

CTI Transfer Panel

Technical Instruction Manual

GB



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GENERAL SAFETY INSTRUCTIONS

- This leaflet provides CTI Automatic Transfer Switch range, safety, connection and operating instructions.
- This system must always be installed and commissioned by specialised and qualified persons.
- Check earth cable connected before powering the unit
- Keep the cabinet clean using a dry cloth.
- It is recommended that this leaflet be kept in a place easily accessible to all of those who may need it.
- The maintenance operations must be carried out exclusively by authorised and appropriately trained personnel.
- This system complies with the community directives applicable to this product. Thus, it bears the CE mark.
- Compliance with IEC 60947-6-1.
- Information provided in this instruction manual is subject to change and not contractual.

INTRODUCTION

General introduction

The CTI enclosure integrates a 4-pole fast changeover switch including electronic control to meet the IEC 60947-6-1 standard. Thanks to the changeover switch technology, it is always possible to manually operate the system in order to guarantee the changeover panel operation under all circumstances.

This new development allows advantages brought using switch technology but keeps contactor control possible on request via programming (Refer to RETURN 0 Function).

CTI transfer panel range

CTI range is available from 63 A to 160 A in two different voltage configurations :

400 Vac P-P*	230 Vac P-P*
CTI 63 A	CTI_1 63 A
CTI 100 A	CTI_1 100A
CTI 125 A	CTI_1 125A
CTI 160 A	CTI_1 160A

The electronic module includes:

- Source supply monitoring
- Metering display (voltage and frequency as standard)
- Test operations and Sequences programming using keypad.

Manual & padlocking operations, as well as electronic module programming and use are directly accessible from the front panel.

Refer to Network configurations chapter to select correct model and configuration

Bottom cable entry is provided as standard.

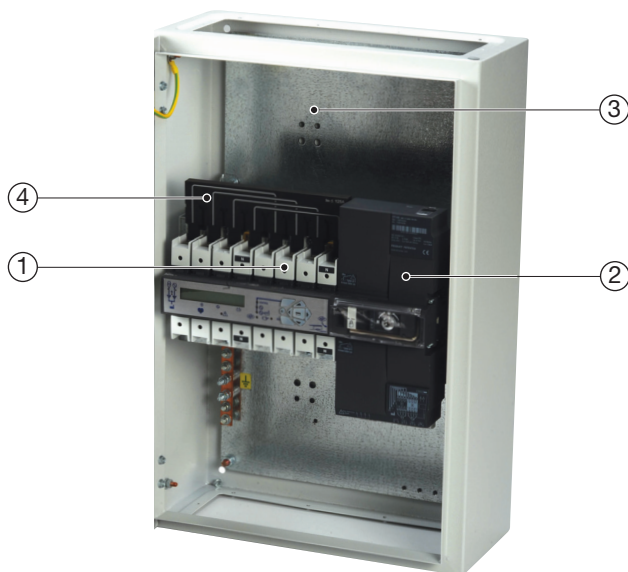
* : Phase to phase



Two types of products for two voltage configurations
 CTI : for 230 vac/400 vac
 CTI_1 : for 127 vac/230 vac

New changeover panel

The fast changeover solution contains four main integrated elements:



- ① 2 switches mechanically interlocked including electronic control and accessories.
- ② A fast electrical operation unit allowing electrical and manual operation of the system.
- ③ A dedicated enclosure
- ④ Bridging bar

> Features and benefits:

1 - SWITCH :

A **fully integrated & interlocked transfer system** with **high electrical characteristics** and a **fully programmable microprocessor control module & display**.

2 - OPERATION :

A **flexible** operating mechanism enables **fast automatic** or local/**emergency manual** operation with **padlocking** facility.

3 - ENCLOSURE :

A **steel enclosure** designed specifically to allow an **easy fixing and wiring of the changeover and its accessories** (IP54, Lightning protection...), as well as an ergonomic use thanks to a flush mounting **allowing a direct access to the means of visualization, configuration and control** (Auto & Manu).

Voltage options

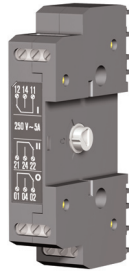
CTI power supply can carry from 220-20% Vac to 277+10% Vac under frequency 50Hz or 60Hz.

Two CTI versions have been developed to meet all of voltage configurations required.

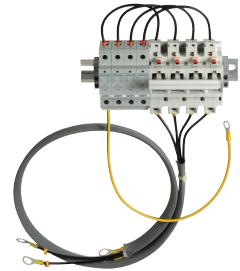
Accessories

> The following accessories are available as customer fitted options

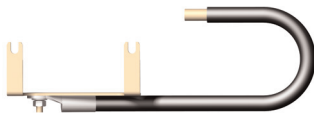
- **Auxiliary contacts module** for switch position information (Main, Gen, zero position). One module includes the 3 positions information. 1 module maximum is the standard CTI enclosure. Option code is TAUX.



- **Lightning protection.** It is available as an accessory to avoid ATS damage in case of a strike on the power cables. This option is highly recommended in stormy areas.



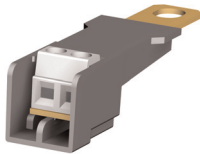
- **Solid neutral link** is available as an accessory, when switching of the neutral cable is not desired. Option code is TLNK.



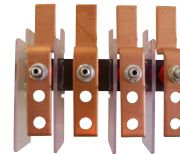
- **IP 54.** An IP54 accessory kit is available to protect the product against dust and water infiltrations. The kit includes : 1 windows to fix on the door cut-out and 1 protection screen kit to avoid direct contacts during manual operation when the door has to be opened.



- **Voltage Sensing tap** accessory allows for each pole voltage sensing or supply (on two 1.5mm² terminals) directly taken from power terminals via a dedicated plug.



- **Terminal extensions.** This accessory allow to convert the CTI plugs to terminal bars. 1 kit includes 3 terminal extensions pieces with their phase screen protection.



Environment

> The complete enclosure meets following environmental requirements:

- Ingress protection:
 - standard Enclosed product = IP4x (possible IP54 with option)
 - Loose product = IP21
- Operating conditions:
 - Temperature :
 - Of -10°C to +40°C without de-rating
 - Of +40°C to +65°C without de-rating
 - Humidity: 95% non condensing at +40°C
- Storage conditions :
 - Duration : 1 year maximum
 - Temperature: <+55°C
 - Humidity: 80% non condensing at 55°C
- Maximum operating altitude without switch de-rating is 2000 m above sea level.

TECHNICAL CHARACTERISTICS

	63A	100A	125A	160A
Frequencies	50 Hz & 60 Hz	50 Hz & 60 Hz	50 Hz & 60 Hz	50 Hz & 60 Hz
Thermal current I _{the} 40 °C (A)	63	100	125	160
Thermal current I _{the} 50°C (A)	63	100	110	125
Thermal current I _{the} 60°C (A)	50	80	100	100
Assigned insulation voltage U _i (V) (power circuit):	600	600	600	600
Assigned impulse voltage U _{imp} (kV) (power circuit):	6	6	6	6
Assigned insulation voltage U _i (V) (auxiliary circuit):	300	300	300	300
Assigned impulse voltage U _{imp} (kV) (auxiliary circuit):	2.5	2.5	2.5	2.5
Other characteristic at 40°C:				
Rated operational currents I_e (A)				
IEC 60947-3 characteristics 415 Vac				
AC 21A / 21 B	63/63	100/100	125/125	160/160
AC 22A / 22 B	63/63	100/100	125/125	125/160
AC 23A / 23 B	63/63	100/100	125/125	125/160
IEC 60947-6-1 characteristics 415 Vac				
AC 31B	63	100	125	160
AC 32B	63	100	125	160
Operating class				
Material class (according to 60947-6-1)	PC	PC	PC	PC
Maximum short circuit current using gG DIN fuse:				
Max short circuit (kA eff)	50	50	50	50
Associated fuse size (gG)	63	100	125	160
Peak current value: withstand and closing operation (kA peak)	7.5	11	13.5	16.5
Short circuit operation:				
Rated short time withstand current (kA eff) / 30 ms	5	5	5	5
Transfer time				
I-O / O-I / II-O / O-II (ms)	50	50	50	50
I-II or II-I (ms)	180	180	180	180
Blackout time during comutation under U _n (ms)	120	120	120	120
Power input				
Peak current during operation (A)	20	20	20	20
Continuous power consumption (VA)	6	6	6	6
Mechanical characteristics				
Number of mechanical operations (according to 60947-6-3)	10000	10000	10000	10000
Cables connection				
Minimum cable size (Cu mm ²)	25	35	50	50
Maximum cable size (Cu mm ²)	50	50	70	70

Single phase configuration :

Table available for single phase configuration using a 4 pole switch and connecting 2 poles in parallel (Max ambient temperature = 40°C)

Nominal rating 3 phase configuration (A)	Nominal rating 1 phase configuration (2 poles in //) (A)
63	100
80	125
100	160
125	200
160	250

- ▶ **First operation**
- ▶ **Wall mounting operation and dimensions**
- ▶ Accessories mounting
- ▶ Power cables connection
- ▶ Network configurations
- ▶ Control terminals connections

First operation

- The system is delivered in position 0 and in auto mode with the generator start contact closed.

Wall mounting installation and dimensions

The enclosure must be fixed on a wall using solid fixing screws (not supplied).

Recommended size : M6 50 mm (minimum).



Drilling template for the gland plate are provided in the appendix.

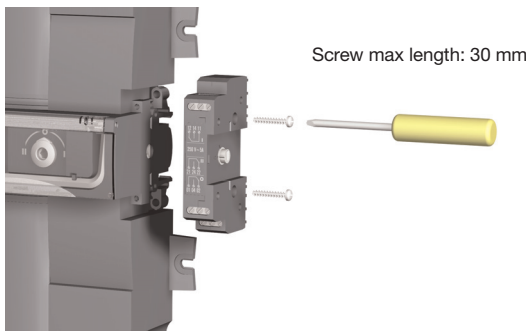


For a correct use in hard environmental conditions, it is essential to use the cable gland plate, in order to protect the product.

Height (mm)	600
Width (mm)	400
Depth (mm)	200
Weight (kg)	From 20 to 25 including accessories

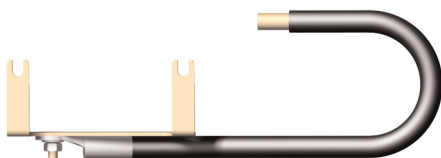
Accessories mounting

> Auxiliary contacts

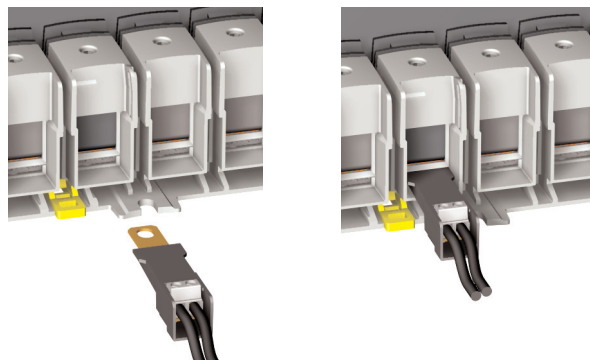


1 auxiliary contact normally open and normally closed for each position I, O, II. Use dedicated screws delivered with the accessory.

