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Modicon Quantum automation platform
Power supply modules

Presentation

Quantum power supply modules serve two purposes - they provide power to the system backplane and protect the system from noise and nominal voltage swings. All power supplies feature over-current and over-voltage protection. They operate in most electrically noisy environments without the need for external isolation transformers. In the event of an unforseen loss of power, the power supplies ensure that the system has adequate time for a safe and orderly shutdown.

A power supply converts the incoming power source to a regulated +5 V d.c. to support the CPU, the local I/O and any communication option modules mounted in the backplane. Power between the field sensors/actuators and the Quantum I/O points is not provided by these power supply modules.

If your Quantum system is being used in a standalone (local I/O) or remote I/O control architecture, three types of power supplies are available:
- Low-power standalone power supplies.
- High-power summable power supplies.
- High-power redundant power supplies.

If your Quantum system is being used in a distributed I/O architecture, special low-power standalone power supplies, which are dedicated to distributed architectures and are integrated into distributed I/O adapter modules, are available. Distributed power supplies are described in the DIO architecture section of this catalog.

Functions

Standalone power supplies

A standalone power supply delivers 3 A of current to a Quantum backplane.When the control system has low-power requirements, a standalone power supply is an economical choice. Standalone supplies are available for 115/230 V a.c., 24 V d.c. and 125 V d.c. source voltages.

Summable power supplies

A summable power supply delivers 8 A or 11 A (depending on the model) of current to a Quantum backplane. Summable supplies can operate in either a standalone or summable mode. Whenever two summable supplies are combined in the same backplane, they automatically operate in summable mode–delivering 16 A or 20 A (depending on the model) of power to the backplane. In summable mode, the two supplies must be the same model and they should be placed in the left and right edge slots of the backplane for maximum life. If one of the two supplies fails, power is lost to the backplane.

If only one summable power supply is placed in a backplane, it functions in standalone mode–delivering 8 A or 11 A (depending on the model) to the backplane.

Summable power supplies are available for 115/230 V a.c., 24 V d.c. and 48/60 V d.c. source voltages.

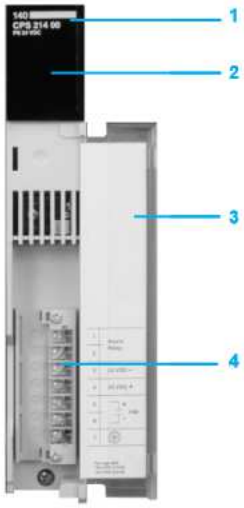
Redundant power supplies

A redundant power supply delivers 8 A or 11 A (depending on the model) of current to a Quantum backplane. For high-availability applications, two redundant power supplies in a backplane deliver 8 A or 11 A (depending on the model) of redundant current. In the event that one supply fails, the healthy one maintains the necessary power so that backplane processing and active communications are not affected. Each redundant supply has a status bit that can be monitored by the CPU's application program or by a supervisory system so that you respond quickly in the event of a power supply failure.

If additional power is required in a redundant power supply configuration, a third redundant supply module can be added to the backplane–increasing the total redundant power capacity to 16 A or 20 A (depending on the model). Should one of the three supplies fail, the two healthy modules will revert to the standard redundant mode–delivering 8 A or 11 A (depending on the model) of redundant current to the backplane.
A single redundant power supply module may be used as a standalone supply if you need to reduce your stockroom requirements.
Redundant power supplies are available for 115/230 V a.c., 24 V d.c., 48/60 V d.c. and 125 V d.c. source voltages.

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Modicon Quantum automation platform
Power supply modules

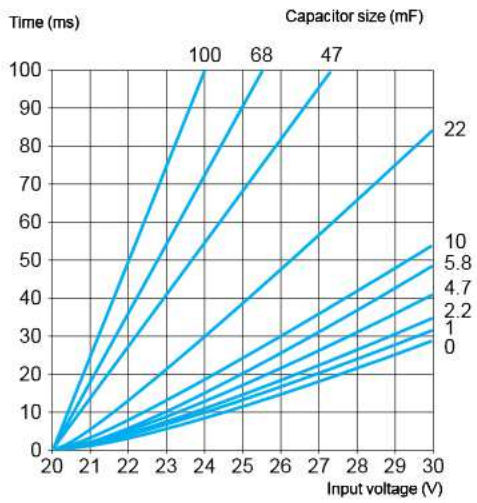


Description

The 140 CPS ●●● ●0 power supply modules comprise on front panel.

