



SA CYCLONE EX AIR CONDITIONING UNIT User Manual

SAAC11440

ATEX, UKEX & IECEX APPROVED for Zone 1 & 2 (Gas)

IT IS MANDATORY TO READ THIS USER MANUAL TO ENSURE THAT THIS EQUIPMENT IS USED CORRECTLY AND SAFELY

WELCOME TO SA EQUIPMENT

Thank you for choosing to use one of SA Equipment's range of high quality ventilation products. The SA CYCLONE EX Air Conditioner should give you many hours of safe and reliable service.

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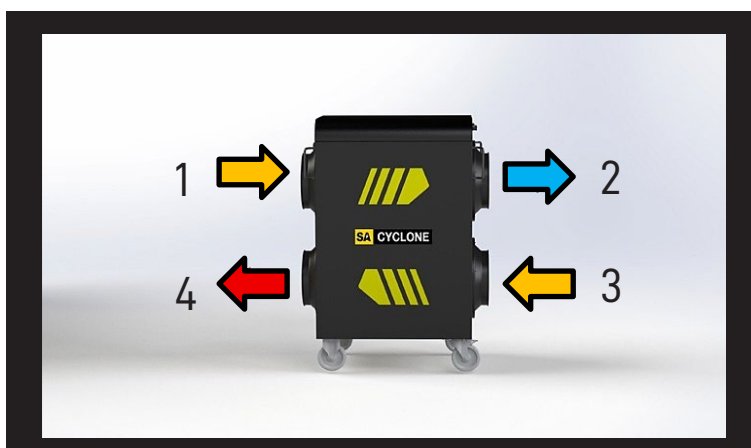
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Product Information

This user guide covers the following products:

- SAAC11440 – SA CYCLONE EX Air Conditioning Unit





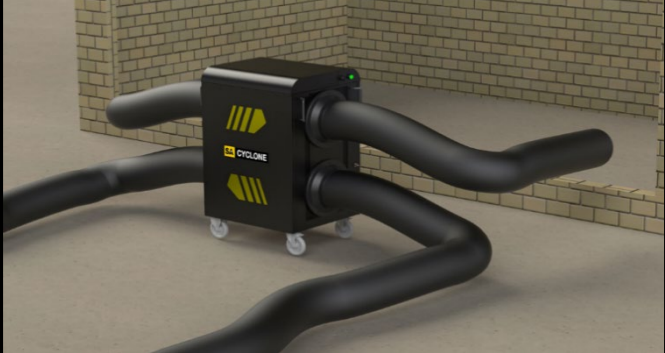
The top airflow pulls in ambient air through 1 and pushes out chilled air through 2. The lower airflow is needed to provide cooling for the refrigerant. It pulls ambient air through 3 and pushes the heat captured from the cooling coil out through 4

Possible configurations

The SA CYCLONE AC can be used in the following ways:

TIPS FOR ACHIEVING BEST PERFORMANCE

- Cooling objects - (e.g.: paintwork, over temperature protection, persons) Place AC/duct outlet 2 close to the object to be cooled (minimum distance: 1 metre).
- Spot Cooling - Use re-circulated air method (config 1 or 2) and place AC/duct outlet 2 in an area where the airflow is directed to where cooling is required.

Configuration	Typical use	Set up
 <p>1. Re-circulated air in</p>	<ul style="list-style-type: none"> • Cooling accommodation modules • Sheeted in scaffold • Large spaces 	<p>AC inside work area</p> <p>1 – no duct 2 – no duct 3 – duct outside 4 – duct outside</p>
 <p>2. Re-circulated air out</p>	<ul style="list-style-type: none"> • Cooling containers • Cabinets • Small spaces 	<p>AC outside work area</p> <p>1 – duct inside 2 – duct inside 3 – no duct / duct outside 4 – no duct / duct outside</p>
 <p>3. Fresh air supply cooled</p>	<ul style="list-style-type: none"> • Habitat • Tank cooling • Confined space cooling • Cooling areas which may generate flammable or toxic atmospheres 	<p>Outside work area</p> <p>1 – no duct / duct outside 2 – duct inside 3 – duct outside 4 – duct outside</p>

■ MULTIPLE AC's CONNECTED WITH DUCTING

Connecting the AC in series using SA CYCLONE Anti-static Ducting will increase the temperature reduction in high ambient temperatures. The airflow of each fan must be in the same direction. The minimum temperature is limited to 5°C by a safety device. Alternatively, two AC units can be used in parallel to provide more cool air volume. Either setup will double the available cooling power.

