

# RDFF, RDIF, RDFT, & RDIT Series Air Duct Heaters

## Application

Ruffneck™ air duct heaters are for use in comfort heating applications. Typical applications include:

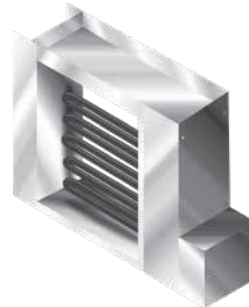
- Make-up air heating
- Air pre-heating
- Air handling equipment
- Fan coils
- Terminal reheating
- Multi-zone reheating
- Heat pump auxiliary systems

Type RDFF is a flanged duct heater with finned tubular heating elements.

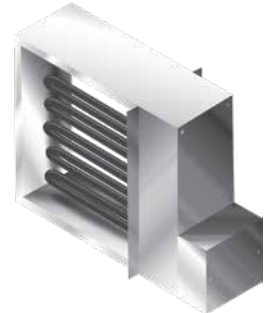
Type RDIF is an insert duct heater with finned tubular heating elements.

Type RDFT is a flanged duct heater with Incoloy® (non-finned) tubular heating elements.

Type RDIT is an insert duct heater with tubular heating elements.



Type RDFT



Type RDIF

In Canada these units are marketed under the Caloritech™ brand name. Refer to Caloritech™ Catalogue Section C.



## Standard Features

- Primary linear cutout: 160°F (71°C), 277/600 Vac, 25/10 amp non-inductive
- Secondary linear cutout: Manual reset complete with back-up magnetic contactor on units under 300 V, 30 kW and less, 225°F (107°C) 277/600 Vac, 25/10 amp non-inductive

## Optional Auxiliary Duct Heater Controls

These controls are available as factory installed on the duct heater or as an EEMAC rated (specify) control panel for wall mount:

- Wall thermostats:
  - T498A
  - T6051A (1 stage)
  - T6052A (2 stage)
  - T921A (0 - 135 ohm)
- Duct thermostats™
  - T675A (1 stage)
  - T678A (2 stage)
  - T991A (0 - 135 ohm)
- Bulb holders
- Silent contactors
- SCR controllers
- Sail switch
- Differential pressure switch
- Main disconnect
- Pneumatic electric switches
- ON-OFF switch
- Magnetic contactors
- Step controllers
- HRC fusing
- Control transformers
- Fan interlock relay
- Pilot lights

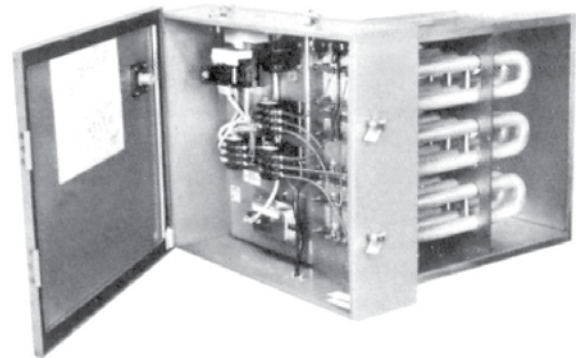


Figure 21 –Duct heater controls

## Element Types

The finned tubular element design is the most popular. It incorporates the highest wattage per cross-sectional duct area, thus making it more economical than the Incoloy® tubular design.

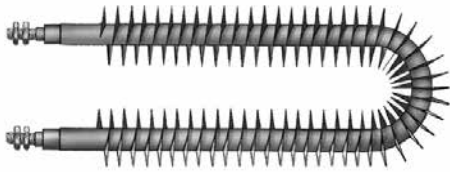


Figure 22 – Finned Tubular Elements

Finned tubular elements are constructed using a steel tube with a corrugated steel fin wrapped around it and brazed together. This increases the heat transfer surface of the element resulting in a lower operating temperature than tubular designs.

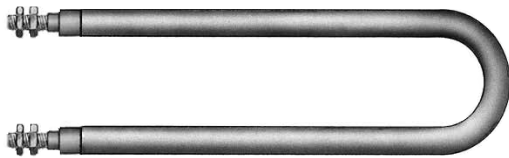


Figure 23 – Tubular Elements

Incoloy® tubular elements are similarly constructed, but without the steel fin in order to increase the corrosion resistance.

