



Protectofier

COMBUSTION SAFEGUARD

FORM 6642FF GROUP M2101

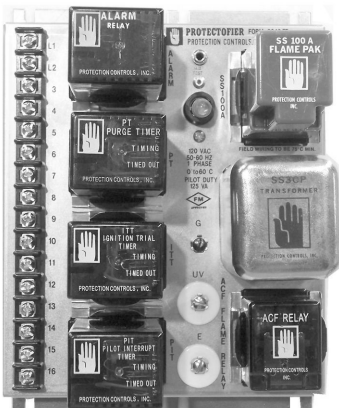
Full Feature Combustion Safeguard including:

- Proof of Closure
- Proof of High Fire Purge
- Purge Timing (In 15 sec. increments to 7¾ min max.)
- Proof of Low Fire Start
- Ignition Trial Timing (Pilot) 10 sec.
- Pilot Interrupt Timing (Main burner ignition trial) 10 or 15 sec.
- Alarm output if the safety interlocks (limit switches) or flame failure causes shutdown.
- Relay contacts available to drive actuator to high fire for purge, low fire for ignition trial, and control when main burner is proven.
- Eight status lights



OPERATING SEQUENCE

NORMAL START SEQUENCE



Specifications:

120VAC 50-60Hz 1 Phase
0° to 60°C

125VA Pilot Duty

Dimensions:

8 ½" H X 6 ½" W



Form 6642FF in Nema 4/12
Enclosure; Power Off/Reset-On
Switch

Dimensions:

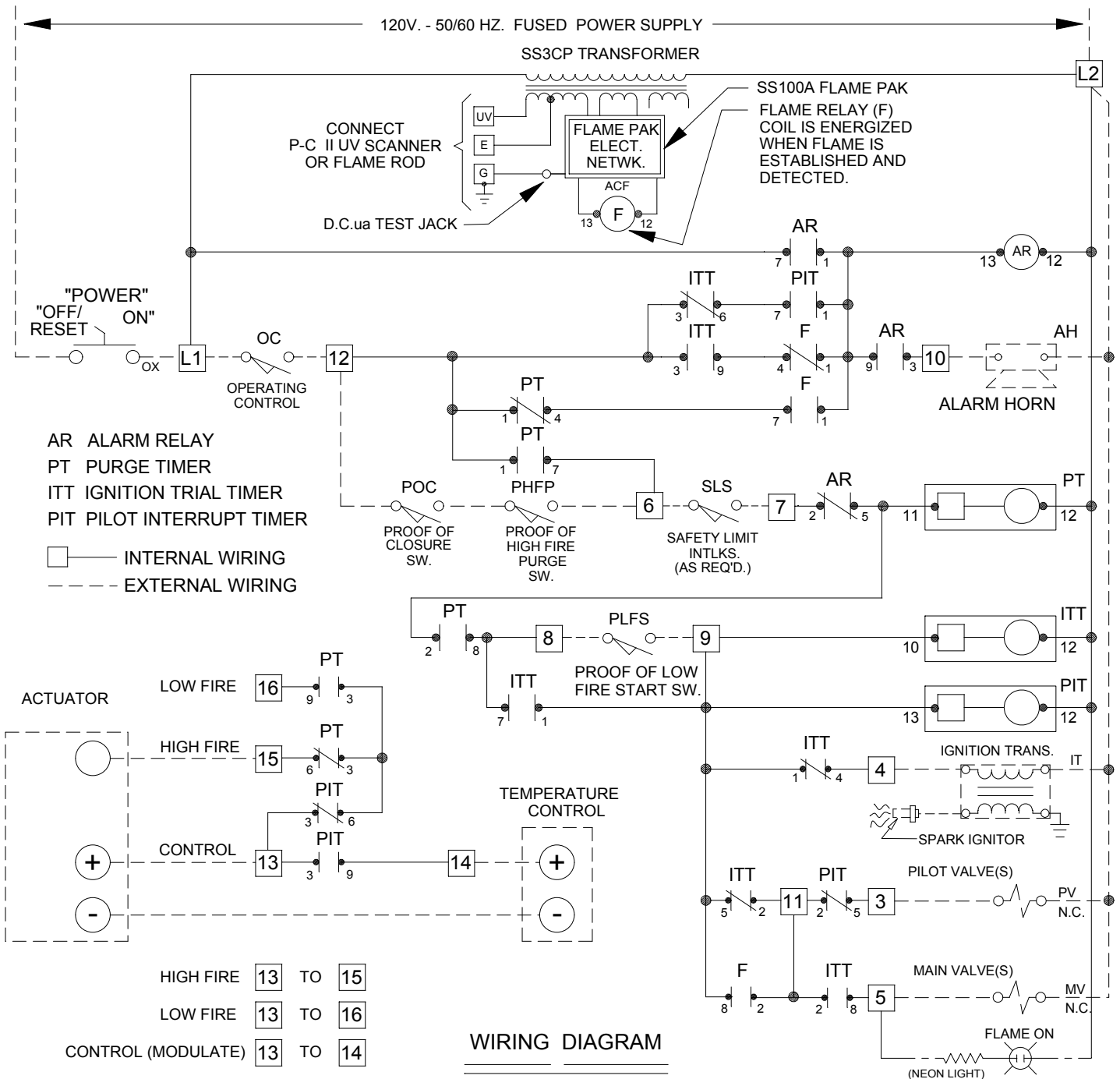
12" H X 10" W X 6" D

MADE IN U.S.A.

1. Turn Power switch to "On" position. Electrical network is powered from terminal L1.
2. Operating control powers terminal 12.
3. When Proof Of Closure switch(s) and Proof of High Fire Purge Switch (if applicable) are made, terminal 6 is powered.
4. When safety limits (high & low gas pressure, combustion air pressure, high temperature, etc.) are made, terminal 7 is powered. Purge Timer PT is powered. PT purging yellow light is on. Interruption of safety limits results in shutdown.
5. When PT is timed out, its green light illuminates and terminal 8 is powered. N.O. PT contact holds power to PT from Terminal 12. The temperature control actuator drives closed.
6. When Proof of Low Fire Start Switch PLFS is made, terminal 9 is powered. Ignition Trial Timer ITT (10 seconds) and Pilot Interrupt Timer PIT start timing. PLFS is necessary if the actuator is driven to high fire for purge.
7. The ignition transformer is powered from terminal 4 thru N.C. ITT contact.
8. Pilot valve(s) is powered from terminal 3 thru N.C. ITT contact and N.C. PIT contact. If no pilot valve(s) is used, the main fuel valve(s) is powered from terminal 11.
9. When flame is established and is sensed, the SS100A Flame Pak "Amplifier" powers Flame Relay F. N.O. F contact powers terminal 11.
10. When the ITT is timed out, its green light will illuminate. Main valve(s) is powered from terminal 5 thru N.O. F and N.O. ITT contacts. The neon "Flame On" light will illuminate. The ignition transformer will be de-energized. N.O. ITT contact will hold between terminals 8 and 9.
11. 15 (or 10) seconds after the main valve(s) is powered, PIT times out and its green light will illuminate. The pilot valve(s) will de-energize so that the sensor is detecting main burner only. The actuator now goes to the control mode and responds to the temperature controller (modulates).
12. The operating control may turn off the burner. When the operating control powers terminal 12 again, the above sequence is repeated.