> Solid neutral kit



> Voltage sensing tap



Allows for each pole voltage sensing or supply (max 1,5 mm² cable), power cables connection capacity remains available.

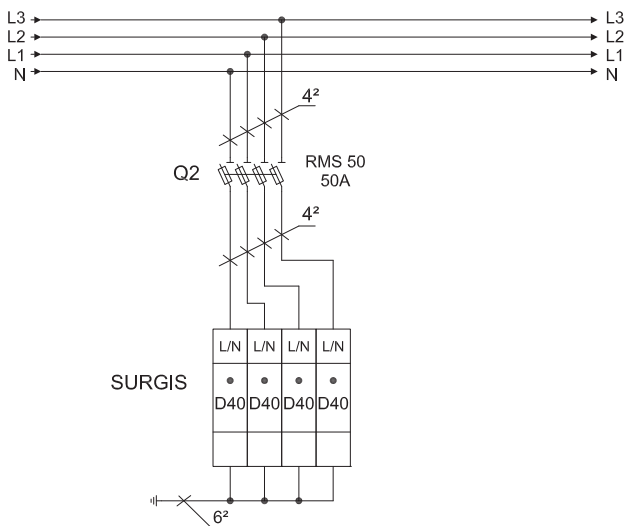
Allows neutral cables from Main, Gen and Load to be connected together. In case of 400 Vac applications, 2 neutral control cables are required to power supply the switch (230 Vac) from Main and Gen.

INSTALLATION

- First operation
- Wall mounting operation and dimensions
- ▶ Accessories mounting
- ▶ Power cables connection
- Network configurations
- Control terminals connections

Accessories mounting (cont.)

> Lightning protection

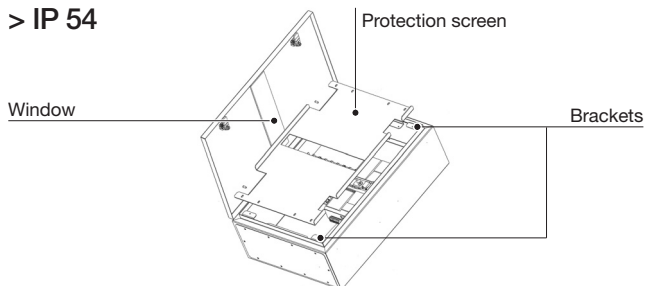


The lightning protection system is hardly recommended to ensure changeover safety.

This option is provided mounted on a din rail which can be fixed with the 2 screws available on the enclosure back plate (on the top or bottom).

The phases and neutral lines can be connected on the upstream side of the source which presents more risks.

> IP 54

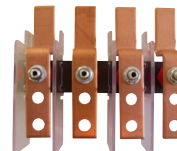


Move the CTI support to reduce the height. Then position the window on the door cut-out. Finally, position the protection screen, screwing it.

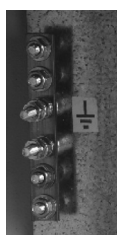
> Terminal extensions

These terminals can be connected in the CTI plugs, then they provide connections on terminals directly.

- 1 piece for the main side
- 1 piece for the genset side
- 1 piece for the load side.



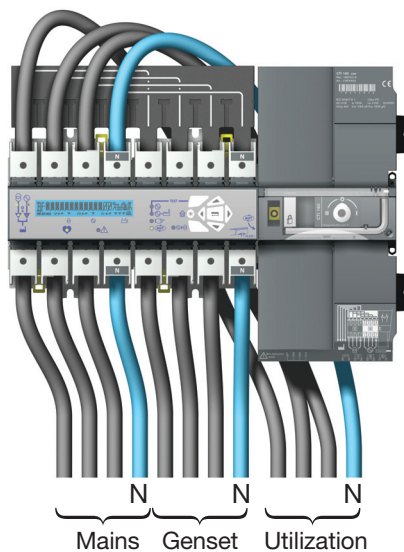
Power cables connection



Maximum cable size 50 mm²

> Cable size according to the ratings

	63A	100A	125A	160A
Minimum cable size (mm ²)	25	35	50	50
Maximum cable size (mm ²)	50	50	70	70



Network configurations

VOLTAGE CONFIGURATIONS

Network type	FG Wilson option code	Voltage	Frequency	Electrical drawing	
Phase to Phase voltage 380 -> 480V 3 phase 4 wires 3P4L	CTI	V502	415 V / 240 V	50 Hz	<p>Mains Genset 220 Vac < V < 254 Vac</p>
		V503	400 V / 230 V		
		V504	380 V / 220 V		
		V601	480 V / 277 V	60 Hz	
		V603	440 V / 254 V		
		V605	380 V / 200 V		
Measurements: [Main: V1-V2-V3-U12-U23-U31] / [Genset: V1-V2-V3-U12-U23-U31]					
Phase to Phase voltage 200 -> 240V 3 phase 4 wires 3P4L	CTI_1	V507	220 V / 127 V	50 Hz	<p>Mains Genset 200 Vac < V < 240 Vac</p>
		V510	200 V / 115 V		
		V608	220 V / 127 V	60 Hz	
		V610	208 V / 120 V		
		V611	240 V / 139 V		
Measurements: [Main: V1-V2-V3-U12-U23-U31] / [Genset: V1-V2-V3-U12-U23-U31]					
Phase to Phase voltage 220 -> 240V 3 phase (3)4 wires 3P3(4)L	CTI_1	V506	230 V / 115 V	50 Hz	<p>Mains Genset 220 Vac < V < 240 Vac</p>
		V508	220 V / 110 V		
		V606	240 V / 120 V	60 Hz	
		V607	230 V / 115 V		
		V609	220 V / 110 V		
Measurements: [Main: U12-U23-U31] / [Genset: U12-U23-U31]					

INSTALLATION

- First operation
- Wall mounting operation and dimensions
- Accessories mounting
- Power cables connection
- Network configurations
- Control terminals connections

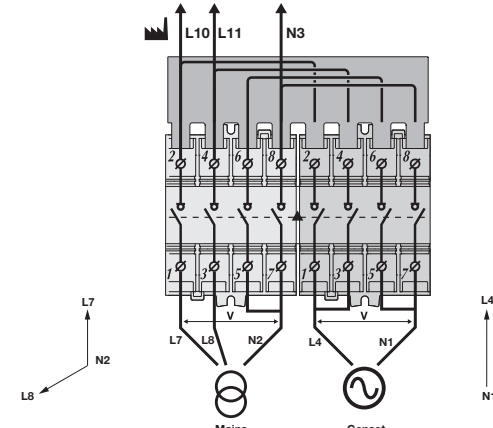
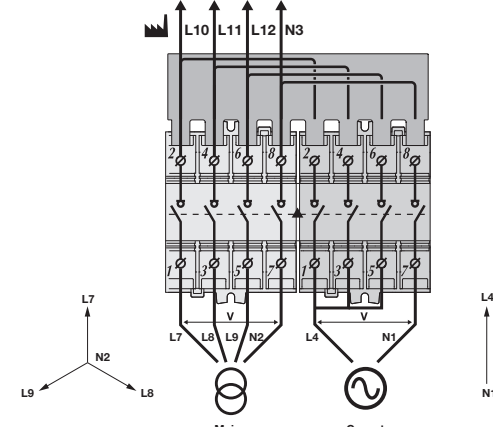
Network configurations

VOLTAGE CONFIGURATIONS

Network type	FG Wilson option code	Voltage	Frequency	Electrical drawing	
Phase to Phase voltage 220 -> 240V 1 phase 3 wires 1P3L	CTI.1	V522	240 V / 120 V	50 Hz	
		V524	230 V / 115 V		
		V526	220 V / 110 V		
		V622	240 V / 120 V	60 Hz	
		V624	230 V / 115 V		
		V626	220 V / 110 V		
Measurements: [Main: U12-U23-U31] / [Genset: U12-U23-U31]					
Phase to Neutral voltage 200 -> 277V 1 phase 2 wires 1P2L Single phase network	CTI		240 V	50 Hz	
			230 V		
			220 V		
			277 V	60 Hz	
			254 V		
			200 V		
Measurements: [Main: V1] / [Genset: V1]					
Phase to Phase voltage 220 -> 240V 1 phase 2 wires 1P2L	CTI.1	V521	240 V	50 Hz	
		V523	230 V		
		V525	220 V		
		V621	240 V	60 Hz	
		V623	230 V		
		V625	220 V		
Measurements: [Main: V1] / [Genset: V1]					

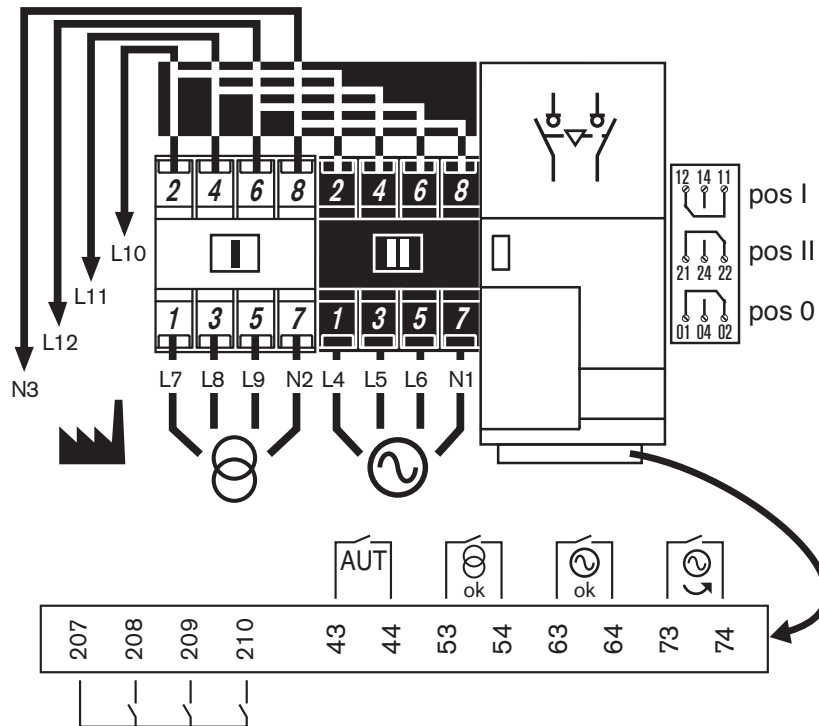
Network configurations

VOLTAGE CONFIGURATIONS

Network type	Description	Electrical drawing
<p>2PAP</p> <p>CTI</p>	<p>2 phases network - single phase GEN</p>	 <p>220 Vac < V < 240 Vac</p> <p>Measurements: [Main: V1-V2] / [Genset: V1]</p>
<p>3PAP</p> <p>CTI</p>	<p>3 phases network - single phase GEN</p>	 <p>220 Vac < V < 240 Vac</p> <p>Measurements: [Main: V1-V2-V3] / [Genset: V1]</p>

- First operation
- Wall mounting operation and dimensions
- Accessories mounting
- Power cables connection
- Network configurations
- ▶ Control terminals connections

Control terminals connections



Denomination	Terminals	Description	Characteristics	Recommended cable section
Input	207 208 209 210	Input common terminal Automatic control inhibit Remote test on load External manual retransfer function	dry contact	0,5 to 2,5mm ²
Output	43/44 53/54 63/64 73/74	Non automatic mode Mains available Generator available Generator start /stop signal	Resistive load: Max. switched power: 60 W or 250 VA Max. switched current: 5A Max. switched voltage: 30 VDC or 250 VAC	0,5 to 2,5mm ²
Auxiliary contact accessory	pos I pos II pos 0	Mains switch state (open or closed) Generator switch state (open or closed) Open position state (open or closed)	250 Vac 5A AC1	0,5 to 2,5mm ²



In manual mode, after a loss of the main voltage and the genset voltage, the start order can't be given.

