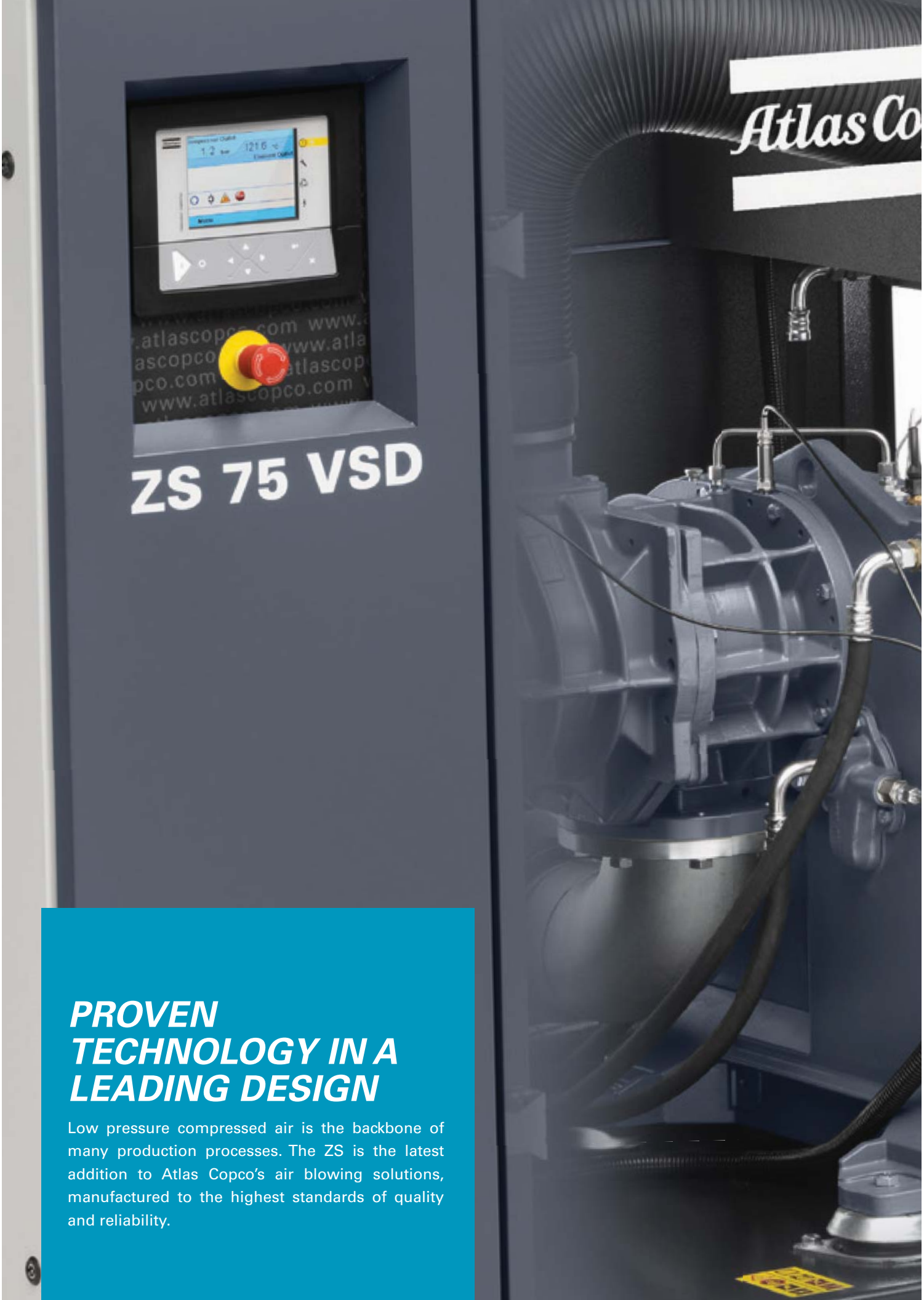
OIL-FREE POSITIVE DISPLACEMENT SCREW BLOWERS

ZS 18-315 (18-315 kW / 24-422 hp)
ZS 18-355 VSD (18-355 kW / 24-475 hp)

Atlas Copco



PROVEN TECHNOLOGY IN A LEADING DESIGN

Low pressure compressed air is the backbone of many production processes. The ZS is the latest addition to Atlas Copco's air blowing solutions, manufactured to the highest standards of quality and reliability.

Keeping your process up and running

A reliable supply of compressed air is critical to ensure process continuity. Incorporating Atlas Copco's proven screw technology and long standing internal engineering practices, the ZS guarantees exceptional reliability. Designed, manufactured and tested in accordance with ISO 9001 certification, the unique ZS stands for uninterrupted production.

Driving down energy costs

Energy costs can amount to 80% of the Life Cycle Costs of a blower. The ZS range reduces energy costs by an average of 30% when compared to lobe technology. The integrated Variable Speed Drive (VSD) technology offers extra energy savings by automatically tuning the compressed air flow precisely to the air demand.

Easy installation

Delivered ready for use, ZS+ VSD blowers come as all-in-one packages including a PLC based Elektronikon® controller, integrated converter, forklift slots, check valve, air filter, blow-off valve and silencer. The complete scope of supply eliminates the need for extras and reduces installation to an absolute minimum, saving you time and money.

Protecting your reputation and production

In virtually any application, oil contamination of the air supply causes serious productivity issues and increases costs.
As the first manufacturer to receive ISO 8573-1 CLASS 0 (2010) certification for its oil-free air blowers, Atlas Copco has set a new standard in air purity. Focusing on the protection of critical applications as well as today's increasing quality demands, Atlas Copco offers TÜV-certified 100% oil-free air.

Assuring your peace of mind

Through continuous investment in our competent, committed and efficient service organization, Atlas Copco ensures superior customer value by maximizing productivity. With a presence in over 170 countries, we offer professional and timely service through interaction and involvement. Uptime is guaranteed by dedicated technicians and 24/7 availability.

A COMPLETE PACKAGE FOR ALL YOUR APPLICATIONS

Built to ensure complete product safety, ZS blowers guarantee a continuous, highly reliable, energy-efficient and 100% oil-free air supply for years on end in all your applications at the lowest possible cost.

Wastewater treatment

- Lowest aeration blower energy cost, representing 70% of the total operational cost.
- Low downtime and low maintenance cost thanks to innovative screw blower technology.
- Very wide flow and pressure operational range.

Pneumatic conveying – dilute phase

- Lowest energy cost, representing up to 80% of the blower life cycle cost.
- Low downtime and low maintenance cost thanks to innovative screw blower technology.

Fermentation

- Lowest energy cost, representing up to 80% of the blower life cycle cost.
- Low downtime and low maintenance cost thanks to innovative screw blower technology.
- Very wide flow and pressure operational range.

Non-woven textile

- Adjustable flow in order to influence fiber characteristics.
- Energy-efficient blowers to come to the lowest operational cost of this 24/7 continuous process.
- Point-of-use installation without noise-preventing measures.

CLASS 0: THE INDUSTRY STANDARD

Oil-free air is used in all kinds of industries where air quality is paramount for the end product and production process. These applications include food and beverage processing, pharmaceutical manufacturing and packaging, chemical and petrochemical processing, semiconductor and electronics manufacturing, the medical sector, automotive paint spraying, textile manufacturing and many more. In these critical environments, contamination by even the smallest quantities of oil can result in costly production downtime and product spoilage.

First in oil-free air technology

Over the past sixty years Atlas Copco has pioneered the development of oil-free air technology, resulting in a range of air compressors and blowers that provide 100% pure, clean air. Through continuous research and development, Atlas Copco achieved a new milestone, setting the standard for air purity as the first manufacturer to be awarded ISO 8573-1 CLASS 0 certification.

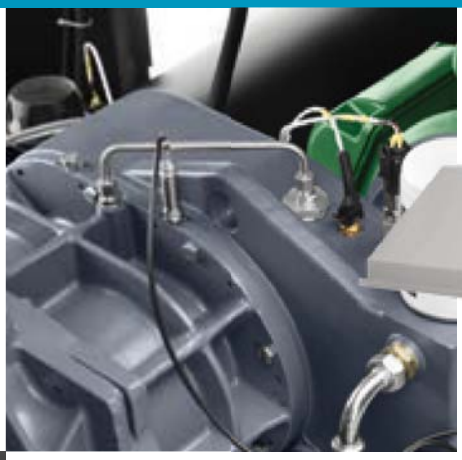
Eliminating any risk

As the industry leader committed to meeting the needs of the most demanding customers, Atlas Copco requested the renowned TÜV institute to type-test its range of oil-free compressors and blowers. Using the most rigorous testing methodologies available, all possible oil forms were measured across a range of temperatures and pressures. The TÜV found no traces of oil at all in the output air stream. Thus Atlas Copco is not only the first compressor and blower manufacturer to receive CLASS 0 certification, but also exceeds ISO 8573-1 CLASS 0 specifications.

CLASS	Concentration total oil (aerosol, liquid, vapor) mg/m^3
0	**As specified by the equipment user or supplier and more stringent than class 1**
1	< 0.01
2	< 0.1
3	< 1
4	< 5

Current ISO 8573-1 (2010) classes (the five main classes and the associated maximum concentration in total oil content).

ON AVERAGE 30% ENERGY SAVINGS WITH ZS SCREW BLOWERS OVER CONVENTIONAL LOBE BLOWERS



1

Gearbox

- Compared to lobe technology, screw technology does not require belt and pulley replacement.
- Reduced maintenance costs and increased uptime.

2

TEFC high-efficiency IE3/NEMA

Even in dusty and humid environments, the TEFC high-efficiency IE3/NEMA premium motor offers assured operation.

3

State-of-the-art oil-free screw element

- Incorporating acclaimed screw technology, years of experience and innovation.
- Precision timing gears for proven reliability, safe operation and increased uptime.
- Industry proven element coating for closer tolerances and increased lifetime.

4

Air inlet filter

The lifetime of the blower is increased by filtering particles up to 3µ at a performance of 99.9%.

5

Rain canopy option

Optional rain canopy available for outdoor applications.

** Rain canopy option available for outdoor applications.*

6

Check valve & pilot operated valve

Reliable, safe and broad operation area.

7

Discharge pulsation damper

- Eliminating the need for external silencer.
- Without damping material suitable for sensitive applications (e.g. food & beverage industry, pharma, pneumatic conveying, etc.)

8

Base frame with forklift slots

- Simple, time-saving installation.
- Reduced start-up costs.

9

ZS Interface-Box (ZS-IB)*

- Safeguards your investment.
- Ensures maximum machine safety and easy networking.
- Facilitates quick and smooth commissioning.
- Monitors all parameters to ensure maximum reliability for your blower installation.

** For versions without electrical cabinet.*

INCREASE YOUR SAVINGS WITH THE INTEGRATED VARIABLE SPEED DRIVE SYSTEM

1

Dedicated variable speed motor

- With very wide speed range to meet flexible air demand.
- With bearing current protection and optimized motor cooling at lower speeds.

2

Electrical cubicle with integrated VSD converter

- Proven design integrating all required electrical components for optimum reliability (EMC filter, Variable frequency drive, RFI filter, Elektronikon® controller).
- Reduced installation and start-up cost thanks to complete integration.

5

Oil system

Longer lifetime of bearings and gears due to lower oil temperature which is achieved by optimum oil system design including an integrated oil pump*, oil cooler and filter.

** Included for certain ranges (please contact your local sales representative for more info).*

3
Elektronikon® controller

- To ensure maximum machine safety and easy networking, the Elektronikon® system controls both the blower and the integrated converter.
- Monitoring of all parameters to ensure maximum reliability for your blower installation.

4
Noise enclosure with internal baffling

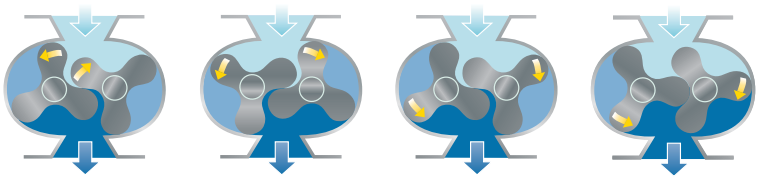
- Intelligent internal baffling design coupled with totally enclosed canopy providing reduced sound levels to 72 dB(A) for an improved working environment.
- Reduced installation costs as there is no need for noise insulated rooms and doors.

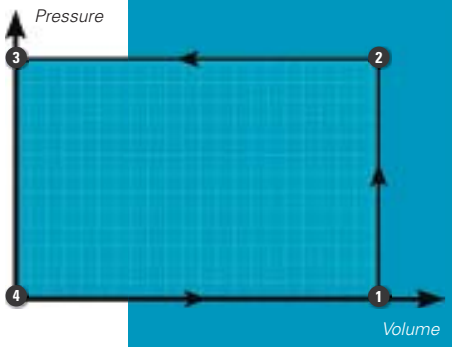
6
Continuous SPM (Shock Pulse Measurement) monitoring

- System of the blower element & motor bearings.
- The sensors are connected to the Elektronikon® which is showing the individual vibration levels.
- Alarm and/or shutdown levels can be programmed during commissioning.
- Option.

MINIMIZE ENERGY COSTS WITH THE ZS SCREW BLOWER

The ZS screw blower was developed in Atlas Copco's drive for innovation and its commitment to sustainable technology, and is on average 30% more energy efficient compared to a traditional 'Roots' type lobe blower.





Energy losses by lobe technology

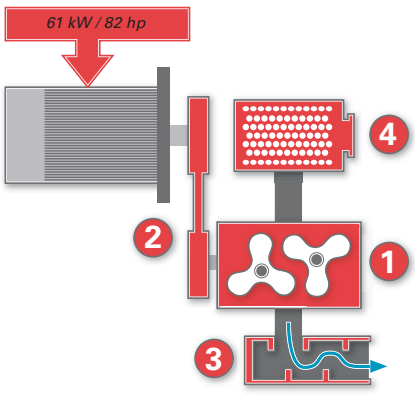
4→1: **Suction.** Air enters the compression chamber. The air volume remains constant while the lobe rotors turn.

1→2: **External compression.** The air is compressed externally due to back-pressure of the connected pipeline.

2→3: **Discharge.** Air is pushed out into the pipeline.

As shown in the Pressure/Volume diagram, the compression work is represented by the blue area and is proportional to the energy consumed.

◯ *Thermodynamic energy consumption*



Energy losses in packaging

High resistance to the internal air flow leads to high pressure drops and increased energy consumption.

Losses by:

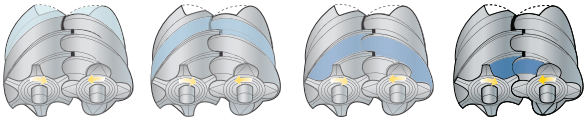
1. External compression
2. Belt/pulley
3. Silencer
4. Inlet filter

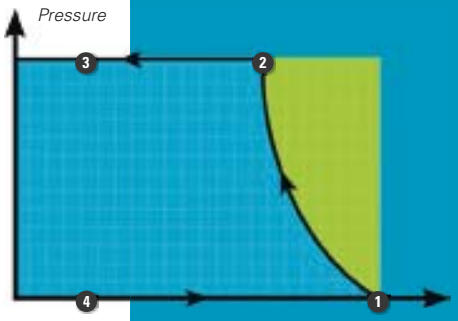
To deliver a flow of 1600 m³/hr (942 cfm) at a pressure of 0.8 bar(e) (11.6 psig), the tri-lobe blower consumes 61 kW (82 hp) on average.

LOBE

True package power comparison

- Savings
- Cooling fan
- Motor
- Frequency converter
- Transmission (drive gear vs belt)
- Pressure drops
- Compression



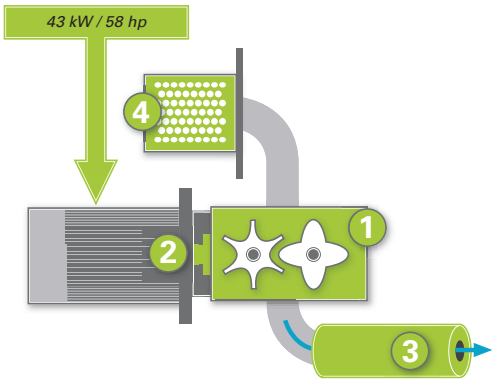


Energy savings by screw technology

4→1: **Suction.** Air enters the compression chamber.
1→2: **Internal compression.** As the rotors move towards each other, the air volume decreases.
2→3: **Discharge.** Air is pushed out into the pipeline.

As shown in the Pressure/Volume diagram, the compression work is represented by the blue area and is proportional to the energy consumed. The green area represents energy savings of a screw blower compared to a traditional 'Roots' type rotary lobe blower. This is due to the internal compression.

- Thermodynamic energy consumption
- Energy savings



Energy savings by integration

In the ZS screw blower, the internal air flow path is optimized to reduce pressure drops and air turbulence.

Maximum savings by:
1. Internal compression
2. Integrated gearbox
3. Smooth silencer
4. Inlet filter

To deliver a flow of 1600 m³/hr (942 cfm) at a pressure of 0.8 bar(e) (11.6 psig), the screw blower consumes 43 kW (58 hp) on average.

SCREW

VSD: DRIVING DOWN ENERGY COSTS

Over 80% of a blower's lifecycle cost is taken up by the energy it consumes. Moreover, the generation of compressed air can account for more than 40% of a plant's total electricity bill. To cut your energy costs, Atlas Copco pioneered Variable Speed Drive (VSD) technology in the compressed air industry. VSD leads to major energy savings, while protecting the environment for future generations. Thanks to continual investments in this technology, Atlas Copco offers the widest range of integrated VSD blowers on the market.

