Tuning can be started/stopped through external digital input

OVEN

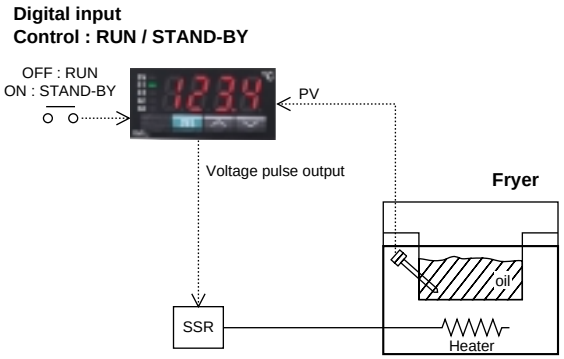
To change SV easily



Set Value (SV) can be selected/changed externally. <main SV, SV1~3 change over>

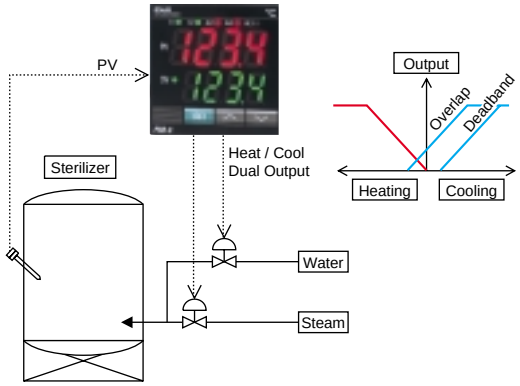
FRYER

To keep oil temperature stable



Control RUN/Stand-by selectable through external digital input

COOLING + HEATING CONTROL



Cooling output and Heating output can be overlapped or a “Dead-band” set between them.