PROJECT MANUAL GUIDE SPECIFICATIONS FOR:
PFANNENBERG SERIES DTS COOLING UNITS FOR SIDE MOUNTING/DOOR MOUNTING TO ELECTRICAL ENCLOSURES AND INDUSTRIAL CONTROL PANELS



PART 1 – GENERAL

1.1 SUMMARY

A. Cooling Units for electrical enclosures and industrial control panels offer a self-contained method for the removal of unwanted and harmful heat from within the enclosure. Their closed-loop designs ensure that ambient air, dust, and humidity are not passed to the interior of the enclosure, thereby keeping sensitive and critical electronics safe from contamination and in prime operating condition. Such cooling units are often referred to as enclosure air conditioners.

Cooling units are typically installed through a cutout on the side panel of the enclosure. Some units may be installed in a cutout through the door, while others may be installed on the top of the enclosure.

1.2 SECTION INCLUDES

A. Electrical Control Panels, Electrical Enclosures, Motor Control Centers, Pump Control Centers, Electrical Power Inverters, Telecom Equipment Enclosures, Enclosure Air Conditioners, Cooling Units, and Cooling Devices as scheduled in this section and as indicated on the drawings.

1.3 SUBMITTALS

A. Product Data: Submit the following manufacturer's documentation for each product specified.
   1. Catalog specifications and outline drawings.
   2. Installation and operating instructions.
   3. Certifications to substantiate necessary agency approvals.

B. Manufacturer Warranty
   1. Manufacturer's warranty for Cooling Units. Manufacturer's standard 1-year warranty for Cooling Units.

PART 2 – PRODUCTS

2.1 MANUFACTURERS

A. Basis of Design and Support: The enclosure cooling unit is ideal for applications with enclosure cooling requirements from approximately 900 BTU/hr up to 24,000 BTU/hr. Cooling units provide a fully self-contained, closed loop method of removing heat from electrical enclosures and control panels. To ensure uniformity of operation, quality of construction, standard 1-year warranty term, and worldwide localized support, specifications are solely based, wherever practical, on the products of Pfannenberg Inc. www.pfannenbergusa.com.

B. Substitution: Products of a similar nature from other manufacturers may be considered only when performance capabilities, component capabilities, installation capabilities, service capabilities, and warranty terms are fully met or exceeded.

2.2 PERFORMANCE / DESIGN CRITERIA

A. Enclosure Cooling Unit Description. Series DTS – Pfannenberg Enclosure Cooling Unit for Side Mounting/Door Mounting to Electrical Enclosures. Available in various frame sizes to support a wide range of capacities from 900 BTU/hr up to 24,000 BTU/hr, the enclosure cooling unit utilizes compressor-based refrigeration technology with two independent air paths – one which circulates enclosure-side air across the evaporator to displace unwanted heat within the enclosure and one which circulates ambient air across the condenser to transfer waste heat to the ambient environment. This system is typically classified as being an active, closed-loop cooling technique.

B. Enclosure Cooling Unit Specifications. Pfannenberg Series DTS Cooling Units.

Model: (pick one) DTS 3021/DTS 3031/DTS 3031 SS

- Cooling Capacity: 900 to 1300 BTU/hr.
- Enclosure Rating and Construction (pick one):
  - NEMA Type 12 (Model DTS 3021) with powder-coated G-90 galvanized steel cabinet.
  - NEMA Type 3R/4 (Model DTS 3031) with powder-coated G-90 galvanized steel cabinet and epoxy-coated condenser coil and refrigeration piping for corrosion resistance.
  - NEMA Type 4/4X (Model DTS 3031SS) with #3 polished 304 stainless steel cabinet and epoxy-coated condenser coil and refrigeration piping for corrosion resistance.
- Temperature Control Range (adjustable): +50 to +104 °F (+10 to +40 °C).
- Ambient Temperature Range: +46 to +114 °F (+8 to +45 °C).
- Power Required / Nominal Power Consumption (pick one):
  - 115 VAC 60 Hz / 243 W.
  - 230 VAC 50-60 Hz / 253 W.
- Noise Level (@ 1 m): <64 dB(A).
- Dimensions (w x l x h): 7.0 x 7.5 x 15.5 in (177.8 x 191.4 x 393.7 mm).

