Transfer Panel ATI

Instruction Manual

FG WILSON

ATI100

ATI series
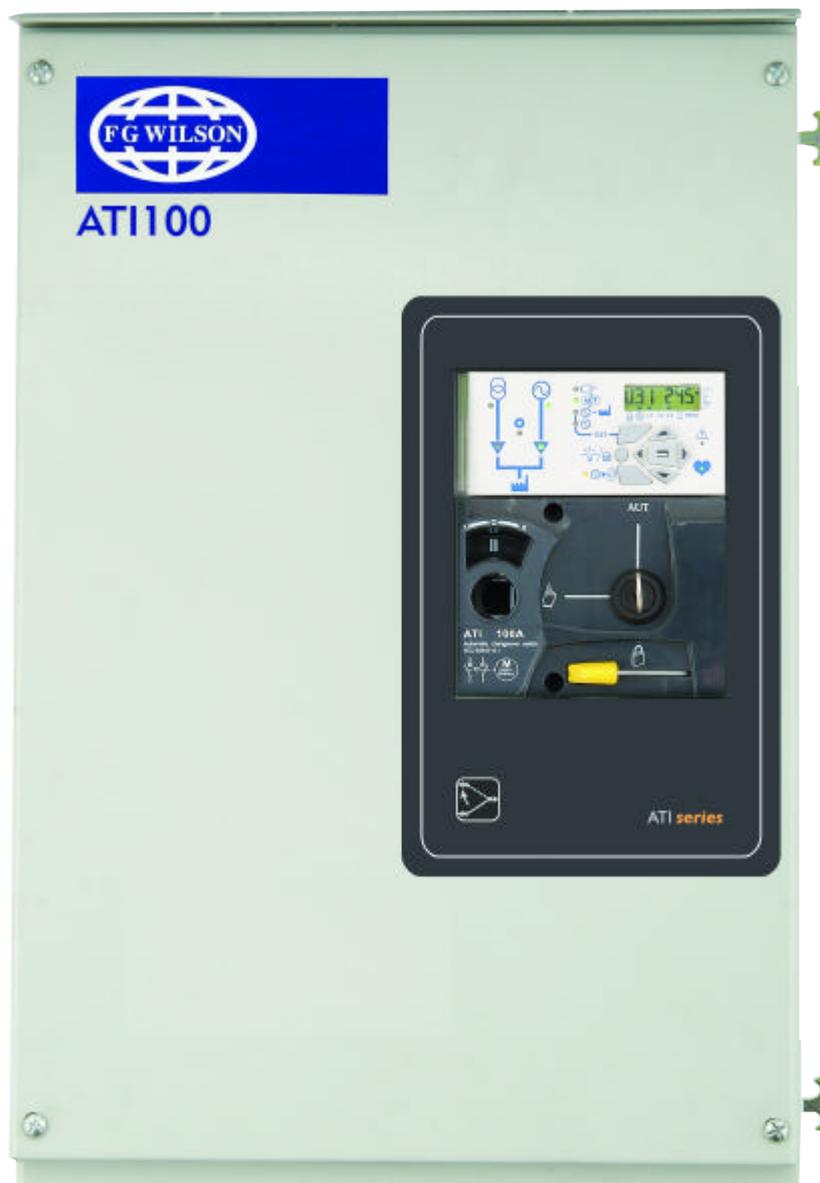
GENERAL SAFETY INSTRUCTIONS

a. This leaflet provides indispensable instructions in termes of the safety, the connection and the operation of the automatic transfer switch.

b. This system must exclusively be installed by specialised, qualified personnel.

c. Before making the connections, it is essential that the earth cable be connected.

d. Keep the cabinet clean using a dry cloth.

e. It is recommended that this leaflet be kept in a place easily accessible to all those who may need it.

f. The maintenance operations must be carried out exclusively by authorised and appropriately trained personnel.

g. This system complies with the community directives applicable to this product. Thus, it bears the CE mark.

ϵ

h. Compliance with IEC 60947-6-1.

i. Information available in this instruction manual are not contractual.

INTRODUCTION

NEW ATI enclosure integrates a new 4-pole changeover switch including electronic's control to meet standard IEC 60947-6-1. Thanks to the changeover switch technology, it is always possible to manually operate the system to guarantee the changeover panel operation in any situation.

The new enclosure design allows switch front panel access to:
• Avoid opening of the enclosure for manual operation
• Allow electronic module access for programming and monitoring

• Simplify connections between the mechanical switch and the electronic module.

With the mode switch in manual position, Padlocking, as well as handle insertion operations are then directly accessible from the front panel.

The electronic module, also accessible from. the front panel, includes:
• Sources monitoring
• Metering display (V and f as standard)
• Test operations and Sequences programming using keypad.

ATI TRANSFER PANEL RANGE

The new ATI panel range will be available from 63 A to 1600 A.

New ATI range models
MODEL
• 63 A	• 630 A
• 100 A	• 800 A
• 125 A	• 1000 A
• 250 A	• 1250 A
• 400 A	• 1600 A

Standard offer includes Bottom cable entry. Top cable entry is offered as an option.

NEW MOTORISED CHANGEOVER SWITCH

The new switch included in the enclosure is made of 3 different parts:

1. A mechanical switch.
2. A motorised block to operate the switch electrically.
3. An electronic module on the top of the motorised block, driving loss of mains and main's return sequence.
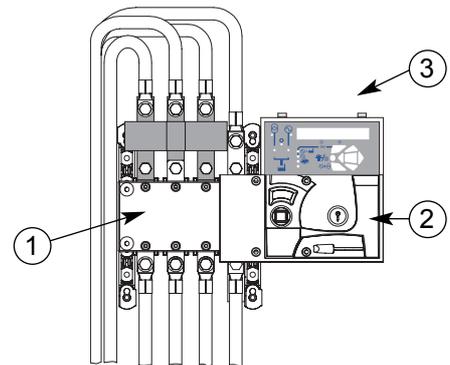
Features and benefits:
• The new Motorisation block is included in a moulded case
• It is possible to remove the motorized block and the electronic module without being obliged to disconnect the power cables
• Manual operation directly acts on the shaft of the mechanical switch for better reliability
• The complete enclosure meets standard IEC 60947-6-1 (ATS applications)
• The enclosure is self-powered (from. Main and Gen sources). There is no need for an external power source to allow automatic sequence after loss of power

• All thresholds and timers can be set using the display and the keypad, or via modbus (optional)
• The standard product integrates voltage and frequency control for better diagnostic
• Main sensing circuit is 3 phases and Gen sensing circuit is single phase
• Standard product includes, phase to phase + phase to neutral voltage measurement and displays system frequency (phase 1) and switch number of operations.

INTRODUCTION (continued)

Option 9
Top Cable Entry

Option 8
Communication

Option 7
2In / 2Out

Option 1
Metering Option

Option 5
Optional Switch
- Voltage 200 VAC
- Voltage 277 VAC

Option 2
IP54 Protection Kit

Option 3
Solid Neutral

Option 4
Lightning Protection
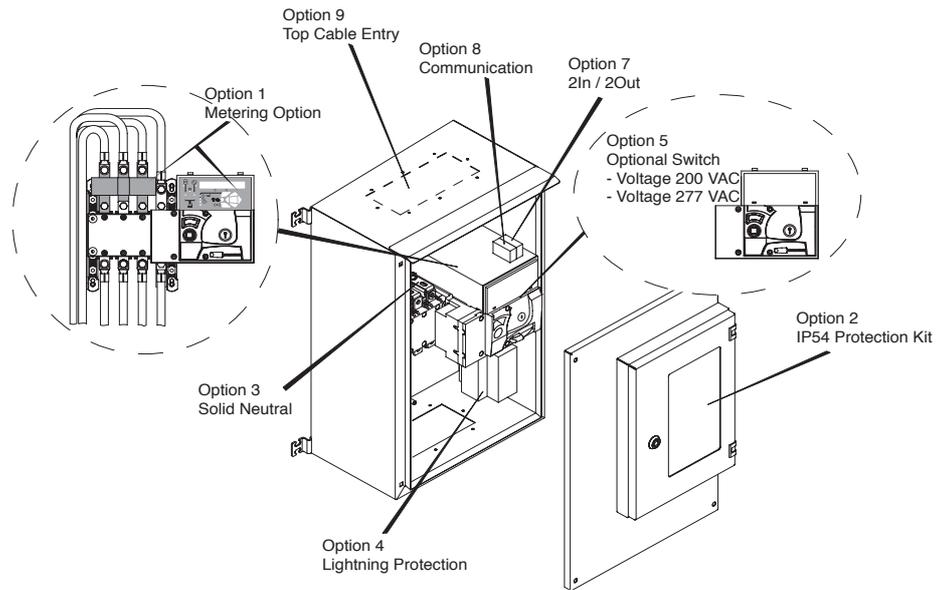
Factory options are available from. first release, delivered pre-installed in the enclosures

Option 6:

- Auxiliary contacts for switch position information, padlocking and Auto/Manual mode information are optionally available. Option code is TAUX.

Option 9:

- Top Cable Entry. For cables to be routed through the top rather than bottom. Option code is TICT.

Other factory options will be available from. early 2004 onwards, delivered pre-installed in the enclosures

Option 1:

- A metering module allowing standard features + current and power metering facilities on a larger backlit display. Option code is PMET.

Option 5:

- A switch allowing 277 Vac specific voltage option for customers requiring voltage code V601 (480/277).

Loose options are available From first release, for customer mounting in the enclosures

Option 2:

- IP54 protection rating is available as an option. A specific protection window must be installed on the front panel of the enclosure to avoid water infiltration in the enclosure. Option code is TIP5.

Option 3:

- Solid neutral link is available as an option on the switch itself, when switching of the neutral cable is not required. Option code is TLNK.

Option 4:

- Lightning protection is also available as an option to avoid ATS damage in case of a strike on the power cables. This option is highly recommended in stormy areas. Option code is TLPR and TI02 is included.

Option 7:

- 2IN/2OUT.1 plug in module allowing auxiliary contacts for Main and Generator available information is also available as an option. Option code is TIO2.

Option 8:

- 1 plug in communication module, Jbus/modbus protocole, can optionally be ordered allowing remote communication of the changeover system. Option code is TCOM

INTRODUCTION (continued)

ENVIRONMENT

The complete enclosure meets following environmental requirements:

- Ingress protection of IP41 with overall rating of IP21
- Operating temperature of –10°C to 40°C without de-rating
- Operating temperature of 40°C to 65°C with de-rating
- Maximum storage is one year
- 80% humidity non condensing at 55°C
- 95% humidity non condensing at 40°C
- Maximum operating altitude without switch de-rating is 2000 m above sea level.

TECHNICAL CHARACTERISTICS

Characteristics

Thermal Current Ith (40°C)	63 A	100 A	125 A	250 A	400 A	630 A
Assigned isolement voltage Ui (V)	800	800	800	800	800	1000
Assigned voltage to chocks Uimp (kV)	8	8	8	8	8	12

CEI 60947-6-1 Characteristics

Assigned current Ie (A) (B categorie)						
415 Vac AC31B	63	100	125	250	400	630
Operating Class						
Material class	PC	PC	PC	PC	PC	PC
Maximum short circuit current using gG DIN fuse						
Max short circuit (kA eff)	100	100	100	50	18	70
Fuse size (A)	63	100	125	250	400	630
Peak current value: withstand and closing operation (kA peak)	10	14	18	23	23	45
Short circuit Operation						
Courant assigné de courte durée admissible Icw (kA eff)	5	5	10	10	10	12.6
Pouvoir assignée de fermeture en CC Icm (kA crête)	8.5	8.5	17	17	17	25.2

Other Characteristics

Commutation duration						
I-II ou II-I (s) [1]	0.75	0.75	0.75	1.3	1.3	1.3
I-o ou II-0 (s) [1]	0.45	0.45	0.45	0.85	0.85	0.85
Black time durating during commutation under Un (ms)	300	300	300	600	600	600
Power input						
Alim. 230 Vac mini/maxi (V)	184/276	184/276	184/276	184/276	184/276	184/276
Alim. 277 Vac mini/maxi (V) - Option 5	184/276	184/276	184/276	184/276	184/276	184/276
Consumption during switching operation						
Alim. 230 Vac maxi/average (VA)	420/80	420/80	420/80	400/400	400/100	420/110
Alim. 277 Vac maxi/average (VA) - Option 5	420/80	420/80	420/80	400/400	400/100	420/110
Mechanical characteristics						
Number of commutation (durability)	10 000	10 000	10 000	8 000	8 000	5 000
Weight (complete std enclosure) kg	21	21	21	39	44	66

All these characteristics are given as information and are note contractual
(1): Between order sent and final position (under nominal conditions)

Temperature de rating

Nominal Rating	Cable Size	De rate			IEC 947-3			
(40°C Max)		50°C	60°C	65°C	40°C 415 V		60°C 415 V	
(A)	(mm)	(A)	(A)	(A)	AC 22	AC 23	AC 22	AC 23
63	16	63	50	45		AC23A 63A		AC23A 45A
100	35	100	80	63		AC23A 100A		AC23A 63A
125	50	125	100	80		AC23A 125A		AC23A 80A
250	120	250	220	200		AC23A 250A		AC23A 200A
400	240	360	300	250	AC22A 400A	AC23A 250A		AC23A 250A
630	2 x 150	550	500	400	AC22A 630A	AC23A 500A		AC23A 400A

Single phase configuration

Table available for single phase configurations using a 4 poles switch and connecting 2 poles in parrallel
Max ambiant Temperature = 40°C

Nominal Rating 3 phase configuration (A)	Nominal Rating 1phase configuration (2 poles 10 //) (A)	
63	100	
100	160 *	* Short circuit level required for 160A not acceptable for 100A version
125	200	
250	400	
400	630 **	** Short circuit level required for 630A not acceptable for 400A version
630	800 ***	*** Short circuit level required for 800A not acceptable for 630A version

ENCLOSURES INSTALLATION

- The system is delivered in position 0 in manual mode, start generator contact closed.

Shroud

- Remove the shroud to allow terminals access.
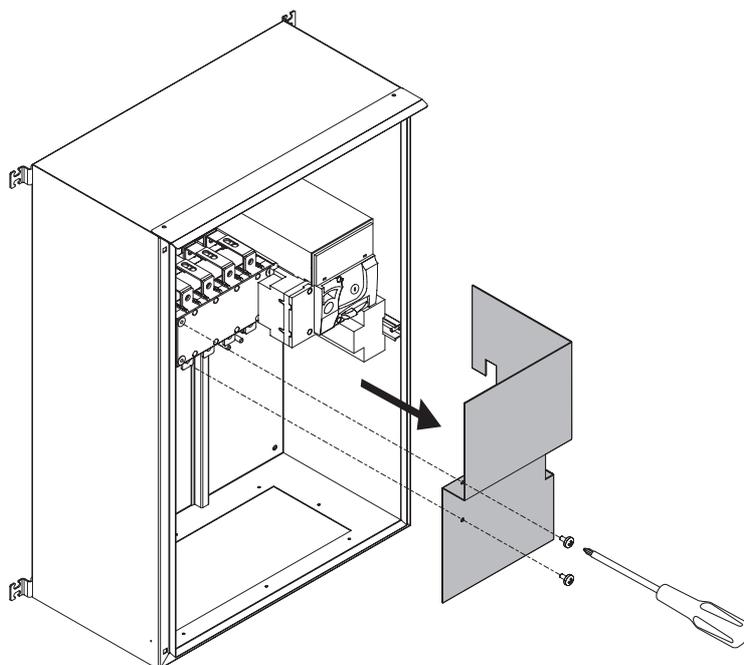
Remove the plastic protection of the plexiglas cover.

ENCLOSURES INSTALLATION (continued)

• Fix the handle + chain on the
  enclosure itself.

x1
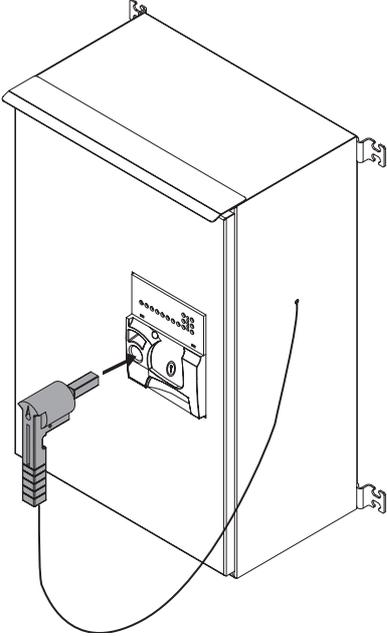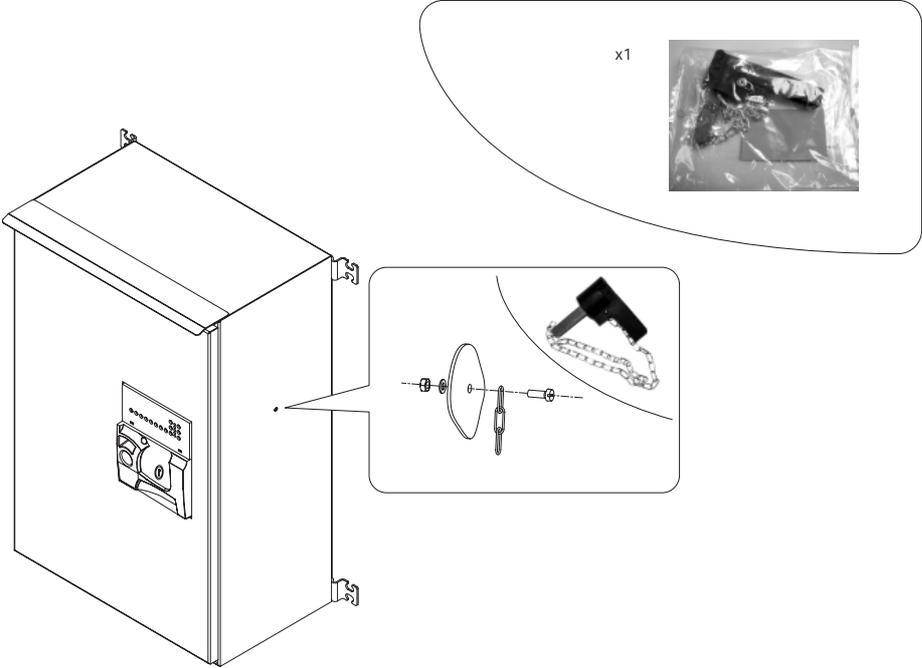
ENCLOSURES INSTALLATION (continued)

Wall mounting brackets

- Use the mounting brackets delivered
  in a bag inside the enclosure to fix the
  enclosure on a wall.

x4

x4

M6

x4

x4
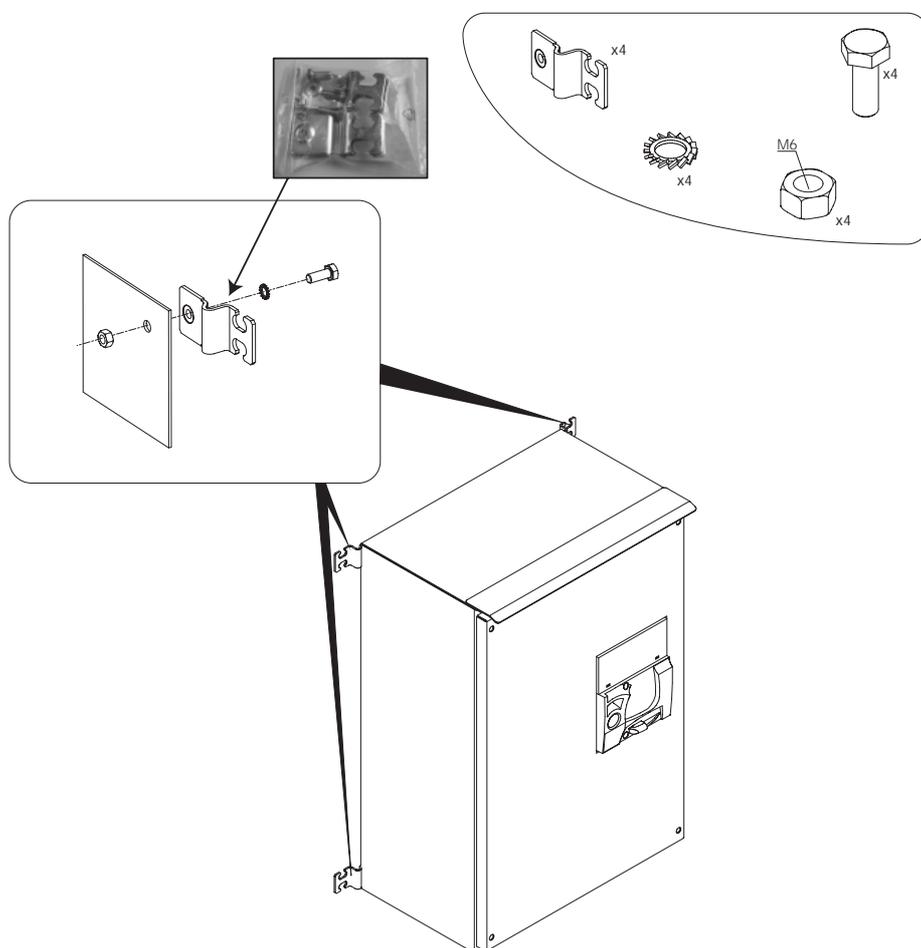
ENCLOSURES INSTALLATION (continued)

