FARNAM
CUSTOM PRODUCTS

7550 SERIES
PROCESS CONTROLLERS

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FARNAM
7550 SERIES
TABLE OF CONTENTS

DESCRIPTION 1
LED INDICATORS 5
ALARM LEDS 6
KEYS 7
SETUP 9
OPERATION 13
TUNING 16
AUTO TUNING 18
HIGH LIMIT SETTING 19
BACKDOOR CODE 20
MANUAL REVISIONS 20
SPECIFICATIONS 21
WARRANTY 23
RECOMMENDED FUSING 24
DRAWINGS
- DIMENSIONS
  - DRAWING #44-755000-30-01 26
  - DRAWING #44-755014-30-00 27
- BLOCK DIAGRAM
  - DRAWING #15-755001-10-03 28
  - DRAWING #15-755012-10-01 29
  - DRAWING #15-755003-10-03 30
  - DRAWING #15-755013-10-01 31
  - DRAWING#15-755040-10-00 32
  - DRAWING#15-755045-10-00 33
  - DRAWING#15-755042-10-00 34
- WIRING DIAGRAM
  - DRAWING #12-755004-20-01 35
  - DRAWING #12-755005-20-02 36
  - DRAWING #12-755006-20-01 37
  - DRAWING #12-755007-20-02 38
  - DRAWING #12-755020-20-00 39
  - DRAWING #12-755044-20-00 40
  - DRAWING #12-755043-20-01 41
  - DRAWING #12-755015-10-00 42
  - DRAWING #12-755016-10-00 43

N O T I C E

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HAS BEEN CAREFULLY CHECKED AND IS BELIEVED TO BE ACCURATE. HOWEVER, NO RESPONSIBILITY IS ASSUMED FOR INACCURACIES.

FARNAM
7550 SERIES
PROCESS CONTROLLER

The Series 7550 is a family of self contained microprocessor based Process Controllers. The units monitor temperature utilizing a Type K thermocouple sensor and control temperature with a rapid response three mode (PID) control scheme, with anti-reset windup. Numerous status and alarm functions are incorporated to monitor various system parameters.

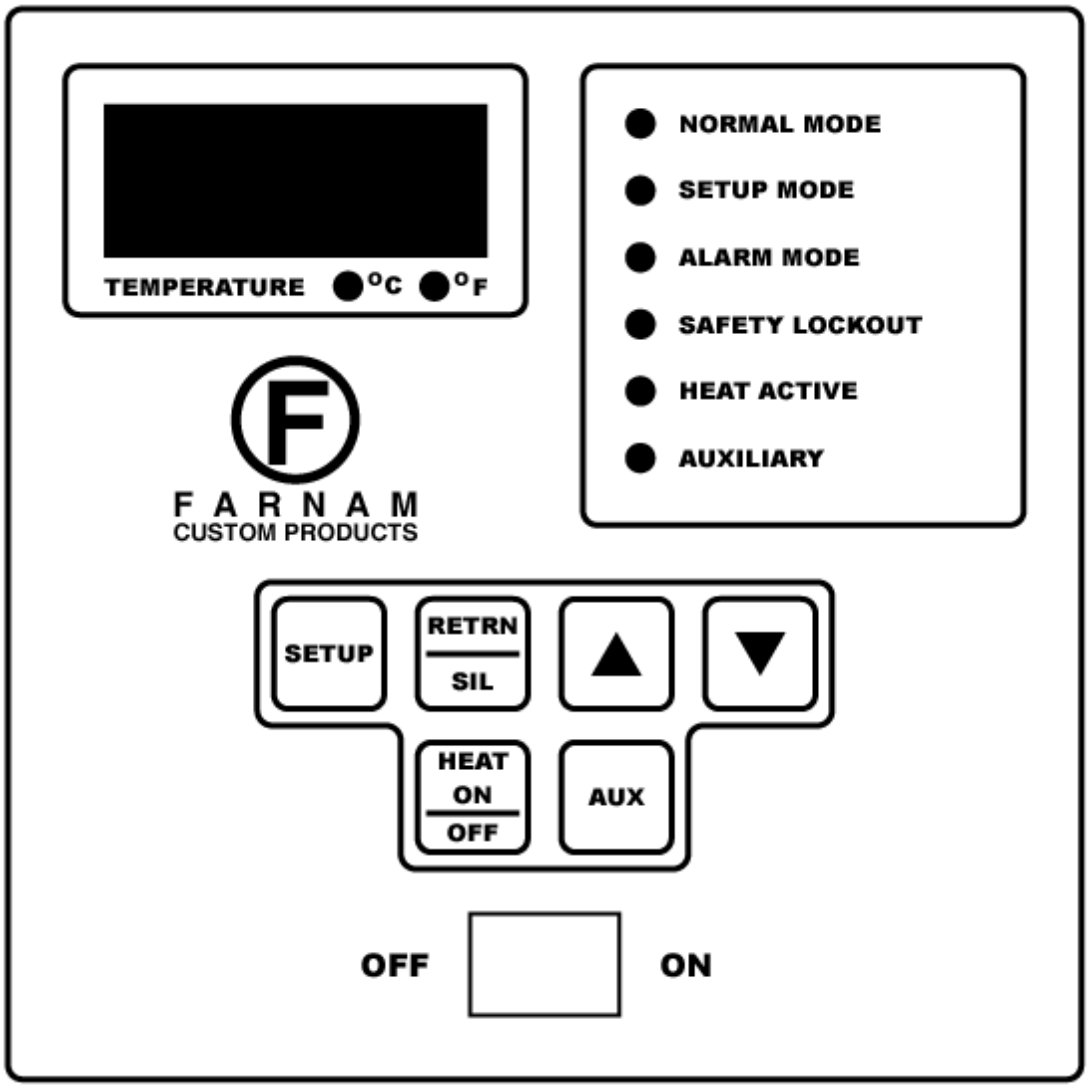
The unit is housed in a NEMA 12 enclosure. It contains not only the temperature controller, but also the necessary terminal blocks, transformers, safety relay and solid state relay to make up a complete system.

An independent high limit circuit is also provided. The sensor is a second Type K thermocouple. This circuit shuts off the internal safety relay should an over-temperature condition occur. It is totally independent of the microprocessor section.

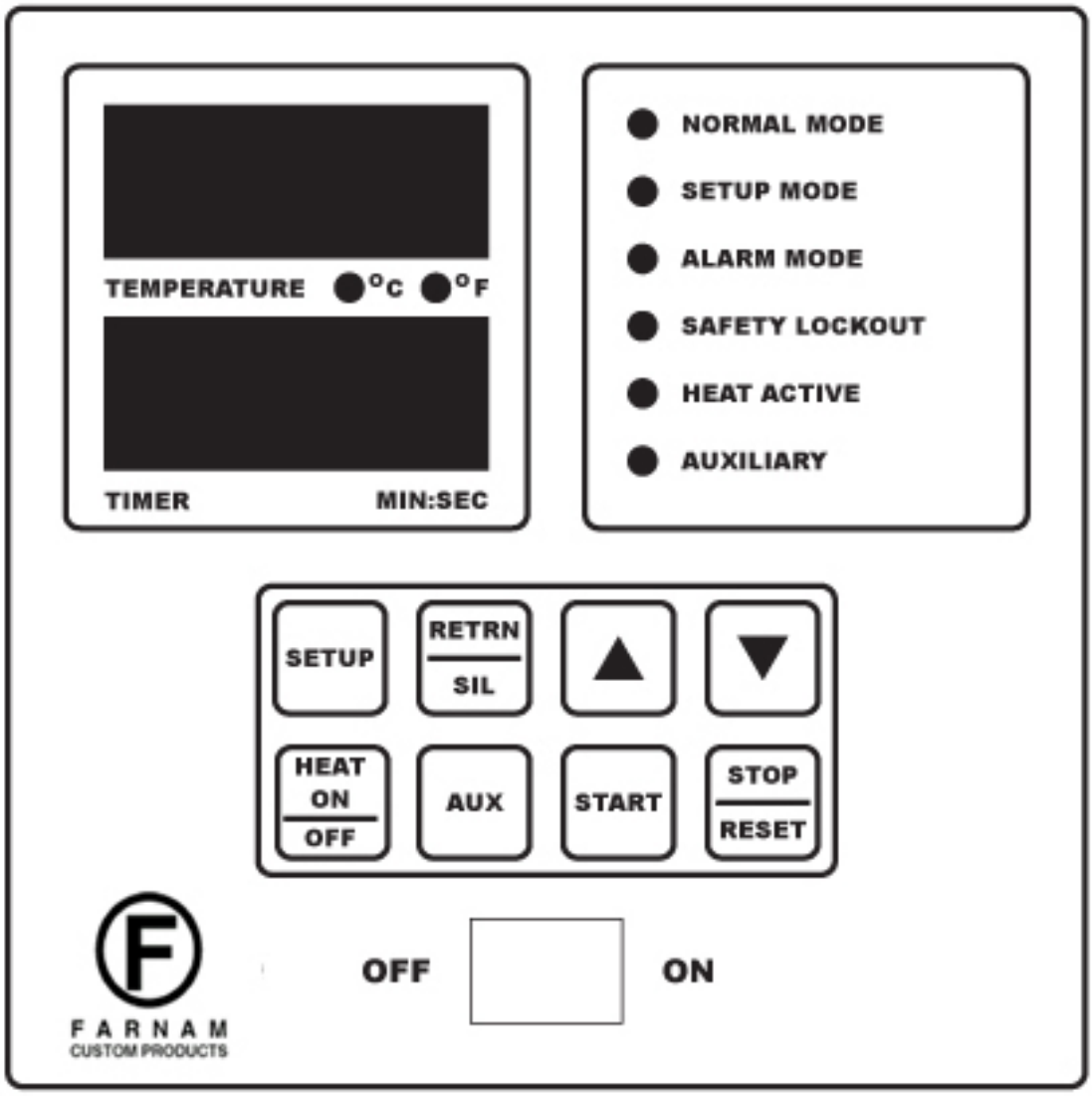
The following are highlights of some of the main features:

* USES TYPE K THERMOCOUPLE FOR PROCESS CONTROL
* USES SECOND TYPE K THERMOCOUPLE FOR HIGH LIMIT
* AUTOMATIC THERMOCOUPLE COLD JUNCTION COMPENSATION
* HI LIMIT CIRCUITRY INDEPENDENT OF MICROPROCESSOR
* ADVANCED RAPID RESPONSE 3 MODE CONTROL
* BUILT IN SAFETY RELAY
* BUILT IN SOLID STATE RELAY
* BUILT IN CLASS 2 TRANSFORMER
* EXTERNAL HEAT SINK
* ON/OFF SWITCH
* HEATER SNAP SWITCH INPUT
* FLOW SWITCH INPUT
* ACCESS CODE PARAMETER PROTECTION
* EEPROM PARAMETER MEMORY
* AUDIO ALARM/ANNUNCIATOR
* ALL PARAMETERS SET IN SOFTWARE-NO POTS OR SWITCHES
* NEMA 12 ENCLOSURE
* TWO BRIGHT FOUR DIGIT LED DISPLAY
* SMOOTH FACE CONSTRUCTION
* MULTIFUNCTION TIMER (OPTIONAL)
* AUXILARY RELAY OR SOLENOID (OPTIONAL)
* RS232 COMMUNICATIONS (OPTIONAL)
* ETHERNET COMMUNICATIONS (OPTIONAL)
* OTHER SENSORS AVAILABLE (TYPE J T/C, RTD, ETC.)

The following figure is a representation of the face of the unit:



The following figure is a representation of the face of the unit with Timer Option:



The Series contains a number of models based on the voltage and current requirements of the application. The chart below shows the differences between the controllers.

MODEL NUMBER	LINE VOLTAGE	PHASE	CURRENT	MAX WATTAGE
7550A20	120/208/240 VAC	1	20 AMPS	2400/4100/4800
7550A40	120/208/240 VAC	1	40 AMPS	4800/8300/9600
7550B20	208/240 VAC	3	20 AMPS	7200/8300
7550B40	208/240 VAC	3	40 AMPS	14400/16600
7550C20	277 VAC	1	20 AMPS	5500
7550C40	277 VAC	1	40 AMPS	11000
7550D20	480 VAC	1	20 AMPS	9600
7550D40	480 VAC	1	40 AMPS	19200
7550E20	480 VAC	3	20 AMPS	16600
7550E40	480 VAC	3	40 AMPS	33200
7550E40-2	480 VAC	3	2 x 40 AMPS	2 x 33200
7550E45-2	480 VAC	3	2 x 45 AMPS	2 x 37400
7550F20	380 VAC	1	20 AMPS	7600
7550F40	380 VAC	1	40 AMPS	15200
7550G20	380 VAC	3	20 AMPS	13100
7550G40	380 VAC	3	40 AMPS	26300
7550G40-2	380 VAC	3	2 x 40 AMPS	2 x 26300
7550H20	415 VAC	3	20 AMPS	14350
7550H40	415 VAC	3	40 AMPS	28700

The options for the Series 7550 Process Controllers are:

Auxiliary Relay -> A
Timer -> T
Communications (RS232) -> C

These letters are added to the end of the base part numbers.
(e.g. 7550-A20-A, 7550-A20-T, 7550-A20-C, 7550-A20-AT, 7550-A20-AC, 7550-A20-TC, 7550-A20-ACT)

Eight discrete LEDs are utilized to indicate system and display status as well as annunciate various alarms. A six or eight element light touch keypad is incorporated in the face panel to allow for user setup and adjustment of the system.

LED INDICATORS

The six primary status modes are indicated by LEDs on the faceplate and are marked NORMAL MODE, SETUP MODE, ALARM MODE, SAFETY LOCKOUT, HEAT ACTIVE and AUXILIARY. Additionally, there are two LEDs to indicate the Temperature scale ^{O}C and ^{O}F.

NORMAL MODE - This mode is the NORMAL condition for the system. It indicates that the system is operating within the defined parameters.

NORMAL MODE (Flashing) - This mode is a STANDBY condition for the unit. It allows all normal monitoring and setup functions, but the heater is disabled. NOTE: For safety, the unit always starts up in this mode initially or after a power failure.

SETUP MODE - This is the Programming mode. When in this mode, the 'SETUP' key causes the controller to step through the parameters.