- Weight: 30 lb (13.6 kg).
- Refrigerant Type / Amount: R134a / 145 to 150 gm.
- Condensate Management: Condensate Drain Port.

Model: (pick one) DTS 3041/DTS 3061/DTS 3081

- Cooling Capacity: 2000 to 3000 BTU/hr.
- Enclosure Rating and Construction (pick one):
    - NEMA Type 12 (Model DTS 3041) with powder-coated G-90 galvanized steel cabinet.
    - NEMA Type 3R/4 (Model DTS 3061) with powder-coated G-90 galvanized steel cabinet and epoxy-coated condenser coil and refrigeration piping for corrosion resistance.
    - NEMA Type 4/4X (Model DTS 3081) with #3 polished 304 stainless steel cabinet and epoxy-coated condenser coil and refrigeration piping for corrosion resistance.
- Temperature Control Range (adjustable): +50 to +104 °F (+10 to +40 °C).
- Ambient Temperature Range:
    - DTS 3041: +46 to +114 °F (+8 to +45 °C).
    - DTS 3061, DTS 3081: +46 to +131 °F (+8 to +55 °C).
- Power Required / Nominal Power Consumption (pick one):
    - 115 VAC 60 Hz / 690 W.
    - 230 VAC 50-60 Hz / 663 W.
- Noise Level (@ 1 m): <64 dB(A).
- Dimensions (w x l x h): 10.0 x 10.8 x 20.2 in (254 x 274 x 512 mm).
- Weight: 51 lb (23 kg).
- Refrigerant Type / Amount: R134a / 400 gm.
- Condensate Management: Condensate Drain Port.

Model: (pick one) DTS 3141/DTS 3161/DTS 3181

- Cooling Capacity: 3000 to 4000 BTU/hr.
- Enclosure Rating and Construction (pick one):
    - NEMA Type 12 (Model DTS 3141) with powder-coated G-90 galvanized steel cabinet.
    - NEMA Type 3R/4 (Model DTS 3161) with powder-coated G-90 galvanized steel cabinet and epoxy-coated condenser coil and refrigeration piping for corrosion resistance, and a weather-protective rain hood.
    - NEMA Type 4/4X (Model DTS 3181) with #3 polished 304 stainless steel cabinet and epoxy-coated condenser coil and refrigeration piping for corrosion resistance, and a weather-protective rain hood.
- Temperature Control Range (adjustable): +77 to +113 °F (+25 to +45 °C).
- Ambient Temperature Range:
    - DTS 3141: +59 to +131 °F (+15 to +55 °C).
    - DTS 3161, DTS 3181: +32 to +131 °F (0 to +55 °C).

- Power Required / Nominal Power Consumption (pick one):
    - 115 VAC 60 Hz / 845 W.
    - 230 VAC 50/60 Hz / 795 W.
    - 400/460 VAC 50/60 Hz / 1200 W.
- Noise Level (@ 1 m): <70 dB(A).
- Dimensions (w x l x h): 15.6 x 9.3 x 29.5 in (395 x 237 x 748 mm).
- Weight: 84 to 97 lb (38 to 44 kg).
- Refrigerant Type / Amount: R134a / 400 gm.
- Condensate Management: Active condensate evaporation system with safety overflow.