Voltage sensing kit

• Cut the voltage sensing kit clips to allow cables connections using screws/nuts/ contact washers delivered in a bag inside the enclosure.
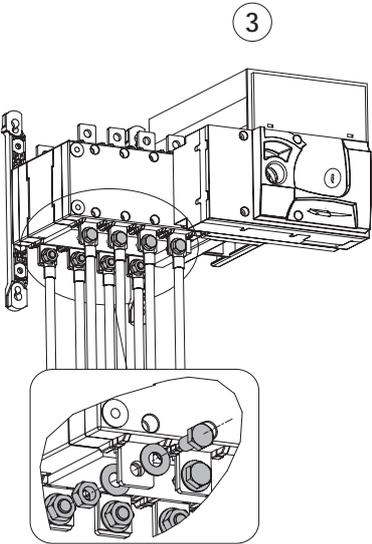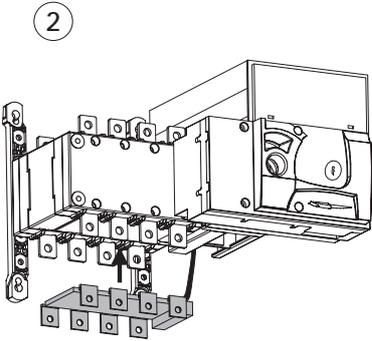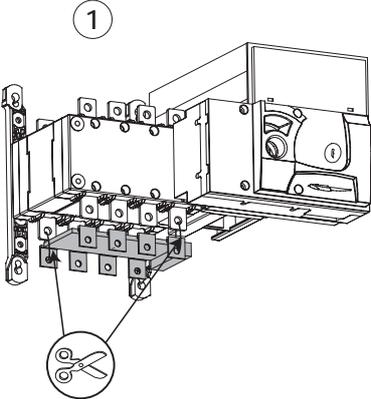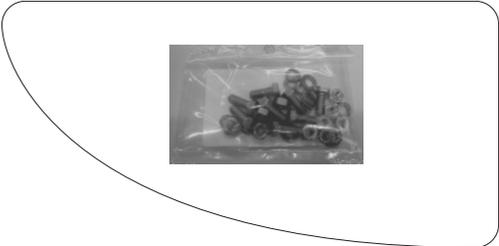
ENCLOSURES INSTALLATION (continued)

BOTTOM CABLE ENTRY ENCLOSURES

63 A / 100 A / 125 A ratings

Power Cables Connection

Power Cables Connection

A-A

A

1 2 3 N

Load

Generator

Main

Earth cable 25 mm^2 (Max)

Phase and neutral
cable 50 mm^2 (Max)

Torque : M8 $\longrightarrow$ 13 Nm (Max)
M10 $\longrightarrow$ 26 Nm (Max)

400

276

128

90

70

238

122

273

248

448

600

39

15

9

7.5

17

39

7

558

12.5

441

455
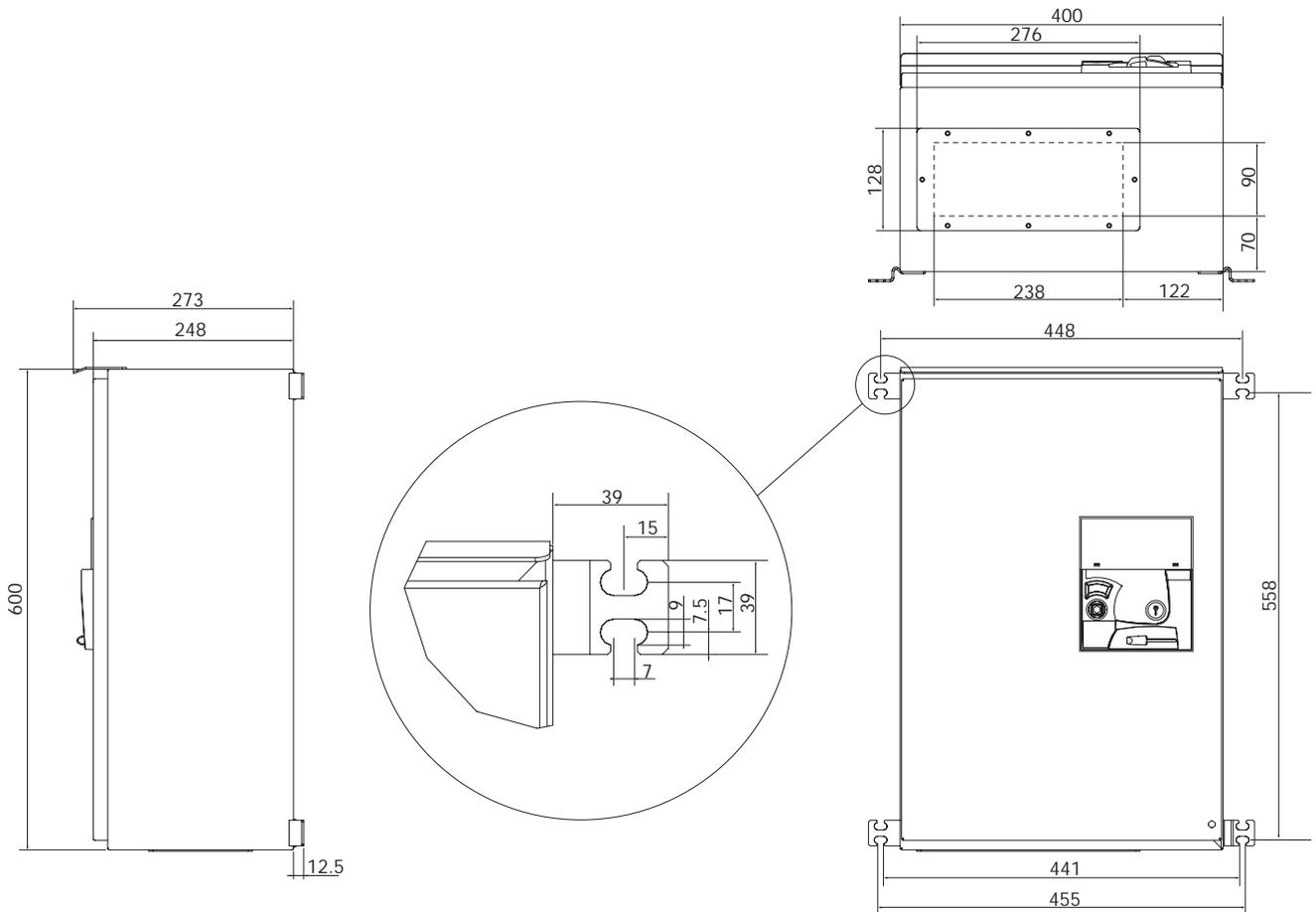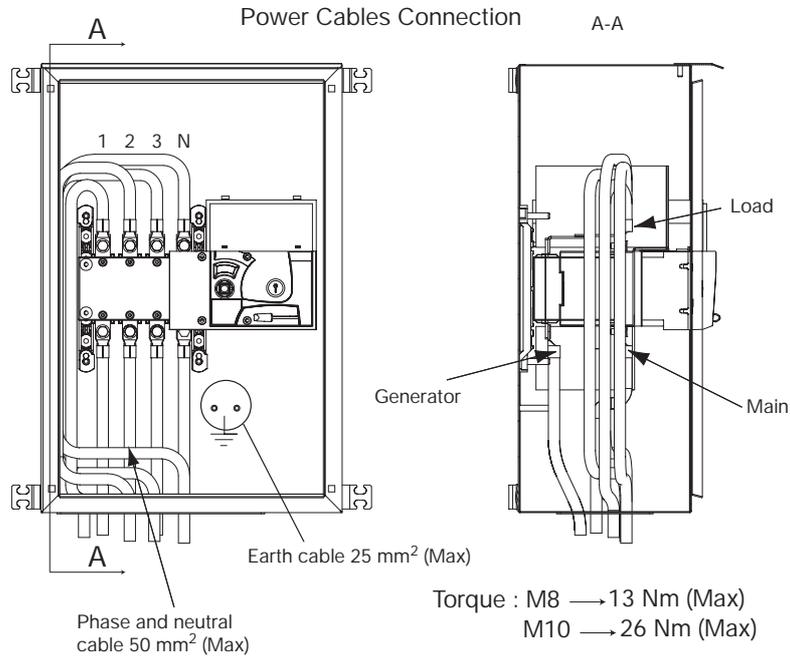
ENCLOSURES INSTALLATION (continued)

250 A ratings

Power Cables Connection

Power Cables Connection

A-A

1 2 3 N

Load

Generator

Main

Earth cable 120 mm^2
or 2 x 50 mm^2 (Max)

Phase and neutral cable
150 mm^2 or 2 x 70 mm^2 (Max)

Torque : M8 ⟶ 13 Nm (Max)
M10 ⟶ 26 Nm (Max)

600
495
245
185
60
435
82.5
648

348
323

900

12.5

39
15
9
7.5
17
39
7

858

641
655

12
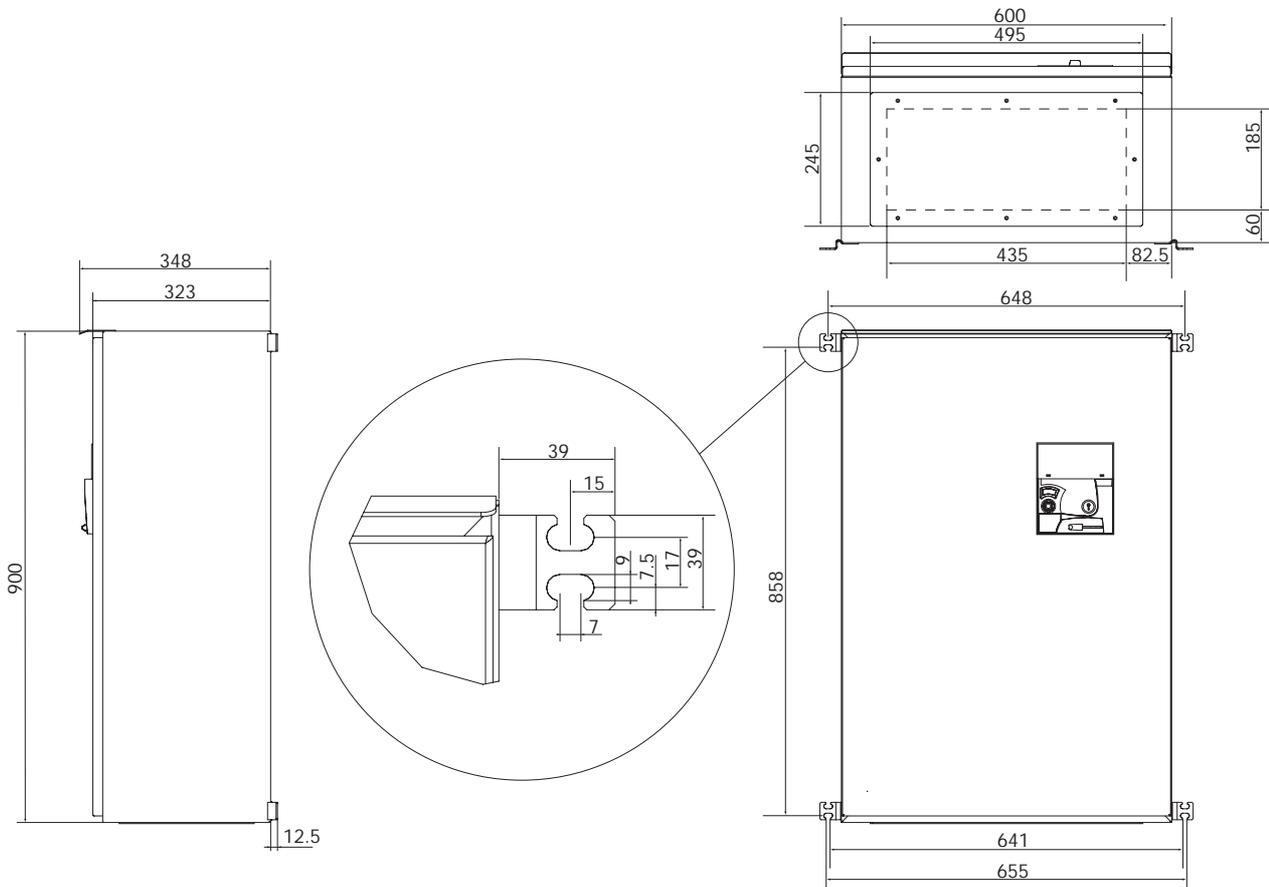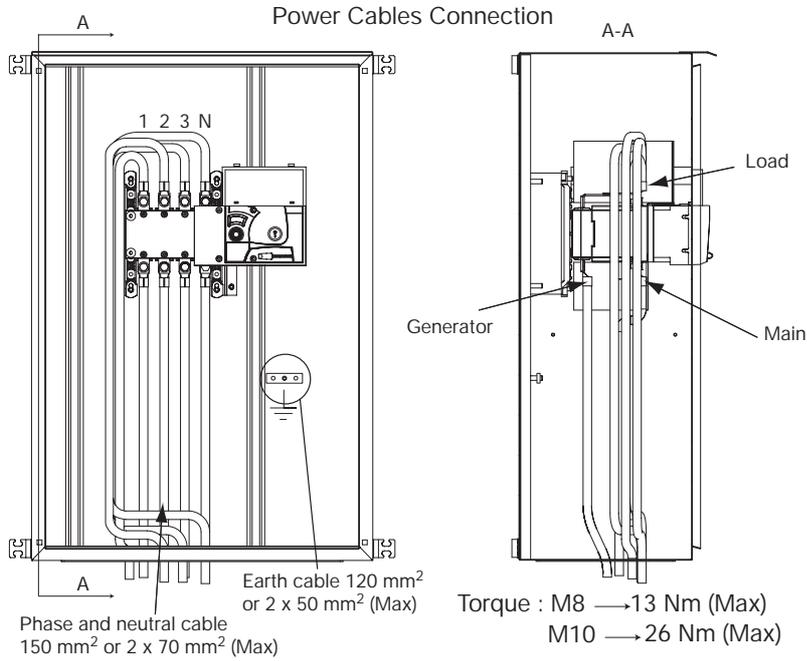
ENCLOSURES INSTALLATION (continued)

400 A ratings

Power Cables Connection

Power Cables Connection

1 2 3 N

Main

Load

Generator

A

A

Earth cable 120 mm^2
or 2 x 70 mm^2 (Max)

Phase and neutral cable
240 mm^2 or 2 x 120 mm^2 (Max)

Torque : M10 ⟶ 26 Nm (Max)
M12 ⟶ 45 Nm (Max)

600
495
245
185
60
435
82.5

348
323
900
12.5

648
858
641
655

39
15
9
7.5
17
39
7

630 A ratings

Power Cables Connection

Power Cables Connection

A-A

1 2 3 N

Main

Load

Generator

Phase and neutral cable
2 x 240 mm² (Max)

Earth cable
240 mm² (Max)

Torque : M10 ⟶ 26 Nm (Max)
M12 ⟶ 45 Nm (Max)

600

Ø14

320

288

328

30

46

495

455

72.5

545

30

423

398

900

200

605
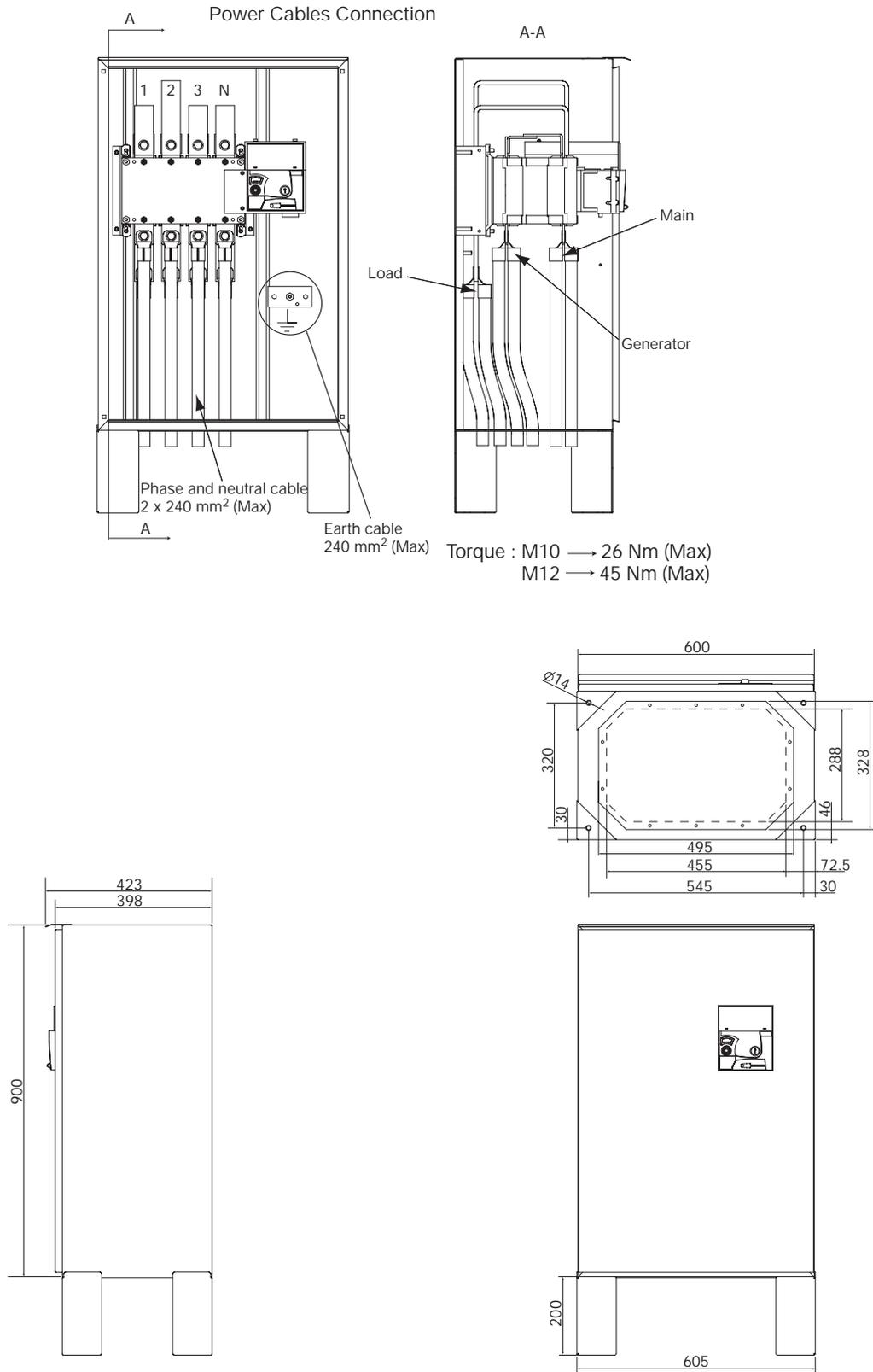
ENCLOSURES INSTALLATION (continued)

TOP CABLE ENTRY

63 A / 100 A / 125 A ratings

Top cable entry

Power Cables Connection

Earth cable 25 mm^2 (Max)

A-A

Generator

Main

Load

1 2 3 N

Phase and neutral cable 50 mm^2 (Max)
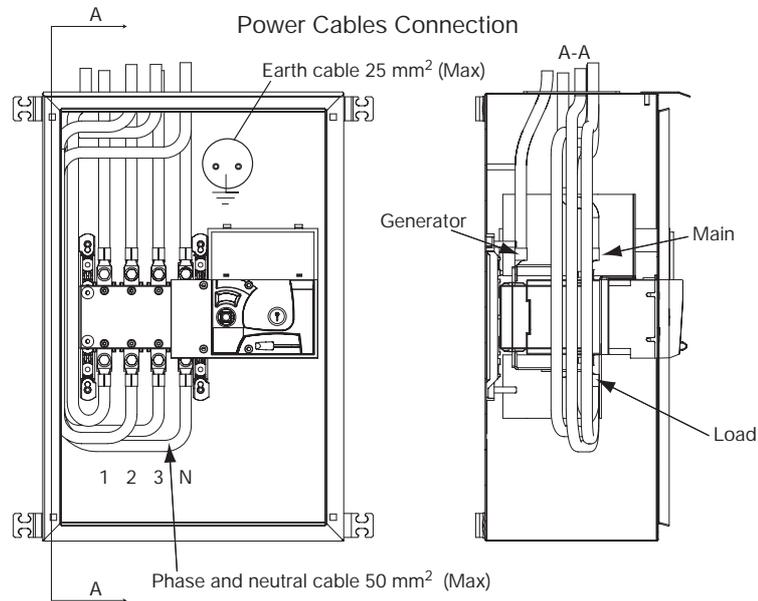
Torque : M8 ⟶ 13 Nm (Max)
M10 ⟶ 23 Nm (Max)