ALARM MODE - The various alarm conditions are activated by many sources and annunciated by both the displays and audio tone. The mode indicator shows that an alarm has occurred and that the system is still performing under the special conditions required by that alarm. The only way to exit this mode is to clear the alarm.

SAFETY LOCKOUT – This indicator is illuminated anytime one of the Safety inputs is activated. These include the Thermocouple High Limit, the Thermal Snap Switch and the Flow Interlock. Note: These inputs independently turn off the Safety relay.

HEAT ACTIVE - This LED is illuminated whenever the heater is on. Note that when the unit is near the setpoint, the LED will continually cycle on and off.

AUXILIARY - This LED is illuminated whenever the Auxiliary output is active. This is an optional relay or pneumatic solenoid.

^{O}C – This LED is illuminated when the system is set to display temperature in degrees Centigrade.

^{O}F – This LED is illuminated when the system is set to display temperature in degrees Fahrenheit.

ALARMS

There are six basic alarms in the unit. When activated, the Alarm LED is illuminated, the audio sounds and the indicated alarm action takes place.

All alarms are latching and require a User action to clear. There is a 3 second alarm delay.

SYSTEM - This alarm is a catch-all indicator for the miscellaneous diagnostics. An example would be the malfunction of the EEPROM SAVE routine. This would simply indicate to the user that something has gone wrong and he should either repeat the command or reset the unit. The process display will alternately flash the temperature and 'SYS'.

SENSOR - This alarm indicates that the Process or High Limit sensor is either open or not connected. Special circuitry has been incorporated to monitor the sensors for an open circuit. The processor continually monitors the inputs and if it detects an open sensor, it shuts off the heater output and turns off the safety relay. The process display will alternately flash the temperature and 'OP' for open sensor.

SAFETY LOCKOUT – This alarm indicates that one of the Safety Interlocks is either tripped or not connected. There are three safeties that can cause this alarm (Snap Switch, Flow or the internal High Limit). The alarms directly control the Safety Relay and it will be shut off regardless of the state of the controller. The microprocessor shuts off the SSR and redundantly shuts off the safety relay. The process display will alternately flash the temperature and 'SFtY'.

HIGH TEMP - This alarm indicates that the process temperature exceeds the high alarm setpoint. When activated, the process display alternately displays the process temperature and the code 'HI'. The SSR and the Safety Relay are shut off. Setting the alarm setpoint to 0 eliminates this feature.

LOW TEMP – This alarm indicates that the process temperature has fallen below the Low alarm setpoint. If the process temperature drops below the setpoint once it has initially come out of the warmup mode, this alarm will be activated. In this case, the code 'LO' is alternately flashed with the process temperature. The alarm is locked out in both the Hold and Warmup Modes. The Warmup Mode is provided to eliminate nuisance alarms. The unit is in this mode from the time the heater is turned on until the process temperature first exceeds the Low Alarm setpoint.

HIGH LIMIT – This alarm indicates that the High Limit temperature exceeds the High Limit setting. This is a hardware function that is independent of microprocessor control. The process display will alternately flash the process temperature and the code 'HL'. The SSR and Safety Relay are shut off.

KEYS

SETUP - This key is used to put the system into the SETUP mode and once in that mode, advance through the parameters.

Depressing the key once will place the unit into the SETUP mode. (Note: if the access code protection is selected, an additional step is required, see Access Code). Depressing the key after entering the SETUP mode will allow the user to scroll through the setup parameters.

RETRN/SIL - This is a multifunction key whose function varies with the current system mode. This key is provided to allow for the elimination of the audio portion of the alarm

SETUP MODE - When in the SETUP mode, this key exits that mode. The stack parameter changes are automatically saved to the EEPROM.

ALARM MODE - When in the ALARM mode, this key will silence the audio portion of the alarm, as well as the portion of the alarm display that affects the display. This essentially allows the unit to be returned to a functional condition where setpoints can be examined and reset without the interference of the special alpha displays. However, the alarm status and annunciator LEDs continue to flash to indicate the alarm and where applicable, the output to the heater is turned off to protect the equipment from any potential damage.

After the alarm has been corrected, this key is used to clear the alarm. Note: All alarms are latching and will remain active until cleared, even after the alarm condition is corrected.

UP - In the SETUP mode, depressing the UP key will cause the display to advance. Depressing the key once and releasing will allow the accurate setting of the least significant digit. Holding the key down will activate the automatic, rapid incrementing of the display.

DOWN - In the SETUP mode, depressing the DOWN key will cause the display to decrease. Depressing the key once and releasing will allow the accurate setting of the least significant digit. Holding the key down will activate the automatic, rapid decrementing of the display.

HEAT ON/OFF – This key Enables and Disables the Heater by toggling the Safety Relay.

AUX - This key toggles the AUXILIARY output on and off.

ON/OFF - This switch toggles the internal power on and off. It is connected in series with the secondary of the internal Class 2 transformer. It disables the Safety relay.

START[T] - This key is used to activate the Timer. It will start the system, if it is reset or it will continue, if the Timer has been placed in the HALT mode. (See STOP/RESET).

STOP/RESET[T] - This is a multifunction key whose function varies with the current system mode.

> **SETUP MODE** - If the Timer is running, depressing STOP/RESET will stop the count and place it in the HALT mode.
>
> **HALT MODE** - If the Timer is in the HALT mode, depressing this key will reset the Timer in preparation for the next run.

T Only available with Timer Option.

SETUP

The SETUP mode is entered by depressing the SETUP key. While in this mode, the SETUP key is used to step through the parameters. The following is a listing of the Code prompts that will appear in the display, when in the SETUP mode. The code will alternately flash with the selected value to indicate to the user the parameter that is currently viewed or set.

CODE	DESCRIPTION	SETTING RANGE
CS[T]	Clock Setpoint	0:00 to 99:59 Min:Sec or Hrs:Min
PA[T]	Pre-Alarm Offset	:00 to :59 Seconds
PS	Process Setpoint	32 to 1999 Degrees F 0 to 1093 Degrees C
HI	High Alarm Setpoint	32 to 1999 Degrees F 0 to 1093 Degrees C
LO	Low Alarm Setpoint	32 to 1999 Degrees F 0 to 1093 Degrees C
dL	Deviation Limit	0 to 199 Degrees F 0 to 111 Degrees C
AC	Access Code	0 to 9999
Cr	Cycle Rate	1 to 19 Seconds
Pb	Proportional Band	0 to 199 Degrees F 0 to 111 Degrees C
rE	Reset	0 to 199 Seconds
rA	Rate	0 to 199 Seconds
CA	Calibration	+ or - 99 Degrees F + or – 55 Degrees C
Cd[T]	Clock Direction	UP/DN (Up or Down)
tt[T]	Timer Type	0=Min:Sec, 1=Hrs:Min
rL[A]	Relay Logic	0 = Aux On-Off, 1 = Alarm, 2 = Timer During, 3 = Timer After, 4 = Timer Counting
At	Auto Tune	ON/OFF
Fb	Filter Band	0 to 25 Degrees F/C
FP	Filter Period	0 to 10.0 Seconds
tu	Temperature Units	Celsius or Fahrenheit
HL[T]	Heater Logic	0 = Manual, 1 = On During Timer Run, 2 = Off During Timer Run
Hd	Heater Delay	0 to 199 Seconds
AS	Auto Start	NO/YES

T Only available with Timer Option.
A Only available with Auxiliary Option.

CS[T] – The >Clock Setpoint= determines the duration of the Timer period. Depending on the >CD= parameter, the Timer will either count up to the desired setting or countdown from the desired setting.

PA[T] – The >Pre-Alarm= is the time at which an audio warning will begin prior to the Timer period being completed. Its purpose is to alert the operator to the fact that the Timer period has almost elapsed. The audio tone will cycle ON and OFF from the beginning of this period until the end of the Timer period.

PS – This is the Process Setpoint for the system. It is the target temperature for the 3 Mode PID algorithm.

HI – This is the High Temperature Alarm Setpoint. The Process Temperature is continually compared with this setting and if the Process Temperature exceeds this setpoint, a High Temperature alarm is activated. Both the SSR and Safety Relay are disabled.

LO – This is the Low Temperature Alarm Setpoint. If the Process Temperature falls below this setpoint, a Low Temperature Alarm will activate.

Note: This alarm is not active in Hold or Warmup Modes.

dL – This is the Deviation limit. It is a soft setting that does not generate an alarm, but it shuts off the SSR output if the process temperature reaches the setpoint plus this setting.

AC – The Access Code is the number that must be matched to allow entry into the Programming mode. This number may be changed at any time, but a note should be kept of its value. If set to >0=, this function is eliminated.

Cr – This parameter sets the CYCLE RATE for the system. Since the controller is a standard proportional time base unit, the CYCLE RATE essentially sets the rate at which the output will cycle ON and OFF. Note that the amount of time that the output is on during each period is controlled to match the heat requirements of the system.

Pb – This parameter determines the cycling range for the controller in degrees C or F. This band indicates the range over which the controller will proportion. (See TUNING section for more information.)

rE – The RESET parameter for the heating mode sets the Integration time for the second mode in the three mode control scheme. If this parameter is set to 0, the RESET function is eliminated.

T Only available with Timer Option.

rA – The RATE function for the heating mode sets the Differentiation constant for the third mode of the three mode control scheme. If this parameter is set to 0, the RATE function is eliminated.

CA – This is the digital calibration for the process sensor. It provides a direct digital offset to the process temperature.

Cd[T] – The >Clock Count Direction= allows the user to program the direction in which the Timer will count.

tt[T] – The 'Timer Type' will allow the user to select either minutes and seconds or hours and minutes for the timer.

rL[A] – The >Relay Logic= will determine the function of the Auxiliary Output. This setting will determine whether the relay will be on during the Timer period, after the Timer period, when Alarms are present, while the timer is counting, or manually with the Aux key.

At – This parameter controls the Auto Tune feature. When set to ON the controller will self-tune the PID parameters for the system upon exiting the SETUP mode.

Fb – The software has a Digital Filter that may be used to average the temperature readings to produce a more stable display. It has no affect on the actual control of the temperature, just the display. This parameter sets the Filter Band. That is the temperature range over which the digital filter is active. If the temperature reading is within this band around the setpoint, the filter is active and performs a moving average on the readings. If the temperature is outside this band, the digital filter is bypassed, providing a quick response to step changes in temperature.

FP – This parameter controls the Filter Period. This setting determines the number of samples that are averaged in the digital filter. The value is set in tenths of seconds and is moving window in which the samples are taken. Increasing this setting will cause a more stable display. However, it will also cause a slower display response to small changes in temperature. The best setting is the smallest number that provides a stable display.

tu – This parameter selects whether the temperature scale used by the controller is degrees Celsius or Fahrenheit.

T Only available with Timer Option.
A Only available with Auxiliary Option.

HL^{T} – This parameter selects the over all logic control for the heater. It does not affect the temperature control, but provides a method to turn the heater on or off based on logic conditions. Its primary function is to allow the user to control the heater with the timer if desired. If set to 0, this logic function is eliminated and the Manual Heater On/Off key is the only logic control.

If set to 1, the heater will be enabled when if the Timer is running. It will be disabled at all other times.

If set to 2, the heater will be disabled when the timer is running.

Note: The Heater On/Off key still has overriding logic control. The Heater must first be manually turned On for the Heater to function and it can turn the Heater Off at any time.

Hd – This parameter sets a time delay that will delay the heater being enabled when the Heater On/Off is set to On.

Note: This heater lockout has a higher priority than the Heater Logic timer function. That function can not turn the heater on while the delay is active.

AS – This parameter determines the mode of operation on initial startup. When this parameter is set to Yes, the controller will startup with the heater enabled. When set to No, the system will startup in the HOLD mode.

The RETURN key will exit the SETUP mode. When the RETURN key is used the stack parameters will be saved to the EEPROM memory. This is a permanent (10-year minimum life) memory that does not require battery backup.

OPERATION

TIMER[T] - After the Timer has been programmed in the SETUP mode, a Timer period can be run by depressing the START key. The following is a description of Timer operation with various system settings.

DOWN COUNT TIMER - The Timer will begin to countdown. The Timer will continue this process until it reaches the pre-alarm time setting. At this point, an audio tone that has a 50/50 duty cycle and a 1 second period will sound. Once the unit has counted down to 0:00, the audio will change to a continuous tone and the display will begin to flash. If the timer is not stopped, it will begin to count back up, accumulating the time that has elapsed.

UP COUNT TIMER - The Timer will begin to count up. It will continue this process until it reaches the set time minus the pre-alarm setting. At this point, an audio tone that has a 50/50 duty cycle and a 1 second period will sound. Once the unit has counted up to the preset time, the audio will change to a continuous tone and the display will begin to flash. If the timer is not stopped, it will reset to zero and count back up, accumulating the time that has elapsed.

Depressing the STOP/RESET key will stop the Timer and freeze the display. Depressing the STOP/RESET key for a second time will reset the Timer for another cycle. If in the DOWN COUNT mode, the pre-programmed setpoint will be inserted in the display. If in the UP COUNT mode, the display will be set to 0:00. In both cases, the Timer is then ready for another cycle.

TEMPERATURE - This system may operate in either a one, two or three mode configuration. Setting the RATE or RESET variables to 0.0 will eliminate the respective function. It should be noted that the RATE and RESET settings adjust the sampling period directly in seconds. Thus, smaller numbers create more rapid sampling.

CALIBRATION - The calibration (CA) adjustment allows the elimination of various sensor and system errors. Thermocouple sensors are manufactured within a specific tolerance. The tolerance may lead to a difference between the actual temperature and the temperature displayed. This error coupled with the differential error caused by sheathing the sensor in materials such as Teflon may cause a difference in the actual temperature and display temperature. This can simply be corrected by monitoring the temperature and utilizing the offset to add or subtract the appropriate number of degrees to bring the display into compliance with the actual temperature.

T Only available with Timer Option.

ACCESS CODE - In some cases, it may be desirable to restrict access to the SETUP mode. An Access Code system is incorporated. If the Access Code is set to >0000=, the function is eliminated and the system operates as previously described. The code is any number from 1 to 9999, as programmed into the system by the customer's authorized personnel. Once this code is entered, any attempt to enter the SETUP mode will cause 'CODE' to appear in the Timer display. The UP and DOWN keys are then used to enter the Access Code. Once the proper code has been selected, the user simply depresses the SETUP key to gain entry into the SETUP parameters.

