PROGRAMMER
40/16 SE

TEMPERATURE / TIME

SECTION

DELAY START IN MIN.	TEMP.	↑
SET / PROGRAMME	TIME IN MIN.	↓

PROGRAMME	1	2
3	4	5
6	7	8
9	0	START

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1.GENERAL

The temperature controller SE4016 is a high precision controller, which heats the kiln to the exact temperature you want.
It has thirty user fixed programms with a maximum of 16 ramps per programm.
There is a long wire connecting the temperature controller SE4016 with your kiln,so it is easy to watch the functioning of your SE4016.

All our temperature controllers are checked carefully in our factory. If there is any defect of the temperature controller please contact your dealer to discuss your problems.

2.CONNECTIONS

For the operation of the temperature controller SE4016 , the appropriate plug contact must be connected to the switch box of the kiln , through this plug contact the temperature controller SE4016 is provided with 220 voltage. At the same time the contact to the elements is achieved.

The main-switch of the temperature controller SE4016 is situated at the left hand side of the case. When the system has been turned on, the temperature of the kiln appears on the digital display; if not, please check:

1: Is the kiln power cord plugged in ?

2: Is the fuse (bottom , beside the connection wire) okay ?

3.EXPLANATION OF FEATURES

There are eight switches to programm the temperature controller SE4016 on the frontside:

Display:

1. TEMPERATURE / TIME

   -Digital display of temperature and time readings. All temperatures in celcius; all time in minutes. Cursor light flashes as SE4016 awaits data inputs ("C" for temp; ' for time).

2. SECTION

   -There are 16 sections available for each program. Each section must have data input for time and temperature.
   Section can be advanced or recalled bye use of the "up arrow" and the "down arrow" keys.

Keyboard:

switchname:	function:
`start/stop`	Start a programm.
`Prog`	choose user fixed programm
`1234567890`	numerical switches
`DELAY START IN MINUTES`	set programm start delay
`TEMP.'	set temperature point
`TIME IN MINUTES'	set time periode
`UP-ARROW'	to advance section (function)
`DOWN-ARROW'	to reverse section (function)
`set programme'	store user programm

3.1 HOW TO PROGRAM

The temperature controller SE4016 is very easy to operate. Each function will remain in memory until you zero it out. As you program you must thoughtfully enter your data slowly and be certain to include each step. You may write your program data on the lines provided on the face of the temperature controller SE4016.

The data must be thoroughly described using the number keys to set the values desired - time periods in minutes and the temperatures in Celsius.

SAMPLE PROGRAM: **NORMAL BISQUE FIRING**

pressdown	reaction of temperature controller
1.	
"DELAY START IN MIN."	
choose your start delay time by pressing the numerical switches e.g. '0'	selected delay time will be displayed e.g. " 0 ' CL"
2. SECTION 1	
"TIME IN MIN."	
"250"	" 250 ' 01"
"TEMP."	
"650"	" 650 oC 01"
"UP ARROW KEY"	" 0 oC 02"
3. SECTION 2	
"TIME IN MIN."	
"0"	" 0 ' 02"
"TEMP."	
"960"	" 960 oC 02"
"UP ARROW KEY"	" 0 oC 03"
4. SECTION 3	
"TIME IN MIN."	
"20"	" 20 ' 03"
"TEMP."	
"960"	" 960 oC 03"
5.	
"SET PROGRAMME"	"S=" SAVE - so now you assign the program a number (i.e. 1)
"1"	"S= 1"

SAMPLE PROGRAM: **NORMAL GLAZE FIRING**

pressdown	reaction of temperature controller
1. "DELAY START IN MIN." choose your start delay time by pressing the numerical switches e.g. '120'	selected delay time will be displayed e.g. " 120 ' CL"
2. SECTION 1 "TIME IN MIN." "120" "TEMP." "450"	" 120 ' 01" " 450 oC 01"
"UP ARROW KEY"	" 0 oC 02"
3. SECTION 2 "TIME IN MIN." "0" "TEMP." "1050"	" 0 ' 02" "1050 oC 02"
"UP ARROW KEY"	" 0 oC 03"
4. SECTION 3 "TIME IN MIN." "10" "TEMP." "1050"	" 10 ' 03" "1050 oC 03"
5. "SET PROGRAMME" "2"	"S=" SAVE - so now you assign the program a number (i.e. 2) "S= 2"

Description of above sample program - a normal bisque firing:

1. No delay start has been programmed.

2. The ramp time has been set for in-putting the electrical power of the kiln over a 250 minute period to the first set-point (Temp.).
   The first set-point temperature is 650 oC, and it has taken 250 minutes to achieve this temperature setting. The kiln will now be at 100 % of power.

3. The second set-point temperature is 960 oC.
   The kiln will operate at 100% of it's power after reaching the first set-point and will continue at 100% of power to the second set-point.

