



Model 600A Model 620A FastTRAC®

Environmental Chamber Programmer/Controller



COMPLETE SINGLE OR DUAL-CHANNEL CHAMBER CONTROL SYSTEM

NEW, FASTER MICROPROCESSOR

CONVENTIONAL AND FastTRAC THERMAL RESPONSE ACCELERATING CONTROL MODELS

VACUUM FLUORESCENT FRONT-PANEL DISPLAY WITH EMI SHIELD

SIMPLE FRONT-PANEL SETUP AND OPERATION

EASY DIRECT CALIBRATION CAPABILITIES FOR ALL INPUT TYPES

JC SYSTEMS QUALITY AND PERFORMANCE

JC SYSTEMS TOOLBOX™ WINDOWS-BASED UTILITY SOFTWARE (OPTIONAL)

BUILT-IN COMPENSATION TABLES FOR HMM30C (%RH SENSOR) AND PX41TO-15AI (ALTITUDE SENSORS)

Y2K COMPLIANT

MADE IN U.S.A.

ONE YEAR WARRANTY

The JC Systems family of Environmental Chamber Programmer/Controllers puts it all together for you: upward compatibility, configuration flexibility, ease of operation, convenient packaging plus the dedication to performance, reliability and service you've come to expect from JC Systems – the leader in chamber control innovation.

UPWARD COMPATIBLE AND FLEXIBLE

Unlike many of our competitors' product lines that have either been discontinued or are no longer supported, JC Systems products continue to improve and remain compatible with previous models.

While maintaining 100% compatibility with the older 620 FastTRAC and 600 models, the 620A FastTRAC and the 600A programmer/controllers can be used to replace other manufacturers' discontinued or unsupported units with little effort.

DUAL-CHANNEL PROGRAMMER/CONTROLLER

JC Systems controllers offer the complete solution for temperature, humidity, altitude, and other control functions with two fully independent controller channels plus a 99 program/200 step/16 event setpoint programmer.

Each controller channel is equipped with two sets of dual, independently tuned, event-selected PID+™ control parameters.

Each control channel has dual time-proportioned (heat and cool) outputs. Programmer/controller reconfiguration is as simple as making a few keypad entries or sending a file from the computer.

FastTRAC CONTROL

Thermal Response Accelerating Control (FastTRAC) is a patented part temperature control technique and a standard feature of the Model 620A. FastTRAC control can improve test chamber throughput performance by 100% or more by rapidly accelerating the part under test to programmed soak temperatures while simultaneously guarding against potentially damaging levels of thermal stress.

JC SYSTEMS TOOLBOX SOFTWARE

This Windows-based software runs under Windows 95/98/NT and provides a powerful operational computer interface for 620A FastTRAC and 600A models.

In addition to remote operation of Model 620A FastTRAC and 600A, the ToolBox allows for creating, viewing and printing of program tables, PID tuning parameters, programmer/controller configurations, and the real time monitoring and datalogging to spreadsheet files.

620A FastTRAC & 600A

Environmental Chamber Programmer/Controller

The Model 620A FastTRAC and the Model 600A offer you the complete array of performance features that set JC Systems apart as the leader in environmental chamber control.

Some of these features are listed below:

PID+™ CONTROL

Each channel of the Model 620A FastTRAC and 600A comes equipped with two completely independent sets of PID+ control. Each controller channel provides dual, time-proportional outputs, guaranteed soak, and tracking deviation alarms programmable for each step of the setpoint program.

Two linear outputs are provided, and each may be assigned to either control channel and used to retransmit the setpoint or process value.

TWO-STAGE PID SETTINGS

Each controller channel is equipped with a second completely independent set of event-selected PID settings. These settings can be used to assure optimum performance when the same channel is used for either humidity or altitude control.

POWERFUL PROGRAMMER

The Model 620A FastTRAC and 600A have a 200 step/16 event setpoint programmer that can control the operation of one or both controller channels. The programming is enhanced with the faster microprocessor on the new CPU board of the 600A and 620A FastTRAC.

Additional features include high and low process limits, MTO (machine time out), guaranteed soak and soft-start.