ALARMS - All of the alarms activate the audio tone as well as the alarm status LED and the individual alarm annunciator. The tone and the LEDs alternate on and off to draw attention to the alarm. As has been noted above, many of the alarms have additional visual displays to further define or draw attention to them.

The ALARM SILENCE key is provided to allow for the elimination of the audio portion of the alarm as well as the portion of the alarm display that affects the process display. This essentially allows the unit to be returned to a functional condition where setpoints can be examined and reset without the interference of the special alpha displays. However, the alarm status and alarm annunciator LEDs continue to flash to indicate the alarm and, where applicable, the output to the heater is turned off to protect the equipment from any potential damage.

After the alarm has been corrected, this key is used to clear the alarm. Note: All alarms are latching and will remain active until cleared, even after the alarm condition is corrected.

AUX RELAY[A] - The unit is provided with an Auxiliary Relay. The logic for this relay is selected by the 'RL' parameter in the setup stack. The relay will respond as follows:

RL=0 (Auxiliary) - This configures the auxiliary relay as a manual output controlled by the AUX key.

RL=1 (Alarm) - This configures the auxiliary relay as an alarm relay. The relay will be on whenever an alarm is present.

RL=2 (During) - This configures the auxiliary relay as a Timer relay. It will be active for the period that the Timer is active. It will activate when the Timer is started and deactivate when the Timer has completed its count. The relay is not active in over count.

RL=3 (Done) - This configures the auxiliary relay as a Timer relay. It will activate at the completion of the Timer cycle. It will remain active until the Timer is reset.

RL=4 (Timer Counting) - This configures the auxiliary relay as a Timer relay. The output will be on whenever the timer is actively counting.

A Only available with Auxiliary Option.

HEATER LOGIC[T] - The unit is provided with a series of options for timer control of the heater. The logic is selected by the 'HL' parameter in the setup stack. The system will respond as follows:

> **HL=0 (Manual)** - This configures the system to ignore any special logic for the heater and it is enabled whenever the Heater On/Off switch has been toggled to On.
>
> **HL=1 (On During Timer Run)** - This configures the heater enable logic to keep the heater Off unless the timer is running. The Heater must be turned On prior to starting the timer. However, the heater will be disabled until the timer is started.
>
> **HL=2 (Off During Timer Run)** - This configures the heater enable logic to keep the heater Off when the timer is running. The Heater must be turned On prior to starting the timer. The heater will then operate as normal, except it will be disabled by the start of the timer and remain off while the timer is running.

HEATER DELAY[T] - The unit is provided with a special feature that allows the user to set a fixed delay whenever the heater is enabled by the Heater On/Off key. The delay time is adjusted using the 'Hd' parameter in the setup stack. The system will respond by keeping the heater disabled for this period of time each time the Heater is turned On.

AUTO START - The mode of operation on system startup is user selectable with the Auto Start Parameter. When ‘AS’ is set to Yes, the controller will startup with the heater active. When ‘AS’ is set to No, the controller will startup in the HOLD mode.

T Only available with Timer Option.

TUNING

The control scheme used in this controller is a standard PID system with anti-reset windup. This section will briefly review PID control as it relates to this system. It should be noted that this discussion specifically relates to this device and may be somewhat different than other systems.

The terms PID and 3 Mode are interchangeable. The first mode of control, >P= (Proportional) refers to the basic control scheme. The concept is that the controller will determine the percentage of heat required by the system and adjust the average power input to the heater to balance the system. The power to the heater is either fully on or fully off. The proportioning is obtained by ratioing the amount of time 'ON' to the amount of time 'OFF'. Thus proportional control in this application is more correctly termed Time Proportioning.

The Cycle Rate (CR) setting is used to determine the rate at which the heater power is turned on and off. The proportioning of the output power is accomplished by varying the percentage of time that the unit is on during the period. For example, if CR = 2, then the unit will cycle on and off once every 2 seconds. If the process has determined that the system requires only half of the full power output of the heater to maintain a specific temperature, the output will be ON for 1 second and OFF for 1 second in a continuous cycle. As the heat requirement varies, this percentage will increase to slightly longer periods ON, such as 1.1 seconds ON, 0.9 seconds OFF. The opposite is true for decreasing heat load requirements. Thus, when the system is at or near the setpoint, the HEAT LED in the status box will continually flash to indicate the time proportioning of the heater.

To compute the required percentage of >ON= time, the system utilizes the Proportional Band (PB) as set in the programming mode. It is over this band that the output will vary from 0 to 100%. If for example, the setpoint is at 1000 degrees F. and the proportional band is set at 100 degrees F., the controller will time proportion the output from 100% to 0% when the process temperature varies from 900 to 1000 degrees F. When the process temperature is at 900 degrees F. and less, the output will be fully on, between 900 and 1000 degrees F. the output will time proportion from 100% down to 0%. At any temperatures above 1000 degrees F., the output will be fully off.

At this point it is important to note that we are discussing systems in which the Rate and Reset functions are not used. Rate and Reset will cause a shifting in the Proportional Band and vary the percentages just discussed. However, Rate and Reset do not affect the basic theory, only the position of the Proportional Band at any moment in time.

Now we will tie the Proportional Band and Cycle Rate together in the example used above. We had a cycle rate of 2 seconds with a Proportional Band of 100 degrees F. and a setpoint of 1000 degrees F. When the process temperature is 960 degrees, we will note that it is 40% into the Proportional Band. Based on this position we require 40% heater output, with the 2 second cycle rate, this means that the heater will be ON for 0.8 seconds and OFF for 1.2 seconds.

Obviously, a proportional control requires a certain degree of error to have the heat on. Therefore, in the example just given if we find that only 10% of the heat is required to maintain the desired temperature. The unit will cycle 0.2 second ON and 1.8 seconds OFF and the temperature will stabilize at 990 degrees. This is not the desired 1000 degrees. The difference between the two is termed Droop. Droop is the difference between the setpoint and the control point in a proportional system.

To remove this Droop, we need the 2nd mode. This is the I (Integral) mode or commonly termed Automatic Reset Mode. The program calculates the difference between the current process temperature and the desired setpoint and mathematically corrects the system to compensate for this error. How often this is done, is based on the parameter that is programmed in the >RE= (Reset Adjustment).

Anti-Reset Windup is a special feature incorporated in the software that locks out the Reset function when the system is outside of the Proportional Band. Obviously, if the system were automatically adjusting the DROOP before the system was nearing stability, large errors would occur. Anti-Reset Windup is used to eliminate such potential errors.

The third mode in the PID scheme is the D (Derivative) mode commonly referred to as RATE. When a system has large step changes in heat requirements, it may require this third mode to compensate for such changes. Its primary function is to eliminate overshoots as the temperature is stabilizing. It controls the rate of change of the temperature when large temperature fluctuations occur. On systems where overshoot is not a problem, the rate function may be eliminated for simplicity.

AUTO TUNING

The system is capable of automatically tuning the PID parameters to fit the specific requirements of a given system. The procedure can take up to 90 minutes depending on the specific system configuration.

To activate the AUTO TUNE:

1. Enter the User Setup stack and change the 'AUTO TUNE' parameter from 'OFF' to 'ON'.
2. Depress the RETURN key to exit the Setup mode.
3. If the system is already active, it will automatically go into AUTO TUNE.
4. If the Heater is turned off, toggle it On with the Heat ON/OFF key.

   Assuming that no alarms are present, the display will display 'AUTO' to indicate that the AUTO TUNE procedure is active.

During this procedure, the system will run a test sequence to determine basic system characteristics. After completing this sequence, the appropriate tuning parameters will be calculated and automatically inserted.

At the completion of this process, the system will perform a ‘SAVE’ function and return to the active mode.

The Proportional Band, Reset and Rate parameters will be affected.

AUTO TUNE should be run with the system operating under normal conditions.

It should be noted that MANUAL TUNING is still available directly through the Programming Stack.

AUTO TUNE may be cancelled without any effect on the old TUNING parameter by either toggling the HEAT ON/OFF key or entering the setup stack and changing the 'AUTO TUNE' parameter back to 'OFF'.

HIGH LIMIT SETTING

The High Limit is an independent circuit that monitors the High Limit thermocouple and physically turns off the safety relay if the preset temperature is exceeded. For safety purposes, this is a totally independent circuit from the microprocessor and thus cannot be set through the front panel. It requires a mechanical adjustment of a multi-turn potentiometer on the circuit board.

WARNING
THIS IS A SAFETY ADJUSTMENT.
DO NOT READJUST WITHOUT SPECIFICALLY
KNOWING THE SAFETY CONSEQUENCES.

The adjustment is a board mounted multi-turn potentiometer. The screw has approximately 25 turns of rotation. Adjusting clockwise, decreases the setpoint. Adjusting counter-clockwise, increases the setpoint.

In this method a thermocouple calibration instrument, Doric Trend-Cal 466 or equivalent is required. This instrument applies the necessary millivolt signal to the controller and displays the equivalent temperature on its digital display.

1) Turn the controller off.
2) Connect a thermocouple lead from the calibrator to the High Limit T/C inputs on the circuit board.
3) If the Process T/C is not connected, place a jumper between Process T/C “IN-“ and “IN+” to eliminate the Open Process T/C alarm.
4) Turn the controller on. Do not turn the Heat on.
5) Adjust the setting on the thermocouple calibrator to the desired trip point. If this is above the current high limit setting, the high limit will trip. This will be indicated by the Alarm LED illuminating and HL alternately flashing in the display.
6) Adjust the Pot in a counterclockwise direction. Once the temperature input falls below the high limit setpoint, the Alarm will be reset. If the setting is below the current high limit setpoint, this step will not be necessary.
7) Adjust the pot slowly in a clockwise direction until the high limit initially activates.
8) Lower the calibrator temperature 25 ^{O}C (45 ^{O}F) and allow the alarm to reset. Then slowly increasing it to the desired trip point. Repeat steps 4 thru 7 if necessary to achieve as accurate a result as required.
9) Write the new setpoint on the sticker in the unit.

BACKDOOR CODE

A special code has been incorporated into the software to insure factory access to all functions no matter what the customer has done with the access codes. This code is 751.

MANUAL REVISIONS

Revision #	Eng. #	Program #	Revision Made
Rev 01	DT7510	DT7510CA	Origination
Rev 02	DT7510	DT7510CB	Editing Updates
Rev 03	DT7510	DT7510CC	Setup Codes/ Editing Updates
Rev 04	DT7510	DT7510CD	Options/ Editing Updates
Rev 05	DT7510	DT7510CE	Setup Codes/ Editing Updates
Rev 06	DT7510	DT7510CE	Alarm Note, Options Wiring
Rev 07	DT7510	DT7510CE	380 VAC Added
Rev 08	DT7510	DT7510CE	7550E40-2 Added
Rev 09	DT7510	DT7510CE	7550E45-2 Added
Rev 10	DT7510	DT7510CE	Add E40-2, E45-2 Block Diagrams
Rev 11	DT7510	DT7510CE	Add Fusing information
Rev 12	DT7510	DT7510CE	Update Table of Contents
Rev 13	DT7510	DT7510CE	415 VAC added
Rev 14	DT7510	DT7510CE	7550G40-2 added

SPECIFICATIONS

7550 SERIES
PROCESS CONTROLLER

RANGE (Temperature)	0 – 1999 Degrees F 0 – 1093 Degrees C
RESOLUTION (Temperature)	1 Degree F 1 Degree C
NOISE REJECTION	NMR – 60 db @ 60 HZ CMR – 120 db @ 60 HZ
RANGE (Time) (Optional)	0:00 – 99:59 Min:Sec 0:00 – 99:59 Hrs:Min
RESOLUTION (Time) (Optional)	1 Sec 1 Min
MEASURING TIME	10 Conversions/Sec
DISPLAY	Four or Eight, 0.56 Inch High, Seven Segment, LED Uniplanar numerals. Eight Discrete LEDs (Red, Green, Amber)
ANNUNCIATOR	Audio Tone, ~ 3200 HZ
SETUP MEMORY	EEPROM, All Parameters
MEMORY RETENTION	10 Years w/o Power (No Battery Required)
SENSOR*	Standard - Type K Thermocouple, Cold Junction Compensation, Up Scale Break Protection.
CONTROL	PID with Anti-Reset Windup.
ADJUSTMENT	Cycle Rate: 1 – 19 Sec. Proportional Band: 0 – 199 Deg. F, 0 – 111 Deg. C Reset (Integral): 0 – 199 Sec Rate (Derivative): 0 – 199 Sec Calibration Offset: ± 99 Deg. F, ± 55 Deg. C

* Other Sensors Available (TYPE J T/C, RTD, etc.)

OPERATING RANGE	0 to 50 Degrees C
STORAGE RANGE	-40 to 60 Degrees C
CONSTRUCTION	Enclosure – NEMA 12, 14 ga steel, powder coated Face – Lexan, Back Printed
SIZE	10 x 8 x 6 inches (HxWxD) (7550A20 Model only) 10 x 10 x 6 inches (HxWxD) (All other Models)
WEIGHT	≤ 18 Lbs. (8.16 kg) ≤ 22 Lbs. (9.98 kg)
CONNECTION	Power & Load – 20 Amp Pressure Connector 22-10 AWG 40 Amp Pressure Connector 22-8 AWG Control – 6-32 Screws, 14 to 24 AWG Communications-DB9 (Optional)
OUTPUT	Heater: SSR, Optically isolated, Zero cross, 25 amps and 50 amps De-rated to carry 20 amps or 40 amps at 40 C.
AUX RATING (Optional)	10 Amp 250 VAC, 1 HP 250 VAC

LIMITED WARRANTY

WARRANTY: FARNAM WARRANTS ITS NEW PRODUCTS TO BE FREE FROM DEFECTS IN MATERIALS AND WORKMANSHIP UNDER THE SERVICE FOR WHICH THEY ARE INTENDED. THIS WARRANTY IS EFFECTIVE FOR TWELVE MONTHS FROM THE DATE OF SHIPMENT.

EXCLUSIONS: THIS WARRANTY IS **IN LIEU OF** ANY OTHER WARRANTY EXPRESSED OR IMPLIED, INCLUDING, BUT NOT LIMITED TO ANY IMPLIED WARRANTY OF **MERCHANTABILITY** OR FITNESS FOR A PARTICULAR PURPOSE.