448

273

248

558

39

15

9
7.5
17

39

7

441

455

600

12.5

238

122

70

128

90

276

400
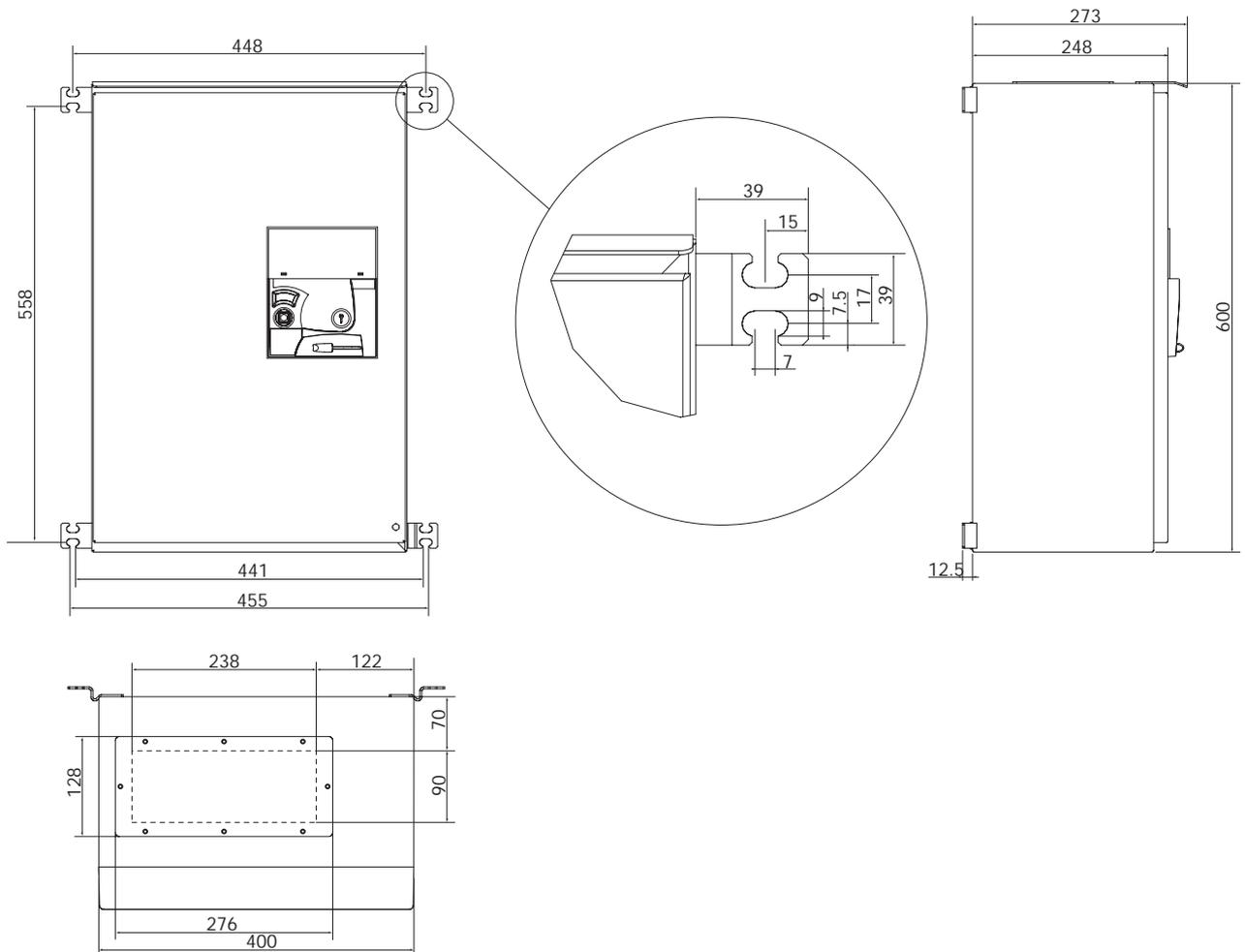
ENCLOSURES INSTALLATION (continued)

250 A ratings

Top cable entry

Power Cables Connection

Earth cable 120 mm^2
or 2 x 50 mm^2 (Max)

A-A

Main

Generator

Load

1 2 3 N

Phase and neutral cable
150 mm^2 or 2 x 70 mm^2 (Max)

Torque : M8 $\longrightarrow$ 13 Nm (Max)
M10 $\longrightarrow$ 26 Nm (Max)

648

858

641

655

348

323

900

12.5

39

15

9

7.5

17

39

7

435

82.5

60

185

245

495

600
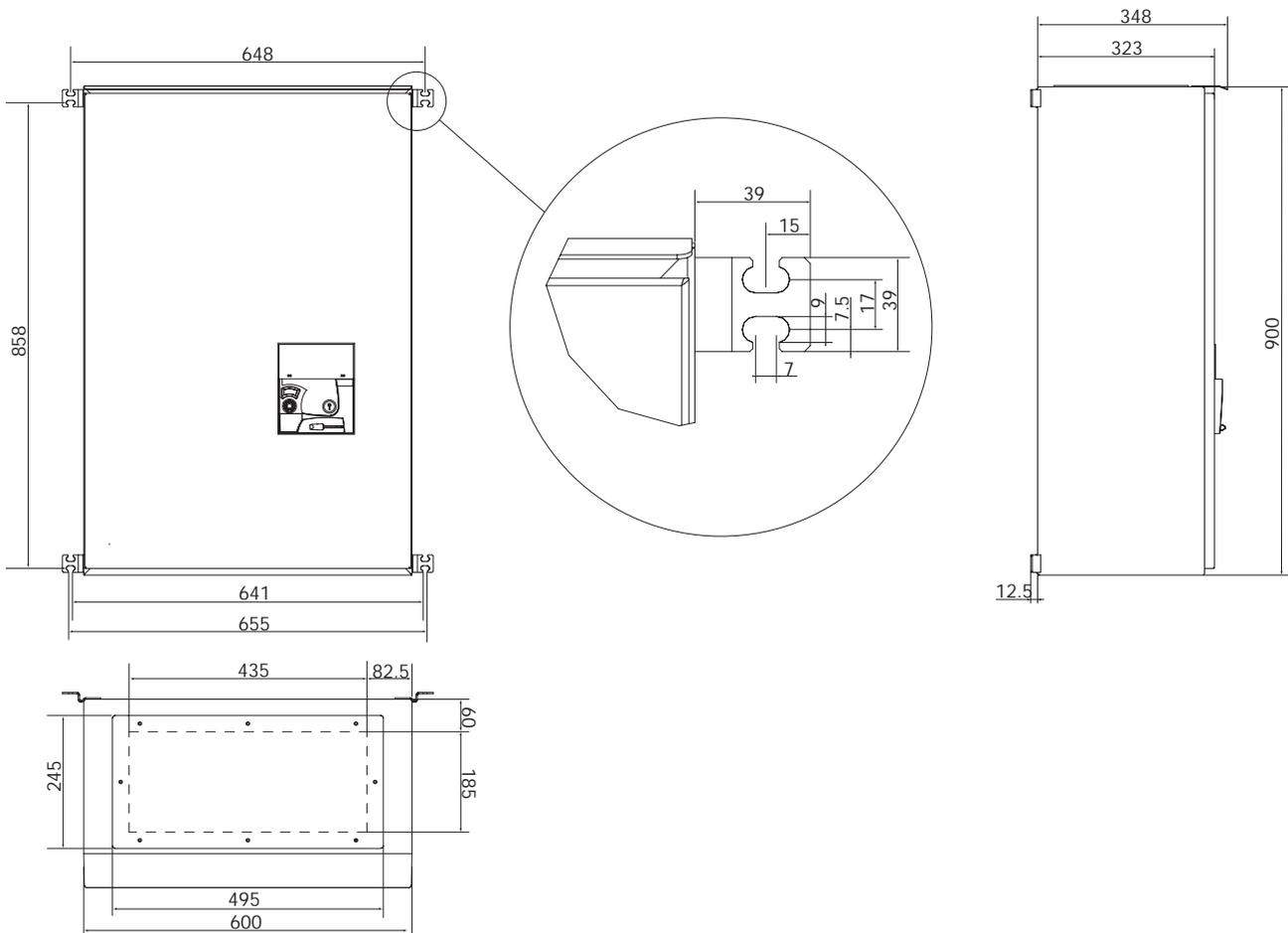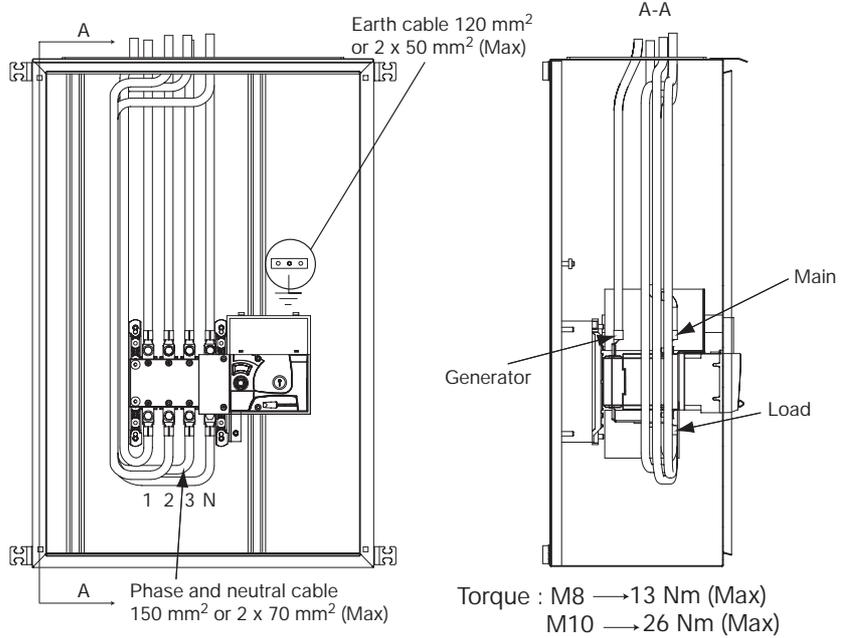
ENCLOSURES INSTALLATION (continued)

400 A ratings Top cable entry

Power Cables Connection

A

Earth cable 120 mm^2
or 2 x 70 mm^2 (Max)

A-A

Load

Main

Generator

1 2 3 N

A

Phase and neutral cable
240 mm^2 or 2 x 120 mm^2 (Max)

Torque : M10 $\longrightarrow$ 26 Nm (Max)
M12 $\longrightarrow$ 45 Nm (Max)

648

858

641

655

39

15

9
7.5
17
39

7

348

323

900

12.5

435

82.5

60

245

185

495

600
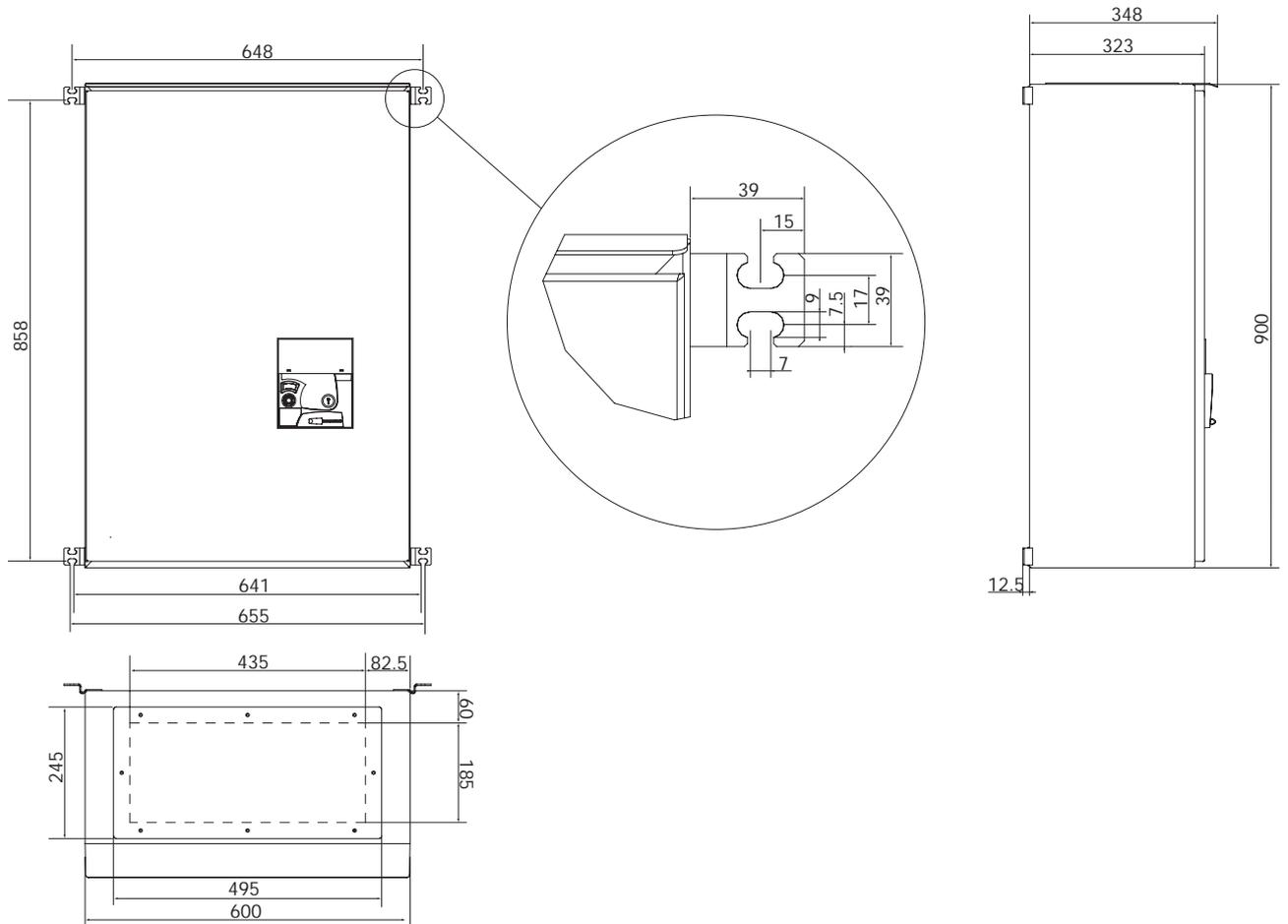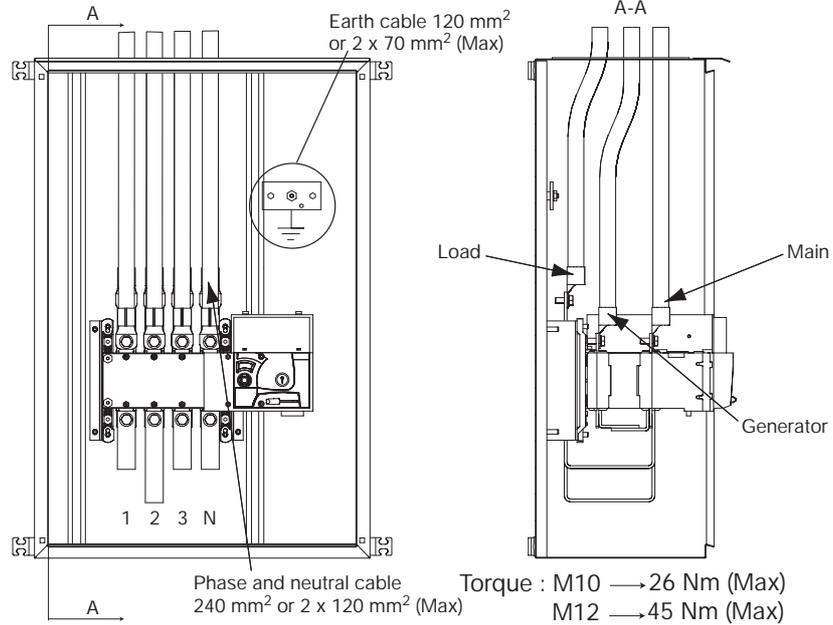
ENCLOSURES INSTALLATION (continued)

630A ratings Top cable entry

Power Cables Connection

A

Earth cable 240 mm≤ (Max)

A-A

Load

Main

Generator

1 2 3 N

Phase and neutral cable
2x240 mm≤ (Max)

A

Torque : M10 $\longrightarrow$ 26 Nm (Max)
M12 $\longrightarrow$ 45 Nm (Max)

423
398

200

1150

600

540
30
455
72.5
495
50
46
280
288
328
Ø13
600
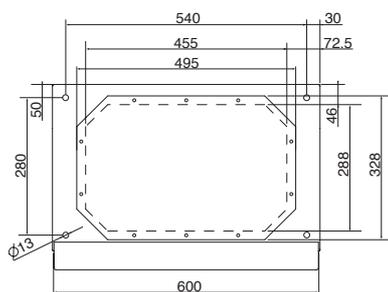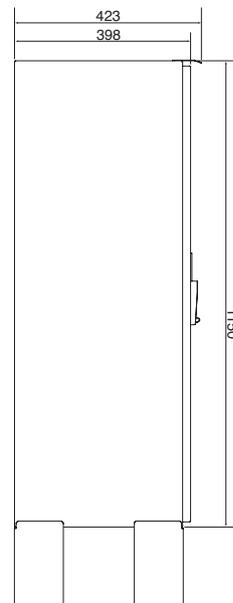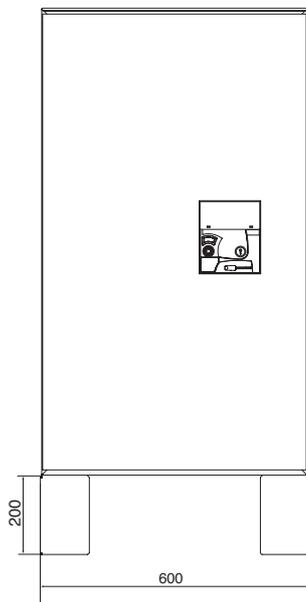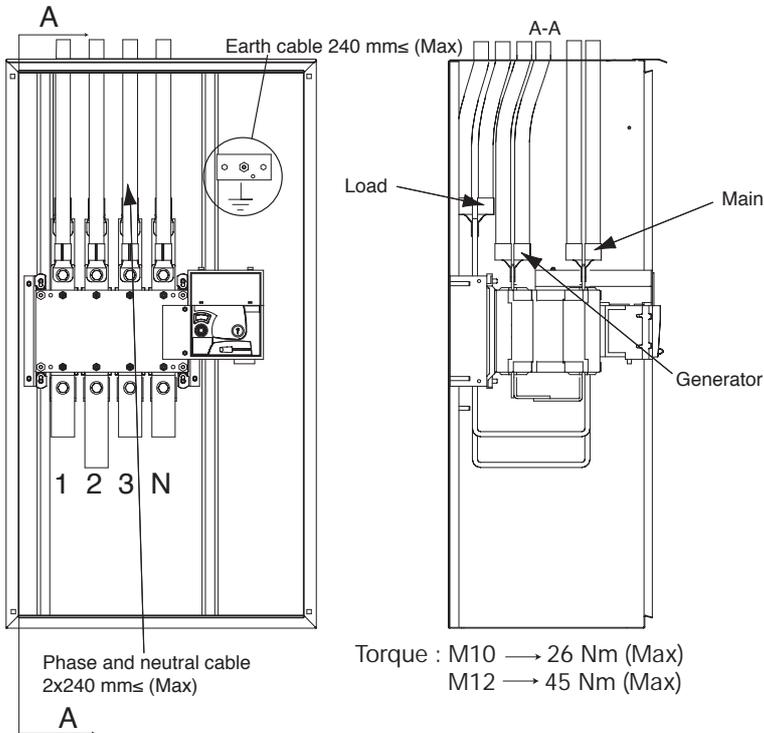
ENCLOSURES INSTALLATION (continued)

⚠ Verify there is no voltage on the terminals before mounting the options.

