Rear Terminal Wiring

**USE COPPER CONDUCTORS (EXCEPT FOR T/C INPUT)**

It is the responsibility of the OEM to ensure suitable conductors are used and that required terminations are manufactured.

Two modules shown. They are installed left to right in a 3U high Euro Rack. There is only one terminating (relay) module allowed per rack and a always installed on the left, standard (non relay) modules are installed to the right of the terminating module. Alarm relay outputs. Digital inputs and RS485 connections are made only to the terminating module. Each module requires a unique RS485 address. This set an upper limit of 63 devices on a single bus. Backplane modules can be interconnected up to a maximum according to the size of the Euro enclosure, power available and maximum internal ambient temperature.

### 1. INSTALLATION

**Backplane Modules**

<table>
<thead>
<tr>
<th>Parameter</th>
<th>Lower Display</th>
<th>Upper Display</th>
<th>Description</th>
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<tbody>
<tr>
<td>Value</td>
<td>Display</td>
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<tr>
<td>PV Value</td>
<td>Operator</td>
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<td>Value</td>
<td>Control</td>
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<td>Value</td>
<td>Scale Range</td>
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<td>Value</td>
<td>Alarm 1</td>
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<td>Alarm 2</td>
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<td>Value</td>
<td>Alarm 25</td>
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### 2. OPERATOR MODE

The operator screens are active from power on, or can be accessed from Select mode (see section 4).

### 3. MESSAGES & ERROR INDICATIONS

These messages indicate that an error has occurred or there is a problem with the process variable input signal or its wiring.

### 4. SELECT MODE

Select mode is used to access the configuration menu functions it can be accessed at any time by holding down and pressing .

### 5. CONFIGURATION MODE

First select Configuration mode from Select mode (refer to section 4).

### 6. DISPLAY STATUS

- **Alarm**
- **Status**
- **Display**
- **Messages**
- **Configuration**
- **Lock Code**
6. SETUP MODE
Note: Configuration must be completed before adjusting Setup parameters. First select Setup mode from Select mode (refer to section 4). Press to scroll through the parameters, then press to set the required value.

To exit from Setup mode, hold down and press to return to Select mode.

Note: Parameters displayed depend on how instrument has been configured.

Parameter Lower Upper Display Range & Description Default Value
Input Filter Time Cons: F t: 0.10 to 10.00 sec 0.10
Proportional Band: P b: 0% to 5% of span 2.5%
Integral Time: I t: 0.10 to 1000 sec 20
Derivative Time: D t: 0.10 to 50 sec 1.5
Manual Reset (Bias): B a: 0% to 100% 25
Primary ON/OFF Differential: d P: ± 10% of input span centered about the setpoint (entered as a percentage of span) 0.5
Setpoint Upper LIM: SPL: Current setpoint to Scale Range max R. max
Setpoint Lower LIM: SLL: Scale Range min to current setpoint R. min
Output Upper LIM: PUL: 0 to 100% of full power 100
Output 1 Cycle Time: Cl t: 0.1, 1, 4, 8, 16, 32, 64, 128, 256 or 512 sec 0.1
High Alarm 1 Value: H a1: Range Minimum to Range Minimum R. max
Low Alarm 1 Value: L a1: Range Minimum to Range Maximum R. max
High Alarm 2 Value: H a2: Range Maximum to Range Maximum R. max
Low Alarm 2 Value: L a2: Range Minimum to Range Minimum R. max
Elevation Alarm 1 Value: E l1: Elevation in span units R. max
Elevation Alarm 2 Value: E l2: Elevation in span units R. max
Software Pre-tune: Auto Pre-tune Rtn to 0.0 to 59.99 (1 to 10 min) 30.0
Software Ramp Adjustment: Auto Ramp raud Rtn to 0.0 to 59.99 (1 to 10 min) 30.0
Self-energised Digital Inputs: Self-energised Pt In Rtn to 0 to 100% 50
Programmable Sensor Break: Programmable Sensor Break List 0 to 100% 50
Programmable Power Limit: Programmable Power Limit List 0 to 100% 50
Soft Start Time: Soft Start△t 0 to 99 mins 59.99
Soft Start Ramp Rate: Soft Start△t 0 to 99 mins 59.99
Soft Start Limit: Soft Start△t 0 to 99 mins 59.99
Cycle Time: Cycle△t 0 to 99 mins 59.99

7. AUTOMATIC TUNING MODE
First select Automatic tuning mode from Select mode (refer to section 4). Press to scroll through the modes, then press to set the required value.