1 Model number and color code.
2 LED array.
3 Removable, hinged door and customer identification label.
4 Terminal block, 7 points (degree of protection < IP 20 rated).

To be ordered separately if necessary:
□ 140 XTS 005 00 terminal block, 7 points (degree of protection < IP 20 rated).



Maximum power interruption

The buffer processing times for the 140 CPS 214 00/224 00/414 00/424 00 power supplies can be increased by adding V d.c. electrolytic capacitors at terminals 5 and 6. Respective capacitor ratings are shown in this diagram.

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Modicon Quantum automation platform
Power supply modules

Characteristics

Model				140 CPS 111 00 standalone	140 CPS 114 20 summable	140 CPS 124 p0 redundant
Input requirements	Input voltage		a V	100 ... 276	93 ... 132 or 170 ... 264	93 ... 138 or 170 ... 276
	Input frequency		Hz	47 ... 63		
	Input current	At a 230 V	A	0.2	0.75	0.6
		At a 115 V	A	0.4	1.3	1.1
	Inrush current	At a 230 V	A	20	19	
		At a 115 V	A	10	38	
	Rating		VA	50	130	
	External fusing		A	1.5 slow-blow	2.0 slow-blow	
	Input power interruption			1/2 cycle at full and minimum line voltage/frequency, and less than 1s between interrupts		
	Harmonic distortion		%	Less than 10 of fundamental rms value		
Output-to-bus	Voltage		c V	5.1		
	Current		A	3 max., 0.3 min.	Summable. 20 at 60 °C (140 °F) Standalone. 11 at 60 °C (140 °F)	8 at 60 °C (140 °F) (140 CPS 124 00) 11 at 60 °C (140 °F) (140 CPS 124 20)
	Protection			Over-current, over-range		
General	Internal power dissipation		W	2.0 + (3 x I_{out}) where I_{out} is in A	6.0 + (1.5 x I_{out}) where I_{out} is in A	

Model			140 CPS 211 00 standalone	140 CPS 214 00 summable	140 CPS 224 00 redundant
Requirement	Input voltage	c V	20 ... 30		
	Input currrent	A	1.6	3.8 max	
	Inrush current	A	30	25 at c 24 V, 14 at c 20 V	
	Input ripple	c V	–	94 ... 189 Hz	
	Input power interruption	ms	1.0 at c 20 V		
			20.0 at ⎓ 25 V	100 ms maxi with external condensator	
	External fusing (recommended)	A	2.5 slow-blow	5.0 slow-blow	
Output-to-bus	Voltage	c V	5.1		
	Current	A	3 max., 0.3 min.	8.0	
	Protection		Over-current, over-range		
General	Surge withstand	c V	–		2.3 x max rated input voltage for 1.3 ms
	Internal power dissipation	W	2 + (3 x I_{out}), where I_{out} is A	6 + (1.8 x I_{out}), where I_{out} is A	
	Alarm relay		No	Yes	
Agency approval			UL 508, CSA 22.2-142, c UL, FM Class 1 Div. 2, e		

Model			140 CPS 414 00 summable	140 CPS 424 00 redundant	140 CPS 511 00 standalone	140 CPS 524 00 redundant
Requirement	Input voltage	c V	48 ... 60		100 ... 150	
	Input currrent	A	3.8 max		0.4	0.5 at c 125 V
	Inrush current	A	14 at c 40 V		10	28 at c 125 V
	Input power interruption	ms	13.0 at c 48 V		1.0 max	
	External fusing (recommended)	A	2.0, medium time lag		3/4 slow-blow	2 slow-blow
Output-to-bus	Voltage	c V	5.1			
	Current	A	8.0		3 max, 0.3 min	8.0
	Protection		Over-current, over range			
General	Internal power dissipation	W	15.6 at 8 A	17.2 at 8 A	2 + (3 x I_{out}) where I_{out} is A	6 + (1.5 x I_{out}) where I_{out} is A
	Alarm relay		Yes		No	
Agency approval			UL 508, CSA 22.2-142, c UL, FM Class 1 Div. 2, CE			

