

Base Units

To use the Do-more H2 Series PLC, you must have at least one base unit. A base unit has an internal power supply that converts the input power (110-220 VAC, 24VDC, or 125VDC) to 5VDC in order to activate the modules installed in the base unit. For the Do-more H2 Series PLC, 10 types of base units are available.

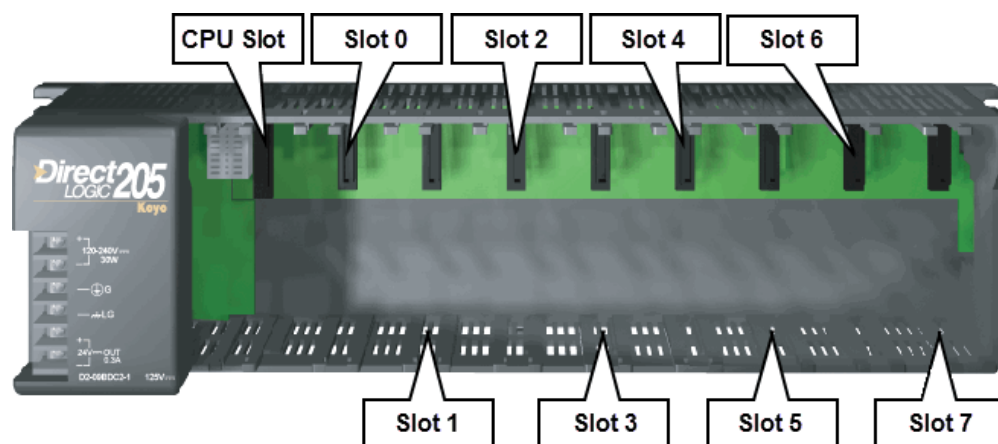
Base Unit Part Numbers

Number of Module Slots	Input Power Type		
	110-220 VAC	24VDC	125VDC
3 slot	D2-03B-1	D2-03BDC1-1	-
4 slot	D2-04B-1	D2-04BDC1-1	-
6 slot	D2-06B-1	D2-06BDC1-1	D2-06BDC2-1
9 slot	D2-09B-1	D2-09BDC1-1	D2-09BDC2-1

Base Unit Prices	
Part Number	Price
D2-03B-1	\$214.00
D2-04B-1	\$233.00
D2-06B-1	\$309.00
D2-09B-1	\$332.00
D2-03BDC1-1	\$286.00
D2-04BDC1-1	\$315.00
D2-06BDC1-1	\$341.00
D2-09BDC1-1	\$361.00
D2-06BDC2-1	\$288.00
D2-09BDC2-1	\$384.00

In the base unit, the far left slot is called the 'CPU Slot'. It is used for a CPU or base controller. Optional modules (discrete I/O modules, analog I/O modules, and specialty modules) can be installed in the other slots. For instance, if you pick a base unit with nine slots, you can install up to eight optional modules.

Module Slots are numbered from left to right starting with zero. The slot to the right of the CPU slot is Slot 0, the slot to the right of it is Slot 1 and so on. The following is an example with the nine slot base unit D2-09B-1.



