Honeywell

Technical Information

Series 8 Controller and I/O Specification

S803-150-530

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1. Introduction

1.1. Overview

This document provides technical information to configure the Experion® Series 8 I/O and the C300 Controller.

1.2. Scope

The following Series 8 hardware items are included in this document.

- Series 8 C300 Controller
- Analog Input with HART – Differential
- Analog Input with HART – Single Ended
- Analog Input – Single Ended
- Low Level Analog (Temperature) Input LLAI
- Analog Output with HART
- Analog Output
- Digital Input, 24 VDC
- Digital Input Sequence of Events (SOE)
- Digital Input Pulse Accumulation
- Digital Output, 24 VDC
- DO Relay Extension Board

1.3. Definitions

- **Input Output Termination Assembly (IOTA):** An assembly that holds the IOM and the connections for field wiring,
- **Input Output Module (IOM):** A device that contains most of the electronics required to perform a specific I/O function. The IOM plugs onto the IOTA.

2. Platform Environmental Specifications

2.1. General Environmental Characteristics

This section relates to the physical characteristics applicable to Series 8 C300 controller and all Series 8 I/O components. Where applicable, specifications state limits within an approved cabinet and to the cabinet skin.

Consideration	Operating Limit [1]	Transportation and Storage Limits [1a]
Ambient Temp Range	External: 0 to 50°C [2] Internal : 0 to 60°C [3]	-40 to 85°C
Temp. Rate of Change	<= 1°C/min	<=5°C/min
Relative Humidity [3]	5 to 95% (non-condensing) [4]	5 to 95% (non-condensing) [4]
Barometric Pressure Altitude	-300 to +3000 m	Any
Corrosives	G3 Standard (ISA S71.04) - Denoted by "8C-" model number in this doc	G3 Standard (ISA S71.04) - Denoted by "8C-" model number in this doc
Vibration (3 axes)	Sinusoidal (5 to 10 Hz) 2.54mm/0.100in Max (10 to 150 Hz) 0.5 g max. (0-Pk)	Random Vertical Shipping Axis 5 to 300 Hz 1.07 g (rms) Longitudinal and Transverse 10 to 500 Hz, 0.74 g (rms) 60 Minutes each axis
Mechanical Shock (3 Axes)	Site Induced: Terminal Peak Sawtooth waveform 4g max. @25ms	N/A

Note 1 – Operating Limits define the range of operating conditions within which the system is designed to operate. Performance characteristics are defined when operating in this state. Please see ANSA/ISA D 51.1 Process Instrumentation Terminology for more information.

Note 1a – Transportation and Storage Limits define the range of conditions to which the system may be subjected without permanent damage to the equipment. Performance is not guaranteed in this state. Please see ANSA/ISA D 51.1 Process Instrumentation Terminology for more information.

Note 2 – This rating applies to the external ambient temperature of the Standard 2000mm enclosure with doors closed.

Note 3 – This rating applies to the internal ambient temperature of the Standard 2000mm enclosure with the doors closed. New version of the C300 controller(8C-PCNT05) and Memory Backup Assembly module (50182539-001) support an extended temperature range from 0°C to 70°C.

Note 4 – The maximum relative humidity spec applies up to 40°C. Above 40°C the RH spec is de-rated to 55% to maintain constant moisture content.

A note on the transportation of Batteries:

Some Government agencies have regulations that may prohibit air transport of Lithium Batteries.

2.2. Approval Bodies

Approval Body	Certification Category	Description
Canadian Standards Association (CSA)	Division 2 Certifications	All models are certified as suitable for use in Class I, Division 2, Group A, B, C, D hazardous locations.
	Zone 2 Certifications	All models are certified as normally non-sparking apparatus, Class I, Zone 2, AEx/Ex ec IIC T4 Gc (except 8C-SDOX01), Class I, Zone 2, AEx/Ex ec nC IIC T4 Gc (for 8C-SDOX01 only), for use in Zone 2 hazardous locations. Temperature rating of all individual models as well as cabinet configurations is not to exceed T4.
ATEX **IECEx** **UKCA**	Zone 2 Certifications	All models are certified as normally non-sparking apparatus, II 3G, Ex ec IIC T4 Gc (except 8C-SDOX01), Ex ec nC IIC T4 Gc (for 8C-SDOX01 only), for use in Zone 2 hazardous locations. Temperature rating of all individual models as well as cabinet configurations are rated T4.
European Compliance (CE)	EMC, LVD	• European EMC Directive 2014/30/EU EN 61326-1 2013 Electrical equipment for measurement, control and laboratory use - EMC requirements. • European LVD Directive 2014/35/EU IEC/EN 61010-1:2010 Safety Requirements for Electrical Equipment for Measurement, Control and Laboratory Use -. Part 1: General Requirements
Others		RCM, EAC

