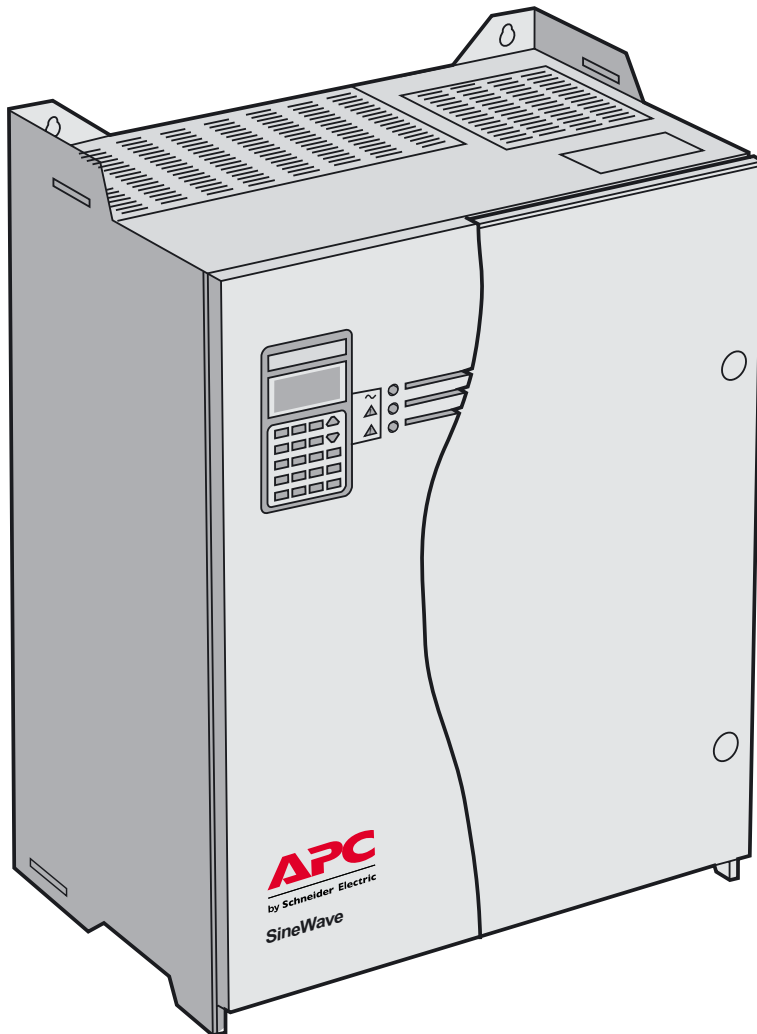


MGE™ SineWave™
20 - 480 A
**Active harmonics
conditioner**

**Installation and user
manual**



To the user

We would like to thank you for choosing the **MGE™ SineWave™** active harmonics conditioner and welcome you to the ever increasing world-wide family of satisfied APC by Schneider Electric product users.
This manual has been written to provide you with all the information necessary to install and operate your **MGE™ SineWave™** active harmonics conditioner.

We remain at your entire disposal should you require any further details.

APC by Schneider Electric

Advice for safety



Danger: dangerous voltages are present inside the conditioner. Any intervention requiring the door or protection panels to be opened must be carried out by qualified personnel;

- ▶ the conditioner must be earthed;
- ▶ do not place the conditioner near liquid or in an excessively damp environment;
- ▶ do not obstruct the air vents;
- ▶ do not place the conditioner in direct sunlight or near a source of heat;

- ▶ if the conditioner is stored before use, it must be kept in a dry place. Storage temperature: between –20 °C and +45 °C;
- ▶ do not store horizontally;
- ▶ dispose of packing waste in compliance with legal provisions in force.

Pictograms



Important instructions that must be followed



Information, advice, help



Action

Identification	5
Standards	5
Principle	
Improvements offered by MGE™ SineWave™	6
Operating principle	6
Device functional features	6
Installation	
Standard arrangements	7
Installing device(s)	9
Mechanical characteristics	9
Installation requirements	10
Connecting power	11
Connecting dry contacts and communication port (optional)	21
Connecting ribbon cables for 120 A and parallel installation	22
Moving the graphic terminal	23
Installing current sensors	23
Sensor mechanical and electrical characteristics	23
Mounting direction of sensors	26
Installing sensors	26
Connecting sensors	29
Energization and de-energization	
Energizing	30
General	30
Starting the MGE™ SineWave™ conditioner	30
Stopping the MGE™ SineWave™ conditioner	30
De-energizing	30
Operation	
Signification of indicator lights	31
User interface	31
User-friendly interface	31
Control and monitoring interface	32
Presentation	32
Use	32
General menu	32
Choice of language	33
Displaying main measurements	33
Displaying secondary measurements	34
Displaying alarms	35
Configuring	36
J-BUS communication	37
Identification	37
RUN-STOP controls	37
Reserved access	37
Maintenance	
Maintenance	38
What to do in case of an alarm	38
Training centers	39
Characteristics and performances	40

Installation of the **MGE™ SineWave™** active harmonics conditioner, monitoring of correct operation and certain repairs must be carried out by qualified personnel trained to deal with electrical hazards. Other operations may be carried out by any other persons with the help of this manual.



All **MGE™ SineWave™** range products are protected by patents; they implement original technology which cannot be used by any competitor of APC by Schneider Electric.

Copies of this document may be made with the approval of APC by Schneider Electric and must bear the compulsory title "APC by Schneider Electric **MGE™ SineWave™** installation and operation manual n°51027008XT".

Identification label



Check that your utility supply is compatible with the characteristics given on the identification label placed inside the door of the **MGE™ SineWave™** active harmonics conditioner.

APC by Schneider Electric		SINEWAVE	
Filtre Actif		60 A	
RESEAU-MAINS-NETZ		T Rs	
Ue - Uin - Ue		46 - 54 Hz	
Fréquence		56 - 64 Hz	
Frequency			
Frequenz			
Capacité de compensation		60 A	
Compensation power			
Kompensations-Strom			
Article			
Article 5102700200		NT 02	
Artikel			
Code Usine - Plant Code			
VH			
N° Série - Serial number - Seriennummer			
VH-452E4004			
Code barre - Bar code			
			
Nombre de cellule - Number of unit-Anzahl de zellen:			1/1
		Designed and manufactured through ISO9001 process	
Made in FRANCE			

Standards

► the **MGE™ SineWave™** active harmonics conditioner complies with the main international standards in force for this type of equipment and notably concerning:

▷ design
IEC 146

▷ construction and safety:
EN 60950-1

▷ noise:
ISO 3746

▷ protection:

IEC 529, NFC 20010,

▷ electromagnetic compatibility:
EN 55011 class A

▷ susceptibility:

IEC 1000-4-1

IEC 1000-4-2 level 3

IEC 1000-4-3 level 3

IEC 1000-4-4 level 4

IEC 1000-4-5 level 3

IEC 1000-4-6 level 3,

▷ quality organisation:

ISO 9001,

▷ EC marking.

Principle

Improvements offered by MGE™ SineWave™

The **MGE™ SineWave™** active harmonics conditioner allows:

- ▶ current distortion to be reduced and problems due to harmonics to be avoided, e.g.:
 - ▷ unintentional tripping of protections owing to the value of current in the neutral,
 - ▷ cable heating, notably in the neutral,
 - ▷ heating of generators (transformers, generator sets, inverters, etc.),
 - ▷ standards on harmonics consumed on the utility power not being respected;
- ▶ voltage distortion to be improved as

well as device operating problems due to over heavily disturbed supply voltages;

- ▶ an installation's characteristics to be improved so that devices can operate in conditions specified by the manufacturer;
- ▶ reactive energy to be compensated,

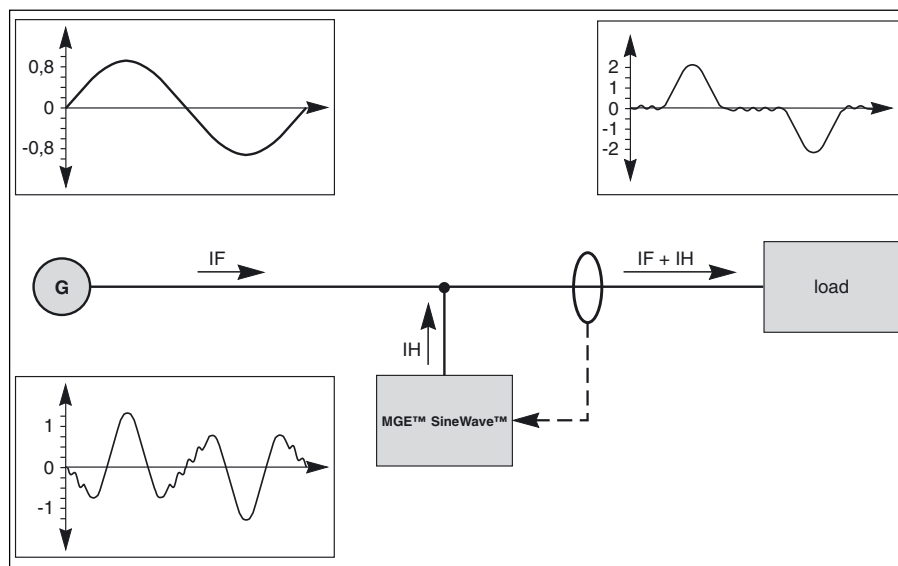
when this type of operation is possible, and the cosine φ to be converted to a value higher than or equal to 0.94 as recommended by electricity utilities.

Operating principle

The current consumed by a non-linear load (e.g. a computer system) is composed of a sinusoidal current I_F , which is a fundamental current at the utility power frequency, and a harmonic current I_H made up of currents having frequencies that are multiples of the network frequency.

The **MGE™ SineWave™** conditioner continuously generates a current equal to I_H so that the utility power current only has to supply the fundamental current.

The load + **MGE™ SineWave™** active harmonics conditioner assembly will then be seen by the utility power as a globally linear load which absorbs sinusoidal current. Thus, the cabling and generator impedances will not introduce any voltage distortion.



Device functional features

The **MGE™ SineWave™** active harmonics conditioner allows:

- ▶ determination of the harmonic orders to be compensated:
 - ▷ by configuring the breadth of the spectrum to be compensated,
 - ▷ or by concentrating the capacity of the **MGE™ SineWave™** compensation on specific harmonic orders during installation and thus carrying out selective compensation;
- ▶ reactive energy compensation to be carried out so as to increase the load cosine φ and return to the cosine range applied by the energy utility;

- ▶ measurements and other variables calculated by the device (voltage, current, distortion rates, etc.) to be displayed;
- ▶ optional communication with an external controller via a J-BUS protocol RS422/485 link for:
 - ▷ transmitting display information,
 - ▷ receiving RUN and STOP orders.

The compensation introduced by **MGE™ SineWave™** in relation to harmonic and reactive currents is continuously recalculated;

- ▶ the **MGE™ SineWave™** active harmonics conditioner continuously measures current absorbed by the load and immediately modifies the current that it reinjects onto the utility power to match this value;
- ▶ the **MGE™ SineWave™** active harmonics conditioner is suitable for all installation load and harmonic spectrum variations thus guaranteeing optimum operation at any instant.

Standard arrangements



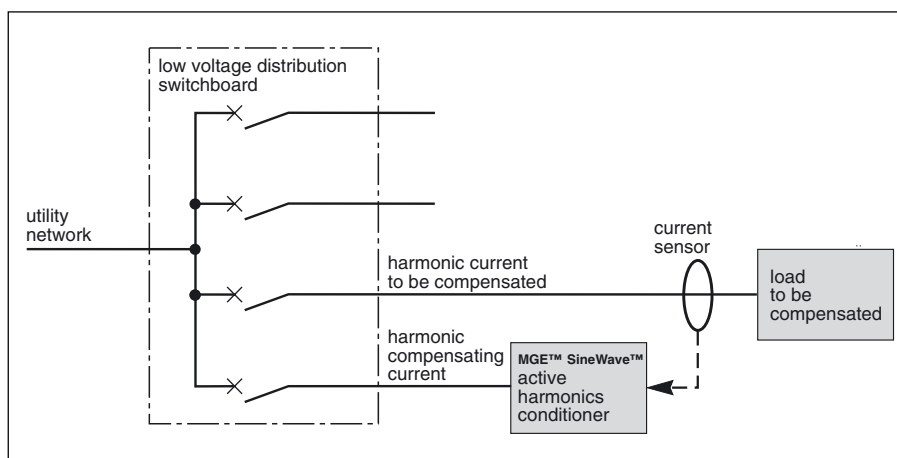
Depending on the type of problem to be solved, the position of the sensors and that of the The **MGE™ SineWave™** harmonics conditioner connection point may be different from one installation to another. The audit carried out before installation enables the optimum respective positions to be determined.

► The **MGE™ SineWave™** conditioner is connected in parallel with the load.

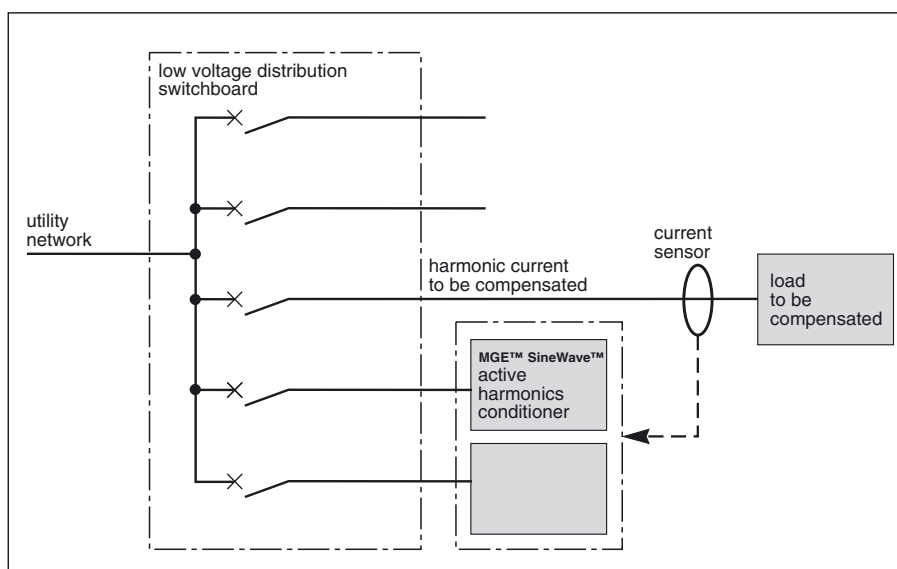


The **MGE™ SineWave™** harmonics conditioner will be fed from a specific outgoing feeder. This line must be protected by a circuit-breaker. The **MGE™ SineWave™** conditioner uses this line to send harmonics destined to compensate the load harmonics back onto the utility power.

Case of a 20 A, 30 A, 45 A or 60 A unit MGE™ SineWave™ conditioner



Case of a 90 A or 120 A unit MGE™ SineWave™ conditioner

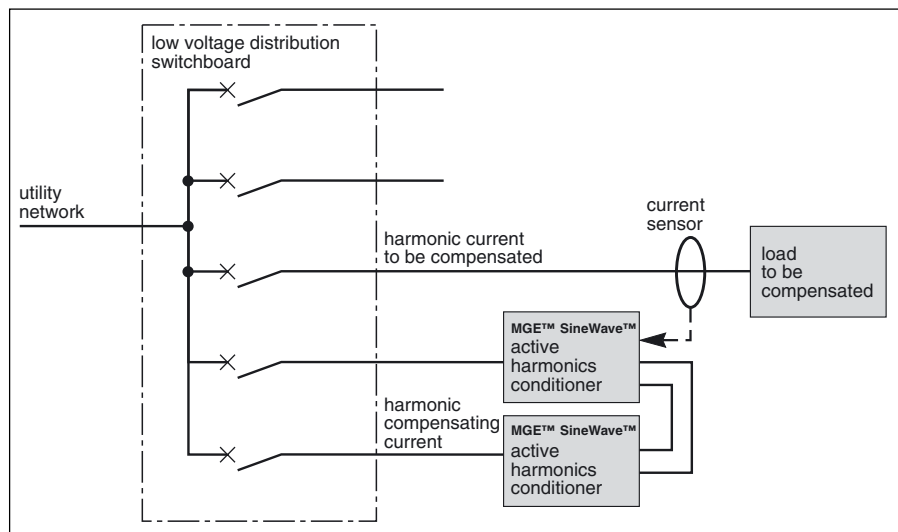


Installation (cont.)

