

# Technical Specifications

AccuSine SWP 20–480 A Active Harmonic Filter



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# Technical Data

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## Model List

### Single Units

- AccuSine SWP Active Harmonic Filter 20 A
- AccuSine SWP Active Harmonic Filter 30 A
- AccuSine SWP Active Harmonic Filter 45 A
- AccuSine SWP Active Harmonic Filter 60 A
- AccuSine SWP Active Harmonic Filter 90 A\*
- AccuSine SWP Active Harmonic Filter 120 A\*\*

\* The 90 A unit consists of two 45 A units with cabling connection.

\*\* The 120 A unit consists of two 60 A units with cabling connection.

### Parallel Units

Up to four AccuSine SWP Active Harmonic Filters can be put in parallel.

- AccuSine SWP Active Harmonic Filter 135 A (3 x 45A)
- AccuSine SWP Active Harmonic Filter 180 A (3 x 60 A)
- AccuSine SWP Active Harmonic Filter 240 A (2 x 120 A)
- AccuSine SWP Active Harmonic Filter 270 A (3 x 90 A)
- AccuSine SWP Active Harmonic Filter 360 A (3 x 120 A)
- AccuSine SWP Active Harmonic Filter 480 A (4 x 120 A)

# Communication and Management

## Input and Output Contacts

Pin	Description
10	(not used)
9	Common
8	Conditioner stopped
7	Conditioner running
6	Common
5	Normal operation
4	Limiting operation
3	Common
2	Conditioner stopped
1	Conditioner running

The diagram shows a vertical stack of pins from 1 to 10. For each of the three sets (1-3, 4-6, 7-9), there is a common terminal (pin 3, 6, 9 respectively) and two signal terminals (pins 1, 2; 4, 5; 7, 8 respectively). Each signal terminal is connected to a switch contact. The top contact of each switch is labeled 'NO' (Normally Open) and the bottom contact is labeled 'NC' (Normally Closed).

## Compliance

The AccuSine SWP Active Harmonic Filter complies with the main international standards in force for this type of equipment and notably concerning:

Reference technical standards	
Safety	EN 60950-1
Protection	IP 20 conforming to EN 60529
EMC	
Conducted and radiated emission	EN 61000-6-4 CISPR 11 level A
Immunity to electrostatic discharge	EN 61000-4-2
Immunity to electromagnetic fields	EN 61000-4-3
Immunity to impulse waves Fast transient Surge	EN 61000-4-4 EN 61000-4-5
Conducted immunity	EN 61000-4-6

# Facility Planning

## AC Input Specifications

Product rating	20 – 30 – 45 – 60 – 90 – 120 - 135 – 180 – 240 - 270 – 360 – 480 A
Nominal voltage	400 V - 20% + 15%
Connection type	3- or 4-wire
Input frequency (Hz)	50 Hz (60 Hz +/- 4 Hz)
Number of phases	3 phases with or without distributed neutral, operation possible on single-phase or unbalanced load.

## Technical Characteristics



**Note:** Unless otherwise stipulated, the performances given in the table below are typical values corresponding to use under a nominal Mains voltage of 400 V three-phase, at 50 Hz at the nominal current.

Compensation capacity per phase	20 A, 30 A, 45 A, 60 A, 90 A, 120 A rms (Conditioning capacity decreases with the frequency of the orders to be conditioned)					
Nominal current in the Neutral	3 x In in each phase (Result of harmonic re-combination into the Neutral)					
Compensated harmonic orders	H2 to H50 (parameter setting possible) Global or selective compensation					
Dynamic capacity in di/dt	20 A and 30 A	45 A and 60 A		90 A and 120 A		
	> 100 kA/s	> 200 kA/s		> 400 kA/s		
Response time	40 ms					
Attenuation Ratio	Load THDI/Mains THDI $\geq 10$ at the active harmonic filter nominal current <ul style="list-style-type: none"> <li>If load THDI &gt; 40%</li> <li>If load THDI &lt; 40% Mains THDI &gt; 4% at the active harmonic filter nominal current</li> </ul> Global compensation reduction rate THDI = I-harmonic/I-fundamental					
Overload	Limiting to nominal current Continuous limiting operation possible					
Inrush current	Less than I Nominal without matching transformer					
Losses	20 A	30 A	45 A	60 A	90 A	120 A
	< 1000 W	< 1200 W	< 1900 W	< 2400 W	< 3800 W	< 4800 W
Ventilation	Forced air by internal fans (inlet via bottom and outlet via top) 1000 m <sup>3</sup> /h for 20 to 60 A ratings 2000 m <sup>3</sup> /h for 90 to 120 A ratings					
Acoustic noise at the nominal current on computer load according to ISO 3746	20 A	30 A	45 A	60 A	90 A	120 A
	<58 dBA	<59 dBA	<62 dBA	<64 dBA	<65 dBA	<67 dBA

# Breakers



**Note:** The breakers listed here are for TNS and TNC earthing systems. For TT and IT earthing system breakers see the installation manual (990–4530) for this product.