General introduction

The product provides:

- Manual operation
- Automatic transfer operation
- Test operations and mimic
- Sources & power availability mimic
- Voltage and frequency metering
- Fault information

It is possible to set up a return to zero position action after source failure (main or gen). 2nd TRIP variable must be activated to allow this feature.

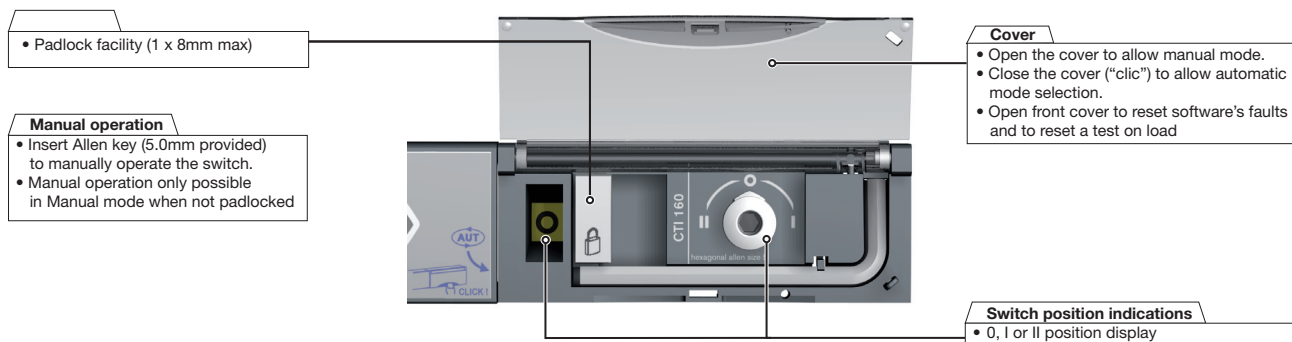
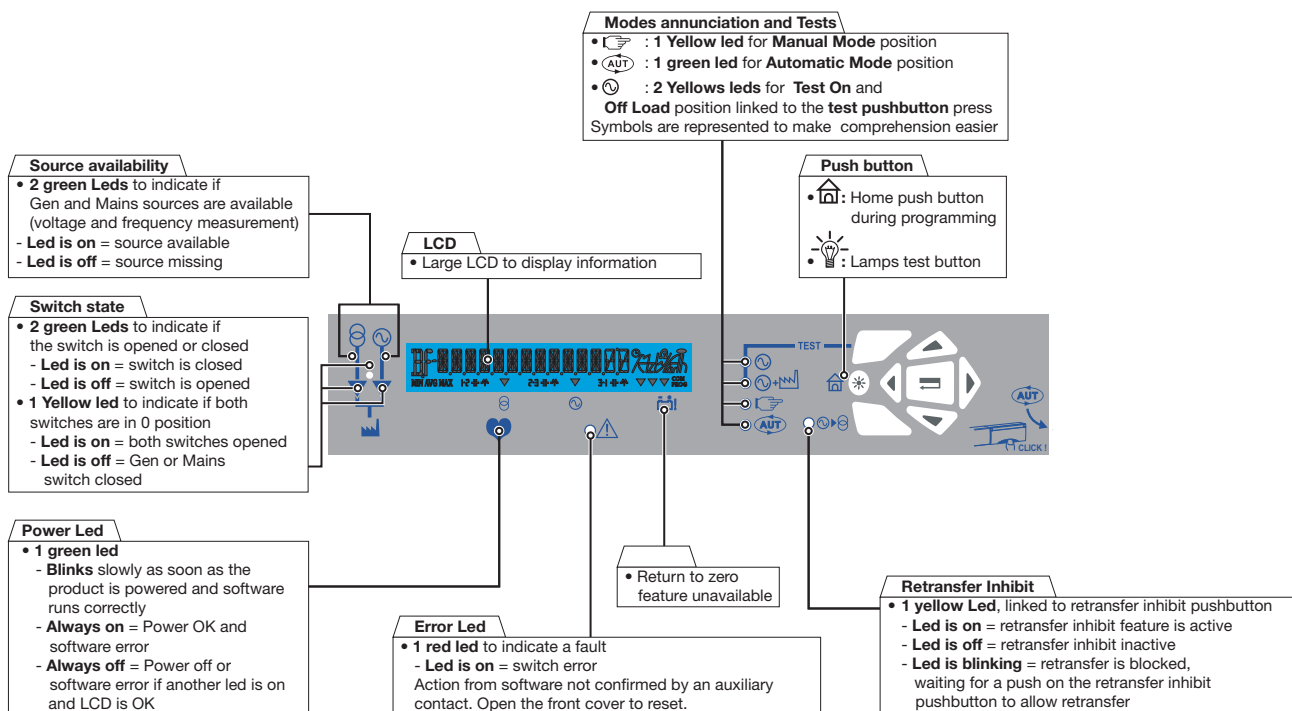
The product requires at least one type of network configuration and a network nominal voltage configuration to be input via the keypad by the user.

Other default values can be stored or modified according to hereafter programming guidelines.

Electronic module introduction

Front panel introduction :

Leds indications are only active once the product is powered (power led activated).



Programming

> Software version

Software version is displayed on the unit after reset (powering up action after minimum 3 minutes power off to discharge the unit).

> Product programming

Product Programming is possible in automatic mode in position I when the mains source is available, or in manual mode.

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

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

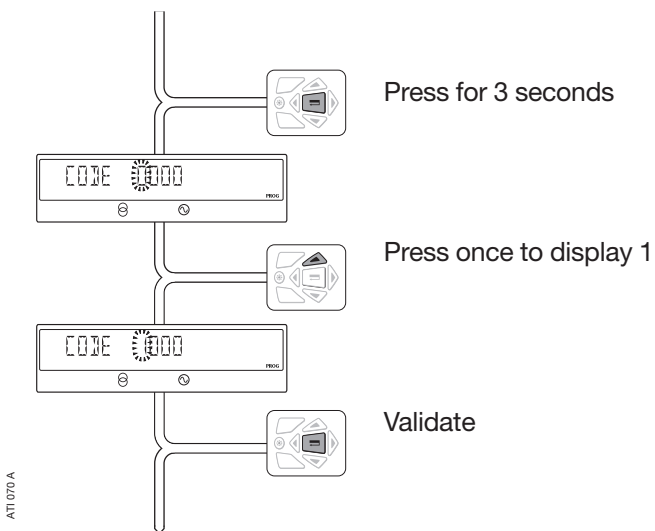
PROGRAMMING ACCESS

Programming mode is accessible by pressing and holding the validation pushbutton for 3 seconds and then entering the code (default code = 1000):

PROGRAMMING EXIT

To exit the Programming and come back to visualisation mode, hold the validation pushbutton for 3 seconds.

Parameters saved permanently after exit.



Access to programming Menus

PRODUCT RESET

- Software reset -> open and reclose the front cover



Programming

PROGRAMMING MENUS

> Architecture and navigation

The programming mode integrates 4 Menus:

Setup: Network parameters

Volt levels: Voltage detection levels

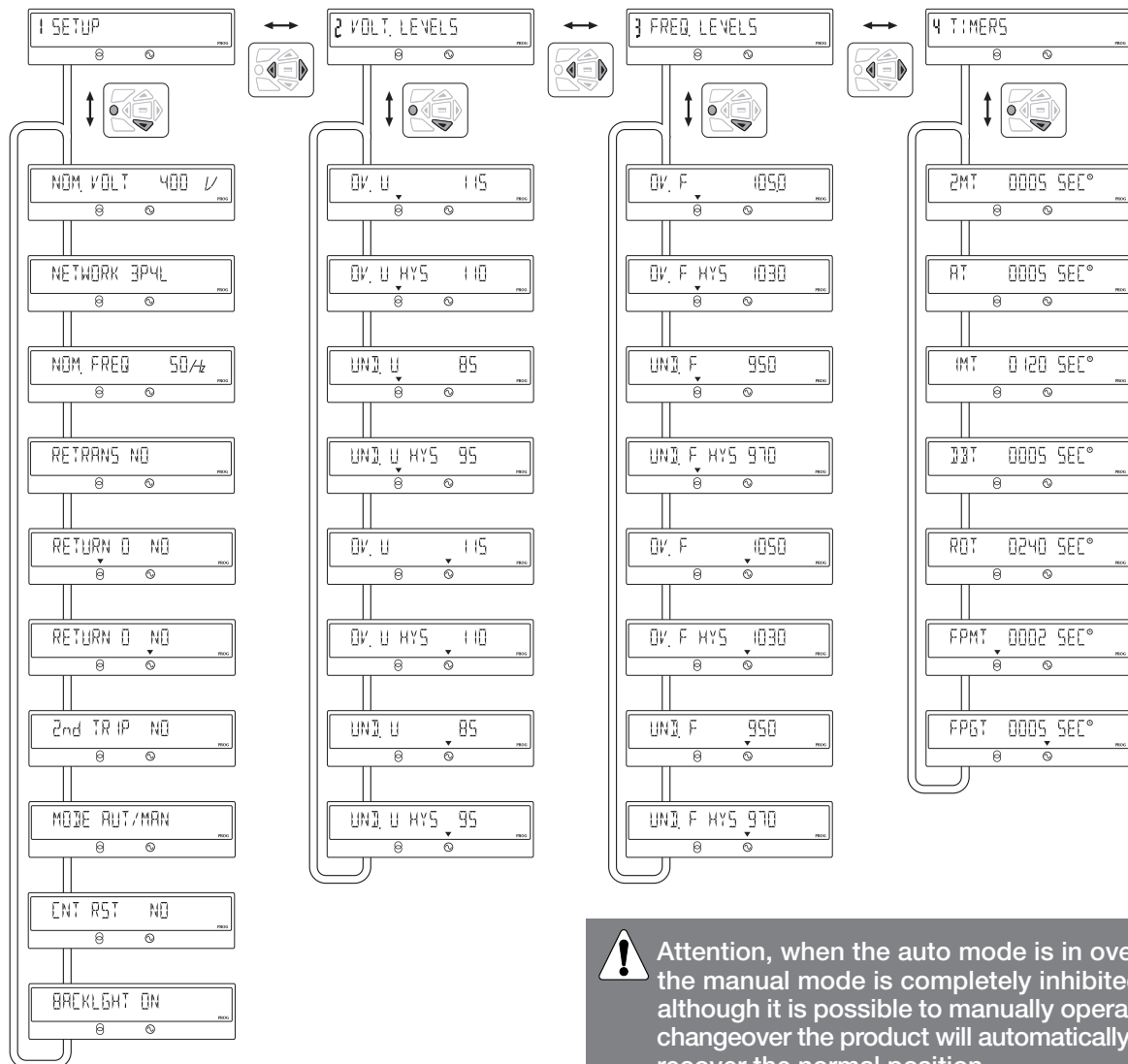
Freq. levels: Frequency detection levels

Timers: Automatic timer settings

Setup parameters must always be verified/modified in accordance to the application.