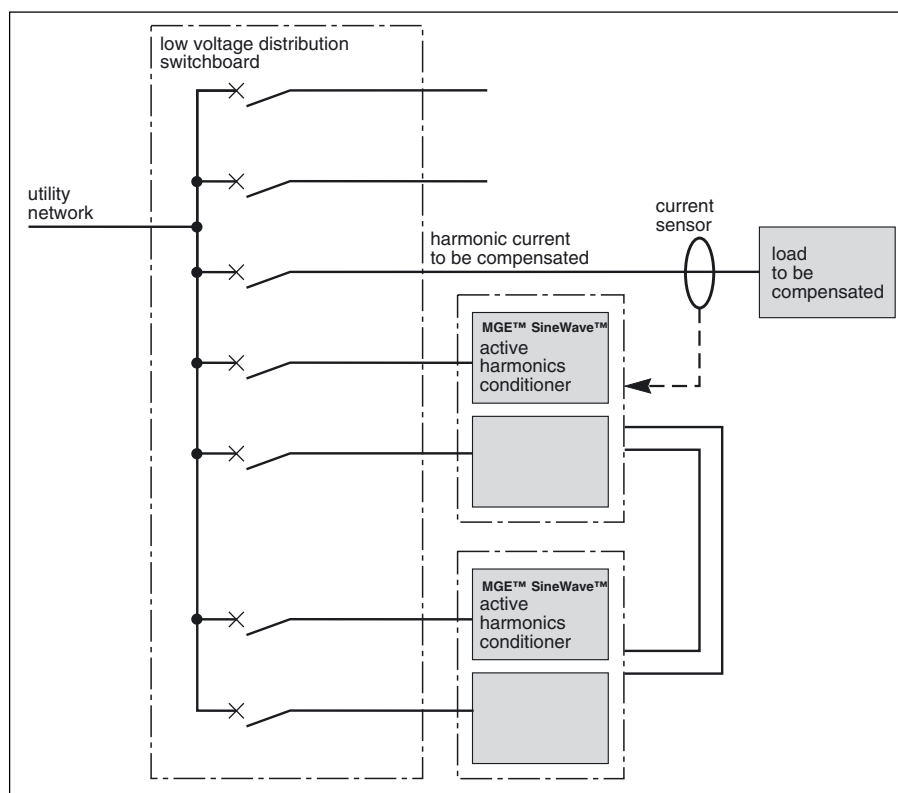
- ▶ each conditioner independently uses current measurements from three sensors, whatever the state of the other conditioner; running, stopped, de-energized;
- ▶ two cables between the conditioners allow each to know the other's state and thus determine the share of harmonics that it has to supply: half or all if the other conditioner is not running;
- ▶ each power circuit remains independent and has its own protection;
- ▶ it is possible to connect up to 4 conditioners with the same rating in parallel to compensate the same load or the same group of loads.

Case of 2 parallel 20 A, 30 A, 45 A, 60 A, 90 A or 120 A MGE™ SineWave™ conditioners

Example of 2 parallel 20, 30, 45 or 60 A MGE™ SineWave™ conditioners:

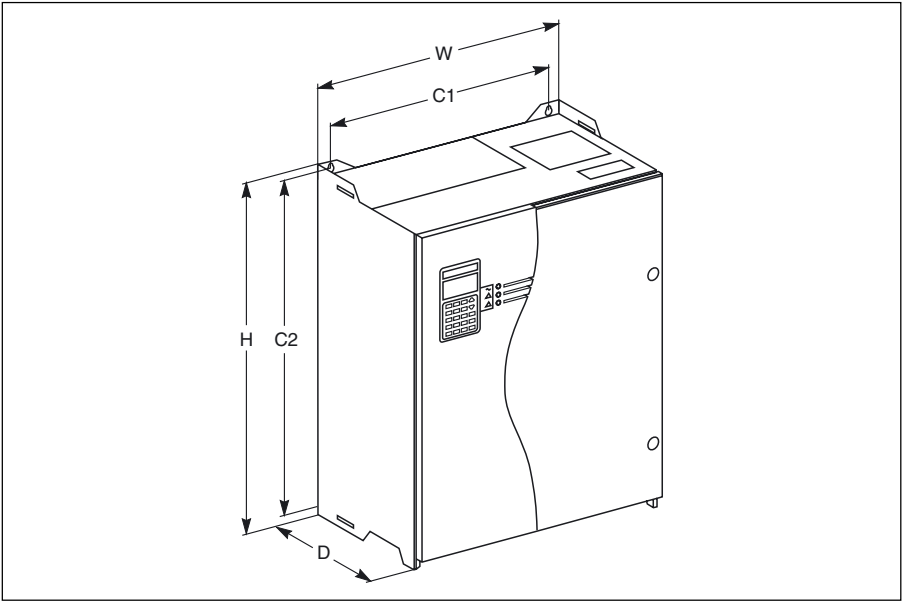


Example of 2 parallel 90 or 120 A MGE™ SineWave™ conditioners:



Installing device(s)

Mechanical characteristics



Dimensions (mm)			Fixing centre distance (mm)		Diameter of fixing screws (mm)	Mass (kg)
Height H	Width W	Depth D	Width C1	Height C2		
► 20 A and 30 A conditioners						
680	540	280	475	660	8	65
► 45 A and 60 A conditioners						
780	590	325	525	760	8	110

► 90 A and 120 A conditioners are made up of two cubicles having the same dimensions as the 45 and 60 A conditioners. These cubicles can be placed side by side or on top of one another (subject to installation requirements relating to ventilation).

Installation (cont.)

Installation requirements



The MGE™ SineWave™ active harmonics conditioner must be mounted vertically and away from any source of heat (heating system,

transformer, motor, etc.).
 ► it may be installed in a cubicle or fixed against a wall.



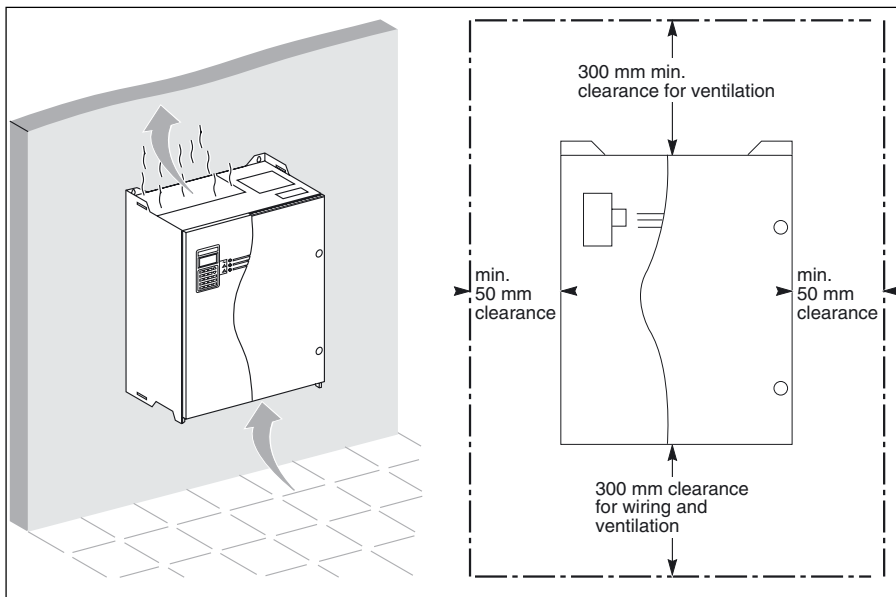
Whatever the installation method, a 600 mm minimum clearance must be provided in front of the MGE™ SineWave™ conditioner allowing for the door to be completely opened.

Installing a MGE™ SineWave™ conditioner alone

- clearances must be provided to allow the circulation of an air flow:
 - ▷ 1000 m³ per hour for 20 to 60 A ratings
 - ▷ 2000 m³ per hour for 90 to 120 A ratings.
- The air is sucked in below the conditioner and expelled via the top;
- the air temperature at the inlet of each conditioner must not exceed 40 degrees (25 °C recommended);
- the power cables and fine wires arrive via the bottom of the conditioner;



To install a 90 A or 120 A conditioner, refer to how to install 2 conditioners on top of each other or side by side.

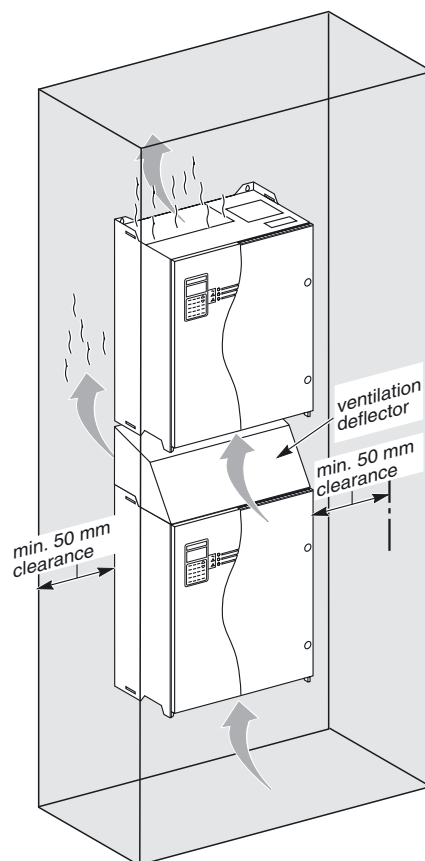


Installing 2 MGE™ SineWave™ conditioners on top of each other in a cubicle:

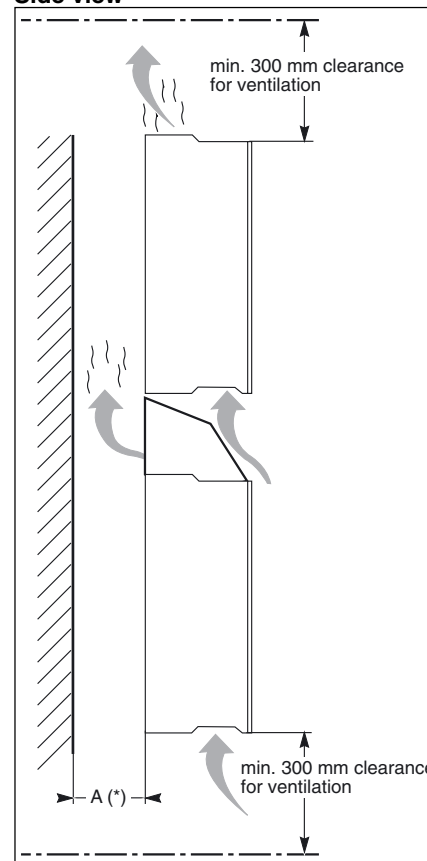


Installing 2 MGE™ SineWave™ conditioners on top of each other must only be done inside a cubicle.

- openings must be provided at the top and bottom of the cubicle to help the conditioners to cool down;
- a ventilation deflector must be used so that the thermal characteristics of the 2 conditioners are respected. The distance between the two cubicles is determined by the height; the air is sucked below each conditioner and then expelled:
- ▷ out the top for the top conditioner,
- ▷ to the rear for the bottom conditioner;
- the air flow required for cooling the cubicle is 2000 m³ per hour;
- the air temperature at the inlet to each conditioner must not exceed 40 degrees (25 °C recommended);
- power cables and signal cables arrive via the bottom of the conditioner.



Side view



A = min. 80 mm : 20 to 30 A ratings
 A = min. 200 mm : 45 to 120 A ratings

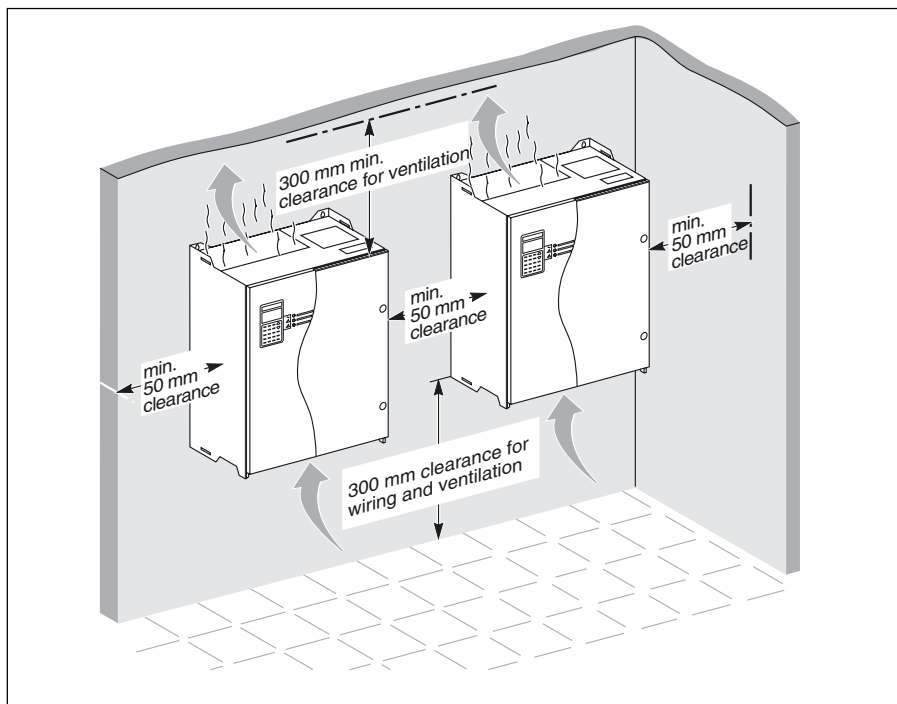
Installing 2 MGE™ SineWave™ conditioners side by side

► clearances must be provided to allow the circulation of an air flow of 1000 m³ per hour per cubicle.

The air is sucked below each conditioner and then expelled out the top;

► the air temperature at the inlet to each conditioner must not exceed 40 degrees (25 °C recommended);

► power cables and signal cables arrive via the bottom of each conditioner.



Connecting power

Determining wiring (not supplied)

Wiring cross-sectional areas shall be determined in compliance with the standards in force using the information in the table opposite and the protection tables 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.



► The minimum cable cross-sectional areas can be determined based on the sizing current (Is) given in the tables below.

► It is advisable to connect the neutral when it is distributed.

MGE™ SineWave™ rating (A)	Recommended cross-sectional areas (mm ²) capacity		Terminal block connection (mm ²)	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 cubicle	50 per cubicle	70	8	20
120	16 per cubicle	70 per cubicle	70	8	20

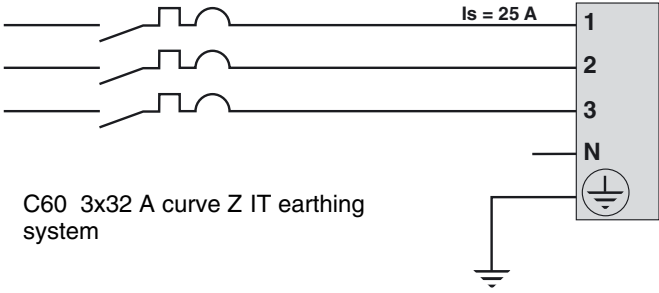
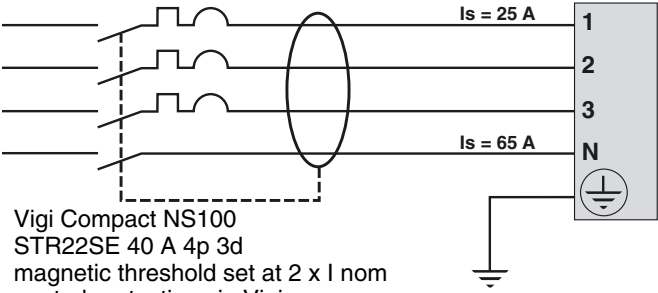
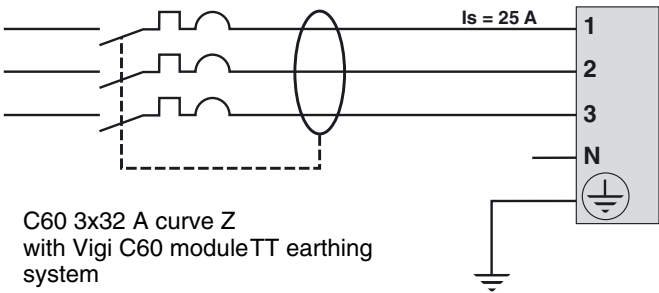
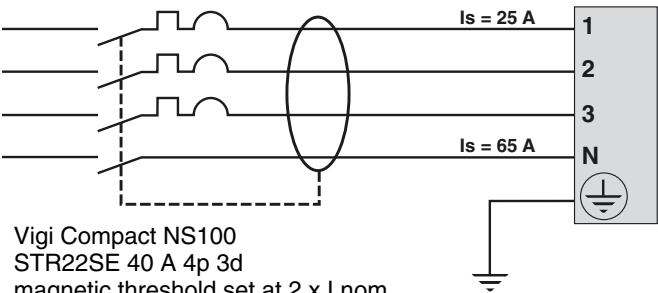
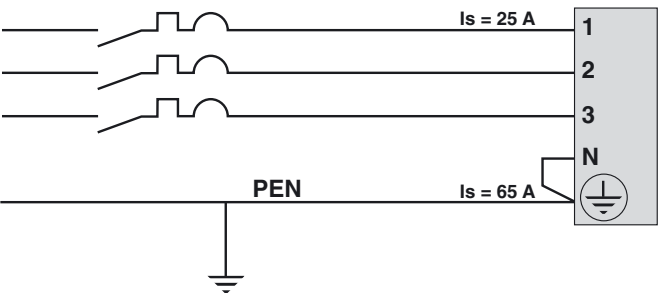


Protections (not supplied)

Protections shall be determined in compliance with the standards in force using the information below and in accordance with selectivity requirements. These models are for guidance only and do not involve the responsibility of APC by Schneider Electric.

Installation (cont.)

