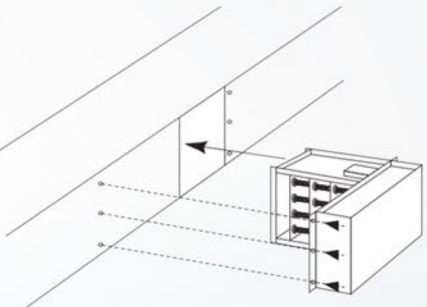
ELECTRIC DUCT HEATER

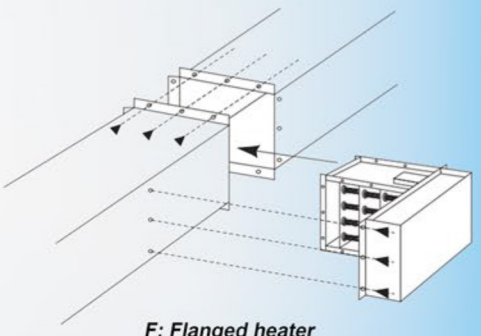
- Duct heaters heat up the air that flows in a ducting system. The duct heater can be delivered in the desired size (round or rectangular). Depending on the minimum air flow, the surface load will be set.
- Electric duct heater can use to heat air for utilities or industrial areas or As an accessory for the blower.
- The casing made of 304 stanless steel. Protection class: IP44.
- Each heater has two thermostats and screw terminals for easy connection.

2 TYPE

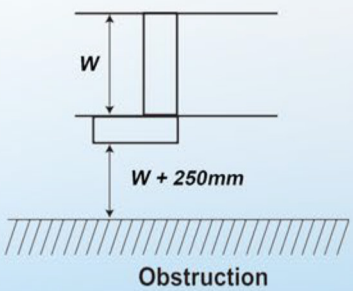
Electric duct heaters are CSA and NRTL/C approved for zero clearance to combustible material. However, space should be provided to install and service the duct heater.
Please see the minimum recommended installation clearances figures.

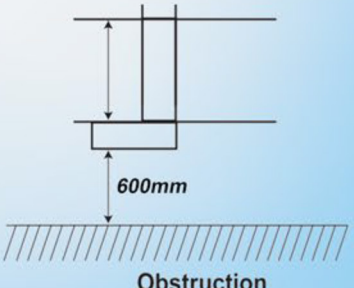


S: Slip-in heater



F: Flanged heater

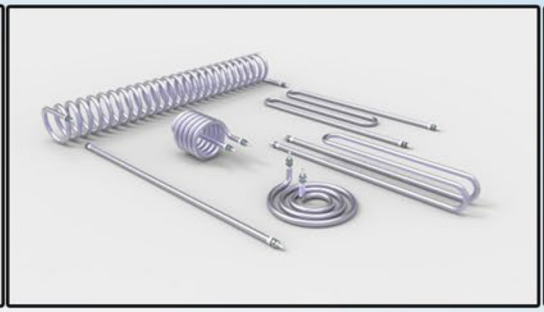




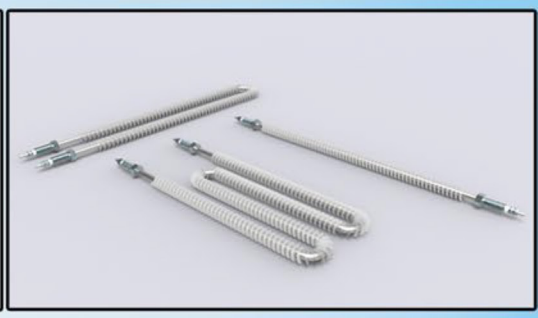
DeAir Joint Stock Company
deair.com.vn 0925 977 579
Office & Factory: 442/8 National Highway 1A, An Phu Dong Ward, District 12, HCMC
Branch: No. 29, Nhu Quynh Street, Nhu Quynh Town, Van Lam District, Hung Yen Province

