



Power quality

AccuSine +

Active harmonic filtering
and electronic VAR control

Catalog 2015



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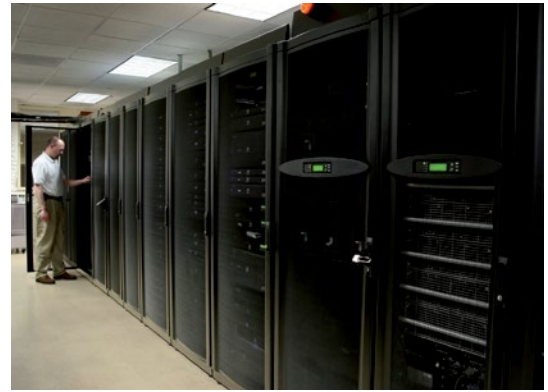
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Power quality



Power quality problems are one of the major causes of unscheduled downtime and equipment malfunction and damage. Reliability and consistency of electricity supply are critical to businesses, from industrial plants, to medical facilities, data centers, and office buildings. When power quality is imperfect due to disturbances such as interruptions, voltage dips, or harmonic pollution, your business suffers.

Power quality is a crucial issue because of the frequency of occurrence and financial impact of issues: 30 – 40 percent of all unscheduled downtime today is related to power quality problems. In the industry sector alone, the cost of poor power quality can reach 4 percent of annual turnover and is often equivalent to the total balance payable on a facility's energy bill.

A capital investment in power factor correction and harmonic filtering equipment can result in a healthy return of investment. AccuSine™ PCS+/PFV+ active filters provide a simple and effective way to mitigate harmonics and reduce process-related voltage fluctuations. Improve electrical network reliability and system capacity while reducing operating costs with one simple solution.



Today, electrical installations are exposed to a great deal of power quality problems; 80 percent of these disturbances are generated by typically installed equipment. In industrial facilities, for example, such disturbances can be caused by nonlinear loads like arc welders or variable speed drives, capacitor switching, or large motor starts. In commercial buildings, electronic equipment like computers, UPS, and servers may also generate additional power quality disturbances.

The other 20 percent of power quality disturbances come from the energy provider: even the most advanced transmission and distribution systems are not able to guarantee 100 percent energy availability. Even with 99.99 percent energy availability, the equivalent interruption time amounts to 52 minutes every year.

Many people believe optimizing facility operations and achieving ideal power factor is complex and costly.

However, Schneider Electric™ helps make realizing superior power system efficiency simple, safe, and economical.

AccuSine+ Products solve a wide range of power quality problems.

A complete solution, when, where, and how you want it

Schneider Electric power quality solutions include everything needed to ensure your power system is operating at its best. Our expertise ranges from power system monitoring and problem diagnosis, to engineering, installing, and supporting the precise power quality solution your facility needs to run at optimal efficiency and cost.

The quality and performance you expect

All our power quality solutions provide an excellent return on investment because they are designed and manufactured by Schneider Electric, using advanced manufacturing methods and premium materials. They are optimized to match your application needs and are engineered to provide superior performance.

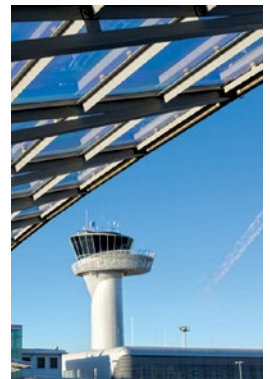
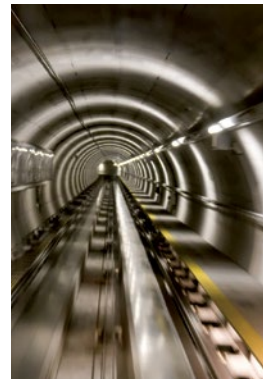
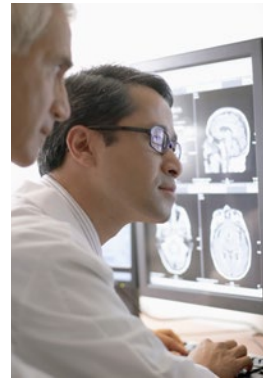
AccuSine PFV+ is a very simple and effective means to eliminate leading or lagging power factor, reduce voltage fluctuations, enhance equipment operating life, and improve system power capacity. AccuSine PFV+ offers many features in one package that others require multiple models to accomplish. Power factor correction with AccuSine PFV+ is worry-free and without the risk of resonance.

AccuSine PCS+ is a flexible, high performance, cost-effective solution to stabilize electrical networks by providing harmonic mitigation, power factor correction, and load balancing.

Both AccuSine PCS+ and AccuSine PFV+ can help you reduce CapEx expenditures and OpEx expenses. They help you to improve:

- Harmonics
- Power factor
- Imbalance (specifically important for motor applications)
- Voltage stability (such as localized photovoltaic networks)
- Flicker

AccuSine PCS+ and AccuSine PFV+ help reduce CO₂ emissions to help minimize climate change as well.



The Schneider Electric solution for active harmonic filtering in industrial installations.



AccuSine PCS+ Specifications	
Technical Specifications	
Standard RMS output current ratings	60 A, 120 A, 200 A, 300 A — 380 – 480 Vac 47 A, 94 A, 157 A, 235 A — 480 – 600 Vac 40 A, 80 A, 133 A, 200 A — 600 – 690 Vac
Electrical System Characteristics	
Nominal voltage	380 – 480 Vac; +10%/-15% 480 – 600 Vac; +10%/-15% 600 – 690 Vac; +10%/-15%
Nominal frequency	50/60 Hz, ± 3 Hz auto sensing
Number of phases	3-phase, with or without neutral
Operation with single phase loads	Yes; no effect on neutral current
Technical Product Characteristics	
Power electronics	IGBT; 3 level inverter
Topology	Digital harmonic FFT Digital reactive power
Losses	At 480 Vac < 3%; at 690 Vac < 5%
Current transformers (CT)	Any ratio with 1 or 5 ampere secondary Type 1 accuracy 50/60 or 400 Hz rated Grounded
Quantity of CT	2 or 3 for 3-wire electrical system 3 required for 4-wire electrical system
CT VA loading	15 m Ω
Spectrum cancellation	2nd to 51st, discrete; fully selectable per harmonic order (amplitude and on/off)
Control basis	Closed loop for new installations ¹ Open loop compatible for retrofit applications
CT position	Closed Loop Control: Source sense (at mains) CT or Load sense CT for single unit ² Open Loop Control: Load sense CT or source sense CT for single unit ³
Harmonic attenuation	Closed Loop: < 3% THD(i); max 20:1 THD(i) reduction with load harmonic current above 50% of AccuSine PCS+ rating Open Loop: < 5% TDD Requires 3% or higher inductive impedance per nonlinear load
Harmonic operational features	% THDi set point % THDv set point
Harmonic avoidance	Output at specific harmonic order turned off if resonance or lack of impedance detected; or manually turned off
Parallel operation	Up to 10 units per set of CT (to 51st order), any size combination Backward compatibility with AccuSine PCS operated in parallel. Contact your SE sales office for applications of more than 10 units
Parallel operation options	Master/Master (masters receive mains CT) Master/Slave Multimaster/multislave Same as AccuSine PCS for retrofits
Parallel sequence options	Lead/lag with unit rotation: one unit operates to full capacity before next unit turns on; timed rotation. Load Share: All operating units function at the same output percentage.
Parallel redundancy	Any unit with CT connections will automatically become master if the controlling master is taken offline. Automatic increase in output of all units to make up capacity of any offline unit.
Parallel HMI control	Any unit permits viewing and changing parameter settings of complete system or any other unit in parallel system
Parallel communications	Proprietary COM Bus between operating units
Power factor correction	Optimized unity PF, Leading (capacitive) or lagging (inductive) power factor (Cos ϕ) to target
Mains current balancing	Negative sequence current injected to balance fundamental current on the mains due to load imbalance (inherently corrects displacement PF (Cos ϕ))
Control response time	25 μ s
Harmonic correction time	2 cycles
Reactive correction time	1/4 cycle
Display	5.7 in./144 mm QVGA TFT 64k-color touch screen
Languages	English
Operator interface	Magelis™ HMI STU touch panel screen
Display parameters	100's: includes THDi, THDv, oscilloscope for viewing many selected parameters, phasor diagrams, load power, measured currents for Ih, Is, If, I neg seq, PF (Cos ϕ), injected currents for Ih, I reactive, I neg seq, etc.

