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Instruction Manual

Temperature Controller

SE 9-6

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SE 9-6 Controller.

This controller has nine programs, each program has six segments a delay start feature, ramp time which is fully adjustable, first temperature which is adjustable.

1.Introduction

The SE 9-6 controller enables very precise control of your kiln. The first eight programs are set at zero and program nine is set up as a test firing to 700°C. You can alter and save any of these programs to fit your individual needs.

For easy handling the control unit is delivered with a mounting sleeve. For programming, you can remove the controller from the sleeve and replace it when programming is completed. The mounting sleeve can be fixed to the side of the kiln or alternatively it can be wall mounted.

IMPORTANT:

Do not put the control unit on the top of the kiln at any time especially during firing.

Do not alter the length of the cable connecting the controller to the kiln in any way.

Every control unit SE 9-6 is thoroughly tested to ensure conformity to quality standards.

Our control units are also fitted with an over-temperature safety device which shuts off the power if the temperature exceeds the desired temperature by 20°C. Personal supervision of firing is preferable especially for the first few times of use.

If you have any problems please refer to the error list at the end of this manual.

If you are not able to solve the problem by yourself, please call CROMARTIE customer support – 01782 313947.

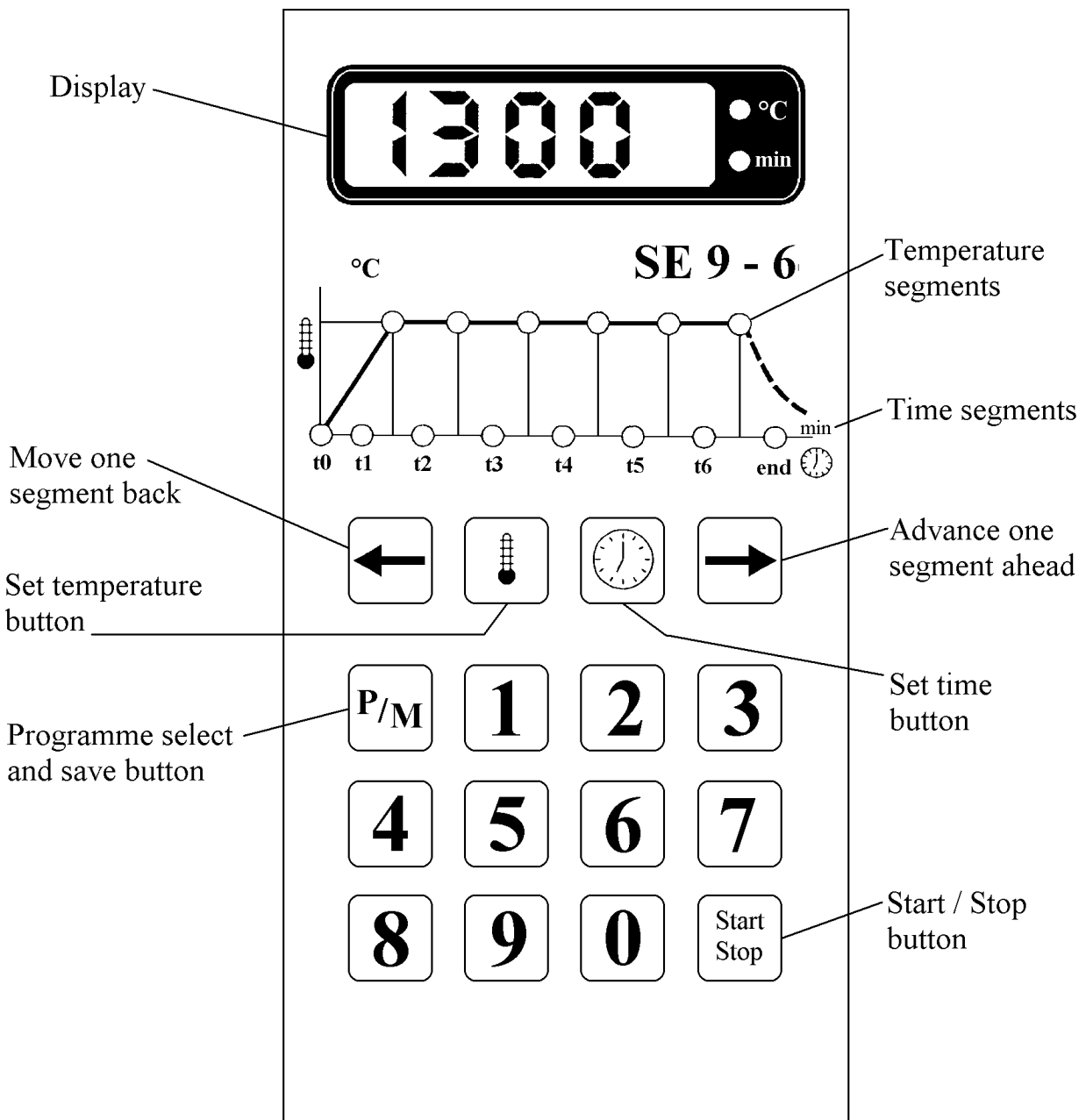
PLEASE ASK FOR A COPY OF OUR BOOKLET “Programming your kiln”.