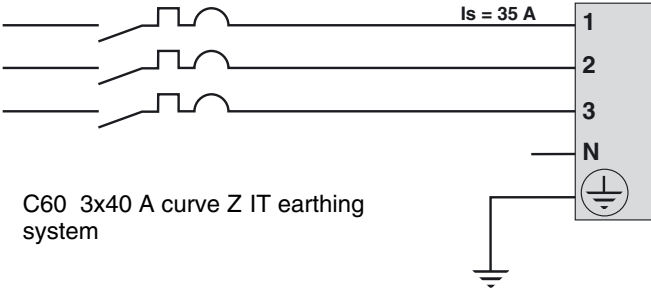
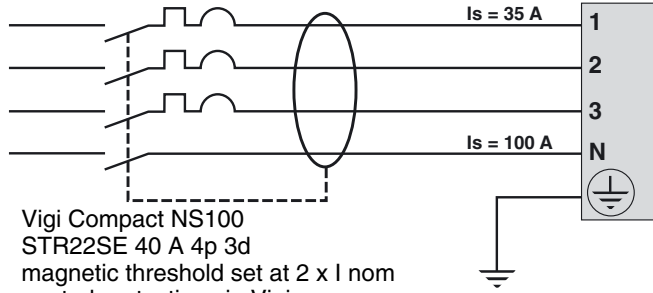
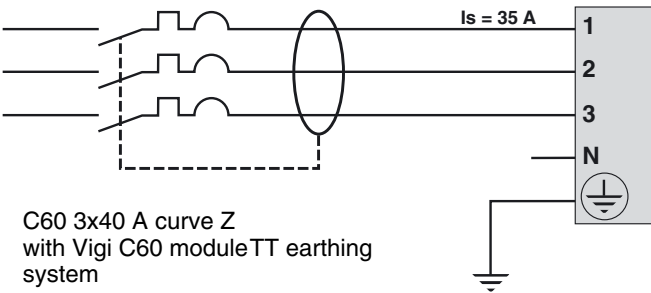
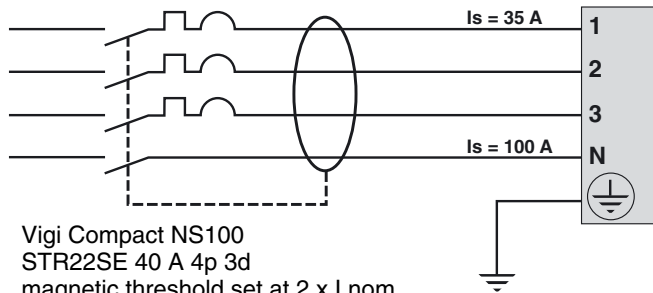
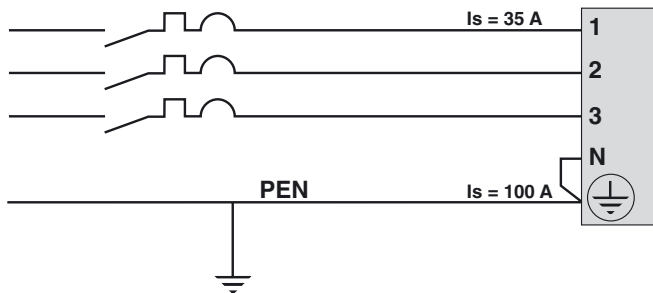

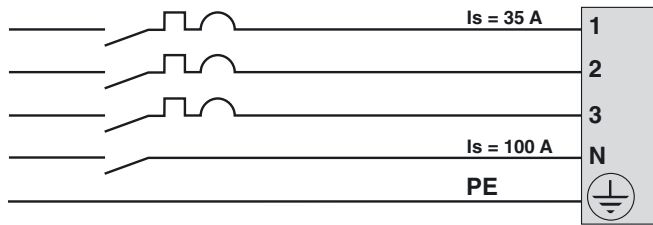
20 A MGE™ SineWave™

Table of recommended protections per rating
Connection to the MGE™ SineWave™ terminal block where P_{cu} = function of I_{sc}

Non-distributed neutral	Distributed neutral
<div>IT earthing system</div> <div></div> <div>C60 3x32 A curve Z IT earthing system</div>	<div>IT earthing system</div> <div></div> <div>Vigi Compact NS100 STR22SE 40 A 4p 3d magnetic threshold set at 2 x I nom neutral protection via Vigi sensitivity: 10 A</div>
<div>TT earthing system</div> <div></div> <div>C60 3x32 A curve Z with Vigi C60 module TT earthing system</div>	<div>TT earthing system</div> <div></div> <div>Vigi Compact NS100 STR22SE 40 A 4p 3d magnetic threshold set at 2 x I nom sensitivity: depending on the installation</div>
	<div>TNC earthing system</div> <div></div> <div>C60 3x32 A curve Z</div>
<div></div> <div>Important: upstream breaking devices should be set in such a way as to guarantee good discrimination with the circuit-breakers recommended on this page.</div> <div>Key: Is = sizing current Pcu = breaking capacity Isc = short-circuit current</div>	<div>TNS earthing system</div> <div></div> <div>NS100 STR22SE 100 A 4p 3d magnetic threshold set at 2 x I nom</div>

30 A MGE™ SineWave™

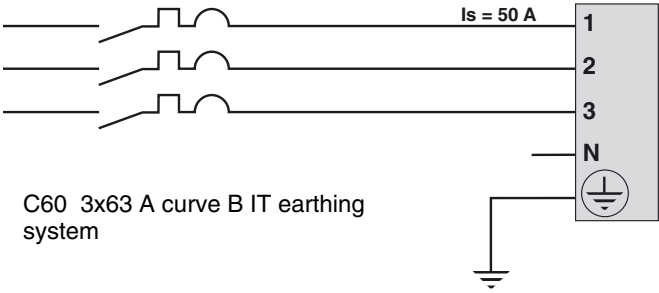
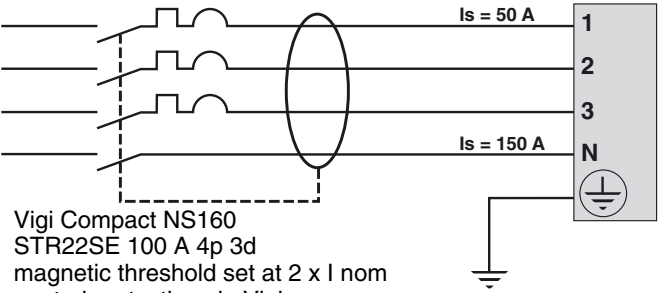
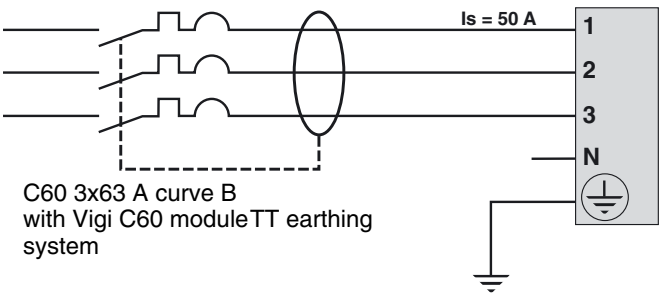
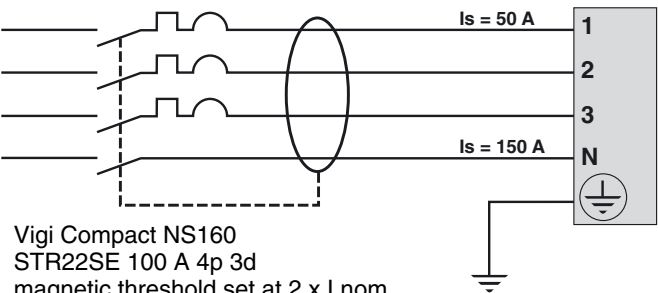
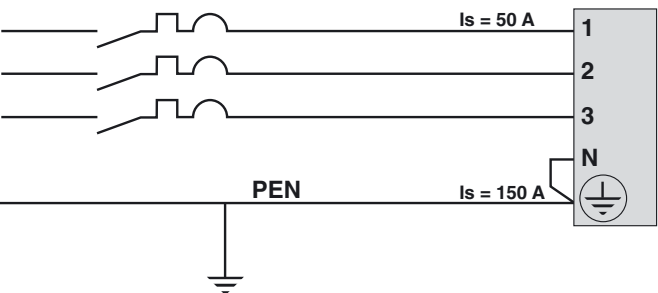


Table of recommended protections per rating
Connection to the MGE™ SineWave™ terminal block where P_{cu} = function of I_{sc}

Non-distributed neutral	Distributed neutral
<div>IT earthing system <p>C60 3x40 A curve Z IT earthing system</p></div>	<div>IT earthing system <p>Vigi Compact NS100 STR22SE 40 A 4p 3d magnetic threshold set at $2 \times I_{nom}$ neutral protection via Vigi sensitivity: 10 A</p></div>
<div>TT earthing system <p>C60 3x40 A curve Z with Vigi C60 module TT earthing system</p></div>	<div>TT earthing system <p>Vigi Compact NS100 STR22SE 40 A 4p 3d magnetic threshold set at $2 \times I_{nom}$ sensitivity: depending on the installation</p></div>
	<div>TNC earthing system <p>C60 3x40 A curve Z</p></div>
<div><p>Important: upstream breaking devices should be set in such a way as to guarantee good discrimination with the circuit-breakers recommended on this page.</p><p>Key: I_s = sizing current P_{cu} = breaking capacity I_{sc} = short-circuit current</p></div>	<div>TNS earthing system <p>NS100 STR22SE 100 A 4p 3d magnetic threshold set at $2 \times I_{nom}$</p></div>

Installation (cont.)

45 A MGE™ SineWave™

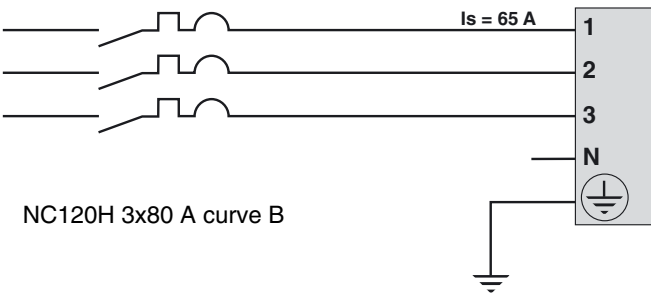
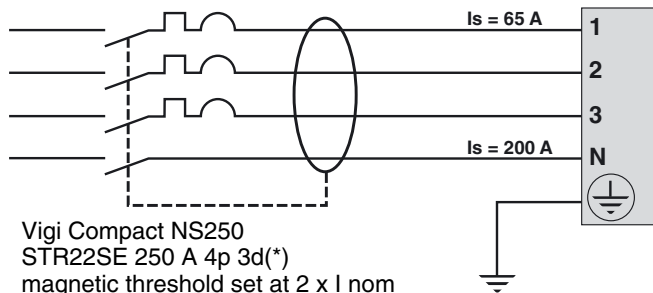
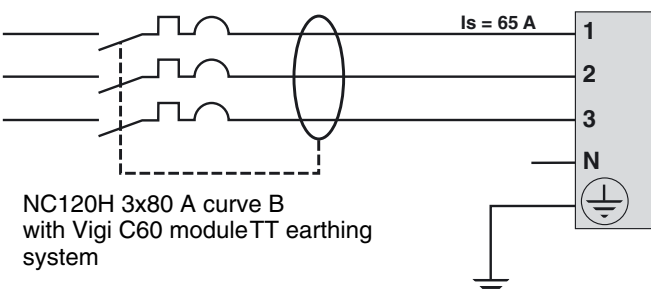
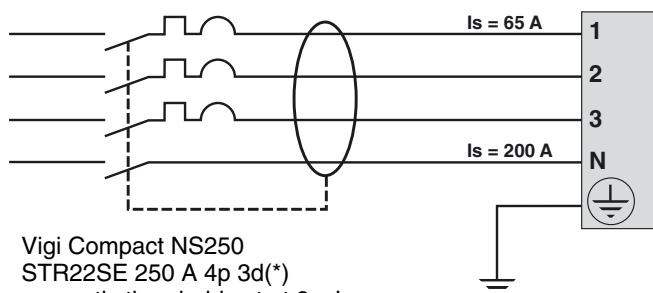
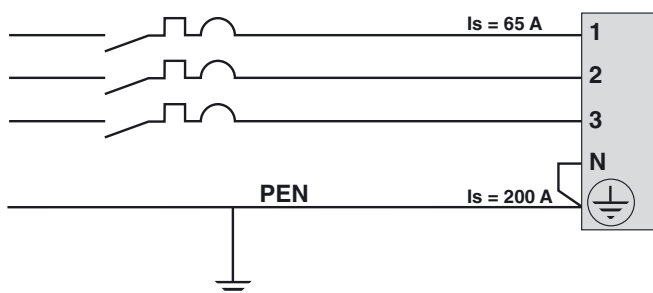

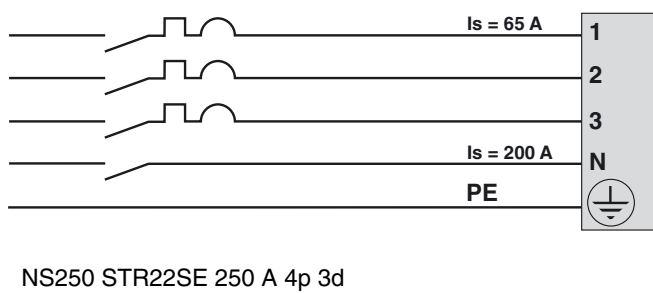
Table of recommended protections per rating
Connection to the MGE™ SineWave™ terminal block where Pcu = function of Isc

Non-distributed neutral	Distributed neutral
<div>IT earthing system</div> <div></div> <div>C60 3x63 A curve B IT earthing system</div>	<div>IT earthing system</div> <div></div> <div>Vigi Compact NS160 STR22SE 100 A 4p 3d magnetic threshold set at 2 x I nom neutral protection via Vigi sensitivity: 10 A</div>
<div>TT earthing system</div> <div></div> <div>C60 3x63 A curve B with Vigi C60 module TT earthing system</div>	<div>TT earthing system</div> <div></div> <div>Vigi Compact NS160 STR22SE 100 A 4p 3d magnetic threshold set at 2 x I nom sensitivity: depending on the installation</div>
	<div>TNC earthing system</div> <div></div> <div>C60 3x63 A curve B</div>
<div></div> <div>Important: upstream breaking devices should be set in such a way as to guarantee good discrimination with the circuit-breakers recommended on this page.</div> <div>Key: Is = sizing current Pcu = breaking capacity Isc = short-circuit current</div>	<div>TNS earthing system</div> <div></div> <div>NS160 STR22SE 160 A 4p 3d magnetic threshold set at 2 x I nom</div>

60 A MGE™ SineWave™

Table of recommended protections per rating

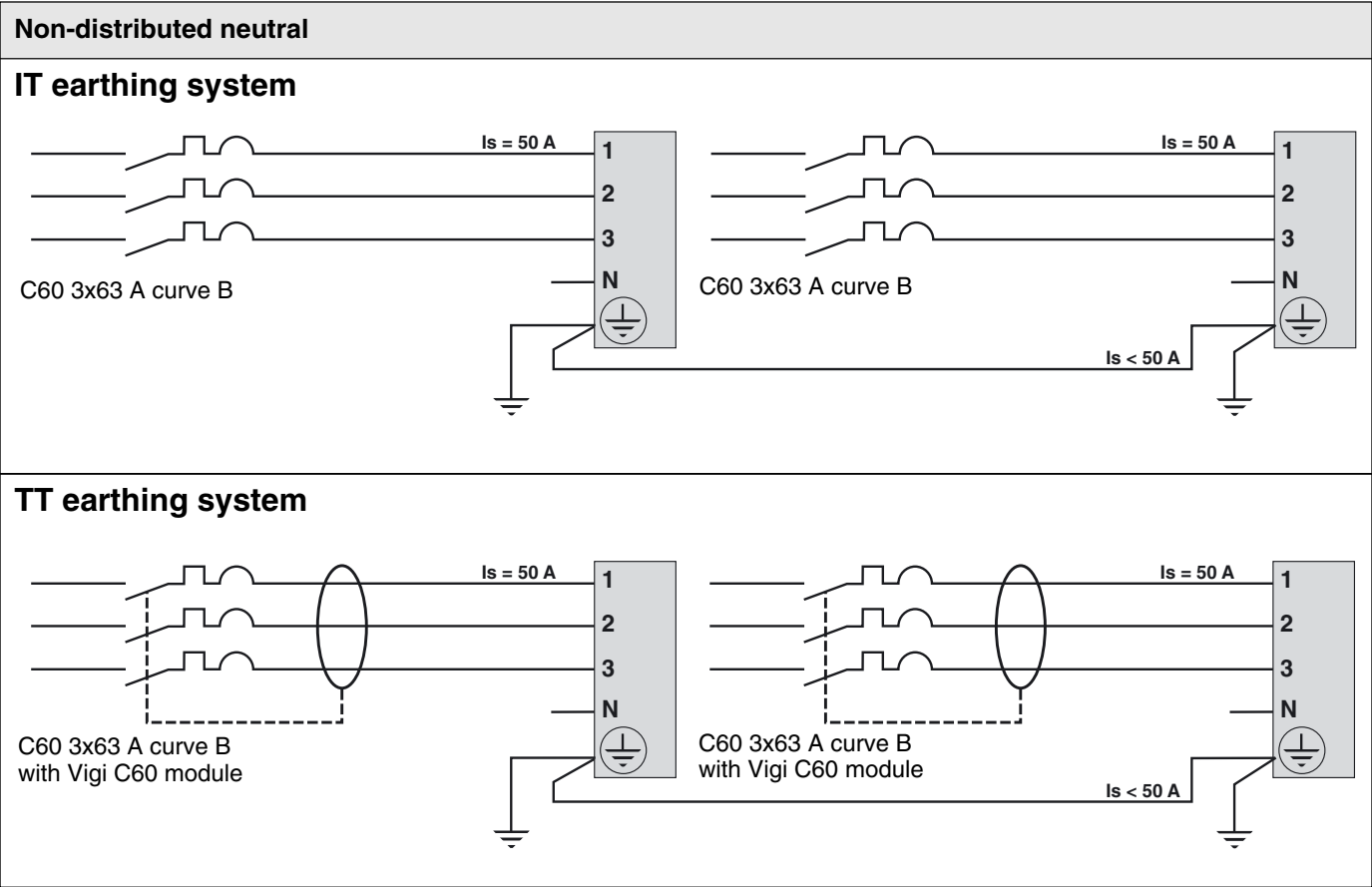
Connection to the SineWave™ terminal block where P_{cu} = function of I_{sc}