FARNAM IS NOT LIABLE FOR ANY INCIDENTAL OR CONSEQUENTIAL DAMAGES.

NO PERSON OTHER THAN AN OFFICER IS AUTHORIZED TO GIVE ANY OTHER WARRANTY OR ASSUME ANY LIABILITY.

REMEDIES: THE PURCHASER'S SOLE AND EXCLUSIVE REMEDY SHALL BE: (1) THE REPAIR OR REPLACEMENT OF DEFECTIVE PARTS OR PRODUCTS, WITHOUT CHARGE. (2) AT THE OPTION OF **FARNAM**, THE REFUND OF THE PURCHASE PRICE.

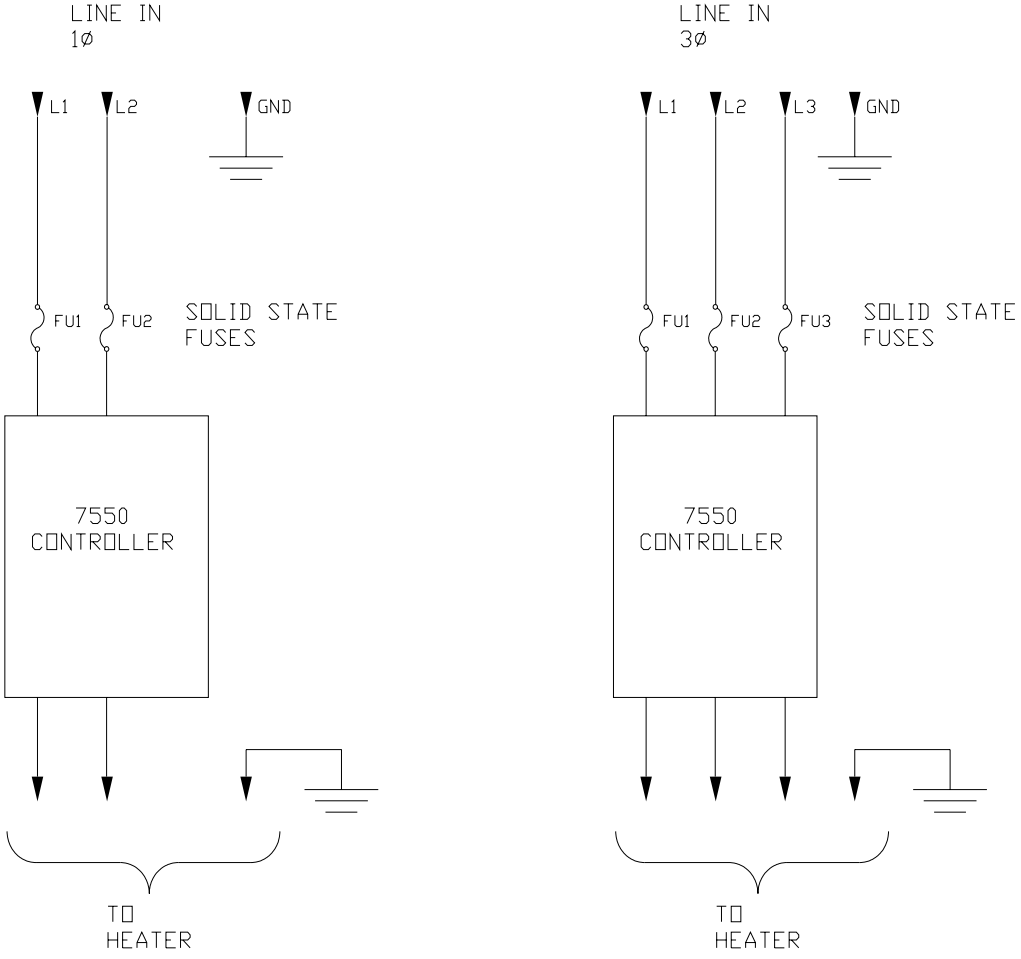
RECOMMENDED FUSING

Ultra fast blow fuses are recommended as protection for the power circuits within the controller. The power circuits contain Solid State Relays (SSR's) that are sensitive to any overcurrent or short circuit conditions. Standard fusing will not open quickly enough to protect the SSR's.

If the recommended fuses are not used, and the heater power is shorted internally or to ground, it is probable that the SSR's will fail in a permanently closed state. Upon restarting the controller, this will result in power being continuously applied to the heater causing a runaway heat condition. Using the recommended fusing should prevent this.

These fuses must be appropriately installed in series with the incoming power to the controller, as shown. Contact the fuse supplier or their distributor, listed on the following page, for installation components and details.

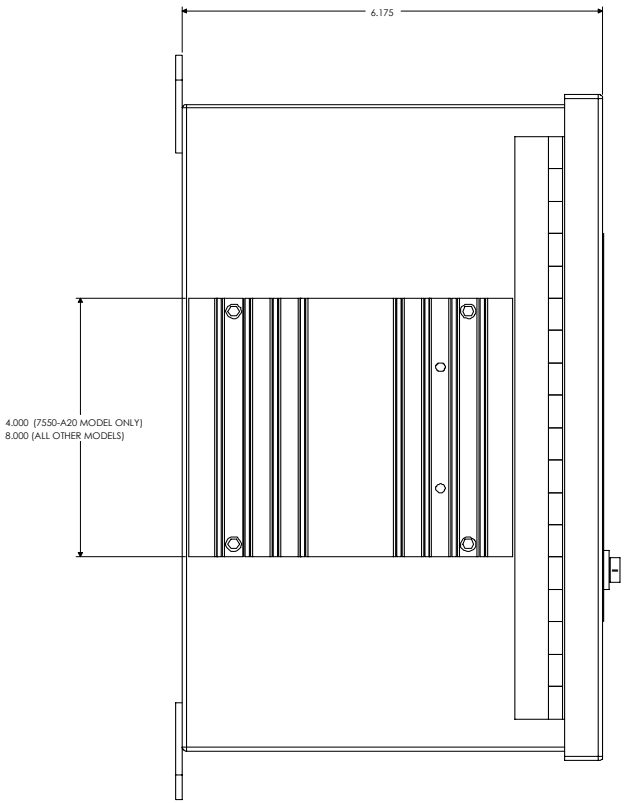
Fuse Wiring Diagrams:



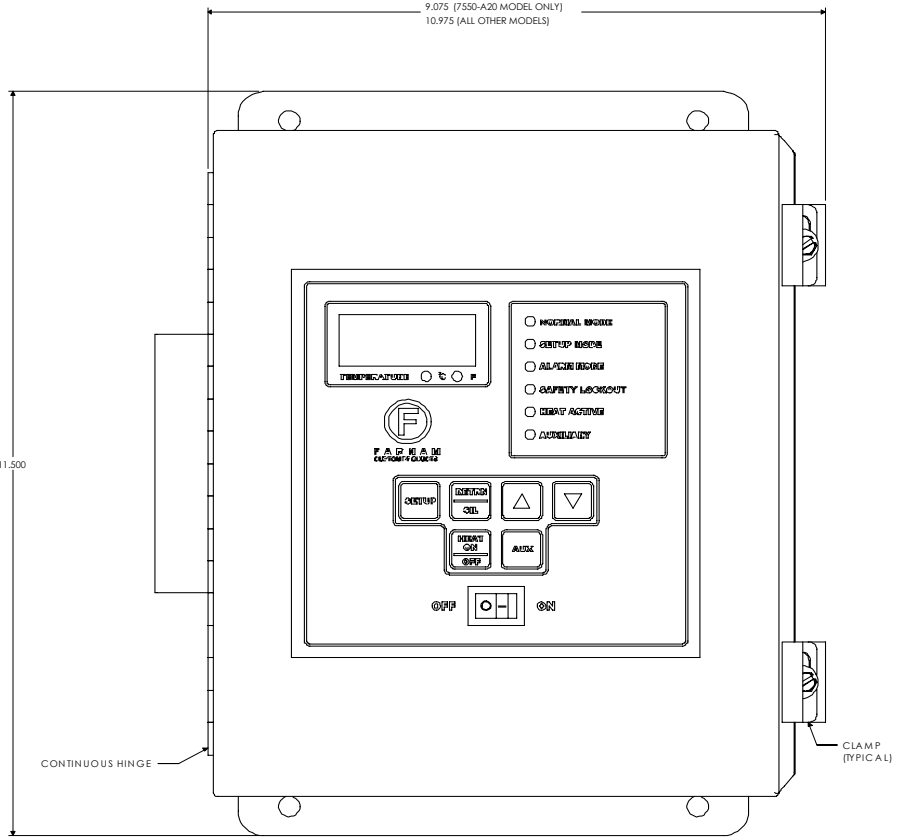
Fusing Contact Information:

Edison	1-510-601-4051	www.EdisonFuseGear.com
Ferraz-Shamut	1-800-739-9145 1-918-665-6888	www.ferrazfuses.com

CONTROLLER PART NUMBER	# FUSES REQUIRED	SSR P/N	Semiconductor Fusing	
			Edison	Ferraz
7550-H40	3	D4850		A50QS50
7550-H20	3	D4825	E50SF25	
7550-G40-2	6	D4850		A50QS50
7550-G40	3	D4850		A50QS50
7550-E45-2	6	D4850		A50QS50
7550-E40-2	6	D4850		A50QS50
7550-E40	3	D4850		A50QS50
7550-E20	3	D4825	E50SF25	
7550-B40	2	D2450	E25S50	A30QS50
7550-B20	2	D2425		A30QS25
7550-A40	2	D2450	E25S50	A30QS50
7550-A20	2	D2425		A30QS25



LEFT SIDE VIEW



FRONT VIEW

GENERAL NOTES
1. NEMA TYPE 12 ENCLOSURE.

TOLERANCES UNLESS OTHERWISE SPECIFIED

ALL DIMENSIONS ARE IN INCHES

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FARNAM CUSTOM PRODUCTS SERIES 7550 PROCESS CONTROLLER
PHYSICAL DIMENSIONS

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QA DATE		SHEET 1 OF 1			

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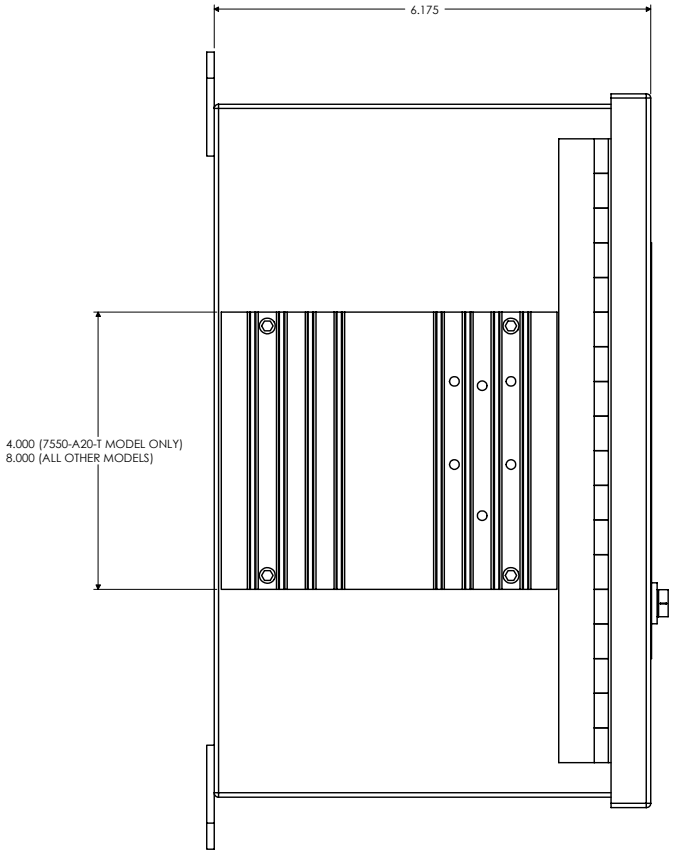
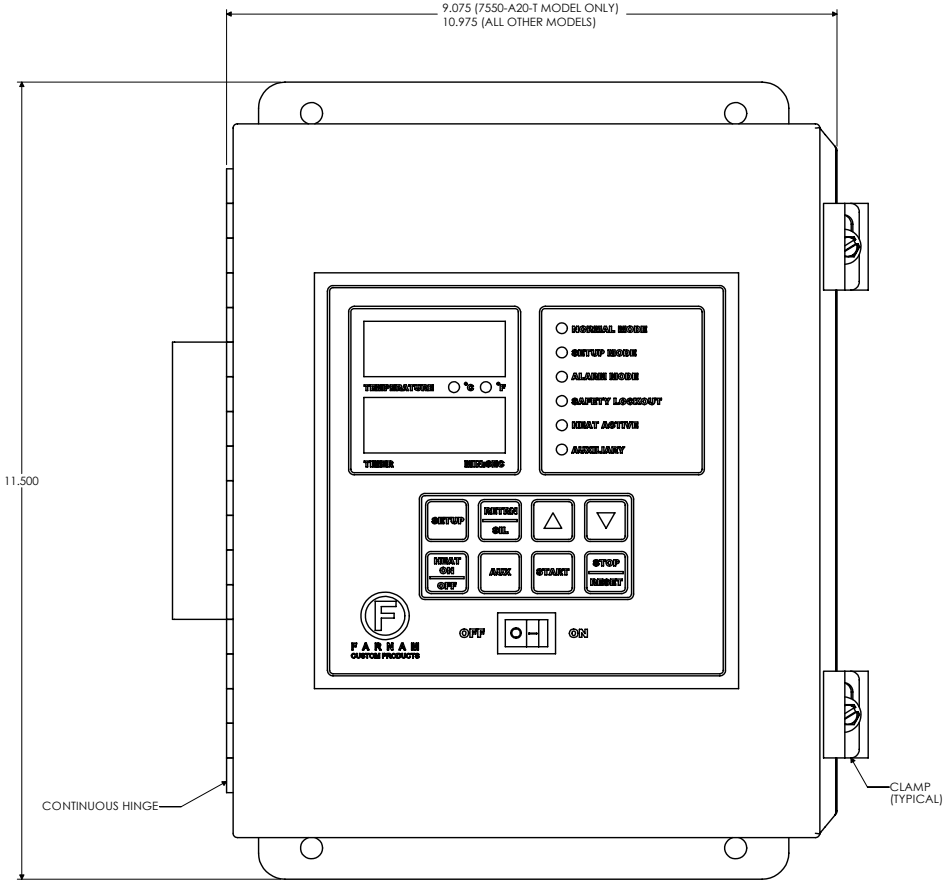


SIDE VIEW



FRONT VIEW

GENERAL NOTES
1. NEMA TYPE 12 ENCLOSURE.