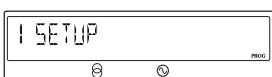


Default values are loaded as standard.



Attention, when the auto mode is in override, the manual mode is completely inhibited and although it is possible to manually operate the changeover the product will automatically try to recover the normal position.

> The first menu to access is the Setup menu




Programming


1 SETUP


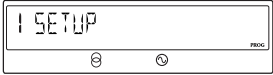
> Parameter Display

For example, the setup menu integrates 10 parameters described in the table hereunder.

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

Press  Down pushbutton to access parameter required.

Press  Up pushbutton to come back to previous value

or  Home pushbutton to come back to .

Programming

1 SETUP

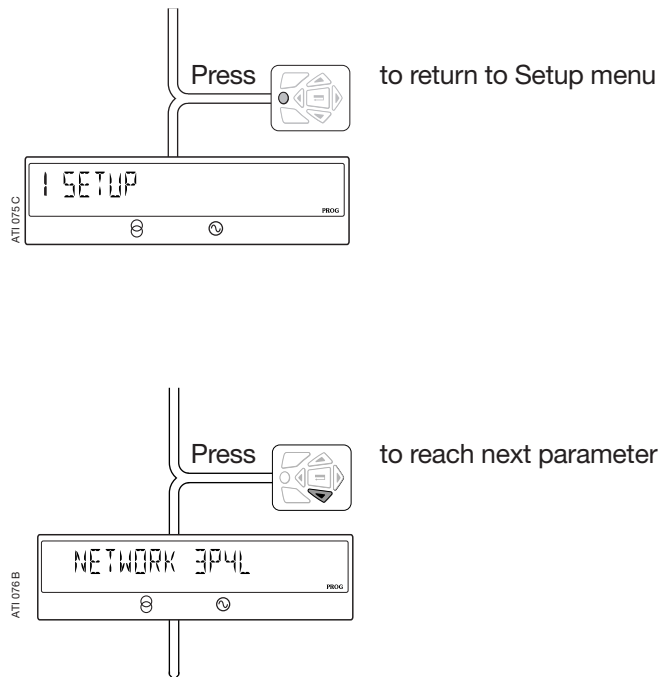
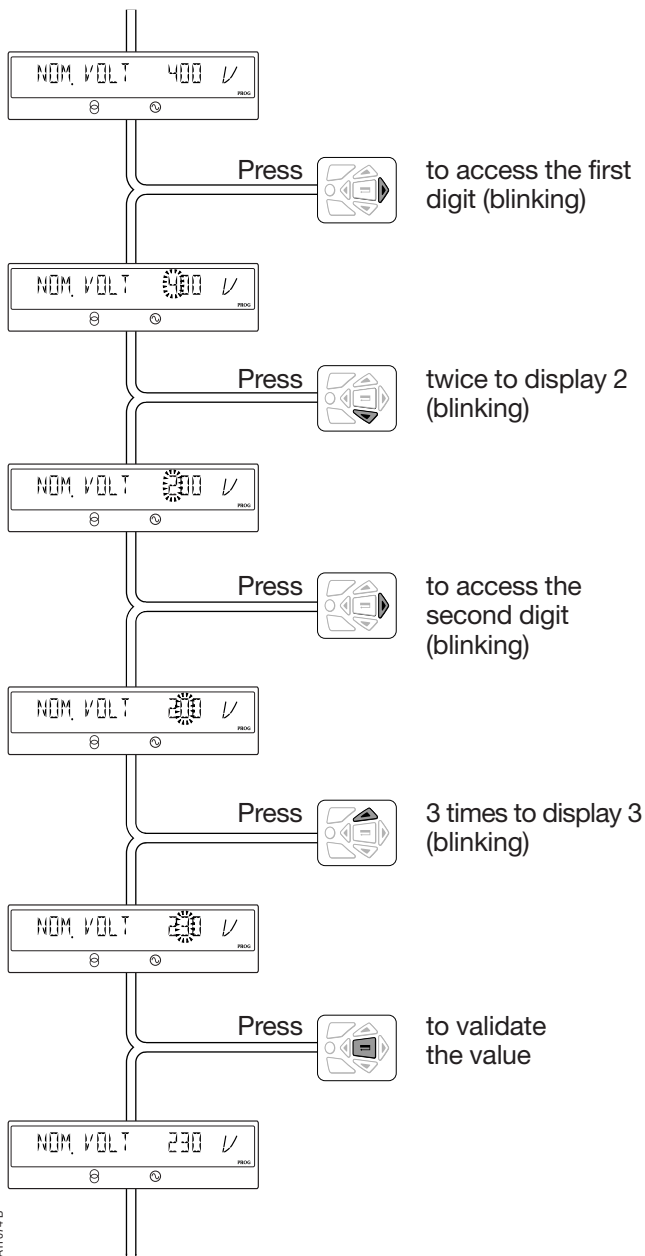
> Parameter modification

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 next table.

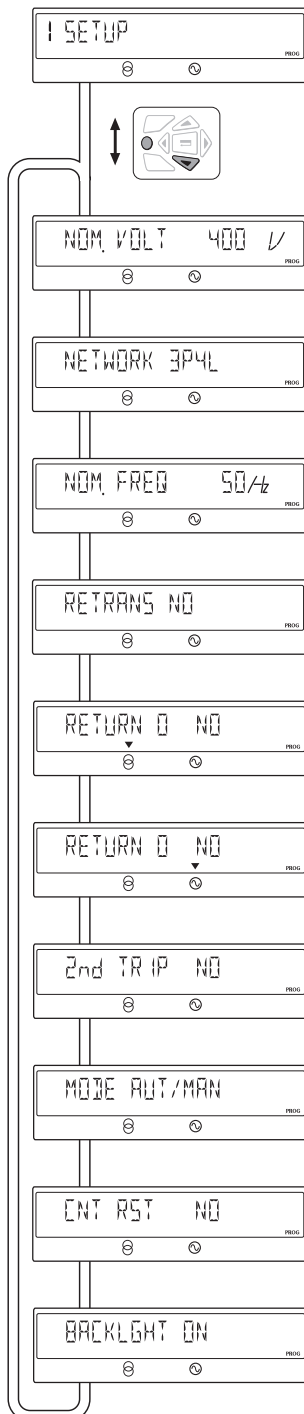
Example: We want to modify network voltage from 400V to 230V.

> To return to Setup menu press home pushbutton or press down to continue.



Programming

1 SETUP



ATYS 636 B

Definition	Setting range	Default value
NOM.VOLT: Phase-Phase Nominal voltage.	From 380 to 480 Vac (CTI) From 200 to 240 Vac (CTI_1)	400 Vac 230 Vac
NETWORK: Network configuration. Type of metering (1P or 3P phases). Number of active wires (2L, 3L or 4L) definition.	3P4L/2 PAP/ 1P2L 3 PAP (CTI) 3P4L/3P3L/1P2L/ 1P3L (CTI_1)	3P4L
NOM.FREQ: Nominal frequency.	50 or 60 Hz	50 Hz
RETRANS: Retransfer inhibit feature: press on RTI button (Ⓢ) > 8) required to allow retransfer from gen to main.	Yes or No	No
RETURN 0 (main): Immediate transfer to 0 position after loss of mains Enables FPMT & ROMT timers (contactor logic)	Yes or No	No
RETURN 0 (Gen): Immediate transfer to 0 position after loss of genset Enables FPGT & ROGT timers (contactor logic)	Yes or No	No
2nd TRIP (Main): System available for 2nd transfer to zero position. - YES: (available) wait for the total capacity of the power capacitor - NO: (unavailable) 2nd trip not immediately available	Yes or No	No
MODE Inhibition of the manual mode AUT : the automatic mode is always activated irrespective of the position of the front cover AUT/MAN : standard fonctionnality	AUT or AUT/MAN	AUT/MAN
CNT RST: Reset number of commutation counter (from Main to Gen). Displays No once reset.	Yes or No	No
BACKLIGHT: the backlight can be set: - OFF: always off - ON: always on - INT: on during operation or during 2 minutes keypad action	On, Off, Int	On

The return to 0 function allows, after the loss of the main or the genset voltage, the changeover switch opening after a delay from I to 0 or from II to 0. So for example, this solution gives the possibility to open the switch after short-circuit. It also allows you to restart the genset after a shutdown without the load connected.

The 2nd trip parameter is associated with the return to 0 function as it requires some energy from an internal energy storage device.

So to achieve a 2nd opening on loss of voltage, you need to wait for the energy storage device to be re-charged.

Programming

2 VOLT. LEVELS

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 and Generator sensing is 3 phases.

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).

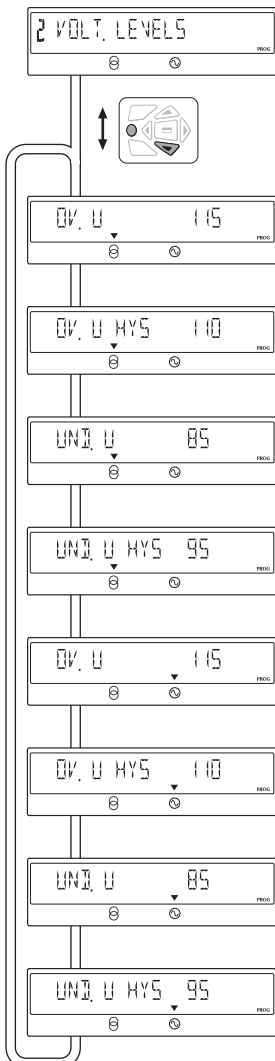
> Parameter modification

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.

Note:

These values only need to be changed if a value is required other than the default.