COMPATIBLE WITH THE FOLLOWING SA PRODUCTS:

SA CYCLONE ANTI-STATIC DUCTING 30cm and 40cm●

PRODUCT CODES: **SAFD30/05-EX** – Length 5m
SAFD30/10-EX – Length 10m
SAFD40/05-EX – Length 5m
SAFD40/10-EX – Length 10m

SA CYCLONE AIR MOVER

SAF35/110 – 110V c/w 30cm or 40cm adaptors
SAF35/230 – 230V c/w 30cm or 40cm adaptors

Before Use - IMPORTANT!

ELECTRICAL SAFETY

- You are responsible to ensure that any equipment you use is suitable for the environment in which it will be used.
- You are also responsible for the safety of the equipment.
- IMPORTANT – The AC must be connected to a suitable electrical supply using an Ex Zone 1 approved plug.
- You must make sure that the equipment is selected, installed and used in accordance with regulations (e.g. EN60079-14) plus any other local laws that may exist, and is checked before use.
- **THIS EQUIPMENT MUST BE KEPT IN A SUITABLE STATE BY REGULAR INSPECTION AND MAINTENANCE PROCEDURES.**
- Important - The AC should not be stored in ambient temperatures below -30°C or above 70°C for more than 24hrs.
- This equipment must only be used for its intended purpose.
- The certification details of the plug can be found on the plug type label.
- If you are unsure about anything, get help before proceeding.

MOVING AND SETTING UP THE AC

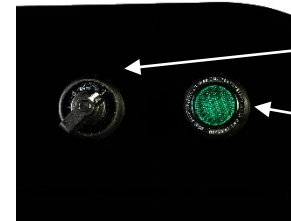
- Take necessary precautions to protect yourself and other workers from risk of hearing loss, by assessing where the AC should be positioned in relation to where people are working and using applicable ear protection. For further information refer to statutory regulations and your company/ site guidelines relating to noise at work.
- IMPORTANT - This **SA CYCLONE AC Unit** must not be taken into a Zone 0 Hazardous Area.
- The AC is to be used in an upright orientation only, including in transport. It has built in detection to prevent operation when not upright.
- The AC should not be moved while switched on; turn off the AC before moving and leave switched off for one hour before and after moving.
- Ensure there are no obstructions within 1 metre of the inlet or outlet of the AC, as this will restrict the airflow and reduce performance.
- Beware of using AC in environments where small particles (e.g. gravel) can be drawn in by the AC due to the high airflow.
- Only **SA CYCLONE** Anti-static Ducting should be used with the AC.
- When using duct ensure there are no obstructions to airflow in either inlet or outlet duct lengths.
- Ship only in the original transport packaging to reduce the likelihood of damage in transit.
- Keep upright during moving, storage and lifting
- DO NOT operate above 50°C



During Use

SWITCHING ON AND RUNNING THE AC

- Position and set up the AC according to the previous instructions.
- Check that the AC is safe for use and has no defects, paying particular attention to the cooling and heating coils, the impellers and both finger guards.
- Ensure there are no loose particles inside the cooling or heating chamber.
- The AC can then be connected to the correct supply. The supply voltage should be within the voltage range shown on the product type label. When power is applied, LED flashes for up to 10 secs. Wait until flashing stops.



