AccuSine+

Catalogue 2018

Active harmonic filtering
and electronic VAR control

FROST & SULLIVAN

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GLOBAL POWER CORRECTION NEW PRODUCT INNOVATION AWARD

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Schneider Electric is Recognized with Frost & Sullivan's 2016 Global New Product Innovation Award

Schneider Electric is the winner of the 2016 Frost & Sullivan New Product Innovation Award for its new high-performance and technologically advanced range of AccuSine+ power correction solutions. This new platform is recognized for its flexible designs and ultra-fast, highly accurate harmonic cancellation and reactive current compensation for power quality management.

As a provider of competitive and innovative products, Schneider Electric operations are tailored to meet customers' requirements with the highest levels of products and services. The company serves the global market for power correction where reliability, availability, scalability, efficiency, cost and control are critical.

> *"Schneider Electric ranks as a leading global specialist in energy management, providing a unique and comprehensive portfolio of power quality management solutions. The company offers innovative, reliable, and safe solutions. Each solution is tested for quality, reliability, safety, efficiency, and productivity."*
>
> *Pritil Gunjan | Industry Analyst | Frost & Sullivan*

AccuSine+

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Power Quality

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

It is an area of growing concern for end users due to 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, for example, the cost of poor power quality can reach four 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. This return depends on the utility's demand rate structure; production quality cost related to harmonics; the cost of downtime and interruptions due to voltage fluctuations in the distribution system.

Today, electrical installations are exposed to a great deal of power quality problems; 80 percent of these disturbances are typically generated by installed equipment. In industrial facilities, for example, such disturbances can be caused by non-linear 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.

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Where used by application

	Buildings			Industry							
	Retail	Commercial & building	Healthcare	Water wastewater	Food & beverage	Automotive	Metal, Minerals & Mining	Petro-chemical	Glass	Semiconductor	
AccuSine PCSn	Office loads, LED/CFL lights, escalators, lifts	Office loads, LED/CFL lights, escalators, lifts	Office loads, LED/CFL lights, medical equipment, escalators, lifts		Process & production lines						
AccuSine PCS+	HVAC loads	HVAC loads	HVAC loads, pumps & fans	Pumps & fans with/ without backup generators	Process & production lines HVAC loads	Process & production lines	Process & heating	Process pumps	Process & heating	Process, heating & production lines pumps & fans	
AccuSine PFV+						PFC in harmonic rich & flicker control for dynamic environment.	PFC in harmonic rich & flicker control for dynamic environment.	PFC in harmonic rich & dynamic environment.	PFC in harmonic rich & dynamic environment.		

AccuSine solutions solve a wide range of power quality problems.

AccuSine PFV+ is an electronic VAR compensation (EVC) employing a multi-level IGBT technology with advanced control systems platform to perform leading or lagging power factor correction (PFC) and flicker mitigation. It is the ideal solution for PFC applications subject to high voltage distortion or subject to dynamic fast changing loads. It offers an ultra-fast response, is resonance free, and provides an infinite resolution of compensation compared to conventional PFC solutions.

AccuSine PCSn and AccuSine PCS+ are flexible, high performance solutions to stabilize electrical networks by providing harmonic mitigation and power factor correction, and load balancing.

AccuSine PCS+ is specifically designed for harsh electrical conditions, for heavy industrial applications including mission critical environments.

In addition to 3-phase mitigation, AccuSine PCSn has the ability to compensate for neutral harmonic currents, typically present in building and commercial environments where single-phase non-linear loads are present.

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 expertize ranges from power system monitoring and problem diagnosis, to engineering, installing, and supporting the precise power quality solution your facility needs to run at an 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, by using advanced manufacturing methods and premium materials. They are optimized to match your application needs and are engineered to provide superior performance.

Where used by function

	Phase harmonics	Neutral harmonics	Power factor correction	Mains current balancing	Volt – VAR support	Flicker	Environmental conditions
AccuSine PCS+	■		■	■			Harsh and heavy industrial
AccuSine PCSn	■	■	■	■			Commercial and light industrial
AccuSine PFV+			■	■	■	■	Harsh and heavy industrial

	Infrastructure						IT & Telco	Renewable	
	Textile	Ski lift / Amusement park	Marine	Airport	Railway & Tunnels	Oil & Gas	Datacentre	Solar	Wind
	Office loads, LED/CFL lights			Office loads, LED/CFL lights, baggage systems, escalators, CCR runway lights, navigation instruments	HVAC, office loads, LED/CFL lights		Load harmonics on UPS & SMPS from blade servers		
	Process & heating, pumps & fans	Load harmonics on chair lift, PFC	Propellors, pumps & fans (VSD driven)	CCR runway lights, pumps & fans, HVAC, with/without backup generators	Pumps & fans	Drilling, pumping, processing	Load harmonics on UPS, cooling system and HVAC	CSP: solar mirrors (VSD driven)	Load harmonics from converter
		Flicker mitigation, dynamic VAR injection	Dynamic PF correction to improve generator prime mover efficiencies		Traction substation load balancing, PF correction, VAR support	Dynamic PF correction to Improve generator prime mover efficiencies	Leading PF correction (for backup generators & UPS)	Voltage support via VAR injection (with or without process logic)	Hybrid VAR compensation (with process logic system)

AccuSine PCSn

The Schneider Electric solution for active harmonic filtering in building and commercial installations.

AccuSine_PCSn.psd

AccuSine PCSn wall mount (main)

AccuSine PCSn RM.png

AccuSine PCSn rack module (main)

AccuSine PCSn Technical Specifications

Electrical Characteristics

Standard RMS output current ratings	Chassis: 20 A, 30 A, 50 A, 60 A Wall: 20 A, 30 A, 50 A, 60 A Rack: 30 A, 60 A
Nominal voltage	208 - 415 VAC, -15%/+10%
Nominal frequency	50 / 60 Hz, ±3 Hz auto sensing
Connection type	3ph/3wire or 3ph/4wire
Compensation type	3ph only or 3ph + Neutral
Earthing systems	TT, TN-C, TN-S, TN-C-S, IT, corner ground, centre-tapped delta, and HRG
Network voltage distortion	Max. 20% phase to phase (up to 30th order)
Voltage notch limits	Notch depth: 10%, Notch area (AN): 13,667 Vμs @ 400 V as per IEEE 519-2014, Annex C

Technical Product Characteristics

Power electronics	3-level IGBT
Topology	Digital harmonic FFT Digital instantaneous reactive power
Efficiency & Losses	400 - 415 Vac ≥ 97% 3ph compensation: ≤ 20.4 W/A 3ph + N compensation: ≤ 22.6 W/A
Current transformer	Any ratio with 1 A or 5 A secondary; Class 1.0 accuracy; 50/60 or 400 Hz rated (instrument rated or better); Grounded; can be shared with other devices.
CT VA loading	1 A: 0.04 VA 5 A: 1 VA
Quantity of CT	2 or 3 CTs for 3-phase loads 3 CTs are required for 4-wire with neutral connected loads
CT position	Grid or load sense
Control basis	Closed or open loop
Spectrum cancellation & selection	2nd to 51st harmonic order; discrete, fully selectable adjustable per harmonic order (amplitude % and ON/OFF).
Modes of operation	Multi-modes simultaneously or discrete - phase harmonic correction - neutral harmonic correction with user-adjustable current limit up to 3 times unit rating - power factor correction (cos φ) - mains load balancing
Operational features	% THDi setpoint % THDv setpoint Target PF setpoint
Harmonic attenuation & filtering performance	THDi < 3% in closed loop control; max 20:1 THDi typical (reduction with load harmonic above 50% unit rating) requires 3% or higher inductive impedance per non-linear load
Power factor correction	Optimize PF and Target PF (cos φ) programmable leading (capacitive) or lagging (inductive).
Load balancing	Negative and zero sequence; selectable individually or simulateneously.
Resonance avoidance	Output at specific harmonic order turned off if resonance or lack of impedance detected or manually turned off.

Paralleling Characteristics

Scalability & Expandability	Upto 12 units in parallel per set of CT; any size unit combination possible (max nth order subject to network characteristics).
Parallel operation options	Master/Slave, Multi-master, Multi-master/Multi-slave (masters receive CT connection). Main units (master capable): 20 A, 30 A, 50 A, 60 A Expansion units (slave only - no CT connection): 60 A
Paralleling architecture	Distributed redundancy with no independent controller required.
Parallel sequence options	Load share: all operating units function at the same ouput percentage. Cascade: lead/lag with unit rotation; one unit operates to full capacity before next unit turns on; timed rotation.
Unit ID assignment	Automatic parallel ID assignment capability or can be set manually.