Definition	Setting range	Default value
OV U: Mains Over voltage detection	102 - 120%	115%
OV U HYS: Mains Over voltage hysteresis detection	101 - 119%	110%
UND.U: Mains Under voltage detection	60 - 98%	85%
UND.U HYS: Mains under voltage hysteresis detection	61 - 99%	95%
OV U: Generator over voltage detection	102 - 120%	115%
OV U HYS: Generator over voltage hysteresis detection	101 - 119%	110%
UND.U: Generator under voltage detection	60 - 98%	85%
UND.U HYS: Generator under voltage hysteresis detection	61 - 99%	95%

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Programming

3 FREQ. LEVELS

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 + hysteresis are defined as percentage of nominal frequency.

Hysteresis levels allow under and over frequency conditions reset (frequency needs to pass hysteresis level to reset).

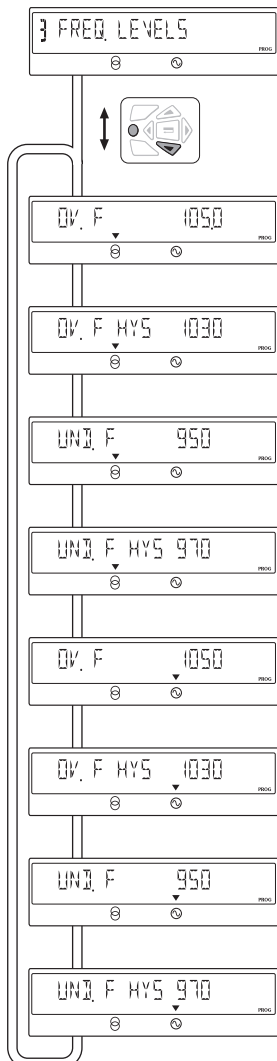
> Parameter modification

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.

Note:

These values only need to be changed if a value is required other than the default.



Definition	Setting range	Default value
OV F: Mains Over frequency detection	101 - 120%	105%
OV F HYS: Mains Over frequency hysteresis	100.5 - 119.5%	103%
UND.F: Mains Under frequency	60 - 99%	95%
UND.F HYS: Mains under frequency hysteresis	60.5 - 99.5%	97%
OV F: Generator over frequency	101 - 120%	105%
OV F HYS: Generator over frequency hysteresis	100.5 - 119.5%	103%
UND.F: Generator under frequency	60.5 - 99.5%	95%
UND.F HYS: Generator under frequency hysteresis	60 - 99%	97%

ATYS 638 B

Programming

4 TIMERS

To reach timer menu from frequency menu press once  .

> Parameter Display

The timers menu integrates 9 parameters described in the table below.

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

Timer precision: setting value: +0/+500 ms

Timers operation is described in operational flow chart page 23.

> Parameter modification

Display the required parameter for modification.

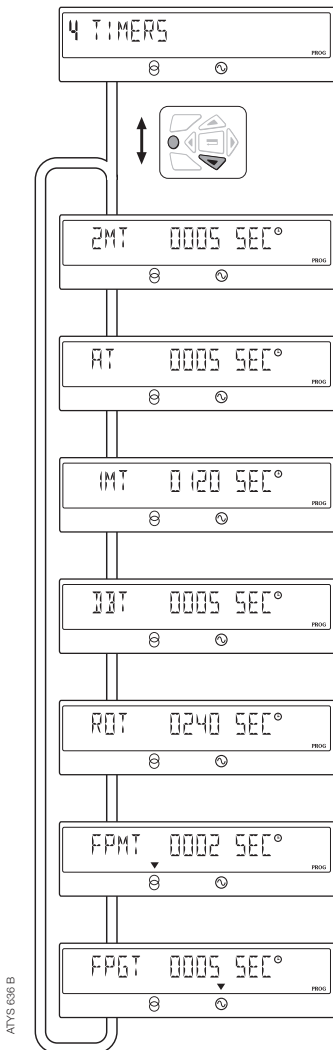
Apply the same procedure as described in the Setup Menu for network voltage modification. Possible settings are described in the previous table.

Note:

These values only need to be changed if a value is required other than the default.

Programming

4 TIMERS



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 comutation 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 1800 sec.	120 sec.
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.
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 600 sec.	240 sec.
FPMT: Fail Protection Mains Timer. Delays transfer to 0 position action after mains' failure. Allows not to transfer to 0 in case of short circuit.	0 to 10 sec.	2 sec.
FPGT: Fail Protection Generator Timer. Delays transfer to 0 position action after generator failure. Allows not to transfer to 0 in case of load impact or short circuit.	0 to 10 sec.	5 sec.

> Information

In a situation of mains returns, if the genset shutdown, the 1MT timer is automatically set to 3 seconds to allow a quick return to the mains.

Metering

PRODUCT METERING

> General comments

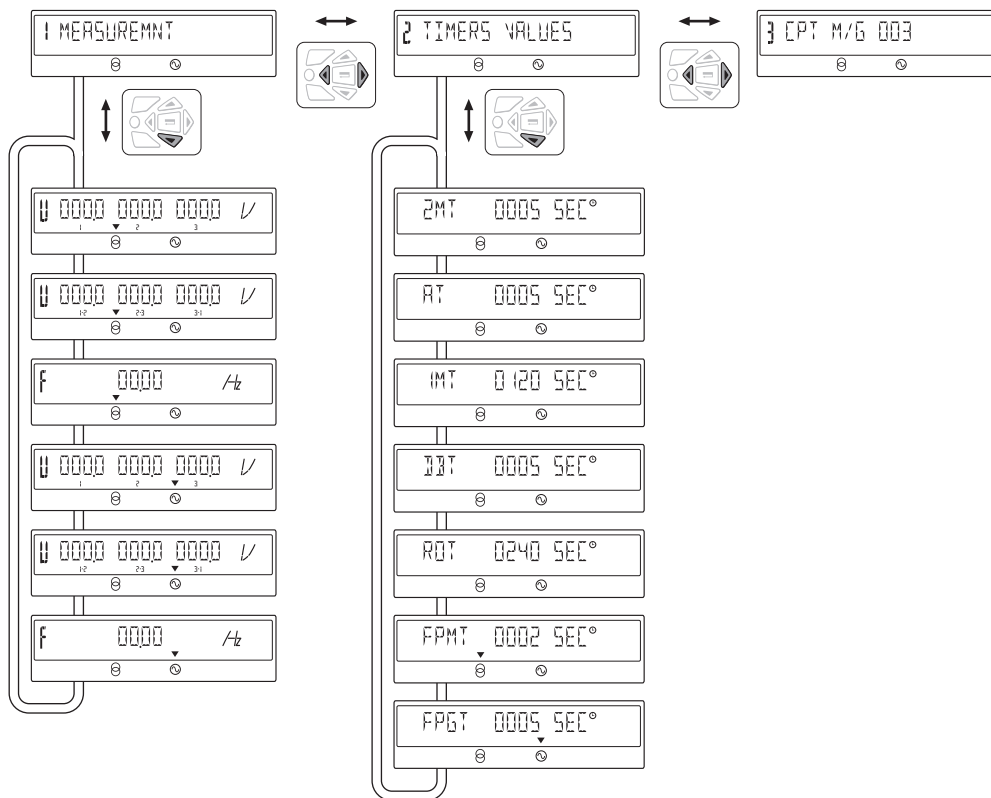
Metering is active as soon as the unit is powered.
Commutation cycles have priority over Visualisation mode and display timers count down as soon as they are active.

After commutation cycle, the display comes back to Mains voltage display (first variable of the mode).

Visualisation mode architecture is as described hereunder.

Any value available in this mode can be kept on the screen once displayed. excepted during commutation cycle; comes back to timer count down after 5 s.

To access requested value press  ,  ,  or  .



ATYS 638 B

Metering

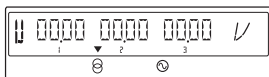
PRODUCT METERING

> Values definition



All these values are not accessible on all networks

- **3P4L:** Mains V1, V2, V3, U12, U23, U31
Gen V1, V2, V3, U12, U23, U31
 - **1P3L:** Mains U12, U23, U31 / Gen U12, U23, U31
 - **1P2L:** Mains U12 / Gen U12
 - **3P3L:** Mains U12, U23, U31 / Gen U12, U23, U31
 - **2PAP:** Mains V1, V2 / Gen V1
 - **3PAP:** Mains V1, V2, V3 / Gen V1
- Mains and Generator sensing are 3 phases.



Mains voltage L1-N, L2-N, L3-N



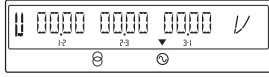
Mains voltage L1-L2, L2-L3, L3-L1



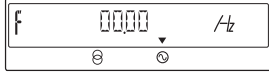
Mains frequency



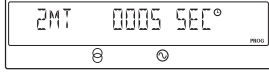
Generator voltage L1-N, L2-N, L3-N



Generator voltage L1-L2, L2-L3, L3-L1



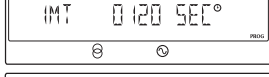
Generator frequency



Loss of mains validation timer



Delay on transfer timer



Mains return validation timer



Dead band timer



Run on timer (Generator cool down period)



Fail Protection Mains Timer



Fail Protection Generator Timer

ATYS 640 B

Manual operation

To access Manual Mode operation open the front cover

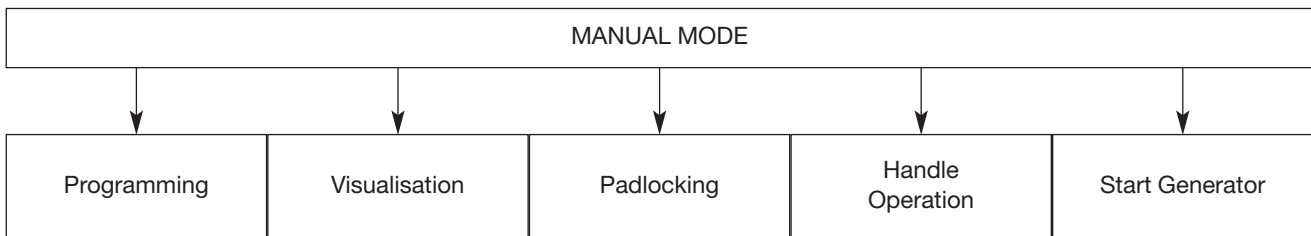
MANUAL MODE

Once in manual mode (cover open) 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.

As soon as the manual mode is activated (cover open), **all automatic actions are inhibited.**

The same result is achieved, if the contact (Excepted the start order if mains failed) between the 207 and 208 terminals is closed : in this case, programming, visualisation, test off load are available.



New stable switch position when returning to automatic mode from manual mode:

The switch transfers to required control position according to flow charts the cover is closed or as soon as Power returns back.



Do not force the product (Max 10 Nm)

MANUAL OPERATION

Take the handle, attached on the front face under the cover, to manually operate the switch.

