

# Automatic Transfer Switching Equipment

## *ATyS p DCNS*



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# 1. GENERAL SAFETY INSTRUCTIONS

- This manual provides instructions on safety, connections and operation of the ATyS p motorised changeover switch manufactured by SOCOMEC.
- Whether the ATyS p is sold as a loose product, as a spare, as an enclosed solution or as 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 by adequately trained and qualified personnel.
- 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 SOCOMEC recommendations or outside 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 ATyS p.
- The ATyS p meets the European Directives governing this type of product and includes CE marking on each product.
- No covers on the ATyS p 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 power cables connected to the ATyS p 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 carry out any maintenance or other work on live parts or other parts in the vicinity of exposed live parts, ensure that the switch including all control and associated circuits are de-energized.



**RISK:**  
**Electric shock, burns, death**



**RISK:**  
**Possible personal injury**



**RISK:**  
**Equipment damage**

- As a minimum the ATyS p comply with the following international standards:

- |                    |                  |
|--------------------|------------------|
| - IEC 60947-6-1    | - IEC 60947-3    |
| - GB 14048-11      | - IS 13947-3     |
| - EN 60947-6-1     | - EN 60947-3     |
| - VDE 0660-107     | - NBN EN 60947-3 |
| - BS EN 60947-6-1  | - BS EN 60947-3  |
| - NBN EN 60947-6-1 |                  |

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

## 2. INTRODUCTION

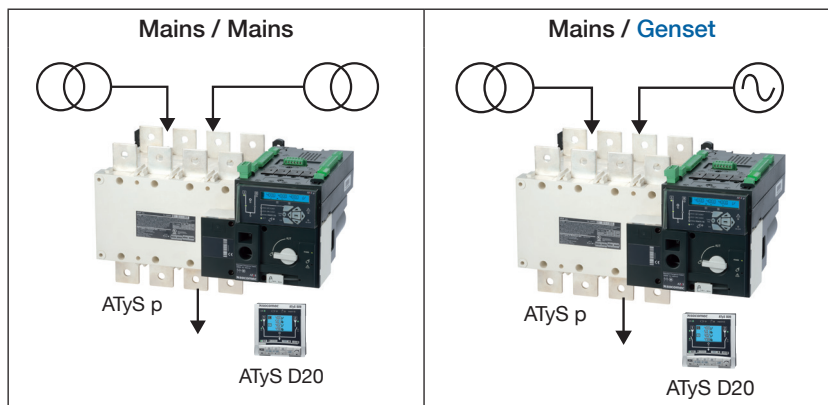
ATyS p “Transfer Switching Equipment” is designed for use in naval vessels for the safe transfer of a load supply between a normal and an alternate source. The changeover is done in open transition and with minimum supply interruption during transfer ensuring full compliance with IEC 60947-6-1, GB 14048-11 and other international TSE standards as listed.

The ATyS p is a full load break (switch type) derived transfer switching equipment where the main components are proven technology devices also fulfilling requirements in IEC 60947-3 standards.

As a Class PC TSE, the ATyS p is capable of “making and withstanding short circuit currents” assigned to IEC 60947-3 utilization categories of up to AC23A, GB 14048-11, IEC 60947-6-1 and equivalent standards with utilization categories of up to AC33B.

### ATyS p motorised source changeover switches ensure:

- Power Control and Safety between a normal and an alternate source.
  - A complete product delivered as a fully assembled and tested solution.
  - Intuitive HMI for emergency / local operation.
  - Integrated and robust switch disconnection.
  - Window with clearly visible position indication I – 0 - II.
  - An inherent failsafe mechanical interlock.
  - Stable positions (I – 0 – II) non affected by typical vibration and shocks.
  - Constant pressure on the contacts non effected by network voltage.
  - Energy Efficient with virtually no consumption whilst on the normal, alternate or off positions.
  - Quick, easy and safe dual “on-load” emergency manual operation.  
*(Manual operation is functional with and without the motorization in place).*
  - Extremely rugged, error free and built in padlocking facility.
  - Straight forward installation with effective ergonomics.
  - Minimal downtime with the possibility to perform easy maintenance.
  - Load power monitoring with Energy metering capability.
  - ATS configuration through a keypad.
  - Integrated auxiliary contacts for switch positions I – 0 - II.
  - Dual active “product availability” status feedback for motorisation and ATS controllers.
  - Ample accessories to suit specific requirements.
- 
- Power supply continuity with power management and communication for most applications.



# 3. QUICK START GUIDE



## ATyS p DCNS

250 A - 800 A

Motorised Source Changeover Switch  
Automatic Transfer Switching Equipment

### Preliminary operations

Check the following upon delivery and after removal of the packaging:

- Packaging and contents are in good condition
- The product reference corresponds to the order
- Contents should include:

- Qty 1 x ATyS p
- Qty 1 x Emergency handle and fixing clip
- Quick Start Guide

### Warning

**⚠** Risk of electrocution, burns or injury to persons and / or damage to equipment.

This Quick Start is intended for personnel trained in the installation and commissioning of this product. For further details refer to the product instruction manual available on the SOCOMEC website.

- This product must always be installed and commissioned by qualified and approved personnel.
- Maintenance and servicing operations should be performed by trained and authorised personnel.
- Do not handle any control or power cables connected to the product when voltage may be, or may become present on the product, directly through the mains or indirectly through external circuits.
- Always use an appropriate voltage detection device to confirm the absence of voltage.
- Ensure that no metal objects are allowed to fall in the cabinet (risk of electrical arcing).

- For 250 - 800 A (Uimp = 12 kV). Terminations must respect a minimum of 14 mm clearance from live parts to parts intended to be earthed and between poles.

Failure to observe good engineering practises as well as to follow these safety instructions may expose the user and others to serious injury or death.

**⚠** Risk of damaging the device In case the product is dropped or damaged in any way it is recommended to replace the complete product.

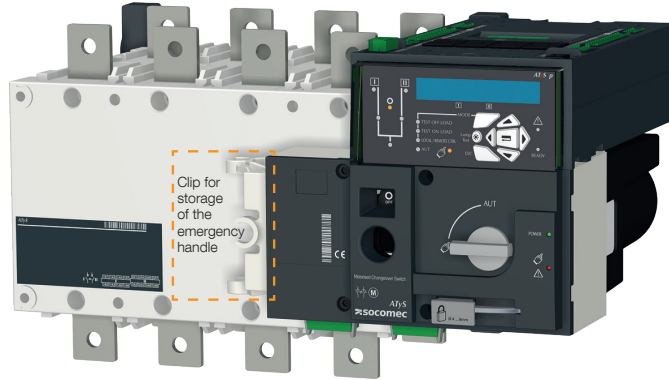
### Accessories

- Bridging bars and connection kits.
- Control voltage transformer (400 VAC → 230 VAC).
- DC power supply (12/24 VDC → 230 VAC).
- Phase barriers.
- Terminal shrouds / Terminal screens.
- Auxiliary contacts (Additional).
- Padlocking in 3 positions (I - O - II).
- Lockout accessories (RONIS - EL 11 AP).
- Door escutcheon frame.
- ATyS D20 Interface (remote control / display unit).
- RJ45 cable for ATyS D20.
- Voltage sensing kit.
- Current transformers.
- Plug-in optional modules: RS485 MODBUS communication, 2 inputs/2 outputs, Ethernet communication, Ethernet communication + RS485 JBUS/MODBUS gateway, Analogue outputs, Pulse outputs.

For further details refer to the product instruction manual under chapter "Spares and Accessories".

## Installation and Commissioning

<b>STEP 1</b> Cabinet / Back Plate Installation	<b>STEP 2</b> Power Terminal Connections	<b>STEP 3</b> COMMAND / CONTROL terminal connections	<b>STEP 4</b> Power SUPPLY and ATS Controller Terminal Connections	<b>STEP 5</b> CHECK	<b>STEP 6</b> PROGRAMMING A - Software B - Keypad
					<b>STEP 7A</b> AUT Mode (Automatic Control)
					<b>STEP 7B</b> AUT Mode (Remote Control)
					<b>STEP 7C</b> Manual Mode
					<b>STEP 7D</b> Padlocking Mode



### 1 ATyS p 250 - 630 A installation

**1** **ATyS p 250 - 630 A installation**

**1** M8 Type Z  
M8

**2** Recommended orientation OK OK

**⚠** Caution: ensure that the product is installed on a flat rigid surface.

**3** **Mounting** **Removing covers**

### ATyS p 800 A installation

**1** M8 Type Z  
M8

**2** Recommended orientation OK OK

**⚠** Caution: ensure that the product is installed on a flat rigid surface.

### 2 Power Terminal Connections

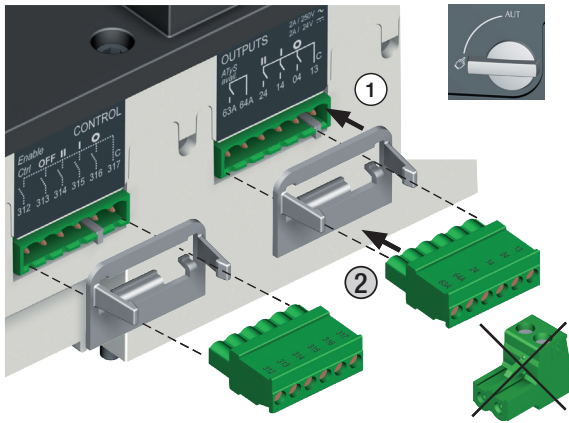
To be connected using terminal lugs, rigid or flexible busbars.	FRAME			
	B4 250 A	B5 400 A	B5 630 A	B6 800 A
Minimum cable section Cu (mm <sup>2</sup> )	120	240	2x120	2x240
Recommended Cu busbar cross-section (mm <sup>2</sup> )	-	-	2x40x5	2x50x5
Maximum Cu cable cross-section (mm <sup>2</sup> )	150	240	2x300	4x185
Maximum Cu busbar width (mm)	32	32	50	63
Type of screw	M10	M10	M12	M8
Recommended tightening torque (N.m)	20	20	40	8,3
Maximum tightening torque (N.m)	26	26	45	13



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### 3 CONTROL / COMMAND Terminals

Ensure that the product is in Manual Mode.



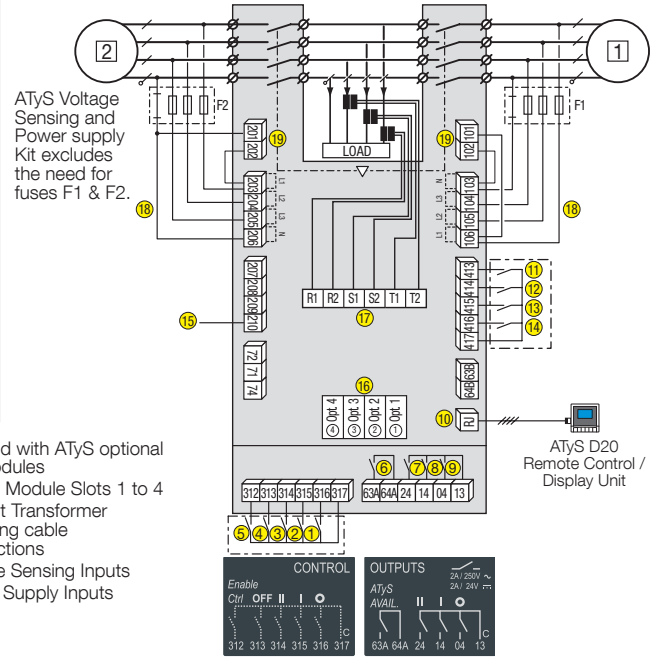
- 1 preferred source
- 2 alternate source
- 1. Position 0 order
- 2. Position 1 order
- 3. Position 2 order
- 4. Zero position priority order
- 5. Remote Control Enable (Priority over Auto)
- 6. Product Available output (Motor)

- 7. Position II aux contact
- 8. Position I aux contact
- 9. Position 0 aux contact
- 10. O/P to ATyS D20 remote unit
- 11. Fixed input Alarme 1
- 12. Fixed input Alarme 2
- 13. Fixed input Alarme 3
- 14. Fixed input Alarme 4
- 15. Aux. Supply (207/210) to

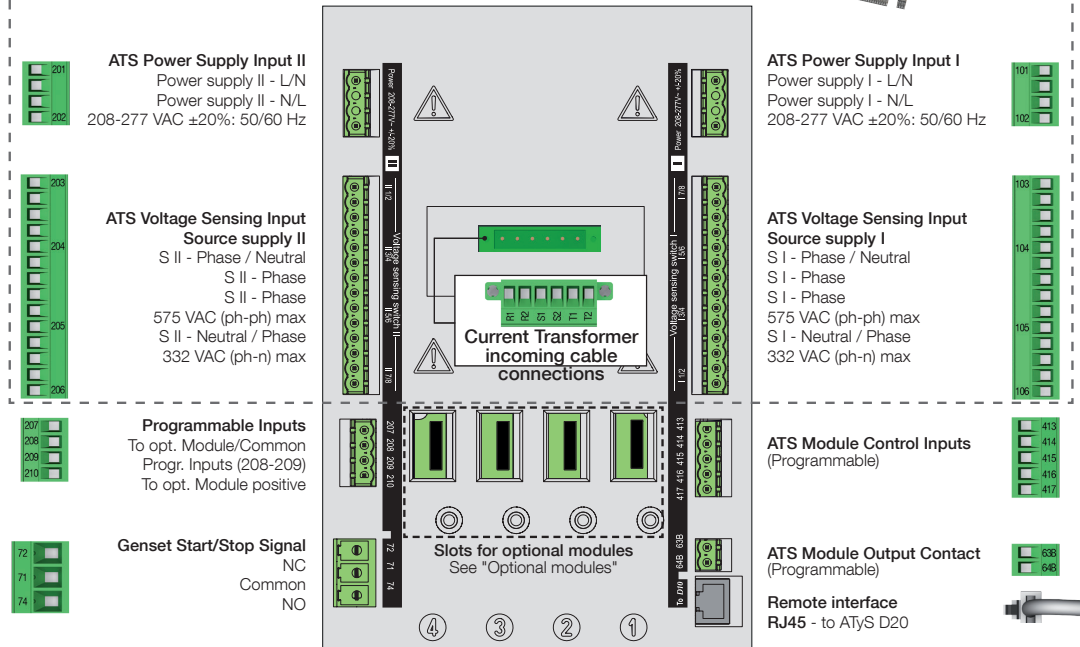
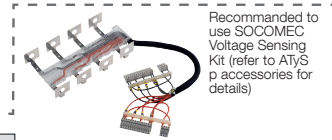
- be used with ATyS optional I/O modules
- 16. Option Module Slots 1 to 4
- 17. Current Transformer incoming cable connections
- 18. Voltage Sensing Inputs
- 19. Power Supply Inputs

### 4 Power Supply, Sensing and Control wiring (ATS Controller)

Example: Control wiring for a 400 VAC application having a 3 phase and neutral supply.

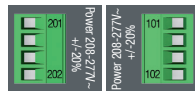


Connect the product with a cable of section of 1,5 to 2,5 mm<sup>2</sup>.  
Screw M3 - Tightening torque: min.: 0.5 Nm - max.: 0.6 Nm

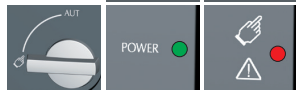


### 5 Check

Whilst in manual mode, check the wiring and if ok power up the product.

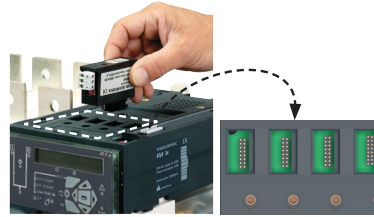
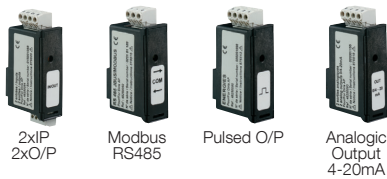


LED "Power" Green: ON  
LED Manual/Fault Red: ON



## Optional Modules

Communication between the software and the ATyS p may be done through the Modbus. Therefore, one communication option module must be installed.  
**Note:** The ATyS p may accept a total of 4 additional Input / Output modules. Refer to the ATyS p accessory section for details.



## 6 Programming the ATyS p with the keypad

The ATyS p is to be programmed powered up and after wiring verification tests. This may either be done through the front of the ATS Controller using the keypad.

The ATyS p is delivered with default setting values based on most used customer application requirements. The minimum configuration parameters that must be programmed are the type of network and application together with the voltage and frequency nominal values.

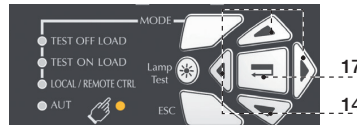
1 SETUP	2 VOLT. LEVELS	3 FREQ. LEVELS	4 I-O	5 COMM	6 DATE/TIME
NETWORK 4NBL	OV. U I 115%	OV. F I 105%	IN 1 AL1 NO	ADDRESS 005	YEAR
NEUTRAL AUTO	OV. U HYS I 110%	OV. F HYS I 103%	IN 2 AL2 NO	BDRATE 9600	MONTH
NOM. VOLT 400 V	UND. U I 085%	UND. F I 095%	IN 3 AL3 NO	STOP BIT 1	DAY
NOM. FREQ 50 Hz	UND. U HYS I 095%	UND. F HYS I 097%	IN 4 AL4 NO	PARITY NONE	HOUR
RETRANS NO	UNB. U I 00%	OV. F II 105%	OUT 1 POP NO		MINUTE
CT PRI 100	UNB. U HYS I 00%	OV. F HYS II 103%	OUT 2 S1A NO <sup>(1)</sup>		SECOND
CT SEC 5	OV. U II 115%	UND. F II 095%	OUT 3 S2A NO <sup>(1)</sup>		
CODE P 1000	OV. U HYS II 110%	UND. F HYS II 097%			
	UND. U II 085%				
	UND. U HYS II 095%				
	UNB. U II 00%				
	UNB. U HYS II 00%				

**Programming access:** Press and hold for 5 s "Validation" push button (17). Access through the keypad is possible in Automatic or Manual mode, when the product is in a stable position (I, 0 or II) with at least one supply source available. Programming is not accessible whilst any cycle sequence is running.

