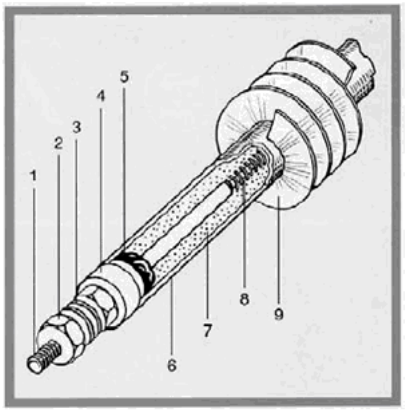
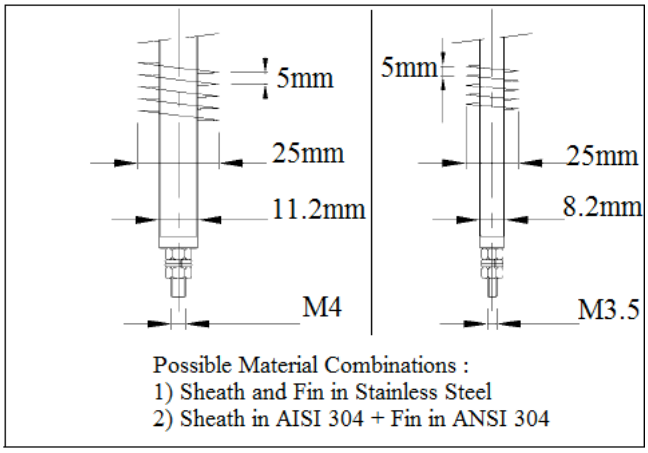
Manufacturer of Electric Heating Elements and Controls

Finned Tubular Heaters

Typical sketch of a finned armoured heater





General Characteristics

The finned armoured heaters have been developed to satisfy the need of temperature controlled air or gas flows which is present in several industrial processes. They are also suitable to keep a closed ambient at a specified temperature.
The are designed to be inserted into ventilation ducts or air conditioning plants and are directly flown by the process air or gas. They can also be installed directly

inside the ambient to be heated since they are suitable to heat static air or gases.
These heaters are finned to increase the heat exchange. However, if the heated fluid contains particles (which could clog the fins) these heaters cannot be used and smooth armoured heaters shall be used in place.
The heaters undergo dimensional and electrical controls all along the production phase, as required by the company quality control system for the industrial standard.
In particular, the following tests are performed:
 Measurement of the Insulation resistance
 Measurement of the di-electrical rigidity
 Measurement of the dispersion current
 Measurement of the resistance ohmic value

Applications

These heaters are used in the heating of closed areas, in air conditioning plants, in the forced ventilation used as part of packaging processes and in drying ovens. A proper choice of the construction materials allows to reach fluid operating temperatures up to 120 ~ 200 °C.
1. **Terminal Stud** threaded M4 (heaters with 11.2 mm diameter sheath) or M3.5 (heaters with 8.2 mm diameter sheath) made of stainless steel AISI304
2. **Nuts** made of stainless steel AISI304
3. **Washer** made of stainless steel AISI304
4. **Insulating Bush** made of Ceramic Bead
5. **Silicon Sealing** suitable for high temperatures
6. **Sheath** made of stainless steel 304 or Incoloy 840,particularly suitable for high temperatures
7. **Electric Isulation** obtained by a high purity MgO powder, suitable for high temperature, with a grains size distribution optimised for this application
8. **Resistive Winding** spiral made of Nickel/ Chrome 80/20, executed with automatic tools which insure long duration
9. **External Fin** obtained by wounding a 0.4 mm thick ribbon (pitch = 5 mm) made of stainless steel ANSI 304 (in case of heaters with AISI304 or Incoloy 840 sheath).

