COMPRESSED AIR SYSTEMS (ADDENDUM 5)

1. GENERAL

1.1 Summary

.1 Section Includes:

.1 Provide reciprocating air compressor.

.2 Provide receiver and accessories.

.3 Provide aftercooler.

.4 Provide refrigerated air dryer.

.5 Provide pressure reducing station.

.6 Materials and installation for piping, fittings, equipment used in compressed air systems.

.2 Related Requirements

.1 Section 15010 – General Mechanical Provisions.

.2 Section 15900 – HVAC Controls General Provisions

1.2 References

.1 American Society of Mechanical Engineers (ASME)

.1 ASME Boiler and Pressure Vessel Code Section VIII Pressure Vessels.

.1 BPVC Section VIII – 1, Rules for Construction of Pressure Vessels Division 1.

.2 BPVC Section VIII – 2, Rules for Construction of Pressure Vessels Division 2 - Alternative Rules.

.3 BPVC Section VIII – 3, Rules for Construction of Pressure Vessels Division 3 - Alternative Rules High Press Vessels.

.2 ASME B16.5, Pipe Flanges and Flanged Fittings.

.3 ASME B16.11, Forged Fittings, Socket-Welding and Threaded.

.2 American Society for Testing and Materials International (ASTM)

.1 ASTM A 53/B, Standard Specification for Pipe, Steel, Black and Hot-Dipped, Zinc-Coated Welded and Seamless.

.2 ASTM A 181, Standard Specification for Carbon Steel Forgings for General Purpose Piping.

.3 Canadian Standards Association (CSA)

.1 CSA B51, Boiler, Pressure Vessel, and Pressure Piping Code.

.4 Health Canada/Workplace Hazardous Materials Information System (WHMIS)

.1 Material Safety Data Sheets (MSDS).

1.3 Action and Informational Submittals

.1 Product Data:

.1 Submit manufacturer's printed product literature, specifications and datasheet for piping, fittings and equipment.

.2 Shop Drawings:

.1 Submit Shop Drawings to indicate project layout including layout, dimensions and extent of piping system.

.1 Vertical and horizontal piping locations and elevations and connections details.

.2 Instructions: submit manufacturer's installation instructions.

2. PRODUCTS

2.1 Air Compressor

.1 General:

.1 Duplex compressors mounted on vertical tanks.

.2 Air-cooled, reciprocating, V-belt driven.

.3 Refer to equipment schedule for performance.

.2 Motor: ODP, 2 x 5 HP.

.3 Control:

.1 Provide controller with the following function and characteristics:

.1 Operates compressors duty standby and switches at scheduled intervals to ensure equal running time.

.2 Switches to non-operating compressor should the operating compressor fail.

.3 Runs both compressors in the event that extra capacity is required.

.4 Manual control with HAND/OFF/AUTO starter switch.

.2 Pressure switch to cut out at 1035 kPa and with minimum differential pressure.

.3 Discharge pressure regulator set to maintain 860 kPa and sized for flow of both compressors operating simultaneously.

.4 Accessories: belt guard, electric drain valve and pressure gauges.

.5 Aftercooler:

.1 Provide air compressor with air aftercooler suitable for operation under 930 kPa working pressure.

.2 Aftercooler shall have capacity to cool discharge air to within 7°C of ambient air temperature with compressors operating at specified capacity.

.6 Air intakes: replaceable cartridge type intake filter.

.7 Vibration isolation: 95% minimum efficiency.

.8 Capacity: as scheduled.

.9 Acceptable model: Atlas Copco CR5-TSP-80GV or approved equal.

2.2 Air Compressor

.1 General:

.1 Simplex compressor mounted on single, vertical tank.

.2 Air-cooled, reciprocating, V-belt driven.

.3 Refer to equipment schedule for performance.

.2 Motor: ODP, 1 x 5HP.

.3 Control:

.1 Provide controller with the following function and characteristics:

.1 Manual control with HAND/OFF/AUTO starter switch.

.2 Pressure switch to cut out at 1035 kPa and with minimum differential pressure.

.3 Discharge pressure regulator set to maintain 860 kPa and sized for flow of both compressors operating simultaneously.

.4 Accessories: belt guard, electric drain valve and pressure gauges.

.5 Aftercooler:

.1 Provide air compressor with air aftercooler suitable for operation under 930 kPa working pressure.