**To change the configuration:** Enter code (factory code = 1000) using navigation push buttons (14).

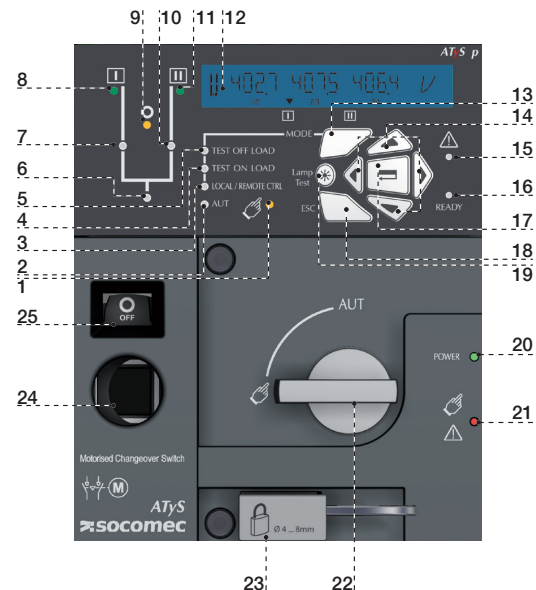
**Programming exit:** Press and hold for 5 s "Validation" push button (17).

**Note:** Values as listed above are the setting values by default.



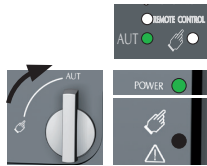
3 phase / 4 wire	3 phase / 3 wire	2 phase / 3 wire	2 phase / 2 wire	1 phase / 2 wire
4NBL 4BL	3NBL 3BL	2NBL	2BL	1BL

- MANUAL Mode LED indication. (Yellow steady light when in Manual Mode).
- AUTO Mode LED indication Green steady light when in Auto mode with no timers running. Green flashing light when in Auto with timers running.
- LOCAL / REMOTE CONTROL Mode LED indication. Yellow steady light when in Local / Remote control mode. Remote control mode is achieved with the Auto/Manu selector switched to Auto and terminals 312 closed with terminal 317. Remote control orders are received through closing 314 to 316 with 317. REMOTE Control is also achievable through Easy Config ATyS p software when connected to the product through Ethernet or MODBUS. (Optional modules). Local Control selectable and operable through the ATyS p keypad.
- TEST ON LOAD CONTROL Mode LED indication. (Yellow steady light when in TON/EON mode)
- TEST OFF LOAD CONTROL Mode LED indication. (Yellow steady light when in TOF/EOF mode).
- Load Supply On LED. (Green when the load is supplied).
- Switch 1 LED position indication. (Green when in position 1).
- Source supply I availability LED indication. (Green when supply I voltage is within the set limits).
- Zero position LED indication. (Green when in position 0).
- Switch 2 LED position indication. (Green when in position 2).
- Source supply II availability LED indication. (Green when supply II voltage is within the set limits).
- LCD Display Screen : (Status, measurement, timers, counters, events, faults, programming ...)
- MODE key to shift between operation modes.
- Navigation Keys to browse through the ATyS p menus without software.
- FAULT LED indication. (Red steady light in case of an ATS controller internal fault. Switch the product from Auto to Manual and back to Auto to reset a fault condition).
- READY LED indication. (Green steady light : Product is powered and in AUTO, Watchdog OK, The Product is Available to changeover).
- Enter Key used to enter Prog Mode (Press and hold for 5 seconds) and to validate the settings programmed through the keypad.
- ESC key used to escape from a specific screen up to the main menu.
- Lamp test key to check the LED's and LCD screen.
- Green LED Indication: Power
- Red LED Indication: Product Unavailable / Manual Mode / Fault Condition
- Auto / Manual mode selector switch (Key version available as an option)
- Padlocking facility (Up to 3 padlocks of dia. 4 - 8mm)
- Emergency manual operation shaft location (Accessible only in manual mode)
- Switch position indication window: I (On switch I) O (Off) II (On switch II).



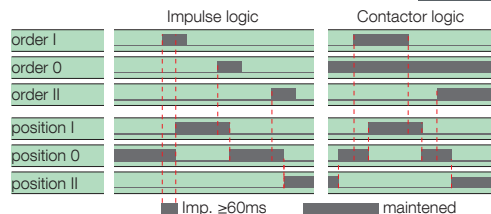
### 7A AUT Mode (Automatic Control)

Ensure that the emergency handle is not inserted in the product and turn the mode selector to the AUT position.



LED "Power" Green: ON  
LED Manual/Default: OFF

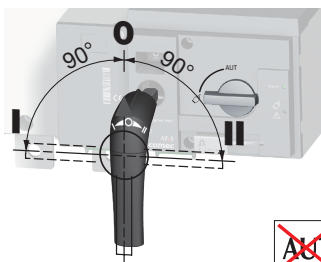
### 7B AUT Mode (Remote Control)



To enable control, close contact 312 with 317. For contactor logic bridge contact 316 with 317. To operate: close the contact corresponding to the desired position. To force the product to 0 position "OFF" bridge contact 313 with 317.



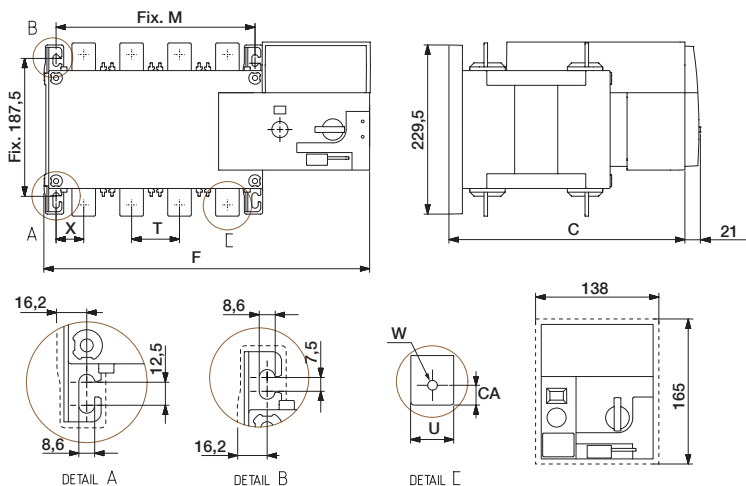
### 7C Manual Operation



### 7D Padlocking Mode (as standard: in position 0)

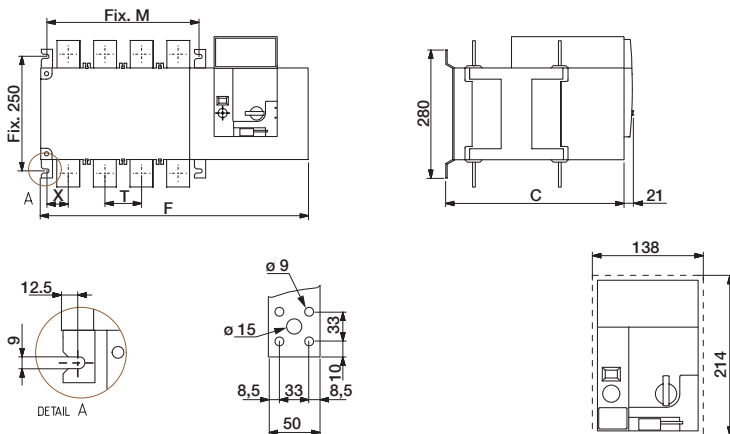


### Dimensions mm. (250 A to 630 A)



	250 A	400 A	630 A
	3 P	3 P	3 P
C	244	244	321
CA	15	15	20
F	328	328	377
M	160	160	210
T	50	50	65
U	25	35	45
W	11	11	13
X	33	33	42,5

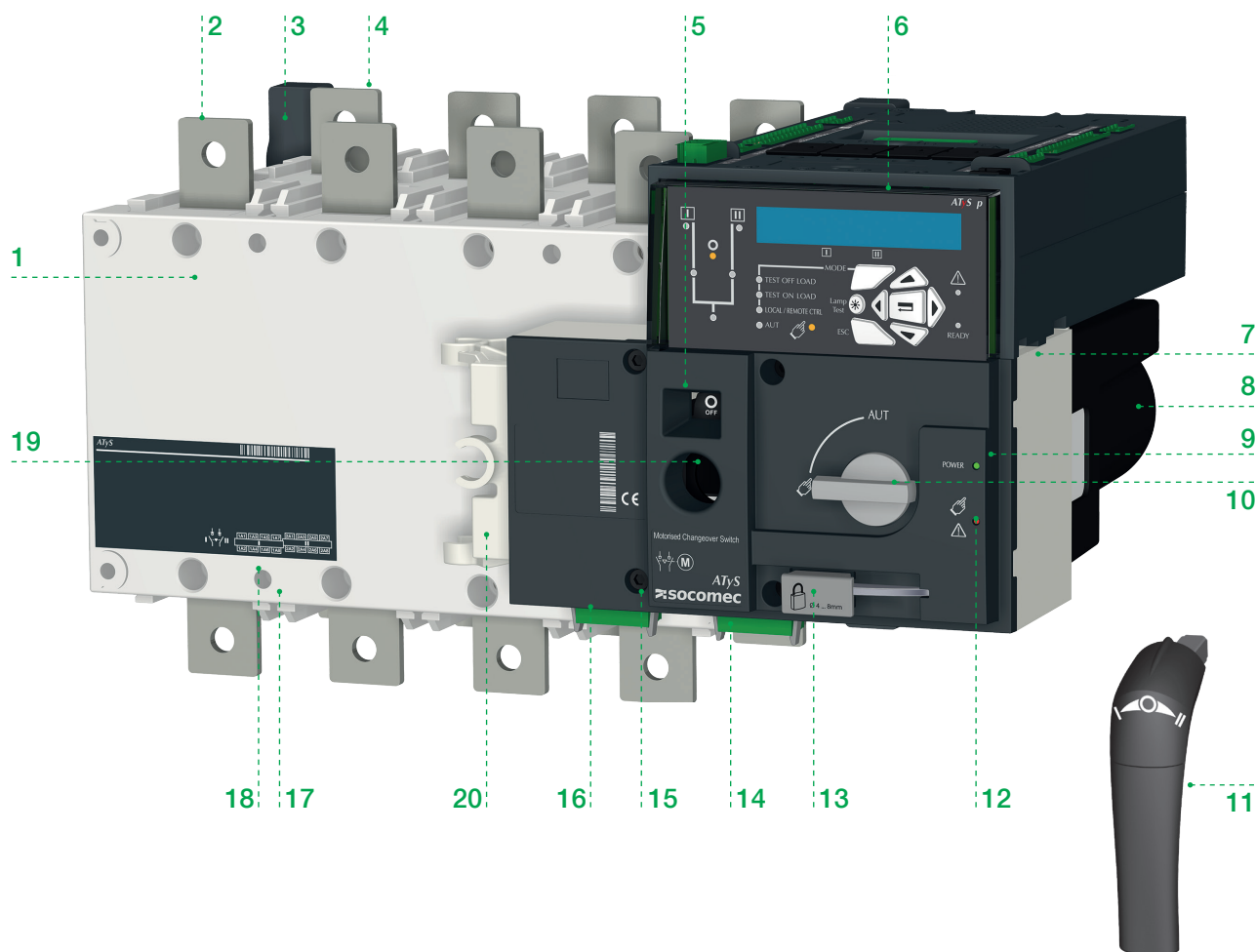
### Dimensions mm. (800 A)



	800 A
	3 P
C	391
F	504
M	255
T	80
X	47.5

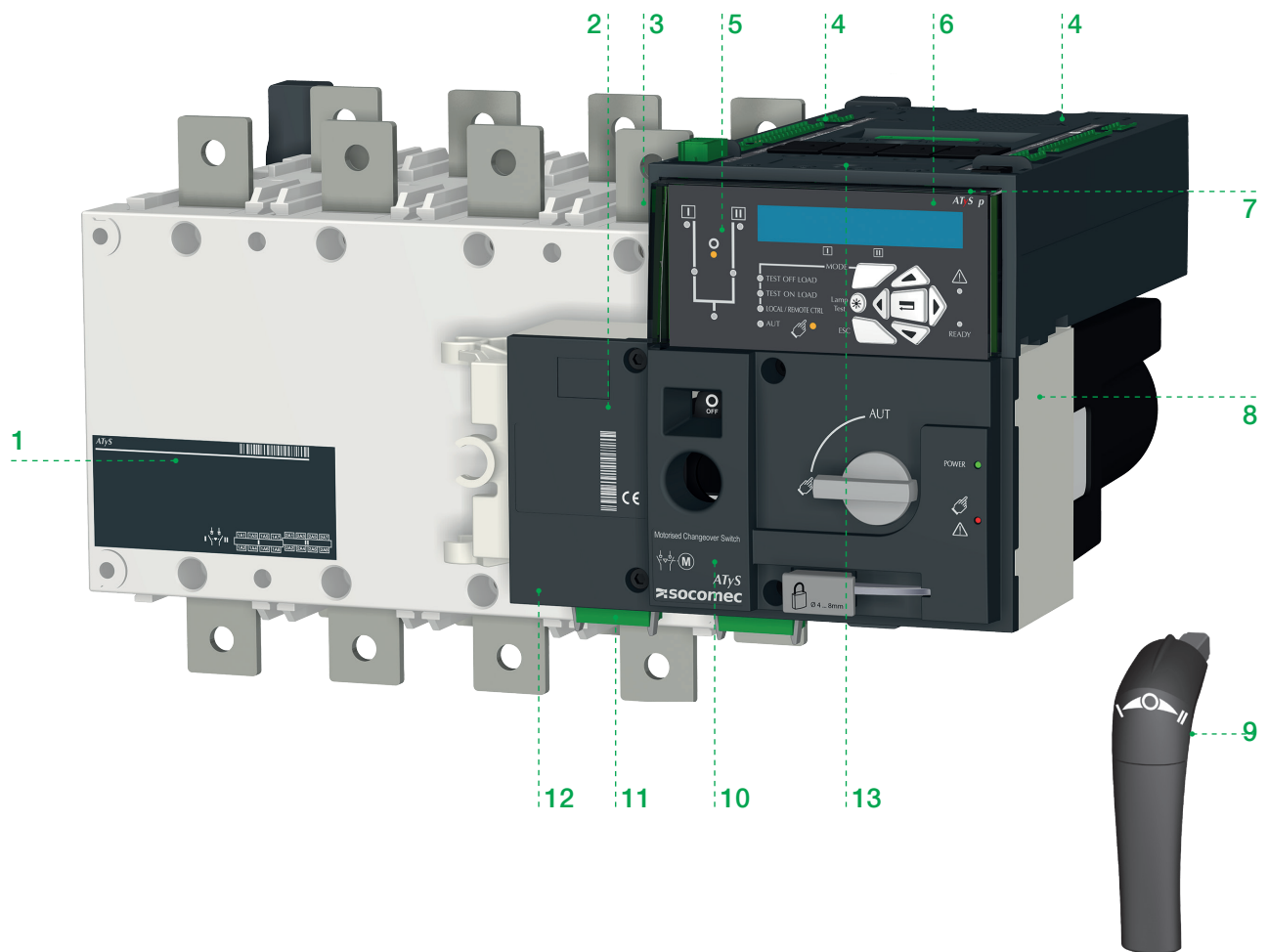
# 4. GENERAL OVERVIEW

## 4.1. Product introduction



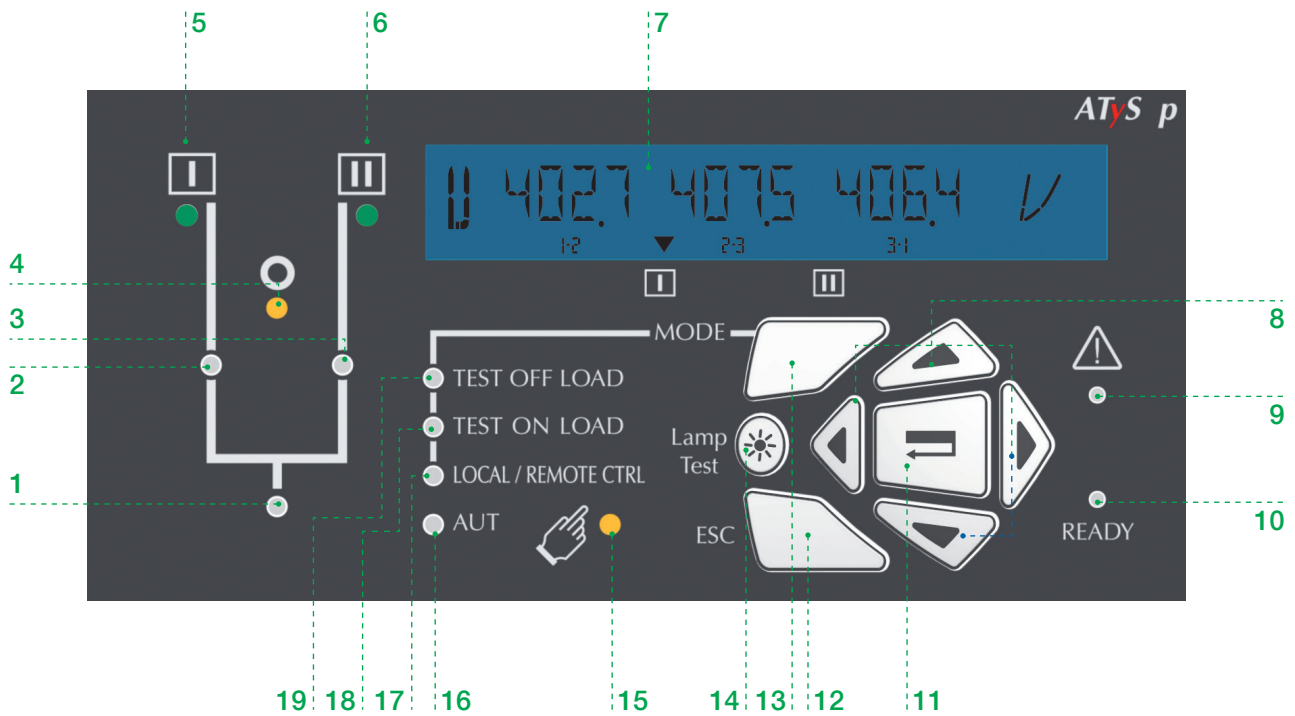
1. Power Section: Changeover switch assembly with inherent mechanical interlock
2. Front: Switch number 1 terminals (3 or 4 pole)
3. Back-plate mounting ATyS fixing lugs
4. Back: Switch number 2 terminals (3 or 4 pole)
5. Switch position indication window: I (On) – O (Off) – II (On)
6. ATS control module with integrated dual power supply
7. Motorized Control Unit
8. Motor housing
9. Green LED Indication: Power
10. Auto / Manual mode selector switch
11. Emergency manual operation “Direct Handle”
12. Red LED Indication: Product Unavailable / Manual Mode / Fault Condition
13. Padlocking facility (Up to 3 padlocks of dia. 4 – 8 mm)
14. Output contacts x 4 (Position indication I-O-II and product availability outputs)
15. Facility for locking all controls in the zero position using a RONIS EL11AP Lock
16. Input contacts x 5:
  - Position order I-O-II
  - Remote control enable
  - Override controls and force to Off position
17. Sliders for Terminal Shields
18. Fixing holes for terminal Shields
19. Emergency manual operation shaft location (Accessible only in manual mode)
20. Clip for emergency handle storage