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Modicon Quantum automation platform
Power supply modules

References

Power supplies

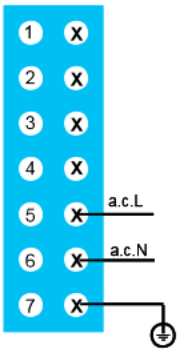
	Input voltage/power	Output current	Type	Reference	Weight kg(lb)
a	**120/230 V**	3 A	Standalone	**140 CPS 111 00**	0.650 (1.43)
a	**115/230 V**	11 A	Summable	**140 CPS 114 20**	0.650 (1.43)
a	**120/230 V**	8 A	Redondante	**140 CPS 124 00**	0.650 (1.43)
a	**115/230 V**	11 A	Redondante	**140 CPS 124 20**	0.650 (1.43)
c	**24 V**	3 A	Standalone	**140 CPS 211 00**	0.650 (1.43)
		8 A	Summable	**140 CPS 214 00**	0.650 (1.43)
			Redondante	**140 CPS 224 00**	0.650 (1.43)
c	**48...60 V**	8 A	Summable	**140 CPS 414 00**	0.650 (1.43)
			Redondante	**140 CPS 424 00**	0.650 (1.43)
c	**125 V**	3 A	Standalone	**140 CPS 511 00**	0.650 (1.43)
		8 A	Redondante	**140 CPS 524 00**	0.650 (1.43)

Separate parts

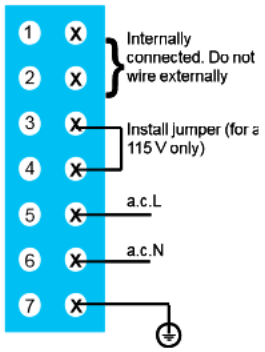
Input voltage/power	Degree of protection	Reference	Weight kg(lb)
Terminal block 7 points	IP 20	**140 XTS 005 00**	0.150 (0.33)

Wiring

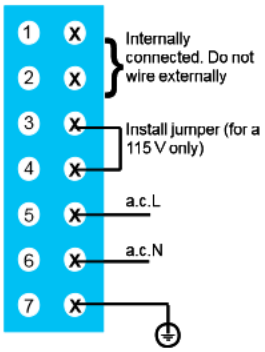
140 CPS 111 00



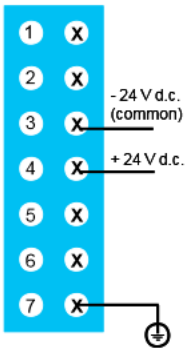
140 CPS 114 20
140 CPS 124 20



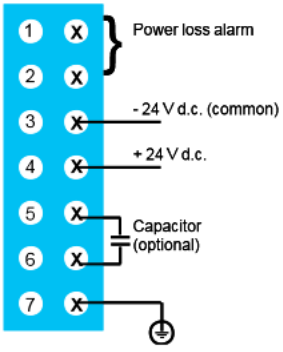
140 CPS 124 00



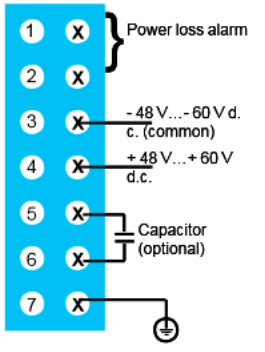
140 CPS 211 00



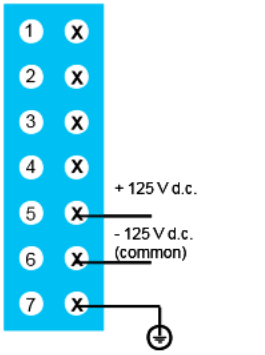
140 CPS 214/224 00



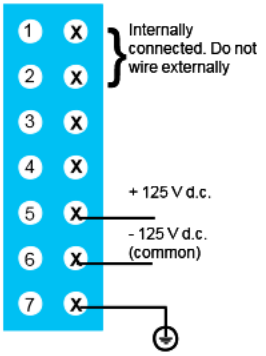
140 CPS 414/424 00



140 CPS 511 00



140 CPS 524 00



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