¹ Default and preferred control method.
² Auxiliary CT required for paralleling of units with Load sense CT position.
³ Auxiliary CT required for paralleling of units with Source (mains) sense CT position.

AccuSine PCS+ Specifications

Communications capability	Modbus RTU, Modbus TCP/IP
Discrete input/outputs	4 input and 4 output dry contacts; assignable
Noise level (ISO3746)	<70 db at one meter from unit surface
Color	RAL7035 Enclosure; RAL7022 Plinth (floor standing units)
Earthing (grounding) systems	Supports TT, TN, and IT grounding systems; Solidly, low, and high resistance grounded; ungrounded; corner grounded delta; high leg delta EMC filter ground switch for IT, high resistance ground or corner grounded systems
Environmental Conditions	
Operating temperature	60 A, 120 A & 200 A: IP00, IP20, UL Type Open, & UL Type 1 configurations -0 °C to 45 °C All others 0 °C to 40 °C Derate 2% per degree °C to 50 °C
Relative humidity	To 95%, noncondensing
Seismic rating	Complies with IBC and ASCE7
Operating altitude	1000 m (derate 1%/100 m above), max 4800 m
Automatic rollback of output	Occurs whenever heatsink temperature sensor exceeds temperature limit
Ambient temperature shutdown	Absolute shutdown if air inlet temperature reaches 51 °C
Preset output limits (rms)	Programmable set limit due to altitude or ambient temperature — becomes fixed output limit
Storage (in original shipping container)	Temperature: -20 °C to 60 °C Relative humidity: to 95%, noncondensing Clean, dry, and protected No conductive particles permitted
Contaminant levels — operating (IEC 60721-3-3)	Chemical Class 3C2 Mechanical Class 3S2 No conductive particles permitted
Contaminant levels — transport and storage (IEC 60721-3-3)	Chemical Class 3C3 Mechanical Class 3S3 When stored in original shipping container No conductive particles permitted
Reference Standards	
Design	CE EMC Certification IEC/EN 60439-1, EN 61000-6-4 Class A, EN 61000-6-2
Protection (enclosure)	IP00, IP20, IP31, IP54, UL Type 1, UL Type 2, UL Type 12, UL Type Open
Standards compliance/certification	cULus (UL508 , CSA 22.2 No. 14) CE Certified, ABS, Lloyds, other local standards
Installation	
Wall mount	IP00, IP20, UL Type 1, & UL Type Open
Free standing	IP31, IP54, UL Type 2, & UL Type 12
Circuit protection	IP00 and IP20 — external means required Free standing enclosures — Incoming circuit breaker or fused disconnect with mechanical door interlock
AIC rating	To 415 Vac — 200 kA cULus; 125 kA IEC To 480 Vac — 200 kA cULus; 75 kA IEC To 600 Vac — 100 kA cULus; 100 kA IEC To 690 Vac — no cULus rating; 100 kA IEC
Cable entry	UL Type open, IP00, UL Type 1, and IP20 — bottom only Free standing — top and bottom entry through gland plates
PCBA protection	Conformal coating on all PCBAs Pollution Degree 2
Cooling configuration	Separate air plenums for heat sink section and PCBA section. Heat sink ("high heat plenum") input from bottom and exhaust out top. All components in high heat plenum rated IP54 or better => no filtering required. PCBA air supply must be clean and dry (filtering may be required). No conductive particles permitted.
Service Provisions	
HMI (Magelis STU)	Plain language output (no cryptic codes) USB port for upload of new software and download of operational records
Service port	USB port: commission, program, or diagnostics via a laptop computer when power is on or off; laptop provides power to control board when no unit power is present
Commissioning	On-board step-by-step process; CT automatic sizing, phase rotation, and polarity; external transformer ratio and phase shift; heat test, and more

Typical applications



Oil and gas

- Oil and gas platforms
- Port cranes
- Steel



Water



Cement

- Water/wastewater HVAC
- Automotive
- Process plants. Pulp and paper



HVAC



Building

- Wind and solar farms
- Lifts (ski or building)
- Marine vessels



Wind mills

Selection Table

Harmonic and PF Correction — 380 – 480 V models, 50/60 Hz							
Rated Current	Frequency (Hz)	Reference Number	Enclosure Information			Frame ¹	Weight (lb.)
			Rating	Style	Cable Entry		
60	50/60	PCSP060D5IP00	IP00 (UL Type Open)	Wall Mount	Bottom	1	94
		PCSP060D5N2	UL Type 2	Floor Standing	Top or Bottom	2	611
		PCSP060D5IP31	IP31				
		PCSP060D5N12	UL Type 12				
		PCSP060D5IP54	IP54				
120	50/60	PCSP120D5IP00	IP00 (UL Type Open)	Wall Mount	Bottom	3	249
		PCSP120D5N2	UL Type 2	Floor Standing	Top or Bottom	4	633
		PCSP120D5IP31	IP31				
		PCSP120D5N12	UL Type 12				
		PCSP120D5IP54	IP54				
200	50/60	PCSP200D5IP00	IP00 (UL Type Open)	Wall Mount	Bottom	5	377
		PCSP200D5N2	UL Type 2	Floor Standing	Top or Bottom	6	875
		PCSP200D5IP31	IP31				
		PCSP200D5N12	UL Type 12				
		PCSP200D5IP54	IP54				
300	50/60	PCSP300D5IP00	IP00 (UL Type Open)	Wall Mount	Bottom	7	463
		PCSP300D5N2	UL Type 2	Floor Standing	Top or Bottom	8	930
		PCSP300D5IP31	IP31				
		PCSP300D5N12	UL Type 12				
		PCSP300D5IP54	IP54				

Note:

60 A IP20/UL Type 1 configuration requires ordering two items: PCSP060D5IP00 and PCSPWMKIT60A; adds 9.13 in. (232 mm) to length and 19 lbs.
 120 A IP20/UL Type 1 configuration requires ordering two items: PCSP120D5IP00 and PCSPWMKIT120A; adds 9.13 in. (232 mm) to length and 20.5 lbs.
 200 A IP20/UL Type 1 configuration requires ordering two items: PCSP200D5IP00 and PCSPWMKIT200A; adds 10.75 in. (273 mm) to length and 19 lbs.
 300 A IP20/UL Type 1 configuration requires ordering two items: PCSP300D5IP00 and PCSPWMKIT300A; adds 10.75 in. (273 mm) to length and 19 lbs.

