



# Protectofier

## COMBUSTION SAFEGUARD Form 6642 VBLT

Multi-Burner Supervision, Automatic Purge and Ignition,  
Plug-in SS100A FLAME-PAKS, Plug-in Control Relays,  
Plug-in U300A TIMOFIER for Purge and Ignition Trial Cycle,  
Built-in SSN TELEFIER for Flame Failure Position Indication.

Power on PROTECTOFIER terminals L1 and L2 provides power to electronic network.

Power on PROTECTOFIER terminal 12 (thru permissive safety limits and cycling circuit).

1. "ACF" CHECK relay "C" is energized thru timer cam switch "CTP1" in starting position (N.O. held closed in zero time position) N.C. contacts of "ACF" FLAME relays "F", N.C. contact of "ACF" LOAD relay "L", low voltage winding of SS3CP TRANSFORMER, and SAFETY LOCKOUT switch circuit.
2. Cam timer motor "CTP" is energized thru N.O. contacts of CHECK relay "C" and N.C. contact of LOAD relay "L" for purging cycle.
  - a. "TIMER" light is lighted to indicate timer motor is energized.
3. Timer cam switch "CTP1" transfers immediately to directly energize the cam timer motor for duration of starting cycle.
4. At end of purge cycle, timer cam switches "CTP2" and "CTP3" close.
  - a. Cam switch "CTP2" in SAFETY LOCKOUT switch circuit closes for ignition trial cycle.
  - b. Cam switch "CTP3" closes to energize ignition transformer (from terminal 5) to provide electric spark ignition to the pilots, and also energize pilot solenoid valve (thru N.C. contact of LOAD relay "L" from PROTECTOFIER terminal 6).

5. With pilot flames established, respective "ACF" FLAME relay "F" is energized and series circuit of "F" contacts energizes "ACF" LOAD relay "L".

a. LOAD relay "L" contacts transfer.

- 1) N.C. "L" contact in safe-start checking and SAFETY LOCKOUT circuit opens.
- 2) N.O. "L" contact in pilot valve circuit (from terminal 6) closes to energize valve around timer cam "CTP3".
- 3) N.C. "L" contact in pilot valve circuit (from terminal 6) opens to isolate timer cam "CTP3" from pilot valve.
- 4) N.O. "L" contact in main valve circuit (from terminal 8) closes to energize main valve. "FLAME ON" indicator light to indicate all flame circuits established can also be connected in parallel with main valve between PROTECTOFIER terminal 8 and terminal L2.
- 5) N.C. "L" contact in series with cam timer motor opens to permit cam timer to stop at end of starting cycle.
- 6) Neon lamps on PROTECTOFIER chassis will glow to indicate pilot flames established. Neon lamp will glow as its respective FLAME relay "F" responds to flame signal upon establishment of flame. These indicator lights may be extended and brought to face of operating panel but they must be NE51H(B2A) neon type and the extended lamps and sockets must NOT have resistors.

*(over)*



PROTECTION CONTROLS, INC.

Power Equipment Company  
Manufacturers Representative

2011 Williamsburg Rd. Richmond, VA 23231  
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INSTALLATION, OPERATION AND MAINTENANCE SHALL CONFORM WITH NATIONAL FIRE PROTECTION ASSOCIATION STANDARDS, NATIONAL AND LOCAL CODES, AND AUTHORITIES HAVING JURISDICTION. ANY MODIFICATION VOIDS APPROVALS.

6. Timer continues to run to zero time position. Cam switch contacts transfer.
  - a. Cam switch "CTP1" breaks circuit to cam timer motor and is in position for safe-start check on next lighting cycle.
  - b. Cam switch "CTP2" in SAFETY LOCKOUT switch circuit opens.
  - c. Cam switch "CTP3" in ignition transformer circuit opens stopping spark ignition.

Failure to establish pilot flames during limited ignition trial cycle will cause SAFETY LOCKOUT switch contacts to open circuit to CHECK RELAY "C" coil. CHECK relay "C" is de-energized, pilot valve is de-energized and electric ignition is stopped. With no flame signal, main valve remains de-energized. Timer continues to run thru cam switch "CTP1" to zero time position and stops.

SAFETY LOCKOUT requires manual reset.

Flame failure during operation de-energizes fuel valves and PROTECTOFIER automatically goes into a new purge and then another ignition trial cycle.

The built-in SSN TELEFIER will indicate the flame position initially causing shut-down by the flame signal neon light of the faulty position remaining lighted at reduced brilliance with one element glowing. All other neon lights will go out.

Power interruption to PROTECTOFIER terminal 12 de-energizes relays and valves. Resumption of power will cause timer motor "CTP" to run to the completion of its cycle plus another safe-start check, complete purge and new ignition trial.