TOLERANCES UNLESS OTHERWISE SPECIFIED

ALL DIMENSIONS ARE IN INCHES

PATH =E:\CC\DT7550\7550T-PHYSICAL0.SLDDRW

FARNAM CUSTOM PRODUCTS SERIES 7550 PROCESS CONTROLLER (with TIMER OPTION) PHYSICAL DIMENSIONS

APPROVAL		DWN BY	DATE	SCALE	CHKD BY
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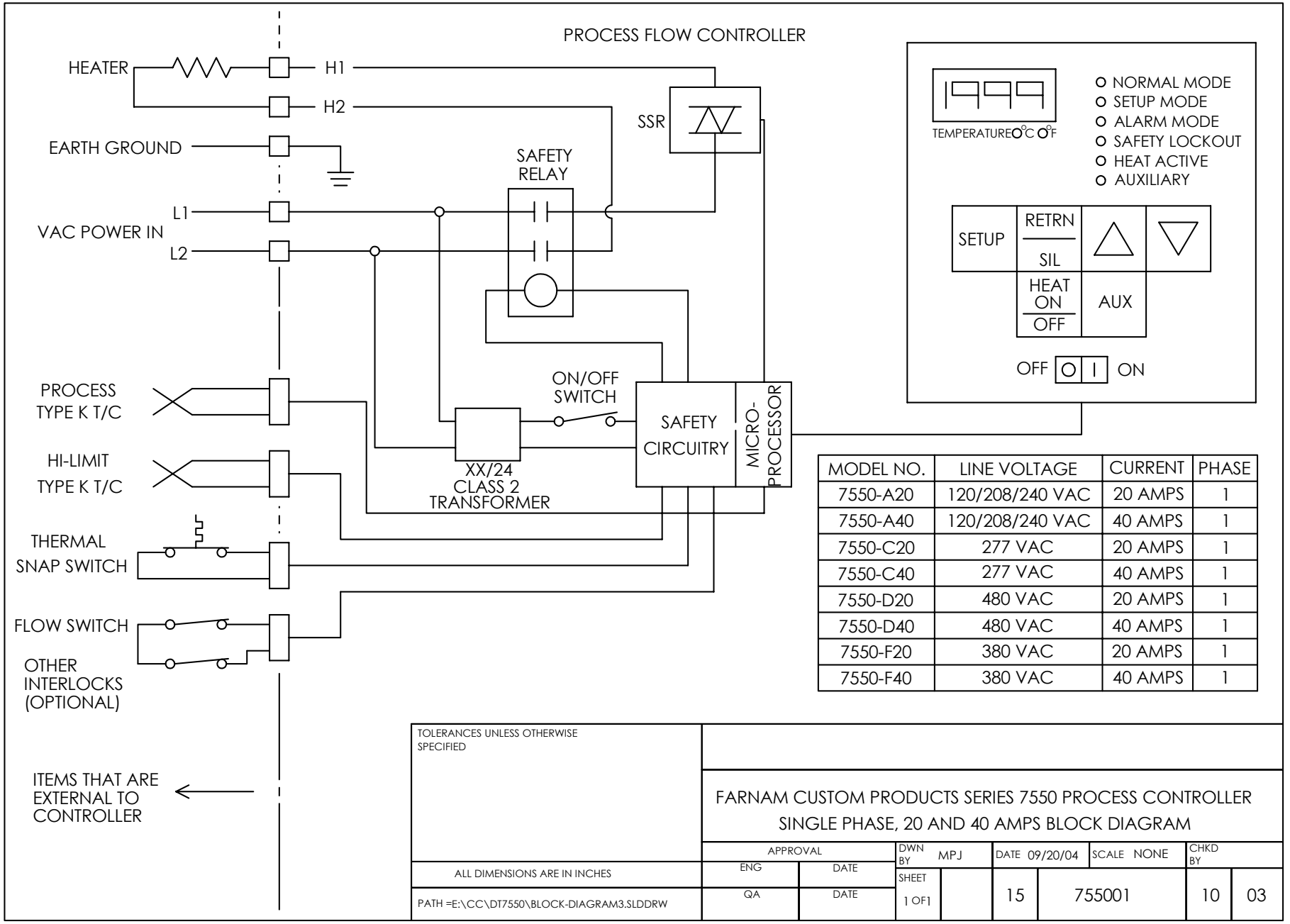
QA	DATE	SHEET 1 OF 1	44	755014	30 00



MODEL NO.	LINE VOLTAGE	CURRENT	PHASE
7550-A20	120/208/240 VAC	20 AMPS	1
7550-A40	120/208/240 VAC	40 AMPS	1
7550-C20	277 VAC	20 AMPS	1
7550-C40	277 VAC	40 AMPS	1
7550-D20	480 VAC	20 AMPS	1
7550-D40	480 VAC	40 AMPS	1
7550-F20	380 VAC	20 AMPS	1
7550-F40	380 VAC	40 AMPS	1

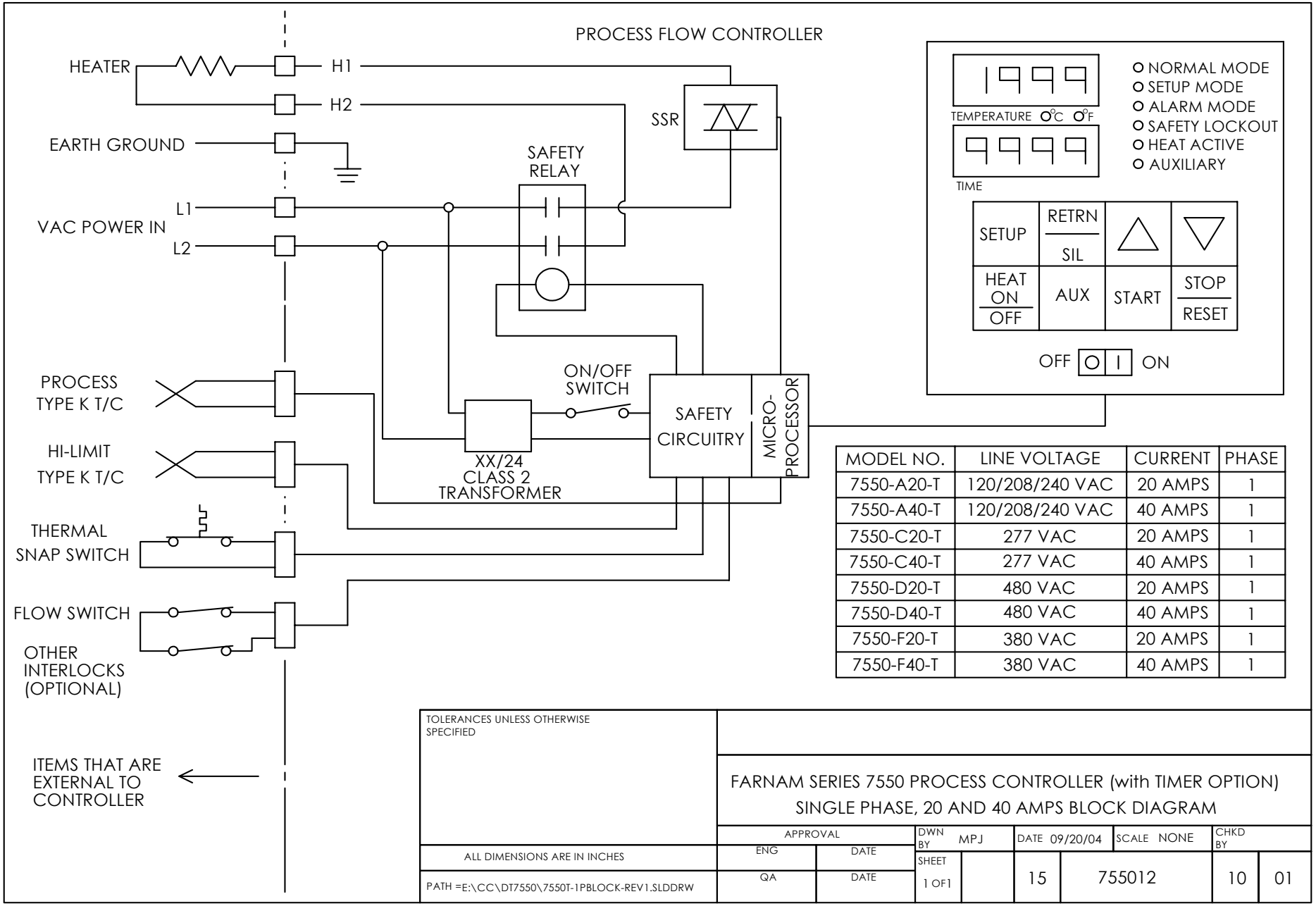
TOLERANCES UNLESS OTHERWISE SPECIFIED

ALL DIMENSIONS ARE IN INCHES

PATH =E:\CC\DT7550\BLOCK-DIAGRAM3.SLDDRW

FARNAM CUSTOM PRODUCTS SERIES 7550 PROCESS CONTROLLER
SINGLE PHASE, 20 AND 40 AMPS BLOCK DIAGRAM

APPROVAL		DWN BY	DATE	SCALE	CHKD BY
ENG	DATE	MPJ	09/20/04	NONE	
QA	DATE	SHEET 1 OF1	15	755001	10 03



MODEL NO.	LINE VOLTAGE	CURRENT	PHASE
7550-A20-T	120/208/240 VAC	20 AMPS	1
7550-A40-T	120/208/240 VAC	40 AMPS	1
7550-C20-T	277 VAC	20 AMPS	1
7550-C40-T	277 VAC	40 AMPS	1
7550-D20-T	480 VAC	20 AMPS	1
7550-D40-T	480 VAC	40 AMPS	1
7550-F20-T	380 VAC	20 AMPS	1
7550-F40-T	380 VAC	40 AMPS	1

TOLERANCES UNLESS OTHERWISE SPECIFIED

ALL DIMENSIONS ARE IN INCHES

PATH =E:\CC\DT7550\7550T-1PBLOCK-REV1.SLDDRW

FARNAM SERIES 7550 PROCESS CONTROLLER (with TIMER OPTION)
SINGLE PHASE, 20 AND 40 AMPS BLOCK DIAGRAM

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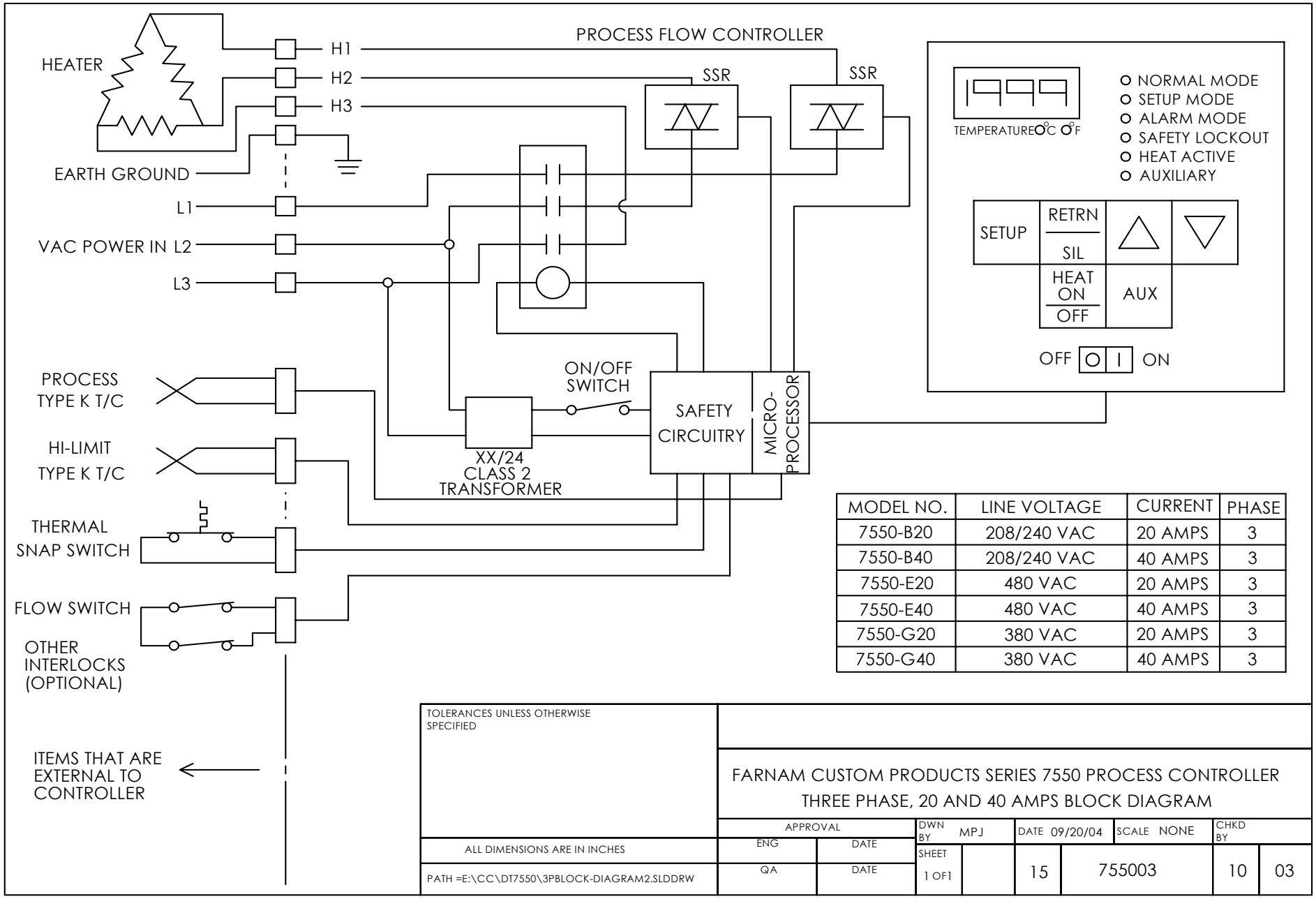
QA	DATE	SHEET 1 OF1			

