



Certificate of Conformity

Certificate num.	Registration date	Version	Valid until	
afp - 1266	16-Feb-2000	Number 14	Issue date 27-Apr-2019	30-Apr-2020

Page 1 of 5

Product designation

Ansul, INERGEN®, 200 bar, Controlled Atmosphere Fire Extinguishing System (NFPA 2001-complying)

(Refer to the Schedule/enclosures for further specified details)

Agent/distributor

Tyco Fire Protection Products
One Stanton Street, MARINETTE, WI, UNITED STATES, 54143-2542

Registrant

Tyco Fire Protection Products
451 North Cannon Avenue, LANSDALE, PA, UNITED STATES, 19446-2256

Producer

Tyco Fire Protection Products
One Stanton Street, MARINETTE, WI, UNITED STATES, 54143-2542

Conformance criteria and evaluation

The Ansul, INERGEN®, 200 bar, Controlled Atmosphere Fire Extinguishing System (NFPA 2001-complying) has been evaluated and verified as conforming with the relevant requirements of the following criteria.

1. SSL Appraisal Specification FAS-118, 'NFPA 2001-complying Gaseous Total-Flood Type Fixed Fire-Extinguishing Systems'.
2. Underwriters Laboratories Standard UL 1058R, 'Fire Extinguishment / Area Coverage Test Procedure for Engineered and Pre-Engineered Clean Agent Extinguishing System Units'.

Limitations/conditions of conformance

Limitations/conditions of conformance, where identified on this certificate, are derived from qualifications from evaluation(s) for conformity and/or other related technical documentation. All details with respect to design, assembly and installation instructions and restrictions should be checked against the producer's current technical manual/data sheets and the requirements of the Authority having Jurisdiction.

Specified limitations/conditions, determined from the evaluation for conformity, include the following.

- i. For use only where the ambient temperature of the storage cylinders will be between 0°C and 54°C. System design and installation shall be done in accordance with ANSUL®, 200 bar INERGEN™ System Design, Installation, Recharge and Maintenance Manual, 15 July 2002 Version (ANSUL® p/n 430149-1), and agent reticulation pipework sizing and layout shall be designed only by use of ANSUL® INERGEN® 200 bar Flow Calculation Software, Version 5.0.1 (ANSUL® p/n 431026).

Issued by

David Whittaker
Executive Officer – ActivFire Scheme



© CSIRO Australia, 2019



This certification is issued within the scope of CSIRO Verification Services – Rules governing ActivFire Scheme and is valid only for the product(s) as submitted for evaluation and verification of conformity, subject to the following conditions.

- Reference to details, limitations and requirements, where documented as a schedule/enclosure with this certificate.
- The Registrant is responsible for their attestation of conformity and ensuring that on-going production complies with the conformance criteria defined in this certificate.
- This certificate will not be valid if any changes or modifications are made to the product which have not been notified and validated by CSIRO Verification Services.
- This certificate is subject to periodical re-validation upon verification that all requirements, as determined by the conformity assessment body, continue to be satisfactorily met by the Registrant.
- This certificate may only be reproduced in its published form, without modification and inclusive of all schedules/enclosures.
- Any changes, errors or omissions, must be submitted in writing and if necessary or requested, substantiated with relevant evidence.
- Any representations, such as advertising or other marketing related activities or articles shall reflect the correct contents of this certificate and conform with all relevant trade practices and consumer protection legislation and regulations.
- Any terms or conditions of use as applicable to content and documentation as published or accessed through web sites administered by the CSIRO Verification Services.

Schedule to Certificate of Conformity

Certificate num.	Registration date	Version		Valid until	
afp - 1266	16-Feb-2000	Number 14	Issue date 27-Apr-2019	30-Apr-2020	Page 2 of 5

(Limitations/conditions of conformance continue)