HEATER ELEMENT

Open coil



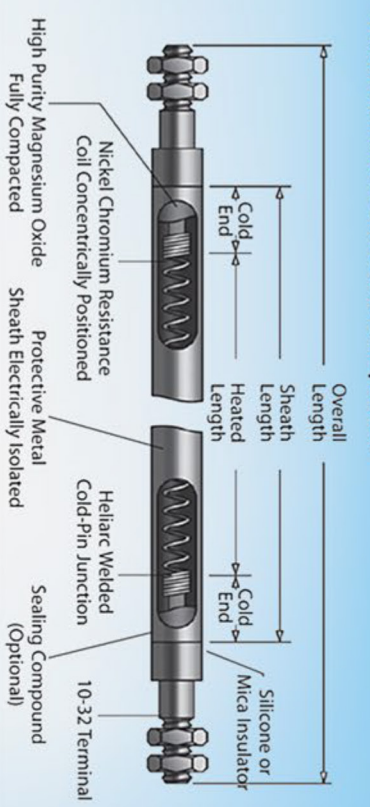
Tubular



Tubular finned

FACTOR	OPEN COIL	TUBULAR	FINNED TUBULAR
COIL TEMPERATURES	Resistance coil, exposed directly to airstream, runs cooler than coils imbedded in sheathed elements.	Tubes run hotter than open coil or finned tubular. Temperatures are kept within safe limits by reducing watt densities.	Finned tubes run hotter than open coil, but cooler than tubular due to heat transfer effect of fins.
AIRFLOW UNIFORMITY	Airflow must be uniformly distributed to prevent hotspots. Pressure plates can help even out airflow.	Less susceptible to hotspots than open coil, but more susceptible than finned tubular.	Finned tubulars heaters are most tolerant of nonuniform airflow. Hotspots tend to be dissipated by sheath and fins.
PRESSURE DROPS	Lowest pressure drop due to large percentage of open space.	Highest pressure drop because of high percentage of space occupied by tubes.	Lower pressure drop than tubular, but higher than open coil.
ELECTRICAL CLEARANCES	Large clearances between live parts and ground enable open coil heaters to withstand severe applications.	Clearances between live parts and sheath are small, but filled with compacted insulation.	Clearances between live parts and sheath are small, but filled with compacted insulation.
AIR QUALITY	Use only with clean air free of conductive particles or water spray. To a certain extent humid air is acceptable.	Can be used with virtually any of atmospheric conditions.	Can be used with air containing water droplets or conductive particles unless particles are likely to build up between fins.
OUTLET AIR TEMPERATURE	1200°F. maximum	1200°F. maximum	600°F. maximum
MECHANICAL STABILITY	Open coil heaters are-most susceptible to damage due to physical abuse.	Tubular heaters are least susceptible to damage due to physical abuse.	Finned tubular heaters can withstand more physical abuse than open coil.
CONTROLLABILITY	Open coil heaters respond quickly to step control because of low thermal inertia. This can produce temperature fluctuations if control system does not compensate.	Thermal inertia greater than open coil, but less than finned tubular.	Higher thermal inertia makes finned tubular heaters slower to respond, but can produce more uniform temperatures if control system is properly designed.
SAFETY	Since element is electrically live, it is advisable and safer to order protective screen at all times, if element may be touched by conductive material or accidentally by personnel.	Because the coil is enclosed in a grounded metal sheath, electrical shock hazard due to accidental contact does not exist.	Because the coil is enclosed in a grounded metal sheath, electrical shock hazard due to accidental contact does not exist.
COST	For most applications, open coil heaters are more economical because manufacturing operations are simpler.	Generally most expensive of the three because of conservative, high temperature design.	Generally more expensive than open coil, but less expensive than tubular because watt densities are higher.
WEIGHT	The lightest of all 3 types.	Heavier than open coil. Additional support required for horizontally mounted units, especially for extra long heaters.	Heavier than open coil. Additional support required for horizontally mounted units, especially for extra long heaters.

Specification:
- *Material: Stainless steel*
- *Watts density:*
  - **Sheath 44.5kW/m2*
  - **Fin and sheath total 7.0kW/m2 at 220V (tubular finned)*



TEMPERATURE CONTROL MODES AND STAGING

In selecting temperature controls the specification writer will generally wish to consider both control accuracy and cost.
In selecting temperature controls the specification writer will generally wish to consider both control accuracy and cost.To provide an acceptably close match of heater output to the system's varying demand for heat it is usually necessary to divide the total KW capacity into separately controlled increments or "control stages".

Temperature rise per control stage, ˚C	Temperature control accuracy
3 or less	FINE
4 to 12	MEDIUM
over 13	COARSE

Each stage accounts for part of the total temperature rise ΔT through the heater. This temperature rise per stage (ΔT/ stage) determines how accurately the temperature in the system can be controlled.

Recommended Number of Control ON/OFF stages or SCR Proportional Control							
Heating Load		ΔT = 6°C 10°F	ΔT = 11°C 20°F	ΔT = 17°C 30°F	ΔT = 22°C 40°F	ΔT = 28°C 50°F	ΔT > 28°C 50°F
Temperature Control Options	Coarse	--	1 stage ON / OFF	2 stages ON / OFF	2 stages ON / OFF	2 stages ON / OFF	SCR
	Medium	1 stage ON / OFF	SCR	SCR	SCR	SCR	
	Fine	SCR	SCR	SCR	SCR	SCR	

DEAIR. HEAT *recommendations for control.*

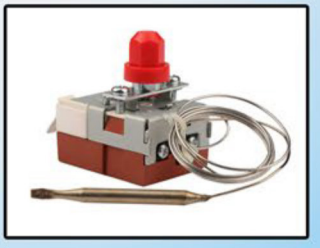
Caution: *It should be reminded that a coarse control puts an additional stress on the contactors since they have to cycle more often.*

PROTECTION

Electric duct heater set with 3 levels of protection. Ensure absolute safety for systems, factory or buildings,...


