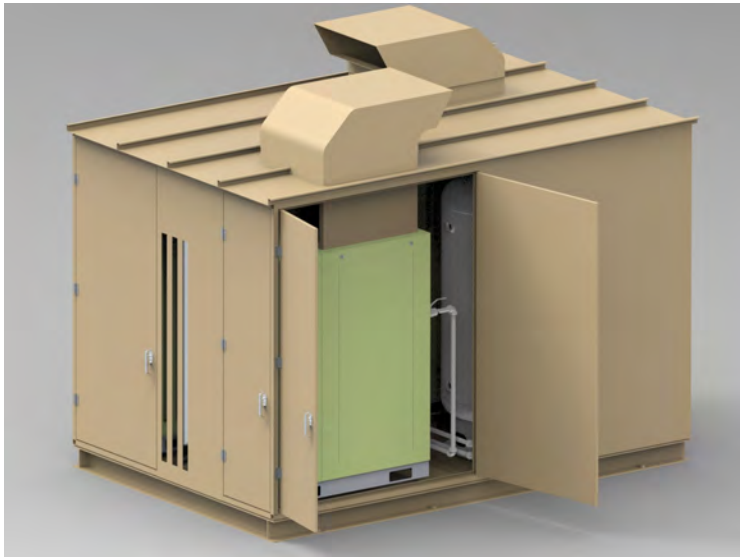


"DUPLEX" INSTRUMENT AIR INFO



TESCORP fully enclosed "cabinet" units



TESCORP open units for mild climate

The TESCORN Instrument Air Units are complete compressor units designed for the harsh service and conditions required in the various oilfield environments. Constructed as a "Duplex" unit, it provides both redundancy and with two Atlas Copco "GA Series" Oil Flooded rotary screw compressors, and excess capacity when necessary. The TESCORN units are designed and constructed with proven and most efficient Atlas Copco compressors and

All Instrument Air Units:

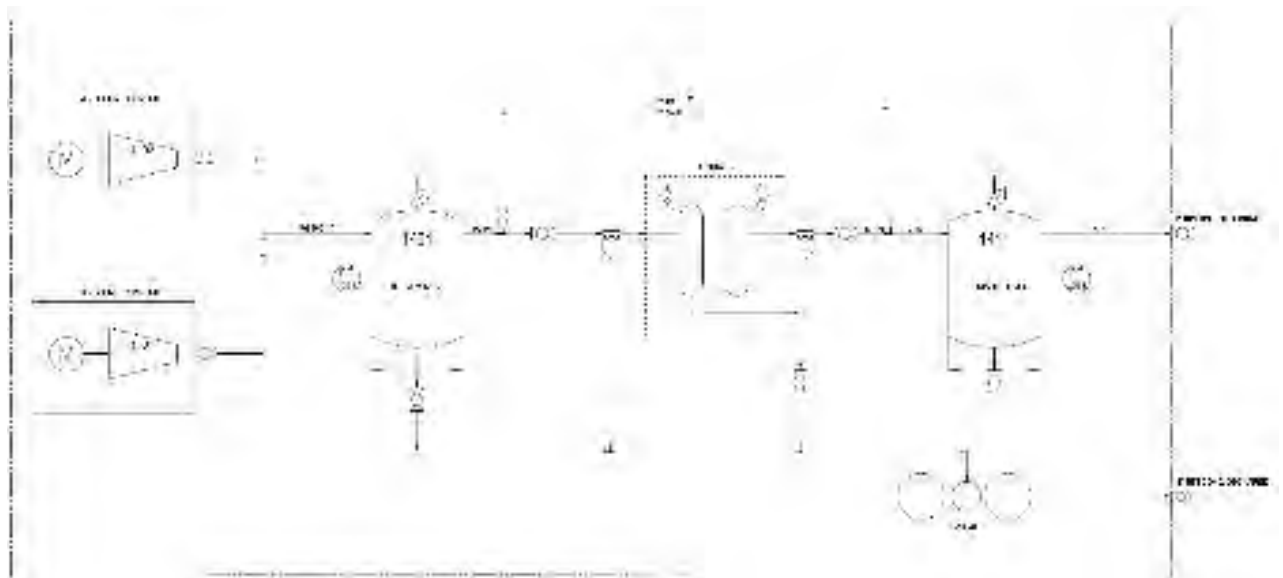
- Two (2) Atlas Copco GA Series Oil Flooded Rotary Screw Compressors
- One (1) Networking software for redundant communication
- One (1) Atlas Copco CD+ Heatless Regenerative Dryer
- One (1) PDP sensor for on demand purge
- One (1) NEMA 4 rating on dryer panel
- One (1) Vertical Receiver for "Wet" Instrument Air Storage
- One (1) Vertical Receiver for "Dry" Instrument Air Storage
- One (1) No-Loss receiver condensate drain valves
- One (1) Atlas Copco "OSC" Oil/Water separator for purification of all condensed water