Rating (A)	TNS (Tripping breaker system: STR22SE)	TNC
20	NSX100 4p3d	C60 32A 3P
30	NSX100 4p3d	C60 32A 3P
45	NSX160 4p3d	C60 63A 3P
60	NSX250 4p3d	C120H 80A 3P
90	2 x NSX160 4p3d	2 x C60 63A 3P
120	2 x NSX250 4p3d	2 x C120H 80A 3P



## Cable Sizes



**Note:** The minimum cable sizing areas can be determined based on the sizing current ( $I_s$ ) given in the table below. It is advisable to connect the neutral when it is distributed.

### Determine Wiring (Not Supplied) for Connecting Power

Wiring sizing areas must be determined in compliance with the standards in force using the information in the table below and the tables on protection per rating. Care should be taken with neutral cable sizing, when the neutral is distributed, owing to the majority presence of third harmonic which may lead to the current tripling in the neutral in relation to the phases.

AccuSine SWP rating (A)	Recommended sizing areas (mm <sup>2</sup> ) capacity		Terminal block connection (mm <sup>2</sup> )	Diameter of lugs (mm)	Maximum length of power cables (m)
	Phases	Neutral			
20	2.5	16	35	6	20
30	4	25	35	6	20
45	10	50	70	8	20
60	16	70	70	8	20
90	10 per active harmonic filter	50 per active harmonic filter	70	8	20
120	16 per active harmonic filter	70 per active harmonic filter	70	8	20

### Determine Wiring for Connecting Dry Contacts and Communication Port

Connector	Sizing area (mm <sup>2</sup> )	Type of recommended conductor	Remark
Dry contact terminal block	0.5 mini 2.5 max	Multi-core wires (not supplied)	Removable screw terminal block (supplied)
9 point Sub-D	Shielded cable (not supplied)		Male connector with female contacts on AccuSine SWP; the shielding must be connected at both ends.

### Determine Wiring for Connecting Ribbon Cables for 90 A or 120 A and Parallel Installations

Connector	Type of Conductors	Remark
90 or 120 A AccuSine SWP inter-enclosure connector	Shielded strand supplied (3 m)	Connection between the 2 active harmonic filters which make up the 90 or 120 A AccuSine SWP
AccuSine SWP parallel connector	Shielded strand supplied (5 m)	Loop connection allows parallel operation of the AccuSine SWP even if it is interrupted for the number of devices to be modified

Wiring for connecting 90 A and 120 A units in parallel is included with parallel units or with the conversion kit.