Option 1

Metering Option
Available from. second quarter 2004. This option is factory fitted and includes a specific metering display + metering CTs to allow current + power metering.
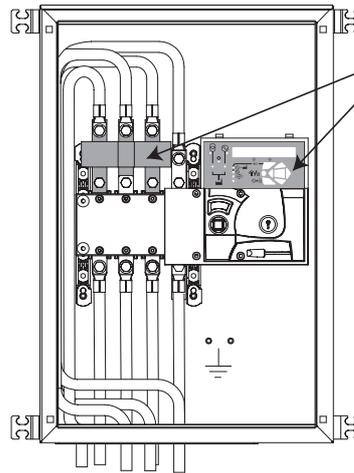
Metering :
- (Sensing) CTS
- Specific Metering Display

Option 2

IP54 protection kit
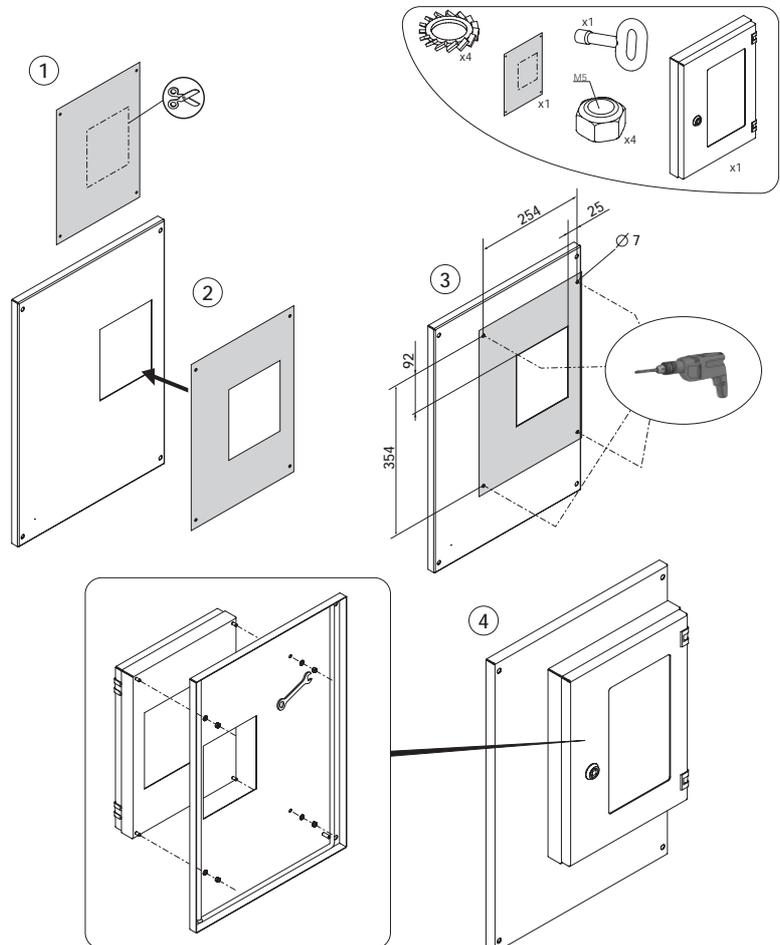
ENCLOSURES INSTALLATION (continued)

Option 3

Solid neutral kit
63A / 100 / 125 / 250A rating

x3

x1

x1

x1

x1

x2

x3 M8/M10 x 20

1

2

3
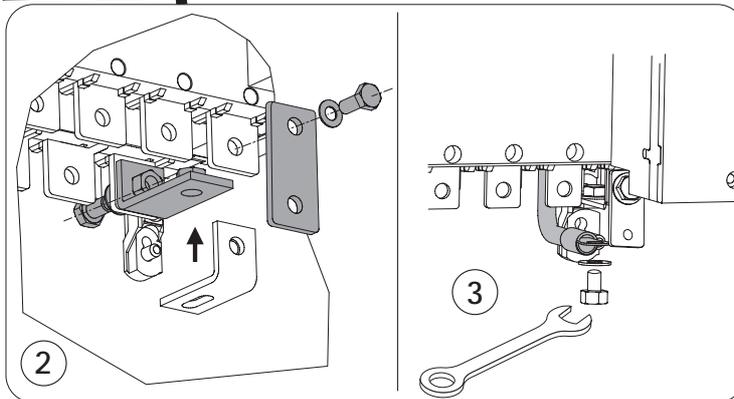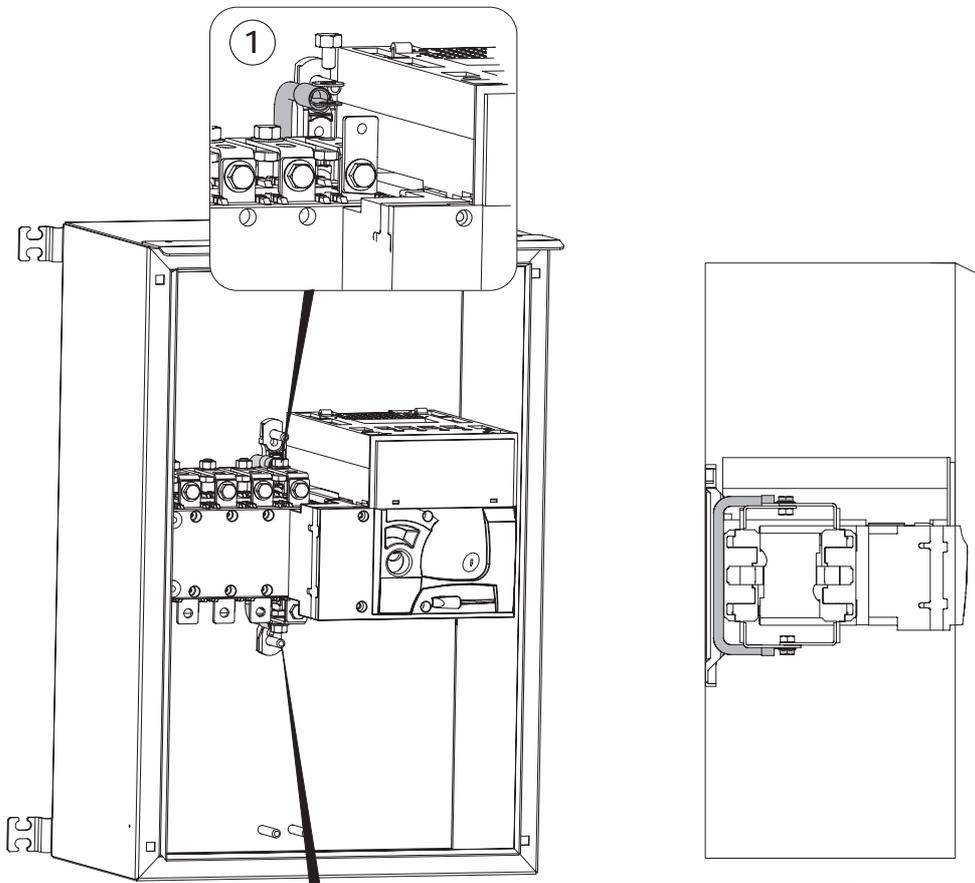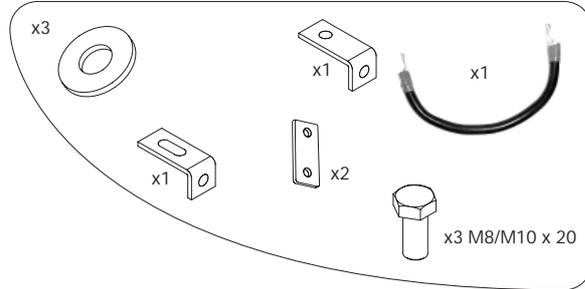
Torque : M8 ⟶ 13 Nm (Max)
M10 ⟶ 26 Nm (Max)

ENCLOSURES INSTALLATION (continued)

Solid neutral kit
400A / 630A rating

x1

x1

x1

x4

M10 / M12

x2

x2 M10/M12 x 20
x1 M10/M12 x 25
x2 M10/M12 x 30

x2

1

M10/M12 X 20

2

M10/M12 X 30

3

M10/M12 X 30

M10/M12 X 25
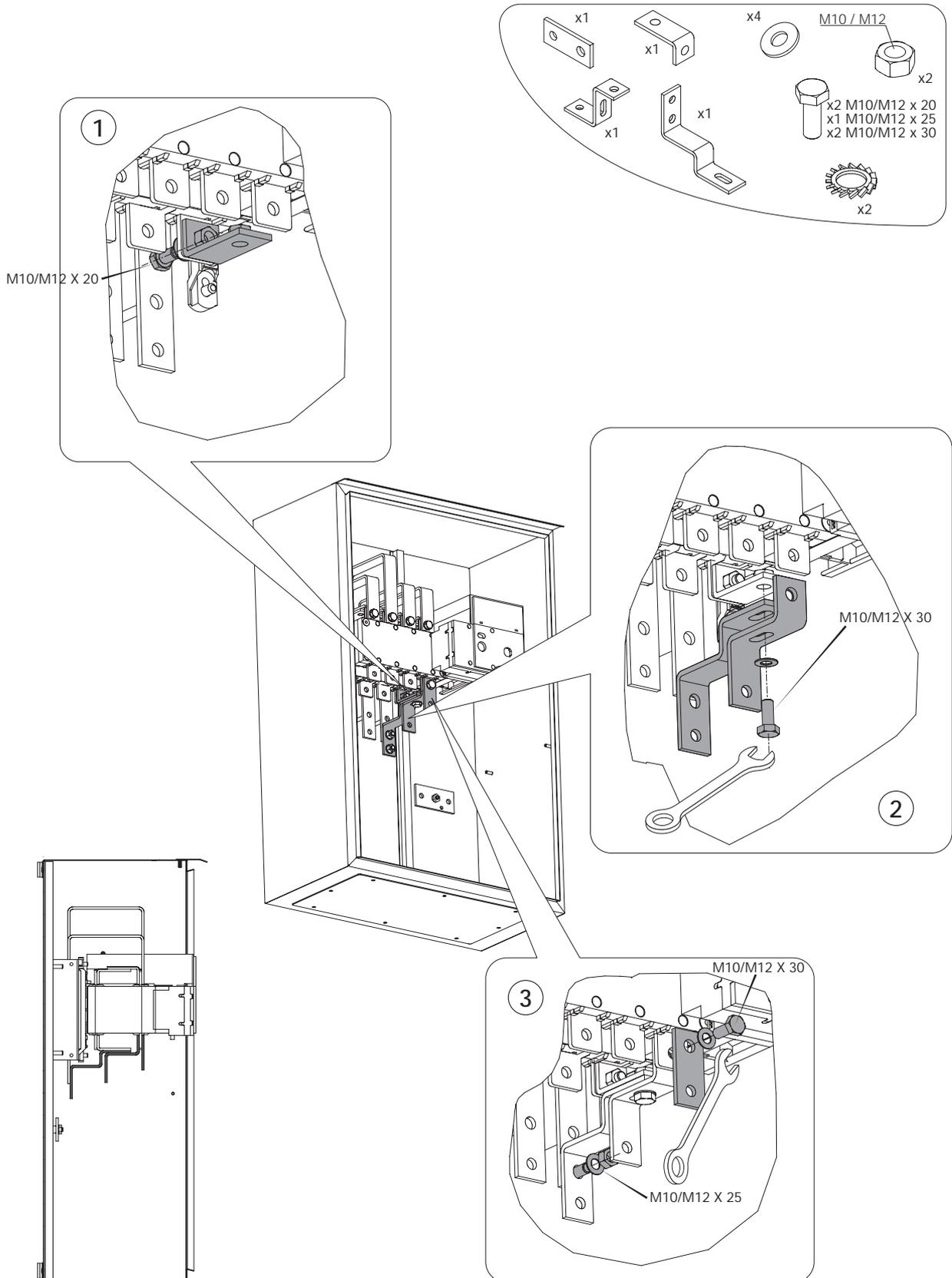
Torque : M10 ⟶ 26 Nm (Max)
M12 ⟶ 45 Nm (Max)

ENCLOSURES INSTALLATION (continued)

Option 4

Lightning protection

⚠️ A power off action is required before startup.

Botton Connection

Top Connection

125A

250A/400A/630A

125A

250A/400A/630A

M6 x2

M8 x1

x1

x1

x2

x2

A

B

C

A

4

5

1 / 2

C

B

1 2 3 N
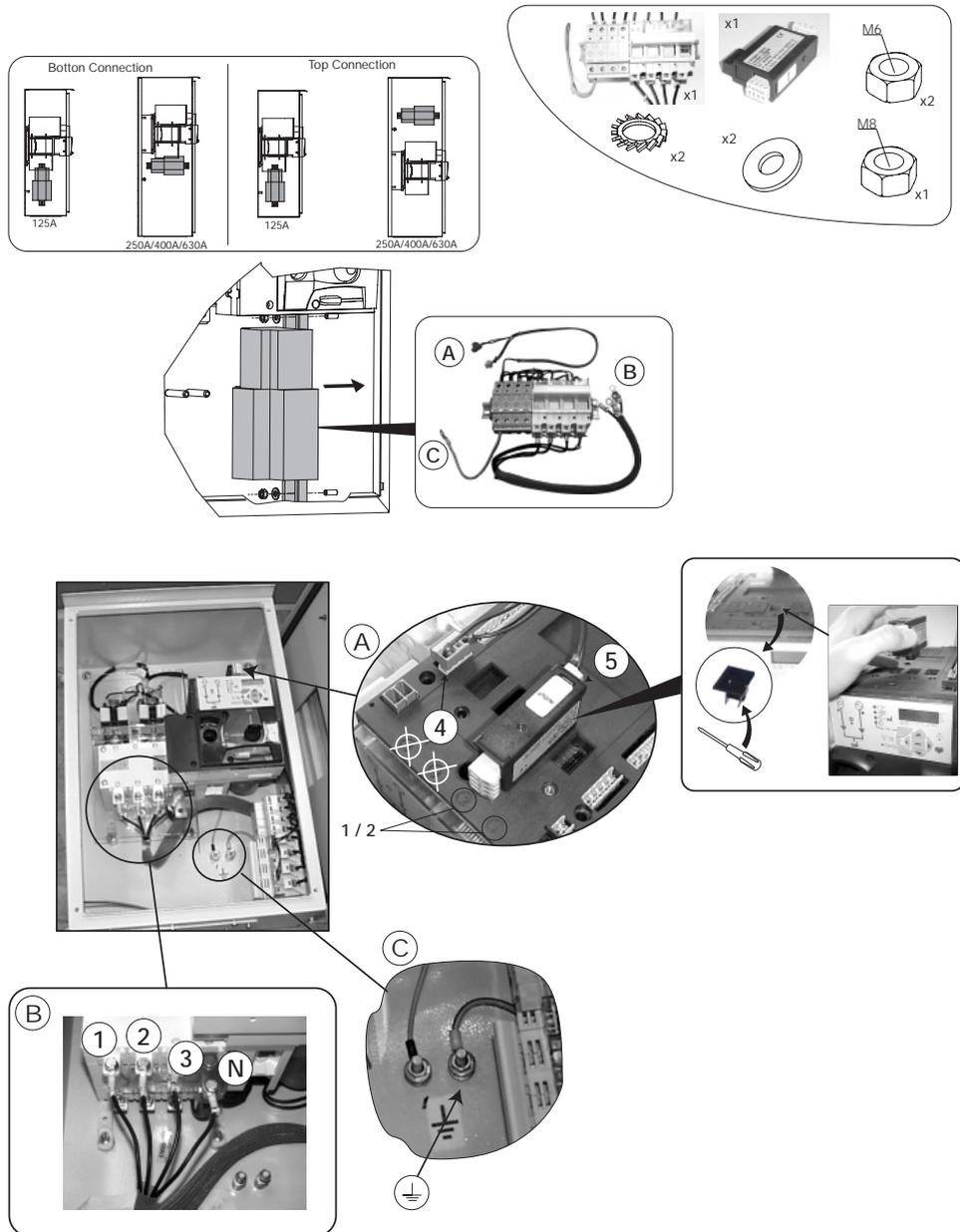
A specific menu in the metering architecture allows monitoring of the protection. Cf variable LIP in the monitoring menu.

LIP variable = 1 as soon as the protection operates (fuse blow or lightning protection operation).

This information is verified every 5 seconds.

Error led also blinks to inform of LIP operation.

It might then either be required to change a fuse or the lightning module.

ENCLOSURES INSTALLATION (continued)

Lightning protection equipment Connection diagram
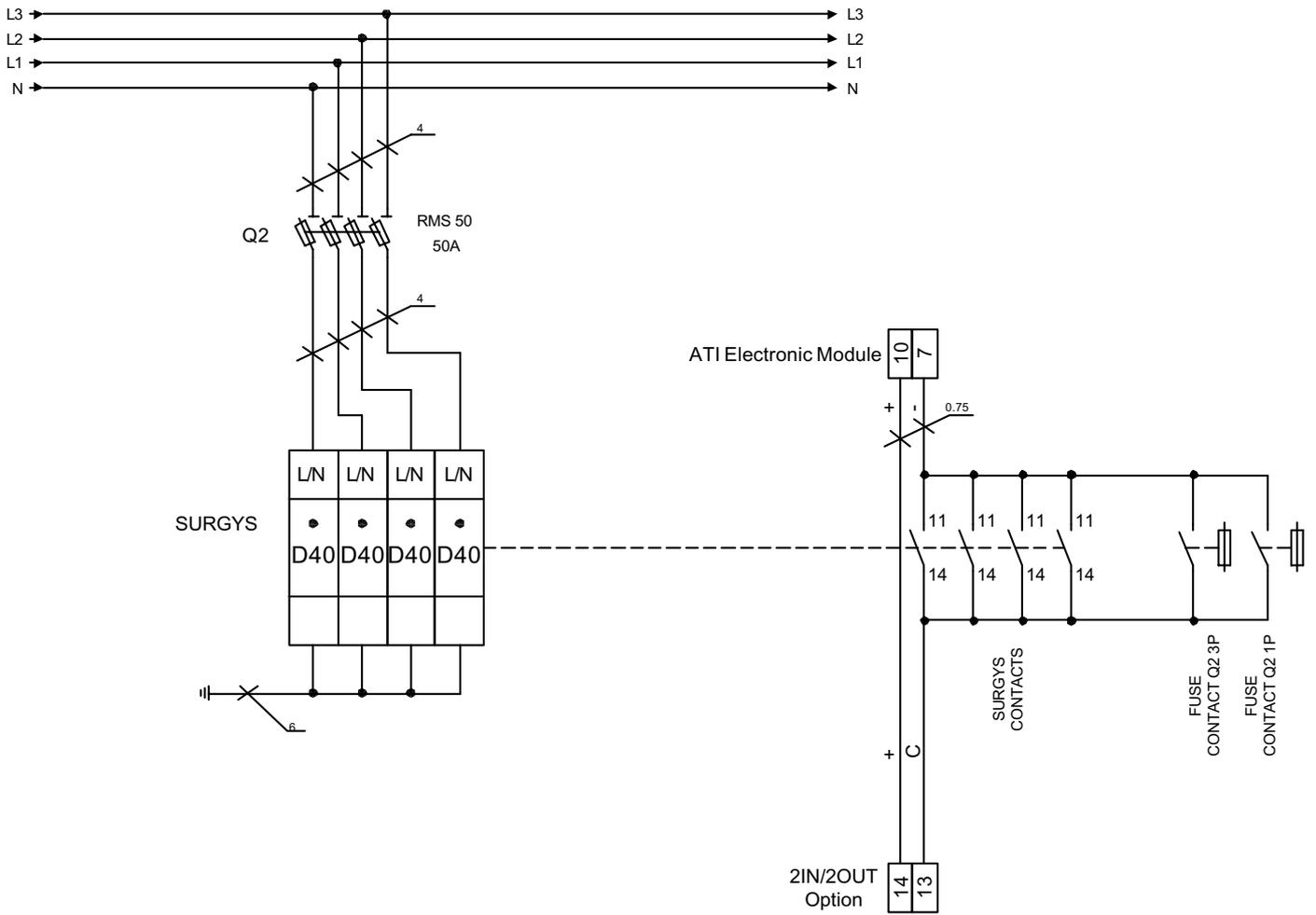
ENCLOSURES INSTALLATION (continued)

277Vac option
Will be available from. factory from
second release.

Option 6

Auxiliary contacts for 0,1,2 position,
padlock and Auto / Manual Mode.
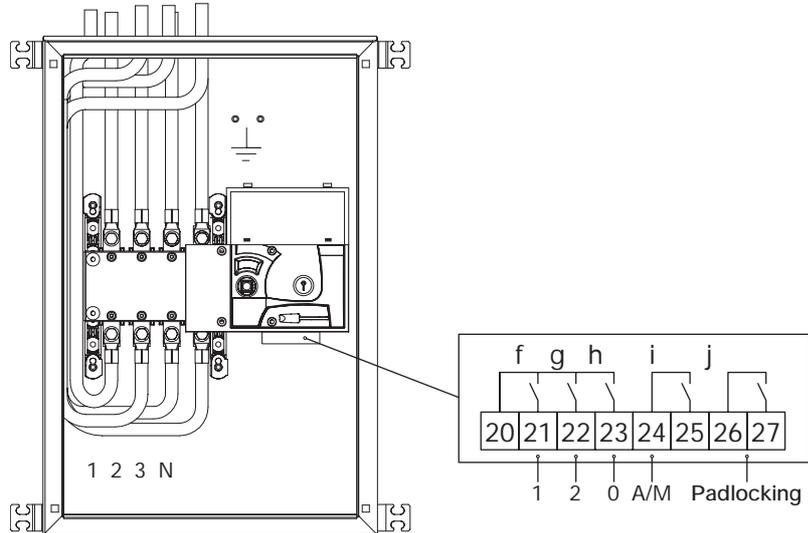
Identification	Terminals	Type	Feature	Rating
f	20-21	Output	Position 1 Auxiliary contact Contact closed when switch is in position 1	Resistive load: 10 A • Inductive load: 3 A Max Vac: 250 - Max operations: 5 x 10^7
g	20-22	Output	Position 2 Auxiliary contact Contact closed when switch is in position 2	
h	20-23	Output	Position 0 Auxiliary contact Contact closed when switch is in position 0	
i	24-25	Output	Auto / Manu information Contact closed when Automatic mode is active	
j	26-27	Output	Padlocking information Contact closed when the switch is padlocked	

Contact f, g and h are closed when
the switch is in position 1, 2 or 0.
Contact i is closed when the switch is
in Automatic mode.
Contact j is closed when the switch is
padlocked.

ENCLOSURES INSTALLATION (continued)

Option 7

2 IN/2 OUT option

Main available / Gen available output contacts.

The contact closes as soon as the source is available.