## 4.2. Product identification



1. Main changeover switch identification label:
  - Electrical characteristics
  - Applicable standards and
  - Terminal incoming and outgoing wiring details.
2. Product serial number, barcode & CE marking.
3. Switch 1 (Front) and Switch 2 (back) identification labels
4. ATS controller terminal contact identification labels
5. Network status and switch position pictogram with LED's
6. ATyS p LCD Screen .
7. ATyS product type identification. (ATyS t, ATyS g or ATyS p)
8. Motor barcode and serial number
9. Emergency manual operation direction of rotation indication
10. ATyS p product current rating and reference number label
11. Output contacts identification label
12. Input contacts identification label
13. Reset button (Push and hold for at least 1s to restart the ATS controller)

## 4.3. ATyS Control module interface



1. Load Supply On LED (Steady green when the load is normally supplied and flashing green when the load is supplied with load shedding output LSC active)
2. Switch 1 LED position indication. (Green when in position I)
3. Switch 2 LED position indication. (Green when in position II)
4. Zero position LED indication. (Yellow when in position O)
5. Source supply I availability LED indication. (Green when supply I voltage is within the set limits)
6. Source supply II availability LED indication. (Green when supply II voltage is within the set limits)
7. LCD Display Screen: (Status, measurement, timers, counters, events, faults, programming...)
8. ATyS p Keypad for direct access to the product parameters  
(Navigation Keys to browse through the ATyS p menus without software)
9. FAULT LED indication. (Red steady light in case of an ATyS controller internal fault  
Switch the product from Auto to Manual and back to Auto to reset a fault condition)
10. READY LED indication. (Green steady light: Product is powered and in AUTO, Watchdog OK  
The Product is Available to changeover)
11. Enter Key used to enter Prog Mode (Press and hold for 5 seconds)  
and to validate the settings programmed through the keypad
12. ESC key used to escape from a specific screen up to the main menu
13. MODE key to shift between operation modes
14. Lamp test key to check the LED's and LCD screen
15. MANUAL Mode LED indication. (Yellow steady light when in Manual Mode)
16. AUTO Mode LED indication  
Green steady light when in Auto mode with no timers running  
Green flashing light when in Auto with timers running
17. LOCAL / REMOTE CONTROL Mode LED indication  
Yellow steady light when in Local / Remote control mode  
Remote control mode is achieved with the Auto/Manu selector switched to Auto  
Remote control orders are received through closing 314 to 316 with 317
18. LED not used
19. LED not used

## 4.4. Environmental

The ATyS p product meets the following environmental requirements:

### 4.4.1. IP Rating



- IP2X against direct contact for the ATyS p motorization control unit.
- IP2X against direct contact for the power section with the connections in place and when including suitable, correctly installed incoming and outgoing terminal shields.
- IP 0 for the bare power section without terminal shields in place.

### 4.4.2. Operating Conditions

#### 4.4.2.1. Temperature



- From -20 to +40°C without derating
- From -20 to +70°C when applying a Kt correction factor

Kt: Correction Factor	Temperature
0.9	40 °C ... 50 °C
0.8	50 °C ... 60 °C
0.7	60 °C ... 70 °C

\* Simplified derating method:  $I_{thu} \leq I_{th} \times K_t$

#### 4.4.2.2. Hygrometry



- 80% humidity without condensation at 55°C
- 95% humidity without condensation at 40°C

#### 4.4.2.3. Altitude



- Up to 2000m in altitude without derating
- For higher altitude the Ka correction factors below apply

	2000 m < A ≤ 3000 m	3000 m < A ≤ 4000 m
Ue	0.95	0.8
Ie	0.85	0.85

### 4.4.3. Storage Conditions

#### 4.4.3.1. Temperature



- From -40 to +70°C

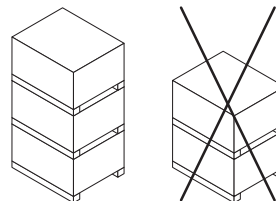
#### 4.4.3.2. Storage duration period

- Maximum storage up to a period of 12 months
- (Recommendation: To be stored in dry, non corrosive and non saline atmospheric conditions)

#### 4.4.3.3. Storage position



≤ 630 A: a maximum of 3 boxes may be stocked vertically  
 ≥ 800 A: a maximum of 1 box may be stocked vertically



#### 4.4.4. Volume and shipping weights by reference ATyS p

Frame Size	Rating	N° of Poles	Reference Number	Weight (kg)		Volume (cm) inc Packing
				Net	Gross	
B4	250 A	3	DCN73025	7,7	11,0	360x480x370
	400 A	3	DCN73040	7,8	11,1	360x480x370
B5	630 A	3	DCN73063	13,3	16,6	585x385x385
B6	800 A	3	DCN73080	29,0	45,0	730x800x600

#### 4.4.5. CE marking

The ATyS p complies the with the European directive for:

- The Electromagnetic compatibility no. 2004/108/CE dated 15th of December 2004.
- Low voltage directive no. 2006/95/CE dated 12th of December 2006.



#### 4.4.6. Lead free process

- The ATyS p complies with the European directive for RoHS.



## 4.4.7. EMC standard

The ATyS p is designed and built in accordance with IEC 60947-1 standards (Products intended to be installed in an «Industrial, Commercial and/or Residential Environment» therefore respecting both Class A as well as Class B EMC requirements).

Description	Std (IEC)	Requirement (criteria)
Conducted	CISPR 11	Class B
Radiated	CISPR 11	Class B
ESD contact	61000-4-2	4KV (B)
ESD air	61000-4-2	8KV (B)
Electromagnetic field	61000-4-3	10V/m (A)
RF Conducted	61000-4-6	10V (A)
Burst	61000-4-4	2KV (A) power 1KV (A) control
Surge differential	61000-4-5	1KV (A)

## 4.5. ATyS p available accessories

### BRIDGING BARS

To connect switch I & II load terminals together.

### VOLTAGE SENSING AND POWER SUPPLY KIT

Allows voltage sensing and power supply connections from switch terminals to power supply and control module. Secure cables tray, no specific cable protection required (fuse type).

### TERMINAL SHROUDS (250 to 630A)

Incoming and outgoing protection against direct contact with the connection terminals or parts. Cannot be mounted in the rear position at the same time as the voltage sensing and power outlet kit or the bridging bars.

Can be mounted top or bottom, in front or in rear position.

### TERMINAL SCREENS

Incoming and outgoing protection against direct contact with the connection terminals or parts.

### REMOTE INTERFACE D20

- Remote Display: Allows source supply state and switch positions to be displayed remotely.
- Remote Control: Allows remote configuration, control and metering (from front panel on which the device is mounted).

Typically door mounted or  $\leq 3\text{m}$  away from the ATyS.

### DOOR ESCUTCHEON PLATE

An accessory to be fixed onto a cabinet door to frame the controller part of flush mounted ATyS p transfer switches.

### CURRENT TRANSFORMERS

An extensive range of CT's is available from SOCOMEC. Refer to the SOCOMEC general catalogue for details.

### COMMUNICATION CABLE

RJ 45 communication cable (3m long) for use with the D20 remote display/controller.

### PADLOCKING IN 3 POSITIONS

Allows locking of the operation in the 3 positions I, 0 and II. (Factory fitted accessory)

### CONTROL VOLTAGE TRANSFORMER

Allows a standard 230 V AC device to be supplied with 400 VAC.

### OPTIONAL MODULES

#### Communication modules

Configuration, Monitoring and control of the changeover switch via MODBUS, (2 or 3-wire RS485 link).

#### Input / Output Extension Module

1 module is used with the product to give access to 2 fixed outputs.

#### 4-20mA analogue output module

3I, In, 3V, 3U, F,  $\pm \Sigma P$ ,  $\pm \Sigma Q$ ,  $\Sigma S$

(Attn: To be configured through a communication module)

#### Pulsed output module

2 configurable pulse outputs (type, weight and duration) on  $\pm \text{kWh}$ ,  $\pm \text{kvarh}$  and  $\text{kVAh}$

(Attn: To be configured through a communication module)

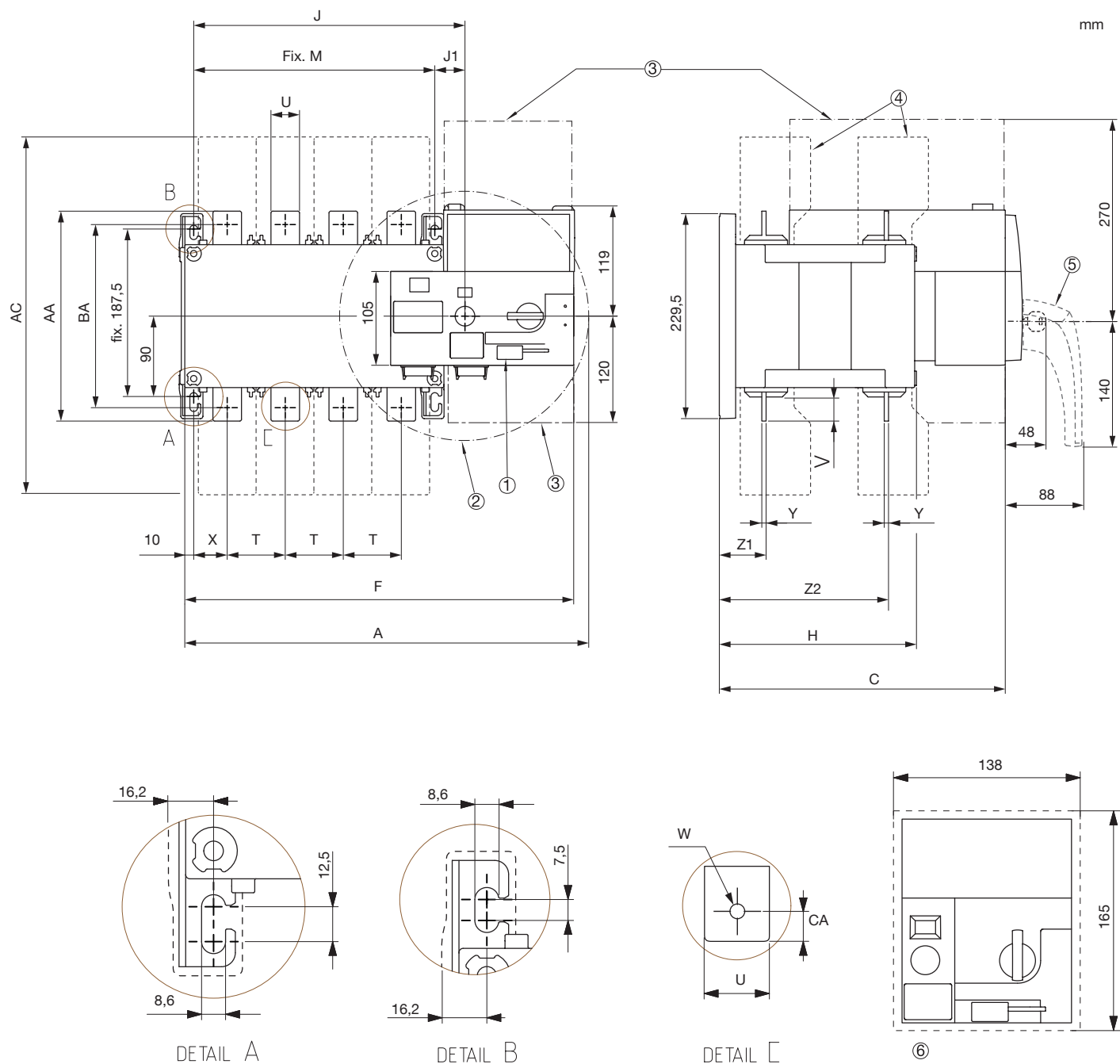
### SUPPLEMENTARY AUXILIARY CONTACT (AC)

Pre-breaking and signaling of positions I and II: 1 additional auxiliary contact NO / NC auxiliary contact in each position.

# 5. INSTALLATION

## 5.1. Product dimensions

### 5.1.1. Dimensions: Frame B4 and B5 (250 to 630A)



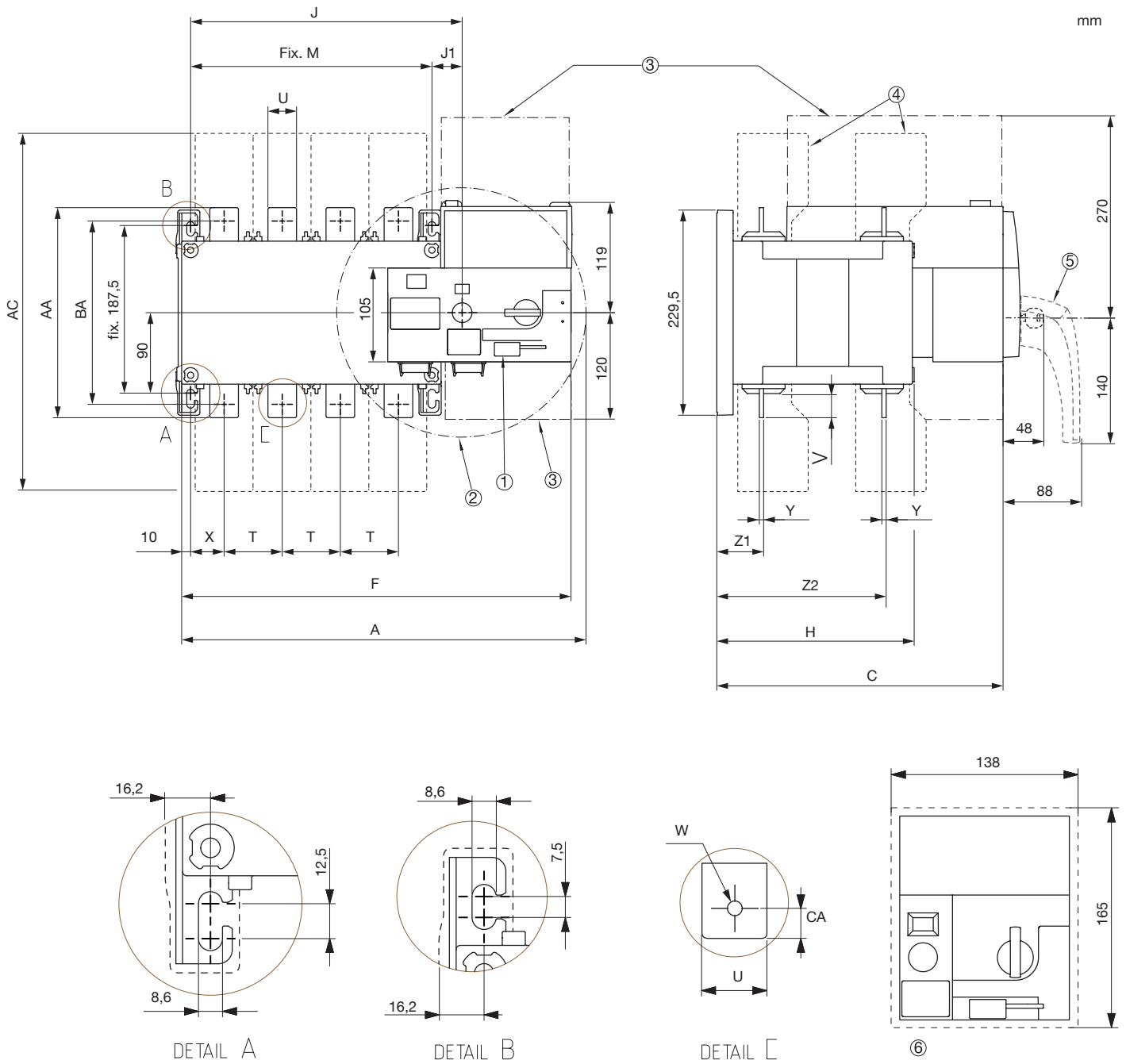
1. Padlocking Facility: Locking bracket for up to 3 padlocks of dia. 4 – 8mm
2. Emergency manual operation: Maximum operating radius with an operating angle of 2x 90°
3. Connection and disconnection area
4. Mounting stand off with spacer accessory
5. Phase Barriers
6. Flush mounting cutout dimensions for front door



**CAUTION !** To consider the space required for manual operation and wiring (when using the ATyS p emergency handle: note 2).