Non-distributed neutral	Distributed neutral
IT earthing system  <p>NC120H 3x80 A curve B</p>	IT earthing system  <p>Vigi Compact NS250 STR22SE 250 A 4p 3d(*) magnetic threshold set at $2 \times I_{nom}$ neutral protection via Vigi sensitivity: 10 A</p>
TT earthing system  <p>NC120H 3x80 A curve B with Vigi C60 module TT earthing system</p>	TT earthing system  <p>Vigi Compact NS250 STR22SE 250 A 4p 3d(*) magnetic threshold set at $2 \times I_{nom}$ sensitivity: depending on the installation</p>
	TNC earthing system  <p>NC120H 3x80 A curve B</p>
 <p>Important: upstream breaking devices should be set in such a way as to guarantee good discrimination with the circuit-breakers recommended on this page.</p> <p>* If the 250A rating of the STR22SE trip unit does not make it possible to ensure discrimination with the existing upstream protection devices, it is possible to replace it with a circuit breaker with a 160A rating for applications in which the neutral current for harmonics elimination does not exceed 160A.</p> <p>Key: I_s = sizing current P_{cu} = breaking capacity I_{sc} = short-circuit current</p>	TNS earthing system  <p>NS250 STR22SE 250 A 4p 3d magnetic threshold set at $2 \times I_{nom}$</p>

Installation (cont.)

90 A MGE™ SineWave™ with non-distributed neutral

Table of recommended protections per rating
Connection to the MGE™ SineWave™ terminal block where P_{cu} = function of I_{sc}



Important: upstream breaking devices should be set in such a way as to guarantee good discrimination with the circuit-breakers recommended on this page.

Key: I_s = sizing current
 P_{cu} = breaking capacity
 I_{sc} = short-circuit current

90 A MGE™ SineWave™ with distributed neutral

Table of recommended protections per rating

Connection to the SineWave™ terminal block where P_{cu} = function of I_{sc}

Distributed neutral	
IT earthing system <p>Vigi Compact NS160(*) STR22E 100 A 4p 3d magnetic threshold set at 2 x I nom neutral protection via Vigi sensitivity: 10 A</p>	<p>Vigi Compact NS160(*) STR22E 100 A 4p 3d magnetic threshold set at 2 x I nom neutral protection via Vigi sensitivity: 10 A</p>
TT earthing system <p>Vigi Compact NS160(*) STR22E 100 A 4p 3d magnetic threshold set at 2 x I nom sensitivity: depending on installation</p>	<p>Vigi Compact NS160(*) STR22E 100 A 4p 3d magnetic threshold set at 2 x I nom sensitivity: depending on installation</p>
TNC earthing system <p>C60 3x63 A curve B PEN Is = 150 A</p>	<p>C60 3x63 A curve B PEN Is = 150 A</p>
TNS earthing system <p>NS160 STR22E 160 A 4p 3d magnetic threshold set at 2 x I nom</p>	<p>NS160 STR22E 160 A 4p 3d magnetic threshold set at 2 x I nom</p>



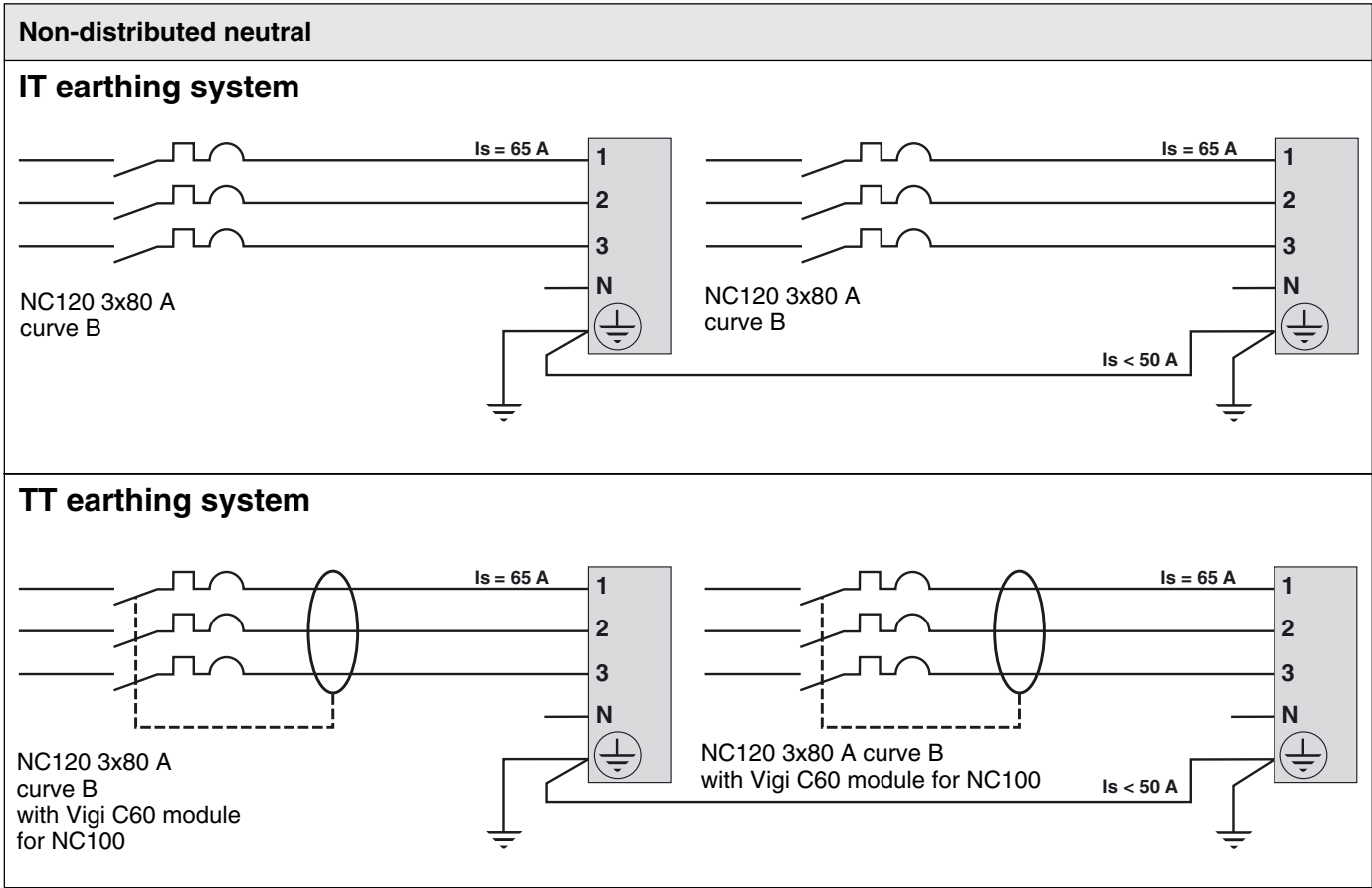
Important: upstream breaking devices should be set in such a way as to guarantee good discrimination with the circuit-breakers recommended on this page.


* 2 vigi compacts placed on each of the 90A SineWaves

Installation (cont.)

120 A MGE™ SineWave™ with non-distributed neutral

Table of recommended protections per rating
Connection to the MGE™ SineWave™ terminal block where P_{cu} = function of I_{sc}



 Important: upstream breaking devices should be set in such a way as to guarantee good discrimination with the circuit-breakers recommended on this page.

Key: I_s = sizing current
 P_{cu} = breaking capacity
 I_{sc} = short-circuit current

120 A MGE™ SineWave™ with distributed neutral

Table of recommended protections per rating

Connection to the MGE™ SineWave™ terminal block where P_{cu} = function of I_{sc}

Distributed neutral	
IT earthing system <p>Vigi Compact NS160(*) STR22E 100 A 4p 3d magnetic threshold set at 2 x I nom neutral protection via Vigi sensitivity: 10 A</p>	<p>Vigi Compact NS160(*) STR22E 100 A 4p 3d magnetic threshold set at 2 x I nom neutral protection via Vigi sensitivity: 10 A</p>
TT earthing system <p>Vigi Compact NS160(*) STR22E 100 A 4p 3d magnetic threshold set at 2 x I nom sensitivity: depending on installation</p>	<p>Vigi Compact NS160(*) STR22E 100 A 4p 3d magnetic threshold set at 2 x I nom sensitivity: depending on installation</p>
TNC earthing system <p>NC120H 3x80A curve B PEN Is = 200 A</p>	<p>NC100H 3x80A curve B PEN Is = 200 A</p>
TNS earthing system <p>NS250 STR22E 250 A 4p 3d magnetic threshold set at 2 x I nom</p>	<p>NS250 STR22E 250 A 4p 3d magnetic threshold set at 2 x I nom</p>



Important: upstream breaking devices should be set in such a way as to guarantee good discrimination with the circuit-breakers recommended on this page.

* 2 vigi compacts placed on each of the 120A SineWaves

Installation (cont.)

Connection operations:



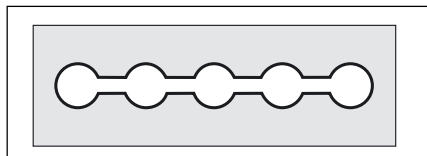
Connection operations must be carried out without the conditioners being energized.

For the protection of persons, remember that the PE or PEN protective conductor must always be connected first.

Earthing system: **MGE™ SineWave™** is suited to all types of earthing system.

Procedure:

- check that the lifting sling has been removed;
- check that the **MGE™ SineWave™** supply circuit-breaker placed in your low voltage switch cubicle is in open position (O);
- wiring is connected via the bottom, in front of the conditioner;
- to access the connection terminal block, remove the front and lower protection plates;
- power connections are made on the bolted terminal block;
- the lower protection plate of the power terminal block must be fitted with bushings for cable feedthrough. If several holes are made to feed the cables through, cut a slot common to all the holes to prevent eddy currents from being generated;



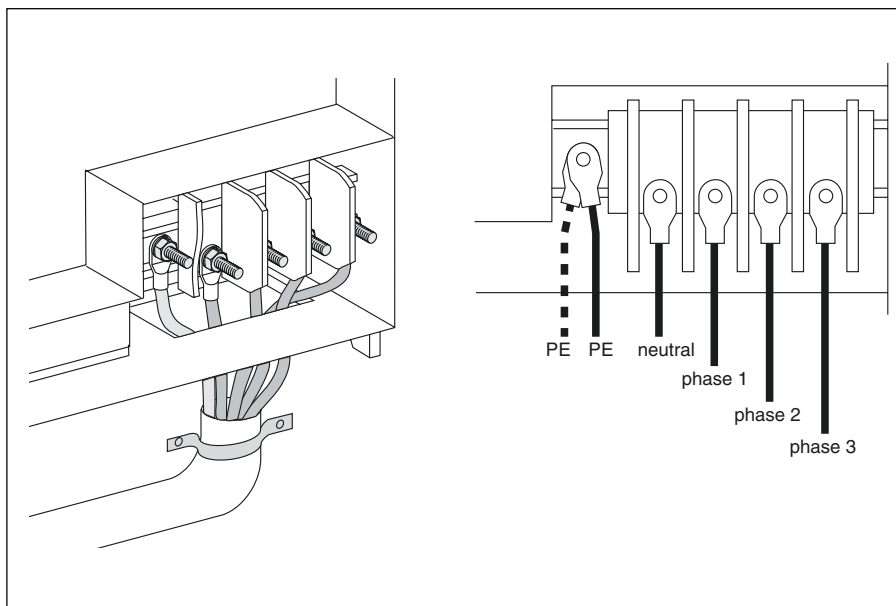
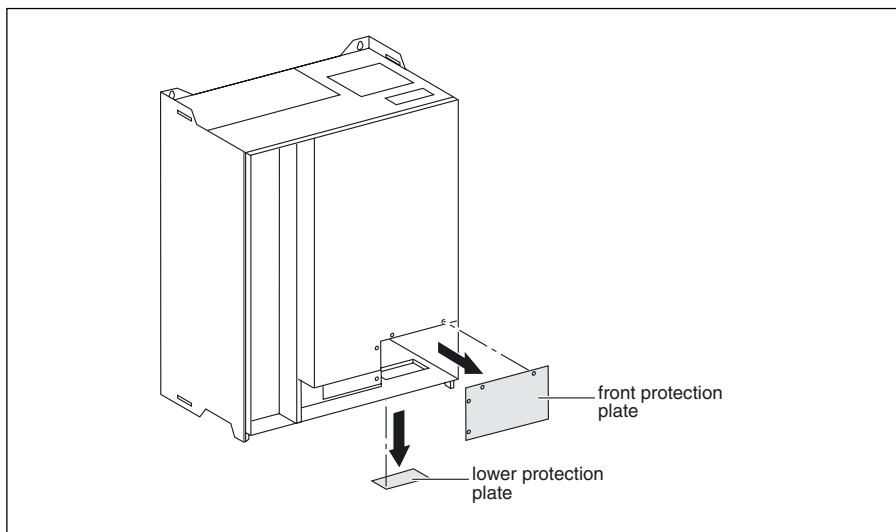
- connect the PE or PEN conductor first;
- connect the other conductors so that they comply with the rotation direction of the phases and the indications in the figures opposite.



The connecting cables must be mechanically fixed near the terminal block so that any mechanical stress on the conductors is prevented.

Note:

If there is traction on the cables, the PE or PEN must be the last conductor subject to its effects.



Connecting dry contacts and communication port (optional)

Determining wiring

Connector	Cross-sectional area (mm²)	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 MGE™ SineWave™ ; the shielding must be connected at both ends.

Connection operations

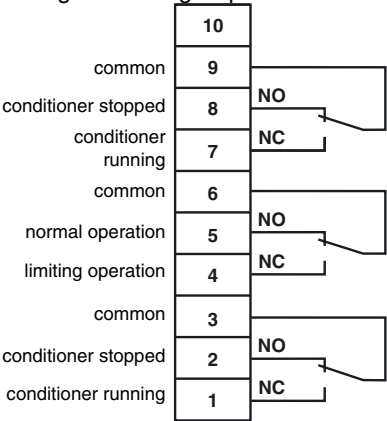
Procedure:

- wiring is connected via the bottom, in front of the device.

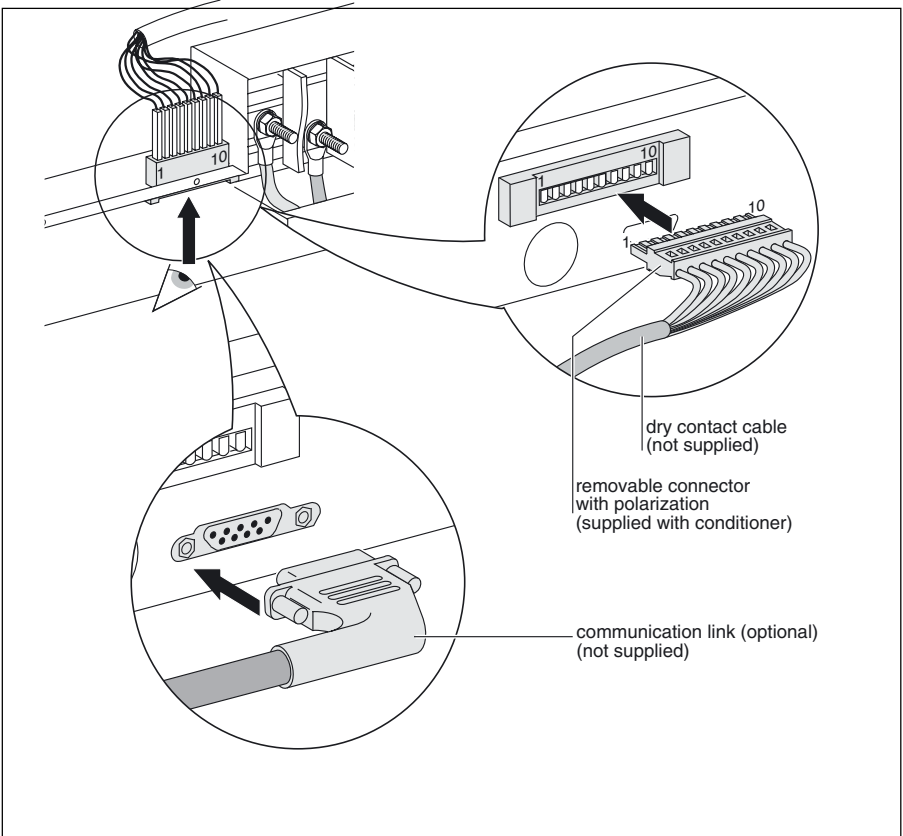


Signal cable connections must be mechanically fixed near the connectors so that any mechanical stress on the conductors is prevented.

