EN INSTRUCTION MANUAL

ATSC25

ATS Controller

www.eti.eu/support

1. GENERAL SAFETY INSTRUCTIONS

- This manual provides instructions on safety, connections instructions on the ETI ATSC25 ATS controller
- Weather the ATSC25 is sold as a loose product, as a spare, in a kit or as part of an enclosed solution or in any other configuration, this device must always be installed and commissioned by qualified and experienced personnel, in line with the manufacturers recommendations, following good engineering practices and after having read and understood the details in the latest release of the relative product instruction manual.
- Maintenance on the product and any other associated equipment including but not limited to servicing operations must be performed offload by adequately trained and qualified personnel using the appropriate protection equipment.
- Each product is shipped with a label or other form of marking including rating and other important specific product information. One must also refer to and respect markings on the product prior to installation and commissioning for values and limits specific to that product.
- Using the product outside the intended scope, outside ETI recommendations or outside the specified the specified ratings and limits can cause personal injury and/or damage to equipment.
- This instruction manual must be made accessible so as to be easily available to anyone who may need to read it in relation with the ATSC25.
- The ATSC25 meets the European Directives governing this type of product and includes CE marking on each product.
- No covers on the C25 should be opened (with or without voltage) as there may still be dangerous voltages inside the product such as those from external circuits.
- Do not handle any control or voltage sensing cables connected to the ATSC25 when voltage may be present on the product directly through the mains or indirectly through external circuits.
- Voltages associated with this product may cause injury, electric shock, burns or death. Prior to carrying out any maintenance or other actions on live parts in the vicinity of exposed live parts, ensure that the switch including all control and associated circuits are de-energized.

DANGER	WARNING	CAUTION
RISK: Electric shock, burns, death	RISK: Possible personal injury	RISK: Equipment damage

The information provided in this instruction manual is subject to change without notice, remains for general information only
and is non-contractual.

Abbreviation and terms:
ATS : Automatic transfer switch (as defined in 60947-6-1)
ATSE : Automatic transfer switching equipment (as defined in 60947-6-1)
RTSE : Remotely operated transfer switching equipment (as defined in 60947-6-1)
HMI : Human machine interface (includes DIP switch and LED information available on the ATSC25 front face).

2. STANDARDS

- As a minimum the ATSC25 comply with the following international standards:

  o IEC/EN 60947-6-1*
  o IEC/EN 60947-1
  o IEC/EN 61010-2-201
  o IEC/EN 61010-2-030
  o IEC/EN 61010-
  1 o GB/T
  14048.11*
  o GB/T 14048.11 Annex
  C o EMC 60947

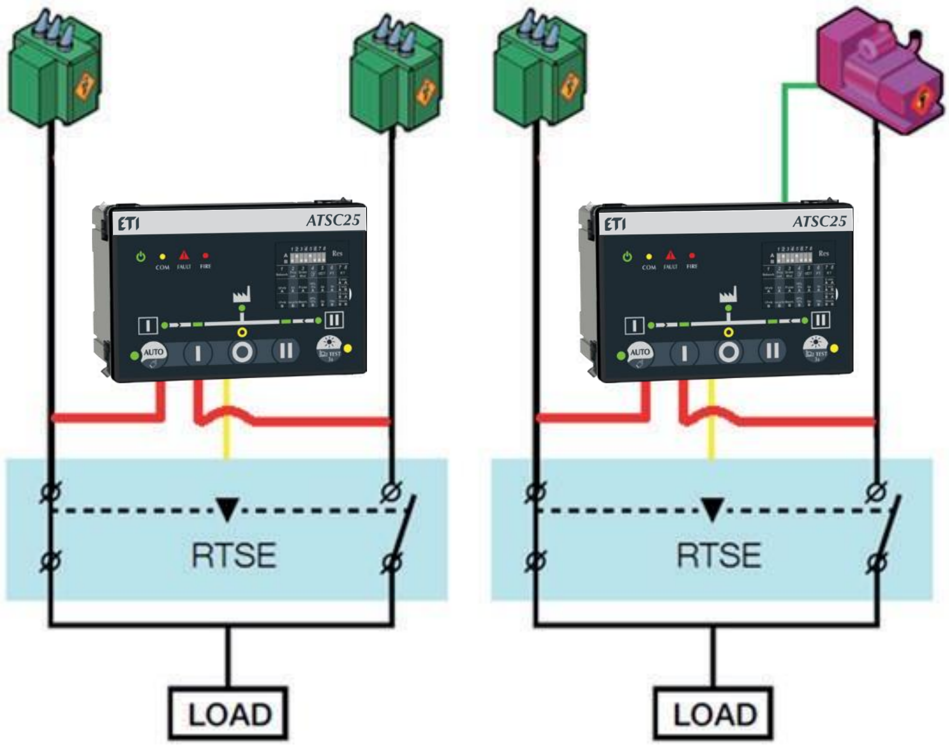
- The Electromagnetic compatibility (EMC) directive 2004/30/UE
- LVD Low voltage directive 2014/35/UE
- EMC according to IEC/EN 60947-6-1 and GB/T 14048.11 (including annex C) & IEC / EN 61326-1 standard
- Vibration according to IEC 60068-2-6 / GB/T 2324.10
- Shock test according to IEC 60068-2-27 / GB/T 2324.5
- Dry heat 16 h , 70 °C according to IEC 60068-2-2 / GB/T 2324.2
- Damp heat at 55°C according to IEC 60068-2-30 / GB/T 2324.4
- Low Temperature 16 h, -25 °C according to IEC 60068-2-1 / GB/T 2423.1
- Salt mist severity 1 according with IEC 60068-2-52 / GB/T 2423.11

3. INTRODUCTION

ATSC25 “ATS Controller” in association with an RTSE (Remote transfer switching equipment) forms an ATSE (Automatic transfer switching equipment), the ATSE formed by the association is designed for use in power systems for the safe transfer of a load supply between a normal and alternate source. When associated with ETI RTSE the changeover is done in open transition insuring full compliance with IEC 60947-6-1, GB 14048-11 and other international standards as listed. As a standalone product the ATSC25 is compliant with IEC 61010-2-201 and is compatible with use with PC and CC type RTSE.

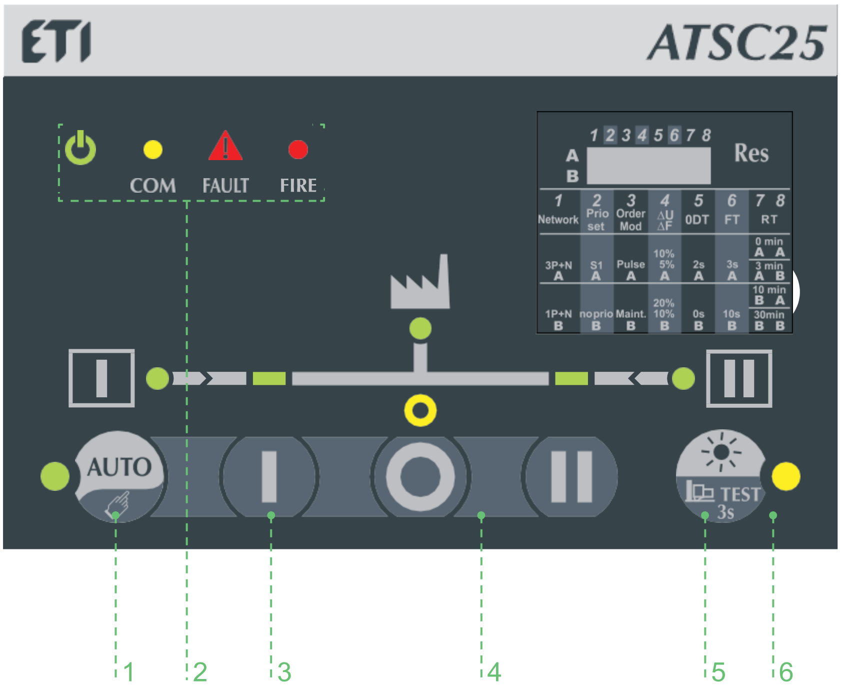
ATSC25 “ATS Controller” Ensures:

- Monitoring of the availability of a Normal and Alternate source
- Supply to the controller and switch from the Normal or Alternate source
- Transfer orders to the RTSE and position reception from the RTSE
- A complete solution fully tested with ETI RSTE
- Intuitive HMI for emergency/local operation
- Clearly visible and indicated HMI
- Suitable for door mounting on the enclosure or DIN Rail mounting inside the enclosure
- Inherent electrical interlock between position orders
- Monitoring of the RTSE stable positions (I – 0 – II)
- Strait forward installation with effective ergonomics
- Power supply continuity for most Utility / Generator or Utility / Utility network applications when linked to an RTSE (Remotely operated transfer switches).