Rating (A)	Overall dimensions		Terminal shrouds	Switch body				Switch mounting	Connection										
	A 3p.	C	AC	F 3p.	H	J 3p.	J1	M 3p.	T	U	V	W	X 3p.	Y	Z1	Z2	AA	BA	CA
250 / B4	345	244	288	328	152	195	35	160	50	25	30	11	33	3,5	39,5	133,5	160	130	15
400 / B4	345	244	288	328	152	195	35	160	50	35	35	11	33	3,5	39,5	133,5	170	140	15
630 / B5	394	321	402	377	221	244	35	210	65	45	50	13	42,5	5	53	190	260	220	20

### 5.1.2. Dimensions: Frame B6 (800A)



1. Padlocking Facility: Locking bracket for up to 3 padlocks of dia. 4 – 8mm
2. Emergency manual operation: Maximum operating radius with an operating angle of 2x 90°
3. Connection and disconnection area
4. Mounting stand off with spacer accessory
5. Phase Barriers
6. Emergency removable handle
7. Flush mounting cutout dimensions for front door



**CAUTION !** To consider the space required for manual operation and wiring (when using the ATyS p emergency handle: note 2).

Rating (A) / Frame size	Overall dimensions	Terminal shrouds	Switch body		Switch mounting	Connection						
	B	AC	F 3p.	J 3p.	M 3p.	T	U	V	X	Y	Z1	AA
800 / B6	370	461	504	306.5	255	80	50	60.5	47.5	7	66.5	321

## 5.2. Mounting orientation

250A to 630A	Recommended	OK	Not Allowed	OK
800A	Recommended	Not Allowed	OK	OK



**CAUTION !** Always install the product on a flat and rigid surface.

## 5.3. Assembly of customer mounted accessories



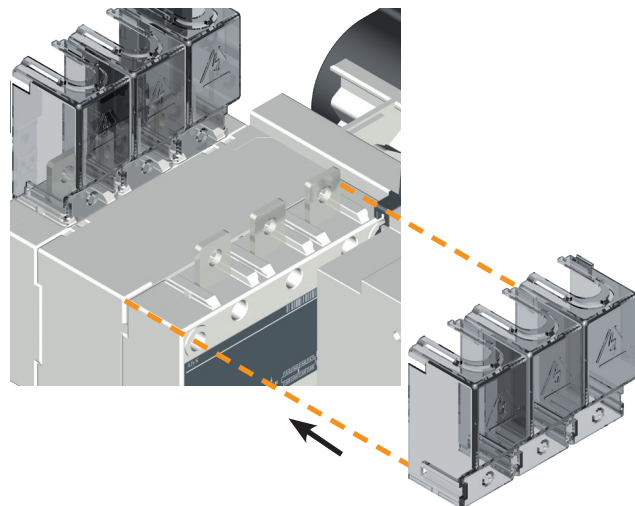
**DANGER !** Never handle any customer mounted accessories while there may be the risk of voltage being or becoming present.

### 5.3.1. Terminal shrouds

Available from 250 to 630A.

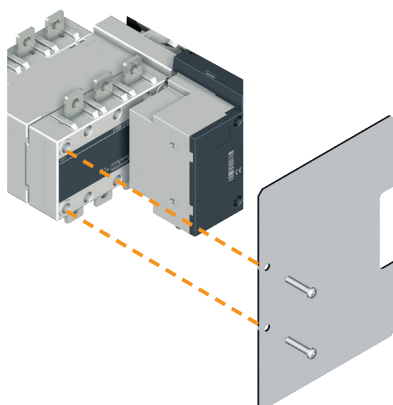
Frame B4 to B5:

- Upstream, downstream, front or rear mounting.
- When fitted with bridging bars or voltage sensing and power supply kit only the front terminal shrouds are to be installed.

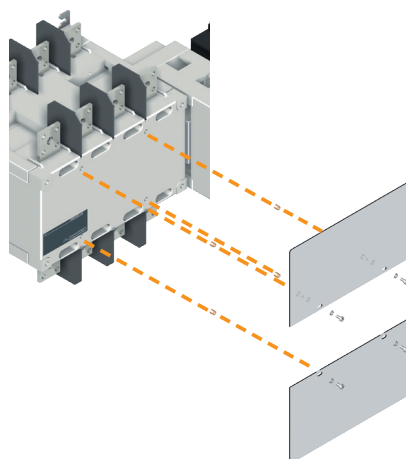


### 5.3.2. Terminal screens

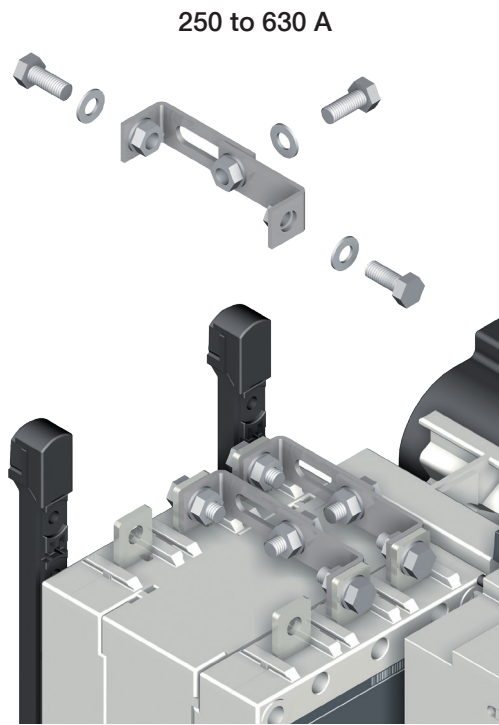
250 to 630 A



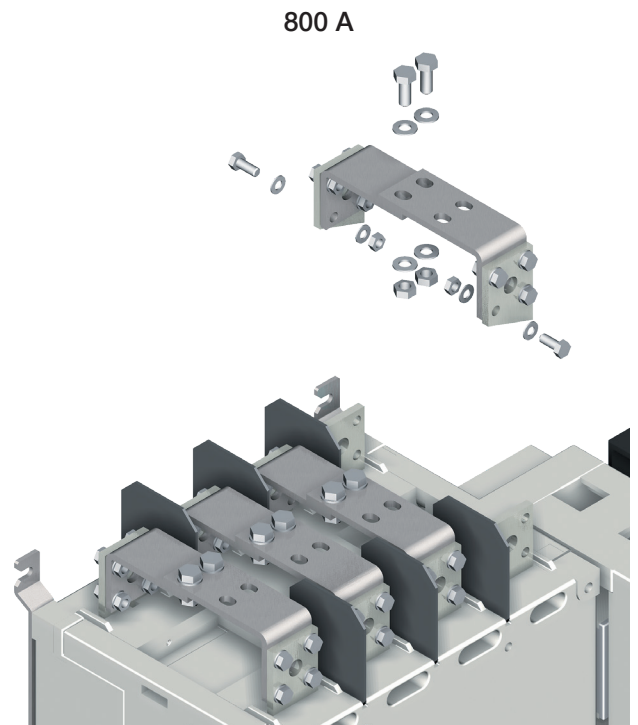
800 A



### 5.3.3. Bridging bar installation



250 to 630 A



800 A

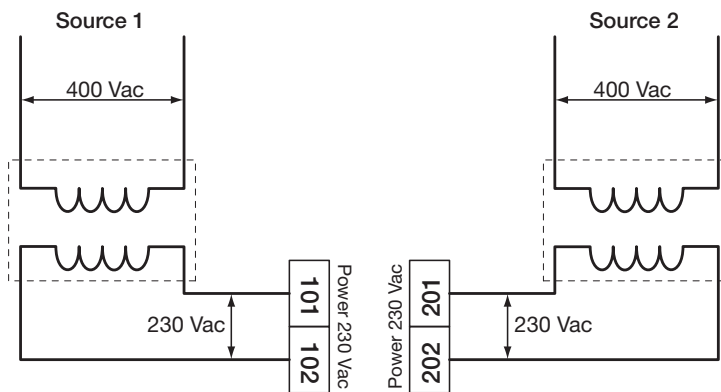
It is possible to mount the bridging bars on either side of the switch.

Recommended tightening torque:  
M8: 8,3 N.m  
M10: 20 N.m

Maximum tightening torque:  
M8: 13 N.m  
M10: 26 N.m

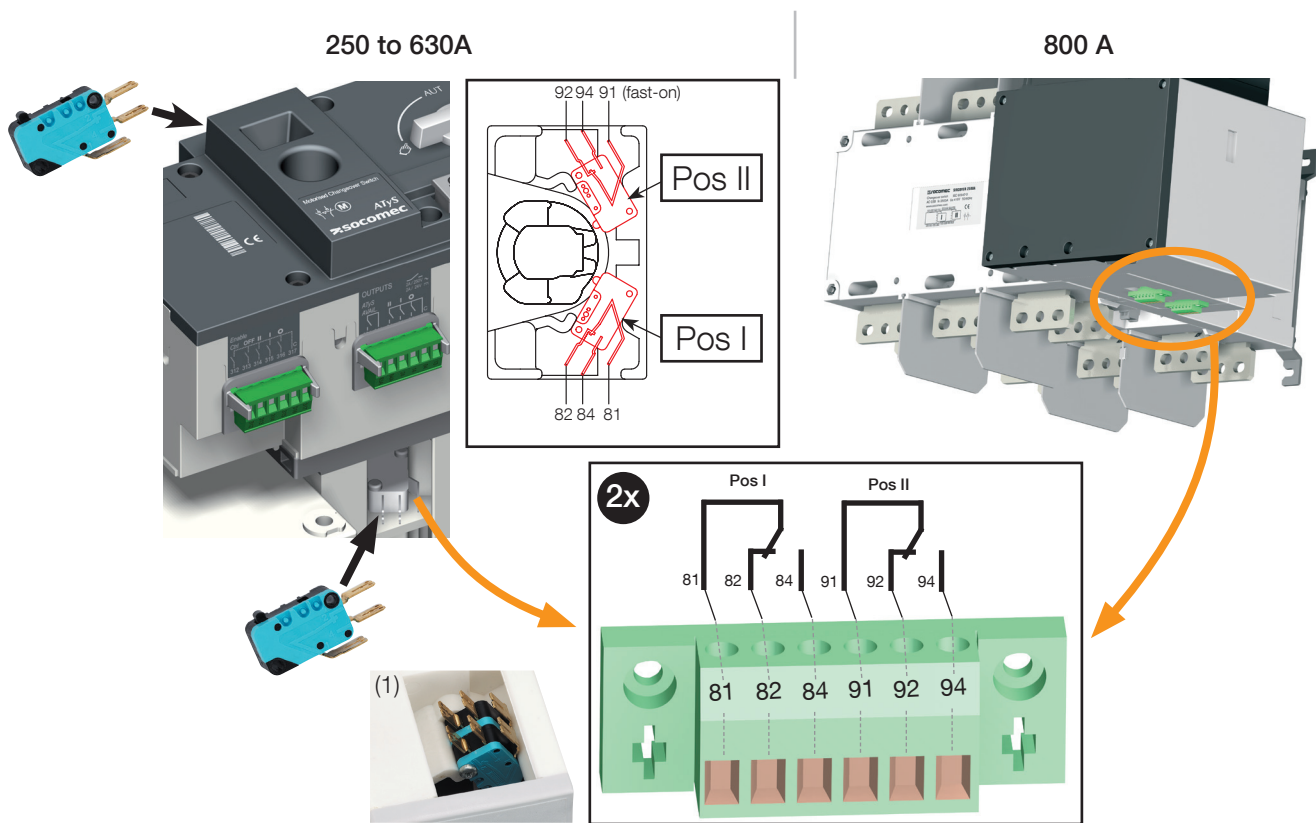
### 5.3.4. External Power supply (400VAC - 230VAC)

Power Transformer intended for 400VAC, Phase to Phase voltage applications that do not provide the availability of a neutral conductor. Transformer data: 400VAC – 230VAC: 200VA. The ATyS p will require 2 transformers to be connected as shown.



### 5.3.5. Additional auxiliary contacts

Intended for pre breaking and signaling of positions I and II:  
A maximum of 2 NO/NC additional auxiliary contacts can be fitted for each position.



<sup>(1)</sup> When mounting one auxiliary contact on position I or II, use the short screws provided.  
When mounting two auxiliary contacts on position I or II, use the long screws provided.

## 5.4. ATyS p Optional module installation



### RS485 MODBUS® communication

RS485 link with MODBUS® protocol (speed up to 38400 bauds).



### Analogue outputs

Outputs assignable to:  
3I, In, 3V, 3U, F,  $\pm \Sigma P$ ,  $\pm \Sigma Q$ ,  $\Sigma S$ .



### 2 inputs - 2 outputs

This module has 2 fixed outputs available.



### Pulse outputs

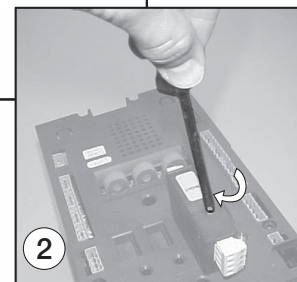
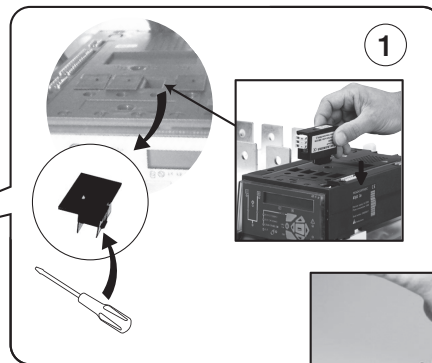
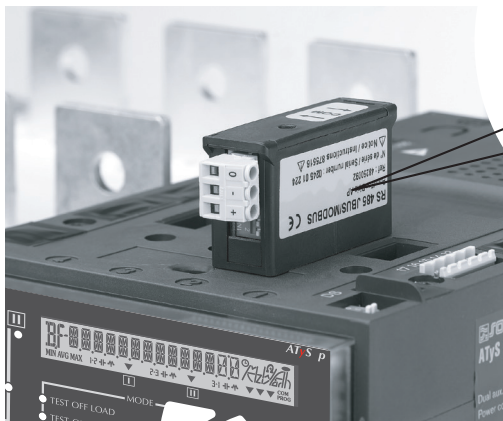
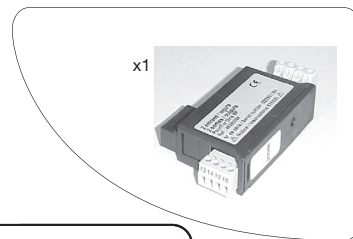
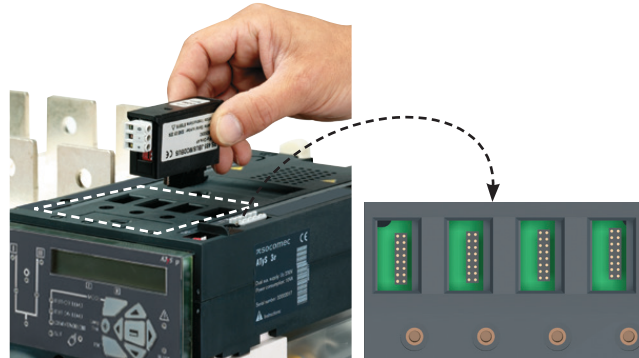
2 configurable pulse outputs (type, weight and duration) on  $\pm$  kWh,  $\pm$  kvarh and kVAh.

The ATyS p includes four slots on the top part of the ATS controller that are dedicated to fixing of optional modules.

The modules are available as an option so as to suit the various user requirements.

Depending on the option mix selected an ATyS may accept a maximum of any 4 module units.

The modules may be mounted in any slot (1-4) and configured according to their location.



### CAUTION !

Connect the modules with the power off.

Ensure that the option fixing bolts are tightened correctly.

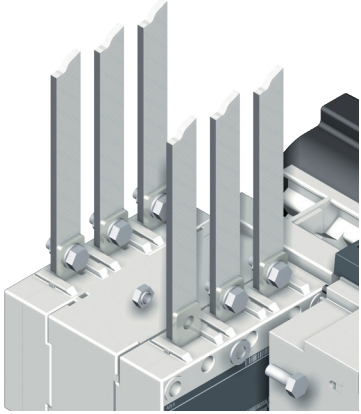
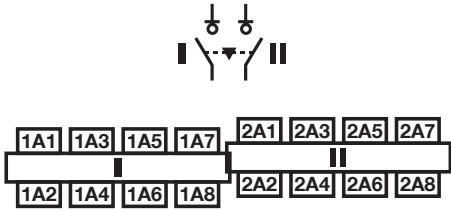
A 3 minute power outage is required to recognize an optional module.

## 6. CONNECTIONS

### 6.1. Power circuits

For specific networks and power connection diagram possibilities, please refer to page 48.

