

DIVISION 15 - MECHANICAL SPECIFICATIONS

15010 GENERAL CONDITIONS

- A. Rules and Regulations
  - 1. Install work in strict accordance with applicable rules, regulations of local and State governments and other authorities having lawful jurisdiction.
  - 2. Conform with, cooperate with, and assist other contractors in conforming with trade jurisdictional rulings.
  - 3. Drawings and specifications indicate the minimum standards of construction, but should any work indicated be sub-standard to any ordinances, laws, codes, rules, or regulations bearing on the work, contractor shall execute work in accordance with such ordinances, laws, codes, rules, or regulations.
- B. Permits, Fees and Inspections: Mechanical Contractor to secure and pay for all necessary permits, fees, taxes, inspections, and certificates thereof required by local, state and federal ordinances, laws, codes, rules, or regulations.
- C. Services: Consult with local building officials and service companies to verify requirements and costs for services and their installations in accordance with specifications, applicable codes and requirements.
- D. Building Conditions:
  - 1. Locations of equipment, piping and other mechanical work is indicated diagrammatically by drawings. Determine exact locations on job, subject to structural conditions and work of other contractors.
  - 2. Make no major change nor decrease size of any ductwork, piping, or equipment without written permission. Cutting of structural members is not allowed.
- E. Materials and Equipment: All equipment shall be new, of the best quality normally used for the purpose in good commercial practice and be products of reputable manufacturers, as indicated on the plans.
- F. Guarantee: The Mechanical Contractor shall guarantee that all equipment, material and workmanship furnished by him is free of defect. Should defects appear within one (1) year from date of installation acceptance, same shall be repaired or replaced at no charge to the owner for parts, equipment or labor. Warranty work on items supplied by the owner will be done on a time and material basis, unless due to improper installation, or as per instructions from owner.
- G. Balancing and Performance: The Mechanical Contractor shall procure the services of an independent firm fully certified with the National Environmental Balancing Bureau (NEBB) to test air moving equipment and air distribution and exhaust systems and to supervise the balance and adjustment of these systems. All work shall be done under direct supervision of a licensed mechanical engineer. Test and adjust each system, including all hoods, for proper CFM and operation in accordance with standard procedures outlined by NEBB. Test operation of controls. Provide 3 copies of written report to Architect. For final acceptance all systems, equipment, apparatus, and appliances shall operate satisfactorily as designed and intended. The Mechanical Contractor shall provide the following services to prepare for and assist the air balancing agency:
  - 1. Clean air filters, ductwork, coils, fans, etc. in the air system to remove all construction dust and debris.
  - 2. Start, lubricate, and balance all fans. Change and/or adjust drive pulleys on fans to give required capacity.
  - 3. Supply and install all balancing dampers as required for final balancing as determined by the Balancing Engineer.
  - 4. Furnish workmen familiar with this project and of the proper trade to assist Balancing Engineer in the air balancing.
  - 5. Furnish operating manuals and shop drawings of all equipment installed for use by the air Balancing Agency.
  - 6. Have all systems in full operation a minimum of 24 hours prior to Balancing Engineer's arrival on job.
- H. Operation and Maintenance Data: Contractor shall submit operation and maintenance manuals to owner or owner's representative upon project completion. Submit maintenance data and parts lists for each new piece of equipment, including controls and accessories; include trouble shooting maintenance guide; plus servicing, and preventative maintenance procedures and schedule. Include this data and product data in maintenance manual.

15400 PLUMBING

- A. Pipe Accessories:
  - 1. Furnish, install unions where indicated or necessary for repair or service. Unions 2" and smaller standard ground joint brass to iron seat, malleable iron, screwed.
- B. Pipe and Fittings:
  - 1. Water supply piping to cooling coil shall be Type "L" hard copper. Fittings of wrought copper with sweat joints using 95.5 hard solder. Properly clean surface with flux recommended by fitting manufacturer. Provide dielectric unions at connection of copper to steel pipe.
  - 2. Cooling coil drain piping shall be schedule 40 PVC or ABS/DWV piping with solvent drainage fittings. Pitch all horizontal lines to drain at minimum fall of 1" per 10' of run.
- C. General Piping Requirements:
  - 1. Ream ends of pipe, remove burrs, dirt and scale from pipe before installation. Install exposed piping plumb, straight and horizontal with lines parallel to walls and accurately, make offsets with fitting. Sprung and bent piping not acceptable. Use reducing fittings where pipe changes sizes.
  - 2. Provide unions at each valve, equipment, control or wherever necessary for replacement or repair of equipment and each location shown or required.
  - 3. Anchor piping securely to prevent vibration.
- D. Tests:
  - 1. Test all piping as required by Code, or in absence of codes, as follows:
  - 2. All domestic hot and cold water lines, test under 100 psi water pressure for at least 12 hours. Cover no pipes until tested and found tight.
  - 3. All drain lines, test under 12' head water pressure for twelve (12) hours minimum, prove tight before covering.

