THERMOREGULATOR AND AIR/GAS RATIO REGULATOR

ESA TARC-II SERIES

FEATURES

GENERAL FEATURES

• Power supply: 85-264 Vac
• Absorption: 20 W
• Operating temperature: 0÷50°C
• Storage temperature: -10÷-70°C
• Degree of protection (attached to panel): IP54
• Mounting position: attached to panel
• Working environment: not suitable for explosive or corrosive environments
• Dimensions: 96X96X150
• Weight: 700g
• Serial communication interface: RS485-2 wires 32 units max expandable to 254
• Serial communication protocol: Modbus RTU
• Regulation on two independent loops: temperature and ratio
• Type of regulation: On/Off, PID, PI, P, PD
• Serial communication option: Profibus module
• Temperature programmer option: 20 different programs to choose from

DISPLAY SECTION

- Upper display: 7 segments, 5 digits, green in colour
- Central display: 7 segments, 5 digits, green in colour
- Lower display: two lines alphanumeric LCD
- State indicators: 10 leds

INPUT SECTION

Input of the high resolution process variable
- Thermocouple type: K, J, T, R, B, S, N, PII, C, D, E < ±0.2 ºC fault
- Pt100 type: 3 wires from 0 to 400 ºΩ
- mA type: 0÷20mA linear with 2.50 ºΩ 1% resistance
- mV type: 0÷80mV linear
- V type: 0÷10 Vdc linear
Inputs from air-gas flow transmitters
- mA type: 0÷20mA linear with 2.50 ºΩ 1% resistance
- mV type: 0÷80mV linear
- V type: 0÷10 Vdc linear
Remote set-point input of the process variable
- mA type: 0÷20mA linear with 2.50 ºΩ 1% resistance
- V type: 0÷10mV linear

APPLICATIONS

- Temperature and ratio regulator
- Temperature programmer and regulator
- Ratio regulator with different set-points in the operating range (bias action, etc.)
DESCRIPTION

ESA-TARC II is a combustion temperature and ratio regulating instrument designed in such a way as to be suitable for controlling and regulating combustion systems.

The instrument has two loops for the independent regulation of the two variables: “Loop 1” - temperature regulation, “Loop 2” - air-gas ratio regulation. The former controls the air valve, whereas the latter controls the gas valve.

When operating in steady state mode the instrument displays the predetermined variable, its value, the regulation set-point, the output percent value and the regulation state. The switching of the display from Loop 1 to Loop 2 and vice versa is automatic (every 2 minutes) or may be obtained by pushing the “LP1/LP2” keybutton.

Navigating through the menu pages, setting the temperature programmer and entering the configuration levels of the instrument is possible via the lower display.

The instrument menu is organized in pages and access levels: the level identifies the pages and parameters to display. The level setting occurs in the “Access” page. There are three levels: level 1, user; Level 2 regulation; Level 3 complete and Conf for Configuration.

By pushing the “Page” keybutton several times navigation starts through the menu pages. Via the “Scroll” keybutton the page and parameter required are displayed.

While navigating through levels 1, 2, and 3, the instrument keeps regulating the system whereas while in the configuration menu regulation is disabled.

All functions and settings may be modified via the keyboard gaining access to the different menu pages. ESA-TARC II regulates the process temperature (Loop 1) receiving the signal from the main input (thermocouple, pirometer, etc.) controlling the air flow regulation valve.

Two options are possible: either the remote set-point setting (via the analogic input enabled by the digital input) or the local set-point setting (via the Up and Down keybuttons).

Two temperature alarms are available, an absolute one and one for the set-point only. Both operate when the variable value rises above a predetermined value, enabling the corresponding output. The combustion air and gas flow ratio (Loop 2) is regulated after receiving the fluid flow values from the transmitters and controlling the gas flow regulation valve; the flow values received by ESA-TARC II must be counterbalanced as for temperature by transmitters.

