

1 **TYPE EXAMINATION CERTIFICATE**

2 **Equipment or Protective System Intended for use in Potentially Explosive Atmospheres
Directive 2014/34/EU**

3 Type Examination Certificate Number: **Baseefa16ATEX0166X**

4 Product: **ATEX Vortex A/C Enclosure Cooler**

5 Manufacturer: **ITW Air Management**

6 Address: **10125 Carver Road, Cincinnati, Ohio, 45242, USA**

7 This product and any acceptable variation thereto is specified in the schedule to this certificate and the documents therein referred to.

8 SGS Baseefa certifies that this product has been found to comply with the Essential Health and Safety Requirements relating to the design and construction of products intended for use in potentially explosive atmospheres given in Annex II to Directive 2014/34/EU of the European Parliament and of the Council, dated 26 February 2014.

The examination and test results are recorded in confidential Report No. **15(C)0477**

9 Compliance with the Essential Health and Safety Requirements has been assured by compliance with:

EN ISO 80079-36:2016

except in respect of those requirements listed at item 18 of the Schedule.

10 If the sign "X" is placed after the certificate number, it indicates that the product is subject to the Specific Conditions of Use specified in the schedule to this certificate.

11 This TYPE EXAMINATION CERTIFICATE relates only to the design of the specified equipment and not to specific items of equipment subsequently manufactured.

12 The marking of the product shall include the following :

⊕ II 2 GD

Ex h IIC T3 Gb

Ex h IIC T200°C Db

Ta +10°C to + 80°C

SGS Baseefa Customer Reference No. **7231**

Project File No. **15/0477**

This document is issued by the Company subject to its General Conditions for Certification Services accessible at <http://www.sgs.com/en/Terms-and-Conditions.aspx> and the Supplementary Terms and Conditions accessible at <http://www.sgs.com/SGSBaseefa/Terms-and-Conditions.aspx>. Attention is drawn to the limitation of liability, indemnification and jurisdiction issues defined therein. Any holder of this document is advised that information contained herein reflects the Company's findings at the time of its intervention only and within the limits of Client's instructions, if any. It does not necessarily indicate that the equipment may be used in particular industries or circumstances. The Company's sole responsibility is to its Client and this document does not exonerate parties to a transaction from exercising all their rights and obligations under the transaction documents. This document cannot be reproduced except in full, schedule included, without prior written approval of the Company. Any unauthorized alteration, forgery or falsification of the content or appearance of this document is unlawful and offenders may be prosecuted to the fullest extent of the law.

SGS Baseefa Limited

Rockhead Business Park, Staden Lane,
Buxton, Derbyshire SK17 9RZ

Telephone +44 (0) 1298 766600 Fax +44 (0) 1298 766601

e-mail baseefa@sgs.com web site www.sgs.co.uk/baseefa

Registered in England No. 4305578.

Registered address: Rossmore Business Park, Ellesmere Port, Cheshire, CH65 3EN



R S SINCLAIR
TECHNICAL MANAGER
On behalf of SGS Baseefa Limited

13

Schedule

14

Certificate Number Baseefa16ATEX0166X

15 Description of Product

“ATEX Zone 1/21 Vortex A/C” enclosure coolers are compressed air powered devices that are intended to cool electronic/electrical enclosures that are located in Zone 1 and Zone 21 areas. The products will be classified as Group II Category 2 equipment and are for use only in areas in which explosive atmospheres caused by mixtures of air and gases, vapors or mists or by air/dusts mixtures are unlikely to occur or, if they do occur, are likely to do so only infrequently and for a short period only and for ensuring a normal level of protection, even under expected malfunctions or fault conditions.

There are no electric/electronic components in these products—they are purely mechanical devices—they are entirely non-electrical. The cooling that they produce is driven by an internal vortex tube which is located inside of an ATEX certified non-metallic carbon loaded enclosure, which serves as the external housing for the product. (A vortex tube is a compressed air powered device that has no moving parts. From a high pressure (6.2 to 6.9 bar) clean and dry compressed air source, the vortex tube creates a cold air stream and a hot air stream, both of these air streams are at low pressure-less than .2 bar.) The vortex tube’s cold air stream is directed inside the (customer’s) protected enclosure while the hot air stream is exhausted outside of the ATEX Zone 1/21 Vortex A/C to the ambient environment. The hot exhaust air is vented out of the ATEX Zone 1/21 Vortex A/C through an opening in the non-metallic housing. The opening in the non-metallic housing is protected from jets of water and dust by a baffled shroud on the back of the product. The ATEX Zone 1/21 Vortex A/C *must be* used in conjunction with a purge/pressurization system, which is provided by another source. It is the responsibility of the end user to select and install the purge/pressurization system on his enclosure.

The ATEX Zone 1/21 Vortex A/C is mounted directly on the top or side of the enclosure to be cooled via a 49mm diameter hole (two 49mm holes are required for the 8170/8170BSP models) in the enclosure. Neoprene gasket(s) between the ATEX Zone 1/21 Vortex A/C and the enclosure maintain an air and liquid tight seal at this interface. When mounted correctly to the top or side of the enclosure, the product will maintain an environmental rating of IP56. The cold airstream is directed inside the enclosure through a one-way check valve and then through a “cold air ducting kit” which can be used to distribute the cold air evenly throughout the enclosure, if desired. As the cold air stream cools the air inside the enclosure, it loses its refrigeration ability and warms up. This warmer air must be vented outside of the protected enclosure so as not to over-pressurize the enclosure. The air is vented outside of the enclosure through the purge system’s spark arrestor vent. The spark arrestor vent is selected by the end user to vent the purge air in addition to the cooling air from the ATEX Zone 1/21 Vortex A/C. The one-way check valve closes when the

ATEX Vortex A/C is not operating (not producing cooled air) so that the purge system can maintain adequate enclosure pressure.

