

Y-HEAT THERMAL MANAGEMENT SYSTEM

FOR OVEN, FURNACE, VACUUM FURNACE, AND CRYOGENIC CHAMBER SYSTEMS

Product Overview and Specifications

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YOKOGAWA ◆ **COMPOSITE CURING OVEN SYSTEM**
Y-HEAT SYSTEM

3/12/201303:32:40 PM

MAIN MENU

ACTIVE ALARMS
FRONT ACCESS DOOR OPENED DURING PROGRAM RUN!
PART T/C #35 PV BURNOUT!

SILENCE ALARM HORN

OVEN FUNCTIONS

TEMPERATURE ZONE OVERVIEW

MAINTENANCE FUNCTIONS

PROGRAM FUNCTIONS

VACUUM FUNCTIONS

T/C MODE FUNCTIONS

PART RECIPE FUNCTIONS

ALARM HISTORY

2/21/201303:43:24 PM

PROGRAM STEPS 1-5

PROGRAM STATUS	
PROGRAM IDLE	
CURRENT SEGMENT #	0
SEGMENT TIME LEFT:	0:00:00
OVERALL TIME LEFT:	0:00:00
T/C MODE	PRIMARY AIR T/C
CONTROL SETPOINT	300
AIR TEMPERATURE	291
PART T/C'S: CONTROL NOT USED	
HI: 275	LO: 273
AVG: 273	

START PROGRAM

STOP PROGRAM

PAUSE PROGRAM

RESUME PROGRAM

RELEASE PROGRAM HOLD

ADVANCE PROGRAM

PART #	PART_1				REV.#	0
SEGMENT#	1	2	3	4	5	
TEMPERATURE	250	400	625	625	150	
TIME OR RATE	TIME	RATE	RATE	TIME	TIME	
RATE (DEG PER MINUTE)		10	8			
HOURS	1			3	3	
MINUTES	0			0	0	
TYPE	CONT	WAIT	WAIT/R	SOAK	END	
HIGH DEV. LIMIT	2	2	2	2	2	
LOW DEV. LIMIT	5	5	5	5	5	
WAIT ZONE	5	5	3	2	5	
AIR OR PART T/C	AIR	PART	PART	PART	PART	
PART T/C HI, LO, AVG	HIGH	AVG	HIGH	HIGH	AVG	
O.D. MAX. TEMP. > SP	100	100	50	10	25	
OVERDRIVE FACTOR	250	400	312	312	100	
OVERDRIVE DEADBAND	2	2	2	2	2	
VACUUM HEADER #1	ON	ON	ON	ON	ON	
VACUUM HEADER #2	ON	ON	ON	ON	ON	
VAC. LINE #1 ON/OFF	ON	ON	ON	ON	ON	
VAC. LINE #1 SP	-8	-8	-8	-8	-8	
VAC. LINE #2 ON/OFF	ON	ON	ON	ON	ON	
VAC. LINE #2 SP	-8	-8	-8	-8	-8	

MAIN MENU

OVEN FUNCTIONS

PAGE DOWN

STEPS 6-10



Throughout the thermal industry, ovens, furnaces, vacuum furnaces, autoclaves, and kilns share similar commonality in regards to controls and data acquisition. A multitude of control choices ranging from simple single loop controllers to high level automation controllers have been utilized through the years to control both simple and complex heating applications. The “grey” area between simple and complex was often spanned by the inappropriate application of multiple controllers. Many times in a complex application requiring multiple loops of control (whether temperature, atmosphere, vacuum, or other), multiple single loop controllers have been applied requiring the management and coordination of multiple configurations and programs. When a high level controller was used for similar applications, while handling the peripheral control items well, the process capabilities of the controller were typically lacking and required a large engineering effort to develop an acceptable overall application program.

Yokogawa understands the thermal industry and with a focus on addressing the gap in product offerings available to customers, Yokogawa developed the Y-HEAT system offering...

- Versions for single zone temperature control, multiple zone temperature control, single/multiple part temperature control, atmosphere furnace control, cryogenic chamber control, and peripheral control for items such as pressure, vacuum, blowers, doors, conveyors, etc.
- Scalable architecture providing up to 8192 I/O points and up to 1152 PID Loops...
- Universal analog inputs accept T/C, RTD, Voltage, and Current Inputs...
- Robust PID control. In the event of a CPU failure, the PID loops continue to function, preventing loss of product...
- Yokogawa's patented Auto-Tuning and Overshoot Suppression features...
- Recipe Management features allow development and management of part program recipes...
- Full featured Alarming, both Active and Historical, for all process items. E-mail Alarm Notification is provided as well...
- T/C status monitoring, T/C Correction, and automatic T/C burnout automatic switching...
- Data logging and reporting. Data files can also be automatically sent to plant enterprise servers...

Yokogawa's Y-HEAT system provides a ready to install system for applications ranging from basic temperature control to highly complex part curing oven systems. Utilizing Yokogawa's proven, best in class hardware and engineering expertise, Y-HEAT delivers a true **“Plug & Play”** package for a wide range of applications.

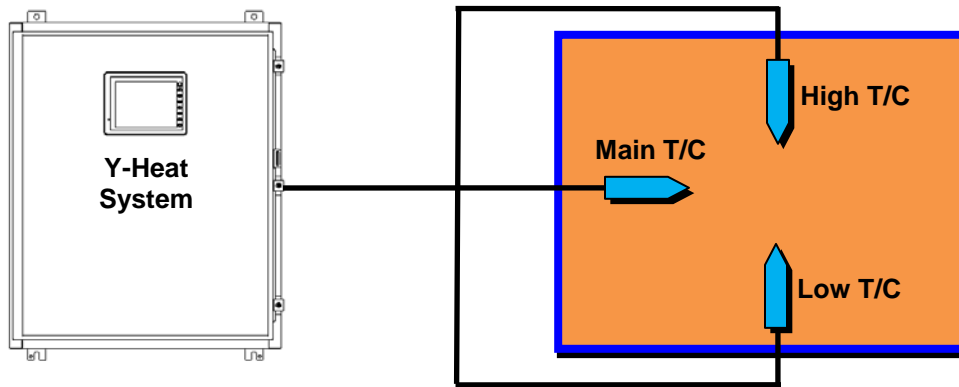
The Y-HEAT core control algorithm provides program control featuring time or rate based ramp/soak profiles, configurable step types, high and low deviation alarm set points, T/C management, atmosphere control (furnace pressure, carbon potential, etc.), part based control features (lead, lag, average, Overdrive, and part T/C uniformity check), and vacuum control.

