TFQU Standard Slip-In Finned Tubular Duct Heaters

The TFQU line of finned tubular duct heaters offers a quick ship alternative to our line of completely custom designed heaters (Figure 47). The greatly reduced lead-time is achieved by limiting the frame and KW offerings. The following is a summary of the custom features we have made available as part of the TFQU program.

Twenty-three Frame Sizes, ranging from 12" x 6" to 36" x 24". Heaters need not match duct sizes exactly as long as the duct is large enough to accommodate the heater frame and has no more than 1" of lining. Select a slightly smaller heater filling at least 80% of the duct area. See page 24 which explains how to size slip-in heaters with the 80% Rule.

KW Ratings ranging from 1 KW through 40 KW.

Three Basic Control Circuit Options and limited Special Features meet the vast majority of installation requirements.

UL Listed for zero clearance to combustible surfaces and conforms to National Electrical Code requirements.

These standardized heaters are particularly adaptable to remodeling jobs, contractor-designed jobs and jobs requiring quick completion.

Control Options G, J and K are available for all TFQU frame sizes. Option K controls are single stage only. Reference sample specification on page 34 for descriptions.

Figure 47.

How To Order

Selection of a heater from our TFQU program is best done in consultation with an INDEECO sales representative. The information listed below is required to place an order. Contact the local representative for pricing and heater selection.

1. **Standard Slip-in Heaters** – Indicate Type TFQU for quick delivery option.
2. **KW Rating**.
3. **"W" and "H" Dimensions**.
4. **Voltage and Phase** – 277 volts available in single-phase only. 480 volts available in three-phase only. 208 and 240 volts available in either single or three-phase.
5. **Number of Stages**.
6. **Control Circuit Voltage** – It is only necessary to specify control circuit voltage for Option G. Either 24 or 120 volt is available.
7. **Control Option** – Option G, J or K are available. With Option K only, a room thermostat will be furnished unless a duct thermostat, input (135 ohms, 2200 ohms, 0-10 VDC, 4-20 mA) or PE transducer is specified. See page 33 for details.
8. **Airflow** – Specify left, right, up or down as illustrated on page 33.
9. **Terminal Box Overhang** – For left or right airflow, left overhang is standard, right overhang is optional. For up or down airflow, up overhang is standard, down overhang optional.
10. **Special Features** – Specify as required from the features listed in **Table XII**, page 33.

Airflow Direction and Terminal Box Overhang

For proper positioning of the terminal cutouts, the airflow direction must be specified on all Type TFQU heaters. Left, right, up or down airflows are available.

Left overhang is standard for either right or left airflow, and up overhang is standard for either up or down airflow. The alternate overhangs are available at no extra charge if specified on the order.

For definitions of airflow and terminal box overhangs, see Figures 48 and 49.

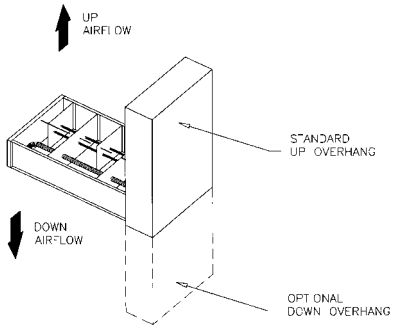

Figure 48.

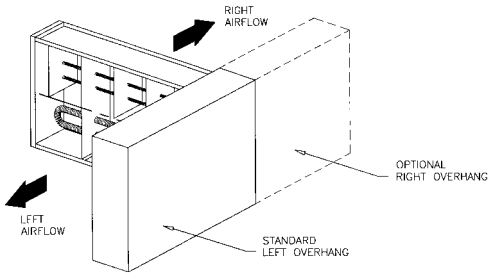

Figure 49.

Control Circuit Options

Type TFQU heaters are available with control circuit Options G, J or K. These options are described in **Table XI**.

Use Option G with simple single or multi-stage on/off electronic thermostats.

Use Option J with pneumatic controls.

Use Option K for precise solid-state SCR temperature control.

Table XI

Option	G	J	K
Disconnect Switch	■	■	■
Thermal Cutouts	■	■	■
Airflow Switch	■	■	■
Contactors	■	■[2]	■[2]
Control Transformer	■	■[3]	■
Fuses	■[1]	■[1]	■[1]
PE Switches		■	
SCR			■
Thermostat			■[4]

Notes: 1. Fuses supplied only on heaters over 48 amps.
2. Contactors supplied only when other devices cannot carry heater load.
3. Transformer only supplied on heaters rated higher than 27 volts.
4. Choice of room or duct thermostat, 135 ohms, 2200 ohms, 0-10 VDC or 4-20 mA inputs.

Special Features

In addition to the standard offerings, the following Special Features are available. A detailed description of each feature is given on the catalog page indicated.