To exit from Automatic tuning mode, hold down and press to return to Select mode. Pre-tune is a single-shot routine and is thus self-disengaging when complete.

If Rp is in Setup mode then Rp-1 will attempt to run at every entry to close loop control (i.e. power off).

8. PRODUCT INFORMATION MODE
First select Product information mode from Select mode (refer to section 4). Press to view each parameter. To exit from Product information mode, hold down and press to return to Select mode. These parameters are read only.

Parameter Lower Upper Display Default Value
Description
Type: Firmware spec 0
Value displayed is firmware type number
Issue: Issue spec 0
Value displayed is firmware issue number
Revision Level: Rev spec 0
Value displayed is Product Revision level
Pre-Tune: Pre-Tune spec 0
Value displayed is average power value
Setpoint Break 1: Ser 1 b 0
Setpoint Break 2: Ser 2 b 0
Setpoint Break 3: Ser 3 b 0
Setpoint Break 4: Ser 4 b 0
Current: Current spec 0
Current rating to scale range
Current Limit: Current Limit spec 0
Current rating to scale range
Start-up 1 Breakpoint: Start-Up breakpoint spec 0
Current Limit: Current rating to scale range
Start-up 2 Breakpoint: Start-Up breakpoint spec 0
Current Limit: Current rating to scale range
Start-up 3 Breakpoint: Start-Up breakpoint spec 0
Current Limit: Current rating to scale range
Temperature: Temperature spec 0
Current Limit: Current rating to scale range
Start-up 4 Breakpoint: Start-Up breakpoint spec 0
Current Limit: Current rating to scale range

9. SOFT START FEATURE
Soft start is used when a gentle start-up phase is required before going to full working temperature. During soft start a dedicated soft start setpoint (SSP) is used to control the process to a lower temperature than normal. The period for which this soft start set point is applied is set by Soft Start Time (△t). During the soft start time the output power is limited by the Soft Start Output Power Limit (SSOL) and setpoint ramping is inhibited.

Auto Pre-tune
Auto Manual Control
Self-energised Input
Self-energised Input Selection
Self-energised Input Shown in Operation Mode
Self-energised Input Shown in Operator Mode
Self-energised Input Increment Value
Digital Inputs
Digital Input Selection
Digital Input Shown
Digital Input Shown in Operator Mode
Digital Input Shown in Operator Mode
Digital Input Shown Increment Value
Programmable Break
Programmable Break List
Programmable Power Limit
Programmable Power Limit List
Software Pre-tune
Software Ramp Adjustment
Soft Start Time
Soft Start Ramp Rate
Soft Start Limit
Cycle Time

10. PROGRAMMABLE SENSOR BREAK
When the Programmable Sensor Break feature is enabled and a sensor break is detected, the output is set to an average power value calculated by the instrument. When the Programmable Sensor Break (PSB) feature is disabled, and a sensor break is detected, the output is set to the Presset Power Output value (PPO).

11. ENABLE PRODUCTION
This feature indicates that temperatures are above the minimum requirement for production. It uses the terminating backplane Output 4 & NC relay contact to open an open contact when:
• Process temperature is more than 10 degrees below SP1
• Controller is in standby mode (SP2 is active)
• Controller is off (via interface signals)

Typically, to configure this feature, set parameters as follows:
Out put 4 Usage: ENAP
Alarm 2 Value = DE
Alarm 2 Value = -10

Note: Selecting Off mode from the front panel key indicates a not used loop.