The instrument has been designed in such a way as to take fluid 1 as the primary fluid, whereas fluid 2 comes after and holds the ratio. ESA-TARC II allows the user to work with ON/OFF, P, PD, PI, PID type regulations and the parameters to be set for the two regulation outputs can be different. The manual control on valves is enabled by switching the corresponding loop in manual mode and pushing the Up and Down keybuttons. The maximum ratio error allowed can be set for each regulation stage. If, during the primary fluid modulation stage, the ratio detected by ESA-TARC II exceeds the maximum error value allowed, the regulator will stop controlling the main valve until the air/gas ratio is brought back within the set range by the secondary valve.

ESA-TARC II allows to set 2 correction values of the ratio set-point, that is 0% and 25% of the fullscale air flow permitting the automatic change of the ratio set-point depending on the instantaneous air flow (low-running BIAS effect).

The serial communication, via the 2-wire, RS485 interface allows to connect up to 32 units (which may be expanded to as many as 254 units) to a remote controlling device from which it is possible to supervise the instrument sending controls (set-point, etc.) and receiving the state of the variables (temperature, fluid flows, ratios, etc.) In this way the instrument trend over the time (treatment curves, etc.) is recorded.
## KEYBOARD DESCRIPTION

Esa Tarc II has 7 keybuttons on the front of it allowing for the access to and setting of all functions.

<table>
<thead>
<tr>
<th>SYMBOL</th>
<th>BUTTON</th>
<th>DESCRIPTION</th>
</tr>
</thead>
</table>
| ![AUTO/MAN](symbol.png) | AUTO/MAN | • It switches the selected loop from automatic to manual mode  
• In the menu pages it allows to exit rapidly going back to the steady state Loop 1 page  
• The keybutton may be disabled during the configuration |
| ![LP1/LP2](symbol.png) | LP1/LP2 | • In steady state mode it switches from temperature regulation to ratio regulation and viceversa  
• In the menu pages it exits rapidly going back to the steady state Loop 1 page  
• The keybutton may be disabled during the configuration |
| ![RUN/HELD](symbol.png) | RUN/HOLD | • When in Hold mode it enables the execution of the selected program (Run Mode)  
• When in Run mode it let the execution program in Hold mode  
• If pushed for more than 2 seconds it disables the programmer and allows for changing the set-point via the Up and Down keybuttons (Reset Mode)  
• The keybutton may be disabled during the configuration |
| ![PAGE](symbol.png) | PAGE | • When in steady state mode it gives access to navigation through the menu pages  
• In the menu pages it selects the following page  
• In the menu pages if pushed together with the Up keybutton it selects the previous page |
| ![SCROLL](symbol.png) | SCROLL | • When in steady state mode it gives access to the parameters concerning the displayed loop  
• In the menu pages it gives access to the page or values of the displayed parameter  
• In the menu pages, when the value of a parameter is being displayed, it selects the following value  
• In the menu pages if pushed together with the Up keybutton it selects the previous value |
| ![DOWN](symbol.png) | DOWN | • In steady state automatic mode it decreases the set-point value  
• In steady state manual mode it closes the valve of the displayed loop  
• In the menu pages it displays the previous parameter  
• In the menu pages it decreases the value of the displayed parameter |
| ![UP](symbol.png) | UP | • In steady state automatic mode it increases the set-point value  
• In steady state manual mode it opens the valve of the displayed loop  
• In the menu pages it displays the following parameter  
• In the menu pages it increases the value of the displayed parameter |
### DESCRIPTION DISPLAYING SECTION

The displaying section of Esa Tarc II is made up of two 7-segment upper displays, one lower alphanumeric LCD and 10 leds as state indicators.