Optional peripheral control features include:

- Recirculation and Exhaust Blower control
- Door control
- Load/Unload conveyor control
- Other Customer requested features

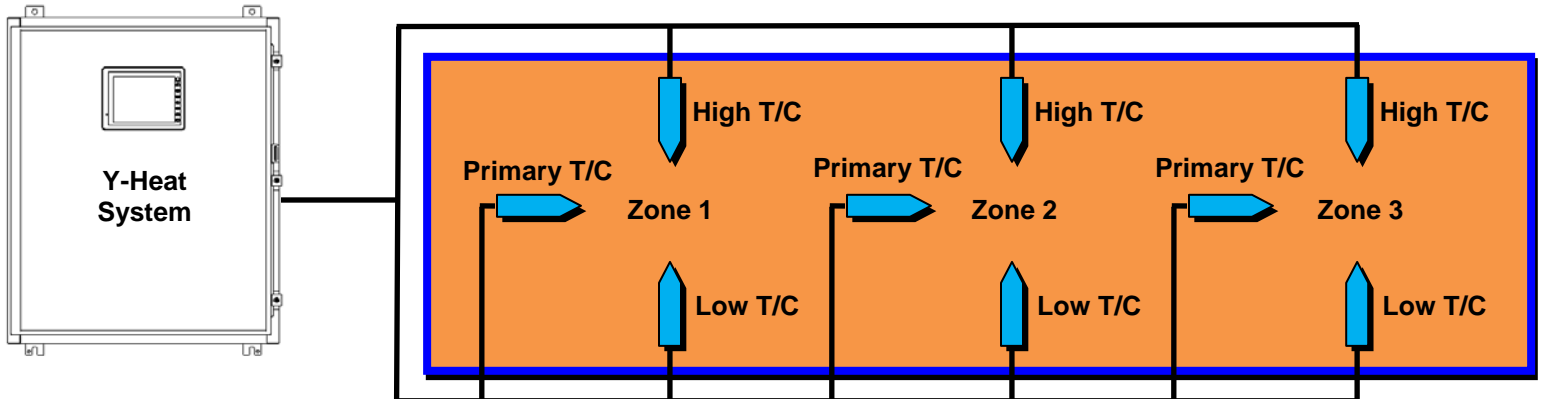
Single Zone

Single or multiple T/C's can be utilized to provide area wide temperature control. When using multiple T/C's, lead/lag/average functions can be used for precise control of the overall environment.



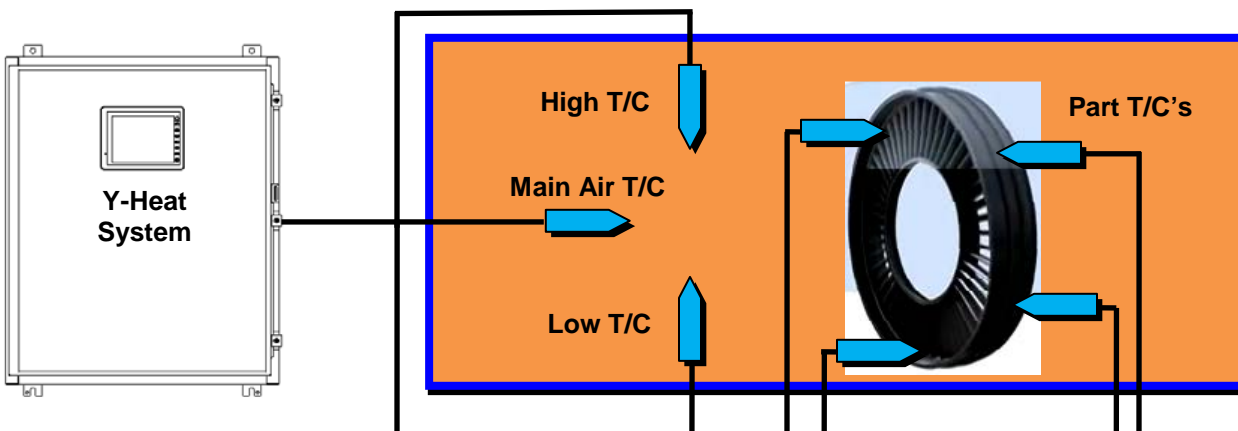
Multi-Zone

Y-Heat can be utilized to control zone ovens or furnaces and provide precise control for individual zones within a system. Single or multiple T/C's can be used for each independent zone.



Part T/C Based Control

In this scenario, temperature is controlled based on input from one or more T/C's placed within a part or vessel. Control can be based on lead, lag, or averaging coupled with Y-Heat's Overdrive function. Whether the application requires 4 Part T/C's or 1000 Part T/C's, the Y-Heat system is easily scaled to accommodate.



T/C Management

For steady state or program driven applications, operators can select single or multiple T/C's that will be utilized for control and monitored for in-range conditions. During a Soak step type, if the selected T/C values fall outside the in-range band, the step timer will be paused until all T/C's are within range. This feature provides for a guaranteed Soak. During the execution of a Wait/Ramp step type, the temperature ramping will be paused until all T/C's are within range. T/C's can also be assigned for monitoring only. Automatic T/C switching on burnout detection is also included.

Atmosphere Control

Control functions for Carbon Potential, CO level, CO2 level, N2, pressure, or other customer specified functions.

Vacuum Functions

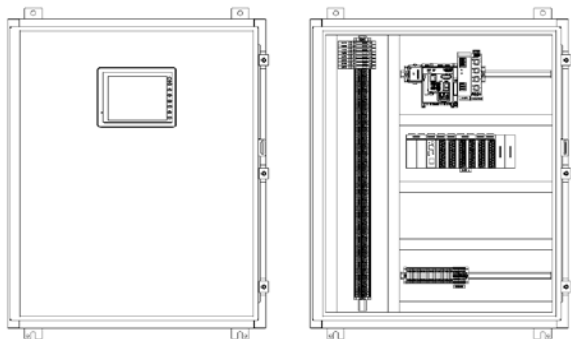
Singe/Multiple lines and header functions are available. For example, in the case of a curing oven with multiple parts, each contained in a vacuum bag, each bag would have its vacuum controlled independently. Steps can be paused until the Vacuum levels are within the in-range dead bands.

Data Recording

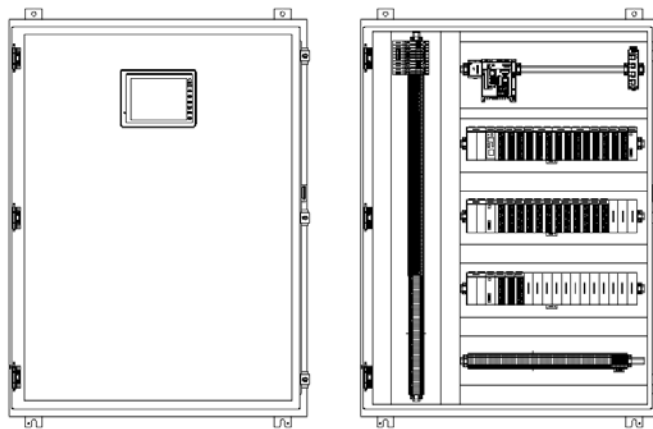
The Y-HEAT system features data recording for all process variables. Sampling is active during program runs. Data is stored on board in the recording unit on industry standard media. When a program is completed, the data files can be automatically FTP'ed to a server or other PC for analysis and reporting.