- ii. Enclosure venting shall be provided and designed to ensure that, when the system is discharged, the pressure within the enclosure can not become harmful to the enclosure or its occupants.
- iii. Unbalanced systems (protecting multiple hazards) Operating Temperature Range: 15°C to 27°C.
- iv. Unbalanced systems (protecting single hazards) Operating Temperature Range: 0°C to 54°C.
- v. Hazard temperature: -40° to 93°C.
- vi. Spare cylinder storage temperature: 0°C to 54°C.
- vii. Minimum Design Concentration: 34.2%.
- viii. Maximum Design Concentration for occupiable spaces: 52%.
- ix. Maximum Nozzle Area Coverage 9.8 m x 9.8 m.
- x. Maximum nozzle height above F.L. for single tier of nozzles is 6.1 m. Additional tiers of nozzles are required in spaces higher than 6.1 m.
- xi. Nozzles to be located a maximum of 305 mm down from the ceiling, positioned vertically down.
- xii. Manifolding: All cylinders on the same manifold must be the same size.
- xiii. Minimum Ceiling Height: 20.3 cm.
- xiv. Maximum length between node points in the manifold is 6.1m.
- xv. Maximum length between the final node in the manifold and the pressure reducer is 30.5m.
- xvi. Length from pressure-reducing orifice to first tee must be a minimum of 10 pipe diameters.
- xvii. Discharge time for 90% of agent shall be more than 30 seconds, but shall not exceed 138 seconds.
- xviii. Maximum allowable split % of INERGEN® agent through a tee is 95% : 5%.
- xix. On a side or through tee, the side outlet must always be the smaller of the two splits.
- xx. Minimum nozzle pressure 2586 kPa.
- xxi. Maximum ratio of pipe volume to cylinder volume 56%.
- xxii. For unbalanced systems, UL/ULC ratio of nozzle orifice diameter to pipe diameter shall be 11.5% minimum to 70% maximum.
- xxiii. For unbalanced systems, UL/ULC ratio of pressure reducer orifice to inlet pipe diameter shall be 13% minimum to 55% maximum.

Producer's description

The Ansul, INERGEN®, 200-bar, Controlled Atmosphere Fire Extinguishing System (NFPA 2001-complying) also UL Listed (GAQF.EX4510), is an engineered gaseous total-flooding type fixed fire protection system which extinguishes fire by using a patented blend of inert gases to dilute the oxygen content of the air within the risk enclosure. The inert gas blend is marketed by Tyco International Pty Ltd as "INERGEN™" (IG-541), and is a mixture of nitrogen, argon and carbon dioxide in the approximate percentages of 52, 40, and 8 respectively. As these gases occur naturally in the atmosphere, accidental and deliberate releases of IG-541 do not contribute to global atmospheric warming or ozone depletion. INERGEN® agent complies with the NFPA Standard 2001, Standard for Clean Agent Fire Extinguishing Systems and EPA Program SNAP. The agent is also listed and approved by Underwriters Laboratories, Inc. (UL) and Factory Mutual Research Corporation (FMRC).

IG-541 is particularly suitable for use in occupiable areas because the recommended extinguishing concentrations result in an atmosphere within the protected enclosure which can be breathed for a prolonged period with no risk to health and little if any discomfort.

The ANSUL®, INERGEN®, Controlled Atmosphere Fire Extinguishing System covered by this Product Listing Data Sheet is quite similar to the SSL/ActivFire Listed ANSUL®, INERGEN® 150 bar system (afp - 718) except that the IG-541 agent is stored at 200 bar, the storage cylinders, discharge valves, other control valves, and manifold piping, being stronger than those of the 150 bar system and otherwise suitable for the higher agent pressure. Overall design, and pipe sizing, of the agent reticulation pipework for the 200 bar system is done with the aid of a computer software program which is similar to that for the 150 bar systems, but allows for the slightly different flow and pressure decay performance due to use of considerably higher storage pressure.

Schedule to Certificate of Conformity

Certificate num.	Registration date	Version		Valid until	
afp - 1266	16-Feb-2000	Number 14	Issue date 27-Apr-2019	30-Apr-2020	Page 3 of 5

The principal reason for development of the 200-bar ANSUL®, INERGEN® equipment was to reduce the number of storage cylinders compared to using 150-bar storage pressure and hence to achieve a significantly lower installed cost and smaller space requirement for housing the cylinders.

Technical specification

The following details are a representative extract of the technical specification for the Ansul, INERGEN®, 200 bar, Controlled Atmosphere Fire Extinguishing System (NFPA 2001-complying) and may be subject to change. Complete and current details should be determined from the designated producer's technical manual/data sheets.

