



Document Number:	CPD-ELTF-1008
Document Title:	AS-Series CSA Safety Test Report and Certificate (no

Document Information

Revision	D	Vault	BU Engineering Document Release
Document Type	BU Engineering Document	Status	Release

Date Information

Effective Date	05 Jun 2024	Next Review Date	
Release Date	05 Jun 2024	Expiration Date	

Control Information

Author	WLUDWIG	Previous Number	
Owner	WLUDWIG	Change Number	BU-DCR-24-05-040

CPD-ELTF-1008 Rev D**AS-Series O2/Nitrogen Non-Medical CAN/CSA C22.2 61010-1-12/UL 61010-1 3rd Ed.**

Project Name: AS Series Models

Design Owner: AirSep Corp.

Purpose

The purpose is to release the most recent safety testing for the AS Series models. This includes the report and CSA certificate issued.

Summary of testing

CSA International

178 Rexdale Boulevard,

Toronto, ON, Canada M9W 1R3

Telephone: 416.747.4000 1.800.463.6727

Fax: 416.747.4149 www.csagroup.org**APPLICABLE REQUIREMENTS**

CSA C22.2 No. 61010-1-12 - Safety requirements for electrical equipment for measurement, control, and laboratory use — Part 1:

General requirements

UL 61010-1, 3rd Edition (May 11, 2012) - UL Standard for Safety Electrical Equipment For Measurement, Control, and Laboratory

Use; Part 1: General Requirements - Third Edition

AS Series Models:

Oxygen Models	Voltage	Frequency	Current (A)
AS-A, AS-B, AS-D, AS-D+, AS-E, AS-G, AS-J, AS-K, AS-L, AS-N, AS-P, AS-Q, AS-R, AS-W, AS-Z	110/120	60	3.0
	240	50/60	1.0
Nitrogen Models	Voltage	Frequency	Current (A)
N2-AS-D+, N2-AS-E, N2-AS-G, N2-AS-J, N2-AS-K, N2-AS-L, N2-AS-N, N2-AS-P, N2-AS-Q, N2-AS-Z	110/120	50/60	3.0
	240	50/60	1.0

Acceptance

The signed below have reviewed this test report and accept the results

APPROVED			
Title	Title		
See Master Control Sign-offs			
Name	Date:	Name	Date:
Title	Title		
Name	Date:	Name	Date:
Title	Title		
Name	Date:	Name	Date:

**Certificate:** 1018431**Master Contract:** 191105**Project:** 80204830**Date Issued:** 2024-05-08

3. Environmental Conditions: Normal: 4 to 40 C, 2000 m max, 0 to 80% rH.

PART B:**Nitrogen generator, fixed, cord-connected**

Model(s)	Voltage (VAC)	Frequency (Hz)	Current (A)
N2-AS-D+, N2-AS-E, N2-AS-G, N2-AS-J, N2-AS-K, N2-AS-L, N2-AS-N, N2-AS-P, N2-AS-Q, N2-AS-Z	110/120	50/60	3.0
	240	50/60	1.0

Notes:

1. The above models are cord connected, Equipment Class I, Pollution Degree 2, Installation Category II.
2. Mode of operation: Continuous.
3. Environmental Conditions: Normal: 4 to 40 C, 2000 m max, 0 to 80% rH.

APPLICABLE REQUIREMENTS

CSA C22.2 No. 61010-1-12 - Safety requirements for electrical equipment for measurement, control, and laboratory use — Part 1: General requirements

UL 61010-1, 3rd Edition (May 11, 2012) - UL Standard for Safety Electrical Equipment For Measurement, Control, and Laboratory Use; Part 1: General Requirements - Third Edition



Certificate: 1018431

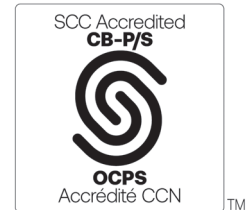
Project: 80204830

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Date Issued: 2024-05-08

Notes:

Products certified under Class(es) C872106, C872186 have been certified under CSA's ISO/IEC 17065 accreditation with the Standards Council of Canada (SCC). www.scc.ca





Supplement to Certificate of Compliance

Certificate: 1018431

Master Contract: 191105

*The products listed, including the latest revision described below,
are eligible to be marked in accordance with the referenced Certificate.*

Product Certification History

Project	Date	Description
80204830	2024-05-08	Update cCSAus report 1018431 (rev 80133090) for the addition of alternate controller to LoCC
80133090	2022-11-28	Update cCSAus report 1018431 (80115139) to include alternate components to CCL, EMI Filter, Terminal Block, VDC Power Supply, Fuses and relays for PLC outputs.
80115139	2022-04-11	Update to cCSAus report 1018431 (70132743) to include alternate MAINS transformer by Hammond; Group F, model # PH250PP to the critical components listing
70132743	2017-09-14	Re-testing to update of report 1018431 (project 2591581) to upgrade to 61010-1 3rd Edition and cover cCSAus Certification of new Nitrogen Concentrator model number series.
2591581	2013-06-24	Address FIR findings of June 8/11, Oct 19/11, & Aug 22/12.
2342553	2011-03-24	Update to C22.2 No. 61010-1-04 and UL 61010-1. Addition of models AS- D+, AS-P and AS-W. Removal of models AS-20, AS-45, AS-80, AS-160, AS-250, AS-450, AS-750, AS-1000, and AS-1250. Evaluation of alternate components. Correction of factory test values.
1577889	2004-07-28	Alternate model designation AS-A, AS-B, AS-D, AS-E, AS-G, AS-J, AS- K, AS-L, AS-N, AS-Q, AS-R, AS-Z, and alternate pressure switch Type 836
1457595	2003-07-31	Addition of 115V isolation transformer A41, controller ZEN 10C2AR, models AS 750, - 1000, and 1250



Descriptive Report

MASTER CONTRACT: 0000191105

REPORT: 1018431

PROJECT: 80204830

EDITION

Edition	Issued On	Project	Location	Prepared By	Authorized By
Edition 1	December 16, 1988	1018431	- Rexdale	John C.G. Marshall, P. Eng.	John C.G. Marshall, P. Eng.
Edition 8	September 14, 2017	70132743	Richmond	Surbhi Seru, EIT	Surbhi Seru, EIT
Edition 9	April 11, 2022	80115139	Toronto	Wan Peng Han	Jean-Philippe Turcot
Edition 10	November 28, 2022	80133090	Toronto	Wan Peng Han	Dimcho Genov, P. Eng
Edition 11	May 8, 2024	80204830	Canada Toronto	Halley McLaren	Halley McLaren

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Attachments- *For CSA Engineering use only*

Att 3 - Schematics – Pages 1 to 13

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Att 5 - N2 Series Device Manual – Pages 1 to 55

Att 6 - IEC 61010-1 3rd Ed Checklist – Pages 1 to 89

PRODUCTS

C872106 ELECTRICAL LABORATORY EQUIPMENT - Electrical Laboratory Equipment

C872186 ELECTRICAL LABORATORY EQUIPMENT - Certified to US Standards

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PART A:

Oxygen separation units, fixed, cord-connected

Model(s)	Voltage (VAC)	Frequency (Hz)	Current (A)
AS-A, AS-B, AS-D, AS-D+, AS-E, AS-G, AS-J, AS-K, AS-L, AS-N, AS-P, AS-Q, AS-R, AS-W, AS-Z	110/120	60	3.0
	240	50/60	1.0

Notes:

1. The above models are cord connected, Equipment Class I, Pollution Degree 2, Installation Category II.
2. Mode of operation: Continuous.
3. Environmental Conditions: Normal: 4 to 40 C, 2000 m max, 0 to 80% rH.

PART B:

Nitrogen generator, fixed, cord-connected

Model(s)	Voltage (VAC)	Frequency (Hz)	Current (A)
N2-AS-D+, N2-AS-E, N2-AS-G, N2-AS-J, N2-AS-K, N2-AS-L, N2-AS-N, N2-AS-P, N2-AS-Q, N2-AS-Z	110/120	50/60	3.0
	240	50/60	1.0

Notes:

1. The above models are cord connected, Equipment Class I, Pollution Degree 2, Installation Category II.
2. Mode of operation: Continuous.
3. Environmental Conditions: Normal: 4 to 40 C, 2000 m max, 0 to 80% rH.

APPLICABLE REQUIREMENTS

Standards Used	Description
CSA C22.2 No. 61010-1-12	Safety requirements for electrical equipment for measurement, control, and laboratory use — Part 1: General requirements
UL 61010-1, 3rd Edition (May 11, 2012)	UL Standard for Safety Electrical Equipment For Measurement, Control, and Laboratory Use; Part 1: General Requirements - Third Edition

MARKINGS

The manufacturer is required to apply the following markings:

- Products shall be marked with the markings specified by the particular product standard.

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- Products certified for Canada shall have all Caution and Warning markings in both English and French.

Additional bilingual markings not covered by the product standard(s) may be required by the Authorities Having Jurisdiction. It is the responsibility of the manufacturer to provide and apply these additional markings, where applicable, in accordance with the requirements of those authorities.

The products listed are eligible to bear the CSA Mark shown with adjacent indicators 'C' and 'US' for Canada and US (indicating that products have been manufactured to the requirements of both Canadian and U.S. Standards) or with adjacent indicator 'US' for US only or without either indicator for Canada only.


Nameplate adhesive label material approval information:

General Data M-714 label: 2 mil matte-chrome, polyester film with permanent emulsion acrylic adhesive and polyester liner. UL approved (MH17205), Accepted for CSA.

The following markings appear on the product:

1. Submitter's identification (company name and/or file number: 191105 and/or registered tradename);
2. Marking on the unit that indicates the manufacturing location, if the equipment is manufactured at more than one factory location;
3. Model designation;
4. Electrical rating;
5. Date of manufacture: Month and year of manufacture or date code. If a serial number is used instead of date of manufacture, a record of serial numbers shall be kept traceable to date of manufacture. (Not related to date of sale);
6. The products listed are eligible to bear the CSA Mark shown with adjacent indicators 'C' and 'US' for Canada and US (indicating that products have been manufactured to the requirements of both Canadian and U.S. Standards) or with adjacent indicator 'US' for US only or without either indicator for Canada

only:  ,or  ,or .