Ready to Run

Yokogawa's Y-HEAT system allows customers to order an application specific solution that will arrive pre-configured and ready to run. Installation involves mounting the enclosure, landing the field wiring, and applying power.



Y-HEAT Part Curing Oven control system with 1 Primary Air T/C, 1 Backup T/C, 10 Part T/C's, Recirculation and Exhaust Blower Control.



Y-HEAT Part Curing Oven control system with 1 Primary Air T/C, 4 Oven Zone T/C's, 72 Part T/C's, 8 Vacuum Control loops, Recirculation and Exhaust Blower Control, and Door Control.

Yokogawa can also provide electromechanical components such as motor starters, VFD's, SCR's, etc., if a complete controls package is required for your application. If the customer chooses, the Y-Heat system can be supplied as components only for mounting in existing enclosures.

Y-HEAT Features - Program Overview...

Unlike single loop program controllers with small, overcrowded faceplates, Y-HEAT's operator interface allows for full viewing of all program parameters giving the operator a window into the entire process versus paging through multiple, non-intuitive, faceplate displays.

The Y-HEAT's step driven program allows operators to enter and monitor program parameters and status in an intuitive and straight forward environment.

Step parameters common to all Y-HEAT applications include:

1. Target Temperature
2. Time or Rate based temperature ramping
3. High and Low Deviation Limits
4. Wait Zone Setting
5. Step Type:
 - a) Continue – When current step times out, advance to next step.
 - b) Wait – When current step times out, wait until temperature is within Wait Zone, then advance to next step.
 - c) Soak – Maintain current temperature setpoint. If temperature falls outside of Wait Zone, stop step timer until temperature is back within Wait Zone (Guaranteed Soak)
 - d) Wait/Ramp – During the ramp, if the temperature falls outside of the Wait Zone, stop ramp until temperature is within defined Wait Zone.
 - e) Hold – When step times out, do not advance to next step until Operator presses, "Release Program Hold" button.
 - f) End – Final Step. Ramp to temperature and then end program.

PART #	PART 375AB					REV. #	0
SEGMENT#	1	2	3	4	5		
TEMPERATURE	1200	1450	1200	400	150		
TIME OR RATE	RATE	TIME	TIME	TIME	TIME		
RATE (DEG PER MINUTE)	30						
HOURS		6	6	6	2		
MINUTES		0	0	0	0		
TYPE	CONT	SOAK	WAIT/R	WAIT	END		
HIGH DEV. LIMIT	3	3	3	3	3		
LOW DEV. LIMIT	5	5	5	5	5		
WAIT ZONE	5	2	5	5	5		

Other available step parameters include:

1. Carbon Potential, PF level, Pressure, etc.
2. Air or Part T/C Control Selection
3. Part T/C Lead, Lag, or Average Value Control Selection
4. Maximum Overdrive Temperature Level Above Setpoint
5. Overdrive Factor
6. Overdrive Deadband
7. Vacuum Header/Line Enable/Disable
8. Vacuum Setpoints
9. Part T/C Check
10. Event Outputs (On/Off)
11. Blowers On/Off
12. Blower Speed
13. Additional customer requested features

PART #	PART 1					REV. #	0
SEGMENT#	1	2	3	4	5		
TEMPERATURE	250	400	625	625	150		
TIME OR RATE	TIME	RATE	RATE	TIME	TIME		
RATE (DEG PER MINUTE)		10	8				
HOURS	1			3	3		
MINUTES	0			0	0		
TYPE	CONT	WAIT	WAIT/R	SOAK	END		
HIGH DEV. LIMIT	2	2	2	2	2		
LOW DEV. LIMIT	5	5	5	5	5		
WAIT ZONE	5	5	3	2	5		
AIR OR PART T/C	AIR	PART	PART	PART	PART		
PART T/C HI, LO, AVG	HIGH	AVG	HIGH	HIGH	AVG		
O.D. MAX. TEMP. > SP	100	100	50	10	25		
OVERDRIVE FACTOR	250	400	312	312	100		
OVERDRIVE DEADBAND	2	2	2	2	2		
VACUUM HEADER #1	ON	ON	ON	ON	ON		
VACUUM HEADER #2	ON	ON	ON	ON	ON		
VAC. LINE #1 ON/OFF	ON	ON	ON	ON	ON		
VAC. LINE #1 SP	-8	-8	-8	-8	-8		
VAC. LINE #2 ON/OFF	ON	ON	ON	ON	ON		
VAC. LINE #2 SP	-8	-8	-8	-8	-8		

PAGE
DOWN

STEPS
6-10

25 Program Segment Steps are included in the standard system. Additional steps are available on request.

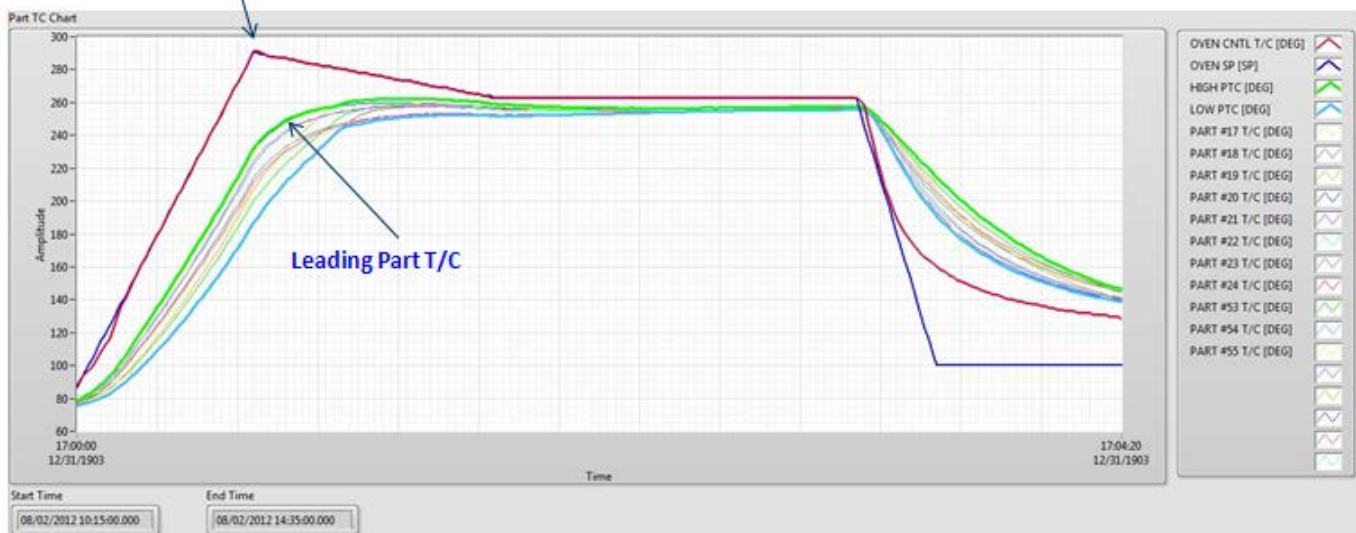
Overdrive function...

