HAMILTON®

Fume Hood Alarm Assemblies 54L259/54L260

Installation, Operation and Trouble Shooting Instructions

GENERAL INFORMATION

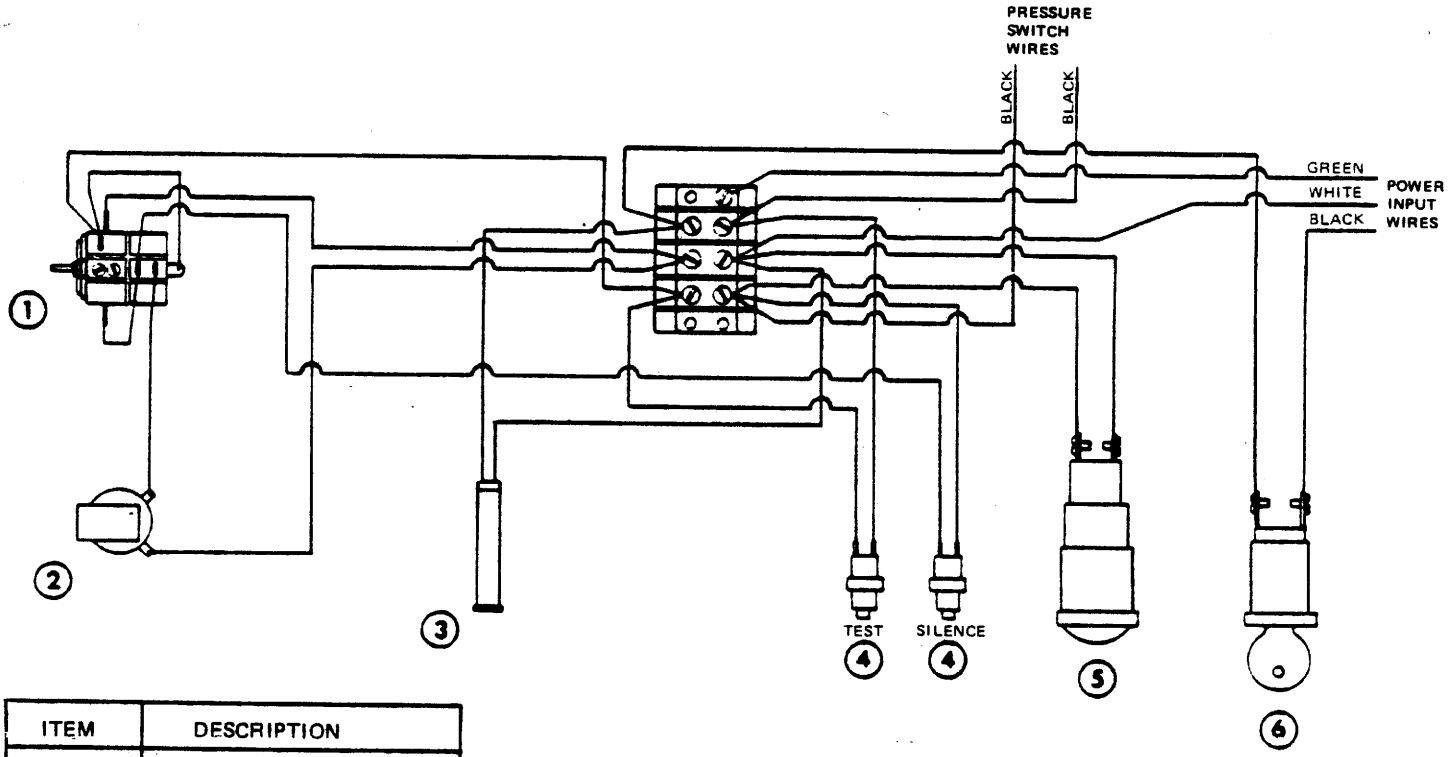
Fume hood alarms are designed to provide an audible and visual signal whenever fume hood face velocities fall below a preselected value. The alarm system is designed to signal potentially unsafe conditions caused by dirty or deteriorating blower parts, perforated and leaking ducts, loose or broken blower belts, malfunctioning dampers, or other conditions causing reduced face velocities or exhaust volumes.

OPTIONAL POWER SOURCES

Ideally, power to the alarm system should be constantly on, with the alarm always ready to signal any condition causing a potentially hazardous reduction in air flow. Actual use conditions, however, may suggest compromises to this ideal situation. When fume hoods are turned off weekly or daily, users may prefer to power the alarm system from the blower circuit, inactivating the alarm when blowers are turned off. Alternately, power connections may be made to the hood light circuit, allowing the alarm to be controlled by the fume hood light switch. A separate alarm circuit with manual or computer control is also feasible.

When alternate power systems are used, laboratory personnel must be instructed as to their limitations and be totally familiar with the operation of the alarm system.

Other exhaust system conditions such as variable volumes, interconnection of ducts and unusual electrical characteristics may suggest alternate alarm power sources. Consultation with the Hamilton Technical Services Department will aid in the evaluation of the pros and cons of each alternative.



