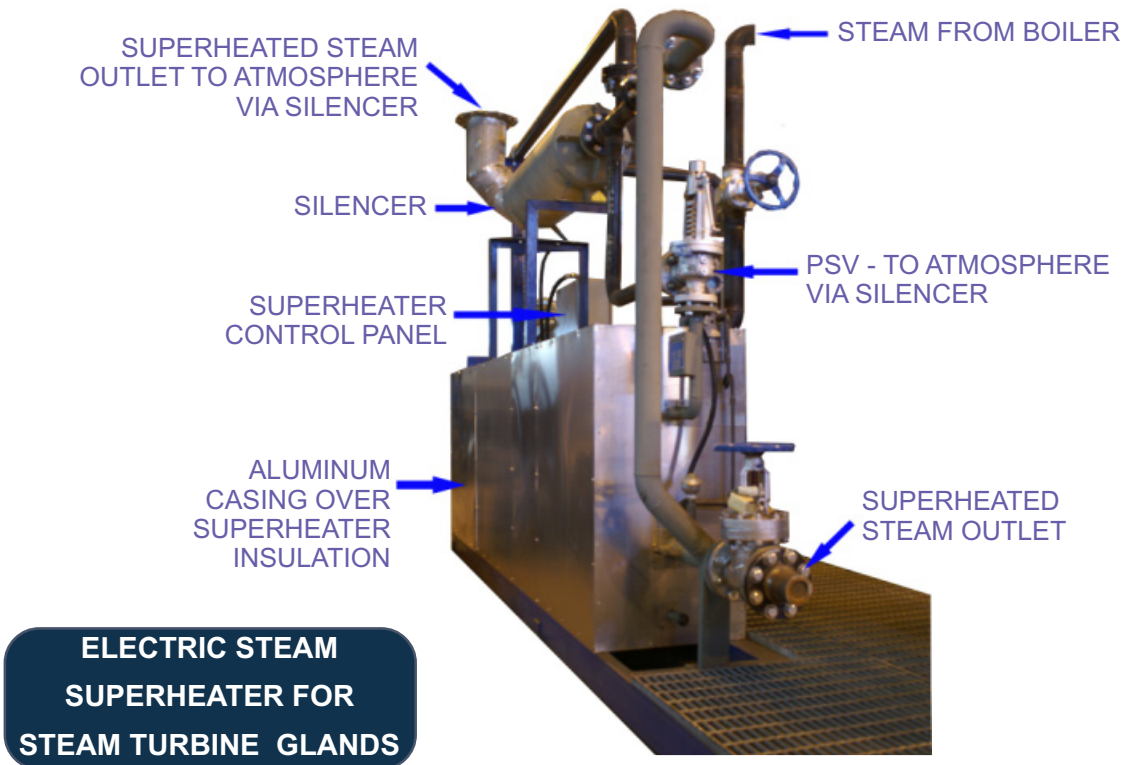


LARGE ELECTRIC STEAM SUPERHEATERS



DESCRIPTION AND PERFORMANCE

ACME ES Series Steam Superheaters are auxiliary equipment to steam boilers. They are built to meet the specific design and performance requirements of each application.

A superheater increases the temperature of the steam but does not increase the latent heat of evaporation. This means that heating with superheated steam is similar to heating with hot air. The material or medium being heated will approach the temperature of the superheated steam as long as the steam is not allowed to condense.

It should be pointed out that if the steam is allowed to condense, the bulk of the heat will be transmitted at the saturated steam temperature for that pressure rather than at the superheated steam temperature.

Capacity up to 25,000 lbs.steam/hour, up to 800 PSIG pressure and up to 1,200°F temperature. Output control is 0-100% using SCR controllers in order to track steam flow variations. A minimum flow of 20% is recommended.



Pressure vessels are built to ASME Code, National Board or CRN registration are available. Pressure vessels can be in Carbon Steel or Stainless Steels - SS304 or SS316

The ACME Horizontal or Vertical Superheaters have inlet and outlet flanged connections oriented to suit local conditions and for simple field installation. A Pressure Safety Valve is standard.

DESCRIPTION AND PERFORMANCE (Continued)

