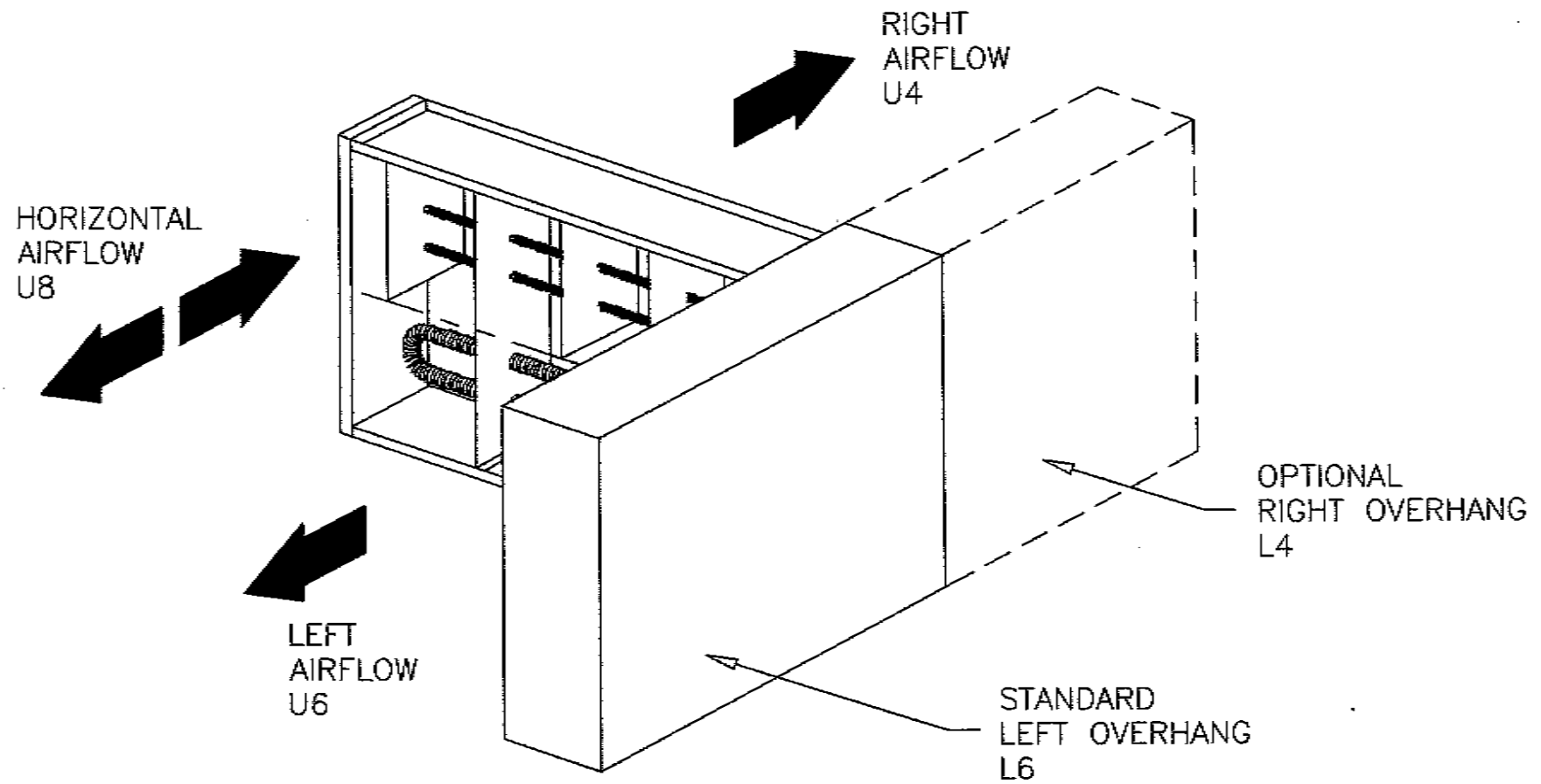



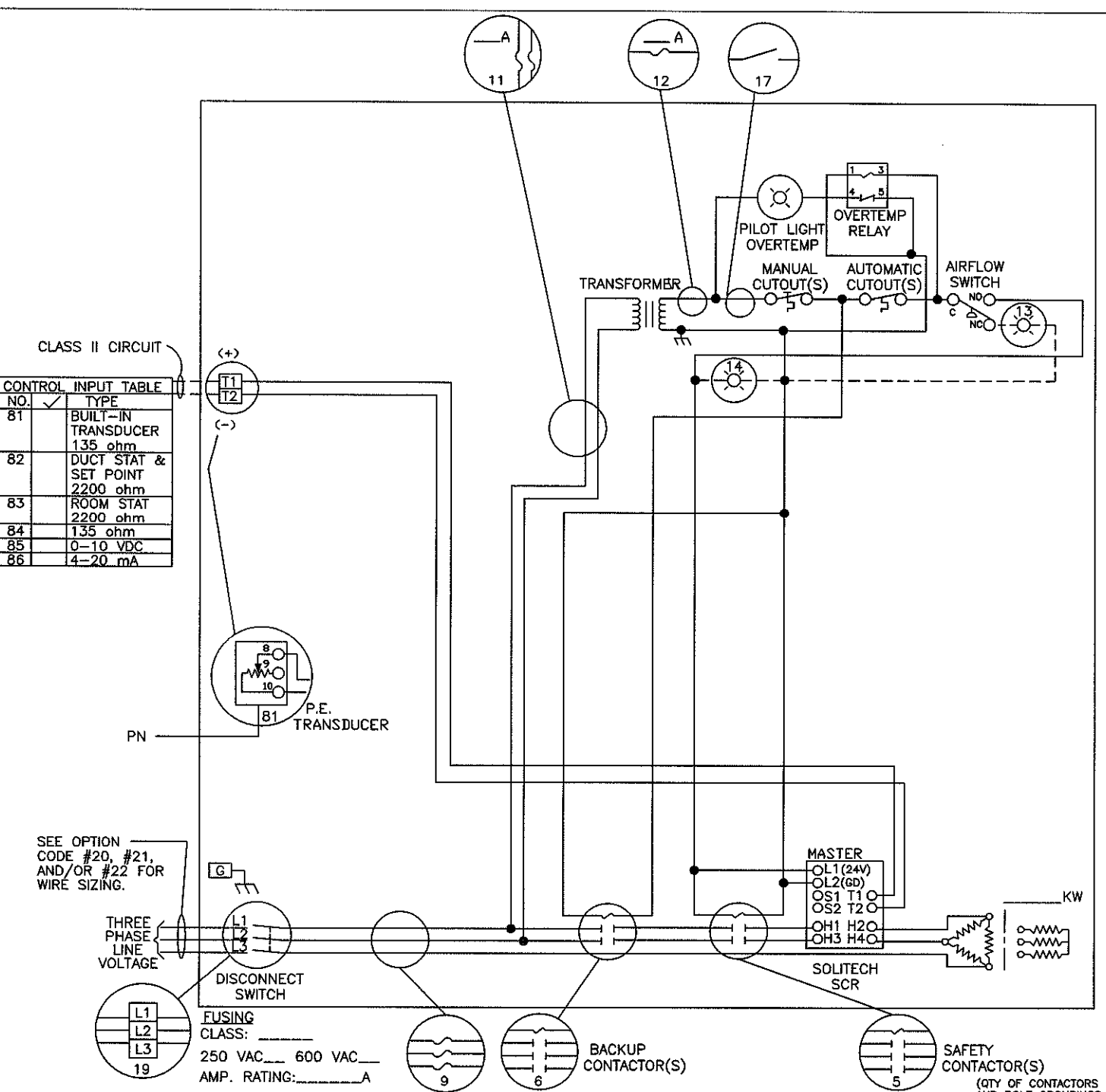
REVISIONS			
REV	DESCRIPTION	DATE	APPROVED



NOTE: EXACT AIRFLOW DIRECTION MUST BE USED FOR FINNED TUBULAR HEATERS (RIGHT OR LEFT).

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	TITLE: HORIZONTAL AIRFLOW AND TBOX OVERHANG NOMENCLATURE	DWS NO. FIGURE 10	
SIZE A	SCALE NONE	SHEET 1 of 1	REV. 0

CONTROL INPUT TABLE	
NO.	TYPE
81	BUILT-IN TRANSUCER 135 ohm
82	DUCT STAT & SET POINT 2200 ohm
83	ROOM STAT 2200 ohm
84	135 ohm
85	0-10 VDC
86	4-20 mA



ITEMS WITHIN A CIRCLE MAY VARY OR MAY NOT BE SUPPLIED. SEE THE OPTION KEY BELOW WHICH INDICATES BY CHECK MARKS WHICH NUMBERED CIRCLES APPLY.