#### 6.1.1. Cable or bar connections

 <p>Recommended tightening torque:</p> <ul style="list-style-type: none"> <li>• M8: 8,3 N.m</li> <li>• M10: 20 N.m</li> </ul>	 <p>Maximum tightening torque:</p> <ul style="list-style-type: none"> <li>• M8: 13 N.m</li> <li>• M10: 26 N.m</li> </ul>
----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------	------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------



**CAUTION !** - For 125 - 160A ( $U_{imp} = 8kV$ ). Terminations must respect a minimum of 8 mm clearance from live parts to parts intended to be earthed and between poles.  
 - For 200 - 1250A ( $U_{imp} = 12kV$ ). Terminations must respect a minimum of 14 mm clearance from live parts to parts intended to be earthed and between poles.

#### 6.1.2. Power Terminal Connections

##### 250 to 630A

Refer to section "Product dimensions", page 18 for Power Terminal Connections details.

#### 6.1.3. Power connection cross-section

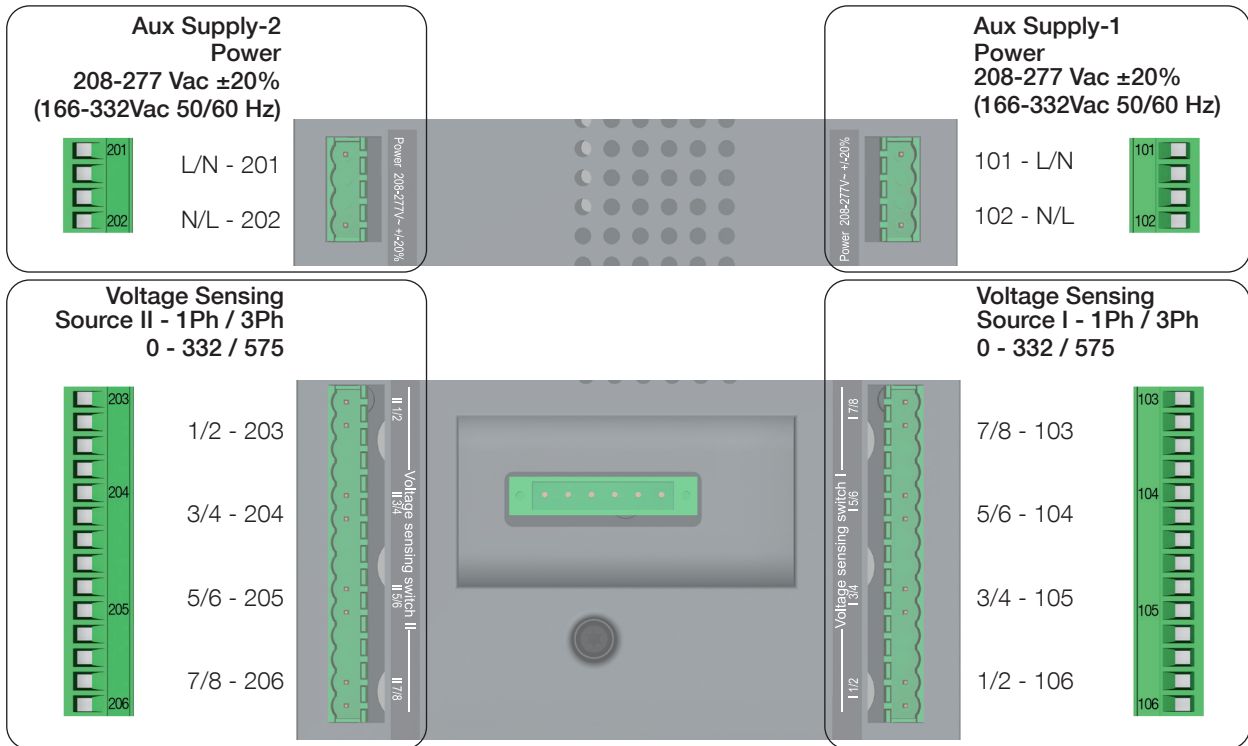
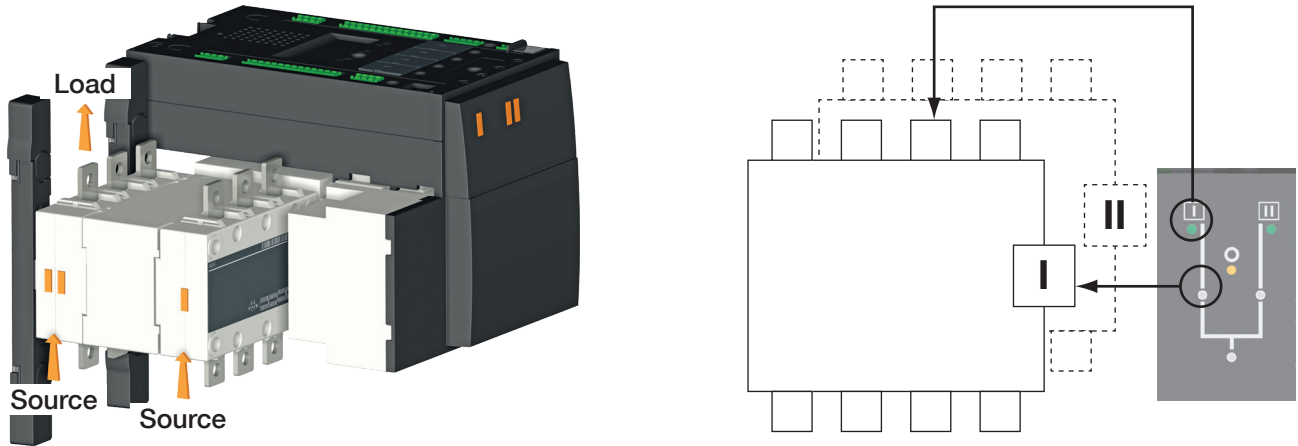
	B4		B5	B6
	250A	400A	630A	800A
Minimum cable section Cu according to IEC 60947-1 (mm <sup>2</sup> )	95	185	2x120	2x185
Recommended cable section Cu (mm <sup>2</sup> ), lth	-	-	2x40x5	2x50x5
Maximum cables section Cu (mm <sup>2</sup> )	150	240	2x300	2x300
Maximum bars width Cu (mm)	32	32	50	63

Note: Take into account the connection cable lengths and/or others environmental specific operating conditions.

## 6.1.4. Connection

The product is delivered with the following configuration:

- Connectors 101 to 106, I 1/2 to I 7/8, located on the right side of the controller are associated with switch I
- Connectors 201 to 206, II 1/2 to II 7/8, located on the left side of the controller are associated with switch II.

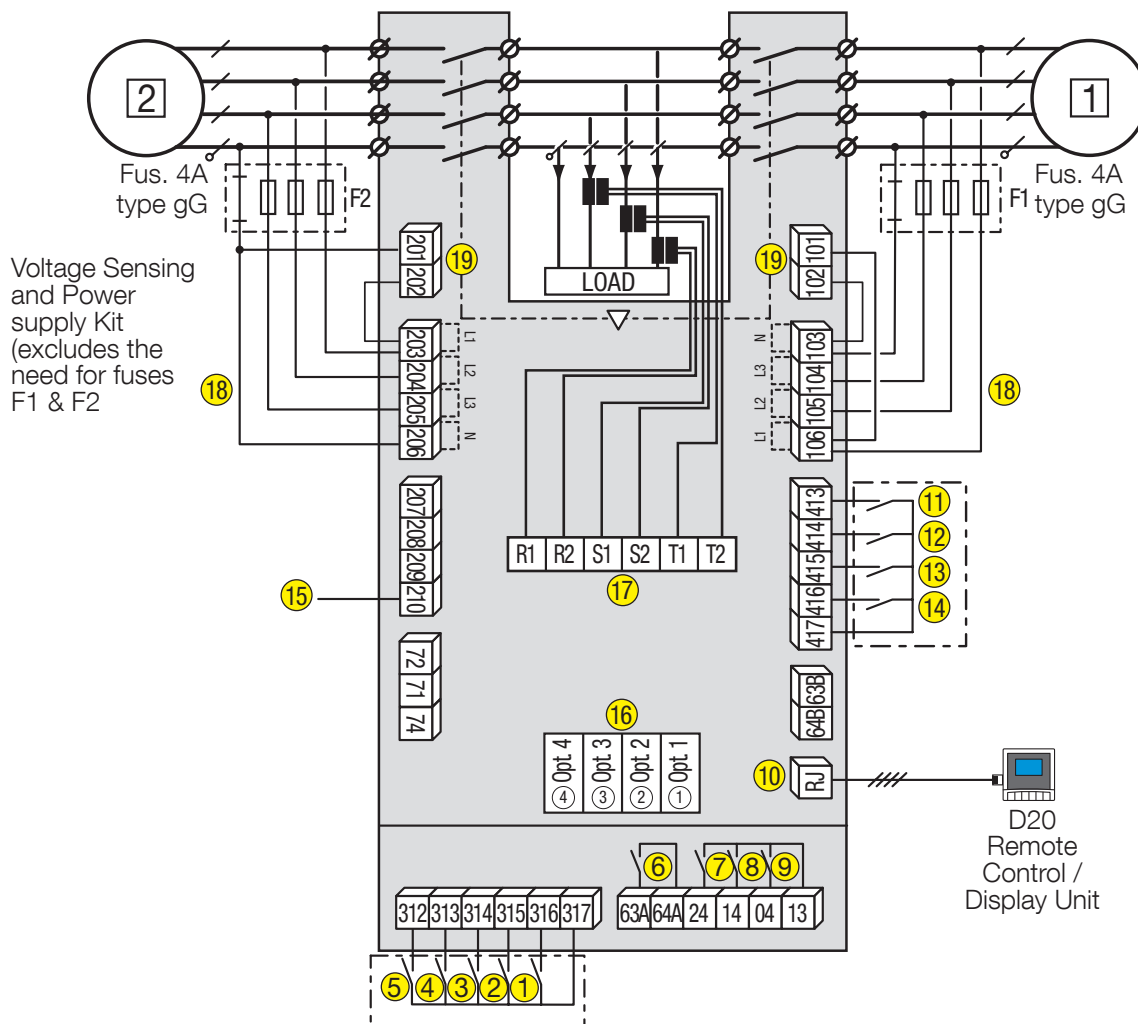


**CAUTION !** It is recommended to connect power and sensing with the ATyS voltage sensing and power supply kit available as an accessory. In this case ensure to mount the kit before connecting the power cables.

## 6.2. Control circuits

### 6.2.1. Typical ATyS p wiring

Example: Control wiring for a 400VAC application having a 3 phase and neutral supply.



- 1 preferred source 2 alternate source
- 1. Position O order
- 2. Position I order
- 3. Position II order
- 4. Zero position priority order
- 5. Remote Control Enable (Hold closed)
- 6. Product Available output (Motor)
- 7. Position II aux contact

- 8. Position I aux contact
- 9. Position O aux contact
- 10. O/P to D20 remote unit
- 11. Fixed Alarm input 1
- 12. Fixed Alarm input 2
- 13. Fixed Alarm input 3
- 14. Fixed Alarm input 4
- 15. Aux. Supply (207/210) to be used with ATyS optional I/O modules

- 16. Option Module Slots 1 to 4
- 17. Current Transformer incoming cable connections
- 18. Voltage sensing inputs
- 19. Power supply Inputs



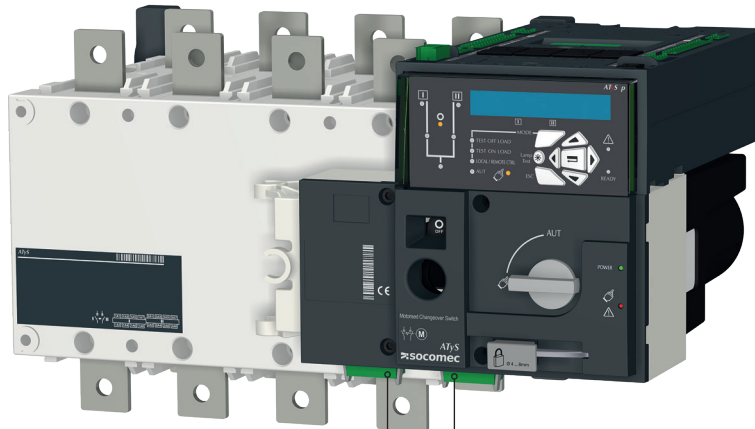
**DANGER ! Do not handle any control or power cables connected to the ATyS when voltage may be present.**



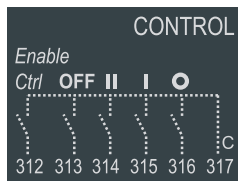
**CAUTION ! Verify that the Auxiliary power supply feeding terminals 101 and 102 / (201 and 202) are within the limits of 208 VAC -> 277 VAC ±20%.**

## 6.2.2. ATyS p input and output contacts

### 6.2.2.1. Motorisation module wiring

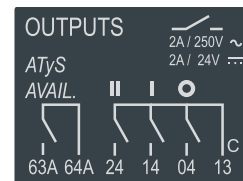


All pressure on the connector pins is to be avoided during wiring of the auxiliary cables

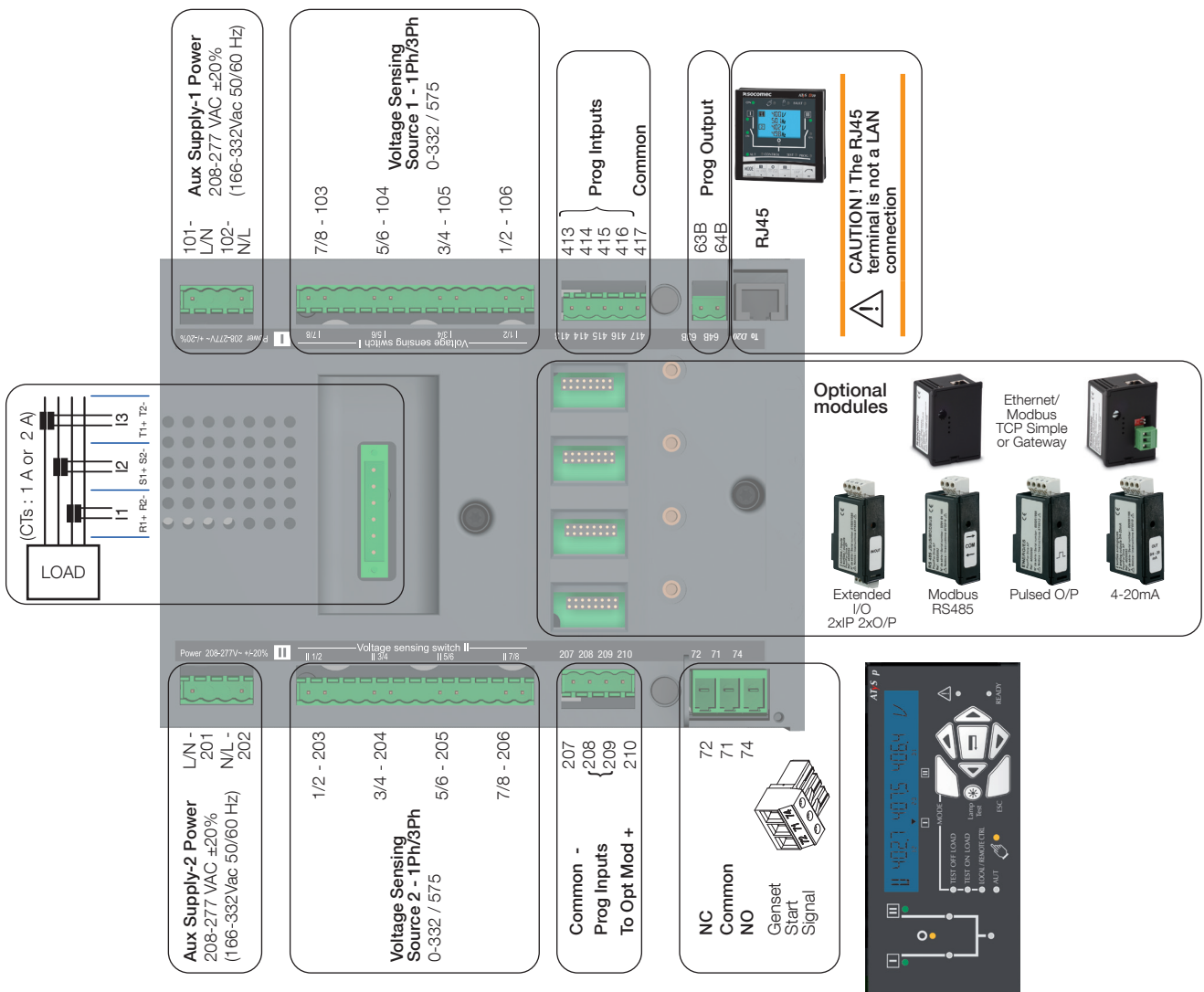


Control Enable:	312
Override to OFF:	313
Sw to Pos II I/P:	314
Sw to Pos I I/P:	315
Sw to Pos O I/P:	316
Common:	317

Prod Avail Common:	63A
Prod Avail O/P:	64A
Pos II Aux Contact:	24
Pos I Aux Contact:	14
Pos O Aux Contact:	04
Common:	13



### 6.2.2.2. ATS control module wiring



### 6.2.2.3. ATyS p (Optional Module) Input / Output Wiring Connections

The ATyS p accept 1 plug in I/O module.