AccuSine PCSn Technical Specifications

Parallel redundancy	As long as there is a main (master capable) unit online, any unit with CT connections will automatically become master if the controlling master is taken offline. Automatic increase in ouput of all units to make up capacity of any offline unit.
Parallel HMI control	The main unit permits viewing and changing parameter settings of the complete system or any other unit in the parallel system.
Control and Communications	
Parallel communications	Proprietary communication bus between operating units (shielded CAT5e or higher required with RJ-45 connectors).
Control response time	40 - 60 µs typical
Harmonic correction time	≤ 2 cycles
Reactive correction time	≤ 1/2 cycle
Communications protocol	Main units: Modbus RTU and Modbus TCP/IP Expansion units: Modbus RTU
Discrete I/O	4 inputs, 4 outputs assignable
Environmental Conditions	
Operating temperature	0 °C to +45 °C (full performance, continuous operation without derating). Derate 2% per °C up to +50 °C
Relative humidity	0 - 95%, noncondensing
Operating altitude	1000 m (full performance, continuous operation). Derate 1% per 100 m above. Above 3000 m requires solid ground. Absolute max altitude: 4800 m.
Ambient temperature safety	Automatic temperature roll back based upon IGBT over temperature. 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 packaging)	Temperature: -20 °C to +60 °C, Relative humidty: upto 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 (stored in original shipping packaging). No conductive particles permitted.
Standards and Certification	
Design reference	IEC 62477-1, IEC 61439-1, EN 61000-6-2, EN 61000-6-4 Class A, ISO 9001, IEEE Std 519-2014
EMC compliance	EN 61000-6-4 Class A (Emissions), EN 61000-6-2 (Immunity).
Seismic compliance	IBC 2015, ICC-ES AC156 (S_{DS} = 2.47 g).
Product certification	CE certified, RCM, EAC, RoHS, IBC
Mechanical and Installation Characteristics	
Mounting configuration	Indoor Vertical: chassis and wall mount. Horizontal: 19" rack mount Floor standing possible using chassis unit.
Ingress protection	Chassis mount: IP00, Wall mount: IP20, Rack mount: IP20
PCBA protection	Conformal coating on all PCBAs. Pollution degree 2.
Incoming circuit protection	None - supplied by others external to AccuSine PCSn unit (refer to AccuSine PCSn installation manual for further information). Recommended earth leakage protection: 500 mA
Cable entry	Chassis and wall mount: bottom entry Rack mount: front entry
Cooling configuration	Variable speed controlled forced ventilation. High heat plenum. Air flow: 560 m^3/hr Chassis and wall mount: bottom to top Rack module: front to back No conductive particles permitted, no corrosive gases.
Noise level	63 dB(A) typical
Dimensions (H x W x D) mm	Chassis and wall mount: 960 x 440 x 265 mm Rack mount: 265 x 440 x 960 mm (6 U) (1 U = 1.75" = 44.45 mm)
Color and material	Galvanized steel enclosure Powder coated Lt. grey RAL7035 wall mount door, rack mount front grill.
HMI and Service Provisions	
Display	Magelis STU HMI, high definition color touchscreen TFT QVGA 64 k
Operator interface	Chassis mount: 144 mm (5.7") supplied for remote mounting Wall mount: 144 mm (5.7") Rack mount: 90 mm (3.5") Expansion units: no HMI required
User interface options	Plain language, no cryptic code. Multiple languages: English, French, Spanish, Portuguese, Chinese, and Korean.
Service port	2 x USB ports for firmware update, diagnostics file, and event log download, connection to PC. Diagnostics can be downloaded via PC even if the unit is de-energized.
Commissioning features	On-board step-by-step commissioning protocol via HMI. On-board commissioning report for download - no additional software required. Automatic CT calibration, polarity detection and correction. Phase sequence insusceptible. Automatic unit neutral connection check.

AccuSine PCSn

AccuSine PCSn Technical Specifications

Interoperability and Integration

Floor standing enclosures	Using chassis module, ensuring air flow requirement is met.
Rack system integration	Suitable for 19" wide rack systems, ensuring rack density requirement is met.
System Integration	EcoStruxure™ Power ready; Native driver to PME 8.2 and PME 9.0; Compatible for operation with AccuSine PCS+/PFV+ range ; Suitable for integration in 3rd party EPMS/SCADA through modbus mapping.

Typical Applications

Building

LED / CFL loads

Research and Life Sciences

Commercial Retail

Hotel and Casino

Healthcare

- Airport terminal
- Railway terminal
- University facilities and accommodation
- Hospital
- Casino
- Datacentre SMPS loads
- Commercial space SMPS loads
- LED and CFL loads

Selection Table

AccuSine PCSn 208-415 V, 50/60 Hz

Rated current (A)	Neutral rated current (A)	Rated kVAR @ 415 V	Catalogue number	Enclosure rating	Mounting type	Unit type	Cable entry	Frame	Weight (kg)
20	60	14	PCSN020Y4CH00	IP00	Chassis	Main	Bottom	12	61
30	90	22	PCSN030Y4CH00	IP00					
50	150	36	PCSN050Y4CH00	IP00					75
60	180	43	PCSN060Y4CH00	IP00					
60	180	43	PCSN060Y4CH00E	IP00		Expansion			
20	60	14	PCSN020Y4W20	IP20	Wall mount	Main	Bottom	12	61
30	90	22	PCSN030Y4W20	IP20					
50	150	36	PCSN050Y4W20	IP20					75
60	180	43	PCSN060Y4W20	IP20					
60	180	43	PCSN060Y4W20E	IP20		Expansion			
30	90	22	PCSN030Y4R19	IP20	19" rack mount	Main	Front	13	61
60	180	43	PCSN060Y4R19	IP20					75
60	180	43	PCSN060Y4R19E	IP20		Expansion			

AccuSine PCSn rack modules are designed to fit the NetShelter SX rack enclosures. Ready for high-density environments right out of the box, NetShelter SX rack enclosures offer the most common features on the market today. Recommended rack solutions and accessories are provided in the following table.

Rack Systems and Accessories

NetShelter SX Rack Enclosure System						
Catalogue number	Description	Weight (kg)	Rack height (U)	Dimensions (mm)		
				Height	Width	Depth
AR3100	NetShelter SX 42U x 600 mm Wide x 1070 mm Deep with doors	125	42	1991	600	1070
AR3300	NetShelter SX 42U x 600 mm Wide x 1200 mm Deep with doors	134	42	1991	600	1200
AR8136BLK	NetShelter SX 1U toolless snap-in blanking panel, 10 pieces per pack	0.1	-	45.0	483	28.0
AR8108BLK	NetShelter SX 1U standard metal blanking panel, 2 pieces per pack	0.1	-	44.0	483	3.0
AR8101BLK	NetShelter SX 1U, 2U, 4U, 8U, blanking panel kit	3	-	-	483	3
AR7700	NetShelter SX stabilization plate to prevent tipping when sliding out equipment	5	-	75	351	207
AR7701	NetShelter SX bolt-down kit - meets IBC seismic requirements for moderate seismic zones	1	-	73	70	62
AR7701-S	NetShelter SX bolt-down kit - meets IBC seismic requirements for high seismic zones	1	-	70	320	50

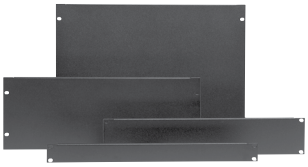
For more information on NetShelter SX, please refer to: http://www.schneider-electric.com/en/product-category/7500-it-racks-and-accessories

1U = 1.75" = 44.45 mm - Each PCSn rack module is 6U high + 1U space for cabling accessory (supplied with each unit).
Included in packaging: PCSn rack module, 1U cable plate and a pair of mounting rails for installation in NetShelter SX rack enclosures.

Note: Rack enclosure and accessories are not included in the PCSn module and must be ordered separately using the commercial references provided in the table above.

NetShelter SX AR3100 or AR3300

Air sealing: covers open space to prevent air recirculation and reduce bypass airflow to improve cooling efficiency.



AR8101BLK

AR8136BLK

Bolt-down and stabilization: prevents tip-over in stand-alone rack applications and meet specific anchoring requirements.

AR7701 and AR7701-S

AR7700

AccuSine PCS+

Active harmonic filtering solution for industrial and heavy-duty applications.