ITEM	DESCRIPTION
1	Relay
2	Buzzer
3	Pilot Light
4	Momentary switches
5	Warning Light
6	Key Switch

FIGURE A

ELECTRICAL SCHEMATIC

RESETTING PRESSURE SWITCH FOR REVISED RESPONSE POINT OF FUME HOOD ALARM.

Prior to shipping a fume hood alarm system, the pressure switch has been set to trigger the alarm at a predetermined point. The following procedure is suitable for resetting the switch when the alarm has been totally installed.

NOTE: An alarm system cannot be used with two speed blowers or with extremely low face velocities.

1. Unless otherwise specified, the pressure switch should be set to activate the alarm when the face velocity falls to 70% of the specified velocity. Since the pressure switch operates on fume hood static pressure, it is necessary to verify the specified face velocity and the resulting static pressure. This can be accomplished by direct measurement using appropriate instruments and approved techniques. Through calculations and/or data table (see below), determine the fume hood static pressure for a face velocity 70% of that which was specified.

   CAUTION: Do not use fume hood catalog static pressure tables as these include built-in safety factors and rounded numbers.
2. To set switch, remove tubing from sensor and connect to the low pressure port of a Test Set 54L328 using additional tubing and a "Y" or "T" connector. See Figure E.
3. Create a negative over pressure to verify that the system is properly connected and working. This can be done by sucking with mouth.

   CAUTION: Limit over pressure to 2" or 3" water gauge (W.G.) to avoid damage to meter and/or switch.

   Turn on alarm and allow pressure to fall (become less negative) until switch activates and alarm sounds. Note reading on magnehelic gauge.
4. Using a screw driver, adjust setscrew on switch. See Figure B. Counterclockwise to lower activating point, clockwise to raise activating point. (NOTE: Approximately one-half turn for a change of .01" W.G.)

   Raise pressure and allow it to fall. Note reading when alarm sounds. Repeat, with adjustment, until alarm sounds at selected pressure.
5. Gradually raise pressure until switch opens and alarm turns off. Verify that opening point falls within fume hood static pressure range.
6. Remove added tubing and connector and reconnect tubing to sensor. See Figure D. Record closing pressure reading on switch housing with date.
7. Cycle hood to verify function of alarm system.

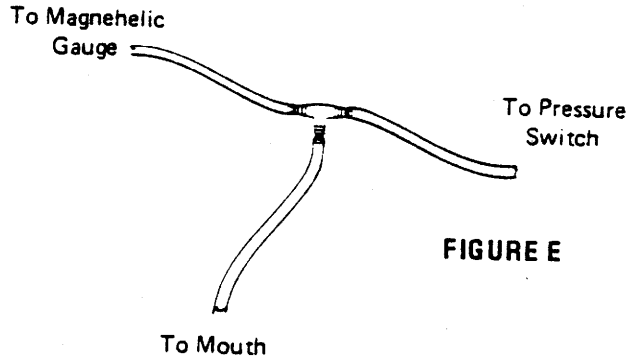


FIGURE E

SUGGESTED WARNING POINT SETTINGS		
	FACE VELOCITIES	
FUME HOOD USAGE	DESIGN	WARN AT
SEVERE/CRITICAL	125 to 150 F. P. M.	88 to 105 F. P. M.
MODERATE	100 F.P.M.	70 F.P.M.
MINIMUM	75 to 80 F.P.M.	52 to 56 F.P.M.

DATA TABLE FOR FUME HOODS WITH VERTICAL RISING SASHES

Static pressure setting points for face velocity 70% of specified figure.

Hood Size	FACE VELOCITIES			
	75 F.P.M. S.P.	100 F.P.M. S.P.	125 F.P.M. S.P.	150 F.P.M. S.P.
3 Ft.	.085	.15	.215	.33
4 Ft.	.07	.145	.235	.325
5 Ft.	.055	.135	.215	.30
6 Ft.	.115	.20	.31	.385
8 Ft.	.085	.16	.235	.34

DATA TABLE FOR VECTAMATIC FUME HOODS OR OTHER HOODS WITH HORIZONTAL SLIDING SASHES

Static pressure setting points for face velocity 70% of specified figure.

Hood Size	FACE VELOCITIES			
	75 F.P.M. S.P.	100 F.P.M. S.P.	125 F.P.M. S.P.	150 F.P.M. S.P.
4 Ft.	.07	.085	.115	.17
5 Ft.	.04	.07	.105	.155
6 Ft.	.035	.07	.095	.165
8 Ft.	.025	.04	.065	.09

For hood sizes not listed or for special and unusual conditions, request data from Hamilton Technical Services Department.

