1 General

1.01 Submittals

.1 Submit shop drawings/product data sheets for all products specified in this section, except piping and valves.

1.02 Closeout Submittals

.1 Submit a letter from compressor manufacturer/supplier to certify proper compressor set installation as specified in Part 3 of this section.

.2 Training attendance records.

2 Products

2.01 Pipe, Fittings and Joints

.1 Galvanized Steel

.1 Schedule 40 mild steel, galvanized, ASTM A53, screwed, complete with Class 125 galvanized cast iron screwed fittings and screwed joints.

.2 Copper

.1 Type "L" hard drawn seamless copper to ASTM B88, complete with forged solder type fittings to suit pipe, and soldered joints using 95% tin / 5% Antimony solder.

2.02 Piping Unions

.1 Screwed Steel Piping

.1 Malleable iron, galvanized, ground joint, brass to iron or bronze to bronze seat unions and union elbows with a minimum pressure rating of 1725 kPa (250 psi) steam at 260°C (500°F).

.2 Soldered Copper Piping

.1 Solder-on forged copper or bronze screwed unions suitable in all respects for the application.

2.03 Low Pressure Shut-Off Valves

.1 Class 600, 4140 kPa (600 psi) WOG rated full port ball valves, each complete with a forged brass or bronze body with solder joint or screwed joint ends as required, forged brass cap and blowout-proof stem, forged brass chrome plated ball, "Teflon" or "PTEF" seat, and a removable lever handle.

.2 Manufacturers:

.1 Toyo Valve Co. Fig. 5049A solder or Fig. 5044A screwed;

.2 Watts Industries (Canada) Ltd. #FBV-3 or #FBVS-3;

.3 Kitz Corporation Code 59 solder or Code 58 screwed;

.4 Apollo Valves #70-100 screwed or #70-200 solder.

2.04 High Pressure Shut-Off Valves

.1 Equal to Apollo Valves #70-100-27, 4140 kPa (600 psi) rated Class 600, screwed bronze ball valve with a PTFE seat, automatic relief vent, and removable lever handle.

2.05 Drain Valves

.1 Minimum 2070 kPa (300 psi) water rated, 20 mm (¾") dia. straight pattern full port bronze ball valves, each complete with a threaded outlet suitable for coupling connection of 20 mm (¾") dia. garden hose, and a cap and chain.

.2 Manufacturers:

.1 Toyo Valve Co. Fig. 5046;

.2 Kitz Corporation Code 58CC;

.3 Apollo Valves #78-100 or #78-200;

.4 Watts Industries (Canada) Ltd. #B6000-CC.

2.06 Air Compressor Set

.1 CompAir Kellogg "American", CSA certified, tank mounted, package type, duplex, pre-piped and pre-wired air compressor set designed for loadless starting, and complete with 2-stage, air cooled compressors arranged for automatic operation, and a separate power/control panel.

.2 Compressor set model number to be confirmed by fire protection sprinkler contractor.

.3 Each compressor complete with:

.1 cast iron cylinders, heads, crankcase, and cast iron connecting roads with replaceable automotive type insert bearings;

.2 cast iron crankshaft supported on both ends by oversized tapered roller bearings;

.3 pressure type oil lubrication with oil sight gauge;

.4 steel inlet and discharge valves, and a high efficiency intercooler with steel fins on copper tubes;

.5 heavy-duty dry type inlet filter-silencer;

.6 high volume, statically balanced flywheel/cooing fan;

.7 motor conforming to requirements specified in Section 20 05 00 – Common Work Results for Mechanical, on an adjustable support base, and V-belt drive with OHSA type steel belt guard, also as specified in Basic Mechanical Materials and Methods.

.4 Welded steel receiver including an ASME rated tank in accordance with CSA B51 and TSSA requirements, complete with welded steel support feet, and following:

.1 ASME rated safety relief valve;

.2 positive seating ball type outlet valve, a screwed union, and a length of braided metallic flexible connection;

.3 pressure gauge with gauge cock;

.4 adjustable pressure switch for automatic start-stop operation of the compressors;

.5 valved manual tank drain, and an automatic tank drain;

.6 properly sized neoprene-steel-neoprene vibration isolating mounting pads;

.7 braided stainless steel flexible pipe connectors supplied loose.

.5 Surface wall mounting power and control panel in a NEMA 1 (NEMA 2 if room is sprinklered) enamelled steel enclosure with a hinged (piano hinge) lockable front door, door interlock disconnect switch, and following:

.1 overload protected across-the-line, non-reversing magnetic starter, and a door mounted H-O-A switch for each motor, in accordance with Section 20 05 00 – Common Work Results for Mechanical;

.2 fused control transformer;

.3 electronic alternator to automatically alternate lead compressor after each start cycle, and to automatically start lag compressor should the lead compressor fail to start;

.4 door mounted "power on" LED for panel and door mounted "run" LED for each compressor;

.5 terminal block and strips for power and control wiring connections, including control wiring from receiver mounted pressure switch.

.6 Manufacturers:

.1 CompAir Kellog;

.2 Atlas Copco Compressors Canada;

.3 DeVair Systems.