Enclosed Units:

- One (1) Metal Equipment Enclosure w/removable side panels for maintenance
- One (1) Inlet Louvers
- One (1) Exhaust Louvers
- One (1) Cabinet heater with controls
- One (1) External connection for electrical isolation

INSTRUMENT AIR MAJOR COMPONENTS

| TESCORP INSTRUMENT AIR UNIT MAJOR COMPONENTS | | | | | | | | |
|--|------------|------------------|--------------|----------------|--|--|----------|----------|
| | | | | PreFilter | | | Wet Air | Dry Air |
| Volume @ 150 PSI | Horsepower | Compressor Model | After-Filter | Heatless Dryer | | | Receiver | Receiver |
| 24.7 ICFM | 7.5 | GA5-150AP | Included | CD+10 | | | 60 Gal | 60 Gal |
| 36.3 ICFM | 10 | GA7-150AP | Included | CD12+ | | | 60 Gal | 60 Gal |
| 52.5 ICFM | 15 | GA11+150AP | Included | CD+22 | | | 60 Gal | 60 Gal |
| 83.5 ICFM | 20 | GA15+150AP | Included | CD35 | | | 80 Gal | 80 Gal |
| 101.3 ICFM | 25 | GA18+150AP | Included | CD35 | | | 80 Gal | 80 Gal |
| 120.6 ICFM | 30 | GA22+150AP | Included | CD45 | | | 120 Gal | 120 Gal |
| 142.9 ICFM | 35 | GA26+150AP | Included | CD55 | | | 120 Gal | 120 Gal |
| 174.0 ICFM | 40 | GA30-150AP | Included | CD65 | | | 120 Gal | 120 Gal |
| 204.0 ICFM | 50 | GA37-150AP | Included | CD90 | | | 120 Gal | 120 Gal |
| 250.0 ICFM | 60 | GA45-150AP | Included | CD90 | | | 200 Gal | 200 Gal |
| 300.0 ICFM | 75 | GA55-150AP | Included | CD110 | | | 200 Gal | 200 Gal |
| 401.0 ICFM | 100 | GA75-150AP | Included | CD165 | | | 200 Gal | 200 Gal |
| 530.0 ICFM | 125 | GA90-150AP | Included | CD195 | | | 400 Gal | 400 Gal |