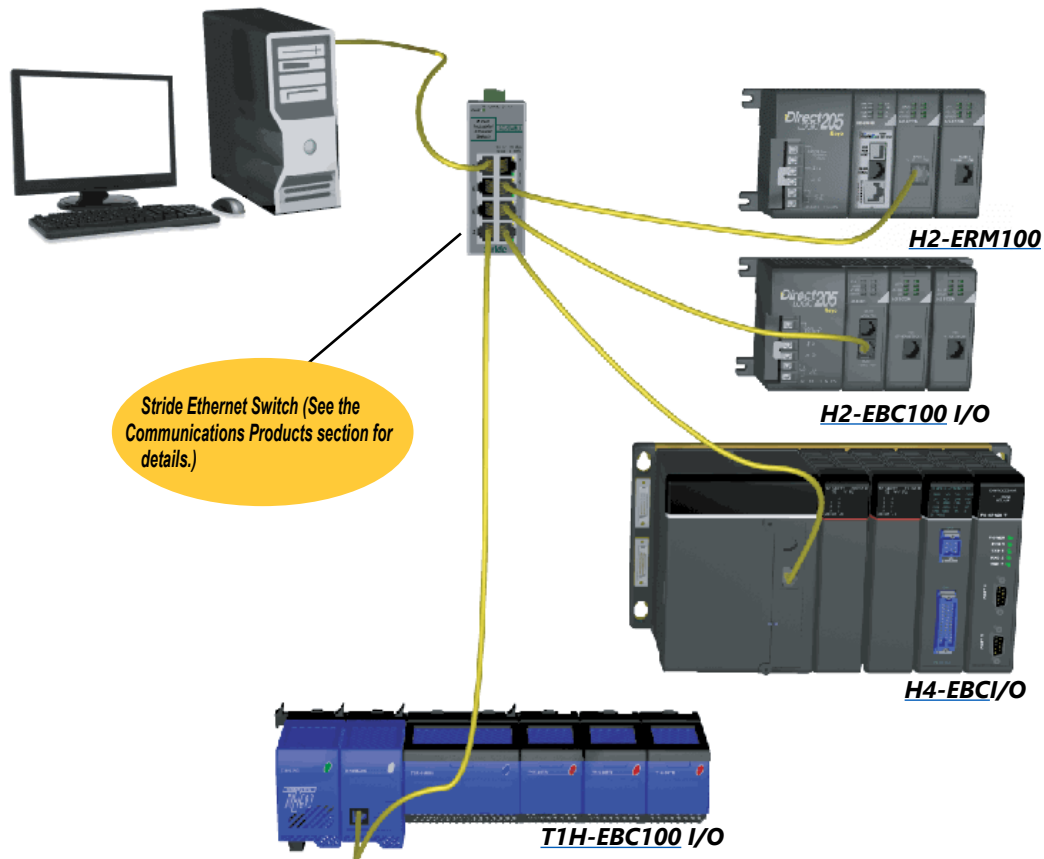
The following is a detailed specification table for the base units.

Power Supply Specifications			
Specification	AC Powered Bases	24VDC Powered Bases	125VDC Powered Bases
Part Numbers	D2-03B-1 , D2-04B-1 , D2-06B-1 , D2-09B-1 ,	D2-03BDC1-1 , D2-04BDC1-1 , D2-06BDC1-1 , D2-09BDC1-1 ,	D2-06BDC2-1 , D2-09BDC2-1
Voltage Withstand (dielectric)	1 minute @ 1,500 VAC between primary, secondary, field ground, and run relay		
Insulation Resistance	> 10MΩ at 500VDC		
Input Voltage Range	85–132 VAC (110 range) 170–264 VAC (220 range) 47–63 Hz	10.2–28.8 VDC (24VDC)/ with less than 10% ripple	100–264 VDC (125VDC)/ with less than 10% ripple
Auxiliary 24 VDC Output	300mA max.	None	300mA max.
Maximum Inrush Current	30A	10A	20A
Maximum Power	80VA	25W	30W

Base Units

I/O Expansion

When you need to use more than eight optional modules or you need to install base units in isolated locations, the Do-more H2 Series PLC supports the Ethernet Remote I/O System.



Note for DL205 PLC customers

The Do-more H2 Series PLC does NOT support local expansion I/O with the [D2-EM/D2-CM](#).

Base Units

Module Placement and I/O Usage Tables

There are very few I/O module placement restrictions with the Do-more H2 Series PLC family. In general, any mix of analog and discrete module types can be used in any local or Ethernet remote base. However, specialty modules can't be used in the Ethernet remote base except for the [F2-08SIM](#). Reference the Module Placement Restrictions table to the right for the Do-more H2 Series PLC.

Analog I/O in the Ethernet remote bases

When using an analog module in an Ethernet remote base, the analog update time to the CPU will be asynchronous to the scan time. Critical analog I/O should be located in the local base.

I/O point usage

The table to the right indicates the number of I/O points consumed by each module. Use this information to ensure you stay within the maximum I/O count of the I/O system you have chosen.

Module Placement Restrictions		
Module/Unit	Local CPU Base	Ethernet Remote Base
CPU's Discrete I/O Analog I/O	CPU slot only ✓ ✓	✓ ✓
Base Controller H2-EBC100		CPU slot only
Specialty Modules H2-CTRIO2 H2-ECOM100 H2-SERIO H2-SERIO-4 H2-ERM100 F2-08SIM	✓ ✓ ✓ ✓ ✓ ✓	✓