### 6.2.2.4. Terminal denomination, description and characteristics.

Denomination	Terminal	Description	Characteristics	Recommended Cable Section
<b>Output Contacts (Motorisation Module)</b>	04	Aux Contact Position 0 - Normally Open Contact	Dry Contacts 2A AC1 / 250V 2 A / 24 VDC	1.5 – 2.5mm <sup>2</sup>
	13	Common for Aux Contacts positions I - 0 - II		
	14	Aux Contact position I: Normally Open Contact		
	24	Aux Contact position II: Normally Open Contact		
	63A	Motorisation module available output. Closed when the ATyS p is in Auto mode and motorisation is operational. (No Fault powered and ready to changeover)		
	64A			
<b>Additional Aux Contact</b>  <b>Included with 2000A to 3200A</b>  <b>Optional for 800A to 1600A</b>	81	Common for Aux Contacts positions I	Dry Contacts 2A AC1 / 250V	1.5 – 2.5mm <sup>2</sup>
	82	Aux Contact position I: Normally Closed Contact		
	84	Aux Contact position I: Normally Open Contact		
	91	Common for Aux Contacts positions II		
	92	Aux Contact position II: Normally Closed Contact		
	94	Aux Contact position II: Normally Open Contact		
<b>ATS Power supply Input I</b>	101 - L/N	Power supply I – L/N	208 - 277Vac ± 20% : 50/60Hz	1.5 – 2.5 mm <sup>2</sup>
	102 - N/L	Power supply I – N/L		
<b>ATS Voltage Sensing Input* Switch I</b>	103 - 7/8	Phase or neutral connected on power contact 7 or 8 of Switch I	575 Vac (ph-ph) max  332Vac (ph-n) max	1.5 – 2.5 mm <sup>2</sup>
	104 - 5/6	Phase connected on power contact 5 or 6 of Switch I		
	105 - 3/4	Phase connected on power contact 3 or 4 of Switch I		
	106 - 1/2	Phase or neutral connected on power contact 1 or 2 of Switch I		
<b>ATS Power supply Input II</b>	201 - L/N	Power supply II – L/N	208 - 277Vac ± 20% : 50/60Hz	1.5 – 2.5 mm <sup>2</sup>
	202 - N/L	Power supply II – N/L		
<b>ATS Voltage Sensing Input* Switch II</b>	203 - 1/2	Phase or neutral connected on power contact 1 or 2 of Switch II	575 Vac (ph-ph) max  332Vac (ph-n) max	1.5 – 2.5 mm <sup>2</sup>
	204 - 3/4	Phase connected on power contact 3 or 4 of Switch II		
	205 - 5/6	Phase connected on power contact 5 or 6 of Switch II		
	206 - 7/8	Phase or neutral connected on power contact 7 or 8 of Switch II		
<b>ATS Module Programmable Inputs</b>	207	Negative for optional module extension I/O supply	<b>Attn :</b> To be used with dry contacts fed from 207 ONLY.	1,5 – 2,5mm <sup>2</sup>
	208	Not used		
	209	Not used		
	210	+ dc Power supply for optional module extension I/O supply		

Denomination	Terminal	Description	Characteristics	Recommended Cable Section
<b>Motorisation Module</b> <b>Control Inputs</b>	312	Remote Control Mode Enable when closed with 317	<p><b>Attn:</b> Do not connect to any Power supply</p> <p>Max cable length 100m</p>	1.5 – 2.5mm <sup>2</sup>
	313	Position 0 order if closed with 317. (Priority order input forcing the product to remote control mode and 0 position)		
	314	Position II order if closed with 317		
	315	Position I order if closed with 317		
	316	Position 0 order if closed with 317		
	317	Common control terminal for 312 - 316 ATyS (Specific Voltage Supply)		
<b>ATS Module</b> <b>Programmable Inputs</b>	413	Fixed input Alarm 1	<p>Do not connect to any power supply.</p> <p><b>Attn:</b> To be used with dry contacts fed from 417 ONLY.</p>	1.5 – 2.5mm <sup>2</sup>
	414	Fixed input Alarm 2		
	415	Fixed input Alarm 3		
	416	Fixed input Alarm 4		
	417	Common supply for programmable inputs 1 to 4 (413 - 416)		
<b>Remote Interface</b>	RJ	Output to D20 remote control & display module	Up to 3m	RJ 45
<b>I/O Extension Modules</b>  <b>2xInput</b> <b>2xOutput</b>  <b>(Optional)</b>	I 13+	Not used	<p>Dry Contacts 2A AC1 / 250V</p>	1.5 – 2.5mm <sup>2</sup>
	I 14 -			
	I 23 +	Not used		
	I 24 -			
	O 13	Fixed Output Source 1 available		
	O 14			
	O 23	Fixed Output Source 2 available		
	O 24			
<b>MODBUS Module (Optional)</b>	0	RS 485 MODBUS Communication module terminals		
	-			
	+			
<b>Current transformers*</b>	R1	Current Transformer:- I1	CT Input 5A or 1A	1.5mm <sup>2</sup>
	R2			
	S1	Current Transformer:- I2		
	S2			
	T1	Current Transformer:- I3		
	T2			

\*For metering and sensing details, please refer to page 49.

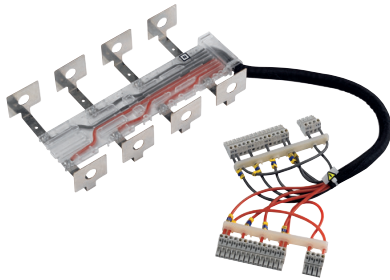


**CAUTION ! Do not connect terminals 312 to 317, 413 to 417 or 207 to 209 to any power supply. These order inputs are powered through terminal 207 (317 or 417 respectively) and external dry contacts ONLY.**

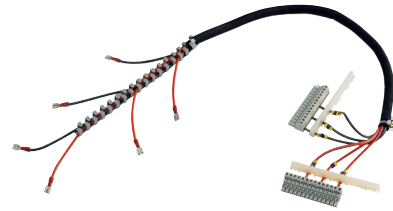
## 6.3. Voltage sensing and power supply kit

The ATyS p voltage sensing kit is available as an accessory and is designed to tap directly of the power section on Switch I and Switch II terminals without the need to add protection fuses. The sensing kit is designed with optimised cable lengths and utilises silicon conductors held safely in an isolated mechanical support.

Frame B4 - B5  
250 - 630A



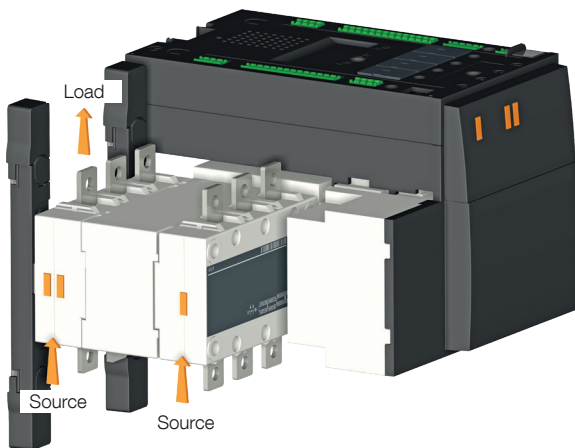
Frame B6  
800A



**CAUTION !** Ensure to mount the kit onto the product before connecting the power cables. Be careful not to damage the contacts during kit mounting and during power cables connections (Tighten the cables carefully).

### 6.3.1. Standard configuration

It can be used with top or bottom cables entry. The only connection to respect is that measures of the source on Switch I must be connected to the inputs located on the right of the electronic module and the measures of the source on Switch II must be connected to the inputs located on the left of the electronic module.



**CAUTION !** Pay attention when wiring the power cables (Respect to the sensing kit legend). 3 wire kits (those without a neutral) do not include for the power supply to terminals (101-102 and 201 - 202). Ensure that you have ordered the correct reference prior to installation. (Refer to the accessory section for details).

## 6.3.2. Sensing kit wiring diagram

### Bottom incoming with Top Outgoing

- Black Wires -> Switch I
- Red Wires -> Switch II

### Top Incoming with Bottom Outgoing

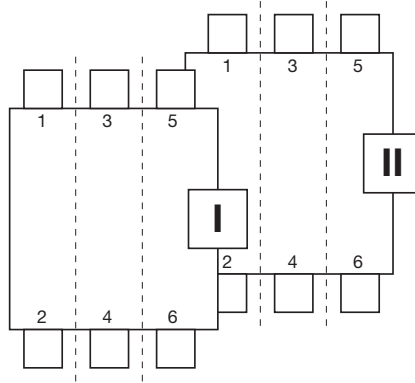
- Black Wires -> Switch II
- Red Wires -> Switch I

### Wiring numbers:

Wire numbering has been determined in accordance to the power switch terminals

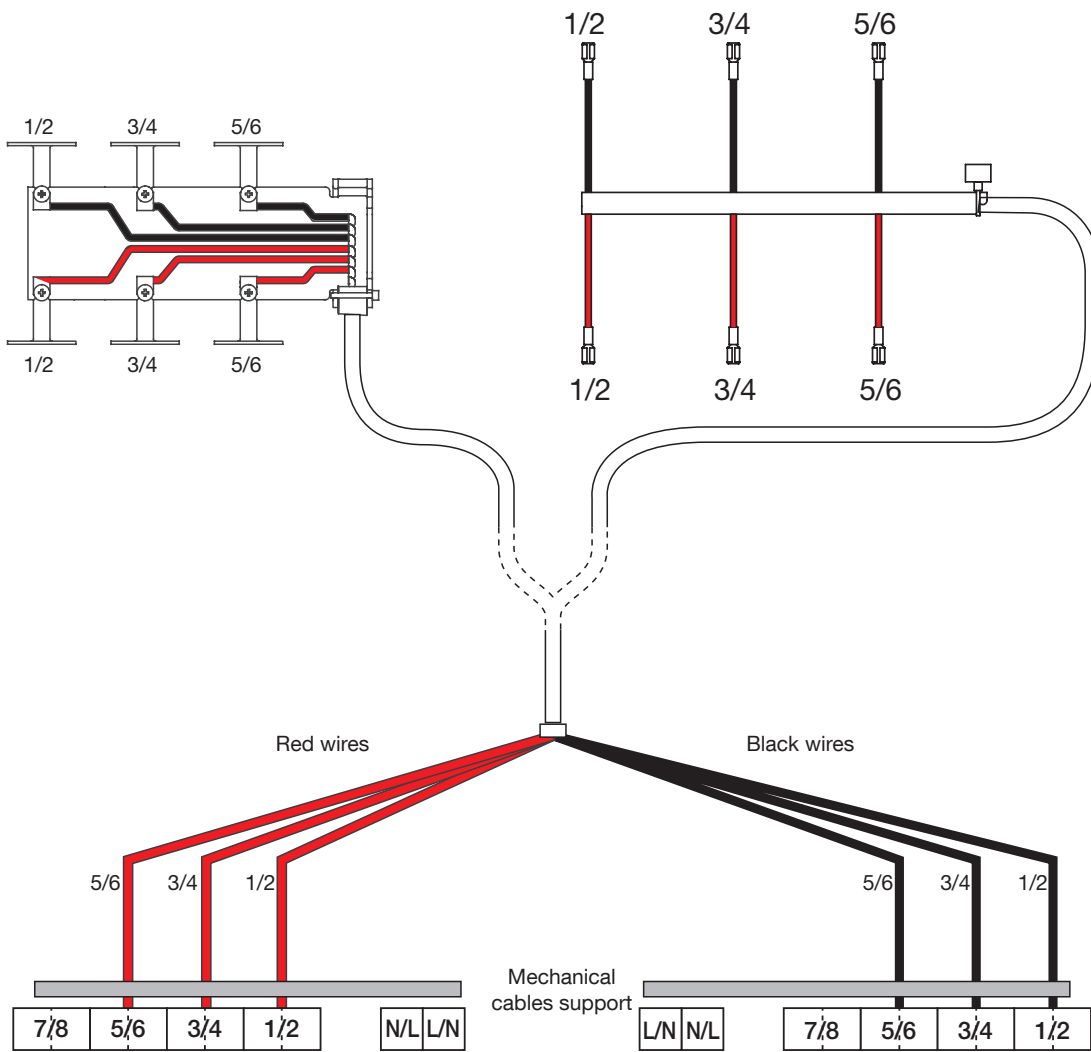
Example:

Black and red wire numbers 1-2 are always connected to terminals 1 or 2 from switch I or II



≤ 630 A Bottom view

≥ 800 A Bottom view



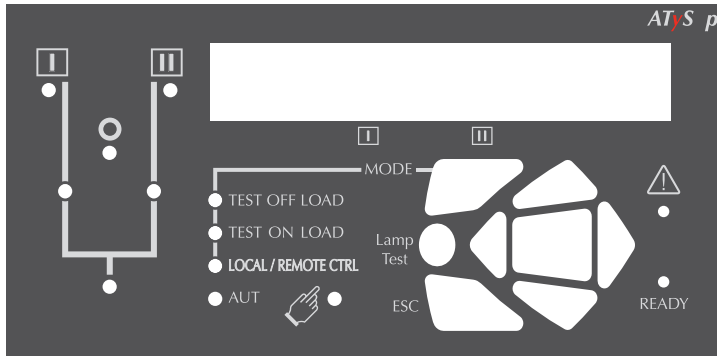
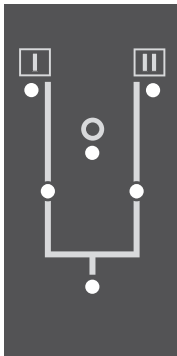
**CAUTION !** Verify kit orientation before mounting the kit.  
Kit output cables always on the right hand side (control module side).

### 6.3.3. Priority source connected on switch I or II (M-G Application)

Certain applications or installation constraints may require that the main supply is connected to switch II instead of switch I. This is possible to cater for with certain precautions.

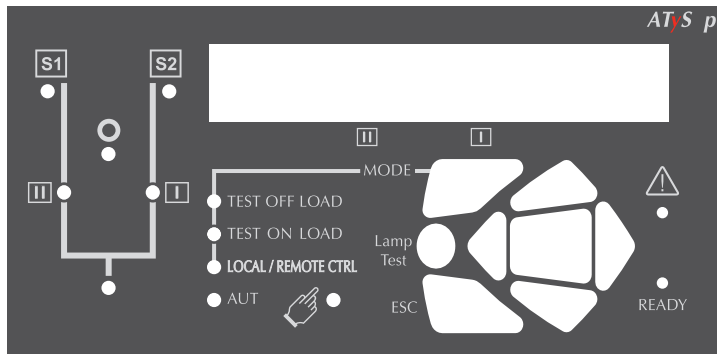
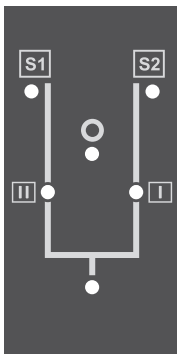
The ATyS p includes the facility to adapt the switch priority supply using the configuration in the software that will swap the main supply and switch logic (S1 = SW2 in SETUP Menu). When this is done pay attention to the LED switch position display that will no longer correspond to the identification labels on the switch. The LED's will correspond to the switch that is energized however the main supply will be displayed under II. In this case it is important to update the ATS controller sticker so as to correspond with the actual wiring and configuration.

Change from:



**Source 1 on switch I:**  
Standard configuration.

to:

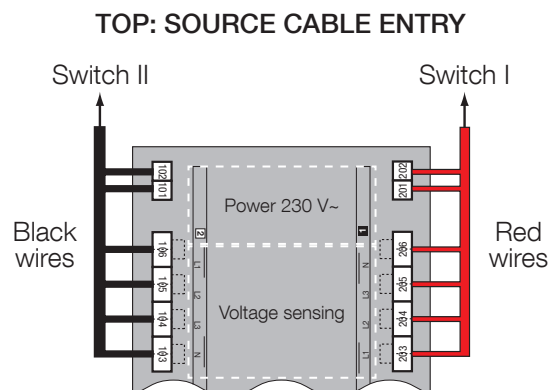
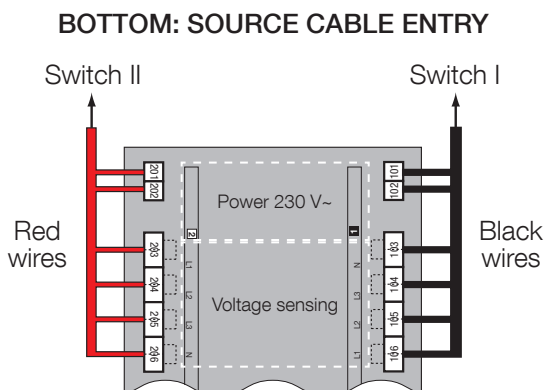


**Source 1 on switch II:**  
Set parameter S1=SW2 at YES, in SETUP menu

S1=SW2 YES



**CAUTION !** When reversing the switch priority (main supply connected to switch II) update the LED numbering on the front of the ATS to correspond with the actual wiring, configuration and LED indication. Inverse (I – II -> II – I).



# 7. OPERATING MODES

The ATyS p includes 3 safe and distinct operating modes through a selector switch located on the front of the product.


- Auto Mode: “Remotely operated transfer switching”
- Manual Mode: “Local emergency manual operation”
- Locked Mode: “Secure locked padlocking facility”

- AUTO MODE:**
- Activates the remote control inputs and the ATS controller automation.
  - Inhibits the padlocking facility
  - Inhibits the insertion of the manual operation handle when in AUTO Mode

AUTO Mode position is inhibited when padlocked or when the handle for manual operation is inserted into the ATyS p.

- MANUAL MODE: (Not Padlocked)**
- Inhibits the control inputs.
  - Allows to insert the handle for emergency manual operation.
  - Allows padlocking in O Position. *(With the handle for manual operation removed)*

Turning the selector switch to  from AUT and back to AUT resets a fault state.

- MANUAL MODE: (Padlocked)**
- Inhibits the control inputs.
  - Inhibits insertion of the emergency handle.
  - Allows padlocking when in O Position.