For parts curing and other applications utilizing multiple T/C's for overall temperature compliance, Y-HEAT's "Overdrive" feature eliminates the need for cascaded loops and different PID settings for different types of parts (i.e. Open Air, Vacuum bagged, etc.). A single tuning sequence for the system is all that is required. The Overdrive Feature has three settings:

- Maximum degrees over CSP (current control setpoint)
- Overdrive Factor
- Overdrive Deadband

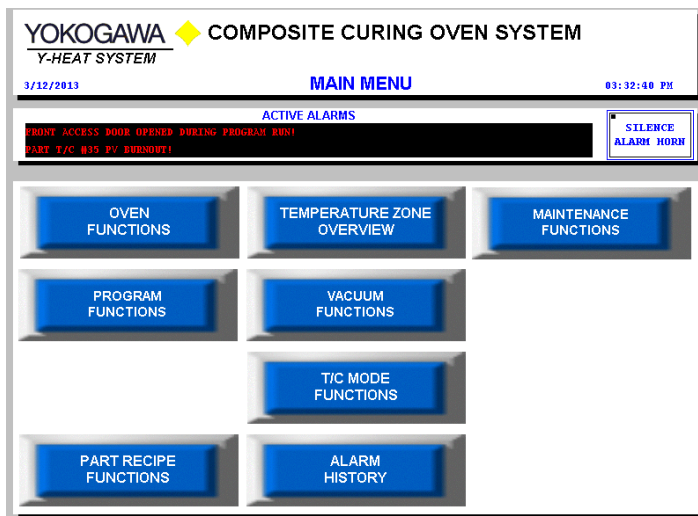
Based on the above settings, the oven's temperature will be "Overdriven" to expedite the process of heating challenging parts while preventing temperature overshoot conditions.

Oven Temperature Set Point

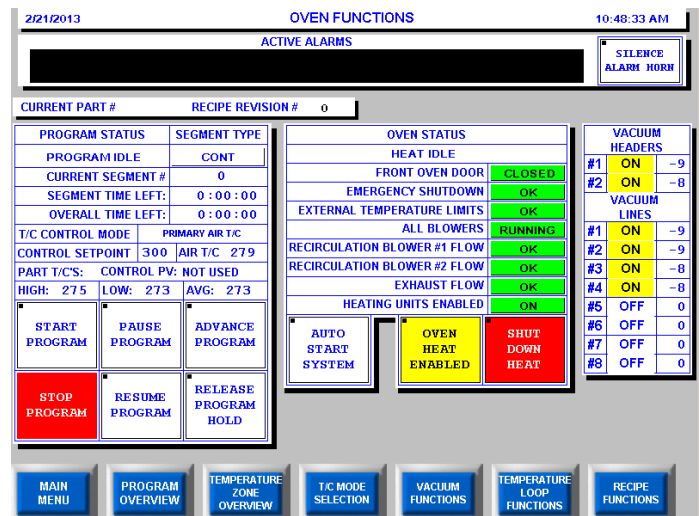


Ease of use for Operators...

One of the keys to successful deployment of a process control system is the ease of use provided for the operators. Y-HEAT features intuitive screens combined with ease of navigation. Operators quickly learn the Y-HEAT system and management personnel easily implement the Recipe Management and Data Reporting features.



Main Menu



Oven Function Overview
(The features on this screen will vary with different customer requirements)

Y-HEAT Feature Overview continued...

2/21/2013 PROGRAM STEPS 1-5 03:43:24 PM

PROGRAM STATUS	
PROGRAM IDLE	
CURRENT SEGMENT #	0
SEGMENT TIME LEFT:	0:00:00
OVERALL TIME LEFT:	0:00:00
T/C MODE	PRIMARY AIR T/C
CONTROL SETPOINT	300
AIR TEMPERATURE	291
PART T/C'S: CONTROL NOT USED	
HI: 275	LO: 273 AVG: 273

PART # PART_1		REV.# 0	
SEGMENT#	1	2	3
TEMPERATURE	250	400	625
TIME OR RATE	TIME	RATE	RATE
RATE (DEG PER MINUTE)	10	8	
HOURS	1		3
MINUTES	0		0
TYPE	CONT	WAIT	WAIT/R
HIGH DEV. LIMIT	2	2	2
LOW DEV. LIMIT	5	5	5
WAIT ZONE	5	5	3
AIR OR PART T/C	AIR	PART	PART
PART T/C HI, LO, AVG	HIGH	AVG	HIGH
O.D. MAX. TEMP. > SP	100	100	50
OVERDRIVE FACTOR	250	400	312
OVERDRIVE DEADBAND	2	2	2
VACUUM HEADER #1	ON	ON	ON
VACUUM HEADER #2	ON	ON	ON
VAC. LINE #1 ON/OFF	ON	ON	ON
VAC. LINE #1 SP	-8	-8	-8
VAC. LINE #2 ON/OFF	ON	ON	ON
VAC. LINE #2 SP	-8	-8	-8

START PROGRAM STOP PROGRAM

PAUSE PROGRAM RESUME PROGRAM

RELEASE PROGRAM HOLD ADVANCE PROGRAM

MAIN MENU OVEN FUNCTIONS PAGE DOWN STEPS 6-10

Program Overview and Status

3/ 7/2013 SEGMENT #1 SETTINGS 03:50:43 PM

TEMPERATURE SP	250	VACUUM LINE #2 OFF(0)/ON(1)	1
TIME (0) OR RATE (1)	0	VACUUM LINE #2 SP	-8
RATE (DEG PER MINUTE)	10	VACUUM LINE #3 OFF(0)/ON(1)	1
HOURS	1	VACUUM LINE #3 SP	-8
MINUTES	0	VACUUM LINE #4 OFF(0)/ON(1)	1
TYPE	0	VACUUM LINE #4 SP	-8
HIGH DEVIATION LIMIT	2	VACUUM LINE #5 OFF(0)/ON(1)	1
LOW DEVIATION LIMIT	5	VACUUM LINE #5 SP	-8
WAIT ZONE	5	VACUUM LINE #6 OFF(0)/ON(1)	0
AIR (0) OR PART T/C (1)	0	VACUUM LINE #6 SP	0
PART T/C - HI (0), LO (1), AVG (2)	0	VACUUM LINE #7 OFF(0)/ON(1)	1
OVERDRIVE MAX. TEMP. > SP	100	VACUUM LINE #7 SP	0
OVERDRIVE FACTOR	250	VACUUM LINE #8 OFF(0)/ON(1)	0
OVERDRIVE DEADBAND	2	VACUUM LINE #8 SP	0
VAC. HEADER #1 OFF (0)/ON (1)	1	PART T/C CHECK OFF (0)/ON (1)	0
VAC. HEADER #2 OFF (0)/ON (1)	1	RECIRCULATION FAN SPEED	65
VACUUM LINE #1 OFF(0)/ON(1)	1	PROGRAM START AT CURRENT PV (0) OR PRE-HEAT VALUE (1)?	1
VACUUM LINE #1 SP	-8	PRE-HEAT VALUE	150
		EVENT OUTPUT #1 OFF(0)/ON(1)	0
		EVENT OUTPUT #2 OFF(0)/ON(1)	0
		EVENT OUTPUT #3 OFF(0)/ON(1)	0

MAIN MENU PROGRAM OVERVIEW SEGMENT TYPE HELP

Segment Overview

3/ 5/2013 PART THERMOCOUPLE CONTROL SELECTION 1-28 03:15:17 PM

ACTIVE ALARMS

FRONT ACCESS DOOR OPENED DURING PROGRAM RUN!
PART T/C #35 PV BURNOUT!