The control unit has a Harting plug for connection to the kiln, this only fits in one position, connect it to the kiln before firing.

2.First Firing

At the bottom side of the SE 9-6 you find the main switch, please switch control unit on and wait for the display.(app. 3 sec.).Now you can read the kiln temperature on the display and you are able to program the control unit.

3.1 Description of the Controller facia SE 9-6



3.2 Choosing and Starting Saved Programmes

The SE 9-6 has 9 Programs that can be individually altered and saved.

Starting a Saved Program

Push the “**P/M**” button to select program mode. The display will show ‘**P=**’.
Use the keypad to choose your desired program. (1 – 9 buttons)
Then push the “Start / Stop” button to start firing.

Example:

To choose and start program number 3, press the following buttons:

“P/M” > “3” > “Start Stop”

If you press the “Start / Stop” button again, the program will be stopped.

3.2.1 Choosing and Starting Saved Programs

Programs 1-8 are pre-set to zero.

Program 9 is a test program which can also be changed.

Program	No	t1	Temp 1	t2	Temp 2	t3	Temp 3	t4	Temp 4	T5	Temp 5	t6	Temp 6
	1												
	2												
	3												
	4												
	5												
	6												
	7												
	8												
Test	9	60 min	300°C	0 min	1000°C	20 min	1000°C	0 min	0°C	0 min	0°C	0 min	0°C

Table: Factory set programs

3.3 Changing the Programs

To change the controllers programs, first choose a program as described earlier in chapter 3.2.

Entering the Time Segments

Push the “⌚” button once. The LED ‘t1’ will start blinking. You are now in the programming mode for ‘time’. You can now change the value that is displayed using the keypad. Use the “←” and “→” buttons to move back and forth through the time segments scale.

Entering the Temperature Segments

Push the “🌡️” button once. The first temperature LED will start blinking. You are now in the programming mode for temperature. You can change the value that is displayed using the keypad. Use the “←” and “→” buttons to move back and forth through the temperature segment scale.

When the programming has been installed, you can start it any time by pressing the “Start / Stop” button. During the firing process, the time segments will be counted backwards. If you would like to restart your program, you can either reload it in case you have it stored, to set the time segments back to their original time, or you can re-enter the time segments.

Saving / Storing the Program

You can set all current time and temperature data to zero by choosing the program number ‘0’ (see chapter 3.2). This is useful if you want to set up a completely new program.

Note. Saved programs will not be affected by this.

Important: The delay time cannot be stored in memory.

Note! If you wish to alter heating ramps and temperatures in a stored program for a one off firing this can be done before the program is started. Once the firing has been completed or the power to the controller has been switched off the program will revert back to the original stored program.

3.31 Use of Program Datas

You can save up to 9 programs,
to save a program, follow these instructions:

First set up the program you wish to save (as detailed 3.2). Then press the “P/M” button twice. The display will now show ‘S=’. Now enter your desired program number and then push the “Start Stop” button. The program will now be saved.

Example:

We now want to enter and save program number 4 with the following:

1. **150°C per Hr to 600°C** (600/150=4Hrs or 240 mins)
2. **FULL Power to 1020°C** (Full power to 1020°C or 0 mins to 1020°C)
3. **15 minute soak at 1020°C** (15 minute soak 15 mins between to identical temperatures)
4. **220°C per Hr to 800°C** (cooling ramp 1020°C-800°C=220°C, 220°C/220°C=1Hr or 60 mins)

Note! Any other unused segments must be left on zero to finish the program. Failure to do this can result in an undesired program being fired.