Profile 1

- 64% of all installations
- Factory working 24 hrs/day: low demand at night & high demand during the day

Profile 2

- 28% of all installations
- Factory working 2 shifts/day, no weekend work: erratically varying air demand

Profile 3

- 8% of all installations
- Factory working 2 shifts/day, no weekend work: typical 'fixed' speed application

Varying air demand in 92% of all installations

In almost every production environment, air demand fluctuates depending on different factors (time of the day, week or even month). Extensive measurements and studies of compressed air demand profiles show that 92% of all compressor and blower installations have substantial variations in air demand. Only 8% of all installations have a more stable air demand. Tests prove that, even in this case, VSD blowers save energy.

Energy savings on average up to 35%

Atlas Copco's VSD technology closely follows the air demand by automatically adjusting the motor speed. This results in large energy savings of up to 35%. The Life Cycle Cost of a blower can be cut by an average of 22%. In addition, lowered system pressure with VSD minimizes energy use across your production dramatically.

Total compressor lifecycle cost

- *Energy*
- *Investment*
- *Energy savings with VSD*
- *Maintenance*

ES – FULLY OPTIMIZED SYSTEM

A properly managed compressed air network will save energy, reduce maintenance, decrease downtime, increase production and improve product quality. Atlas Copco's ES central controllers are the most efficient way to monitor and control multiple blowers simultaneously as well as dryers and filters. An ES controller offers one central point of control for your whole compressed air network, ensuring all blowers provide optimum performance for your process. The result is a completely dependable and energy efficient network, giving you peace of mind and keeping your costs to a minimum.

Built-in intelligence

- Improved user-friendliness: 5.7" color display with clear pictograms for easy readout.
- Monitoring of running conditions and graphical indication of the service plan.
- Regulates system pressure within a predefined narrow pressure band.
- Integrated energy savings functions like dual pressure set point, 4 different programmable week schedules.
- Comprehensive icon indications and intuitive navigation.
- 31 different languages including character-based languages.
- Durable keyboard to resist tough treatment in demanding environments.
- Internet-based blower visualization using a simple Ethernet connection.
- Remote control and advanced connectivity functions.

SMARTLink*: Data Monitoring Program

- A remote monitoring system that helps you optimize your compressed air system and save you energy and cost.
- It offers you a complete insight in your compressed air network and anticipates on potential problems by warning you up-front.

** Please contact your local sales representative for more information.*

CHOOSE THE MOST SUITABLE UNIT FOR YOUR APPLICATION

With the ZS range, Atlas Copco provides the most suitable scope of supply for both replacements and new installations by offering basic, standard and premium variants.

Scope of supply

Air circuit	Air intake filter
	Flexible air intake pipe
	Coated screw element
	Starting/safety valve
	Check valve
	Discharge pulsation damper
	Outlet air flange
Oil circuit	Supplied oil-filled
	Completely pre-piped oil circuit
	Oil pump
	Oil coolerz
	Oil filter
	Built-in oil breather system
Connections	ANSI or DIN flanges
Electrical components	Pre-mounted TEFC IP55 motor
Framework	Base frame with forklift slots
Mechanical approval	ASME or CE approval

Additional features & options

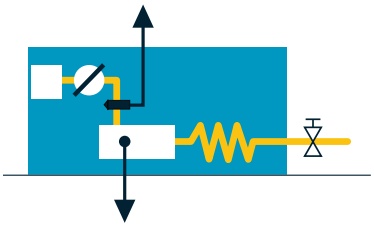
	ZS without electrical cabinet	ZS with electrical cabinet
Additional features		
Integrated Variable Speed Drive (VSD)/integrated YD starter	-	√
Flow control via 4-20 mA (external source)	-	√
LAN or Internet control/monitoring	√	√
Control system (Elektronikon®)	-	√
EMC filter	-	√
RFI filter	-	√
Options		
Wooden case	•	•
Full option motor (anti-condensation heater and PT1000's)	•	•
Variable speed duty motor	•	•
ZS Interface-Box (ZS-IB)	√	-
Rain canopy	•	•*
SPM	-	•

** For more information, please contact your local sales representative.*

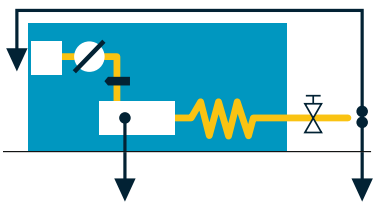
√: Standard • : Optional -: Not available

True performance

Atlas Copco's ZS blowers are measured according to ISO 1217, Annex C, latest edition, stipulating the FAD measurement at the outlet of the package, net of all losses. Atlas Copco specifications correspond to the capacity and pressure the customer receives, not to the intake volume of the blower. Differences are substantial.



Inlet flow referred to blower element inlet conditions. Seal leakages and inlet losses should not deprive you of the air you paid for.



FAD according to ISO 1217, Annex C, latest edition. A ZS blower truly delivers what is promised.

REFERENCE LIST (EXHIBIT A)

#	Job/Operating Facility Name	Process Used For? (Municipal WWTP, Processing, Etc)	Year Installed	Installation Location (Indoor/Outdoor)	Number of and Size of Units	Operation Period (24/7, etc.)	Blower Design Capacity (_SCFM @_PSI	Job/Facility Contact Name	Contact Phone Number	Contact Email
1	Town of Guilderland	Municipal - CAS	2012	Indoor	(2) ZS110	24/7	2690SCFM @9.5PSIG	Tony Zaccardot	518.456.2745	zaccardot@togny.org
2	Town of Hurlock	Municipal - CAS	2012-2017	Outdoor	(5) ZS55	24/7	1000SCFM @11.6PSIG	Eric Barnhardt	410.943.3401	eric.barnhart@verizon.net
3	Town Millsboro	Municpal - MBR	2016	Indoor	(2) ZS75	24/7	1200SCFM @7.7PSIG	Ken Niblett	302.934.8171	kennyn@millsboro.org
4	Clackamus County - Tri City	Municpal- CAS & MBR	2017	Indoor	(5) ZS250	24/7	3800SCFM @12PSIG and 2400SCFM @ 10PSIG	Anthony Micallef	503.723.6623	anthonymic@co.clackamas.or.us
5	Kachina Village WWTP	Municipal - CAS	2013	Indoor	(2) ZS37	24/7	528SCFM @8PSIG	Bill Lesko	928.525.1775	blesko@kachinawater.com
6	Warsaw WWTP	Municipal - CAS	2015	Indoor	(2) ZS37	24/7	700 SCFM @6.6PSIG	Eric Moore	859.567.6300	carolynmarksberry@mw.twcbc.com

ZS Installation List

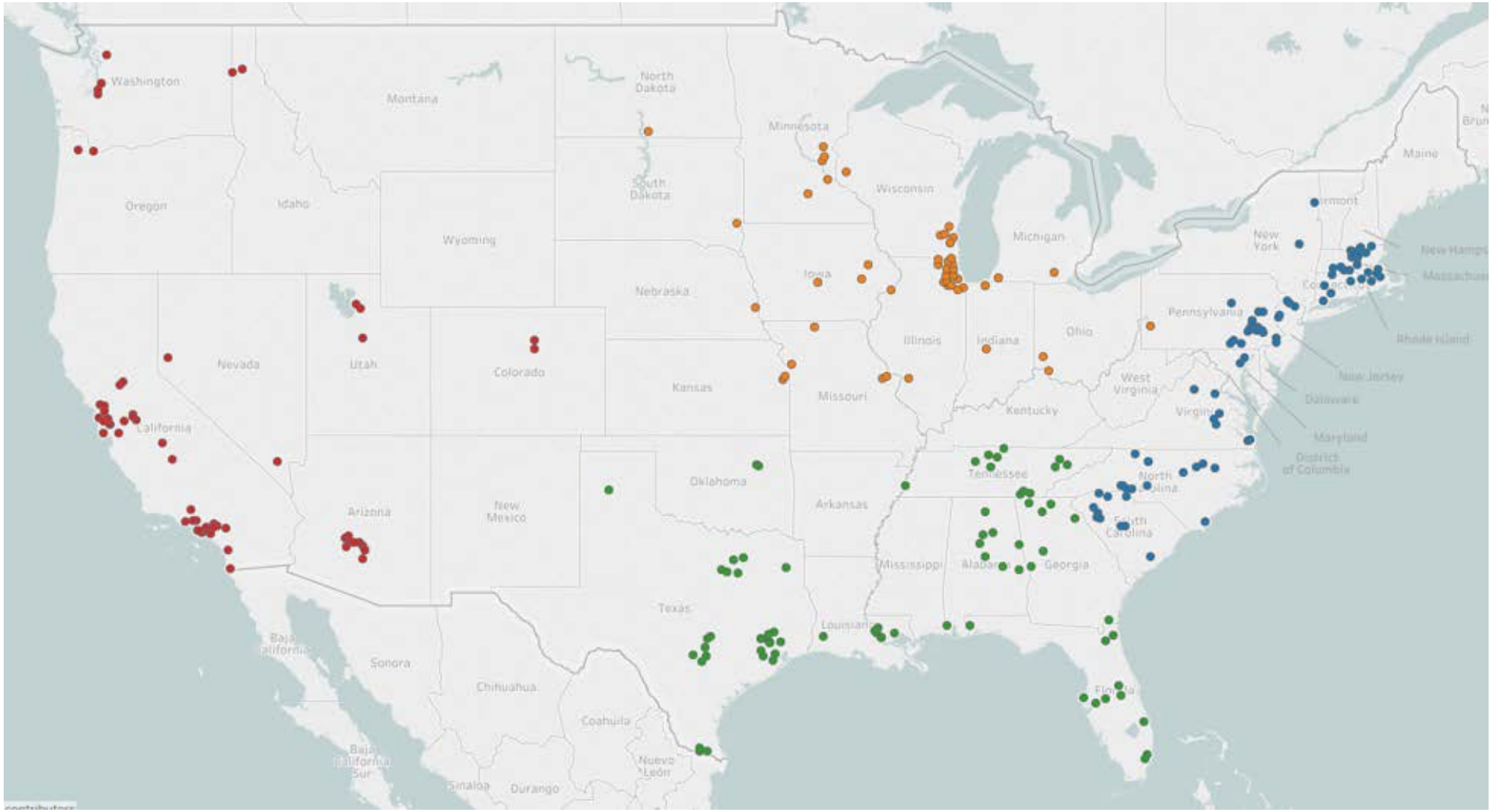
Model	Sold to Name	Main City/Town	Main State/Province	Region
ZS37-H-400-60-VSD	ITT WATER & WASTEWATER USA,INC	CHARLOTTE	NC	South
ZS37-H-400-60-VSD	ITT WATER & WASTEWATER USA,INC	CHARLOTTE	NC	South
ZS-IB-75-60-900	DIVERSIFIED FOODS	Mandeville	LA	South
ZS-IB-55-60-1000	KIMBERLY-CLARK CORPORATION	KNOXVILLE	TN	South
ZS55-F-1000-60	KIMBERLY-CLARK CORPORATION	KNOXVILLE	TN	South
ZS160PVSD-K-1200-60	YUHAN-IMBERLY LTD TAEJON MILL	KNOXVILLE	TN	South
MODEL ZS-IB	VICKSBURG - HOLCIM	Vicksburg	MS	South
ZS37-C-800-60-FS	VICKSBURG - HOLCIM	Vicksburg	MS	South
ZS132-G-1000-50	ECOLOGIX ENVIRONMENTAL SYSTEMS	ALPHARETTA	GA	South
ZS132-G-1000-50	ECOLOGIX ENVIRONMENTAL SYSTEMS	ALPHARETTA	GA	South
ZS30-G-800-50-VSD	ECOLOGIX ENVIRONMENTAL SYSTEMS	ALPHARETTA	GA	South
ZS30-G-800-50-VSD	ECOLOGIX ENVIRONMENTAL SYSTEMS	ALPHARETTA	GA	South
ZS55-H-700-60	SHIN-ETSU SILICONES OF AMERICA	HOUSTON	TX	South
ZS 55	HOKE COUNTY WWTPNC. CONSTRUCT	FAYETTEVILLE	NC	South
ZS75VEA-G-1200-60	HARMONY PROTEIN RVAF	SPRINGDALE	AR	South
ZS75VEA-G-1200-60	HARMONY PROTEIN RVAF	SPRINGDALE	AR	South
ZS75VEA-G-1200-60	HARMONY PROTEIN RVAF	SPRINGDALE	AR	South
ZS75VEA-G-1200-60	HARMONY PROTEIN RVAF	SPRINGDALE	AR	South
ZS75VEA-G-1200-60	HARMONY PROTEIN RVAF	SPRINGDALE	AR	South

ZS Installation List

ZS37VEA-H-1200-60	DIVERSIFIED FOODS	VESTAVIA	AL	South
ZS30-H-1000-60	DIVERSIFIED FOODS	VESTAVIA	AL	South
ZS75VCA-G-60	ATEX INC	GAINESVILLE	GA	South
ZS75VCA-G-60	ATEX INC	GAINESVILLE	GA	South
ZS75PVSD-B-1200-60	ATEX INC	GAINESVILLE	GA	South
ZS55PVSD-B-800-60	GAMMA FREIGHT	JACKSONVILLE	FL	South
ZS18-C-700-60-FS	GYRODATA INC.	HOUSTON	TX	South
ZS18PVSD-J-60	CITY OF GODLEY	GODLEY	TX	South
ZS18PVSD-J-60	CITY OF GODLEY	GODLEY	TX	South

CTS Service Technicians

292 Technicians in the USA



North American Service Center

The Atlas Copco North American Service Center (NSC) has become the logistical hub for the Compressor Technique and Construction Technique business areas in North America, supporting the aftermarket operations of Atlas Copco Compressors, BeaconMedaes, Pneumatech, CP Compressors, Quincy Compressor, as well as Atlas Copco's Construction Technique customer centers in the US and Canada. It also supports the Industrial Technique business area acting as the distribution hub for the CP Tools business.

The service center operates out of two facilities (both located in Charlotte, North Carolina), with a total footprint of 215,000 square feet and ships more than one million order lines on a yearly basis. In order to exceed service level expectations the NSC manages more than USD 40 million in spare parts stock on hand, and carries over 36,000 different spare parts on the shelves.

This contributes to reaching 92.5% total availability on compressor parts - 96.5% availability on stocked components. On average, 99.5% of all express air orders printed prior to 18:00 EST ship same day.

A committed team of 140 employees make it happen on a daily basis.

Quote No.
Revision No. 00
Date: September 28, 2018

Energy-Efficient products

Proposal

West Rankin Utility Authority

Guaranteed local support

Expert analysis of your compressed air system

Named as one of the top 100 Sustainable Companies in the world for five consecutive years

GLOBAL100 Most Sustainable Corporations in the World

Quote No.
Revision No. 00
Date: September 28, 2018

Date: September 28, 2018

Attn: Bidding Contractors

Project: West Rankin Utility Authority

We thank you for your above referenced inquiry, and are pleased to submit our quotation for your consideration.

Please see the next page for a summary of our offer. Full details can be found in subsequent pages.

We hope you find our quotation in line with your requirements. However, if you have any questions, please do not hesitate to contact us.

Sincerely,

Zachary Azra
Regional Municipal Sales Manager
Southern and Western U.S.
Email: zachary.azra@us.atlascopco.com
Phone: 832-649-0119

Gatlin Gold
National Municipal Applications Engineer
Email: gatlin.gold@us.atlascopco.com
Phone: 281-776-4941

Quote No.
Revision No. 00
Date: September 28, 2018

Proposal

To: Bidding Contractors
Project: West Rankin Utility Authority

The following is a price summary for this quotation. Please see item specific pages for more details.

Item Number	Description	Equipment	Unit Price	Qty	Extended
Item 001	Variable Speed Rotary Screw Blower& Field Mounted Alarm panel w/o Integral VFD	ZS132VEA	$	4	$
Item002	DO Control Package	MCP & Field Devices	$	1	$

SCOPE OF SUPPLY: Any work or equipment beyond the scope of this proposal will be performed or provided only after customer approval and acceptance by our company. No assumption should be made that anything not specifically defined is included.

VALIDITY: This quotation is valid for 60 days.

PRICE: The price quoted is for all items purchased at one time. Partial orders may be subject to a price adjustment. Rental fees can be applied to purchase price of equipment.

PAYMENT TERMS: Net 30 days.

TAXES: Not Included

FREIGHT: Included

SHIPMENT: 22 Weeks from signed and approved submittals

SUBMITTALS: Submittal generation 4-6 weeks from approval of PO.

WARRANTY:

Complete Unit: 12 months from commissioning or 15 months from shipment whichever is earlier.
Element: 60 months from shipment.

START-UP: Included

QUALITY STANDARDS: All of our manufacturing locations are ISO 9001-2008 certified.

TERMS AND CONDITIONS: Our Standard terms and conditions are attached.