SILENCE ALARM HORN

PART T/C SELECTION						
PART T/C #1 USED	PART T/C #2 USED	PART T/C #3 USED	PART T/C #4 USED	USE PART T/C #5	USE PART T/C #6	USE PART T/C #7
USE PART T/C #8	USE PART T/C #9	USE PART T/C #10	USE PART T/C #11	USE PART T/C #12	USE PART T/C #13	USE PART T/C #14
USE PART T/C #15	USE PART T/C #16	USE PART T/C #17	USE PART T/C #18	USE PART T/C #19	USE PART T/C #20	USE PART T/C #21
USE PART T/C #22	USE PART T/C #23	USE PART T/C #24	USE PART T/C #25	USE PART T/C #26	USE PART T/C #27	USE PART T/C #28

T/C MODE SELECTION NEXT>

Select Part T/C's For Control

3/ 5/2013 PART THERMOCOUPLE MONITOR SELECTION 1-28 03:33:47 PM

ACTIVE ALARMS

FRONT ACCESS DOOR OPENED DURING PROGRAM RUN!
PART T/C #35 PV BURNOUT!

SILENCE ALARM HORN

PART T/C SELECTION						
USE PART T/C #1	USE PART T/C #2	USE PART T/C #3	USE PART T/C #4	PART T/C #5 USED	PART T/C #6 USED	PART T/C #7 USED
USE PART T/C #8	USE PART T/C #9	USE PART T/C #10	USE PART T/C #11	PART T/C #12 USED	USE PART T/C #13	USE PART T/C #14
USE PART T/C #15	USE PART T/C #16	USE PART T/C #17	USE PART T/C #18	PART T/C #19 USED	USE PART T/C #20	USE PART T/C #21
USE PART T/C #22	USE PART T/C #23	USE PART T/C #24	USE PART T/C #25	PART T/C #26 USED	USE PART T/C #27	USE PART T/C #28

T/C MODE SELECTION NEXT>

Select Part T/C's For Monitoring

2/21/2013 TEMPERATURE ZONE OVERVIEW 11:31:55 AM

OVEN			
THERMOCOUPLE	MAIN AIR	HIGH T/C	LOW T/C
TEMPERATURE	279.0	0.0	0.0

PARTS										
THERMOCOUPLE	1	2	3	4	5	6	7	8	9	10
TEMPERATURE	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
THERMOCOUPLE	11	12	13	14	15	16	17	18	19	20
TEMPERATURE	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
THERMOCOUPLE	21	22	23	24	25	26	27	28	29	30
TEMPERATURE	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
THERMOCOUPLE	31	32	33	34	35	36				
TEMPERATURE	0.0	0.0	0.0	0.0	0.0	0.0				

C < INDICATES T/C IS BEING USED FOR CONTROL

MAIN MENU OVEN FUNCTIONS PROGRAM OVERVIEW T/C MODE SELECTION VACUUM FUNCTIONS OVEN ZONE TEMPERATURE TRENDS PART TEMPERATURE TRENDS

Temperature Zone Overview

3/ 5/2013 THERMOCOUPLE MODE SELECTION 03:36:15 PM

ACTIVE ALARMS

FRONT ACCESS DOOR OPENED DURING PROGRAM RUN!
PART T/C #35 PV BURNOUT!

SILENCE ALARM HORN

CURRENT PART #

CURRENT TEMPERATURE	
AIR	291
PART T/C'S	277

CONTROL MODE SELECT	
USE AIR T/C FOR CONTROL	SELECT T/C AVERAGING
PART T/C CONTROL SELECTED	HIGH T/C SELECTED
	SELECT LOW T/C

PART T/C SELECTION	
SELECT PART T/C'S FOR CONTROL	SELECT PART T/C'S FOR MONITORING

MAIN MENU OVEN FUNCTIONS PROGRAM OVERVIEW TEMPERATURE ZONE OVERVIEW VACUUM FUNCTIONS TEMPERATURE LOOP FUNCTIONS RECIPE FUNCTIONS

T/C Mode Selection

Y-HEAT Feature Overview continued...

3/ 4/2013 MAINTENANCE FUNCTIONS 02:16:24 PM

ACTIVE ALARMS

SILENCE ALARM HORN

ENTER PASSWORD TO CONTINUE..... 0

OVEN TEMPERATURE LOOP TUNING

OVEN SHUTDOWN TEMPERATURE SETUP

VACUUM SETUP

T/C CALIBRATION

BLOWER FUNCTIONS

EDIT PASSWORD

MAIN MENU

Maintenance Functions

1/25/2015 T/C CORRECTION FUNCTIONS 02:22 PM

CORRECTION FUNCTION

ENABLED DISABLE

ACTUAL RAW INPUT TEMPERATURE

449.0

ACTUAL CORRECTED TEMPERATURE

500.0

CONTROL T/C CORRECTION		
ACTUAL RAW TEMPERATURE	CORRECTION FACTOR	CORRECTED TEMPERATURE
32.3	-0.3	32.0
199.9	0.1	200.0
449.0	1.0	450.0
698.6	1.4	700.0
948.5	1.5	950.0
1199.4	0.6	1200.0
0.0	0.0	0.0
0.0	0.0	0.0
0.0	0.0	0.0
0.0	0.0	0.0

NEXT>

MAINT MENU

T/C FIXED BIAS FUNCTIONS

T/C Correction

3/ 5/2013 FURNACE LOOP TUNING 03:00 PM

ACTIVE ALARMS

SILENCE ALARM HORN

PROGRAM STATUS

PROGRAM IDLE

SEGMENT TYPE

COST

CURRENT SEGMENT # 0

SEGMENT TIME LEFT: 0:00:00

OVERALL TIME LEFT: 0:00:00

TEMPERATURE

PV +475

SP +475

START AUTO-TUNE

STOP AUTO-TUNE

ENABLE SUPER-FUNCTION

DISABLE SUPER-FUNCTION

HOUT% 23

COUT% 0

TUNING PARAMETERS

CURRENT PID SET: 0

P 1.8 COOLING GAIN 0.02

I 67 COOLING DB 0.1

D 3

MAIN MENU

MAINT FUNCTIONS

PROGRAM OVERVIEW

PROGRAM ARCHIVE

ACTIVE ALARMS

PID SETS

Temperature Control Loop Tuning

3/ 5/2013 VACUUM FUNCTIONS 03:58:17 PM

ACTIVE ALARMS

SILENCE ALARM HORN

FRONT ACCESS DOOR OPENED DURING PROGRAM RUN!

