


Specifications for Ethernet/IP

Bulletin 280/281

Electrical Ratings		UL/NEMA			IEC		
Power Circuit	Rated Operation Voltage	200...480V			200...480V		
	Rate Insulation Voltage	600V			600V		
	Rated Impulsed Voltage	6 kV			6 kV		
	Dielectric Withstand	2200V AC			2500V AC		
	Operating Frequency	50/60 Hz			50/60 Hz		
	Utilization Category	N/A			AC-3		
	Protection Against Shock	N/A			IP2X		
	Rated Operating Current Max.	280_-____-10A-*	1.2 A				
280_-____-10B-*		2.5 A					
280_-____-10C-*		5.5 A					
280_-____-10D-*		16 A					
Control Circuit	Rated Operation Voltage	24V DC (+10%, -15%) A2 (should be grounded at voltage source)					
	Rate Insulation Voltage	250V			250V		
	Rated Impulsed Voltage	—			4kV		
	Dielectric Withstand	1500V AC			2000V AC		
	Overvoltage Category	—			III		
	Operating Frequency	50/60 Hz			—		
Short Circuit Protection	Short Circuit Protection Device (SCPD) Performance Type 1	Current Rating	Voltage	480Y/277V	480/480V	600Y/347V	600V
		0.24...1.2 A	Sym. Amps RMS	65 kA	65 kA	30 kA	30 kA
		0.5...2.5 A					
		1.1...5.5 A		30 kA	30 kA	30 kA	30 kA
	3.2...16 A						
SCPD List	Size per NEC Group Motor				—		

		UL/NEMA	IEC	
Environmental	Operating Temperature Range	-20...40°C (-4...104°F)		
	Storage and Transportation Temperature Range	-25...85°C (-13...185°F)		
	Altitude	2000 m		
	Humidity	5...95% (on-condensing)		
	Pollution Degree	3		
	Enclosure Ratings	NEMA 4/12/13	IP67	
		NEMA 4X 	IP69K	
Approximate Shipping Weight	18.1 kg (40 lbs)			
Mechanical	Mechanical Resistance to Shock			
	Operational	15 G		
	Non-Operational	30 G		
	Resistance to Vibration			
	Operational	1 G, 0.15 mm (0.006 in.) Displacement		
	Non-Operational	2.5 G, 0.38 mm (0.015 in.) Displacement		
	Power and Ground Terminals			
	Wire Size	Primary/Secondary Terminal: #16 AWG...#10 AWG	Primary/Secondary Terminal: 1.5 mm ² ...4.0 mm ²	
	Tightening Torque	Primary Terminal: 10.8 lb-in. Secondary Terminal: 4.5 lb-in.	Primary Terminal: 1.2 N-m Secondary Terminal: 0.5 N-m	
	Wire Strip Length	0.35 in. (9 mm)		
	Control and Safety Monitor Inputs			
	Wire Size	#18 AWG...#10 AWG	1.0 mm ² ...4.0 mm ²	
	Tightening Torque	6.2 lb-in.	0.7 N-m	
	Wire Strip Length	0.35 in. (9 mm)		
	Disconnect Lock Out	Maximum of 5/16 in. (8 mm) lock shackle or hasp. The hasp should not exceed 5/16 in. (8 mm) when closed, or damage will occur to disconnect guard.		
	Other Rating	EMC Emission Levels		
Conducted Radio Frequency Emissions		10V RMS Communications Cables 10V RMS (PE) 150 KHz – 80 MHz		
Radiated Emissions		Class A		
EMC Immunity Levels				
Electrostatic Discharge		4 kV contact and 8 kV Air		
Radio Frequency Electromagnetic Field		10V/m, 80 MHz – 1 GHz 3V/m, 1.4 GHz – 2 GHz 1V/m, 2.0 GHz – 2.7 GHz		
Fast Transient		2 kV (Power) 2 kV (PE) 1 kV (Communications and Control)		
Surge Transient	1 kV (12) _{L-L} , 2 kV (2) _{L-N} (Earth)			

		UL/NEMA		IEC
Other Rating	Overload Current Range	280_-____-10A-*	0.24...1.2 A	
		280_-____-10B-*	0.5...2.5 A	
		280_-____-10C-*	1.1...5.5 A	
		280_-____-10D-*	3.2...16 A	
	Trip Classes	10, 15, 20		
	Trip Rating	120% of Full Load current (FLC) Setting		
	Number of poles	3		

❶ Used when caustic chemicals are used in food and beverage applications. The wash down rating is 1000 psi.

