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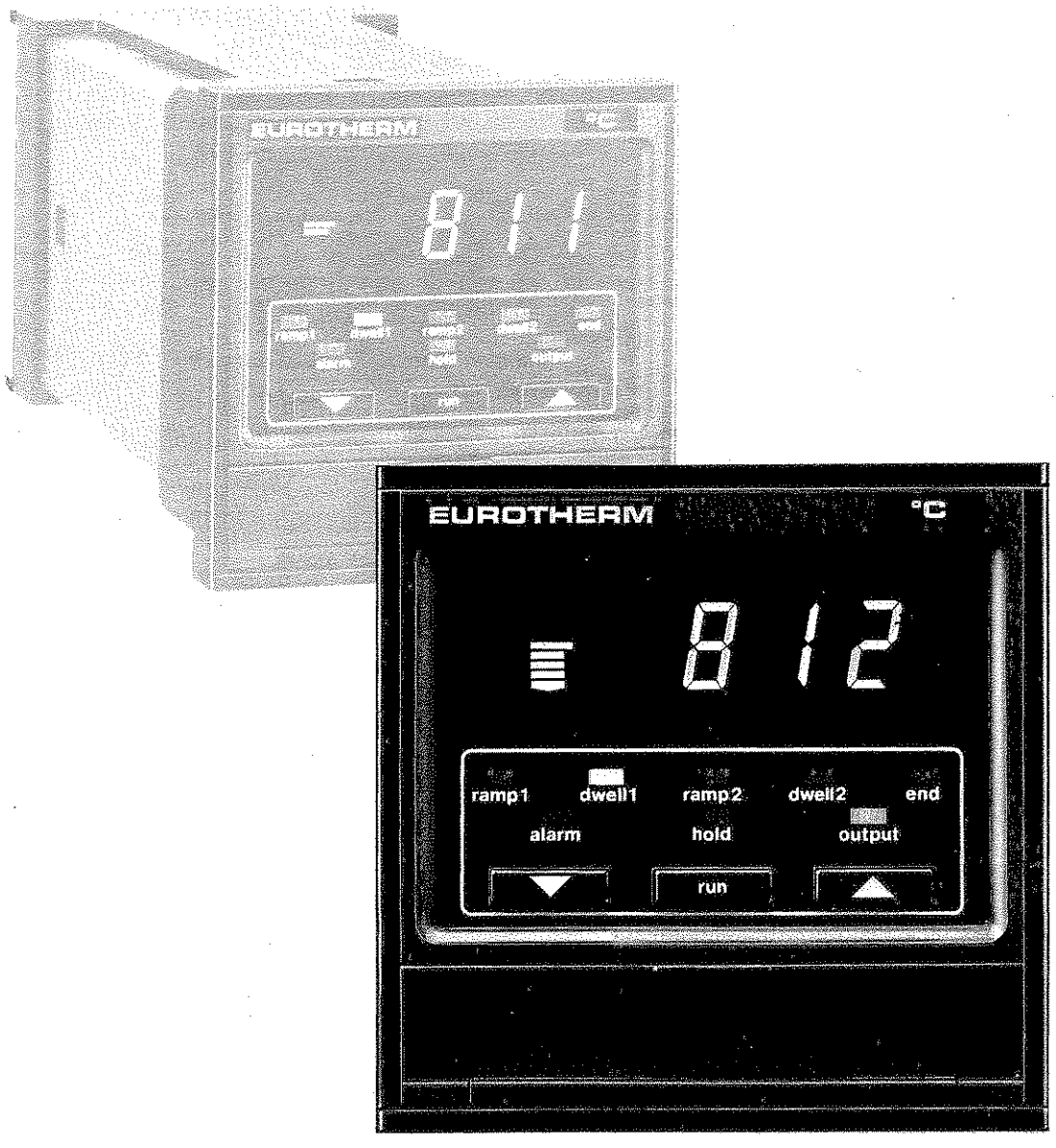
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Find the *Schneider Electric / Eurotherm 812/PAP/00/R/0-1600C/SPS/S/HH/HL//* at our website: *Click HERE*

EUROTHERM

811 Setpoint generator/programmer
812 Microprocessor based programmer/controller



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General Description

811/812

The 811/812 are microprocessor based instruments giving a temperature profiling facility with digital readout.