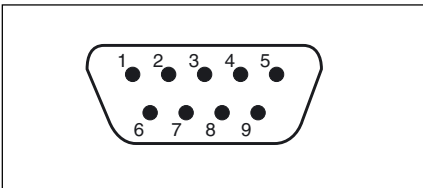
- configuration of dry contact terminal block:
 - ▷ 2 x voltage-free changeover switches: conditioner running/stopped,
 - ▷ 1 x voltage-free changeover switch: current-limiting operation;
- connection to the terminal block may be made whilst **MGE™ SineWave™** is operating;
- these contacts comply with safe extra low voltage insulating requirements.



Contact breaking capacity:
P = 2 VA, U = 30 V max.,
I = 1 A max.



- configuration of 9 point Sub-D connector for RS 422/485 communication link (optional);
 - the communication link can be plugged into the sub-D connector without shutting down the **MGE™ SineWave™**;
 - this interface complies with safe extra low voltage insulating requirements.
- MGE™ SineWave™ connector**
seen from below



Key:
pin 1: 0 volts
pin 2: RP_5V
pin 3: RC_A
pin 4: RD-(B')
pin 5: TD-(B)
pin 6: RP_0V
pin 7: RC_B
pin 8: RD+(A')
pin 9: TD+(A)

Installation (cont.)

Connecting ribbon cables for the 90 or 120 A and for parallel installation

Type of connections

Connector	Type of conductors	Remark
90 or 120 A MGE™ SineWave™ inter-cubicle connector	shielded strand supplied (3 m)	connection between the 2 cubicles which make up the 90 or 120 A MGE™ SineWave™
MGE™ SineWave™ parallel connector	shielded strand supplied (5 m)	loop connection allows parallel operation of the MGE™ SineWave™ even if it is interrupted for the number of devices to be modified

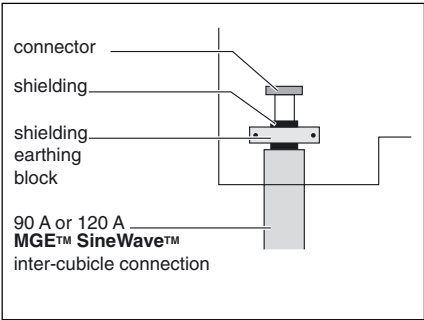
Connection operations for parallel or 90 A or 120 A conditioners



Connection operations must be carried out with the conditioner de-energized.

Procedure:

- wiring is connected via the bottom, in front of the device;
- remove the protection plate;
- the conductor connectors must be correctly locked;
- shielding shall be earthed in compliance with the indications given below;

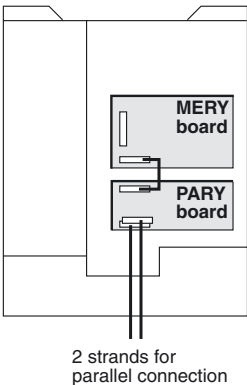


- configure the parallel connection board using the indications in the table below.

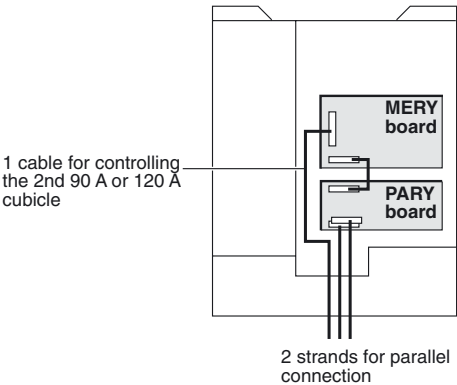


Signal cables connections must be mechanically fixed near the connectors so that any stress on the conductors or conductor shielding earthing is prevented.

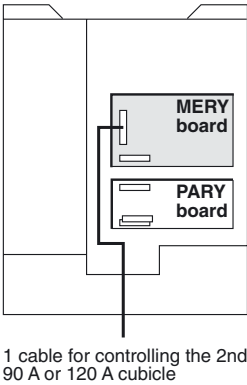
20 A or 60 A parallel conditioner connection



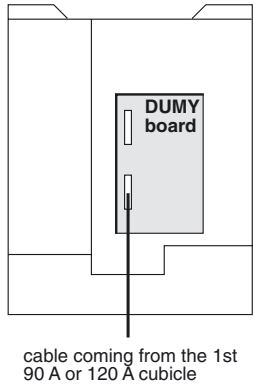
90 A or 120 A parallel conditioner connection



90 A or 120 A parallel conditioner connection



2nd 90 or 120 A conditioner cubicle connection



Close-up of connectors

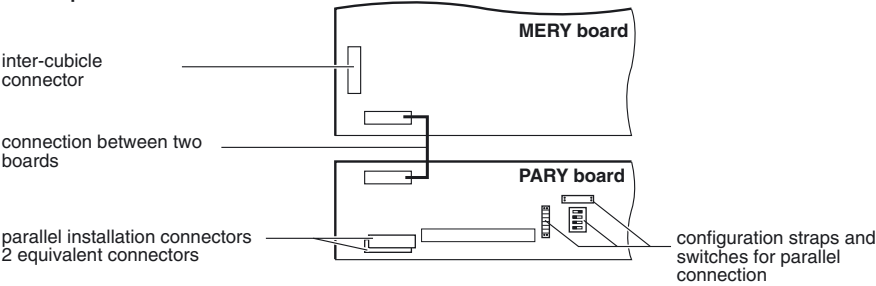
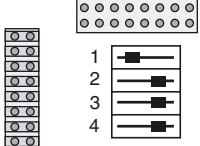
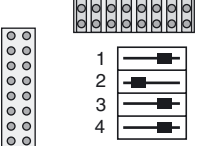
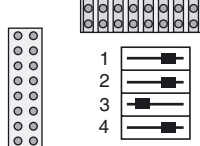
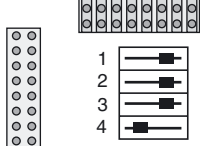


Table of strap configurations for each parallel conditioner

	MGE™ SineWave™ n° 1	MGE™ SineWave™ n° 2	MGE™ SineWave™ n° 3	MGE™ SineWave™ n° 4
configuration of parallel conditioners				

Moving graphic terminal

The **MGE™ SineWave™** harmonics conditioner graphic terminal can be moved to the front panel of a switch cubicle where a **MGE™ SineWave™** is installed.

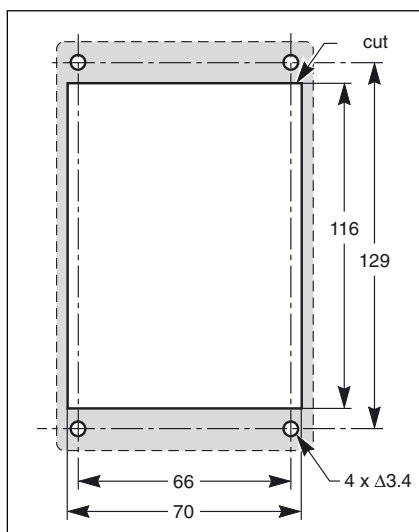
► To do this, use the optional kit reference n° 5102726400 which contains:

- ▷ a cover plate replacing the terminal located on the **MGE™ SineWave™** door,
- ▷ a 2.5 metre long extension lead. This lead cannot be lengthened without this causing a risk of abnormal operation;

► Moving the graphic terminal:

- ▷ disconnect the terminal ribbon cable on the back of the door,
- ▷ remove the terminal by unscrewing the 4 fixing screws,
- ▷ use these 4 screws to fix the cover plate in place of the terminal,
- ▷ connect the ribbon cable onto the extension lead,
- ▷ feed the extension lead through the rectangular bushing at the bottom of the **MGE™ SineWave™** conditioner,
- ▷ fix the terminal at the required location,
- ▷ connect the extension lead to the graphic terminal.

Cutting and fixing template for the moved terminal



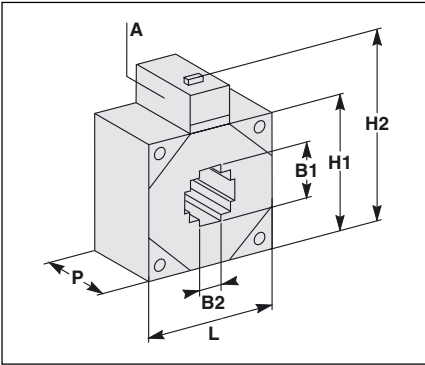
Installation (cont.)

Installing current sensors (supplied)

Once installed, the current sensor secondaries must be short-circuited. The secondary terminals of the current sensors must be short-circuited as soon as they are installed. This short-circuit is achieved by moving a strap (X1) to the “MAINT” position on the CCTY card where the secondary terminals are connected. The strap must remain in this position until the **MGE™ SineWave™** conditioner has been put into service.

Sensor mechanical and electrical characteristics

Closed sensors:
Important: the shape of the sensor may be different depending on the rating and supplier.



Rating	External dimensions H1 / H2 / L / P (mm)	Primary		Secondary		
		B1 / B2 (mm)	Max. cable diameter	Diameter of lugs (A)	Cross-sectional area of wires (twisted 2-core cables) (mm²)	Max. length of wires (not supplied) (m)
300/1 500 / 1	76 / 106 76 / 44	31 / 11	23	3 or 5 depending on supplier	0.75 min. 0.75 recommended 2.5 max.	20
1000/1	90 / 106 77 / 44	41 / 11	31	3 or 5 depending on supplier	0.75 min. 0.75 recommended 2.5 max.	20
1500/1	165 / 194 95 / 40	103 / 22	rod only	3 or 5 depending on supplier	0.75 min. 0.75 recommended 2.5 max.	20
2000/1	165 / 194 95 / 40	103 / 22	rod only	3 or 5 depending on supplier	0.75 min. 0.75 recommended 2.5 max.	20
3000/1	180 / 209 115 / 45	103 / 32	rod only	3 or 5 depending on supplier	0.75 min. 0.75 recommended 2.5 max.	20
4000/1	180 / 209 115/45	103 / 32	rod only	3 or 5 depending on supplier	0.75 min. 0.75 recommended 2.5 max.	
5000/1	Available in option					
6000/1	Available in option					

Opening sensors:

Depending on availability, opening sensors are of the OPTELEC or SACI type.

OPTELEC opening sensors:

On wiring kit supplied:

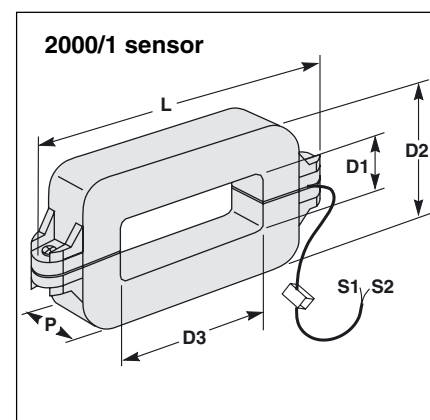
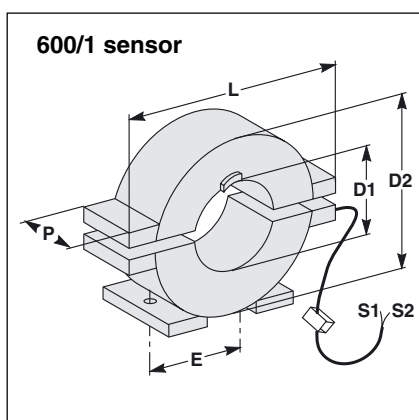
S1 = blue

S2 = brown

The sensors must be closed and screwed on both sides.

600/1 sensor: it is advisable to fix the sensor onto the cable. Fixing lugs are provided for this purpose.

Important: the shape of the sensor may be different depending on the rating and supplier.



Rating	External			Primary	Secondary		
	Dimensions (mm)	Fixing centre distance C (mm)	Diameter of screws (mm)	Max. cable diameter	Fine wire connection	Cross-sectional area of wires (2-core cables) (mm ²)	Max. length of wires (m)
600/1	D2 = 96.5 L = 128 P = 35	60	6	D1 = 48	wiring kit supplied (5 m)	0.75 min. 0.75 recommended 2.5 max.	20
2000/1	D2 = 137.5 L = 298 P = 34			D1 = 69 or rod D1 = 69 D3 = 206	wiring kit supplied (5 m)	0.75 min. 0.75 recommended 2.5 max.	20

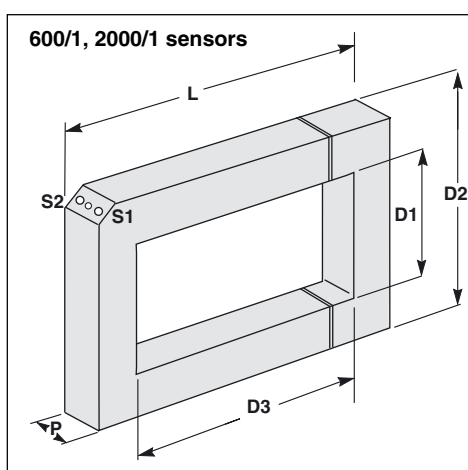
SACI opening sensors

Wiring kit not supplied

The sensors must be closed and screwed on both sides.

600/1 and 2000/1 sensors: it is advisable you fix the sensor to the bar. Fixing lugs are provided for this purpose.

Important: the shape of the sensor may be different depending on the rating and supplier.



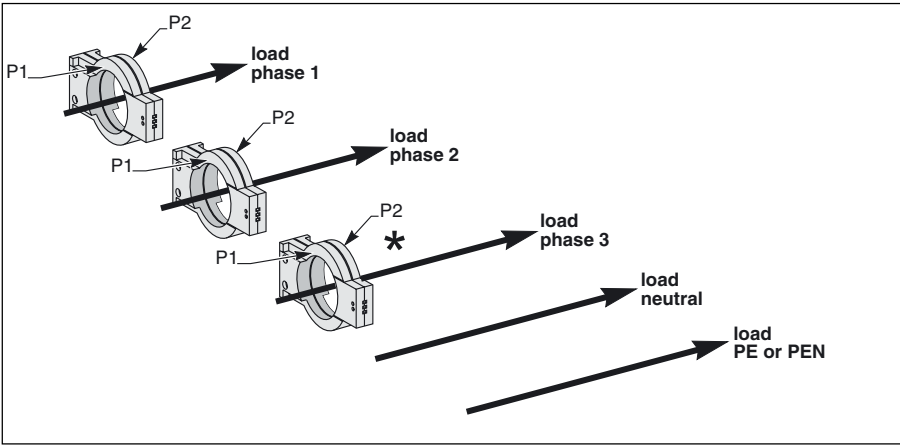
Rating	External	Primary	Secondary		
	Dimensions (mm)	Max. cable diameter	Diameter of screws (mm)	Cross-sectional area of wires (2-core cables) (mm ²)	Max. length of wires (m)
600/1	D2 = 120 L = 157 P = 34	D1 = 52 D3 = 82	5	0.75 min. 0.75 recommended 2.5 max.	20
2000/1	D2 = 150 L = 239 P = 34	D1 = 82 D3 = 162	5	0.75 min. 0.75 recommended 2.5 max.	20

Installation (cont.)

Mounting direction of sensors



The current sensors must be mounted on each of the phases supplying the load. They must be mounted in the direction shown in the figure opposite.



Installing sensors



The secondary terminals of the current sensors must be short-circuited as soon as they are installed by placing the strap X1 in the "MAINT" position on the CCTY card.

The strap X1 will remain in the "MAINT" position until the **MGE™ SineWave™** conditioner has been put into service - see adjacent diagrams.

Connection:

- Remove the CCTY card that is plugged into the TIFY card via the XR4 connector.
- Turn the CCTY card over to connect the secondary terminals of the current sensors to the screw terminals XR1, XR2 and XR3 of this card. Care must be taken to ensure that the phase order and polarity of the sensors are respected.
- Once the connections have been made, refit the CCTY card to the TIFY card.