4. The "TIME IN MIN" setting provides for a 20 minutes "soak" periode at 960 oC.

5. It is possible to store as many as 30 programs in memory.

Description of above sample program - a normal glaze firing:

1. A 2 hour delay in the start of the firing has been programmed.

2. The ramp time to the first set-point (temp.) is 2 hours. The first set-point is 450 oC. The kiln will now go to 100 % of power.

3. The second set-point temperature is 960 oC.
   The kiln will continue to operate at 100% of power to the second set-point.

4. A 10 minute soak at 1050 oC has been programmed.

5. The programm has been saved and a number assigned.

3.2 TO ERASE OR CHANGE A PROGRAM

To change one item of data only - call up that one item and enter new data. For instance:

1. Turn SE4016 on.
2. Press "Programe" key and enter program number (i.e. 1)
3. Press up or down arrow key until the number for the section you want to change appears on the read-out.
4. Enter new data for time and/or temperature - or zero out old data (enter "0").
5. Press "Set Programme" key.

To erase an entire program:

1. Press key "Programme " and enter the number 0
2. Press "SET PROGRAMME"
3. Put in the number of program to erase

3.3 TO RUN A PROGRAMM (TO FIRE THE KILN)

1. Turn on SE4016 (and , if necessary kiln "on" switch)
2. Press "Programme" and enter desired program's assigned number (i.e. 1).
3. Press "START" and the program will begin to run thru to completion and shut of.

The digital display will indicate time remaining in a delay start;temperature of the kiln chamber; section number, etc. and at shut off will display "E" for end of program.

3.4 READ OUT OF THE STORED DATA:

It is possible to "read out" the particulars of the stored data at any time. If a read-out is carried out during the course of the program, the firing process will be interrupted. However , when the key "START" is pressed, the firing continues.

If a time read-out is requested during the course of a program, the remaining time is shown on the digital display. If a temperature read-out is requested during the course of a program, the target temperature for that section is shown.

For example: if the sample program "2" (glaze firing) is running and has reached Section 03 and you wish to read-out the time remaining on the soak - press "TIME IN MIN." and the remaining number of minutes will appear on the digital read-out. Press the "TEMP" key and the target temperature for the third set-point (1050 oC) will appear.

Press "START" to resume firing.

3.5 DELAY START FUNCTION

If the switch 'delay start in min' is pressed, a delay in the programm start can be obtained through the number keys. If a programm start delay is programmed, the display will show, after pressing the switch 'START', the remaining delayed time. When the delay time has run out, the temperature controle system will start by itself and the temperature of the kiln is indicated.

3.6 KEYBOARD LOCKING

After pressing the key 'START' , the keyboard of the temperature control system can be locked with a key switch. It is then protected from any adjustment by unauthorized persons.

4. POWER-DOWN ACTIVITY

All data will be stored until it has been switched on again. When the temperature controller SE4016 has been switched on again, it will work with the old data, so it is possible to span a powerline cut off.

5.ERROR MESSAGES

The temperature controller SE4016 is able to check itself, when there is a defect the temperature controller SE4016 will switch off the kiln and display an error message.

Display: F3

The temperature controller SE4016 checks constantly the data. When there is a defect with the thermocouple it will be displayed by the message 'F3'.

Possible causes:

-Thermocouple defect

-Thermocouple-wire defect

Display: F4

This error message will be displayed when the thermocouple is wrongly connected.

Display: F5

If the temperature input is too high, the temperature controller will display F5.

Display: F6

F6 will be displayed by a selftest error.
Please contact your dealer to get more instructions.

6.TECHNICAL DATA

Input	:	Thermocouple Type S (Pt/Pt10Rh) Thermocouple Type K (NiCr/Ni)
		-factory installing necessary -
powerline	:	200-250 Volt 50/60 Hz
power-consumption	:	14 VA
fuse	:	0.1 A slow
Output	:	relay contact 220V ac max.4A
measurement-range	:	+10 ... +1500 oC Thermocouple Type S +10 ... +1300 oC Thermocouple Type K
temperature-compensation	:	+8oC ... +40oC
exactness	:	0.3% +/- 1 Digit

Input-restrictions:

Temp.-range	:	+0 ... +1300 oC Thermocouple Type S +0 ... +1200 oC Thermocouple Type K adjustable in steps of 1 oC
time-range	:	0 ... 9999 min adjustable in steps of 1 min
lowest heating up ramp	:	4 K / 60 min
highest heating up ramp	:	4000 K / min

control-retain :	PI-control (kp=15)
	or two point control
Display:	13 mm LED red, 7-segment
size :	250 mm * 320 mm * 100 mm .
weight :	1.8 kg
outside-temperature range :	0 oC ... 50 oC
connection-wire :	1.6 m
Plug :	AMP-plug 14 pins

Pin-connection:

8	input	L1 220 V
9	input	N
7	output	L1 -switched by main-switch
13	output	L1 coil of contactor
14	output	N
1	Thermocouple Type S	+ side
2	Thermocouple Type S	- side

alternative:

12	Thermocouple Type K	+ side
11	Thermocouple Type K	- side