Air pressure switch


Temperature control


Temperature protector

DETERMINE HEATER CAPACITY

Given CFM (volume of air in cubic feet per minute) and ΔºT (temperature rise in º F), the KW capacity can be determined from the formulas:

$$KW^{**} = \frac{CFM \times \text{Temperature Rise, } ^\circ F^{*}}{3000}$$

$$\text{Temperature Rise, } ^\circ F = \frac{KW \times 3000}{CFM}$$

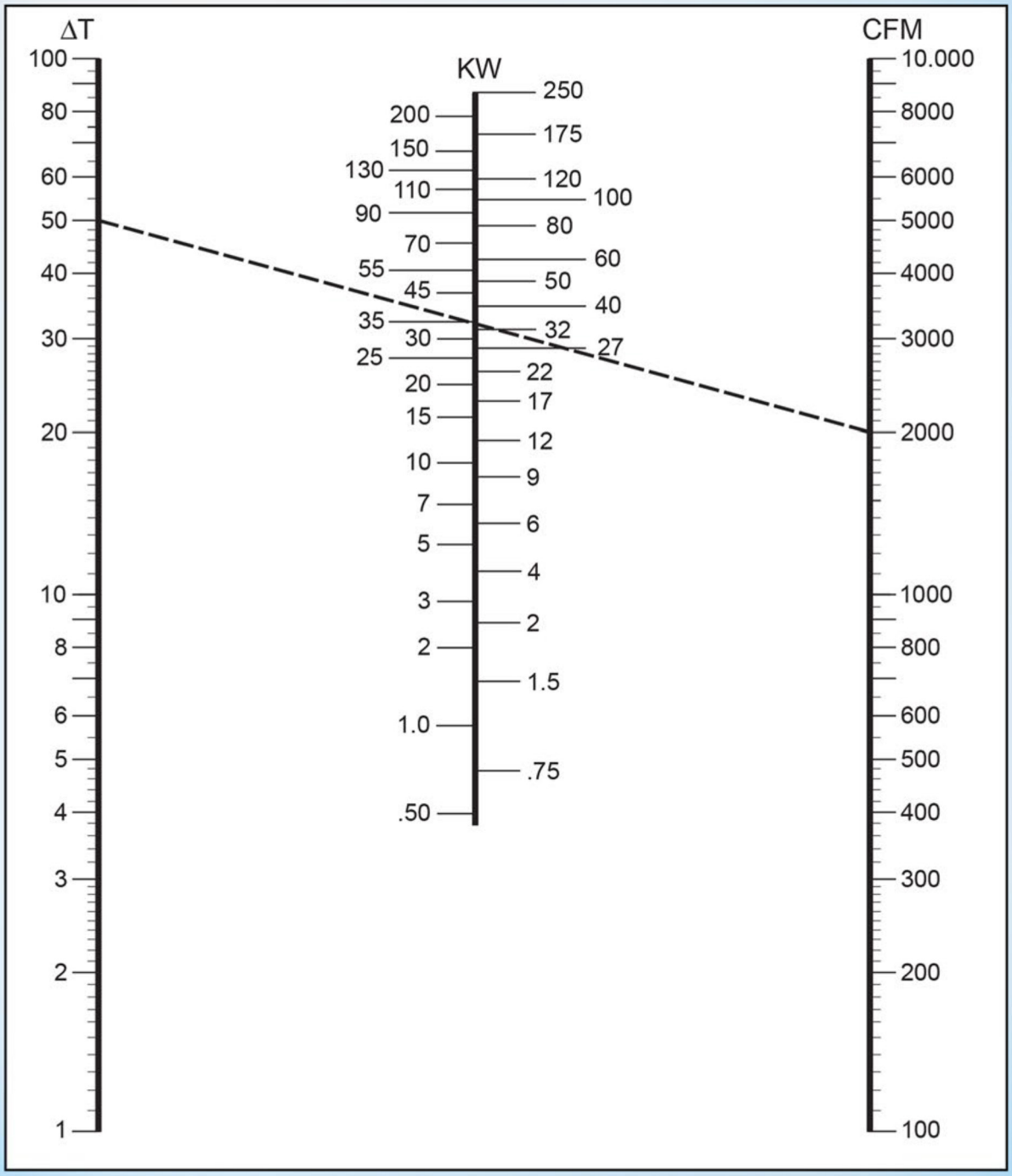
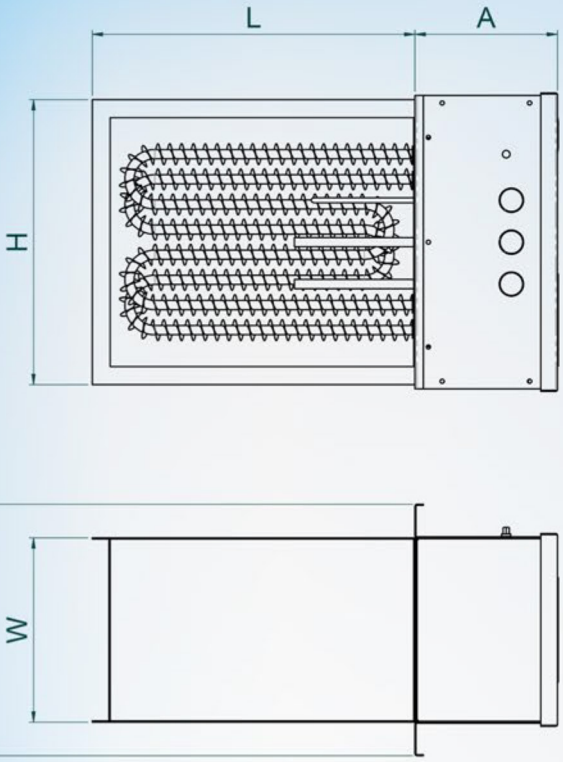
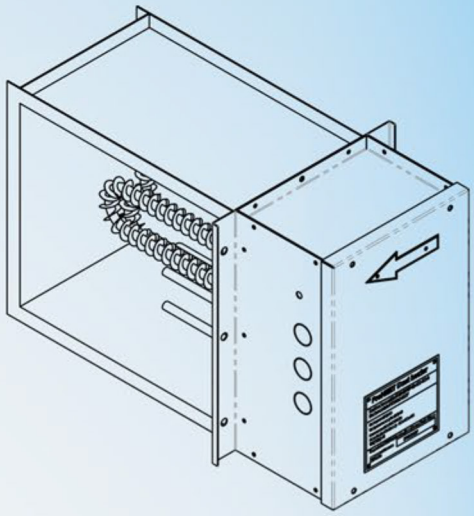