Switch

LED/Lamp

- Turn the AC on using the power switch. LED should illuminate.
- The AC contains an automatic control system which controls the temperature of the discharged air.
- If the AC stops functioning or does not switch on, it should be taken into safe area before inspecting control box. The AC contains a manual-reset thermal cut-out and fuses, which may stop the AC functioning in the event of a fault. It also contains level detection so make sure the unit is on flat ground. Please refer to the trouble shooting section on page 77.
- If the AC gets damaged during use it must be immediately disconnected from the supply and removed to a safe area for inspection and test. Correct use of the equipment should help to ensure that it is not damaged. If you would like more information on ancillary products, please contact the Sales Team on **+44 (0) 3332406111** or **sales@saequip.com**.
- The fan blade rotates at high speed and care should be taken to ensure nothing protrudes through the finger guards while the AC is running. Do not operate the AC with missing or damaged finger guard or side / end panels.
- Switch off: Turn the AC off using the power switch, the fan motor will run for 30 secs and lamp will flash while cooling down. Once fan stops you can disconnect the supply

After Use

INSPECTION & MAINTENANCE PROCEDURES

- Operator is responsible to comply with the following regulations: EN60079-17 and EN60079-19
- The basic resetting procedures as shown in the following trouble shooting section are the only repairs or adjustments that can be done by the user. More complex/detailed inspection and maintenance should be carried out by a Competent qualified electrician or a refrigeration engineer who meets the competence requirements of EN 13313. Carrying out work beyond this without permission and instruction from SA Equip will invalidate any warranty and could compromise the safety and functionality of the equipment.
- Only original spares from SA Equip must be used. The use of any other parts will invalidate any warranty and could compromise the safety and functionality of the equipment. SA Equip offer a full repairs service. Contact the SA on +44 (0) 3332406111 or info@saequip.com for more details.
- Use appropriate treatment or disposal facilities in accordance with local laws and regulations. Oil is to be replaced with 175PZ, POE Oil when required. Collection and disposal of refrigerant must be in accordance with local laws and regulations. In EU, this requires compliance with FGNS Regulations.
- Bearings in belt drive replaced every 5 years or 30,000 hours of use.

The following tasks should be carried out on a periodic basis (annually depending on usage and site requirements):

- External** - Visually inspect all external parts and ensure no deformation has taken place due to mechanical loading or impact. Check all information and warning labels are present and legible. Do not allow dirt and/or dust to accumulate on the external surfaces of the equipment and pay particular attention that the finger guards are not damaged and are free from dust and dirt and any debris should be removed. The AC should be cleaned when necessary using a damp cloth. If necessary use neutral soap. Do not spray or immerse in water and no abrasives, detergents or solvents should be used. Check for any loose bolts or nuts.
- Evaporator Duct Internal** - Visually inspect components inside duct for damage, excessive build-up of dust, dirt and oil, paying particular attention to the cooling and heating coils, liquid drain, heat sink, motor casing and impeller. Check that bolts in the underside of the enclosure are not loose and that the condensate drain is not blocked or leaking. Clean the coils.
- Enclosures** - Check that AC cable glands are tight, both on the enclosure and on the cable. Inspect the mains supply cable for damage. Verify that electrical enclosures are clean, dry and free of foreign materials and free of corrosion. Check lid gasket for damage. Check all bolts and nuts are tight.
- Electrical Enclosures** - Check the conductors are free of damage. Check the tightness of all terminal connections. Tighten loose connections. Check that the correct fuses are present in the fuse holders - fuse rating and type are printed on label mounted to inside of enclosure. Ensure enclosure lids are in place with all fasteners present and tight (3Nm).
- Temperature Controls** - Check the thermostat settings have not been tampered with - the anti-tamper seal on the temperature setting indicator should be unbroken.
- Pressure Controls** - Disconnect the pressure switches individually (one at a time) and ensure this prevents the AC starting. If Unit starts, switch off immediately.
- Run Test** - To verify operation, turn on AC and run for a minimum of five minutes and check the air exiting the outlet cools down and then the

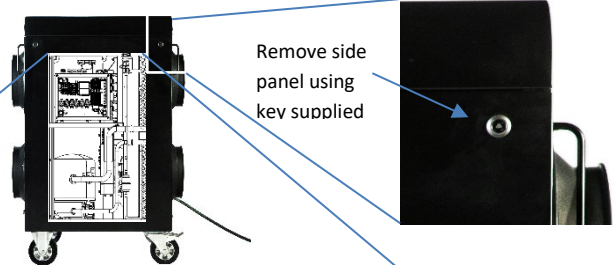
controls cut in and the air warms up as in the normal cycle pattern of the AC. Check unit runs with normal amount of vibration and there is absence of anomalous noises.