# Physical

## Weights and Dimensions

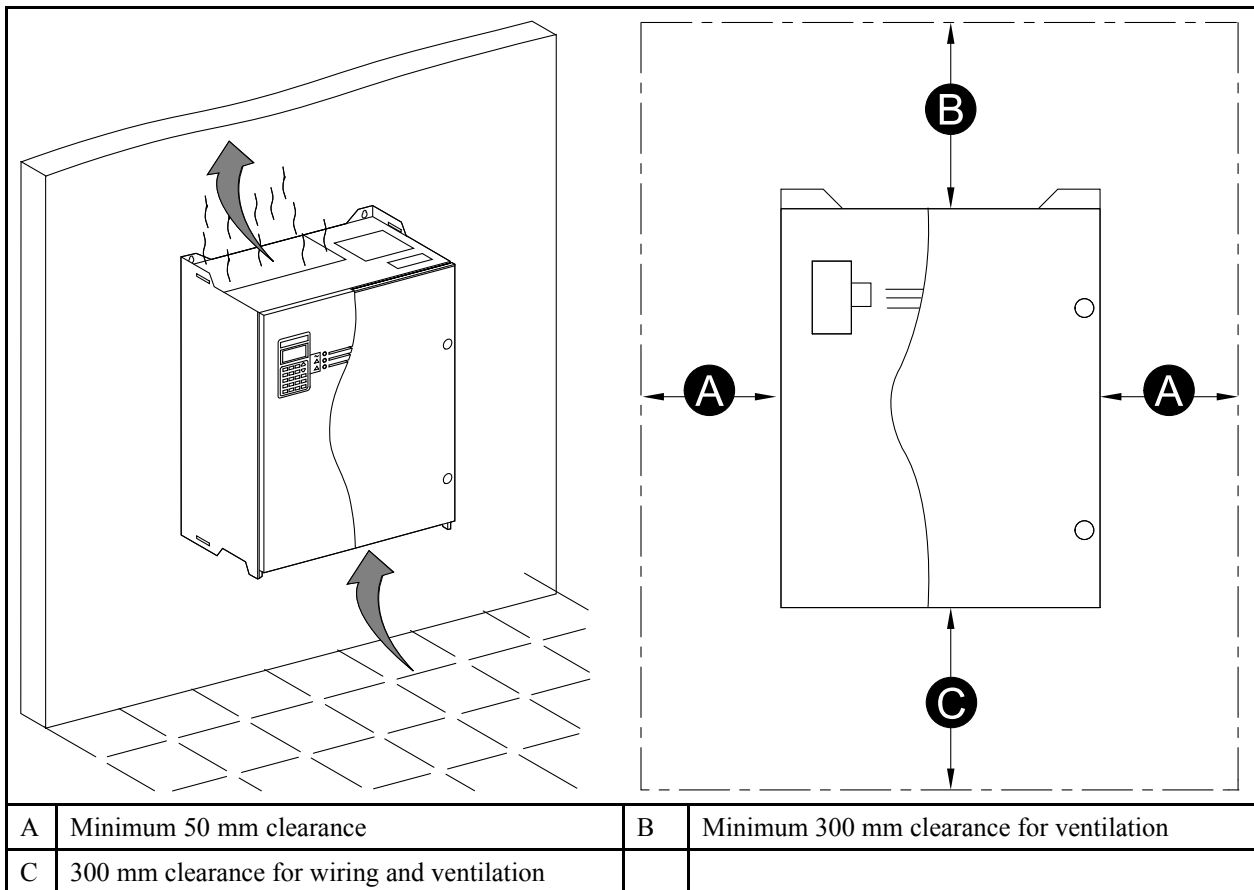
Conditioner Size	Weight kg (lbs)	Height mm (in)	Width mm (in)	Depth mm (in)
20 A and 30 A	65 (143.3)	680 (26.7)	540 (21.2)	280 (11)
45 A and 60 A	110 (242.5)	780 (30.7)	590 (23.2)	325 (12.8)
90 A and 120 A	2 x 110 (2 x 242.5)	2 x 780 (2 x 30.7)	2 x 590 (2 x 23.2)	325 (12.8)