Chart to determine the required kilowatts

SELECT MODEL





Item no.	Model duct heater	Model heater	Quantity	Capacity (kW)	Duct size (mm)	Power supply	L (mm)	H (mm)	W (mm)	A (mm)	B (mm)
PU SHAPE											
1	PU-TS/FS-1.5	PU-0.5-250	3	1.5	350x300	380V/3Ph/50Hz	345	220	220	170	300
2	PU-TS/FS-3.0		6	3.0	350x300	380V/3Ph/50Hz	345	220	310	170	390
3	PU-TS/FS-4.5		9	4.5	350x300	380V/3Ph/50Hz	345	220	400	170	480
4	PU-TS/FS-6.0		12	6.0	350x300	380V/3Ph/50Hz	345	220	490	170	570
5	PU-TS/FS-4.5	PU-0.75-350	6	4.5	450x300	380V/3Ph/50Hz	445	220	310	170	390
6	PU-TS/FS-6.75		9	6.8	450x300	380V/3Ph/50Hz	445	220	400	170	480
7	PU-TS/FS-9.0		12	9.0	450x300	380V/3Ph/50Hz	445	220	490	170	570
8	PU-TS/FS-11.25		15	11.3	450x300	380V/3Ph/50Hz	445	220	580	170	660
9	PU-TS/FS-6.0	PU-1.0-450	6	6.0	550x300	380V/3Ph/50Hz	545	220	310	170	390
10	PU-TS/FS-9.0		9	9.0	550x300	380V/3Ph/50Hz	545	220	400	170	480
11	PU-TS/FS-12.0		12	12.0	550x300	380V/3Ph/50Hz	545	220	490	170	570
12	PU-TS/FS-15.0		15	15.0	550x300	380V/3Ph/50Hz	545	220	580	170	660
PW SHAPE											
1	PW-TS/FS-3.0	PW-1.0-250	3	3.0	350x400	380V/3Ph/50Hz	345	340	220	170	300
2	PW-TS/FS-6.0		6	6.0	350x400	380V/3Ph/50Hz	345	340	310	170	390
3	PW-TS/FS-9.0		9	9.0	350x400	380V/3Ph/50Hz	345	340	400	170	480
4	PW-TS/FS-12.0		12	12.0	350x400	380V/3Ph/50Hz	345	340	490	170	570
5	PW-TS/FS-3.75	PW-1.25-300	3	3.8	400x400	380V/3Ph/50Hz	395	340	220	170	300
6	PW-TS/FS-7.5		6	7.5	400x400	380V/3Ph/50Hz	395	340	310	170	390
7	PW-TS/FS-11.25		9	11.3	400x400	380V/3Ph/50Hz	395	340	400	170	480
8	PW-TS/FS-15.0		12	15.0	400x400	380V/3Ph/50Hz	395	340	490	170	570
9	PW-TS/FS-4.5	PW-1.5-350	3	4.5	450x400	380V/3Ph/50Hz	445	340	220	170	300
10	PW-TS/FS-9.0		6	9.0	450x400	380V/3Ph/50Hz	445	340	310	170	390
11	PW-TS/FS-13.5		9	13.5	450x400	380V/3Ph/50Hz	445	340	400	170	480
12	PW-TS/FS-18.0		12	18.0	450x400	380V/3Ph/50Hz	445	340	490	170	570
13	PW-TS/FS-5.25	PW-1.75-400	3	5.3	500x400	380V/3Ph/50Hz	495	340	220	170	300
14	PW-TS/FS-10.5		6	10.5	500x400	380V/3Ph/50Hz	495	340	310	170	390
15	PW-TS/FS-15.75		9	15.8	500x400	380V/3Ph/50Hz	495	340	400	170	480
16	PW-TS/FS-21.0		12	21.0	500x400	380V/3Ph/50Hz	495	340	490	170	570