54L829-P

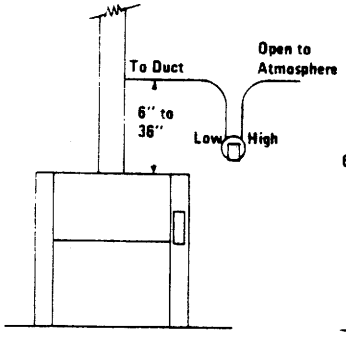
P= Pressure Switch

TROUBLESHOOTING: HAMILTON FUME HOOD ALARMS 54L259 AND 54L260

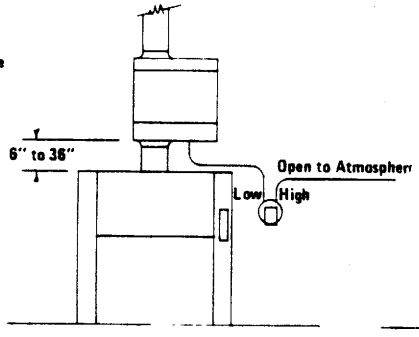
1. Pilot light does not glow.
   a. Obtain key and move switch to "ON". Pilot light should glow. If not, go to "b".
   b. Turn on fume hood light. Alarm may be wired to light switch for convenience and control. If light does not glow, go to "c".
   c. Verify that fume hood blower is operating. Alarm may be wired to blower circuit for night shutdown, energy saving, cycling.
   d. Press test button. If red jewel glows and buzzer sounds, pilot light is defective. Replace.
2. Pilot light glows, but alarm does not sound when blower is turned off.
   a. Verify that pilot light remains on when blower is turned off. Alarm may be wired to blower circuit.
   b. Press test button. If alarm signals, problem is in wiring, pressure switch and/or sensor, repeat installation procedure, check system.
   c. Adjust pressure switch per instructions.
   d. If a, b and c do not result in correct operation, replace pressure switch.
   e. Replace alarm.
3. Alarm signals all the time.
   a. Verify that all mechanical and electrical connections are properly made. Pay particular attention to the pressure switch.
   b. Measure fume hood face velocity and compare data with specified velocity and volume requirements. Correct as necessary and recheck.
   c. Using a manometer, verify that fume hood static pressure is within range of pressure switch. Adjust pressure switch per instructions.
   d. Disconnect tubing from duct sensor and suck gently. Alarm should stop signaling. Using a "T" connector and a short piece of tubing, connect test set 54L328. Repeat sucking procedure until alarm stops. Allow vacuum to fall until alarm sounds. Repeat procedure until signal pressure reading is verified on dial of gauge. Compare with setting schedule in AL-854-3 or marked on switch. Adjust as required following procedure detailed on these pages.
   e. Reconnect tubing to sensor and check for correct operation.
   f. Replace pressure switch.
4. Alarm does not signal – With power to the alarm, turn off fume hood exhaust blower. Alarm should signal as face velocity and exhaust volume fall to zero.
   Verify that all mechanical and electrical connections are properly made.
   a. Press test button. Alarm should signal. If not, see 1 and 2 above.
   b. Check pressure differential switch. Tubing must be connected to "low" port and the other port must be open to the atmosphere. Second "low" port must be plugged.
   c. Disconnect tube from sensor. Blow gently. If alarm signals, connection is to wrong (high) port. See 3.
   d. Disconnect tube from sensor. Suck gently. If alarm signals, setting of pressure switch may need adjustment or fume hood exhaust may be inadequate.

Follow fume hood trouble shooting procedure to verify proper fume hood operation with specified face velocity and exhaust volume. If face velocity and exhaust volume agree with specification data, follow procedure for resetting the pressure switch – test – and if alarm system fails to function, repeat all steps of the alarm trouble shooting procedure.

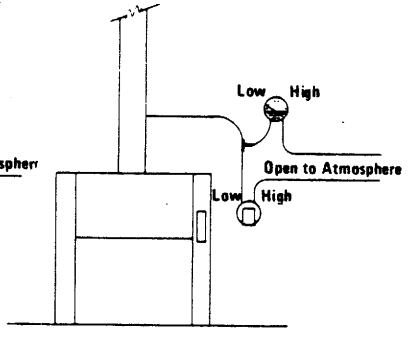
SUGGESTED CONNECTION POINTS AND TUBING CONFIGURATIONS FOR ALARM, FILTERS AND OPTIONAL PRESSURE GAUGES



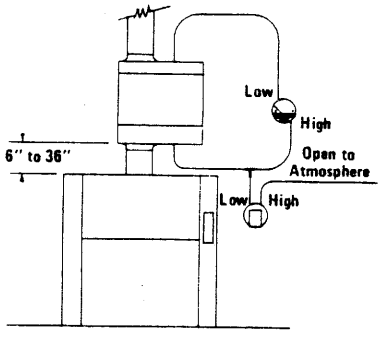
1. Fume Hood with Alarm System- Conventional Arrangement