OPTION KEY — CHECK MARKS INDICATE WHICH CIRCLES APPLY

<input type="checkbox"/>	01	CONTROLLING CONTACTOR(S) - 2 POLE
<input type="checkbox"/>	02	SAFETY CONTACTOR(S) - 2 POLE
<input type="checkbox"/>	03	BACK-UP CONTACTOR(S) - 2 POLE
<input type="checkbox"/>	04	CONTROLLING CONTACTOR(S) - 3 POLE
<input type="checkbox"/>	05	SAFETY CONTACTOR(S) - 3 POLE
<input type="checkbox"/>	06	BACK-UP CONTACTOR(S) - 3 POLE
<input type="checkbox"/>	07	SINGLE PHASE LINE FUSING (L1 ONLY)
<input type="checkbox"/>	08	SINGLE PHASE LINE FUSING (L1 & L2)
<input type="checkbox"/>	09	THREE PHASE LINE FUSING
<input type="checkbox"/>	10	PRIMARY TRANSFORMER FUSING - 1 LINE
<input type="checkbox"/>	11	PRIMARY TRANSFORMER FUSING - 2 LINE
<input type="checkbox"/>	12	SECONDARY TRANSFORMER FUSING
<input type="checkbox"/>	13	PILOT LIGHT - LOW AIRFLOW
<input type="checkbox"/>	14	PILOT LIGHT - HEATER ON
<input type="checkbox"/>	15	PILOT LIGHT - STAGE(S) ON
<input type="checkbox"/>	16	PILOT LIGHT - FAN ON
<input type="checkbox"/>	17	PILOT SWITCH
<input type="checkbox"/>	18	CONTROL CIRCUIT DISCONNECT SWITCH
<input type="checkbox"/>	19	NO DISCONNECT SWITCH
<input type="checkbox"/>	20	IF CHECKED, HEATER MAY BE WIRED WITH _____ AWG MIN. SUPPLY WIRE PER 424.22(d) NEC. IF THE HEATER IS CONTROLLED IN ONE OF THE FOLLOWING 3 WAYS (1) TWO OR MORE THERMOSTAT(S) (2) THERMOSTAT WITH 2 OR MORE STAGES (3) PROPORTIONING TYPE THERMOSTAT(S)
<input type="checkbox"/>	21	USE _____ AWG MIN. SUPPLY WIRE. _____ WIRE(S) PER PHASE.
<input type="checkbox"/>	22	UTILISER UN CABLE D'ALIMENTATION D'AU MOINS _____ AWG. _____ CONDUCTEUR(S) PAR PHASE.
<input type="checkbox"/>	23	CLASS 1 CIRCUIT
<input type="checkbox"/>	24	CLASS 2 CIRCUIT
<input type="checkbox"/>	25	NO MANUAL CUT-OUT(S)

LEGEND: ——— POWER WIRING
——— CONTROL WIRING
- - - - - WIRING SUPPLIED ONLY WHEN ASSOCIATED OPTION IS SUPPLIED

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USE COPPER SUPPLY WIRE SUITABLE FOR 75°C. (90°C IN CANADA). WIRE EXTERNAL CONTROL CIRCUIT PER CLASS 1, ARTICLE 725 OF NEC, AND/OR CLASS 1, SECTION 16 OF CEC, EXCEPT THE CLASS 2 CIRCUIT(S) SHOWN ABOVE.
UTILISEZ DU CONDUIT CAPABLE DE SUPPORTER 75°C. (90°C AU CANADA). CONNECTEZ LE CIRCUIT DE CONTROL EXTERNE EN SUIVANT CLASSE 1, ARTICLE 725 DE LA NEC, OU/ET CLASSE 1, SECTION 16 DE LA CEC (EXCEPTION: LE CIRCUIT DE CLASSE 2 DE'JA MENTIONNE AU DESSUS)

NO. L931N1:c19159-A-0



ELECTRIC FINNED TUBULAR DUCT HEATERS

HEATER TYPE

This print covers the following heater types:

- TFXU Finned Tubular, Custom Slip-In
- TFZU Finned Tubular, Custom, Flanged
- 831U Remote Panel
- TFQU Finned Tubular, Standard Slip-In

INDEECO duct heaters utilize the finest construction principles and techniques. A coil of 80% nickel, 20% chromium resistance wire is precisely centered in a .475" diameter stainless steel sheath. Magnesium oxide powder, compacted to rock-like density, insulates the coil electrically from the sheath. A 1-1/4" O.D. spiral wound stainless steel fin makes a minimum of five passes per linear around the outside of the tubular element. The elements are furnished with mounting flanges, making them individually removable from the terminal box. The heater frame is constructed of heavy gauge corrosion resistant steel and is provided with generous flanges for structural rigidity. All heaters are suitable for installation in ducts with up to one inch of interior lining.

All heaters include both automatic and manual reset thermal cutouts (not heat limiters or fusible links). All controls are factory-wired to clearly marked terminal blocks for field connections. Properly sized knockouts are provided. All heaters are supplied complete with wiring diagrams and installation instructions, and all are given a dielectric test at a minimum of 1200 volts before shipment.

UNDERWRITERS LISTING AND NATIONAL ELECTRIC CODE

INDEECO duct heaters and panels with a "U" in the type designation are listed by UL under reference E23192 and E53412. As such, they are suitable for installation with zero clearance to combustible surfaces and for use with heat pumps and central air conditioners. They are also supplied with all necessary provisions for installation in full accordance with the National Electric Code.