Harmonic and PF Correction — 480 – 600 V models, 50/60 Hz							
Rated Current	Frequency (Hz)	Reference Number	Enclosure Information			Frame ¹	Weight (lb.)
			Rating	Style	Cable Entry		
47	50/60	PCSP047D6N2	UL Type 2	Floor Standing	Top or Bottom	9	1,014
		PCSP047D6IP31	IP31				1,038
		PCSP047D6N12	UL Type 12				
		PCSP047D6IP54	IP54				
94	50/60	PCSP094D6N2	UL Type 2	Floor Standing	Top or Bottom	9	
		PCSP094D6IP31	IP31				1,118
		PCSP094D6N12	UL Type 12				
		PCSP094D6IP54	IP54				
157	50/60	PCSP157D6N2	UL Type 2	Floor Standing	Top or Bottom	10	
		PCSP157D6IP31	IP31				1,448
		PCSP157D6N12	UL Type 12				
		PCSP157D6IP54	IP54				
235	50/60	PCSP235D6N2	UL Type 2	Floor Standing	Top or Bottom	10	
		PCSP235D6IP31	IP31				1,697
		PCSP235D6N12	UL Type 12				
		PCSP235D6IP54	IP54				

¹ See pages 12 to 14.

Harmonic and PF Correction — 600 – 690 V models, 50/60 Hz

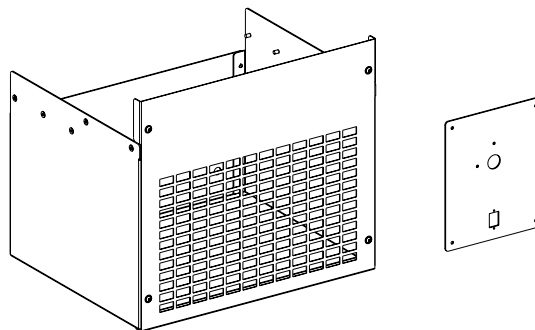
Rated Current	Frequency (Hz)	Reference Number	Enclosure Information			Frame ¹	Weight (lb.)
			Rating	Style	Cable Entry		
40	50/60	PCSP040D7N2	UL Type 2	Floor Standing	Top or Bottom	9	1,065
		PCSP040D7IP31	IP31				1,089
		PCSP040D7N12	UL Type 12				
		PCSP040D7IP54	IP54				
80	50/60	PCSP080D7N2	UL Type 2	Floor Standing	Top or Bottom	9	1,175
		PCSP080D7IP31	IP31				1,195
		PCSP080D7N12	UL Type 12				
		PCSP080D7IP54	IP54				
133	50/60	PCSP133D7N2	UL Type 2	Floor Standing	Top or Bottom	10	1,561
		PCSP133D7IP31	IP31				1,609
		PCSP133D7N12	UL Type 12				
		PCSP133D7IP54	IP54				
200	50/60	PCSP200D7N2	UL Type 2	Floor Standing	Top or Bottom	10	1,821
		PCSP200D7IP31	IP31				1,850
		PCSP200D7N12	UL Type 12				
		PCSP200D7IP54	IP54				

¹ See pages 12 to 14.

AccuSine+ Wall Mount Conversion Kit

- Converts IP00 (UL Type Open) to IP20 (UL Type 1) wall-mounted enclosed assemblies.
- Includes HMI mounting plate and cable entry enclosure for mounting on the bottom of the IP00 assemblies.

Wall-mount Kit Reference	Assembled Dimensions — IP20				IP20 Assembly	Cable Entry Enclosure
	Unit Rating (A)	Height (in./mm)	Width (in./mm)	Depth (in./mm)	Weight (lb.)	Weight (lb.)
PCSPWMKIT60A	60	60.24/1530	16.58/421	13.75/349	214.5	19
PCSPWMKIT120A	120	68.11/1730	16.58/421	15.12/384	269	20.5
PCSPWMKIT300A	200	64.64/1642	22.64/575	17.13/435	397	19
PCSPWMKIT300A	300	74/1882	22.64/575	17.13/435	482	19



The Schneider Electric solution for electronic reactive current compensation for specific and high-performance solutions.



AccuSine PFV+ Specifications	
Technical Specifications	
Standard RMS output current ratings	60 A, 120 A, 200 A, 300 A — 380 – 480 Vac 47 A, 94 A, 157 A, 235 A — 480 – 600 Vac 40 A, 80 A, 133 A, 200 A — 600 – 690 Vac
Electrical System Characteristics	
Nominal voltage	380 – 480 Vac; +10%/-15% 480 – 600 Vac; +10%/-15% 600 – 690 Vac; +10%/-15%
Nominal frequency	50/60 Hz, $\pm 3\%$ auto sensing
Number of phases	3-phase, with or without neutral
Operation with single phase loads	Yes; no effect on neutral current
Technical Product Characteristics	
Power electronics	IGBT; 3 level inverter
Topology	Digital 1/4 cycle response
Losses	At 480 Vac < 3%; at 690 Vac < 5%
Current transformers (CT)	Any ratio with 1 or 5 ampere secondary Type 1 accuracy 50/60 or 400 Hz rated Grounded
Quantity of CT	2 or 3 for 3-wire electrical system 3 required for 4-wire electrical system
CT VA loading	15 m Ω
Control basis	Closed loop for new installations ¹ Open loop compatible for retrofit applications
CT position	Closed Loop Control: Source sense (at mains) CT or Load sense CT for single unit ² Open Loop Control: Load sense CT or source sense CT for single unit ³
Parallel operation	Up to 10 units per set of CT (to 51 st order), any size combination. Backward compatibility with AccuSine PFV operated in parallel. Contact your SE sales office for applications of more than 10 units
Parallel operation options	Master/Master (masters receive mains CT) Master/Slave Multimaster/multislave Same as AccuSine PCS for retrofits
Parallel sequence options	Lead/lag with unit rotation: one unit operates to full capacity before next unit turns on; timed rotation. Load share: All operating units function at the same output percentage.
Parallel redundancy	Any unit with CT connections will automatically become master if the controlling master is taken offline. Automatic increase in output of all units to make up capacity of any offline unit.
Parallel HMI control	Any unit permits viewing and changing parameter settings of complete system or any other unit in parallel system.
Power factor correction	Optimized unity PF, leading (capacitive) or lagging (inductive) power factor (Cos ϕ) to target.
Mains current balancing	Negative sequence current injected to balance fundamental current on the mains due to load imbalance (inherently corrects displacement PF (Cos ϕ)).
Voltage support (Volt-VAR mode)	Mains voltage support via VAR injection: Maintain defined set point voltage by injecting leading VARs to raise voltage and lagging VARs to lower voltage; includes speed of adjustment.
Control response time	25 μ s
Reactive correction time	1/4 cycle
Display	5.71 in./145 mm QVGA TFT 7-color touch screen
Languages	English
Operators	Magelis HMISTU touch panel screen
Display parameters	100's: includes oscilloscope for viewing many selected parameters, phasor diagrams, load power, measured currents for Is, If, I neg seq, PF (Cos ϕ), injected currents for I reactive, I neg seq, etc.
Communications capability	Modbus RTU, Modbus TCP/IP
Discrete input/outputs	4 input and 4 output dry contacts; assignable
Noise level (ISO3746)	< 75 db at one meter from unit surface
Color	RAL7035 Enclosure; RAL7022 Plinth (floor standing units)
Earthing systems	Supports TT, TN, and IT grounding systems; Solidly, low, and high resistance grounded; ungrounded; corner grounded delta; high leg delta EMC filter ground switch for IT, high resistance ground or corner grounded systems

¹ Default and preferred control method.
² Auxiliary CT required for paralleling of units with Load sense CT position.
³ Auxiliary CT required for paralleling of units with Source (mains) sense CT position.