The components that have been evaluated and form part of the listed system include the following:

Ansul part num.	Description
841463	1 1/2 inch Check Valve
417720	1 1/2 inch Nozzle Deflector Shield
426157	1 1/2 inch NPT Nozzle, 180 Degrees
417366	1 1/2 inch NPT Nozzle, 360 Degrees
416681	1 1/2 inch NPT Pressure Reducer/Union
841549	1 1/4 inch Check Valve
417717	1 1/4 inch Nozzle Deflector Shield
426143	1 1/4 inch NPT Nozzle, 180 Degrees
417365	1 1/4 inch NPT Nozzle, 360 Degrees
416680	1 1/4 inch NPT Pressure Reducer/Union
841470	1 inch Check Valve
417714	1 inch Nozzle Deflector Shield
426142	1 inch NPT Nozzle, 180 Degrees
417364	1 inch NPT Nozzle, 360 Degrees
416679	1 inch NPT Pressure Reducer/Union
427185	1 inch Selector Valve - threaded
840860	1/2 inch Check Valve
417708	1/2 inch Nozzle Deflector Shield
426140	1/2 inch NPT Nozzle, 180 Degrees
417362	1/2 inch NPT Nozzle, 360 Degrees
416677	1/2 inch NPT Pressure Reducer/Union
426138	1/4 inch NPT Nozzle, 180 Degrees
417908	1/4 inch NPT Nozzle, 360 Degrees
873252	12.5 inch Carriage Bolt w/Nut
840656	2 1/2 inch Check Valve
426145	2 1/2 inch NPT Nozzle, 180 Degrees
426156	2 1/2 inch NPT Nozzle, 360 Degrees
427883	2 1/2 inch Pressure Reducer - Flanged - Slip-on Weld
427880	2 1/2 inch Pressure Reducer - Flanged - Threaded
427886	2 1/2 inch Pressure Reducer - Flanged - Weld Neck
427907	2 1/2 inch Replacement Orifice Plate (customer-specified orifice diameter)
840649	2 inch Check Valve
426144	2 inch NPT Nozzle, 180 Degrees
426155	2 inch NPT Nozzle, 360 Degrees
416682	2 inch NPT Pressure Reducer/Union
427150	2 inch Selector Valve - threaded
430149-1 Rev 1	200 bar INERGEN Systems Design, Installation, Recharge & Maintenance Manual, 15 July 2002 Version.
873255	26 inch Carriage Bolt w/Nut
840665	3 inch Check Valve
426146	3 inch NPT Nozzle, 180 Degrees
426137	3 inch NPT Nozzle, 360 Degrees
427884	3 inch Pressure Reducer - Flanged - Slip-on Weld
427881	3 inch Pressure Reducer - Flanged - Threaded
427887	3 inch Pressure Reducer - Flanged - Weld Neck
840852	3/4 inch Check Valve

Schedule to Certificate of Conformity

Certificate num.	Registration date	Version	Valid until	
afp - 1266	16-Feb-2000	Number 14	Issue date 27-Apr-2019	30-Apr-2020