Model: (pick one) DTS 3141 SL/DTS 3161 SL/DTS 3181 SL

- Cooling Capacity: 3000 to 5000 BTU/hr.
- Enclosure Rating and Construction (pick one):
    - NEMA Type 12 (Model DTS 3141 SL) with powder-coated G-90 galvanized steel cabinet.
    - NEMA Type 3R/4 (Model DTS 3161 SL) with powder-coated G-90 galvanized steel cabinet and epoxy-coated condenser coil and refrigeration piping for corrosion resistance, and a weather-protective rain hood.
    - NEMA Type 4/4X (Model DTS 3181 SL) with #3 polished 304 stainless steel cabinet and epoxy-coated condenser coil and refrigeration piping for corrosion resistance, and a weather-protective rain hood.
- Temperature Control Range (adjustable): +77 to +113 °F (+25 to +45 °C).
- Ambient Temperature Range:
    - DTS 3141 SL:
        - 115 VAC version: +59 to +113 °F (+15 to +45 °C).
        - 230/460 VAC versions: +59 to +131 °F (+15 to +55 °C).
    - DTS 3161 SL:
        - 230/460 VAC versions: +32 to +131 °F (0 to +55 °C).
    - DTS 3181 SL:
        - 230/460 VAC versions: +59 to +131 °F (+15 to +55 °C).
- Power Required / Nominal Power Consumption (pick one):
    - 115 VAC 60 Hz / 917 W.
    - 230 VAC 50/60 Hz / 890 W.
    - 400/460 VAC 50/60 Hz / 751 W.
- Noise Level (@ 1 m): <70 dB(A).
- Dimensions (w x l x h): 12 x 12 x 36 in (304 x 305 x 914 mm).
- Weight: 108 lb (49 kg).
- Refrigerant Type / Amount: R134a / 900 gm.
- Condensate Management: Active condensate evaporation system with safety overflow.

Model: (pick one) DTS 3145/DTS 3165/DTS 3185

- Cooling Capacity: 5000 to 7000 BTU/hr.
- Enclosure Rating and Construction (pick one):
  - NEMA Type 12 (Model DTS 3145) with powder-coated G-90 galvanized steel cabinet.
  - NEMA Type 3R/4 (Model DTS 3165) with powder-coated G-90 galvanized steel cabinet and epoxy-coated condenser coil and refrigeration piping for corrosion resistance, and a weather-protective rain hood.
  - NEMA Type 4/4X (Model DTS 3185) with #3 polished 304 stainless steel cabinet and epoxy-coated condenser coil and refrigeration piping for corrosion resistance, and a weather-protective rain hood.
- Temperature Control Range (adjustable): +77 to +113 °F (+25 to +45 °C).
- Ambient Temperature Range:
  - DTS 3145: +59 to +131 °F (+15 to +55 °C).
  - DTS 3165: +32 to +131 °F (0 to +55 °C).
  - DTS 3185: +32 to +131 °F (0 to +55 °C).
- Power Required / Nominal Power Consumption (pick one):
  - 115 VAC 60 Hz / 1000 W.
  - 230 VAC 50/60 Hz / 1020 W.
  - 400/460 VAC 50/60 Hz / 1283 W.
- Noise Level (@ 1 m): <70 dB(A).
- Dimensions (w x l x h): 12 x 12 x 36 in (304 x 305 x 918 mm).
- Weight: 108 lb (49 kg).
- Refrigerant Type / Amount: R134a / 750 gm.
- Condensate Management: Active condensate evaporation system with safety overflow.

Model: (pick one) DTS 3241/DTS 3261/DTS 3281

- Cooling Capacity: 7000 to 8500 BTU/hr.
- Enclosure Rating and Construction (pick one):
  - NEMA Type 12 (Model DTS 3241) with powder-coated G-90 galvanized steel cabinet.
  - NEMA Type 3R/4 (Model DTS 3261) with powder-coated G-90 galvanized steel cabinet and epoxy-coated condenser coil and refrigeration piping for corrosion resistance, and a weather-protective rain hood.
  - NEMA Type 4/4X (Model DTS 3281) with #3 polished 304 stainless steel cabinet and epoxy-coated condenser coil and refrigeration piping for corrosion resistance, and a weather-protective rain hood.
- Temperature Control Range (adjustable): +77 to +113 °F (+25 to +45 °C).
- Ambient Temperature Range:
  - DTS 3241: +59 to +131 °F (+15 to +55 °C).
  - DTS 3261: +32 to +131 °F (0 to +55 °C).

  - DTS 3281: +32 to +131 °F (0 to +55 °C).
- Power Required / Nominal Power Consumption (pick one):
  - 115 VAC 60 Hz / 1680 W.
  - 230 VAC 50/60 Hz / 1425 W.
  - 400/460 VAC 50/60 Hz / 1400 W.
- Noise Level (@ 1 m): <73 dB(A).
- Dimensions (w x l x h): 12 x 12 x 36 in (304 x 305 x 918 mm).
- Weight: 84 to 97 lb (38 to 44 kg).
- Refrigerant Type / Amount: R134a / 400 gm.
- Condensate Management: Active condensate evaporation system with safety overflow.