811

The 811 instrument provides a high accuracy output representation of setpoint. The linear dc isolated analogue output can be used to drive an 810 controller with remote analogue input.

812

The 812 operates as a three term controller or a programmer.

811/812

Both the 811 and 812 have four programmable segments, an initial ramp and a dwell time followed by another ramp and dwell time. As standard, ramp rates are adjustable in the range of 0.1 to 999.9 units/minute. Dwell times are adjustable in the range 0 to 999.9 minutes. Other ranges are optionally available. An alarm channel is provided as standard with relay output and having LED indication. An undedicated relay is also provided which can be driven directly by any of the logic outputs. Optionally the alarm relay can be specified as an additional undedicated relay.

Operation of running and resetting the program can be achieved from the controls on the front of the instrument. Alternatively, logic signals, input to the rear terminals of the instrument, enable RUN, HOLD and RESET operations. Logic outputs are provided enabling monitoring of the DWELL 1, RAMP 2, DWELL 2 and END of program functions.

The Display

811/812

The digital display is a customised fluorescent indicator panel comprising a nine segment error bar display (to give analogue indication of proximity to setpoint) and four, 7 segment, indicators giving accurate digital indication of process variables.

811

With the 811 Setpoint Generator the measured value or the setpoint can be displayed during normal operation. Depression of either the UP or DOWN ▼▲, button causes the setpoint to be displayed and set as required.

812

On the 812 the measured value is displayed during normal operation. Depression of either the UP or DOWN, ▼▲, button causes the setpoint to be displayed and set as required.