Quote No.
Revision No. 00
Date: September 28, 2018

Scope of Supply

Equipment	Qty.
Item: 001: Rotary Screw Blower – ZS132VEA F 800	**4**
- ZS132VEA, air cooled, oil free positive displacement rotary screw blower featuring: o The first air compressors TÜV-certified as “oil-free” (ISO 8573-1 CLASS 0) o 132kW Premium efficient 460V TEFC drive motor o Rotary screw element for pulsation free air o Full noise silencing canopy for 80 dB(A) noise level o Integrated Gear-Box (No Belts) o Integrated air intake filter / silencer o Integrated discharge air relief valve o Integrated discharge silencer o Oil-Circuit Components (Internal to enclosure) o Check Valve (Internal to enclosure) o Base Frame w/ Forklift Slots - Adders o Weather Hood o Ethernet / IP Communication Package ▪ NIP (Network Integration Panel) ▪ CAN Communication from ZS-IB to NIP required for VEA units ▪ CAN wiring kit - Field Installed Accessories o ZS-IB (Control Unit) ▪ Hardwired & CAN Communication protocol Standard ▪ Integrated Instrumentation • Inlet Filter Differential Pressure Reading, Warning, & Alarm • Discharge Temperature & Pressure Readings, Warning, & Alarm • Oil Pressure, Temperature, & Level Readings, Warning, & Alarm o 8” Discharge Expansion Joint o 8" Discharge Silencer - Spare Parts o (1) Sets of Inlet filters per blower - Testing o ISO Factory Test - Freight - Start-up & Training	

Equipment	Qty.
Item 002: DO Controls Package	**1**
- Master Control Panel – DO Process Control o NEMA 12/IP65 Carbon Steel Enclosure o Allen Bradley Compact Logix PLC o Allen Bradley Panel View Plus 7 HMI 7” o Ethernet IP o Remote Access o 120VAC UPS o 120 VAC x 24VDC Power Supply o Ethernet Switch o AC Power Surge Protector o Analog and Signal Isolation o Analog and Digital Surge protection - Field Devices o (4) Analytic Controllers ▪ (2) probes per controller o (8) Rail Mounted DO Porbes o (16) Control Zone Airflow Meters o (16) Air Control Valves	

Quote No.
Revision No. 00
Date: September 28, 2018

Clarifications:

General:

1. Installation, piping, elbows, spool pieces, piping hardware, piping gaskets, anchor bolts, housekeeping pads, and wiring to be provided by others.
2. Blower design is direct drive. Exception taken to any references of belt driven equipment
3. Proposed VEA unit vendor standard package includes field mounted ZS-IB Elektronikon Controller and connection cable to unit. Controller is used as monitoring and protection of unit only. Speed must be controlled locally or remotely at VFD by others. BOV is not electronically actuated, and these units also require the motor PTC's to be connected to the VFD. Communication options other than hardwired I/O include using a Network Integration Panel (NIP) which uses a CAN network to daisy chain each unit to the NIP. The NIP then converts each machines communication digital registers for direct access to available machine parameters.
4. Vendor Standard blower sound pressure levels are reported [dB(A)] with respect to sizes according to A-weighted emission sound pressure level at the workstation, LpWSAd, according ISO 2151:2004 using ISO 9614/2 (Intensity scanning), at Maximum Speed and pressure with an uncertainty +3dB.
5. The specification is somewhat ambiguous regarding the actual I/O to the MCP. For purposes of this quote, we are expecting that only the discrete input for Power Loss will be wired directly to the MCP. All other signals are to be provided via communications.
6. **Terms and conditions will be agreed upon at the time a PO is received**.

Spec Section: 431133

1. 2.3 B. 3. – Rotor is cast iron GG20 and is proposed as equivalent to AISI 1043
2. 2.3 D. 1. – The timing gears shall be of spur type, Quality DIN Class 6 or equivalent & made of alloy steel 20 MnCr5, case hardened.
3. 2.3 G. 2. – Sight glass is easily visible on the side of the oil reservoir when the maintenance panel is removed. Indications when oil system needs maintenance done will be indicated on the ZS IB Monitoring Panel.
4. 2.3 H. – Vendor standard paint and surface preparation will be provided. Vendor standard paint spec will be provided.
5. 2.3 J. 2. a. – Absorption material is used. The noise absorption material is stainless steel wool & average sound attenuation shall be minimum 30dB(A).
6. 2.3 L. 2. – Motors are IEC standard. Proposed as NEMA equivalent.
7. 2.4 A. 3. – Absorption material is used in the additional discharge silencer. Universal Silencer SU 5-4 is proposed.

Spec Section: 4069950

1. 2.2.A.b, the master panel will only be able to enable/disable automatic detection of malfunctioning instruments for instruments that report directly to the master panel. The local panels are responsible for providing this feature for any instruments monitored directly by the locals.
2. 2.2.A.4, Standard DO control methodology used in hundreds of WWTP sites does not include modeling or mass transfer equations to properly control the process. Atlas Copco offers our standard DO control methodology for this project which does not include these features.
3. 2.2.A.5, exception is taken to adjusting our controls algorithms based on the process variables identified.
4. Item 3 – A requirement for pressure based control is described; however, there are no header pressure instruments specified. The header pressure transmitter is assumed to be by others.
5. Item 4 – We are offering an L30ER with (1) 120VAC discrete input card. Since all of the valve commands are supposed to be provided via communications, and the flowmeters, and DO sensor signals are supposed to be provided via communications, no other cards are required and are not included. If it is determined that the master panel must accept analog inputs/outputs and discrete signals from any of the valves, the DO sensors, flowmeters, or pressure transmitters, the hardware will need to be re-evaluated and the project requoted accordingly.

Quote No.
Revision No. 00
Date: September 28, 2018

ISO 9001:2008 CERTIFICATE OF APPROVAL:

CERTIFICATE OF APPROVAL

This is to certify that the Quality and Environmental Management System of:

Divisions Airtec, Oil-free Air, Industrial Air, Quality Air, Gas and Process, Compressor Technique Service (belonging to Business Area Atlas Copco Compressor Technique), and Divisions Portable Energy and Construction Technique Service for Portable Energy, Specialty Rental (belonging to Business Area Atlas Copco Construction Technique)

has been approved by Lloyd's Register Quality Assurance to the following Management System Standards:

ISO 9001 : 2008 - ISO 14001 : 2004

The Quality and Environmental Management System is applicable to:

Marketing, design, sales, manufacturing, distribution, assembling, installation, service and rental of air / gas compressors, blowers , expanders, turbo machinery, vacuum pumps, air / gas treatment equipment, generator sets, assemblies and related products and services, under Atlas Copco Brand as well as other Brands i.e. multi-brand

This certificate is valid only in association with the certificate schedule bearing the same number on which the locations applicable to this approval are listed.

Approval Certificate No:
ANT02146

Original ISO 9001 Approval	:	09 December 2002
Original ISO 14001 Approval	:	01 January 2005
Current Certificate	:	02 January 2014
Certificate Expiry	:	01 January 2017

Issued by: Lloyd's Register EMEA, Antwerp Office
for and on behalf of Lloyd's Register Quality Assurance Limited

UKAS MANAGEMENT SYSTEMS
001

Approval Certificate No: ANT02146

Rijnkaai 38, 2000 Antwerp, Belgium. Company Number 0860.936.663
(For and on behalf of 71, Fenchurch Street, London EC3M 4BS, United Kingdom, registration number 1879380)
This approval is carried out in accordance with the LRQA assessment and certification procedures and monitored by LRQA.
The use of the UKAS Accreditation Mark indicates Accreditation in respect of those activities covered by the Accreditation Certificate Number 001

Quote No.
Revision No. 00
Date: September 28, 2018

Standard Conditions of Sale

General – Unless otherwise expressly agreed in writing by a duly authorized representative of Atlas Copco these terms and conditions supersede all other communications and agreements and notwithstanding any conflicting or different terms and conditions in any order or acceptance of Purchaser, all sales and shipments shall exclusively be governed by these terms and conditions. When used herein "affiliates" shall mean Atlas Copco AB and its wholly-owned subsidiaries. Section headings are for purposes of convenience only. "Products" as used herein shall include products, parts and accessories furnished Purchaser by Atlas Copco. Orders shall be subject to acceptance at Atlas Copco's principal corporate offices in Holyoke, Massachusetts.

Delivery – Unless otherwise agreed in writing, Products manufactured, assembled or warehoused in the continental United States are delivered F.O.B. shipping point, and Products shipped from outside the continental United States are delivered F.O.B. point of entry. Where the scheduled delivery of Products is delayed by Purchaser or by reason of any of the contingencies referred to in Section 5. Atlas Copco may deliver such Products by moving it to storage for the account of and at the risk of Purchaser. Shipping dates are approximate and are based upon prompt receipt of all necessary information and approvals from Purchaser. Atlas Copco reserves the right to make delivery installments.

Security and Risk of Loss - Upon request from Atlas Copco, Purchaser agrees to execute a security agreement covering the Products sold or other assets and to perform all acts which may be necessary to perfect and assure a security position of Atlas Copco. Notwithstanding any agreement with respect to delivery terms or payment of transportation charges, the risk of loss or damage shall pass to Purchaser and delivery shall be deemed to be complete upon delivery to a private or common carrier or upon moving into storage, whichever occurs first, at the point of shipment for Products assembled, manufactured or warehoused in the continental United States or at the point of entry for Products shipped from outside the continental United States.

Payment – If Purchaser fails to pay any invoice when due, Atlas Copco may defer deliveries under this or any other contract with Purchaser, except upon receipt of satisfactory security for or cash in payment of any such invoice.

A service charge of the lesser of 1% per month or the highest rate permitted by applicable law shall be charged on all overdue accounts. Failure on the part of Purchaser to pay invoices when due shall, at the option of Atlas Copco, constitute a default in addition to all other remedies Atlas Copco may have under these conditions of sale or applicable law. If, in the judgment of Atlas Copco, the financial condition of Purchaser at any time prior to delivery does not justify the terms of payment specified. Atlas Copco may require payment in advance or cancel any outstanding order, whereupon Atlas Copco shall be entitled to receive reasonable cancellation charges. If delivery is delayed by Purchaser, payment shall become due on the date Atlas Copco is prepared to make delivery. Should manufacture be delayed by Purchaser, pro rata payments shall become due if and to the extent required at Atlas Copco by its contracts with the manufacturer. All installment deliveries shall be separately invoiced and paid for without regard to subsequent deliveries. Delays in delivery or non-conformities in any installment shall not relieve Purchaser of its obligations to accept any pay for remaining installments.

Force Majeure – Atlas Copco shall not be liable for loss, damage, detention, or delay, nor be deemed to be in default from causes beyond its reasonable control or from fire, strike or other concerted action of workmen, act or omission of any governmental authority or of Purchaser, compliance with import or export regulations, insurrection or riot, embargo, delays or shortages in transportation, or inability to obtain necessary engineering talent, labor, materials, or manufacturing facilities from usual sources. In the event of delay due to any such cause, the date of delivery will be postponed by such length of time as may be reasonably necessary to compensate for the delay.

New Product Warranty – Atlas Copco warrants to the Purchaser that all stationary compressors, portable compressors, compressed air dyers, Atlas Copco-designed compressor parts and other Products manufactured by Atlas Copco and affiliates shall be free of defects in design, material and workmanship for a period of fifteen (15) months from date of shipment to Purchaser, or twelve (12) months from date of initial start-up, whichever occurs first, except as set forth below or in the New Products Warranty attached hereto.

Should any failure to conform with this warranty appear prior to or after shipment of the Product to Purchaser during the specified periods under normal and proper use and provided the Product has been properly stored, installed, handled and maintained by the Purchaser, Atlas Copco shall, if given prompt notice by Purchaser, repair or replace, the non-conforming Product or authorize repair or replacement by the Purchaser at Atlas Copco's expense.

Replaced Products become the property of Atlas Copco.

Atlas Copco warrants Products or parts thereof repaired or replaced pursuant to the above warranty under normal and proper use, storage, handling, installation, and maintenance, against defects in design, workmanship and material for a period of thirty (30) days from date of start-up of such repaired or replaced Products or parts thereof or the expiration of the original Product warranty, whichever is longer.

When the nature of the defect is such that it is appropriate in the judgment of Atlas Copco to do so, repairs will be made at the site of the Product. Repair or replacement under applicable warranty shall be made at no charge for replacement parts, F.O.B. Atlas Copco Warehouse, warranty labor, serviceman transportation and living costs, when work is performed during normal working hours (8 a.m. to 4:30 p.m. Monday through Friday, exclusive of holidays). Labor performed at other times will be billed at the overtime rate then prevailing for services of Atlas Copco personnel.

The Atlas Copco warranty does not extend to Products not manufactured by Atlas Copco or affiliates. As to such Products, Purchaser shall be entitled to proceed only upon the terms of that particular manufacturer's warranty. The Atlas Copco warranty does not apply to defects in material provided by Purchaser or to design stipulated by Purchaser.

Used Products, Products not manufactured by Atlas Copco or affiliates and Products excluded from the above warranties are sold AS IS with no representation or warranty, and ALL WARRANTTIES OF QUALITY, WRITTEN, ORAL, OR IMPLIED, other than may be expressly agreed to by Atlas Copco in writing, INCLUDING WITHOUT LIMITATION WARRANTIES OF MERCHANTIABILITY OR FITNESS, ARE HEREBY DISCLAIMED.

Any services performed by Atlas Copco in connection with the sale, installation, servicing or repair of a Product are warranted to be performed in a workmanlike manner. If any nonconformity with this warranty appears within 45 days after the services are performed, the exclusive obligation of Atlas Copco shall be to re-perform the services the services in a conforming manner.

THE FOREGOING WARRANTIES ARE EXCLUSIVE AND IN LIEU OF ALL OTHER WARRANTIES OF QUALITY, WRITTEN, ORAL OR IMPLIED, AND ALL OTHER WARRANTIES, INCLUDING WITHOUT LIMITATION ANY WARRANTY OF MERCHANTABILITY OR FITNESS ARE HEREBY DISCLAIMED. Correction of nonconformities as provided above shall be Purchaser's exclusive remedy and shall constitute fulfillment of all liabilities of Atlas Copco (including any liability for direct, indirect, special, incidental or consequential damage) whether in warranty, strict liability, contract, tort, negligence, or otherwise with respect to the quality of or any defect in Products or associated services delivered or performed hereunder.

Limitation of Liability – IN NO EVENT SHALL ATLAS COPCO BE LIABLE FOR SPECIAL, INDIRECT, INCIDENTAL OR CONSEQUENTIAL DAMAGES, however arising, whether in warranty, strict liability, contract, tort, negligence or otherwise, including but not limited to loss of profits or revenue, loss of total or partial use of the Products or facilities or services, downtime cost, or claims of the Purchaser for such or other damages whether on account of Products furnished hereunder or delays in delivery thereof or services performed upon or with respect to such Products. Atlas Copco's liability on any claim whether in warranty, strict liability, contract, tort, negligence or otherwise for any loss or damage arising out of, connected with, or resulting from this contract or the performance or breach thereof, or from the design, manufacture, sale, delivery, resale, repair, replacement, installation, technical direction of installation, inspection, servicing, operation or use of any Product covered by or furnished under this contract shall in no case (except as provided in the section entitled "Patent Indemnity") exceed the purchase price allocable to the Product or Part thereof which gives rise to the claim.

All causes of action against Atlas Copco arising out of or relating to this contract or the performance hereof shall expire unless brought within on year of time of accrual thereof.

Prices – Prices to the Purchaser shall be the Atlas Copco list price in effect at time of order. Atlas Copco may, upon thirty (30) days prior written notice to Purchaser, change prices, or other terms of sale affecting the Products, by issuing new price schedules, bulletins or other notices.

This contract applies to new Products only. Purchases of used equipment shall be on terms to be agreed upon at time of sale to Purchaser.

This price does not include any Federal, state or local property, license, privilege, sales, service use, excise, value added, gross receipts, or other like taxes which may now or hereafter by applicable to, measured by or imposed upon or with respect to this transaction, the property, its purchase, sale, replacement, value, or use, or any services performed in connection therewith. Purchaser agrees to pay or reimburse Atlas Copco, its subcontractors or suppliers any such taxes, which Atlas Copco, its subcontractors or suppliers are required to pay or collect or which are required to be withheld by Purchaser.

The price shall also be subject to adjustment in accordance with the published Price Adjustment Clauses, which price adjustment information shall supersede the terms of this Section 8, where inconsistent herewith.

Information Furnished Purchaser – Any design, manufacturing drawings or other information or materials submitted to the Purchaser and not intended for dissemination by Purchaser remain the exclusive property of Atlas Copco and may not, without its consent, be copied or communicated to a third party.

Patent Indemnity – For purposes only of this Section 10, where used, the designation "Atlas Copco" shall be deemed to mean Atlas Copco North America Inc. and its subsidiaries.

Atlas Copco shall at its own expense defend any suits or proceedings brought against purchaser insofar as based on an allegation that Products furnished hereunder constitute an infringement of any claim of any patent of the United States of America, other than a claim covering a process performed by said Products or a product produced by said Product, provided that such Products are manufactured by Atlas Copco, are not supplied according to Purchaser's detailed design, are used as sold by Atlas Copco. Purchaser shall have made all payments then due hereunder, and Atlas Copco is notified promptly in writing and given authority, information and assistance for the defense of said suite or proceeding; and Atlas Copco shall pay all damages and costs awarded in any suit or proceeding so defended, provided that his indemnity shall not extend to any infringement based upon the combination of said Products or any portion thereof with other Products or things not furnished hereunder unless Atlas Copco is a contributory infringer. Atlas Copco shall not be responsible for any settlement of such suit or proceeding made without its written consent. If in any suit or proceeding defended hereunder any Product is held to constitute infringement, and its use is enjoined, Atlas Copco shall, at its option and its own expense, either replace said Products with non-infringing Products; or modify them so that they become non-infringing; or remove them and refund the purchase price and the transportation costs thereof. THE FOREGOING STATES THE ENTIRE LIABILITY OF ATLAS COPCO AND AFFILIATES WITH RESPECT TO PATENT INFRINGEMENT.

