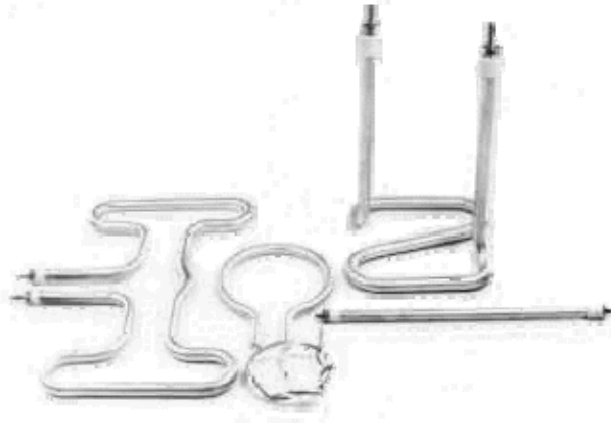


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Tubular Heaters: **Straight and Formed**



Features

- 1 The Electrolux Macedonia Tubular Heater has built-in resistance to shock, vibration, corrosion and temperature extremes.
- 1 The heater is swaged, reducing the diameter of the metal sheath and compacting the insulation. This insures rapid heat transfer and holds the coil in position for forming.
- 1 Many formations are available.
- 1 Long, trouble free service.

Construction



1. Steel, stainless steel, copper, or Incoloy sheathed elements.
2. Element wire situated in proximity to outside surface for maximum heat transfer and minimum internal temperature while preserving good dielectric qualities.
3. Pure magnesium oxide compressed to an optimum density for best heat transfer and electrical insulation at elevated temperatures.
4. Weld connection.
5. Cold pin.
6. Insulator.
7. Standard post terminal.

Standard Sizes and Materials

The sheath materials available are stainless steel, steel, copper, and incoloy.

Standard diameters are: .260", .315", .375", .440" and .490".

Diameter tolerance is $\pm .010$ ".

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| Sheath Material | Max. Temp. Allowed on Sheath | Max. Length of Sheath | Max. Cold Lengths |
|-----------------|------------------------------|-----------------------|-------------------|
| Steel | 750°F | 252" | 96" |
| Copper | 350°F | 252" | 96" |
| St. Steel | 1200°F | 324" | 96" |
| Incoloy | 1600°F | 324" | 96" |

Sheath Materials and Watt Densities

| Application | Approx. Operating Temp. | Rec. Sheath Material | Watts/sq.in. Of Element Surface |
|-------------------------------|-------------------------|----------------------|---------------------------------|
| Clamped to Surfaces | up to 300°F | Steel | 30 |
| | 500°F | Steel | 20 |
| | 800°F | Incoloy | 15 |
| | 1000°F | Incoloy | 10 |
| | 1200°F | Incoloy | 7 |
| | 1400°F | Incoloy | 2.5 |
| Still Air (Sheath Temp.) | 800°F | Incoloy | 7 |
| | 1000°F | Incoloy | 11 |
| | 1200°F | Incoloy | 14 |
| | 1400°F | Incoloy | 30 |
| Clamped into Machined Grooves | 500°F | Steel | 25 |
| | 800°F | St. Steel | 15 |
| | 900°F | Incoloy | 15 |

Formula for Determination of Unit Wattage

Unit Wattage = Diameter x 3.142 x Heated Length x Allowable watts/sq.in.

Electrical Tolerances and Limits

| Sheath Diameter | .260" | .315" | .375" | .440" | .490" |
|-----------------|-------|-------|-------|-------|-------|
| Min. OHMS/in. | .15 | .05 | .05 | .05 | .05 |
| Max. OHMS/in. | 80 | 50 | 50 | 50 | 50 |
| Max. Voltage | 250 | 300 | 480 | 600 | 600 |
| Max. Amperes | 20 | 30 | 40 | 40 | 40 |

Standard Length Tolerances

| Sheath length | Length | Heated Length |
|---------------|---------|---------------|
| Up to 20" | ± 1/16" | ± 2% |
| 20" to 100" | ± 1/8" | ± 2% |
| 100" to 200" | ± 1/4" | ± 2% |