SELECT MODEL

Item no.	Model duct heater	Model heater	Quantity	Capacity (kW)	Duct size (mm)	Power supply	L (mm)	H (mm)	W (mm)	A (mm)	B (mm)
PUW SHAPE											
1	PUW-TS/FS-6.0	PUW-2.0-300	3	6.0	400x500	380V/3Ph/50Hz	395	490	220	170	300
2	PUW-TS/FS-12.0		6	12.0	400x500	380V/3Ph/50Hz	395	490	310	170	390
3	PUW-TS/FS-18.0		9	18.0	400x500	380V/3Ph/50Hz	395	490	400	170	480
4	PUW-TS/FS-24.0		12	24.0	400x500	380V/3Ph/50Hz	395	490	490	170	570
5	PUW-TS/FS-7.5	PUW-2.5-350	3	7.5	450x500	380V/3Ph/50Hz	445	490	220	170	300
6	PUW-TS/FS-15.0		6	15.0	450x500	380V/3Ph/50Hz	445	490	310	170	390
7	PUW-TS/FS-22.5		9	22.5	450x500	380V/3Ph/50Hz	445	490	400	170	480
8	PUW-TS/FS-30.0		12	30.0	450x500	380V/3Ph/50Hz	445	490	490	170	570
9	PUW-TS/FS-9.0	PUW-3.0-450	3	9.0	550x500	380V/3Ph/50Hz	545	490	220	170	300
10	PUW-TS/FS-18.0		6	18.0	550x500	380V/3Ph/50Hz	545	490	310	170	390
11	PUW-TS/FS-27.0		9	27.0	550x500	380V/3Ph/50Hz	545	490	400	170	480
12	PUW-TS/FS-36.0		12	36.0	550x500	380V/3Ph/50Hz	545	490	490	170	570
13	PUW-TS/FS-10.5	PUW-3.5-500	3	10.5	600x500	380V/3Ph/50Hz	595	490	220	170	300
14	PUW-TS/FS-21.0		6	21.0	600x500	380V/3Ph/50Hz	595	490	310	170	390
15	PUW-TS/FS-31.5		9	31.5	600x500	380V/3Ph/50Hz	595	490	400	170	480
16	PUW-TS/FS-42.0		12	42.0	600x500	380V/3Ph/50Hz	595	490	490	170	570

PU/PW/PUW: Shape of heater element.
TS: Heater TUBULAR, type SLIP-IN.
FS: Heater TUBULAR FINNED, type SLIP-IN
TF: Heater TUBULAR, type FLANGED.
FF: Heater TUBULAR FINNED, type FLANGED
1.5: Capacity of duct heater (kW).