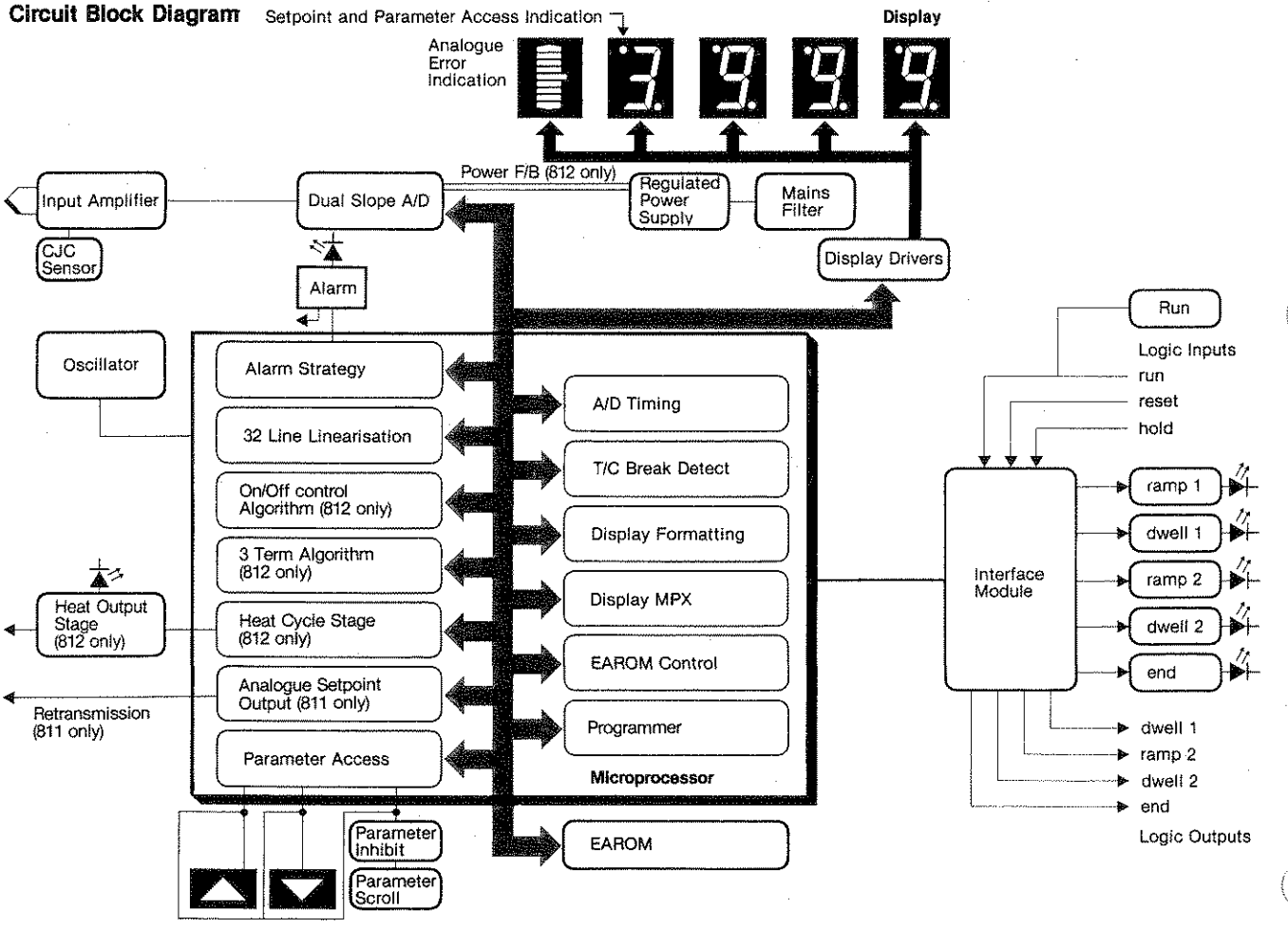
811/812

A flashing dot top left of the display confirms that a parameter other than the standard is being displayed and a timing feature returns the display to the standard five seconds after the last change.

The nine segment bars can provide error indications of measured value with respect

- **Controller/Programmer (812) 2 ramps 2 dwells** — Operates as a 3 term controller or a programmer with up to 2 ramps and 2 dwells.
- **Wide adjustment of slope and dwell times** — Adjustable in ranges from zero minutes to 9999 hours.
- **Clear indication of program state** — LEDs provide indication of each state of program.
- **Microprocessor based** — Enables many extra features as standard.
- **Digital display** — 0.5" high green fluorescent display and a nine segment error bar display.
- **Many applications** — Stress relieving and annealing of glass and metal, heat treatment furnaces, annealing ovens, pottery kilns, environmental chambers, crystal growing, etc.
- **Setpoint Generator (811)** — Provides a linear dc isolated analogue output

Circuit Block Diagram



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to the programmed setpoint when displaying measured value. On the 811 when setpoint is displayed the error bars are inhibited.

Parameters

812

The 812 has the following control parameter adjustments: Proportional band, Integral and Derivative time constants, Output power limit and Cycle time.

811/812

The 811 and 812 have the following parameter adjustments: Ramp rates, Dwell times and Loop count.

Parameters may be adjusted when the instrument is in a reset state i.e. not running (811/812) or during a hold (811). When running, all the parameters are displayed as their set values except for the dwell time where the time remaining is displayed when the program is running in that segment. On loop count the number of program cycles remaining, including the current cycle, is displayed.

Indications

811/812

Eight LEDs are provided on the front panel to give indications of the following functions:

ALARM	illuminates in the alarm condition
OUTPUT	illuminates when an output is active
HOLD	illuminates when the program is held by an external HOLD input
RAMP 1	illuminates when the program is in the RAMP 1 mode of its programming sequence
DWELL 1	illuminates when the program is in its first dwell period
RAMP 2	illuminates during the program second ramp period
DWELL 2	illuminates during the program second dwell period
END	illuminates at the completion of the programming sequence

Operation

811/812

The desired units/time profile is set using the ramp rate, set level and dwell scroll parameters. Each parameter is accessed through the scroll button and adjusted by means of the UP/DOWN buttons. The programmer sequence is executed by pressing the RUN button.

811

The setpoint is ramped at RAMP rate 1 from an initial value, equal to the initial setpoint, to the set level 1.