PART T/C B35 PV BURNOUT!

VACUUM HEADER #1	VACUUM HEADER #2	LINE #1 VACUUM LEVEL	LINE #2 VACUUM LEVEL	LINE #3 VACUUM LEVEL	LINE #4 VACUUM LEVEL	LINE #5 VACUUM LEVEL	LINE #6 VACUUM LEVEL
ACT. -9	ACT. -8	ACT. -9	ACT. -9	ACT. -8	ACT. -8	ACT. 0	ACT. 0
SP 0	SP 0	SP 0	SP 0	SP 0	SP 0	SP 0	SP 0
VACUUM HEADER #1 ENABLED	VACUUM HEADER #2 ENABLED	VACUUM LINE #1 ENABLED	VACUUM LINE #2 ENABLED	VACUUM LINE #3 ENABLED	VACUUM LINE #4 ENABLED	VACUUM LINE #5 ENABLED	VACUUM LINE #6 ENABLED
DISABLE VACUUM HEADER #1	DISABLE VACUUM HEADER #2	DISABLE VACUUM LINE #1	DISABLE VACUUM LINE #2	DISABLE VACUUM LINE #3	DISABLE VACUUM LINE #4	DISABLE VACUUM LINE #5	DISABLE VACUUM LINE #6

VACUUM LOW LEVEL SETTING

-3

VACUUM LINES 7-8

MAIN MENU

OVEN FUNCTIONS

PROGRAM OVERVIEW

TEMPERATURE ZONE OVERVIEW

VACUUM CALIBRATION

Vacuum Functions

3/ 5/2013 VACUUM CALIBRATION FUNCTIONS 04:49:34 PM

VACUUM HEADER #1 LEVEL	VACUUM HEADER #2 LEVEL
-9	-8
CALIBRATION OFFSET	CALIBRATION OFFSET
0	0

LINE #1 VACUUM LEVEL	LINE #2 VACUUM LEVEL	LINE #3 VACUUM LEVEL	LINE #4 VACUUM LEVEL	LINE #5 VACUUM LEVEL	LINE #6 VACUUM LEVEL	LINE #7 VACUUM LEVEL	LINE #8 VACUUM LEVEL
-9	-9	-8	-8	0	0	0	0
CALIBRATION OFFSET	CALIBRATION OFFSET	CALIBRATION OFFSET	CALIBRATION OFFSET	CALIBRATION OFFSET	CALIBRATION OFFSET	CALIBRATION OFFSET	CALIBRATION OFFSET
0	0	0	0	0	0	0	0
ENABLE VACUUM LINE #1 CALIBRATION	ENABLE VACUUM LINE #2 CALIBRATION	ENABLE VACUUM LINE #3 CALIBRATION	ENABLE VACUUM LINE #4 CALIBRATION	ENABLE VACUUM LINE #5 CALIBRATION	ENABLE VACUUM LINE #6 CALIBRATION	ENABLE VACUUM LINE #7 CALIBRATION	ENABLE VACUUM LINE #8 CALIBRATION
DISABLE VACUUM LINE #1 CALIBRATION	DISABLE VACUUM LINE #2 CALIBRATION	DISABLE VACUUM LINE #3 CALIBRATION	DISABLE VACUUM LINE #4 CALIBRATION	DISABLE VACUUM LINE #5 CALIBRATION	DISABLE VACUUM LINE #6 CALIBRATION	DISABLE VACUUM LINE #7 CALIBRATION	DISABLE VACUUM LINE #8 CALIBRATION

MAIN MENU

OVEN FUNCTIONS

PROGRAM OVERVIEW

TEMPERATURE ZONE OVERVIEW

VACUUM LINE FUNCTIONS

Vacuum Calibration

3/ 4/2013 VACUUM LINE #1 SETUP FUNCTIONS 02:44:00 PM

ACTIVE ALARMS

SILENCE ALARM HORN

ENABLE RUN MODE

STOP RUN MODE

ENABLE AUTO MODE

MANUAL MODE ENABLED

VACUUM LINE #1		SETUP PARAMETERS	
PV	-9	LINE ON/OFF HYS.	0.0
SP	0	VENT ON/OFF HYS.	0.0
		DEADBAND	0.0

MANUAL OUT%

SET LINE OUT% TO 0%

SET VENT OUT% TO 0%

SET LINE OUT% TO 100%

SET VENT OUT% TO 100%

MAIN FUNCTIONS

NEXT>

Vacuum Control Tuning

Y-HEAT Feature Overview continued...

2/27/2013 **RECIPE FUNCTIONS** 03:34:51 PM

ACTIVE ALARMS

SILENCE ALARM HORN

CURRENT PART# IN CONTROLLER: PART #1 REVISION # 1

AVAILABLE RECIPES

PART #1
PART #2
PART #3

DOWNLOAD RECIPE TO CONTROLLER

RETURN

Recipe Functions

2/27/2013 **RECIPE FUNCTIONS** 03:54:20 PM

ACTIVE ALARMS

SILENCE ALARM HORN

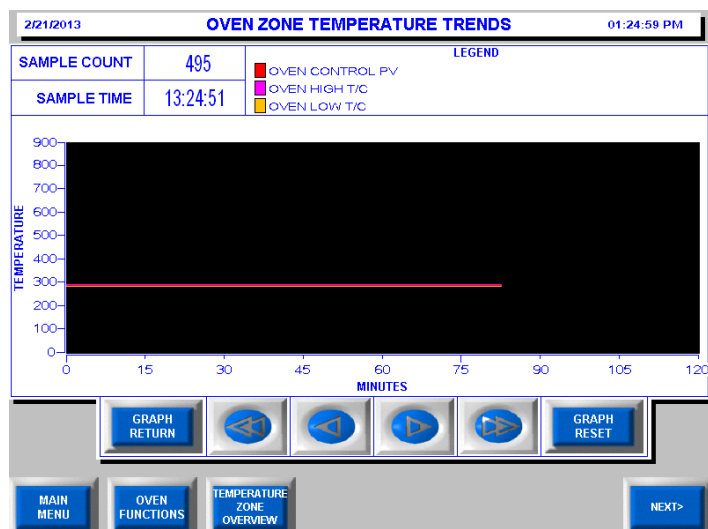
CURRENT PART# IN CONTROLLER: PART #1 REVISION # PART #1