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Model 6 MCC (UL and CSA approved)

PD405100.eps

Okken / Blokset (IEC61439 certified)

AccuSine PCS+ Specifications

Technical Specifications

Standard RMS output current ratings	60 A, 120 A, 200 A, 300 A @ 208 - 240 VAC 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	208 - 240 VAC, + 10% / -10% 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 (no neutral cancellation)

Technical Product Characteristics

Power electronics	3-level IGBT
Topology	Digital harmonic FFT Digital instantaneous reactive power.
Efficiency	to 480 VAC >97%; to 690 VAC >95%
Current transformers (CT)	Any ratio with 1 or 5 ampere secondary; Class 1.0 accuracy; 50/60 or 400 Hz rated (Instrument rated or better); Grounded; can be shared with other devices.
CT VA loading	1 A: 0.04 VA 5 A: 1 VA
Quantity of CT	2 or 3 for 3-phase loads 3 required for 4-wire with neutral connected loads
Spectrum cancellation	2nd to 51st, discrete; fully selectable per harmonic order (amplitude and on/off).
Control basis	Closed loop; Open loop (compatible with AccuSine PCS for retrofit applications).
CT position	Grid sense (at mains) or load sense
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 non-linear load
Operational features	% THDi set point % THDv set point Target PF set point
Resonance avoidance	Output at specific harmonic order turned off if resonance or lack of impedance detected; or manually turned off.
Parallel operation	Upto 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 if more than 10 units required.
Parallel operation options	Master/Master (masters receive mains CT); Master/Slave; Multi-master/Multi-slave; Same as AccuSine PCS for retrofits.
Parallel sequence options	Load share: all operating units function at the same ouput percentage. Cascade: lead/lag with unit rotation: one unit operates to full capacity before next unit turns on; timed rotation.
Parallel redundancy	Any unit with CT connections will automatically become master if the controling master is taken offline. Automatic increase in ouput of all units to make up capacity of any offline unit.
Parallel HMI control	Any unit permits viewing and changing parameter settings of the complete system or any other unit in the parallel system.
Parallel communications	Proprietary COM Bus between operating units (shielded CAT5e or higher required).
Power factor correction	Optimized PF correction, leading (capacitive) or lagging (inductive) power factor (Cos ø) to target.
Control response time	25 µs
Harmonic correction time	2 cycles
Reactive correction time	1/4 cycle
Display	144 mm QVGA TFT 64k-color touchscreen
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 f), injected currents for Ih, 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)	<70 dB(A) typical
Earthing (Grounding) systems	Suitable for most earthing (grounding) systems; IT switch on EMC filter for IT earthing (ground), high resistance earthing (ground) or corner earthed (grounded) systems.

AccuSine PCS+ Specifications

Environmental Conditions	
Operating temperature	60 A, 120 A, and 200 A: IP00 (UL Type Open) and IP20 (UL Type N1 wall mount): 0 °C to 45 °C; All others: 0 °C to 40 °C; Derate 2% per °C upto 50 °C.
Relative humidity	0-95%, noncondensing
Seismic rating	Complies with IBC and ASCE7 (Requires top anchorage for all floor standing models).
Operating altitude	1000 m, (derate 1% per 100 m above)
Ambient temperature safety	Automatic temperature roll back based upon any device OT. 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 humidty: 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 61439-1, 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, DNV-GL, CNAS, RCM, EAC, RoHS, IBC and other local standards.
Installation	
Wall mount	IP00 (UL Type open) and IP20 (UL Type 1) configurations
Free standing	IP31, IP54, UL Type 1, UL Type 2, and UL Type 12
Circuit protection	IP00 and IP20 - external means required. Supplied by others. Free standing enclosures - Incoming circuit breaker or fuse disconnect with mechanical door interlock.
AIC rating	to 240 VAC - 200 kA cULus; 150kA IEC to 415 VAC - 200 kA cULus; 125 kA IEC to 480 VAC - 200 kA cULus; 75 kA IEC to 600 VAC - 100 kA cULus; 20 kA IEC to 690 VAC - No cULus; 100 kA IEC
Cable entry	Wall mount: 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. Polution Degree 2.
Cooling configuration	Natural and forced ventilation; Separate air plenums for heat sink section and PCBA section; Heat sink plenum input from bottom with exhaust out top; All components in heat sink 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). Languages: English, French, Spanish, Portuguese, and Chinese. 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 platforms
- Port cranes
- Steel
- Water/wastewater
- HVAC
- Automotive
- Process plants, pulp, and paper
- Wind and solar farms
- Lifts (ski or building)
- Marine vessels

Selection Table

AccuSine PCS+ 208 - 240 V, 50/60 Hz

Rated current	KVAR rating @ voltage	Catalog number	Enclosure			Frame	Weight kg
			Rating	Style	Cable entry		
60	21.6 @ 208 24.9 @ 240	PCSP060D2IP00	IP00 (chassis)	Wall mount	Bottom	1	88
		PCSP060D2N2	UL Type 2	Floor standing	Top or Bottom	2	277
		PCSP060D2IP31	IP31				
		PCSP060D2N12	UL Type 12				291
		PCSP060D2IP54	IP54				
120	43.2 @ 208 49.9 @ 240	PCSP120D2IP00	IP00 (chassis)	Wall mount	Bottom	3	113
		PCSP120D2N2	UL Type 2	Floor standing	Top or Bottom	4	279
		PCSP120D2IP31	IP31				
		PCSP120D2N12	UL Type 12				293
		PCSP120D2IP54	IP54				
200	72.1 @ 208 83.1 @ 240	PCSP200D2IP00	IP00 (chassis)	Wall mount	Bottom	5	171
		PCSP200D2N1	UL Type N1	Floor standing	Top or Bottom	11	363
		PCSP200D2N2	UL Type 2			6	384
		PCSP200D2IP31	IP31				
		PCSP200D2N12	UL Type 12				402
		PCSP200D2IP54	IP54				
300	108.1 @ 208 124.7 @ 240	PCSP300D2IP00	IP00 (chassis)	Wall mount	Bottom	7	210
		PCSP300D2N1	UL Type N1	Floor standing	Top or Bottom	11	402
		PCSP300D2N2	UL Type 2			8	422
		PCSP300D2IP31	IP31				
		PCSP300D2N12	UL Type 12				436
		PCSP300D2IP54	IP54				

Note:
60 A IP20/UL Type 1 configuration requires ordering two items: PCSP060D2IP00 and PCSPWMKIT60A; adds 232 mm to IP00 length and 8.7 kg.
120 A IP20/UL Type 1 configuration requires ordering two items: PCSP120D2IP00 and PCSPWMKIT120A; adds 232 mm to IP00 length and 9.3 kg.
200 A IP20/UL Type 1 configuration requires ordering two items: PCSP200D2IP00 and PCSPWMKIT300A; adds 273 mm to IP00 length and 8.6 kg.
300 A IP20/UL Type 1 configuration requires ordering two items: PCSP300D2IP00 and PCSPWMKIT300A; adds 273 mm to IP00 length and 8.6 kg.

AccuSine PCS+ 380 - 480 V, 50/60 Hz

Rated current	KVAR rating @ voltage	Catalog number	Enclosure			Frame	Weight kg
			Rating	Style	Cable entry		
60	39.5 @ 380 41.6 @ 400 43.1 @ 415 49.9 @ 480	PCSP060D5IP00	IP00 (chassis)	Wall mount	Bottom	1	88
		PCSP060D5N2	UL Type 2	Floor standing	Top or Bottom	2	277
		PCSP060D5IP31	IP31				
		PCSP060D5N12	UL Type 12				291
		PCSP060D5IP54	IP54				
120	79.0 @ 380 83.1 @ 400 86.3 @ 415 99.8 @ 480	PCSP120D5IP00	IP00 (chassis)	Wall mount	Bottom	3	113
		PCSP120D5N2	UL Type 2	Floor standing	Top or Bottom	4	279
		PCSP120D5IP31	IP31				
		PCSP120D5N12	UL Type 12				293
		PCSP120D5IP54	IP54				
200	131.6 @ 380 138.6 @ 400 143.8 @ 415 166.3 @ 480	PCSP200D5IP00	IP00 (chassis)	Wall mount	Bottom	5	171
		PCSP200D5N1	UL Type N1	Floor standing	Top or Bottom	11	363
		PCSP200D5N2	UL Type 2			6	384
		PCSP200D5IP31	IP31				
		PCSP200D5N12	UL Type 12				402
		PCSP200D5IP54	IP54				
300	197.5 @ 380 207.8 @ 400 215.6 @ 415 249.4 @ 480	PCSP300D5IP00	IP00 (chassis)	Wall mount	Bottom	7	210
		PCSP300D5N1	UL Type N1	Floor standing	Top or Bottom	11	402
		PCSP300D5N2	UL Type 2			8	422
		PCSP300D5IP31	IP31				
		PCSP300D5N12	UL Type 12				436
		PCSP300D5IP54	IP54				

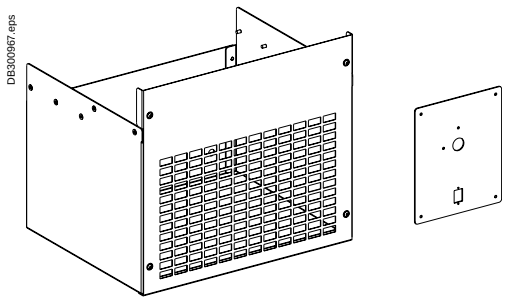
Note:
60 A IP20/UL Type 1 configuration requires ordering two items: PCSP060D5IP00 and PCSPWMKIT60A; adds 232 mm to IP00 length and 8.7 kg.
120 A IP20/UL Type 1 configuration requires ordering two items: PCSP120D5IP00 and PCSPWMKIT120A; adds 232 mm to IP00 length and 9.3 kg.
200 A IP20/UL Type 1 configuration requires ordering two items: PCSP200D5IP00 and PCSPWMKIT300A; adds 273 mm to IP00 length and 8.6 kg.
300 A IP20/UL Type 1 configuration requires ordering two items: PCSP300D5IP00 and PCSPWMKIT300A; adds 273 mm to IP00 length and 8.6 kg.