If there is an electrical malfunction inside the protected enclosure and a spark or incendiary particle is produced, the spark cannot escape the protected enclosure as it will be captured and extinguished by the purge/pressurization system’s spark arrestor vent. When the ATEX Zone 1/21 Vortex A/C is not providing cooling (see below), the air path through the cold outlet of the unit is closed off and sealed via the one-way check valve on the unit.

The ATEX Zone 1/21 Vortex A/C utilizes a built-in mechanical thermostat (thermal actuator) that monitors and controls the temperature inside the customer’s enclosure within a set temperature range. The thermostat senses the temperature inside the enclosure and then opens or closes an internal valve that controls the compressed air flow to the internal vortex tube. When high temperatures (32 to 38°C) inside the customer’s enclosure are sensed, the thermal actuator opens the internal valve which allows compressed air to flow into the vortex tube and start cooling the enclosure.

Once the temperature inside the enclosure drops to approximately 25 to 28°C, the thermal actuator closes the valve and the compressed air flow to the vortex tube is stopped, therefore stopping the flow of cold air into the protected enclosure. At this point, the purge system maintains a safe level of enclosure pressure.

The main ignition source from the ATEX Zone 1/21 Vortex A/C is from the hot air exhaust and surface temperatures that it can develop. The temperature of the hot air exhaust is dependent on the temperature and the pressure of the compressed air that is supplied to the product. When the compressed air pressure is limited to a maximum of 6.9 bar (100 psig) *and* a maximum temperature of 49°C (120°F) *and* the ambient temperature does not exceed 80°C (175°F), then the hot exhaust air temperature and corresponding surface temperatures on or inside the product will not exceed 135°C (275°F) under normal conditions. Under fault conditions and worst case compressed air and ambient temperature conditions (6.9 bar compressed air pressure and 49°C compressed air temperature and 80°C ambient), the maximum surface temperature will not exceed 302°F (150°C). This corresponds to a temperature classification of T3. Fault conditions may occur when an internal orifice at the hot end of the vortex tube becomes restricted or clogged with foreign material or dirt. To reduce the chances of fault conditions occurring, a 5 micron compressed air filter is supplied with every model to remove foreign material from the compressed air supply and reduce the possibility of fault conditions. It is imperative that the compressed air supply conditions and ambient temperatures be stated and adhered to.

The ATEX Zone 1/21 Vortex A/C is available in four different cooling capacities: 900, 1500, 2500 and 5000 BTUH (264, 440, 732 and 1465 watts). Eight different models are offered:

<u>Model No.</u>	<u>Cooling Capacity (BTUH)</u>	<u>Compressed air inlet thread size and type</u>	<u>Compressed Air Consumption (scfm)</u>	<u>Supplied with a 5 micron compressed air filter?</u>
8115	900	3/8" NPT	15	Yes
8125	1500	3/8" NPT	25	Yes
8135	2500	3/8" NPT	35	Yes
8170	5000	3/8" NPT	70	Yes
8115BSP	900	3/8" BSPP	15	Yes
8125BSP	1500	3/8" BSPP	25	Yes
8135BSP	2500	3/8" BSPP	35	Yes
8170BSP	5000	3/8" BSPP	70	Yes

16 Report Number

15(C)0477

17 Specific Conditions of Use

1. When the equipment is to be used on an enclosure intended to be protected by a concept according to EN 60079-2 the pressurised air supply to the equipment must be of the same quality as that used to purge and pressurise the enclosure to which it is installed on.
2. When the equipment is to be used on an enclosure intended to be protected by a concept according to EN 60079-2 the equipment shall be fitted to, and assessed/tested, as part of the enclosure.
3. The equipment shall be suitably earthed (grounded) prior to operation. Earth continuity shall be maintained between the equipment and the enclosure to which it is installed on.
4. The equipment shall be mounted to the top or side face of the enclosure to which it is installed.

5. Inlet pressure shall not exceed 6.9 Bar (100PSIG).
6. Inlet air temperature shall not exceed 49°C (120°F).
7. WARNING: Potential Electrostatic charging hazard ~ cleaned only with a damp cloth.
8. When installed, consideration shall be given to the guidance given in PD CLC/TR 60079-32-1 'Explosive atmospheres - Electrostatic hazards, guidance'.

18 Essential Health and Safety Requirements

In addition to the Essential Health and Safety Requirements (EHSRs) covered by the standards listed at item 9, the following are considered relevant to this product, and conformity is demonstrated in the report:

Clause	Subject
1.2.8	Overloading of equipment.
1.4.1	External effects.
1.4.2	Aggressive substances.

19 Drawings and Documents

Number	Sheet	Issue	Date	Description
1601GA-S	1 of 2	D2	11/2016	8115,8125,8135,8115BSP,8125BSP,8135BSP
1601GA-S	2 of 2	D2	11/2016	8115,8125,8135,8115BSP,8125BSP,8135BSP
1601GA-L	1 of 4	D	11/2016	8170,8170BSP
1601GA-L	2 of 4	D	11/2016	8170,8170BSP
1601GA-L	3 of 4	D	11/2016	8170,8170BSP
1601GA-L	4 of 4	D	11/2016	8170,8170BSP