Model: (pick one) DTS 3245/DTS 3265/DTS 3285

- Cooling Capacity: 10,000 to 13,000 BTU/hr.
- Enclosure Rating and Construction (pick one):
  - NEMA Type 12 (Model DTS 3245) with powder-coated G-90 galvanized steel cabinet.
  - NEMA Type 3R/4 (Model DTS 3265) with powder-coated G-90 galvanized steel cabinet and epoxy-coated condenser coil and refrigeration piping for corrosion resistance, and a weather-protective rain hood.
  - NEMA Type 4/4X (Model DTS 3285) with #3 polished 304 stainless steel cabinet and epoxy-coated condenser coil and refrigeration piping for corrosion resistance, and a weather-protective rain hood.
- Temperature Control Range (adjustable): +77 to +113 °F (+25 to +45 °C).
- Ambient Temperature Range:
  - DTS 3245: +59 to +131 °F (+15 to +55 °C).
  - DTS 3265: +59 to +131 °F (+15 to +55 °C).
  - DTS 3285: +32 to +131 °F (0 to +55 °C).
- Power Required / Nominal Power Consumption (pick one):
  - 115 VAC 60 Hz / 1600 W.
  - 230 VAC 50/60 Hz / 1600 W.
  - 400/460 VAC 50/60 Hz / 1700 W.
- Noise Level (@ 1 m): <73 dB(A).
- Dimensions (w x l x h): 16 x 11.9 x 53 in (406 x 301 x 1347 mm).
- Weight: 150 lb (68 kg).
- Refrigerant Type / Amount: R134a / 1200 gm.
- Condensate Management: Active condensate evaporation system with safety overflow.

Model: (pick one) DTS 3441/DTS 3461/DTS 3481

- Cooling Capacity: 15,000 to 20,000 BTU/hr.
- Enclosure Rating and Construction (pick one):

  - NEMA Type 12 (Model DTS 3441) with powder-coated G-90 galvanized steel cabinet.
  - NEMA Type 3R/4 (Model DTS 3461) with powder-coated G-90 galvanized steel cabinet and epoxy-coated condenser coil and refrigeration piping for corrosion resistance, and a weather-protective rain hood.
  - NEMA Type 4/4X (Model DTS 3481) with #3 polished 304 stainless steel cabinet and epoxy-coated condenser coil and refrigeration piping for corrosion resistance, and a weather-protective rain hood.
- Temperature Control Range (adjustable): +77 to +113 °F (+25 to +45 °C).
- Ambient Temperature Range:
  - DTS 3441: +46 to +131 °F (+8 to +55 °C).
  - DTS 3461: +20 to +131 °F (-4 to +55 °C).
  - DTS 3481: +20 to +131 °F (-4 to +55 °C).
- Power Required / Nominal Power Consumption (pick one):
  - 230 VAC 50/60 Hz / 2360 W.
  - 400/460 VAC 50/60 Hz / 1979 W.
- Noise Level (@ 1 m): <69 dB(A).
- Dimensions (w x l x h): 16 x 16 x 56.75 in (406 x 405 x 1440 mm).
- Weight: 175 to 191 lb (79 to 87 kg).
- Refrigerant Type / Amount: R134a / 400 gm.
- Condensate Management: Active condensate evaporation system with safety overflow.