AccuSine PCS+ 480 - 600 V, 50/60 Hz

Rated current	KVAR rating @ voltage	Catalog number	Enclosure Rating	Style	Cable entry	Frame	Weight kg
47	48.8 @ 600	PCSP047D6N2	UL Type 2	Floor standing	Top or Bottom	9	461
		PCSP047D6IP31	IP31				
		PCSP047D6N12	UL Type 12				461
		PCSP047D6IP54	IP54				
94	97.7 @ 600	PCSP094D6N2	UL Type 2	Floor standing	Top or Bottom	9	498
		PCSP094D6IP31	IP31				
		PCSP094D6N12	UL Type 12				498
		PCSP094D6IP54	IP54				
157	163.2 @ 600	PCSP157D6N2	UL Type 2	Floor standing	Top or Bottom	10	653
		PCSP157D6IP31	IP31				
		PCSP157D6N12	UL Type 12				653
		PCSP157D6IP54	IP54				
235	244.2 @ 600	PCSP235D6N2	UL Type 2	Floor standing	Top or Bottom	10	757
		PCSP235D6IP31	IP31				
		PCSP235D6N12	UL Type 12				757
		PCSP235D6IP54	IP54				

AccuSine PCS+ 600 - 690 V, 50/60 Hz

Rated current	KVAR rating @ voltage	Catalog number	Enclosure Rating	Style	Cable entry	Frame	Weight kg
40	47.8 @ 690	PCSP040D7N2	UL Type 2	Floor standing	Top or Bottom	9	483
		PCSP040D7IP31	IP31				
		PCSP040D7N12	UL Type 12				483
		PCSP040D7IP54	IP54				
80	95.6 @ 690	PCSP080D7N2	UL Type 2	Floor standing	Top or Bottom	9	533
		PCSP080D7IP31	IP31				
		PCSP080D7N12	UL Type 12				533
		PCSP080D7IP54	IP54				
133	159.0 @ 690	PCSP133D7N2	UL Type 2	Floor standing	Top or Bottom	10	709
		PCSP133D7IP31	IP31				
		PCSP133D7N12	UL Type 12				709
		PCSP133D7IP54	IP54				
200	239.0 @ 690	PCSP200D7N2	UL Type 2	Floor standing	Top or Bottom	10	827
		PCSP200D7IP31	IP31				
		PCSP200D7N12	UL Type 12				827
		PCSP200D7IP54	IP54				



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.

	Assembled dimensions - IP20				IP20 assembly	Cable entry enclosure
Wall mount kit reference	Unit rating (A)	Height	Width	Depth	Weight (kg)	Weight (kg)
PCSPWMKIT60A	60	1530	421	349	97.3	8.7
PCSPWMKIT120A	120	1630	421	384	122.0	9.3
PCSPWMKIT300A	200	1642	575	435	180.0	8.6
PCSPWMKIT300A	300	1882	575	435	218.6	8.6

AccuSine PFV+

Reactive current compensation solution for specific and high performance systems.

PB502825_R.eps

PB115718.eps

Model 6 MCC (UL and CSA approved)

PD405100.eps

Okken / Blokset (IEC61439 certified)

AccuSine PFV+ Specifications

Technical Specifications

Standard RMS output current ratings	60 A, 120 A, 200 A, 300 A @ 208 - 240 VAC 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	208 - 240 VAC, +10%/-10% 380 - 480 VAC; +10%/-15% 480 - 600 VAC; +10%/-15% 600 - 690 VAC; +10%/-15%
Nominal frequency	50/60 Hz, ±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 %
Efficiency	to 480 VAC >97%; to 690 VAC >95%
Current transformers (CT)	Any ratio with 1 or 5 ampere secondary; Type 1 accuracy; 50/60 or 400 Hz rated (Instrument rated or better); Grounded;can be shared with other devices.
Quantity of CT	2 or 3 for 3-phase loads 3 required for 4-wire with neutral connected loads
CT VA loading	40 mΩ
Control basis	Closed loop (for new installations). Open loop (compatible for retrofit applications).
CT position	Closed loop control: Source sense (at mains) CT or load sense CT for single unit. Open loop control: Load sense CT or source sense CT for single unit.
Parallel operation	Upto 10 units per set of CT 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; Multi-master/Multi-slave; Same as AccuSine PCS for retrofits.
Parallel sequence options	Cascade: 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 ouput percentage
Parallel redundancy	Any unit with CT connections will automatically become master if the controling master is taken offline. Automatic increase in ouput of all units to make up capacity of any offline unit.
Parallel HMI control	Any unit permits viewing and changing parameter settings of the complete system or any other unit in the parallel system.
Power factor correction	Optimized PF correction, leading (capacitive) or lagging (inductive) power factor (Cos ø) 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 µs
Reactive correction time	1/4 cycle
Display	145 mm QVGA TFT 7-color touchscreen
Operators	Magelis HMI STU 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 (Grounding) systems	Suitable for most earthing (grounding) systems; IT switch on EMC filter for IT earthing (ground), high resistance earthing (ground) or corner earthed (grounded) systems.

AccuSine PFV+ Specifications

Environmental Conditions

Operating temperature	60 A, 120 A, and 200 A: IP00 (UL Type Open) and IP20 (UL Type N1 wall mount): 0 °C to 45 °C; All others: 0 °C to 40 °C; Derate 2% per °C upto 50 °C.
Relative humidity	0-95 %, noncondensing
Seismic rating	Complies with IBC and ASCE7 (Requires top anchorage for all floor standing models).
Operating altitude	1000 m, (derate 1% per 100 m above)
Ambient temperature safety	Automatic temperature roll back based upon any device OT. 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 humidty: 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 61439-1, EN 61000-6-4 Class A, EN 61000-6-2
Protection (enclosure)	IP31, IP54, UL Type 1, UL Type 2, and UL Type 12
Standards compliance/ certification	cULus (UL508 , CSA 22.2 No. 14) CE Certified, ABS, other local standards

Installation

Wall mount	IP00 (UL Type Open) and IP20 (UL Type 1) configurations
Free standing	IP31, IP54, UL Type 2, and UL Type 12
Circuit protection	IP00 and IP20 - external means required. Supplied by others. Free standing enclosures - Incoming circuit breaker or fuse disconnect with mechanical door interlock.
AIC rating (applies to input circuit breaker ratings for free standing model enclosures)	to 240 VAC - 200 kA cULus; 150kA IEC to 415 VAC - 200 kA cULus; 125 kA IEC to 480 VAC - 200 kA cULus; 75 kA IEC to 600 VAC - 100 kA cULus; 20 kA IEC to 690 VAC - No cULus; 100 kA IEC
Cable entry	Wall mount: 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	Natural and forced ventilation; Separate air plenums for heat sink section and PCBA section; Heat sink plenum input from bottom with exhaust out top; All components in heat sink 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). Languages: English, French, Spanish, Portuguese, and Chinese. 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 | Water | Cement | HVAC | Building | Wind turbines

- Oil and gas platforms
- Port cranes
- Steel
- Water/wastewater
- HVAC
- Automotive
- Process plants, pulp, and paper
- Wind and solar farms
- Lifts (ski or building)
- Marine vessels

Selection Table

AccuSine PFV+ 208 - 240 V, 50/60 Hz

Rated current	KVAR rating @ voltage	Catalog number	Enclosure Rating	Style	Cable entry	Frame	Weight kg
60	21.6 @ 208 24.9 @ 240	EVCP060D2IP00	IP00 (chassis)	Wall mount	Bottom	1	88
		EVCP060D2N2	UL Type 2	Floor standing	Top or Bottom	2	277
		EVCP060D2IP31	IP31				
		EVCP060D2N12	UL Type 12				291
		EVCP060D2IP54	IP54				
120	43.2 @ 208 49.9 @ 240	EVCP120D2IP00	IP00 (chassis)	Wall mount	Bottom	3	113
		EVCP120D2N2	UL Type 2	Floor standing	Top or Bottom	4	279
		EVCP120D2IP31	IP31				
		EVCP120D2N12	UL Type 12				293
		EVCP120D2IP54	IP54				
200	72.1 @ 208 83.1 @ 240	EVCP200D2IP00	IP00 (chassis)	Wall mount	Bottom	5	171
		EVCP200D2N1	UL Type N1	Floor standing	Top or Bottom	11	363
		EVCP200D2N2	UL Type 2			6	384
		EVCP200D2IP31	IP31				
		EVCP200D2N12	UL Type 12				402
		EVCP200D2IP54	IP54				
300	108.1 @ 208 124.7 @ 240	EVCP300D2IP00	IP00 (chassis)	Wall mount	Bottom	7	210
		EVCP300D2N1	UL Type N1	Floor standing	Top or Bottom	11	402
		EVCP300D2N2	UL Type 2			8	422
		EVCP300D2IP31	IP31				
		EVCP300D2N12	UL Type 12				436
		EVCP300D2IP54	IP54				