Padlocking in position I - O and II is possible when the optional function is included in the ATyS p. (Refer to product catalogue)

**WARNING !** Depending on the state of the ATyS p the ATS automation may change the switch position as soon as the mode selector is switched to AUTO. This is a normal operation.

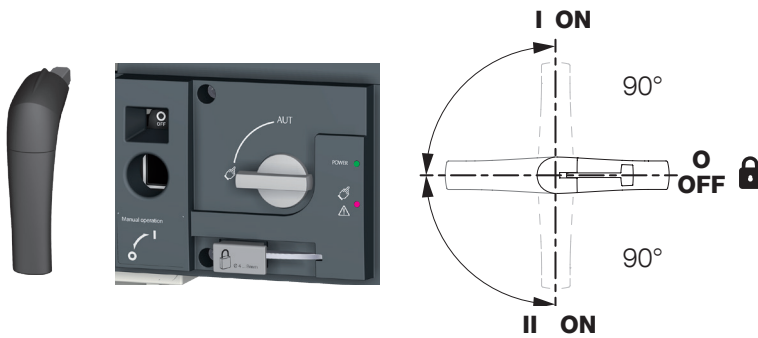
## 7.1. Manual operation

### 7.1.1. Emergency manual operation

The ATyS p can be manually operated as a “Manual Transfer Switch Equipment – MTSE” whilst retaining the electrical characteristics and performance of the power switching function. This function is usually used in case of emergencies or during maintenance.

To operate the ATyS p manually ensure that no live parts are accessible, turn the front selector switch into the manual position (see page 12) and insert the handle (see page 12) into the emergency handle shaft location hole provided (see page 13).

Turn the handle 90° clockwise or anti-clockwise (depending on the position to be reached) for each consecutive change in position. I -> O -> II -> O -> I.



**CAUTION !** Ensure to verify the product position and direction of rotation before effecting manual operation.  
Ensure to remove the handle from the product before changing the selector switch back to AUT position.

### 7.1.2. Padlocking

The ATyS p can be padlocked in the O position as standard whilst padlocking in positions I, O or II is available as a factory fitted option.

To padlock the ATyS p first ensure that the ATyS p mode selector switch is on Manual then ensure that the emergency manual operation handle is not inserted into the location hole. (Remove if inserted).

Pull the padlocking mechanism outwards to reveal the slot for inserting.

Padlock the device with approved quality padlocks of minimum diameter 4mm and maximum diameter of 8mm. A maximum of 3x 8mm padlocks may be padlocked onto the ATyS p to padlocking mechanism.



**CAUTION !** As standard, padlocking is only made possible in the “O position”, when in manual mode and with the emergency handle not inserted.

## 7.2. Electrical operation

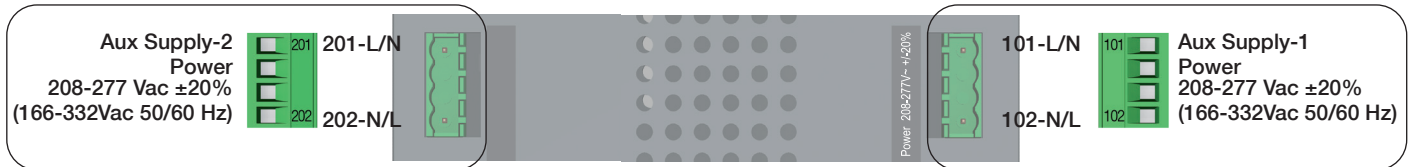
### 7.2.1. Dual power supply

The ATyS p includes a dual power supply and is to be powered between terminals 101 - 102 and 201 - 202 (2 different supplies - main & alternative) within the limits of: 208 - 277 VAC  $\pm$  20% / 50/60Hz  $\pm$  10%.

Current Input: 100mA (Standby mode) / 15 A max (during switching mode)

Surge Protection :  $V_{in\_sg}$ : 4.8KV - 1.2/50 $\mu$ s according to IEC 61010-1

Terminal connectors: Minimum 1.5 mm<sup>2</sup> / Maximum 2.5 mm<sup>2</sup>



### 7.2.2. Voltage sensing inputs

The ATyS p includes dual single phase and three phase voltage sensing (terminals 103 - 106 and 203 - 206) designed to monitor 1Phase (L-N) supplies of up to 332VAC and 3 phase (L-L) of up to 600VAC.

The ATyS p is designed to handle single phase, as well as three phase networks. Simply define the correct configuration (single or three phase) during configuration.

Sensing connections are usually tapped directly off the ATyS p power terminals using the A TyS sensing kit available as an accessory.

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

The parameters monitored through sensing are the following:

- **Phase rotation / imbalance (3 phase networks)**  
Phase imbalance in the ATyS p is relative to the nominal voltage configured in the product.
- **Frequency within set limits**  
This will depend on the nominal frequency configured.

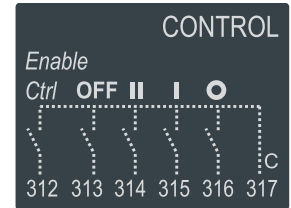


## 7.2.3. Fixed inputs

### 7.2.3.1. Description

The ATyS p includes for 5 off fixed inputs through a 6 pin connector installed on the motorisation module. No additional power supply should be used on these contacts as the inputs **MUST** be used with the common supply taken from terminal 317.

At least one of the ATyS p aux power supplies (101 – 102 or 201 - 202) must be available to activate these inputs.



Pulse duration for activation of contact inputs:  $\geq 60\text{ms}$ .

- **Pin 312:** Remote Control Mode Enable when closed with 317.

This contact must be closed with 317 so as to activate all control inputs except for 313 that takes priority and is active immaterial of the state of input 312. Enabling remote control through 312 activates the remote control inputs whilst inhibiting the ATS module automation.

- **Pin 313:** Position 0 order if closed with 317 when in AUTO. **(Force the switch to the OFF Position)**

This is a “**Priority Order Input**” meaning that when closed with 317 it takes priority over all other electrical commands. The ATyS p will remain in 0 position as long as the contact 313 – 317 remains closed. Once the contact is open the ATyS p is ready to receive new orders. This contact order is independent of other inputs and is also enabled without 312 connected to 317. Impulse duration to activate and start switching to position O is a minimum of 60ms. The product state will be unavailable.

- **Pin 314:** Position II order if closed with 317.

This contact is active with the ATyS p in AUT mode with contact 312 – 317 closed and 313 – 317 open. Impulse duration to activate and switch to position II is a minimum of 60ms.

- **Pin 315:** Position I order if closed with 317

This contact is active with the ATyS p in AUT mode with contact 312 – 317 closed and 313 – 317 open. Impulse duration to activate and switch to position I is a minimum of 60ms.

- **Pin 316:** Position 0 order if closed with 317

This contact is active with the ATyS p in AUT mode with contact 312 – 317 closed and 313 – 317 open. Impulse duration to activate and switch to position O is a minimum of 60ms. For contactor logic maintain contacts on between terminal 316 and 317.

- **Pin 317:** Common - Common supply for inputs 312 to 316

### 7.2.3.2. Remote control logic

Remote switching operation can be driven in AUT mode by external volt free contacts as described above using input contacts 312 to 317.

Depending on the wiring configuration there are two types of logic that may be applied to the ATyS p.

- Impulse logic or
- Contactor logic.

In remote control, the ATyS p inputs give priority to orders I and II over O therefore contactor logic can be implemented by simply bridging terminals 316 and 317.



Note: 313 – 317 closed / Force ATyS to OFF Position, takes priority over all other orders no matter of the control logic used.

#### Impulse logic:

The ATyS p is driven to a stable position (I – O – II) after receiving an impulse order.

- A switching command of at least 60 ms is necessary to initiate the switching operation.
- Orders I and II have priority over order O.

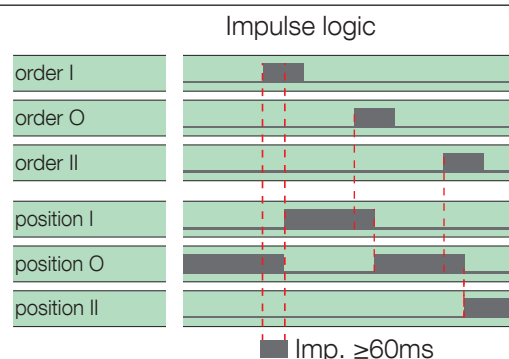
Note: The logic diagrams exclude the transfer times.

#### Contactor Logic:

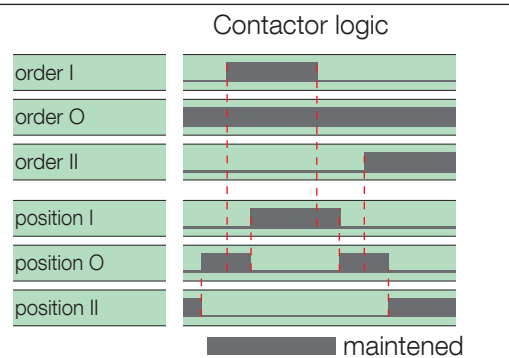
The ATyS p is driven to a specific position (I or II) for as long as the order is maintained.

- Order O is maintained. (Bridge 316 – 317)
- Orders I and II have priority over order O.
- Orders I and II have equal priority.  
(1st order received is held until no longer maintained).
- If order I or II disappears, the device returns to zero position. (With the power supply available).

(Note : Excludes position switching delays)



(Note : Excludes position switching delays)



(Note : Excludes position switching delays)

## 7.2.4. Programmable fixed inputs

### 7.2.4.1. Description

4 inputs are available on the ATyS p, they are to be found on the electronic module.

- **Pin 413:** AL1 (External alarm 1)
- **Pin 414:** AL2 (External alarm 2)
- **Pin 415:** AL3 (External alarm 3)
- **Pin 416:** AL4 (External alarm 4)
- **Pin 417:** Common

Common supply for programmable inputs 1 – 4 on terminals 413 to 416.

## 7.2.4.2. Technical data

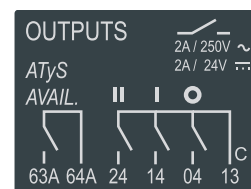
	Motorisation Module	ATS Control Module
Input Qty	5	4
Direct Current lin	0.35 to 0.5mA	1 to 2.5mA
Line resistance	1k $\Omega$	1k $\Omega$
Line length	100m (Min. wire 1.5mm <sup>2</sup> #16AWG)	100m (Min. wire 1.5mm <sup>2</sup> #16AWG)
Pulse duration	60ms	60ms
Power per Input	0.06VA	0.03VA
Surge protection Vin_sg	4.8kV (1.2/50 $\mu$ s surge)	2.4kV (1.2/50 $\mu$ s surge)
ESD withstand voltage (Contact/air)	2/4kV	2/4kV
Insulation (Common mode)	4.8kVAC (Between I/P and all common parts)	4.8kVAC (Between I/P and all common parts)
Terminal connector	1.5mm <sup>2</sup> minimum / 2.5mm <sup>2</sup> max	1.5mm <sup>2</sup> minimum / 2.5mm <sup>2</sup> max

## 7.2.5. Fixed outputs - Dry contacts

### 7.2.5.1. Description

As standard, the ATyS p is equipped with four fixed outputs located on the motorisation module.

(Dry contacts to be powered by the user).



### 7.2.5.2. Position auxiliary contact

The ATyS p is equipped with integrated position (I – O – II) auxiliary contact outputs through 3 off micro switches.

#### **Pins 13, 04, 14, 24**

(Normally Open contacts with pin 13 as common)

### 7.2.5.3. ATyS p Product available output (motorisation)

#### Pin 63A – 64A

(Normally Open contact that is held closed when the motorisation is available).

This contact gives constant feedback about the product's availability and it's capacity to transfer from the main supply to the alternative. The feedback given is relative to the motorisation module excluding the ATS controller that may be monitored separately.

The ATyS p performs a self diagnostics test on the motorisation module at startup, when put from Manual -> Auto and then every 5 minutes. This test ensures that the ATyS p is operational in terms of control inputs. Should one of the tests fail, a second test is performed to reconfirm the error state. Should the ATyS p motorisation module become unavailable, contact 63A – 64A are opened, the power/ready LED's are switched off, and the fault LED is activated. The fault LED will remain active for as long as sufficient power is available and the fault condition is not reset. The fault is reset when the product is switched from AUT -> Manual -> Auto mode.

ATyS p (Motorisation) Product Available / Unavailable Watchdog relay will open for any of the following reasons below: For added security, "Product Availability" is informative and does not necessarily inhibit motor operation.

Product Unavailable + Warning LED Condition:	Inhibition
Product in manual mode	Yes
Motor not detected (Autotest)	No
Control voltage out of range	Yes
Operating factor fault active (N° of operations / min)	Yes
Powerfail active	Yes
Customer input autotest failed	No
Abnormal switching when not in manual mode	Yes
Requested position not reached	Yes
Locked mode active when not in manual mode	Yes
External Fault -> User input	No
Unexpected current flowing through the motor when idle	Yes

Sampling rate for the above is every 10 ms

Exception: motor detection sampling rate is every 5 min

### 7.2.5.4. Technical data

Auxiliary Contact Quantity	4
Configuration	NO
Mechanical Endurance	100k cycles
Response Time	5 – 10 ms
Startup duration	200ms
Rated Voltage / Switching Voltage	250VAC
Rated Current	2A
Surge protection Vin_sg:	4.8kV (1.2/50µs surge)
ESD withstand voltage (Contact/air):	2/4kV
Dielectric Strength contact/parts:	4.8kVAC (Reinforced Insulation)
Insulation:	4.8KVAC
Output Terminal:	1.5mm2 minimum / 2.5mm2 maximum

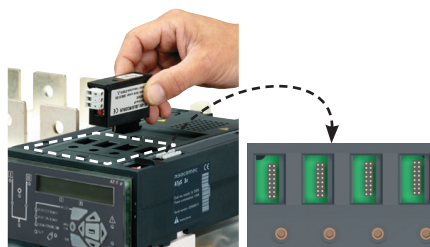
### 7.2.6. Programmable dry contact output

Refer to accessory section for details:

2 outputs are available on the ATyS p, they are to be found on the option module.

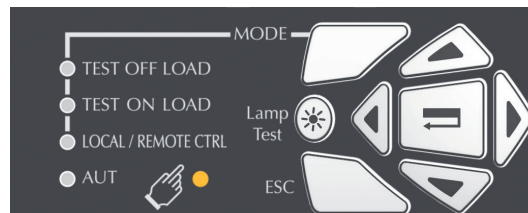
Contacts O13/O14 : S1A (Source 1 available)

Contacts O23/O24 : S2A (Source 2 available)

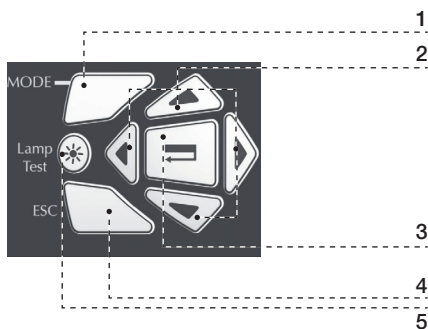


## 8. PROGRAMMING

The ATyS p is to be programmed powered up and after wiring verification tests. This may either be done through the front of the ATS Controller using the keypad.



### 8.1. Programming with the ATyS p keypad



1. MODE key to have access to position control via the keypad.
2. Navigation Keys to browse through the ATyS p menus without software.
3. Enter Key used to enter Prog Mode (Press and hold for 5 seconds) and to validate the settings programmed through the keypad.
4. ESC key used to escape from a specific screen up to the main menu.
5. Lamp test key to check the LED's and LCD screen.

Programming access through the keypad is possible in Automatic or Manual mode, when the product is in a stable position (I, 0 or II) with at least one supply source available.

Programming is not accessible whilst any cycle sequence is running.

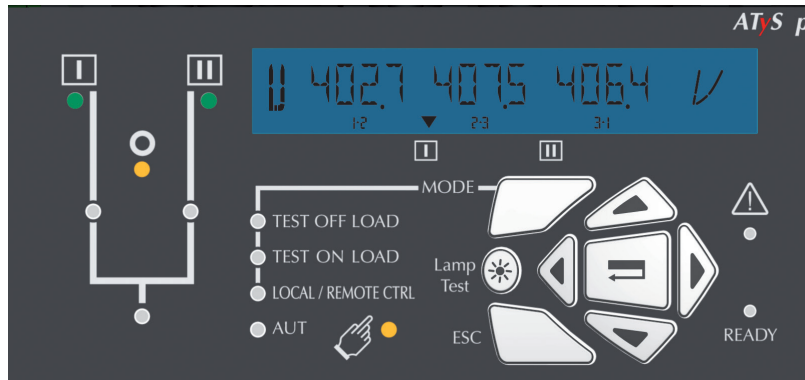


Refer to Annexe page 57 for details regarding Programming with the ATyS p Keypad.

# 9. THE LCD DISPLAY

## 9.1. Presentation

Display mode is activated as soon as the device is switched on. It enables parameter visualisation whatever the functioning mode that is running. The switchover cycles take priority over any other display, and will show the time delay countdowns as soon as they are activated. After this time, or following a switchover cycle, the screen will return to source 1 (depending on the switch position) phase to phase voltage display (depending on the network type).





## 10. LOCAL / REMOTE CONTROL (POSITIONS I – 0 – II)

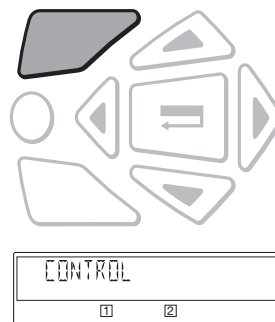
Local control will allow the user to change position locally without the need for the emergency manual handle. This function is available in AUT mode only.