The Incoloy® design should be chosen where high humidity or slightly corrosive chemical contaminants are present in the air stream. These units are made and approved on special order only.

Both element types are designed to provide many years of maintenance free service.

Unlike open coil designs, duct heaters fitted with tubular elements are not subject to hazards of electrical shock which allows installation close to a register or grille.

## Recommended Kilowatts

In order to select the proper kW for your application, use Figure 24 below.

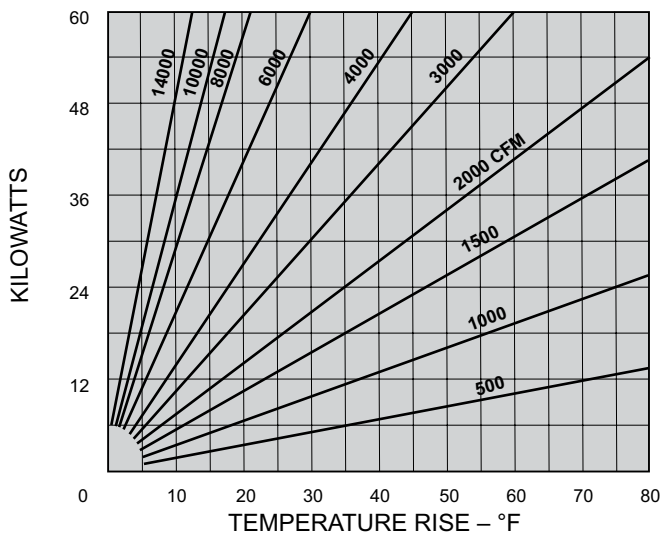


Figure 24 – Recommended Kilowatts

## Wiring and Auxiliary Controls

Ruffneck™ electric duct heaters are available for supply voltages up to 600 V, 3 phase. Multi-staging to provide increments of temperature rise can be incorporated where dimensional space and element spacing allows. Special electrical features are available providing simple or sophisticated temperature control to suit individual requirements. See optional controls on previous page.

## Construction

Two basic heater frame constructions are available, flange type or insert type (see Figure 25 and Figure 26 below).

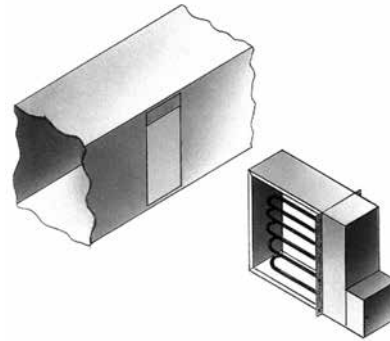


Figure 25 – Insert Type

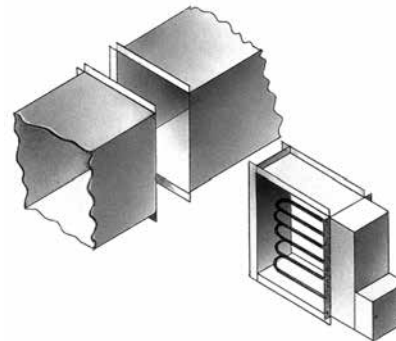


Figure 26 – Flange Type

All frames are fabricated from 16-gauge satin-coat steel. Specially constructed stainless-steel frames are also available.

A unique modular construction using stock frame components is employed using vertical and horizontal dimensional increments of two inches, ensuring rapid delivery.

## Standard Dimensions

Insert type duct heaters are slightly undersized to permit installation in ducts having the A and B dimensions listed in Table 33.



## Selection and Installation

Finned tubular duct heaters are approved for horizontal duct installation where the maximum inlet air temperature does not exceed 77°F (25°C) and the maximum rating does not exceed 120 kW.

Multiple heaters can be installed in tandem (series) provided that the inlet temperature to any heater section (one heater) is not more than 77°F (25°C) and the air velocity is not less than the requirements of Figure 27. Check factory if you require assistance.