THERMOCOUPLE, RTD OR LINEAR INPUTS

Every controller comes equipped to handle thermocouple or linear inputs. Inputs are temperature-compensated, and transducer linearization and compensation is provided for all standard thermocouples (see detailed specifications guide for wet bulb/dry bulb or linear direct % RH).

Dual constant-current sources for each RTD input are provided to compensate for temperature effects on lead length in 3-wire type systems.

COMPUTER COMMUNICATIONS

RS232 and RS422 serial communications are standard and the IEEE-488 interface is an available option for both models.

Simple front panel selections define baud rate, data structure and address. Nearly every operation that can be performed from the front panel can also be executed via the computer interface using simple 3-character mnemonic commands. PID settings can be adjusted "on the fly" under computer control.

RSR (REMOTE SOAK RAMP)

Any new program downloaded or selected from the "In Unit Memory" will always start from the unit's last valid programmed setpoint. This feature allows great flexibility in designing and running environmental tests.

HALF DIN — FULLY JC

The Model 620A FastTRAC and 600A package is industry standard 1/2-DIN in size and meets tough JC Systems standards for ease of installation, setup and operation. Plus you'll find quality design touches such as a gold-plated keypad with stainless steel high-tactile feel snap-action dome switches, new vacuum fluorescent display, new front panel internal EMI shield, gold-plated gas-tight connectors, and shock-mounted printed circuit boards.

LEDs illuminate whenever a controller output is ON.

The program and step number and time remaining in the step are displayed here.

Operating status including the new Ramp-Soak-Remote (RSR) feature is displayed here.



The process variable and setpoint for both controllers plus the status of all 16 events are shown in this Vacuum Fluorescent display.

Alarm conditions are displayed here.

SIMPLE KEYSTROKE OPERATIONS MAKE FAST WORK OF OPERATION, SETUP AND CALIBRATION.

The JC Systems ToolBox application program (developed under National Instruments' LabVIEW for Windows) runs under Windows 95/98/NT. Specify Serial or GPIB interface when ordering ToolBox.

Key features of this powerful, ready-to-use Windows-based operator/computer interface are:



Step of step	SP 1	SP 2	HH	MM	SS	ON Events
Soak at Soak	25	30	0	5	0	135
Soak at Soak	25	30	1	30	0	13
Soak at Soak	85	30	0	30	0	135
Soak at Soak	85	75	0	30	0	135

PROGRAM EDITOR FEATURES

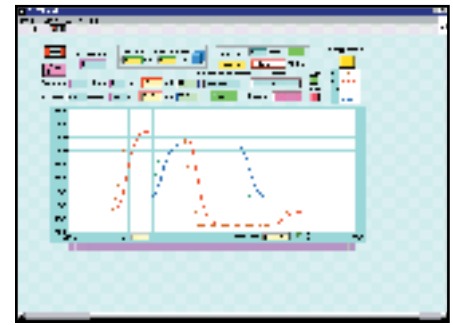
- Create new or edit existing program files (access-code protected)
- View stored program files (no access-code required)
- Generate and view a program in a table format; Edit, insert, or delete steps from the profile, or make changes to individual items of any step
- Display program profile as setpoint vs. step number in graphical or table format
- Make immediate changes to any step of any program in the unit's memory (in Unit Memory Editor). View and/or print the program table of any stored program

REMOTE OPERATION

- Run, hold, or reset the current program of the unit
- Select a new program and step for the unit to run
- Change Current value—temporary change (one time) of current running step value(s)
- Computer control of Manual Mode operation (Direct setpoint and event entry)

DISK STORAGE AND RETRIEVAL

- Autochecks for correct configuration match when sending a program file to the unit
- View and/or modify programmer and controller configuration parameters



VIEW GRAPH/DATALOG CURRENT CONDITIONS

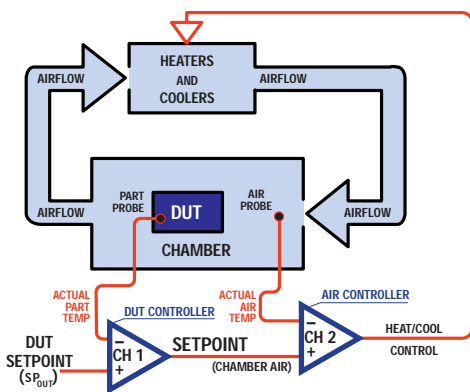
- Alphanumeric and graphic display of real time current conditions
- Datalog selected unit(s) to a hard drive in spreadsheet format (datalog intervals 5 to 360 seconds)
- Floppy Dump: Copies running datalog file (up to the last reading) to a floppy disk without interfering with program operation.