⚠ A power off action is required before startup.
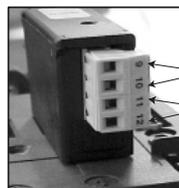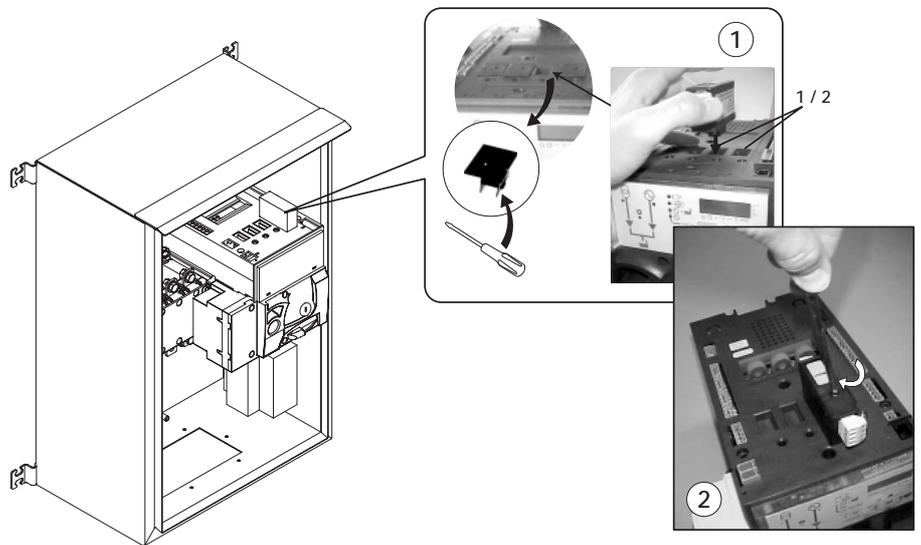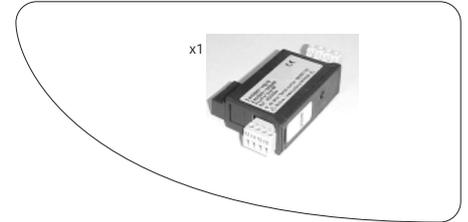
OUT

9 / 10 : Main Available output contact

11/12 : Gen Available output contact

a	b
9	10	11	12
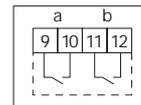
Identification	Terminals	Type	Feature	Rating
a	9-10	Output	Main available information Generator available information	230 Vac - 5 A - 1150 VA Max operations £ 10⁵ - Galvanic insulation 2,5 kV (1 min 50 Hz)
b	11-12	Output	Main available information Generator available information	

ENCLOSURES INSTALLATION (continued)

⚠️ A power off action is required before startup.

Communication module
Read paragraph communication for instructions.
Installation of this module allows RS485 connection. Protocoles avaible are JBUS/MODBUS®.
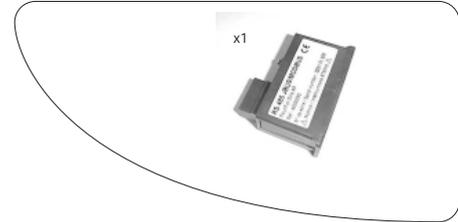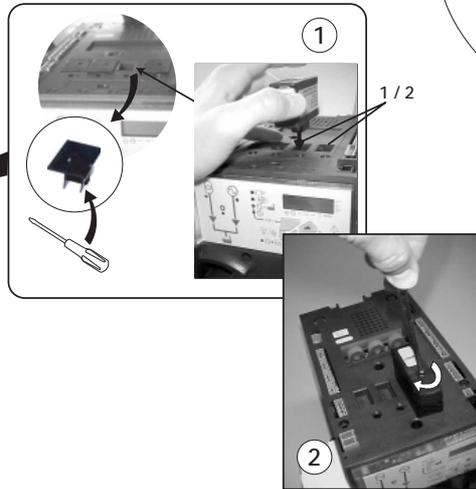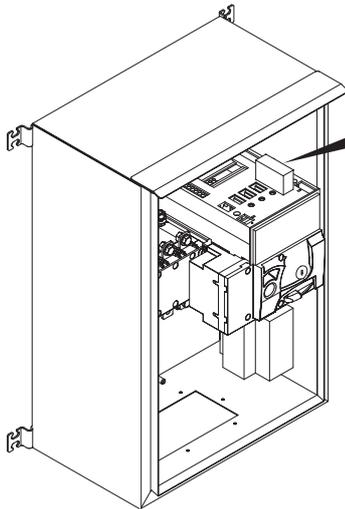
RS485	2 or 3 wires half duplex
Protocol	JBUS/MODBUS® protocol / RTU mode
Speed	2400, 4800 Bauds
Galvanic insulation	4 kV (1 min 50 Hz)

GENERAL POINTS

Recommendations:
You should use a shielded twisted pair (LIYCY type). In a disturbed environment or large network (in terms of length) we recommend the use of 2 shielded pairs (type LIYCY-CY). In this case, one pair is used for the + and the –, and another pair, where the 2 wires are short-circuited, for the 0 V. A repeater (1 channel) or an arrestor (4 channels) should be used if you intend to exceed the distance (1500 m) and/or maximum number (31) of ATI. Please contact us for more information.

NB :
A 120 ohm resistance (found on the additional module) must be fixed at both ends of the link.

Other solutions are available (modem, optical fibre, etc.). Please contact us.

For standard configurations, an RS 485 link is used to connect up to 31 ATI with a PC or a PLC over a distance of 1500 metres, using JBUS/MODBUS© protocol.
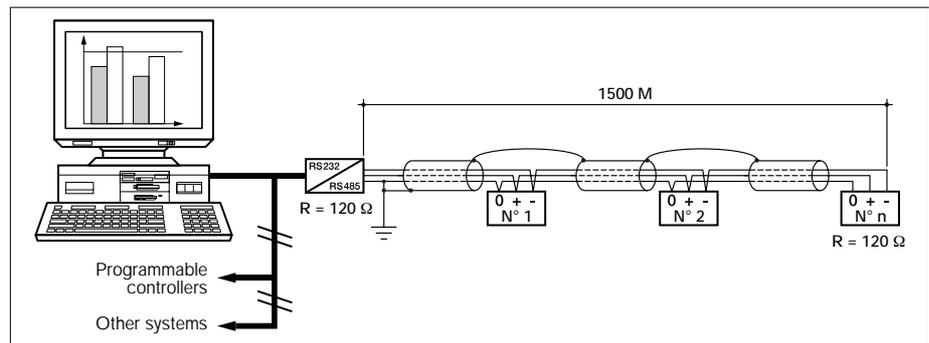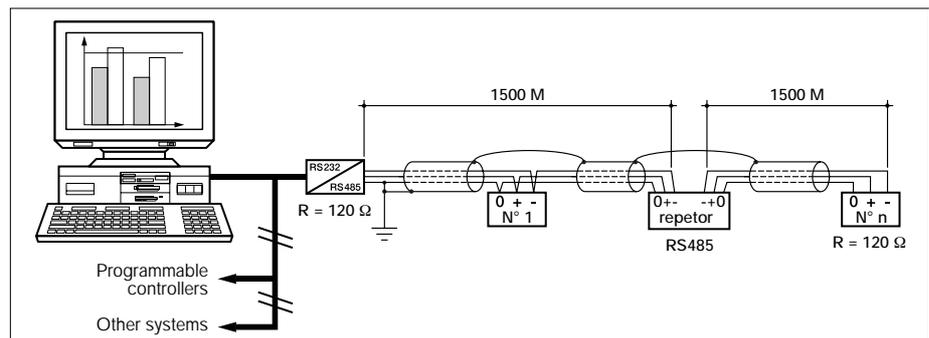
VOLTAGE CONFIGURATIONS

To meet all voltages required by the market, 2 ATI versions have been developed:

Standard 230 Vac +/- 20 % - AVAILABLE FROM. FIRST RELEASE

50Hz 3 phase 4 wires - 3P4L Star connections		60Hz 3 phase 4 wires – 3P4L Star connections	
FG Wilson option code	Voltage	FG Wilson option code	Voltage
V502	415/240V	V603	440/254V [2]
V503	400/230V	V605	380/220V
V504	380/220V	V608	220/127V
V507	220/127V	V610	208/120V [3]
V510	200/115V [1]	V611	240/139V

(1): +20%/-12%
(2): +13%/-30%
(3): +20%/-15%

50Hz 3 phase 3 (4) wires - 3P3(4)L Delta connections		60Hz 3 phase 3 (4) wires – 3P3(4)L Delta connections	
V506	230/115V	V606	240/120V
V508	220/110V	V607	230/115V
		V609	220/110V

50Hz single phase 3 wire – 1P3L		60Hz single phase 3 wire – 1P3L	
V522	240/120V	V622	240/120V
V524	230/115V	V624	230/115V
V526	220/110V	V626	220/110V

50Hz single phase 2 wire – 1P2L		60Hz single phase 2 wire – 1P2L	
V521	240V	V621	240V
V523	230V	V623	230V
V525	220V	V625	220V

Optional 277 Vac +/-20 % - AVAILABILITY First Quarter 2004

50Hz 3 phase 4 wires - 3P4L Star connections		60Hz 3 phase 4 wires – 3P4L Star connections	
FG Wilson option code	Voltage	FG Wilson option code	Voltage
		V601	480/277V

A voltage sensing kit is used to provide sensing and power connections from. the switch terminals to the electronic module terminals.

The ATI enclosures are delivered as standard for 3 phases 4 wires applications, 400/230 Vac nominal voltage.

In 3P4L, 3P3L, 1P2L, 1P3L, 1PAP, some 3 phase 4 wires, all 3 phases 3 wires, or single phase 2 or 3 wires applications, sensing connections keep the same, but power connections must be modified according to hereafter guidelines.

In standard ATI (bottom entry) generator cable is red and main cable is black.

In top entry ATI main cable is red and generator cable is black.

VOLTAGE CONFIGURATIONS (continued)

⚠ Verify voltage between 101/102 & 201/202 = 220/240 Vac ±20%

The Voltage sensing kit provides power and sensing to the electronic module from. the generator and the main side.

Main sensing is 3 phases sensing:
- 103: Neutral
- 104: Phase 3
- 105: Phase 2
- 106: Phase 1

Gen sensing is single phase sensing:
- 203: Phase 1
- 205: Phase 3

3 Phases 4 Wires connections-3P4L

A. No wiring change required from standard delivery
Configurations:

V502	415/240 Vac	50Hz
V503	400/230 Vac	50Hz
V504	380/220 Vac	50Hz
V603	440/254 Vac	60Hz
V605	380/220 Vac	60Hz
V601	480/277 Vac	60Hz - Special Voltage Option 5, Power = 277 Vac
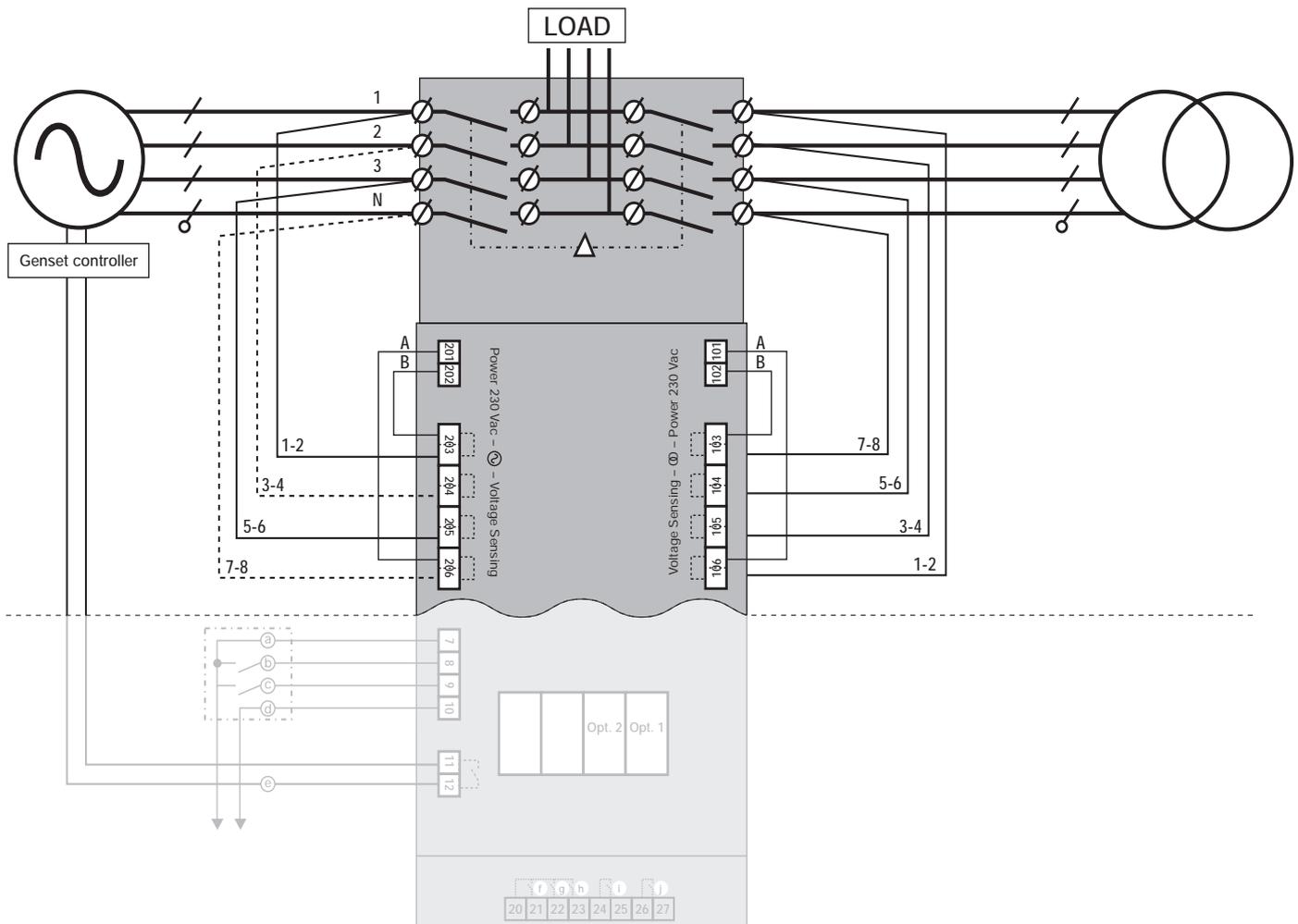
VOLTAGE CONFIGURATIONS (continued)

3 Phases 4 Wires connections-3P4L

B. Wiring change required from standard delivery: 206 & 103 power wires must to be connected to 205 & 104 to provide 220/230 Vac or 240 Vac to the power input 101/102 and 201/202.

Configurations:

V507	220/127 Vac	50Hz
V510	200/115 Vac	60Hz
V608	220/127 Vac	50Hz
V610	208/120 Vac	60Hz
V611	240/139 Vac	60Hz
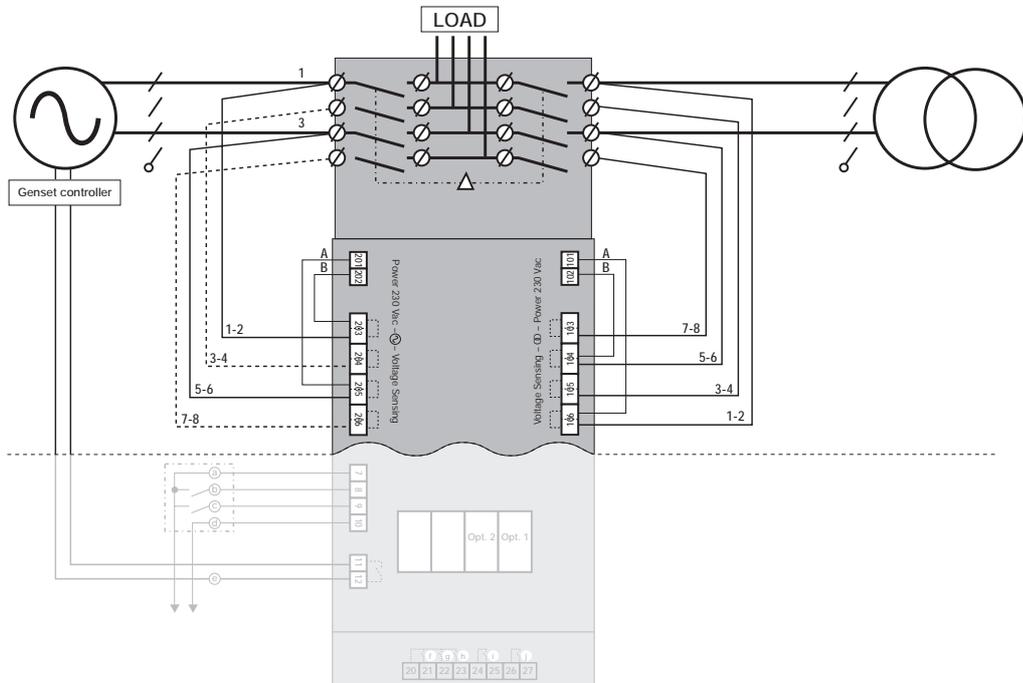
3 Phases 3 (4) Wires connections-3P3(4)L

Wiring change required from standard delivery: 206 & 103 power wires must to be connected to 205 & 104 to provide 220 / 230 Vac or 240 Vac to the power input 101/102 and 201/202.

Configurations:

V506	230/115 Vac	50Hz
V508	220/110 Vac	50Hz
V606	240/120 Vac	60Hz
V607	230/115 Vac	60Hz
V609	220/110 Vac	60 Hz
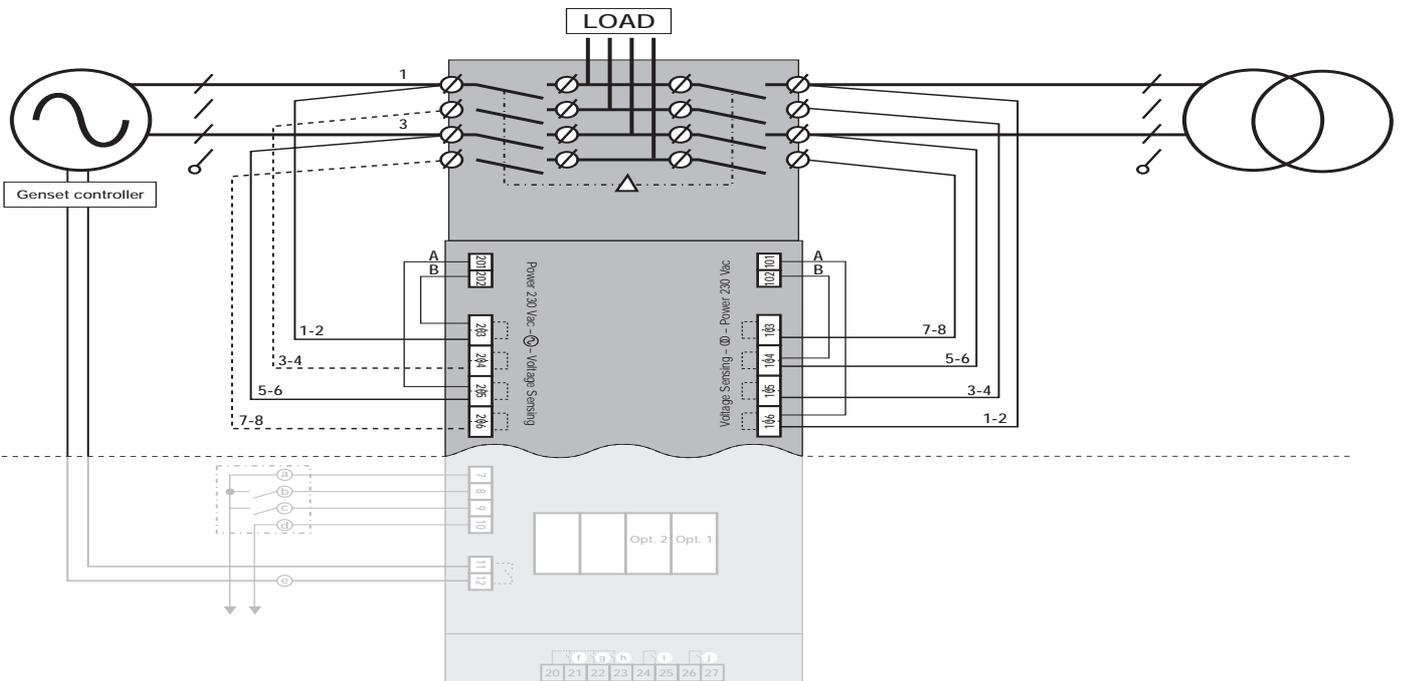
VOLTAGE CONFIGURATIONS (continued)

1 Phase 3 Wires connections - 1P3L

Wiring change required from standard delivery: 206 & 103 power wires must be connected to 205 & 104 to provide 220 / 230 Vac or 240 Vac to the power input 101/102 and 201/202.