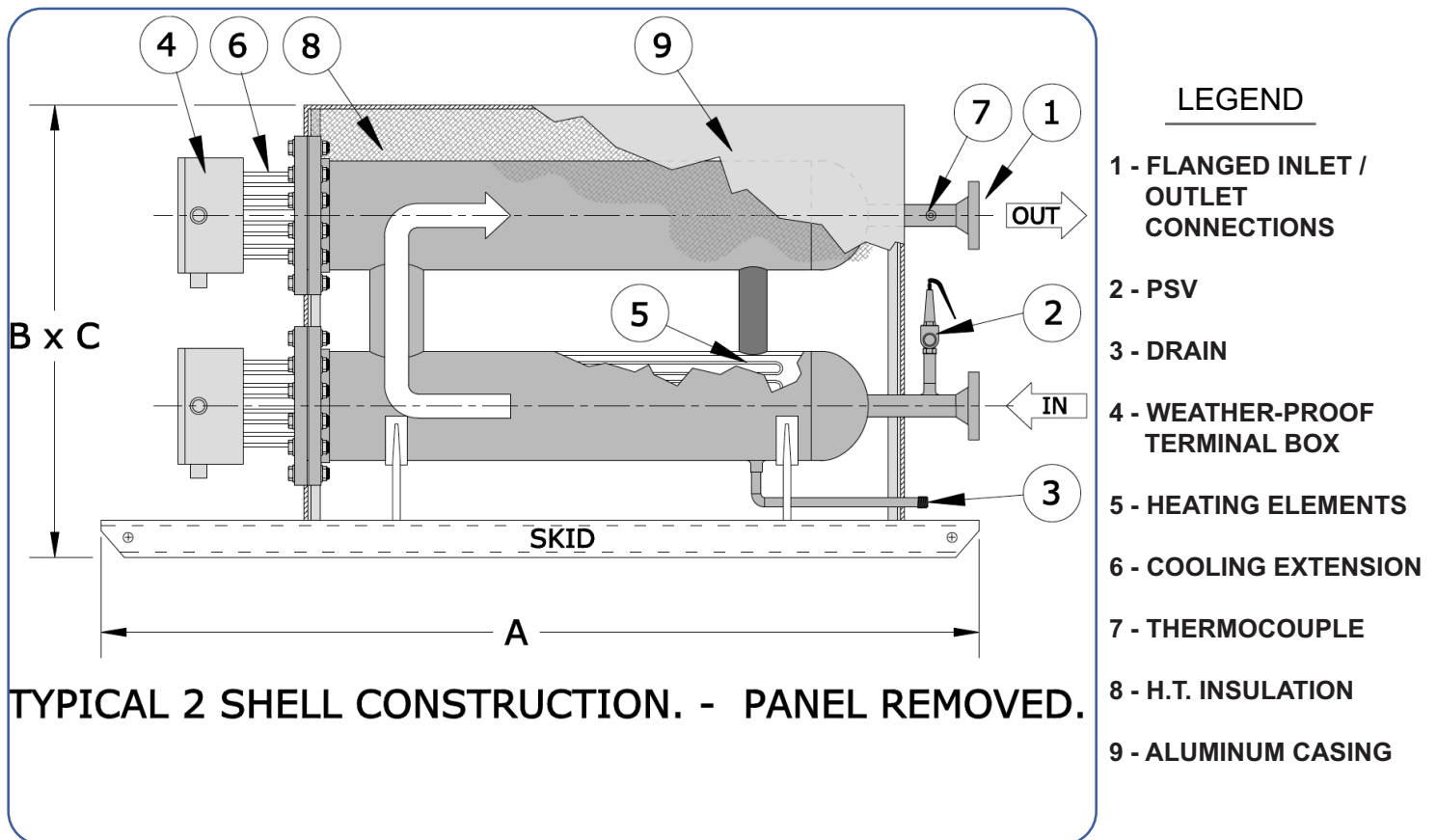
Flanged heating elements have Incoloy blades derated to suit application. Flanges are class 300 or higher as applicable. Heating elements have cooling extensions leading to a weatherproof terminal enclosure. A thermocouple is installed on one of the blades for high temperature protection.

ACME Superheaters are insulated using H.T. ceramic fiber. Aluminum plates mounted on an angle frame cover the insulation.

The packaged superheater is delivered on a skid, prewired and prepiped, requiring only piping and electrical connections. Two Service and Operating Manuals are provided with each unit.

APPLICATIONS

- * SUPERHEATED STEAM FOR NON CONDENSING PROCESSES AND STEAM INJECTION.
- * SUPERHEATED STEAM FOR STERILIZATION IN HOSPITALS, PHARMACEUTICAL AND FOOD PLANTS.
- * SUPERHEATED STEAM FOR HIGH TEMPERATURE DRYING PROCESSES.
- * SUPERHEATED STEAM FOR TURBINE BEARINGS.
- * SUPERHEATED STEAM TO AVOID MOISTURE AT POINT OF USE IN INDUSTRIAL PLANTS WITH LONG DISTRIBUTION LINES.





PACKAGED 2 SHELL SUPERHEATER

STANDARD POWER AND CONTROL PANEL

NEMA 12 or 4 or 4X Enclosure includes the following:

- * Disconnect Switch or Magnetic Breaker, door interlocked;
- * Buss Bars or Splitter Blocks;
- * Fuses - HRC 200K;
- * Control Transformer, fused primary;
- * ON-OFF Breaker for 120V control circuit;
- * Dual Digital Display Microprocessor Controller, 1/4" DIN size for ease of operation;
- * SCR Power Controller to modulate total heating capacity from 0 to 100%, according to steam flow variations. (one or more)
- * I²t Semiconductor fuses to protect the SCR's;
- * Thermocouple in outlet to detect leaving steam temperature;
- * High steam temperature in outlet protection with Manual Reset;
- * Temperature Controller for high temperature protection of heating element, with Manual Reset (one or more), connected to thermocouple on blade;
- * Emergency Stop push button;
- * Provision for Remote Flow interlock input;
- * Audible and visual alarm circuit with associated display lights, Silencing button and born;
- * SPDT dry contacts for remote alarm supervisions;

OPTIONAL EQUIPMENT

- * Remote Set-Point (SV) using 4-20 mA input.
- * Retransmission of Process output Value (PV) via 4-20 mA output.
- * Remote Emergency Stop.
- * Remote Start-Stop in addition to local Start-Stop.