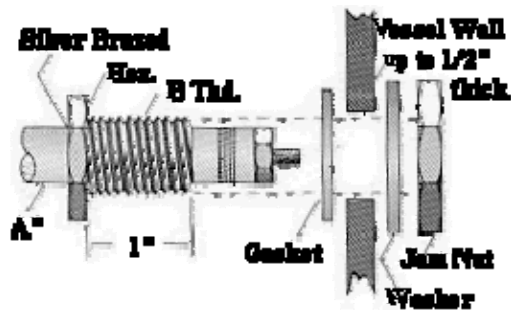
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Cold Ends

When not specified, cold ends will be the minimum length as shown in table below. Longer cold lengths may be specified. Optional cold ends of unequal lengths are available.

| Sheath Length | Minimum Cold Ends |
|---------------|-------------------|
| Up to 20" | 1" |
| 20" to 100" | 1 1/2" |
| 100" to 200" | 4" |

Mounting Fitting



Fittings are available with light jam nuts (plated steel), plain washers (plated steel), and/or copper gaskets. Brass bushings are used with copper and steel sheaths. Silver brazed stainless steel bushings are used with stainless steel and incoloy sheaths. Welded stainless steel bushings are available at additional cost.

| Catalog Number | Sheath Diameter A" | Thread Size B" |
|----------------|--------------------|----------------|
| EF-12 | .260" | 1/2"-20 |
| EF-13 | .315" | 1/2"-20 |
| EF-16 | .375" | 5/8"-18 |
| EF-17 | .440" | 3/4"-16 |
| EF-17 | .490" | 3/4"-16 |

Forming

If you plan to do the bending required, observe the minimum bend limits in the table, and do not plan any bend within 1" of a cold end junction.

Annealing for bending must be specified.

If Electrolux Macedonia is to do the bending, submit a sketch showing clearly the form the bent unit is to take.

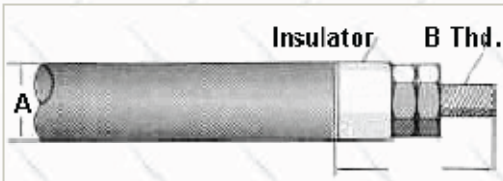
| Minimum Bend Radius | | | | | |
|---------------------|-------|-------|--------|--------|--------|
| Diameter | .260" | .315" | .375" | .440" | .490" |
| Formed By Factory | 1/4" | 5/16" | 3/8" | 7/16" | 7/16" |
| Formed By Customer | 3/4" | 1" | 1 1/4" | 1 1/2" | 1 1/2" |

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Optional Terminations

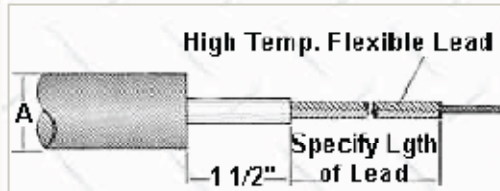
Post terminations will be supplied unless otherwise specified.

SF3S: Post



| A" | B" | C" | Max. Amps. |
|-------|--------|------|------------|
| .260" | 6"-32 | 5/8" | 20 |
| .315" | 6"-32 | 5/8" | 20 |
| .375" | 8"-32 | 3/4" | 30 |
| .375" | 10"-32 | 1" | 40 |
| .440" | 8"-32 | 3/4" | 30 |
| .440" | 10"-32 | 1" | 40 |
| .490" | 10"-32 | 1" | 40 |

SF2A: Lead Wire



| A" | Max. Amps. |
|-------|------------|
| .260" | 21 |
| .315" | 28 |
| .375" | 28 |
| .440" | 28 |
| .490" | 28 |

SF3P: Pin



| A" | B" | C" | Max. Amps. |
|-------|-------|------|------------|
| .260" | .091" | 5/8" | 20 |
| .315" | .135" | 5/8" | 20 |
| .375" | .156" | 3/4" | 40 |
| .440" | .156" | 3/4" | 40 |
| .490" | .156" | 3/4" | 40 |

SF23: Hermetic Seal



| A" | B" | C" | Max. Amps. |
|-------|---------|----------|------------|
| .260" | 8"-32 | 1 11/16" | 20 |
| .315" | 10"-32 | 1 7/8" | 30 |
| .375" | 10"-32 | 1 7/8" | 30 |
| .440" | 1/4"-28 | 2 1/8" | 40 |
| .490" | 1/4"-28 | 2 1/8" | 40 |