2.3. Detailed Specification- Approvals

Consideration	Approval
Agency Approvals	NA: Class I, Division 2, Grp. ABCD, T4; Class I, Zone 2, AEx/Ex ec IIC T4 Gc Class I, Zone 2, AEx/Ex ec nC IIC T4 Gc ATEX: II 3G Ex ec IIC T4 Gc II 3G Ex ec nC IIC T4 Gc IECEx: Ex ec IIC T4 Gc Ex ec nC IIC T4 Gc Ex ec IIC T4 Gc (except 8C-SDOX01); Ex ec nC IIC T4 Gc (for 8C-SDOX01 only)

Item	Specification		
CE Conformity	This product is in conformity with the protection requirements of the following European Council Directives: 2014/35/EU, the Low Voltage Directive, and 2014/30/EU, the EMC Directive. Conformity of this product with any other “CE Mark” Directive(s) shall not be assumed.		
	LVD Directive:		
	Title	Number	Issue date
	Safety requirements for electrical equipment for measurement, control, and laboratory use - Part 1: General requirements	EN 61010-1	2010
	EMC directive:		
	Title	Number	Issue date
	Electrical equipment for measurement, control and laboratory use - EMC requirements - Part 1: General requirements	EN 61326-1	2021
	Industrial, scientific and medical equipment - Radio-frequency disturbance characteristics - Limits and methods of measurement	CISPR 11	2015
	Electromagnetic compatibility (EMC) - Part 3-2: Limits –Limits for harmonic current emissions (equipment input current ≤ 16A per phase)	IEC 61000-3-2	2018
	Electromagnetic compatibility (EMC) - Part 3-3: Limits –Limitation of voltage changes, voltage fluctuations and flicker in public low-voltage supply systems, for equipment with rated current ≤ 16 A per phase and not subject to conditional connection	IEC 61000-3-3	2013
	Electromagnetic compatibility (EMC) - Part 4-2: Testing and measurement techniques – Electrostatic discharge immunity test	IEC 61000-4-2	2008
	Electromagnetic compatibility (EMC) - Part 4-3: Testing and measurement techniques – Radiated, radio-frequency, electromagnetic field immunity test	IEC 61000-4-3	2020
	Electromagnetic compatibility (EMC) - Part 4-4: Testing and measurement techniques – Electrical fast transient/burst immunity test	IEC 61000-4-4	2012
	Electromagnetic compatibility (EMC) - Part 4-5: Testing and measurement techniques – Surge immunity test	IEC 61000-4-5	2014
	Electromagnetic compatibility (EMC) - Part 4-6: Testing and measurement techniques – Immunity to conducted disturbances, induced by radio-frequency fields	IEC 61000-4-6	2023
	Electromagnetic compatibility (EMC) - Part 4-8: Testing and measurement techniques – Power frequency magnetic field immunity test	IEC 61000-4-8	2009
	Electromagnetic compatibility (EMC) - Part 4-11: Testing and measurement techniques – Voltage dips, short interruptions and voltage variations immunity tests	IEC 61000-4-11	2020
CSA (US)[1,2]	Nonincendive Electrical Equipment for Use in Class I and II, Division 2 and Class III, Divisions 1 and 2 Hazardous (Classified) Locations	ANSI/UL 121201	2017 Ninth Edition
	Explosive atmospheres - Part 0: Equipment - General Requirements	ANSI/UL 60079-0	2013(R2017) Sixth Edition
	Explosive atmospheres - Part 7: Equipment protection by increased safety "e"	ANSI/UL 60079-7	2017 Fifth Edition