To the extent that said Products or any portion thereof are supplied according to Purchaser's detailed design or instructions, or modified by Purchaser, or combined by Purchaser with equipment or things not furnished hereunder, except to the extent that Atlas Copco is a contributory infringer, or are used by Purchaser to perform a process, or produce a product, and by reason of said design, instructions, modification, combination, performance or production, a suit or proceeding is brought against Atlas Copco, Purchaser agrees to indemnify Atlas Copco in the manner and to the extent Atlas Copco indemnities Purchaser in this Section 10 insofar as the terms hereof are appropriate.

Assignment – Any assignment of this contract or any rights hereunder, without prior written consent of Atlas Copco by a duly authorized representative thereof shall be void.

Termination – Any order or contract may be cancelled by Purchaser only upon payment of reasonable charges (including an allowance for profit) based upon costs and expenses incurred, and commitments made by Atlas Copco.

Partial Invalidity – If any provision herein or portion thereof shall for any reason be held invalid or unenforceable, such invalidity or enforceability shall not affect any other provision or portion thereof, but these conditions shall be construed as if such invalid or unenforceable provision or portion thereof had never been contained therein.

Remedies – The remedies expressly provided for in these conditions shall be in addition to any other remedies, which Atlas Copco may have under the Uniform Commercial Code or other applicable law.

Note: Sale of the equipment or services described or referred to herein at the price indicated is expressly conditioned upon the terms and conditions set forth on the front and back of this page. Any confirmatory action by the Purchaser hereunder, or any acceptance of such equipment of services, shall constitute assent to said terms and conditions. Any additional or different terms or conditions set forth in the Purchaser's order or other communications are objected to by Seller and shall not be effective or binding unless assented to in writing by an authorized representative of Seller.

Payment Terms

For orders under $100,000 the payment terms shall be **Net 30 days** from date of shipment.

For orders over $100,000 or with lead times greater than six months the following terms shall apply:

1. Domestic Shipments

A. 30% of order value 30 Days from date of customer's purchase order.
B. 30% of order value after passage of 1/3 of the time from date of customer's order to the originally scheduled shipment date.
C. 30% of order value after passage of 2/3 of the time from date of customer's order to the originally scheduled shipment date.
D. 10% of order value, net 30 days from date of shipment.

In those cases where progress payments are required, all work on the order will cease if payment is not received in accordance with the payment schedule.

2. Export Shipments

All export shipments are subject to purchaser arranging for an irrevocable letter of credit in favor of Atlas Copco Industrial Compressors Inc., from a recognized American bank.

Should the order fall in a category that requires progress payments, the letter of credit shall be arranged to release payment in accordance with the agreed payment schedule.

3. Payment Retention

Payment retention will not be allowed. An irrevocable bank letter of credit will be furnished at Atlas Copco's expense in lieu of retention.

4. Credit Approval

All terms are subject to credit approval by Atlas Copco Compressors Inc.

Cancellation Schedule

Orders for Engineered Equipment

A) Prior to release for manufacturing:
*10% of optional equipment or purchased materials will be charged (including special components including, but not limited to, motors, controls, etc.)

B) After production has started:
*40% of optional equipment or purchased materials will be charged (including special components including, but not limited to, motors, controls, etc.)
*10% of base compressor price

C) After production has been completed:
100% of optional equipment or purchased materials will be charged (including special components including, but not limited to, motors, controls, etc.)
*20% of base compressor price

Orders for Standard Equipment

A) After production has started:
*10% of base compressor price

B) After production has been completed:
*20% of base compressor price

Performance at Operating Point

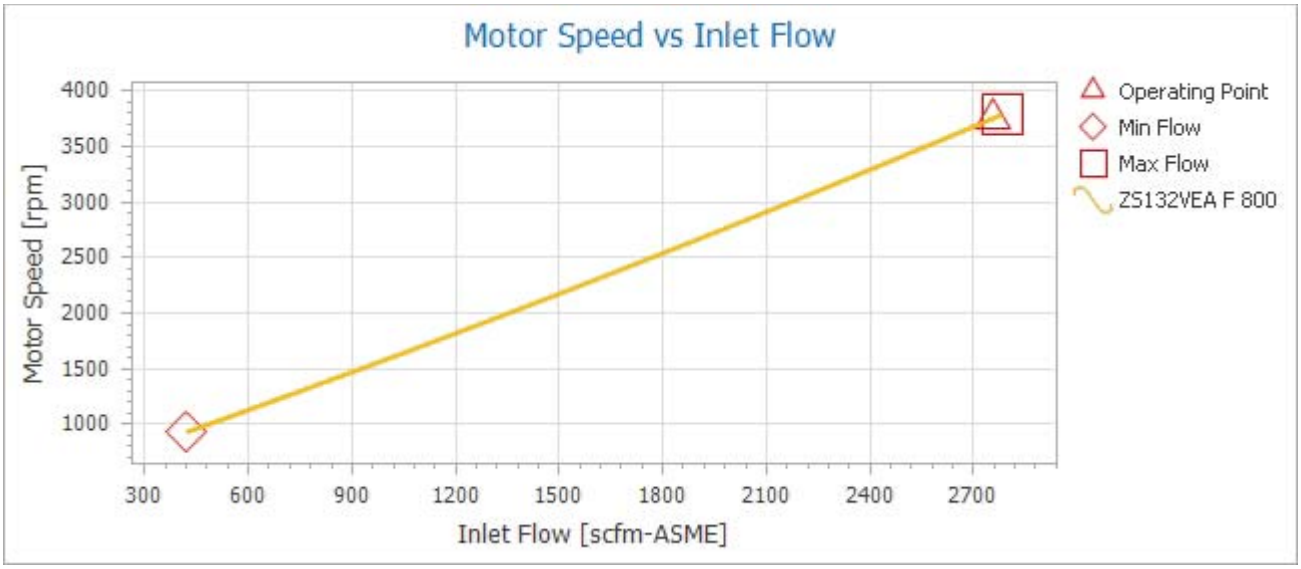
Atlas Copco

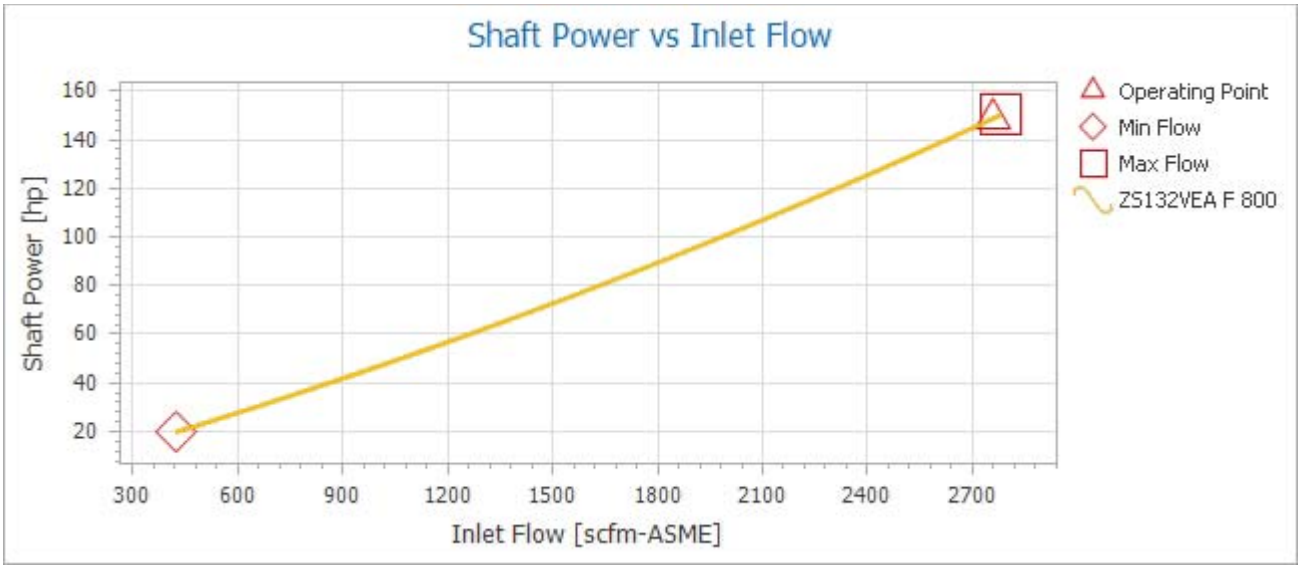
Date Monday, September 24, 2018

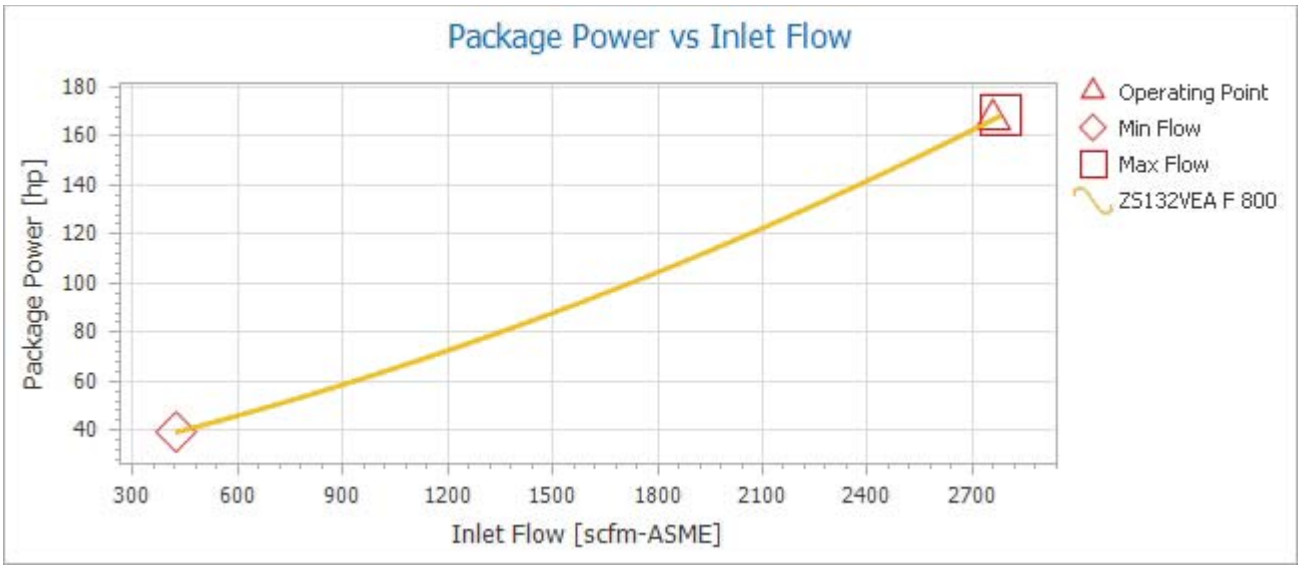
Range

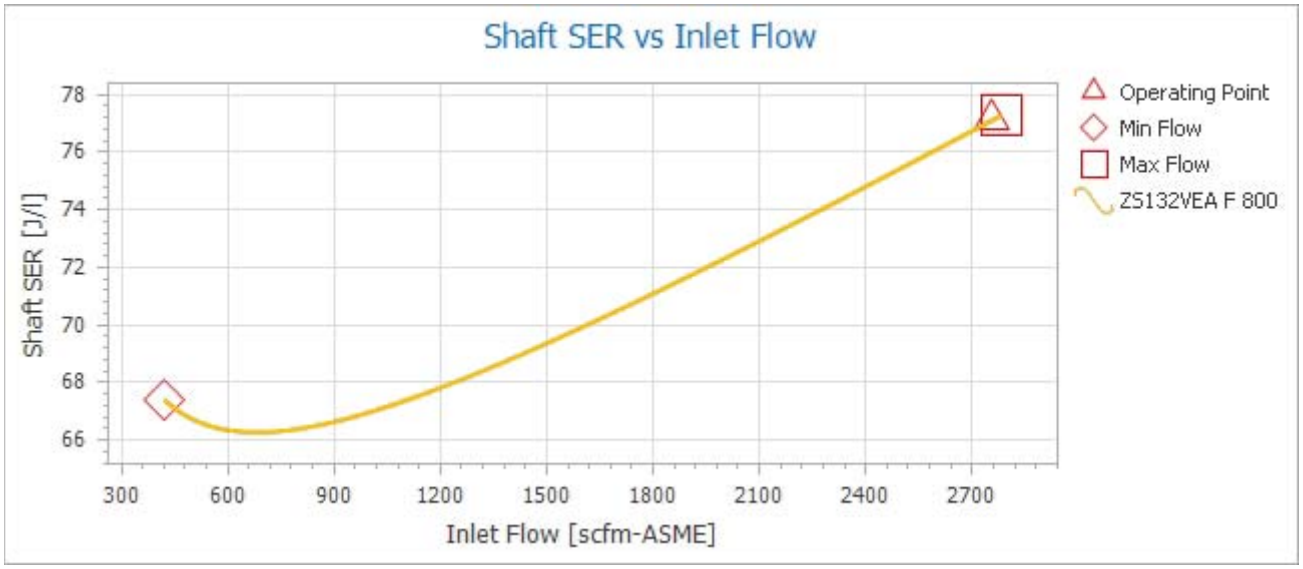
ZS 132 VEA F 800 with electrical cubicle

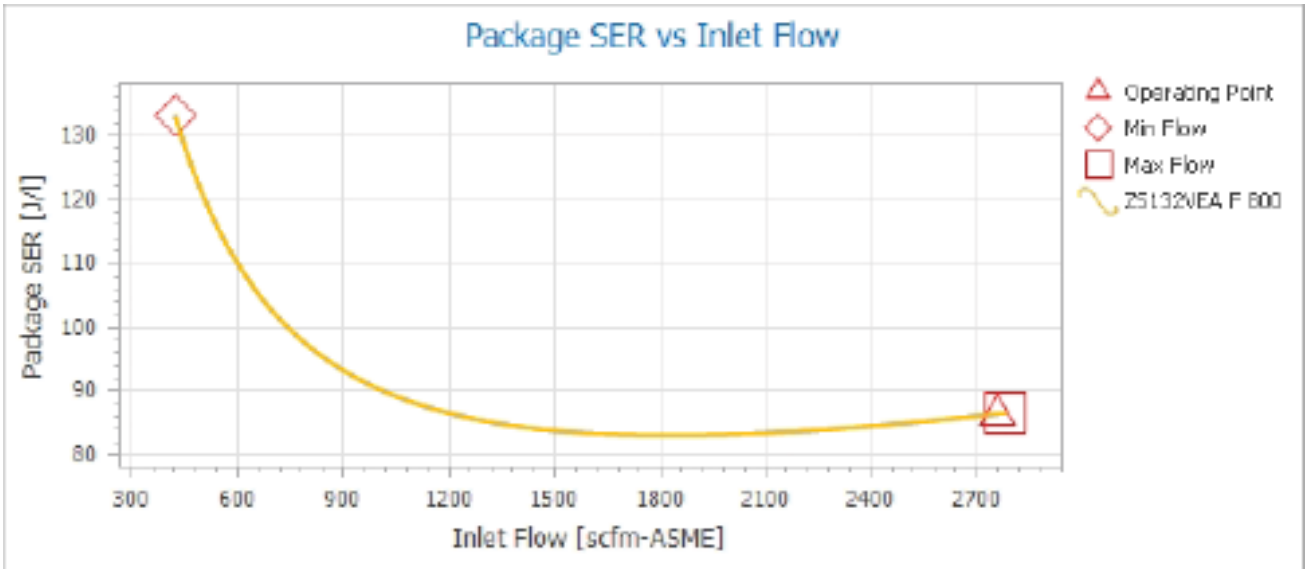
		ZS132VEA F 800 Operating point	ZS132VEA F 800 Min Flow at Pressure	ZS132VEA F 800 Max Flow at Pressure
Customer Conditions				
Process gas		AIR	AIR	AIR
Cooling medium		AIR	AIR	AIR
Network frequency				
Barometric pressure	PSI	14.55	14.55	14.55
Inlet temperature	°F	100	100	100
Relative humidity	%	80	80	80
Inlet gas density	kg/m³	1.102	1.102	1.102
Reference Conditions				
Pressure	PSI	14.7	14.7	14.7
Temperature	°F	68	68	68
Relative humidity	%	36	36	36
Tolerance				
Flow +/-	%	2	2	2
Model Performance				
Discharge pressure				
- AfterCheckValve	PSI	11.27	11.27	11.27
Inlet flow	scfm-ASME	2757	420.72	2783.61
Power				
- Shaft	hp	149.31	19.26	151.06
- Package	hp	170.06	39.87	172.02
Specific energy				
- Shaft	J/l	77	65	78
- Power	J/l	88	135	88
Motor speed	rpm	3754	931	3789
Stage isentropic eff.				
- Shaft	%	82.34	97.42	82.17
- Power	%	72.29	47.05	72.16
Air outlet temperature	°F	239	276	240