PART #1	TEMPERATURE	TIME OR RATE	RATE
1	250	0	0
2	400	1	10
3	625	1	8
4	625	0	0
5	150	0	0
6			
7			
8			
9			
10			
11			

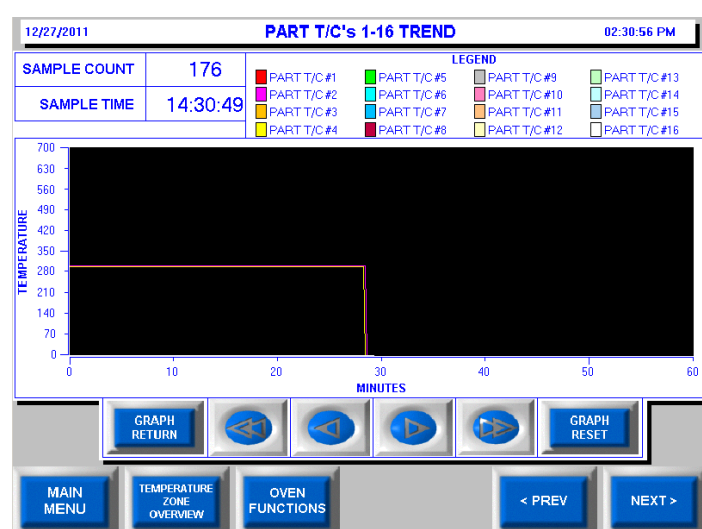
DOWNLOAD RECIPE TO CONTROLLER

RETURN

Recipe Parameter View



Oven T/C Trend



Part T/C Trend

3/ 5/2013 **ALARM HISTORY** 05:25:49 PM

PAGE UP

SCROLL UP

TOP OF LIST

SCROLL DOWN

PAGE DOWN

ACK ALARMS

CLEAR INACTIVE ALARMS

RETURN

Alarm History

3/ 4/2013 **OVEN SHUTDOWN SETTINGS** 03:22:55 PM

ACTIVE ALARMS

SILENCE ALARM HORN

BLOWER SHUTDOWN SETTINGS

TEMPERATURE

AIR T/C 140

PART T/C's 140

SHUTDOWN TEMPERATURE CONFIRM DELAY

MINUTES 2

DOOR UNLOCK TEMPERATURE

150

RETURN

Oven Shutdown Functions

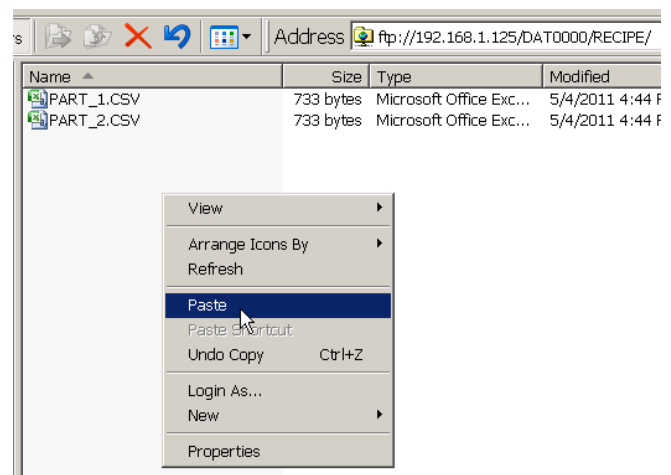
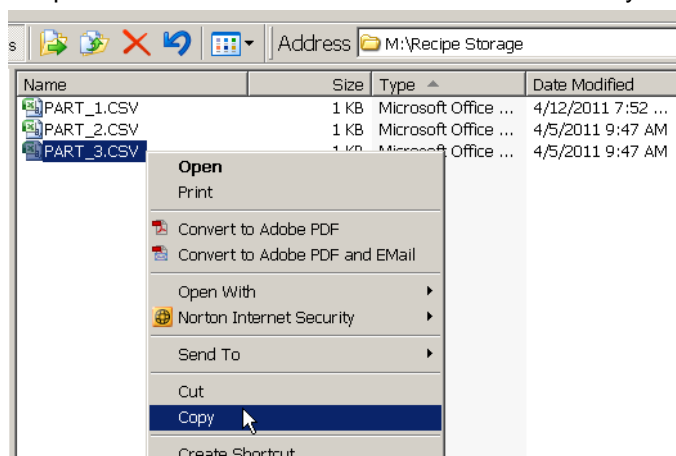
Recipe Management Functions

The Recipe capabilities of the system allow for Recipe management and creation via Microsoft Excel.

	A	B	C	D	E	F	G	H	I	J	K
1		TEMPERATURE	TIME OR RATE	RATE	HOURS	MINUTES	STEP TYPE	HIGH DEV.	LOW DEV.	WAIT ZONE	AIR OR PART T/C CONTROL
2	1	250	0	0	1	0	0	3	2	3	0
3	2	400	1	10	0	0	1	3	2	3	1
4	3	625	1	8	0	0	2	3	2	3	1
5	4	625	0	0	0	0	3	3	2	3	1
6	5	150	0	0	0	0	5	3	2	3	1
7	6	0	0	0	0	0	0	0	0	0	0
8	7	0	0	0	0	0	0	0	0	0	0
9	8	0	0	0	0	0	0	0	0	0	0
10	9	0	0	0	0	0	0	0	0	0	0
11	10	0	0	0	0	0	0	0	0	0	0
12	11	0	0	0	0	0	0	0	0	0	0
13	12	0	0	0	0	0	0	0	0	0	0
14	13	0	0	0	0	0	0	0	0	0	0
15	14	0	0	0	0	0	0	0	0	0	0
16	15	0	0	0	0	0	0	0	0	0	0
17	16	0	0	0	0	0	0	0	0	0	0
18	17	0	0	0	0	0	0	0	0	0	0
19	18	0	0	0	0	0	0	0	0	0	0
20	19	0	0	0	0	0	0	0	0	0	0
21	20	0	0	0	0	0	0	0	0	0	0
22	21	0	0	0	0	0	0	0	0	0	0
23	22	0	0	0	0	0	0	0	0	0	0
24	23	0	0	0	0	0	0	0	0	0	0
25	24	0	0	0	0	0	0	0	0	0	0
26	25	0	0	0	0	0	0	0	0	0	0
27											

Recipes contain 25 steps (or more if required) and have columns referencing program parameters and a Recipe Revision entry.

Recipes are sent to and retrieved from the Y-HEAT system via simple FTP...



Recipe Management PC

Y-HEAT System



Report Generation

When a program is completed, the acquired data can automatically be sent to a PC via FTP. With Yokogawa's Reporting software, customer specified reports are automatically generated. Trend and Tabular Data Report formats are included. Data can also be exported to Microsoft Excel.