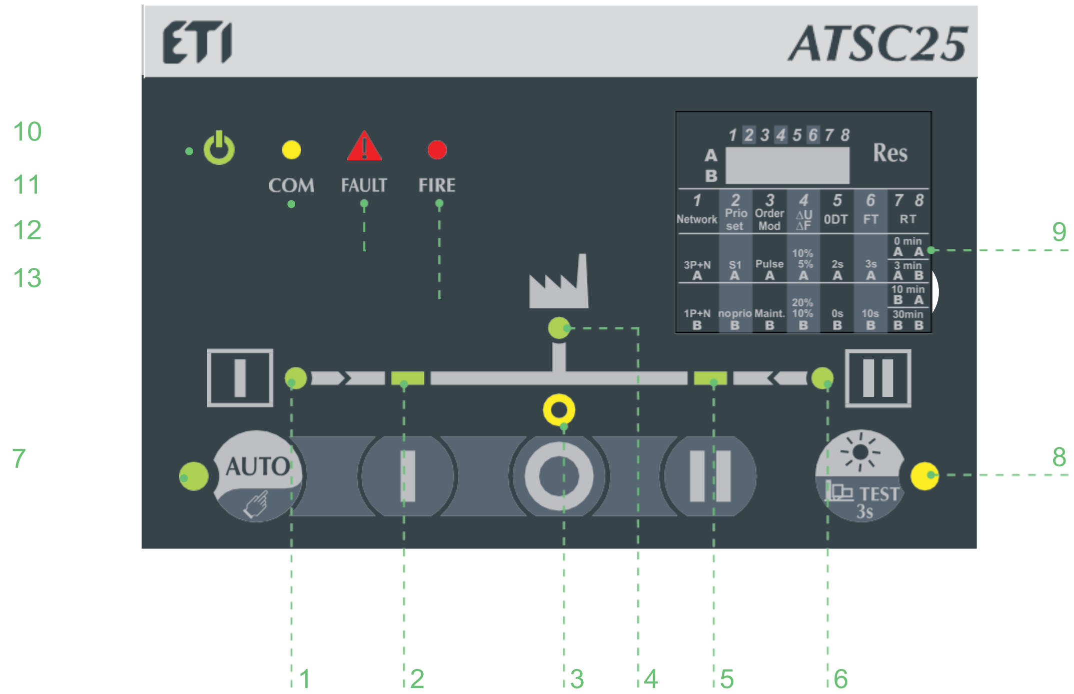
4. GENERAL OVERVIEW

4.1 Product identification



1. AUTO/Manual selector
2. Controller state LED
3. Remote position order selector
4. ATSE Synoptic
5. Test function selector
6. DIP switch programing

4.2 CONTROLLER HMI

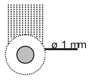


1. Source 1 availability information (Green fixed when source 1 is present and available within threshold limits, green blinking when source 1 is present but outside of threshold limits, off when under 50VAC).
2. Switch 1 LED position indication (Green fixed when in position 1).
3. Zero position LED indication (Yellow when in position 0).
4. Load supplied information (Green fixed when load is supplied by an available source)
5. Switch 2 LED position indications (Green fixed when in position 2).
6. Source 2 availability information (Green fixed when source 2 is present and available within threshold limits, green blinking when source 2 is present but outside of threshold limits, off when under 50VAC).
7. Auto LED indication (Green fixed when in automatic, blinking when a transfer is ongoing, off when in manual mode or inhi- bited or fault is ongoing).
8. Test LED (Yellow fixed when test on load is ongoing).
9. Configurations dip switches (8 dip switches with 2 positions A and B.
10. Run LED (Green when product is powered).
11. COM LED (yellow blinking when RS communications is ongoing).
12. Fault LED (Red blinking – long blink when fault or product in inhibited, fast blink when a dip switch parameter has been changed and needs validation).
13. Fire (Red when fire input is activated).

See Annex I page 29 for more details on the LED indicators

4.3 Environmental

The ATSC25 controllers meet the following environmental requirements:

- IP Rating 

IP degree according to IEC 60529

- P4X on the front face when door mounted.
- IP2X on the back of the controller.

- IK Rating

IK rating according to IEC 61010-2-201

- IP4X on the front face when door mounted
- IP2X on the back of the controller

- Operating Conditions
  - From -25 to + 60°C
  - 95% humidity without condensation at 40°C according to IEC 61010-1
  - 95% humidity without condensation 50°C according to GB14.11 Annex Q

- EMC
  - · IEC/EN 60947-6-1 and GB/T 14048.11 (including annex C) standards
  - · IEC / EN 61326-1

- Altitude 
  - Up to 2000m

- Storage Conditions
  - From -30 to +70°C
  - Maximum storage up to a period of 12 months
  - To be stored in a dry, non-corrosive and non-saline atmospheric conditions
  - A maximum of 3 boxes may be stacked vertically

- Volume and shipping weights
  - Volume LxWxH (mm): 172x128x154.5
  - Weight : 850 g

- Lead free process
- The ATSC25 complies with :
- The UE directive for RoHS 2 2011/65/UE
- The UE directive RoHS 3 2015/863/UE
- China RoHS 2 SJ/T 11364-2014

RoHS COMPLIANT Pb Pb-Free

- WEEE
  - The ATSC25 is built in accordance with 2012/19/EU directive:

- Pollution class
  - Pollution class II

- Other compliances and marking

4.4 CONTENT OF PACKAGING

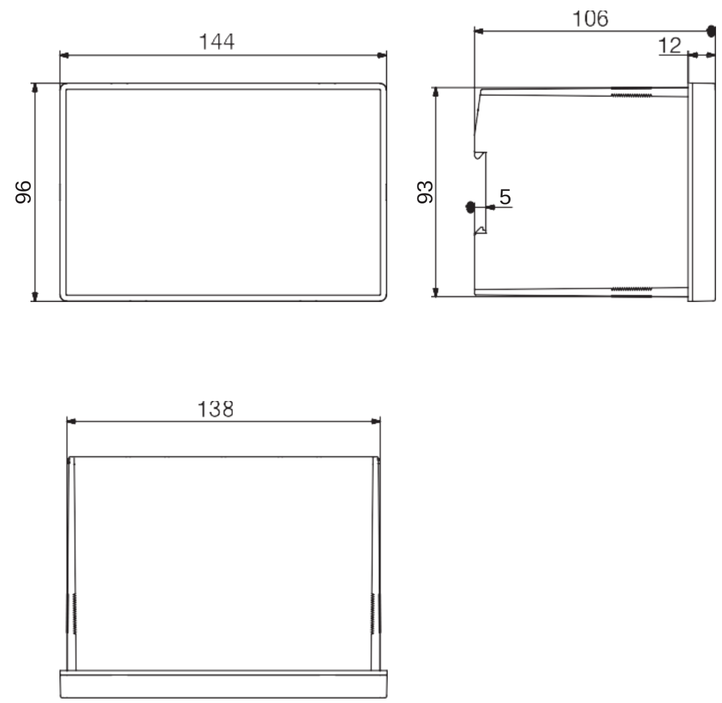
The C25 packaging includes:

- 1 C25 controller
- 1 C25 quickstart guide
- All connector
- Door mounting clips

All other products described in this instruction sheet are delivered and sold separately.

5.1 Product dimensions

dimensions in mm.

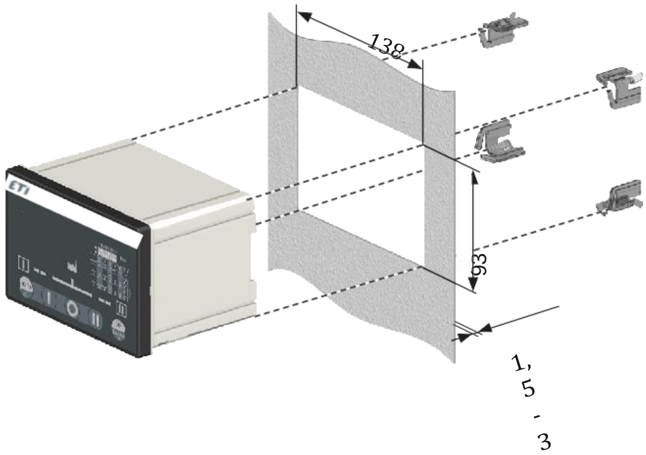


5.2 Mounting

Door mounting

Door cut-out of 93(+0.8) x138(+1) mm, door thickness 1.5- 3mm.

Remove all connectors and clip before inserting the controller in the cut-out then fix the controller in place using all 4 fixations clips (cf. image below):

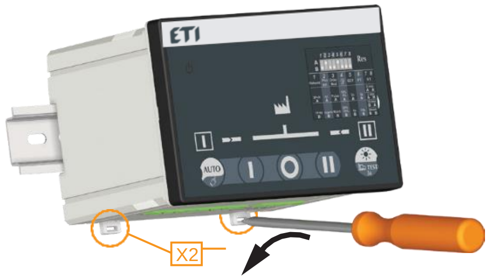


- DIN RAIL mounting

Install on IEC 60715 Standard Din RAIL.

When mounting make sure both clips are pushed up, then clip on the DIN Rail.

To remove from the DIN Rail, drag the two mounting clips down before removing the product.