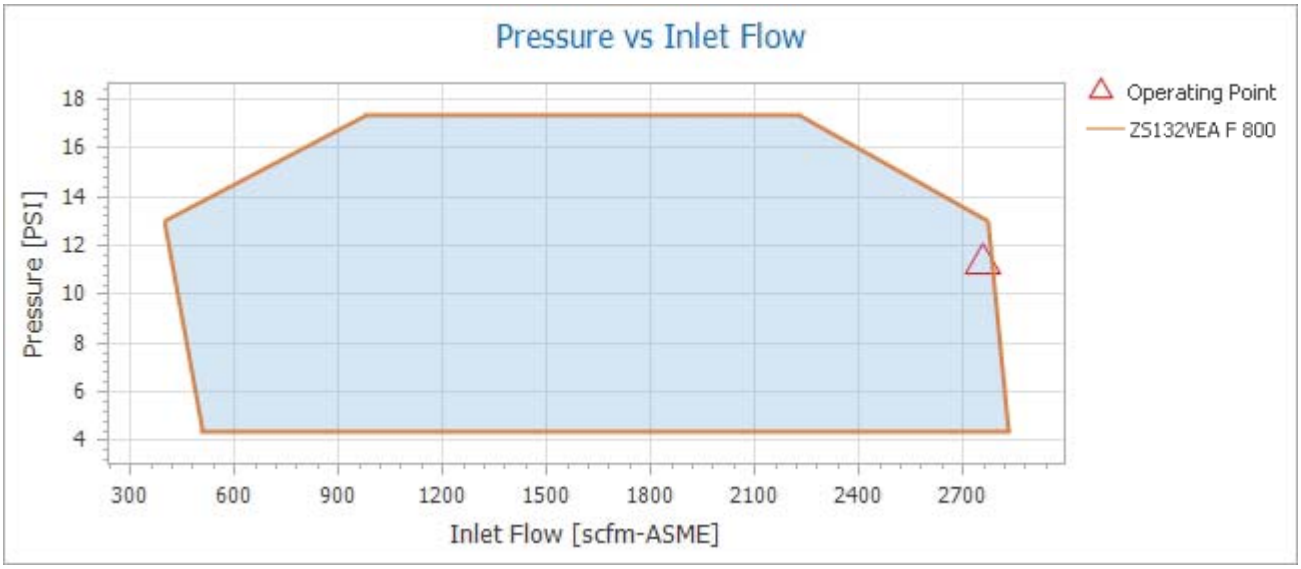

Motor Speed vs Inlet Flow
Motor Speed [rpm]
4000
3500
3000
2500
2000
1500
1000
300
600
900
1200
1500
1800
2100
2400
2700
Inlet Flow [scfm-ASME]
Operating Point
Min Flow
Max Flow
ZS132VEA F 800

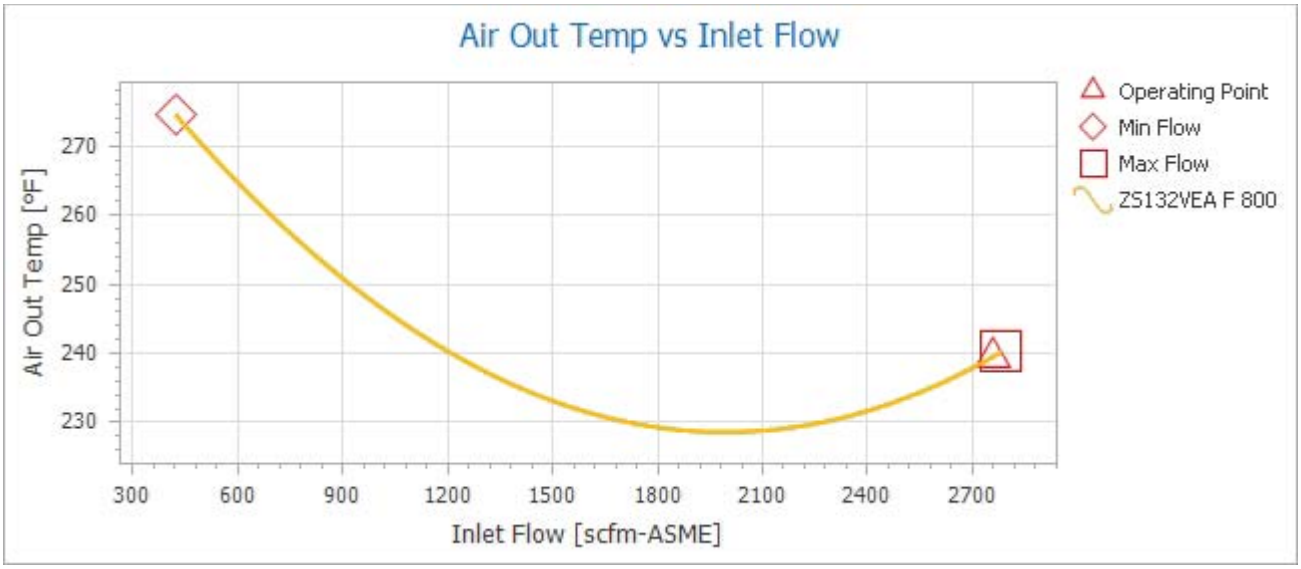

Shaft Power vs Inlet Flow
Shaft Power [hp]
160
140
120
100
80
60
40
20
300
600
900
1200
1500
1800
2100
2400
2700
Inlet Flow [scfm-ASME]
Operating Point
Min Flow
Max Flow
ZS132VEA F 800


Package Power vs Inlet Flow
Package Power [hp]
180
160
140
120
100
80
60
40
300
600
900
1200
1500
1800
2100
2400
2700
Inlet Flow [scfm-ASME]
Operating Point
Min Flow
Max Flow
ZS132VEA F 800


Shaft SER vs Inlet Flow
Shaft SER [J/l]
78
76
74
72
70
68
66
300
600
900
1200
1500
1800
2100
2400
2700
Inlet Flow [scfm-ASME]
Operating Point
Min Flow
Max Flow
ZS132VEA F 800


Package SER vs Inlet Flow
Package SER [J/l]
130
120
110
100
90
80
300
600
900
1200
1500
1800
2100
2400
2700
Inlet Flow [scfm-ASME]
Operating Point
Min Flow
Max Flow
ZS132VEA F 800

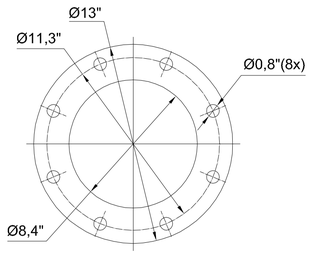

Pressure vs Inlet Flow
Pressure [PSI]
18
16
14
12
10
8
6
4
300
600
900
1200
1500
1800
2100
2400
2700
Inlet Flow [scfm-ASME]
Operating Point
ZS132VEA F 800

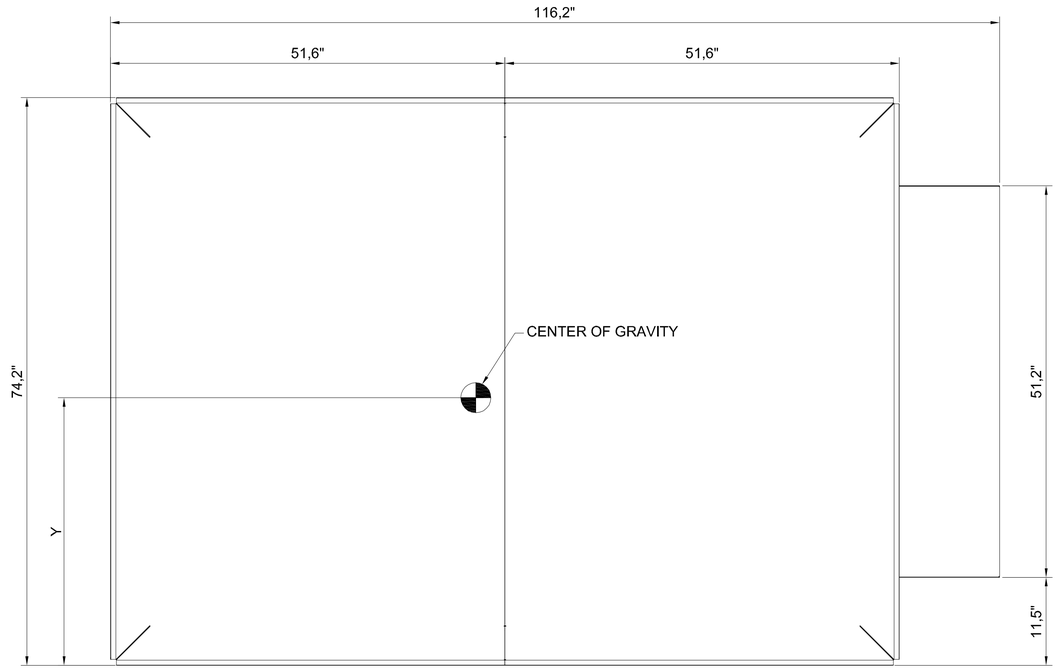

Air Out Temp vs Inlet Flow
Air Out Temp [°F]
270
260
250
240
230
300
600
900
1200
1500
1800
2100
2400
2700
Inlet Flow [scfm-ASME]
Operating Point
Min Flow
Max Flow
ZS132VEA F 800

COMPRESSOR AIR OUTLET

DN200 / PN10 acc. DIN2501

SCALE 1:5



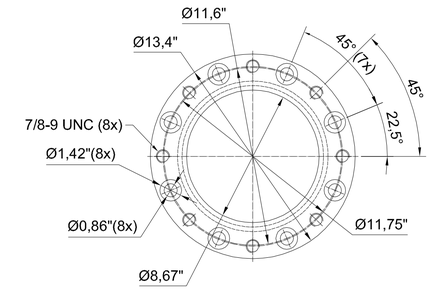


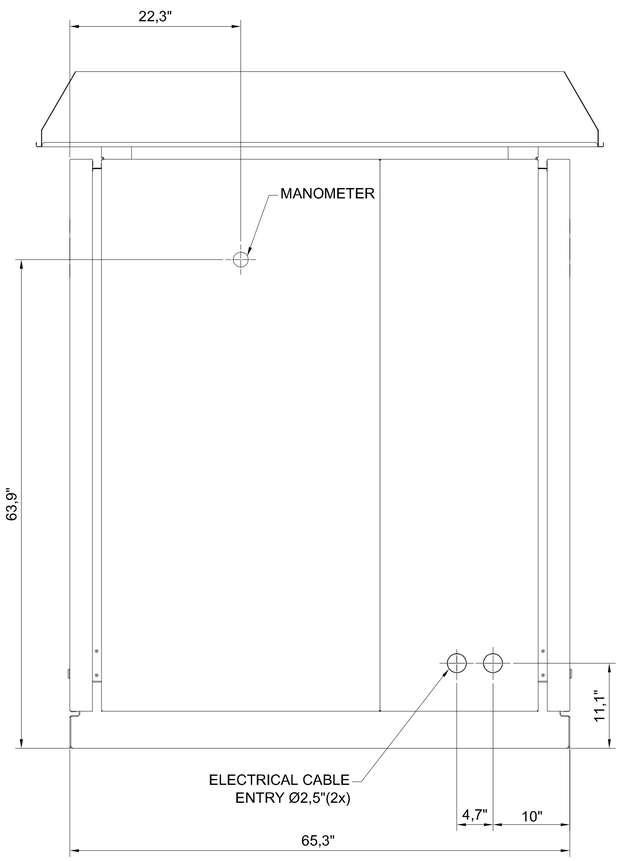
COMPRESSED AIR OUTLET

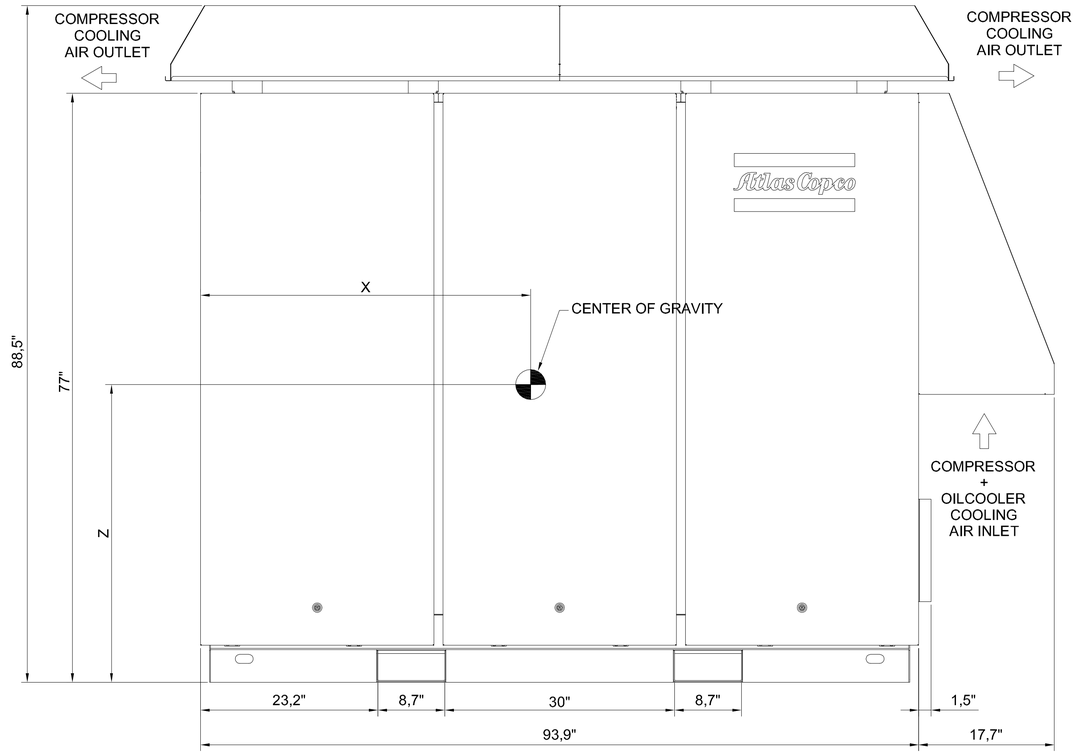
DELIVERED WITH CONNECTION FLANGE COMPRESSOR AIR OUTLET

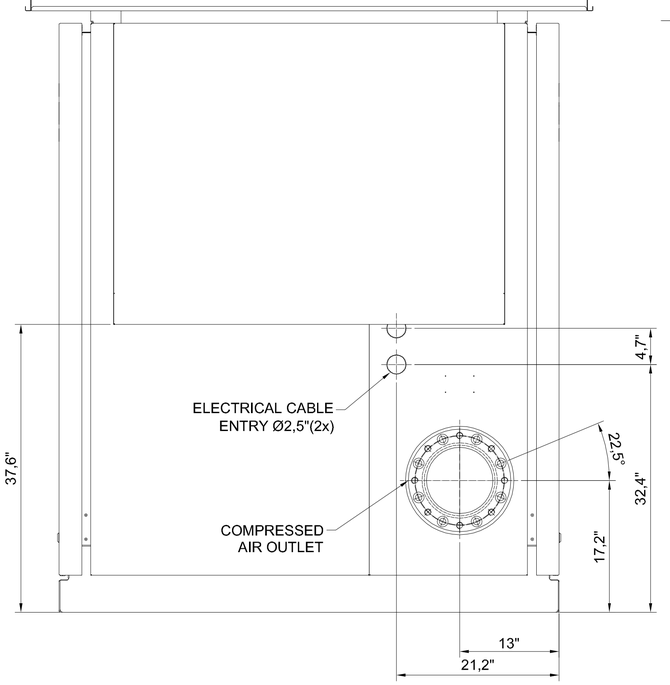
8"-cl.150lbs acc. ANSI B16,5

SCALE 1:5









	X	Y	Z	Max. net. weight
ZS75HF	43,1"	35"	38,9"	5115 lb
ZS90	43,1"	35"	38,9"	5732 lb
ZS110	43,1"	35"	38,9"	5732 lb
ZS132	43,1"	35"	38,9"	6173 lb

Note	Position	Modified from	Date	Init./Appd.
01		model ZS75HF added	2014-03-10	

All materials supplied are in compliance with the requirements of the List of Prohibited Substances

Tolerances,if not indicated,according to: ATLAS COPCO STANDARD Class

Name	DIMENS. DRWG			Secrecy Class	
Material	NOT APPLICABLE			1102 K/ 3	
Treatment	Not Applicable			ACD	
Scale	1:10	Family	A1	Compare 9823444800	Drawing owner AIF
Drawn by	sghusaile	Blank nr.		Replaces	
Version Dwg 01	Blank wt. 0 kg	Fini wt. 0 kg		Designation	Sheet ( ) 02 02
Des checked	Prod checked	Approved	Date 2012-06-13	9823 4773 00	

Parent 3D Model | Ed. Version 3D

STATUS: Approved

Quote No.
Revision No. 00
Date: September 27, 2018

ISO 9001:2008 CERTIFICATE OF APPROVAL:

CERTIFICATE OF APPROVAL

This is to certify that the Quality and Environmental Management System of:

Divisions Airtec, Oil-free Air, Industrial Air, Quality Air, Gas and Process, Compressor Technique Service (belonging to Business Area Atlas Copco Compressor Technique), and Divisions Portable Energy and Construction Technique Service for Portable Energy, Specialty Rental (belonging to Business Area Atlas Copco Construction Technique)

has been approved by Lloyd's Register Quality Assurance to the following Management System Standards:

ISO 9001 : 2008 - ISO 14001 : 2004

The Quality and Environmental Management System is applicable to:

Marketing, design, sales, manufacturing, distribution, assembling, installation, service and rental of air / gas compressors, blowers , expanders, turbo machinery, vacuum pumps, air / gas treatment equipment, generator sets, assemblies and related products and services, under Atlas Copco Brand as well as other Brands i.e. multi-brand

This certificate is valid only in association with the certificate schedule bearing the same number on which the locations applicable to this approval are listed.