	UL/NEMA	IEC
Standards Compliance	UL 508 CSA C22.2, No. 14 EN/IEC 60947-4 EN/IEC 60947-4-1 CE Marked per Low Voltage 2006/95/EC EMC Directive 2004/108/EC CCC - In Process ODVA for EtherNet/IP	
Certifications	cULus (File No. E3125, Guides NLDX, NLDX7)	

EtherNet/IP Version – Control and I/O Power Requirements						
	Units	A1/A2 ❶	A3/A2 ❷	A1/A2 ❶	A3/A2 ❷	A3/A2 ❸
		W/O HOA		W/ HOA		
Control Voltage	Volts	24V DC				
Module Inrush	Amps	0.92	0.30	1.09	0.125	0.295
Module Steady	Amps	0.06	0.30	0.23	0.125	0.295
Total Control Power (Pick Up)	Watts	22.08	7.20	26.16	3.00	7.08
Total Control Power (Running)	Watts	1.44	7.20	5.52	3.00	7.08

- ❶ Add power requirements for outputs (1 A max.) to A1/A2.
- ❷ Add power requirements for inputs (200 mA max.) to A3/A2.
- ❸ If A1 power is disconnected.

		UL/NEMA	IEC	
Input Ratings – Sourced from Control Circuit (A3/A2)	Rated Operation Voltage	24V DC		
	Input On-State Voltage Range	10...26V DC		
	Input On-State Current	3.0 mA @ 10V DC		
		7.2 mA @ 24V DC		
	Input Off-State Voltage Range	0...5V DC		
	Input Off-State Current	<1.5 mA		
	Input Filter — Software Selectable			
	Off to On	Settable from 0...64 ms in 1 ms increments		
	On to Off	Settable from 0...64 ms in 1 ms increments		
	Input Compatibility	N/A	IEC 1+	
	Number of Inputs	4		
	Sensor Source			
	Voltage Status Only	11...26.4V DC		
	Current Available	50 mA max. per input, 200 mA total		
Output Ratings – Sourced from Control Circuit (A1/A2)	Rated Operation Voltage	26.4V DC		
	Rate Insulation Voltage	250V		
	Dielectric Withstand	1500V AC (UL)	2000V AC (IEC)	
	Type of Control Circuit	Solid state sourcing output		
	Type of Current	24V DC		
	Conventional Thermal Current Ith	0.5 A each, 1 A max. combined		
	Type of Contacts	Normally open (N.O.)		
	Number of Contacts	2		
	Load Types	Resistive or light inductive		
	Surge Suppression	Integrated diode, clamps @ 35V DC		
	Thermo-Protection	Integrated short circuit and over current protection		
	Maximum Cycle Rate	30 operations/minute capacitive and inductive loads		
	Maximum Blocking Voltage	35V DC		
	Maximum On-State Voltage @ Maximum Output	1.5V DC		
Maximum Off-State Leakage Current	10 µA			
Device Level Ring (DLR)		Beacon-based performance including IEEE 1588 end to end transparent clock		
	Maximum Nodes	50		
	Fault Recovery	Ring recovery time is less than 3 ms for a 50 node network		

		UL/NEMA	IEC
EtherNet Port		2 D-coded, 4-pin female M12 connectors	
	Ports	Embedded switch with 2 ports	
	IP Address	DHCP enabled by default	
	DHCP Timeout	30 s	
	Communication Rate	10/100 Mbs with auto negotiate half duplex and full duplex	
	Data	Transported over both TCP and UDP	
Web Server		Embedded web server	
	Security	Login and password configurable	
	E-mail	Support Simple Mail Transfer Protocol (SMTP)	
	Configuration	Status, diagnostics, and configuration tabs	
Device Connections		Supports scheduled (Class 1) and unscheduled (Class 3 & UCMM) connections	
		6 - Class 3 connections	
		2 - Class 1 (1 exclusive owner, 1 input only and 1 listen only) connections are supported	

Motor Overload Trip Curves

Figure 88 - Bulletin 280E/281E Overload Trip Curves