<table>
<thead>
<tr>
<th>INDICATORS</th>
<th>DESCRIPTION</th>
</tr>
</thead>
</table>
| **Upper display** | - When in steady state mode it displays the value of the variable of the selected loop  
- During navigation through the menu pages it displays the parameter of the steady state mode  
- In configuration it displays the sign “ CONF “, to show the state of the regulator |
| **Central display** | - In auto mode the display show the set point of the selected data  
- In local mode the display show the position of the valve  
- During the menu scrolling the status is always shown  
- During the configuration the name of the selected page is displayed |
| **Lower display** | - In auto mode the displayed name show the selected process data and the out position of the valve  
- During the scrolling of the menu it is showing the page, the parameter, the value as well as the unit of measure of the displayed data.  
- In configuration mode the page, the parameter, the modified value and possible links between variable. |
| LED AUTO | Auto mode selected |
| LED MAN | Local mode selected |
| LED LP1 | Loop 1 : temperature control |
| LED LP2 | Loop 2 : page of the gas parameters. This made is only accessible with a complete access level (Level 3) |
| LED LP3 | Not used |
| LED AUX | Together with led LP2 this means that the ratio control inputs are displayed |
| LED RUN | Run mode |
| LED HOLD | Wait mode |
| LED ALM | Alarm: when blinking this means that the operator has not recognized it. When fixed the alarm has been recognized by operator but still active. |
| LED SBY | Standby mode and so controls are not operated. This is shown during configuration mode |
Please follow the following instruction for proper installation:

- Avoid placing the equipment near intense magnetic or electric fields, and in such conditions as to be exposed to direct heat or products resulting from combustion, such as corrosive liquids, solvents or gases.
- The equipment must be installed by skilled staff, in compliance with the regulations in force at the time and in the place of installation.
- ESA TARC II in vertical or oblique mounting, with panel up to 1.5mm. The back part of the instrument should always be accessible for wiring. The cooling windows on the side box should not be covered in any way.
- Please follow the dimensions of page 21 for the cut out of the panel as well in case of multiple units.
- The unit should be mounted from the extern with the 2 supplied clips in the intern of the cabinet. Before to lock the clips, check the correct mounting of the gasket.
- Please read carefully the technical documentation, and check the polarity of the wires. The terminal screws are made for wires of .5 to 1.5mm².
- Remember that signal coming from thermocouples could not be connected to several units. We recommend to use compensated cable.
- Check that power supply is corresponding to the name plate of the units. The consumption could not exceed the outlet contacts.
WORKING MODE

ESA TARC II is already supplied with the parameter data given by the customer. On power on, after an auto check, the unit displays the main loop and starts its process, taking into account the parameters, the eventual local mode or temperature set point. You can, with the appropriate level change, read the various parameters as shown in the below graph.

In auto mode the barograph of the bottom display shows the position of the air valve versus the rotation time, in local mode it shows the gas valve position.
ACCESS LEVEL SELECTION

The navigation through the menu pages giving access to all parameters is subject to the current access level: lower levels allow for access to fewer pages or parameters making navigation easier.

<table>
<thead>
<tr>
<th>Level</th>
<th>Access Level</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>Level 1</td>
<td>User</td>
<td>Used during normal functioning, gives access to main parameters only</td>
</tr>
<tr>
<td>Level 2</td>
<td>Regulation</td>
<td>Used during regulation, gives access to all regulation parameters</td>
</tr>
<tr>
<td>Level 3</td>
<td>Complete</td>
<td>Gives access to all instrument parameters</td>
</tr>
<tr>
<td>Config</td>
<td>Configuration</td>
<td>Configuration level of the instrument where the types of inputs, outputs and functions are set. In this level regulation is disabled.</td>
</tr>
</tbody>
</table>

The selection of a new access level occurs in steady state mode and entails navigating in the menu until the “Access” page is reached. In order to go to a higher level a passcode is required, whereas the passage to a lower level is direct. Passcodes may be customer-tailored.

<table>
<thead>
<tr>
<th>OPERATION</th>
<th>LOWER DISPLAY</th>
<th>DESCRIPTION</th>
</tr>
</thead>
<tbody>
<tr>
<td>none</td>
<td>Temperature/Ratio</td>
<td>Steady state mode displaying one of the two loops</td>
</tr>
<tr>
<td>ACCESS</td>
<td>General page for the selection of the access levels</td>
<td></td>
</tr>
<tr>
<td>Access level: level...</td>
<td>Visualisation of the current access level</td>
<td></td>
</tr>
<tr>
<td>▲ ▼</td>
<td>Selection of a higher level</td>
<td></td>
</tr>
<tr>
<td>none</td>
<td>Enter Passcode: lev...</td>
<td>Request for passcode: 2 for level 2, 3 for level 3, 4 for the configuration level</td>
</tr>
<tr>
<td>▲ ▼</td>
<td>Enter Passcode: lev...</td>
<td>Passcode entering</td>
</tr>
<tr>
<td>none</td>
<td>Access level... pass</td>
<td>Passcode accepted</td>
</tr>
<tr>
<td>none</td>
<td>Access level: level...</td>
<td>Visualisation of the current access level</td>
</tr>
</tbody>
</table>
NAVIGATING THROUGH THE MENU PAGES (LEVEL 2)