Approval Certificate No:
ANT02146

Original ISO 9001 Approval	:	09 December 2002
Original ISO 14001 Approval	:	01 January 2005
Current Certificate	:	02 January 2014
Certificate Expiry	:	01 January 2017

Issued by: Lloyd's Register EMEA, Antwerp Office
for and on behalf of Lloyd's Register Quality Assurance Limited

UKAS MANAGEMENT SYSTEMS
001

Approval Certificate No: ANT02146

Rijnkaai 38, 2000 Antwerp, Belgium. Company Number 0860.936.663
(For and on behalf of 71, Fenchurch Street, London EC3M 4BS, United Kingdom, registration number 1879380)
This approval is carried out in accordance with the LRQA assessment and certification procedures and monitored by LRQA.
The use of the UKAS Accreditation Mark indicates Accreditation in respect of those activities covered by the Accreditation Certificate Number 001

Atlas Copco

Atlas Copco Airpower n.v.

AIF

Component List

Note	Modified from	Date	Intr./Appd		

Name: **Component List**		Date 18-jun-15
Detail		Print date
		Secr. Class 1102 K/ 2-Controlled distribution only (default)
Project title		Project nr
	Written by Michael Van Staeyen	Owner AIF
Edition 00	Compare 982398800000	**Designation**
Status Approved	Replaces 982398800000	**9823988000**
		Sheet 1(3)

COMPONENT LIST

100a & 100b Air inlet filter process air

Duty	Filter process air at air inlet
Specs: Material	Dry paper filter Perforated zinc plate Rubber gasket & ring Housing: 100% recyclable plastic

101a & 101b Expansion joint

Duty	Provide stress free connection between air inlet filter and blower stage
Specs: Material	EPDM 80

102a & 102b Inlet silencer

Duty	Reduce level by absorption, deflection
Specs: Material	Box: Sheet metal (St37-2) Foam: Polyurethane UL94 certified

104a & 104b Oil-free air compressor stage

Duty	Realize the compression
Specs: Material	Casing: cast iron GG20 Rotors: GGG40, teflon coated Timing gears: low alloy steel 20MnCr5, case hardened, spur teeth Air seals: Carbon ring. Oil seals: Tin bronze visco seal Bearings: radial: deep groove ball, sealed and greased axial: cylindrical roller, NUP type

105 Air outlet silencer

Duty	Reduce the noise and pulsations, generated in the outlet system by absorption and deflection
Specs: Material	Casing: P265GH Internal lining: Mild steel Damping material: Stainless steel wool

106a & 106b Compensator

Duty	Provide stress free connection
Specs: Material	Compensator: Austenitic stainless steel – Quench annealed Flange: Stainless steel Zn-plated

107a & 107b Control valve

Duty	Control start-up valve 110a &110b
Specs: Type	Solenoid

110a & 110 b Start-up / blow-off / safety valve

Duty	Load at start-up Unload at stop Relieve pressure at over pressure
Specs: Material	Flange: Structural steel non-alloyed Ring: Wrought aluminum alloy Bellow: EPDM B with Nylon reinforced

115 Check valve

Duty	Isolate the blower from the air net when the unit is stopped
Specs: Type	Swing type
Specs: Material	Body: SS316 Ni-plated Disk: SS316 Ni-plated Seat: Viton

130 Oil sump

Duty	Collect oil for recirculation
Specs: Material	Structural steel, non-alloyed steel - Cold rolled

131 Oil pump + motor

Duty	Circulate oil
Specs: Type	Screw type
Specs: Material	Aluminum
Motor:	See motor data

132a & 132b Oil-cooler

Duty	Oil cooling
Specs: Type	Block Cooled medium: Oil Cooling medium: Forced air
Specs: Material	Aluminum

133 Oil filter

Duty	Filter lubrication oil
Specs: Material	Cartridge: Inorganic fibers

134 By-pass valve (integrated in oil-pump)

Duty	Limit oil-pressure over stage
Specs: Type	Spring actuated

136 Valve

Duty	Drain oil of oil sump
Specs: Type	Ball valve

137 Manifold

Duty	Divides the oil to the injection points
Specs: Material	Aluminum

150 Drive motor

Duty	Drive the blower element
Specs: Type	See motor data

154a & 154b Fan + motor

Duty	Provide cooling air to oil-cooler
Specs: Material	Fan: Polyamide 6, reinforced Motor: See cooling fan data

160 El. Cubicle (incl. Controller)

	Controller
Duty	Control, protect, monitor the unit
Specs: Material	Electronics, see Elektronikon user manual
YD units	Electrical starter
Duty	Star-delta starter, start, stop
Specs: Material	Electrical components, see electrical diagrams
VSD units	Frequency drive
	Speed regulation, start, stop
Specs: Material	Electrical components, see electrical diagrams

161 (**) ZS-IB (Interfacefax)

Controller	Mk5 Elektronikon
Duty	Control, protect, monitor the unit
Specs: Material	Electrical components, see electrical diagrams

169 Oil sump breather with filter

Duty	Relieve over pressure in gear box and retain oil fumes
Specs: Material	Housing: Plastic
	Filter media: Foam

170 Gear box, gears

Duty	Torque transmission from motor shaft to drive shaft of the blower elements
Specs: Material	Gear box: Cast iron GGG40
	Gears: low alloy steel, case hardened

005 Frame

Duty	Base frame, transport slots
Specs: Material	Structural steel , non-alloyed
Specs: Paint	Polyester powder – TGIC free
	Thickness 70 - 100 µm

007 Panels and doors

Duty	Unit enclosure
Specs: Material	Electrolytically zinc coated steel
Specs: Paint	Polyester powder – TGIC free
	Thickness 70 - 100 µm

008 Silencing foam

Duty	Noise reduction by sound absorption
Specs: Material	Polyurethane, UL94 certified

012 Hydraulic hoses

Duty	Oil circuit
Specs: Material	Hose: Oil-resistant synthetic rubber, reinforced with wire braid
	Fittings: brass

(*) : ZS including cubicle

(**) : ZS excluding cubicle

Atlas Copco

Atlas Copco Airpower n.v.

AIF

Instrument List ZS 75+ - 160 Excluding Cubicle

Note	Modified from	Date	Intr./Appd		

Name: **Instrument List**		Date 18-jun-15
Detail		Print date
		Secr. Class 1102 K/ 2-Controlled distribution only (default)
Project title		Project nr
	Written by Michael Van Staeyen	Owner AIF
Edition 00	Compare 982398780000	**Designation**
Status Approved	Replaces 982398780000	**9823987800**
		Sheet 1(3)

Transmitter list

NR.	DESCRIPTION	QTY	MAKE	RANGE (°C)	CONN.SIZE
Temperature sensors					
TT 11	Element outlet	1	A.C.	-40/270	ISO7-R3/8
TT 41	Oil temperature	1	A.C.	-40/220	ISO7-R1/4
Pressure transducers					
PT 11	Compressor outlet	1	A.C.	-1/5 bar(e)	¼ NPT-18
PT 41	Oil pressure	1	A.C.	-1/10 bar(e)	¼ NPT-18
Level instruments					
LI 41	Oil level	1	A.C.	Level indicator	

Display list

TEMPERATURE DISPLAYS		READING	STEP
TI 11	Element outlet	Continuous	-10 to 270	1 °C
TI 41	Oil temperature	Called up	-10 to 220	1 °C

PRESSURE DISPLAYS		READING	STEP
PDI 02	DP air filter		1 – 100%	%
PI 11	Compressor outlet	Continuous	-1 / 5 bar(e)	0,01 bar
PI 41	Oil pressure	Called up	-1 / 10 bar(e)	0,1 bar

Setting list

TEMPERATURES	WARNING	LEVEL	SETTING	SHUT-DOWN	LEVEL	SETTING
Element outlet	TSH 11	High	135°C	TSHH 11	High	140°
Oil temperature	TSH 41	High	70°C	TSHH 41	High	75°C

PRESSURES	WARNING	LEVEL	SETTING	SHUT-DOWN	LEVEL	SETTING
DP air filter	PDL 02	Low	- 50 mbar(e)	No shut-down		
Oil pressure	PSL 41	Low	2,0 bar(e)	PSLL 41	Low	1,8bar(e)
Oil pressure	PSH 41	High	6,5 bar(e)	PSHH 41	High	7 bar(e)
ZS 600mbar	PSH 11	High	625mbar(e)	PSHH 29	High	750mbar(e)
ZS 800mbar	PSH 11	High	825mbar(e)	PSHH 29	High	950mbar(e)
ZS 1000mbar	PSH 11	High	1025mbat(e)	PSHH 29	High	1150mbar(e)
ZS 1200mbar	PSH 11	High	1225mbar(e)	PSHH 29	High	1350mbar(e)

COUNTERS

KSH 48 High service life of oil filter warning indication
KSH 49 High service life of oil warning indication
KSH 93 High service life of drive motor regreasing warning indication
KSH 12 High service life of bearings and element

		STEP	SETTING	RESET
KSH 48	Called up	1 h	8000	0 h
KSH 49	Called up	1 h	8000	0 h
KSH 93	Called up	1 h	4000	0 h
KSH 12	Called up	1 h	40000	0 h

Running hours	Continuous	0 – 999999 h	1 h
Loaded hours	Called up	0 – 999999 h	1 h
Motor starts	Called up	0 – 999999 h	1 h
Module Hours	Called up	0 – 999999 h	1 h
Load Relay	Continuous	0 – 999999 h	1 h
Emergency Stops	Called up	0 – 999999 h	1 h

OTHERS

SSA	Sensor error
ESHH 92	Overload pump motor shut-down indication
150	Main motor
161	ZS - IB
170	Integrated Gearbox

OPTIONAL (Customer)

TT95	PT1000	Winding phase U1-U2
TT96	PT1000	Winding phase V1-V2
TT97	PT1000	Winding phase W1-W2
TT98	PT1000	Drive-end bearing
TT99	PT1000	Non drive-end bearing
ESHH 91	Overload main motor shut-down indication	

Ed	Modified from	Date	Intr./Appd		
01					

Motor type	Three-phase squirrel cage induction motor
Make	WEG
Type	W22 444/5T
N° of Poles	2
Construction form	IM 3001+sup.
Enclosure (IP rating)	IP55
Type of cooling	IC 411
Type of bearing	Roller
Fix speed - VSD	Single speed
Main terminal box	Yes
Aux. terminal box	Yes
Flying leads	No

Operating Conditions	(Shaft) power [kW]	(Shaft) power [Hp]	Rated Voltage	Freq (Hz)	Approval
1	150	200	440	60	nd CSA and UL
2	150	200	460	60	nd CSA and UL
3					nd CSA and UL
4					
5					
6					
7					
8					
9					
10					

Winding protection	3 x PT1000 + 3 x PTC
Bearing protection	2 x PT1000
Anti-cond.heater	Yes

Name	MOTOR			Date	2015/06/15
Detail				Secr. Class 1102 K/ 3-Free distribution	
Atlas Copco		Weight [kg]		Written by	Michael Van Staeyen
		Material		Owner	AIF
Edition	01	Compare	1635087504 01	Designation	1635087504
Status	Approved	Replaces	1635087504 01		

Three-phase AC motors

Identification/Designation	Edition	Date
1635 0875 04	**01**	**2015-06-15**

1.1	motor type			Three-phase squirrel cage induction motor				
1.2	make			WEG				
1.3	supplier type & frame size			W22 444/5T				
1.4	Number of poles			2				
1.5	Fix speed - VSD			Single speed				
2. REQUIRED ELECTRICAL DATA								
2.1	Electrical data for operating condition 1							
		Cooling temp. Air		0.0	40.0			°C
		Altitude above sealevel		1000	1000			m
2.1.1	shaft power	acc. EN 60034-1			150			kW
					200			Hp
2.1.2	rated voltage				440			V
2.1.3	service factor = SF				1.00			
2.1.4	Motor windings	Insulation Class			F			
		Temp Rise			F			
2.1.5	winding configuration for rated voltage				D			
2.1.6	frequency	VSD : min - FWP - max			60			Hz
2.1.7	rated speed				3565			rpm
2.1.8	rated current				232			A
2.1.9	starting current - locked rotor current				750.0			%
2.1.10	rated torque				394			Nm
2.1.11	starting torque - locked rotor torque				230.0			%
2.1.12	cos phi				0.89			
2.1.13	full load efficiency	IE3 -IEC 60034-30			95.4			%
2.1.14	Approval				CE and CSA and UL (UR)			
2.2	Electrical data for operating condition 2							
		Cooling temp. Air		0.0	40.0			°C
		Altitude above sealevel		1000	1000			m
2.2.1	shaft power	acc. EN 60034-1			150			kW
					200			Hp
2.2.2	rated voltage				460			V
2.2.3	service factor = SF				1.00			
2.2.4	Motor windings	Insulation Class			F			
		Temp Rise			F			
2.2.5	winding configuration for rated voltage				D			
2.2.6	frequency	VSD : min - FWP - max			60			Hz
2.2.7	rated speed				3560			rpm
2.2.8	rated current				224			A
2.2.9	starting current - locked rotor current				800.0			%
2.2.10	rated torque				393			Nm
2.2.11	starting torque - locked rotor torque				230.0			%
2.2.12	cos phi				0.88			
2.2.13	full load efficiency	IE3 -IEC 60034-30			95.4			%
2.2.14	Approval				CE and CSA and UL (UR)			
2.3	Electrical data for operating condition 3							
2.4	Electrical data for operating condition 4							
2.5	Electrical data for operating condition 5							

3. MECHANICAL DATA

3.1	Construction form	according EN 60034-7	IM 3001+sup.	Horz,flange mounted with support				
3.2	Enclosure (IP or NEMA rating)	according EN 60034-5 / NE	IP55					
3.3	Type of cooling	according EN 60034-6	IC 411	Air cooled,Surface cooled,self circulation				
3.4	Rotation sense - facing drive end shaft		Clock wise					

3.5 Dimensions — Document reference:

3.5.1	main dimension drawing	9823 5685 03				
	- Design acc. NEMA MG1 (up to 200Hp)	No				
	- painting colour	RAL6002				
	- support arrangement (threat / design)	Not applicable				
	- shaft + key dimensions	Part of dim drwg				
	- flange (flanged motor) -gear (geared motor) -feet (foot motor)	Part of dim drwg				
	- position and connection dimensions of cooling in- and outlet	Part of dim drwg				
	- centre of gravity	Part of dim drwg				
	- position of lifting eye(s)	Part of dim drwg				
	- position dataplate	Part of dim drwg				
	- Earthing	In- and outside terminal box				
	- Earthing outside main terminal box: bolt size,max. cable size	M 12		70 mm²		
3.5.2	data plate : template or example	Drawing number		9823 7013 00		
	- CODE letter Locked-rotor KVA for CSA / UL approved motors	J				
	- NEMA name plate	No				
3.5.3	main terminal box	Yes				
	- dimensions	Drawing number		9823 5685 03		
	- Supply cable/conduit entry number & size	Number	2	Size	M 63 x 1,5	
	- Aux.cable entry number & size	Number		Size		
	- electrical connections (number, size of connection terminals)	Drawing number		9823 5685 03		
	- flanged terminal box to motor body (possibility to rotate)	No				
	- EMC protected	No				
3.5.4	auxiliary terminal box	Yes				
	- dimensions	Drawing number				
	- size and number of cable inlet openings	Number	1	Size	M 20 x 1,5	
		Number		Size		
	- electrical connections (number, size of connection terminals)	Drawing number				
	- EMC protected	No				
3.5.5	flying leads, conduit / multi-core cable	No				
3.5.6	current transmitter (CT) or star terminal box	No				

3.6 Mechanical data

3.6.1	mass	915.0					kg
3.6.2	moment of inertia rotor or gear assembly	1.880					kg*m²
3.6.3	mass of rotor or gear assembly	208.0					kg
3.6.4	resonance frequency of rotor or gear assembly						Hz
3.6.5	torsional stiffness of rotor or gear assembly						Nm/rad
3.6.6	stator housing material	Cast iron					
3.6.7	rotor material	Al					
3.6.8	type of bearing	Roller					
	- type nr. and internal clearance of Drive-end bearing	6314-C4					
	- type nr. and internal clearance of Non Drive-end bearing	6314-C4					
	- which bearing is axially fixed	Drive end					
	- which bearing is insulated	None					
	- bearing data sheet						
3.6.9	(re)greasing required	Yes - Grease					
	- greasing instruction	9823 5575 00					
	- type of grease or oil		MOBIL POLYREX EM				
	- greasing data sheet (eg. oil : filter requirements, temp. …)						
	- quantity & greasing interval /bearing (or oil flow & design pressure)						
	Drive end	27.00	g	4000.0	h		
	Non drive end	27.00	g	4000.0	h		
	- delivered configuration	With grease					
	- position of greasing nipples	Part of dim drwg					
	- position of grease release	Part of dim drwg					
	- position and connections forced lubricated sleeve bearings + positi	Not applicable					
	- position of greasing data plate	Part of dim drwg					
	- drawing template of greasing data plate						