7. Replacement fuse markings; Fuse type(s) and rating(s) (in volts and amperes), adjacent to the fuseholder(s).
8. Protective earthing TERMINAL is identified by the IEC 417 No 5019 symbol  , adjacent to the TERMINAL;
9. The IEC 417 Symbols 5007-a ("I") and 5008-a ("O"), or equivalent, on or adjacent to the principal on/off switch/circuit breaker when serving as a disconnect device; "I" inside a circle for push-push type switches.
10. Neutral is identified by the letter "N" (for units with a non-detachable supply cord).

The following additional markings are also provided:

1. The warning: "DISCONNECT SUPPLY BEFORE SERVICING".

DOCUMENTATION

Equipment is accompanied by the following documentation.

General: Technical specifications, instructions for use and details of where technical assistance may be obtained if required.

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Equipment Ratings: This includes equipment supply, description of I/O connections, duty cycle and operating environmental conditions.

1. Pollution degree: 2.
2. Installation category: II.
3. Altitude: 2000 m.
4. Electrical supply: 240 Va.c., 50/60 Hz; or 110/120 Va.c., 60 Hz.
5. Indoor use statement.
6. Temperature: 4 to 40 °C.
7. Humidity: 0 to 80% rH.
8. Statement advising that mains supply voltage fluctuations are not to exceed 10 percent of the nominal supply voltage.

Equipment Installation: This includes instructions for assembly and mounting, location requirements, details for special services (cooling supply, etc.) as applicable.

Equipment Operation: This includes explanations of operating controls and warning symbols used, and instructions for interconnection, replacement of consumables (e.g. paper) and cleaning as required.

Equipment Maintenance and Service: This includes instructions for preventative maintenance, inspection and cleaning, replacement of parts, etc.

1. Instructions on the following subjects shall be provided for service personnel, as necessary (NOTE: Instructions for service personnel need not be supplied, but should be made available to service personnel).

ALTERATIONS

1. Markings as above.
2. Documentation as above.
3. Fuses (FU1, FU2) of 240V unit have alternate rating as 1.5A (LOCC item# 4.4c), 4.4d), 4.5f), 4.5g).

FACTORY TESTS

The following tests are conducted following production. Factory tests are conducted on 100% of production.

Applicable Factory Test (indicate by X)	Type of Factory Test
X	<p><u>Dielectric Voltage Withstand Test:</u></p> <p>(a) Test voltages are raised to the specified value within 5 sec and maintained for 2 sec.</p> <p>(b) Test voltage is specified below for Installation Category II.</p> <p>(c) The factory test may be done at existing room temperature; equipment is not normally energized.</p>

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Applicable Factory Test (indicate by X)	<u>Type of Factory Test</u>
	<p>Warning: The factory test(s) specified may present a hazard of injury to personnel and/or property and should only be performed by persons knowledgeable of such hazards and under conditions designed to minimize the possibility of injury.</p> <p><u>For units up to 150V:</u> The equipment at the conclusion of manufacture, before shipment, shall withstand without breakdown, the application of 840V ac or 1200V dc between mains TERMINALS and ACCESSIBLE conductive parts.</p> <p><u>For units rated above 150V and up to 300V:</u> The equipment at the conclusion of manufacture, before shipment, shall withstand without breakdown, the application of 1400V ac or 2000V dc between mains TERMINALS and ACCESSIBLE conductive parts.</p>
X	<p><u>Protective Earth Continuity Test:</u></p> <p>Each unit that has a power supply cord with earthing conductor shall be tested to determine that earthing continuity is provided between the PROTECTIVE (earthing) CONDUCTOR TERMINAL and the ACCESSIBLE conductive parts of the unit that are required to be connected to the PROTECTIVE CONDUCTOR TERMINAL.</p> <p>Any indicating device (an ohmmeter, a battery and buzzer combination or the like) can be used to determine compliance.</p>

SPECIAL INSTRUCTIONS FOR FIELD SERVICES

- Component descriptions marked with either the "(INT)" or "(INT*)" identifiers may be substituted with other components providing the requirements specified under the notes in the "Description" are complied with.

COMPONENT SPECIAL PICKUP

- Component descriptions marked with the identifier "(CT)" are subject to annual pickup and Conformity Testing.

DESCRIPTION

Notes:

- Component Substitution
 - Critical components (those identified by mfr name, cat no), which are NOT identified with either "INT" or "INT*" are not eligible for substitution without evaluation and report updating
 - The term "INT" means a "Certified" and/or "Listed" (or a "Recognized" and/or "Accepted") component may be replaced by one "Certified" and/or "Listed" by another certification organization accredited by the appropriate accreditation body or scheme requirements to the correct standard, for the same application; providing the applicable country identifiers are included and requirements in item "d" below are complied with.

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- c) The Term "(INT*)" means a "Recognized" and/or "Accepted" component may be replaced by a component that is CSA Certified. The applicable country identifiers shall be included, the requirements in item "d" below as well as any "conditions of suitability" for the component (as recorded in this descriptive report) shall be complied with;
- d) Components which have been substituted, must be of an equivalent rating, configuration (size, orientation, mounting) and the applicable minimum creepage and clearance distances are to be maintained from live parts to bonded metal parts and secondary parts.
- e) Substitution of a "Certified" and/or "Listed" component with a component that is "Recognized" or "Accepted" is not permitted without evaluation and report updating.
- f) Substitution of a "Recognized" and/or "Accepted" component by one that is not CSA Certified is not permitted without a proper evaluation as well as a report update because the Conditions of Acceptance of the original component may be different than the Conditions of Acceptance of the substitute component.

General: These are cord connected, oxygen separation units and nitrogen concentration units. All models are essentially similar in construction (such as with or without decorative enclosure which contain no electrical parts), and vary in size of enclosure, size of molecular sieve beds and size of valves.

The ground-bond means is established as follows: The earthing conductor of the supply cord is provided with a Certified/Recognized ring type pressure connector, which is secured to the metallic enclosure by dedicated, No. 6 screw stud, star toothed washer and nut. The grounding section of the terminal block is connected by a separate 18AWG conductor, with a Certified/Recognized ring type pressure connector, which is attached to the stud with a star toothed washer and nut.

1. Class of Equipment: **I**
2. Pollution Degree: 2.
3. Degree of Mobility: Fixed.
4. Environmental Conditions: Standard.
5. Operating Conditions: Continuous.
6. Connection to Supply Mains: Non-detachable cord connected.
7. Operating Temperature: 4 to 40 °C
8. Dimensions (L x W x H): 229 x 295 x 559 cm / 90 x 116 x 220 in (max)
9. Weight: 8,826.9 kg / 19,460 lbs (max)

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LIST OF SAFETY CRITICAL COMPONENTS:

Unique component reference or location	Application / function	Manufacturer / trademark	Type / model	Technical data	Standard	Mark(s) of conformity evidence of acceptance
1	Main Enclosure	Hoffman Enclosures Inc	Cat No: CSD16208/SPL	Material: Min 1/16 in thick painted sheet steel. Dimensions: AS-A: 11 in by 30-3/4 in by 5 in AS-B: 14-1/8 in by 34 in by 5 in AS-D: 16-1/2 in by 34-1/4 in by 5-1/2 in AS-D+, AS-E, AS-G, AS-J, AS-K, AS-L, AS-N, AS-P, AS-Q, AS-R, AS-W, AS-Z: 20 in by 16 in by 9 in Cover: Same material secured by draw-pull latches and by screws.	CSA61010-1 UL61010-1	Accepted

Additional information:

The ground-bond means is established as follows: The earthing conductor of the supply cord is provided with a Certified/Recognized ring type pressure connector, which is secured to the metallic enclosure by dedicated, No. 6 screw stud, star toothed washer and nut. The grounding section of the terminal block is connected by a separate 18AWG conductor, with a Certified/Recognized ring type pressure connector, which is attached to the stud with a star toothed washer and nut.

2. Absorber Vessels: (Typically two vessels are provided per unit).

Copies of the tank drawings are attached to the engineering file copy of this report.

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Unique component reference or location	Application / function	Manufacturer / trademark	Type / model	Technical data	Standard	Mark(s) of conformity evidence of acceptance
2.1	Absorber Vessel for model: AS-A (INT)	Tri-Metal Industries	Cat No: A033187-2	Material: Cold rolled steel Dimensions: 4 in OD by 56 in long; 10 Ga head, 0.083 in thick shell. Working Pressure: 100 PSI	CSA61010-1 UL61010-1	Accepted
2.2	Absorber Vessel for model: AS-B (INT)	Tri-Metal Industries	Drawing No: A033187	Material: Cold rolled steel Dimensions: 6 in OD by 57 in long; 12 Ga head, 0.120 in thick shell. Working Pressure: 100 PSI	CSA61010-1 UL61010-1	Accepted
2.3	Absorber Vessel for model: AS-D (INT)	Steel Fab	Drawing No: A11752 L & R	Material: SA 414-G Carbon Steel Dimensions: 8 in OD by 57 in long; 0.094 in thick head and shell Capacity: 11.4 gallons Working Pressure: 200 PSI, "U" Stamped	CSA61010-1 UL61010-1	Accepted

