



# Protectofier

## COMBUSTION SAFEGUARD Form 6642 VBT

Single Burner Supervision, Automatic Purge and Ignition,  
Plug-in SS100A FLAME-PAK, Plug-in Control Relays,  
Plug-in U300A TIMOFIER for Purge and Ignition Trial Cycle.

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

Terminal L1 must be powered before terminal 12.

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 relay "F", 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 FLAME relay "F" 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 pilot, and also energize pilot solenoid valve (thru N.C. contact of FLAME relay "F") from PROTECTOFIER terminal 6.
5. With pilot flame established "ACF" FLAME relay "F" is energized.
  - a. FLAME relay "F" contacts transfer.
    - 1) N.C. "F" contact in safe-start checking and SAFETY LOCKOUT circuit opens.
    - 2) N.O. "F" contact in pilot valve circuit (from terminal 6) closes to energize pilot valve around timer cam "CTP3".
    - 3) N.C. "F" contact in pilot valve circuit (from terminal 6) opens to isolate timer cam "CTP3" from pilot valve.
    - 4) N.O. "F" contact in main valve circuit (from terminal 8) closes to energize main valve. Neon lamp on PROTECTOFIER chassis will glow to indicate pilot flame established.
    - 5) N.C. "F" contact in series with cam timer motor opens to permit cam timer to stop at end of starting cycle.
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 flame 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.

(over)



PROTECTION CONTROLS, INC.

Power Equipment Company  
Manufacturers Representative

2011 Williamsburg Rd. Richmond, VA 23231  
(804) 236-3800 Fax (804) 236-3882

INSTALLATION, OPERATION AND MAINTENANCE SHALL CONFORM WITH NATIONAL FIRE PROTECTION ASSOCIATION STANDARDS, NATIONAL AND LOCAL CODES, AND AUTHORITIES HAVING JURISDICTION. ANY MODIFICATION VOIDS APPROVALS.

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.

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.

**POWER EQUIPMENT CO.**

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**PROTECTOFIER**

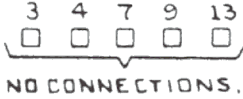
**AUTOMATIC OPERATION**

SS100A FLAME PAK

ACF { C - CHECK RELAY  
F - FLAME RELAY

CTP - U300A AUTOMATIC TIMOFIER

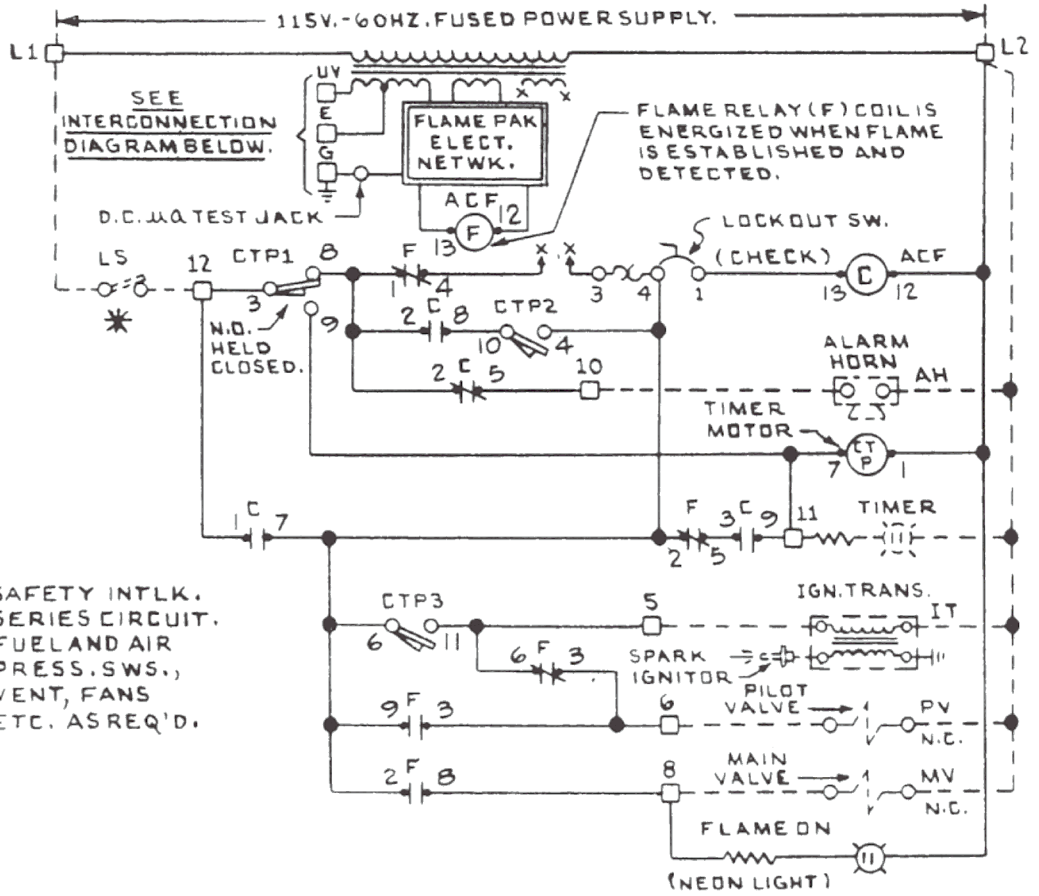
SINGLE BURNER  
PROTECTOFIER  
(FORM 6642 VBT  
GROUP M3101).