## Shipping Weights and dimensions

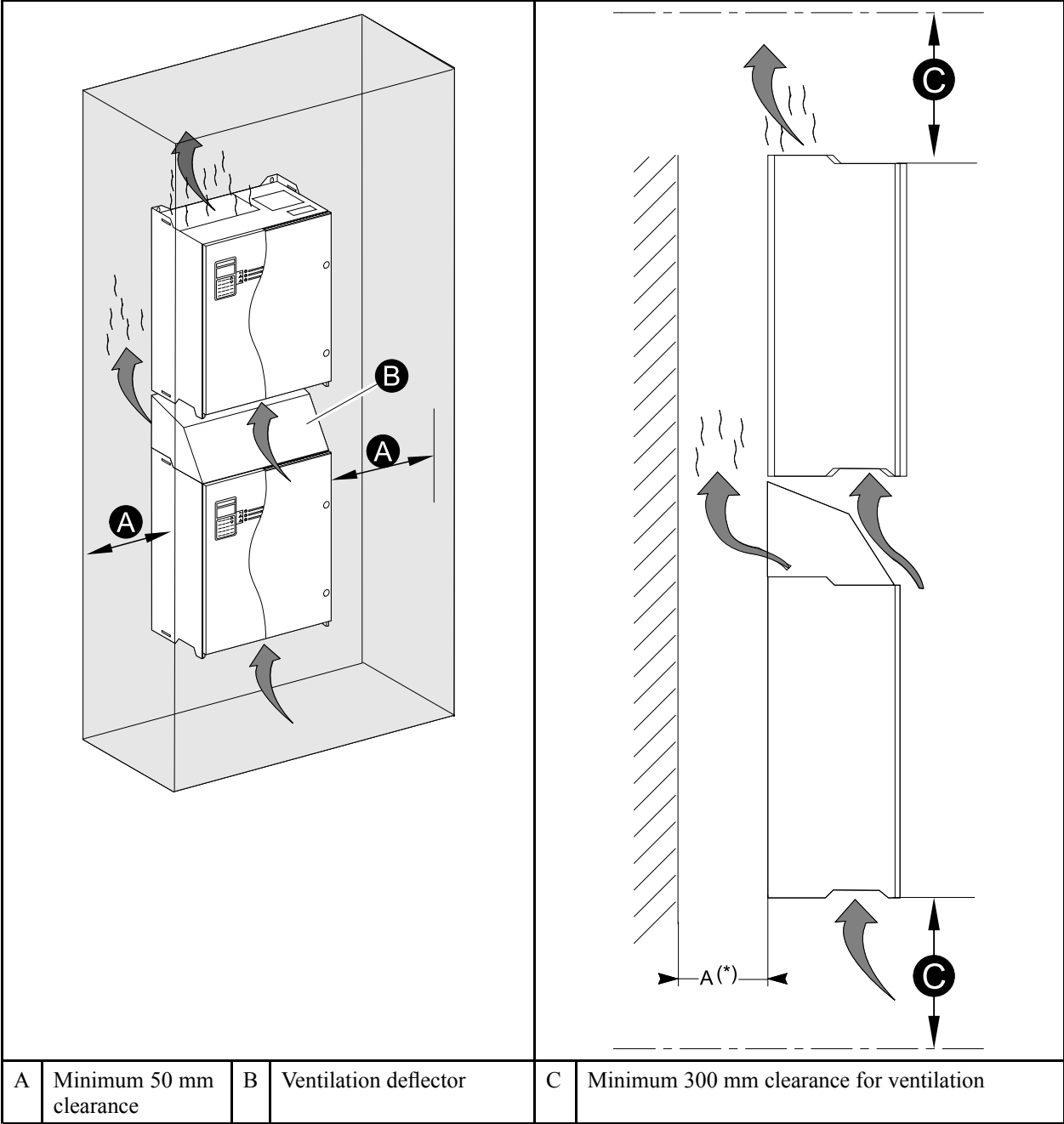
Conditioner Size	Weight kg (lbs)	Height mm (in)	Width mm (in)	Depth mm (in)
20 A and 30 A	75 (165.35)	980 (38.58)	700 (27.56)	440 (17.32)
45 A and 60 A	125 (275.58)	1080 (42.52)	750 (29.53)	485 (19.09)
90 A and 120 A	2 x 125 (2 x 275.58)	2 x 1080 (2 x 42.52)	2 x 750 (2 x 29.53)	2 x 485 (2 x 19.09)