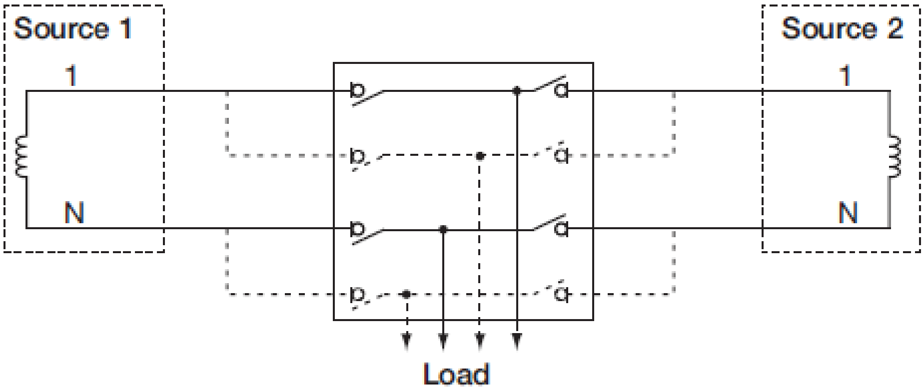
6.1 Networks

Type of networks

1P +N :

The C25 is suitable for single phase networks, for with voltages within 184-300 V.a.c Ph-N

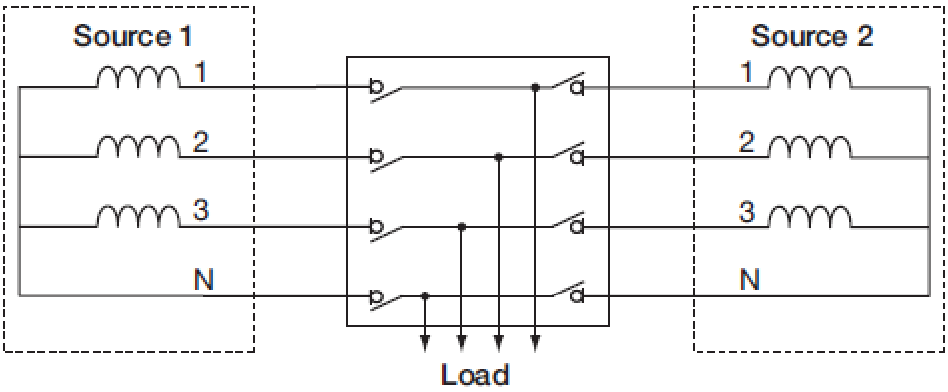
In these networks, the phase must be connected to the L1 input (terminal 104 for source 1 and 204 for source 2).



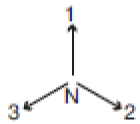
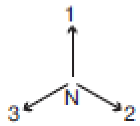
3P+N:

The ATSC25 is suitable for three phase with neutral networks, for with voltages within 184-300 V.a.c Ph-N and 318-520 PH-PH.

In these networks, the phase must be connected to the L1 input (terminal 104 for source 1 and 204 for source 2).



- Metering and sensing detail

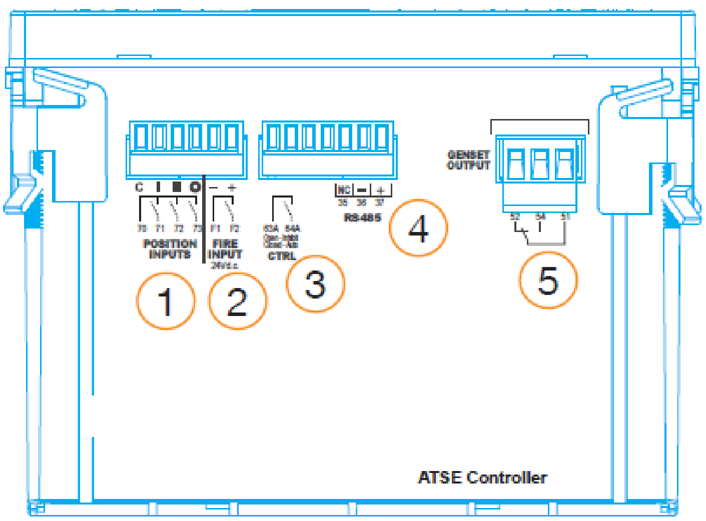
Network type		
	1P	3P+N
Source 1 Source 2	1 phase 2 wire	3 phase 4 wire
Source 1		
Source 2		
Voltage sensing		
Source 1	- V1	U12, U23, U31 V1, V2, V3
Source 2	- V1	U12, U23, U31 V1, V2, V3
Source presence (source available)	✔	✔
Source in ranges (U, V, F)	✔	✔

CAUTION

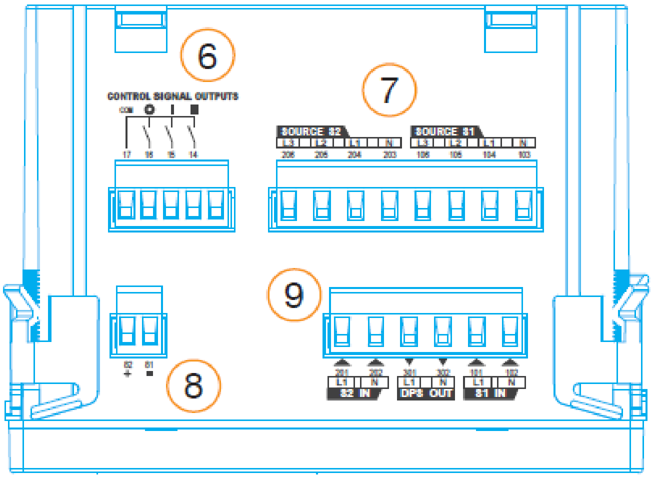
In 3 phases with Neutral balanced networks, there is a risk that the loss of neutral will not be detected.
To limit this risk the Dip switch 4 (Hysteresis) can be switched to position A. (Cf chapter 7-5 programing).

7.2 Connections

TOP



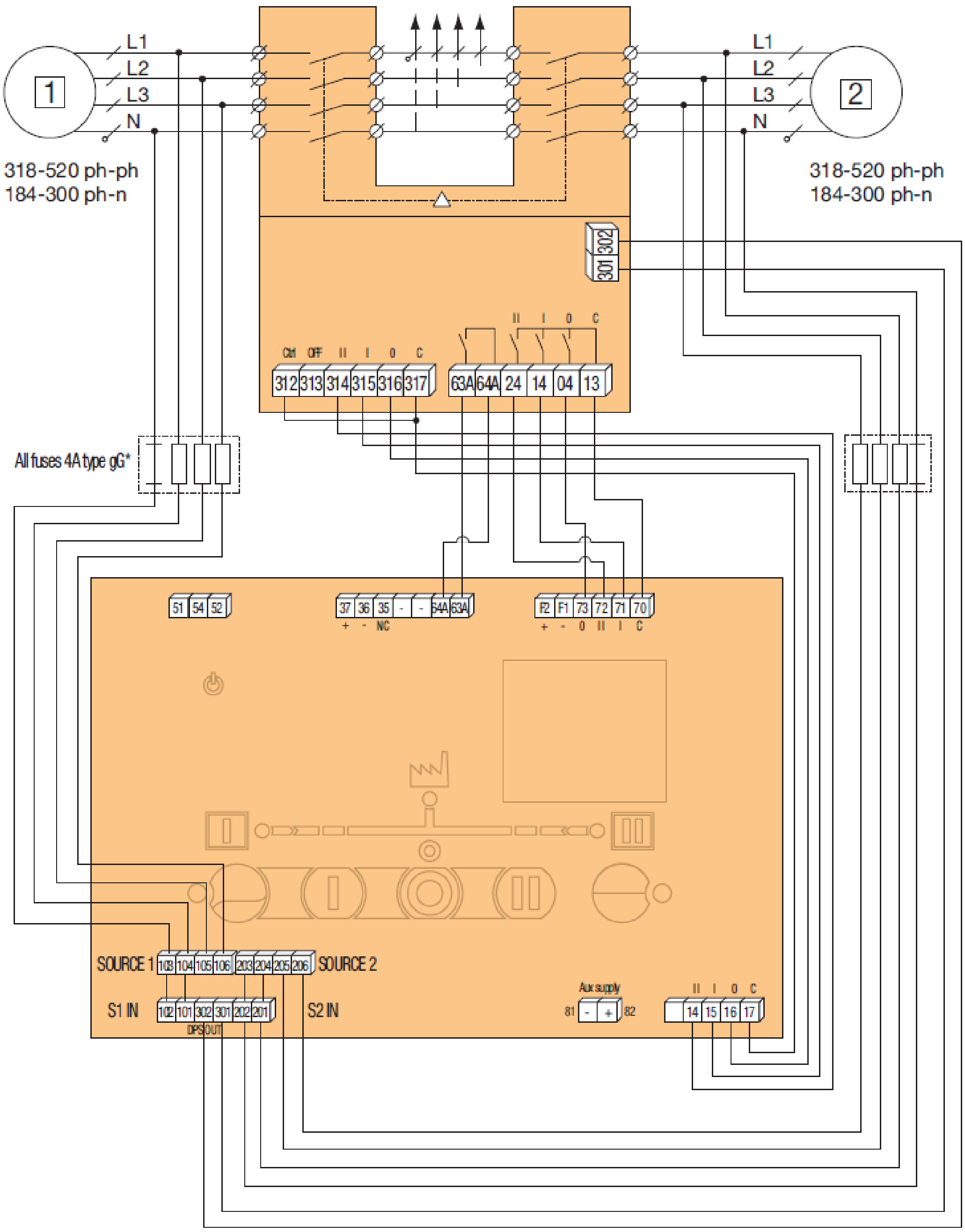
BOTTOM



1. RTSE position feedback input
2. 24 V.d.c fire input
3. Enable control when closed / disable control when open
4. RS485 connections
5. Genset Start relay
6. RTSE position control outputs
7. Source 1 and 2 voltage inputs
8. 24 V.d.c Aux supply
9. External DPS – Input / output

6.2 Connection diagrams with MLBS 3P/4P 250...630A

For additional connection diagrams (MLBS 4P 63...125, Contactors , etc..) see ANNEX I