Power

The finned tubular heaters are normally manufactured with a specific power in the range 13 - 35 W/Inches Sq.. If the air or gas flow is sufficiently high, specific power values up to 39 - 52 W/Inches Sq. can be reached

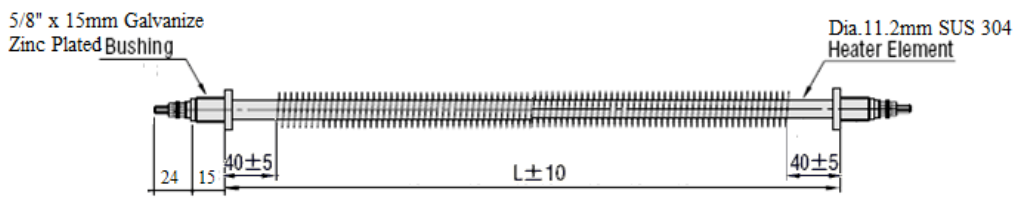
Manufacturing Alternatives

Different manufacturing alternatives exist for this family of heaters. The variables are:
 The sheath diameter (8.2 or 11.2 mm)
 The sheath and fin material (sheath and fin made of

stainless steel AISI304 sheath and AISI304 fin)
 The shape (straight element, “U” or “M” shaped element – see above drawing)
 The type of fixation device selected for the heater installation (threaded bush, insulating ceramic bush, positioning washer.
Possible shaped for finned tubular heaters
To select, amongst all possible solutions, the one that best suits the application of interest, the customer shall specify at least:
 The fluid to be heated (air or other)
 The type of heating (static or in forced convection) and the temperatures that the fluid shall reach
 The power supply voltage
 The desired mounting solution and the applicable envelope constrains (if any).
Based on this information our specialists will be able to define the best most suitable product and to present an offer. In all cases the customer can order directly the product of interest specifying the electrical characteristics (power and voltage) and providing a drawing (or even a sketch) of the desired mechanical and dimensional characteristics.

Construction Diameter:	Diameter 8.2mm Stainless steel 304, 316L, 321 & Incoloy sheath
Tube Material:	Stainless steel 304, 316L, 321 & Incoloy available for your requirements
Diameter Tolerance:	Tolerance +.010 -.010"
Use of Alloys:	Suitable for heater tube AISI 304 in water or humid environment max. temperature up to 170^0C. In air max. 220^0C
Termination:	M3.5 or M4 stainless steel screw & nuts
Watt Density:	Tube watt density of 30 watts sq. in.- suitable for many uses
Custom:	Custom configurations, lengths, watts, volts available

Straight Tubular Air Finned Heater



120 Volt	240 Volt	Overall Tube Length		Heated Length		Approx. Wt.	
Catalogue No.	Catalogue No.	inches.	mm	Inches.	mm	Watts	(kg)
SYN-111A	SYN-111B	20.5	520	16.5	420	500	0.40
SYN-112A	SYN-112B	28.7	730	24.8	630	750	0.55
SYN-113A	SYN-113B	37.0	940	33.0	840	1000	0.70
SYN-114A	SYN-114B	45.5	1155	41.5	1015	1250	0.95
SYN-115A	SYN-115B	53.4	1355	49.4	1255	1500	1.20
SYN-116A	SYN-116B	61.4	1560	57.5	1460	1750	1.30
SYN-117A	SYN-117B	70.3	1785	66.3	1685	2000	1.45
SYN-118A	SYN-118B	86.8	2205	82.8	2105	2500	1.95
SYN-119A	SYN-119B	103.3	2625	99.4	2525	3000	2.20
SYN-120A	SYN-120B	136.8	3476	132.9	3376	4000	3.20

Construction Diameter 11.2mm Stainless steel 304, 316L,321 &
Diameter Incoloy sheath
Tube Material : Stainless steel 304,316L,321 & Incoloy available for your requirements.

Diameter Tolerance: Tolerance +.010 -.010"

Suitable for heater tube AISI 304 in water or humid

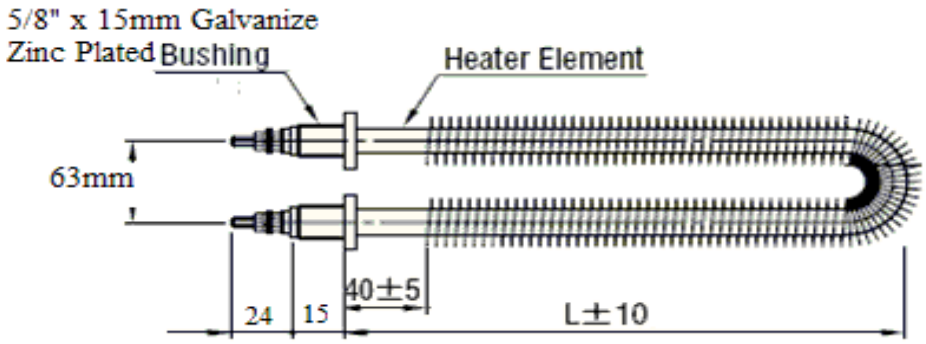
Use of Alloys: environment max. temperature up to 170^0C. In air max 220^0C