TESCORP: "Duplex" Instrument Air System P&ID

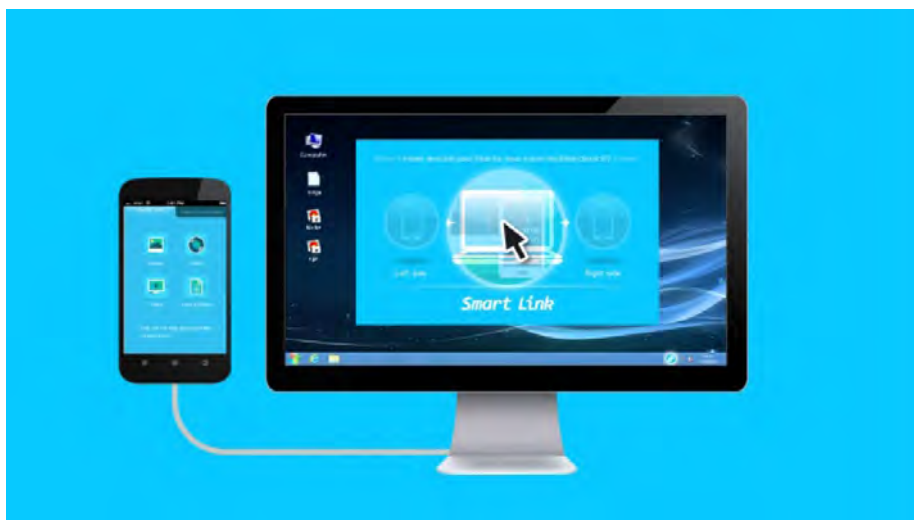
ATLAS COPCO COMPRESSOR

- High efficiency, EPA-compliant TEFC motor
- High efficiency and 100% maintenance-free gear-drive system
- Inlet air filter
- Differential pressure oil system with oil cooler
- Air/oil separator with oil-level sight glass
- Factory filled with synthetic oil
- Aluminium aftercooler with integrated water separator
- Zero-loss electronic water drain with manual bypass
- Load/no load capacity control
- Sound-attenuating enclosure
- Mk5 Elektronikon® microprocessor controller
- Wye-delta motor starter, mounted and pre-wired
- Low-noise radial type cooling fan
- Emergency stop button
- 115°F maximum ambient operating temperature
- Certified drawings



ATLAS COPCO "SMARTLINK" COMMUNICATIONS

- SmartLink is Atlas Copco's flexible solution for data monitoring. Easy to install and customize, as well as being user-friendly, the system enables central compressed air and vacuum systems and individual machines to be connected to the user's engineering team. The product brings system-relevant data to the user's mobile phone, smartphone, and PC.
- Whenever the user has access to the internet, it is possible to display the information required: from machine alarms and faults, to visualized representations of demand and load for complete site vacuum installations. This allows the user to respond quickly to changing circumstances. Service calls can be efficiently planned and production losses minimized. The flexible system delivers as much or as little information as the user chooses.
- The web portal features an event overview of the last 30 days, access to service data and monthly status reports by email. Requirements of machine-related services (service, spare parts) are displayed directly via the web portal.
- Logging and download service data for the last 30 days is available via Excel, Word, or PDF. SMS/email notifications indicate service, failures and warnings. A status display is available via an online trend graph.



ELEKTRONIKON® MK5 GRAPHIC CONTROL MODULE

The Mk5 Elektronikon® control system provides energy efficient load/no load control. The graphic based controller has a 3.5" HD color display and uses icons for navigation. The unit can be programmed in two languages, from a choice of 32, and has a processor speed of 300 MIPS. Together with the variable speed frequency converter, the controller automatically regulates controls and monitors compressor operations and provides efficient operation of the compressor. A partial description for the module's capabilities include:

Compressor status indication

- Automatic operation
- Voltage on
- General alarm/shutdown

Graphic display & I/O connections

- 1 Ethernet & 2 CAN connections
- Remote control and connectivity
- 10 digital inputs
- 5 temperature and 2 pressure analog inputs
- 9 digital outputs
- RS485 connection
- IO expansion connection

Available data

- Element outlet temperature
- Delivery air pressure
- Running hours and hours to next service
- Loaded hours
- Elektronikon® regulator hours
- Motor overload status
- Oil separator differential pressure

Full feature only

- Outlet dew point
- Dryer monitoring
- Dryer inlet pressure
- Vessel pressure

Algorithms & Features

- Delayed second stop
- Continuous pressure follow up
- Dryer Saver cycle
- Fan Saver cycle
- Numerous advanced timers

Service Indicators

- Air filter
- Oil filter
- Oil separator
- Oil lifetime

Configuration Parameters

- Time
- Date
- Format of date
- Multiple language display
- Units for pressure
- Units for temperature
- Auto restart after power failure (factory disabled)
- Motor start mode
- Extra digital input
- Pressure band

Shutdown and/or Warning Indications

- High element outlet temperature
- Drive motor overload
- Dew point (full feature units only)