Configurations:

V522	240/120 Vac	50Hz
V524	230/115 Vac	50Hz
V526	220/110 Vac	50Hz
V622	240/120 Vac	60Hz
V624	230/115 Vac	60Hz
V626	220/110 Vac	60Hz
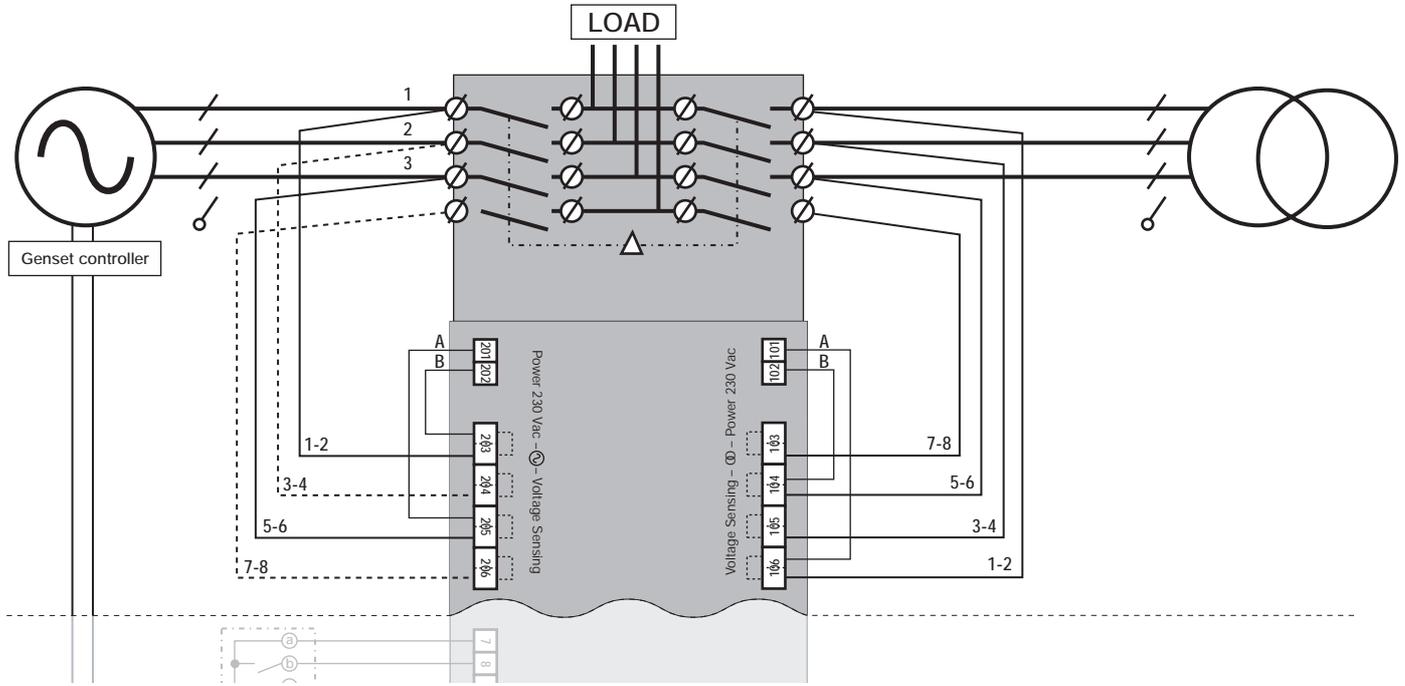
1 Phase 2 Wires connections - 1P2L

Wiring change required from standard delivery: 206 & 103 power wires must be connected to 205 & 104 to provide 220 / 230 Vac or 240 Vac to the power input 101/102 and 201/202.

Configurations:

V521	240 Vac	50Hz
V523	230 Vac	50Hz
V525	220 Vac	50Hz
V621	240 Vac	60Hz
V623	230 Vac	60Hz
V625	220 Vac	60Hz
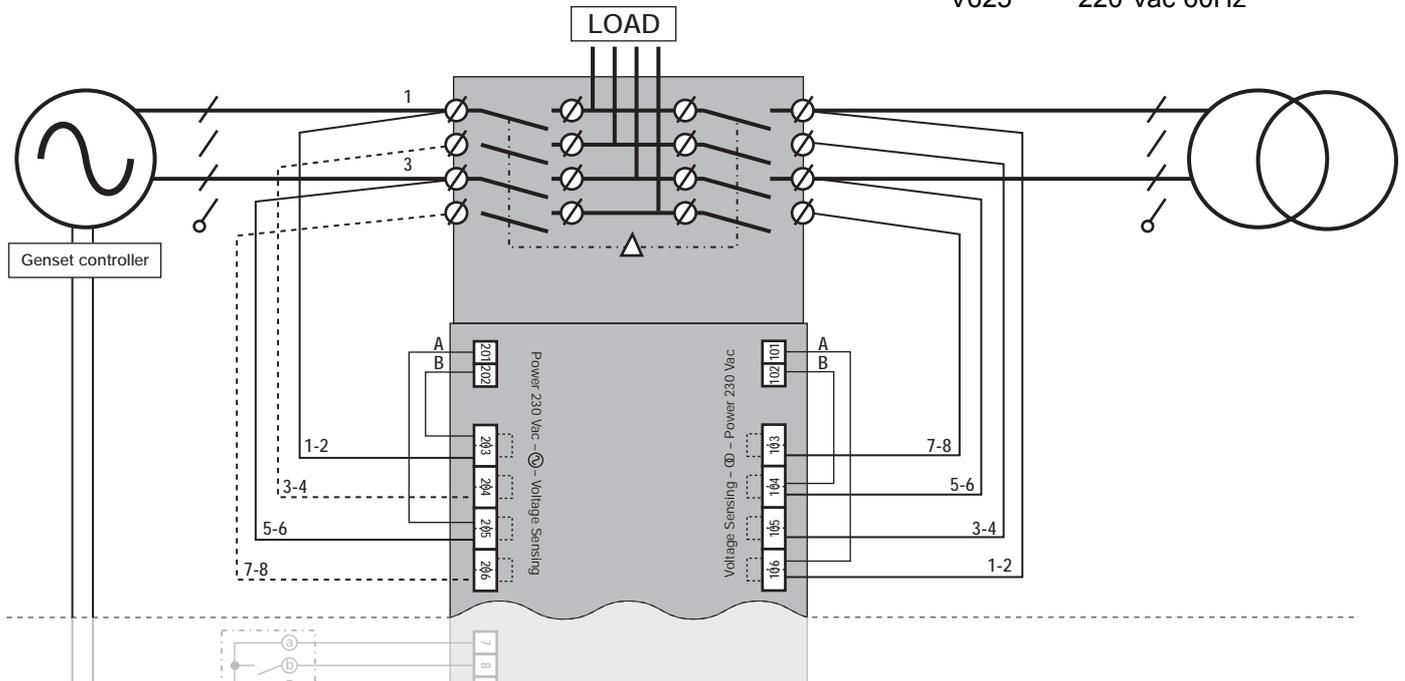
VOLTAGE CONFIGURATIONS (continued)

- Split phase network/single phase generator.

This configuration must be used on applications using single phase generators to supply 2 phases networks feeding single phase loads.
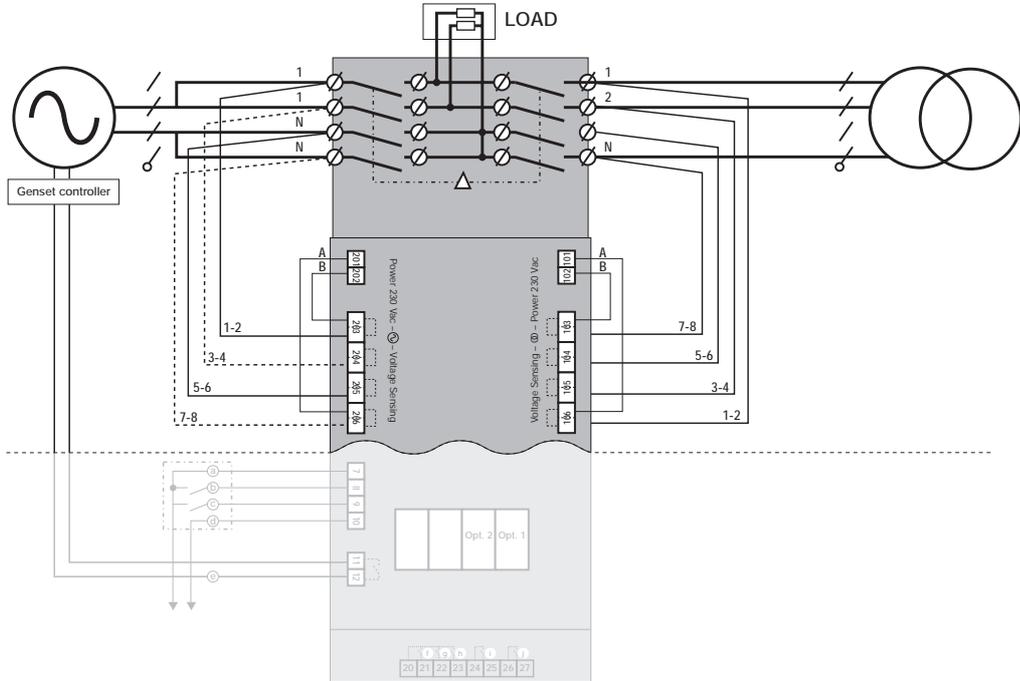
- Three phase network/single phase generator.

This configuration must be used on applications using single phase generators to supply 3 phases networks feeding single phase loads.
Wiring change required. Change 5-6 and 7-8 on 205 & 206.
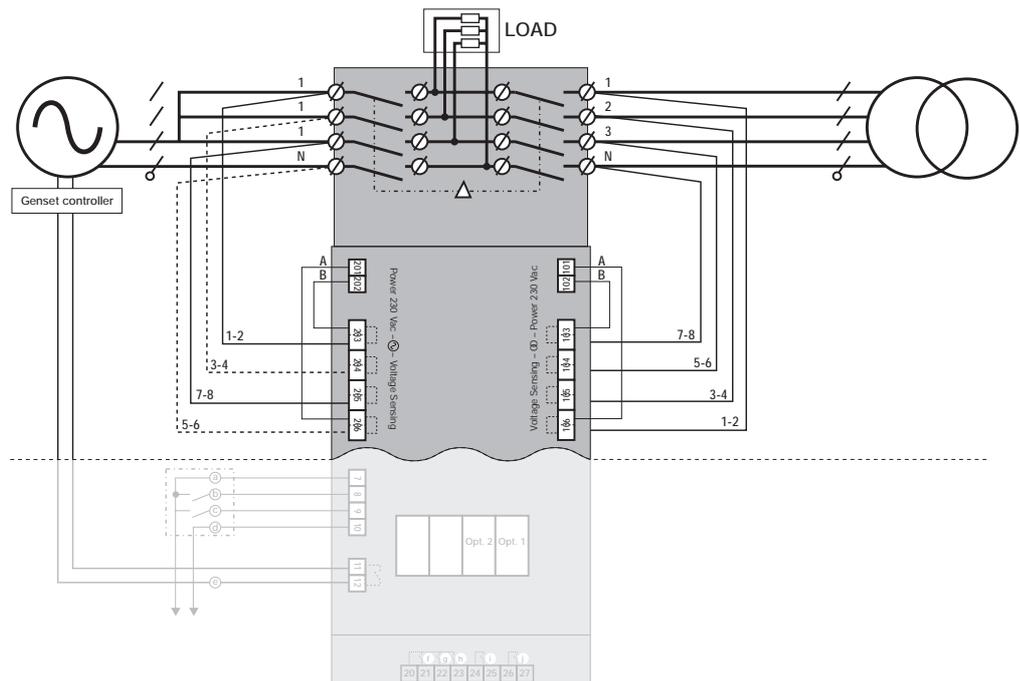
INPUTS AND OUTPUT CONTACTS

Identification	Terminals	Type	Feature	Rating
a	7		Inputs Common terminal	Max direct voltage 30 Vdc - Min direct voltage 10 Vdc / Max inverse voltage 30 Vdc - Galvanic insulation 3 kV (1 min 50 Hz) / Min pulse duration 1 s - Max number of operations 10^8
b	7-8	Input	AT Timer inhibit input Dry contact to close between terminals 7-8 to inhibit AT timer	
c	7-9	Input	Remote test on load input Dry contact to close between terminals 7-9 to start remotely a test on load (only available in automatic mode)	
d	10	Power supply	Power supply dedicated to lightning option $15\ Vdc < V_{7\text{-}10} < 16\ Vdc$ without load $9\ Vdc < V_{7\text{-}10} < 10\ Vdc$ for 1 to 4 inputs	
e	11-12	Output	Start Gen signal 250 Vac - 8 A Maximum capacity: 2000 VA 30 Vdc - 1 A	

PRODUCT USE

⚠️ Verify power applied on the electronic module power inputs terminals 101-102 or 201-202 before powering up the unit.

GENERAL INTRODUCTION

The product provides sources availability monitoring, Automatic/Manual Retransfer, Manual/Automatic or Test operation monitoring, voltage and frequency metering, and good operation or error information.

The product requires at least one type of network configuration and a network nominal voltage configuration to be input via the keypad by the user.
Other default values can be kept or modified according to hereafter programming guidelines.

ELECTRONIC MODULE USAGE

Front Panel Introduction

The electronic module is directly mounted on the motorised block.

It integrates the following features:
- Voltage and frequency metering
- Automatic transfer controls

Following diagram introduces product front panel.

Led indication is only active once the product is powered (power led activated).

LCD
- 7 digits to display information
- 14 pointers to inform about displayed information unit or source:
  - ⊙: Mains information
  - ⊙: Generator information
  - L1, L2, L3 : Information regarding Phase 1,2 or 3
  - ⊠: Timer active
  - PROG: Programming active
  - Com: communication active
  - V: Volt
  - Hz: Hertz
  - %: percentage
  - sec: second
  - min: minute
  - n°: number of commutations

Modes annunciation and Tests
- 1 Top yellow led for Manual Mode position linked to the key position
- 1 green led for Automatic Mode position linked to the key position
- 2 Bottom yellows leds for Test On and Off Load position Linked to the test pushbutton press
Symbols are represented to make comprehension easier

Source availability
- 2 green Leds to indicate if Gen and Mains sources are available (voltage and frequency measurement)
  - Led is on = source available
  - Led is off = source missing

Switch state
- 2 green Leds to indicate if the switch is opened or closed
  - Led is on = switch is closed
  - Led is off = switch is opened
- 1 Yellow led to indicate if both switches are in 0 position
  - Led is on = both switches opened
  - Led is off = Gen or Mains switch closed

Push button
- 🏠: Home push button during programming
- 💡: Lamps test button

Keypad

Error Led
- 1 red led to indicate a fault
  - Led is on = switch error
  Action from software not confirmed by an auxiliary contact. Reset after power off
  - Led blinks in case of lightning protection operation
  No reset required (blinking disappears once input is low)

Power Led
- 1 green led
  - Blinks slowly as soon as the product is powered and software runs correctly
  - Always on = Power OK and software error
  - Always off = Power off or software error if another led is on and LCD is OK

Retransfer Inhibit
- 1 yellow Led, linked to retransfer inhibit pushbutton
  - Led is on = retransfer inhibit feature is active
  - Led is off = retransfer inhibit inactive
  - Led is blinking = retransfer is blocked, waiting for a push on the retransfer inhibit pushbutton to allow retransfer

Switch Position Indications
- 0, 1 or 2 position display

Keyswitch
- Insert key to allow switch operational mode modification
- Turn right to access automatic mode
- Turn left to access manual mode

Manual Operation
- Insert handle to manually operate the switch.
- Manual operation only possible in Manual mode (keyswitch), when not padlocked

Padlock
- Pull the yellow handle to allow padlock insertion
- Padlocking posibble in position 0,1 or 2 but only in Manual mode (keyswitch position), handle out of housing.

PRODUCT USE (continued)

Software version is displayed on the unit after reset (powering up action after 2 minutes power off to discharge the unit).

Version Number

Before first product use, access programming mode and verify product programming parameters.

Product Programming

Product Programming is possible in Automatic Mode in position 1 when the Mains Source is available, or in Manual mode.

It is not accessible when a test or an automatic sequence is activated.

PROGRAMMING ACCESS

Programming mode is accessible by pressing and holding the validation pushbutton for 5 seconds and then entering the code 1000:

Press for 5 seconds

Press once to display 1
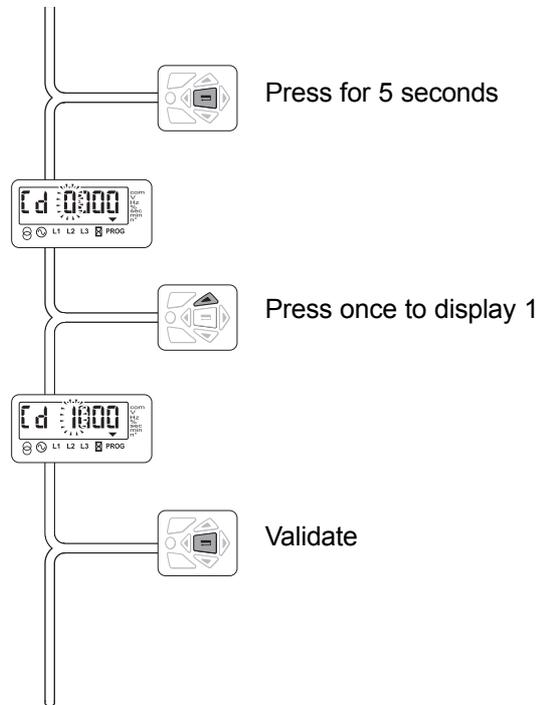
Validate

Access to programming Menus

PROGRAMMING EXIT

To exit the Programming and come back to visualisation mode, hold the validation pushbutton for 5 seconds.

PRODUCT USE (continued)

Default values are loaded as standard.

PROGRAMMING MENUS

Architecture and navigation

The programming mode integrates 5 Menus

Setup : Network parameters
Volt : Voltage detection levels
Fr : Frequency detection levels
tim : Automatic timer settings
Comm: Communication parameters (Optional), communication module must be plugged.

Setup parameters must always be verified / modified in accordance to the application.
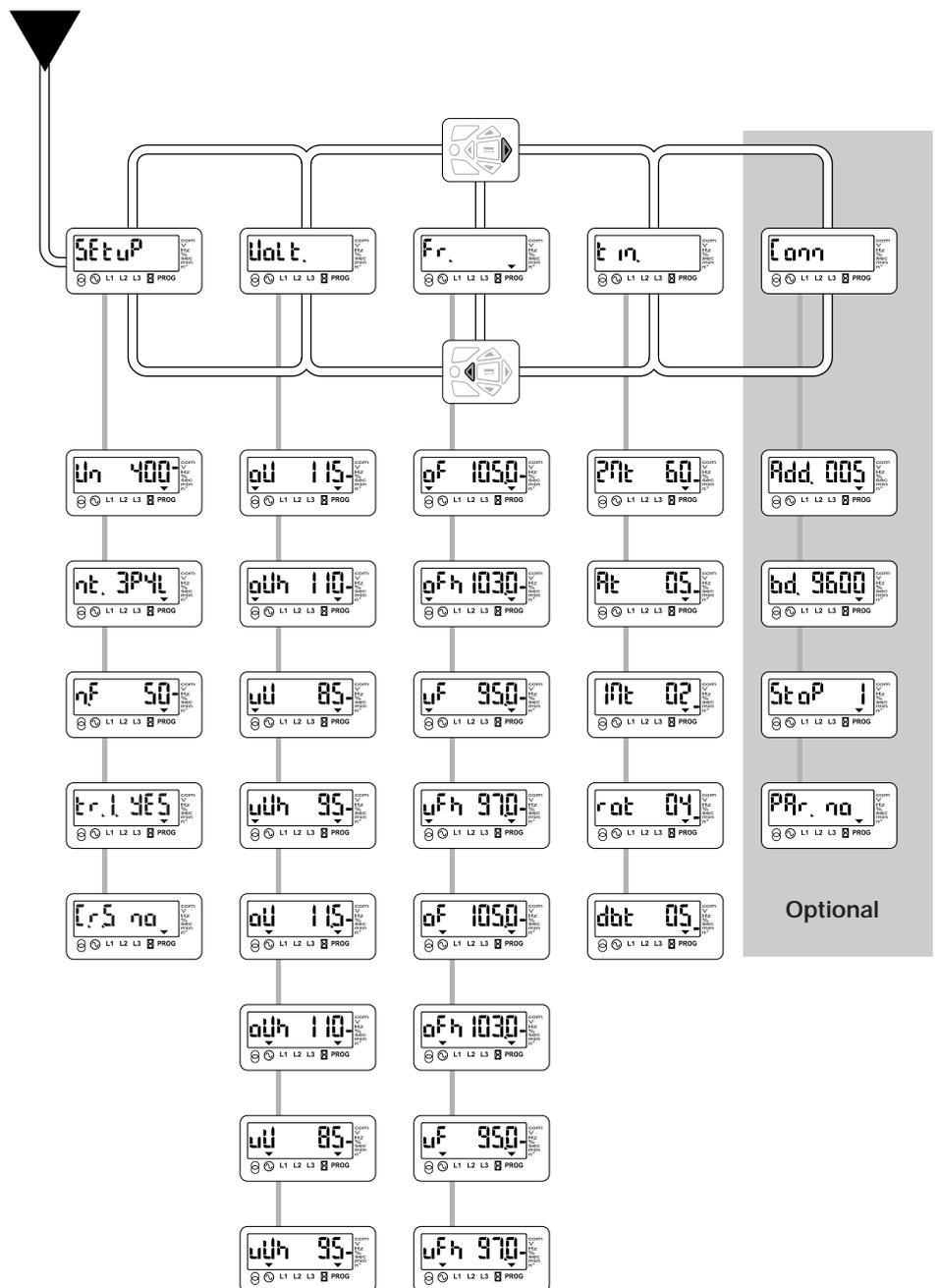
The first menu to access is the Setup menu

PRODUCT USE (continued)

SETUP MENU

Parameter Display

The setup menu integrates 5 parameters described in the table hereunder.
The table explains parameters' definition, settings possibilities, and default values.

Press ⬇ Down push button to access parameter required.