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Unique component reference or location	Application / function	Manufacturer / trademark	Type / model	Technical data	Standard	Mark(s) of conformity evidence of acceptance
2.3.a	Alternative Absorber Vessel for model: AS-D (INT)	Brunner Engineering	Drawing No: 30-5310	Material: Cold rolled steel. Dimensions: 8 in OD by 54 in long; 0.094 in thick head and shell. Capacity: 11.2 gallons Working Pressure: 100 PSI	CSA61010-1 UL61010-1	Accepted
2.4	Absorber Vessel for model: AS-D+ (BE168) (INT)	Steel Fab	Drawing No: A12749	Material: SA 414-G Carbon Steel Dimensions: 8 in OD by 58 in long; 0.094 in thick head and shell Capacity: 11.7 gallons Working Pressure: 125 PSI, "U" Stamped	CSA61010-1 UL61010-1	Accepted
2.5	Absorber Vessel for model: AS-E (INT)	Steel Fab	Drawing No.: A11751	Material: SA 414-G Carbon Steel Dimensions: 12 in OD by 56 in long; 0.094 in thick head and shell. Capacity: 25.9 gallons Working Pressure: 200 PSI	CSA61010-1 UL61010-1	Accepted

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Unique component reference or location	Application / function	Manufacturer / trademark	Type / model	Technical data	Standard	Mark(s) of conformity evidence of acceptance
2.5.a	Alternative Absorber Vessel for model: AS-E (INT)	Brunner Engineering	Drawing No: 30-6613.	Material: Cold rolled steel. Dimensions: 12 in OD by 56 in long; 0.094 in thick head and shell. Capacity: 26.2 gallons Working Pressure: 100 PSI	CSA61010-1 UL61010-1	Accepted
2.6	Absorber Vessel for model: AS-G (INT)	Steel Fab	Drawing No.: A11837	Material: SA414-G Carbon Steel Dimensions: 14 in OD by 65 in long; 0.094 in thick head and shell Capacity: 40 gallons Working Pressure: 200 PSI, "U" Stamped	CSA61010-1 UL61010-1	Accepted
2.6.a	Alternative Absorber Vessel for model: AS-G (INT)	Brunner Engineering	Drawing No: 30-5308.	Material: Cold rolled steel. Dimensions: 14 in OD by 65 in long; 0.094 in thick head and shell. Capacity: 41.4 gallons Working Pressure: 100 PSI	CSA61010-1 UL61010-1	Accepted

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Unique component reference or location	Application / function	Manufacturer / trademark	Type / model	Technical data	Standard	Mark(s) of conformity evidence of acceptance
2.7	Absorber Vessel for model: AS-J	Steel Fab	Drawing No.: A11838	Material: SA414-G Carbon Steel Dimensions: 20 in OD by 66 in long; 0.109 in min. heads and 0.159 in nom. shell Capacity: 80 gallons Working Pressure: 200 PSI, "U" Stamped	CSA61010-1 UL61010-1	Accepted
2.7.a	Alternative Absorber Vessel for model: AS-J (INT)	Brunner Engineering	Drawing No: 30-5019.	Material: Cold rolled steel. Dimensions: 20 in OD by 68 in long; 0.094 in thick head and shell. Capacity: 86.8 gallons Working Pressure: 100 PSI	CSA61010-1 UL61010-1	Accepted

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Unique component reference or location	Application / function	Manufacturer / trademark	Type / model	Technical data	Standard	Mark(s) of conformity evidence of acceptance
2.8	Absorber Vessel for model: AS-K (INT)	Steel Fab	Drawing No.: C102884 L & R	Material: SA414-G Carbon Steel Dimensions: 24 in OD by 72-3/16 in long; 0.131 in min. heads, 0.159 in nom. shell Capacity: 110 gallons Working Pressure: 200 PSI, "U" Stamped	CSA61010-1 UL61010-1	Accepted
2.9	Absorber Vessel for model: AS-L (INT)	Steel Fab	Drawing . No.: C102971 L & R	Material: SA516-70 Heads; SA414-G Shell Dimensions: 26 in OD by 80 in long; 0.133 in min. heads, 0.151 in nom. shell Capacity: 172 gallons Working Pressure: 125 PSI, "U" Stamped	CSA61010-1 UL61010-1	Accepted

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Unique component reference or location	Application / function	Manufacturer / trademark	Type / model	Technical data	Standard	Mark(s) of conformity evidence of acceptance
2.10	Absorber Vessel for model: AS-N (BE027) (INT)	Steel Fab	Drawing . No.: C101993 L & R	Material: SA414-G Carbon Steel Dimensions: 30 in OD by 91 in long; 0.177 in head min thick; 0.142 in shell min thick Capacity: 240 gallons Working Pressure: 125 PSI, "U" Stamped	CSA61010-1 UL61010-1	Accepted
2.11	Absorber Vessel for model: AS-P (BE029) (INT)	Steel Fab	Drawing . No.: C101829 L & R	Material: SA414-G Carbon Steel Dimensions: 36 in OD by 92 in long; 0.251 in head min thick; 0.173 in shell min thick Capacity: 379 gallons Working Pressure: 125 PSI, "U" Stamped	CSA61010-1 UL61010-1	Accepted

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Unique component reference or location	Application / function	Manufacturer / trademark	Type / model	Technical data	Standard	Mark(s) of conformity evidence of acceptance
2.12	Absorber Vessel for model: AS-Q (BE166) (INT)	Steel Fab	Drawing . No.: C104244 L & R	Material: SA414-G Carbon Steel Dimensions: 36 in OD by 117 in long; 0.187 in head min thick; 0.173 in shell min thick Capacity: 480 gallons Working Pressure: 125 PSI, "U" Stamped	CSA61010-1 UL61010-1	Accepted
2.13	Absorber Vessel for model: AS-R (BE099) (INT)	Steel Fab	Drawing . No.: C102193 L & R	Material: SA414-G Carbon Steel Dimensions: 42 in OD by 128 in long; 0.226 in head min thick; 0.214 in shell min thick Capacity: 713 gallons Working Pressure: 125 PSI, "U" Stamped	CSA61010-1 UL61010-1	Accepted

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Unique component reference or location	Application / function	Manufacturer / trademark	Type / model	Technical data	Standard	Mark(s) of conformity evidence of acceptance
2.14	Absorber Vessel for model: AS-W (BE157) (INT)	Steel Fab	Drawing . No.: C103534 L & R	Material: SA414-G Carbon Steel Dimensions: 42 in OD by 165 in long; 0.226 in head min thick; 0.214 in shell min thick Capacity: 927 gallons Working Pressure: 125 PSI, "U" Stamped	CSA61010-1 UL61010-1	Accepted
2.15	Absorber Vessel for model: AS-Z (BE199) (INT)	Steel Fab	Drawing . No.: C104223 L & R	Material: SA414-G Carbon Steel Dimensions: 44 in OD by 190 in long; 0.188 in head min thick; 0.250 in shell min thick Capacity: 1133 gallons Working Pressure: 125 PSI, "U" Stamped	CSA61010-1 UL61010-1	Accepted

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3	Power Supply Cord (INT)	Mega Electronics	SJTOW N/14750 H05VV-F IEC S0227	18-3 AWG Rating: 60 °C, 300 V Attachment Plug: Molded-on parallel blade grounding type. Strain Relief: Certified. Heyco Cat No SR-7K-2, mounted in a double "D" shaped hole in the enclosure to prevent rotation. Alternate Strain Relief: Certified. Appleton Cat No CG-1850.	UL 817 CSA No.21	UR E217655
4. Over-current Protection Devices						
4.1	Fuse Holder For use with model(s) AS-A, AS-B, AS-D	Littelfuse	Cat No: 342858	Rating: 15 A, 250 Va.c. Mounting: Stem mounted in "D" shaped hole in enclosure.	UL 4248-1 CSA 4248.1	UR E14721 CSA File 7316

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4.1.a	Alternative Fuse Holder For use with model(s) AS-A, AS-B, AS-D	Bussmann	Cat No: HTB-44M	Rating: 16 A, 250 Va.c. Mounting: Stem mounted in "D" shaped hole in enclosure	UL 4248-1 CSA 4248.1	UR E14853 CSA File 47235
4.2	Fuse Holder For use with model(s) AS-D+, AS-E, AS-G, AS-J, AS-K, AS-L, AS-N, AS-P, AS-Q, AS-R, AS-W, AS-Z	Allen Bradley	Cat No: 1492-H6	Rating: Max. 15A, 300 Va.c., 300 Vd.c., or 500 Va.c., 500 Vd.c. Mounting: Din Rail	UL 1059 CSA No.158	UR E40735
4.2.a	Alternate Fuse Holder For use with model(s) AS-D+, AS-E, AS-G, AS-J, AS-K, AS-L, AS-N, AS-P, AS-Q, AS-R, AS-W, AS-Z	Bussmann	Cat No: HTB-461	Rating: 20A (UL) or 16A (CSA), 250 V. Mounting: Din Rail	UL 4248-1 CSA 4248.1	UR E14853 CSA File 47235
4.2.b	Alternate Fuse Holder For use with model(s) N2-AS-D+, N2-AS-E, N2-AS-G, N2-AS-J, N2-AS-K, N2-AS-L, N2-AS-N, N2-AS-P, N2-AS-Q, N2-AS-R, N2-AS-Z	Allen Bradley	Cat No: 1492-FB	Rating: 30A, 600 Vac Mounting: DIN Rail	UL 512 CSA No. 39	UR E34648
4.3	120V MAINS Fuse (FU1) Mains protection (3A) in models rated: 110/120 Va.c. Description: For use with model(s) AS-A, AS-B, AS-D, AS-D+, AS-E, AS-G, AS-J, AS-K, AS-L, AS-N, AS-P, AS-Q, AS-R, AS-W, AS-Z	Littlefuse	Cat No: 312003	Rating: 3 A, 250 V Type: 1/4 by 1-1/4 in glass cartridge fuse	UL 248-1 CSA No.248-1	UL E10480

