

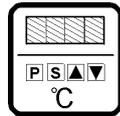
**THQ SERIES**

The microprocessor-based controllers of the THQ series are characterised by remarkable regulation precision, in particular in heat-sealing and thermoforming operations typical of the automatic packaging.

The AT initial autotuning and the ADT permanent autoadaptive functions can both be activated through the PID control action, responding excellently to frequent or fast system variations, as for example in process start and stop.

The panel with single or double display allows the setting of all the controller's values and configurations, such as sensor input, control action and alarm functions, with the possibility to lock the programming on three different safety levels.

The exclusive LFA diagnostic function is able to detect failures along the entire regulation loop, for example thermocouples short-circuit or heating resistance breaking.



SENSOR

**HIGHLIGHTS**

- Excellent measurement precision and regulation stability
- 9 sensors, 4 control actions, 16 alarms all keyboard configurable
- PID action with AT autotuning and ADT autoadaptive functions
- LFA diagnostic function of the regulation loop

**APPLICATIONS**

**Packaging lines**



**Process control**



## TECHNICAL DATA

|                                |  |
|--------------------------------|--|
| Power Supply                   | 12-24 Vac/Vdc $\pm 10\%$ version, or 80-240 Vac $\pm 10\%$ version   |
| Consumption                    | 5 VA max.  |
| Sensor input                   | selectable between E, J, K, L, R, S, T thermocouples and Pt100W/0°C RTDs   |
| Measurement scale              | selectable in °C or °F degrees with lower and upper limits, refer to table 1                                     |
| Precision                      | thermocouple measurement $\pm 0,4\%$ f.s.  |
|                                | RTD measurement $\pm 0,3\%$ f.s.   |
|                                | temperature drift 0,01% f.s. / °C of ambient   |
|                                | temperature setting and indication $\pm 1$ digit   |
| Data updating                  | input, output and indication every 500 ms  |
| Data retention                 | non volatile eeprom memory   |
| Keyboard correction indication | from -99,9 to +99,9 °C/°F  |
| 1st point control action       | on/off or PID selection, maximum or minimum, with AT initial autotuning and ADT permanent autoadaptive functions |

## FUNCTIONS

|                        |  |
|------------------------|--|
| Proportional band      | 20°C (sel. from 1 to 999 °C/°F)  |
| Integral time          | 120 sec. (sel. from 0 to 960 sec.)   |
| Derivative time        | 30 sec. (sel. from 0 to 240 sec.)  |
| Cycle time             | 12 sec. (sel. from 1 to 120 sec.)  |
| On/off hysteresis      | $\pm 1$ °C (sel. from $\pm 0,1$ to $\pm 99,9$ °C/°F)   |
| 1st point output type  | relay SPDT 250 Vac, 5 A version  |
|                        | trans. PNP 12 Vcc $\pm 20\%$ version   |
|                        | 20 mA short-circuit protection   |
| 2nd point alarm action | selectable alarm setting from -999 to +999 °C/°F respect to 1st point, or fixed point setting on selected scale, refer to table 2                                    |
| 2nd point output type  | relay SPST 250 Vac, 3 A  |
| Auxiliary functions    | LFA Loop Failure Alert diagnostic function, digital filter with an average of 10 measures, SW program LOCK with 3 levels   |
| Setting                | PROG, SET, UP, DOWN push-buttons   |
| Indicators             | 4 digit red display (10mm height), 4 digit green display (7mm height) QD vers. or 5 LED movement bar (QS), yellow ON1 LED, red ON2 LED, green LOCK LED, green AT LED |
| Connection             | terminal block with 10 screw contacts, electronic block extractable from panel   |
| Electric protection    | class 1  |
| Mechanical protection  | IP54 - front panel   |
|                        | IP20 - housing   |
|                        | IP10 - contacts  |
| Housing material       | ABS  |
| Weight                 | 175 g max.   |
| Operating temperature  | -10 ... +55°C  |
| Storage temperature    | -20 ... +65°C  |
| Reference standard     | EN 61010-1   |
| Certifications         | CE   |

## TABLES

| Sensor  | °C scale    | °F scale    |
|---------|-------------|-------------|
| TR int. | -150...450  | -200...850  |
| TR dec. | -99,9...450 | -99,9...850 |
| TC - E  | 0...600     | 0...1100    |
| TC - J  | -50...760   | -50...1400  |
| TC - K  | -100...1250 | -150...2300 |
| TC - L  | -50...760   | -50...1400  |
| TC - S  | 0...1700    | 30...3000   |
| TC - R  | 0...1700    | 30...3000   |
| TC - T  | -100...400  | -150...750  |