## Clearance

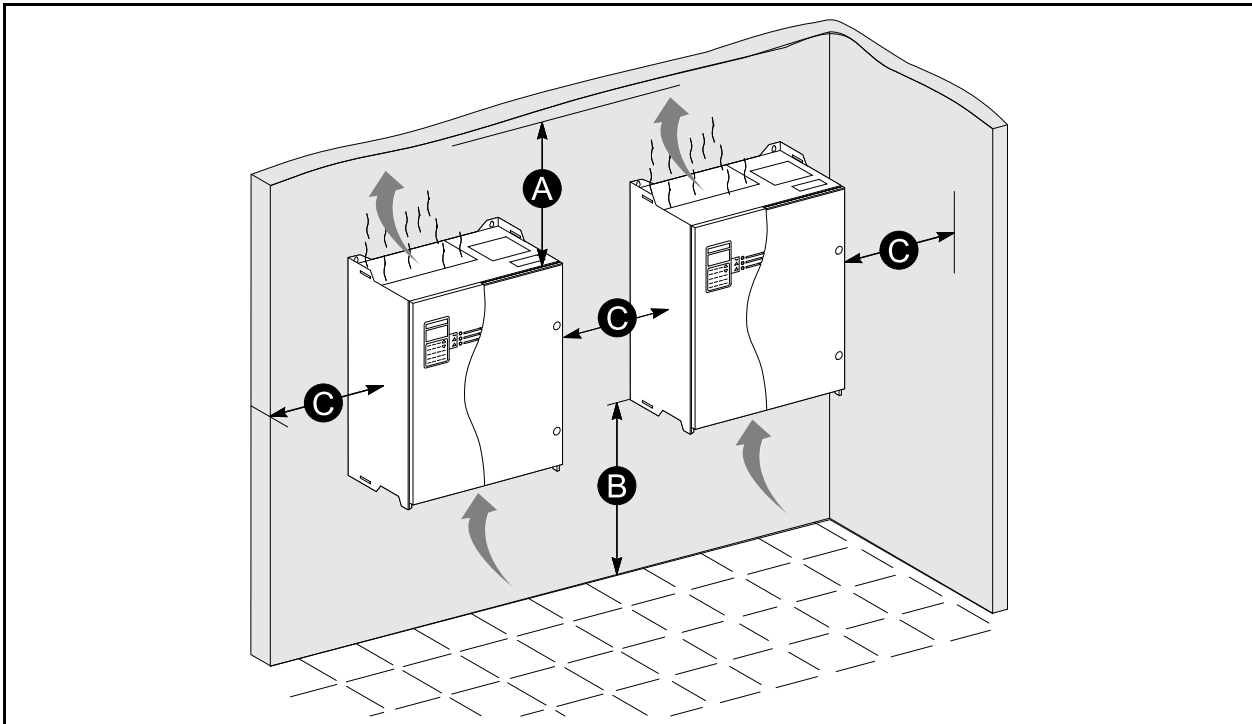
### AccuSine SWP Stand Alone



**2 x AccuSine SWP in Cabinet**



## 2 x AccuSine SWP Side by Side



A	Minimum 300 mm clearance for ventilation	C	Minimum 50 mm clearance
B	Minimum 300 mm clearance for wiring and ventilation		

## Environmental

Operating temperature	0 to 40° C The recommended temperature is $\leq 25^{\circ}\text{C}$ –higher temperature can shorten component service life
Storage temperature	-25 to 70° C
Operating relative humidity	95 % relative humidity non– condensing
Operating elevation	$\leq 1000$ m without derating > 1000 m derating of 10% per additional 1000 m
Storage elevation	$\leq 10000$ meters
Protection Class	IP20
Colour	RAL 9002 (light grey)

# Drawings



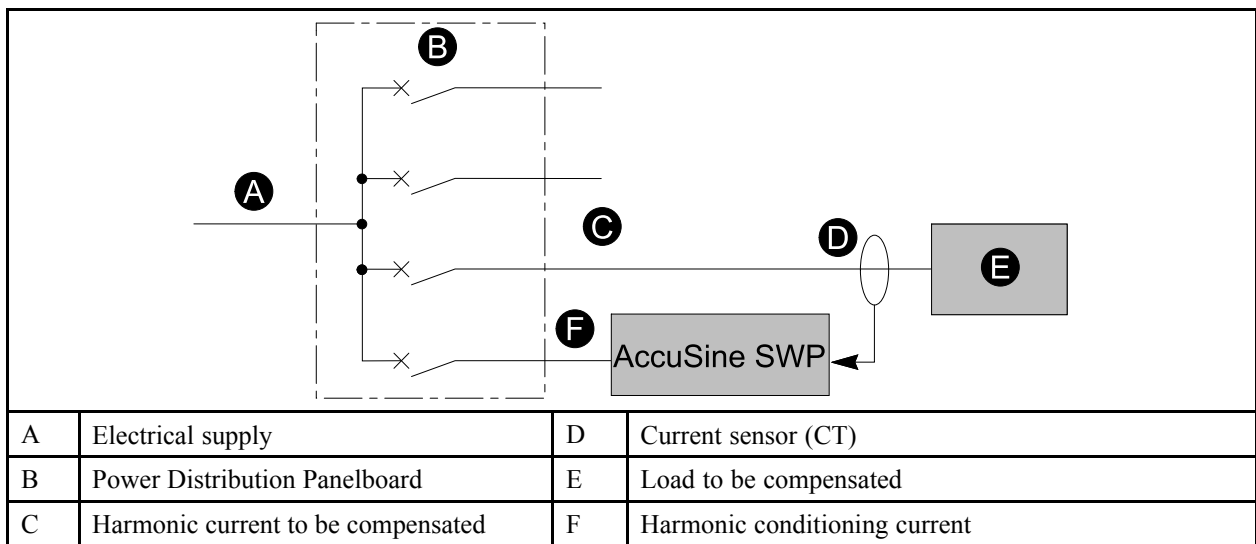
**Note:** A comprehensive set of drawings is available on the engineering website at [engineer.apc.com](http://engineer.apc.com).



