AccuSine PCS+

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

PB502824_R.eps

PB115718.eps

Model 6 MCC (UL and CSA approved)

PD405100.eps

Okken / Blokset (IEC61439 certified)

AccuSine PCS+ Technical Specifications

Electrical System Characteristics

Standard RMS output current ratings	208 - 240 Vac: 60 A, 120 A, 200 A, 300 A 380 - 480 Vac: 60 A, 120 A, 200 A, 300 A 480 - 600 Vac: 47 A, 94 A, 157 A, 235 A 600 - 690 Vac: 40 A, 80 A, 133 A , 200 A
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
Connection type	3ph/3wire or 3ph/4wire (no neutral connection)
Compensation type	3-phase only (no neutral cancellation)
Voltage notch limits	Notch depth: 20%, Notch area (AN): 22,800 Vμs @ 400-480 V as per IEEE 519-2014, Annex C

Technical Product Characteristics

Power electronics	3-level IGBT
Control 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 L-N connected loads
Spectrum cancellation	2nd to 51st, discrete; fully selectable per harmonic order (amplitude and on/off).
Control basis	Closed or open loop (open loop only if in parallel with AccuSine PCS)
CT position	Grid sense (at mains) or load sense
Harmonic attenuation & filtering performance	THDi < 3% in closed loop control; max 20:1 THDi; in open loop control, TDD < 5%. (typical reduction with load harmonic above 50% unit rating) 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; Contact your SE sales office if more than 10 units in parallel required.
Parallel operation options	Master/Master (masters receive mains CT); Master/Slave; Multi-master/Multi-slave.
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	Optimize PF and Target PF (cos φ) programmable leading (capacitive) or lagging (inductive).
Mains current load balancing	Negative sequence current
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	<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...45 °C; All others: 0...40 °C; Derate 2% per °C upto 50 °C.
Relative humidity	0-95%, noncondensing
Seismic rating	Complies with IBC and ASCE7 (Requires top constraint for all floor standing models - rec. use NSYSFWFIX).
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...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 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 commissioning protocol via HMI; 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 PCS+ 208 - 240 V, 50/60 Hz

Rated current	KVAR rating @ voltage	Catalog number	Enclosure Rating	Enclosure Style	Enclosure Cable entry	Frame	Weight kg
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 Rating	Enclosure Style	Enclosure Cable entry	Frame	Weight kg
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.

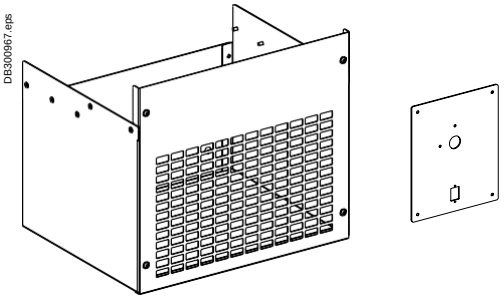
Selection Table

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 IP20/UL Type 1 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