Failure of CHECK relay "C" to prove safe-start check will cause the timer motor to remain de-energized and prevent cycling of the PROTECTOFIER.

Connect jumper wire between PROTECTOFIER terminals L1 and 3 to obtain SSN TELEFIER flame response neon light indication. One of the neon lights on the chassis will glow when PROTECTOFIER terminal 3 is energized —this is normal.

**POWER EQUIPMENT CO.**

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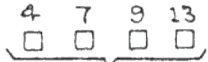
**PROTECTOFIER**

**AUTOMATIC OPERATION**

- SS100A FLAME PAK
- L- LOAD RELAY
- ACF- CHECK RELAY
- F- FLAME RELAY
- CTP- U300A AUTOMATIC TIMOFIER.

**TWO BURNER PROTECTOFIER**  
(FORM 6642 VBLT GROUP M4102.)

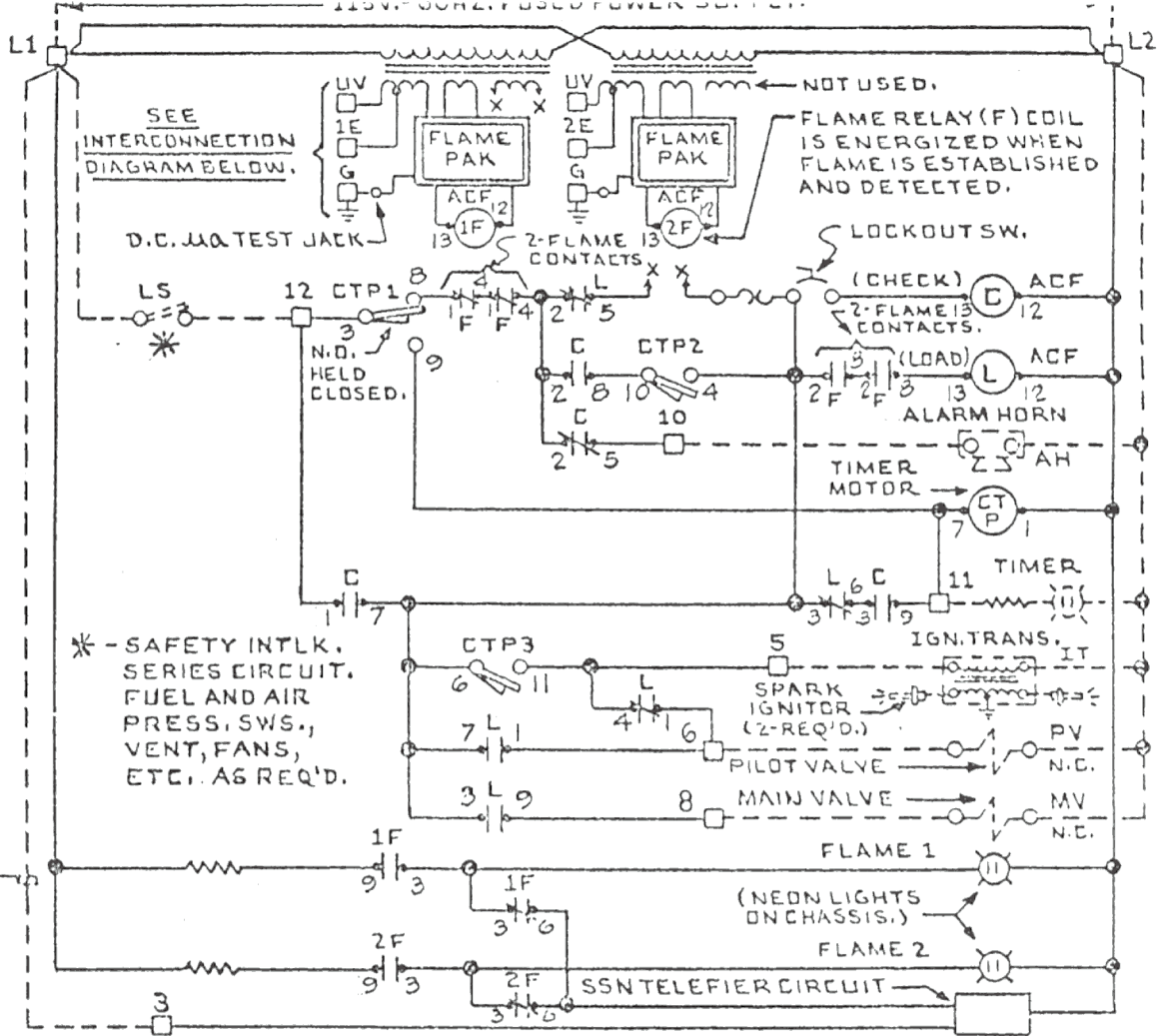
- INTERNAL WIRING.
- EXTERNAL WIRING.