6.3 Terminal denomination, description and characteristics

Denomination	Terminal	Description	Characteristics	Recom-mended Cable section	Tightening torque / screw type
Control signal outputs (orders to RTSE)	14	Position II order	AC1 – General use – Ie: 5A , Ue: 250 V.a.c DC1 – General use – Ie: 5A , Ue: 30 V.d.c AC15 - Ie: 3A, Ue: 120 V.a.c AC15 - Ie: 1.5A, Ue: 240 V.a.c DC13 - Ie: 0.22A, Ue: 125 V.d.c DC13 - Ie: 0.11A, Ue: 250 V.d.c	1-2.5mm²	0.58 Nm
	15	Position I order			
	16	Position 0 order			
	17	Common point for position output			
RS485	35	NC – Not connected	RS485 Isolated bus		
	36	Negative electrode			
	37	Positive electrode			
Genset output	51	Common point			
	52	Closed to start the Genset (closed when controller is powered off)	AC1 – General use – Ie: 3A , Ue: 250 V.a.c DC1 – General use – Ie: 3A , Ue: 30 V.d.c AC15 - Ie 54/51: 3A 52/51: 1.5A Ue: 120 V.a.c AC15 - Ie 54/51: 1.5A 52/51: 0.75A Ue: 240 V.a.c DC13 - Ie 54/51: 0.22A 52/51: 0.22 A 125 V.d.c DC13 - Ie 54/51: 0.11A 52/51: 0.11 A 250 V.d.c		
	54	Open to start the genset			
Controller inhibit input	63A	Controller is inhibited when this contact is open	Do not use external voltage - Power from common point	0.5-1.5mm²	0.2 Nm/ M2
	64A				
Return of information from RTSE (Position inputs)	70	Common point for position inputs	Do not use external voltage - Power from common point		
	71	Position I RTSE			
	72	Position II RTSE			
	73	Position 0 RTSE			
Fire input	F1	Negative electrode of the 24 V.d.c	12-24 V.d.c		
	F2	Positive electrode of the 24 V.d.c			
Optional Aux supply 24V.d.c	81	Negative electrode of the 24 V.d.c	10-30 V.d.c (Auxiliary supply for controller, does not supply RTSE)	1-2.5mm²	0.58 Nm / M3
	82	Positive electrode of the 24 V.d.c			
Source 1 and 2 voltage inputs	103	Source 1 N	Sensing range: 90-520 V.a.c (ph-ph) 50-300 V.a.c (ph-n) 45-65 Hz Supply: 184-300 V.a.c* (ph-n) 45-65 Hz Max consumption 10 W *200-300 V.a.c in maintained mode		
	104	Source 1 L1			
	105	Source 1 L2			
	106	Source 1 L3			
	203	Source 2 N			
	204	Source 2 L1			
	205	Source 2 L2			
	206	Source 2 L3			
DPS output (RTSE power supply)	301	Phase output	AC – General use – Ie: 6A , Ue: 250 V.a.c DC – General use – Ie: 6A , Ue: 30 V.d.c AC15 - Ie: 3A, Ue: 120 V.a.c AC15 - Ie: 1.5A, Ue: 240 V.a.c DC13 - Ie: 0.22A, Ue: 125 V.d.c DC13 - Ie: 0.11A ,Ue: 250 V.d.c		
	302	Neutral output			

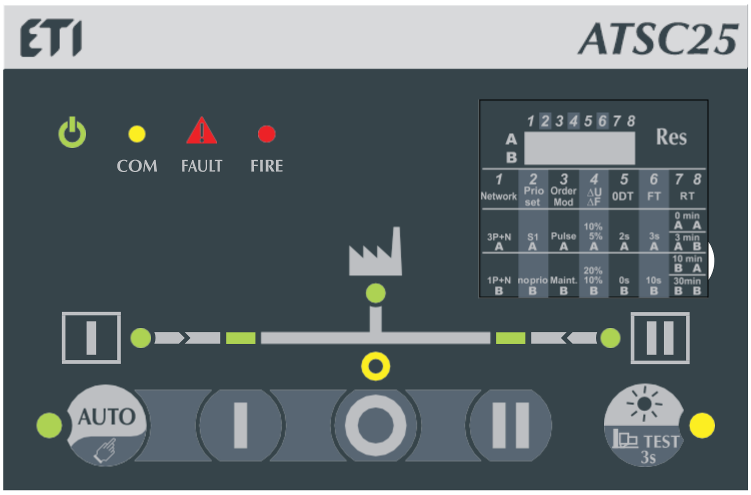
*LiYCY sheilded twisted pair

NOTE 1: Use 7mm as stripping length for the controller terminals
NOTE 2: Use 90°C copper wire for installations with ambient temperature from 35-60°C.

When the ambient temperature is above 60°C, Use 105°C copper wire.

7. ATSC25 OPERATING MODES

The ATSC25 has 3 distinct working modes, the working modes are selected using the HMI button or by using the 63A/64A input.



The 3 working modes are working as described below:

- Auto mode

In this mode the controller will automatically give orders to the RTSE connected to switch to the correct position according to the settings selected.

In this mode, the manual order buttons , , are disabled.

This mode is activated when the LED 7 is ON (fixed). To access this Mode make sure that you are in manual mode (the LED 7 is OFF and that the fault LED (12) or the TEST LED (8) are not activated) and then press the AUTO button for 3 seconds, the LED 7 should then turn ON.

- Manual mode

In this mode the manual orders buttons , , enable manual orders to switch respectively to position I , 0 or II.

This mode is activated when the LED 7 is OFF and the LED 12 is OFF and that the fault LED (12) or the TEST LED (8) are not activated. To switch from AUTO mode to manual mode, press the button AUTO for 3 seconds.

- Inhibit mode

In this mode both the Automatic transfer and manual orders will be blocked. This mode is activated when the input 63A/64A is OPEN.

In this mode the fault LED (12) will be blinking, and AUTO LED will be OFF. To leave the inhibit mode close the 63A/64A input, the controller will return to the last working mode (Automatic or Manual).

7.1 Triple power supply

The ATSC25 can be supplied by 3 power sources:

AC – Power through the voltage sensing (terminals 103-104 for source 1 and terminal 203-204 for source 2) with power supply range going from 184-300 V.a.c (in pulse mode) 200-300 V.a.c (in maintained mode) 50/60 Hz+/- 10%

DC - Auxiliary supply (optional), 10-30 V.d.c power supply using terminals 82-81.

CAUTION **The DPS output to the RTSE will not be functional when powering through the DC auxiliary power supply.**

7.2 Voltage sensing Inputs

The ATSC25 includes dual single phase and 3 phase voltage sensing (terminals 103-106 and 203-206) designed to monitor 1 Phase supplies up to 300 V.a.c (L-N) and 3 phase +N up to 520 V.a.c (L-L).

The ATSC25 is designed to handle single phase and three phases with neutral networks, simply define the correct configuration of single phase / 3phase with neutral using the DIP switch 1 on the front of the controller (cf. Chapter 7-5 programming).

Sensing values measured will have a direct influence on determining the availability of the main and alternate supplies as well as the ATSC25 automation.

The parameters monitored through the sensing are the following:

7.3 Phase rotation

When both sources are available the controller will check that the phase rotation is identical on both sources. If the sources have different phase rotations the source available LED will be blinking on both sources.

CAUTION **When only one source is available, the controller will automatically accept the source regardless of the phase rotation order**

7.2.1 Frequency within set limits

The ATSC25 will check that the frequency is within the limits configured through DIP switch 4 or through communication (cf. configuration chapter configuration). Frequency is checked on L1 only.

7.2.2 Loss of the main or alternate power supply

Loss of supply depends on the nominal voltage and frequency configured together with the hysteresis (set in DIP switch 4)The source will be considered as lost after the fail timer as counted down (set through dip switches 7 & 8 (0 / 3 /10 / 30 min).

7.2.3 Return of main and/ or alternate power supply

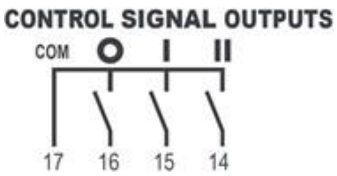
Return of supply depends on the nominal voltage and frequency configured together with the hysteresis set. (Set in DIP switch 4). The source will be considered as available when the return timer will have counted down (set through dip switches 6 (3s / 10s).

7.2.4 Loss of Neutral

In a 3phase network with unbalanced loads the loss of the neutral will be detected.

7.3 Fixed outputs

10.3.1. Control signal outputs



Control signal outputs are the output orders (dry contact) to the RTSE; the ATSC25 includes 3 signal outputs and a common (point powered by the user) (Terminals 17 to 14). These outputs are rated for 250 Vac, 50/60 Hz 5A general use , and 30 V.d.c 5A general use.

These outputs function as described below:

When order 0 is given through the Automatism in automatic mode or manually using the button  the contact between 17 and 16 will be closed.

When order I is given through the Automatism in automatic mode or manually using the button  the contact between 17 and 14 will be closed.

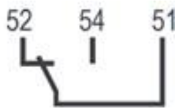
When order II is given through the Automatism in automatic mode or manually using the button  the contact between 17 and 15 will be closed.

These outputs can be impulse or maintained depending on the setting on DIP switch 3 Order Mod.

In maintained mode when an order is sent it will be maintained until a different order is sent.

In impulse mode orders are sent for maximum 5s and are stopped when either 5s has expired or the controller received feedback that the RTSE has reached the requested position. If 5s expire and the RTSE has not reached the requested position the controller will consider this as a fault and will inhibit the automatism until the fault is cleared.

10.3.2. Genset start output



Genset start outputs are the output orders (dry contact), the contact between 51 and 54 will open & the contact between 51 and 52 will close when the signal to start the genset should be sent (during a test on load or when source 1 is lost). These outputs are rated for 250 V.a.c, 50/60 Hz 5A general use for NO contact and 3A general use for NC contact, and 30 V.d.c 5A general use for the contact between 51-54 and 3A general use for the contact 51-52.

