

HOW DO I WRITE A RECIPE FOR A MARATHON SENSORS INSTRUMENT?

Here is a sample program using a main program and subprograms 195, 196, 197. The Main Program calls program 195 to do a probe burnoff and set the temperature deviation alarm. Then it sets up a controlled ramp so that the furnace burners are not driven too hard. It allows 10 minutes for the furnace to reach temperature then it sets the carbon deviation alarm to determine if the carbon level set on step 2 has been achieved. The step descriptions with the "*" indicate lines with settings that can be changed to create additional recipes.

[MAIN PROGRAM]

<u>Step</u>	<u>Opcode</u>		<u>Description</u>
001	G	0195	Ramp temp up. Burn-off probe. Set Temp. Dev. alarms.
002	C	0130	*Set Carbon to 1.30
003	r	00:06	*Set second Temp. ramp time to 6 minutes.
004	H	1550	*Set furnace temperature to 1550 deg. F
005	L	00:10	*Limit time to reach Temp.
006	G	0196	Set Carbon deviation alarm
007	S	01:30	Soak period 1 for 30 minutes.
008	c	0080	*Is carbon above 0.80% ?
009	b	14.13	If not branch to step 13 otherwise step 14
010	A	0020	Sound alarm if carbon is not up
011	S	02:15	*Soak period 2 for 15 minutes
012	G	0197	Turn off Temp and Carbon Deviation Alarms
013	C	0110	*Set carbon to 1.10

Sub-program 195 does a controlled temperature ramp to 1400 deg. There is a 35-minute time limit on this set point. If the furnace gets to 1400 deg then a probe burnoff is done, assuming that the burnoff function is wired to the instrument's event 0. The temperature set point is then changed to 1475 deg. and the temperature deviation alarm is enabled. The program returns to the Main Program.

[SUB-PROGRAM 195]

Do probe burnoff on Event 0

<u>Step</u>	<u>Opcode</u>		<u>Description</u>
001	C	0000	Shut off natural gas and air.
002	H	1300	Set ramp 1 starting point
003	r	00:10	Set ramp 1 time
004	H	1425	Set ramp 1 end point
005	h	1400	Is Temp back up to 1400?
006	L	00:35	Limit Max time to reach 1400. PAL 93 if exceeded.
007	H	1500	Set ramp 2 starting point (ramp time in main program)
008	E	00.01	Start probe burnoff
009	h	1475	Is temp > 1475?
010	L	00:20	Limit Max time to reach 1475. PAL 93 if exceeded.
011	A	0081	Turn on temperature deviation alarm
012	L	00:20	Set temperature deviation band

Sub-program 196 turns on the carbon deviation alarm when the Main Program is ready to start the soak. The program returns to the Main Program.

[SUB-PROGRAM 196]

Turn on Carbon Deviation Alarm

Step	Opcode		Description
001	A	0083	Turn on Carbon deviation alarm.
002	L	00:20	Carbon deviation amount in % carbon.

Sub-program 197 turns off the temperature and carbon deviation alarms after the soak is completed in the Main Program. The program returns to the Main Program.

[SUB-PROGRAM 197]

Turn off Temperature and Carbon Alarms

001	A	0082	Turn off Temperature deviation alarms
002	A	0084	Turn off Carbon deviation alarm

The Main Program can be any program number from 1 to 200. We recommend that you try to reserve the upper program numbers for subroutines like these shown here at programs 195, 196, and 197. Multiple recipes can then be written using the common structure of the Main Program and the associated subroutines.