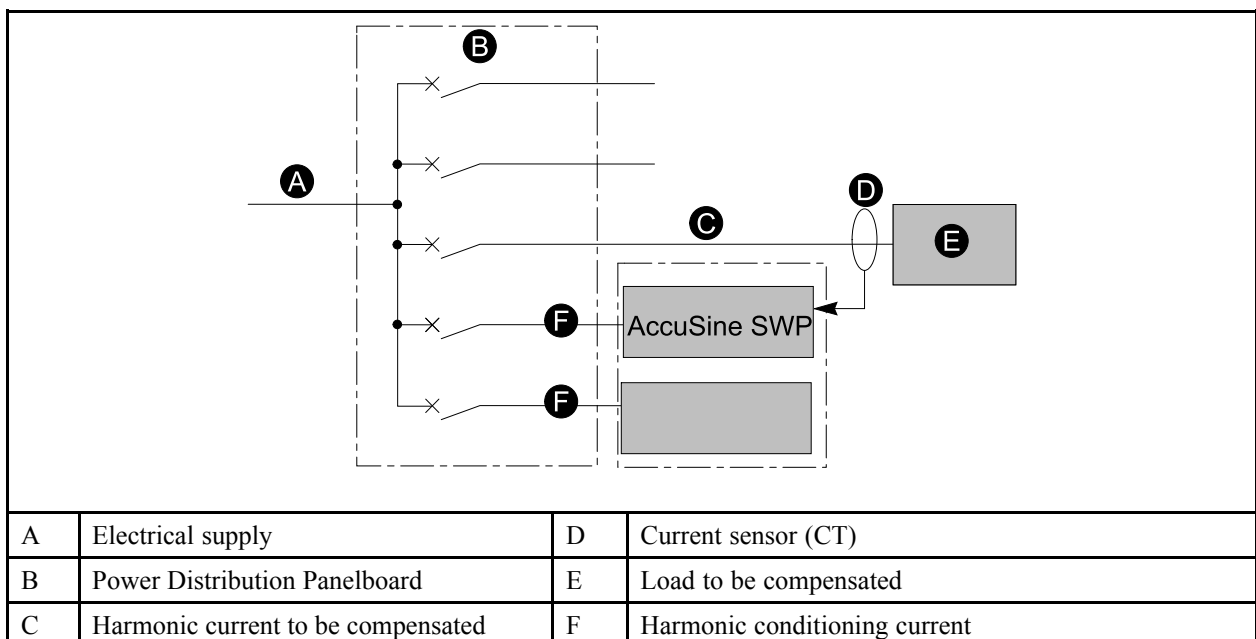
**Note:** These drawings are for reference ONLY — subject to change without notice.