ESA TARC II has a page menu to visualise and modify all the parameters which are not displayed in the two steady state loops. When navigating the menu pages are displayed on the lower display, whereas the upper and central displays keep displaying the variable and the main loop set-point (temperature). Via the Page keybutton navigation starts displaying the menu pages one after the other (picture 1). The parameter visualisation or scanning is enabled via the "Scroll", "Up", "Down" keybuttons (see pictures below). To exit push the " Auto/Man " or " LP1/LP2 " keybuttons. Another way to exit: if no modification is performed for 1 minute, the instrument automatically displays the steady state mode.

LEVEL 2 Regulation

Visualisation of the current access level or modification to pass to other levels

Visualisation of the instantaneous air flow

Visualisation of the instantaneous gas flow

Visualisation of the instantaneous ratio between comburent and fuel
The intervention of both alarms enables the AA alarm output, which can be used to switch the burners off.
**LEVEL 2 Regulation**

**ALARMS**

**Low lim A Page**

- **Type**
  - Full scale Low

- **Setpoint**
  - Nm³/h

- **Output**
  - Off

**Indication of alarm output state. If ON the valve cannot close completely**

This alarm is used to set the min. air flow limit (Nm³/h), under which the air valve cannot go on closing.

**ALARMS**

**High lim A Page**

- **Type**
  - Full scale High

- **Setpoint**
  - Nm³/h

- **Output**
  - Off

**Indication of the alarm output state. If ON the air valve is locked**

This alarm is used to set the max. air flow limit (Nm³/h), under which the air valve cannot go on opening.

**Type of alarm: absolute of low air flow**

- Setting in Nm³/h of min. air flow

**Type of alarm: absolute of high air flow**

- Setting in Nm³/h of max. air flow
This alarm is used to set the max. ratio error limit (engineeristic units), above which the air valve is locked waiting for the ratio to come down to the limit allowed. The band is symmetrical to the ratio set-point.

The autotuning function may be enabled when no good regulation can be obtained, although the PID values of the regulation Loops have been modified (see note on page 15).
LEVEL 2 Regulation

Trim value on ratio set-point with air flow equal to 0.1% of fullscale. In the intermediate values between 0.1% and 25% the trim change is proportional.

Trim value on ratio set-point with air flow equal to 25% of fullscale. In the intermediate values between 25% and 50% (trim = 0) the change is proportional.

Setting of air flow fullscale value (Nm³/h), concerning the 20mA signal from transmitter.

Setting of gas flow fullscale value (Nm³/h), concerning the 20mA signal from transmitter.
During regulation it is sometimes necessary to set limits to the set-point settings so as to avoid putting uncorrect values which would compromise the system safety. Moreover it can be useful to modify the software filtering value of the analogic inputs (temperature, air flow and gas flow) because they may be disturbed by external causes. These settings must be performed in the "complete" level (level 3). We would like to remind you that this level allows to modify all instrument parameters therefore the uncorrect entry of some of them could entail some malfunctioning; should that be the case, quickly leave the navigation menu via the "Auto/Man" or "LP1/LP2" keybuttons without confirming the change via the "Scroll" keybutton.

LEVEL 3 Complete

When entering the navigation menu, via the Page keybutton, when there is a dotted arrow, it is necessary to push the keybutton which is being indicated several times until the desired parameter is displayed.

Selected temperature set-point. The STD version only has one temperature set-point.

Min. regulation limit of temperature SP1 (set-point 1).