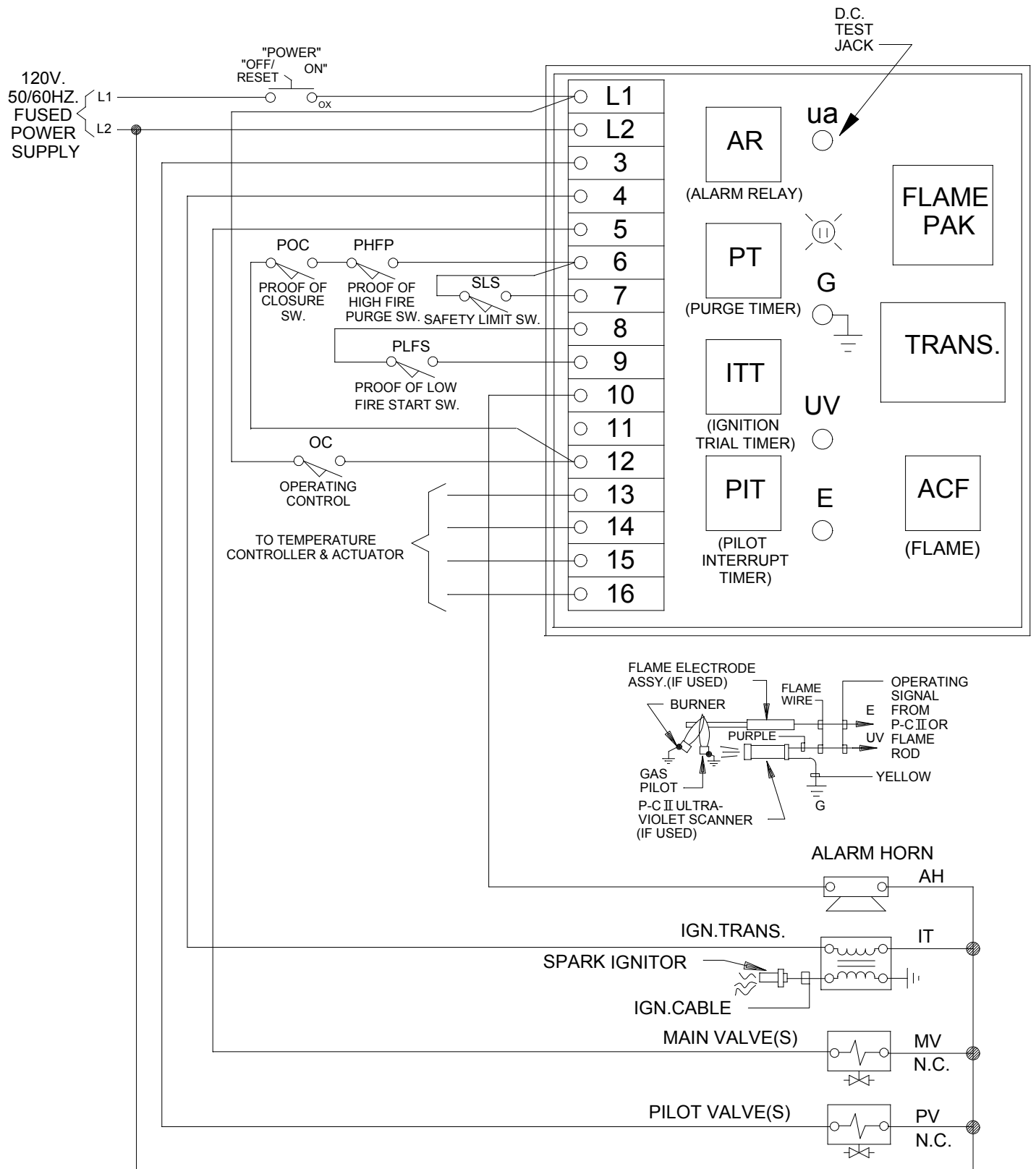
FAULT SEQUENCE

1. If a flame signal is sensed during purge time, PT is de-energized. The alarm relay AR is powered thru N.C. PT contact and N.O. F contact. AR will hold in from terminal L1 thru its own N.O. contact.
2. If a flame is not sensed during the ignition trial time, AR will be powered from terminal 12 thru N.O. ITT and N.C.F contacts.
3. If, after the flame has been proven but at some time later flame signal is lost, AR will be powered from terminal 12 thru N.O. ITT and N.C. F contacts.
4. All Fault sequences listed above lock out the control and may be reset by turning the power switch to "Off/Reset."