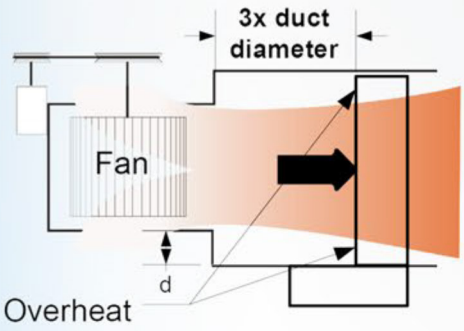
Item no.	Model duct heater	Model heater	Quantity	Capacity (kW)	Duct size (mm)	Power supply	L (mm)	H (mm)	W (mm)	A (mm)	B (mm)
PU SHAPE											
1	PU-TF/FF-1.5	PU-0.5-250	3	1.5	300x300	380V/3Ph/50Hz	340	380	220	170	300
2	PU-TF/FF-3.0		6	3.0	300x300	380V/3Ph/50Hz	340	380	310	170	390
3	PU-TF/FF-4.5		9	4.5	300x300	380V/3Ph/50Hz	340	380	400	170	480
4	PU-TF/FF-6.0		12	6.0	300x300	380V/3Ph/50Hz	340	380	490	170	570
5	PU-TF/FF-4.5	PU-0.75-350	6	4.5	400x300	380V/3Ph/50Hz	440	380	310	170	390
6	PU-TF/FF-6.75		9	6.8	400x300	380V/3Ph/50Hz	440	380	400	170	480
7	PU-TF/FF-9.0		12	9.0	400x300	380V/3Ph/50Hz	440	380	490	170	570
8	PU-TF/FF-11.25		15	11.3	400x300	380V/3Ph/50Hz	440	380	580	170	660
9	PU-TF/FF-6.0	PU-1.0-450	6	6.0	500x300	380V/3Ph/50Hz	540	380	310	170	390
10	PU-TF/FF-9.0		9	9.0	500x300	380V/3Ph/50Hz	540	380	400	170	480
11	PU-TF/FF-12.0		12	12.0	500x300	380V/3Ph/50Hz	540	380	490	170	570
12	PU-TF/FF-15.0		15	15.0	500x300	380V/3Ph/50Hz	540	380	580	170	660
PW SHAPE											
1	PW-TF/FF-3.0	PW-1.0-250	3	3.0	300x400	380V/3Ph/50Hz	340	480	220	170	300
2	PW-TF/FF-6.0		6	6.0	300x400	380V/3Ph/50Hz	340	480	310	170	390
3	PW-TF/FF-9.0		9	9.0	300x400	380V/3Ph/50Hz	340	480	400	170	480
4	PW-TF/FF-12.0		12	12.0	300x400	380V/3Ph/50Hz	340	480	490	170	570
5	PW-TF/FF-3.75	PW-1.25-300	3	3.8	350x400	380V/3Ph/50Hz	390	480	220	170	300
6	PW-TF/FF-7.5		6	7.5	350x400	380V/3Ph/50Hz	395	480	310	170	390
7	PW-TF/FF-11.25		9	11.3	350x400	380V/3Ph/50Hz	395	480	400	170	480
8	PW-TF/FF-15.0		12	15.0	350x400	380V/3Ph/50Hz	395	480	490	170	570
9	PW-TF/FF-4.5	PW-1.5-350	3	4.5	400x400	380V/3Ph/50Hz	445	480	220	170	300
10	PW-TF/FF-9.0		6	9.0	400x400	380V/3Ph/50Hz	445	480	310	170	390
11	PW-TF/FF-13.5		9	13.5	400x400	380V/3Ph/50Hz	445	480	400	170	480
12	PW-TF/FF-18.0		12	18.0	400x400	380V/3Ph/50Hz	445	480	490	170	570
13	PW-TF/FF-5.25	PW-1.75-400	3	5.3	450x400	380V/3Ph/50Hz	495	480	220	170	300
14	PW-TF/FF-10.5		6	10.5	450x400	380V/3Ph/50Hz	495	480	310	170	390
15	PW-TF/FF-15.75		9	15.8	450x400	380V/3Ph/50Hz	495	480	400	170	480
16	PW-TF/FF-21.0		12	21.0	450x400	380V/3Ph/50Hz	495	480	490	170	570

