R1-120A-I

Multiloop controller with 6 0/4-20 mA input channels

Multiloop temperature controller for DIN rail mounting; 6 analog inputs for 0/4-20 mA; accurate readings without need of calibration; up to 6 PID loops; heat, cool or heat/cool control with various output types: on/off, time proportional, analog (with addition of C1-10 external module) or for motorized valve control (open/close); PID autotuning algorithm; programmable activation sequence to limit the energy consumption during start-up; dedicated interface for connection with a local operator panel (F1-10); RS422/485 serial interface with Modbus (ASCII or RTU) protocol; a common supervision of many controllers can be provided by the SCADA software WINLOG-A or by the F1-100 and the F1-500 (touch screen) operator panels.

GENERAL SPECIFICATIONS

Power supply	From 9 to 36 Vdc, 100 mA @ 24 Vdc (without F1-10), 170 mA (with)
Power supply protections	Against surge, voltage peaks and polarity inversion
Operating environment	Temperature: from 0 to 70 °C, relative humidity: from 25 to 85 % (non condensing)
Operating atmosphere	Without corrosive gas
Storage temperature	From -20 to 80 °C (without ice)
Electromagnetic compatibility CE	• Radio frequency emissions: EN55011 Group 1 Class A • Conducted emissions: EN55011 Group 1 Class A • Radio frequency immunity: ENV50140 10 V/m AM from 80 to 1000 MHz • Conducted immunity: ENV50141 10V/m AM from 0.15 to 80 MHz
IP grade	Connectors: IP20, enclosure: IP20
Insulation	• Between analog inputs and digital inputs/outputs: 500 V • Between analog inputs and power supply section: 500 V • Between analog inputs and 485/422 section: 1000 V • Between digital inputs/outputs and 485/422 section: 1500 V • Between power supply and 485/422 sections: 1500 V
Signalling leds	Power on, self-test, digital inputs and outputs status, serial tx, serial rx
Mounting mode	DIN EN50022 rail
Dimensions	175L x 120H x 65P mm
Weight	450 g
Ordering code	R1-120A-I

ANALOG INPUTS SPECIFICATIONS

Sensor type	6 current sensors (from 0 to 20 mA)
Analog/digital conversion	Double ramp, 16 bit resolution
Current allowed	From 0 to 25 mA
Input impedance	246 Ω
Overall accuracy	±10 μA
Acquisition rate	1 s (all the six channels)

DIGITAL INPUTS SPECIFICATIONS

Input type	2 inputs, optoisolated, common positive (power supply voltage)
Voltage levels	Active state: from 15 to 36 V, non active state: from 0 to 4 V
Current sinked	10 mA @ 24 V
Detectable pulse duration	Not less than 500 ms

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DIGITAL OUTPUTS SPECIFICATIONS

Output type	12 outputs PNP transistor open collector, pull-down resistor: 22 kΩ to ground
Output voltage when active	The voltage supply
Maximum load current	100 mA each output
Protections	Suppression diode, overvoltages and short circuit

COMMUNICATION INTERFACE SPECIFICATIONS

Communication interface	EIA RS485 or RS422 (selectable by dip-switches)
Communication speed	9600 or 19200 baud (selectable by dip-switches)
Communication protocol	Modbus ASCII or Modbus RTU (selectable by dip-switches)
Device address	From 1 to 63 (selectable by dip-switches)
485/422 lines protections	Against surge, short circuits and voltage peaks
Pull-up and pull-down resistors	10 kΩ

FUNCTIONAL SPECIFICATIONS

Watch-dog	Hardware
RAM data retention	One hour maximum
Read software filter	Moving average, 8 samples depth (individually selectable for each channel)
Set-points	Two, runtime selectable by using one of the digital inputs
Set-point options	• Can be the temperature read from one of other channels • Hold-back and soft start • Set-point ramp, user configurable
Regulation strategies	Heat, cool, heat/cool, with start order
Regulation algorithm	Advanced PID, with cycle time selectable from 1 to 240 s
Autotuning	Yes (one channel at time)
Outputs	• For SSR, with ramp and outputs limits user configurable • For relays, with working cycle user configurable • For motorized valves without potentiometric feedback
Alarms	Band type and mininum/maximum type alarms, with time activation filter (individually selectable for each channel)