- Electrical Test - Check continuity across each pole of the SSR by testing between terminals S1-H1, S2-H2 and S3-H3 with the power supply isolated – there should be no continuity. Conduct electrical earth bond, insulation resistance and phase tests or other tests as required by site regulations.
- Refrigerant system checks to be done by competent HVAC Engineer/Technician
Refrigeration - check pipework components and coils for damage, seals are intact, adequate oil level, pressure switches and temperature switches are in place, TEV operating correctly, refrigerant system charge is correct. Check for signs of leakage.
- Belt Drive - check belt for signs of wear or misalignment, check belt tensioner moves freely and is creating adequate tension on the belt, adjust if necessary. Check belt and bearings for signs of wear/damage and replace if necessary.

TROUBLESHOOTING

PLEASE NOTE:

The AC enclosure must not be opened in a hazardous area or while the AC is energised



Hang refrigeration gauges here

Thermostat reset switch

400V Mains fuses (x3)

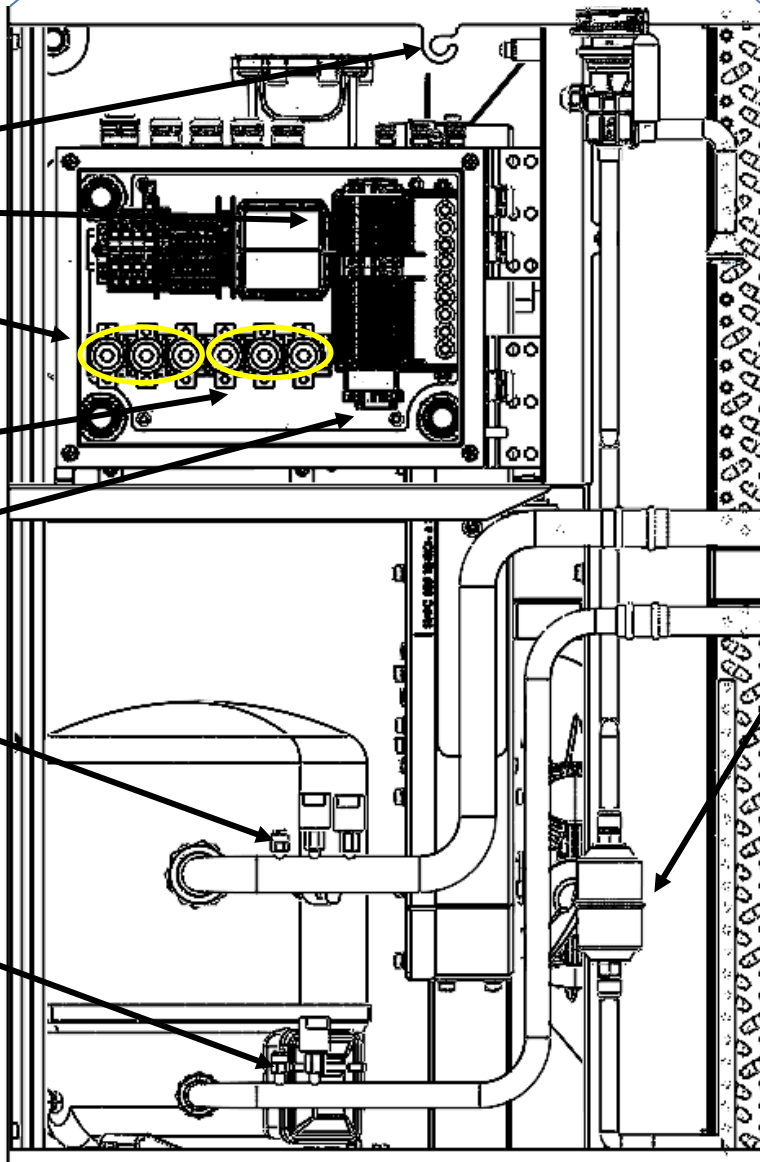
400V Power fuses (x3)