PID TUNING AND CONFIGURATION

- View and make on-the-fly adjustments of the unit's PID settings and configurations
- Store/restore the unit's PID settings and configurations to/from a file
- Visual tuning aid significantly reduces time to tune chambers; graphically observe the controller's internal action during the tuning process

FastTRAC®

Thermal Response Accelerating Control



FastTRAC is a patented control technique that offers dramatic improvements in the performance of environmental chamber test program development and execution.

With the model 620A's FastTRAC control:

- Time-consuming test chamber characterization studies are minimized prior to actual device testing

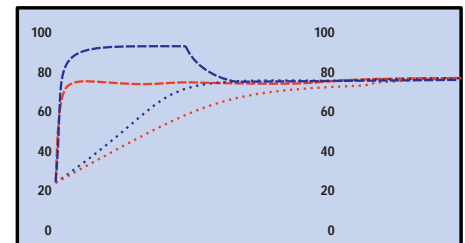
Document: 600.pdf Revision: 7/23/2007

- The thermal transition of the device-under-test (DUT) will be improved by at least 2:1
- High and low limits, maximum cap, and air temperature setpoints can be selected

FastTRAC control combines JC Systems' proprietary ThermoBoost™ technique with a patented adaptation of classic cascade control to cut DUT thermal transition time by 50% or more over conventional techniques while simultaneously guarding the DUT against potentially damaging levels of thermal stress.

FastTRAC improves test chamber throughput. Actual part temperature and chamber temperature are monitored so testing can commence immediately after the DUT reaches the specified temperature at each stage of the test program. And since the DUT temperature is directly controlled, minimal thermal characterization tests are necessary.

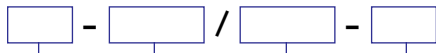
The chart below demonstrates the dramatic improvement in test performance that FastTRAC control provides. In this example, the DUT is being heated from ambient to 76°C. Note that while the DUT temperature is well below the new setpoint value, FastTRAC control drives the chamber temperature to the ThermoBoost level of 91°C (15°C above the programmed setpoint). As the DUT actual temperature approaches the programmed setpoint, the chamber temperature is automatically reduced.



..... DUT Temp. Response: FastTRAC Control
 DUT Temp. Response: Conventional Control
 - - - - Internal Chamber Temp: FastTRAC Control
 - - - - Internal Chamber Temp: Conventional Control

ORDERING GUIDE

600A - TC / LIN (1-5V) - 488 ← EXAMPLE



Options: (RS-232 and RS-422 interfaces are standard on all models)
488 IEEE-488 Interface option

Input Type: (Specify one input type for each controller channel)
TC Thermocouple; Type J, K, T, R, S, B or E. (Unit is configured for type T with -99 to 315°C range unless specified at time of order)
RTD 100Ω Platinum; a = 0.00385
LIN() Linear Input; Signal conditioning network is added for input current (mA) or voltage specified (Unit is configured for 4-20 mA if not specified)
RHV Vaisala model HMM30C; 0 to 5 Vdc, non-compensated direct % humidity sensor
ALT Omegadyne model PX41TO-15AI, 4-20 mA, pressure transducer

Programmer/Controller:

600A Standard Environmental Chamber Programmer/Controller
620A FastTRAC Environmental Chamber Programmer/Controller

ACCESSORIES

A2320 8-Event SSR Board	A2192 Chamber Enhancer	S14 PLC Staging System (2 to 4 stages of heat and cool)
A2388 4-Relay Event/Control Board	A2298 Single Fast Analog & Sync	M355 Linear Input Attenuator
A2271 Event/Alarm Relay Board	A2336 Dual Fast Analog/Dual Sync	