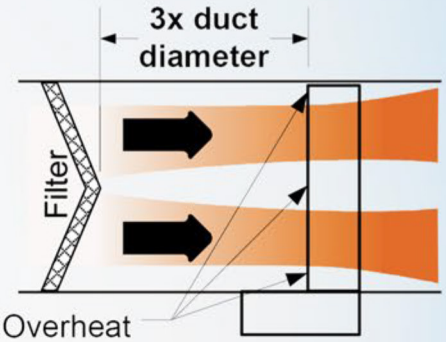
SELECT MODEL

Item no.	Model duct heater	Model heater	Quantity	Capacity (kW)	Duct size (mm)	Power supply	L (mm)	H (mm)	W (mm)	A (mm)	B (mm)
PUW SHAPE											
1	PUW-TF/FF-6.0	PUW-2.0-300	3	6.0	350x500	380V/3Ph/50Hz	390	580	220	170	300
2	PUW-TF/FF-12.0		6	12.0	350x500	380V/3Ph/50Hz	390	580	310	170	390
3	PUW-TF/FF-18.0		9	18.0	350x500	380V/3Ph/50Hz	390	580	400	170	480
4	PUW-TF/FF-24.0		12	24.0	350x500	380V/3Ph/50Hz	390	580	490	170	570
5	PUW-TF/FF-7.5	PUW-2.5-350	3	7.5	400x500	380V/3Ph/50Hz	440	580	220	170	300
6	PUW-TF/FF-15.0		6	15.0	400x500	380V/3Ph/50Hz	440	580	310	170	390
7	PUW-TF/FF-22.5		9	22.5	400x500	380V/3Ph/50Hz	440	580	400	170	480
8	PUW-TF/FF-30.0		12	30.0	400x500	380V/3Ph/50Hz	440	580	490	170	570
9	PUW-TF/FF-9.0	PUW-3.0-450	3	9.0	500x500	380V/3Ph/50Hz	540	580	220	170	300
10	PUW-TF/FF-18.0		6	18.0	500x500	380V/3Ph/50Hz	540	580	310	170	390
11	PUW-TF/FF-27.0		9	27.0	500x500	380V/3Ph/50Hz	540	580	400	170	480
12	PUW-TF/FF-36.0		12	36.0	500x500	380V/3Ph/50Hz	540	580	490	170	570
13	PUW-TF/FF-10.5	PUW-3.5-500	3	10.5	550x500	380V/3Ph/50Hz	590	580	220	170	300
14	PUW-TF/FF-21.0		6	21.0	550x500	380V/3Ph/50Hz	590	580	310	170	390
15	PUW-TF/FF-31.5		9	31.5	550x500	380V/3Ph/50Hz	590	580	400	170	480
16	PUW-TF/FF-42.0		12	42.0	550x500	380V/3Ph/50Hz	590	580	490	170	570

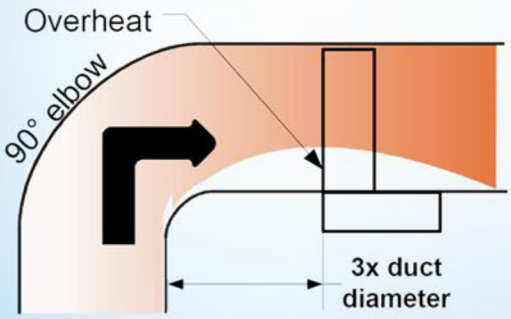
Note: *In the event that a suitable duct heater cannot be selected available in the catalogue, please contact with us for design advice.*

INSTALLATION

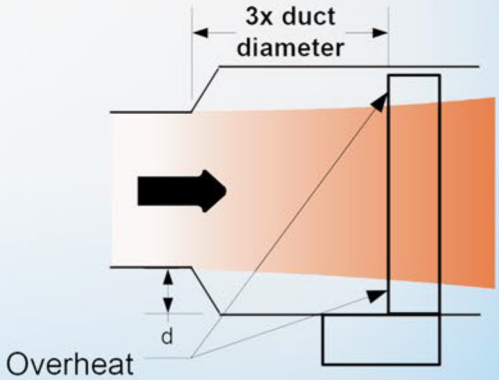




Electric heater too close to elbow.

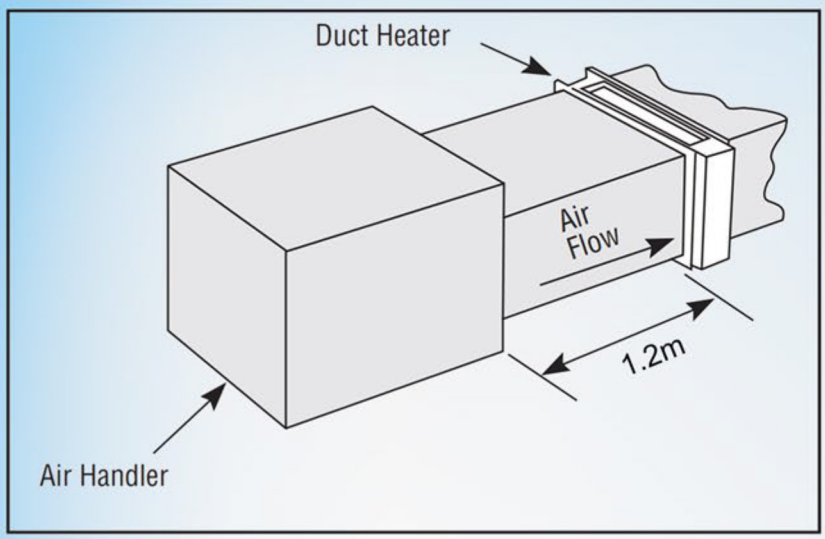


Electric heater too close to transition.