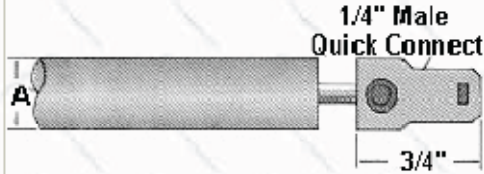
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SF3T: Tab



| A" | Max. Amps. |
|-------|------------|
| .260" | 20 |
| .315" | 30 |
| .375" | 30 |
| .440" | 30 |
| .490" | 30 |

SF11: Quick Connect



| A" | Max Amps. |
|-------|-----------|
| .260" | 20 |
| .315" | 30 |
| .375" | 30 |
| .440" | 30 |
| .490" | 30 |

| Diameter: | .260: Incoloy | | .315: Incoloy | | .375: Incoloy | |
|-------------------|---------------|-------------------|---------------|-------------------|---------------|-------------------|
| Maximum Amperage: | 20 | | 30 | | 40 | |
| Sheath Length | Cat. No. | Max.Watts at 240V | Cat. No. | Max.Watts at 240V | Cat. No. | Max.Watts at 480V |
| 20" | TA26-20 | 555 | TA31-20 | 675 | TA37-20 | 800 |
| 40" | TA26-40 | 1210 | TA31-40 | 1465 | TA37-40 | 1745 |
| 60" | TA26-60 | 1860 | TA31-60 | 2255 | TA37-60 | 2685 |
| 80" | TA26-80 | 2515 | TA31-80 | 3050 | TA37-80 | 3630 |
| 100" | TA26-100 | 3170 | TA31-100 | 3840 | TA37-100 | 4570 |
| 120" | TA26-120 | 3825 | TA31-120 | 4630 | TA37-120 | 5515 |
| 140" | TA26-140 | 4475 | TA31-140 | 5425 | TA37-140 | 6455 |
| 160" | TA26-160 | 4640 | TA31-160 | 6215 | TA37-160 | 7395 |
| 180" | TA26-180 | 4640 | TA31-180 | 7010 | TA37-180 | 8340 |
| 200" | TA26-200 | 4640 | TA31-200 | 7005 | TA37-200 | 9285 |
| 220" | TA26-220 | 4640 | TA31-220 | 7005 | TA37-220 | 10225 |
| 240" | TA26-240 | 4640 | TA31-240 | 7005 | TA37-240 | 11170 |

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| Diameter: | .440: Incoloy | | .490: Incoloy | | .260: St. Steel | |
|-------------------|---------------|-------------------|---------------|-------------------|-----------------|-------------------|
| Maximum Amperage: | 40 | | 50 | | 20 | |
| Sheath Length | Cat. No. | Max.Watts at 480V | Cat. No. | Max.Watts at 480V | Cat. No. | Max.Watts at 240V |
| 20" | TA44-20 | 960 | TA49-20 | 1055 | TT26-20 | 420 |
| 40" | TA44-40 | 2090 | TA49-40 | 2300 | TT26-40 | 910 |
| 60" | TA44-60 | 3225 | TA49-60 | 3545 | TT26-60 | 1395 |
| 80" | TA44-80 | 4355 | TA49-80 | 4790 | TT26-80 | 1885 |
| 100" | TA44-100 | 5485 | TA49-100 | 6035 | TT26-100 | 2375 |
| 120" | TA44-120 | 6615 | TA49-120 | 7280 | TT26-120 | 2865 |
| 140" | TA44-140 | 7745 | TA49-140 | 8520 | TT26-140 | 3355 |
| 160" | TA44-160 | 8880 | TA49-160 | 9765 | TT26-160 | 3845 |
| 180" | TA44-180 | 10010 | TA49-180 | 11010 | TT26-180 | 4340 |
| 200" | TA44-200 | 11140 | TA49-200 | 12255 | TT26-200 | 4705 |
| 220" | TA44-220 | 12270 | TA49-220 | 13495 | TT26-220 | 4705 |
| 240" | TA44-240 | 13400 | TA49-240 | 14740 | TT26-240 | 4705 |