Model: (pick one) DTS 3641/DTS 3661/DTS 3681

- Cooling Capacity: 20,000 to 24,000 BTU/hr.
- Enclosure Rating and Construction (pick one):
  - NEMA Type 12 (Model DTS 3641) with powder-coated G-90 galvanized steel cabinet.
  - NEMA Type 3R/4 (Model DTS 3661) with powder-coated G-90 galvanized steel cabinet and epoxy-coated condenser coil and refrigeration piping for corrosion resistance, and a weather-protective rain hood.
  - NEMA Type 4/4X (Model DTS 3681) with #3 polished 304 stainless steel cabinet and epoxy-coated condenser coil and refrigeration piping for corrosion resistance, and a weather-protective rain hood.
- Temperature Control Range (adjustable): +77 to +113 °F (+25 to +45 °C).
- Ambient Temperature Range:
  - DTS 3641: +59 to +131 °F (+15 to +55 °C).
  - DTS 3661: +32 to +131 °F (0 to +55 °C).
  - DTS 3681: +32 to +131 °F (0 to +55 °C).
- Power Required / Nominal Power Consumption (pick one):
  - 230 VAC 50/60 Hz / 3142 W.
  - 400/460 VAC 50/60 Hz / 2275/2920 W.

- Noise Level (@ 1 m): <73 dB(A).
- Dimensions (w x l x h): 19 x 20.5 x 66.5 in (485 x 520 x 1665 mm).
- Weight: 230 to 240 lb (105 to 109 kg).
- Refrigerant Type / Amount: R134a / 1300 gm.
- Condensate Management: Active condensate evaporation system with safety overflow.

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C. Series DTS Enclosure Cooling Unit Component Details.

1. The enclosure cooling unit shall be comprised of the following:

Cabinet rating (pick one):

- Powder coated G-90 galvanized steel cabinet with NEMA Type 12 rating.
- Powder coated G-90 galvanized steel cabinet with NEMA Type 3R/4 rating, epoxy-coated condenser coil and refrigeration piping for corrosion resistance
- 3 polished 304 stainless steel cabinet with NEMA Type 4/4X rating, epoxy-coated condenser coil and refrigeration piping for corrosion resistance.

2. Hermetically sealed refrigerant compressor and piping with no fill valve to represent a potential leak path.

3. Thermal Expansion Valve to regulate the flow of refrigerant based on thermal demand for efficient performance over the entire operating temperature range. Fixed expansion devices such as capillary tubes are not acceptable.

4. Backward-curved impeller fan for improved airflow efficiency and longevity.

5. A high pressure cut-out switch shall be included to stop compressor operation in the event of excessively high refrigerant pressure. This switch shall have a manual reset to prevent short cycling.

6. An electronic controller to facilitate continuous, unattended operation and to allow the user to enter a temperature set point that the system will work to maintain inside the electrical enclosure, within specified limits.