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4.3.a	Alternative 120V MAINS Fuse (FU1): Note: Mains protection (3A) in models rated: 110/120 V.a.c. Description: For use with model(s) AS-A, AS-B, AS-D, AS-D+, AS-E, AS-G, AS-J, AS-K, AS-L, AS-N, AS-P, AS-Q, AS-R, AS-W, AS-Z	Bussmann	Cat No: AGC-3	Rating: 3 A, 250 V Type: 1/4 by 1-1/4 in glass cartridge fuse	UL 248-1 CSA No.248-1	UR E19180
4.3.b	Alternative 120V MAINS Fuse (FU1): Note: Mains protection (1.5A) in models rated: 110/120 V.a.c. Description: For use with model(s) N2-AS-D+, N2-AS-E, N2-AS-G, N2-AS-J, N2-AS-K, N2-AS-L, N2-AS-N, N2-AS-P, N2-AS-Q, N2-AS-R, N2-AS-Z	Bussmann	Cat No: FNQ-R-1-1/2	Rating: 1.5 A, 600 Vac Type: CC type	UL 248-4	UL E4273 CSA File 53787
4.3.c	Alternative 120V MAINS Circuit Breaker (CR1): Note: Mains protection (3A) in models rated: 110/120 V.a.c. Description: For use with model(s) AS-D+, AS-E, AS-G, AS-J, AS-K, AS-L, AS-N, AS-P, AS-Q, AS-R, AS-W, AS-Z	Allen Bradley	Cat No: 1492-SP1C030	Rating: 3.0 A, 277 V.a.c., 48 V.d.c., -5 to 40 °C	UL 1077 CSA C22.2 No. 235	UR E65138

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4.3.d	Alternative 120V MAINS Fuse (FU1): Note: Mains protection (3.0A) in models rated: 110/120 V.a.c. Description: For use with model(s) AS-D+, AS-E, AS-G, AS-J, AS-K, AS-L, AS-N, AS-P, AS-Q, AS-R, AS-W, AS-Z, N2-AS-D+, N2-AS-E, N2-AS-G, N2-AS-J, N2-AS-K, N2-AS-L, N2-AS-N, N2-AS-P, N2-AS-Q, N2-AS-R, N2-ASZ	Bussmann	FNQ-R-3	Rating: 3.0A 600Vac, IR 200kA Vac Class CC, Time-delay, Dimension: 38mm x 10mm(dia)	UL 248 CSA No.248	cURus E4273
4.3.e	Alternative 120V MAINS Fuse (FU1): Note: Mains protection (3.0A) in models rated: 110/120 V.a.c. Description: For use with model(s) AS-D+, AS-E, AS-G, AS-J, AS-K, AS-L, AS-N, AS-P, AS-Q, AS-R, AS-W, AS-Z, N2-AS-D+, N2-AS-E, N2-AS-G, N2-AS-J, N2-AS-K, N2-AS-L, N2-AS-N, N2-AS-P, N2-AS-Q, N2-AS-R, N2-ASZ	Bussmann	LP-CC-3	Rating: 3.0A 600Vac, IR 200kA Vac Class CC, Time-delay, Dimension: 38mm x 10mm(dia)	UL 248 CSA No.248	cURus E4273
4.4	240V MAINS Fuse (FU1): Note: Mains protection (1A) in models rated: 240 V.a.c. Description: For use with model(s) AS-D+, AS-E, AS-G, AS-J, AS-K, AS-L, AS-N, AS-P, AS-Q, AS-R, AS-W, AS-Z	Bussmann	Cat No: AGC-1	Rating: 1 A, 250V Type: 1/4 by 1-1/4 in glass cartridge fuse	UL 248-1 CSA No.248-1	UR E19180

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4.4.a	Alternative 240V MAINS Fuse (FU1): Note: Mains protection (1A) in models rated: 240 Va.c. Description: For use with model(s) N2-AS-D+, N2-AS-E, N2-AS-G, N2-AS-J, N2-AS-K, N2-AS-L, N2-AS-N, N2-AS-P, N2-AS-Q, N2-AS-R, N2-AS-Z	Bussmann	Cat No: FNQ-R-1	Rating: 1 A, 600 Vac Type: CC type	UL 248-1 CSA No.248-1	UR E19180
4.4.b	Alternative 240V MAINS Fuse (FU1): Note: Mains protection (1A) in models rated: 240 Va.c. Description: For use with model(s) AS-D+, AS-E, AS-G, AS-J, AS-K, AS-L, AS-N, AS-P, AS-Q, AS-R, AS-W, AS-Z	Allen Bradley	Cat No: 1492-SP1C010	Rating: 1.0 A, 277 Va.c., 48 Vd.c., -5 to 40 °C	UL 1077 CSA C22.2 No. 235	UR E65138
4.4.c	Alternative 240V MAINS Fuse (FU1): Note: Mains protection (1.5A) in models rated: 240Va.c. Description: For use with model(s) AS-D+, AS-E, AS-G, AS-J, AS-K, AS-L, AS-N, AS-P, AS-Q, AS-R, AS-W, AS-Z, N2-AS-D+, N2-AS-E, N2-AS-G, N2-AS-J, N2-AS-K, N2-AS-L, N2-AS-N, N2-AS-P, N2-AS-Q, N2-AS-R, N2-ASZ	Bussmann	FNQ-R-1-1/2	Rating: 1.5A 600Vac, IR 200kA Vac Class CC, Time-delay, Dimension: 38mm x 10mm(dia)	UL 248 CSA No.248	cURus E4273

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4.4.d	Alternative 240V MAINS Fuse (FU1): Note: Mains protection (1.5A) in models rated: 240Va.c. Description: For use with model(s) AS-D+, AS-E, AS-G, AS-J, AS-K, AS-L, AS-N, AS-P, AS-Q, AS-R, AS-W, AS-Z, N2-AS-D+, N2-AS-E, N2-AS-G, N2-AS-J, N2-AS-K, N2-AS-L, N2-AS-N, N2-AS-P, N2-AS-Q, N2-AS-R, N2-ASZ	Bussmann	LP-CC-1-1/2	<u>Rating:</u> 1.5A 600Vac, IR 200kA Vac Class CC, Time-delay, Dimension: 38mm x 10mm(dia)	UL 248 CSA No.248	cURus E4273
4.5	Fuse (FU2) Description: For use with model(s) AS-D+, AS-E, AS-G, AS-J, AS-K, AS-L, AS-N, AS-P, AS-Q, AS-R, AS-W, AS-Z	Bussmann	Cat No: AGC-3	<u>Rating:</u> 3A, 250V. <u>Type:</u> 1/4 by 1-1/4 in glass cartridge fuse.	UL 248-1 CSA No.248-1	UR E19180
4.5.a	Alternative Circuit Breaker (CR2): Description: For use with model(s) AS-D+, AS-E, AS-G, AS-J, AS-K, AS-L, AS-N, AS-P, AS-Q, AS-R, AS-W, AS-Z	Allen Bradley	Cat No: 1492-SP1C030	<u>Rating:</u> 3.0 A, 277 Va.c., 48Vd.c., -5 to 40 °C	UL 1077 CSA C22.2 No. 235	UR E65138
4.5.b	Alternative Circuit Breaker (CR2): Description: For use with model(s) AS-D+, AS-E, AS-G, AS-J, AS-K, AS-L, AS-N, AS-P, AS-Q, AS-R, AS-W, AS-Z	Allen Bradley	Cat No: 1492-H	<u>Rating:</u> 3.0 A, 500 Va.c., 48 Vd.c., -5 to 40 °C	UL 60947 CSA 60947	UR E40735
4.5.c	Alternative Fuse (FU2): Description: For use with model(s) AS-D+, AS-E, AS-G, AS-J, AS-K, AS-L, AS-N, AS-P, AS-Q, AS-R, AS-W, AS-Z	Bussmann	Cat No: AGC-3	<u>Rating:</u> 3 A, 250 V. <u>Type:</u> 1/4 by 1-1/4 in glass cartridge fuse	UL 248-1 CSA No.248-1	UR E19180

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4.5.d	Alternative 120V MAINS Fuse (FU2): Note: Mains protection (3.0A) in Schneider Electric PLC panels rated: 110/120 V.a.c. Description: For use with model(s) AS-D+, AS-E, AS-G, AS-J, AS-K, AS-L, AS-N, AS-P, AS-Q, AS-R, AS-W, AS-Z, N2-AS-D+, N2-AS-E, N2-AS-G, N2-AS-J, N2-AS-K, N2-AS-L, N2-AS-N, N2-AS-P, N2-AS-Q, N2-AS-R, N2-ASZ	Bussmann	FNQ-R-3	<u>Rating:</u> 3.0A 600Vac, IR 200kA Vac Class CC, Time-delay, Dimension: 38mm x 10mm(dia)	UL 248 CSA No.248	cURus E4273
4.5.e	Alternative 120V MAINS Fuse (FU2): Note: Mains protection (3.0A) in Schneider Electric PLC panels rated: 110/120 V.a.c. Description: For use with model(s) AS-D+, AS-E, AS-G, AS-J, AS-K, AS-L, AS-N, AS-P, AS-Q, AS-R, AS-W, AS-Z, N2-AS-D+, N2-AS-E, N2-AS-G, N2-AS-J, N2-AS-K, N2-AS-L, N2-AS-N, N2-AS-P, N2-AS-Q, N2-AS-R, N2-ASZ	Bussmann	LP-CC-3	<u>Rating:</u> 3.0A 600Vac, IR 200kA Vac Class CC, Time-delay, Dimension: 38mm x 10mm(dia)	UL 248 CSA No.248	cURus E4273