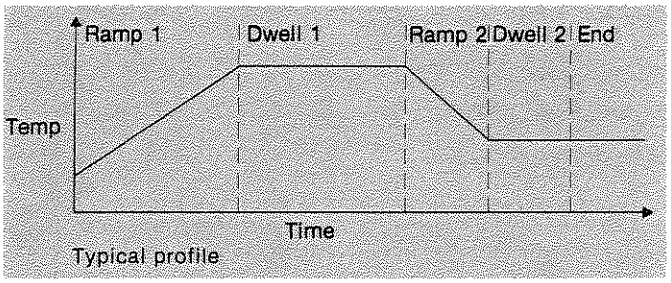
812

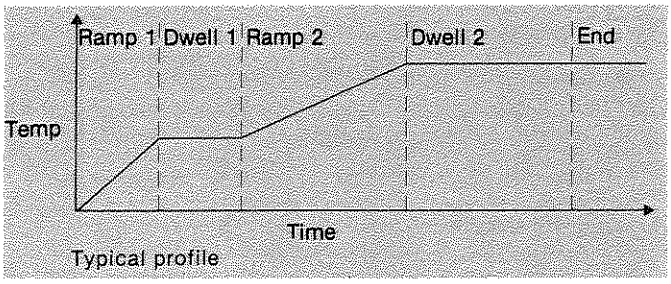
The setpoint is ramped at RAMP rate 1 from an initial value, equal to the processed measured value, to the set level 1.

811/812

Once this level is reached, the value is held for a period set by the DWELL 1 setting. At the end of the dwell period the setpoint is

Profiles





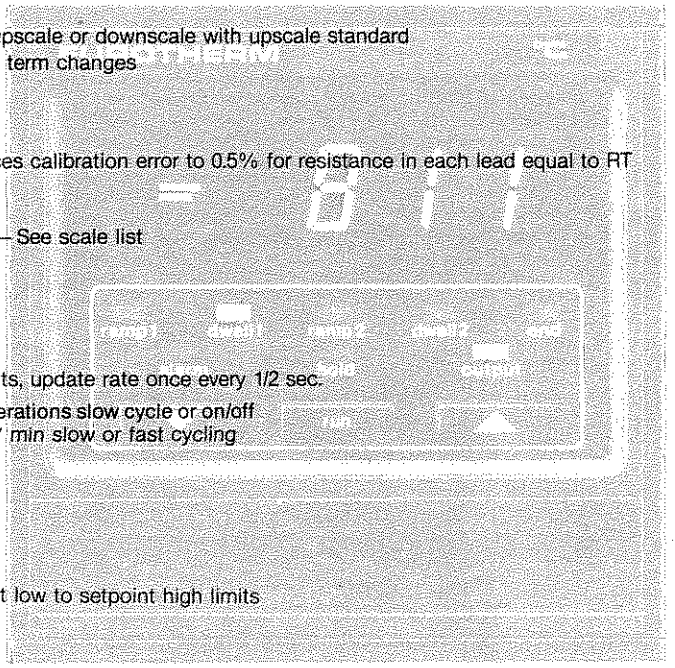
Technical Specification

Inputs 811/812

General		Span minimum 5mV maximum 65mV Common mode rejection: no observable effect with sensor at 264mV rms 50/60Hz Series mode rejection: >1000:1 Giving no observable effect for up to 50mV rms at 50Hz
Thermocouple	U.S. Standard	ASTM E230 (1972)
	British Standard	BS 4937 (1973)
	German Standard	DIN 43710
	Input bias current	<0.5μA Break detection either upscale or downscale with upscale standard
	Cold junction compensation	>20:1 Rejection of long term changes
RTD	British Standard	BS1904
	German Standard	Pt 100 to DIN 43760 3 wire connection reduces calibration error to 0.5% for resistance in each lead equal to RT span resistance
	Sensor bias current	0.5mA (Approx.)
Millivolts etc.		Linear Scales Available – See scale list

