

The 50A65-843 is an automatic gas interrupted ignition control that employs a microprocessor to continually monitor, analyze, and control the proper operation of the gas burner, inducer, and fan.

Signals interpreted during continual surveillance of the thermostat and flame sensing element initiate automatic ignition of the burner, sensing of the flame, and system shut-off during normal operation.

These controls incorporate system fault analysis for quick gas flow shut-off, coupled with automatic ignition retry upon sensing a fault correction.

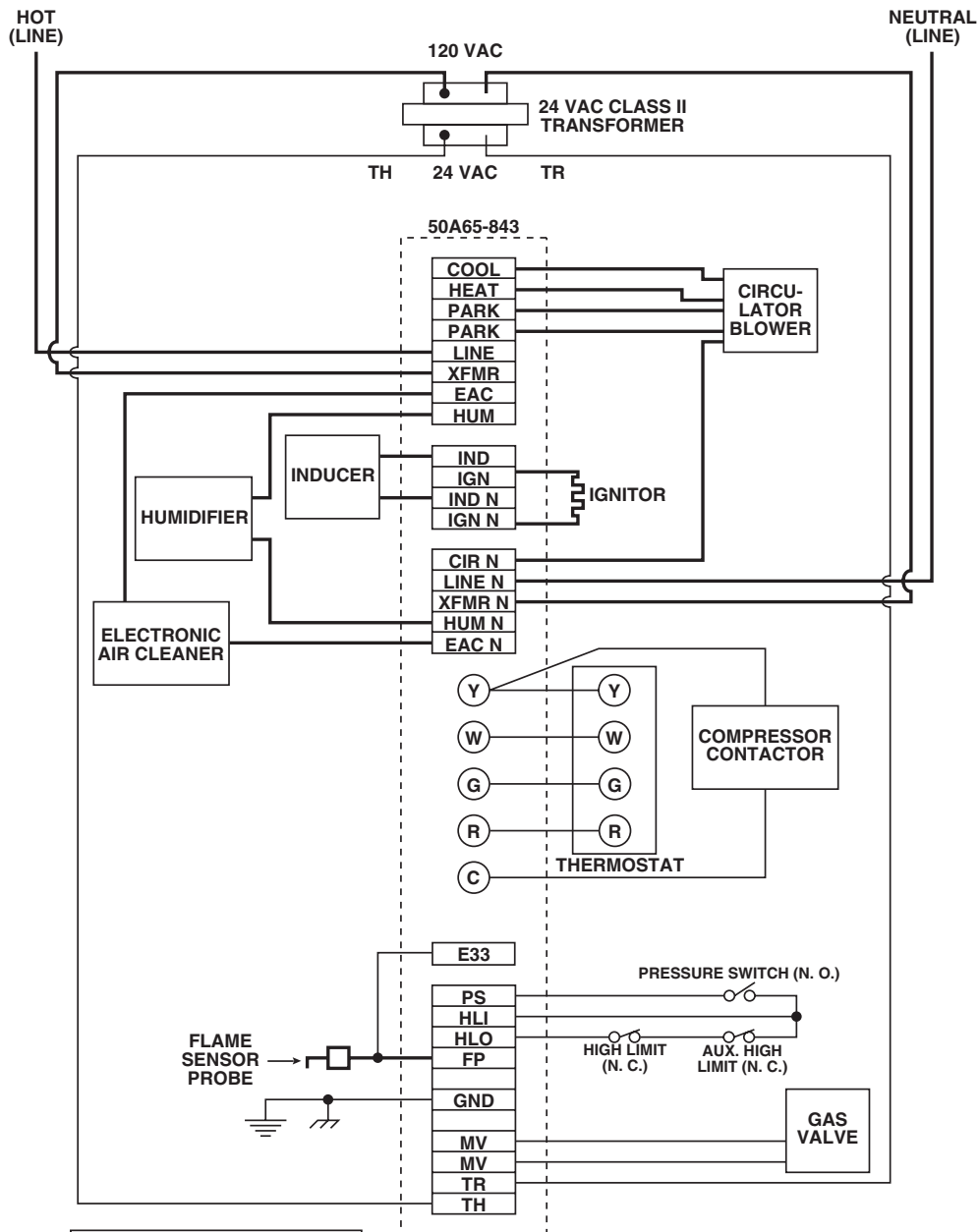
Flame Current Requirements:

