

UNIVERSAL CONTROLLER

C5I50V2.4

TECHNICAL DESCRIPTION

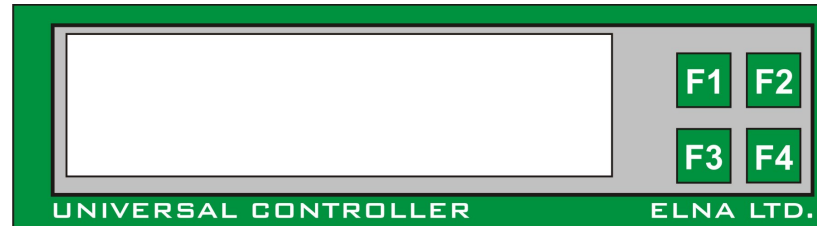


General description

The controller has seven opto-insulated inputs, controlled with 24V and seven transistor outputs. The inputs and the outputs can be galvanic separated. The controller manages the system pneumatic cylinder and induction heating generator.

Description of the interface

The control panel consists of LCD display with 2 rows of 16 symbols each and 4 functional keys – F1 ÷ F4:



The particular function of each key is shown on the right side of the display.

After switching on, the information for the type of the controller is displayed and then - the general status of the system is displayed:

C:RDYWait... » ■■	readiness; the system is in initial state (open cylinder); waiting for start signal or command, applied by the user in manual mode (as it is displayed, in manual mode F2-g grips the detail, F3-h starts heating, F4-r return in initial position)
C:RDYWait... » g h r	Note 1: key F1-> blinks with mode indication (manual or automatic). Using this key the user can enter the menu at any time. Note 2: The exit from the menu returns the system in the default – automatic mode.
C: Grip... » ■■	gripping; the cylinder is switched on and the detail is gripped
C: Heating... » ■■	heating; the start signal is supplied to the generator for high frequency heating
C: Cooling... » ■■	cooling; awaiting for cooling of the detail before opening the cylinder
C: Return... » ■■	return; switching off the pneumatic cylinder and returning the system in initial state

The system settings menus are:

<p>PARAMETER « ↑ SETTINGS «↓ ↓</p> <p>▶ Theat1 =0.20 « ↑ «↓ ↓</p> <p>▶ Tcool1 =0.45 « ↑ «↓ ↓</p> <p>▶ T grip=0.05 « ↑ T pass=0.50 «↓ ↓</p>	<p>Manual settings of the system parameters:</p> <p>Theat1 = [0,01 ÷ 1,50]s heating time This is the working time of the high-frequency generator (it is on).</p> <p>Tcool1 = [0,01 ÷ 2,50]s cooling time This is the time, necessary for cooling after heating, before releasing the detail.</p> <p>T grip = [0,01 ÷ 0,20]s gripping time This is the time for stable detail grip after the signal for closed cylinder.</p> <p>T pass = [0,01 ÷ 1,00]s time for cylinder movement This is time in which the cylinder passes from one to another state (from applying the signal to sensor reaction). Note: The selected parameter is indicated by an arrow. If the marker blinks, the parameter can be changed by the keys.</p>
<p>DEFAULT VALUES « ↑ LOAD ↓</p> <p>DEFAULT VALUES LOADED «↑ ■ ↓</p>	<p>Loading of the default values of all parameters; By pressing the key F3 (LOAD) the default values (marked in this table) are loaded. This report is indicated when the default parameters are loaded.</p>
<p>MANUAL MODE « ↑ «↓ ↓</p>	<p>Activating the manual mode; By pressing the key F3 (ENTER) – the system is switch to manual mode and the basic display with system status is indicated.</p>

The menus are entered by key F3 (ENTER «↓), and the return from one menu to the previous one is by the key F1-«. Using the arrow keys the user can choose the menu and the parameter values.

The errors that appear during the operating time stop the system and are indicated as follows:

<p>C: ReturnTimeout » ■ é ■</p>	<p>The time for the opening of the pneumatic cylinder is bigger than Tpass. There is a mechanical fault or initial system state sensor error.</p>
<p>C: GripTimeout » ■ é ■</p>	<p>The gripping time is greater than Tpass. There is a mechanical fault or problem with sensor for closed pneumatic cylinder of the system.</p>
<p>C: SensorError » ■ é ■</p>	<p>There is a signal from the two sensors (open and closed cylinder) and/or error position in the initial system state.</p>

By pressing the button F3-é, the error clears and allows new system start.

Operating principle

After the start, the system follows this algorithm:

1. Opens the cylinder.
2. Waits for initial positioning and, if there is a start signal, goes to the next algorithm step.
3. Closes the cylinder (Grip...).

4. After receiving the signal from the closed cylinder sensor, waits time Tgrip for stable detail grip.
5. Switches on the heating generator and waits time Theat1 (Heating...).
6. Switches off the generator and waits for the detail cooling Tcool1 (Cooling...).
7. Opens the cylinder and returns the system into initial position until the signal from the open cylinder sensor (Return...).

Note: If there is an error, the system turns off (opens the cylinder, generator stops) and error signal is generated.

Assembling

A controller unit with 7 transistor outputs (3 for control of the cylinder, generator and error signal) and 7 digital inputs (24V) for sensors (3- open and closed cylinder and start signal) is used.

The connections are as described in the tables:

Inputs							
Input №	1	2	3	4	5	6	7
Function	Start signal*	Sensor for opened cylinder	Sensor for closed cylinder	NC	NC	NC	NC

Outputs							
Output №	1	2	3	4	5	6	7
Function	Cylinder	NC	Generator	Error	NC	NC	NC

* The start signal is generated by a mechanical flag, mounted on the machine mechanic. It activates a proper situated induction sensor when the machine is in position for operation start.