Note:
60 A IP20/UL Type 1 configuration requires ordering two items: EVCP060D2IP00 and PCSPWMKIT60A; adds 232 mm to length and 8.7 kg.
120 A IP20/UL Type 1 configuration requires ordering two items: EVCP120D2IP00 and PCSPWMKIT120A; adds 232 mm to length and 9.3 kg.
200 A IP20/UL Type 1 configuration requires ordering two items: EVCP200D2IP00 and PCSPWMKIT300A; adds 273 mm to length and 8.6 kg.
300 A IP20/UL Type 1 configuration requires ordering two items: EVCP300D2IP00 and PCSPWMKIT300A; adds 273 mm to length and 8.6 kg.

AccuSine PFV+ 380 - 480 V, 50/60 Hz

Rated current	KVAR rating @ voltage	Catalog number	Enclosure Rating	Style	Cable entry	Frame	Weight kg
60	39.5 @ 380 41.6 @ 400 43.1 @ 415 49.9 @ 480	EVCP060D5IP00	IP00 (chassis)	Wall mount	Bottom	1	88
		EVCP060D5N2	UL Type 2	Floor standing	Top or Bottom	2	277
		EVCP060D5IP31	IP31				
		EVCP060D5N12	UL Type 12				291
		EVCP060D5IP54	IP54				
120	79.0 @ 380 83.1 @ 400 86.3 @ 415 99.8 @ 480	EVCP120D5IP00	IP00 (chassis)	Wall mount	Bottom	3	113
		EVCP120D5N2	UL Type 2	Floor standing	Top or Bottom	4	279
		EVCP120D5IP31	IP31				
		EVCP120D5N12	UL Type 12				293
		EVCP120D5IP54	IP54				
200	131.6 @ 380 138.6 @ 400 143.8 @ 415 166.3 @ 480	EVCP200D5IP00	IP00 (chassis)	Wall mount	Bottom	5	171
		EVCP200D5N1	UL Type N1	Floor standing	Top or Bottom	11	363
		EVCP200D5N2	UL Type 2			6	384
		EVCP200D5IP31	IP31				
		EVCP200D5N12	UL Type 12				402
		EVCP200D5IP54	IP54				
300	197.5 @ 380 207.8 @ 400 215.6 @ 415 249.4 @ 480	EVCP300D5IP00	IP00 (chassis)	Wall mount	Bottom	7	210
		EVCP300D5N1	UL Type N1	Floor standing	Top or Bottom	11	402
		EVCP300D5N2	UL Type 2			8	422
		EVCP300D5IP31	IP31				
		EVCP300D5N12	UL Type 12				436
		EVCP300D5IP54	IP54				

Note:
60 A IP20/UL Type 1 configuration requires ordering two items: EVCP060D5IP00 and PCSPWMKIT60A; adds 232 mm to length and 8.7 kg.
120 A IP20/UL Type 1 configuration requires ordering two items: PCSP120D5IP00 and PCSPWMKIT120A; adds 232 mm to length and 9.3 kg.
200 A IP20/UL Type 1 configuration requires ordering two items: EVCP200D5IP00 and PCSPWMKIT300A; adds 273 mm to length and 8.6 kg.
300 A IP20/UL Type 1 configuration requires ordering two items: EVCP300D5IP00 and PCSPWMKIT300A; adds 273 mm to length and 8.6 kg.

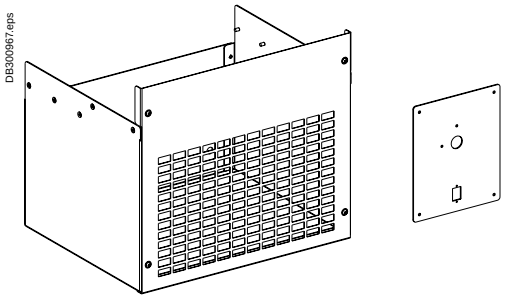
Selection Table

AccuSine PFV+ 480 - 600 V, 50/60 Hz

Rated current	KVAR rating @ voltage	Catalog number	Enclosure Rating	Style	Cable entry	Frame	Weight kg
47	48.8 @ 600	EVCP047D6N2	UL Type 2	Floor standing	Top or Bottom		461
		EVCP047D6IP31	IP31				
		EVCP047D6N12	UL Type 12				461
		EVCP047D6IP54	IP54				
94	97.7 @ 600	EVCP094D6N2	UL Type 2	Floor standing	Top or Bottom		498
		EVCP094D6IP31	IP31				
		EVCP094D6N12	UL Type 12				498
		EVCP094D6IP54	IP54				
157	163.2 @ 600	EVCP157D6N2	UL Type 2	Floor standing	Top or Bottom		653
		EVCP157D6IP31	IP31				
		EVCP157D6N12	UL Type 12				653
		EVCP157D6IP54	IP54				
235	244.2 @ 600	EVCP235D6N2	UL Type 2	Floor standing	Top or Bottom		757
		EVCP235D6IP31	IP31				
		EVCP235D6N12	UL Type 12				757
		EVCP235D6IP54	IP54				

AccuSine PFV+ 600 - 690 V, 50/60 Hz

Rated current	KVAR rating @ voltage	Catalog number	Enclosure Rating	Style	Cable entry	Frame	Weight kg
40	47.8 @ 690	EVCP040D7N2	UL Type 2	Floor standing	Top or Bottom	9	483
		EVCP040D7IP31	IP31				
		EVCP040D7N12	UL Type 12				483
		EVCP040D7IP54	IP54				
80	95.6 @ 690	EVCP080D7N2	UL Type 2	Floor standing	Top or Bottom	9	533
		EVCP080D7IP31	IP31				
		EVCP080D7N12	UL Type 12				533
		EVCP080D7IP54	IP54				
133	159.0 @ 690	EVCP133D7N2	UL Type 2	Floor standing	Top or Bottom	10	709
		EVCP133D7IP31	IP31				
		EVCP133D7N12	UL Type 12				709
		EVCP133D7IP54	IP54				
200	239.0 @ 690	EVCP200D7N2	UL Type 2	Floor standing	Top or Bottom	10	827
		EVCP200D7IP31	IP31				
		EVCP200D7N12	UL Type 12				827
		EVCP200D7IP54	IP54				



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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.

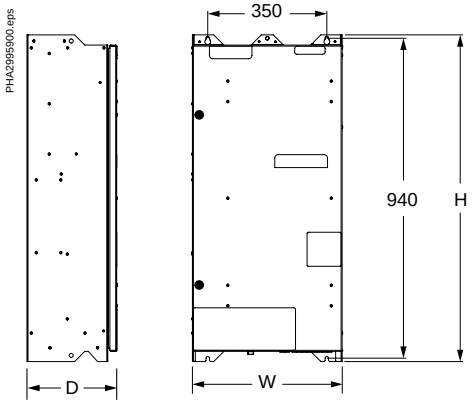
	Assembled dimensions - IP20				IP20 assembly	Cable entry enclosure
Wall mount kit reference	Unit rating (A)	Height	Width	Depth	Weight (kg)	Weight (kg)
PCSPWMKIT60A	60	1530	421	349	97.3	8.7
PCSPWMKIT120A	120	1630	421	384	122.0	9.3
PCSPWMKIT300A	200	1642	575	435	180.0	8.6
PCSPWMKIT300A	300	1882	575	435	218.6	8.6

Unit Dimensions and Installation Guidelines for AccuSine PCSn

Frame size figure	Description	Exterior dimensions		
		Height mm	Width mm	Depth mm
12	AccuSine PCSn chassis and wall mount	960	440	265
13	AccuSine PCSn rack mount	265	440	960

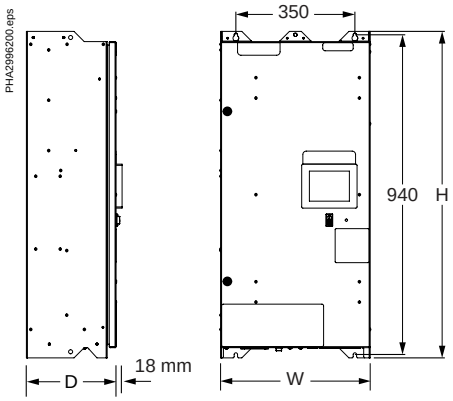
Frame size 12

Chassis mount IP00



- HMI only on main unit – supplied loose in the box for mounting remotely.
- Expansion unit has the same dimensions as the main unit, except no HMI provided.