15	755012	10	01



MODEL NO.	LINE VOLTAGE	CURRENT	PHASE
7550-B20	208/240 VAC	20 AMPS	3
7550-B40	208/240 VAC	40 AMPS	3
7550-E20	480 VAC	20 AMPS	3
7550-E40	480 VAC	40 AMPS	3
7550-G20	380 VAC	20 AMPS	3
7550-G40	380 VAC	40 AMPS	3

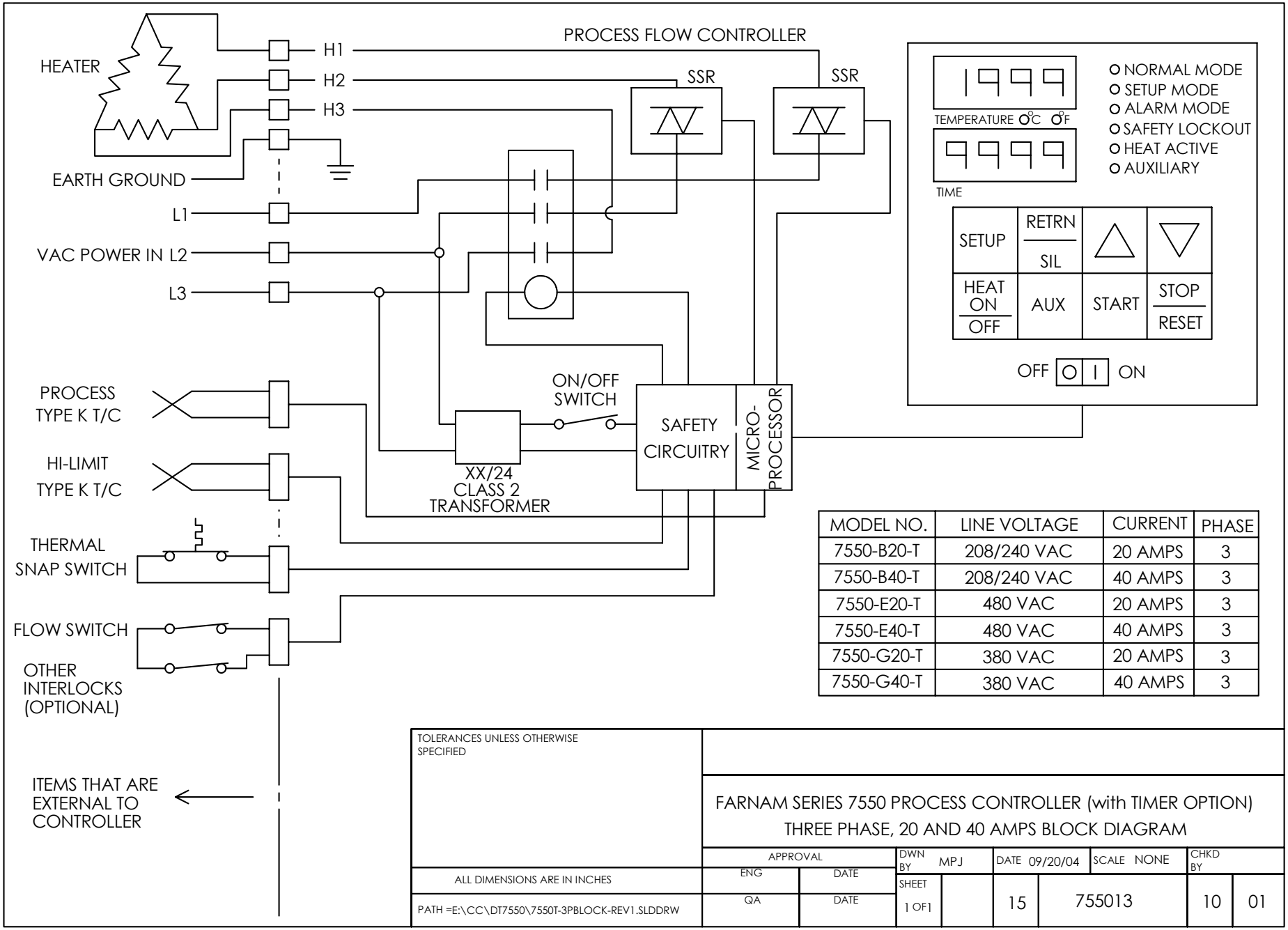
TOLERANCES UNLESS OTHERWISE SPECIFIED

ALL DIMENSIONS ARE IN INCHES

PATH =E:\CC\DT7550\3PBLOCK-DIAGRAM2.SLDDRW

FARNAM CUSTOM PRODUCTS SERIES 7550 PROCESS CONTROLLER
THREE PHASE, 20 AND 40 AMPS BLOCK DIAGRAM

APPROVAL		DWN BY MPJ	DATE 09/20/04	SCALE NONE	CHKD BY	
ENG	DATE	SHEET 1 OF1	15	755003	10	03
QA	DATE					



MODEL NO.	LINE VOLTAGE	CURRENT	PHASE
7550-B20-T	208/240 VAC	20 AMPS	3
7550-B40-T	208/240 VAC	40 AMPS	3
7550-E20-T	480 VAC	20 AMPS	3
7550-E40-T	480 VAC	40 AMPS	3
7550-G20-T	380 VAC	20 AMPS	3
7550-G40-T	380 VAC	40 AMPS	3

TOLERANCES UNLESS OTHERWISE SPECIFIED

ALL DIMENSIONS ARE IN INCHES

PATH =E:\CC\DT7550\7550T-3PBLOCK-REV1.SLDDRW

FARNAM SERIES 7550 PROCESS CONTROLLER (with TIMER OPTION)
THREE PHASE, 20 AND 40 AMPS BLOCK DIAGRAM

APPROVAL		DWN BY MPJ	DATE 09/20/04	SCALE NONE	CHKD BY	
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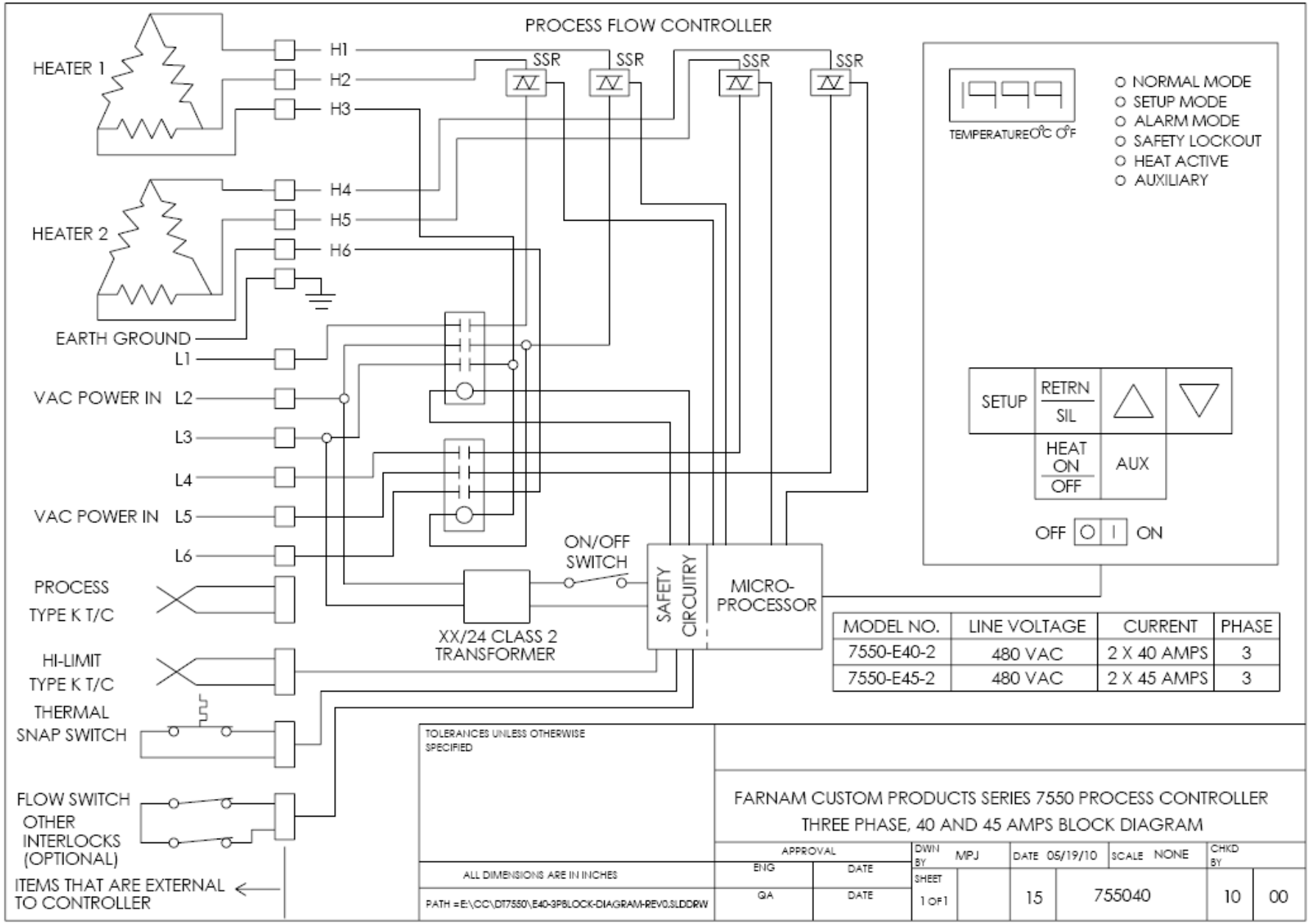
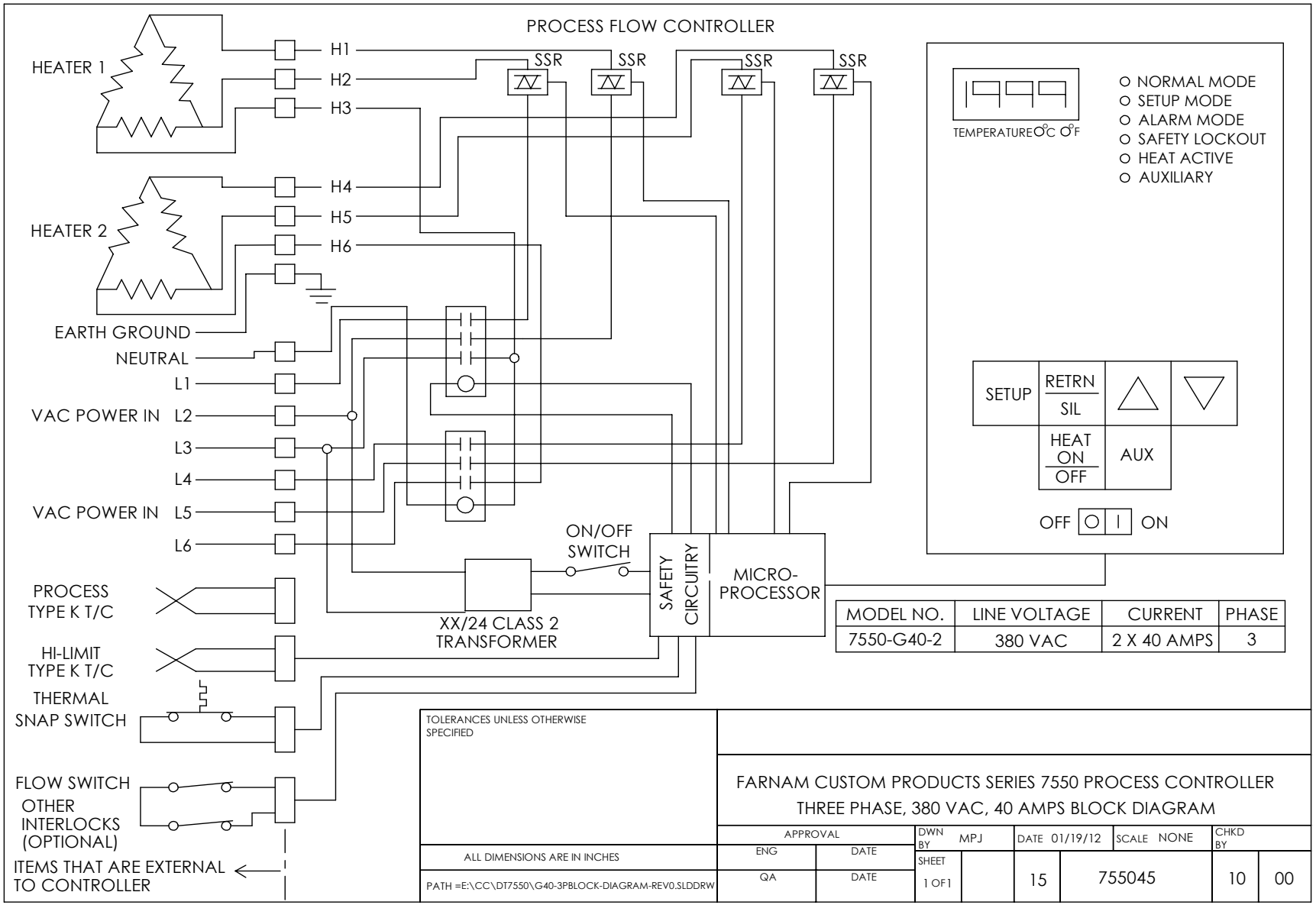
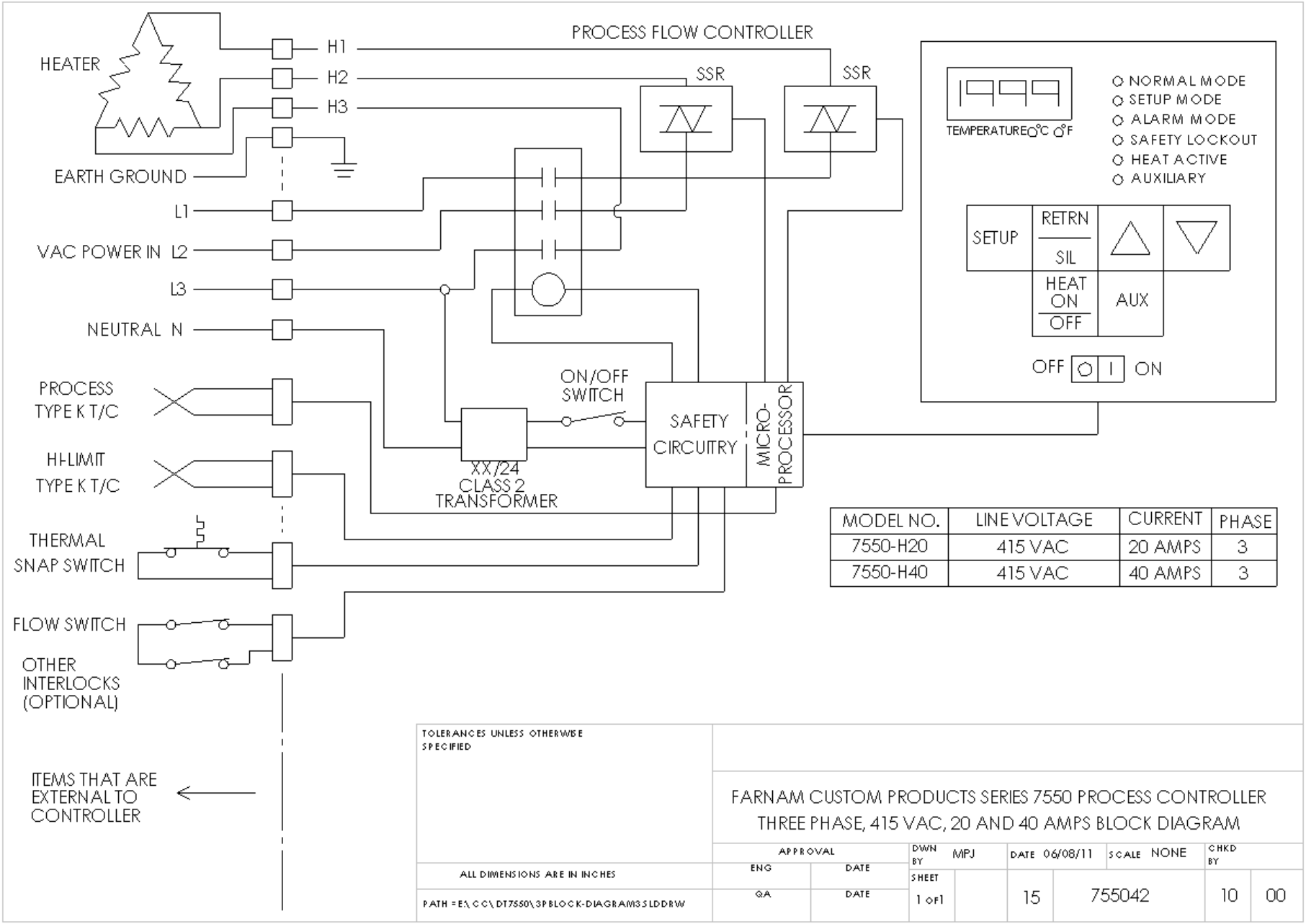
QA	DATE						