I/O Module Point Usage					
DC INPUT		RELAY OUTPUT		SPECIALTY MODULES	
D2-08ND3	8 X	D2-04TRS	8 Y1		
D2-16ND3-2	16 X	D2-08TR	8 Y		
D2-32ND3	32 X	F2-08TR	8 Y		
D2-32ND3-2	32 X	F2-08TRS	8 Y		
AC INPUT		D2-12TR	16 Y2		
D2-08NA-1	8 X	COMBINATION			
D2-08NA-2	8 X	D2-08CDR	8 X/8 Y1		
D2-16NA	16 X				
DC OUTPUT		ANALOG		F2-08SIM	8 X
D2-04TD1	8 Y ¹	F2-04AD-1	8 X/4 WX	H2-CTRIO2	None
D2-08TD1	8 Y	F2-04AD-2	8 X/4 WX	H2-EBC100	None
D2-08TD2	8 Y	F2-08AD-1	8 X/8 WX	H2-ECOM100	None
D2-16TD1-2	16 Y	F2-08AD-2	8 X/8 WX	H2-ERM100	None
D2-16TD2-2	16 Y	F2-02DA-1L	2 WY	H2-SERIO	None
F2-16TD1P	16 X/16 Y	F2-02DA-2L	2 WY	H2-SERIO-4	None
F2-16TD2P	16 X/16 Y	F2-4AD2DA	8 X/4 WX/2 WY		
D2-32TD1	32 Y	F2-8AD4DA-1	8 X/8 WX/7 WY		
D2-32TD2	32 Y	F2-8AD4DA-2	8 X/8 WX/7 WY		
AC OUTPUT		F2-02DAS-1	2 WY		
D2-08TA	8 Y	F2-02DAS-2	2 WY		
F2-08TA	8 Y	F2-08DA-1	8 WY		
D2-12TA	16 Y ²	F2-08DA-2	8 WY		
		F2-04RTD	8 X/4 WX		
		F2-04THM	8 X/4 WX		

Note 1: 4-pt. modules consume eight points. Only the first four points are used.

Note 2: 12-pt. modules consume 16 points. The first six points are assigned, two are skipped, and then the next six points are assigned. For example, a D2-12TA installed in slot 0 would use Y0–Y5, and Y8–Y13. Y6–Y7, and Y14–Y15 would be unused.

Base Units

Power Budget

When determining the types and quantity of I/O modules you will be using, it is important to remember there is a defined amount of power available from the base power supply.

The chart on the next page indicates the power supplied and used by each module. The adjacent chart shows an example of how to calculate the power used by your particular system. These charts should make it easy for you to determine if the devices you have chosen will operate within the power budget of your system configuration.

If the I/O you have chosen for a base exceeds the maximum power available from the power supply, you may be able to resolve the problem by using remote I/O bases.

Base power supply specifications

The table below lists base power supply specifications, including maximum inrush current and maximum power consumed from your power source.

Power budget example

The example on the right shows how to calculate the power budget for the Do-more PLC system. The examples are constructed around a single 9-slot base using the devices shown. It is recommended you construct a similar table for your Do-more PLC system. Follow the steps to the right to determine your power budget.

- Using a chart similar to the one below, fill in column 2.
- Using the tables on the next page, enter the current supplied and used by each device (columns 3 and 4). Devices which fall into the "Other" category (Row D) are devices such as the operator interface and the handheld programmer, which also have power requirements, but do not directly plug into the base.
- Add the current used by the system devices (columns 3 and 4) starting with the CPU slot and put the total in the row labeled "Maximum Current Required" (Row E).
- Subtract the row labeled "Maximum Current Required" (Row E), from the row labeled "Current Supplied" (Row B). Place the difference in the row labeled "Remaining Current Available" (Row F).
- If "Maximum Current Required" is greater than "Current Supplied" in either column 3 or 4, the power budget will be exceeded. It will be unsafe to use this configuration, and you will need to restructure your I/O configuration. Note the auxiliary power supply does not need to supply all the external power. If you need more than the 300mA supplied, you can add an external 24V power supply. This will help keep you within your power budget for external power.