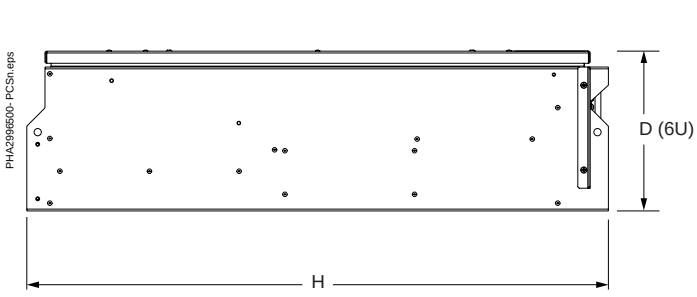
Wall mount IP20

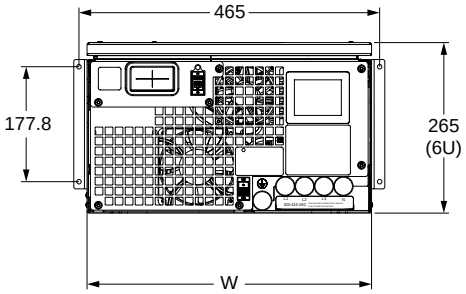


- HMI only on main unit.
- Expansion unit has the same dimensions as the main unit, except no HMI provided.

Frame size 13

Rack mount





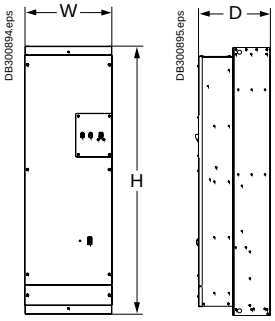
- HMI only on main unit.
- Expansion unit has the same dimensions as the main unit, except no HMI provided.

Note:
All dimensions are indicative. Please refer to the dimensions in the Installation manual and engineering drawings for design purposes.

Unit Dimensions and Installation Guidelines for AccuSine PCS+ and AccuSine PFV+

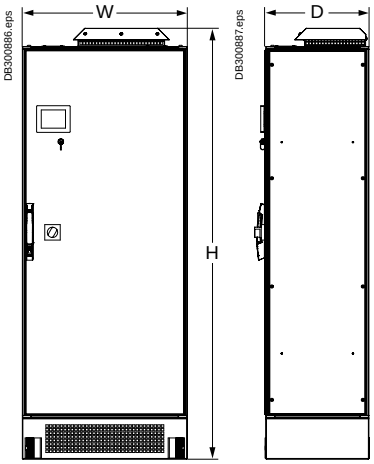
Frame size figure	Exterior dimensions		
	Height mm	Width mm	Depth mm
1	1300	421	349
2	2100	800	500
3	1400	421	384
4	2100	800	500
5	1323	582	438
6	2100	900	600
7	1560	582	438
8	2100	900	600
9	2100	1300	500
10	2100	1400	600
11	2000	800	600

Frame size 1

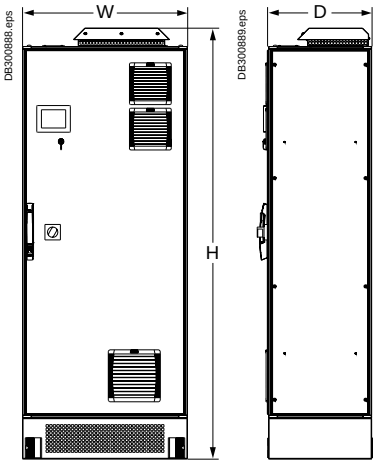


Frame size 2

IP31



IP54



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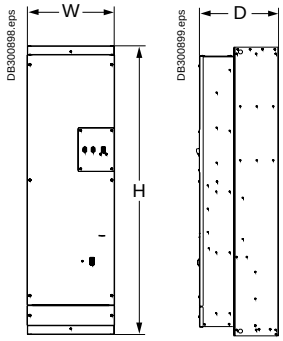
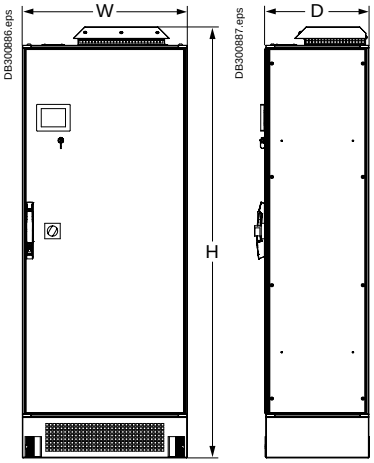
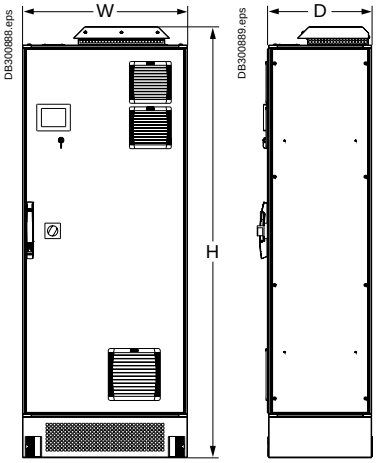


Frame size 4

IP31



IP54

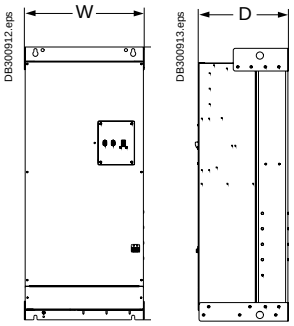


Note:

- Dimensions are subject to change without notice.
- Obtain current mechanical drawings at www.schneider-electric.com.
- Please refer to installation manual and engineering drawings for design purposes.

Unit Dimensions and Installation Guidelines for AccuSine PCS+ and AccuSine PFV+

Frame size 5



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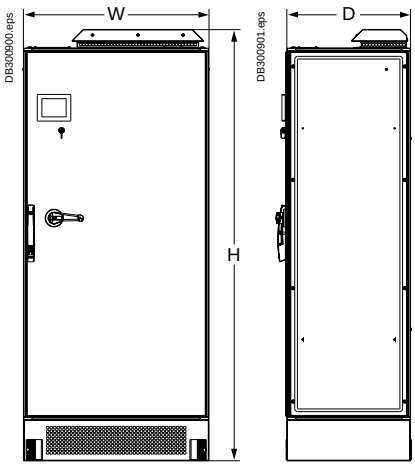

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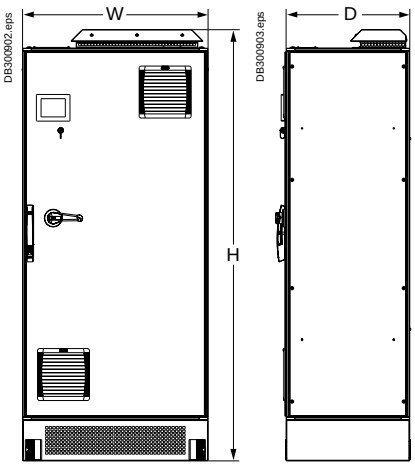

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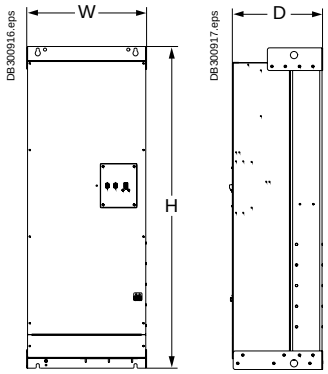

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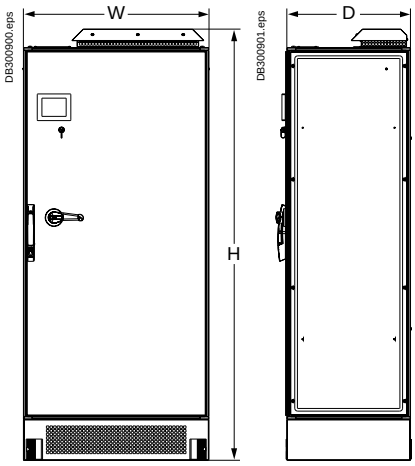

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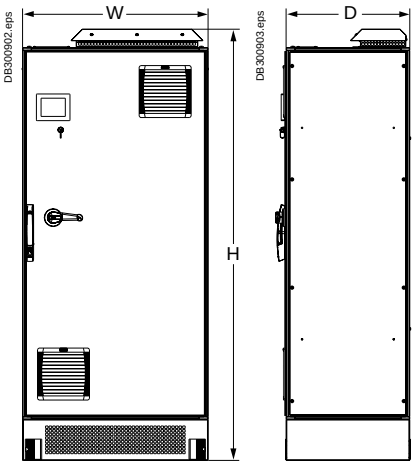