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4.5.f	Alternative 240 MAINS Fuse (FU2): Note: Mains protection (1.5A) in Schneider Electric PLC panels rated: 240V.a.c. Description: For use with model(s) AS-D+, AS-E, AS-G, AS-J, AS-K, AS-L, AS-N, AS-P, AS-Q, AS-R, AS-W, AS-Z, N2-AS-D+, N2-AS-E, N2-AS-G, N2-AS-J, N2-AS-K, N2-AS-L, N2-AS-N, N2-AS-P, N2-AS-Q, N2-AS-R, N2-ASZ	Bussmann	FNQ-R-1-1/2	<u>Rating:</u> 1.5A 600Vac, IR 200kA Vac Class CC, Time-delay, Dimension: 38mm x 10mm(dia)	UL 248 CSA No.248	cURus E4273
4.5.g	Alternative 240 MAINS Fuse (FU2): Note: Mains protection (1.5A) in Schneider Electric PLC panels rated: 240V.a.c. Description: For use with model(s) AS-D+, AS-E, AS-G, AS-J, AS-K, AS-L, AS-N, AS-P, AS-Q, AS-R, AS-W, AS-Z, N2-AS-D+, N2-AS-E, N2-AS-G, N2-AS-J, N2-AS-K, N2-AS-L, N2-AS-N, N2-AS-P, N2-AS-Q, N2-AS-R, N2-ASZ	Bussmann	LP-CC-1-1/2	<u>Rating:</u> 1.5A 600Vac, IR 200kA Vac Class CC, Time-delay, Dimension: 38mm x 10mm(dia)	UL 248 CSA No.248	cURus E4273
4.6	Fuse (FU3): Description: For use with model(s) AS-D+, AS-E, AS-G, AS-J, AS-K, AS-L, AS-N, AS-P, AS-Q, AS-R, AS-W, AS-Z	Littlefuse	Cat No: 312002	Rating: 2 A, 250 V. Type: 1/4 by 1-1/4 in glass cartridge fuse	UL 248-1 CSA No.248-1	UL E10480

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4.6.a.	Alternative Fuse (FU3): Description: For use with model(s) AS-D+, AS-E, AS-G, AS-J, AS-K, AS-L, AS-N, AS-P, AS-Q, AS-R, AS-W, AS-Z	Bussmann	Cat No: AGC-2	Rating: 2 A, 250 V. Type: 1/4 by 1-1/4 in glass cartridge fuse	UL 248-1 CSA No.248-1	UR E19180
4.6.b	Alternative Circuit Breaker (CR3): Description: For use with model(s) AS-D+, AS-E, AS-G, AS-J, AS-K, AS-L, AS-N, AS-P, AS-Q, AS-R, AS-W, AS-Z	Allen Bradley	Cat No: 1492-SP1C020	Rating: 2.0 A, 277 Va.c., 48 Vd.c., -5 to 40 °C	UL 1077 CSA C22.2 No. 235	UR E65138
4.6.c	Alternative Circuit Breaker (CR3): Description: For use with model(s) AS-D+, AS-E, AS-G, AS-J, AS-K, AS-L, AS-N, AS-P, AS-Q, AS-R, AS-W, AS-Z	Allen Bradley	Cat No: 1492-H	Rating: 3.0 A, 500 Va.c., 48 Vd.c., -5 to 40 °C	UL 60947 CSA 60947	UR E40735
4.6.d	Alternative Fuse (FU3): Description: For use with model(s) AS-D+, AS-E, AS-G, AS-J, AS-K, AS-L, AS-N, AS-P, AS-Q, AS-R, AS-W, AS-Z	Bussmann	Cat No: AGC-3	Rating: 3A, 250V. Type: 1/4 by 1-1/4 in glass cartridge fuse.	UL 248-1 CSA No.248-1	UR E19180
4.7	Fuse (FU4): Note: Over-current protection (0.5A) for Controller (see item 9). Description: For use with model(s) AS-D+, AS-E, AS-G, AS-J, AS-K, AS-L, AS-N, AS-P, AS-Q, AS-R, AS-W, AS-Z	Littlefuse	Cat No: 312.500	Rating: 0.5 A, 250 V Type: 1/4 by 1-1/4 in glass cartridge	UL 248-1 CSA No.248-1	UL E10480

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4.7.a	Alternative Fuse (FU4): Note: Over-current protection (0.5A) for Controller (see item 9). Description: For use with model(s) AS-D+, AS-E, AS-G, AS-J, AS-K, AS-L, AS-N, AS-P, AS-Q, AS-R, AS-W, AS-Z	Bussmann	Cat No: AGC-1/2	Rating: 0.5 A, 250 V Type: 1/4 by 1-1/4 in glass cartridge fuse	UL 248-1 CSA No.248-1	UR E19180
4.7.b	Alternative Circuit Breaker (CR4): Note: Over-current protection (0.5A) for Controller (see item 9). Description: For use with model(s) AS-D+, AS-E, AS-G, AS-J, AS-K, AS-L, AS-N, AS-P, AS-Q, AS-R, AS-W, AS-Z	Allen Bradley	Cat No: 1492-SP1C005	Rating: 0.5 A, 277 V a.c., 48 V d.c., -5 to 40 °C	UL 1077 CSA C22.2 No. 235	UR E65138
4.8	Fuse (FU5): Note: Over-current protection (0.5A) for HMI (see item 11.1). Description: For use with model(s) AS-D+, AS-E, AS-G, AS-J, AS-K, AS-L, AS-N, AS-P, AS-Q, AS-R, AS-W, AS-Z	Littlefuse	Cat No: 312.500	Rating: 0.5 A, 250 V Type: 1/4 by 1-1/4 in glass cartridge	UL 248-1 CSA No.248-1	UL E10480
4.8.a	Alternative Fuse (FU5): Note: Over-current protection (0.5A) for HMI (see item 11.1). Description: For use with model(s) AS-D+, AS-E, AS-G, AS-J, AS-K, AS-L, AS-N, AS-P, AS-Q, AS-R, AS-W, AS-Z	Bussmann	Cat No: AGC-1/2	Rating: 0.5 A, 250 V Type: 1/4 by 1-1/4 in glass cartridge fuse	UL 248-1 CSA No.248-1	UR E19180

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4.8.b	Alternative Circuit Breaker (CR5): Note: Over-current protection (0.5A) for HMI (see item 11.1). Description: For use with model(s) AS-D+, AS-E, AS-G, AS-J, AS-K, AS-L, AS-N, AS-P, AS-Q, AS-R, AS-W, AS-Z	Allen Bradley	Cat No: 1492-SP1C005	Rating: 0.5 A, 277 Va.c., 48 Vd.c., -5 to 40 °C	UL 1077 CSA C22.2 No. 235	cURus E65138
5	EMI Filter (EMI1)	Delta	Cat No: 02DBAG5	Rating: 115/250V, 50/60Hz, 2A Mounting: Secured by screws inside enclosure	UL 1283 CSA No.8	cURus E79109
5.a	EMI Filter (EMI1)	Corcom	Cat No: 2VB1	Rating: 2 A, 250 V, 50-60 Hz, -10 to 40 °C Mounting: Secured by screws inside enclosure	UL 1283 CSA No.8	cURus E48570
5.b	EMI Filter (EMI1)	Corcom	Cat No: 3VB1	Rating: 3A, 250 V, 50-60 Hz, -10 to 40 °C Mounting: Secured by screws inside enclosure	UL 1283 CSA No.8	cURus E48570

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6	MAINS Transformer (TR1): Description: For use with model(s) AS-D+, AS-E, AS-G, AS-J, AS-K, AS-L, AS-N, AS-P, AS-Q, AS-R, AS-W, AS-Z	Signal Transformer Co	Type: A41-175-230	Rating: Pri (dual) 115/230 V, 1.52/0.76 A, 50/60 Hz, 175 VA, Sec (parallel) 115 V, 1.52 A Insulation Class: Class F (155°C)	CSA-C22.2 No.66.1 UL506	CSA (221070), cURus (E63829)
6.a	Alternative MAINS Transformer (TR1): Description: For use with model(s) AS-D+, AS-E, AS-G, AS-J, AS-K, AS-L, AS-N, AS-P, AS-Q, AS-R, AS-W, AS-Z	Hammond Manufacturing	Type: 185G230	Rating: Pri (dual) 115/230 V, 50/60 Hz, 175 VA, Sec (parallel) 115 V, 1.52 A Insulation: Class F (155 °C)	UL 506 CSA-C22.2 No.66.1	cURus (E207860)
6.b	Alternative MAINS Transformer (TR1): Description: For use with model(s) AS-D+, AS-E, AS-G, AS-J, AS-K, AS-L, AS-N, AS-P, AS-Q, AS-R, AS-W, AS-Z	Hammond Power Solutions Inc.	Type: 194263	Rating: Pri (dual) 115/230 V, 50/60 Hz, 1.52/0.76 A, 175 VA, Sec (parallel) 115 V, 175VA, 1.52 A Insulation: Class F (155 °C)	UL5085-1 UL5085-2 CSA No. 66.1 CSA No. 66.2	cULus E50394
6.c	Alternate Mains Transformer (TR1)	Hammond Power Solutions Inc.	PH250PP	Rating: Primary: 120/240V 250VA 50/60Hz Secondary: 120/240V 250VA Isolation Class B	UL5085-1 UL5085-2 CSA No. 66.1 CSA No. 66.2	cULus E50394

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7	Optional Transformer (TR2): Note: For use with Optional Alarm Board (see item 20). Description: For use with model(s) AS-D+, AS-E, AS-G, AS-J, AS-K, AS-L, AS-N, AS-P, AS-Q, AS-R, AS-W, AS-Z	ATC Frost Magnetics / Standex	Type: FT2432	Rating: Pri 115 V, 50/60 Hz, Sec (dual) 5/10 V, 1.2/0.1A Insulation: Class B (130 °C), Thermal Fuse: 115 °C	UL506	UR E105782
8	Controller (INT)	Omron Corp	Type: ZEN-10C2AR-A	Rating: 100 – 240 Va.c., 50/60 Hz, 30 VA max, -25 to 55 °C	UL 508 CSA No. 142	UR E95399
8.a	Alternative Controller (INT)	Omron Corp	Type: ZEN-20C2AR-A-VZ	Rating: 100 – 240 Va.c., 50/60 Hz, 23 VA max, -25 to 55 °C	UL 508 CSA No. 142	UR E95399
8.b	Alternative Controller (INT)	Allen Bradley	Type: Micrologix 1200	Rating: 85 – 265 Va.c., 47-63 Hz, 70 VA max, 0 to 55 °C	CSA C22.2 No. 142 Class I Div2 UL 508	UR
8.c	Alternative Controller (INT)	Omron Corp	Type: ZEN-20C2AR-A-V2	Rating: 100 – 240 Va.c., 50/60 Hz, 7 VA max (for 100 Va.c.), 10 VA max (for 240 Va.c.), -25 to 55 °C	UL 508 CSA No. 142	UR E95399
8.d	Alternative Controller (INT)	Schneider Electric	Type: Modicon M221	Rating: 85-264 Vac, 50/60Hz, 58VA max, -10 to 55 °C	UL 508	UR E468248