| Diameter: | .315: St. Steel | | .375: St. Steel | | .440: St. Steel | |
|-------------------|-----------------|-------------------|-----------------|-------------------|-----------------|-------------------|
| Maximum Amperage: | 30 | | 40 | | 40 | |
| Sheath Length | Cat. No. | Max.Watts at 240V | Cat. No. | Max.Watts at 240V | Cat. No. | Max.Watts at 480V |
| 20" | TT31-20 | 505 | TT37-20 | 600 | TT44-20 | 720 |
| 40" | TT31-40 | 1095 | TT37-40 | 1305 | TT44-40 | 1570 |
| 60" | TT31-60 | 1690 | TT37-60 | 2015 | TT44-60 | 2415 |
| 80" | TT31-80 | 2285 | TT37-80 | 2720 | TT44-80 | 3265 |
| 100" | TT31-100 | 2880 | TT37-100 | 3425 | TT44-100 | 4115 |
| 120" | TT31-120 | 3475 | TT37-120 | 4135 | TT44-120 | 4960 |
| 140" | TT31-140 | 4065 | TT37-140 | 4840 | TT44-140 | 5810 |
| 160" | TT31-160 | 4660 | TT37-160 | 5550 | TT44-160 | 6660 |
| 180" | TT31-180 | 5255 | TT37-180 | 6255 | TT44-180 | 7505 |
| 200" | TT31-200 | 5850 | TT37-200 | 6965 | TT44-200 | 8355 |
| 220" | TT31-220 | 6440 | TT37-220 | 7670 | TT44-220 | 9205 |
| 240" | TT31-240 | 7035 | TT37-240 | 8375 | TT44-240 | 10050 |

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| Diameter: | .260: Steel | | .315: Steel | | .440: Steel | |
|-------------------|-------------|-------------------|-------------|-------------------|-------------|-------------------|
| Maximum Amperage: | 20 | | 30 | | 40 | |
| Sheath Length | Cat. No. | Max.Watts at 240V | Cat. No. | Max.Watts at 240V | Cat. No. | Max.Watts at 240V |
| 20" | TS26-20 | 280 | TS31-20 | 335 | TS44-20 | 480 |
| 40" | TS26-40 | 605 | TS31-40 | 730 | TS44-40 | 1045 |
| 60" | TS26-60 | 930 | TS31-60 | 1130 | TS44-60 | 1610 |
| 80" | TS26-80 | 1260 | TS31-80 | 1525 | TS44-80 | 2175 |
| 100" | TS26-100 | 1585 | TS31-100 | 1920 | TS44-100 | 2745 |
| 120" | TS26-120 | 1910 | TS31-120 | 2315 | TS44-120 | 3310 |
| 140" | TS26-140 | 2240 | TS31-140 | 2710 | TS44-140 | 3875 |
| 160" | TS26-160 | 2565 | TS31-160 | 3105 | TS44-160 | 4440 |
| 180" | TS26-180 | 2890 | TS31-180 | 3505 | TS44-180 | 5005 |
| 200" | TS26-200 | 3220 | TS31-200 | 3900 | TS44-200 | 5570 |
| 220" | TS26-220 | 3545 | TS31-220 | 4295 | TS44-220 | 6135 |
| 240" | TS26-240 | 3870 | TS31-240 | 4690 | TS44-240 | 6700 |

| Diameter: | .315: Copper | | .440: Copper | |
|-------------------|--------------|-------------------|--------------|-------------------|
| Maximum Amperage: | 30 | | 40 | |
| Sheath Length | Cat. No. | Max.Watts at 240V | Cat. No. | Max.Watts at 600V |
| 20" | TC31-20 | 1345 | TC44-20 | 1925 |
| 40" | TC31-40 | 2930 | TC44-40 | 4185 |
| 60" | TC31-60 | 4515 | TC44-60 | 6445 |
| 80" | TC31-80 | 6095 | TC44-80 | 8710 |
| 100" | TC31-100 | 6890 | TC44-100 | 10970 |
| 120" | TC31-120 | 6890 | TC44-120 | 13230 |
| 140" | TC31-140 | 6890 | TC44-140 | 15495 |
| 160" | TC31-160 | 6890 | TC44-160 | 17755 |
| 180" | TC31-180 | 6890 | TC44-180 | 18885 |
| 200" | TC31-200 | 6890 | TC44-200 | 18885 |
| 220" | TC31-220 | 6890 | TC44-220 | 18885 |
| 240" | TC31-240 | 6890 | TC44-240 | 18885 |

Wattage

Wattages as shown in the above tables are based on sheath material or voltage/amperage limitations. For allowable wattage for your application, refer to Sheath Material/Watt Density chart above.

How to Order

Specify: Catalog number, wattage, voltage, termination, and other optimal features. If forming is required, include a dimensional sketch and reference formation number, if applicable.