Outputs

Output 811	DC	Isolated 0 – 5V at 20mA 0 – 20mA at 10V min 4 – 20mA at 10V min
	Resolution	12 bit, one in 4000 counts, update rate once every 1/2 sec.
Output 812	Relay	2A 264V rms for 10^5 operations slow cycle or on/off
	Logic	Unisolated 10mA at 14V min slow or fast cycling
	DC	Isolated 0 – 5V at 20mA 0 – 20mA at 10V min 4 – 20mA at 10V min
Alarms 811	Band High deviation Low deviation	Adjustable 0 to 50 units
	Full scale high Full scale low	Adjustable from setpoint low to setpoint high limits
Alarms 812	Band High deviation Low deviation	Adjustable 0 to 50 units



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ramped, at RAMP rate 2, to the level 2 setting and is held there for the time set by the DWELL 2 period. The appropriate LEDs illuminate for each section of the program being actioned. At the end of the DWELL 2 period the END LED illuminates indicating completion of the programming sequence.

Ramps can be positive or negative and selected ramps/dwells can be omitted as required.

The program sequence can be run in a continuous cycling mode of operation.

811

In the RESET condition, the programmer is inoperative and the setpoint is reset to the initial value.

812

In the RESET condition, the programmer is inoperative but the instrument can now function as a normal controller. The controller incorporates a control algorithm of proven design and embodies powerful overshoot inhibition.

Characterisation

811/812

The specific configuration for an input in terms of range, thermocouple or input type, alarm configuration, linearisation etc. is held in electrically alterable ROM. In the event of loss of power, this device employs charge storage characteristics to retain this specific information for periods of several years. There is thus no need for 'back-up batteries'.

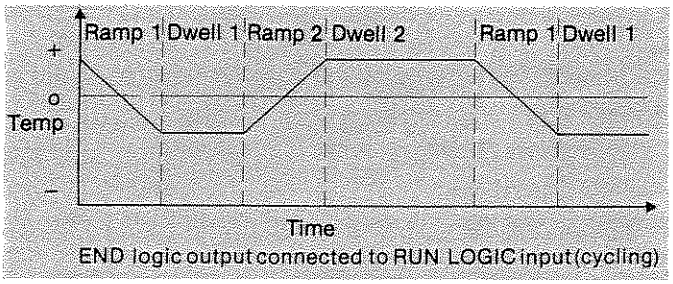
Linearisation of the input signal is accurately performed by the latest microprocessor techniques. Cold junction compensation is provided by a specially designed sensor housed within the input block on the rear terminals.

Mechanical Details

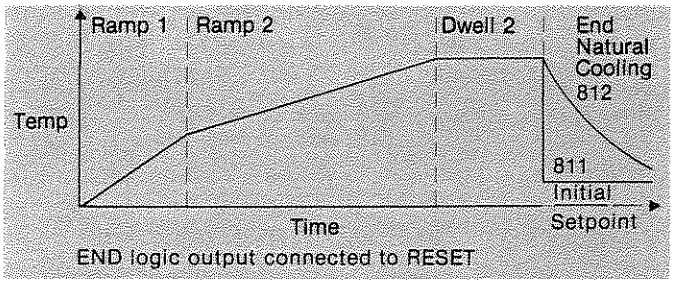
811/812

Each instrument is equipped with a sleeve for ease of installation, calibration and maintenance. Both screw and faston terminals are available, but only the faston version meets the relevant safety specification. The instrument is retained in the sleeve by a special screw which also aids its removal.

The internal construction is based on the proven Eurotherm practice of mother and daughter boards for ease of maintenance and simplicity of reconfiguration as required.