Frame size 9

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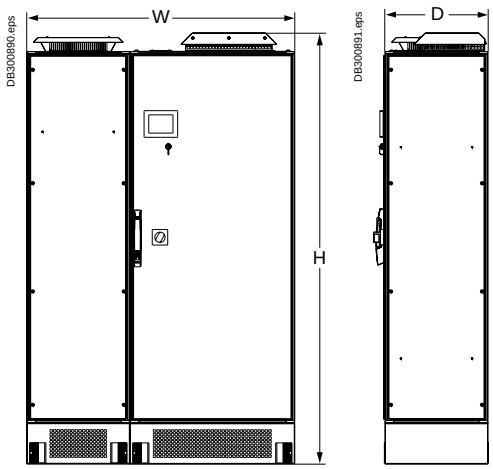

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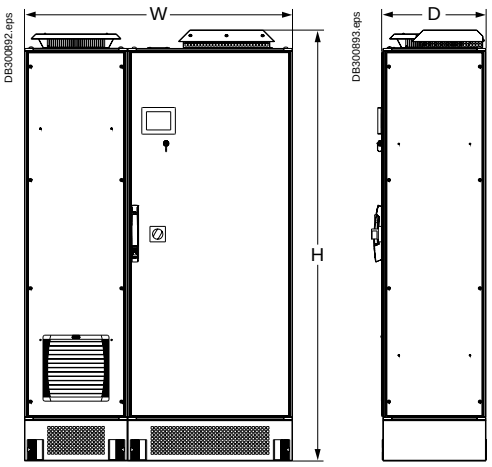
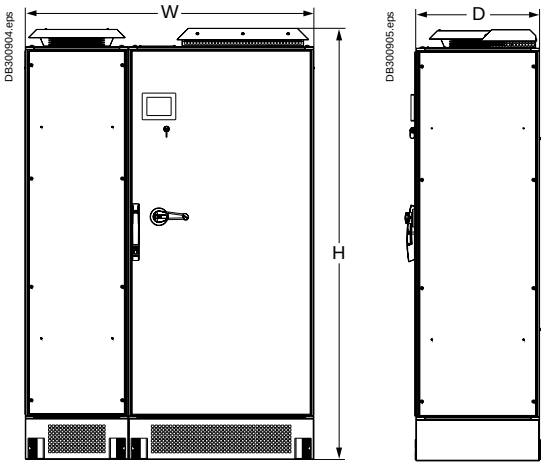


Note:
All dimensions are indicative. Please refer to the dimensions in the Installation manual and engineering drawings for design purposes.

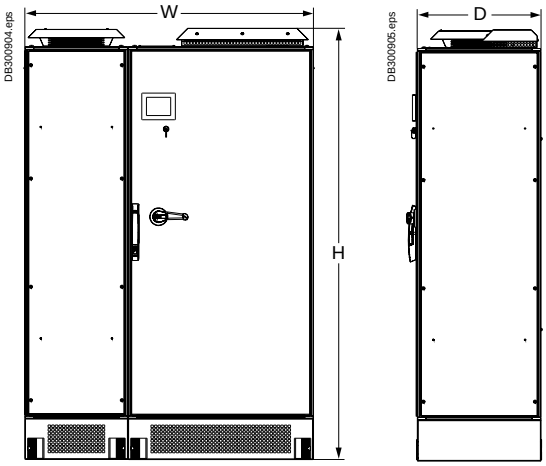
Unit Dimensions and Installation Guidelines for AccuSine PCS+ and AccuSine PFV+

Frame size 10

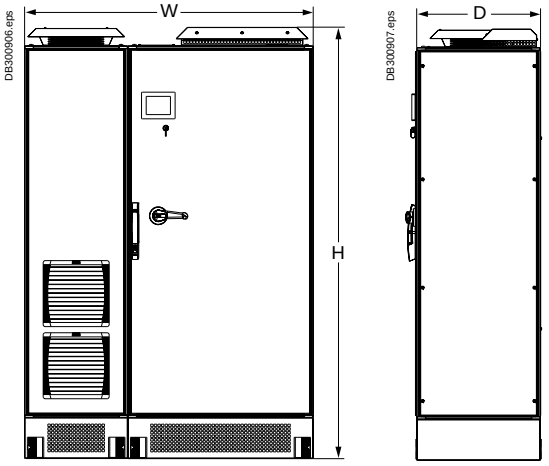
IP31 600 VAC



IP31 690 VAC



IP54 600 VAC



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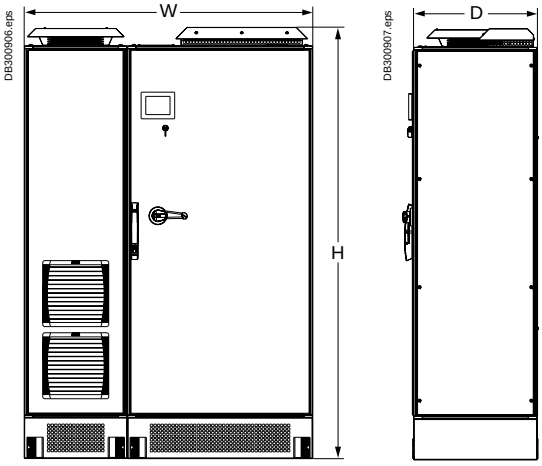
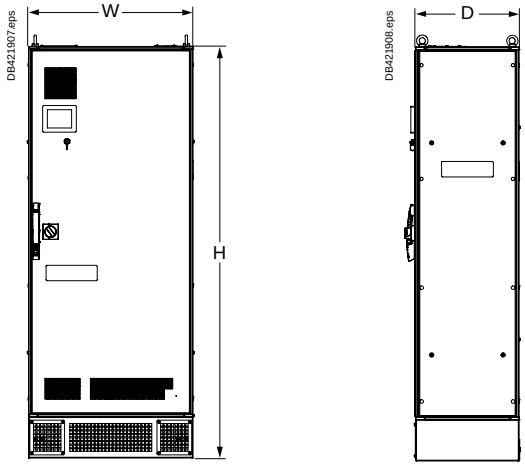


Frame size 11

UL Type 1 (IP20) 240-480 VAC



Note:
All dimensions are indicative. Please refer to the dimensions in the Installation manual and engineering drawings for design purposes.

Split Core Design

E93779.eps CE_logo.eps

Meets
IEC 60044-1
Standards

RoHS.eps

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 (primary rating)	200 thru 300	4 %
	400 thru 500	3 %
	600 thru 800	2 %
	1000 thru 6000	1 %
Secondary leads		3.65 m with spade connectors
Color		Transformer (red) - Leads (yellow)
Remains flexible from -45 °C to +200 °C		

PCSCTFC-round-open.eps

Twisting motion opens to CT diameter of round CT and smaller distance of rectangular CT.

Round Split Core Design

Reference number by secondary current		Maximum load (A)	Inside diameter (ID) mm - A	Burden capacity (Ω)		Weight (kg)
5 A	1 A			5 A	1 A	
PCSPCTFCL50054	**PCSPCTFCL50014**	500	101.6	0.120	2.0	1.6
PCSPCTFCL100054	**PCSPCTFCL100014**	1000	101.6	0.200	10.0	1.6
PCSPCTFCL150054		1500	101.6	0.375	15.0	1.6
PCSPCTFCL160054		1600	101.6	0.375	15.0	1.6
PCSPCTFCL50056		500	152.4	0.120	2.0	1.9
PCSPCTFCL100056	**PCSPCTFCL100016**	1000	152.4	0.200	10.0	1.9
PCSPCTFCL120056		1200	152.4	0.200	15.0	1.9
PCSPCTFCL150056	**PCSPCTFCL150016**	1500	152.4	0.375	15.0	1.9
PCSPCTFCL200056	**PCSPCTFCL200016**	2000	152.4	1.000	18.0	1.9
PCSPCTFCL250056		2500	152.4	1.400	20.0	1.9
PCSPCTFCL300056		3000	152.4	1.800	20.0	1.9
	PCSPCTFCL200018	2000	203.2	1.000	18.0	2.5
PCSPCTFCL250058		2500	203.2	1.400	20.0	2.5
PCSPCTFCL400058		4000	203.2	1.800	20.0	2.5
PCSPCTFCL500058		5000	203.2	1.800	20.0	2.5
PCSPCTFCL2500511		2500	279.4	1.400	20.0	3.4