Verify the switch position on the front position label before any manual operation:

- from position I turn anti clockwise to reach position 0
- from position 0 turn anti clockwise to reach position II
- from position II turn clockwise to reach position 0
- from position 0 turn clockwise to reach position I



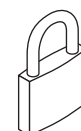
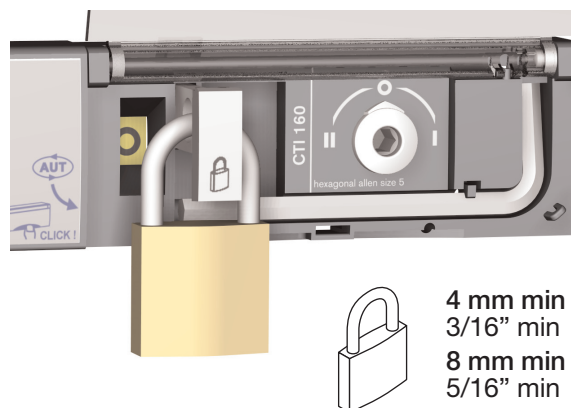
Do not leave the manual handle in automatic mode.

PADLOCKING

Padlock is only possible in manual operating mode (front cover opened).

Padlocking is configurable in position 0 only or in 3 positions (I-0-II).

Manually pull the padlock handle to allow the padlock to be inserted into the hole provided



4 mm min
3/16" min
8 mm min
5/16" min

Automatic operation

Ensure cover is fully closed and switch is in automatic mode. Close the front cover “Click” to access automatic operation.

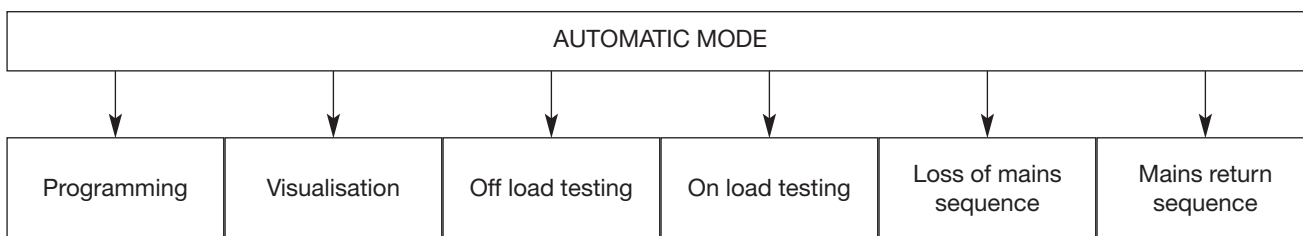
The automatic mode must be activated as soon as source switching is required after loss of mains condition.

The unit integrates a power capacitor source to provide enough power during black out (loss of mains) to wait for generator starting and to eventually drive the switch to zero position if required. Further external protection will be required if “phasing” is a concern.

POSSIBLE ACTION

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



MANUAL-AUTOMATIC MODE/POWER RETURN CONDITION

- 2 seconds 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 = 3 minutes).
- Read timers definition for 1MT or 2MT understanding.**

NEW STABLE POSITION OF THE SWITCH

Original switch position	Status of supply	New position
Mains	Available, genset standby or running	Mains
Mains	Mains unavailable for 2MT time period, genset standby or running	Genset. If genset Standby, then start genset first and wait for AT TIMER before transfer
Genset	Genset on load, mains unavailable	Genset
Genset	Genset on load, mains available for 1MT time period	Mains
Zero	Mains available, genset standby	Count down 1MT (3 sec) before transfer to Mains
Zero	Mains available, genset running	Genset to count down 1MT before transfer to Mains
Zero	Mains unavailable, genset running	Genset
Zero	Mains unavailable, genset standby	No action (because no supply). When supply becomes available change to mains or genset

Automatic operation

LOSS OF MAINS SEQUENCE

This sequence is started as soon as the switch is in automatic mode and in position I.

Position I:

- mains is available
- switch is in position I (Mains)
- generator is on or off.

> Specific feature

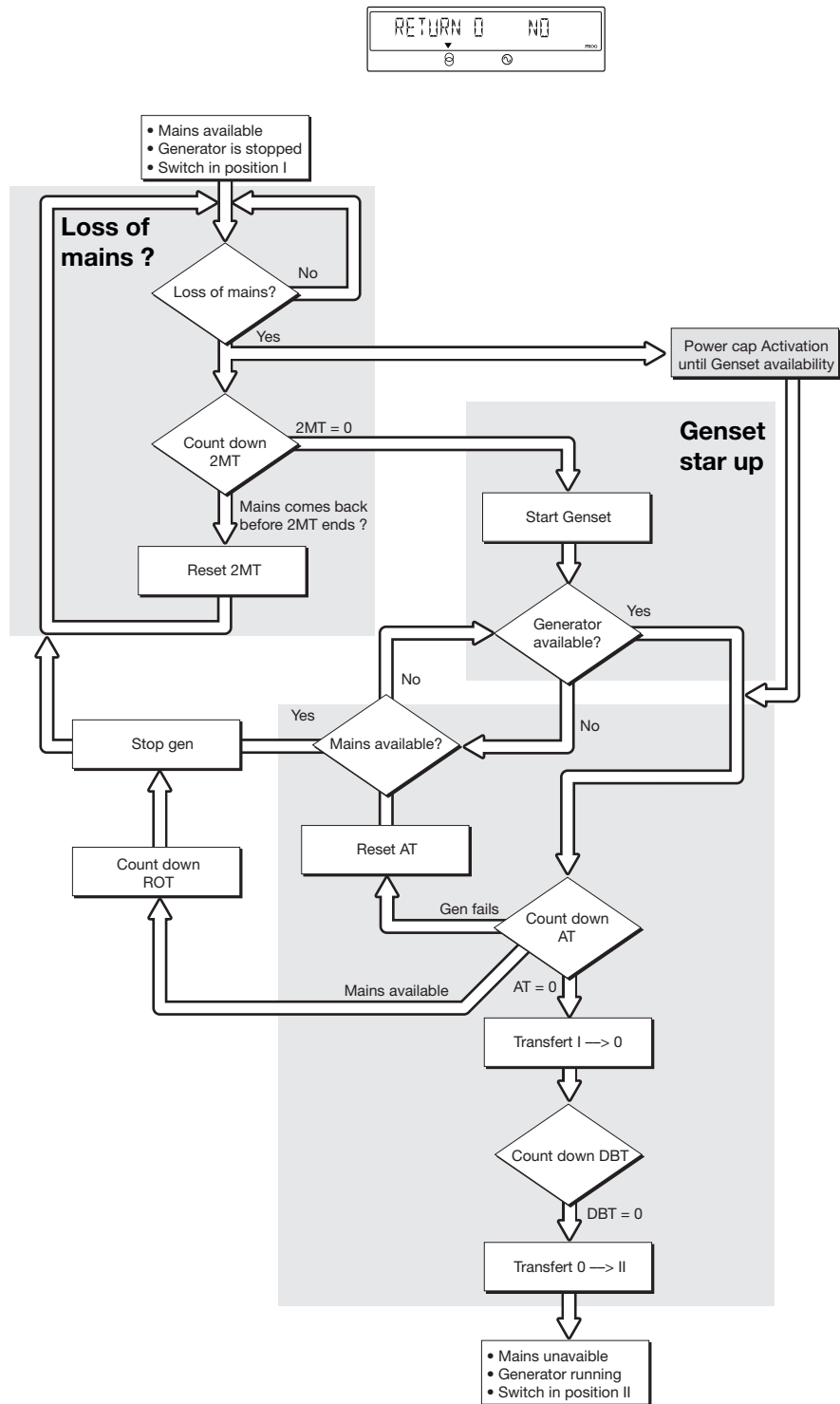
Automatic control inhibit

It is possible to inhibit completely the automatic sequence using the CTI contact (closing the contact between terminals 207 - 208). This can be useful to inhibit the transfer in case of power outage due to load short circuit.

Automatic operation

LOSS OF MAINS SEQUENCE

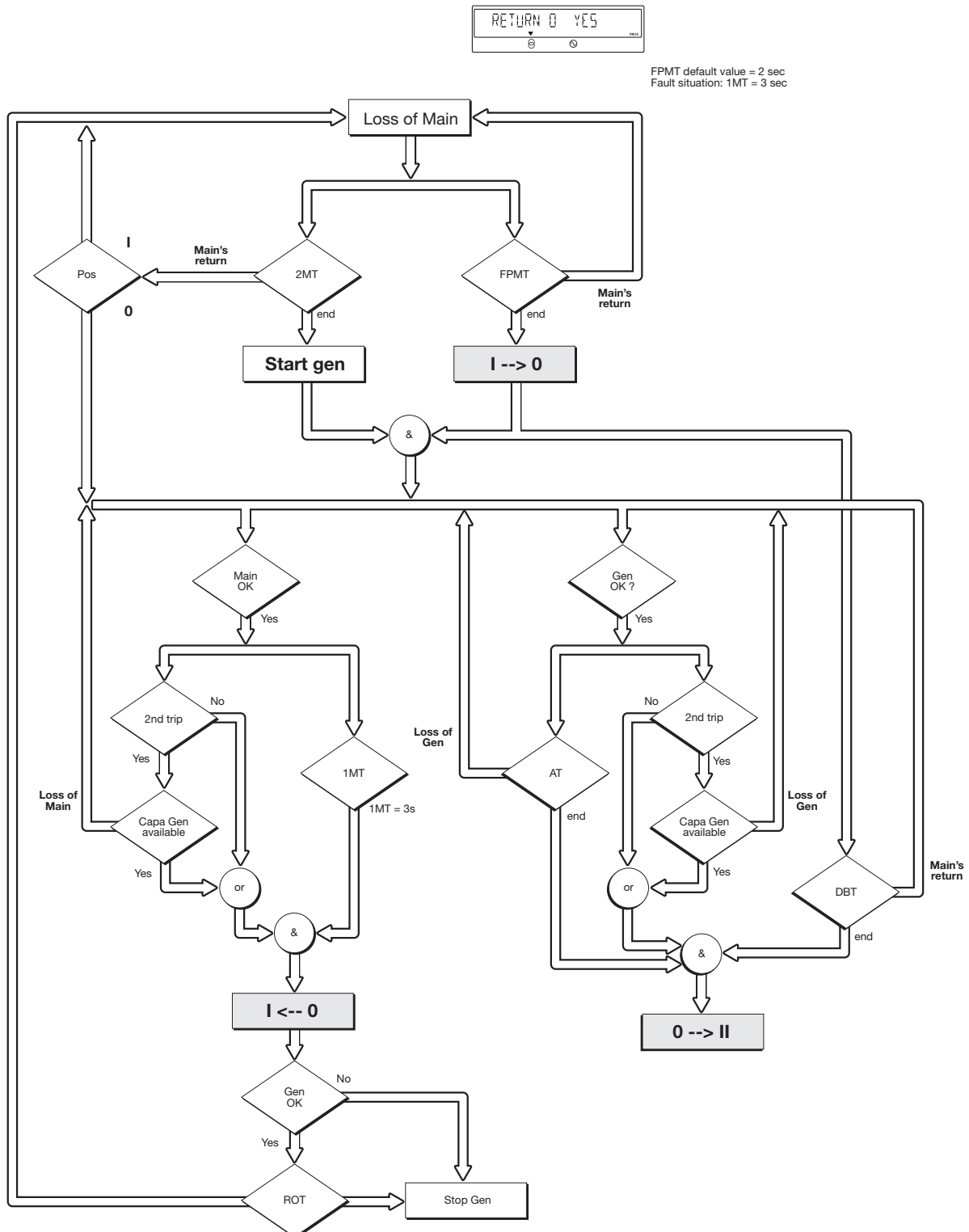
> "RETURN TO 0 POSITION" variable set to NO



Automatic operation

LOSS OF MAINS SEQUENCE

Loss of Main
Return to 0 position = Yes



Automatic operation

MAINS RETURN AUTOMATIC SEQUENCE

This sequence is started as soon as the unit is in automatic mode and in position II.