MODEL NO.	LINE VOLTAGE	CURRENT	PHASE
7550-E40-2	480 VAC	2 X 40 AMPS	3
7550-E45-2	480 VAC	2 X 45 AMPS	3

FARNAM CUSTOM PRODUCTS SERIES 7550 PROCESS CONTROLLER
THREE PHASE, 40 AND 45 AMPS BLOCK DIAGRAM


PROCESS FLOW CONTROLLER
HEATER 1
HEATER 2
H1
H2
H3
H4
H5
H6
SSR
SSR
SSR
SSR
EARTH GROUND
NEUTRAL
L1
VAC POWER IN L2
L3
L4
VAC POWER IN L5
L6
PROCESS TYPE K T/C
HI-LIMIT TYPE K T/C
THERMAL SNAP SWITCH
FLOW SWITCH
OTHER INTERLOCKS (OPTIONAL)
ITEMS THAT ARE EXTERNAL TO CONTROLLER
ON/OFF SWITCH
XX/24 CLASS 2 TRANSFORMER
SAFETY CIRCUITRY
MICRO-PROCESSOR
TEMPERATURE °C °F
NORMAL MODE
SETUP MODE
ALARM MODE
SAFETY LOCKOUT
HEAT ACTIVE
AUXILIARY
SETUP
RETRN
SIL
HEAT
ON
OFF
AUX
OFF O I ON
MODEL NO. | LINE VOLTAGE | CURRENT | PHASE
7550-G40-2 | 380 VAC | 2 X 40 AMPS | 3
TOLERANCES UNLESS OTHERWISE SPECIFIED
ALL DIMENSIONS ARE IN INCHES
PATH =E:\CC\DT7550\G40-3PBLOCK-DIAGRAM-REV0.SLDDRW
FARNAM CUSTOM PRODUCTS SERIES 7550 PROCESS CONTROLLER
THREE PHASE, 380 VAC, 40 AMPS BLOCK DIAGRAM
APPROVAL
ENG
DATE
QA
DATE
DWN BY MPJ
DATE 01/19/12
SCALE NONE
CHKD BY
SHEET 1 OF1
15
755045
10
00



MODEL NO.	LINE VOLTAGE	CURRENT	PHASE
7550-H20	415 VAC	20 AMPS	3
7550-H40	415 VAC	40 AMPS	3

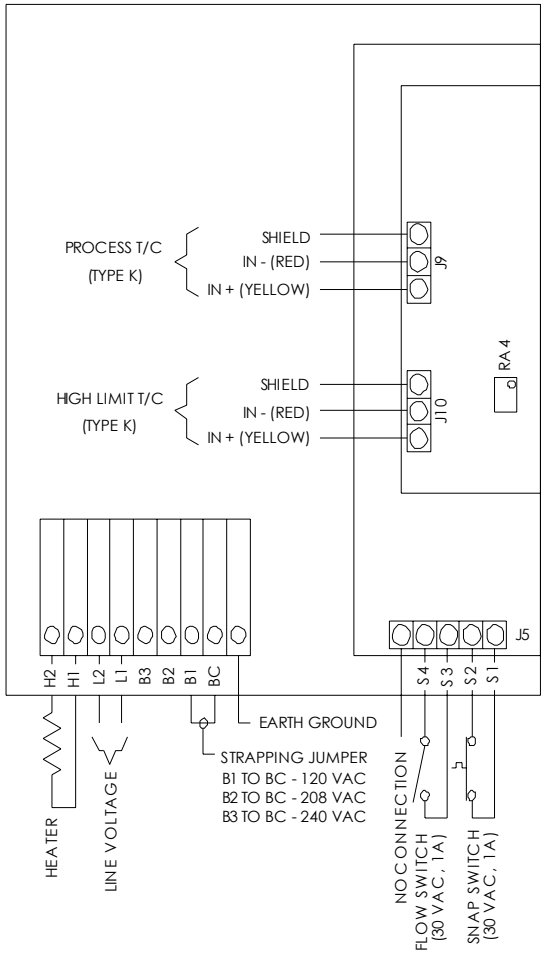
TOLERANCES UNLESS OTHERWISE SPECIFIED

ALL DIMENSIONS ARE IN INCHES

PATH = E:\CC\DT7550\3PBLOCK-DIAGRAM3SLDDRW

FARNAM CUSTOM PRODUCTS SERIES 7550 PROCESS CONTROLLER
THREE PHASE, 415 VAC, 20 AND 40 AMPS BLOCK DIAGRAM

APPROVAL		DWN BY	DATE	SCALE	CHKD BY
ENG	DATE	MPJ	06/08/11	NONE	
QA	DATE	SHEET 1 OF 1	15	755042	10 00



RA4 - HIGH LIMIT ADJUST (0 °F TO 2200 °F)

MODEL NUMBER	VOLTAGE	PHASE	CURRENT
7550-A20	120/208/240 VAC	1	20 AMPS
7550-A40	120/208/240 VAC	1	40 AMPS

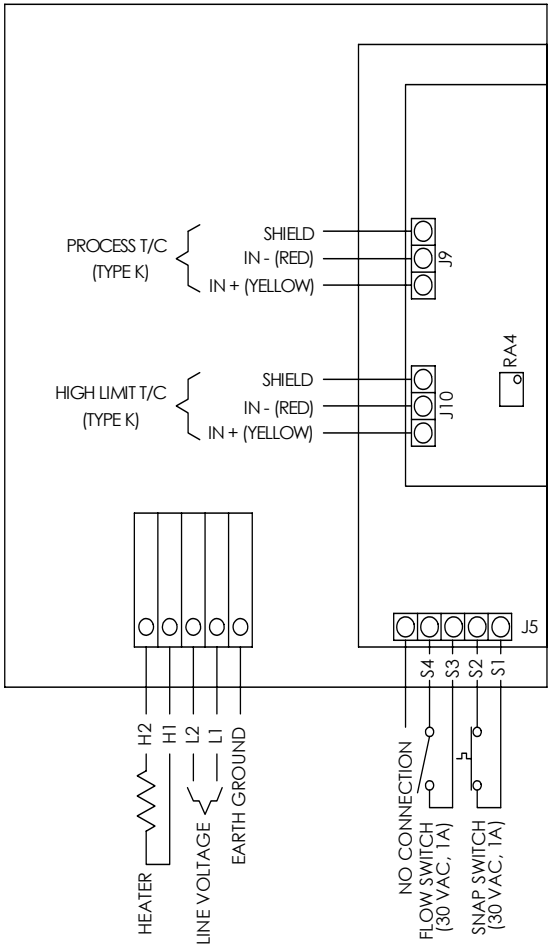
TOLERANCES UNLESS OTHERWISE SPECIFIED

ALL DIMENSIONS ARE IN INCHES

PATH = E:\CC\DT7550\WIRING-1P120-240-REV1.SLDDRW

FARNAM CUSTOM PRODUCTS SERIES 7550 PROCESS CONTROLLER
SINGLE PHASE, 120/208/240 VAC, 20/40 AMPS WIRING DIAGRAM

APPROVAL		DWN BY	DATE	SCALE	CHKD BY
ENG	DATE	MPJ	05/17/03	NONE	
QA	DATE	SHEET 1 OF 1	12	755004	20 01



RA4 - HIGH LIMIT ADJUST (0 °F TO 2200 °F)

MODEL NUMBER	VOLTAGE	PHASE	CURRENT
7550-C20	277 VAC	1	20 AMPS
7550-C40	277 VAC	1	40 AMPS
7550-D20	480 VAC	1	20 AMPS
7550-D40	480 VAC	1	40 AMPS
7550-F20	380 VAC	1	20 AMPS
7550-F40	380 VAC	1	40 AMPS

TOLERANCES UNLESS OTHERWISE SPECIFIED

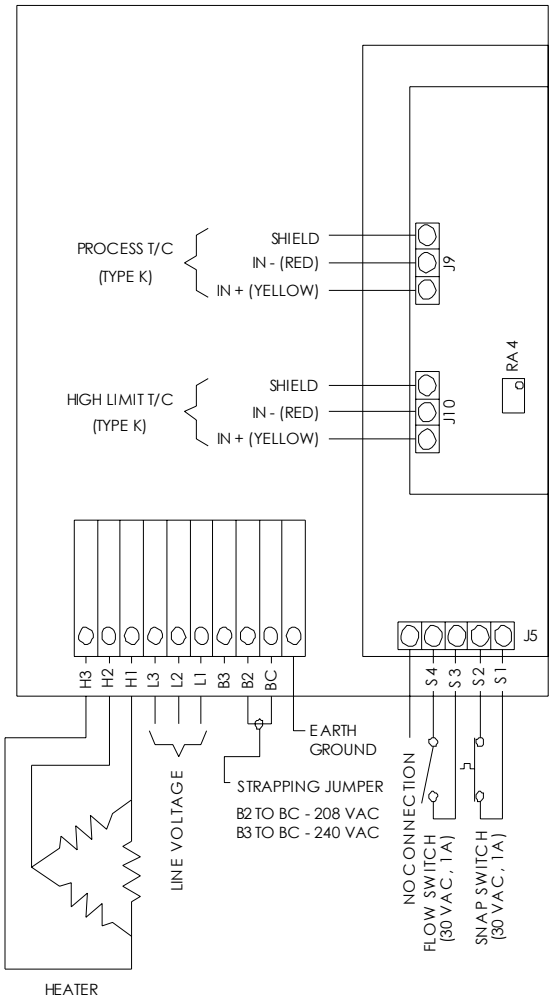
ALL DIMENSIONS ARE IN INCHES

PATH =E:\CC\DT7550\WIRING-1P277-480-REV2.SLDDRW

FARNAM CUSTOM PRODUCTS SERIES 7550 PROCESS CONTROLLER
SINGLE PHASE, 277/380/480 VAC, 20/40 AMPS WIRING DIAGRAM

APPROVAL		DWN BY	DATE	SCALE	CHKD BY
ENG	DATE	MPJ	09/20/04	NONE	
QA	DATE	SHEET 1 OF 1			

12 | 755005 | 20 | 02



RA4 - HIGH LIMIT ADJUST (0 °F TO 2200 °F)