Table 1: °C/°F SCALE

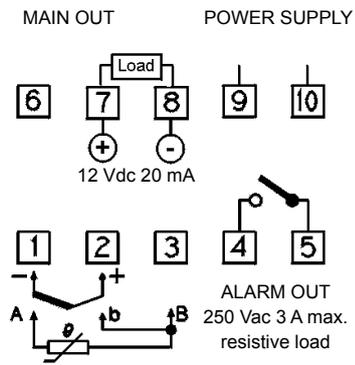
| Alarm | Fixed pt | Function          |
|-------|----------|-------------------|
| AL20  | FP20     | deactivate        |
| AL21  | FP21     | minimum           |
| AL22  | FP22     | maximum           |
| AL23  | FP23     | neutral zone on   |
| AL24  | FP24     | neutral zone off  |
| AL25  | FP25     | minimum*          |
| AL26  | FP26     | maximum*          |
| AL27  | FP27     | neutral zone on*  |
| AL28  | FP28     | neutral zone off* |

Table 2: ALARM FUNCTION

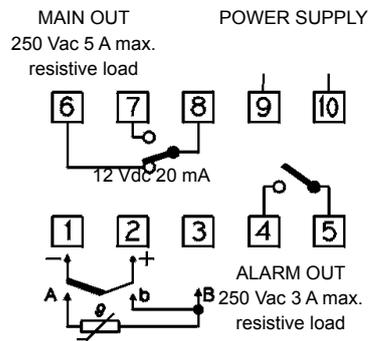
\*stand-by: first intervention inhibition

**CONNECTIONS**

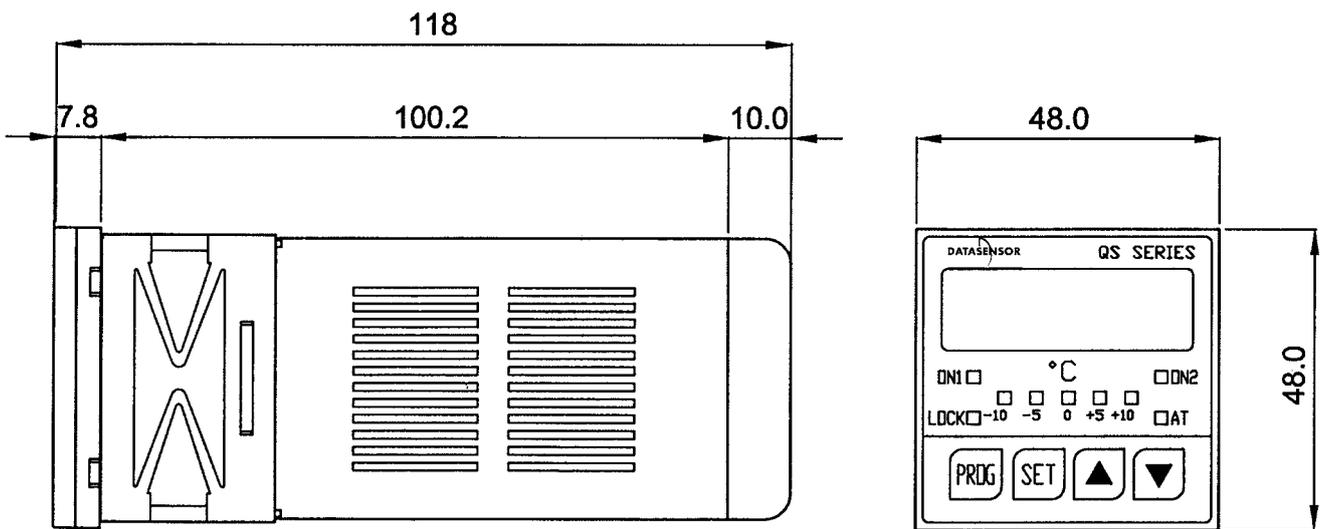
**TRANSISTOR VERSION**



**RELAY VERSION**



**DIMENSIONS**



mm

Panel cutout: 45 x 45 mm

## MODEL SELECTION AND ORDER INFORMATION

| MODEL | DISPLAY | POWER SUPPLY      | MAIN OUTPUT | ORDER N°  |
|-------|---------|-------------------|-------------|-----------|
| QS-00 | single  | 12 ... 24 Vdc/Vac | relay       | 974021000 |
| QS-01 | single  | 12 ... 24 Vdc/Vac | transistor  | 974021010 |
| QS-10 | single  | 80 ... 240 Vac    | relay       | 974021020 |
| QS-11 | single  | 80 ... 240 Vac    | transistor  | 974021030 |
| QD-00 | double  | 12 ... 24 Vdc/Vac | relay       | 974031000 |
| QD-01 | double  | 12 ... 24 Vdc/Vac | transistor  | 974031010 |
| QD-10 | double  | 80 ... 240 Vac    | relay       | 974031020 |
| QD-11 | double  | 80 ... 240 Vac    | transistor  | 974031030 |



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