Press ⬆ Up push button to come back to previous value, or press

to come back to 　SEtuP　.
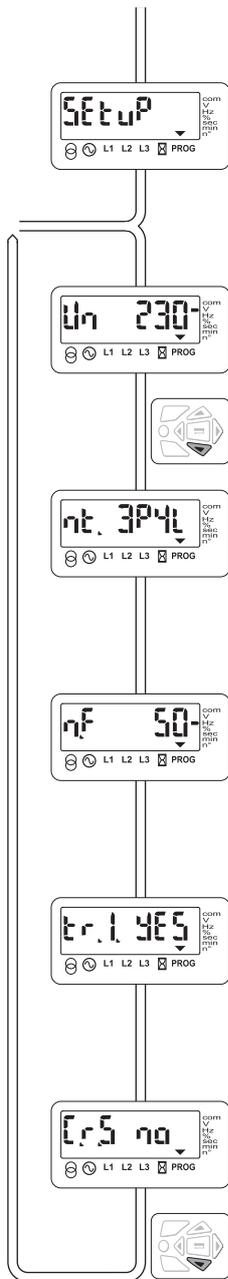
Definition	Setting range	Default value
Un: Phase-Phase nominal voltage.	From 110 to 480 V	400 V AC
nt: Network configuration. Type of metering (1P or 3P phases). Number of active wires (2L, 3L or 4L) definition.	1P2L, 1P3L, 3P4L 3P3L, IPAP	3P4L
Fn: Nominal frequency.	50 or 60 Hz	50 Hz
trI: Retransfer inhibit feature: press on RTI button required to allow retransfer from gen to main.	Yes or No	Yes
Crs: Reset number of commutation counter (from Main to Gen). Displays no once reset.	Yes or No	No

PRODUCT USE (continued)

Display the required parameter for modification.

Apply the same procedure described hereunder for network voltage modification, to all other parameters.

Possible settings are described in the previous table.

Example :
We want to modify network voltage from 400 V to 230 V.

Press — to access the first digit (blinking)

Press — twice to display 2 (blinking)

Press — to access the second digit (blinking)

Press — 3 times to display 3 (blinking)

Press — to validate the value
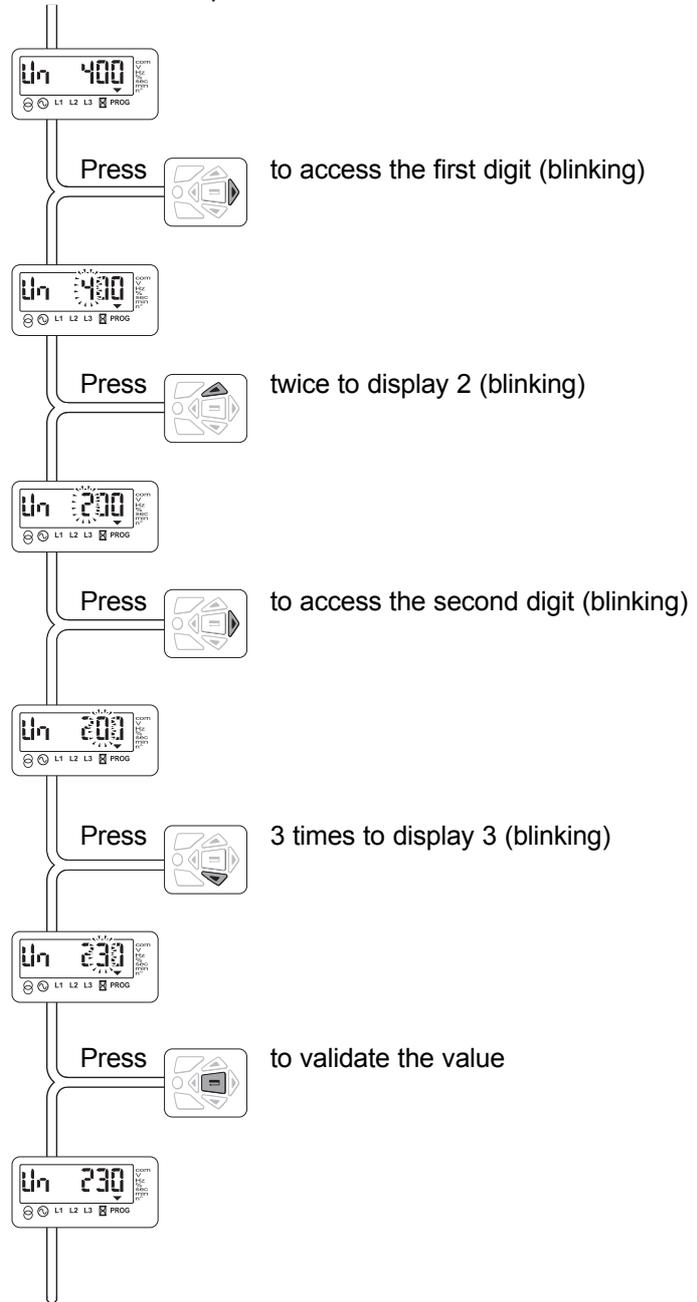
To return to Setup menu press home pushbutton or press down to continue.

Press — to return to Setup menu

Press — to reach next parameter
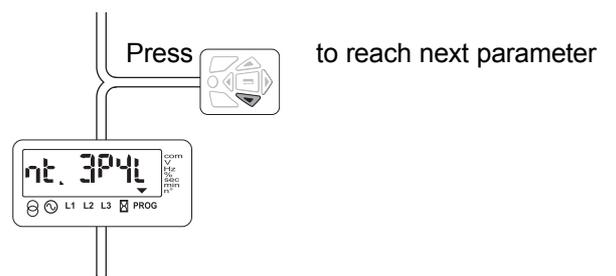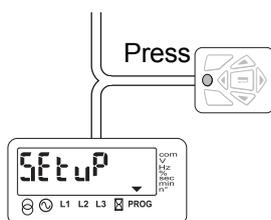
PRODUCT USE (continued)

VOLTAGE MENU

To reach voltage menu from Setup menu press once ⬡.

Parameter Display

The voltage menu integrates 8 parameters described in the table hereunder.
The table explains parameters' definition, settings possibilities, and default values.
Over and Under voltage conditions are verified on Mains and Generator side to allow operation as per the flow chart. Mains sensing is 3 phase and Generator sensing single phase.
Over and under voltage detection levels + hysteresis are defined as percentage of nominal voltage.
Hysteresis levels allow under and over voltage conditions reset (voltage needs to pass hysteresis level to reset).

Press ⬡ Down push button to access parameter required.

Press ⬡ Up push button to come back to previous value

or ⬡ to come back to ⬚.
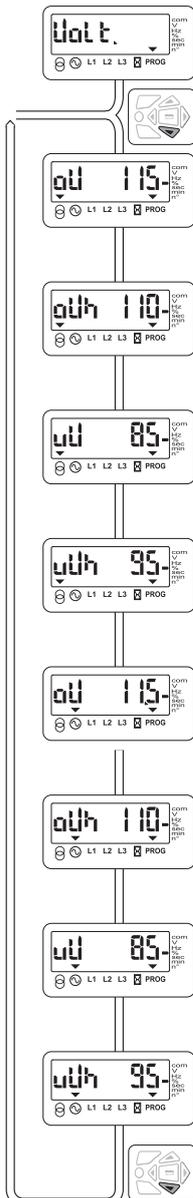
Definition	Setting range	Default value
oU: Main Over voltage detection	102 - 120 %	115 %
oUh: Main Over voltage hysteresis detection	101 - 119 %	110 %
uU: Main Under voltage detection	80 - 98 %	85 %
uUh: Main Under voltage hysteresis detection	81 - 99 %	95 %
oU: Generator over voltage detection	102 - 120 %	115 %
oUh: Generator over voltage hysteresis detection	101 - 119 %	110 %
uU: Generator under voltage detection	80 - 98 %	85 %
uUh: Generator under voltage hysteresis detection	81 - 99 %	95 %

PRODUCT USE (continued)

Parameter modification

Display the required parameter for modification.
Apply the same procedure as described in Setup Menu for network voltage modification. Possible settings are described in the previous table.

FREQUENCY MENU

To reach frequency menu from voltage menu press once .

Parameter Display

The frequency menu integrates 8 parameters described in the table hereunder.

The table explains parameters' definition, settings possibilities, and default values. Over and Under frequency conditions are verified on Mains and Generator side to allow operation following operational flow chart.

Over and under frequency detection levels + hystérisis are defined as percentage of nominal frequency.
Hysteresis levels allow under and over frequency conditions reset (frequency needs to pass hysteresis level to reset).

Press Down push button to access parameter required.

Press Up push button to come back to previous value

or to come back to .
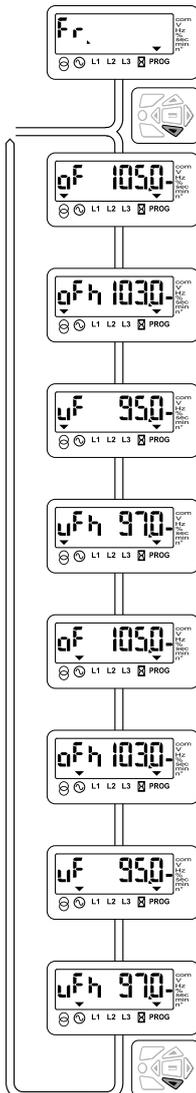
Definition	Setting range	Default value
oF: Main over frequency detection	101 - 120%	105%
oFh: Main over frequency hysteresis	100.5 - 119.5%	103%
uF: Main under frequency	80 - 99%	95%
uFh: Main Under frequency hysteresis	80.5 - 99.5%	97%
oF: Gen over frequency	101 - 120%	105%
oFh: Generator over frequency hysteresis	100.5 - 119.5%	103%
uF: Generator under frequency	80.5 - 99.5%	95%
uFh: Generator under frequency hysteresis	80 - 99%	97%

PRODUCT USE (continued)

Display the required parameter for modification.
Apply the same procedure as described in the Setup Menu for network voltage

modification. Possible settings are described in the previous table.

TIMERS MENU

To reach timer menu from. frequency menu press once [⟩].

Parameter Display

The timers menu integrates 5 parameters described in the table hereunder.
The table explains parameters' definition, settings possibilities, and default values.

Timers operation is described in operational flow chart page.

Press [▼] Down push button to access parameter required.

Press [▲] Up push button to come back to previous value

or [●] to come back to [t ın.].
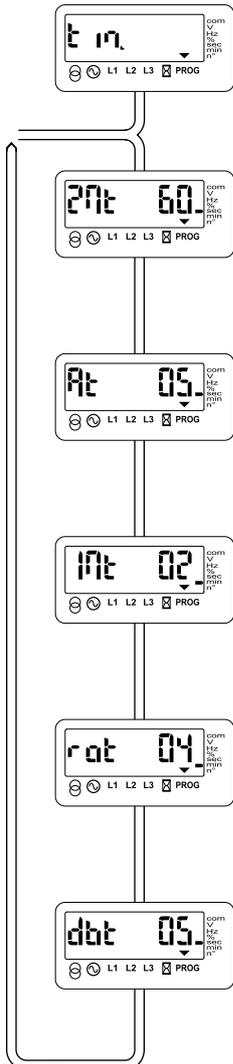
Definition	Setting range	Default value
2Mt: loss of mains validation timer. Once mains has disappeared, 2Mt is started. If Mains comes back before 2Mt ends, the commutation cycle is not started. (Delay on Gen start.)	0 to 60 sec.	5 sec.
At: Generator voltage and frequency stabilisation timer. Generator needs to be stable during AT to allow transfer from Mains.	0 to 60 sec.	5 sec.
1Mt: Mains Return validation timer. Once main is back 1Mt is started. If Mains disappears before 1Mt ends, the load is not switched back to the Mains.	0 to 30 min.	2 min.
rot: Run on time timer. Once the load is switched back from the Generator to the Mains, ROT is started and the Generator will stop once ROT is finished (allows generator cool down).	0 to 10 min.	4 min.
dbt: Dead Band timer. This timer is counted down before transferring the load from the Mains source to the Generator or vice versa. It allows the load residual voltage to decrease under a non critical value before transfer (Necessary in case of rotating loads).	0 to 20 sec.	5 sec.

PRODUCT USE (continued)

⚠ This menu is only accessible when the option has been purchased and is present in the optional slots. Once plugged into the electronic module, a 2 minutes power off action is required for option identification by software.

Parameter modification

Display the required parameter for modification.

Apply the same procedure as described in the Setup Menu for network voltage

modification. Possible settings are described in the previous table.

COMMUNICATION MENU (OPTIONAL)

To reach timer menu from. frequency menu press once .

Parameter Display

The COMM menu integrates 4 parameters described in the table hereunder.

The table explains parameters' definition, settings possibilities, and default values.

Communication operation is described in paragraph 5.

Press Down push button to access parameter required.

Press Up push button to come back to previous value

or to come back to .
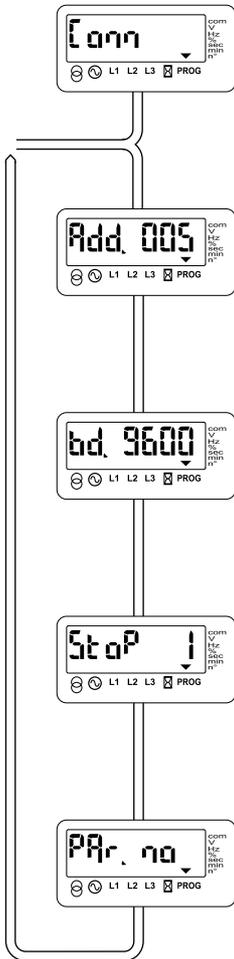
Definition	Setting range	Default value
Slave Jbus /Modbus adress	001 to 247	005
Communication Speed	2400,4800,9600, 14400,19200, 28800, 38400	9600
Stop Bit	0,1,2	1
Parity	No, Eve (Even), Odd	No

PRODUCT USE (continued)

General comments

Metering is active as soon as the unit is powered.
Commutation cycles have priority over Visualisation mode and display timers count down as soon as they are active. Any value available in this mode can be kept on the screen once displayed.

After commutation cycle, the display comes back to Mains voltage L1N (first variable of the mode).
Visualisation mode architecture is as described hereunder.

General comments

To access requested value press ⬇️ , ◀️ , ◀️ or ⬆️ .

⚠️ If lightning protection option is fitted, LIP menu is avaible. cf option 4.
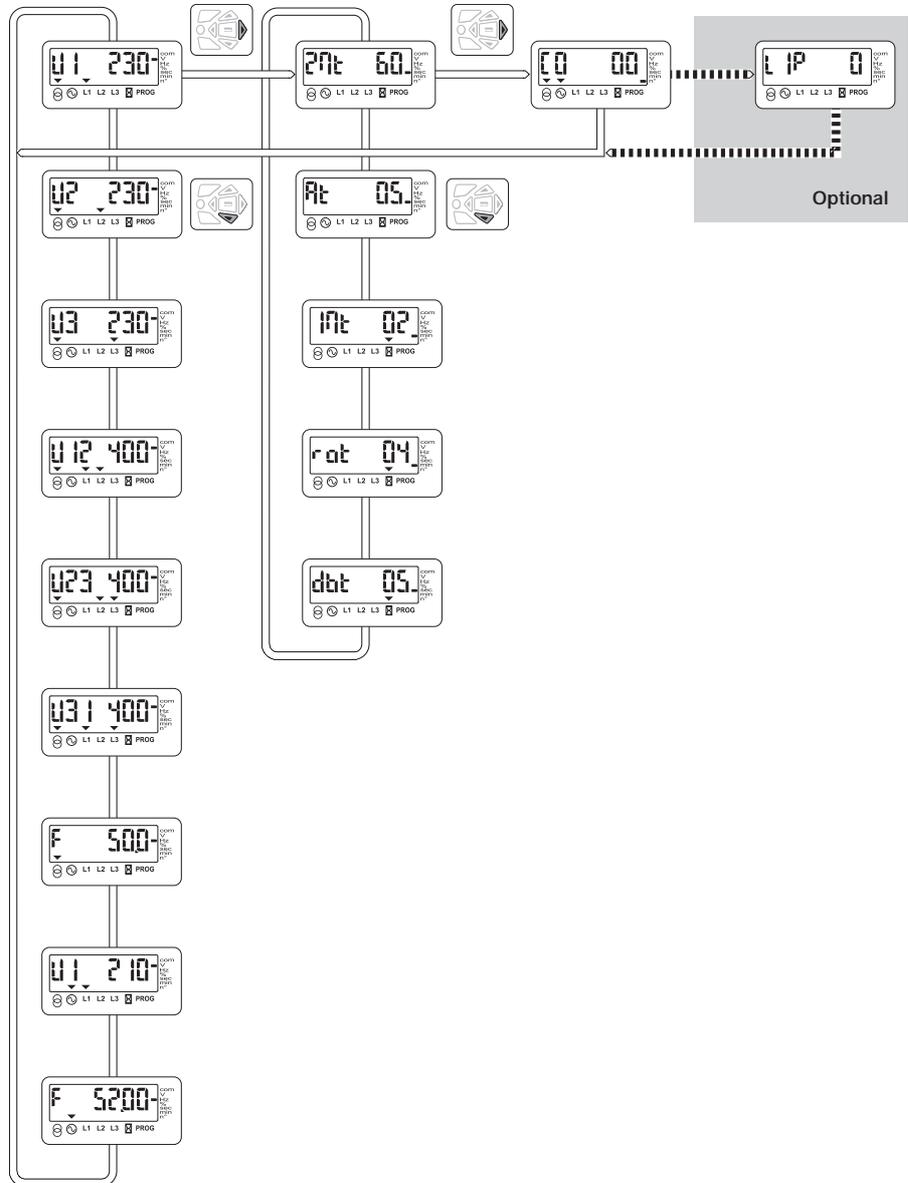
PRODUCT USE (continued)

⚠️ All these values are not accessible on all networks.

- 3P4L
  Main U1, U2, U3
       U12, U23, U31
  Gen U31

- 1P3L
  Main U12, U23, U31
  Gen U31

- 1P2L
  Main U31
  Gen U31

- 3P3L
  Main U12, U23, U31
  Gen U31

- 1PAP
  Main U1, U2, U3
  Gen U31

Reminder:
Mains sensing is 3 phases.
Generator sensing is single phase.

⚠️ LIP = option

Values definition

U1 230	Main Voltage L1-N
U2 230	Main Voltage L2-N
U3 230	Main Voltage L3-N
U12 400	Main Voltage L1-L2
U23 400	Main Voltage L2-L3
U31 400	Main Voltage L3-L1
F 50.0	Main frequency
U31 400	Generator Voltage L3-L1
F 52.00	Generator Frequency
2Mt 60.	Loss of Mains validation Timer
At 05.	Delay on transfer Timer
1Mt 02.	Mains return validation timer
rat 04.	Run on timer (Generator cool down period)
dbt 05.	Dead Band timer
C0 00.	Main -> Gen commutation Counter
LIP 0	Lightning protection operation (0 or 1)
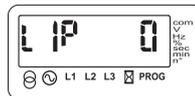
PRODUCT USE (continued)

⚠️ Do not force the product

⚠️ Do not leave the manual handle in automatic mode.

MANUAL MODE

To access Manual Mode turn the front keyswitch to manual position.

Manual operation

Take the handle, attached to the chain, on the right side of the enclosure, to manually operate the switch.
Verify the switch position on the front position label before any manual operation.

- From. Position 1 turn clockwise to reach position 0
- From. position 0 turn clockwise to reach position 2
- From. position 2 turn anti clockwise to reach position 0
- From. position 0 turn anti clockwise to reach position 1

Padlocking

Padlock is only possible in manual position.
- handle must be out of its housing to padlock
- padlock is possible in position 0, 1, 2.
Manually pull the padlock handle to allow padlock insertion in the hole.

Manual mode operation

Once in manual mode it is possible :
- To access programming and visualisation menus
- To padlock the switch
- To operate the switch with the handle
- To start the Gen using test off load pushbutton.

MANUAL MODE				
Programming	Visualisation	Padlocking	Handle Operation	Start Generator (Test off Load)
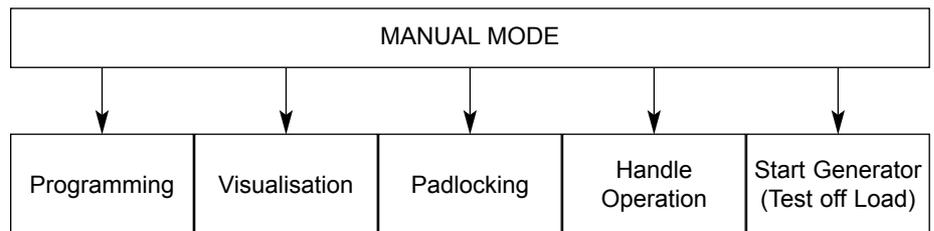
PRODUCT USE (continued)

Turn the keyswitch from Manual to Automatic position.
The automatic mode must be activated as soon as automatic starting of the generator and source switching is required after loss of mains condition.

The unit integrates a power capacitor source to provide enough power during black out (loss of mains) to wait for generator starting. (It does not have power to drive the switch to zero position). Further external protection will be required if "phasing" is a concern.