AccuSine PFV+ Specifications

Environmental Conditions

Operating temperature	60 A, 120 A & 200 A: IP00, IP20, UL Type Open, & UL Type 1 configurations -0 °C to 45 °C All others 0 °C to 40 °C Derate 2% per degree °C to 50 °C
Relative humidity	0 – 95%, noncondensing
Seismic rating	Complies with IBC and ASCE7
Operating altitude	1000 m (derate 1%/100 m above)
Automatic rollback of output	Occurs whenever any internal temperature sensor exceeds temperature limits
Ambient temperature shutdown	Absolute shutdown if air inlet temperature reaches 55 °C
Preset output limits (rms)	Programmable set limit due to altitude or ambient temperature — becomes fixed output limit
Storage (in original shipping container)	Temperature: -20 °C to 60 °C Relative humidity: to 95%, noncondensing Clean, dry, and protected No conductive particles permitted
Contaminant levels — operating (IEC 60721-3-3)	Chemical Class 3C2 Mechanical Class 3S2 No conductive particles permitted
Contaminant levels — transport and storage (IEC 60721-3-3)	Chemical Class 3C3 Mechanical Class 3S3 When stored in original shipping container No conductive particles permitted

Reference Standards

Design	CE EMC Certification IEC/EN 60439-1, EN 61000-6-4 Class A, EN 61000-6-2
Protection (enclosure)	IP00, IP20, IP31, IP54, UL Type 2, UL Type 12
Standards compliance/certification	cULus (UL508, CSA 22.2 No. 14) CE Certified, ABS, Lloyds, other local standards

Installation

Wall mount	IP00 (UL Type Open) and IP20 (UL Type 1) configurations
Free standing	IP31, IP54, UL Type 2, & UL Type 12
Circuit protection	IP00 and IP20 — external means required Free standing enclosures — Incoming circuit breaker or fused disconnect with mechanical door interlock
AIC rating (applies to input circuit breaker ratings for free standing model enclosures)	To 415 Vac — 200 kA cULus; 125 kA IEC To 480 Vac — 200 kA cULus; 75 kA IEC To 600 Vac — 100 kA cULus; 100 kA IEC To 690 Vac — no cULus rating; 100 kA IEC
Cable entry	UL Type open, IP00, UL Type 1, and IP20 — bottom only Free standing — top and bottom entry through gland plates
PCBA protection	Conformal coating on all PCBAs
Cooling configuration	Separate air plenums for heat sink section and PCBA section. Heat sink ("high heat plenum") input from bottom and exhausts out top. All components in high heat plenum rated IP54 or better => no filtering required. PCBA air supply must be clean and dry (filtering may be required). No conductive particles permitted

Service Provisions

HMI (Magelis STU)	Plain language output (no cryptic codes)
Service port	USB port to diagnose through a laptop computer when power is on or off; laptop provides power to control board when no unit power is present.
Commissioning	On-board step-by-step process; automatic sizing, phase rotation, and polarity for installed CT; external transformer windings and ratio, heat test, and more.

Typical applications



Oil and gas

- Oil and gas platforms
- Port cranes
- Steel



Water



Cement

- Water/wastewater HVAC
- Automotive
- Process plants. Pulp and paper



HVAC



Building

- Wind and solar farms
- Lifts (ski or building)
- Marine vessels



Wind mills

Selection Table

PF Correction and Load Balancing — 380 – 480 V models, 50/60 Hz							
Rated Current	Frequency (Hz)	Reference Number	Enclosure Information			Frame ¹	Weight (lb.)
			Rating	Style	Cable Entry		
60	50/60	EVCP060D5IP00	IP00 (UL Type Open)	Wall Mount	Bottom	1	194
		EVCP060D5N2	UL Type 2	Floor Standing	Top or Bottom	2	611
		EVCP060D5IP31	IP31				
		EVCP060D5N12	UL Type 12				
		EVCP060D5IP54	IP54				
120	50/60	EVCP120D5IP00	IP00 (UL Type Open)	Wall Mount	Bottom	3	249
		EVCP120D5N2	UL Type 2	Floor Standing	Top or Bottom	4	633
		EVCP120D5IP31	IP31				
		EVCP120D5N12	UL Type 12				
		EVCP120D5IP54	IP54				
200	50/60	EVCP200D5IP00	IP00 (UL Type Open)	Wall Mount	Bottom	5	377
		EVCP200D5N2	UL Type 2	Floor Standing	Top or Bottom	6	875
		EVCP200D5IP31	IP31				
		EVCP200D5N12	UL Type 12				
		EVCP200D5IP54	IP54				
300	50/60	EVCP300D5IP00	IP00 (UL Type Open)	Wall Mount	Bottom	7	463
		EVCP300D5N2	UL Type 2	Floor Standing	Top or Bottom	8	930
		EVCP300D5IP31	IP31				
		EVCP300D5N12	UL Type 12				
		EVCP300D5IP54	IP54				

Note:

60 A IP20/UL Type 1 configuration requires ordering two items: EVCP060D5IP00 and PCSPWMKIT60A; adds 9 in. (232 mm) to length and 19 lb.
 120 A IP20/UL Type 1 configuration requires ordering two items: EVCP120D5IP00 and PCSPWMKIT120A; adds 9 in. (232 mm) to length and 20.5 lb.
 200 A IP20/UL Type 1 configuration requires ordering two items: EVCP200D5IP00 and PCSPWMKIT200A; adds 10.75 in. (273 mm) to length and 19 lb.
 300 A IP20/UL Type 1 configuration requires ordering two items: EVCP300D5IP00 and PCSPWMKIT300A; adds 10.75 in. (273 mm) to length and 19 lb.