INPUT	RANGE	RESOLUTION SETPOINT/DISPLAY ¹	REPEATABILITY	ACCURACY	INPUT	RANGE	RESOLUTION SETPOINT/DISPLAY ¹	REPEATABILITY	ACCURACY
T T/C	-99.9 to 315.0	0.1	0.1	±0.5	RTD ²	-99.9 to 315.0	0.1	0.1	±0.2
T T/C	-250 to 315.0	1.0	1.0	±1.0	LINEAR MA ³	-99.9 to 999.9	0.1	0.1	±0.2
J T/C	-99.9 to 750.0	0.1	0.1	±0.5	LINEAR MA ³	-418 to 999.0	1.0	1.0	±1.0
K T/C	-99.9 to 999.9	0.1	0.1	±0.5	LINEAR MV ⁴	-99.9 to 999.9	0.1	0.1	±0.2
K T/C	-250 to 1250	1.0	1.0	±1.0	LINEAR MV ⁴	-418 to 999.0	1.0	1.0	±1.0
R T/C	-50.0 to 1500	1.0	1.0	±1.0	RHV	0.0 to 100.0	0.1	0.1	See note 5
S T/C	-50.0 to 1500	1.0	1.0	±1.0	ALT	0.0 to 100,000 ft. ⁶	0.1	0.1	See note 5
E T/C	-190 to 770.0	1.0	1.0	±1.0					

Accuracies are given for an ambient temperature of 23°C ±2°C. Thermocouple tables 1968.
¹ Resolution for all inputs from -99.9 to 999.9 = 0.1 and for below -99.9 and above 999.9 = 1.0.
² 100Ω platinum, a=0.00385

³ Common positive current ranges (e.g., 4–20mA, 0–16mA)
⁴ Common positive voltage ranges (e.g., 0–500mV, 0–1V, 0–5V, 0–10V)
⁵ Please see manufacturer's specification tables.
⁶ The display will show 0.0 to 100.0 for 0.0 to 100,000 ft.

SPECIFICATIONS

CONTROLLER

Control Functions: Dual PID+: two independent, event-selectable sets of control functions for each channel consisting of proportional, integral and derivative control plus reset windup inhibit and reset clipping. "Set 2" tuning is in effect when the enabling event is ON. Cycle time ranges from 2 to 15 seconds.

Time Proportioning: Two per channel (increase & decrease); clamp logic outputs for driving photo-isolated solid state relay.

Linear Outputs: Two outputs, each assignable to either channel as process variable or setpoint retransmit.
 4-20mA or 0-16mA; maximum loop resistance, 600Ω.

Cold Junction Comp: ±0.01 degree/ degree over 15°C to 35°C ambient operating range.

PHYSICAL CHARACTERISTICS

Overall Dimensions: 6" x 6" x 12 7/8" (w/o accessories); 10 lbs.
Mounting: 5 3/8" square cutout.
Power Requirements: 117VAC ±10%; 25W.
Operating Temperature: 0 to 40C; 85% max. RH, non-condensing.
Numeric Displays: two 2-line, 20 character per line, VFD.



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SETPOINT PROGRAMMER

Setpoint Range: Full range of the controller.
Program Steps: 200 total steps; 99 programs, max.
Step Types: RAMP/SOAK (Standard), EOP (End of Program); LOOP; GOTO; GOTO_IF and PAUSE.

Step Time Duration: 0 to 99:59:59.
Delay Start: 0 to 99:59:59.
Guaranteed Soak: Program waits at the end of a ramp step until the process is within specified tolerance; programmable, per step, in 1 unit increments, per channel.

External Events: 16 programmed clamp logic outputs suitable for driving photo-isolated solid state relays.

Process Deviation Alarms: ±1 to 55 units, programmable per channel, per step.
Display Alarm Action: Flashing indication on front panel display plus clamp logic output; programmable to clear automatically or to require manual reset.

Programmer Alarm Action: Programmable to continue running; or pause until condition clears or until alarm is manually reset.

HI/LO Process Limits: Programmable per channel in 1 unit increments over full input range.

Alarm & Limit Outputs: One each per channel, logic output suitable for driving photo-isolated solid state relay.

Control Inputs: External inputs provided for run, stop, reset and front panel lockout.

Program Restart: Three power fail recovery modes: Normal (auto resumption of program); Hold (program and setpoint values at time of power fail); Run (selected program and step #).