INSTALLATION

INDEECO slip-in duct heaters are installed by inserting through a rectangular opening cut in the side of the ductwork and are secured to the duct with sheet metal screws. To install INDEECO flanged duct heaters, flanges must be provided on the duct to match the heater flanges, both on the entering and leaving air sides. The heater is secured to the ductwork by sheet metal screws or bolts through the mating flanges.

When the duct heater is being used in conjunction with an air conditioning or heat pump unit, it must be installed at least 48" from that unit. Per NEC requirements, a minimum of 3-1/2 feet of accessible working space clearance must be provided on the terminal box side of the heater. Care should be taken to follow all instructions found in the Installation, Operating and Maintenance instruction sheet supplied with each heater.

CONTROL OPTIONS

The following table indicates the basic control components which are supplied with each of the standard control options.

STANDARD CONTROL OPTIONS

Option	G Basic	J Pneumatic	K SCR
Thermal Cutouts	X	X	X
Airflow Switch	X	X	X
Control Transformers	X	O	O
Fuses (for heaters over 48 amps)	X	X	X
Disconnect Switch	X	X	X
Contactors (de-energizing)	X	O	O
PE Switches		X	
SCR Controller			X
Thermostat	O		O

X Standard O Provide as necessary

SPECIAL FEATURES

INDEECO heaters are available with a wide variety of special features and constructions. Your quotation or certified print includes a column for special feature codes. The codes in this column, as defined by the table below, describes details of both the standard control options, as well as any special features on the heater in question.

SPECIAL FEATURE CODE DEFINITIONS

A60, A62	PE Switch-Close on Rise	H1	Aluminized Steel Frame & Terminal Box
		H2	Stainless Steel Frame & Terminal Box
		H3	Stainless Steel Elements
B	Terminal Box-Bottom	L3 to L6	Terminal Box Overhang (See Figs. 10 & 11)
B1	Terminal Box-Side Cover	L7	No Overhang, C=M (See Fig. 7)
B2	Terminal Box-Insulated	M to M7	Manual Thermal Cutout
B3	Enclosure-Weatherproof NEMA 4 Type	M8	Remote Manual Reset Rod
B4	Enclosure-Dust-Tight-NEMA 12 Type	N(OO)	Fan Relay (OO is control voltage)
B5	Panelboard-Required for Heater Control	P1	Pilot Light Each Stage On
B7	Enclosure-Dustproof	P2	Pilot Light Insufficient Air
B8	Enclosure-Outdoor-3R Type	P3	Pilot Light Heater On
B9	Enclosure-Stainless Steel Weatherproof Nema 4X Type	P4	Pilot Light-Overtemperature
C, C4, C8	Contactors-Magnetic De-energizing	Q, Q1	Disconnect Switch-Power
C1, C5, C9	Contactors-Magnetic Disconnecting	Q2	Pilot Switch-Control Circuit
C2, C6, C10	Contactors-Mercury De-energizing	Q3, Q4	Airflow Switch Positive
C3, C7, C11	Contactors-Mercury Disconnecting	Q5, Q6	Airflow Switch Negative
		Q8	Disconnect Switch-Control Circuit
		Q10	Disc. Switch-Control Circuit Fan Relay
D3	Derated Coils-25 Watts per Square Inch	S5	SOLITECH STEP CONTROLLER
D4	Derated Coils-35 Watts per Square Inch	S16	2200 Ohm Input-Deadband
E20 to E22	SCR Controller	S18	135 Ohm Input-Proportional
E30	SCR input-2200 Ohms	S19	4-20mA Input-Proportional
E31	SCR input-135 Ohms	S20	with Transducer-Proportional
E32	SCR input-with transducer	S21	0-10VDC Input-Proportional
E33	SCR input-slave for vernier		Step Controller-0-10VDC Thermostat
E34	SCR input-4-20mA	T1, T5	Control Circuit Transformer, Fused Primary
E35	SCR input-0-10VDC	T2 to T4	Control Circuit Transformer
E36	SCR input-0-10VDC Thermostat Controlling Master SCR	U3 to U9	Airflow Direction (See Figs. 10 & 11)
E37	SCR input-Pulse Thermostat Controlling Slave SCR	V	Protective Screens-Both Sides
F	Fuses-Minimum NEC	V1	Pressure Plate-Inlet Side
F1	Fuses-Per Circuit	V2	Protective Screens-One Side
F3	Circuit Breaker-Minimum NEC	Z to Z5	Automatic Thermal Cutout
F5	Circuit Breaker-Per Circuit		
F6	Time Delay Fusing		
G1	Slip-and-Drive Connection		
G2	Extended Cold Section		
G3	Recessed Terminal Box		
GG2	Insulated Duct Construction (extended cold section)		
GG3	Insulated Duct Construction (recessed terminal box)		



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