2.07 Refrigerated Dryer

.1 Package type, wall mounting refrigerated air dryer supplied with air compressor set, capable of reducing the dew point of total compressor set air delivery to -23°C (-10°F) with a maximum 20 kPa (3 psi) pressure drop at rated capacity, and complete with:

.1 pressure regulator;

.2 moisture separator with automatic drain;

.3 manual 3-valve bypass to permit isolation and removal of heat exchanger for servicing without interrupting air flow;

.4 pressure relief valve;

.5 pre-wired NEMA 1 (NEMA 2 if room is sprinklered) power and control panel with disconnect switch, motor starter, power on LED, air inlet temperature gauge, high temperature LED, refrigerant suction pressure gauge, air outlet temperature gauge, air outlet pressure gauge, and terminal strips for wiring connections;

.6 non CFC refrigerant;

.7 hot gas by-pass to maintain continuous operation and stable dew point;

.8 replaceable element air filter capable of removing 99% of the total oil present, 100% of solid particles 0.6 micron or larger, and 90% of solid particles 0.4 micron or larger.

2.08 Piping System Components

.1 Outlets equal to DeVair or ARO Fluid Products female bayonet lock type quick-connect outlets with exact type and size as directed, each complete with a non-corrosive hose hanger.

.2 Pressure regulators equal to Watts (CompAir) R119 Series, adjustable, heavy-duty diaphragm type pressure regulators, each complete with a pressure gauge and a mounting bracket.

.3 Filters equal to Watts (CompAir) F602 Series heavy-duty 40 micron filters, each complete with a zinc bowl with sight glass, internal automatic drain, and mounting bracket.

.4 Combination filter-regulator assemblies equal to Watts (CompAir) B11 Series general purpose filter-regulators, each complete with an adjustable diaphragm type pressure regulator with pressure gauge, a 40 micron filter with zinc bowl, sight glass and automatic drain, and a mounting bracket.

3 Execution

3.01 Installation of Air Compressor Set

.1 Provide an air compressor set.

.2 Secure set in place on vibration isolation on a concrete housekeeping pad.

.3 Ensure housekeeping pad is keyed to structure, and compressor assembly is secured to structure by slack cable restraints. Refer to Section 20 05 48.16 - Seismic Controls for Mechanical Systems.

.4 Install accessories shipped loose with set, except power and control panel.

.5 Extend type DWV soldered hard copper drainage piping from tank drain assemblies to nearest floor drain.

.6 Hand power and control panel to electrical trade at site for mounting and power wiring connections as part of electrical work.

.7 Connect receiver pressure switch to starter and control panel with wiring in conduit to the standards of the electrical work and in accordance with panel supplier’s instructions.

.8 Touch-up paint any damage to the factory finish.

3.02 Installation of Refrigerated Dryer

.1 Provide a refrigerated dryer and wall mount adjacent to compressor set. Connect with piping, including type DWV hard copper drainage piping terminated over a floor drain.

3.03 Installation of Piping and Piping System Components

.1 Provide required compressed air piping. Unless otherwise specified, install horizontal piping to outlets 1.5 m (5 feet) above finished floor level.

.2 Pipe is to be Schedule 40 mild galvanized steel, screwed, or type "L" hard copper, soldered.

.3 Support and secure piping generally as specified in Section 20 05 00 – Common Work Results for Mechanical, but with extra support and securing hardware as required to prevent drumming. Provide rigid supports at each side of outlets.

.4 Arrange piping so condensate will drain from mains and branches into drip legs. Provide drip legs at bottom of risers, every 30 m (100') of pipe run, and at the end of each branch piping run, whether indicated on drawings or not.

.5 Drip legs are to extend down from bottom of pipe and consist of a piping tee and 250 mm (10") long pipe nipple same size as main or branch pipe, then a reducing fitting (if required) and 12 mm (½") dia. piping extended down to floor level and terminated with a ball valve. Ensure drain points are easily accessible and identified.

.6 Extend branch piping to outlets and/or equipment off the top of the main(s).

.7 Provide shut-off valves in piping at all equipment connections, to isolate piping components for removal or maintenance, and wherever else specified or shown. Provide vented type valves between air compressor set and pressure reducing stations.

.8 Provide unions in piping at connections to equipment.

.9 When piping is complete and has been pressure tested, but before connection of outlets, blowout piping to remove oil and foreign matter.

.10 Provide adjustable pressure regulators, filters, compressed air outlets, etc. Unless otherwise indicated locate outlets 1.5 m (5 feet) above floor and properly secured in place. Provide a hose hanger at each outlet location. Confirm exact location of piping components prior to roughing-in.

3.04 System Startup

.1 For equipment/system start-up requirements, refer to Section 20 05 00 – Common Work Results for Mechanical.

.2 For equipment/system manufacturer certification requirements, refer to Section 20 05 00 – Common Work Results for Mechanical. Submit a copy of the letter prior to Substantial Performance of the Work.

3.05 Closeout Activities

.1 Include for 4 hours of on-site training for 2 groups of 6 people. Training is to be a full review of all components including but not limited to a full operation and maintenance demonstration, with abnormal events.

End of Section