HEATLESS REGENERATIVE DESICCANT DRYER

CD DRYER



| Features | Benefits |
|--------------------------------|--|
| Controls | Display dryer operation, alarms and set synchronization with compressor |
| Valve Manifold | With large diameters and “Swirl” technology air flow is optimized |
| PD Inlet Filter | Protects the dryer and adsorption material from impurities and oil contamination |
| DDp After filter | Protecting the downstream equipment from the fine desiccant dusts |
| Silencers | Large format silencers for decreased blow off noise |
| High quality Activated Alumina | High adsorption capacity desiccant for maximum performance of the dryer |

The dryer towers are constructed of durable aluminum extrusions and a uniquely designed valve manifold ensures not only high reliability, but also a low pressure drop that contributes to having a low regeneration air consumption. Maximum inlet air pressures of 203 psi are allowed.

Filters

- Inlet PD and Outlet DP filters included in the dryer scope (supplied loose)

High-quality desiccant

- High adsorption capacity Activated Alumina desiccant for maximum performance
- Secured in spring loaded desiccant bags to prevent desiccant bed movement for extended service life
- Low pressure dew point -40°C/-40°F
- Inlet Coalescing Pre-filter with isolation & bypass piping with moisture trap and drain
- Discharge particulate after-filter with manual drain
- Filter & Dryer Bypass piping and valves

CONDENSATE MANAGEMENT OSC: OIL-WATER SEPARATOR SERIES

If treated in the right way, condensate is nothing to worry about. The Atlas Copco range of condensate separators efficiently separates the oil from the water. The harmless water can be drained away and the oil disposed of in an environment-friendly manner.

The patented OSC technology brings a whole series of new advantages to the market. These free standing units, with multi-stage oleophilic filtration, can separate all kinds of condensate from all compressor technologies, giving unparalleled performance and reliability for minimal maintenance.

DESIGN STANDARDS

PIPING

The gas transmission piping shall be constructed per the following:

- The gas transmission piping to be sized for maximum compressor performance, minimal vibration
- Pipe supports will be U-clamp style and designed in such a way to support the weight of the pipe and allow for easy removal for maintenance
- All gas transmission piping 2" and larger to be designed and constructed in accordance with ANSI B31.3 Latest Edition with no X-ray
- All gas transmission and accessory piping less than 2" and smaller shall be socket welded
- All primary suction and discharge piping connections, drain lines, and utility piping shall terminate close to skid edge for connection by others
- All mated flanges will be sealed with a spiral-wound gasket
- The gas transmission discharge will terminate with check valve

All primary suction and discharge piping connections, drain lines, and utility piping will terminate at the edge of the skid for connection by others. The air piping is sized for maximum compressor performance, minimal vibration and designed in accordance with ANSI B31.3 latest edition with no X-Ray.

VALVES

RELIEF VALVES

- Relief valve devices shall be sized in accordance with API RP 520 and ASME Boiler and pressure vessel code, Section VIII Div 1, and will be based on the maximum quoted capacity of the unit

- Each vessel will be supplied with a relief valve

Relief valve sizing will be based on the following:

- 14.7 to 150 psig- 15psi above system pressure
- 151 to 2500 psig-10% above system pressure
- If possible by relief valve design, each relief valve shall be connected to a vent pipe and then pointed in a safe direction, or vented out of the building, whichever allows for no adverse operations of the relief valve

VALVES (CONT'D)

*****AUTOMATE VALVES*****

- The condensate drain will be an automated valve designed to operate on demand
- The valve will operate independently from any unit
- The dryer valves will be pneumatically operated by the dryer local control panel
- The valves will operate with the process gas and vented atmospherically

*****MANUAL VALVES*****

- All manual valves under 2" and under will be at least ball valves with an NPT connection
- All manual valves 2" and greater will be at least flanged ball valves rated accordingly
- Valves in the instrument air package will be of carbon construction