2. Fume Hood with Filter and Alarm- Conventional Arrangement



3. Fume Hood with Alarm and Pressure Gauge



4. Fume Hood with Filter, Alarm and Pressure Gauge Measuring Filter Pressure Drop

HAMILTON INDUSTRIES, INC.
TWO RIVERS WISCONSIN 54241 TELEPHONE 414 793-1121

Vectaire® Fume Hoods — Accessories

Alarm

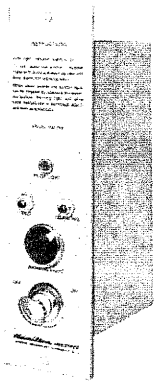
Alarm assembly monitors fume hood exhaust and signals when exhaust volume and face velocity fall below a pre-selected point. Alarm system will report such potentially hazardous conditions as slipping or broken blower belts, duct and blower deterioration caused by corrosion or accumulation of deposits on blower impeller blades. On/off switch with key provides positive control of alarm by laboratory director or health-safety personnel. Pilot light burns when alarm is on. Test circuits verify alarm function. Audible alarm signal can be silenced by pressing silencing relay button. Red warning light continues to burn until condition causing alarm signal is corrected.

54L259 — For Vertical Mounting

Dimensioned to mount in the front vertical post of Hamilton Vectaire fume hoods. Can be installed anywhere panel space is available or bracketed from either post of existing fume hoods.

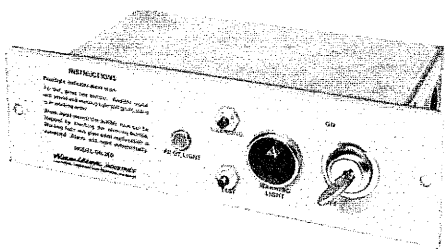
Alarm consists of sensor, pressure switch with mounting bracket, connecting tubing and pre-wired alarm box. Installation of suitable connecting wires and final connections are field operations by electrician.

Electrical Characteristics: Underwriters Laboratories Inc. Classified, 120 Volts, 60 Hz, 0.1 Amps.



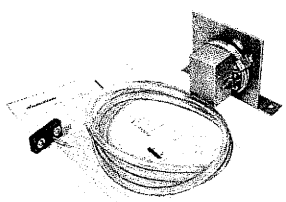
54L260 — For Horizontal Mounting

Suitable for installation in base cabinet panels of existing fume hood installations, or anywhere panel space is available for horizontal configuration.



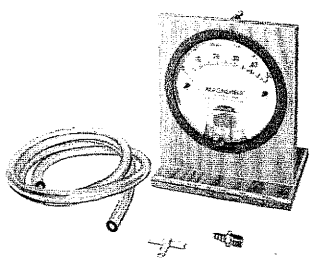
Dimensions:

	Length	Width	Depth
Face Plate	9½''	2-5/8''	¼''
Overall	9½''	1-5/8''	4¾''
Cutout	8''	2-¼''	—



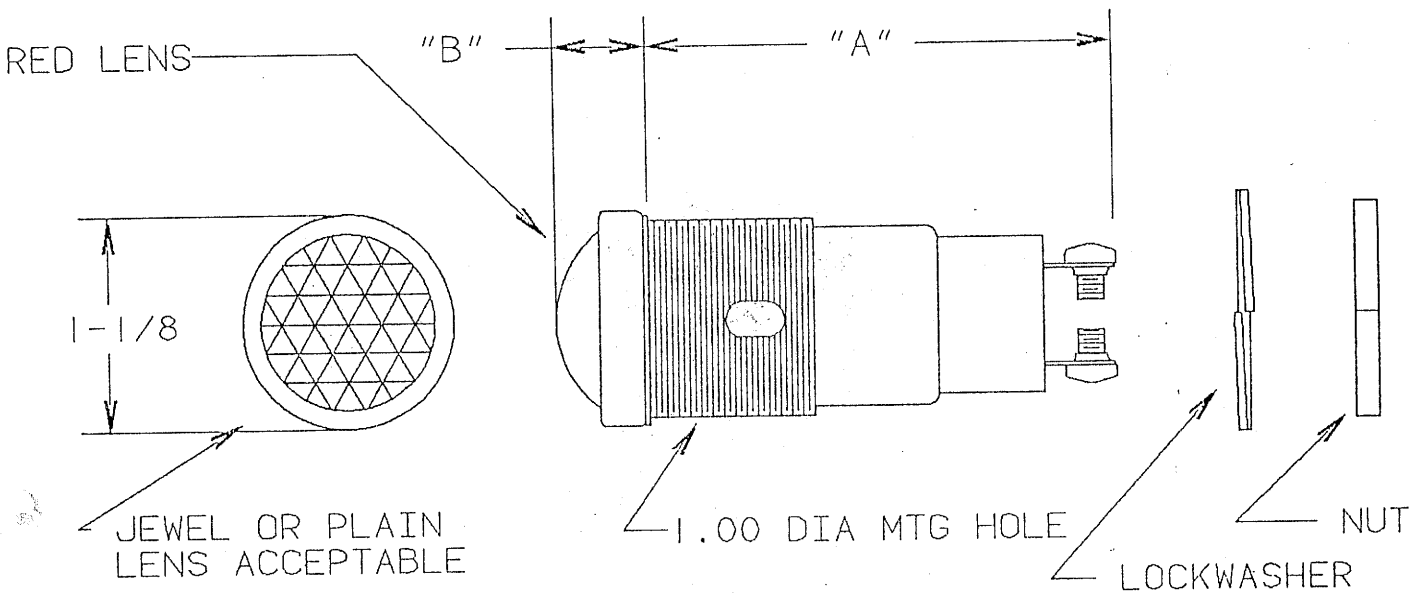
54L327 — Pressure Adjusting Set, Gauge Range 0-1'' W.C.