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8.e	Alternative Controller (INT) Description: For use in model(s) AS-B, AS-D, AS-D+, AS-E, AS-G, AS-J, AS-K, AS-L, AS-N & AS-P	Schneider Electric	Type: Zelio SR2 E201FU	Rating: 85-264VAC, 50/60Hz, 11 VA max, -20 to 40 °C	UL 508 CSA No. 142	cULus E316433
9. Manual Interface Components						
9.1	Printed Wiring Board: Description: For use in model(s) AS-A, AS-B, AS-D	4Front Solutions LLC	CB144-1	Material: 1/16 in thick fiberglass epoxy board Dimensions: 4 in by 4 in. Function: Mounts components in low and extra-low voltage circuits. Spacings: 0 to 30V: 0.04mm maintained in transient limited circuits per C22.2 No 142-M1987. 120V: 1.05mm maintained per C22.2 No 142-M1987.	UL94	UR
9.2	Printed Wiring Board Connectors: (INT) Description: For use in model(s) AS-A, AS-B, AS-D	Panduit	Cat No: CE156F22-15 and MLSR156-15.	CONN RCPT 15P IDC 22AWG TIN-LEAD	UL94	UR

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Unique component reference or location	Application / function	Manufacturer / trademark	Type / model	Technical data	Standard	Mark(s) of conformity evidence of acceptance
9.3.1	On/Off Switch Description: For use in model(s) AS-A, AS-B, AS-D	Carling technologies	Cat No: LT1GK61	Rating: 6 A, 125 Va.c. Type: Panel mounted, lighted DPST rocker switch. Mounting: Secured in enclosure opening.	UL 1054 UL 61058-1 CSA No.55 CSA 61058-1	UR E7560
9.3.2	On/Off Switch Description: For use in model(s) AS-D+, AS-E, AS-G, AS-J, AS-K, AS-L, AS-N, AS-P, AS-Q, AS-R, AS-W, AS-Z	Idec Corp	Cat No: ASLD-200 operator, BST-010, or BST-001 contact block.	Rating: 6 A, 120 Va.c. Type: Panel mounted, lighted, SPST rotary switch, consisting of operator and contact block.	UL508 CSA C22-2 No.14	UR E68961
9.3.3	On/Off Switch Description: For use in model(s) AS-D+, AS-E, AS-G, AS-J, AS-K, AS-L, AS-N, AS-P, AS-Q, AS-R, AS-W, AS-Z	Allen Bradley	Cat No: 800FM series	Rating: 10 A, 690 V, -25 to 70°C Type: Panel mounted, lighted, SPST rotary switch, consisting of operator and contact block.	UL 508A CSA C22.2 No. 14	UR E14840
9.4.1	Auto/Manual Switch: Description: For use in model(s) AS-A, AS-B, AS-D	Carling technologies.	Cat No: LTILA61	Rating: 6 A, 120 Va.c. Type: Panel mounted, lighted SPST rocker switch. Mounted: Secured in enclosure opening.	UL 1054 UL 61058-1 CSA No.55 CSA 61058-1	UR E7560

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Unique component reference or location	Application / function	Manufacturer / trademark	Type / model	Technical data	Standard	Mark(s) of conformity evidence of acceptance
9.4.2	Auto/Manual Switch: cULus Description: For use in model(s) AS-D+, AS-E, AS-G, AS-J, AS-K, AS-L, AS-N, AS-P, AS-Q, AS-R, AS-W, AS-Z	Allen Bradley	Cat No: 800FM series	Rating: 10 A, 690 V, -25 to 70 °C Type: Panel mounted, lighted, SPST rotary switch, consisting of operator and contact block.	UL 508A CSA C22.2 No. 14	UR E14840
9.5.1	Pushbutton Switch: Description: For use in model(s) AS-D+, AS-E, AS-G, AS-J, AS-K, AS-L, AS-N, AS-P, AS-Q, AS-R, AS-W, AS-Z	Allen Bradley	Cat No: 800FM series	Rating: 10 A, 690V, -25 to 70°C Type: Panel mounted, lighted, SPST rotary switch, consisting of operator and contact block	UL 508A CSA C22.2 No. 14	UR E14840
9.6.1	Hour Meter	Hobbs	Cat No: 20184	Rating: 120 V, 60 Hz, 3 W max Mounting: Screws	UL CSA	UL, CSA
9.6.2	Hour Meter: Description: For use in model(s) AS-B, AS-D, AS-D+, AS-E, AS-G, AS-J, AS-K, AS-L, AS-N, AS-P, AS-Q, AS-R, AS-W, AS-Z	Sendec	Cat No: 807D-800-8111	Rating: 120 V, 60 Hz, 3 W max Mounting: Press in retaining clips	UL CSA	cETLus
9.6.3	Hour Meter: Description: For use in model(s) AS-B, AS-D, AS-D+, AS-E, AS-G, AS-J, AS-K, AS-L, AS-N, AS-P, AS-Q, AS-R, AS-W, AS-Z	Sendec	Cat No: N330-0200	Rating: 120 V, 60 Hz, 150uA max load current Mounting: Integrated snap-in case	UL CSA	cETLus
10 Optional Electronic Interface Components: <u>Description:</u> Alternative user interface replaces all components in Manual Interface (see item 9).						

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Unique component reference or location	Application / function	Manufacturer / trademark	Type / model	Technical data	Standard	Mark(s) of conformity evidence of acceptance
10.1	HMI: (INT) Description: For use in model(s) AS-D+, AS-E, AS-G, AS-J, AS-K, AS-L, AS-N, AS-P, AS-Q, AS-R, AS-W, AS-Z	Allen Bradley	Type: PanelView 600 Cat No: 2711P-T6M5A	Rating: 85 – 264 VAC, 47 – 63 Hz, 60 VA max, 0 – 55 °C	ANSI/ISA 12.12.01 CSA No.213 Enclosure: UL 50 CSA C22.2 No. 94.2-07	UR E10314
10.2	HMI: Description: For use in model(s) AS-D+, AS-E, AS-G, AS-J, AS-K, AS-L, AS-N, AS-P, AS-Q, AS-R, AS-W, AS-Z	Schneider Electric	Type: Magelis STO & STU Cat No: HMISTU855	Rating: 20.4-28.8 VDC, 6.8W, 0 – 50 °C	UL 508 UI 61010-1 CSA No.142 CSA 61010-1	UR E164866
11	Solenoid Valves	Automatic Switch Co	Cat No: series 8256, 8210, 8262, 8225, 189	Rating: 120 V, 50/60 Hz, 11 to 16.7 W, 150psi	UL 429 CSA No.139	CSA File 010381_C_000
11.a	Alternative Solenoid Valves	ASCO	Cat No: 18900036	Rating: 120/110 V, 50/60 Hz, 2.5 W, 150 psi	UL 429 CSA No.139	CSA File 010381_C_000
11.b	Alternative Solenoid Valves	ASCO	Cat No: 8210G054	Rating: 120V, 60 Hz, 16.1 W, 150 psi.	UL 429 CSA No.139	CSA File 010381_C_000
11.c	Alternative Solenoid Valves	ASCO	Cat No: 8290A394	Rating: 120V, 60 Hz, 150 psi.	UL 429 CSA No.139	CSA File 010381_C_000
11.d	Alternative Solenoid Valves	ASCO	Cat No: Series 8551	Rating: 120/110V, 50/60 Hz, 2.5W, 150psi max	UL 429 CSA No.139	CSA File 010381_C_000

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Unique component reference or location	Application / function	Manufacturer / trademark	Type / model	Technical data	Standard	Mark(s) of conformity evidence of acceptance
11.e	Alternative Solenoid Valves	Granzow	Cat No: ET20M	Rating: 120VAC, 50/60 Hz 20W 300 psig	CSA 61010-1 UL 61010-1	Accepted with project 70132743
12.1	Pressure Switch	Automatic Switch Co	Cat No: PA16A/RF10A71	Rating: 5A (res.), 125/250V ac. 10-100,200psi	UL Recognized CSA Certified	CSA, UR
12.2	Pressure Switch Description: For use in model(s) AS-D+, AS-E, AS-G, AS-J, AS-K, AS-L, AS-N, AS-P, AS-Q, AS-R, AS-W, AS-Z	Allen Bradley	Cat No: 836 series	Rating: 5A 250V ac. -30-375, 750psi	UL 508 CSA No. 14	UL E114842 CSA File LR1234
12.3	Pressure Switch Description: For use in model(s) AS-A, AS-B, AS-D	ASCO	Cat No: PG16A	Rating: 5A 250V ac. 10-100,200psi	UL Recognized CSA Certified	CSA, UR
13	Pressure Relief Device ALL set to 100psi AS_D+,E,G,J,K,N,L,P,Q, B, D, Q,R,W,Z	Control Devices Inc	Cat No: SV25, ST-25, ST-33, SF-50, SB-50, SW10	Rating: 100 PSI, 150 PSI	ASME	ASME Certificate 14396
13.1	Alternative Pressure Relief Device AS_D+,E,G,J,K,N,L,P,Q, B, D, Q,R,W,Z	Kunkle	Cat No: 6000series	Rating: 100 PSI	ASME	ASME Certified
14	Connectors (INT)	AMP Inc	Type: Crimp-on, insulated push-on type	18A, 600V max, 18AWG, 105 C 12A, 600V max, 105 C, 22 AWG	UL	UL E326725
15	Internal Wire (INT)	Alan Wire Co	Type: TEW		UL 1063	UR E83039