Max. regulation limit of temperature SP1.

Min. regulation limit of temperature SP2. (set-point 2)

Max. regulation limit of temperature SP2.
Attention: ratio set-point limits are on page "Ratio Page". The "SP Page" page concerns gas flow therefore any change in the limits (concerning gas flow) on this page compromises the ratio regulation.

Min. limit for ratio set-point setting
Ratio Lo Lim ▲▼ 0.0
Max. limit for ratio set-point setting
Ratio Hi Lim ▲▼ 100.0

Filter value in seconds on temperature input. By increasing the value, rapid oscillations decrease.
Filter value in seconds on gas flow input. By increasing the value, rapid oscillations decrease.
Filter value in seconds on air flow input. By increasing the value, rapid oscillations decrease.
Offset value in engineering units on the input reading
Offset ▲▼ 0.0

Going back to the start menu
Esatarc II makes use of different regulation modes (On/Off, PID, PI, P, PD), and you can always choose the one which suits you better. The PID regulation mode takes into consideration some parameters to be configured which cause a change in the regulating output depending on the change of the error between variable and setpoint. Regulation parameters are: Proportional Band (PB), expressed in engineering units which stands for the area where the regulator regulates the output depending on the parameters; Integral Time (IT), expressed in seconds stands for the reaction time to default, by increasing this time the system reaction is faster; Derivative Time (DT) expressed in seconds but unlike the Integral Time, by increasing this value the system reaction is slower.

The temperature regulation process is considered more or less slow depending on the application, therefore the effect of the PB, IT and DT (PID regulation) is taken into account. The ratio regulation process on the other way is considered fast, therefore the effect of the PB and IT, but not of the DT (PI regulation) is taken into account.

Access to the rapid setting of regulation parameters is obtained by pushing the "Scroll" keybutton when in steady state mode (disabled menu) during the visualisation of the loop in question. This setting is only possible if the "regulation" access level (level 2) is enabled.
Main page concerning temperature regulation

Setting of temperature set-point value.

Visualisation of regulation output power

Air valve regulation band. If set at 0 the proportional action is disabled

Integral time of air valve regulation

Derivative time of air valve regulation

Time actuator air valve used to switch from completely closed to completely open

Min. time impulse for actuator

Regulation dead zone across the temperature set-point

Main page concerning ratio regulation

Setting of ratio set-point value

Visualisation of regulation output power

Gas valve regulation band. If set at 0 the proportional action is disabled

Integral time of gas valve regulation

Derivative time of gas valve regulation

Time actuator gas valve used to switch from completely closed to completely open

Min. time impulse for actuator

Regulation dead zone across ratio set-point
CONFIGURATION MENU

Navigating in the configuration menu is necessary when some parameters which are not accessible in the lower levels need changing. This access level allows the user to change all parameters and instrument functions, therefore any mistake in this phase entails some kind of malfunctioning.

In this level regulation is disabled, therefore before getting to the configuration mode, check for the system safety. In this menu it is also possible to change the type of main input (thermocouple, mV, etc.), the type of remote set-point input and select the pages to give access to in the previous levels (user, regulator, etc).

Configuration LEVEL

Access Level Config

STANDARD IO

STANDARD IO Temperat Page

Channel Type 80mv/mA/termoc

Linearisation Linear/K-J-S-type

Electrical Lo mV ▼▲ 0.00

Electrical Hi mV ▼▲ 50.00

Eng Val LO °C ▼▲ 200

Eng Val Hi °C ▼▲ 1200

Page concerning temperature input

Type of input temperature signal from probe

Type of linearisation of input electrical signal

Setting of min. input electrical signal

Setting of max. input electrical signal

ISetting of min. temperature value of min. electrical signal

Setting of max. temperature value of max. electrical signal

Set input type: with thermocouple type it gets the signal in mV, whereas by setting 80 mV or mA the signal ranges must be set.

Set linearisation type: for thermocouple inputs, the type must be set (J, K, S, R, …) whereas for linear inputs just set Linear.

Set min. electrical signal value: for ex. with 4-20mA signal set 4.00. This setting is not enabled with signals from thermocouples.