PCSCTFC-rec-open.eps

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

Rectangular Split Core Design

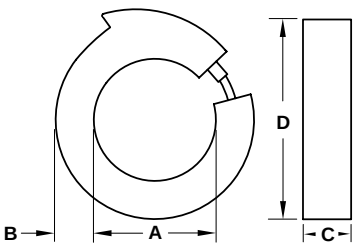
Reference number by secondary current		Maximum load (A)	Inside diameter (ID) mm		Burden capacity (Ω)		Weight (kg)
5 A	1 A		A	B	5 A	1 A	
PCSPCTFCL5005R	**PCSPCTFCL5001R**	500	69.8	168.2	0.12	2.0	1.9
PCSPCTFCL10005R	**PCSPCTFCL10001R**	1000	69.8	168.2	0.2	10.0	1.9
PCSPCTFCL12005R	**PCSPCTFCL12001R**	1200	69.8	168.2	0.2	15.0	1.9
PCSPCTFCL15005R	**PCSPCTFCL15001R**	1500	69.8	168.2	0.375	15.0	1.9
PCSPCTFCL16005R	**PCSPCTFCL16001R**	1600	69.8	168.2	0.375	15.0	1.9
PCSPCTFCL20005R		2000	69.8	168.2	1	18.0	1.9
PCSPCTFCL30005R		3000	69.8	168.2	1.8	20.0	1.9
PCSPCTFCL25005R411	**PCSPCTFCL25001R411**	2500	101.6	279.4	1.4	20.0	2.8
PCSPCTFCL30005R411		3000	101.6	279.4	1.8	20.0	2.8
PCSPCTFCL40005R411		4000	101.6	279.4	1.8	20.0	2.8
PCSPCTFCL50005R411		5000	101.6	279.4	1.8	20.0	2.8

Dimensions

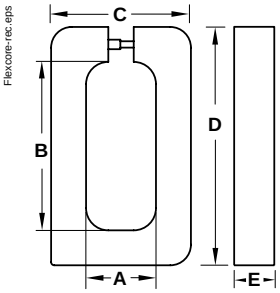
ID	Dimensions in mm		
A	B	C	D
101.6	31.75	38.1	165.1
152.4	31.75	38.1	215.9
203.2	31.75	38.1	266.7
279.4	31.75	38.1	342.9

ID		Dimensions in mm		
A	B	C	D	E
69.8	168.2	139.7	238	38.1
101.6	279.4	165.1	339.7	38.1

Flexcore-round.eps



Flexcore-rec.eps



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 mm²), 609.6 mm
Weight	Approximately 0.68 kg
Accuracy	1 %

E93779.eps

Logo_SA.eps

LR89403

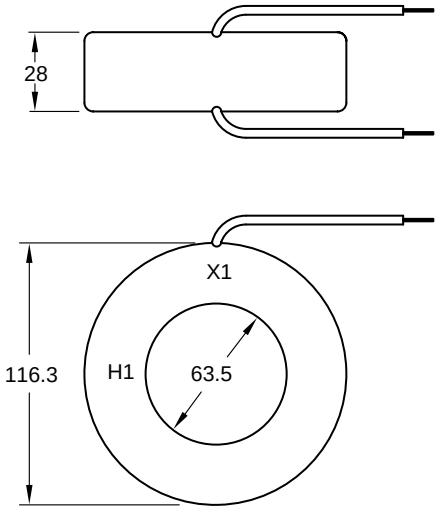
Round Solid Core Design

Reference number by secondary current		Maximum load (A)	Burden capacity (Ω)	
5 A	1 A		5 A	1 A
	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

PCSCT7RL.eps

Dimensions (mm)

7rl-dim.eps



Auxiliary and Summing Transformers

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LR89403

Description

- The Reference 'PCSCT190X…' is an auxiliary transformer for use in the secondary of mains current transformers to change the ratio.
- The Reference 'PCSCT190XSUM…' is a summing transformer for use when three or five current transformers need to be totalized.

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 1.8 kg
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 V - 60 Hz Hi Pot test. They are designed to be used on circuits not to exceed 600 V-to-ground or between windings.

Flex-core.eps

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 totalized must have same ratio.

Dimensions (mm)

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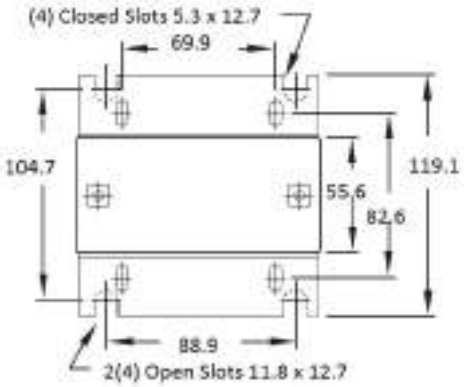

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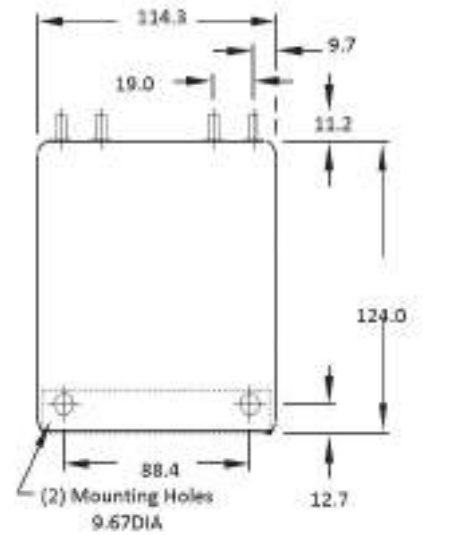


Shorting Terminal Switch and Parallel Connection Cables

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	

UL and cUL logos

LR19766

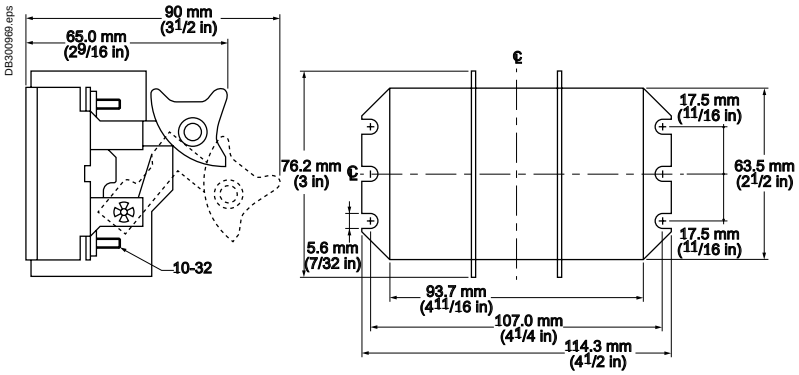
RoHS

Shorting Terminal Switch

Reference number	Description
PCSPNHA38255	CT shorting switch 6 terminals dpst

PCSPNHA3825

Dimensions



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

Parallel Connection Cables

- Parallel connection cables - shielded CAT5E type.
- Required to interconnect all units operating in parallel - requires N-1 cables, where N is the quantity of units operating in parallel.

Reference	Description	Length (m)
PCSPNHA38244	Paralleling cable CAT5E 3 m	3
PCSPNHA38245	Paralleling cable CAT5E 4.5 m	4.5
PCSPNHA38246	Paralleling cable CAT5E 6 m	6
PCSPNHA38247	Paralleling cable CAT5E 7.5 m	7.5
PCSPNHA38248	Paralleling cable CAT5E 9 m	9
PCSPNHA38249	Paralleling cable CAT5E 12 m	12
PCSPNHA38250	Paralleling cable CAT5E 15 m	15
PCSPNHA38251	Paralleling cable CAT5E 18 m	18
PCSPNHA38252	Paralleling cable CAT5E 22 m	22
PCSPNHA38253	Paralleling cable CAT5E 30 m	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.

PB503017.eps

Touch Screen

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

Display

A graphical display is used for different functions:
- accessing and setting up of operating parameters
- measuring data
- viewing 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

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)

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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Relevant documents

Relevant documents published by Schneider Electric

- Electrical Installation Guide
- Expert Guide n° 4: Harmonic
- Expert Guide n° 6: Power Factor Correction and Harmonic Filtering Guide
- Technical Guide 152: Harmonic disturbances in networks, and their treatment
- Technical Guide n° 202: The singularities of the third harmonic
- White paper: controlling the impact of Power Factor and Harmonics on Energy Efficiency
- Harmonic mitigation - Solution Handbook (SLTED109014EN)
- AccuSine+ Installation and User Manuals

Relevant standards

- IEC 60831 - Shunt power capacitors of the self healing for a.c. systems up to 1000 V
- IEC 61642 - Application of filters and shunt capacitors for industrial a.c. networks affected by harmonics
- IEC 61921 - Power capacitors, low voltage power factor correction capacitor banks

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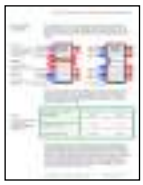
Effective cooling and cable management



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