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Unique component reference or location	Application / function	Manufacturer / trademark	Type / model	Technical data	Standard	Mark(s) of conformity evidence of acceptance
		Coleman Cable Inc		Rating: 600V, 22AWG, 18 AWG, 105°C	UL Traceability Requirements	UR E137733
		Omni Cable Corp			UL Traceability Requirements	UR E129971
16	Alternate Wire Harness: Description: For use in model(s) AS-R, AS-W, AS-Z	OLFLEX	Type:601603	Rating 600V, 18AWG, 90°C	CSA61010-1 UL61010-1	Accepted
17	Optional Alarm Board (Oxygen Sensor Module)	Fujikura Japan	FCX-MWAS-ST1	Rating: 5 VAC, 10 VAC, 0 to 60 °C	CSA61010-1 UL61010-1	Accepted
17.1	Alternative Optional Alarm Board (Oxygen Sensor Module)	Airsep	CB130-1	Rating: 115VAC, 4 to 40 °C	CSA61010-1 UL61010-1	Accepted
17.2	Alternative Optional Alarm Board (Oxygen Sensor Module)	Advanced Micro Instruments Inc	Model 65	Rating: 7-28VDC, 0 to 130 °F, 250mA at 12V	CSA61010-1 UL61010-1	Accepted
18. Optional Quick Connectors:						
Note: Used for connections to solenoid valves, pressure switches and pressure relief devices only.						
18.1	Optional Quick Connector (female receptacle)	Hubbell Inc	MRMS24325	Rating: 300 VAC, 300 VDC, 4 A, -20 to 105 °C, 1/4in NPT	UL 2238 CSA C22.2 No.182.3	CSA (LR 285), cULus (E192071)
18.2	Optional Quick Connector (male plug)	Hubbell Inc	MPMS2415	Rating: 300 VAC, 300 VDC, 4 A, -20 to 105 °C	UL 2238 CSA C22.2 No.182.3	CSA (LR 285), cULus (E192071)

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Unique component reference or location	Application / function	Manufacturer / trademark	Type / model	Technical data	Standard	Mark(s) of conformity evidence of acceptance
18.3	Optional Quick Connector (male plug)	ASCO	400125-098	Rating: 115 VAC, 4 A, -20 to 75 °C	CSA UL	UR, CSA
19	Acoustic Signaling Alarm (INT)	Allen Bradley	855P-B10ME22	Rating: 120 VAC, 42 mA, 100 dB at 1 meter	UL 508 CSA C22.2 No. 14	UR E14840
20	Optional Power Supply <u>Description:</u> For use with display and flowmeter	Meanwell	MDR-20-24	Rating: 85-264VAC, 0.55A/115VAC 0.35A/230VAC, 47-63Hz, -20 to 85 °C	UL508	UR E215312
20a	Optional Power Supply (Alternate) <u>Description:</u> For use with Schneider Electric PLC panels	Phoenix Contact	UNO-PS/1AC/24DC/30W (2902991)	Rating: 100-240Vac 50-60Hz 0.8A 100Vac/ 0.4A 240Vac Output:24Vdc 1.25A	UL 60950-1 CSA 60950-1	cURus E214596
Note:						

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TEST HISTORY

Edition 1 – Application LR 83232-1:

The following tests were conducted on model: AS-20.

1. Rating:
2. Temperature:
3. Dielectric Strength:
4. Leakage Current: (C22.2 No 68, Cl 6.10)
5. Hydrostatic Tests: (C22.2 No 68, Cl 6.18)

Edition 2 – Application LR 83232-4:

No testing was deemed necessary.

Edition 3 – Project 1018431:

The tests summarized below were conducted with satisfactory results. Detailed test results are on file at CSA.

Device Tested: Oxygen Separator, Model AS45

Test Requirements: CSA C22.2 No 1010.1/UL 3101.1.

Note: Checklist Location in the following table refers to the form for test results found in the CSA 1010.1 Conformance Verification Report.

Clause:	Description:	Compliance:			Checklist location:	Comments:
		Y	N	N/A		
4.4	Testing in SINGLE FAULT CONDITION			X	Form A.2	
4.4.1	Non-specific faults			X	Form A.2	
4.4.2.1	PROTECTIVE IMPEDANCE			X	Form A.2	
4.4.2.2	Protective conductor (Earth leakage current)	X			Form A.2	
4.4.2.3	Equipment or parts for short term or intermittent operations			X	Form A.2	
4.4.2.4	Motors			X	Forms A.2/A.25	
4.4.2.5	Capacitors			X	Form A.2	
4.4.2.6	Mains transformers			X	Forms A.2/A.27/A.28	
4.4.2.7	Outputs			X	Form A.2	
4.4.2.8	Equipment for more than one supply (also Cl. 14.5)			X	Form A.2	
4.4.2.9	Cooling			X	Form A.2	
4.4.2.10	Heating devices			X	Form A.2	
4.4.2.11	Insulation between circuits and parts			X	Form A.2	
4.4.2.12	Interlocks			X	Form A.2	
5.1.3	Mains Supply (Input)	X			Form A.3	
5.3	Durability of markings	X			Form A.4	
6.2	Determination of ACCESSIBLE parts:	X				
6.2.1	General examination	X			Form A.6	
6.2.2	Top openings			X	Form A.6	
6.2.3	Preset control openings			X	Form A.6	
6.3	Permissible limits for ACCESSIBLE parts:					

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Clause:	Description:	Compliance:			Checklist location:	Comments:
		Y	N	N/A		
6.3.1	Values in NORMAL CONDITION:					
6.3.1.1	- Voltage	X			Form A.7	
6.3.1.2	- Current			X	Form A.7	
6.3.1.3	- Capacitance			X	Form A.7	
6.3.2	Values in SINGLE FAULT CONDITION:					
6.3.2.1	- Voltage	X			Form A.8	
6.3.2.2	- Current	X			Form A.8	
6.3.2.3	- Capacitance			X	Form A.8	
6.5.1	Protective Earthing:					
6.5.1.2	Bonding impedance, plug-connected equipment	X			Form A.9	
6.5.1.3	Bonding impedance, PERMANENTLY CONNECTED EQUIPMENT			X	Form A.9	
6.5.1.4	Indirect bonding from measuring and test equipment			X	Form A.9	
6.6.1	Separation of circuits - short circuits due to insufficient separation			X	Form A.2	
6.6.2 (6.1.1)	Terminals for external circuits - charge on capacitors			X	Forms A.6/A.7	
6.7	Creepage and clearance distances:					
	Working voltage	X			Form A.5	
	Comparative tracking index (CTI)	X			Form A.5	
	10 N on bare conductor	X			Form A.11	
	30 N on outside enclosure	X			Form A.11	
6.8	Voltage (dielectric strength) tests:					
	After humidity preconditioning	X			Form A.12	
	After enclosure tests (Cl. 8)	X			Form A.12	
	After resistance to heat (Cl. 9)	X			Form A.12	
	After SINGLE FAULTS (Cl. 4.4.4)			X	Form A.12	
	After cord entry (Cl. 6.10.2.1)			X	Form A.12	
	After protection against hazards from fluids (Cl. 11)	X			Form A.20	
6.10.2	Fitting of non-detachable mains supply cords:					
6.10.2.1	Cord entry			X	Form A.13	
6.10.2.2	Cord anchorage			X	Form A.13	
6.10.3	Capacitor discharge - NORMAL CONDITION	X			Form A.6	
6.11.1	Free strand test	X			6.11.1	
7.3	Stability:					
	10 deg tip	X		X	7.3	
	Horizontal force	X			7.3	
	Downward force	X			7.3	
7.4	Provisions for lifting and carrying			X	7.4	
8	Mechanical resistance to shock and impact:					
8.1	Rigidity	X			Forms A.11/A.20	
8.2	Impact hammer test	X			Forms A.11/A.20	
8.4	Drop test:					

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Clause:	Description:	Compliance:			Checklist location:	Comments:
		Y	N	N/A		
8.4.1	Equipment other than hand-held			X	Forms A.11/A.20	
8.4.2	Hand-held equipment			X	Forms A.11/A.20	
9.2	Temperature, general	X			Form A.18	
9.2.1	Temperature, heating equipment			X	Form A.18	
9.2.2	Temperature, equipment intended for installation into a cabinet or wall			X	Form A.18	
9.3	Guards			X	Form A.18	
10.2	Resistance to heat of non-metallic ENCLOSURES			X	Form A.19	
10.3	VICAT softening test (ISO 306)			X	10.3	
11	Protection against hazards from fluids:					
11.2	Cleaning	X			Form A.20	
11.3	Spillage			X	Form A.20	
11.4	Overflow			X	Form A.20	
11.5	Battery electrolyte			X	11.5	
11.6	Specially protected equipment (IEC 529)			X	Form A.20	
11.7	Fluid pressure and leakage	X			Form A.21	
12.2.1	Ionizing Radiation (IEC 405)			X	Form A.22	
12.3	Ultra-violet radiation			X	N/A	Test under consideration.
12.4	Microwave radiation			X	N/A	Test under consideration.
12.5.1	Sound level			X	Form A.23	
12.5.2	Ultrasonic pressure (max. 22.4 kHz)			X	Form A.23	Test under consideration.
12.6	Laser sources (IEC 825)			X	12.6	
13.1	Poisonous and injurious gases			X	attach data	
13.2.2	Batteries			X	Form A.24	
13.3	Implosion of high-vacuum devices (IEC 65)			X	13.3	
14.2.1	Motor temperatures (also 4.4.2.4)			X	Form A.25	
14.3	Over-temperature protection devices			X	Form A.26	
14.4	Fuseholder accessibility			X	14.4	
14.5	Mains voltage selecting devices (also 4.4.2.8)			X	Form A.2	
14.6	High integrity components (appropriate IEC publications)			X	Form A.10	
14.7.1	Mains transformers; short circuit			X	Form A.27	
14.7.2	Mains transformers; overload			X	Form A.28	
15	Interlocks			X	15	
Annex F	Protection against the spread of fire:					
F.2.1	Limited circuits			X	Form A.15	
F.4.3.3	Flammability			X	Form A.16	

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Clause:	Description:	Compliance:			Checklist location:	Comments:
		Y	N	N/A		
6.7	PCB Coatings			X		
6.10.4.5	Conduit Enclosure Entry Tests	X				CSA Certified
6.10.4.5.1	Conduit Pull-out	X				
6.10.4.5.2	Conduit Torque Test	X				
6.10.4.5.3	Bending			X		
6.10.4.5.4	Knockouts			X		
13.4	Fluid Pressure and Leakage	X				
13.4.1	Hydraulic Test Pressure	X				
13.4.2	Maximum Permissible Working Pressure	X				
13.4.3	Pressure Relief Devices			X		
13.4.4	Leakage Test	X				
14.8.1	Conductive Coatings			X		

Edition 4 – Project 1457595:

The tests summarized below were conducted with satisfactory results on a representative sample of Mains Transformer (TR1); Manufacturer: Signal; Type: A41-175-230. Detailed test results are on file at CSA.