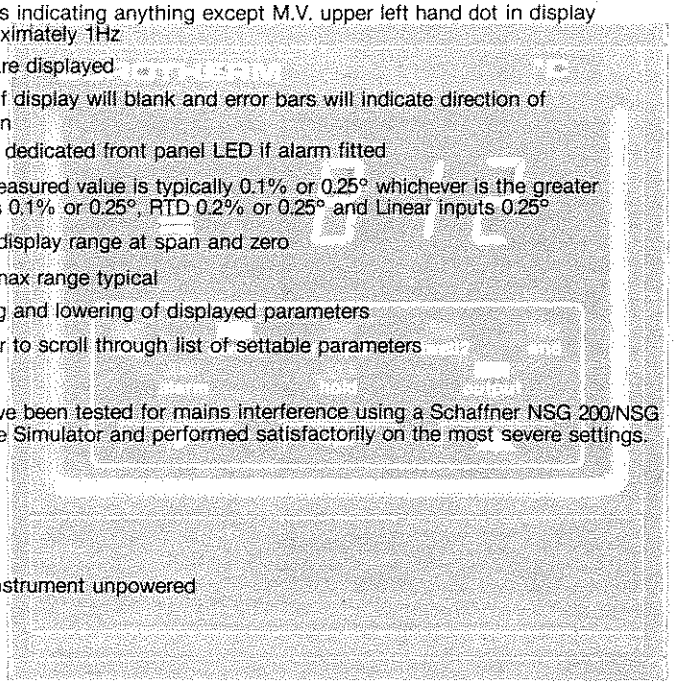
END logic output connected to RUN LOGIC input (cycling)



END logic output connected to RESET

General 811/812

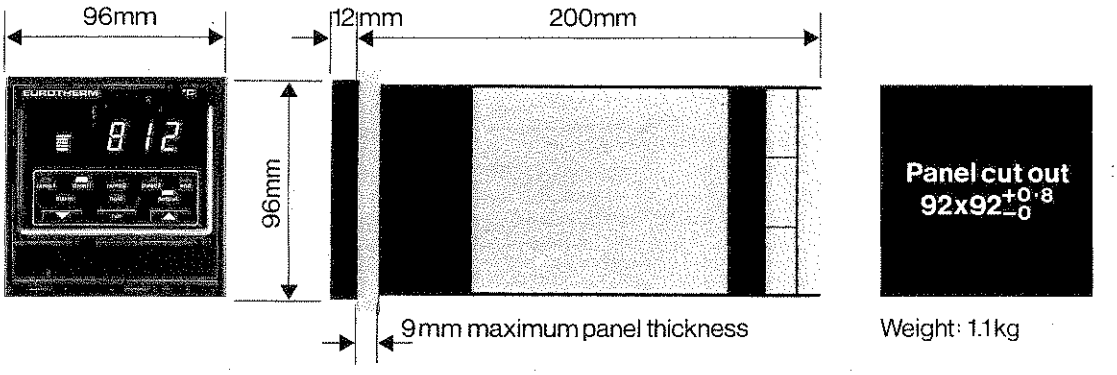
	Display	4 grid 7 segment 0.5" high fluorescent display incorporating 9 segment analogue error indicator. The display can display –999 to 9999. Max. resolution 4,000 units
	Error indicator (9 bar indicator)	<±5%; 0.5–1%; 1–2%; 2–5%; >5% max. range
	Parameter identification	By means of code displayed prior to actual parameter
	Measured value identification	When display is indicating anything except M.V. upper left hand dot in display blinks at approximately 1Hz
	Setpoint indentification	No error bars are displayed
	T/C break indication	Numeric part of display will blank and error bars will indicate direction of break protection
	Alarm indication	By means of a dedicated front panel LED if alarm fitted
Accuracy	Linearity	Accuracy of measured value is typically 0.1% or 0.25° whichever is the greater Thermocouples 0.1% or 0.25°, RTD 0.2% or 0.25° and Linear inputs 0.25°
	Calibration	±0.25% total display range at span and zero
Temp. coefficient	Temp. coefficient	<150ppm/°C max range typical
Operator controls	Up/Down pushbuttons	To allow raising and lowering of displayed parameters
	Scroll button	Allows operator to scroll through list of settable parameters
Power requirement		10VA
Noise immunity		The 811/812 have been tested for mains interference using a Schaffner NSG 200/NSG 222 Interference Simulator and performed satisfactorily on the most severe settings.



Environmental

Operating temperature range	0–50°C
Data retention	>1 year with instrument unpowered

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