HEAT#: G-45-6

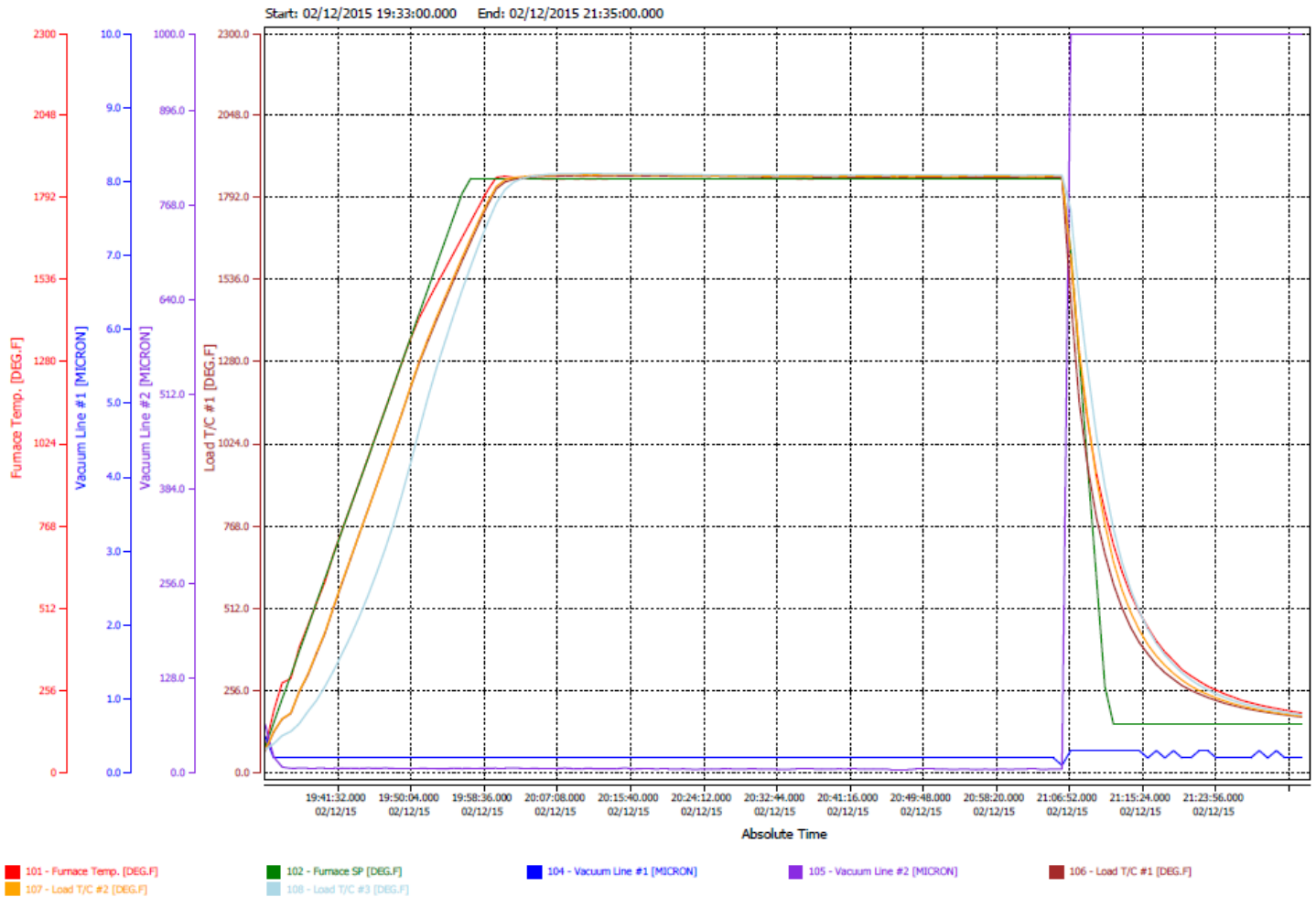
CUSTOMER NAME: IACME
QUANTITY: 1 & 6 & 1 & 29& 14

WORK ORDERS: SEE LOG
OPERATOR: JIM LUKAS

PART #: 6081017 & 6091055 & 6042445 &
SHOP ORDER:

Start: 02/12/2015 19:33:00.000 End: 02/12/2015 21:35:00.000

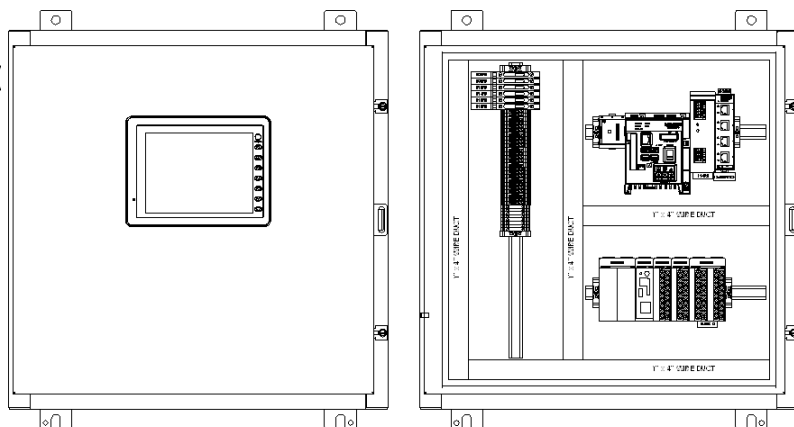
Page: 1



Trend Report

The base Y-HEAT system includes:

4 - Universal Analog Inputs (T/C, RTD, Voltage, or Current)
4 - 4-20ma Analog Outputs
8 - Time Proportional Solid State Outputs
16 - Digital Inputs (24VDC)
16 - Relay Outputs
8" Color Operator Interface
Ethernet Switch
NEMA12/13 Enclosure
120VAC Power
(DC Powered systems are also available)



The Y-HEAT system can also be supplied as components only for customer mounting in their own enclosures.

Y-HEAT is fully configured and ready to run upon delivery. No customer action is required other than mounting the system and landing field wiring.

Systems can be provided with any number of analog inputs/outputs, PID loops, and discrete I/O points.

Yokogawa Representatives can quickly provide Y-HEAT system pricing based on the following information:

1. Type of application (oven, furnace, multi-zone oven or furnace, autoclave, cryogenic furnace, etc.)?
2. Number of thermal measurement devices (T/C's or RTD's) required (main, zone, part, etc.)?
3. Number of analog inputs required (pressure, vacuum, other)?
4. # of PID control loops required (temperature, vacuum, pressure, atmosphere, etc.)?
5. # of PID loops that are Heat/Cool
6. Gas or electric heat system?
7. Discreet Input voltage? (24VDC, 120VAC)
8. # of discrete inputs required with functional description
9. # of discrete outputs required with functional description
10. # of Blowers and Fans to be controlled? Start/Stop only or with analog speed control?
11. Peripheral control needed (i.e. Door, Conveyor, Vacuum pumps, etc.)?
12. Operator Interface Screen Size? (5.7", 8", 10", 12" or 15") 8" is standard and is the smallest size recommended for systems with high parameter and T/C counts.
13. Supply complete Y-HEAT system or components only for customer mounting in enclosure?
14. Yokogawa to supply all control components (Relays, Starters, VFD's, SSR's, etc.)?
15. Other customer specific requirements...

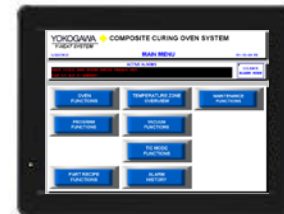
Y-HEAT systems feature Yokogawa's industry leading components...



FA-M3 Process Automation Controller



MW100 Data Recorder



Y-View Operator Interface