54L328 — Pressure Adjusting Set, Gauge Range 0-3'' W.C.



Each set includes pressure gauge, wood stand, tubing, adapter and "T" fitting. Select correct set for checking and/or resetting of fume hood alarm per instructions included with each alarm.

UL RECOGNIZED COMPONENT DIALIGHT CORP. CAT. NOS.	A	B	REMARKS:
31-3101-0111-302	2-1/2	15/32	EXPOSED TERMINALS AND PRESS FIT LENS
31-0901-0431-301	2-1/2	15/32	RECESSED TERMINALS AND PRESS FIT LENS
19-1901-0431-301	1-7/8	13/16	RECESSED TERMINALS AND SCREW CAP LENS



NOTE:
3S6/5 120V LAMP
NOT INCLUDED.
TO BE SUPPLIED BY HAMILTON.
(PART NO. 48699)

FACTORY

CONTROLLED COPY

SYM.	CHG. NO.	DATE	NAME	REVISION
	X-10833	9-10-85	SEH	ROUTER DATE CHG'D
				FOR PREVIOUS CHGS SEE NG A-53596
				MASTER

MATERIAL

SPECIFICATION:

DIMENSION TOLERANCE UNLESS OTHERWISE SPECIFIED

ONE DECIMAL PLACE +/-.060"
TWO DECIMAL PLACES +/-.030 ANGLES +/- 0-30'
THREE DECIMAL PLACES +/-.015

DRAWN SEH 9-10-85

APPROVED SEH 9-13-85

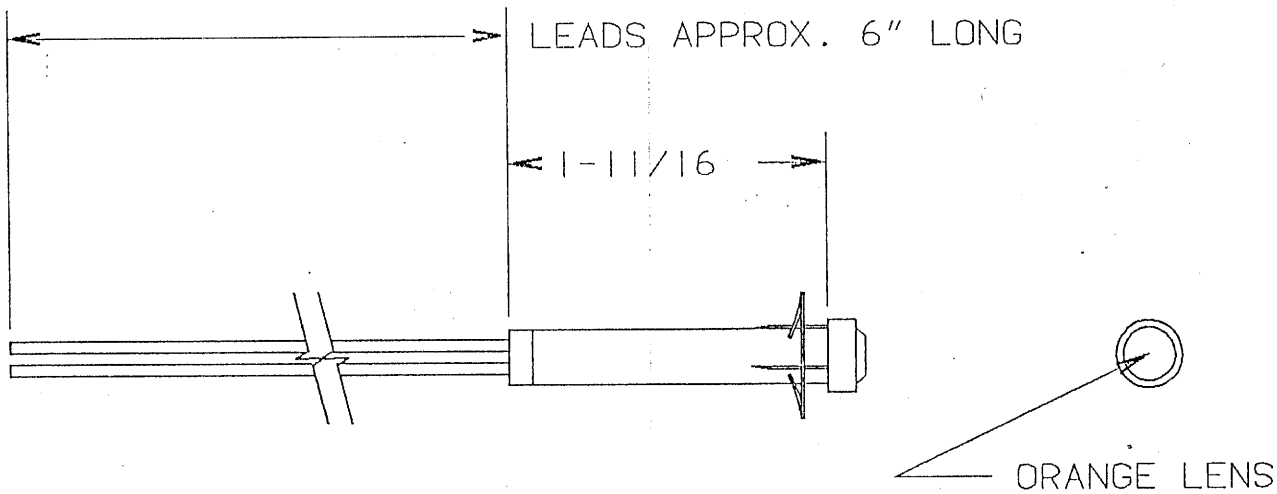
REFERENCE DRAWINGS
NG A-53596

SCALE FULL

HAMILTON INDUSTRIES
TWO RIVERS WISCONSIN 54241 TELEPHONE 414 793-1121

TITLE
WARNING LIGHT

DRAWING NO.
A-53596



5/16" DIA. HOLE IN PANEL FOR PILOT LIGHT

FACTORY

ONLY UL LISTED "LEECRAFT 3600" RATED 125V, 1/3W WITH CLIP AND UL RECOGNIZED "INDUSTRIAL DEVICES INC. 2110A3" RATED 115V ARE ACCEPTABLE

REF: ALLIED 679-6613

FEB. 8, '91

SYM.	CHG. NO.	DATE	NAME	REVISION
	X-10833	9-13 85	SEH	ROUTER DATE CHANGE
				FOR PREVIOUS CHGS SEE NG A-53595

MASTER

MATERIAL

SPECIFICATION:

DIMENSION TOLERANCE UNLESS OTHERWISE SPECIFIED

ONE DECIMAL PLACE +/-.060"
TWO DECIMAL PLACES +/-.030 ANGLES +/- 0-30'
THREE DECIMAL PLACES +/-.015

DRAWN SEH 9-13-85

APPROVED SEH 9-17-85

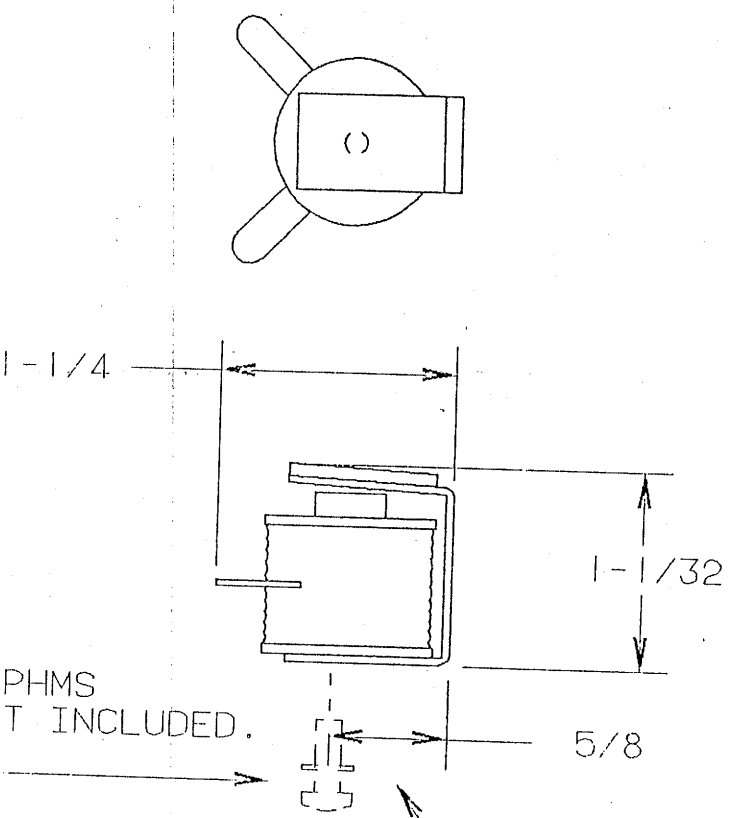
REFERENCE DRAWINGS
NG A-53595

SCALE FULL

HAMILTON INDUSTRIES
TWO RIVERS WISCONSIN 54241 TELEPHONE 414 793-1121

TITLE
PILOT LIGHT

DRAWING NO.
A-53595



NOTE:
#6-32 X 3/8 PPHMS
AND WASHER NOT INCLUDED.

REF.: ALLIED #886-0043 OR POTTER BRUMFIELD TYPE BU,
20V COIL. BOTH RECOGNIZED UNDER U.L.
COMPONENT PROGRAM (FILE #S1154)

6/10/1

SYM.	CHG. NO.	DATE	NAME	REVISION
	X-10833	9-16 85	SEH	ROUTER DATE CHANGE
				FOR PREVIOUS CHGS SEE NG A-60101

MASTER

MATERIAL

SPECIFICATION:

DIMENSION TOLERANCE UNLESS OTHERWISE SPECIFIED

DRAWN SEH 9-16-85

APPROVED SEH 9-17-85

ONE DECIMAL PLACE +/-.060"
TWO DECIMAL PLACES +/-.030 ANGLES +/- 0-30'
THREE DECIMAL PLACES +/-.015

REFERENCE DRAWINGS
NG A-60101

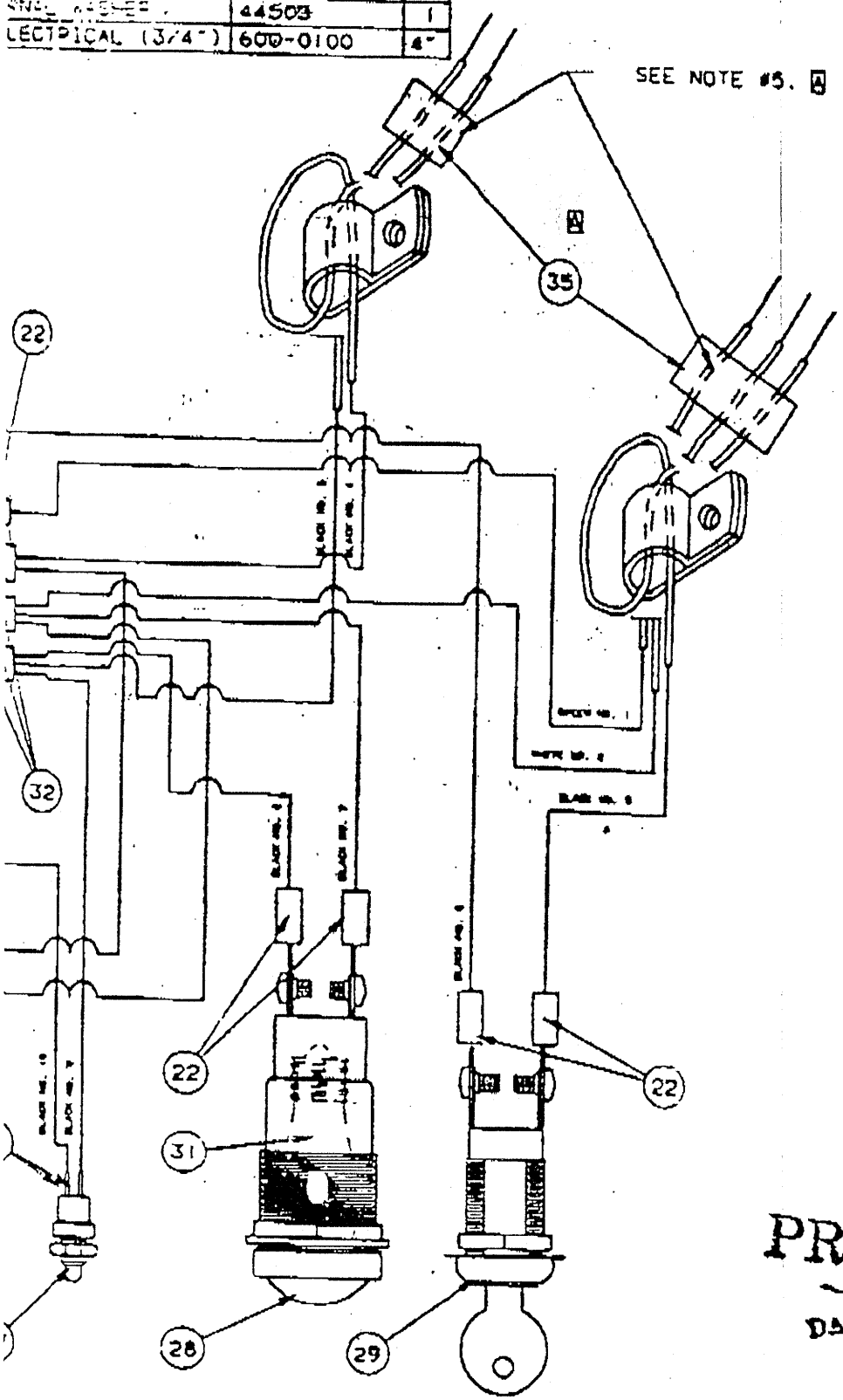
SCALE F.S.

HAMILTON INDUSTRIES
TWO RIVERS WISCONSIN 54241 TELEPHONE 414 793-1121

TITLE
BUZZER

DRAWING NO.
A-60101

S&S 120V	48699	1
NGUE CONNECTOR	49100	3
3/8 PRIMS	3940606	1
[illegible]	44503	1
LECTRICAL (3/4")	600-0100	4"