FOR A QUOTE ON YOUR SUPERHEATER'S SPECIFICATIONS, PLEASE SUBMIT FORM "QUOTATION REQUEST FOR ACME ELECTRIC STEAM SUPERHEATER" AVAILABLE ON WEBSITE: WWW.ACMEPROD.COM OR E-MAIL REQUEST

MODEL NUMBER CLASSIFICATION

ES-	-XXX-	-YYY-	-ZZZ-	-AB-	-CDE-	-F-	-G-	-H-	-J
	↑ Size	↑ Design Pressure PSIG	↑ Design Temperature °F	↑ kW	↑ Voltage	↑ Phase	↑ Constr.	↑ Panel	↑ Position
					600 480 380 240 220 208	1 or 3	1- Carbon Steel 2- SS304 3- SS316	1- NEMA 1 2- NEMA 12 3- NEMA 4 4- NEMA 4X	1- Horizontal 2- Vertical

Example:

For a class 300 Superheater, 700 °F Max, 110kW, 480V, 3PH, CS, NEMA 4 PANEL, horizontal Installation.

Model # is ES-080-300-700-110-480-3-1-3-1

SUPERHEATER SIZING INFORMATION

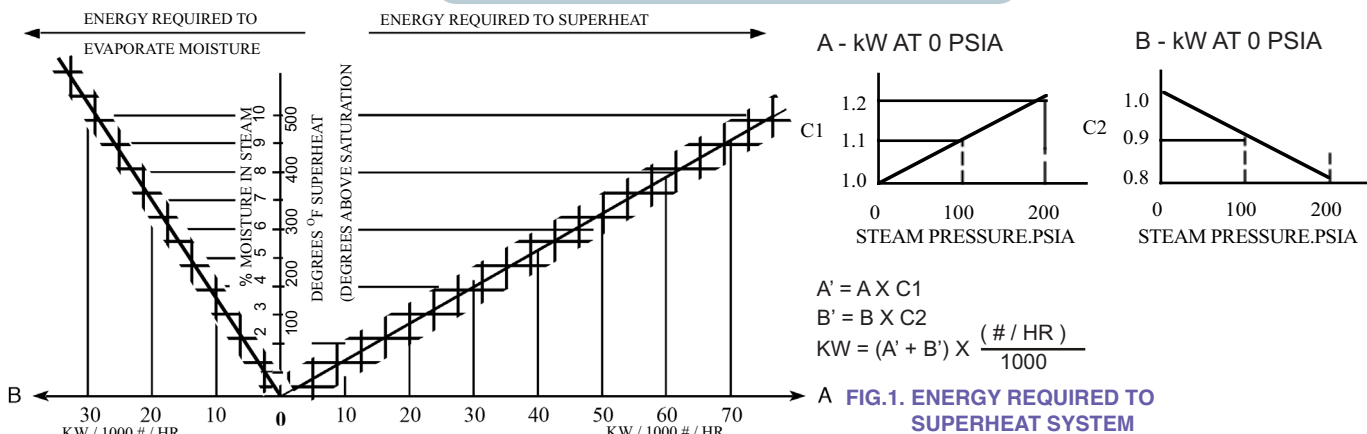


Figure 1 graphically shows the power required to superheat 1000 lbs of steam per hour. The total power required is the sum of the energy required to vaporize the moisture content plus the energy to superheat the vapor. Use Figure 1 to determine the required KW.

EXAMPLE : What KW is required to superheat 500#/hour of steam from 100 psia saturated, 2% moisture to 500° F at the superheater outlet?

- Find temperature of saturated steam (from steam table) @ 100 psia + sat = 328° F.
- Degrees superheat = 500 - 328 = 172° F.
- On vertical scale at 2% moisture, proceed horizontally left to energy line and read down to B = 7KW for 1000# / hr.
- On vertical scale at 172° F superheat, proceed right to energy line and read down to A = 27KW for 1000# / hr.
- Determine correction factor C1 and C2 for 100 psia. C1 = 1.09; C2 = 0.91.
- Determine A' = A X C1 = 27 X 1.09 = 29.43KW
- Determine B' = B X C2 = 7 X 0.91 = 6.37KW
- KW = (29.43 + 6.37) X (500/1000) = 17.9KW.
- Add an allowance for safety and heat loss, round off at 20KW.
- Select the ACME Steam Superheater equal or larger than calculated requirements.

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