Termination : M4 or M5 stainless steel screw & nuts

Watt Density: Tube watt density of 30 watts sq. in.- suitable for many uses

Custom: Custom configurations, lengths, watts, volts available

U-Shape Tubular Air Finned Heater



120 Volt	240 Volt	Overall Tube Length		Heated Length		Approx. Wt.	
Catalogue No.	Catalogue No.	inches.	mm	Inches.	mm	Watts	(kg)
SYN-121A	SYN-121B	11.0	280	9.0	230	750	0.50
SYN-122A	SYN-122B	15.0	381	13.0	331	1150	0.60
SYN-123A	SYN-123B	18.0	457	16.0	407	1450	0.80
SYN-124A	SYN-124B	23.0	584	21.0	534	1750	1.00
SYN-125A	SYN-125B	26.0	660	24.0	610	2000	1.20
SYN-126A	SYN-126B	29.0	736	27.0	686	2500	1.35
SYN-127A	SYN-127B	32.0	812	30.0	762	2700	1.45
SYN-128A	SYN-128B	35.0	889	33.0	839	3000	1.60
SYN-129A	SYN-129B	38.0	965	36.0	915	3250	1.80
SYN-130A	SYN-130B	42.0	1066	40.0	1016	3600	2.00

Construction Diameter 11.2mm Stainless steel 304, 316L,321 &
Diameter Incoloy sheath
Tube Material : Stainless steel 304,316L,321 & Incoloy available for your requirements.

Diameter Tolerance: Tolerance +.010 -.010"

Suitable for heater tube AISI 304 in water or humid

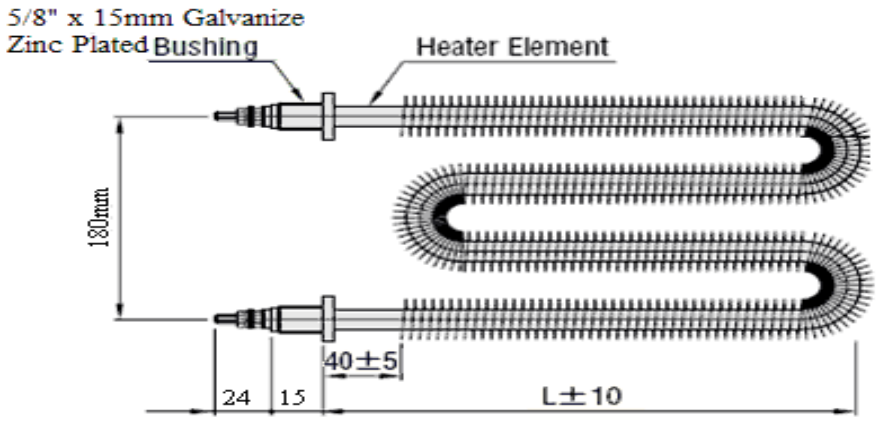
Use of Alloys: environment max. temperature up to 170^0C. In air max 220^0C

Termination : M4 or M5 stainless steel screw & nuts

Watt Density: Tube watt density of 30 watts sq. in.- suitable for many uses

Custom: Custom configurations, lengths, watts, volts available

M-Shape Tubular Air Finned Heater



120 Volt	240 Volt	Overall Tube Length		Heated Length		Approx. Wt.	
Catalogue No.	Catalogue No.	inches.	mm	Inches.	mm	Watts	(kg)
SYN-131A	SYN-131B	8.0	205	6.0	155	1000	0.60
SYN-132A	SYN-132B	11.2	285	9.2	235	1500	1.00
SYN-133A	SYN-133B	14.4	365	12.4	315	2000	1.25
SYN-134A	SYN-134B	17.1	435	15.1	385	2500	1.50
SYN-135A	SYN-135B	20.0	510	18.0	460	3000	1.70
SYN-136A	SYN-136B	23.6	600	21.6	550	3500	2.10
SYN-137A	SYN-137B	26.0	660	24.0	610	4000	2.30
SYN-138A	SYN-138B	29.7	755	27.7	705	4500	2.60
SYN-139A	SYN-139B	31.8	810	29.8	760	5000	2.90
SYN-140A	SYN-140B	34.0	863	32.0	813	6000	3.10