Those loops indicate always they are ready for production.

12. HEATER BREAK ALARMS
The heater current limit must be set to identify faults in the heater elements. A low heater break alarm is typically used for early detection of heater element failure; it detects when the heater current is lower than it should be. A high heater break alarm can sometimes be useful for detecting partial shorts between heater elements or failures where the heater current is higher than it should be. Short Circuit Heater Break Alarm is typically used if the heater control device is stuck on or a failed relay contacts etc. This alarm is based on heater currents acquired whilst the Output is off.

Note: On very low output power combined with fast output cycle times a valid heater current reading may not be possible. To access the display indicates _A.

13. SERIAL COMMUNICATIONS
An RS485 interface is provided for serial communications. The Modbus RTU protocol is provided with 0 based parameter numbers. The following Modbus parameters are likely to be useful, but many more are available. Contact your supplier if the parameter is required.

Parameter Lower Upper Display
Description
Address: 1 Word
Power: 1 Word
Measured Power: 1 Word
Output Power: 1 Word
Output Power Limit in manual control
Output Power Limit
Output Power Limit
Setpoint 1: 31 Word
Setpoint 2: 32 Word
Setpoint 1 and Operating Setpoint
Setpoint 2: 33 Word
Setpoint 2
Tight + Output 1
Soft Start Relays

14. TECHNICAL ASSISTANCE
EWEKON Elektrowarmerbau GmbH & Co. KG Segener Straße 35 35066 Frankenberg
Tel.: +49-5461-501-0 Email: info@ewikon.com

15. SPECIFICATIONS
UNIVERSAL INPUT
Thermocouple: ±0.1% of full range; ±1.5% (for Thermoelectric CJC).
Calibration: BS4307, NBS125 & ECE854
Sampling Rate: 4 per seconds
Impedance: >10MΩ resistive.
Sensor Break: Control outputs go to a calculated average power value or to the programmable output power.

Isolated: Isolated from all other inputs and outputs except for the master control where the digital inputs are isolated from the thermocouple input. Digital inputs are intended to be connected to feeding switches only.

Universal input must not be connected to operator accessible circuits. If digital inputs are powered from backplane supply and are connected to a hazardous voltage source.

HEATER CURRENT MEASUREMENT
Accuracy: ±1% of input range ±1LSD.
Sampling Rate: 2 per second.
Heater current range: 0 to 15A

DIGITAL INPUTS
Self-energised: >470Ohm Open
contact closure: <100Ohm Closed

Isolation: Rewind safety isolation from inputs and other outputs.

OUTPUTS
Control Output Type:
Operating Voltage: 120, 240VAC
Current Rating: 1A to 15A (full cycle rms on-state @ 25°C)
See Output Current Derating chart below for operation above this temperature.

Isolated: Isolated from input and other outputs.

SERIAL COMMUNICATIONS
Physical: RS485, at 1200, 2400, 4800, 9600 or 19200 bps.
Protocol: Modbus/RTU
Communication.
Relay Interface: Rewind safety isolation from all inputs and outputs.
Cable: Screened twisted pair is recommended for optimum communication. The screen should be connected to a solid ground at each end.

OPERATING CONDITIONS (FOR INDOOR USE)
Ambient Temperature: 0°C to 70°C (Operating), –20°C to 80°C (Storage)
Relative Humidity: 20% to 95% non-condensing
Supply Voltage: 88 to 100VAC @ ±10%, 50/60Hz Max.

ENVIRONMENTAL STANDARDS
CE, UL, ULc, (UL applied for)
EMI: Complex with EN61326 (Susceptibility & Emissions).
Safety: Complied with EN61010-1 & IAI2121.
Considerations: Pollution Degree 2, Installation Category II.
Front Panel Sealing: IP20

PHYSICAL
Front Panel Size: 40 x 130 mm
Depth Behind Panel: 210mm (including backplane)
Weight: 0.4 kg maximum.