Set max. electrical signal value: for ex. with 4-20mA signal set 20.00. This setting is not enabled with signals from thermocouples.

Set min. temperature value corresponding to min. electrical signal. This setting is not enabled with signals from thermocouples.

Set max. temperature value corresponding to max. electrical signal. This setting is not enabled with signals from thermocouples.
To authorise or deny access to some pages in the lower levels, it is only necessary to modify the minimum access level. Such modification can only be performed in the configuration level.
Serial communication allows the ESA TARC regulator to communicate with a PC, PLC or with a remote supervisor, exchanging data and controls to check and supervise the plant.

The hardware interface which is installed is a 2-wire RS485 interface. It allows the connection of up to 32 units coming from the same line. If necessary, by means of special signal repeaters, up to 254 units may be connected. The communication protocol is the standard MODBUS-RTU type.

A module for Profield communication may be installed on request. The setting of the serial address of ESA TARC II occurs in the complete level (level 3). Obviously, this address must be different for each unit connected to the serial line.

**LEVEL 3 Complete**

- **TemperatAUT**
- **Gas Flow AUT**
- **Ratio AUT**
- **ACCESS**
- **COMMS**
- **H Page**

When entering the navigation menu, via the Page keybutton, when there is a dotted arrow, it is necessary to push the indicated keybutton until the parameter is displayed.