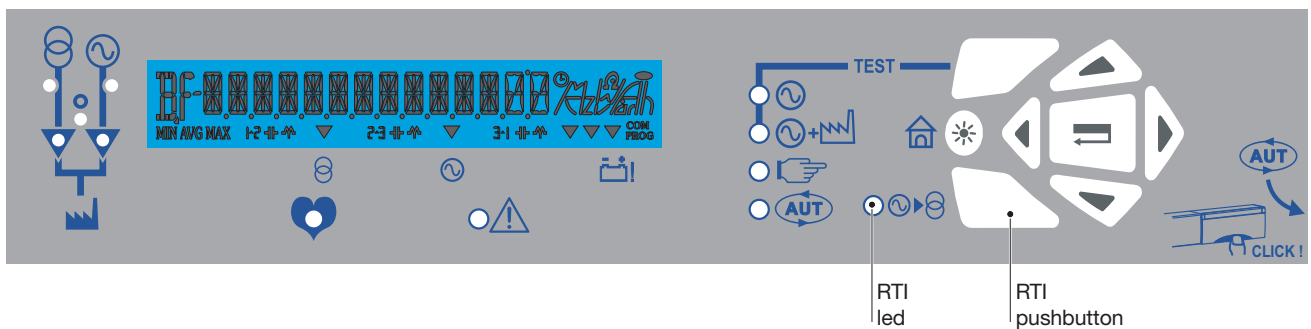
Position II:

- Mains is not available
- Switch is in position II (Generator)
- Generator is on

> Specific feature

Retransfer inhibit feature

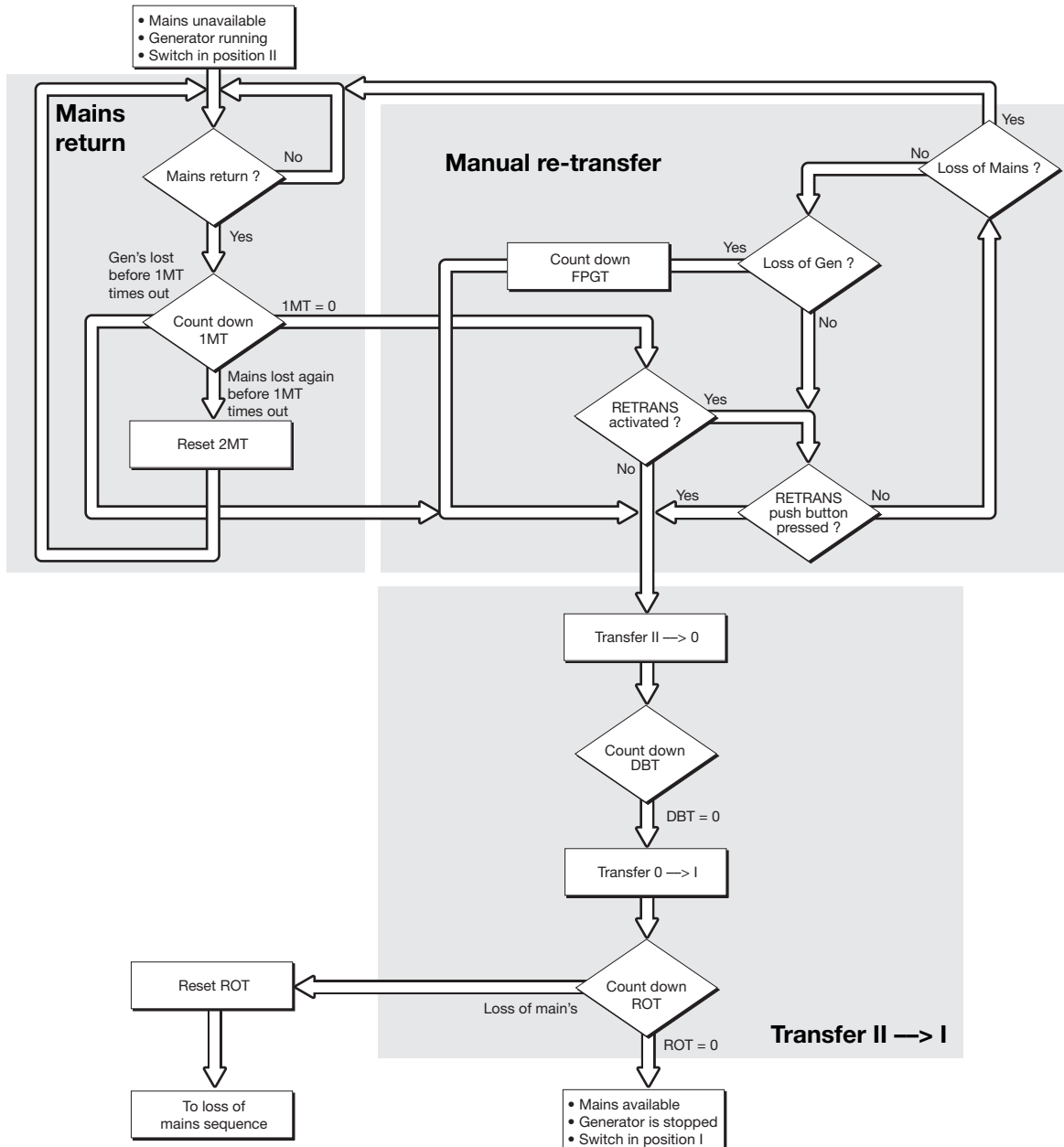
- Once the mains is back, it might be preferable not to immediately transfer the load from the generator to the mains.
- If retransfer inhibit feature has been enabled in the programming mode, the RTI led is on.
- Once retransfer from the generator to the mains is ready, RTI feature blocks the retransfer and the RTI led is blinking.
- A manual press on the RTI pushbutton is necessary to start retransfer.



