



**Kompact Series Heatless Regenerative Compressed Air Dryer
(8 - 39 scfm)**

1.0 Scope

1.1 Work by Seller

- 1.1.1 Design, fabricate, test and deliver a heatless regenerative compressed air dryer with prefilter, drain valves and afterfilter in accordance with this specification.
- 1.1.2 Furnish under this specification: combination particulate/coalescing filter, automatic drain valve, dual tower heatless dryer, color-change moisture indicator, pressure gauges, pressure differential indicators, and final particulate filter.
- 1.1.3 Sellers manufacturing facility shall be certified by Underwriters Labs (UL) and registered to ISO9001 (ANSI/ASQCQ Q90 Series).

1.2 Work by Buyer

- 1.2.1 Equipment installation
- 1.2.2 Piping connections to compressed air dryer and filter system from distribution system.
- 1.2.3 120-volt single phase power connection.
- 1.2.4 Drain connections to sump.

1.3 Codes and Standards (latest edition)

- 1.3.1 National Electrical Manufacturers Association (NEMA)
- 1.3.2 American Society for Testing Materials (ASTM)
- 1.3.3 American National Standards Institute (ANSI)
- 1.3.4 National Electrical Code (NEC)
- 1.3.5 ASME Boiler and Pressure Vessel Code, Section VIII
- 1.3.6 Occupational Safety and Health Act (OSHA)
- 1.3.7 Compressed Gas Association (CGA)
- 1.3.8 ISO9001 (ANSI/ASQCQ Q90 Series)

1.4 Submittals

- 1.4.1 Seller shall provide:
 - 1.4.1.1 A reproducible drawing stamped certified for construction and signed by an authorized agent of the manufacturer.

- 1.4.1.2 Manuals for installation, operation and maintenance including specific instructions for filter replacements.
- 1.4.1.3 Elevation and plan drawings
- 1.4.1.4 Electrical schematic
- 1.4.1.5 Mill Test Reports for ASME Code Vessels
- 1.4.1.6 Form U-1 manufacturer's data report

2.0 Products

2.1 Mechanical design and equipment design details

2.2 General Design

- 2.2.1 The heatless regenerative compressed air dryer shall be a complete unitized filtration and drying system. The integrated package shall produce clean and dry air from ordinary compressed air by using a combination of impingement, coalescence, adsorption, and mechanical interception. The air dryer package accomplishes this by removing the liquid water, oil, particulate matter and moisture to produce clean, dry compressed air.
- 2.2.2 All equipment specified herein shall be mounted on a common skid, prepiped and prewired, such that the buyer need only to supply utilities and make tie-ins to form a complete functioning system.

2.3 Basic Design

2.3.1 Coalescing oil and water removal filters

- 2.3.1.1 The compressed air coalescing filter to remove liquid water, solid particulate, liquid oil and oil mists from the air for removal of solid particulate from air at an absolute 0.6 micron filtration. The maximum remaining oil aerosol content of 0.001 ppmw shall be provided. The proprietary drain layer shall channel coalescing liquids away from the air stream. This channeling action shall ensure that contaminants, once removed, shall not be allowed to re-entrain into the air stream. The initial (dry) pressure drop at inlet air pressure and rated flow shall not exceed 1.5 psid. The filter shall include a visual indicator for element replacement. The carousel indicator shall have enhanced visibility and be in the green zone when element is good and in the red zone to indicate need for element replacement.
- 2.3.1.2 Filtration mechanisms shall be impaction and diffusion. Filter housing shall incorporate a large-volume sump for the collection of separated particulate. Filter elements shall be replaceable and non-directional and shall be constructed of bonded non-fiber releasing pleated, microglas fiber and non-woven polyester medium with glass-filled end caps. Elements shall be replaceable without breaking air connections. The elements are to be pleated and have six (6) times the surface area of smooth elements to allow a longer service life. The elements shall not require any tie rods or mounting hardware and shall not allow misalignment.
- 2.3.1.3 The element is to be mounted on a non-corrosive stainless steel support core and be capable of withstanding pressure surges up to 100-psi differential. The housing shall be constructed of diecast aluminum and incorporate the means to provide an audible signal should bowl is inadvertently loosened while filter is pressurized. The housing shall incorporate an automatic drain for removal of contaminants collected in sump. The filter housing shall be provided with a liquid presence indicator.