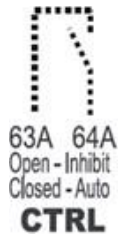
Control	51/54	51/52
Generator Start	Contact open	Contact closed
Generator Stop	Contact closed	Contact open

When the switch returns in position I the Cooldown timer will start counting (Default value 180s) during the cooldown timer, the contacts will maintain the generator start signals.

CAUTION **If the 24 V.d.c auxiliary power supply is not used the timer 1FT will not count and the order to start the generator will be sent immediately when source 1 is lost.**

7.4 Fixed inputs

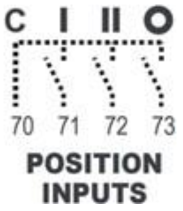
10.4.1. Inhibit input



When the contact 63A/64A is open the controller is in inhibit mode (Fault LED blinking and automatism and manual controls are deactivated). When this contact is closed the controller returns to the last working mode (either manual mode or automatic mode).

When the product is delivered this input is hardwired to closed, to use the input first remove the wire

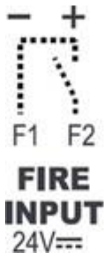
10.4.2. Position inputs



These inputs must be connected from the RTSE to the controller in order to indicate the position of the RTSE, when the controller gives an order both through manual command and automatically it will check that the position input corresponding to this order has closed. If this is not the case the controller fault LED will blink and the buzzer will be on, to clear the fault expected position input should be closed and the user must press the AUTO button.

73/70 must be closed when the RTSE is in position 0.
72/70 must be closed when the RTSE is in position II.
71/70 must be closed when the RTSE is in position I.

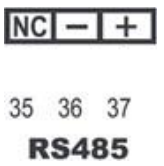
10.4.3. Fire input



This input is activated by applying 24 V.d.c (12-24 V.d.c) on F1 and F2 (negative electrode connected to F1 and positive electrode on F2.

When this input is activated the Fire LED (13) will be ON (fixed) and the buzzer will sound, the controller will give the order to the switch to go to position 0 and both manual and automatic controls will be inhibited. When the input is removed, the switch will go back to the last working mode automatically

10.4.4. RS485



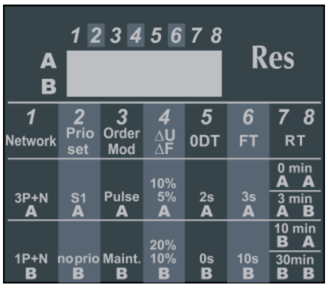
The RS485 connector provides the Modbus communication allowing to read values from the controller (eg: Voltage values, settings, switch position etc...) for details on the values that can be read through communication (see Annex II).

7.5 Programming

The programming of the controller is done through the DIP switches available on the front HMI.

WARNING **Program only when in manual mode to avoid unexpected transfers or injuries.**

7.5.1 Programing through DIP switch



Programming through DIP switches is done using the 8 DIP switches on the front of the controller. Each DIP switch has positions A & B, by default all DIP switches are in position A.

When programming the dip switches with the switch powered off simply change the position of the DIP switches. To change the position of the DIP switches use a small screwdriver.

When programing the DIP switches with the controller powered on, switch to manual mode. When a DIP switch changed position the Fault LED will blink fast (3Hz), to validate the change of the DIP switch press the RES button shortly (<1s). The Fault LED will stop blinking and the buzzer will sound twice. If instead of validating the DIP switch is brought back to the original position without pressing the Res button, the Fault LED will also stop blinking and the configuration will remain the same

DIP Switch		
1. Network	A	Three phase network
	B	Single phase network
2. Prio Set	A	Prioritty source 1
	B	No priority
3. Order Mod	A	Control mode impulse logic
	B	Control mode contactor logic
4. ΔU/ΔF	A	Overvoltage setting at 10% of nom voltage / overfrequency setting 5% of nominal frequency (hysteresis value is 20% of ΔU/ΔF)
	B	Overvoltage setting at 20% of nom voltage / overfrequency setting 10% of nominal frequency (hysteresis value is 20% of ΔU/ΔF)**
5. 0DT	A	Load supply down time of 2 second (0DT = 02 sec)**
	B	Load supply down time of 0 second (0DT = 0 sec)
6. FT	A	Wait time of 3s before source is lost (Fail timer = 3s)
	B	Wait time of 10s before source is lost (Fail timer = 10s)
7/8. RT	AA	Wait time of 0min (3s) before source returns (retrun timer = 0min (3s))*
	AB	Wait time of 3min before source returns (retrun timer = 3min)
	BA	Wait time of 10min before source returns (retrun timer = 10min)
	BB	Wait time of 30min before source is lost returns (retrun timer = 30min)

*When 0min is selected the return timer is set to 3s

**When Control mode contactor is selected the minimum hysteresis is -15%

8.CHARACTERISTICS

Electrical characteristics	
AC operating limits	184 - 300 VAC(2)
Optional DC supply	24 VDC
Frequency limits	45 - 65 Hz
Power consumption	< 10 W
Inputs	5 - fixed (auto inhibit & 24 VDC fire input, position indication I-0-II)
Outputs	4 - fixed (position control I-0-II & genset start)
Impulse withstand	6/4 kV(1)
Overvoltage category	CAT 3

Mechanical characteristics	
Weight	845 gr
Door cutout	138 x 92 mm
Operating temperature	-25 … +60°C
Communications	
Interface type	RS485. 2 to 3 half duplex wires
Protocol	MODBUS RTU
Baudrate	38400

(1) 6 kV tested between phases of a different source and 4 kV tested between phases of a the same source.
(2) 190 - 300 VAC in contactor mode.

9. PREVENTIVE MAINTENANCE

WARNING **Maintenance operation should be done by trained and qualified personnel using the appropriate protection equipment.**

It is recommended to verify at least once a year the tightening torque of all connections and to operate the product in a full operating cycle (I – 0 – II – 0 – I: Auto and Manual) as well as tightening the door mounting clips and testing the LED’s with the lamp test button when applicable.

In case of upstream protection tripping (fuse protection / Circuit breakers) make sure that the ATS remains functional by doing a functional test with the RTSE connected to the controller.

To clean the front face of the equipment, use a soft cloth with water and non-abrasive liquids.

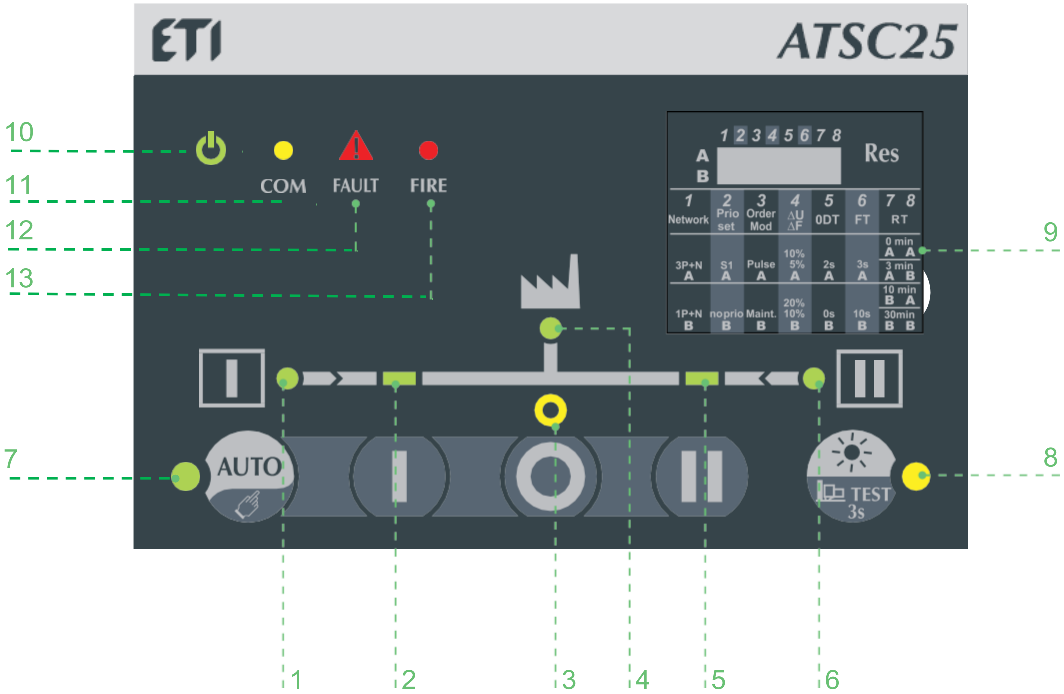
Note: Maintenance should be planned carefully and carried out by qualified and authorized personnel. Consideration of the critical level and application where the product is installed should form an essential and integral part of the maintenance plan. Good engineering practice is imperative whilst all necessary precautions must be taken to ensure that the intervention (whether directly or indirectly) remains safe in all aspects.

10. TROUBLE SHOOTING GUIDE

DEFINITION	RECOMMENDED ACTION
Sources are not detected	- Verify that the product is correctly powered on using the power LED. - Verify that the DIP switch settings are corresponding to your installation.
Positions are not detected	-Verify that the position input cabling is correctly done.
Source LED are blinking	- Verify that the sources are in the voltage range configured through DIP switch or communication. - Verify that the sources are cabled correctly. - Verify that the phase rotation.
Alarm LED is blinking	- Verify that the input 63-64 is closed. - Verify that there has not been a problem during a transfer order and validate fault with the AUTO button. -Verify that the DIP switches have not changed position or validate the change of position using the RES button.
COM LED is on fixed	- Verify that Communication settings are set according to your specification. - Press “RES” for 30 seconds to reset the Communication settings. - Contact ETI for other information.
DIP switch parameters are not taken into account	- Check if the alarm LED is blinking. - Verify that you are in manual mode when changing DIP switch parameters. - Press the “RES” button for less than 3s to validate the parameter change.