24V fuse

Low pressure Schrader valve

High pressure Schrader valve

Liquid line filter



THE FLOW DIAGRAM BELOW ILLUSTRATES THE PROCEDURES FOR THE FOLLOWING SCENARIOS:

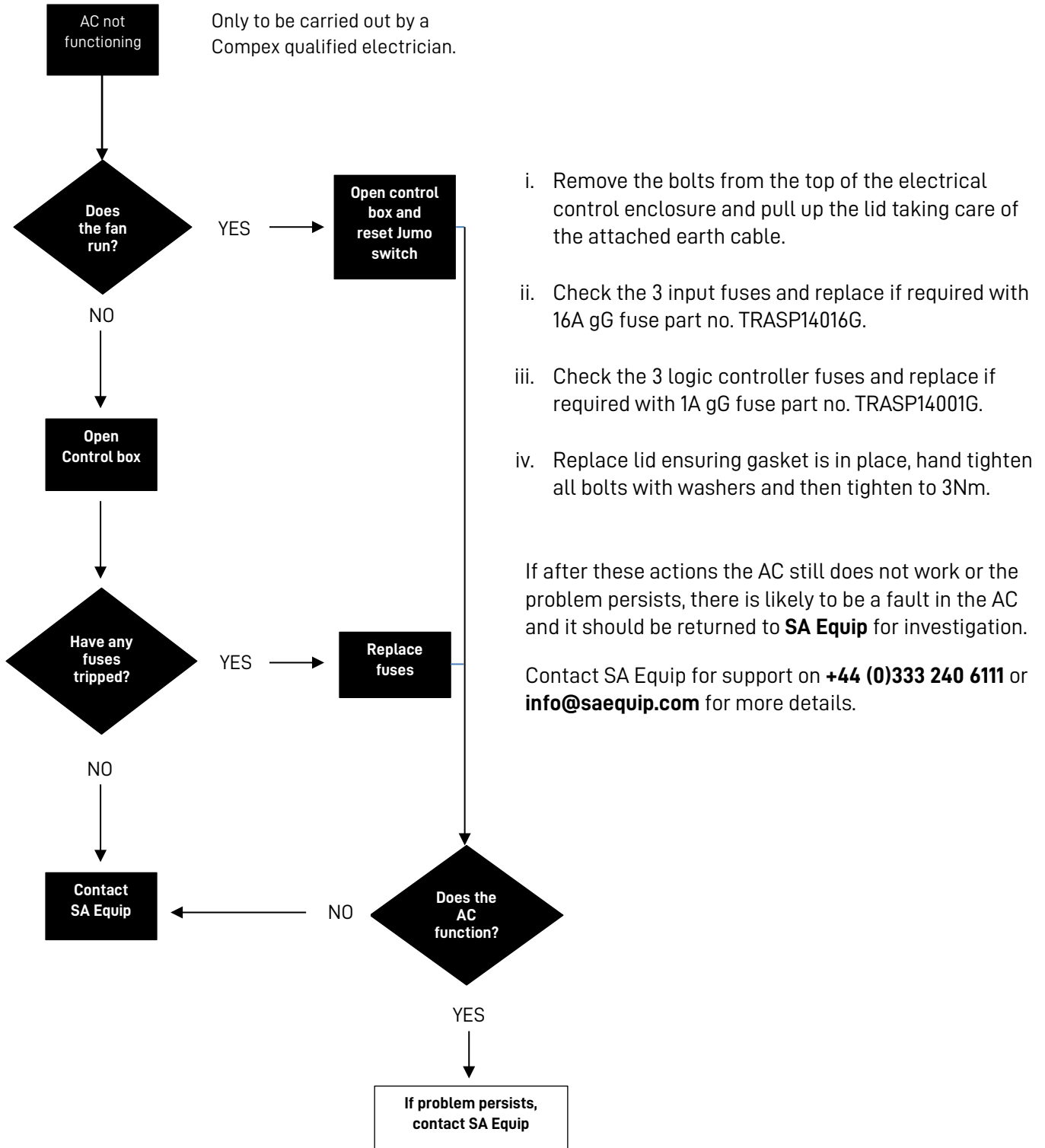
■ AC NOT RUNNING (FLASHING LED) – see page 7 for details