## One Line Diagrams

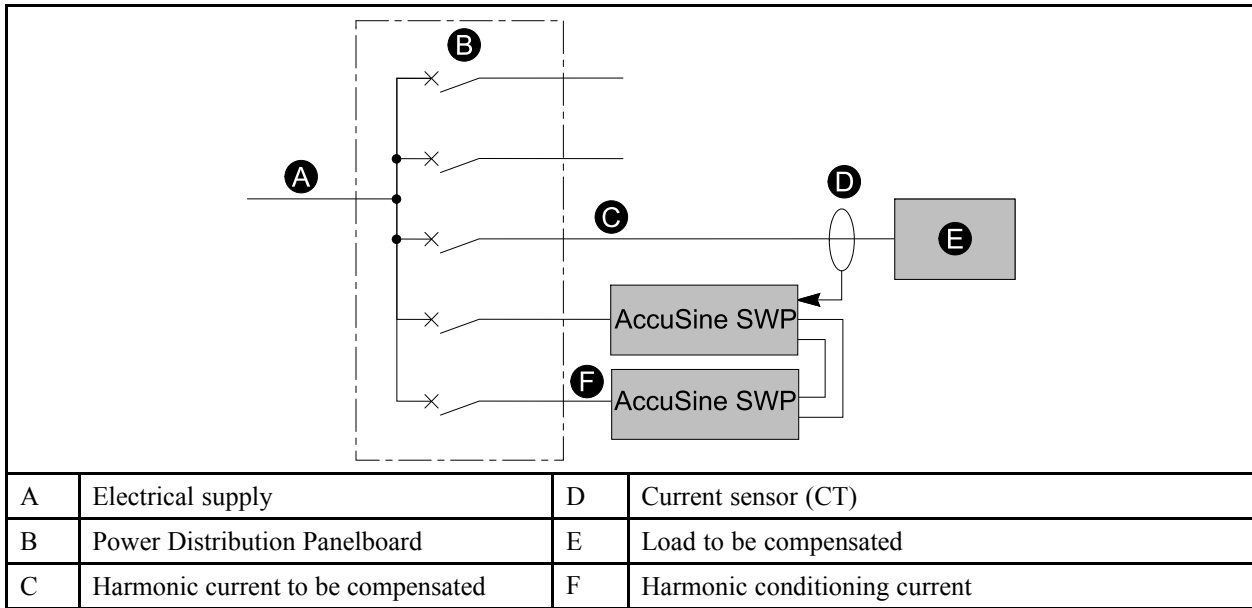
### Example of 20 A, 30 A, 45 A or 60 A



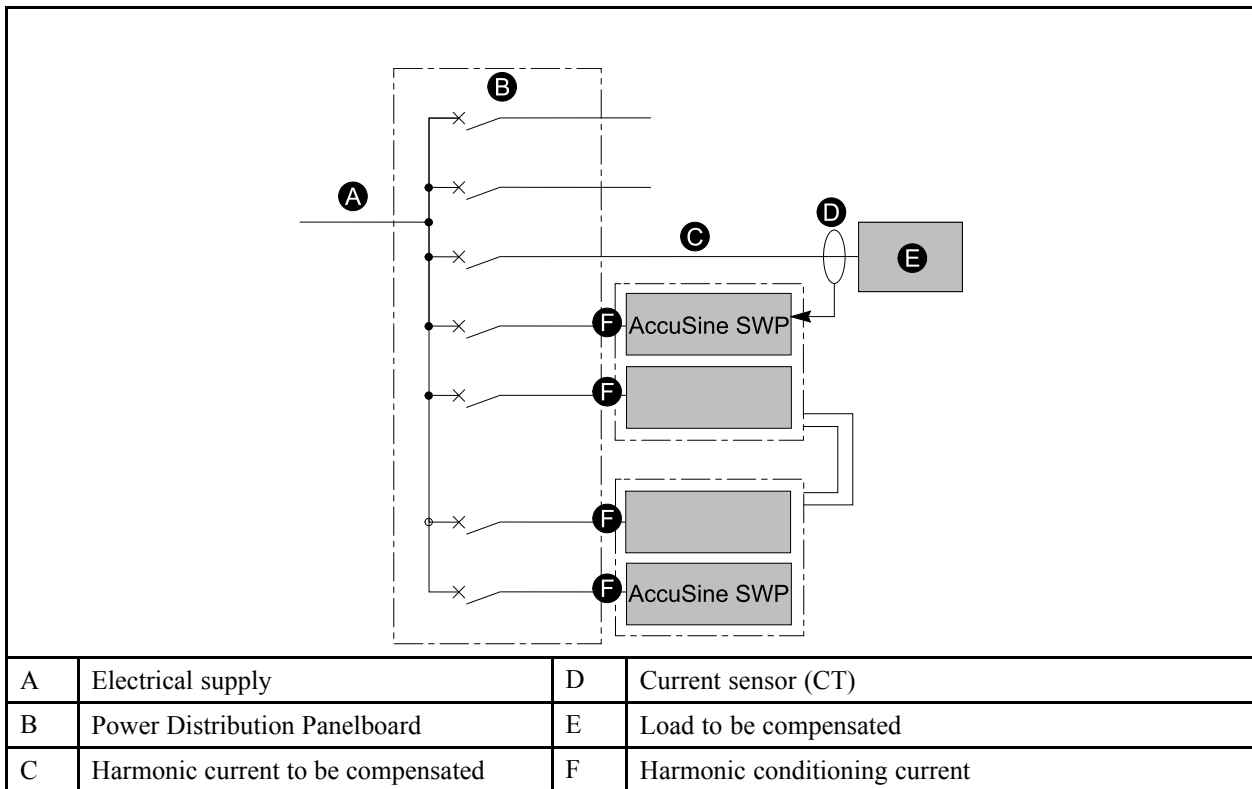
### Example of 90 A or 120 A



### Example of Two 20 A, 30 A, 45 A or 60 A in Parallel



### Example of Two 90 A or 120 A in Parallel



# Options

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## Hardware Options

### CT kits

Kit of 3 Closed CT 1000A/1

Kit of 3 Closed CT 1500A/1

Kit of 3 Closed CT 2000A/1

Kit of 3 Split CT 2000A/1

Kit of 3 Closed CT 3000A/1

Kit of 3 Closed CT 300A/1

Kit of 3 Closed CT 4000A/1

Kit of 3 Closed CT 500A/1

Kit of 3 Split CT for 600A/1

### Air Deflectors

Air Deflector for 20 A and 30 A Products

Air Deflector for 45 A and 60 A Products

### Evolution Packs

Single to Parallel Evolution Pack

Remote Man-Machine Interface Pack

## Configuration Options

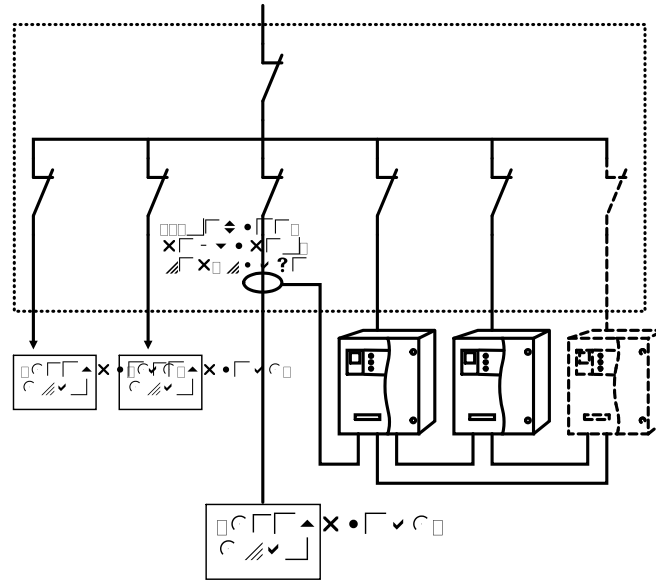
- Parallel up to four units for capacity or redundancy

# Parallel Capabilities

## Parallel connection of conditioners

The parallel connection of AccuSine SWP product provides conditioning of higher rated loads.

The parallel connection increases the conditioning capacity (up to 480 A per phase) or ensures redundancy in certain installations where conditioning of harmonics is critical to continuity of service.