PF Correction and Load Balancing — 480 – 600 V models, 50/60 Hz							
Rated Current	Frequency (Hz)	Reference Number	Enclosure Information			Frame ¹	Weight (lb.)
			Rating	Style	Cable Entry		
47	50/60	EVCP047D6N2	UL Type 2	Floor Standing	Top or Bottom	9	2,238
		EVCP047D6IP31	IP31				
		EVCP047D6N12	UL Type 12				
		EVCP047D6IP54	IP54				
94	50/60	EVCP094D6N2	UL Type 2	Floor Standing	Top or Bottom	9	2,418
		EVCP094D6IP31	IP31				
		EVCP094D6N12	UL Type 12				
		EVCP094D6IP54	IP54				
157	50/60	EVCP157D6N2	UL Type 2	Floor Standing	Top or Bottom	10	3,172
		EVCP157D6IP31	IP31				
		EVCP157D6N12	UL Type 12				
		EVCP157D6IP54	IP54				
235	50/60	EVCP235D6N2	UL Type 2	Floor Standing	Top or Bottom	10	3,677
		EVCP235D6IP31	IP31				
		EVCP235D6N12	UL Type 12				
		EVCP235D6IP54	IP54				

¹ See pages 12 to 14

PF Correction and Load Balancing — 600 – 690 V models, 50/60 Hz

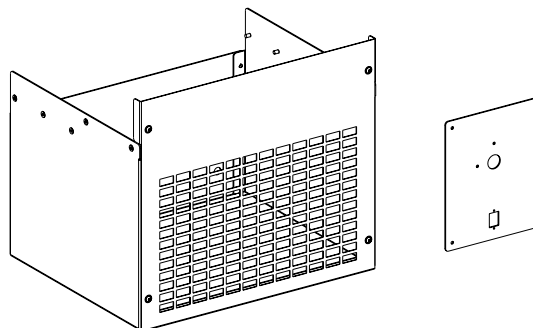
Rated Current	Frequency (Hz)	Reference Number	Enclosure Information			Frame ¹	Weight (lb.)
			Rating	Style	Cable Entry		
40	50/60	EVCP040D7N2	UL Type 2	Floor Standing	Top or Bottom	9	2,346
		EVCP040D7IP31	IP31				2,370
		EVCP040D7N12	UL Type 12				
		EVCP040D7IP54	IP54				
80	50/60	EVCP080D7N2	UL Type 2	Floor Standing	Top or Bottom	9	2,588
		EVCP080D7IP31	IP31				2,619
		EVCP080D7N12	UL Type 12				
		EVCP080D7IP54	IP54				
133	50/60	EVCP133D7N2	UL Type 2	Floor Standing	Top or Bottom	10	3,441
		EVCP133D7IP31	IP31				3,481
		EVCP133D7N12	UL Type 12				
		EVCP133D7IP54	IP54				
200	50/60	EVCP200D7N2	UL Type 2	Floor Standing	Top or Bottom	10	4,017
		EVCP200D7IP31	IP31				4,068
		EVCP200D7N12	UL Type 12				
		EVCP200D7IP54	IP54				

¹ See pages 12 to 14.

AccuSine+ Wall-mount Conversion Kit

- Converts IP00 (UL Type Open) to IP20 (UL Type 1) wall-mounted enclosed assemblies.
- Includes HMI mounting plate and cable entry enclosure for mounting on the bottom of the IP00 assemblies.

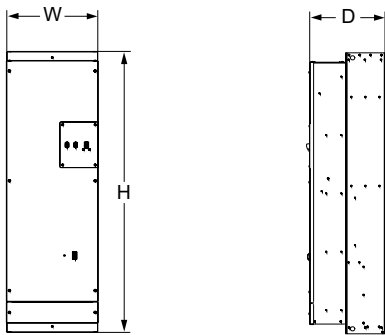
Wall-mount Kit Reference	Assembled Dimensions — IP20				IP20 Assembly	Cable Entry Enclosure
	Unit Rating (A)	Height (in./mm)	Width (in./mm)	Depth (in./mm)	Weight (lb.)	Weight (lb.)
PCSPWMKIT60A	60	60.24/1530	16.58/421	13.75/349	214.5	19
PCSPWMKIT120A	120	68.11/1730	16.58/421	15.12/384	269	20.5
PCSPWMKIT300A	200	64.64/1642	22.64/575	17.13/435	397	19
PCSPWMKIT300A	300	74/1882	22.64/575	17.13/435	482	19



Unit dimensions and installation guidelines for AccuSine PCS+ and AccuSine PFV+

Frame Size Figure	Exterior Dimensions		
	Height (in./mm)	Width (in./mm)	Depth (in./mm)
1	51.18/1300	16.57/421	13.74/349
2	82.36/2092	31.50/800	19.69/500
3	55.11/1400	16.57/421	15.12/384
4	82.24/2089	31.50/800	19.69/500
5	52.08/1323	22.91/582	17.24/438
6	82.24/2089	35.43/900	23.62/600
7	61.41/1560	22.91/582	17.24/438
8	82.36/2092	35.43/900	23.62/600
9	82.68/2100	51.18/1300	19.69/500
10	82.68/2100	55.11/1400	23.62/600