3.6.10	balancing	according EN 60034-14	Half key					
	balance level of rotor	according ISO 1940-1	G 2,5					
	Delivered with key		Yes					
3.6.11	vibration level of motor		Unload			Load		mm/s
	vibration level on torque		Amplitude			Freq.		Hz
	- data sheet							
	SPM nippels included		Yes					
	- position of SPM nipples		Part of dim drwg					
	- setting value for warning		30					
	- setting value for shut down		35					
3.6.12	earth brush:		No					
3.6.13	max, permissible thrust (shock) forces		Axial			Axial		
	- datasheet		9823 5692 08					
3.6.14	external cooling flow		No					
3.6.15	cooling fan (internal)		Yes					
	- cooling fan type		Radial Bi-Directional					
	- fan drawing, including material spec.		Drawing number			1635 1267 02		
	- fan cover drawing, including material spec.		Not applicable					
3.6.16	Motor mounted heat exchanger		No					
3.6.17	noise level	according ISO1680/3744	81.0					dB(A)
	- noise level curve or datasheet							
3.6.18	gear data							

4. ADDITIONAL ELECTRICAL DATA

4.1 Electrical data

4.1.1	duty cycle	according EN 60034-1	S1: Continuous running duty, "CONT"				
4.1.2	winding protection		3 x PT1000 + 3 x PTC				
	- setting value for warning of winding temperature		130.0				°C
	- setting value for shut down of winding temperature		155.0				°C
4.1.3	bearing protection		2 x PT1000				
	- setting value for warning of bearing temperature		105.0				°C
	- setting value for shut down of bearing temperature		110.0				°C
4.1.4	anti condensation heater		Yes				
	- heater size		1 phase	115	V	140	W
4.1.5	Voltage and frequency variation and unbalance		Data listed in next rows				
4.1.6	Number of starts		Data listed in next rows				
	permissive number of starts		starts/day		starts/hrs	10	
	consecutive starts cold condition		at Un		at 80% Un		
	consecutive starts warm condition		at Un		at 80% Un		
4.1.7	thermal time constants : - starting time		at Un		at 80% Un		s
4.1.8	partial load data		Data listed in next rows				
		Load	IE3 -IEC	Power factor	current (A)	speed (rpm)	
	partial load data operation condition 1	25%	89.0	0.64	86.4		
		50%	94.5	0.85	123		
		75%	95.0	0.86	181		
		100%	95.4	0.89	232.00		
		100%	95.4	0.89	232		
	partial load data operation condition 2	25%	89.0	0.62	85.3		
		50%	94.5	0.84	119		
		75%	95.0	0.85	175		
		100%	95.4	0.88	224		
		100%	95.4	0.88	224		
	partial load data operation condition 3	25%					
	partial load data operation condition 5	25%					
4.1.09	current transmitters (CT)		No				
4.1.10	star connection in separate terminal box		No				
4.1.11	leakage water sensor		No				

4.2 Curves and equivalent electrical drawings

4.2.1	torque-speed curve at nominal volt and freq + at voltage tolerance	Drawing number	9823 5686 19
4.2.2	current-speed curve at nominal volt and freq + at voltage tolerance	Drawing number	9823 5686 19
4.2.3	thermal limit curve for cold and warm motor conditions	Drawing number	9823 5686 19
4.2.4	equivalent electrical drawing	Drawing number	9823 5690 19

4.4 Operation limits

5. INSTRUCTIONS

6. TEST REPORTS

7. REMARKS:

7.1	Ref. motor	FD-2010-009460	
7.2	Fieldweakening point curve	10002 6934 24	
7.3	Derating table	9823 4542 00	
7.4	Required quantity of cooling air	0,28 M^3/s	
7.5	FREE COMMENTS		

SHEET	DESCRIPTION
01	INDEX
02	SETTINGS
03	POWER CIRCUIT
04	CONTROL CIRCUIT
05	CONTROLLER
06	SENSORS + DIO
07	SENSORS
08	VOLTAGE FREE CONTACTS
09	LEGEND

Note	Posi-tion	Modified from	Date	Intr./Appd.	Parent 3D Model	Ed.Version 3D
03		Connection pumpmoto adapted	2015-04-01	AIR13809		

Name	DIAGRAM SERVICE			Secrecy Class	
Material	NOT APPLICABLE			1102 K/ 3	
Treatment	Not Applicable			ACD	
Atlas Copco	Scale 1:1	Family	A3	Compare	Drawing owner
	Drawn by AIR15547	Blank nr.		Replaces	AIF
STATUS	Version Drwg 03	Blank wt. 0 Kg	Fini wt. 0.1 Kg	Designation	Sheet 01 (09
Approved	Des checked.	Prod checked.	Approved.	Date 2013-09-30	9823 5620 55

MAIN POWER SUPPLY

VOLTAGE : V
FREQ : ..... Hz 3 PH

MAX FUSE [a]

IEC : Class gL/gG (Type 1)
F0' 6 A

MAX FUSE [a]

CSA : HRC Form II
F0' 8 A
UL : Class K5
F0' 8 A

Q15 *	. . . .A

Control voltage 115V 60Hz: CSA-Certifed and UL listed industrial control panel as shown within dotted lines

* Only for CSA: Interrupter setting specific to installation

Note	Position	Modified from	Date	Intr./Appd.	Parent 3D Model	Ed.Version 3D
03		Connection pumpmoto adapted	2015-04-01	AIR13809		

Name	DIAGRAM SERVICE			Secrecy Class	
Material	NOT APPLICABLE			1102 K/ 3	
Treatment	Not Applicable			ACD	
Atlas Copco	Scale 1:1	Family	A3	Compare	Drawing owner
STATUS	Drawn by AIR15547	Blank nr.		Replaces	AIF
Approved	Version Drwg 03	Blank wt. 0 Kg	Fini wt. 0.1 Kg	Designation	Sheet 02 (09
	Des checked.	Prod checked.	Approved.	Date 2013-09-30	9823 5620 55

CUSTOMER'S INSTALLATION

L1
L2
L3
PE

F0'
1X0
1L1
1L2
1L3

T1
[e]
F4
115V - 230V
F5
24V
F6
F1 [e]
F2 [e]
04.1
04.1
06.7
06.8

K21
04.8

S0

Z1

F0
[d]
WITH 3 FUSES
TYPE "1"

Q15
[c]
K15
04.4
2L1
2L3
2L2
3L1
3L2
3L3

U1
RUN-ENABLE START
VSD READY
K10
04.3
Contact: AC3 10A
04.3
07.9
07.9
4-20mA

X156

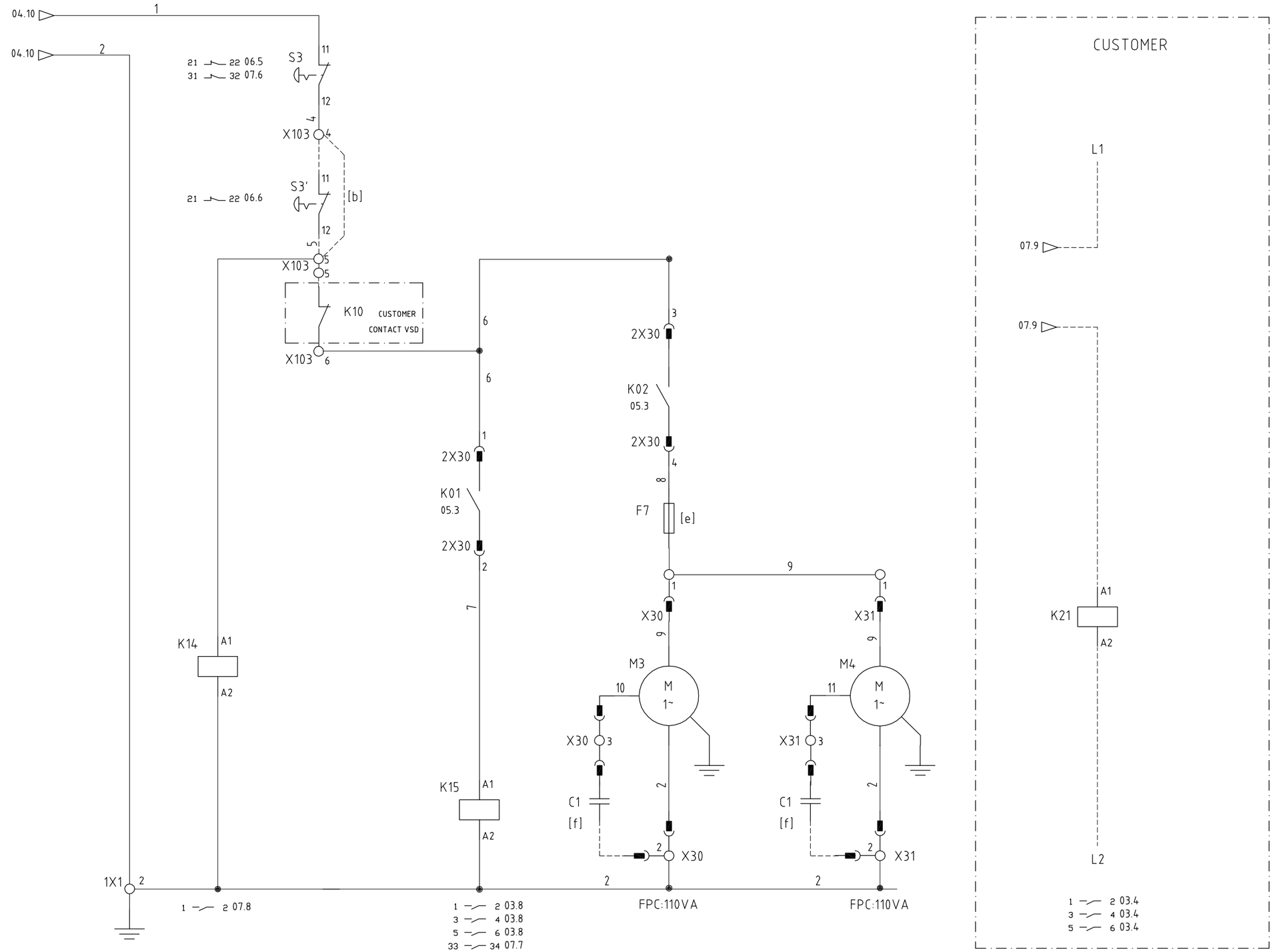
PE

FRAME

1R1
1R2
U1-W2 or U
V1-U2 or V
W1-V2 or W
KTY
M
3~
M1
VSD MAIN DRIVE MOTOR

M2

Atlas Copco	ACD	Name DIAGRAM SERVICE	STATUS	Ed.	Date	Prev. Page 02	Next Page 04	A3	Designation	Sheet 03 (09
	Drawing owner AIF		Approved	03	2015-04-01	Drawn by AIR15547	Date 2013-09-30		9823 5620 55	



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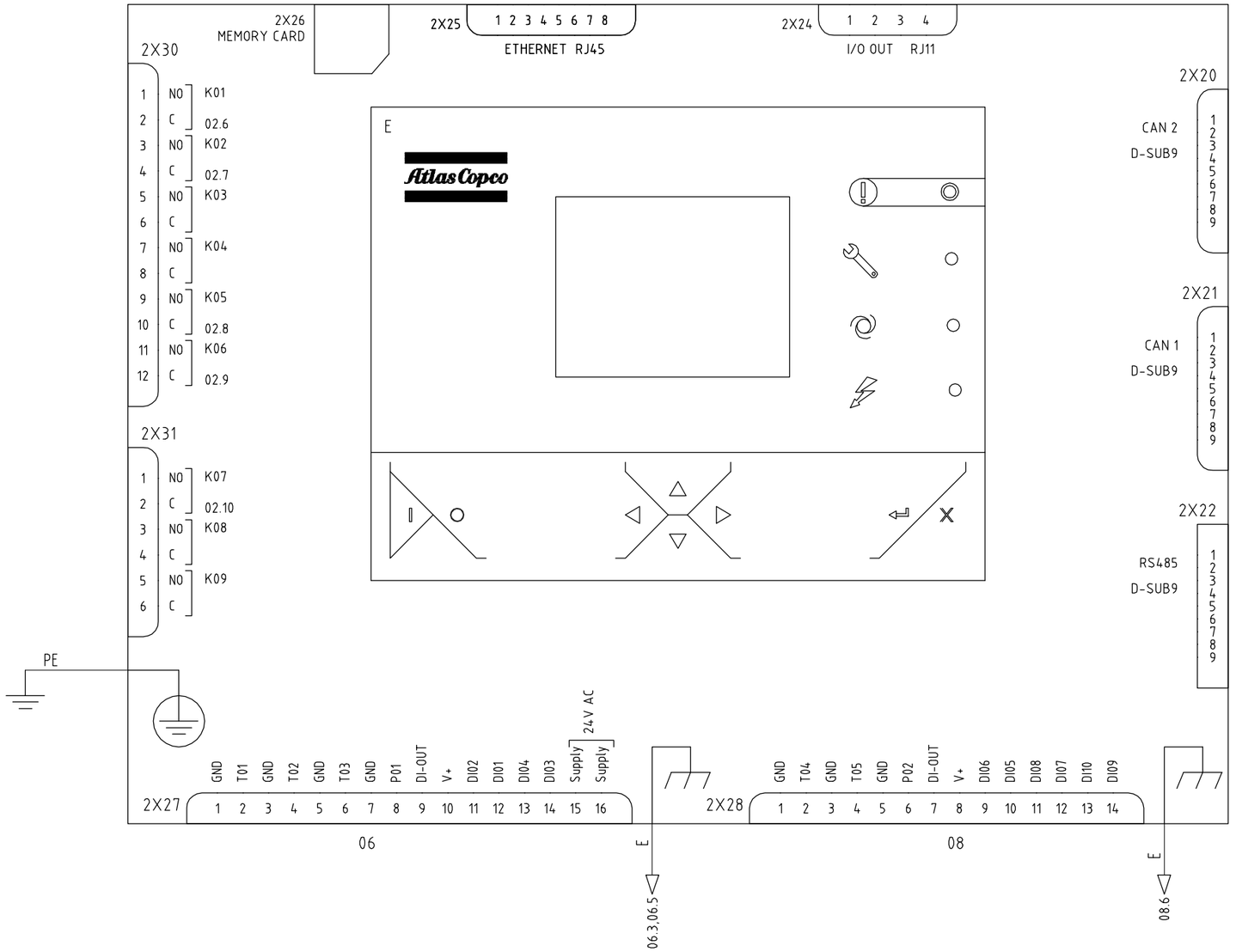

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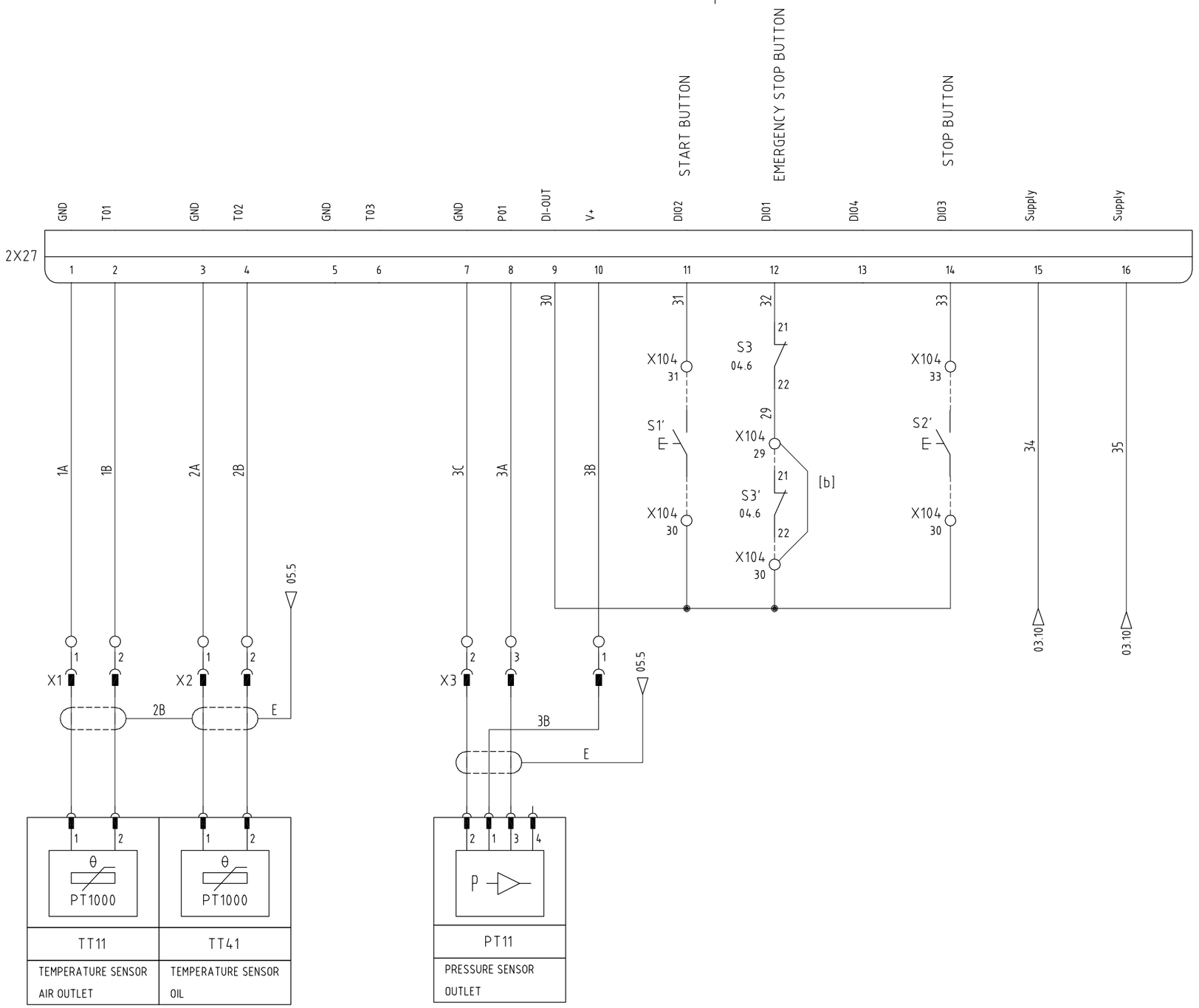
	Drawing owner AIF		Approved	03	2015-04-01	Drawn by AIR15547	Date 2013-09-30		9823 5620 55	