Clause:	Description:	Compliance:			Checklist location:	Comments:
		Y	N	N/A		
14.7.1	Mains transformers; short circuit	X				
14.7.2	Mains transformers; overload	X				

Edition 5 – Project 1577889:

No test was deemed necessary.

Edition 6 – Project 2342553:

Updated to the latest edition of the standard. Product was found to be in compliance with the applicable requirements. The following models are added: AS-D+, AS-P, and AS-W. The following models are removed: AS-20, AS-45, AS-80, AS-160, AS-250, AS-450, AS-750, AS-1000, and AS-1250.

The tests summarized below were conducted with satisfactory results on a representative sample of model: AS-E. Detailed test results are available in Attachment 4. Testing was conducted in Cleveland, OH.

Compliance Criteria: Y = Pass, N = Did Not Pass, N/A = Not Applicable

Clause:	Description:	Checklist Location:	Compliance: (Y, N, N/A)	Comments:
4.4.2.6.1	Mains transformers - Short circuit	Form A.2	Y	--
5.1.3	Mains Supply	Form A.3	Y	--
6.5.1.3	Bonding impedance of plug connected equipment	Form A.10	Y	--
6.8	Dielectric Strength Tests:	Form A.14	Y	--
10	Temperature Measurements	Form A.20A	Y	--
Annex G.3	Leakage and Rupture from Fluids Under Pressure	Form A.24	Y	--

MASTER CONTRACT: 0000191105**REPORT:** 1018431**PROJECT:** 80204830**Page No:** 40**Date Issued:** May 8, 2024Edition 7 – Project 2591581:

Update report to address FIR findings dated 2011-06-08, 2011-10-19, and 2012-08-22. List of Safety Critical Components was updated to address the FIR findings. No additional testing was deemed necessary.

Edition: 8 (Project 70132743)

Report updated to upgrade to 61010-1 3rd Edition and cover cCSAus Certification of new Nitrogen Concentrator model series N2-AS.

The tests summarized below were conducted with satisfactory results on a representative sample of model N2-AS-G configured for the worst conditions of normal operation and representative of both Part A and Part B models. Detailed test results are on file at CSA.

Device Tested: Nitrogen Concentrator N2-AS-G

Test Location: CSA Group Testing and Certification Inc.,
13799 Commerce Parkway, Richmond, BC, Canada V6V 2N9
and
CSA Group Testing and Certification Inc.,
178 Rexdale Blvd., Toronto, ON, Canada M9W 1R3

Test Requirements: CSA C22.2 No 61010-1-12 and ANSI/UL 61010-1:2012

Note: Checklist Location in the following table refers to the form for test results found in the CSA 61010-1-12 Checklist

IEC 61010-1-10 Check List:

Clause:	Description:	Checklist Location:	Compliance: (Y, N, N/A)
4.4.2.3	Protective conductor	Form A.6	Y
4.4.2.7.2	Mains transformers – short circuit	Form A.39	Y
4.4.2.7.3	Mains transformers – overload	Form A.40	Y
5.1.3	Mains supply	Form A.2	Y
5.3	Durability of markings	Form A.3	Y
6.2	List of accessible parts	Form A.4	Y
6.3.1	Limit values for accessible parts – levels in normal condition	Form A.5	Y
6.3.2	Limit values for accessible parts – levels in single fault condition	Form A.6	Y
6.5.2.4	Bonding impedance of plug connected equipment	Form A.9	Y
6.7	Insulation requirements – Clearances and Creepage	Form A.15	Y
6.8	Dielectric strength tests	Form A.18	Y
6.10	Cord anchorage	Form A.19	Y
7.2	Sharp Edges	Form A.43	Y
8.2	Enclosure rigidity	Form A.21A	Y
9	Protection against the spread of fire	Form A.22	Y
10	Temperature Measurements	Form A.26	Y

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The tests summarized below were conducted with satisfactory results on a representative sample of model the Granzow ET20M solenoid valve. Detailed test results are on file at CSA under project 70132743.

Device Tested: Granzow ET20M solenoid valve

Test Location: CSA Group Testing and Certification Inc.,
178 Rexdale Blvd., Toronto, ON, Canada M9W 1R3

Test Requirements: CAN/CSA C22.2 No. 139-13 and ANSI/UL 429:2013

CAN/CSA C22.2 No. 139-13 and ANSI/UL 429:2013:

Clause:	Description:	Compliance: (Y, N, N/A)
7.10/sec 34	Strength tests of fluid-containing parts	Y
7.18/sec 39	Burnout test	Y
7.6/sec 37	Dielectric strength	Y

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Report updated to include the alternative transformer provided by Hammond Power Solutions, Model.PH250PP.
LOCC updated with Table format as per CSA Descriptive Report required.

Change is considered as replacement of an existing part for a new part with same ratings and approvals and is in line with Measurement, Control and Laboratory Equipment Certification Informs No. 26

The tests summarized below were conducted with satisfactory results on a sample of model PH250PP for transformer testing outside the equipment. Detailed test results are on file at CSA.

Device Tested: Transformer PH250PP

Test Location: CSA Group Testing and Certification Inc.,
178 Rexdale Blvd., Toronto, ON, Canada M9W 1R3

Test Requirements: CSA C22.2 No 61010-1-12 and ANSI/UL 61010-1:2012

Test performed: 4.4.2.7 Transformer (OL/SC)
10.2 Temperature of winding
14.6 Mains transformer tested outside equipment

Construction Review:

Construction review performed with satisfactory results.

Edition 10: Project 80133090

Report updates to add alternate component to LOCC:

- Item 4.3, FU1 for 120V unit. (3.0A)
- Item 4.4, FU1 for 240V unit. (1.5A)
- Item 4.5, FU2 for 120V unit. (3.0A)
- Item 4.5, FU2 for 240V unit. (1.5A)
- Item 5, EMI filter (EMI1) for 120V unit.
- Item 20, alternate PSU. (For use with Schneider Electric PLC panels display and flowmeter only)

The tests summarized below were conducted with satisfactory results on an end unit sample of model AS-D+. Detailed test results are on file at CSA.

Device Tested: Oxygen separation units, Model AS-D+

Test Location: CSA Group Testing and Certification Inc.,
178 Rexdale Blvd., Toronto, ON, Canada M9W 1R3

Test Requirements: CSA C22.2 No 61010-1-12 and ANSI/UL 61010-1:2012

Test performed: 4.4.2.7 Transformer (OL/SC)

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5.1.3 Power Input
6.3.1 Permissible Limits - Normal condition
6.3.2 Permissible Limits – Single fault condition
10.1 / 10.3 Temperature
10.2 Temperature of winding
14.6 Mains transformer tested outside equipment

Construction Review:

Construction review performed with satisfactory results.

Edition 11: Project 80204830

Update cCSAus report 1018431 (rev 80133090) for the addition of alternate controller to LoCC.

No testing was deemed necessary. The new alternate controller has similar ratings to the previously used alternate controllers and is rated for a max temperature much greater than has been measured on previously used controllers. In addition, the new alternate controller is certified as cULus.

Construction Review:

Construction review performed with satisfactory results.

This Edition supersedes all previous editions.

Signature Manifest

Document Number: CPD-ELTF-1008

Revision: D

Title: AS-Series CSA Safety Test Report and Certificate (non-medical products) Model: AS Series Oxygen and Nitrogen Systems, UL 61010-1/CAN/CSA-C22.2 No. 61010-1-12

Effective Date: 05 Jun 2024

All dates and times are in Eastern Standard Time.

CPD Nitrogen ConcentratorModel: AS-G-N2_CAN/CSA-C22.2 No. 61010-1-12 for CSA Mark_ Test Report and Attachments

Collaboration

Name/Signature	Title	Date	Meaning/Reason
Ted Vlahopoulos (TVLAHOPOULOS)	Regulatory Specialist	10 May 2024, 02:41:04 PM	Complete

Engineering

Name/Signature	Title	Date	Meaning/Reason
Utkarsh Bharadwaj (UBHARADWAJ)	Project Manager	05 Jun 2024, 09:42:48 AM	Approved

Production Quality

Name/Signature	Title	Date	Meaning/Reason
Greg Webb (GWEBB)	Manufacturing Manager	13 May 2024, 10:56:02 AM	Approved

Regulatory

Name/Signature	Title	Date	Meaning/Reason
Sean Switzer (RSWITZER)	Regulatory Specialist	13 May 2024, 11:13:06 AM	Approved

Notification

Name/Signature	Title	Date	Meaning/Reason
Greg Webb (GWEBB)	Manufacturing Manager	05 Jun 2024, 09:42:48 AM	Email Sent
Rupal Sharma (RSHARMA)	Project Engineer	05 Jun 2024, 09:42:48 AM	Email Sent
Sean Switzer (RSWITZER)	Regulatory Specialist	05 Jun 2024, 09:42:48 AM	Email Sent
Ted Vlahopoulos (TVLAHOPOULOS)	Regulatory Specialist	05 Jun 2024, 09:42:48 AM	Email Sent
Utkarsh Bharadwaj (UBHARADWAJ)	Project Manager	05 Jun 2024, 09:42:48 AM	Email Sent