■ AC RUNNING BUT NO COOLING IS GENERATED

This means that only the fan is functioning and not the compressor, or the refrigeration has leaked. Contact refrigeration engineer to assess and empty.

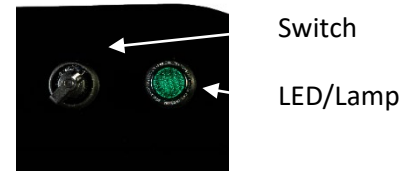
■ AC DOES NOT RUN AT ALL (NO LIGHTS)

This can be caused by either the input fuses or the PSU fuses inside the electrical control box enclosure tripping. This could be caused by a power supply problem, or misuse of the unit such as blocking the airflow.



When first turning the AC on the LED flashes for approx. 10 seconds and stops.

If there's a fault the LED will flash for a sequence, stop flashing briefly, then repeat the same sequence. Count the number of flashes in the sequence and refer to the table below.



LED LAMP ERROR CODE GUIDE

Number of LED Flashes	Error	Remedy
2	Orientation Limit	Ensure AC unit is orientated on a level surface. The tilt angle must not be greater than 5 deg.
3	Vibration Limit	Check fan assembly for damaged impellers / belt misalignment / worn belt / failed bearings. Vibration alarm error will occur if AC unit vibration levels reach 11.8mm/s RMS.
4	Refrigerant Fault	Check the AC unit is not being operated above the maximum ambient temperature. Check that the refrigerant charge is correct and there are no refrigerant leaks
5	Fan fault 1	Check fan assembly for damaged impellers / belt misalignment / failed bearings
6	Fan fault 1	Check fan assembly for damaged impellers / belt misalignment / failed bearings
7	Wiring Fault	Check the fuse / check the power supply and connections.
8	High temperature fault	Ensure AC unit is air inlet is orientated more than 1m away from obstructions and ensure the warm air duct is not recirculating in the area intended for cooling.
9	Low temperature fault	AC unit will not operate in temperatures below 8 deg C
10	Electronics Fault / Refrigeration Fault	Faulty hardware / firmware, graphic user interface may be used for further analysis - contact SA Equip for further Information.
11	Vibration Limit	Check fan assembly for damaged impellers / belt misalignment / worn belt / failed bearings. Vibration shutdown will occur if AC unit vibration levels reach 12.5mm/s RMS.
12	Electronics Fault	Faulty hardware / firmware, graphic user interface may be used for further analysis - contact SA Equip for further Information.
13	Electronics Fault	Faulty hardware / firmware, graphic user interface may be used for further analysis - contact SA Equip for further Information.
14	Electronics Fault	Faulty hardware / firmware, graphic user interface may be used for further analysis - contact SA Equip for further Information.
15	Electronics Fault	Check the AC unit is not being operated above the maximum ambient temperature. Check that the refrigerant charge is correct and there are no refrigerant leaks
16	Refrigerant Fault	Ensure system pressure is over 2 Bar. If system pressure has dropped under 2 bar there may be a leak and a refrigeration engineer will be required to perform a leak test/top up system refrigerant.
17	Refrigerant Fault	HP trip should be regarded as a critical fault - contact refrigeration engineer
18	Compressor fault	Faulty hardware / firmware, graphic user interface may be used for further analysis - contact SA Equip for further Information.
19	Compressor fault	Faulty hardware / firmware, graphic user interface may be used for further analysis - contact SA Equip for further Information.
20	Fan fault 2	Check fan belt for damage or breakage
21	Wiring Fault	Check the fuse / check the power supply and connections.
22	Wiring Fault	Check the fuse / check the power supply and connections.
23	Electronics Fault	Faulty hardware / firmware, graphic user interface may be used for further analysis - contact SA Equip for further Information.