Item	Specification		
	Explosive atmospheres - Part 15: Equipment protection by type of protection “n”	ANSI/UL 60079-15	2013(R2017) Fourth Edition
	Safety Requirements for Electrical Equipment for Measurement, Control, and Laboratory Use - Part 1: General Requirements	UL 61010-1	3rd edition (2012), AMD1: 2018
CSA (Canada)[1,2]	Nonincendive electrical equipment for use in Class I and II, Division 2 and Class III, Division 1 and 2 hazardous (classified) locations	CAN/CSA C22.2 No. 213-17	2017
	Explosive atmospheres - Part 0: Equipment - General requirements	CAN/CSA-C22.2 No. 60079-0	2015
	Explosive atmospheres - Part 7: Equipment protection by increased safety “e”	CAN/CSA-C22.2 No. 60079-7	2016
	Explosive atmospheres - Part 15: Equipment protection by type of protection “n”	CAN/CSA-C22.2 No. 60079-15	2018
	Safety Requirements for Electrical Equipment for Measurement, Control, and Laboratory Use - Part 1: General Requirements	CAN/CSA C22.2 No. 61010-1-12	UPD1: 2015, UPD2: 2016, AMD1: 2018
ATEX/UKCA[1]	Explosive atmospheres - Part 0: Equipment - General requirements	EN IEC 60079-0	2018
	Explosive atmospheres - Part 7: Equipment protection by increased safety "e".	EN IEC 60079-7	2015+A1:2018
	Explosive atmospheres - Part 15: Equipment protection by type of protection "n"	EN 60079-15	2010
IECEx[1]	Explosive atmospheres - Part 0: Equipment - General requirements	IEC 60079-0	2017 Edition 7.0
	Explosive atmospheres - Part 7: Equipment protection by increased safety "e"	IEC 60079-7	2017 Edition 5.1
	Explosive atmospheres - Part 15: Equipment protection by type of protection "n"	IEC 60079-15	2010 Edition 4

Note1:

i. The installation shall provide a controlled environment that limits the pollution degree to the pollution degree 2 or better, as defined in IEC/EN 60664-1.

ii. The equipment shall be mounted within a tool-secured enclosure which meets the requirements of IEC/EN/CSA/UL 60079-0, IEC/EN/CSA/UL 60079-7 and is capable of accepting the applicable wiring methods specified in IEC/EN 60079-14, CEC Part I and NFPA 70.

iii. The enclosure for the equipment shall provide a degree of protection not less than IP54 in accordance with the test of enclosure section of IEC/EN/CSA/UL 60079-0 and IEC/EN/CSA/UL 60079-7 unless the equipment is afforded an equivalent degree of protection by location.

iv. The installer shall provide transient over-voltage protection external to the equipment such that the voltage at the supply terminal of the equipment does not exceed 140% of the voltage rating of the equipment.

Note2:

v. Equipment is only to be installed by trained personal in accordance with the installation, set-up, operation and maintenance of comparable devices.

vi. Equipment has only been tested for electrical safety. No evaluation of functional safety and performance characteristics has been conducted.

5.2. Header Board and Combo IOLINK Cable

The header board is used to distribute power and IOLink throughout the cabinet. It distributes 24 VDC from a power system to one or more columns of mounting plates in one or both sides of a cabinet that contains the power system. The IOTA receives its power and IOLINK communication through the combination power / IOLink Cable from the header board. One pair of header boards can provide redundant power and IO communication.

5.2.1. Notable Features

- Redundant power distribution and IOLink communication system
- Ability to extend power and IOLink to adjacent cabinets through connectors
- Four connectors for combination power / IOLink cable to IO modules in cabinet
- Combination power / IOLink cable is daisy-chained to allow connection to multiple IO modules, disconnecting cable from one IO module does not affect other modules

5.2.2. Model Number

Description	Model or Part Number
Series 8 Header Board	8C-SHEDA1
Combo IOLINK 6-Drop Cable GREY	51202971-102
Combo IOLINK 6-Drop Cable VIOLET	51202971-112

5.2.3. Detailed Specifications- Header Board

Header Board Parameter	Specifications
Power Input (VDC)	24
Power Output (VDC)	24
Power Connector	3
Combo Cable Connector	4 pairs, 6 pins
IOLINK Extension	2 pairs, 3 pins
Ambient Temperature Range (deg. C)	0 to 60