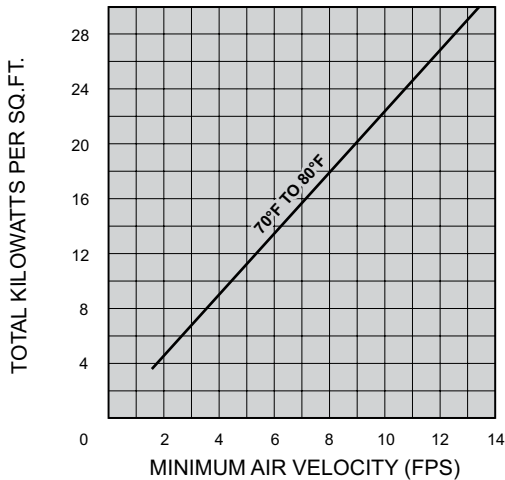


Figure 27 – Air Velocity Requirements

See Table 33 for typical duct heater sizes and kW ratings based on an air flow velocity of 500 ft/min or higher.

If the flow velocity is less than 500 ft/min, the typical maximum kW ratings in the table must be derated using Figure 28

Multiply the kW ratings shown in Table 33 by the appropriate derating factor from Figure 28.

Table 33 lists some of the more common heater sizes with maximum kilowatt ratings for each size. Stock modular frames allow quick delivery for other sizes in increments of 2" (51 mm).

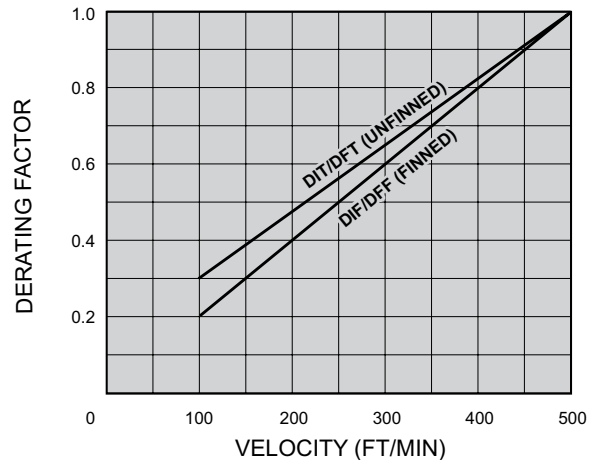


Figure 28 – Derating Factors

Table 33 – Maximum Single Heater kW Rating for Typical Duct Heater Sizes

Dimensions A x B	Types RDIF / RDFF		Types RDIT / RDFT	
	Max. kW	Max No. of Elements.	Max. kW	Max No. of Elements.
6 x 6 (125 x 152)	2.5	3	1.5	6
8 x 6 (203 x 152)	3	3	3.0	6
10 x 6 (254 x 152)	4	3	2.5	6
10 x 8 (254 x 203)	5.5	4	3.5	8
12 x 6 (305 x 125)	5	3	3.5	6
12 x 8 (305 x 203)	6.5	4	4.5	8
12 x 10 (305 x 254)	8	5	5.5	10
14 x 8 (356 x 203)	7.5	4	5.5	8
14 x 10 (356 x 254)	9.5	5	6.5	10
14 x 12 (356 x 305)	11.5	6	8.0	12
16 x 10 (406 x 254)	11	5	7.5	10
16 x 12 (406 x 305)	13	6	9.0	12
16 x 14 (406 x 356)	15.5	7	10.5	14
18 x 12 (457 x 305)	15	6	10.5	12
18 x 14 (457 x 356)	17.5	7	12	14
18 x 16 (457 x 406)	20	8	14	16
20 x 14 (508 x 356)	19	7	13.5	14
20 x 16 (508 x 406)	22	8	13.5	16
20 x 18 (508 x 457)	25	9	17.5	18
22 x 16 (559 x 406)	24	8	17	16
22 x 18 (406 x 457)	27.5	9	19	18
22 x 20 (406 x 508)	30.5	10	21	20
24 x 18 (610 x 457)	30	9	21	18
24 x 20 (610 x 508)	33	10	23	20
24 x 22 (610 x 559)	36.5	11	25.5	22
26 x 20 (660 x 508)	36	10	25	20
26 x 22 (660 x 406)	39.5	11	27.5	22
26 x 24 (660 x 610)	43	12	30	24
28 x 22 (711 x 559)	42.5	11	29.5	22
28 x 24 (711 x 610)	46.5	12	32.5	24
28 x 26 (711 x 660)	50.5	13	35	26
30 x 24 (762 x 610)	50	12	35	24
30 x 26 (762 x 660)	54	13	37.5	26
30 x 28 (762 x 711)	58	14	40.5	28
30 x 30 (762 x 762)	62.5	15	43.5	30