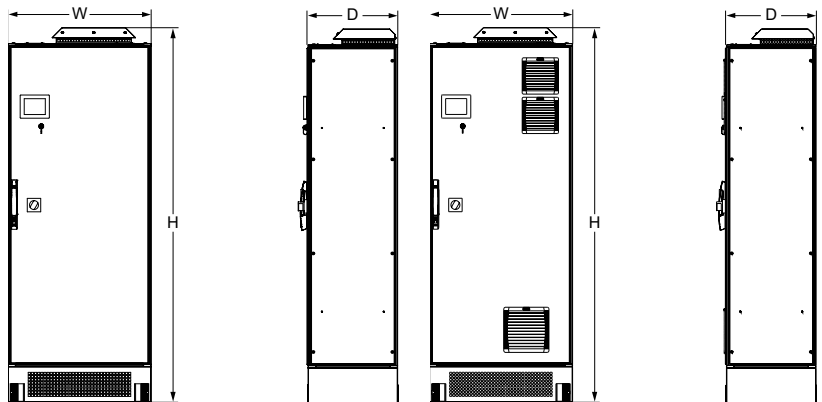
Frame Size 1



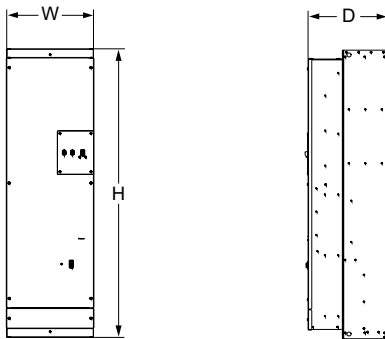
Frame Size 2

IP31

IP54



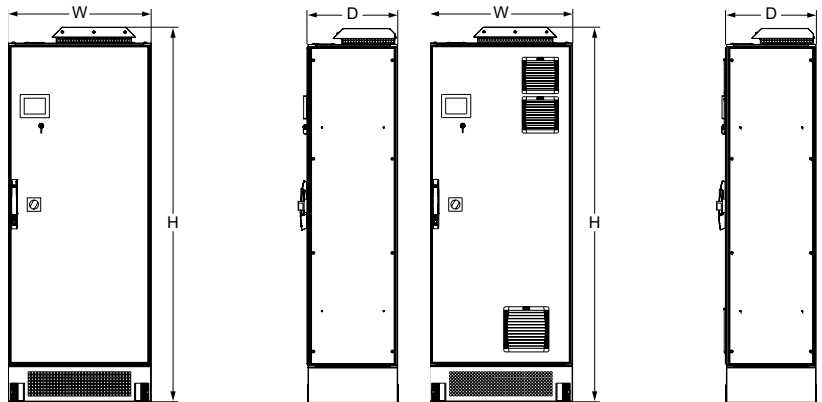
Frame Size 3



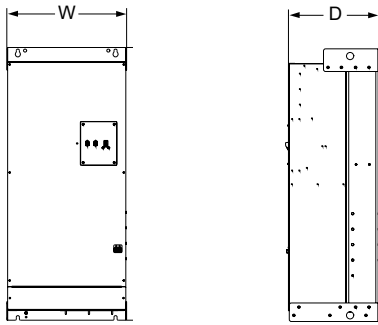
Frame Size 4

IP31

IP54



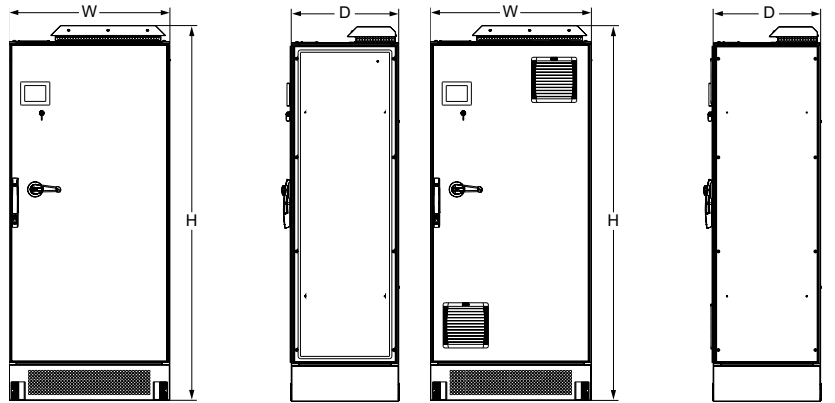
Frame Size 5



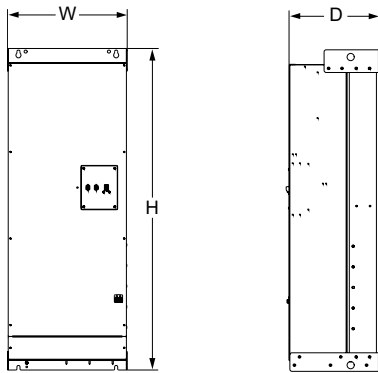
Frame Size 6

IP31

IP54



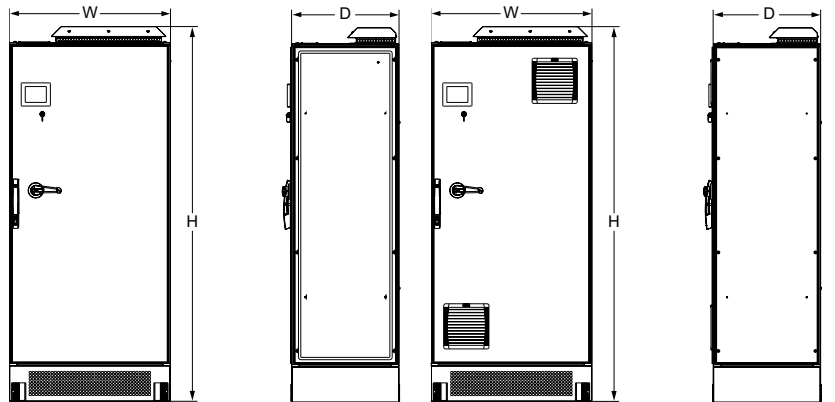
Frame Size 7



Frame Size 8

IP31

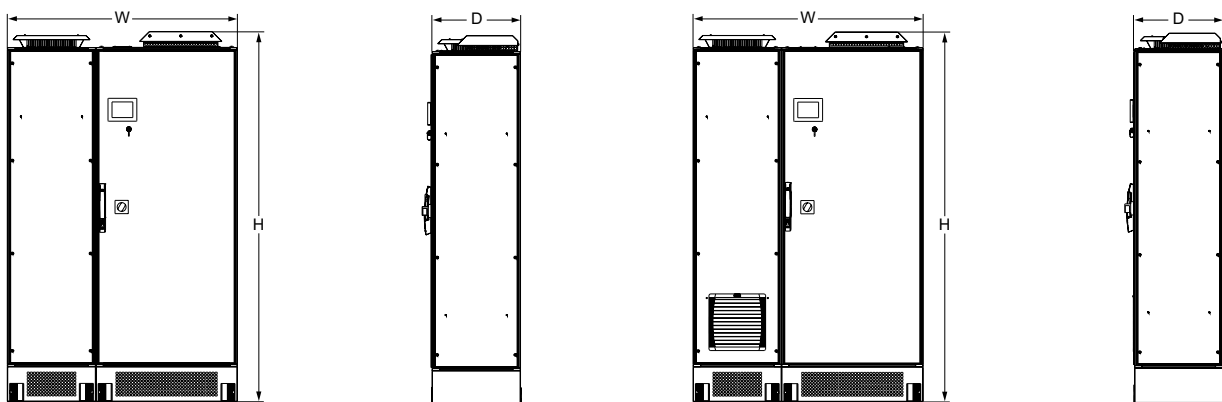
IP54



Frame Size 9

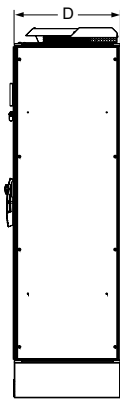
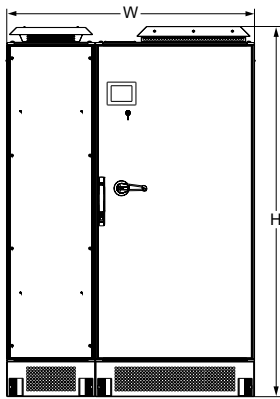
IP31

IP54

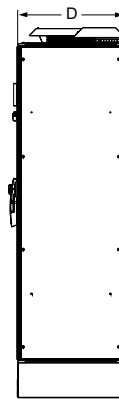
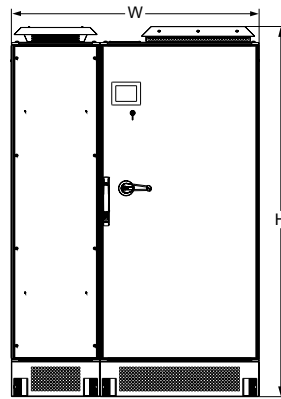


Frame Size 10

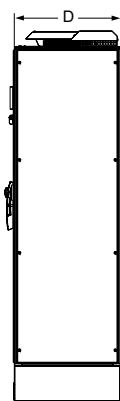
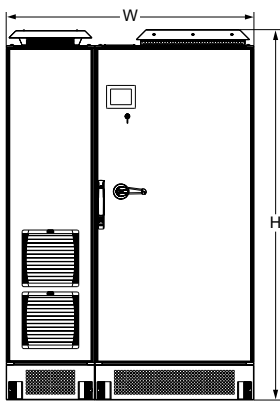
IP31 600 Vac



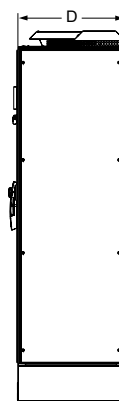
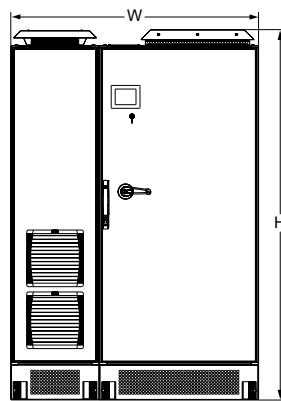
IP31 690 Vac



IP54 600 Vac



IP54 690 Vac



Current Transformers and Accessories Split Core Design



Specifications

Construction:

Directional silicon steel is used for the flexible core. Secondary windings are of copper. Unit is encapsulated in silicone rubber, which protects against moisture, dirt, oil, and corona.