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

□ — INTERNAL WIRING.  
--- EXTERNAL WIRING.

**WIRING DIAGRAM**



\* — SAFETY INTLK.  
SERIES CIRCUIT.  
FUEL AND AIR  
PRESS. SWS.,  
VENT, FANS  
ETC. AS REQ'D.

**SINGLE BURNER PROTECTOFIER  
(FORM 6642 VBT GROUP M3101.)**

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  
EXTERNAL TO PROTECTOFIER TO BE  
FURNISHED BY OTHERS UNLESS  
OTHERWISE SPECIFIED.

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

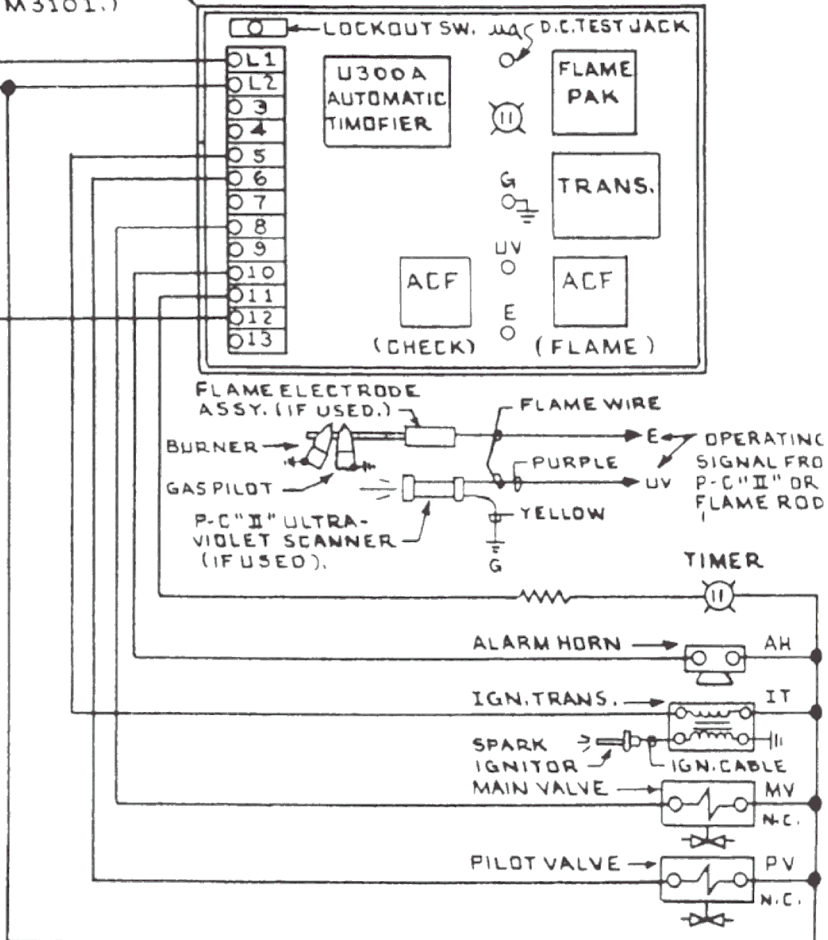
**U300A AUTOMATIC  
TIMOFIER TIMING**

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

**PROTECTION CONTROLS, INC.**  
SKOKIE, ILLINOIS

**WIRING DIAGRAM FOR:  
PROTECTOFIER FORM 6642 VBT GROUP M3101**

JOB NO.	DRWN. BY	DATE	DRWNG. NO.
	<i>DR</i>	6-2-79	X-244



**INTERCONNECTION DIAGRAM**

REVISED AND REDRAWN, REV. 9-30-81