1. **Scope**
   1. This specification is for a direct driven, oil-lubricated, single-stage, variable speed, air cooled, rotary screw air compressor. The compressor shall be an Atlas Copco model GA22VSDS to GA37VSDS or pre-approved equivalent.
   2. The compressor shall deliver 35 to 187 acfm at 125 psi in accordance with ISO 1217, Annex E. acfm is actual cubic feet per minute at inlet conditions.
   3. The units shall be manufactured in accordance with this specification. The construction as described in this specification is considered essential and critical to the application. The vendor shall state in his quotation any and all exceptions to the specification.
2. **General**
   1. The rotary screw air compressor shall be capable of producing and delivering 100% of the required air demand as specified at standard operating conditions.
   2. The compressor shall be designed and supplied as a complete package with all necessary equipment, including but not limited to the following components: inlet filter, air compression element, drive motor, aftercooler with integral moisture separator, oil cooler, cooling fan, variable speed drive, microprocessor regulation and control system. All components shall be mounted on a common solid base frame and fully enclosed with a sound attenuating enclosure.
   3. The compressor package shall be rated to operate in ambient conditions from 32°F to 115°F.
   4. The compressor shall be able to operate at any speed in between its minimum and maximum speed.
   5. The compressor must not idle when the demand decreases below the minimum flow of the compressor.
   6. The units shall be manufactured by a qualified manufacturer who has been manufacturing air compressors for at least ten (10) years.
   7. The compressor manufacturer shall be certified under ISO 9001 / 9002 quality standards and ISO 14001 environmental standards.
   8. The manufacturer must participate in the Compressed Air & Gas Institute (CAGI) Performance Verification program.
3. **Compressor Enclosure**
   1. The compressor shall be enclosed in a steel sound attenuating canopy with removable panels.
   2. The sound attenuating material shall be flame retardant polyurethane foam.
   3. The compressor canopy should be of a hot-cold canopy design. This design should isolate all heat producing components (motor, electronics, compressor element) from all other components.
4. **Noise Levels**
   1. The compressor package shall not exceed 71 dB(A) when measured in the free field conditions at one meter in accordance with the CAGI-Pneurop Test Code.
5. **Compressor Element**
   1. The compression profile shall be of the asymmetric profile design with four lobes on the male rotor and six lobes on the female rotor.
   2. The male and female rotors shall have the same diameter.
   3. The compressor element must be vertically oriented in the canopy.
   4. The oil for the lubrication of the compressor element must be pre-heated by the cooling jacket of the motor.
   5. The element housing shall be of cast iron construction.
6. **Drive Motor**
   1. The drive motor must be a totally enclosed, oil lubricated, ferrite-assisted synchronous reluctance magnet motor with an enclosure rating of IP66
   2. The drive motor must be inverter duty rated.
   3. The motor shall meet or exceed the NEMA Premium Efficiency rating.
   4. The complete motor shall be 100% maintenance-free.
   5. Approved manufacturers include:
7. Siemens

B. Atlas Copco

C. ABB

D. TECO Westinghouse

E. Reliance

F. Leroy Somer

G. Toshiba

H. Baldor

1. **Drive Arrangement**
   1. The drive arrangement shall be a direct driven design.
   2. The drive system shall be fully enclosed to protect against dirt and dust intrusion.
2. **Cooling System**
   1. The compressor package shall be fitted with an aluminum, air-cooled, oil cooler and aftercooler.
   2. The cooling system shall include a variable speed fan.
3. **Moisture Separator**
   1. The compressor shall be equipped with a labyrinth style moisture separator integrated in the discharge side of the after-cooler.
4. **Water Drain**
   1. A electronic condensate drain shall also be included.
5. **Inlet Air Filter**
   1. The filter shall be a paper cartridge type and be factory installed inside the compressor enclosure.
   2. The filter shall have the following SAE fine efficiency ratings:

1 micron: 98.0%

2 microns: 99.5%

3 microns: 99.9%

* 1. The service interval of the filter must be at least 8,000 hours.

1. **Oil System**
   1. The oil system shall include an ASME approved air/oil separator with oil level indicator. The service interval of the separator element must be at least 4,000 hours.
   2. The oil filter shall be a spin-on type with an integrated bypass valve. The oil filter element will have a 12 micron beta 75 rating and the service interval must be at least 4,000 hours.
   3. The oil temperature shall be regulated by means of a thermostatic bypass valve. Oil circulation is achieved through differential pressure.
   4. The oil must be synthetic and rated for a change interval of 4,000 hours.
2. **Electric Cubicle**
   1. The control cubicle must be designed to NEMA 1 standards.
   2. The unit must have an EMC filter installed.
   3. The unit must have a line reactor (choke) installed.
3. **Regulating and Control System**
   1. The compressor shall have a regulating system which is of the variable-speed design, controlled by an air compressor discharge pressure sensor which senses the pressure variations at the compressor discharge and adjusts the speed of the compressor to maintain a stable discharge pressure.
   2. The full variable-speed regulation shall be combined with start / stop regulation to automatically stop the compressor as required during low demand periods without idling.
   3. The compressor shall be equipped with an onboard microprocessor controller which will control, monitor and protect the operation and condition of the air compressor.
   4. The controller shall have a 3.5” color display.
   5. The controller shall allow programming of two pressure set points.
   6. Time based start / stop and changeover of the pressure set point shall be programmable.
   7. The controller must be capable of automatically restarting the compressor in the event of a voltage failure.
   8. The controller must be capable of graphing any of the measured temperature or pressure inputs on the display. The time frame of the graph shall be adjustable from 4 minutes to 10 days.
   9. The compressor shall be able to be controlled locally, remotely or via a local area network.
   10. The controller must be equipped with auxiliary contacts for external indication of automatic or manual load control, general warning and general shutdown conditions.
   11. The controller must be capable of providing remote monitoring by a PC through the local Ethernet system via an Ethernet port on the controller.
   12. The controller must be capable of providing remote monitoring via a iPhone, iPad, or Android phone or tablet.
   13. The controller shall monitor the hours of operation and output a message on the display to notify the operator to provide preventative maintenance in accordance with the factory approved service plan.
   14. The control system shall have the capability to monitor the following items:

* Discharge air pressure
* Element outlet temperature
* Ambient temperature
* Compressor status
* Motor overload status
* Running hours
* Loaded hours
* Regulator hours
  1. Compressor protective functions shall include:
* Emergency stop
* Element outlet temperature
* Service warnings
* Drive and cooling fan motor overload

1. **Shipment and Delivery Preparation**
   1. The compressor must be packaged on a wooden skid and fully enclosed with a wooden enclosure.
2. **General Installation Requirements**
   1. Upon placement on a level surface and connection to essential utilities, the unit shall be provided available for immediate operation.
   2. The compressor must not require bolting to the floor.