- Minimum current to insure flame detection..... 1 μ DC^①
- Maximum current for non-detection..... 0.1 μ DC^①
- Maximum allowable leakage resistance..... 100 M ohms
- Flame establishing time..... 0.8 seconds maximum
- Flame failure response time..... 2.0 seconds maximum

① Measured with a DC microammeter in the flame probe lead

50A65-843

TYPICAL SYSTEM WIRING DIAGRAM



LEGEND	
	Low Voltage (24 VAC)
	Line Voltage (120 VAC)
	N. C. = Normally closed switch
	N. O. = Normally open switch

TECHNICAL HELP

TYPICAL SYSTEM WIRING TABLE

50A65 TERMINAL	TERMINAL TYPE	SYSTEM COMPONENT CONNECTION
W G R Y C	Terminal block with captive screws	low voltage thermostat W terminal (or equivalent) low voltage thermostat G terminal (or equivalent) low voltage thermostat R terminal (or equivalent) low voltage thermostat Y terminal (or equivalent) (2nd wire from Y terminal goes to 24 VAC HOT side of compressor contactor coil) 24 VAC COMMON side of compressor contactor coil
MV (2 terminals) TR TH FP PS HLI HLO GND (3 unused terminal)	12-pin connector & harness	gas valve (both gas solenoids are connected in parallel) 24 VAC transformer (low voltage COMMON side) 24 VAC transformer (low voltage HIGH side) flame sensor probe* pressure switch INPUT high limit INPUT high limit OUTPUT MUST BE RELIABLY GROUNDED TO CHASSIS
IND IGN IND N IGN N	4-pin connector & harness	inducer HOT side ignitor HOT side inducer NEUTRAL side ignitor NEUTRAL side
COOL	spade terminal	circulator blower COOL SPEED terminal
HEAT	spade terminal	circulator blower HEAT SPEED terminal
PARK (2 terminals)	spade terminal	unused circulator blower terminals
LINE	spade terminal	input voltage (120 VAC) HOT side
XFMR	spade terminal	24 VAC transformer line voltage HOT side
EAC (optional)	spade terminal	electronic air cleaner HOT side
HUM (optional)	spade terminal	humidifier HOT side
CIR N	spade terminal	circulator blower NEUTRAL terminal
LINE N	spade terminal	input voltage (120 VAC) NEUTRAL side
XFMR N	spade terminal	24 VAC transformer line voltage NEUTRAL side
EAC N (optional)	spade terminal	electronic air cleaner NEUTRAL side
HUM N (optional)	spade terminal	humidifier NEUTRAL side
E33	3/16" spade terminal	Auxiliary flame sense

* maximum recommended flame probe wire length is 36 inches.

The 50A65 has only one serviceable part—an automotive type fuse, which protects the low voltage transformer from damage if its output is short-circuited. If the fuse has opened up, remove whatever caused the short circuit and replace the fuse with only a 3 Amp automotive type fuse. If the fuse is not the cause of the control's problem, replace the entire 50A65 control. There are no other user serviceable parts.

Additional jumper wires are included in this package and should be used if the original wiring does not reach the control after mounting. Refer to the furnace wiring diagram for proper connection of the wires.

Some applications may require connection to terminal E33 located in the middle of the control cover. If the control being replaced does not have this connection, it is not needed in the application and connection to terminal E33 is not required.

Trane application - Jumper wire 151-2906 (provided with control) must be installed on the furnace from R01 to R02 of the 12-pin connector.

OPTION SWITCHES

The option switches on the 50A65-843 control are used to determine the length of the cool delay-to-fan-off, heat delay-to-fan-on and heat delay-to-fan-off periods. The following table shows the time periods that will result from the various switch positions.