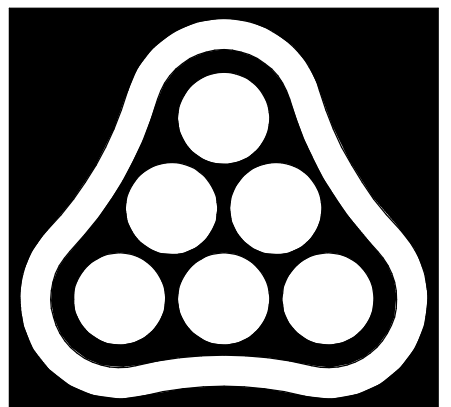
15800 HEATING, VENTILATING, AND COOLING

- A. Sheet Metal Work:
  - 1. Ductwork size, shape and location shall be in accordance with plans as closely as possible. Note that duct sizes called out on drawings are clear inside dimensions of ductwork.
  - 2. Construction and materials shall be as required by the Uniform Mechanical Code and in accordance with Sheet Metal and Air Conditioning Contractors National Association, Inc. (SMACNA) HVAC Duct Construction Standards (Second Edition - 1995).
  - 3. Seal all transverse joints, fittings, connections, and seams with Hardcast DT tape and FTA adhesive or Hardcast AFG-1402 "Foil Grip" applied per manufacturer's instructions.
  - 4. Rectangular supply and exhaust ducts to be externally wrapped and taped with 1# to 1.5# density, 1 1/2" thick, R-5.7 min. fiberglass duct wrap insulation with foil backing to provide proper barrier.
  - 5. No flexible ducts may be utilized on duct runouts.
  - 6. All duct insulation, adhesives, sealers, etc. shall have a flame spread rating of 25 or less and a smoke developed rating of 50 or less when tested in accordance with ASTM E 84.
- B. Grilles & Registers:
  - 1. Grilles and registers as manufactured by Titus or equal by Nailor, Metal-Aire, Carnes, Krueger, or Price. Close attention shall be paid to blow patterns indicated on plans. Screens, dampers, and accessories as scheduled on plans.