.2 Aftercooler shall have capacity to cool discharge air to within 7°C of ambient air temperature with compressors operating at specified capacity.

.6 Air intakes: replaceable cartridge type intake filter.

.7 Vibration isolation: 95% minimum efficiency.

.8 Capacity: as scheduled.

.9 Acceptable model: Ingersoll Rand 2-2475E5-P or approved equal.

2.3 Air Dryers

.1 Provide refrigerated air dryer of self-contained mechanical refrigeration type complete with heat exchanger, refrigeration compressor, automatic controls, moisture removal trap, internal wiring and piping and full refrigerant charge.

.2 Design so air inlet and air outlet connections are at same level and factory insulated.

.3 Heat exchangers to consist of air to air and refrigerant to air coils. Provide moisture separator located at discharge of heat exchanger. Provide heat exchangers with automatic control system to bypass refrigeration system on low or no load condition.

.4 Refrigeration unit shall be hermetically sealed type to operate continuously to maintain specified minus 6°C (21°F) dew point using R134a refrigerant. House unit in steel cabinet provided with access door and panel for maintenance and inspection.

.5 Dryer shall be provided with air inlet temperature gauge, air inlet pressure gauge, on/off switch, high temperature light, power on light, refrigerant gauge.

2.4 Pressure Reducing Valve

.1 Provide pressure reducing stations complete with automatic reducing valve and bypass, and low pressure side relief valve and gauge. Provide oil separator where indicated.

2.5 Piping

.1 Compressed air piping:

.1 Piping: Schedule 40 type 316L stainless steel.

.2 Fittings;

.1 Forged type 316L stainless steel.

.3 Joints:

.1 Socket or but welded.

2.6 Ball Valves

.1 Three piece design or top entry for ease of in-line maintenance.

.1 To ASTM A 181/A 181M, Class 70, carbon steel body socket welded or screwed ends, carbon steel ball and associated trim suitable for compressed air application.

.2 To withstand 1034 kPa maximum pressure.

2.7 Couplers/Connectors

.1 Industrial interchange series, full-bore.

.2 Maximum inlet pressure: 1034 kPa.

.3 Valve seat: moulded nylon.

.4 Body: zinc plated steel.

.5 Threads: NPT.

3. EXECUTION

3.1 Manufacturer's Instructions

.1 Compliance: comply with manufacturer's written recommendations or specifications, including product technical bulletins, handling, storage and installation instructions, and datasheet.

3.2 Compressed Air Piping Connections and Installation

.1 Install shut-off valves at outlets, major branch lines and in locations as indicated.

.2 Install quick-coupler chucks and pressure gauges on drop pipes.

.3 Install unions to permit removal or replacement of equipment.

.4 Install tees in lieu of elbows at changes in direction of piping. Install plug in open ends of tees.

.5 Grade piping at 1% slope minimum toward drip pockets.

.6 Install compressed air trap and pressure equalizing pipe at moisture collecting points. Drain pipe to nearest floor drain.

.7 Make branch connections from top of main.

.8 Install compressed air trap at bottom of risers and at low points in mains, piped to nearest drain. Distance between drain points to be 30 m maximum.

.9 Provide drain from air dryer.

.10 Weld steel piping in accordance with Section 23 05 17 - Pipe Welding and;

.1 To ASME code and requirements of Authority Having Jurisdiction (AHJ).

.2 Weld concealed and inaccessible piping regardless of size.

3.3 Field Quality Control

.1 Register with the Office of the Fire Commissioner, Inspection and Testing Services, MB.

.2 Guarding and complete installation in accordance with the regulatory requirements of Manitoba.

.3 Site Tests/Inspection:

.1 Testing: pressure test in accordance with requirements of Section 21 05 01 - Common Work Results for Mechanical, for 4 hour minimum, to 1100 kPa, with outlets closed and with compressor isolated from system. Pressure drop not to exceed 10 kPa.

.2 Testing in accordance with requirements of CSA B51, B31.3, and AHJ.

3.4 Cleaning

.1 Refer to Section 15090 – Pre-operational Cleaning and Chemical Treatment.

.2 Cleaning: blow out piping to clean interior thoroughly of oil and foreign matter.

.3 Check entire installation is approved by AHJ.

.4 Perform cleaning operations in accordance with manufacturer's recommendations.

.5 Upon completion and verification of performance of installation, remove surplus materials, excess materials, rubbish, tools and equipment.

END OF SECTION