Insulation level	0.72 KV, BIL 10 KV Full Wave	
Frequency	50 – 400 Hz	
Thermal factor	1.25 at 30 °C.. 1.0 at 55 °C	
Operating temp range	-45 °C to +55 °C	
Altitude	Up to 4000 Meters	
Accuracy	200:5 thru 300:5	4%
	400:5 thru 500:5	3%
	600:5 thru 800:5	2%
	1000:5 thru	1%
	6000:5	
Secondary leads	3.65 m with spade connectors	
Color	Transformer (red); Leads (yellow)	
Remains flexible from -45° to +200 °C		



Round Split Core Design

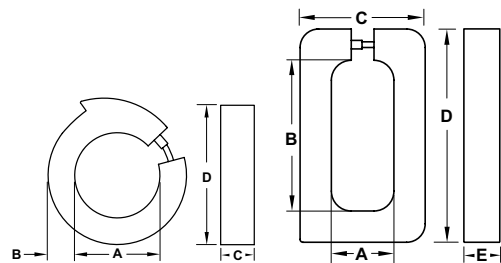
Reference Number by Secondary Current		Maximum Load (Amps)	Inside Diameter (ID) in./mm — A	Burden Capacity (Ω)		Weight (lb.)
5 Amps	1 Amp			5 Amp	1 Amp	
PCSPCTFCL50054	PCSPCTFCL50014	500	4/101.6	0.120	2.0	3.5
PCSPCTFCL100054	PCSPCTFCL100014	1000	4/101.6	0.200	10.0	3.5
PCSPCTFCL150054	PCSPCTFCL150014	1500	4/101.6	0.375	15.0	3.5
PCSPCTFCL160054	PCSPCTFCL160014	1600	4/101.6	0.375	15.0	3.5
PCSPCTFCL50056	PCSPCTFCL50016	500	6/152.4	0.120	2.0	4
PCSPCTFCL100056	PCSPCTFCL100016	1000	6/152.4	0.200	10.0	4
PCSPCTFCL120056	PCSPCTFCL120016	1200	6/152.4	0.200	15.0	4
PCSPCTFCL150056	PCSPCTFCL150016	1500	6/152.4	0.375	15.0	4
PCSPCTFCL200056	PCSPCTFCL200016	2000	6/152.4	1.000	18.0	4
PCSPCTFCL250056	PCSPCTFCL250016	2500	6/152.4	1.400	20.0	4
PCSPCTFCL300056	PCSPCTFCL300016	3000	6/152.4	1.800	20.0	4
PCSPCTFCL200058	PCSPCTFCL200018	2000	8/203.2	1.000	18.0	5.5
PCSPCTFCL250058	PCSPCTFCL250018	2500	8/203.2	1.400	20.0	5.5
PCSPCTFCL400058	PCSPCTFCL400018	4000	8/203.2	1.800	20.0	5.5
PCSPCTFCL500058	PCSPCTFCL500018	5000	8/203.2	1.800	20.0	5.5
PCSPCTFCL2500511	PCSPCTFCL2500111	2500	11/279.4	1.400	20.0	7.5

Note: Open split-core with a twisting motion only.



Rectangular Split Core Design

Reference Number by Secondary Current		Maximum Load (Amps)	Inside Diameter (ID) in./mm		Burden Capacity (Ω)		Weight (lb.)
5 Amps	1 Amp		A	B	5 Amp	1 Amp	
PCSPCTFCL5005R	PCSPCTFCL5001R	500	2.75/69.8	6.62/168.2	0.12	2.0	4
PCSPCTFCL10005R	PCSPCTFCL10001R	1000	2.75/69.8	6.62/168.2	0.2	10.0	4
PCSPCTFCL12005R	PCSPCTFCL12001R	1200	2.75/69.8	6.62/168.2	0.2	15.0	4
PCSPCTFCL15005R	PCSPCTFCL15001R	1500	2.75/69.8	6.62/168.2	0.375	15.0	4
PCSPCTFCL16005R	PCSPCTFCL16001R	1600	2.75/69.8	6.62/168.2	0.375	15.0	4
PCSPCTFCL20005R	PCSPCTFCL20001R	2000	2.75/69.8	6.62/168.2	1	18.0	4
PCSPCTFCL25005R	PCSPCTFCL25001R	2500	2.75/69.8	6.62/168.2	1.4	20.0	4
PCSPCTFCL30005R	PCSPCTFCL30001R	3000	2.75/69.8	6.62/168.2	1.8	20.0	4
PCSPCTFCL25005R411	PCSPCTFCL25001R411	2500	6.63/168.3	11/279.4	1.4	20.0	6
PCSPCTFCL30005R411	PCSPCTFCL30001R411	3000	6.63/168.3	11/279.4	1.8	20.0	6
PCSPCTFCL40005R411	PCSPCTFCL40001R411	4000	6.63/168.3	11/279.4	1.8	20.0	6
PCSPCTFCL50005R411	PCSPCTFCL50001R411	5000	6.63/168.3	11/279.4	1.8	20.0	6



ID A	Dimensions in in./mm			
	B	C	D	
101.6	1.25/31.75	1.5/38.1	6.5/165.1	
152.4	1.25/31.75	1.5/38.1	8.5/215.9	
203.2	1.25/31.75	1.5/38.1	10.5/266.7	
279.4	1.25/31.75	1.5/38.1	13.5/342.9	

ID A	B	Dimensions in in./mm			
		C	D	E	
69.8	168.2	5.5/139.7	9.37/238	1.5/38.1	
168.3	279.4	6.5/165.1	13.39/340	1.5/38.1	

Round Solid Core design



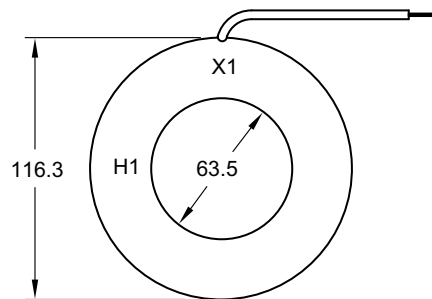
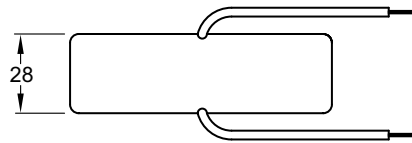
Specifications

Frequency	50 – 400 Hz
Class	0.6 kV, 10 kV BIL Full Wave
Flexible leads	UL1015, 105 °C; CSA approved; 16 AWG (1.31 mm ²), 24 in. 609.6 mm
Weight	Approximately 1.5 lb.
Accuracy	1%



Round Solid Core Design

Reference Number by Secondary Current		Maximum Load (Amps)	Burden Capacity (Ω)	
5 Amps	1 Amp		5 Amp	1 Amp
	PCSPCT7RL2011	200	0.5	5.0
PCSPCT7RL3015	PCSPCT7RL3011	300	0.5	5.0
PCSPCT7RL4015	PCSPCT7RL4011	400	0.6	7.5
PCSPCT7RL5015	PCSPCT7RL5011	500	1.0	10.0
PCSPCT7RL6015	PCSPCT7RL6011	600	1.2	12.5
PCSPCT7RL7515	PCSPCT7RL7511	750	1.2	12.5
PCSPCT7RL8015	PCSPCT7RL8011	800	1.4	20.0
PCSPCT7RL1025	PCSPCT7RL1021	1000	1.4	25.0
PCSPCT7RL1225	PCSPCT7RL1221	1200	1.4	15.0
PCSPCT7RL1525	PCSPCT7RL1521	1500	1.6	20.0
PCSPCT7RL1625	PCSPCT7RL1621	1600	2.0	25.0



Auxiliary and Summing Transformers



Description

- The Reference "PCSPCT190X..." is an auxiliary transformer for use in the secondary of main current transformers to change the ratio.
- The Reference "PCSPCT190XSUM..." is a summing transformer for use when three or five current transformers need to be totaled.