A	Column 1	Column 2	Column 3	Column 4
		<i>Device Type</i>	<i>5VDC (mA)</i>	<i>External Power 24 VDC (mA)</i>
B	CURRENT SUPPLIED			
	Base	9 slot	2,600	300
C	CURRENT REQUIRED			
	CPU SLOT			
	SLOT 0	H2-DM1E	275	0
	SLOT 1	D2-16ND3-2	100	0
	SLOT 2	D2-16ND3-2	100	0
	SLOT 3	D2-16NA	100	0
	SLOT 4	D2-08NA-1	50	0
	SLOT 5	D2-16TD1-2	200	80
	SLOT 6	D2-08TA	250	0
	SLOT 7	D2-08TA	250	0
D	OTHER			
	Operator interface	EA1-S3ML	220	0
E	Maximum Current Required	1545	80	
F	Remaining Current Available	2600-1545=1055		300-80=220

Power Supply Specifications			
Specification	AC Powered Bases	24VDC Powered Bases	125VDC Powered Bases
Part Numbers	D2-03B-1, D2-04B-1, D2-06B-1, D2-09B-1	D2-03BDC1-1, D2-04BDC1-1 D2-06BDC1-1, D2-09BDC1-1	D2-06BDC2-1, D2-09BDC2-1
Voltage Withstand (dielectric)	1 minute @ 1500VAC between primary, secondary, field ground, and run relay		
Insulation Resistance	> 10MΩ at 500VDC		
Input Voltage Range	85-132 VAC (110 range) 170-264 VAC (220 range) 47-63 Hz	10.2-28.8 VDC (24VDC) with less than 10% ripple	100-264 VDC (125 VDC) with less than 10% ripple
Auxiliary 24VDC Output	300mA max.	None	300mA max.
Maximum Inrush Current	30A	10A	20A
Maximum Power	80VA	25W	30W

Base Units

Power Requirements

This section shows the amount of power supplied by each of the base power supplies and the amount of power consumed by each module. The Power Consumed charts list how much INTERNAL power from each power source is required for the modules. Use this information when calculating the power budget for your system.

In addition to the internal power sources, bases offer a 24VDC auxiliary power supply with external power connections. This auxiliary power supply can power external devices.

Use ZipLinks to reduce power requirements

If your application requires a lot of relay outputs, consider using the ZipLink AC or DC relay output modules ZL-RRL16-24-1 or ZL-RRL16-24-2. These modules can switch high current (10A) loads without putting a heavy load on your base power budget. Refer to the Terminal Blocks and Wiring Solutions section in this catalog for more information.

This logo is placed next to the I/O modules that are supported by the **ZIP**Link connection systems. See the I/O module specifications at the end of this section.



Power Supplied					
Device	5V(mA)	24V Auxiliary	Device	5V(mA)	24V Auxiliary
Bases			Bases		
D2-03B-1	2600	300	D2-04BDC1-1	2600	None
D2-04B-1	2600	300	D2-06BDC1-1	2600	None
D2-06B-1	2600	300	D2-09BDC1-1	2600	None
D2-09B-1	2600	300	D2-06BDC2-1	2600	300
D2-03BDC1-1	2600	None	D2-09BDC2-1	2600	300

Power Consumed		
Device	5V(mA)	24V Auxiliary
CPUs		
H2-DM1	250	0
H2-DM1E	275	0
DC Input Modules		
D2-08ND3	50	0
D2-16ND3-2	100	0
D2-32ND3	25	0
D2-32ND3-2	25	0
AC Input Modules		
D2-08NA-1	50	0
D2-08NA-2	100	0
D2-16NA	100	0
DC Output Modules		
D2-04TD1	60	20
D2-08TD1	100	0
D2-08TD2	100	0
D2-16TD1-2	200	80
D2-16TD2-2	200	0
F2-16TD1P	70	50
F2-16TD2P	70	50
D2-32TD1	350	0
D2-32TD2	350	0
AC Output Modules		
D2-08TA	250	0
F2-08TA	250	0
D2-12TA	350	0
Relay Output Modules		
D2-04TRS	250	0
D2-08TR	250	0
F2-08TR	670	0
F2-08TRS	670	0
D2-12TR	450	0
Combination In/Out Module		
D2-08CDR	200	0

Power Consumed		
Device	5V(mA)	24V Auxiliary
Analog Modules		
F2-04AD-1	100	5
F2-04AD-2	110	5
F2-08AD-1	100	5
F2-08AD-2	100	5
F2-02DA-1	40	60 (note 1)
F2-02DA-2	40	60
F2-02DA-2L	40	70 @ 12V
F2-02DAS-1	100	50 / channel
F2-02DAS-2	100	60 / channel
F2-08DA-1	30	50 (note 1)
F2-08DA-2	60	140
F2-4AD2DA	60	80 (note 1)
F2-8AD4DA-1	35	100 (note 1)
F2-8AD4DA-2	35	80 (note 1)
F2-04RTD	90	0
F2-04THM	110	60
Specialty Modules		
H2-CTRIO2	275	0
H2-EBC100	300	0
H2-ECOM100	300	0
H2-ERM100	300	0
H2-SERIO	80	0
H2-SERIO-4	80	0
F2-08SIM	50	0
Note 1: Add an additional 20mA per output loop.		