11 ANNEX I

Reminder C25 HMI :



1. Source 1 availability information (Green fixed when source 1 is present and available within threshold limits, green blinking when source 1 is present but outside of threshold limits, off when under 50VAC).
2. Switch 1 LED position indication (Green fixed when in position 1).
3. Zero position LED indication (Yellow when in position 0).
4. Load supplied information (Green fixed when load is supplied by an available source)
5. Switch 2 LED position indications (Green fixed when in position 2).
6. Source 2 availability information (Green fixed when source 2 is present and available within threshold limits, green blinking when source 2 is present but outside of threshold limits, off when under 50VAC).
7. Auto LED indication (Green fixed when in automatic, blinking when a transfer is ongoing, off when in manual mode or inhi- bited or fault is ongoing).
8. Test LED (Yellow fixed when test on load is ongoing).
9. Configurations dip switches (8 dip switches with 2 positions A and B see chapter 7.5 for configuration details).
10. Run LED (Green when product is powered).
11. COM LED (yellow blinking when RS communications is ongoing).
12. Fault LED (Red blinking – long blink when fault or product in inhibited, fast blink when a dip switch parameter has been changed and needs validation).
13. Fire (Red when fire input is activated).

11.1 LED Functioning modes

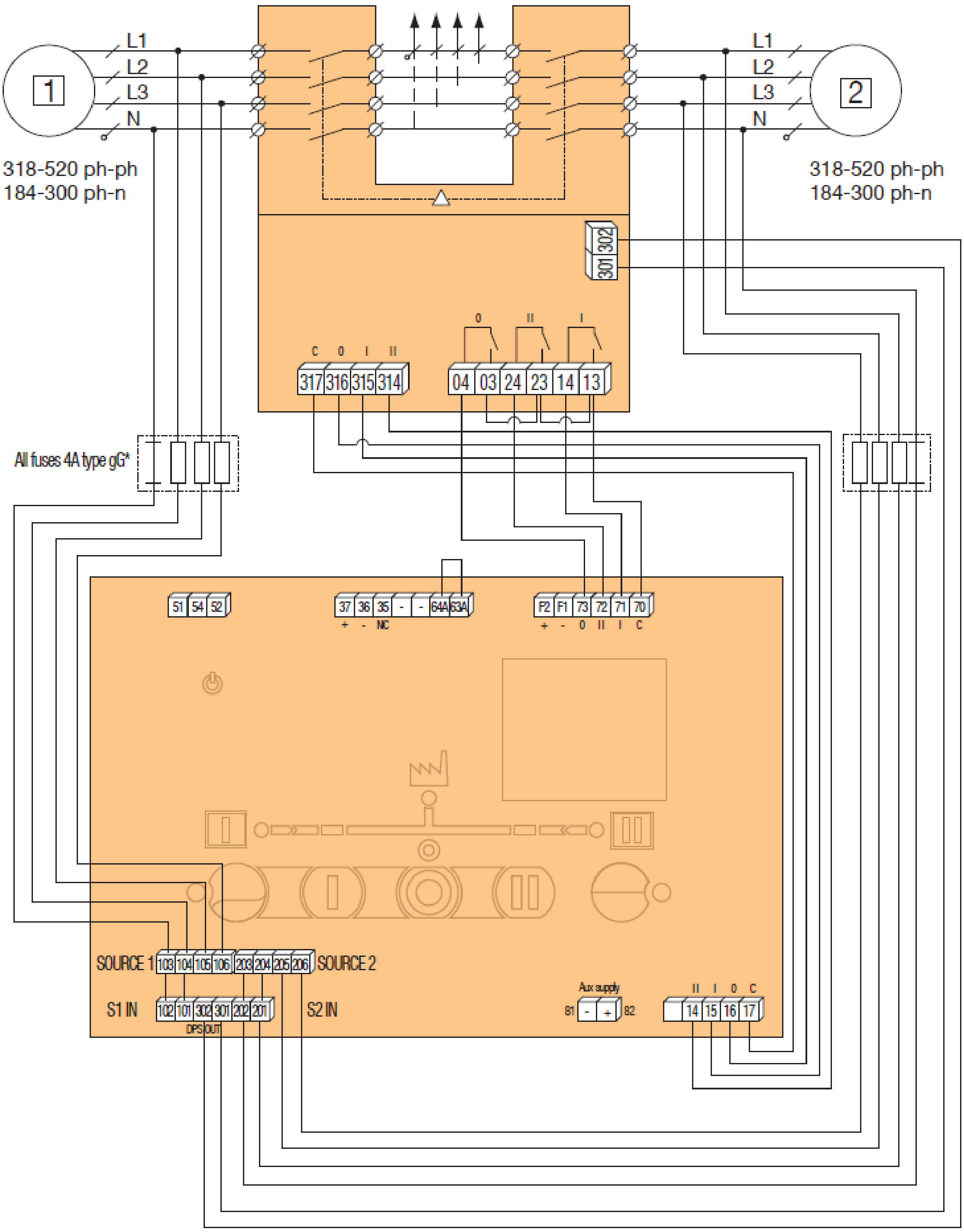
LED indicator (cf HMI image)	LED blinking	LED ON**	LED OFF*
1: Source 1 availability	Source 1 present but not available for following possible reason: -Source undervoltage / under frequency -Source overvoltage /over frequency -Phase rotation order of source 1 & 2 are different	Source is available	Source is not available
2: Position I indicator	/	RTSE is in position I / Load is connected to source 1	RTSE is not in position 1 / Load is not connected to source 1
3: Position 0 indicator	/	RTSE is in position 0 / Load is not connected to source 1 or source 2	RTSE is in position 0 / Load is not connected to either source 1 or source 2
4: Load supplied indicator	/	Load is being supplied by a source which is available	Load is not being supplied by a source which is available
5: Position I indicator	/	RTSE is in position II / Load is connected to source 1	RTSE is not in position II / Load is not connected to source 1
6: Source 2 availability	Source 2 present but not available for following possible reason: -Source undervoltage / under frequency -Source overvoltage /over frequency -Phase rotation order of source 1 & 2 are different	Source is available	Source is not available
7: AUTO/MANUAL indicator	A timer is counting down and a transfer will be initiated. (If fault is blinking with buzzer AUTO/MANU will be blinking)	The controller is in automatic mode	Controller is not in automatic mode possible modes : -Manual -Inhibited -Fault detected
8: TEST led	/	Test is ongoing	No test ongoing
10: Power	/	Controller is powered up	Controller is OFF
11: Communication	Controller is sending / receiving information	Communication parameters have been modified (Baud rate / Parity / address)	No communications orders are currently being sent or received
12 : Fault indicator	Fast blinking (3Hz): one or more Dip switch has changed and configuration as not been saved. Long blinking (2Hz): Inhibit input is active or fault is active	/	Inhibit is not active / no faults active and dip switch configuration has been saved.

*Considering that the controller is powered.

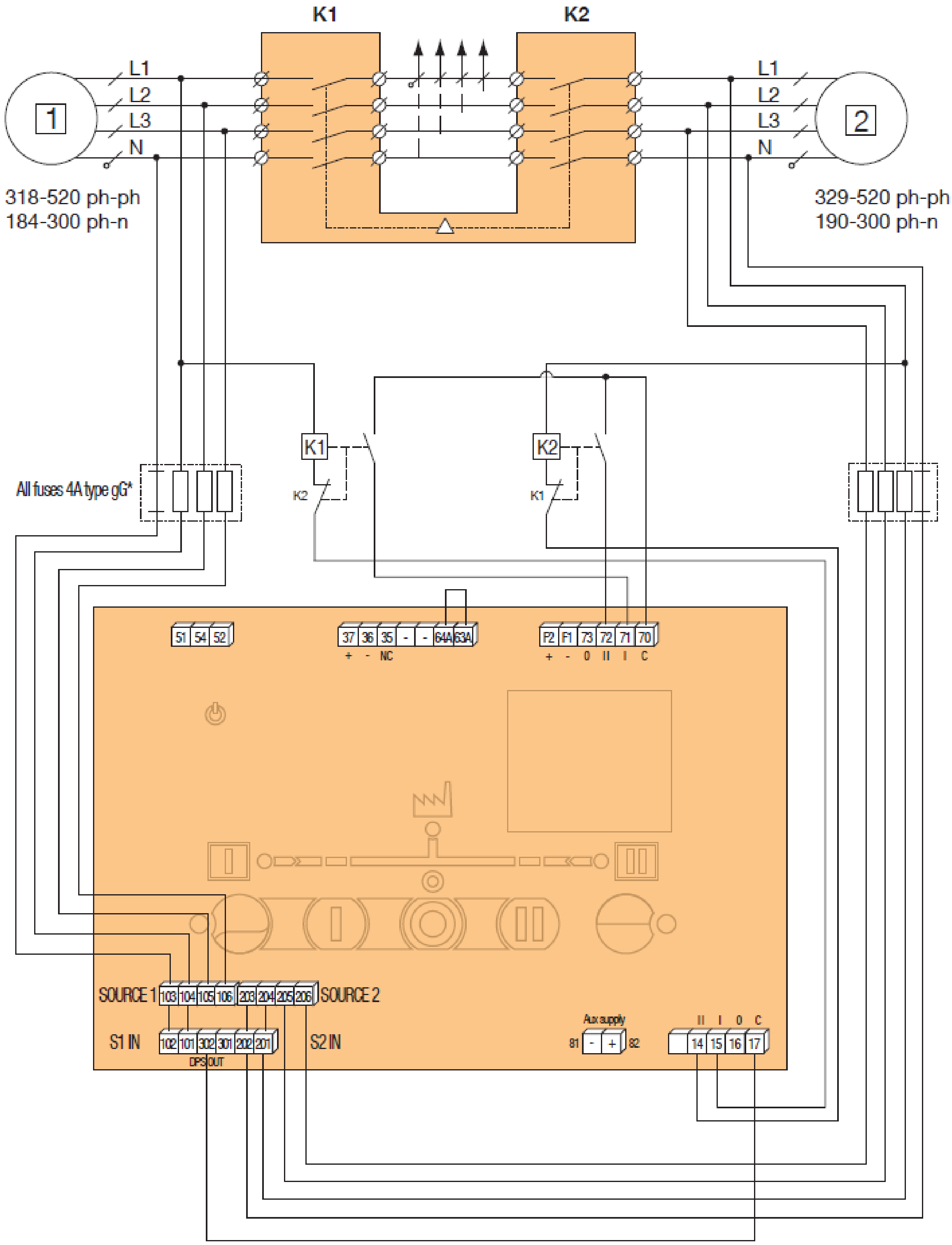
**Considering that lamp TEST has not been initiated