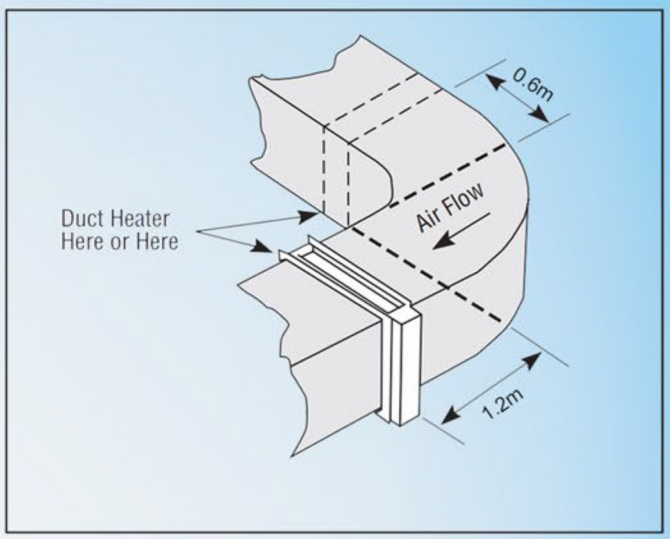


Airflow condition to avoid

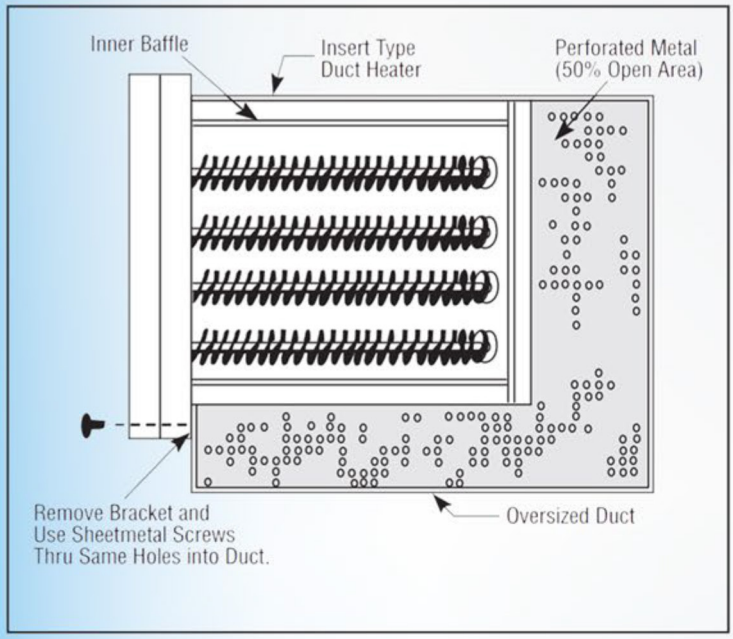
INSTALLATION



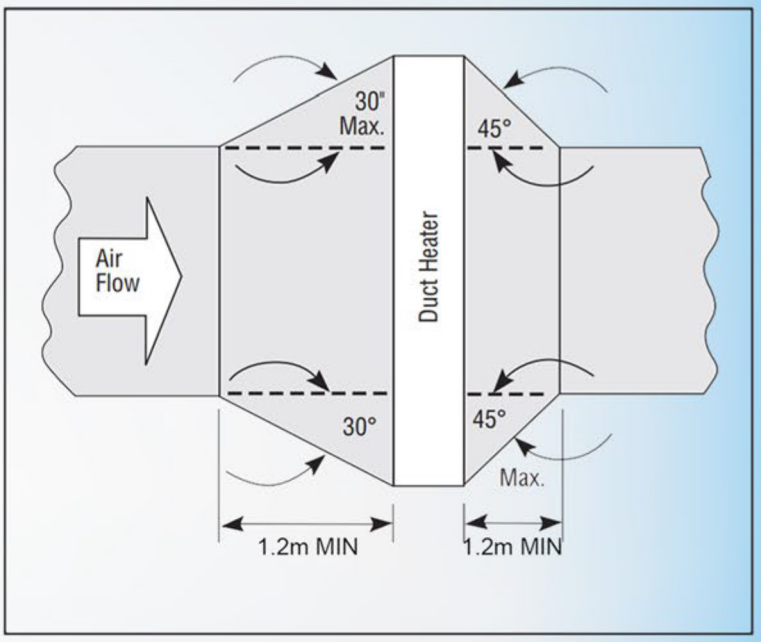
Installation near air handler discharge.



Installation near turns. The turning vanes will straighten out the air flow so it will be uniform over the face of the heater.



Installation in duct larger than heater. For installation where the duct dimensions exceed the insert type heater dimensions, the area beyond the heater dimensions must be filled with wire mesh, expanded or perforated sheet metal of 50% open area as shown in figure. This will maintain a uniform air velocity across the face of the duct.



Installation with duct transitions in some air distribution systems, the duct heater may be considerably larger than the ductwork and the duct area must be increased by a sheet metal transition.