R2-50
PROGRAMMABLE MULTIFUNCTION CONTROLLER

GENERAL DESCRIPTION

The R2-50 programmable multifunction controller is a high performance device which can adapt to a wide variety of industrial applications. It can operate as a single or double loop controller, and allows a range of control strategies to be applied: heat/cool control, remote set-point, cascade, feedforward, override; it can also be used as a motorised valve controller with potentiometer feedback; other control strategies can be provided on request. It also allows set point programming for complex thermic profiles and operating timetable for automatic start/stop. It provides two universal control inputs (TC, Pt100, V, mA) and two programmable control outputs for all kinds of actuators (relay, logic, analog or motor-positioner outputs); it also provides two user logic inputs and three alarm relay outputs. A watch-dog supervisory function ensures automatic reset of the device. A serial RS485 interface with Modbus protocol allows communication with a supervisory computer.

MAIN FEATURES

- SINGLE OR DOUBLE LOOP CONTROLLER
- VARIOUS CONTROL STRATEGIES
- SET POINT PROGRAMMING
- OPERATING TIMETABLE
- TWO UNIVERSAL CONTROL INPUTS
- TWO UNIVERSAL CONTROL OUTPUTS
- PROGRAMMABLE DIGITAL I/O PORTS
- WATCH-DOG TIMER INSIDE
- MODBUS COMMUNICATION PROTOCOL

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CONTROL INPUTS

The two control inputs can be configured as:
- Pt100 (2 or 3 wire) with automatic line resistance calculation,
- TC (J, K, N, R, S, T) with automatic cold junction compensation,
- linear (voltage or current) with square root extraction if necessary.

With the addition of the TA (Current Transformer) option the second input can be used to measure the heat resistance breakdown (HB).

LOGIC INPUTS

Two logic inputs can be used to:
- select automatic or manual operating mode,
- enable or disable PID control,
- start or stop set-point profile program.

CONTROL OUTPUTS

Two control outputs can be configured as:
- relay outputs for on/off regulation,
- logic outputs for proportional time regulation (SSR),
- couples of relay for motorized valve positioning,
- linear DC outputs (V or mA).

All the outputs are optically isolated and have a ground which is galvanically isolated from the internal ground.

ALARM OUTPUTS

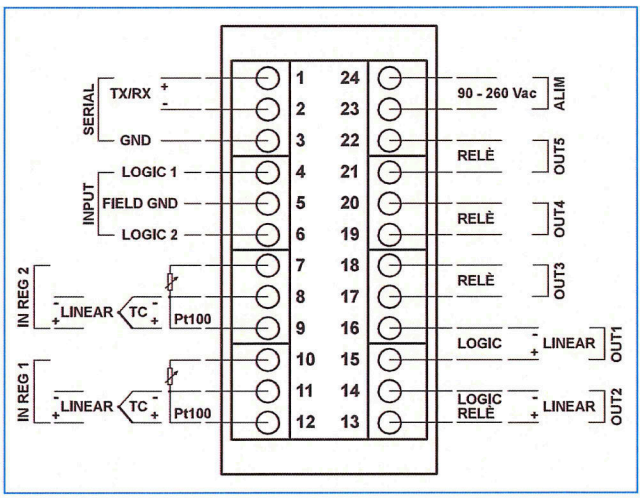
Three relay outputs can be associated with any combination of process alarms (high, low, minimum, maximum), or device alarms (sensor break, internal alarms). Alarm thresholds can be configured and alarm reset can be automatic or manual. A watch-dog supervisory function provides automatic reset and signals any CPU fail.

CONTROL STRATEGIES

The device can be configured to operate according to the desired control strategy: single or double loop, heat/cool control, remote set-point, cascade, feedforward, override; it can also be used as a motorised valve controller with potentiometer feedback; other control strategies can be implemented on request.

PID CONTROL ALGORITHM

An advanced PID control algorithm with unique features allows a quick response without overshoot; optimal PID coefficients are automatically calculated by the auto-tuning procedure. Set-point variation during start, stop or update is managed by a programmable ramp. Soft-start and hold-back options available. Control outputs limits (min and max) and variation speed can be programmed.



THERMIC PROFILE AND TIMETABLE

Complex thermic profiles can be set up by programming the set point values of both loops; the status of two relay outputs can be programmed as a function of the program step being executed. The clock option makes it possible to program the automatic start and stop of the thermic cycle (or of the PID control), according to a timetable and the day of the week.

OPERATOR INTERFACE

The operator interface is simple and safe; the dialogue procedures are based on menus; update of parameters must be confirmed; eight leds give additional information on the status of control outputs and alarms.

COMMUNICATION INTERFACE

The device provides an RS485 optically isolated serial interface with Modbus communication protocol; up to 250 devices can be connected, through the same link, to a Supervisory Computer.

SUPERVISION SOFTWARE

WINLOG is the real time software package recommended when centralised supervision of R2-50 controls is required. WINLOG software provides an operator interface in a Windows environment for process supervision, recipes programming, analysis of historical trends, alarms management, and printing of reports. An integrated development environment provides a set of tools for the easy and quick creation of entire multilanguage applications.

ELECTRICAL AND MECHANICAL CHARACTERISTICS

- power supply: 90-260 Vac
- power consumption: 5 VA
- connections: 24 screw connectors
- connector protection: IP 20
- front protection: IP 65
- front: 48 x 96 mm (1/8 DIN)
- depth: 127 mm