OPTION SWITCH POSITIONS			
COOL delay-to-fan-off:	Set switch #1		
45 sec.*	On		
90 sec.	Off		
HEAT delay-to-fan-on:	Set switch #2		
30 sec.*	On		
45 sec.	Off		
HEAT delay-to-fan-off:	Set switch #3	#4	
60 sec.	On	On	
90 sec.	Off	On	
120 sec.	On	Off	
180 sec.*	Off	Off	

* Factory setting

HEAT MODE

In a typical system, a call for heat is initiated by closing the thermostat contacts. This starts the 50A65 control's heating sequence. The inducer blower and optional humidifier are energized and the 768A silicon nitride ignitor is powered within one second.

This control has an adaptive algorithm that reduces the ignitor temperature to slightly greater than the minimum temperature required to ignite gas in each particular application. The control measures the line voltage and determines an initial ignitor temperature setting based on the measurement. After each successful ignition, the control lowers the ignitor temperature slightly for the next ignition attempt. The control continues to lower the ignitor temperature until ignition does not occur, and the control goes into retry mode. For the second attempt to ignite gas within the same call for heat, the control increases the ignitor temperature to the value it was on the third previous successful ignition. After ignition is successful, the control sets the ignition temperature at this value for the next 255 calls for heat, after which the control repeats the adaptive algorithm. The control is constantly making adjustments to the ignitor temperature to compensate for changes in the line voltage.

The 80 VAC Silicon Nitride ignitor manufactured by White-Rodgers must be used. These ignitors are specially designed to operate with the 50A65's adaptive ignition routine to ensure the most efficient ignitor temperature.

MANUAL FAN ON MODE

If the thermostat fan switch is moved to the ON position, the circulator fan (cool speed) and optional electronic air cleaner are energized. When the fan switch is returned to the AUTO position, the circulator fan and electronic air cleaner (optional) are de-energized.

COOL MODE

In a typical system, a call for cool is initiated by closing the thermostat contacts. This energizes the 50A65 control and the compressor. The cool delay-to-fan-on period begins. After the delay period ends, the optional electronic air cleaner is energized, and the circulator fan is energized at cool speed. After the thermostat is satisfied, the compressor is de-energized and the cool mode delay-to-fan-off period begins. After the delay-to-fan-off period ends, the circulator fan and electronic air cleaner (optional) are de-energized.

SYSTEM LOCKOUT FEATURES

When system lockout occurs, the gas valve is de-energized, the circulator blower is energized at heat speed, and, if flame is sensed, the inducer blower is energized. The diagnostic indicator light will flash or glow continuously to indicate system status. **(System lockout will never override the precautionary features.)**

To reset the control after system lockout, do one of the following:

1. Interrupt the call for heat or cool at the thermostat for at least one second but less than 20 seconds (if flame is sensed with the gas valve de-energized, interrupting the call for heat at the thermostat will **not** reset the control).
2. Interrupt the 24 VAC power at the control for at least one second. You may also need to reset the flame rollout sensor switch.
3. After one hour in lockout, the control will automatically reset itself.

DIAGNOSTIC FEATURES

The 50A65-843 control continuously monitors its own operation and the operation of the system. If a failure occurs, the LED will indicate a failure code as shown below. **If the failure is internal to the control, the light will stay on continuously. In this case, the entire control should be replaced, as the control is not field-repairable.**

If the sensed failure is in the system (external to the control), the LED will flash in the following flash-pause sequences to indicate failure status (each flash will last approximately 0.25 seconds, and each pause will last approximately 2 seconds).

1 flash, then pause	System lockout
2 flashes, then pause	Pressure switch stuck closed
3 flashes, then pause	Pressure switch stuck open
4 flashes, then pause	Open limit switch
5 flashes, then pause	Open rollout switch
6 flashes, then pause	115 Volt AC power reversed / Improper ground
7 flashes, then pause	Low flame sense signal
8 flashes, then pause	Check ignitor
Continuous flashing (no pause)	Flame has been sensed when no flame should be present (no call for heat)

The LED will also flash once at power-up.