**NOTE:**  
TIMER CAMS (CTP) SHOWN IN ZERO TIME POSITION, CTP2 AND CTP3 CLOSE AT END OF PURGE FOR IGNITION.

ADD JUMPER BETWEEN TERMINALS L1 AND 3 FOR FLAME FAILURE INDICATION.

**WIRING DIAGRAM**



**TWO BURNER PROTECTOFIER**  
(FORM 6642 VBLT GROUP M4102.)

115V.-60HZ. FUSED POWER SUPPLY.

- NOTES:**
- FLAME WIRE TO BE NO. 14 TYPE TW. 600V. INSULATED WIRE OR EQUAL. FLAME WIRE MUST NOT BE IN SAME CONDUITS WITH POWER WIRING.
  - IGNITION CABLE MUST BE RUN IN SEPARATE CONDUIT TO SPARK ELECTRODE. (DO NOT MIX WITH 115V. WIRING.)
  - WIRING AND INSTALLATION TO CONFORM WITH NATIONAL AND LOCAL ELECTRICAL CODES. ALL WIRING AND EQUIPMENT EXTERNALLY TO PROTECTOFIER TO BE FURNISHED BY OTHERS UNLESS OTHERWISE SPECIFIED.

ADD JUMPER BETWEEN TERMINALS L1 AND 3 FOR FLAME FAILURE INDICATION.

**NOTE:**  
INSTALLATION, OPERATION AND MAINTENANCE SHALL CONFORM WITH NATIONAL FIRE PROTECTION ASSOCIATION STANDARDS, NATIONAL AND LOCAL CODES, AND AUTHORITIES HAVING JURISDICTION.

**U300A AUTOMATIC TIMOFIER TIMING**

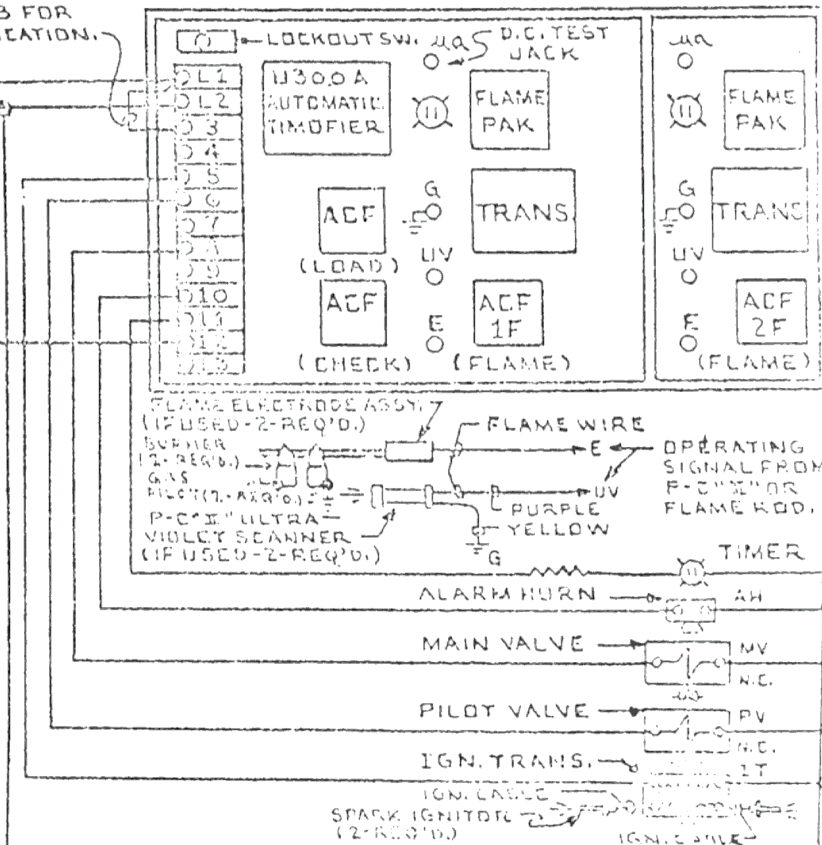
RANGE	PURGE (MIN.)	IGN. (SEC.)
A-	MIN.	SEC.

PROTECTION CONTROLS, INC.  
MCKEAN, ILLINOIS

WIRING DIAGRAM FOR:

PROTECTOFIER FORM 6642 VBLT GROUP M4102

JOB NO.	DRN. BY	DATE	DRAWING NO.
	WGT	6-4-79	X-246



**INTERCONNECTION DIAGRAM**

REVISED AND REDRAWN. REV. 9-30-81