15785 DESICCANT DEHUMIDIFIER

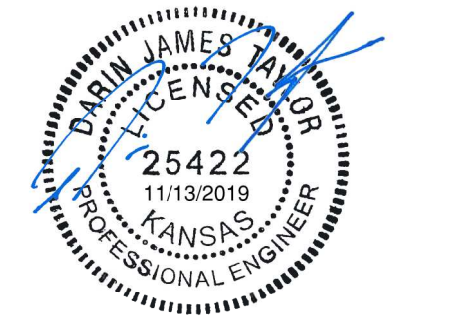
- A. GENERAL
  - 1. Furnish constant-volume, Desiccant Dehumidification air handling system with cooling coil, desiccant dehumidification, reactivation heater, filtration, supply fan, reactivation fan, and controls as specified in the schedule. System shall be designed for indoor installation. System connected utility requirements cannot exceed scheduled values. System to be provided by Munters Corporation – Business Area Air Treatment
  - 2. Requirements for equipment approval: The manufacturer shall provide all necessary documentation for verification of the following:
    - A. Performance meets or exceeds scheduled requirements.
    - B. Connected utilities requirements will be equal to or less than scheduled values.
    - C. System dimensions are within specified constraints
  - 3. Standard Warranty
    - A. The Equipment shall be free from defects in workmanship and materials for 12 months
  - 4. Factory Start-Up to be provided by a Factory-Trained, Certified Technician
    - A. The manufacture shall warrant its Start-up labor services for a period of ninety (90) days from date of substantial completion of start-up by a factory-trained, certified technician who visits the site after all other equipment has been installed and tested, and after all wiring, ducting and other installation items are complete by the customer's representative.
    - B. The factory Technician will review the installation of the dehumidification system, will assist with any problems that occur when system is first started, will verify proper operation and adjust the unit to perform according to the specifications detailed in the Technical Data Sheet contained in the Operating and Maintenance Manual. The Technician will also provide on-site training to the customers' personnel during start-up activities.
    - C. The start-up visit will result in a written report documenting the operating performance of the equipment, along with a list of any recommended actions or system modifications required by the customer or manufacturer to insure optimum operating conditions.
- B. MANUFACTURERS
  - A. Munters Corporation
  - B. Engineered Air
  - C. Bry Air
  - D. Pre-approved equal - Equal indicates that all capacities, dimensions, weights, materials, and performance criteria are equal or better than basis of design. All costs incurred by design deviation shall be the responsibility of the mechanical contractor.
- C. Construction:
  - A. All major components within the air handling structure shall be easily removable through access panels without disturbing ductwork. The unit casing shall include access panels for inspection and for any maintenance required by the Operating and Maintenance Manual
  - B. All ducted connections points will be provided with flanged connection points.
  - C. The unit base shall include lifting holes which shall not protrude beyond the edge of the skid.
  - D. Insulated casing
  - E. Removable desiccant wheel with wheel face seals.
  - F. Drive Motor: fractional horsepower with rotation detection.
  - G. Filters shall be UL 900, and provided with a local differential pressure gauge.
  - H. The fan wheel: Forward Curve, statically and dynamically balanced. Process Cooling Coil(s)
- D. General Design Criteria
  - 1. Coils shall be sized to provide the full capacity scheduled.
  - 2. Coils shall be rated in accordance with ARI standard 410.
  - 3. Tubes: tubes shall be copper with aluminum fins
  - 4. Coil shall be counter-flow design and circuited to provide for optimum performance with minimum pressure loss.
  - 5. Coil shall be designed for 250-PSI working pressure and factory tested under water at 300-PSI air pressure.
  - 6. Supply and return connections are brazed in place with sweat connections for piping.
- E. Electric regeneration coil
  - A. Heaters shall be UL Listed for zero clearance and shall meet all NEC requirements.
  - B. Open coil heating elements shall be 80% nickel and 20% chromium; steps shall be arranged to prevent stratification when operating at less than full capacity.
  - C. Safety devices: a disc-type automatic reset thermal cutout shall be furnished for primary over-temperature protection. For secondary protection, a sufficient number of replaceable thermal cutouts in the power lines shall de-energize elements if the primary cutout fails. All safety devices shall be serviceable through the terminal box without removing the heater from the duct.
  - D. Built-in components shall include safety interlocking disconnect switch, disconnecting break magnetic contactors, transformer with primary fusing per UL, pressure-type airflow switch set at .05" WC, supplementary circuit fuses per NEC (one set of fuses per 48 amp circuit), and separate load and control terminal blocks to accept conductors as shown on the electrical plan.
  - E. Solid-state proportional heater control for automatic modulation of energy in proportional response to a temperature control signal. Modulation shall be infinitely adjustable. Electrical Control Cabinet
- F. General:
  - A. All equipment provided with unit shall be electrically-self contained. All electrical and controls components necessary for proper operation shall be furnished, installed, wired and ready for operation.
  - B. Equipment shipped loose or removed for shipping shall be noted accordingly on approved installation wiring diagrams shipped with the unit. Wiring connections that must be reconnected at shipping splits shall be noted accordingly on approved installation wiring diagrams shipped with the unit.
  - C. Incoming power to the unit shall be made at a single point electrical connection in the unit mounted electrical control panel. In addition to any internal functionality requirements of the manufacturer, the main system controls shall comply with the sequence of operation as defined on the drawings.
- G. Electrical Raceways and Wiring:
  - A. All wiring shall be routed in conduit raceway. Exposed wiring is not allowed.
  - B. Conduit and conduit fittings shall be EMT [OPTION: rigid galvanized steel] [OPTION: rigid aluminum] both inside and outside the unit and be provided with compression fittings. All conduit clamps, hangers, fasteners and hardware shall be galvanized steel.
  - C. Flexible conduit connections to devices or instruments shall be made using Liquidtight flexible non-metallic conduit and non-metallic fittings. The maximum length shall be 36".
  - D. All conduit connections shall be made with watertight hubs through the sides or bottom of boxes and panels. No conduit connections through the top of boxes and panels.
  - E. All wiring shall conform to NEC standards.
    - 1. All wiring shall terminate at a wiring terminal.
    - 2. Terminated wires and terminal blocks shall be labeled with wire number to match wiring diagrams.
  - F. Unit Mounted Electrical Control Panel.
  - G. A NEMA 4 UL Listed and Labeled control panel shall be mounted to the unit for main incoming power, power distribution and controls complete with fuses, control power transformer, motor starters, terminal strips for all wiring originating or terminating at the panel, and PLC chassis with appropriate modules (cards).
  - H. Control power transformer shall satisfy the control power voltage requirements. The transformer shall be selected to have a minimum of 10% spare capacity for future expansion. Control circuits shall not exceed 120 volts. The control power transformer shall be powered from the single point electrical connection to the unit.

MABCD REVIEWER:



**PEC**

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2020 HESS PUMP STATION  
DEHUMIDIFIER REPLACEMENT  
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MECHANICAL SPECIFICATIONS

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