Specifications

Frequency	50 – 400 Hz
Thermal factor	1.33 at 30 °C, 1.0 at 55 °C
Secondary terminals	Brass studs No. 8-32
Weight	Approximately 4 lb.
Insulation class	0.6 kV, 10 kV BIL Full Wave

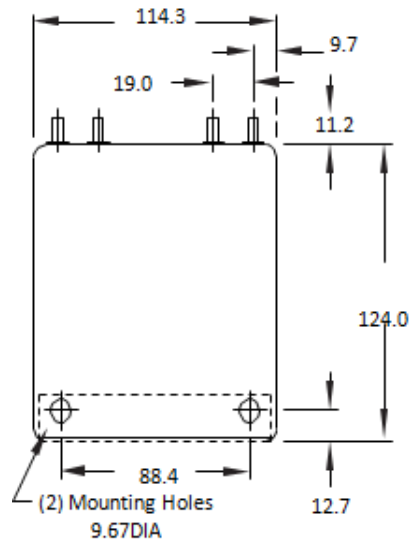
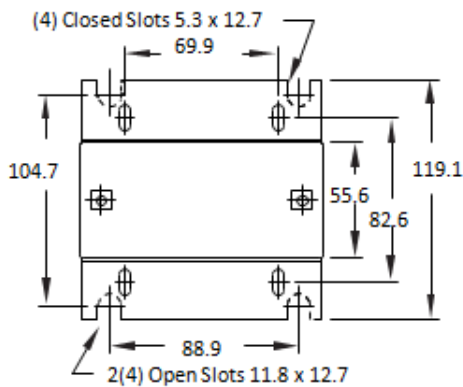
Note: Since these units are used in the secondary of another current transformer, they do not have a voltage rating. They are given a 2500 Volt - 60 Hz Hi Pot test. They are designed to be used on circuits not to exceed 600 volts-to-ground or between windings.



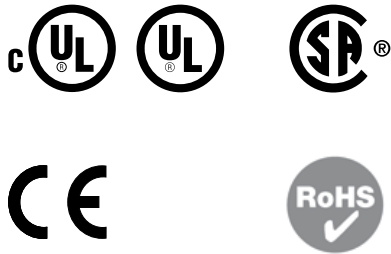
Auxiliary Transformers		
Reference Number	Current Ratio	Burden Capacity (Ω)
PCSPCT190X1000	5:1	0.5
PCSPCT190X10005	1:5	0.5
PCSPCT190X5000	5:5	0.5
Summing Transformers ¹		
Reference Number	Current Ratio	Burden Capacity (Ω)
PCSPCT190XSUM3	5+5+5:5	0.3
PCSPCT190XSUM5	5+5+5+5+5:5	0.3

¹ All current transformers to be totaled must have same ratio.

Dimensions (mm)



Shorting Terminal Block and Parallel Connection Cables



Specifications

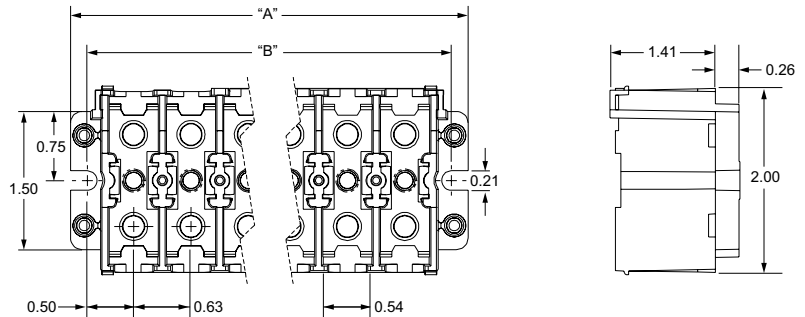
Rating	600 Vac, 30 A
Thermal rating	to 55 °C
Humidity	to 95%
Class 1E qualified per IEEE 323-1974	
This device is not CE certified	

Shorting Terminal Block

Reference Number	Description
PCSPNHA3825	CT shorting switch 6 terminals dpst



Dimensions



- Torque wire terminals to 0.565 nm.
- Torque mounting screws to 2.26 nm.

Parallel Connection Cables

- Parallel connection cables — CAT5E type.
- Required to interconnect all units operating in parallel — need one per AccuSine+ unit.



Reference	Description	Length (ft./m)
PCSPNHA38244	Paralleling cable CAT5E 3 m	9.84/3
PCSPNHA38245	Paralleling cable CAT5E 4.5 m	14.76/4.5
PCSPNHA38246	Paralleling cable CAT5E 6 m	19.78/6
PCSPNHA38247	Paralleling cable CAT5E 7.5 m	24.6/7.5
PCSPNHA38248	Paralleling cable CAT5E 9 m	29.52/9
PCSPNHA38249	Paralleling cable CAT5E 12 m	39.37/12
PCSPNHA38250	Paralleling cable CAT5E 15 m	49.21/15
PCSPNHA38251	Paralleling cable CAT5E 18 m	59.06/18
PCSPNHA38252	Paralleling cable CAT5E 22 m	72.18/22
PCSPNHA38253	Paralleling cable CAT5E 30 m	98.43/30

Human-machine Interface (HMI)

AccuSine+ products include a full color HMI with a Graphical User Interface.

Direct control, programming, and monitoring are possible without a PC or the Internet.



Measurements

A complete set of measurement data is accessible:

- line-to-line r.m.s. voltages
- total r.m.s load currents (on three phases)
- active filter output r.m.s currents (on three phases)
- harmonic r.m.s load and line currents
- voltage and current distortions (THDu and THDi)
- reactive r.m.s load current
- active filter reactive r.m.s output current
- heatsink temperature (in deg. C)

Human-machine Interface

Touch Screen

Direct control of AccuSine+ units is possible by using the touch screen.

Display

A graphical display is used for different functions:

- access and set up of operating parameters
- measurement data
- operation status (warnings, fault messages)

Menus are accessible for easy navigation.

Configuration Parameters

List of selectable parameters:

- 3- or 4-wire configuration
- harmonics or reactive energy compensation (separately or in combination)
- current transformer ratio
- power factor target
- number of units in parallel
- communication parameters

Alarms and Fault display

Detailed alarms and fault messages are displayed for easy trouble shooting:

- supply voltage or frequency outside of normal operating range
- current limitation
- overtemperature
- controller fault
- communication fault

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