Automatic operation

MAINS RETURN AUTOMATIC SEQUENCE

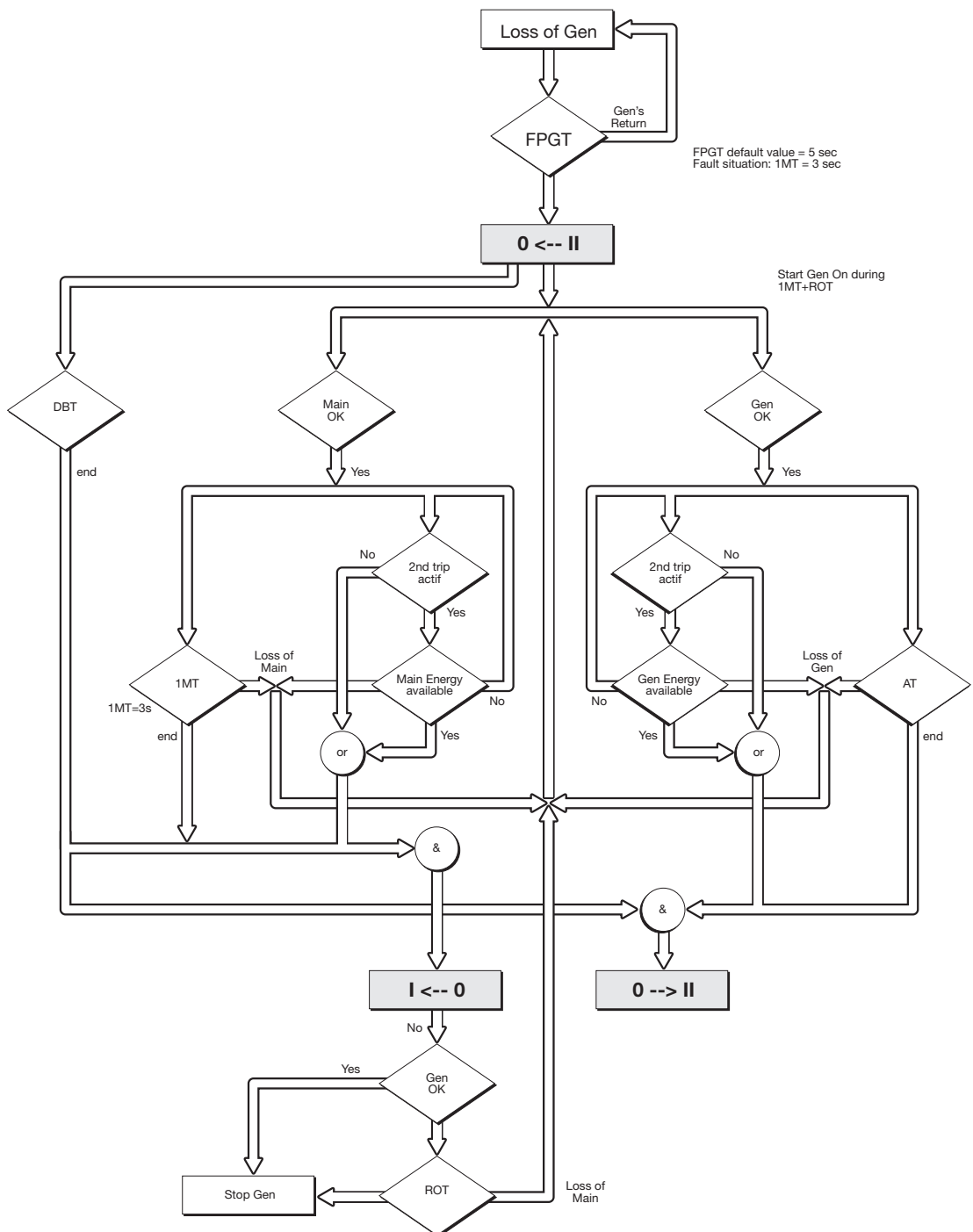
> Sequence description



Automatic operation

GEN FAILURE

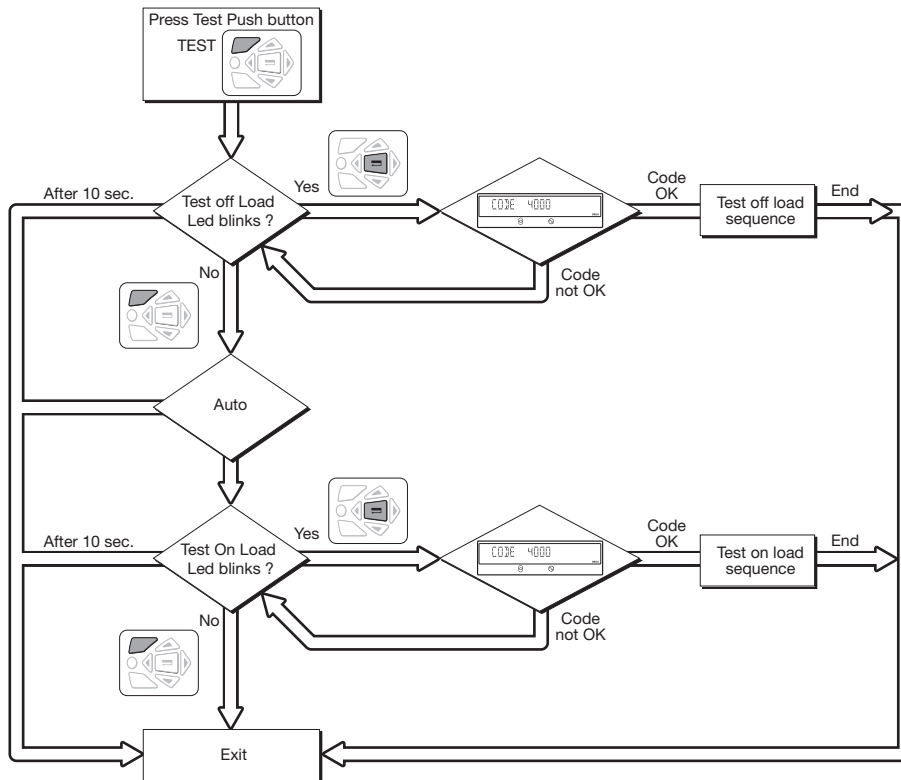
Loss of Gen
Return to 0 position = Yes



Test mode

TEST MODE ACCESS

> Functionality



Test mode

OFF LOAD TESTING

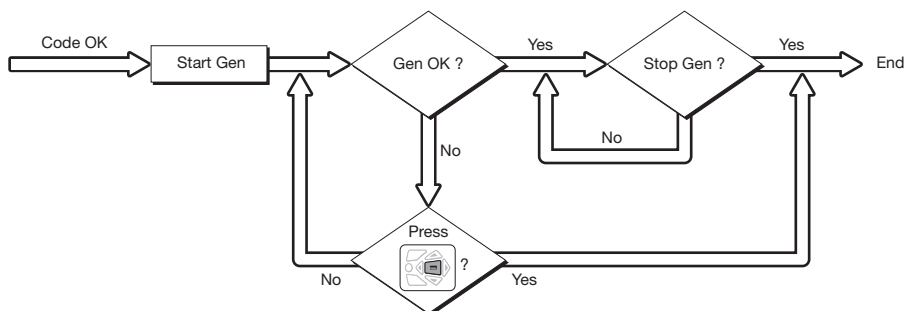
This test is possible in automatic mode in position I when the mains is available or in manual mode. It can be considered as a generator manual start in manual mode.

> 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 always possible except during a loss of main sequence.

> Sequence

Press test pushbutton to make test off load led blink and press validation pushbutton to start.



Test off load sequence

ON LOAD TESTING

This test is only possible in automatic mode, it allows to start the genset even if the mains is unavailable before and during a critical period on the mains.

> Description

- This test simulates a loss of mains condition. Loss of mains sequence is started and main's return sequence automatically activated as soon as generator is available
- All timers are run following their setting. The DBT is running not only during the "main's return" sequence but during the "loss of main's" sequence too!
- The "retransfer inhibit" feature is always activated during test on load (from keypad)

Press "TEST" pushbutton to make test on load Led blinking, press "validation" pushbutton to enter the code and start the test cycle, following loss of main + main's return sequences.

After the test, the automatic mode is activated.

> Remote activation via remote test

It is possible to remotely start the "test on load" closing the contact 207 and 209 on the control terminal.

The cycle is started as soon as the input is closed. The retransfer from generator to main is blocked, and only allowed once the input is de-activated.

Test mode

RETURN TO Ø FEATURE

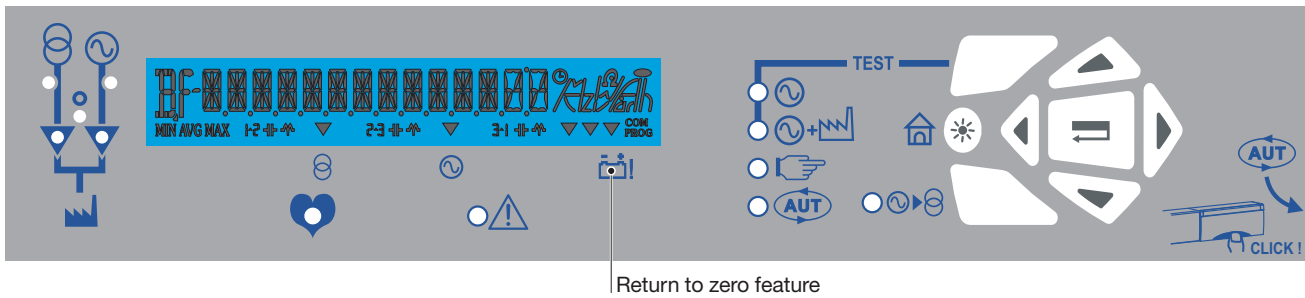
> Energy storage device end of life

Return to zero feature unavailability.



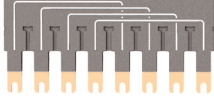

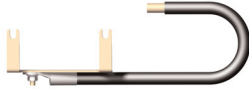
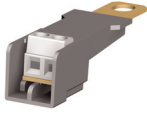
Unavailability of this optional feature will be indicated on the front panel. Please Refer to the trouble shooting guide.


Return to zero position feature is realised thanks to a internal energy storage device.

In case of failure of this component, a pointer remains on to inform operator that return to zero feature ("2nd TRIP") is no longer operational.

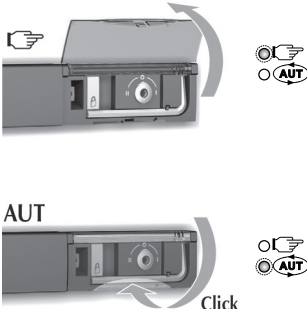


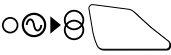
RANGE

		63 A	100 A	125 A	160 A
Complete product 	CTI_1 230Vac	348-7795	348-7798	348-7811	348-7813
	CTI 400Vac	348-7797	348-7799	348-7812	348-7814
Changeover switch 	CTI_1 230Vac	306-9846	306-9848	306-9849	306-9850
	CTI 400Vac	306-9851	306-9852	306-9853	306-9854
Bridging bar 		306-9836			306-9894
Auxiliary contacts 		306-9835			
Solid neutral 		306-9895			
Voltage sensing tap  x 2		306-9845			

	63 A	100 A	125 A	160 A
Terminal shroud (2 pieces) 	306-9896			
Lightning protection 	355-1440			
IP 54 	348-8814			
Terminal extensions (3 pieces) 	348-8815			

TROUBLESHOOTING GUIDE

Symptom	Step	Result
01 Automatic operations availability.	01 AUTO Led is on.	<p>> NEGATIVE</p> <ul style="list-style-type: none"> • Check that the switch has not been padlocked. • Check that the manual operating handle has been removed from housing. • Close the Auto/Manu front cover. • Then consult your local dealer. <p>> POSITIVE</p> <ul style="list-style-type: none"> • Go to the next step.
	02 Fault synthesis Led is off.	<p>> NEGATIVE</p> <ul style="list-style-type: none"> • Led is on Try to reset the product (see the instructions below). Then consult your local dealer. <p>• Reset</p> 
	03 Power supply Led is blinking.	<p>> NEGATIVE</p> <ul style="list-style-type: none"> • Consult your local dealer. <p>> POSITIVE</p> <ul style="list-style-type: none"> • Go to the next symptoms.
02 The mains availability.	01 Mains availability Led is on.	<p>> NEGATIVE</p> <ul style="list-style-type: none"> • Check lamp test. • Check that the mains return timer (1MT) is still not counting down. • Check that the mains protection system (breaker) is on (Position 1). • Then consult your local dealer. <p>> POSITIVE</p> <ul style="list-style-type: none"> • Go to the next steps or symptoms.
03 The genset availability (genset supposed started).	01 Genset availability Led is on.	<p>> NEGATIVE</p> <ul style="list-style-type: none"> • Check lamp test. • Check that the genset stabilisation timer (AT) is still not counting down. • Check that the genset protection system (breaker) is on (Position 1). • Then consult your local dealer. <p>> POSITIVE</p> <ul style="list-style-type: none"> • Go to the next steps or symptoms.

Symptom	Step	Result
04 The product doesn't transfer to the genset in case of mains failure or test on load.	01 AUT Led is on & Fault synthesis Led is off & Power supply Led is blinking.	> NEGATIVE • Go to symptom 01.
		> POSITIVE • Go to the next step.
	02 Genset is started.	> NEGATIVE • Check that the mains failure timer (2MT) is still not counting down. • Check the genset control panel is set to the auto position. • Then consult your local dealer.
		> POSITIVE • Go to the next step.
	03 Genset availability Led is on.	> NEGATIVE • Go to symptom 03.
		> POSITIVE • Consult your local dealer.
05 The product doesn't transfer to the mains in case of mains return or test on load end.	01 AUT Led is on & Fault synthesis Led is off & Power supply Led is blinking.	> NEGATIVE • Go to symptom 01.
		> POSITIVE • Go to the next step.
	02 Mains availability Led is on.	> NEGATIVE • Go to symptom 02.
		> POSITIVE • Go to the next step.
	03 Retransfer inhibit (RTI) function is off.	> NEGATIVE • Push the RTI push button: 
		> POSITIVE • Consult your local dealer.
06 Genset keeps on running after mains restores and switch retransfers to the mains position.	01 AUT Led is on & Fault synthesis Led is off & Power supply Led is blinking.	> NEGATIVE • Go to symptom 01.
		> POSITIVE • Go to the next step.
	02 The run on time timer (ROT) is still counting down (visible on the display).	> NEGATIVE • Check the genset control panel is set to the auto position. • Then consult your local dealer.
		> POSITIVE • Wait for the ROT end.
07 Switch manual operations are not possible.	01 The manual operation is possible	> NEGATIVE • Check the required rotation of the switch • Check that the sufficient torque has been applied. • Then consult your local dealer.
		> POSITIVE • Goal reached.
08 Switch padlocking operations are not possible.	01 Possible to pull the padlocking mechanism	> NEGATIVE • Check that the product is in the 0 position for standard configuration. • Then consult your local dealer.
		> POSITIVE • Goal reached.