11.2 Connection diagrams

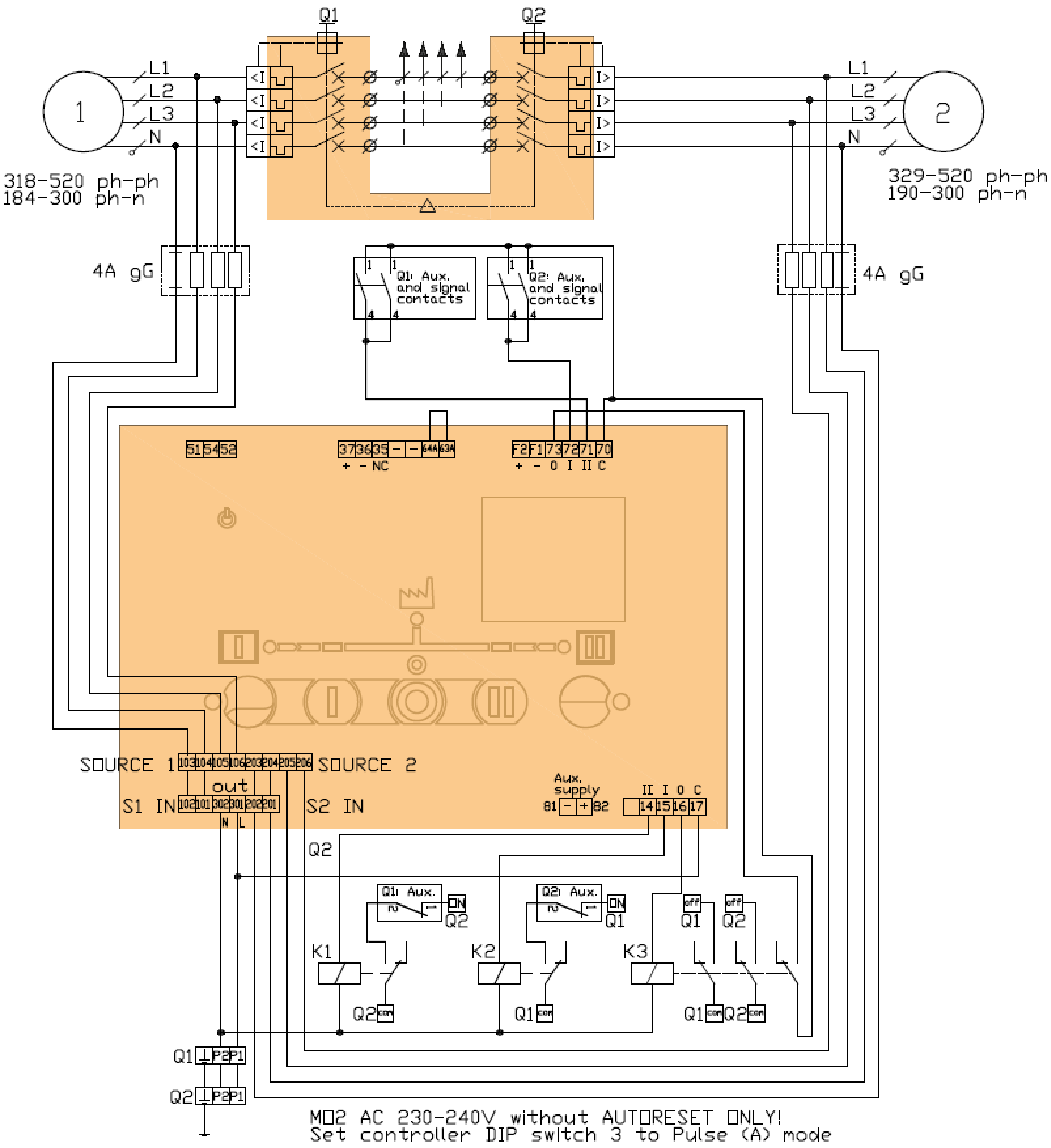
11.2.1 Connections with MLBS 4P 63...125



11.2.2 Connections with standard Contactors (CEM and CES)



11.2.3 Connections with MCCBs EB2 and MO2



11.3 Phase rotation check

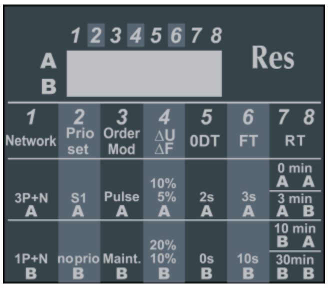
When both sources are available the controller will check that both sources have the same phase rotation.

If the two sources have different phase orders the source LED (1 & 6) will blink , the fault LED will light up and the sources will be considered as not available (switch will not transfer from the current position to the opposite source).

If only 1 source is available the product will not check the phase rotation order.

11.4 Voltage/Frequency Levels configuration

Voltage and frequency levels can be configured through communication or DIP switch (DIP switch 4).



Configuration through DIP switch

The DIP switch configuration allows setting the voltage and frequency limits to 10% of nominal vol- tage & 5% of nominal frequency or 20% of nominal voltage & 5% of nominal frequency. In both cases the hysteresis is 20 % of the selected value. The default value for nominal voltage is 230 V.a.c and the default value for nominal frequency is 50Hz.

To reboot the product press the Res button for 30s, this will restart the product and take into account any changes on the DIP switches (even if the controller was in AUTO mode at the time of restart). In case of a configuration change the controller Buzzer will beep twice.

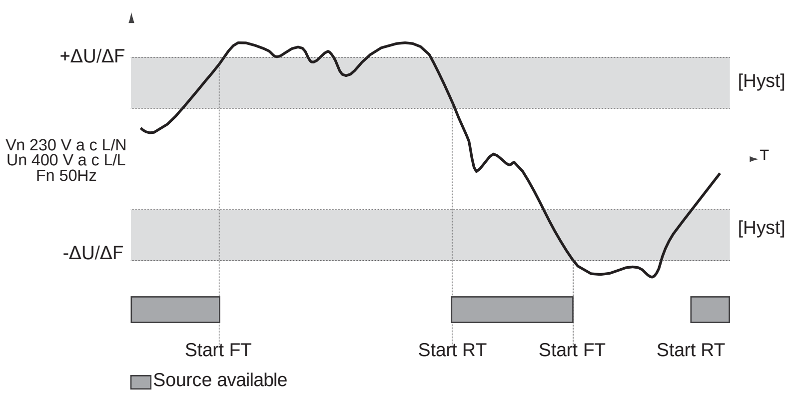
11.5 Timers

11.5.1 Fail timers and Return timers

Source failure timers FT and source return timers can be configured using the DIP switches.
The source fail timer FT is the time during which the source can be outside the voltage and frequency threshold before it is considered lost. (cf. graph below)

The source return timer is the time for which the source must be within the voltage and frequency threshold before it is considered available. (cf. graph below)

If only one source is present, the controller will give the order to switch to this source before the return timer has finished counting.



11.5.2 Cooldown timer

When the switch returns in position I the Cooldown timer will start counting (Default value 180s) during the cooldown timer, the contacts will maintain the generator start signals.

11.5.3 Dead band timer ODT

The dead band timer ODT can be configured using the DIP switches 5 (2s or 0s). This timer defines the time for which the switch should stay in the 0 position when transferring from one source to another.

11.6 Priority settings

Priority settings can be configured using the DIP switch 2 “PRIO SET” or through

communication. The priority can be set to:

11.6.1 S1, in this case when source 1 is available the controller will give the order to switch to position I
11.6.2 No prio, if both sources are available the controller will give the order to remain in the current position.

12 Tests

The C25 allows for 2 test functions using the HMI test button: 

A short press on this button (<3s) will start a LED test, allowing the user to check that all LEDs are functional.