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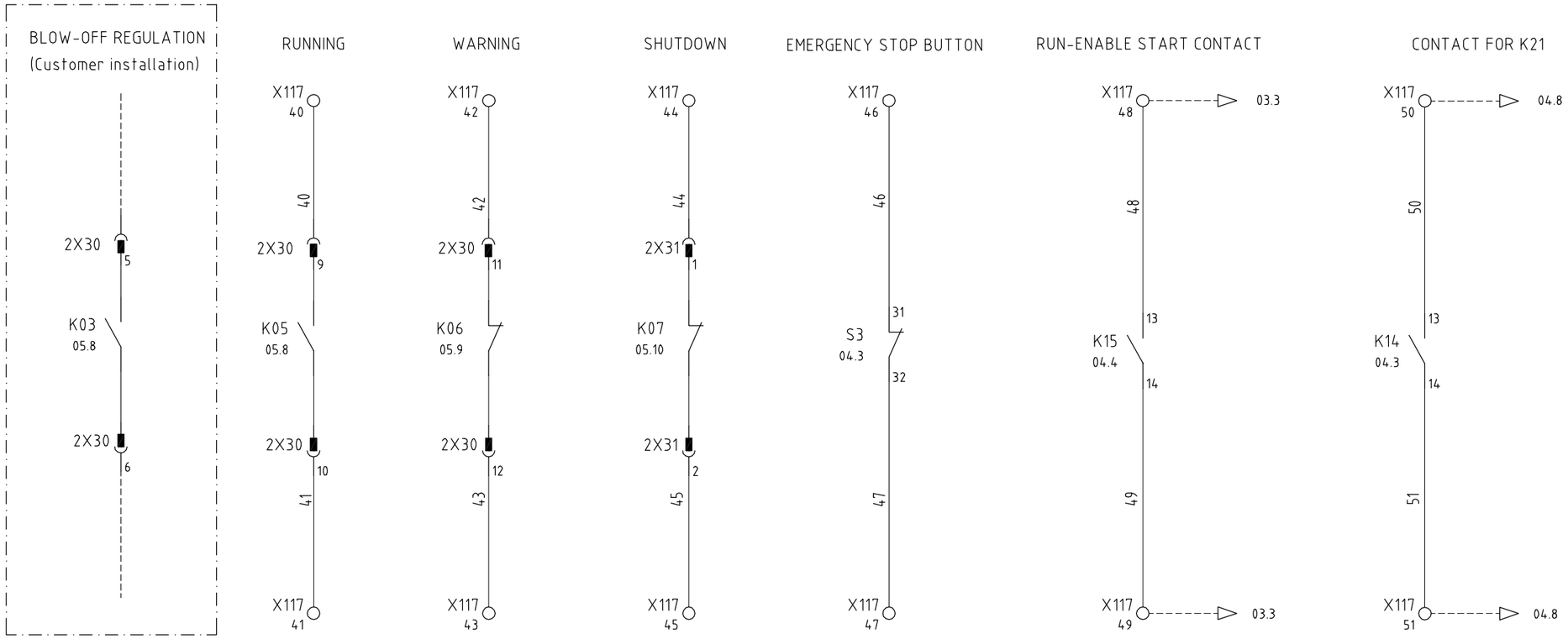
			Approved	03	2015-04-01	Drawn by AIR15547	Date 2013-09-30		9823 5620 55	

Voltage free contacts 10A-AC3



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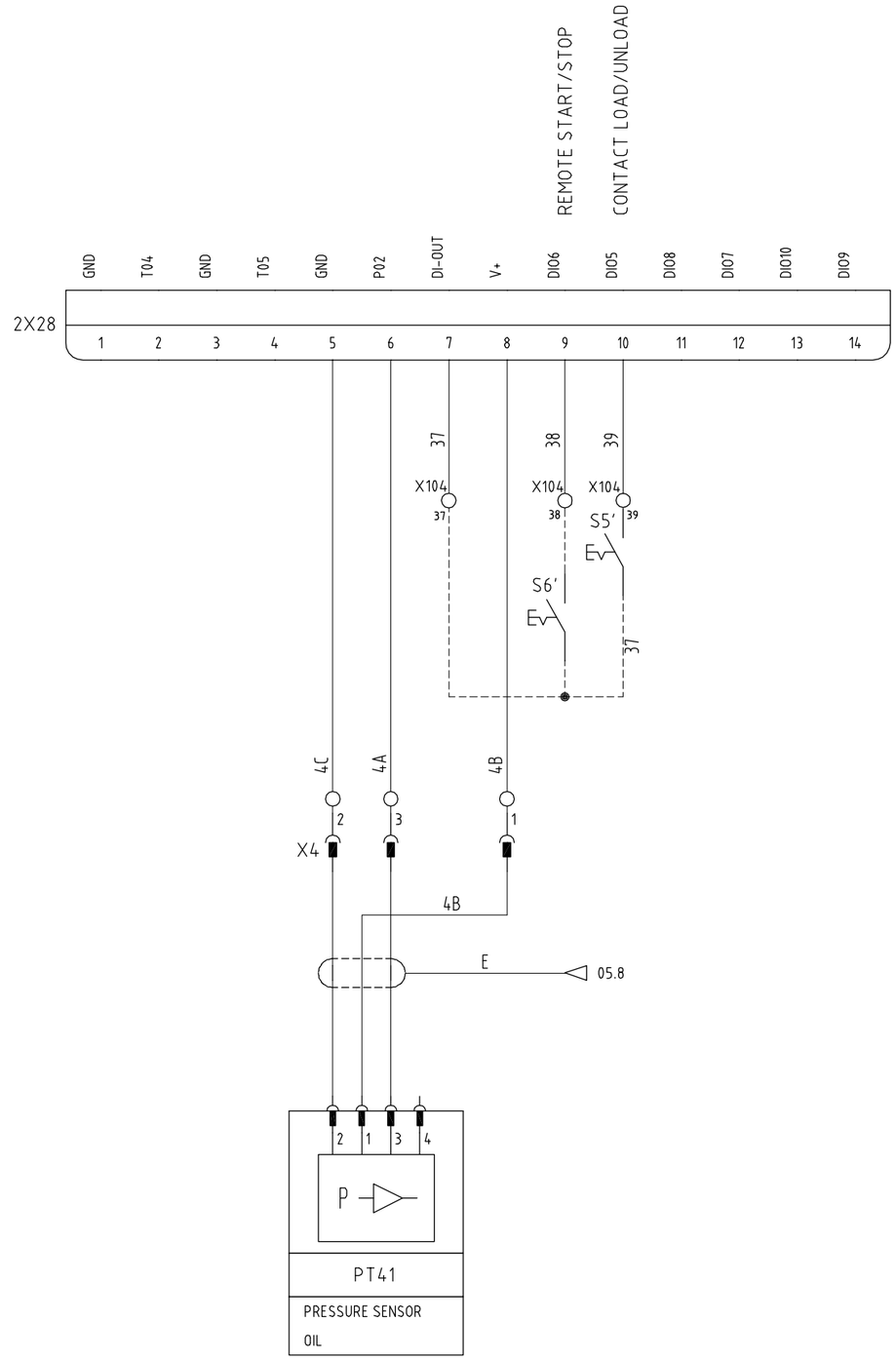

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	Drawing owner AIF		Approved	03	2015-04-01	Drawn by AIR15547	Date 2013-09-30		9823 5620 55	

LOC	TAGNAME	SH	DESC1	
COMPRESSOR	PT41	08	PRESSURE SENSOR	OIL
COMPRESSOR	PT11	06	PRESSURE SENSOR	OUTLET
COMPRESSOR	TT41	06	TEMPERATURE SENSOR	OIL
COMPRESSOR	TT11	06	TEMPERATURE SENSOR	AIR OUTLET
COMPRESSOR	M1	03	MAIN MOTOR	
COMPRESSOR	M2	03	PUMP MOTOR	
COMPRESSOR	M3	04	OIL COOLER FAN	
COMPRESSOR	M4	04	OIL COOLER FAN	
CONTROL PANEL	X1	06	CONNECTOR	
CONTROL PANEL	X2	06	CONNECTOR	
CONTROL PANEL	X3	06	CONENCTOR	
CONTROL PANEL	X4	08	CONNECTOR	
CONTROL PANEL	X156	03	CONNECTOR	
CONTROL PANEL	X117	07	CONNECTOR	
CONTROL PANEL	X30	04	CONNECTOR	
CONTROL PANEL	X31	04	CONNECTOR	
CONTROL PANEL	X103	04	CONNECTOR	
CONTROL PANEL	X104	06 - 08	CONNECTOR	
CUST INSTAL	F0 - F0'	03	FUSE	
CONTROL PANEL	F1 - F2	03	FUSE	
CONTROL PANEL	F4	03	FUSE	
CONTROL PANEL	F5- F6	03	FUSE	
CONTROL PANEL	F7	04	FUSE	
CONTROL PANEL	E	07	REGULATOR	ELEKTRONIKON Mk5
CUST INSTAL	S0	03	MAIN SWITCH	
CUST INSTAL	S1'	08	START BUTTON	
CUST INSTAL	S2'	08	STOP BUTTON	
CONTROL PANEL	S3 - S3'	04-06-07	EMERGENCY STOP BUTTON	
CUST INSTAL	S5'	08	CONTACT LOAD/UNLOAD	
CUST INSTAL	S6'	08	REMOTE START / STOP	
CONTROL PANEL	Q15	03	CIRCUIT BREAKER	
CONTROL PANEL	K14	04	CONTACTOR	
CONTROL PANEL	K15	03	CONTACTOR	
CUST INSTAL	K21	04	MAIN CONTACTOR	
CONTROL PANEL	T1	02	TRANSFORMER	
CONTROL PANEL	C1 - C2	04	CONDENSATOR	
CUST INSTAL	Z1	03	Filter	
CUST INSTAL	L1	03	Filter	
CUST INSTAL	U1	03	Convertor	
CONTROL PANEL	K01 - K02	04	Contact Mk5 Elektronikon	
CONTROL PANEL	K05-K06-K07	07	Contact Mk5 Elektronikon	

[a] Max. Fuse with regard to short-circuit protection of starter. Cable section may impose a fuse of smaller value.

[b] Install emergency button, remove bridge.

[d] For field wiring: USE COPPER WIRE ONLY

[f] for a 115VAC fan the condensator is located in the interface box.
for a 230VAC fan is the condensator located on the fan.

Control voltage 115V 60Hz: UL listed industrial control panel
Applicable for all components unless a different location is specified.

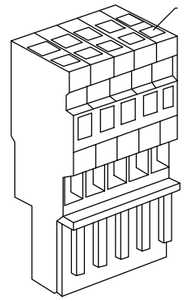
Tightening torque see label.

[c] Setting of Q15

400V 50Hz	2.0A
500V 50Hz	1.6A
690V 50Hz	1.2A
380V 60Hz	2.0A
440-460V 60Hz	1.8A
575V 60Hz	1.4A

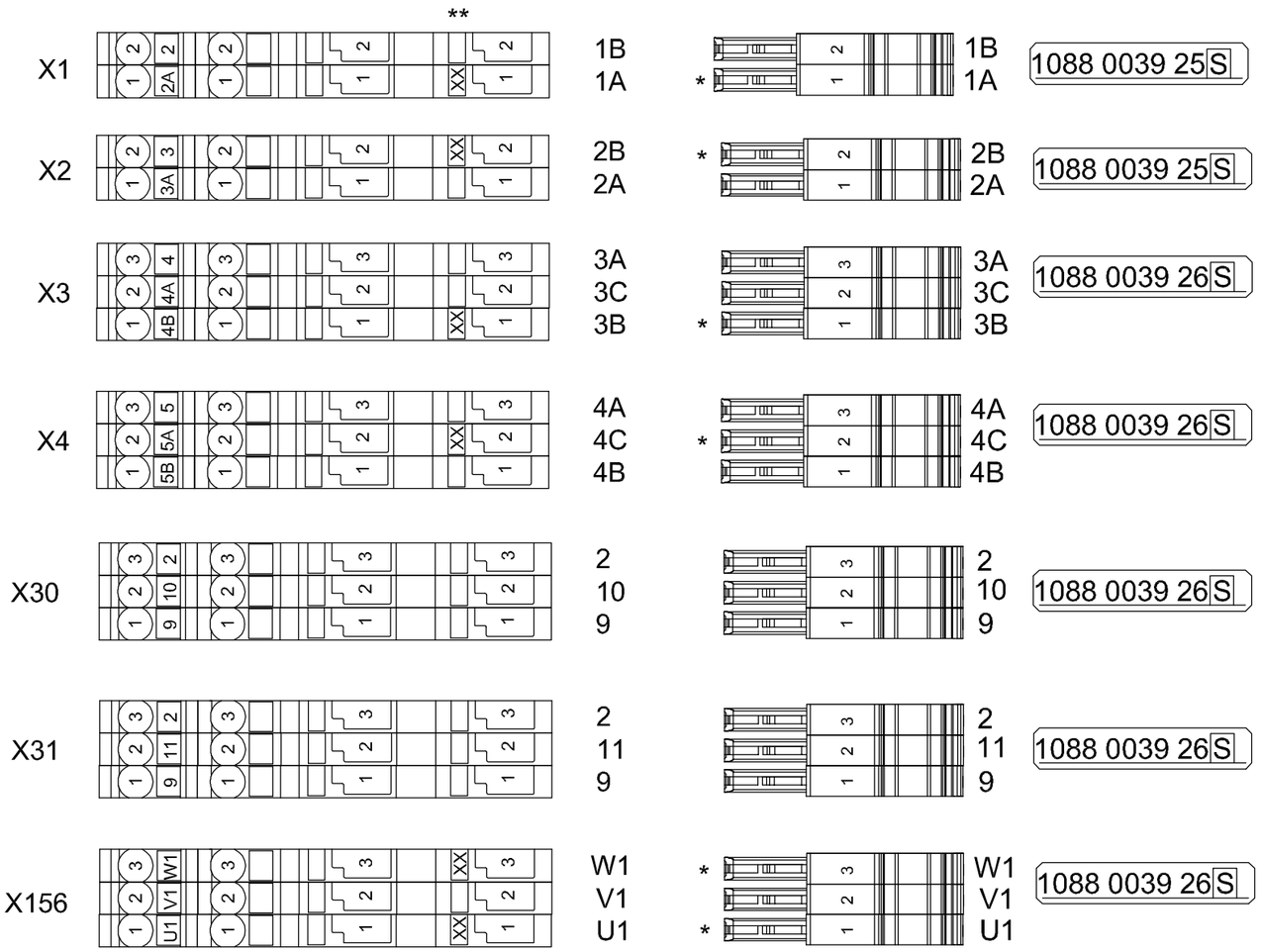
[e] Fuse settings

Fuse	115V	230V
F1-2	2A	2A
F4	3.16A	1.6A
F5-6	4A	4A
F7	3A	3A



* Removed key(s)

** On the opposite connector, coding key 1088 0037 99 has to be installed at the same place



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	Drawing owner AIF			Approved	03	2015-04-01	Drawn by AIR15547	Date 2013-09-30	

Designation 9823 5620 55 Sheet 09 (09

Panels (Light grey)

Raw material	Electrolytically zinc coated steel (Zincor)
Preparation	1) Hot alkaline degreasing 2) Pickling 3) Rinsing 4) Drying
Paint process	Electrostatic Powder Coating
Coating	Polyester Powder Enamel
Surface	High grade rough structure paint
Color	**NCS S1902G23Y (Light Grey)** [ref. Doc.: 0017 4002 07]
Total dry film thickness	70µm to 100µm
Drying process	Oven baking

Panels (Dark grey)

Raw material	Electrolytically zinc coated steel (Zincor) or Structural non-alloyed steel.
Preparation	1) Hot alkaline degreasing 2) Picking 3) Rinsing 4) Drying
Paint process	Electrostatic Powder Coating
Coating	Polyester Powder Enamel
Surface	High grade rough structure paint
Color	**RAL 7011 (Dark Grey)** [ref. Doc.: 0017 4001 40]
Total dry film thickness	70µm to 100µm
Drying process	Oven baking

Raw material	Structural, non-alloyed steel
Preparation	1) Hot alkalic degreasing 2) Phosphatation 3) Rinsing with water 4) Passivation 5) Rinsing 6) Drying
Paint process	Electrostatic Powder Coating
Coating	Polyester Powder Enamel
Surface	Minor grade rough structure paint
Color	**RAL 9011 (Black - Dull)** [ref. Doc.: 0017 4000 87]
Total dry film thickness	70µm to 100µm
Drying process	Oven baking