Program	No	t1	Temp 1	t2	Temp 2	t3	Temp 3	t4	Temp 4	T5	Temp 5	t6	Temp 6
My Prog	4	240 mins	600°C	0 mins	1020°C	15 mins	1020°C	60 mins	800°C	0 mins	0°C	0 mins	0°C

To do this, follow these instructions:

1. Enter the time segments 🕒:

“🕒” >2>4>0> → >0> →>1>5> →>6>0> →>0> →>0>

2. Enter the temperature segments 📉:

“📉” >6>0>0> → >1>0>2>0> →>1>0>2>0> →>8>0>0> →>0> →>0>

3. Save the program: (Press P/M twice until S=0 is displayed, enter in the desired new program number, (example, to store on program 1, press 1. The display will then show S=1. then press start / stop twice to store program).

3.3.2 Meaning of the LED's

The LED's (red lights) have the following meanings:

t0: *delay time (green light)*

The firing process will be delayed after pushing the "Start Stop" button by the set amount of time.

Note: The delay time can not be saved to any program.

t1: *heat-up, soak & cool-off times*

Here you can enter heat-up, soak and cooling times

Note: When entering a cooling time, you can not cool the kiln faster than it's natural cooling speed.

end: end

This LED shows that the firing process has been finished and the elements have been switched off. The Kiln will now cool down.

The LED's above the time LED's show the current set temperature of the segment.

4.0 The Firing Process

After choosing a program (see chapter 3.1), and press the "Start Stop" button, the firing process will be started. If you have entered a delay time, the delay time will be displayed and counted backwards when you start the program. As soon as the time reaches zero, the actual firing process will be started. The delay time is especially useful for kilns that are used on cheap night rate electricity (Economy 7).

The controller will start to heat up the kiln in segment 't1' to the temperature of the first segment. As soon as the temperature has been reached, the controller will start with the next segment. After the controller has finished all the segments, the 'end'-LED will light up and display the temperature within the kiln, during the cooling period.

5.0 Error Messages

The control unit has a self test feature which checks the functions. If the control unit finds any error, the kiln will be switched off and the fault number will be displayed:

Display: **F1**

During the full power period, the controller checks the rise of the kiln temperature; it must be more than 1°C in 20 Minutes. If the kiln is too slow, the control unit shows F1.

Causes:

- heating element is faulty or worn out.
- with 3 Phase Systems: one Phase is missing.
- Thermocouple is short connected.
- door or lid switch not closed.

Display: **F2**

If the heating time with full power is longer than 18 hours the kiln will be switched off and the display shows F2.

Causes:

- Heating element is faulty or worn out.
- with three Phase Systems: one Phase is missing.

Display: **F3**

If the measurement from the thermocouple is too high, the controller shows F3.

Causes:

- Thermocouple faulty.
- Wire to thermocouple faulty.

Display: **F4**

If the measurement from the thermocouple is negative the controller shows F4 and the controller will not operate.

Causes:

- Thermocouple wrongly connected.
- Wire to thermocouple wrongly connected.
- Temperature below 0°C (Warm thermocouple)

In cold weather the thermocouple may need to be warmed with a hairdryer or cigarette lighter to bring it to above 0°C

Display: **F5** or **F6**

Internal System Error.

Action –

Return to Cromartie.

Display: **F7**

If the kiln temperature is 20°C higher than the top temperature programmed and takes longer than five minutes to correct itself the control unit will switch the kiln off and display F7.

Causes:

- relay / contactor in the kiln is faulty.

Power loss:

In case of a sudden power loss, the controller will store the current temperature. After the power has returned, the controller measures the current temperature, and compares it to the saved temperature. If these two temperatures differ from each other more than 20°C, the controller will abort the firing.

If the difference is less than 20°C (In case of just a short loss of power) the firing will be continue as normal.

6.0 Technical Data

Power	200 / 250Volt 50 / 60Hz
Fuse	0,04 A T
Power consumption	2 VA
Output	2 Contacts 230 V max. 4 A
Input	Thermocouple Type S Pt10Rh / Pt
Accuracy of Full Scale	1 °C
Display	0,3 % +/- 1 Digit
Dimension	200mm x 100mm x 45 mm
Weight	0,6 kg
Ambient temperature	0 - 50 °C

6.1 Table: Technical Data of the SE 9-6

wire No.	Harting 7D Pin-No.	Function
+ red	3	Thermocouple
-white	4	Platinum
1	5	Input L1
2	2	Input N
3	6	Output heating
4	1	Output N
7	7	Output safety relay

6.2 Table: Controller Harting Plug Pin Details