MODEL NUMBER	VOLTAGE	PHASE	CURRENT
7550-B20	208/240 VAC	3	20 AMPS
7550-B40	208/240 VAC	3	40 AMPS

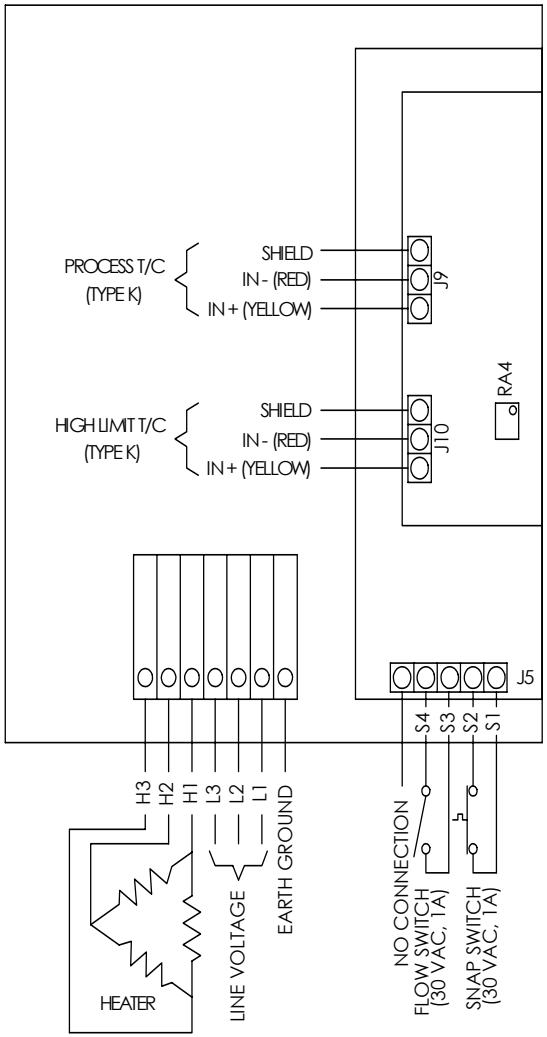
TOLERANCES UNLESS OTHERWISE SPECIFIED

ALL DIMENSIONS ARE IN INCHES

PATH = E:\CC\DT7550\WIRING-3P208-240-REV1.SLDDRW

FARNAM CUSTOM PRODUCTS SERIES 7550 PROCESS CONTROLLER
THREE PHASE, 208/240 VAC, 20/40 AMPS WIRING DIAGRAM

APPROVAL		DWN BY	DATE	SCALE	CHKD BY
ENG	DATE	MPJ	05/19/03	NONE	
QA	DATE	SHEET 1 OF 1	12	755006	20 01



RA4 - HIGH LIMIT ADJUST (0 °F TO 2200 °F)

MODEL NUMBER	VOLTAGE	PHASE	CURRENT
7550-E20	480 VAC	3	20 AMPS
7550-E40	480 VAC	3	40 AMPS
7550-G20	380 VAC	3	20 AMPS
7550-G40	380 VAC	3	40 AMPS

TOLERANCES UNLESS OTHERWISE SPECIFIED

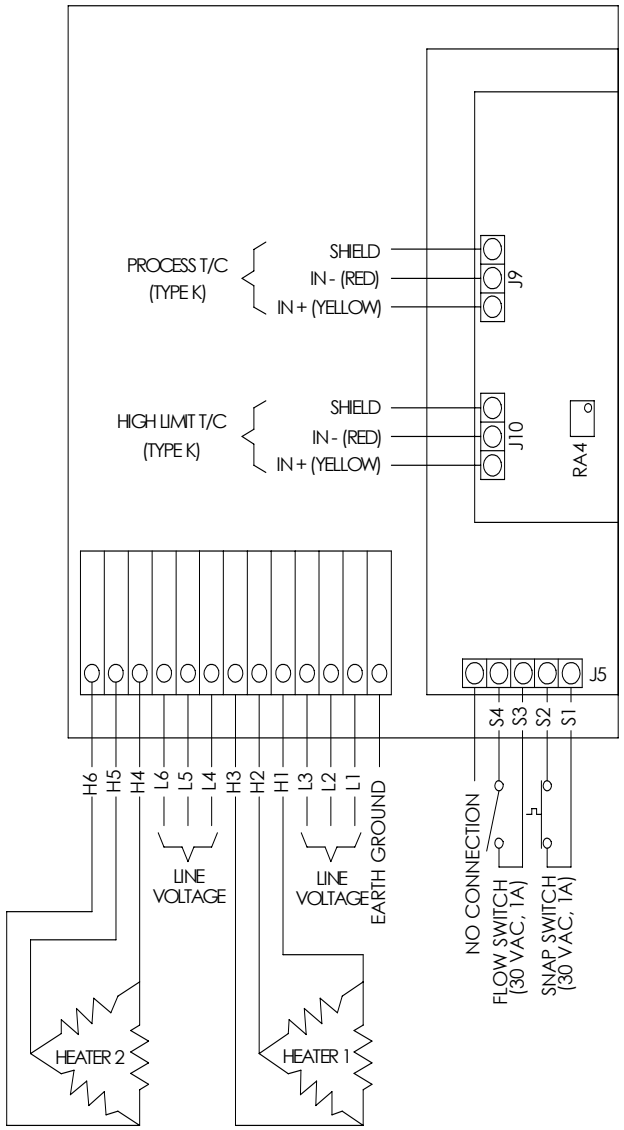
ALL DIMENSIONS ARE IN INCHES

PATH =E:\CC\DT7550\WIRING-3P480-REV2.SLDDRW

FARNAM CUSTOM PRODUCTS SERIES 7550 PROCESS CONTROLLER
THREE PHASE, 380/480 VAC, 20/40 AMPS WIRING DIAGRAM

APPROVAL		DWN BY MPJ	DATE 09/20/04	SCALE NONE	CHKD BY
ENG	DATE	SHEET 1 OF 1			
QA	DATE				

12	755007	20	02



RA4 - HIGH LIMIT ADJUST (0°F TO 2200°F)

MODEL	DESCRIPTION
7550-E40-2	3-PHASE, 480 VAC, 40AMP, 2 CIRCUIT
7550-E45-2	3-PHASE, 480 VAC, 45 AMP, 2 CIRCUIT

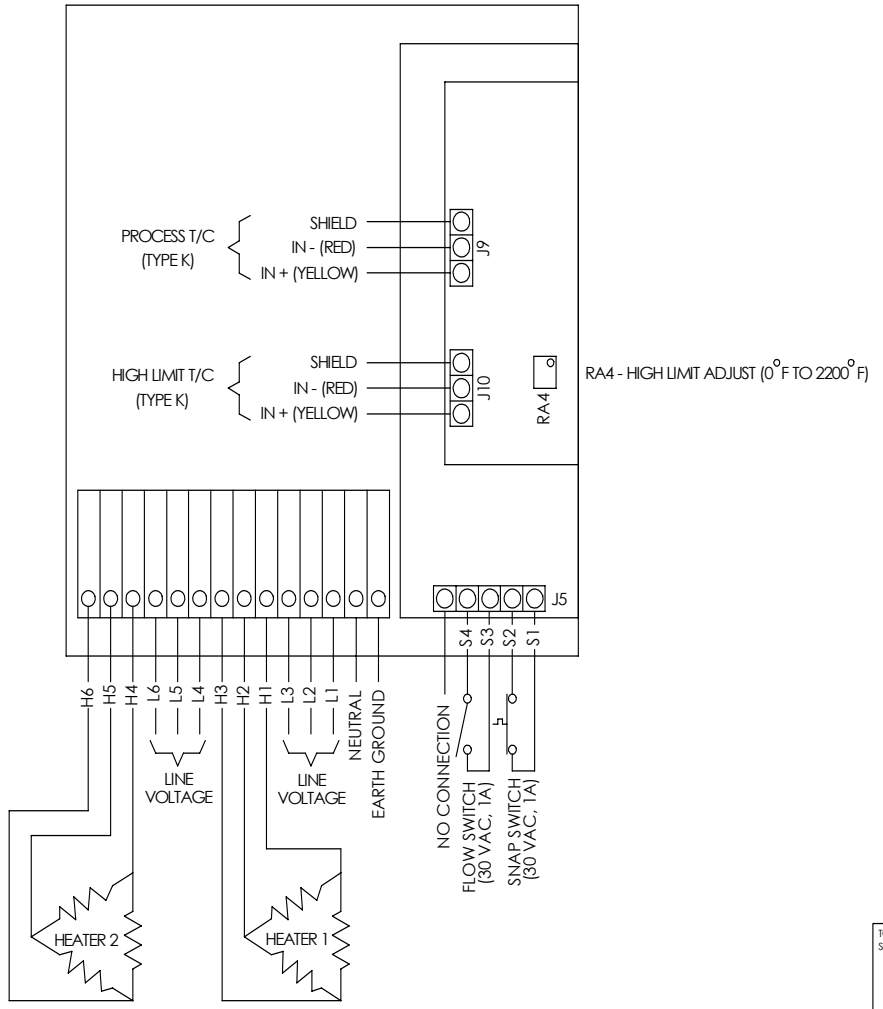
TOLERANCES UNLESS OTHERWISE SPECIFIED

ALL DIMENSIONS ARE IN INCHES

PATH =E:\CC\DT7550\7550-E40-2-WIRING-REV0.SLDDRW

FARNAM CUSTOM PRODUCTS
SERIES 7550-EXX-2 PROCESS CONTROLLER
THREE PHASE, 480 VAC, 40 AMPS WIRING DIAGRAM

APPROVAL		DWN BY	MPJ	DATE	06/09/05	SCALE	NONE	CHKD BY	
ENG	DATE	SHEET		12	755020		20		00
QA	DATE	1 OF 1							



MODEL	DESCRIPTION
7550-G40-2	3 - PHASE, 380 VAC, 40 AMP, 2 CIRCUIT

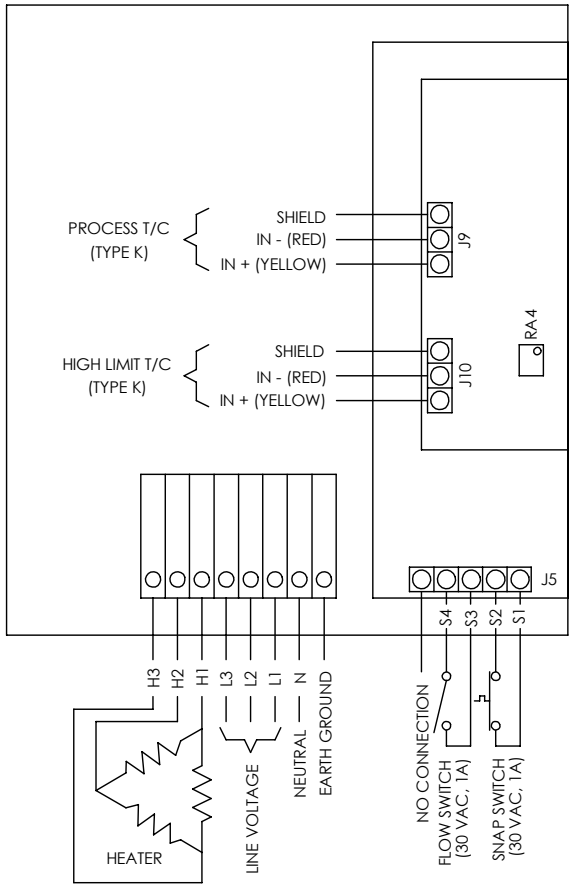
TOLERANCES UNLESS OTHERWISE SPECIFIED

ALL DIMENSIONS ARE IN INCHES

PATH =E:\CC\DI7550\7550-G40-2-WIRING-REV0.SLDDRW

FARNAM CUSTOM PRODUCTS
SERIES 7550-G40-2 PROCESS CONTROLLER
THREE PHASE, 380 VAC, 40 AMPS WIRING DIAGRAM

APPROVAL		DWN BY MPJ	DATE 01/19/12	SCALE NONE	CHKD BY
ENG	DATE	SHEET 1 OF 1			
QA	DATE	12	755044	20	00



RA4 - HIGH LIMIT ADJUST (0 F° TO 2200 F°)

MODEL NUMBER	VOLTAGE	PHASE	CURRENT
7550-H20	415 VAC	3	20 AMPS
7550-H40	415 VAC	3	40 AMPS

TOLERANCES UNLESS OTHERWISE SPECIFIED

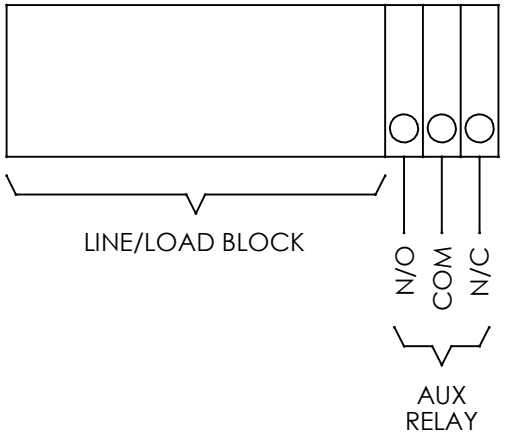
ALL DIMENSIONS ARE IN INCHES

PATH =E:\CC\DT7550\WIRING-3P415-REV1.SLDDRW

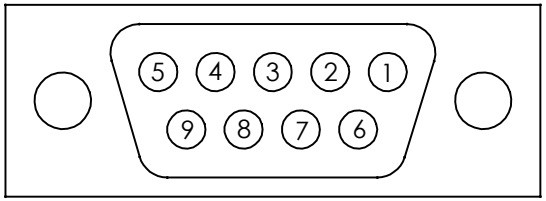
FARNAM CUSTOM PRODUCTS SERIES 7550 PROCESS CONTROLLER
THREE PHASE, 415 VAC, 20/40 AMPS WIRING DIAGRAM

APPROVAL		DWN BY MPJ	DATE 01/19/12	SCALE NONE	CHKD BY
ENG	DATE	SHEET 1 OF 1			
QA	DATE				

12	755043	20	01



TOLERANCES UNLESS OTHERWISE SPECIFIED	FARNAM CUSTOM PRODUCTS SERIES 7550 PROCESS CONTROLLER WIRING DIAGRAM FOR AUX RELAY OUTPUT FUNCTION							
	APPROVAL		DWN BY MPJ	DATE 01/20/04	SCALE NONE	CHKD BY		
ALL DIMENSIONS ARE IN INCHES	ENG	DATE	SHEET					
PATH =E:\CC\DT7550\AUX-RELAY0.SLDDRW	QA	DATE	1 OF1		12	755015	10	00



9 PIN FEMALE D-SUBMINATURE CONNECTOR

RS232

1 - NO CONNECTION
2 - TxD
3 - RxD
4 - NO CONNECTION
5 - COMMON
6 - NO CONNECTION
7 - NO CONNECTION
8 - NO CONNECTION
9 - NO CONNECTION

TOLERANCES UNLESS OTHERWISE SPECIFIED	FARNAM CUSTOM PRODUCTS SERIES 7550 PROCESS CONTROLLER WIRING DIAGRAM FOR RS232 COMMUNICATION							
	APPROVAL		DWN BY MPJ	DATE 01/20/04	SCALE NONE	CHKD BY		
ALL DIMENSIONS ARE IN INCHES	ENG	DATE	SHEET					
PATH =E:\CC\DT7550\RS232-WIRING-DIAGRAMO.SLDDRW	QA	DATE	1 OF1		12	755016	10	00