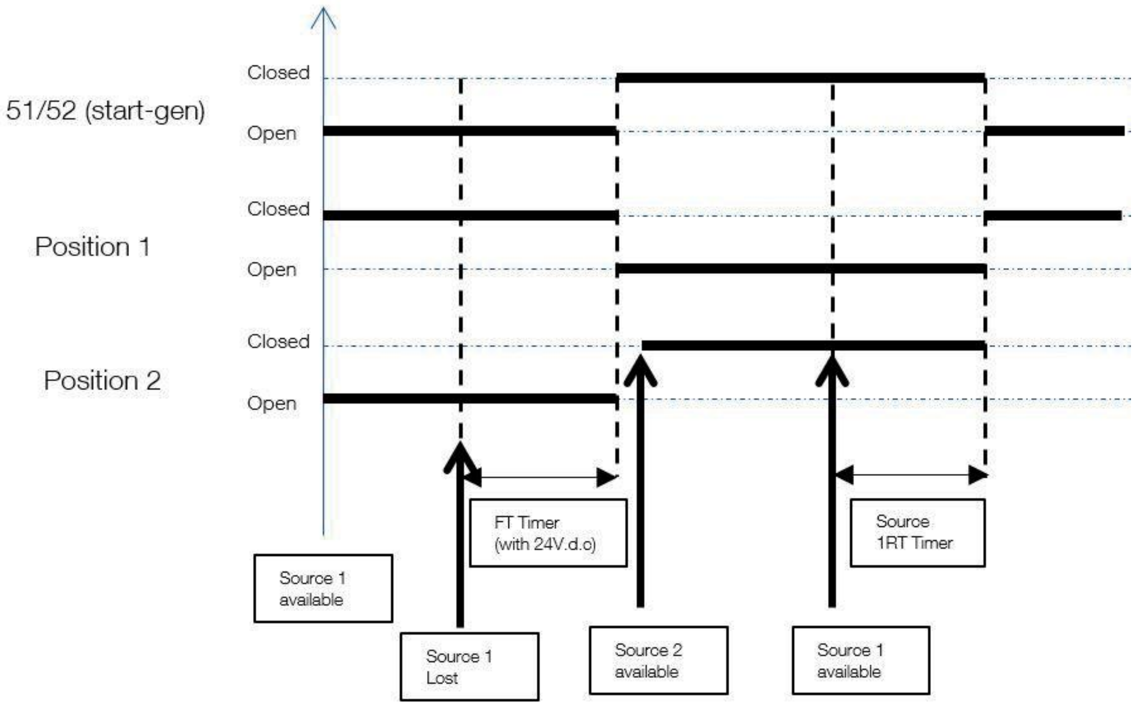
A long press (>3s) on this button will start a TEST ON LOAD, this test will start the genset, and transfer to the Source II once the source is considered available.

The product will remain on source 2 until the test ends, to end the test press again the test button for more than 3s to return in the last working mode (Manual or Automatic).

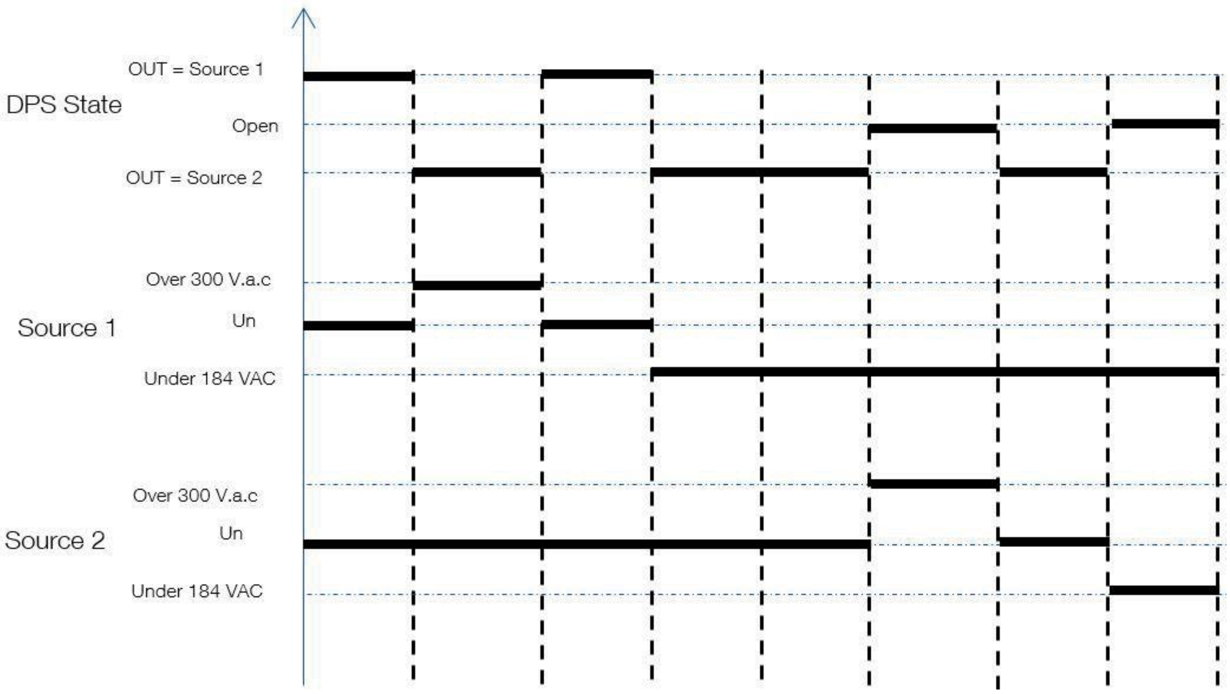
It is also possible to start and stop the test on load and off load through communication

13 ATSC25 Operating sequence

Controller operating sequence with source 1 priority:



DPS Output operating sequence :



14. ANNEXE II MODBUS COMMUNICATION ADDRESS AND DESIGNATION DETAILS

All communication addresses, except communication parameters (4) are read only RO (read function 03/04).

The communication protocol adopts the standard MODBUS-RTU protocol, with master-slave acknowledgment connection (half duplex).

As standard the baud rate is set to 38400, parity bit to 1 (these settings can be modified through

Modbus). When the product is communicating the COM Led will blink.

- ## Input / Output state

Dec. Address	Word count	Description	Unit
10008	1	Position I input state (70-71) :	0 : OFF 1 : ON
10009	1	Position II input state (70-72) :	0 : OFF 1 : ON
10010	1	Position 0 input state (70-72) :	0 : OFF 1 : ON
10011	1	Fire Input state (F1-F2):	0 : OFF 1 : ON
10012	1	CTRL inhibit (63A-64A)	0 : Inhibit 1 : Automatic
10022	1	Genset control output: (51-52-54)	0 : Genset start order OFF 0 : Genset start order ON
10023	1	Control signal output I (15-17):	0: Output not activated I : Output activated
10024	1	Control signal output II (16-17):	0: Output not activated I : Output activated
10025	1	Control signal output I (15-17):	0: Output not activated I : Output activated
10026	1	Control signal output I (15-17):	0: Output not activated I : Output activated
10120	1	I position state :	0 : OFF I : ON
10121	1	II position state :	0 : OFF I : ON
10123	1	0 position state :	0 : OFF I : ON

- ## Status

Dec. Address	Word count	Description	Unit
10124	1	Source 1 power status	0 : OFF 1 : ON
10125	1	Source 2 power status	0 : OFF 1 : ON
10040 – 10071	32	Alarms 01-32 :	0 : No alarm 1 : Alarm
40005	1	C25 operating mode (1-4):	2 : Manual 3 : Automatic 4 : Test

• Voltage sensing

Dec. Address	Word count	Description	Unit
10192	1	Source 1 L1-N voltage value	(V)
10193	1	Source 1 L2-N voltage value	(V)
10194	1	Source 1 L3-N voltage value	(V)
10195	1	Source 1 L-N average voltage	(V)
10196	1	Source 1 L1 –L2 voltage value	(V)
10197	1	Source 1 L2 –L3 voltage value	(V)
10198	1	Source 1 L3 –L1 voltage value	(V)
10199	1	Source 1 L-L average voltage	(V)
10204	1	Source 1 frequency	(0.1 Hz)
10205	1	Source 2 L1-N voltage value	(V)
10206	1	Source 2 L2-N voltage value	(V)
10207	1	Source 2 L3-N voltage value	(V)
10208	1	Source 2 L-N average voltage	(V)
10209	1	Source 2 L1 –L2 voltage value	(V)
10210	1	Source 2 L2 –L3 voltage value	(V)
10211	1	Source 2 L3 –L1 voltage value	(V)
10212	1	Source 2 L-L average voltage	(V)
10217	1	Source 2 frequency	(0.1 Hz)

• Communication parameters

Dec. Address	Word count	Description	Unit
40017	1	C25 communication node address:	1-247
40018	1	Baud rate :	2 – 2400 3 – 4800 4 – 9600 5 – 19200 6 – 38400
40019	1	Serial Data format : 1-5	1- 8N 2 – 80 3 – 8E 4 – 70 5 – 7E
40020	1	Stop bit:	1 – 2

As standard the baud rate is set to 38400, parity bit to 1, Modbus address 3 these parameters can be changed using the write function 10.

Once the configuration is done, write data 1 at address Dec. 40565. After changing the parameters the product buzzer will sound twice and the Com LED will stay on.

To reset to default parameters press the RES button for 30 seconds, the product will reboot and the standard communication settings will be set.

- ## Maintenance

Dec. Address	Word count	Description	Unit
10126	2	Position I operation count in AUTO mode:	0-60 000
10128	2	Position II operation count in AUTO mode:	0-60 000
10130	2	Position I operation count in Manual mode:	0-60 000
10132	2	Position II operation count in Manual mode:	0-60 000
10170 -10179	8	Serial number	(V)
10186	1	Hardware version	(V)
10187	1	Software version	(V)