Table XII

Special Features Available on TFQU Heaters

Feature	Page Number
Airflow switch for negative pressure operation	15
Insulated terminal box	38
Dust tight terminal box	37
Controls mounted in remote panelboard	40
Deletion of transformer	16
Deletion of transformer and contactor	16
Transformer primary fused	—
Deletion of disconnect	17
Fuses for heaters rated 48 amps or less	16
“Low Airflow” pilot light	17
“Heater On” pilot light	17
Each “Stage On” pilot light(s)	17
Disconnecting contactors	16
Mercury controlling contactors	16
Fan relay (instead of airflow switch)	15
Fan relay (in addition to airflow switch)	15
Step controller	19-20
Built-in PE transducer	12
When specified, heaters shall be supplied with the following thermostats:	
Pilot duty single stage room thermostat (Fig. 11)	12
Pilot duty two stage room thermostat (Fig. 12)	12
Proportional electronic room thermostat (Fig. 13 & 14)	12
Pilot duty single stage duct thermostat (Fig. 16)	13
Pilot duty two stage duct thermostat (Fig. 17)	13
Proportional electronic duct thermostat with set point adjuster (Fig. 18 & 19)	13
Special inputs (4-20 mA, 0-10 VDC)	21

TFQU – Sample Specification

A job specification can be prepared by using the following information. Simply darken the applicable circles. Material which is part of the basic specification has already been darkened. Additional copies of this specification guide are available from your local INDEECO representative.

● 1. Duct heaters shall be INDEECO
  ● Type TFQU Standard Slip-in heaters

● 2. Approvals – Heaters and panelboards (if required) shall meet the requirements of the National Electrical Code and shall be listed by Underwriters Laboratories for zero clearance to combustible surfaces and for use with heat pumps and air conditioning equipment.

● 3. Heating elements shall consist of a coil, 80% nickel, 20% chromium, Grade A resistance wire, precisely centered in a stainless steel tube filled with granular magnesium oxide. A stainless steel fin is to be helically wound onto the tube. Elements are to be furnished with mounting flanges, making them individually removable through the terminal box.

● 4. Heater frames and terminal boxes shall be corrosion resistant steel. Unless otherwise indicated, the terminal box shall be NEMA 1 construction and shall be provided with a hinged, latching cover and multiple concentric knockouts for field wiring.

● 5. All heaters shall be furnished with triple overtemperature protection. A disc type and linear, automatic reset thermal cutout are included for primary overtemperature protection. All heaters must also be furnished with a linear type manual reset thermal cutout with backup contactors (as required). For secondary overtemperature protection, heat limiters or other fusible overtemperature devices are not acceptable.

● 6. Heaters shall be rated for the voltage, phase and number of heating stages indicated in the schedule. All three-phase heaters shall have equal, balanced, three-phase stages. All internal wiring shall be stranded copper with 105°C insulation and shall be terminated in crimped connectors or box lugs.

● 7. Terminal blocks shall be provided for all field wiring and shall be sized for installation of 75°C copper wire rated in accordance with NEC requirements.

● 8. Heaters shall be furnished either with the Control Option specified in the schedule and described below or with the specific components listed in the schedule.

○ Option G – Thermal cutouts, airflow switch, contactors, fuses (if over 48 amps), control circuit transformer (where required) and built-in, snap-acting, door interlocked disconnect switch.

○ Option J – Thermal cutouts, airflow switch, PE switches, contactors (where required), fuses (if over 48 amps), control circuit transformer (where required), and built-in, snap-acting, door interlocked disconnect switch.

○ Option K – Thermal cutouts, airflow switch, contactors (where required), SCR, fuses (if over 48 amps), control circuit transformer and built-in, snap-acting, door interlocked disconnect switch.

○ 9. When specified in the schedule, or below, heaters will be supplied with the following Special Features:

- ○ Airflow switch for negative pressure operation
- ○ Insulated terminal box
- ○ Dust-tight terminal box
- ○ Controls mounted in remote panelboard
- ○ Deletion of transformer
- ○ Deletion of transformer and contactor
- ○ Transformer primary fusing
- ○ Deletion of disconnect switch
- ○ Fuses for heaters rated 48 amps or less
- ○ “Low Airflow” pilot light
- ○ “Heater On” pilot light
- ○ Each “Stage On” pilot light(s)
- ○ Disconnecting contactors
- ○ Mercury controlling contactors
- ○ Fan relay (instead of airflow switch)
- ○ Fan relay (in addition to airflow switch)
- ○ Step controller
- ○ Built-in PE transducer

○ 10. When specified in the schedule, or below, heaters shall be supplied with the following thermostats:

- ○ Pilot duty single stage room thermostat
- ○ Pilot duty two stage room thermostat
- ○ Proportional electronic room thermostat
- ○ Pilot duty single stage duct thermostat
- ○ Pilot duty two stage duct thermostat
- ○ Proportional electronic duct thermostat with set point adjuster
- ○ Special inputs (135 ohms, 2200 ohms, 4-20 mA, 0-10 VDC)

○ 11. Duct Heater Schedule – Use of the following typical format will insure that all necessary information is available to bidders:

Item or Tag #	Heater Type	KW	Duct Dimensions (Inches)		Supply Line		No. of Heating Stages	Control Circuit Voltage	Control Option	Special Features	Thermostats
			W (Width)	H (Height)	Volts	Phase					
EDH -1	TFQU	10	24	24	208	3	2	24	G	Vertical Up Airflow Pilot Light	Room
EDH -2	TFQU	18	36	16	208	1	4	208	J	Insulated Terminal Box	None
EDH -3	TFQU	7.5	20	12	480	3	1	24	K	Fan Relay (24V)	Duct