For a 20 A, 30 A, 45 A or 60 A unit:

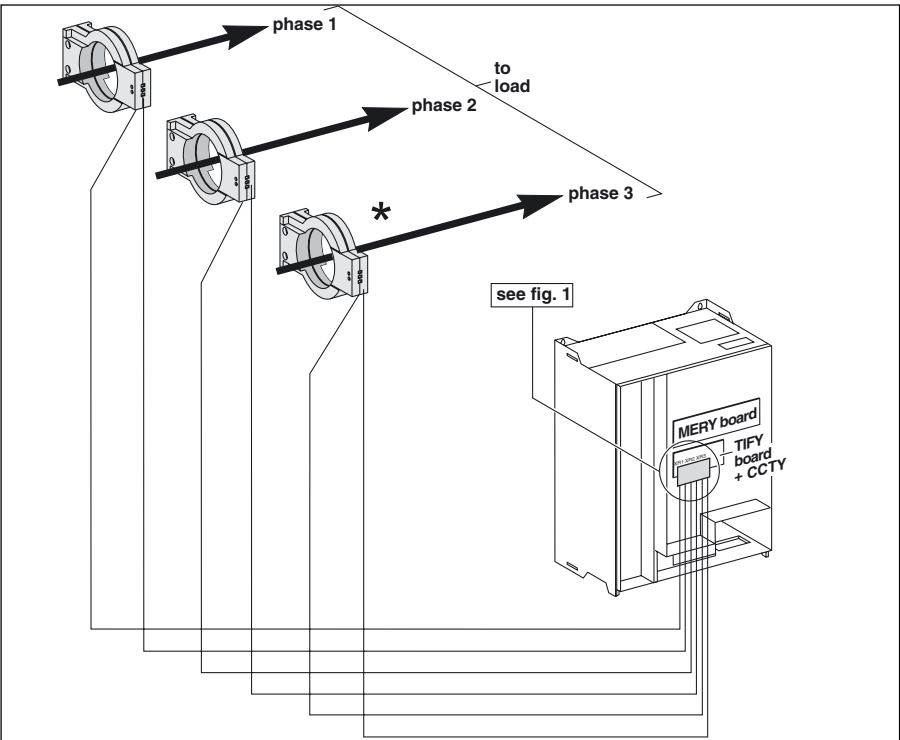
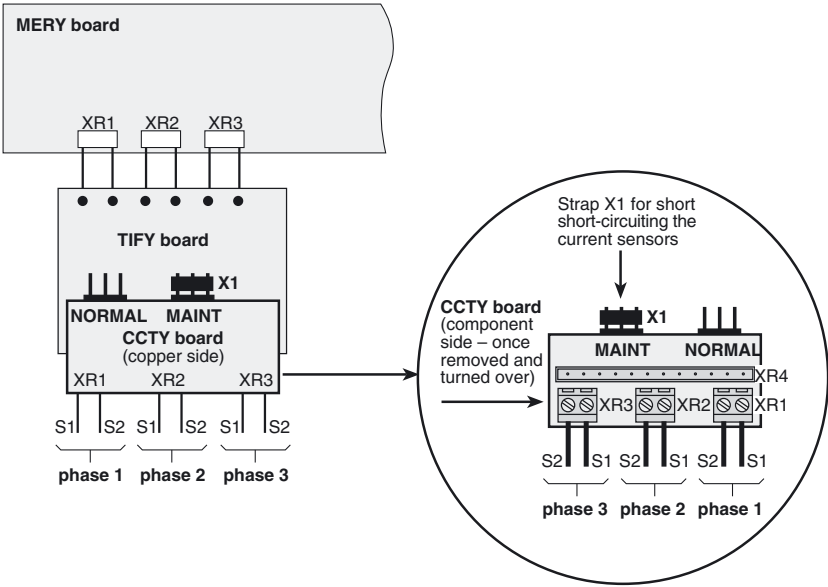


Fig. 1



* Captor used if neutral connected



The secondary terminals of the current sensors must be short-circuited as soon as they are installed by placing the strap X1 in the "MAINT" position on the CCTY card.

The strap X1 will remain in the "MAINT" position until the **MGE™ SineWave™** conditioner has been put into service - see adjacent diagrams.

Connection:

- ▶ Remove the CCTY card that is plugged into the TIFY card via the XR4 connector.
- ▶ Turn the CCTY card over to connect the secondary terminals of the current sensors to the screw terminals XR1, XR2 and XR3 of this card. Care must be taken to ensure that the phase order and polarity of the sensors are respected.
- ▶ Once the connections have been made, refit the CCTY card to the TIFY card.

For a 90 A or 120 A unit:

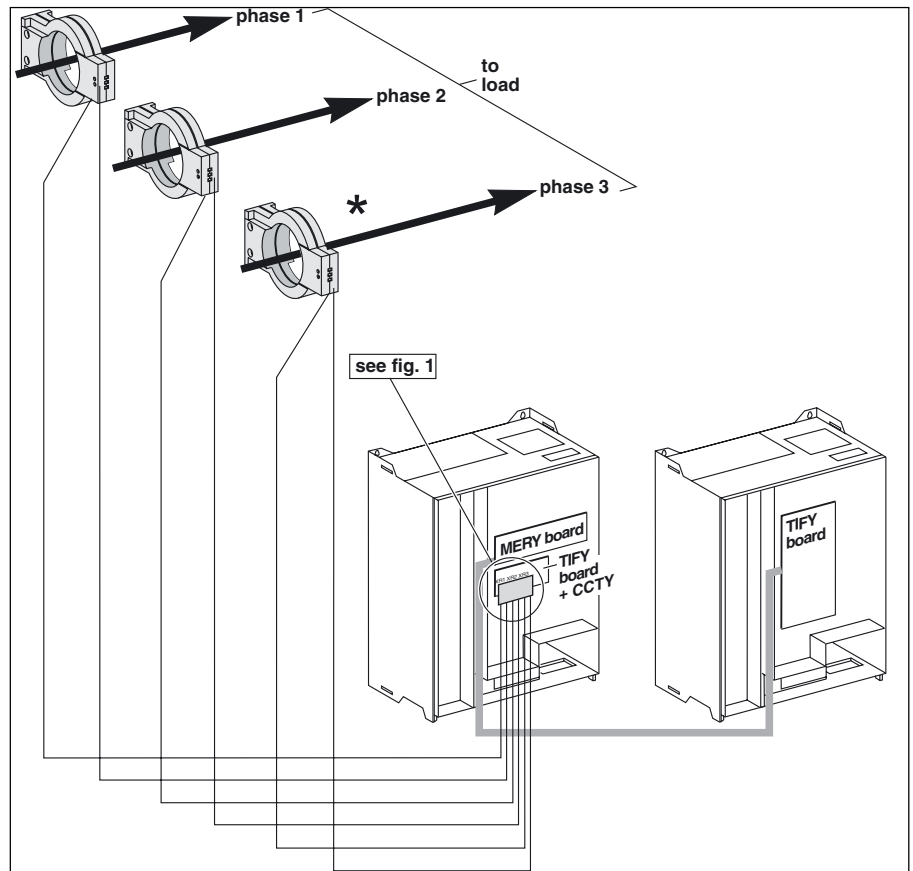
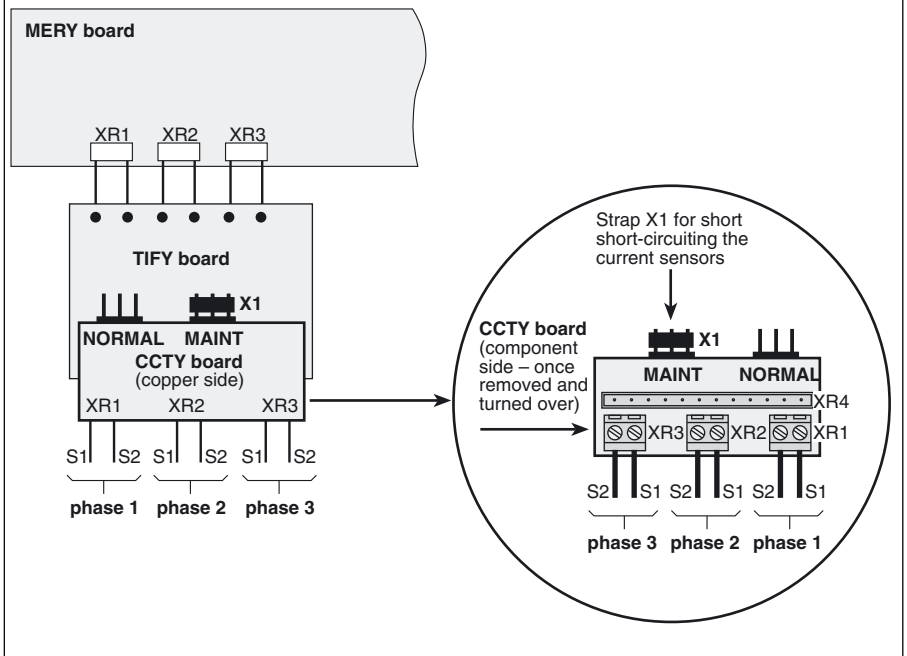


Fig. 1



* Captor used if neutral connected

Installation (cont.)



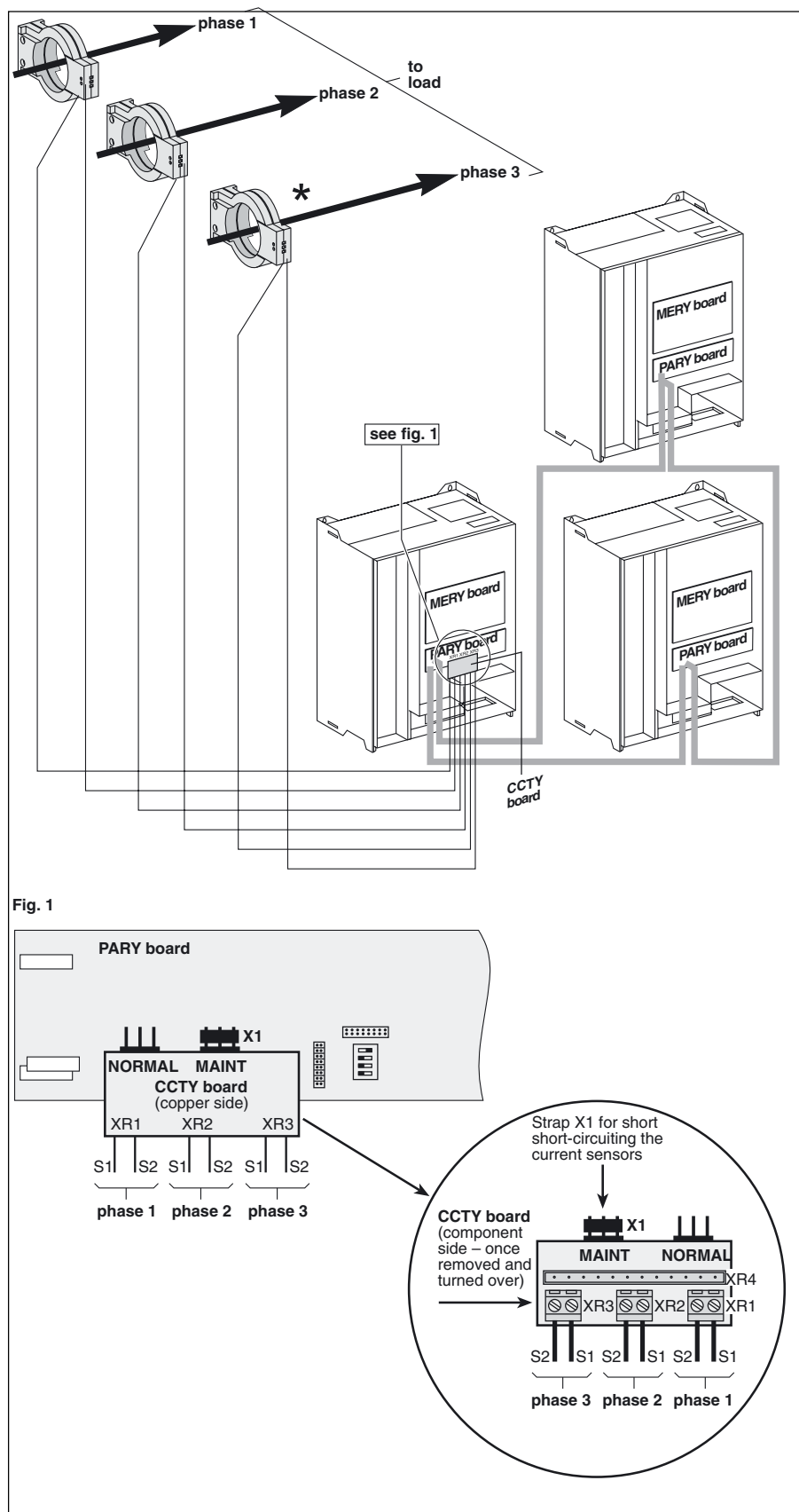
The secondary terminals of the current sensors must be short-circuited as soon as they are installed by placing the strap X1 in the "MAINT" position on the CCTY card.

The strap X1 will remain in the "MAINT" position until the **MGE™ SineWave™** conditioner has been put into service - see adjacent diagrams.

Connection:

- Remove the CCTY card that is plugged into the PARY card via the XR4 connector.
- Turn the CCTY card over to connect the secondary terminals of the current sensors to the screw terminals XR1, XR2 and XR3 of this card. Care must be taken to ensure that the phase order and polarity of the sensors are respected.
- Once the connections have been made, refit the CCTY card to the PARY card.
- the connection leads supplied with the conditioners will allow the **MGE™ SineWave™** conditioners to operate in parallel via loop communication.

For 90 A or 120 A parallel units:



* Captor used if neutral connected



The secondary terminals of the current sensors must be short-circuited as soon as they are installed by placing the strap X1 in the "MAINT" position on the CCTY card.

The strap X1 will remain in the "MAINT" position until the **MGE™ SineWave™** conditioner has been put into service - see adjacent diagrams.

Connection:

- ▶ Remove the CCTY card that is plugged into the PARY card via the XR4 connector.
- ▶ Turn the CCTY card over to connect the secondary terminals of the current sensors to the screw terminals XR1, XR2 and XR3 of this card. Care must be taken to ensure that the phase order and polarity of the sensors are respected.
- ▶ Once the connections have been made, refit the CCTY card to the PARY card.
- ▶ the connection leads supplied with the conditioners will allow the **MGE™ SineWave™** conditioners to operate in parallel via a loop communication;
- ▶ other leads supplied with the conditioners will ensure connections between the two cubicles which make up each 120 A.

For 90 A or 120 A parallel units:

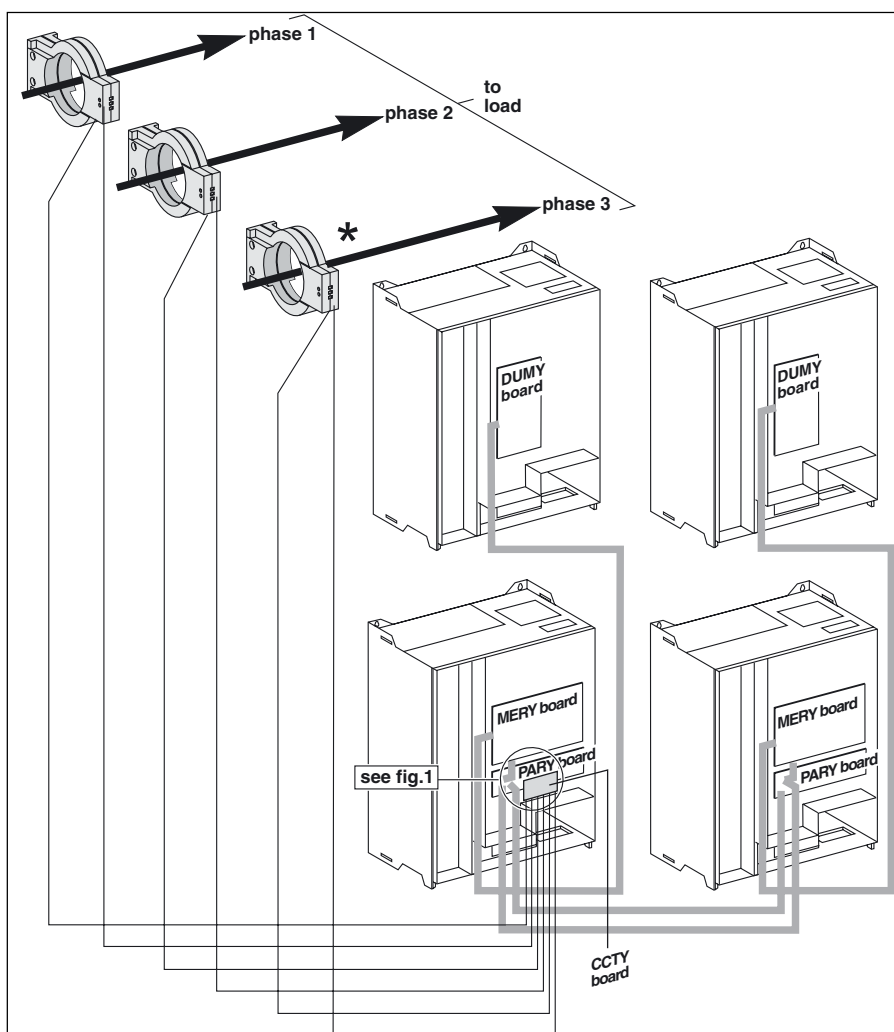
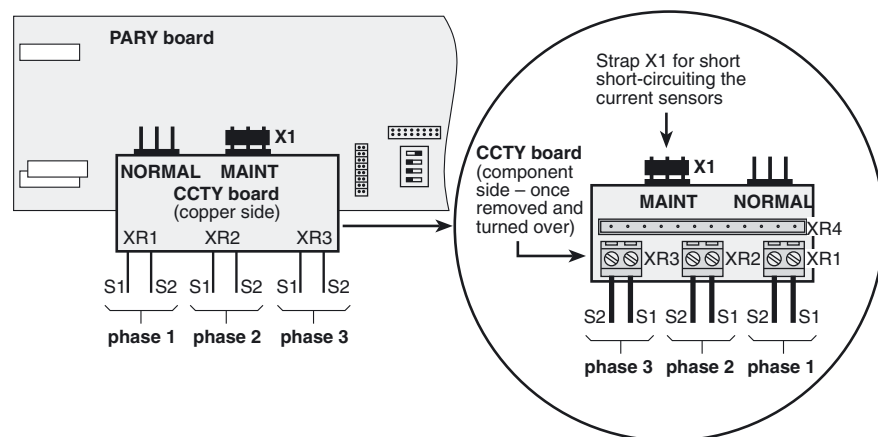


Fig. 1



* Captor used if neutral connected

Connecting sensors

Connection operations



The signal cables connecting the current sensors to the **MGE™ SineWave™** conditioner must be moved away from the power cables so that any disturbance is avoided.