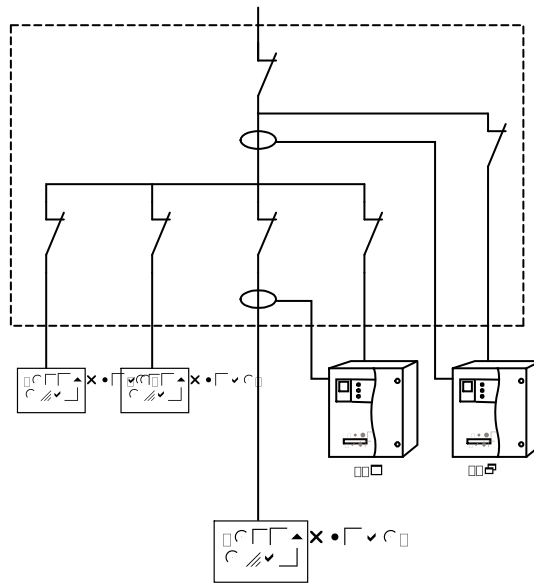
### Note:

- Parallel connection of up to four conditioners
- All the conditioners must have the same rating
- An additional board must be installed in each of the parallel-connected conditioners
- A connection (wire) between the conditioners is used to exchange the measurement data on the current drawn by the load and operating-status information on each of the conditioners



## Cascading installation of conditioners

Conditioners may be installed in a cascading configuration, as long as certain precautions are taken.



Special settings must be made to avoid any interaction between the various conditioners. The first AccuSine SWP **SW1** generally conditions a high-power application and the other AccuSine SWP **SW2**, installed upstream, conditions other, low-power feeders and, if applicable, any residual harmonics not conditioned by SW1.



### Note:

- The conditioners can have different ratings
- The total number of conditioners is limited to two
- The conditioners require special parameter settings





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