- 2.3.1.4 The filter shall be provided with an automatic electronic drain valves with LED indicators for "Power On" and "Drain Open" with manual push-to-test buttons. The valve body shall use Viton seals with a full 7/16" orifice.
- 2.3.2 Heatless air dryer to remove water vapor.
- 2.3.2.1 The air dryer shall be capable of reducing the moisture content of the air to maintain an outlet pressure dew point of -40°F . The dryer shall provide a continuous supply of dry air by automatically switching the flow of air between the twin desiccant towers via a non-lubricated shuttle valve, on a 4 minute cycle (2 min. each). The valve is life tested to more than 500,000 cycles with a cast manifold using built in flow channels to eliminate internal connections, elbows, and tees, virtually eliminating leaks. The shuttle valve has the fewest moving parts, requiring no routine maintenance with nothing to lubricate and no sliding seals to wear or replace. No check valves, 4 way, diaphragm or spool valves acceptable. The non-corrosive desiccant shall be spherical particles of activated alumina and shall be in a replaceable desiccant (through 39 scfm at 100 psig) cartridge housed in a cast aluminum alloy vessel. The cast housing shall incorporate the means to provide an audible signal should bowl be inadvertently loosened while dryer is pressurized. The dryer shall be provided with panel mounted tower pressure gauges.
- 2.3.2.2 Purge exhaust mufflers bring noise levels for exhaust to within OSHA guidelines. A spare set of replacement muffler cores shall be included. No electrical or other energy shall be supplied to the dryer from an outside source for regeneration.
- 2.3.3 Final Particulate Filter
- 2.3.3.1 The compressed air particulate filter for removal of solid particulate from air at an absolute 0.9-micron filtration. The initial (dry) pressure drop at inlet air pressure and rated flow shall not exceed 1 psid. The filter shall include a visual indicator for element replacement. The indicator shall be in the green zone when element is good and in the red zone to indicate need for element replacement.
- 2.3.3.2 Filtration mechanisms shall be mechanical separation and interception. Filter housing shall incorporate a large-volume sump for the collection of separated particulate. Filter elements shall be replaceable and non-directional and shall be constructed of non-fiber releasing pleated, microglas fiber and non-woven polyester medium with glass-filled end caps. Elements shall be replaceable without breaking air connections. The elements are to be pleated and have six (6) times the surface area of smooth elements to allow a longer service life.
- 2.3.3.3 The element is to be mounted on a stainless steel support core and be capable of withstanding pressure surges up to 100 psi differential. The housing shall be constructed of diecast aluminum and incorporate the means to provide an audible signal should bowl be inadvertently loosened while filter is pressurized. The housing shall incorporate a manual drain for periodic removal of contaminants collected in sump.
- 2.3.4 Control and Alarm Monitoring System
- 2.3.4.1 Controls shall be watertight, rated NEMA 4 for non-hazardous location.
- 2.3.4.2 A lighted schematic shall be included to give continuous on line indication of proper operation.
- 2.3.4.2 A solid state timer to deliver reliable, precise control shall be provided.

- 2.3.4.3 Visual color change moisture indicators at dryer outlet. The indicator will be dry when green and wet when yellow (Change color at approx. 4% RH).
- 2.3.5 Piping
 - 2.3.5.1 All pipe shall be standard weight ASTM A53 GR B with threaded connections.
 - 2.3.5.2 Threaded fittings are 150# black malleable iron and conform to ASTM A197 and ANSI B16.3.
- 2.3.6 Design Pressure and Temperature
 - 2.3.6.1 The maximum pressure shall be 230 psig.
 - 2.3.6.2 The rated capacity is based on 100 psig and 100°F inlet air temperature with 120°F max. Ambient temperature range shall be 35°-120°F.
 - 2.3.6.3 All pressure vessels shall be hydrostatically pressure tested individually to 1½ times maximum operating pressure. Assembly shall be tested with shop air pressure and threaded pipe connections shall be soap bubble tested.
- 2.3.7 Utilities
 - 2.3.7.1 Total electrical requirement shall not exceed 45 watts at 115vac
- 2.3.8 The compressed air system shall be Kemp Kompact Series Heatless Regenerative Compressed Air Dryer, Model Number _____.