7. A door switch input to facilitate shutdown of the unit in the event that the enclosure door is opened.

8. A dry output contact to indicate a fault condition and facilitate remote monitoring.

D. Series DTS Enclosure Cooling Unit Options

1. Low ambient package.
2. Custom paint colors.

2.3 ENCLOSURE COOLING UNIT SCHEDULE

A. Pfannenberg **Model DTS 3021 Side Mount NEMA 12 Cooling Unit** (900 to 1300 BTU/hr).
B. Pfannenberg **Model DTS 3031 Side Mount NEMA 3R/4 Cooling Unit** (900 to 1300 BTU/hr).
C. Pfannenberg **Model DTS 3031SS Side Mount NEMA Cooling Unit** (900 to 1300 BTU/hr).
D. Pfannenberg **Model DTS 3041 Side Mount NEMA 12 Cooling Unit** (2000 to 3000 BTU/hr).
E. Pfannenberg **Model DTS 3061 Side Mount NEMA 3R/4 Cooling Unit** (2000 to 3000 BTU/hr).
F. Pfannenberg **Model DTS 3081 Side Mount NEMA 4/4X Cooling Unit** (2000 to 3000 BTU/hr).
G. Pfannenberg **Model DTS 3141 Side Mount NEMA 12 Cooling Unit** (3000 to 4000 BTU/hr).
H. Pfannenberg **Model DTS 3161 Side Mount NEMA 3R/4 Cooling Unit** (3000 to 4000 BTU/hr).
I. Pfannenberg **Model DTS 3181 Side Mount NEMA 4/4X Cooling Unit** (3000 to 4000 BTU/hr).
J. Pfannenberg **Model DTS 3141SL Side Mount NEMA 12 Cooling Unit** (3000 to 5000 BTU/hr).
K. Pfannenberg **Model DTS 3161SL Side Mount NEMA 3R/4 Cooling Unit** (3000 to 5000 BTU/hr).
L. Pfannenberg **Model DTS 3181SL Side Mount NEMA 4/4X Cooling Unit** (3000 to 5000 BTU/hr).
M. Pfannenberg **Model DTS 3145 Side Mount NEMA 12 Cooling Unit** (5000 to 7000 BTU/hr).
N. Pfannenberg **Model DTS 3165 Side Mount NEMA 3R/4 Cooling Unit** (5000 to 7000 BTU/hr).
O. Pfannenberg **Model DTS 3185 Side Mount NEMA 4/4X Cooling Unit** (5000 to 7000 BTU/hr).
P. Pfannenberg **Model DTS 3241 Side Mount NEMA 12 Cooling Unit** (7000 to 8500 BTU/hr).
Q. Pfannenberg **Model DTS 3261 Side Mount NEMA 3R/4 Cooling Unit** (7000 to 8500 BTU/hr).
R. Pfannenberg **Model DTS 3281 Side Mount NEMA 4/4X Cooling Unit** (7000 to 8500 BTU/hr).
S. Pfannenberg **Model DTS 3245 Side Mount NEMA 12 Cooling Unit** (10,000 to 13,000 BTU/hr).
T. Pfannenberg **Model DTS 3265 Side Mount NEMA 3R/4 Cooling Unit** (10,000 to 13,000 BTU/hr).
U. Pfannenberg **Model DTS 3285 Side Mount NEMA 4/4X Cooling Unit** (10,000 to 13,000 BTU/hr).
V. Pfannenberg **Model DTS 3441 Side Mount NEMA 12 Cooling Unit** (15,000 to 20,000 BTU/hr).
W. Pfannenberg **Model DTS 3461 Side Mount NEMA 3R/4 Cooling Unit** (15,000 to 20,000 BTU/hr).
X. Pfannenberg **Model DTS 3481 Side Mount NEMA 4/4X Cooling Unit** (15,000 to 20,000 BTU/hr).
Y. Pfannenberg **Model DTS 3641 Side Mount NEMA 12 Cooling Unit** (20,000 to 24,000 BTU/hr).
Z. Pfannenberg **Model DTS 3661 Side Mount NEMA 3R/4 Cooling Unit** (20,000 to 24,000 BTU/hr).
AA. Pfannenberg **Model DTS 3681 Side Mount NEMA 4/4X Cooling Unit** (20,000 to 24,000 BTU/hr).

PART 3 – EXECUTION

3.1 INSTALLATION

A. Install products in strict compliance with manufacturer's written instructions and recommendations.

END OF SECTION

CSI Master Format Sections for which this product may be applicable include the following:

23 06 60 Schedules for HVAC
- 23 06 60.16 Packaged Water Chiller Schedule

23 64 00 Packaged Water Chillers
- 23 64 19 Reciprocating Water Chillers
- 23 64 23 Scroll Water Chillers

26 06 00 Schedules for Electrical
- 26 06 20.13 Electrical Switchboard Schedule
- 26 06 20.16 Electrical Panelboard Schedule
- 26 06 20.19 Electrical Motor-Control Center Schedule

26 24 00 Switchboards and Panelboards
- 26 24 13 Switchboards
- 26 24 16 Panelboards
- 26 24 19 Motor-Control Centers

26 27 00 Low-Voltage Distribution Equipment
- 26 27 16 Electrical Cabinets and Enclosures

26 29 00 Low-Voltage Controllers
- 26 29 13 Enclosed Controllers
- 26 29 13.13 Across-the-Line Motor Controllers
- 26 29 13.16 Reduced-Voltage Motor Controllers
- 26 29 23 Variable-Frequency Motor Controllers
- 26 29 33 Controllers for Fire Pump Drivers
- 26 29 33.13 Full-Service Controllers for Fire Pump Electric-Motor Drivers
- 26 29 33.16 Limited-Service Controllers for Fire Pump Electric-Motor Drivers
- 26 29 33.19 Controllers for Fire Pump Diesel Engine Drivers

42 22 00 Process Chillers and Coolers
- 42 22 16 Reciprocating Process Chillers and Coolers
- 42 22 23 Rotary Process Chillers and Coolers

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