### Protocol
- Modbus

### Address
- 1

### Resolution
- Full

### H Activity
- 0

**Type of serial protocol enabled**

**Serial address of ESA TARC II**: up to 254 addresses may be set

**Resolution of transmitted data**: Full (complete values) or Integer (integral values)

**Activity of the serial port**
Below is a list of the modbus addresses of the main variables of Esa Tarc II.

<table>
<thead>
<tr>
<th>PARAMETERS</th>
<th>ADDRESS</th>
<th>READING (R)</th>
<th>WRITING (W)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Process temperature</td>
<td>1</td>
<td>R</td>
<td></td>
</tr>
<tr>
<td>Comburent air flow</td>
<td>6178</td>
<td>R</td>
<td></td>
</tr>
<tr>
<td>Fuel gas flow</td>
<td>6218</td>
<td>R</td>
<td></td>
</tr>
<tr>
<td>Instantaneous air/gas ratio</td>
<td>1177</td>
<td>R</td>
<td></td>
</tr>
<tr>
<td>Temperature set-point 1</td>
<td>24</td>
<td>R / W</td>
<td></td>
</tr>
<tr>
<td>Temperature set-point 2</td>
<td>25</td>
<td>R / W</td>
<td></td>
</tr>
<tr>
<td>Ratio set-point</td>
<td>1180</td>
<td>R / W</td>
<td></td>
</tr>
<tr>
<td>High temperature deviation alarm set-point</td>
<td>11586</td>
<td>R / W</td>
<td></td>
</tr>
<tr>
<td>High temperature absolute alarm set-point</td>
<td>11596</td>
<td>R / W</td>
<td></td>
</tr>
<tr>
<td>Max. ratio error alarm set-point (AI Ratio)</td>
<td>11762</td>
<td>R / W</td>
<td></td>
</tr>
<tr>
<td>Temperature set-point 1 min. limit</td>
<td>112</td>
<td>R / W</td>
<td></td>
</tr>
<tr>
<td>Temperature set-point 1 max. limit</td>
<td>111</td>
<td>R / W</td>
<td></td>
</tr>
<tr>
<td>Temperature set-point 2 min. limit</td>
<td>114</td>
<td>R / W</td>
<td></td>
</tr>
<tr>
<td>Temperature set-point 2 max. limit</td>
<td>113</td>
<td>R / W</td>
<td></td>
</tr>
<tr>
<td>Ratio set-point min. limit</td>
<td>1171</td>
<td>R / W</td>
<td></td>
</tr>
<tr>
<td>Ratio set-point max limit</td>
<td>1172</td>
<td>R / W</td>
<td></td>
</tr>
<tr>
<td>Min. limit air flow (Low lim A)</td>
<td>11730</td>
<td>R / W</td>
<td></td>
</tr>
<tr>
<td>Max. limit air flow (High lim A)</td>
<td>11746</td>
<td>R / W</td>
<td></td>
</tr>
<tr>
<td>0% set-point ratio trim value (0% Ratio)</td>
<td>9220</td>
<td>R / W</td>
<td></td>
</tr>
<tr>
<td>25% set-point ratio trim value (25% Ratio)</td>
<td>9225</td>
<td>R / W</td>
<td></td>
</tr>
<tr>
<td>Air flow fullscale (FS air)</td>
<td>9230</td>
<td>R / W</td>
<td></td>
</tr>
<tr>
<td>Gas flow fullscale (FS gas)</td>
<td>9235</td>
<td>R / W</td>
<td></td>
</tr>
<tr>
<td>Proportional band (Loop 1)</td>
<td>351</td>
<td>R / W</td>
<td></td>
</tr>
<tr>
<td>Integral time (Loop 1)</td>
<td>352</td>
<td>R / W</td>
<td></td>
</tr>
<tr>
<td>Derivative time (Loop 1)</td>
<td>353</td>
<td>R / W</td>
<td></td>
</tr>
<tr>
<td>Time actuator valve (Loop 1)</td>
<td>21</td>
<td>R / W</td>
<td></td>
</tr>
<tr>
<td>Min. impulse time (Loop1)</td>
<td>54</td>
<td>R / W</td>
<td></td>
</tr>
<tr>
<td>Regulation dead zone (Loop1)</td>
<td>11778</td>
<td>R / W</td>
<td></td>
</tr>
<tr>
<td>Manual regulation (Loop1): 0 auto, 1 man</td>
<td>273</td>
<td>R / W</td>
<td></td>
</tr>
<tr>
<td>Temperature set-point selection: 0 set 1, 1 set 2</td>
<td>15</td>
<td>R / W</td>
<td></td>
</tr>
<tr>
<td>Proportional band (Loop2)</td>
<td>1375</td>
<td>R / W</td>
<td></td>
</tr>
<tr>
<td>Integral time (Loop2)</td>
<td>1376</td>
<td>R / W</td>
<td></td>
</tr>
<tr>
<td>Derivative time (Loop2)</td>
<td>1377</td>
<td>R / W</td>
<td></td>
</tr>
<tr>
<td>Time actuator valve (Loop2)</td>
<td>1045</td>
<td>R / W</td>
<td></td>
</tr>
<tr>
<td>Min. impulse time (Loop2)</td>
<td>1078</td>
<td>R / W</td>
<td></td>
</tr>
<tr>
<td>Regulation dead zone (Loop2)</td>
<td>11794</td>
<td>R / W</td>
<td></td>
</tr>
<tr>
<td>Manual regulation (Loop2): 0 auto, 1 man</td>
<td>1297</td>
<td>R / W</td>
<td></td>
</tr>
</tbody>
</table>
Greater panel thickness: 12 mm, 0.5 in

Minimum room recommended among the instruments:

92x92 mm 3.62x3.62 inch

Dimension of hole in panel:

92x92 mm 3.62x3.62 inch

-0 +0.8

10 mm (0.4 inch)

38 mm (1.5 inch)
NOTA: In base alla propria politica di continuo miglioramento della qualità del prodotto, la ESA-PYRONICS si riserva il diritto di modificare le caratteristiche tecniche del medesimo in qualsiasi momento e senza preavviso. Al nostro sito internet www.esapyronics.com è disponibile il catalogo aggiornato all’ultima versione, dal quale è possibile scaricare i documenti modificati.

ATTENZIONE: Il funzionamento dell’impianto di combustione può risultare pericoloso e causare ferimenti a persone o danni alle attrezzature. Ogni bruciatore deve essere provvisto di dispositivo di protezione e controllo della combustione. Le operazioni di installazione, regolazione e manutenzione dell’impianto devono essere eseguite solo da personale qualificato.

ELECTRICAL CONNECTIONS WITH LINEAR VALVE

[Diagram showing electrical connections with linear valve]