SPECIFICATION

SAAC 11440 - SA CYCLONE EX Air Conditioner

■ SUPPLY VOLTAGE RANGE	380 to 480VAC 3 phase 50/60hz The AC will be supplied fitted with either a 3P+E or a 3P+N+E plug as requested at time of order.
■ NOMINAL OUTPUT POWER	11kW @440VAC Output power will vary according to the actual voltage of the supply.
■ NOMINAL CURRENT DRAW @ 400V	Run 15A @ 400VAC Start-up 22A @ 400VAC
■ DIMENSIONS	800mm(l) x 700mm(w) x 1290mm(h)
■ WEIGHT	200kg
■ FREE AIRFLOW	690m ³ /h (406cfm) @ 50Hz
■ NOISE LEVEL	83dba at 1 metre
■ TYPICAL TEMPERATURE CHANGE	Approx. 20°C below ambient (HTAC) Approx. 10°C below ambient (LTAC)
■ MAX PRESSURE	25.3 bar
■ REFRIGERANT	2kg of R134a.

CERTIFICATION

■ The **SA CYCLONE** EX Portable Air Conditioning Unit is UKEX & IECEx certified as transportable equipment for use in Zone 1 and Zone 2 Gas areas. Each AC has a marking plate bearing the specific product information and certification details as follows:

■ ATEX CERTIFICATE NUMBER	Ex Veritas 25 ATEX 2037X
■ UKEX CERTIFICATE NUMBER	Ex Veritas 25 UKEX 2038X
■ IECEx CERTIFICATE NUMBER	IECEx EXV 25.0010X
■ CERTIFICATION MARKING	Ex II 2 G/D

Ex II 2 G/D

Ex

II

2 G

Ex db eb ib mb IIB T4 Gb

Ex

Ex

IIB

IIIC

Ex db ib mb pb tb IIIC T135°C Db

T4/T135°C

T4/T135°C

Gb/Db

Explosive Atmospheres Symbol. Indicates compliance with ATEX directives.

Equipment Group II. Certified for use above ground (i.e. not mines).

Equipment Category 2 – Gas. Certified for Zone 1 classified areas (inc. Zone 2).

Explosive Atmospheres Symbol. Indicates compliance with ATEX directives.

Indicates protection methods used to achieve ATEX certification.

Gas equipment group IIB. Suitable for areas with IIA, IIB gases.

Dust equipment group IIIC.

Temperature Classification (Gas/Dust)

Surface temperature of the heater will not exceed 135°C.

Equipment Protection Level – High Level of Protection Certified for Zone 1 classified areas (inc. Zone 2).

■ **OPERATING TEMPERATURE**

Ta -20°C to +50°C

Certified for use in areas with ambient temperatures within this range.

■ **INGRESS PROTECTION**

IP65

The AC is suitable for use outdoors in all normal weather conditions as the electrical enclosures have at least this level of ingress protection.

■ **SPECIFIC CONDITION OF USE**

The AC is to be used in a horizontal orientation only.

■ **OTHER CERTIFICATION**

The AC is also compliant with the following regulations.