Page 4 of 5

Ansul part num.	Description
417711	3/4 inch Nozzle Deflector Shield
426141	3/4 inch NPT Nozzle, 180 Degrees
417363	3/4 inch NPT Nozzle, 360 Degrees
416678	3/4 inch NPT Pressure Reducer/Union
426139	3/8 inch NPT Nozzle, 180 Degrees
417723	3/8 inch NPT Nozzle, 360 Degrees
427885	4 inch Pressure Reducer - Flanged - Slip-on Weld
427882	4 inch Pressure Reducer - Flanged - Threaded
427888	4 inch Pressure Reducer - Flanged - Weld Neck
418502	13 in. (33.0cm) carriage bolt with nut (for single row 575 ft. ³ (16.3 m ³) cylinders)
418503	27 in. (68.6cm) carriage bolt with nut (for double row 575 ft. ³ (16.3 m ³) cylinders)
842104	50 ft x 1/16 inch Cable With Swaged End Fitting
845122	575 ft. ³ (16.3 m ³) cylinder strap (single cylinder)
845245	575 ft. ³ (16.3 m ³) cylinder channel with nuts and bolts (single cylinder)
423250	Aluminium Corner Pulley, 1/2 inch EMT Type
17728	Ansul AUTOMAN IIC Releasing Device, 24 VDC; UL Listed (R5998)
32525	Ansul AUTOMAN IIC Releasing Device, Explosion Proof, 120 Vac
31492	Ansul AUTOMAN IIC Releasing Device, Explosion Proof, 24 Vdc
32526	Ansul AUTOMAN IIC Releasing Device, Explosion Proof, 240 Vac
431025	Ansul INERGEN 150 bar Flow Program, 1 March 2002, Version 2.0.1
431026	Ansul INERGEN 200 bar Flow Program, 1 March 2002, Version 5.0.1
879638	Back Frame Assembly (2 Cylinder)
879639	Back Frame Assembly (3 Cylinder)
879640	Back Frame Assembly (4 Cylinder)
879641	Back Frame Assembly (5 Cylinder)
879642	Back Frame Assembly (6 Cylinder)
842402	Brass Cap, Pneumatic Actuator, Selector Valve
845515	Brass Corner Pulley, With Brass Wheel
841527	Break-glass window pull box
842678	Brass Corner Pulley, With Nylon Wheel
428949	Booster Actuator
418508	Centre Upright Foot
430952	CV-98 INERGEN Valve/Cylinder Shipping Assembly
873091	Cylinder Clamp (2 Cylinders)
873092	Cylinder Clamp (3 Cylinders)
873555	Double Row Bracket Foot (Left Side)
873556	Double Row Bracket Foot (Right Side)
843166	Dual/Triple Cable-Pull Junction Box (long)
842784	Dual/Triple Cable-Pull Junction Box (short)
427082	Flexible Discharge Bend
840309	Header Vent Plug
73327	HF Electrical Actuator; UL Listed (E91021)
845062	Latch door type pull box
70846	Lever Release, (1 1/4-18 mounting thread), Mounts directly to an HF electrical actuator
423309	Lever Release, (1 1/8-18 mounting thread), Mounts directly to a CV-98 cylinder valve
427207	Lever Release, (1 1/8-18 mounting thread) Mounts directly to the 1 in. and 2 in. selector valves
5373	LT-30 R Nitrogen Cartridge
831810	Male Elbow (7/16 - 20 x 1/4 NPT)
832338	Male Straight Connector (7/16 - 20 x 1/4 NPT)
831811	Male Tee (7/16 - 20 x 7/16 - 20 x 1/4 NPT)
841527	Manual-Pull Box, Break-Glass Window Type
845062	Manual-Pull Box, Latched Door Type
841942	Name Plate, "MAIN"
841943	Name Plate, "RESERVE"
842175	Pressure Bleeder Plug, 1/4 NPT
842344	Pressure Switch - 3PST

Schedule to Certificate of Conformity

Certificate num.	Registration date	Version	Valid until	
afp - 1266	16-Feb-2000	Number 14	Issue date 27-Apr-2019	30-Apr-2020

Page 5 of 5

Ansul part num.	Description
843241	Pressure Switch - DPDT
846250	Pressure Switch - DPST
427953	Pressure Test Assembly, for CV-98 Valve
805156	Pressure Trip
428566	Pressure operated stackable actuator
843168	Remote Cable Pull Equaliser (long)
842791	Remote Cable Pull Equaliser (short)
873553	Single Row or Back-to-Back Row Bracket Foot (Left Side)
873554	Single Row or Back-to-Back Row Bracket Foot (Right Side)
831809	Stainless Steel Actuation Hose, 16 inch
832335	Stainless Steel Actuation Hose, 20 inch
832336	Stainless Steel Actuation Hose, 24 inch
842109	Stainless Steel Cable, 100 ft x 1/16 inch, With Swaged End Fitting
842113	Stainless Steel Cable, 150 ft x 1/16 inch, With Swaged End Fitting
841542	Support Legs, Manual-Pull Boxes
840696	Thread Adaptor, Brass Corner pulleys
873257	Upright, for 575 ft. ³ (16.3 m ³) cylinders
416265	Warning Plate, Inside of Room w/Alarm
416266	Warning Plate, Outside of Room without Alarm
842430	Washer, Female Adaptor, Flexible Discharge Bend
423027	Weigh Rail Support - Back-to Back Double Row
871684	Weigh Rail Support - Back-to Back Rows
871682	Weigh Rail Support - Double Row
871683	Weigh Rail Support - Single Row

Piping requirements:

Piping shall comply with the requirements of NFPA 2001. The wall thickness shall be calculated in accordance with ASME B31.1 "Power Piping Code". System manifold piping must be constructed to withstand a minimum pressure of 3000 psi (206.9 bar). Distribution piping downstream from the orifice union must be constructed to withstand the maximum downstream pressure as determined by the flow calculation. The calculations shall be based on the following:

Maximum agent storage temperature	55°C
Pressure upstream of pressure-reducer	23.67 MPa
Pressure downstream of pressure-reducer	6.9 MPa

If steel piping is used, it shall conform to ASTM A 53 or ASTM A 106.

If copper piping is used, it shall conform to ASTM B 88.

Other piping materials are permitted providing that design is in accordance with ASME B31.1