Do-more H2 Series PLC Overview

Module Compatibility

The following table shows which DL205 components are supported by the H2-DM1 and H2-DM1E Do-more CPUs.

Module Compatibility Table					
Module	Part Number	Status	Module	Part Number	Status
Base Units	D2-03B-1	✓	Analog I/O Modules	D2-03B-1	✓
	D2-04B-1	✓		D2-04B-1	✓
	D2-06B-1	✓		D2-06B-1	✓
	D2-09B-1	✓		D2-09B-1	✓
	D2-03BDC1-1	✓		D2-03BDC1-1	✓
	D2-04BDC1-1	✓		D2-04BDC1-1	✓
	D2-06BDC1-1	✓		D2-09BDC1-1	✓
	D2-09BDC1-1	✓		D2-06BDC2-1	✓
	D2-06BDC2-1	✓		D2-09BDC2-1	✓
	D2-09BDC2-1	✓		D2-08ND3	✓
Discrete I/O Modules	D2-08ND3	✓	Local Expansion Modules	D2-08NA-2	No
	D2-16ND3-2	✓		D2-16NA	No
	D2-32ND3	✓	Specialty Modules	D2-04TD1	✓
	D2-32ND3-2	✓		D2-08TD2	No
	D2-08NA-1	✓		D2-16TD1-2	
	D2-08NA-2	✓		D2-16TD2-2	✓
	D2-16NA	✓		F2-16TD1P	No
	D2-04TD1	✓		F2-16TD2P	
	D2-08TD1	✓		D2-32TD1	✓
	D2-08TD2	✓		D2-32TD2	✓
	D2-16TD1-2	✓		D2-08TA	✓
	D2-16TD2-2	✓		F2-08TA	✓
	F2-16TD1P	✓		D2-12TA	No
	F2-16TD2P	✓		D2-04TRS	✓
	D2-32TD1	✓		D2-08TR	No
	D2-32TD2	✓		F2-08TR	✓
	D2-08TA	✓		F2-08TRS	✓
	F2-08TA	✓	Programmer	D2-12TR	No
	D2-12TA	✓		D2-08CDR	
	D2-04TRS	✓			
	D2-08TR	✓			
	F2-08TR	✓			
	F2-08TRS	✓			
	D2-12TR	✓			
	D2-08CDR	✓			

✓ = Supported No = Not Supported

Do-more H2 Series PLC Overview

Communications

The Do-more H2 Series PLC supports many communication protocols. The following table shows which CPU module communications port or specialty module supports each protocol.

Protocols	CPU Modules			Specialty Modules		
	<i>H2-DM1 / H2-DM1E</i>		<i>H2-DM1E</i>	<i>H2-ECOM100</i>	<i>H2-SERIO H2-SERIO-4</i>	<i>H2-ERM100</i>
	USB Port	RS-232 Serial Port	Ethernet Port			
<i>Do-more Designer Programming</i>	Yes	Yes	Yes	Yes	Yes	
<i>Modbus/RTU Client (Master)</i>		Yes			Yes	
<i>Modbus/RTU Server (Slave)</i>		Yes			Yes	
<i>Modbus/TCP Client (Master)</i>			Yes	Yes		
<i>Modbus/TCP Server (Slave)</i>			Yes	Yes		
<i>DirectLOGIC RX/WX Client (Master)</i>			Yes	Yes		
<i>DirectLOGIC RX/WX Server (Slave)</i>			Yes	Yes		
<i>K-Sequence Server (Slave)</i>		Yes		Yes	Yes	
<i>DirectNET Server (Slave)</i>				Yes		
<i>Embedded Web Server: HTTP (unsecure)</i>				Yes		Yes
<i>Ethernet: HTML (unsecure) configuration</i>				Yes		Yes
<i>HEI Ethernet Remote I/O Master</i>			Yes			Yes
<i>SMTP (EMail) Client w/Authentication</i>			Yes			
<i>Simple Network Time Protocol (SNTP) Client</i>			Yes			
<i>Do-more/PEERLINK</i>			Yes			
<i>Do-more Time Synchronization Protocol (Client, Server, Alternate Client)</i>			Yes			
<i>Do-more Logger/UDP</i>			Yes			
<i>Serial ad-hoc ASCII/Binary Programatic Control</i>		Yes			Yes	
<i>UDP ad-hoc Programmatic Control</i>			Yes			
<i>TCP Client Programmatic Control</i>			Yes			
<i>TCP Server Programmatic Control</i>			Yes			

Blank = Not Supported

Dimensions and Installation

Understanding the installation requirements for your Do-more H2 Series PLC system will help ensure that the components operate within their environmental and electrical limits.