Possible actions

Once in automatic mode it is possible:
• To access programming and visualisation menus
• To start off load or on load testing
• To start a loss of Mains sequence
• To start a Mains return sequence

AUTO MODE					
Programming	Visualisation	Off load testing	On load testing	Loss of Mains sequence	Mains Return sequence
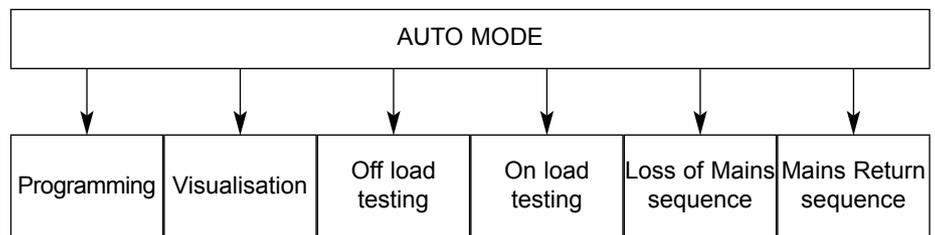
Manual-automatic mode / power return condition

• As soon as the unit is switched from Manual to Automatic mode, the automatic cycle is started.
• Mains and Generator voltage & frequency are verified to define the new stable position of the switch.

• The same table is considered after a complete power off action (Power Cap must be completely discharged = 2 minutes).

Read timers definition for 1MT or 2MT understanding.

New stable switch position:

Original switch position	Status of supply	New position
Mains	Available, genset available or unavailable	Mains
Mains	Mains unavailable for 2MT time period, genset available or unavailable	Genset. If genset unavailable start genset first and wait for AT timer period before transfer
Genset	Genset on load, mains unavailable	Genset
Genset	Genset on load, mains available for 1MT time period	Mains
Zero	Mains available, genset unavailable	Genset to count down 1MT before transfer to Mains
Zero	Mains available, genset available	Mains
Zero	Mains unavailable, genset available	Genset
Zero	Mains unavailable, genset unavailable	No action (because no supply). When supply becomes available change to mains or genset

The switch immediately transfers as soon as the keyswitch is turned from Manual to Automatic mode or as soon as Power comes back.

PRODUCT USE (continued)

This Sequence is started as soon as the switch is in automatic mode and in position 1.
Position 1:
• Mains is available
• Switch is in position 1 (Mains)
• Generator is on or off

Specific features

Remote AT timer Inhibit
It is possible to bypass the At timer using the ATI input (closing the contact) when At timer setting is at its maximum value = 60s.
• Active when At = At Max = 60 s (cf programming mode).
• When input ATI (terminals 17-18) is high, At is bypassed.

Sequence description

```
                        ┌─────────────────┐
                        │ Automatic mode  │
                        └─────────────────┘
       Loss of                  │
       mains?              ◇ Loss of main? ──No──┐
                                │ Yes            │
                                                 │        ┌────────────────────────┐
                                                 └──────→ │ Power Cap Activation    │
                          ◇ Count down 2MT ──2MT = 0──┐   │ until Genset availability│
                                │                     │   └────────────────────────┘
                       Main comes back          Genset start up
                       before 2MT ends?           │
                          ┌──────────┐     ┌──────────────┐
                          │ Reset 2MT│     │ Start Genset │
                          └──────────┘     └──────────────┘
                                                 │
                                          ◇ Generator available? ──Yes──┐
                                                 │ No              │ No  │
                   ┌──────────┐                  │                      │
                   │ Stop gen │◇── Yes ◇ Mains avaible ?              │
                   └──────────┘                                         │
                                                                        │
                                          ◇ ATI = AT max ? ──Yes──┐     │
                  ┌──────────┐                  │ No              │     │
                  │ Reset AT │            ◇ ATI = 1 ?             │
                  └──────────┘                  │                 │
                          Gen fails  ◇ Count down AT              │
                                           │ AT = 0               │
                                     ◇ DBT =/0 ? ──No────────┐
                                  Yes │                      │
                           ┌─────────────┐                   │
                           │ Transfert 1->0│                 │
                           └─────────────┘                   │
                           ┌─────────────┐                   │
                           │Count down DBT│                  │
                           └─────────────┘                   │
                                  │ DBT = 0                   │
                           ┌─────────────┐          ┌─────────────┐
                           │ Transfert 0->2│        │ Transfert 0->2│
                           └─────────────┘          └─────────────┘
                                          Transfert 1-2
                                     ┌──────────────────┐
                                     │ Go to mains'     │
                                     │ return automatic │
                                     │ sequence         │
                                     └──────────────────┘
```

PRODUCT USE (continued)

MAINS RETURN AUTOMATIC SEQUENCE

This sequence is started as soon as the unit is in automatic mode and in position 2.
Position 2:
• Mains is not available
• Switch is in position 2 (Generator)
• Generator is off

Specific features

Retransfer Inhibit Feature
• Once the Mains is back, it might be preferable not to immediately transfer the load from the generator to the mains.
• If Retransfer inhibit feature has been enabled in the programming mode, the RTI led is on (default value).
• Once retransfer from the Generator to the Mains is ready, RTI feature blocks the retransfer and the RTI led is blinking.
• A manual press on the RTI push button is necessary to start retransfer.

RTI Led

RTI pushbutton

Sequence description

Main not available
Generator running &
Switch in position 2

Main's return

Main's return? — No

Yes

Count down IMT — 1MT = 0

Main's lost again
before 1MT
times out?

Reset 1MT

Time delay on transfer

Loss of Mains ? — Yes / No

RTI activated? — Yes / No

RTI PB pressed ? — Yes / No

DBT ≠ 0? — Yes / No

Transfert 2 ≥ 0

Count Down DBT — DBT = 0

Transfert 0 ≥ 1

Transfert 2 ≥ 1

Count Down ROT — ROT = 0

Loss of main's

Reset ROT

To loss of main's sequence

Stop generator
position 1
Back to main's control

PRODUCT USE (continued)

TEST MODE ACCES

Press and hold the test pushbutton for 5 seconds to allow test modes access.

Enter code = 4000

Press   during 5 sec

Cd 0000

Press   4 times to display 4

Cd 4000

Validate
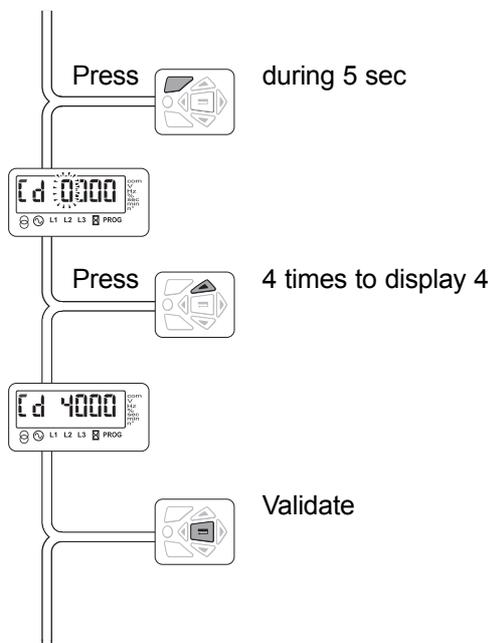
TEST MODE EXIT

Press and hold the test pushbutton for 5 seconds to exit test mode and come back to visualisation mode after test achievement.   TEST

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PRODUCT USE (continued)

This test is possible in automatic in position 1 when the mains is available or in manual mode. It can be considered as a Generator manual start in manual mode.

Description

- This mode allows generator testing without load transfer from the Mains to the Generator.
- The generator is started and stopped normally
- This test is possible in automatic or manual mode
- This test is not possible when an automatic sequence is running.

Sequence

Press Test pushbutton to make test off load Led blink and press validation pushbutton to start.
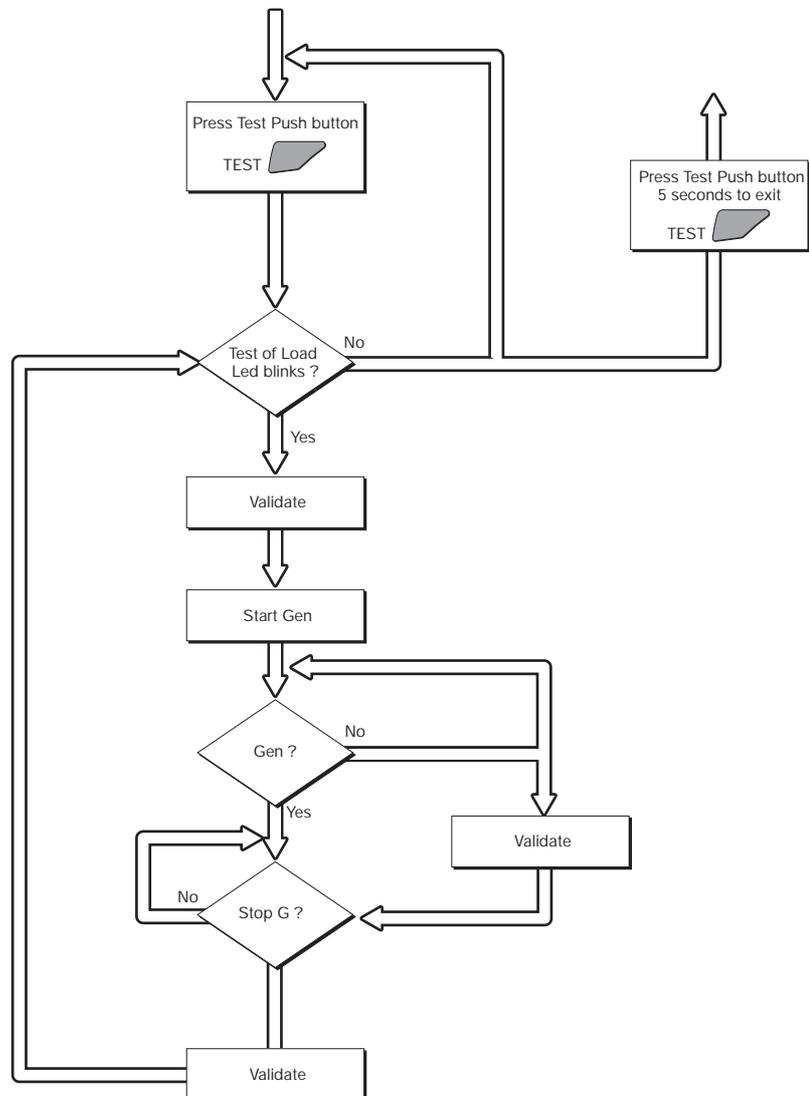
In automatic mode, as soon as you enter in test mode option, 't on l'is displayed. Press test key once for to reach test on load option.

PRODUCT USE (continued)

ON LOAD TESTING

Keypad activation

This test is only possible in automatic mode in position 1 and Mains available.

Description

- This test simulates a loss of mains condition. Loss of Mains sequence is started and Mains return sequence automatically activated as soon as generator is available.
- All timers are run following their setting.
- The retransfer inhibit feature is always activated during test on load (from keypad).

Description

Press Test pushbutton to make test on load Led blinking and press validation pushbutton to start the cycle, Following Loss of Mains + Mains return sequences.

Remote activation via remote test on load input

It is possible to remotely start the test on load closing contacts 7 and 9 on the electronic module.

The cycle is started as soon as the input is closed.

The retransfer from. generator to mains is blocked, and only allowed once the input is de activated.

COMMUNICATION

The JBUS/MODBUS® used by the ATI involves a dialogue using a master-slave hierarchical structure. There are two possible dialogues:
- the master communicates with a slave (ATI) and waits for its reply
- the master communicates with all the slaves (ATI) without waiting for their reply.

The mode of communication is the RTU (Remote Terminal Unit) using hexadecimal characters of at least 8 bits.

The standard communications frame consists of:

Slave address	Function code	Address	Data	CRC 16
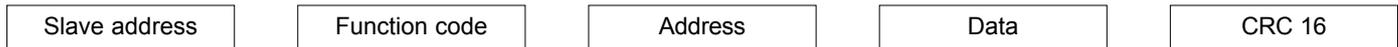
NB:
When selecting slave address 0, a message is sent to all the instruments present on the network (only for functions 6 and 16).

According to the JBUS/MODBUS® protocol, transmission time must be less than 3 silences, i.e. the emission time of 3 characters so that the message is processed by the ATI.

To correctly use information, the following functions are important:
- 3 : to read n words (maximum 128).
- 6 : to write one word.
- 8 : to diagnose exchanges between the master and the slave via meters 1, 3, 4, 5 and 6.
- 16 : to write n words (maximum 128).

Comment:
The maximum reply time is 250 ms.

LIST OF PARAMETERS TO BE DISPLAYED (FUNCTION 3)

Table of values on 2 words

Decimal Address	Hexa Address	Number of words	Variable	Units
776	308	2	U12Main	V/100
778	30A	2	U23Main	V/100
780	30C	2	U31Main	V/100
782	30E	2	V1Main	V/100
784	310	2	V2Main	V/100
786	312	2	V3Main	V/100
788	314	2	Freq.Main	Hz/100
884	374	2	U31Gen	V/100
892	37C	2	FreqGen	Hz/100
894	37E	1	1MT	s
895	37F	1	2MT	s
896	380	1	AT	s
897	381	1	DBT	s
898	382	1	ROT	s

Example:
To read U31 gen = 228,89, the following message should be sent :

Slave	Function	High-order address	Low-order address	High-order word n°	Low-order word n°	CRC 16
05	03	03	74	00	02	85D1

ATI reply:

	Slave	Function	Number of bytes	Value high-order	Value low-order	CRC 16
Hex	05	03	04	59	69	458D
Dec				89	105	

Decimal value = 89 x 256 + 105 = 22889 (/100)

COMMUNICATION (continued)

Table of values on 1 word

Decimal Address	Hexa Address	Number of words	Variable	Units
1792	700	1	U12 Main	V/100
1793	701	1	U23 Main	V/100
1794	702	1	U31 Main	V/100
1795	703	1	V1 Main	V/100
1796	704	1	V2 Main	V/100
1797	705	1	V3 Main	V/100
1798	706	1	Freq. Main	Hz/100
1801	709	1	U31 Gen	V/100
1805	70D	1	Freq. Gen	Hz/100
1806	70E	1	1MT Timer	s
1807	70F	1	2MT Timer	s
1808	710	1	AT Timer	s
1809	711	1	DBT Timer	s
1810	712	1	ROT Timer	s

Table of values of the programming zone

Decimal Address	Hexa Address	Number of words	Variable	Units	Standard Product
512	200	1	Type of network - 0=3P4L - 1=1P3L 2=1P2L - 3=1PAP 4=3P3L		x
518	206	1	VNominal	V	x
519	207	1	FNominal - 50 or 60	Hz	x
521	209	1	Transfer Inhibit Feature	0=No, 1=Yes	x
522	20A	1	VOver	% (0-100)	x
523	20B	1	VHystOver	% (0-100)	x
524	20C	1	VUnder	% (0-100)	x
525	20D	1	VHystUnder	% (0-100)	x
526	20E	1	VGenOver	% (0-100)	x
527	20F	1	VHystGenOver	% (0-100)	x
528	210	1	VGenUnder	% (0-100)	x
529	211	1	VHystGenUnder	% (0-100)	x
530	212	1	FOver	% (0-100)	x
531	213	1	FHystOver	% (0-100)	x
532	214	1	FUnder	% (0-100)	x
533	215	1	FHystUnder	% (0-100)	x
534	216	1	FGenOver	% (0-100)	x
535	217	1	FHystGenOver	% (0-100)	x
536	218	1	FGenUnder	% (0-100)	x
537	219	1	FHystGenUnder	% (0-100)	x
538	21A	1	1MT Timer	min	x
539	21B	1	2 MT Timer	s	x
540	21C	1	AT Timer	s	x
541	21D	1	DBT Timer	s	x
542	21E	1	ROT TImer	min	x

COMMUNICATION (continued)

Example:
Configuration of 233 V nominal
voltage for ATI n° 5.

	Slave	Function	High-order address	Low-order address	N° word		N° octet	High-order word n°	Low-order word n°	CRC 16
Hex	05	10	02	06	00	01	02	00	E9	76B8
Dec		16							233	

ATI reply:

Slave	Function	High-order address	Low-order address	N° word		CRC 16
05	10	02	06	00	01	E1F4
			89	105		

SAVED COMMAND (RESET)

The following command should be done to save programming parameters changes for ATI number 5.

NB:
ATI will not reply to this command.

Slave	Function	High-order address	Low-order address	Values	CRC 16
05	06	06	00	0000	88C6

Diagnostic zone

Decimal Address	Hexa Address	Number of words	Variable	
257	101	1	Product Identification	Standard version 1239 Metering version 1241
258	102	1	SlotIdentOption 1	available option 0 communication option Option of slot 1 0xFF no option 0x20 Main/Gen
259	103	1	SlotIdentOption 2	available option 0 communication option Option of slot 2 0xFF no option 0x20 Main/Gen
260	104	2	Reserved	
262	106	1	Version	soft version of product
263	107	2	Serial number	serial number
265	109	17	Reserved	
278	116	1	Motor Mode	3 stable states Bit3 Bit2 Bit1 Bit0 1 0 1 0 Auto 1 0 0 1 Padlock 0 1 1 0 Manu
282	11A	1	Switch State	3 stable states Bit2 Bit1 Bit0 0 0 1 Position 1 0 1 0 Position 0 1 0 0 Position 2
283	11B	2	Reserved	
285	11D	1	CounterMainGen	Counter number of transfer

MAINTENANCE

		63/100/125A	250/400A	630A	
A	Front cover			BB	TT
		H = 576	H = 876	H = 876	H = 576
		L = 396	L = 596	L = 596	L = 396
		Ref : 610-831(BB / TT)	Ref : 610-832 (BB) Ref : 610-833 (TT)	Ref : 610-832	Ref : 610-834
B	Enclosure			BB	TT
		H = 600	H = 900	H = 900	H = 1400
		L = 400	L = 600	L = 600	L = 600
		P = 230	P = 305	P = 380	P = 380
		Ref : 610-825 (BB) Ref : 610-828 (TT)	Ref : 610-826 (BB) Ref : 610-829 (TT)	Ref : 610-827	Ref : 610-830
C	Cable gland Plate	Lp = 276	Lp = 495	Lp = 495	
		Pp = 128	Pp = 245	Pp = 328	
		Ref : 590-950	Ref : 590-951	Ref : 590-953	
D	Wall Mounting Brackets				
		Ref : 530-956			
E	Mechanical switch	H = 135	H = 160	H = 260	
		L = 231	L = 292	L = 359	
		P = 148	P = 148	P = 225	
		Ref : 604-670 (63A) Ref : 604-671 (100A) Ref : 601-702 (125A)	Ref : 604-673 (250A) Ref : 604-674 (400A)	Ref : 604-675 (630A)	
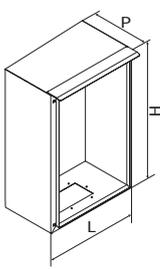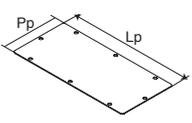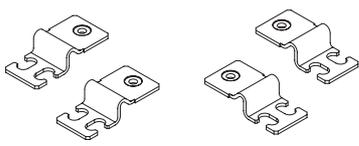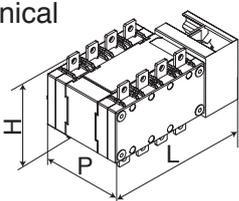
MAINTENANCE
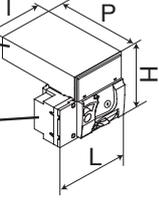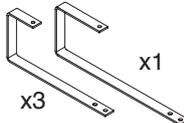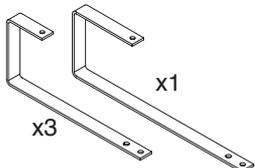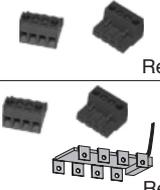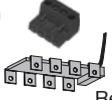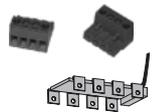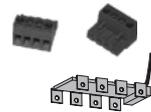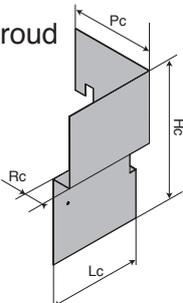
	63/100/125A	250/400A	630A
F — Bridging Bar Kit	Ref : 603-412	Ref : 603-413 (250A) Ref : 603-414 (400A)	Ref : 603-415
G1 — ATI Electronic Module $H = 180$ $L = 200$ $P = 250$ $l = 145$ **G2** — Motorized Module		G1 : Ref : 650-881	G2 : Ref : 650-700 (63A) Ref : 650-701 (100A) Ref : 650-702 (125A) Ref : 650-703 (250A) Ref : 650-704 (400A) Ref : 650-705 (630A)
H — Load Bar Kit		x1 / x3 Ref : 330-168	x1 / x3 Ref : 330-169
I — ATI Connectors Kit / ATI Voltage Sensing Kit	Ref : 656-931 Ref : 656-932	Ref : 656-933 (250A) Ref : 656-934 (400A)	Ref : 656-935
J — Terminal Shroud	$Hc = 300$ $Lc = 177$ $Pc = 176$ $Rc = 47$ Ref : 603-408 (BB) Ref : 603-417 (TT)	$Hc = 460$ $Lc = 277$ $Pc = 247$ $Rc = 57$ Ref : 603-409 (BB) Ref : 603-418 (TT)	$Hc = 640$ $Lc = 307$ $Pc = 315$ $Rc = 57$ Ref : 603-411 (BB) Ref : 603-419 (TT)
K — Handle with Chain	63/125A Ref : 604-668	125-630A Ref : 604-669	
L — Manual/auto Key		Ref : 531-273	
M — Leg Kit 630A			Ref : 509-310 x4