2004/108/EC EMC

2006/42/EU Machinery 2011/65/EU RoHS

DECLARATION OF CONFORMITY



Manufacturer: SA Equipment Ltd
Address: 10 Clifton View
East Mains Industrial Estate
Broxburn
EH52 5NE

EU Address: SA Equip Europe BV
Oud Camp 22
3155 DL Maasland
The Netherlands

This is to declare that Equipment Type: **SA CYCLONE EX AIR CONDITIONER**

Has been designed and manufactured in accordance with the following directives and regulations: **Equipment and Protective Systems Intended for use in Potentially Explosive Atmospheres Regulations 2016 - SI 2016 No. 1107 and 2014/34/EU ATEX**

Provisions of the Directive 2014/34/EU fulfilled by the Equipment:

**Ex II 2 G/D Ex db eb ib mb pb IIB T4 Gb Ta -20°C to +50°C IP65
Ex db ib mb pb tb IIIC T135°C Db**

Notified Body for EC-Type Examination:	Intertek Italia SPA
Approved Body for Type Examination:	Intertek
EC-Type Examination Certificate:	Ex Veritas 25 ATEX 2037X
UK Type Examination Certificate:	Ex Veritas 25 UKEX 2038X
Notified Body for production:	SGS Fimko Oy 0598 Espoo Finland
Approved Body for production:	SGS Baseefa 1180

2006/42/EC S.I. 2008 No. 1597. (Machinery) the product fulfils all the provisions of this directive including compliance with the Essential Health and Safety Requirements in Annex 1.

2014/30/EU S.I. 2016 No. 1091. EMC

2014/68/EU S.I. 2016 No. 1105. PED

2011/65/EU S.I. 2012 No. 3032. RoHS

Harmonised/designated standards used:

- EN IEC 60079-0:2018 Explosive atmospheres. Equipment. General requirements
- EN 60079-1:2014 Explosive atmospheres - Part 1: Equipment protection by flameproof enclosures "d"
- EN 60079-2:2014/AC:2015 Equipment protection by pressurized enclosure "p"
- EN 60079-7:2015/A1:2018 Explosive atmospheres. Equipment protection by increased safety "e"
- EN 60079-11:2012 Explosive atmospheres. Equipment protection by intrinsic safety "I"
- EN 60079-18:2015+A1:2017 Explosive atmospheres. Equipment protection by encapsulation "m"
- EN 60079-31:2014 Equipment dust ignition protection by enclosure "t"
- EN ISO 80079-36:2016 Explosive atmospheres. Non-electrical equipment for explosive atmospheres. Basic method and requirements
- EN ISO 80079-37:2016 Explosive atmospheres. Non-electrical equipment for explosive atmospheres. Non-electrical type of protection constructional safety "c", control of ignition sources "b", liquid immersion "k"
- EN 14986:2017 Design of fans working in potentially explosive atmospheres.

Other standards used.

- EN 60079-14 was used in part as a reference for the interconnection of the individual units of the assembly.
- EN ISO 14694:2003 Industrial fans. Specifications for balance quality and vibration levels
- EN ISO 12100:2010 Safety of machinery. General principles for design. Risk assessment and risk reduction
- EN ISO 13857:2008 Safety of machinery. Safety distances to prevent hazard zones being reached by upper and lower limbs.
- EN 378-1/2/3/4: 2016 Refrigerating systems and heat pumps — Safety and environmental requirements
- EN 60204-1:2018 Safety of machinery. Electrical equipment of machines. General requirements

This declaration is issued under the sole responsibility of the manufacturer.

On behalf of the above-named company, I declare that, on the date the equipment accompanied by this declaration is placed on the market, the equipment conforms with all technical and regulatory requirements of the above listed directives and regulations.

Signed



M Shimwell, Managing Director

Issue 1 - 10/2025

WARRANTY

The **SA CYCLONE** EX AC has a product warranty of one year from the date of delivery. The warranty does not cover cables. The warranty only covers defects in materials or workmanship. User abuse and/or failure to comply with these instructions will invalidate the warranty and may also invalidate the safety certification. The information supplied in this User Guide does not in any way remove any responsibility from the user of the AC. For more information please see our full Conditions of Sale, available on request.

English is original language version

Info@saequip.com
saequip.com

SA Equipment Ltd - 10 Clifton View, East Mains Industrial Estate - Broxburn - EH52 5NE - United Kingdom
+44 (0) 333 240 6111

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