2-11859

PRELIMINARY

DATE JUN 4 1985 SIGNED

MATERIAL	
SPECIFICATION	
HAMILTON INDUSTRIES	SCH 9-10-85
TITLE WIRING ASSEMBLY	DWG. NO. 2-147262

10-13-97 08:09 [871] #2/2

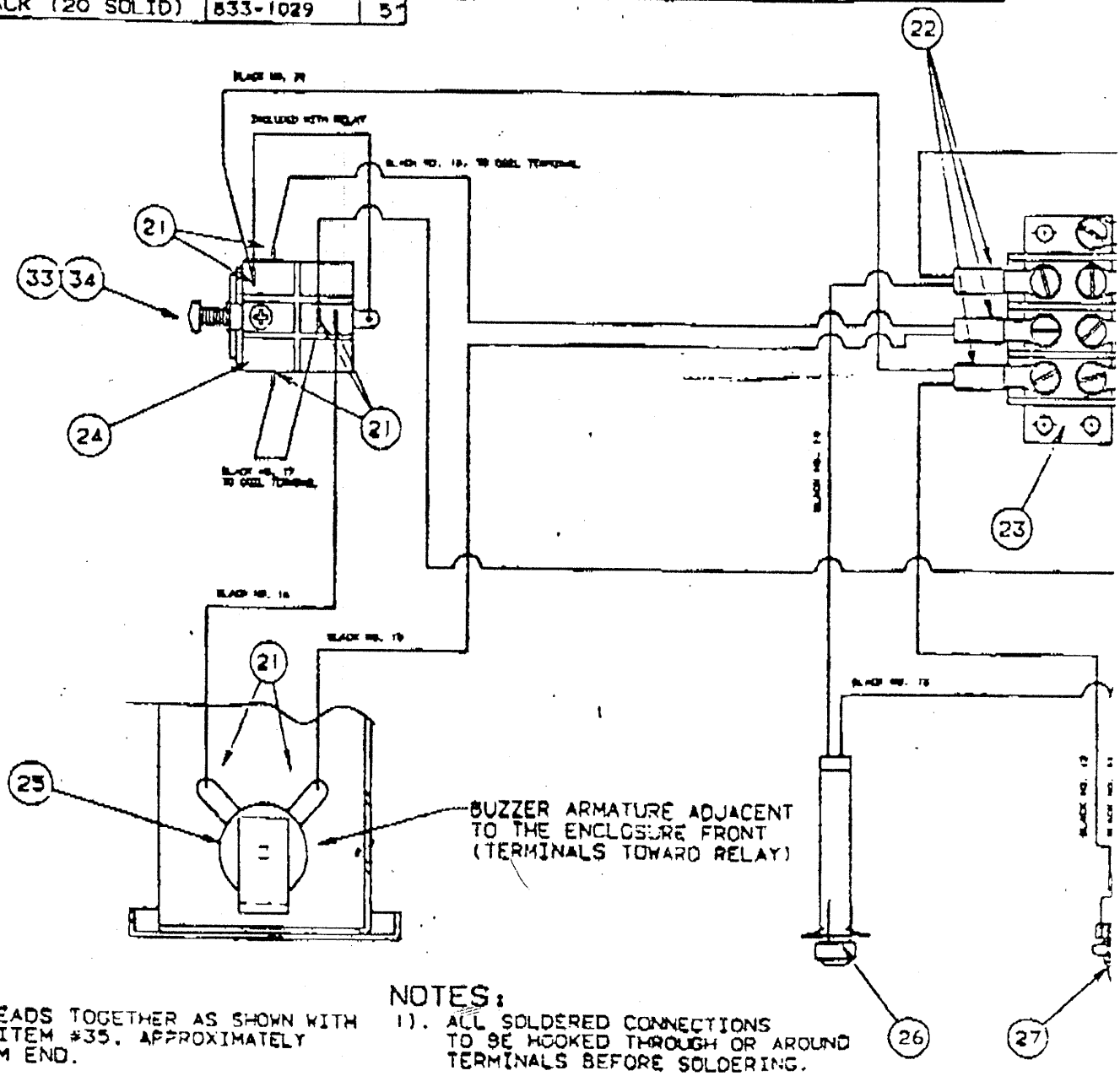
FISHER HAMILTON

NG.
EMP-
K ON

2	WIRE, WHITE (16 STRAND)	833-2009	17"
3	WIRE, BLACK (16 STRAND)	833-2010	17"
4	WIRE, BLACK (16 STRAND)	833-2010	15"
5	WIRE, BLACK (16 STRAND)	833-2010	15"
6	WIRE, BLACK (20 SOLID)	833-1029	8"
7	WIRE, BLACK (20 SOLID)	833-1029	2.75"
8	WIRE, BLACK (20 SOLID)	833-1029	2.75"
9	WIRE, BLACK (20 SOLID)	833-1029	4"
10	WIRE, BLACK (20 SOLID)	833-1029	5"
11	WIRE, BLACK (20 SOLID)	833-1029	5"
12	WIRE, BLACK (20 SOLID)	833-1029	5"
13	CUT LEADS TO 4" LONG (PILOT LT.)		1
14	CUT LEADS TO 4" LONG (PILOT LT.)		1
15	WIRE, BLACK (20 SOLID)	833-1029	5"

17	WIRE, BLACK (20 SOLID)	833-1029	2"
18	WIRE, BLACK (20 SOLID)	833-1029	4"
19	SHRINK WRAP (4 PCS: 1/2" LG)	790-0279	.167
20	WIRE, BLACK (20 SOLID)	833-1029	4"
21	SOLDERED CONNECTION		11
22	RING TONGUE CONN. (RED)	49083	8
23	TERMINAL BLOCK	49045	1
24	RELAY	49867	1
25	BUZZER	60101	1
26	PILOT LIGHT	53595	1
27	MOMENTARY SWITCH	49848	2
28	WARNING LIGHT	53596	1
29	KEY SWITCH	49882	1

31	CLAMP		
32	[illegible]		
33	[illegible]		
34	[illegible]		
35	TAPE		



A 5). TAPE LEADS TOGETHER AS SHOWN WITH 2" OF ITEM #35. APPROXIMATELY 1" FROM END.

NOTES:

1). ALL SOLDERED CONNECTIONS TO BE HOOKED THROUGH OR AROUND TERMINALS BEFORE SOLDERING.

2). LOOP WIRES 1.2.& 3 THRU CABLE CLAMP (P/N 14525)
LOOP WIRES 4 & 5 THRU CABLE CLAMP (P/N 14525)

3). AFTER APPLYING CRIMPED-ON TERMINALS. TEST SECURITY OF CRIMP BY FIRMLY PULLING ON WIRE.

4). COVER SOLDER CONNECTIONS WITH UL RECOGNIZED SHRINK MINIMUM TEMPERATURE RATING 105°C. MARKED: "ALPHA" ERATURE RATING. 1/2 INCH REQ'D FOR EACH TERMINAL. WITH HEAT BLOWING TOOL.

A | ADDED ITEM #35, TAPE 6662-0102, ADDED NOTE