Procedure:

- ▶ wiring is connected via the bottom, in front of the conditioner;
- ▶ the signal cables connections are made on 3 screw terminals.



The signal cables must be mechanically fixed near the terminals so that any mechanical stress on the conductors is avoided:

- ▶ put back the protection panels and close the door;
- ▶ close the **MGE™ SineWave™** conditioner protection circuit-breaker.

Energization and de-energization



The conditioner must be energized for the first time by qualified APC by Schneider Electric personnel who will carry out the necessary checks to make sure that operation of the installation is optimum.

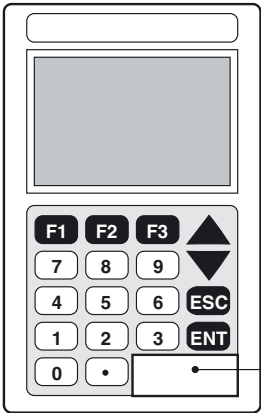
Important: to enable the **MGE™ SineWave™** conditioner to operate, remove the short-circuit from the current sensors' secondary windings by moving the strap X1 on the CCTY card from the "MAINT" position to the "NORMAL" position.

Energization

- ▶ close the conditioner supply circuit-breaker on your low voltage supply switchboard;
- ▶ the "conditioner stopped" red indicator lamp lights up;
- ▶ the terminal screen lights up;
- ▶ after several seconds, the general menu is displayed on the terminal screen.

General

- ▶ if the load harmonic current is higher than the **MGE™ SineWave™**'s capacity to eliminate harmonics, the orange indicator lamp will flash, whether the conditioner is running or stopped;
- ▶ to access the RUN and STOP keys, remove the protection cover located at the bottom of the terminal;
- ▶ **MGE™ SineWave™** starting and stopping can be controlled manually using the terminal keyboard or via the communication link;
- ▶ if **MGE™ SineWave™** conditioners are connected in parallel, each conditioner can be started or stopped independently of the others.



protection cover

Starting the MGE™ SineWave™ conditioner

- ▶ Press the RUN key on the terminal to start the **MGE™ SineWave™** conditioner and then confirm the command displayed on the terminal by pressing the ENT key.
- ▶ the **MGE™ SineWave™** conditioner starts and is then operational. The red indicator lamp goes off and the green lamp lights up.



The **MGE™ SineWave™** conditioner will be automatically restarted when energized following disappearance of the utility voltage during operation of the **MGE™ SineWave™** conditioner. If it is not energized following the disappearance of the utility voltage, the **MGE™ SineWave™** conditioner will remain stopped.

Stopping the MGE™ SineWave™ conditioner

- ▶ to stop the **MGE™ SineWave™** conditioner manually, press the STOP key and confirm the displayed command by pressing the ENT key on the terminal;
- ▶ the **MGE™ SineWave™** conditioner stops and no longer carries out compensation. The green indicator lamp goes off and the red indicator lamp lights up.

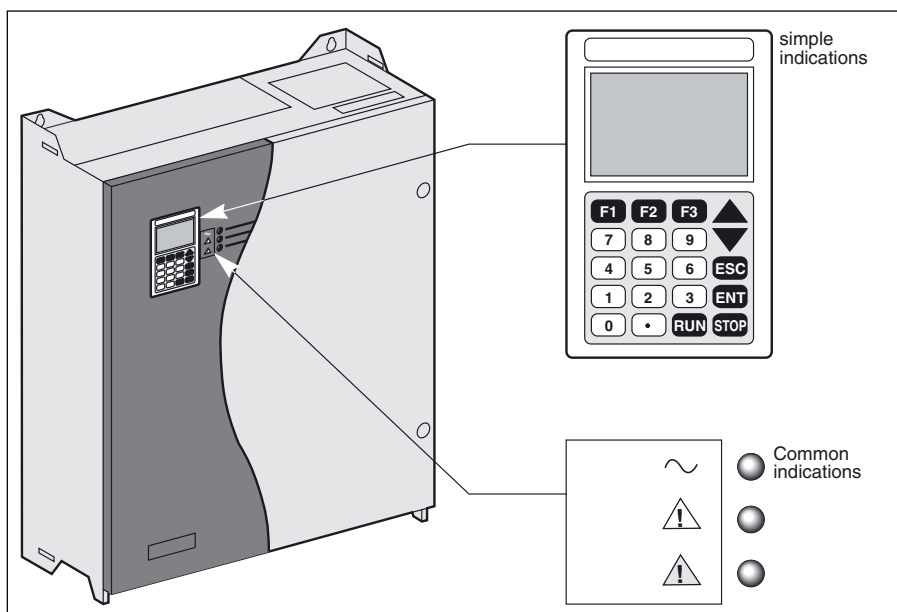
De-energization

The **MGE™ SineWave™** conditioner can be de-energized whatever its state: running or stopped.

Signification of indicator lamps

The conditioner's operating state is given by common indications

User interface



User-friendly interface

These clearly indicate:

► normal operation: green indicator lamp lit.

The **MGE™ SineWave™** conditioner is eliminating harmonics on the utility power. This is its normal operating state;

► conditioner stopped: red indicator lamp lit.

The conditioner has stopped following a manual STOP command or an operating anomaly. Consult the user interface to know what the fault is due to and what action to undertake in order to correct the anomaly;

► current-limiting operation: green indicator lamp lit and orange indicator lamp flashing.

The harmonic RMS current absorbed by the load exceeds the

MGE™ SineWave™ nominal current.

The conditioner thus operates in current-limiting mode:

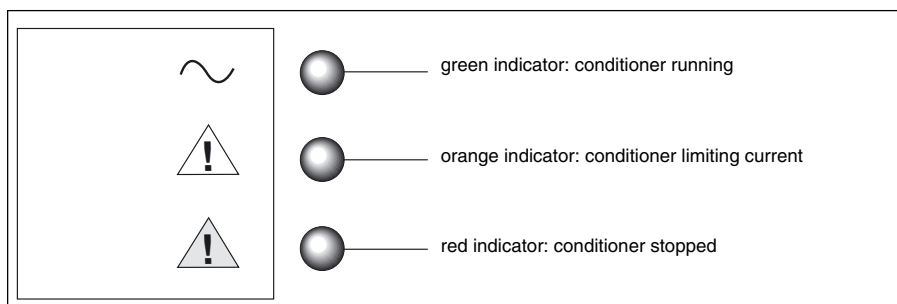
▷ the conditioner limits its compensating current to its nominal current rating (e.g. 30 A RMS for a 30 A

MGE™ SineWave™ conditioner),

▷ the load is not entirely compensated,

▷ the harmonic current difference (load harmonic I - compensating I) remains on the utility power,

▷ consult the chapter on "what to do in case of an alarm".



Operation (cont.)

Control and monitoring interface

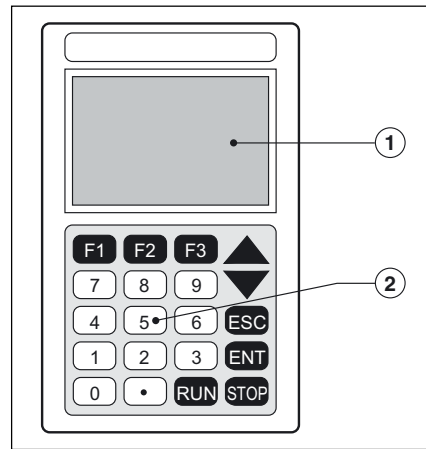
Presentation

The **MGE™ SineWave™** active harmonics conditioner has a highly user-friendly graphic terminal on the front panel which makes the product easy to use. This terminal may optionally be moved to the front panel of a switch board from the conditioner using a separate supply cable.

This terminal allows:

- ▶ the language of the displayed messages to be chosen from a selection of 7 languages;
- ▶ the conditioner identification and operating parameters to be clearly displayed;
- ▶ the **MGE™ SineWave™** configuration to be modified to better meet specific applications;
- ▶ conditioner operation to be controlled.

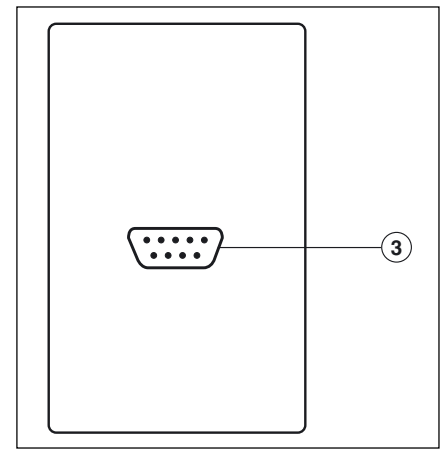
Front view of terminal



① Liquid crystal graphic display with back lighting (128 x 64 points, i.e. 6 lines of 21 characters) allowing information to be displayed.

② 20-key keyboard
– 1 - ENT key (enter)
– 1 - ESC key (escape)
– 2 - ▲ and ▼ keys
– 11 - number keys: 0 to 9 and decimal point
– 3 - function keys: F1, F2, F3
– 2 - command keys: RUN and STOP protected by a removable protective cover.

Back view of terminal



③ 9 point SUB-D connector for connecting the terminal to the **MGE™ SineWave™** conditioner.

Use

▶ ENT key:

- ▷ move to following menu,
- ▷ confirmation of a choice;

▶ ESC key:

- ▷ return to previous menu,
- ▷ cancellation of parameter setting in process and return to original values;

▶ ▲ and ▼ keys:

- ▷ scrolling and selection from menu
- ▷ choice of parameter,

▷ setting of value (use in + or -)

▶ number keys from 0 to 9 and decimal point

- ▷ entering of passwords,
- ▷ entering of numerical values;

▶ function keys F1, F2, F3:

- ▷ F1 provides access to the help menu,
- ▷ the functions of F2 and F3 depend on the menu displayed;

▶ RUN and STOP keys

- ▷ RUN: conditioner local RUN command,
- ▷ STOP: conditioner local STOP command.

General menu

A menu is a screen offering a list of options and possible choices.

▶ to select something from the menu:

- ▷ use the ▲ and ▼ keys to choose the required option,
- ▷ press ENT to confirm the chosen option.

When a menu offers more than 4 options, the presence of the ▼ symbol at the bottom of the screen indicates that the menu continues onto another screen.

The ▲ arrow is used to move back up the menu.

The main menu is automatically displayed when the equipment is energized. It can also be accessed from a sub-menu by pressing ESC several times.

MAIN MENU
Language / langue
Principle measurements
Secondary measurements
Alarms
▲ ▼
Configuration
JBUS communication
Identification
Reserved access

The main menu offers:
Language:
available languages displayed.

Principle measurements:
I r.m.s., load and network THDI, network voltage and **MGE™ SineWave™** load rate displayed.

Secondary measurements:
detailed load and network current spectrum displayed.

Alarms:
alarms and level 1 diagnosis displayed, faults acknowledged.

Configuration:
operating parameters modified.

JBUS communication:
communication port parameters modified.

Identification:
main conditioner characteristics and software versions displayed.

Reserved access:
access to APC by Schneider Electric personnel only.

Choice of language



Press ESC several times if necessary to display the main menu.

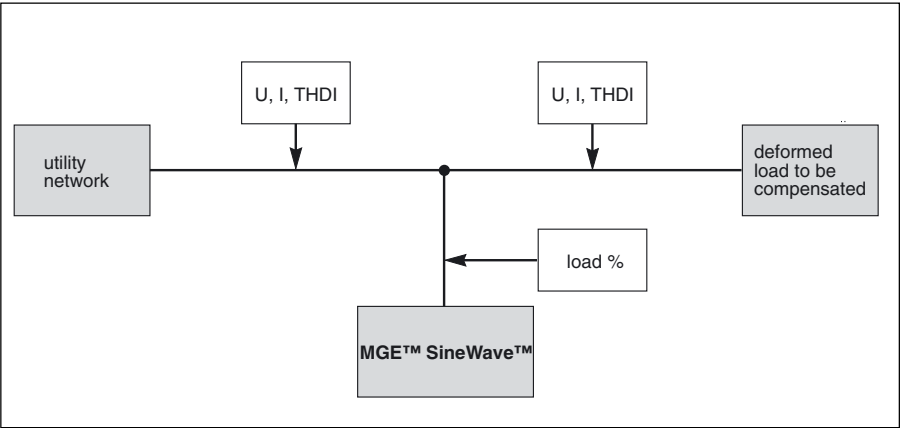
MAIN MENU
Language / langue
Principle measurements
Secondary measurements
Alarms
▲ ▼
Configuration
JBUS communication
Identification
Reserved access

CHOICE OF LANGUAGE
French
Deutsch
English
Español
▲ ▼
Nederlands
Italiano
US English

- ① Choose the **Language** option using the ▲ and ▼ keys. The choice must be displayed in reverse video.
- ② Confirm the **language** option by pressing ENT.
- ③ Choose the language using the ▲ and ▼ keys and confirm via ENT

Displaying main measurements

Locating measurement points



Operation (cont.)

Locating measurement points
Using the main menu:

Press ESC several times if necessary to display the general menu:

MAIN MENU	
Language / langue	
Principle measurements	
Secondary measurements	
Alarms	
▲ ▼	
Configuration	
JBUS communication	
Identification	
Reserved access	

- 1 Choose the **Principle measurements** option using the ▲ and ▼ keys. The choice must be displayed in reverse video.
- 2 Confirm the **Principle measurements** option by pressing the ENT key.

MAINS	LOAD
I1 = xxxA	I1 = xxxA
I2 = xxxA	I2 = xxxA
I3 = xxxA	I3 = xxxA
IN = xxxA	IN = xxxA
▲ ▼	

I1, I2, I3, IN = actual root mean square values in amps of the 3 phases and neutral of the:
► current supplied by the utility power;
► current absorbed by the non-linear load.

- 3 Press the ▲ and ▼ keys to run over the main measurement screens: circular loop display.

MAINS	LOAD
THDI1=xx%	THDI1=xx%
THDI2=xx%	THDI2=xx%
THDI3=xx%	THDI3=xx%
Umains=xxxV	
▲ ▼	

THDI1, THDI2, THDI3 = distortion rates of the 3 phases (THDI = I-harmonic/I-basic) of the:
► current supplied by the utility power;
► current absorbed by the non-linear load.
Umains = average value of the 3 utility network phase-to-phase voltages.

LOAD LEVEL SINEWAVE
I1 / In = xxx%
I2 / In = xxx%
I3 / In = xxx%
<div><div></div><div></div></div>

I1/In, I2/In, I3/In = MGE™ SineWave™ active conditioner load rates on each of the phases.
I1 = root mean square current supplied by the conditioner on phase 1,
In = nominal root mean square current.

The current measurements in the neutral are not displayed in the case of a utility power without distributed neutral.

Insignificant measurements are replaced by * characters on the terminal screen and measurements where the capacity is exceeded are displayed with # characters on the terminal screen.

Displaying secondary measurements

MAIN MENU	
Language / langue	
Principle measurements	
Secondary measurements	
Alarms	
▲ ▼	
Configuration	
JBUS communication	
Identification	
Reserved access	

- 1 Choose the **Secondary measurements** option using the ▲ and ▼ keys.
- 2 Confirm the **Secondary measurements** option by pressing the ENT key.

I1 LOAD SPECTRUM	
H1 = xx%	H9 = XX%
H3 = xx%	H11 = xx%
H5 = xx%	H<50 = xx%
H7 = xx%	THDI = xx%
I2	I3
▲ ▼	

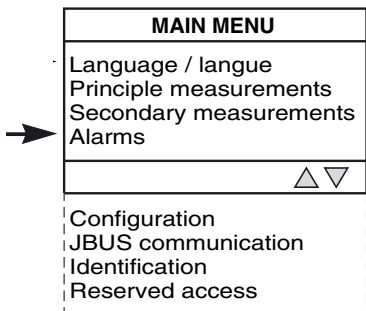
H1, H3 - H11 = detailed spectrum of first 11 harmonic orders.
THDI = total harmonic distortion rate of the current absorbed by the load.