HIGH FIRE 13 TO 15
 LOW FIRE 13 TO 16
 CONTROL (MODULATE) 13 TO 14

POWER ON, OPERATING CONTROL ON	DRIVE TO HIGH FIRE	PURGING (15 SEC. TO 7 3/4 MIN.)	DRIVE TO LOW FIRE	IGNITION TRIAL (10 SEC.)	MAIN IGNITION TRIAL (10 SEC. OR 15SEC.)	RUN	ALARM
LIMITS COMPLETE	6 TO 7	12 TO 6					
POC		12 TO 6					
PHFP							
SAFE START CHECK							
PLFS				8 TO 9			
IGNITION				4			
PILOT				3			
MAIN					5		
ALARM							10
ACTUATOR	13 TO 15	FULL OPEN		FULL CLOSED 13 TO 16	FULL CLOSED	CONTROL MODE MODULATE	13 TO 14



PROTECTION CONTROLS, INC. SKOKIE ILLINOIS		
WIRING DIAGRAM FOR: PROTECTOFIER FORM 6642FF GROUP M2101		
JOB NO.	DATE: 1-15-10	DRAWING NO. X-383

INTERCONNECTION DIAGRAM

Terms used on drawing:

Operating Control (OC): is an off-on switch which may be a manual selector switch, a temperature control switch, a time of day switch, or a process control sequence switch.

Proof of Closure (POC): is a switch or switches located on the main fuel valve(s) which is closed when the valve(s) is closed. See NFPA 86 for valve standards.

Proof of High Fire Purge Switch (PHFP): is an end switch on the temperature control motor or actuator which is closed when the actuator is in the full open position.

Safety Limit Switches (SLS): include, but not limited to, high gas pressure, low gas pressure, combustion air pressure, auxiliary contact on combustion blower motor starter, and high temperature.

Proof of Low Fire Start Switch (PLFS): is an end switch on the temperature control motor or actuator which is closed when the actuator is in the position that allows the optimal, most reliable light-off of the burner. Do not jumper PLFS (8 to 9) if actuator is driven to high fire for purge.

- Note: 1. Contact ratings on above should be suitable to carry loads of ignition transformer and pilot valve(s) or pilot valve(s) and main valve(s).
 2. Purge time shall allow 4 cu. ft. of fresh air per cu. ft. of system volume.

Indicator Lights	ALARM RELAY	☒	☒	☒	☒	☒	☒	●
	PURGE PT TIMER	TIMING	☒	●	☒	☒	☒	☒
		TIMED OUT	☒	☒	●	●	●	●
	IGNITION TRIAL TIMER	TIMING	☒	☒	☒	●	☒	☒
		TIMED OUT	☒	☒	☒	☒	●	●
PILOT INTERRUPT TIMER	TIMING	☒	☒	☒	☒	●	☒	
	TIMED OUT	☒	☒	☒	☒	☒	●	
FLAME ON	☒	☒	☒	☒	●	●	☒	
Inputs	POWER ON, OPERATING CONTROL ON	DRIVE TO HIGH FIRE	PURGING (15 SEC. TO 7 3/4 MIN.)	DRIVE TO LOW FIRE	IGNITION TRIAL (10 SEC.)	MAIN IGNITION TRIAL (10 SEC. OR 15SEC.)	RUN	ALARM
	LIMITS COMPLETE	(6) TO (7)	(12) TO (6)					
	POC		(12) TO (6)					
	PHFP							
	SAFE START CHECK							
Output	PLFS				(8) TO (9)			
	IGNITION				(4)			
	PILOT				(3)			
	MAIN					(5)		
	ALARM							(10)
ACTUATOR	(13) TO (15)	FULL OPEN		FULL CLOSED (13 TO 16)	FULL CLOSED	CONTROL MODE MODULATE		(13) TO (14)



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ELECTRICAL SAFETY EQUIPMENT

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