Plan for safety

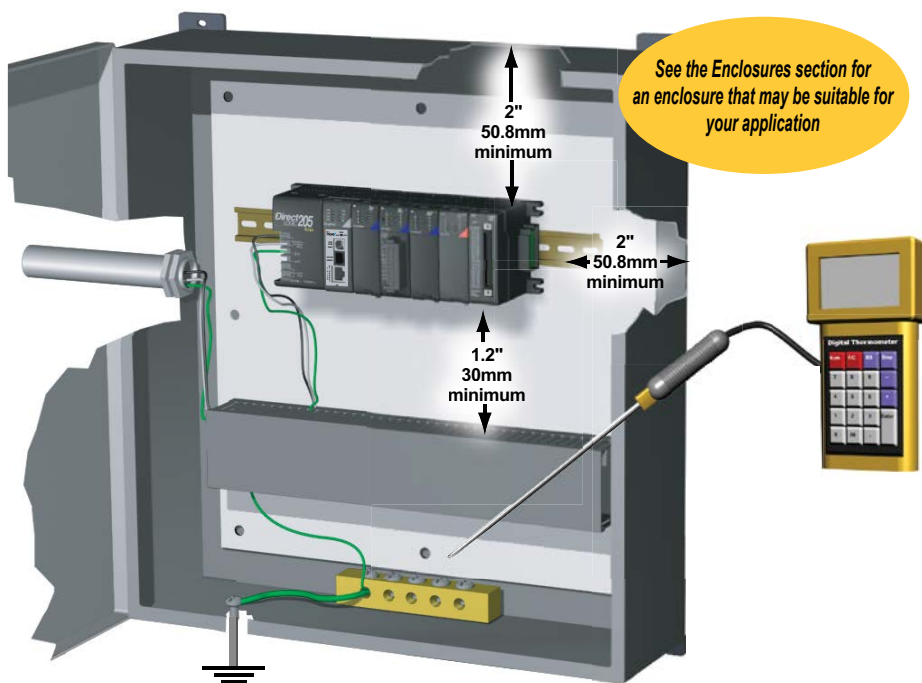
This catalog should never be used as a replacement for the user manual. The user manual, H2-DM-M (sold separately or downloadable online), contains important safety information that must be followed. The system installation should comply with all appropriate electrical codes and standards.

Environmental specifications

The Environmental Specifications table at the right lists specifications that apply globally to the Do-more H2 Series PLC system (CPUs, bases, and I/O modules). Be sure that the system is operated within these environmental specifications.

Base dimensions and mounting

Use the diagrams below to make sure the Do-more H2 Series PLC system can be installed in your application. To ensure proper airflow for cooling purposes, bases must be mounted horizontally. It is important to check these dimensions against the conditions required for your application. For example, it is recommended that approximately 3" of space is left in front PLC surface for ease of access and cable clearances. Also, check the installation guidelines for recommended cabinet clearances.



Environmental Specification	Rating
Storage Temperature	-40°F - 158°F (-20°C to 70°C)
Ambient Operating Temperature	32°F - 131°F (0°C to 55°C)
Ambient Humidity	30%-95% relative humidity (non-condensing)
Vibration Resistance	MIL STD 810C, Method 514.2
Shock Resistance	MIL STD 810C, Method 516.2
Noise Immunity	NEMA (ICS3-304)
Atmosphere	No corrosive gases

Base	A (Base Total Width)		B (Mounting Hole)		C (Component Width)	
	Inches	Millimeters	Inches	Millimeters	Inches	Millimeters
3-slot	6.77"	172mm	6.41"	163mm	5.8"	148mm
4-slot	7.99"	203mm	7.63"	194mm	7.04"	179mm
6-slot	10.43"	265mm	10.07"	256mm	9.48"	241mm
9-slot	14.09"	358mm	13.74"	349mm	13.14"	334mm