- 3 Press ▲ and ▼ arrows to display the detailed spectrum of the current supplied by the utility power.

I1 MAINS SPECTRUM	
H1 = xx%	H9 = XX%
H3 = xx%	H11 = xx%
H5 = xx%	H<50 = xx%
H7 = xx%	THDI = xx%
I2	I3
▲ ▼	

- H1, H3 - H11 = detailed spectrum of first 11 harmonic orders.
THDI = total harmonic distortion rate of the current supplied by the utility power.
- 4 Press the function keys F2 and F3 to display phase 2 and phase 3 currents.

Displaying alarms



- ① Choose the **Alarms** option using the ▲ and ▼ keys. The choice must be displayed on the screen in reverse video.
- ② Confirm the **Alarms** option by pressing the ENT key.

The following screen is displayed during normal operation: conditioner running and no anomaly present.

ALARMS
No Alarm SineWave Keeps your electrical AC network clean
▲ ▼

In the event of an operating anomaly, the following screen is displayed with the active alarms only.

ALARMS
Start-up inhibited MERY PC board fault 1 Internal fault Voltage out of tol.
? Diag. Reset ▲ ▼
Frequency out of tol. MERY PC board fault 2 Phase rotation WRONG Internal overtemp Harm current >Inom Conditioner OFF

The ▲ and ▼ keys allow 2 pages of faults to be displayed. The F2 "Diag" key provides access to the level 1 diagnosis and the F3 "Reset" key allows memorised faults to be acknowledged.

List of alarms displayed:

MERY PC board fault 1: the main control and monitoring board is faulty. The board must be replaced by the APC by Schneider Electric after-sales service.

Internal fault: this message informs the user of an internal conditioner fault which requires intervention by the APC by Schneider Electric after-sales service.

Voltage out of tol.: the amplitude of the utility network voltage is out of the permitted limits. Check the presence and amplitude of the utility power 3 phases and neutral. The voltage tolerances permitted are defined in the section on "characteristics and

performances".

Frequency out of tol.: the utility power frequency is out of the permitted limits. Check the utility power frequency. The frequency tolerances permitted are defined in the section on "characteristics and performances".


MERY PC board fault 2: the main control and monitoring board is faulty. The board must be replaced by the APC by Schneider Electric after-sales service.

Internal overtemp: the conditioner has been stopped by the thermal protection thus avoiding damage to the equipment. Check that the 3 ventilators are operating correctly, that the air vents are clean and check the temperature of the room. The temperature tolerances permitted are

defined in the paragraph on "characteristics and performances".
Harm current > I nom: the harmonic root mean square current absorbed by the load exceeds the **MGE™ SineWave™** conditioner nominal current making it operate in current-limiting mode.
▶ the conditioner limits its compensating current to its nominal current rating (e.g. 30 A root mean square for a 30 A **MGE™ SineWave™** conditioner);
▶ the load is not entirely compensated;
▶ the harmonic current difference (load harmonic I - compensating I) remains on the utility power;
▶ problems may occur in your installation depending on the rate of harmonics remaining on the utility power;
▶ consult the APC by Schneider Electric after-sales service.

Operation (cont.)

Configuring


 The configuration of the conditioner carried out in the factory will be checked when the conditioner is first energized, and must not be further modified. Only qualified APC by Schneider Electric personnel are allowed access.

MAIN MENU	
Language / langue	
Principle measurements	
Secondary measurements	
Alarms	
▲ ▼	
Configuration	
JBUS communication	
Identification	
Reserved access	

- ① Choose the **Configuration** option using the ▲ and ▼ keys.
- ② Confirm the **Configuration** option by pressing the ENT key.

CONFIGURATION	
Enter password: * * * *	
▲ ▼	

- ③ Enter the password (4 characters) then press ENT.

 The password characters are displayed by an "*".

CONFIGURATION MENU	
Current sensor 1000/1	
Neutral connected	
ON/OFF JBUS validated	
Reactive compensated	
? Mem ▲ ▼	
Harmonics choice	
Application: 0005	
Nb of // units: 2	
Mains voltage: 400 V	
Derating %: 10	
Sensor connected	
Startup delay/s: 20	

- ④ Choose the parameter to be modified using the ▲ and ▼ keys and press ENT.

For example, modification of the rating of the sensors used to measure load currents.

SENSOR SIZE CHOICE	
Current sensor 300/1	
Current sensor 500/1	
Current sensor 600/1	
Current sensor 1000/1	
▲ ▼	
Current sensor 1500/1	
Current sensor 2000/1	
Current sensor 3000/1	
Current sensor 4000/1	
Current sensor 5000/1	
Current sensor 6000/1	

- ⑤ Choose the sensor rating using the arrows and press ENT.

The Configuration Menu screen is again displayed for modification of other parameters if required

CONFIGURATION MENU	
Current sensor 1000/1	
Neutral connected	
ON/OFF JBUS validated	
Reactive compensated	
? Mem ▲ ▼	
Harmonics choice	
Application: 0005	
Nb of // units: 2	
Mains voltage: 400 V	
Derating %: 10	
Sensor connected	
Startup delay/s: 20	

- ⑥ Press F2 "Mem" key to memorise the new parameters.

COMPENSATION CHOICE	
Inductive reactive	
Capacitive reactive	
Ind. & Cap. reactive	
Reactive uncompensa.	
▲ ▼	
F1 F2 F3 ↑	

The screen opposite is displayed after pressing F2 to confirm memorisation of the new parameters

MEMORIZATION	
Confirmation: ENT	
Escape: ESC	
WARNING: Memorization = STOP of SineWave	
▲ ▼	

- ⑦ Confirm memorization by pressing ENT or cancel modifications in progress by pressing ESC.

MEMORIZATION	
Memorization in progress	
▲ ▼	

This screen is displayed while the parameters are being saved, wait a few seconds for the general menu to be displayed before starting the **MGE™ SineWave™** up again.

Configuration parameter lists

Sensor rating: choose the rating of the sensors used to measure the load currents.

Type of utility power: utility power with or without distributed neutral.

RUN/STOP authorisation via JBUS communication port: authorisation or non authorisation of remote RUN and STOP commands via the JBUS communication port.

Reactive compensation or no reactive compensation: compensation or no compensation of the reactive energy. Reactive energy compensation is carried out to the detriment of harmonic compensation and it is therefore necessary to oversize the conditioner if it is required to compensate both reactive energy and harmonics.

Choice of compensated harmonic orders: if this option is selected, the harmonic orders to be compensated, in order to optimise conditioner performance, can be chosen.

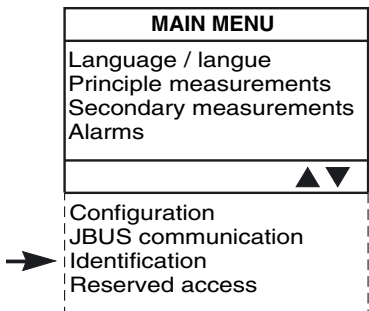
Choice of application type: the choice of application type is a parameter which is set in the factory. It is defined in relation to the customer's installation configuration.

Number of parallel-connected devices.
Utility power voltage: load supply voltage
Derating: depending on altitude.

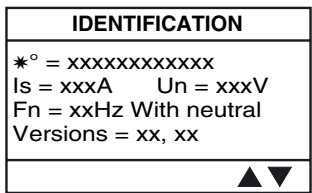
J-BUS communication

Parameter setting of the communication port is described in the specific J-BUS communication port manual.

Identification



- ① Choose the **Identification** option using the ▲ and ▼ keys.
- ② Confirm the **Identification** option by pressing the ENT key.

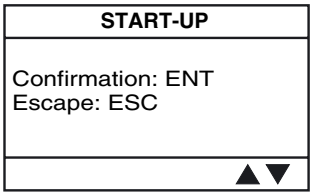


This screen displays the device serial number, the nominal current in amps, the nominal voltage in volts, the nominal frequency in Hz, the type of network (with or without distributed neutral) and the software versions built into the control and monitoring board.

- ③ Press ESC to return to the general menu.

RUN - STOP commands

- ① Press RUN to start the device or STOP to stop the device.



This screen allows the command to be confirmed by pressing ENT or cancelled by pressing ESC.

Reserved access

This command provides access to the centre of the system and is for APC by Schneider Electric personnel

only so that they may carry out a detailed survey of the conditioner's internal operation.

Maintenance

Maintenance



Before any intervention:
► in the MGE™ SineWave™ conditioner: switch off the power supply and wait for the capacitors to discharge (5 min.);
► on the current sensor connection: short-circuit the sensor secondaries.

The MGE™ SineWave™ harmonics conditioner does not require any preventive maintenance.
It is nevertheless advisable to carry out the following at regular intervals:
► clean the air vents and check that ventilation is efficient;

► check the state and tightness of connections;
► make sure that the temperature of the air at the MGE™ SineWave™ conditioner inlet is below 40 degrees.

What to do in case of an alarm

Symptoms	Corrective actions
Terminal and indicator lamps off	check the voltage at the MGE™ SineWave™ conditioner input. The voltage tolerances permitted are defined in the section on "characteristics and performances".
Terminal OFF	check that the graphic terminal is plugged in.
MERY PC board fault 1	ask the APC by Schneider Electric after-sales service to intervene.
MERY PC board fault 2	ask the APC by Schneider Electric after-sales service to intervene.
Internal fault	ask the APC by Schneider Electric after-sales service to intervene.
Voltage out of tol.	check the voltage at the conditioner inlet. The voltage tolerances permitted are defined in the section on "characteristics and performances".
Frequency out of tol.	check the frequency at the conditioner inlet. The voltage tolerances permitted are defined in the section on "characteristics and performances".
Internal overtemp	check ventilator operation, the temperature inside the room and the cleanliness of the air vents. The temperature tolerances permitted are defined in the section on "characteristics and performances".
Orange indicator lamp flashing	the conditioner is limiting current because the installation's compensation need is higher than the current that the conditioner can supply. The conditioner automatically protects itself. Compensation is not total.

Training centers

To allow you to use APC by Schneider Electric products effectively and carry out basic maintenance, we offer a complete range of technical training courses in English and French.

Training centers Schneider Critical Power & cooling services 50 Hz :

France Training Centre
140, Avenue Jean Kuntzmann
Innovallée
38334 - St Ismier Cedex
France

Tel: +33 (0)4 76 18 34 14
Fax: +33 (0)4 76 18 45 21

Singapore Training Centre
10 Ang MO Kio Street 65, #03-06/10
Techpoint Building
Singapore 569059
Singapore

Tel: +65 6389 6792

China Training Centre
No. 999, Shen Fu Road
Min Hang District
Shanghai 201108
P.R. China

Tel: +86 21 3407 3365
Fax: +86 21 3407 4526

Internet : [Http://powerlearning.apc.com](http://powerlearning.apc.com)
On-line catalogue and registration.

Training center Schneider Critical Power & cooling services 50-60 Hz :

United States Training Centre
132 Fairgrounds Road
West Kingston - RI02892
U.S.A

Tel: +1 877 800 4272

Characteristics and performances

Technical reference base: active conditioner characteristics (07/03/97 version)

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

Network input	▮ nominal voltage	D 400 V -20% + 15%	
	▮ nominal frequency	D 50 Hz, 60 Hz +/- 4 Hz	
	▮ number of phases	D 3 phases with or without distributed neutral, operation possible on single-phase or unbalanced loads.	
Functions	▮ harmonic compensation	D global or order by order	
	▮ power factor compensation		
	▮ cosine Φ compensation	D possible to set parameters	
Operating mode	▮ single		
	▮ connected in parallel	D up to 4	
Technical characteristics	▮ compensation capacity per phase	D 20 A r.m.s.	D 30 A r.m.s.
		D 45 A r.m.s.	D 60 A r.m.s.
		D 90 A r.m.s.	D 120 A r.m.s.
		note: the compensation capacity decreases with the frequency of the harmonic orders to be compensated.	
	▮ compensation capacity in neutral conductor	D 60 A r.m.s.	D 90 A r.m.s.
		D 135 A r.m.s.	D 180 A r.m.s.
		D 270 A r.m.s.	D 360 A r.m.s.
	▮ compensated harmonic orders	D H2 to H50 (parameter setting possible) D global or selective compensation	
	▮ dynamic capacity in di/dt:	D > 100 kA/s for 20 A and 30 A	
		D > 200 kA/s for 45 A and 60 A	
		D > 400 kA/s for 90 A and 120 A	
	▮ response time	D 40 ms	
	▮ reduction rate	D load THDI /network THDI > = 10 at the conditioner nominal current if	
		D load THDI > 40%;	
		D network THDI > 4% at the conditioner nominal current if load THDI < 40% Global compensation reduction rate THDI = I_harmonic/I-basic.	
	▮ overload	D limiting to nominal current continuous limiting operation possible.	
▮ inrush current	D < nominal current without matching transformer		
▮ losses	D < 1000 W at 20 A < 1200 W at 30 A		
	D < 1900 W at 45 A < 2400 W at 60 A		
	D < 3800 W at 90 A < 4800 W at 120 A		
▮ ventilation	D forced air (inlet via bottom and outlet via top)		
	D 1000 m³/h for 20 to 60 A ratings,		
	D 2000 m³/h for 90 to 120 A ratings.		
▮ acoustic noise according to ISO 3746	D < 58 dBA at 20 A	D < 59 dBA at 30 A	
	D < 62 dBA at 45 A	D < 64 dBA at 60 A	
	D < 65 dBA at 90 A	D < 67 dBA at 120 A	
	At the nominal current on computer load according to ISO 3746.		
Environmental conditions	▮ ambient temperature	D 0 a 40°C permanently	
	▮ rate or relative humidity	0 to 95 % relative humidity without condensation.	
	▮ operating altitude	D < 1000 m without derating, above this derating of 10% per additional 1000 m.	

Characteristics and performances (cont.)

Configuration	▶ language	▷ French, English, German, Italian, Spanish, Dutch, American
	▶ type of utility power	▷ with or without Neutral
	▶ sensor ratings	▷ closed sensors: 300/1, 500/1, 1000/1, 1500/1, 2000/1, 3000/1, 4000/1, 5000/1, 6000/1 ▷ opening sensor: 600/1, 2000/1
	▶ reactive compensation	▷ Inductive Reactive ▷ Capacitive Reactive ▷ Inductive & Capacitive Reactive ▷ No Reactive compensation
	▶ remote RUN/STOP confirmation	▷ YES or NO
	▶ choice or compensated orders	▷ Hn = YES or NO
	▶ communication parameters	▷ speed, format, parity, nb stop bits, address
	▶ type of application	▷ 0 to 5
	▶ number of parallel conditioners	▷ 1 to 4
	▶ derating In relation to altitude	▷ 0 to 100%
	▶ utility power voltages	▷ 208 V, 220 V, 240 V, 400 V, 460 V, 500 V, 575 V, 700 V
	▶ automatic startup delay	▷ 0 to 9000 seconds
Display	▶ front panel	▷ green led = normal operation ▷ red led = conditioner OFF ▷ orange led = inverter in limitation
	▶ display	▷ display of measurements and alarms ▷ implementation guide, diagnosis ▷ entry of customer parameters
Commands	▶ front panel keypad	▷ conditioner RUN push-button ▷ conditioner STOP push-button
Remote transfers	▶ 3 voltage-free changeover dry contacts	▷ 2 x conditioner running/stopped ▷ 1 x limiting operation
Dimensions and weight	▶ height (overall)	▷ 680 mm - 20 A, 30 A ▷ 780 mm - 45 A, 60 A ▷ 2 x 780 mm + 250 mm - 90 A, 120 A
	▶ unit height	▷ 620 mm - 20 A, 30 A ▷ 720 mm - 45 A, 60 A ▷ 2 x 720 mm + 250 mm - 90 A, 120 A
	▶ width	▷ 540 mm - 20 A, 30 A ▷ 590 mm - 45 A, 60 A ▷ 590 mm - 90 A, 120 A
	▶ depth	▷ 280 mm - 20 A, 30 A ▷ 325 mm - 45 A, 60 A ▷ 325 mm - 90 A, 120 A
	▶ weight	▷ 65 kg - 20 A, 30 A ▷ 110 kg - 45 A, 60 A ▷ 220 kg - 90 A, 120 A
colour	▶ standard	RAL 9002 (light grey)
reference standards	▶ safety construction	EN 60950-1
	▶ design	IEC 60146
	▶ protection	IEC 60529, NFEN 60529, IP205
electromagnetic compatibility	▶ conducted and radiated emissions	EN 55011 level A
	▶ testing and measuring techniques	IEC 61000-4-1
	▶ testing immunity to electrostatic discharges	IEC 61000-4-2 level 3
	▶ testing immunity to radiated fields	IEC 61000-4-3 level 3 (10 V/m)
	▶ testing immunity to fast transients voltage bursts	IEC 61000-4-4 level 4
	▶ testing immunity to surge voltage	IEC 61000-4-5 level 3 in differential mode level 4 in common mode
	▶ testing immunity to conducted disturbances induced by electrical radio fields	IEC 61000-4-6 level 3 (10 V)