GAUGES

*****PRESSURE*****

- Pressure gauges used to monitor inlet, interstage, and discharge pressure shall be mounted on the process piping and arranged so that they can be easily read by the operator
- Pressure gauges used shall be designed for instrument air process and be of bronze construction
- Fittings for process gas shall be stainless steel and supplied by Parker Industries. Please note that TESCOPR will take exception to fittings used for the compressor specification and accepting specification for fittings used for the dryer specifications
- Pressure gauges used for accessory applications shall be locally mounted and oriented so that they can be easily read from the skid edge

*****TEMPERATURE*****

- Temperature gauges shall be mounted locally and oriented so that they can be easily read from the skid edge
- Temperature gauges shall be inserted into a 304SS thermowells with a 3/4" process connection
- Discharge temperature gauges shall be mounted as close as reasonable to the discharge of the compressor
- Where adequate immersion cannot be obtained by a perpendicular installation of a thermowells into the process piping, installation of an elbow-let or an enlargement of the pipe shall be used

*****WIRING*****

- All power and control wiring within the confines of the main unit base area, and console base area or any auxiliary skid area shall be resistant to heat, moisture, and abrasion
- Wiring shall be properly laid out and anchored to the skid in suitable sized conduit
- Stranded copper conductors shall be used within the confines of the skid and other areas subject to vibration
- Flexible metallic conduit shall have a liquid-tight thermoset or thermoplastic outer jacket
- Where applicable, armored cable and watertight glands will be used
- All wiring terminates at the edge of skid for single point customer connection

GAUGES (CONT'D)

PAINT

- Due to the purchased products used on this skid, each individual component will arrive painted. No extra paint will be applied to these components
- The skid shall be painted per the following specification. The building will be painted Shale Green and the interior will be painted a light grey
- Paint and painting standards shall meet or exceed the following TESCORN standard System 1:
 - Surface prep: Hand and solvent clean per SSPC-SP2
 - Primer: Sherman Williams tile-clad high solids 2 part epoxy. Thickness 2.5-4.0 MIs
 - Finish: Sherman Williams tile-clad high solids 2 part epoxy. Thickness 2.5-4.0 MIs
 - Safety decals shall be installed after paint has been applied and cured
 - Surfaces not required to be painted
 - Stainless steel tubing that is not rigidly attached to the skid deck
 - Stainless steel parts or pipe
 - Galvanized steel parts
 - Moving parts
 - Ground lugs
 - Name plates or tags
 - Non-rigid conduit and fittings
 - Valve handles
 - Instrumentation and gauges

TESTING

Due to process conditions that cannot be duplicated for testing, a factory test shall be per the following:

- All completed unit testing will be performed at TESCORN facilities in Tulsa, OK
- Leak test shall be performed with compressed air and visually inspected for leaks with a water-soap mix.
- Hydrostatic testing shall be conducted on pressure vessels that are National Board in accordance with ASME Section VIII Div 1 Latest edition, Subgroup UG-99.
- Units 100HP and under @ 460VAC will be test run before shipping
- All run tests are performed on atmospheric air at atmospheric suction pressure and ambient temperature
- The unit shall have a mechanical run test at a pressure to adequately check drive, compressor and flow control valve integrity
- All pressure, temperature, level and flow controls set and tested
- TESCORN does invite customer to inspect through, either company or 3rd party representatives, all units prior to completion



STARTUP AND SERVICE

Service supervision is available to insure proper "start-Up" of your compressor unit. This service is also provided to instruct your personnel in the proper operating and maintenance procedures of the unit. Waiting time, travel time, travel expense and living expenses are not included and will be charged for in accordance with the following service rate schedule.

WARRANTY

- If TESCORP is present for commissioning, TESCORP warranties its units for a period of eighteen (18) months from shipment and twelve (12) months from start-up
- TESCORP will not be responsible for alignment changes or damage due to shipping, loading, or actions by field personnel
- Any disassembly or modifications of the gas compressor unit after shipment without TESCORP permission will nullify all warranties
- Operating the compressor out of the designed parameters or manually defeating safety devices will nullify all warranties

We appreciate this opportunity to be of service to you on this application and hope that we may continue to service all of your air and gas compression requirements. Should you have any questions, please call (918) 665-0031, or email v.thomas@tescorp.com

Prices Available Upon Request