### Description:

- Changeover of the switch positions: PS1, PS0, PS2.

### Activation:

- via motorisation module fixed input.
- or via the ATyS p front face (via the Mode key).
- or via communication (MODBUS).



### Steps to control positions via the front face:

- Select Local / Remote mode using the Mode key
- When Control is displayed press the validation key
- Enter the password when prompted with CODE (Default 4000)
- Press the validation key to validate the password and access the position menu
- To change from POS0 to POS1 to POS2 etc press the MODE key to select the desired position.
- YES and NO define the actual position that the switch will be in.

### To change position: example

- POS2 NO (This states that the switch is not in position II)
- To go to position II press the validation key with POS2 NO on the display
- Once position II has been reached the display will change to POS2 YES

### Deactivation:

- either via the Escape key,
- or by switching the selector switch on the front of the ATyS p from AUT to Manual and back to AUT.



Note: Local / Remote Control takes priority over all other operating functions.

# 11. COMMUNICATION

One can benefit of all the ATyS p functionality when including one of the communication options.



## 11.1. General information

Communication via an RS485 connection (MODBUS® protocol) enables you to connect up to 31 ATyS to a PC or programmable logic controller over a distance of 1200 metres.

To authorise a change in configuration: define address HEXA E300 as 1000.

### Recommendations:

Use a shielded twisted pair, type LIYCY.

If the distance of 1200 m and / or the number of 31 ATyS be exceeded, it will be necessary to connect a repeater to allow an connection of ATyS for over 1200 m.

For further information on the connection methodology, please consult SOCOMEC.

Communication via an RJ45 Ethernet cable enables you to connect up to 31 ATyS to a PC or a programmable logic controller over a distance of 100 metres.

## 11.2. MODBUS® protocol

The MODBUS® protocol used by the ATyS requires a dialogue using a master/slave hierarchical structure. Two dialogues are possible:

- the master communicates with a slave (ATyS) and waits for its response,
- the master communicates with all the slaves (ATyS) without waiting for their response.

The communication mode is RTU (Remote Terminal Unit) which uses hexadecimal 8 bit characters.

In the communication protocol, a standard frame is made up of the following elements:




- Slave address: communicating device address
- Function codes:
  - 3: to read n words (maximum 125)
  - 6: to write one word.
  - 16: to write n words (maximum 125).
- Address: Register address (refer to following tables)
- Data: parameters linked to function (number of words, value).  
When slave address 0 is selected, a message is sent to all devices present on the network (only for functions 6 and 16), this type of message is called general distribution, so it is not followed up with a response from the slaves. The maximum response time (timeout) is 250 ms between a question and a response.

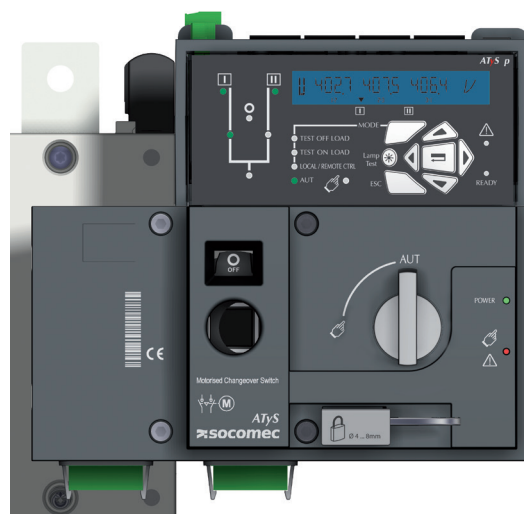
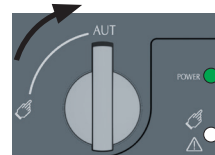
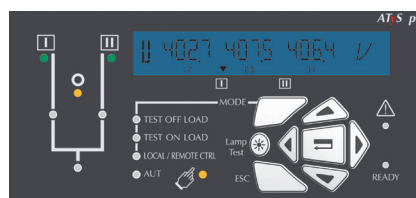
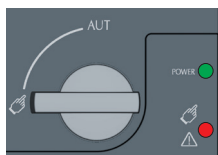



Refer to Annexe page 57 for details regarding Programming with the ATyS p Keypad.

## 12. PUTTING THE ATYS P INTO AUTO OPERATION

After all checks have been verified and all programming and commissioning procedures are ready and ok, once ready to put the ATyS p into AUTO operation, turn the mode selector switch from Manual to Auto.

 Note: when the product is powered and properly configured, when switching the product from Manual Mode to AUT the POWER and READY LED's should be a steady Green light.



 **WARNING !** Depending on the state of the ATyS p the ATS automation may change the switch position as soon as the mode selector is switched to AUT. This is a normal operation.

# 13. CHARACTERISTICS

Characteristics according to IEC 60947-3 and IEC 60947-6-1

Thermal current $I_{th}$ to 40°C	250 A	400 A	630 A	800 A	
<b>Frame size</b>	<b>B4</b>	<b>B4</b>	<b>B5</b>	<b>B6</b>	
Rated insulation voltage $U_i$ (V) (power circuit)	1000	1000	1000	1000	
Rated impulse withstand voltage $U_{imp}$ (kV) (power circuit)	12	12	12	12	
Rated insulation voltage $U_i$ (V) (control circuit)	300	300	300	300	
Rated impulse withstand voltage $U_{imp}$ (kV) (control circuit)	4	4	4	4	
Rated operational currents $I_e$ (A) according to IEC 60947-3					
<b>Rated voltage</b>	<b>Utilisation category</b>	<b>A/B</b>	<b>A/B</b>	<b>A/B<sup>(1)</sup></b>	<b>A/B</b>
415 VAC	AC-21 A / AC-21 B	250/250	400/400	630/630	800/800
415 VAC	AC-22 A / AC-22 B	250/250	400/400	630/630	800/800
415 VAC	AC-23 A / AC-23 B	200/200	400/400	500 /630	800/800
500 VAC	AC-21 A / AC-21 B	250/250	400/400	630/630	800/800
500 VAC	AC-22 A / AC-22 B	200/250	200/400	500/500	630/630
500 VAC	AC-23 A / AC-23 B	200/200	200/200	400/400	630/630
690 VAC	AC-21 A / AC-21 B	200/200	200/200	500/500	800/800
690 VAC	AC-22 A / AC-22 B	160/160	160/160	400/400	630/630
690 VAC	AC-23 A / AC-23 B	125/125	125/125	400/400	630/630
220 VDC	DC-21 A / DC-21 B	250/250	250/250	630/630	800/800
220 VDC	DC-22 A / DC-22 B	250/250	250/250	630/630	800/800
220 VDC	DC-23 A / DC-23 B	200/200	200/200	630/630	800/800
440 VDC <sup>(1)</sup>	DC-21 A / DC-21 B	200/200	200/200	630/630	800/800
440 VDC <sup>(1)</sup>	DC-22 A / DC-22 B	200/200	200/200	630/630	800/800
440 VDC <sup>(1)</sup>	DC-23 A / DC-23 B	200/200	200/200	630/630	800/800
<b>Rated operational currents <math>I_e</math> (A) according to IEC 60947-6-1</b>					
<b>Rated voltage</b>	<b>Utilisation category</b>				
415 VAC	AC-31 B	250	400	630	800
415 VAC	AC-32 B	200	400	500	800
415 VAC	AC-33 B	200	200	400	800
<b>Current rated as conditional short-circuit with fuse gG DIN, according to IEC 60947-3</b>					
Prospective fuse protected short-circuit withstand at 415 VAC(6)		50	50	50	50
Prospective fuse protected short-circuit withstand at 690 VAC(kA rms)		50	50	50	50
Associated fuse rating (A)		250	400	630	800
<b>Current rated as conditional short-circuit according to IEC 60947-3</b>					
Current rated as short-time withstand $I_{cw}$ 0,3s, 415 VAC (kA rms)		15	15	17	64
Current rated as short-time withstand $I_{cw}$ 0,3s, 690 VAC (kA rms)		15	15		/
Current rated as short-time withstand $I_{cw}$ 1s, 415 VAC (kA rms)		8	8	10	35
Current rated as short-time withstand $I_{cw}$ 1s, 690 VAC (kA rms)		8	8		/
Power rated as closing short-circuit $I_{cm}$ at 415 VAC (peak kA)		22	22	45	73.5
<b>Current rated as conditional short-circuit according to IEC 60947-6-1</b>					
Current rated as short-time withstand $I_{cw}$ 30 ms (kA rms), 415 VAC		10	10		/
Current rated as short-time withstand $I_{cw}$ 60 ms (kA rms), 415 VAC		/	/	12.6	20
Power rated as closing short-circuit $I_{cm}$ at 415 VAC (peak kA)		17	17		40
<b>Connection</b>					
Minimum Cu cable cross-section as per IEC 60947-1 (mm <sup>2</sup> )		95	185	2 x 120	2 x 185
Recommended Cu busbar cross-section (mm <sup>2</sup> )				2 x 40 x 5	2 x 50 x 5
Maximum Cu cable cross-section (mm <sup>2</sup> )		150	240	2 x 300	4 x 185
Maximum Cu busbar width (mm)		32	32	50	63
Min./max. tightening torque (Nm)		20/26	20/26	40/45	9/13
<b>Switching time (rated voltage, after receiving command)</b>					
Transfer time I-II or II-I (s)		0.9	0.9	0.95	2.8
I-0 or II-0 (s)		0.5	0.5	0.55	1.4
Contact transfer time ("black-out" I-II) minimum (s)		0.4	0.4	0.4	1.4
<b>Power supply</b>					
Min./max. power (VAC)		166/332	166/332	166/332	166/332
<b>Control supply power demand</b>					
Demand/rated power (VA)		298/137	298/137	298/172	482/206
<b>Mechanical specifications</b>					
Durability (number of operating cycles)		8,000	8,000	5,000	4,000
Weight 3 P / 4 P (kg)		7.7/ 8.5	7.8/ 8.9	13.0/ 15.1	29.0/ 33.3

(1) Category with index A = frequent operation - Category with index B = infrequent operation.

(2) 3-pole device with 2 pole in series for the „+“ and 1 pole for the „-“. 4-pole device with 2 poles in series by polarity.

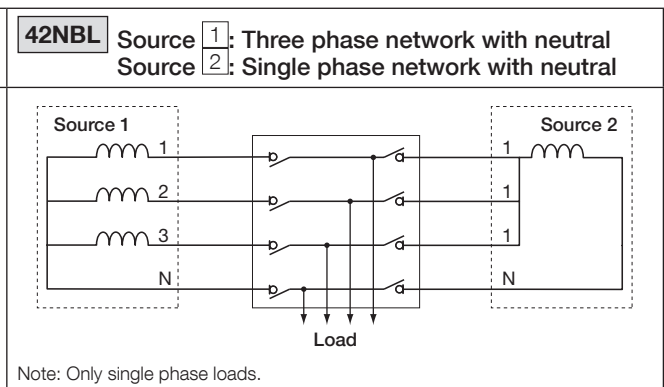
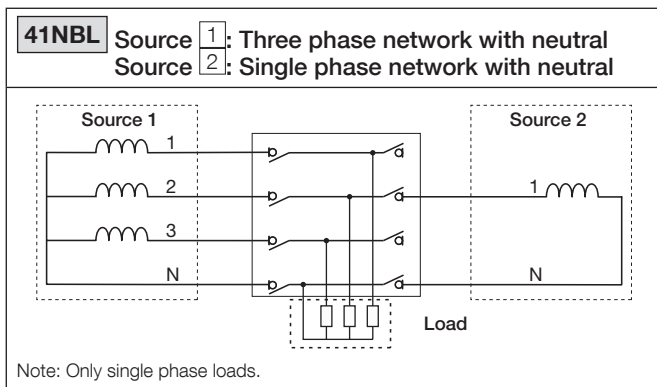
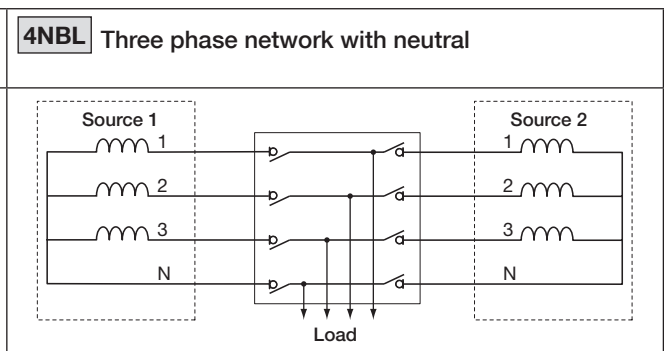
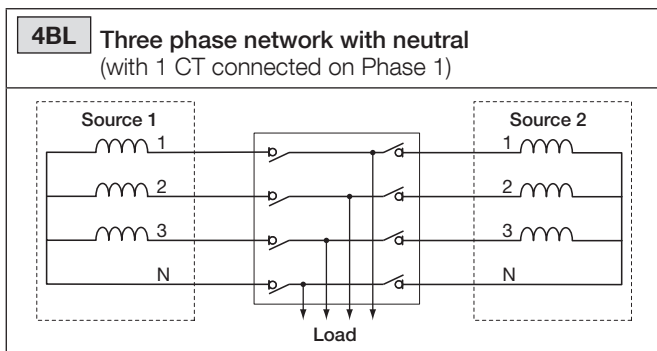
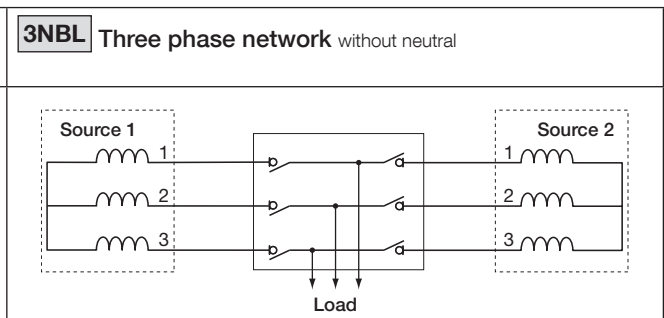
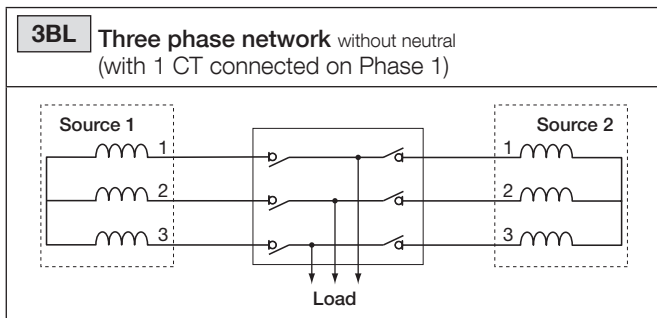
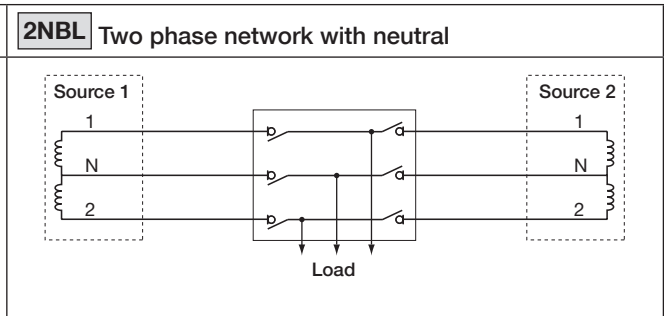
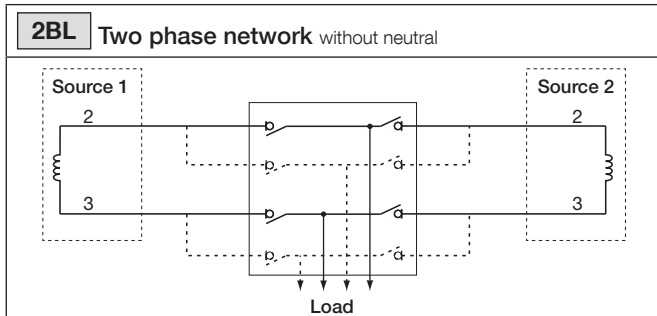
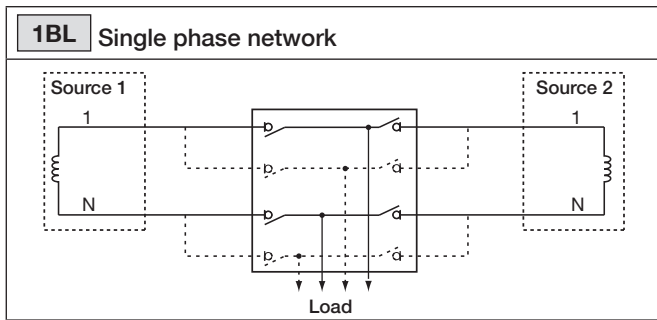
(3) At 415 VAC.

(6) Value for coordination with any circuit-breaker that ensures tripping in less than 0.3s. For coordination with specific circuit-breaker references, higher short-circuit current values are available. Please consult us.

(5) At 30ms.

# 14. NETWORKS AND POWER CONNECTION POSSIBILITIES

## 14.1. Type of networks



## 14.2. Metering and sensing details

Network type									
	1BL	2 BL	2NBL	3BL	3NBL	4BL	4NBL	41NBL	42NBL
Source [1]	1 phase 2 wire	2 phase 2 wire	2 phase 3 wire	3 phase 3 wire	3 phase 3 wire	3 phase 4 wire	3 phase 4 wire	3 phase 4 wire	3 phase 4 wire
Source [2]								1 phase 2 wire	3x1 phase 4 wire
Source [1]									
Source [2]									
ATyS p CT cabling (load side)									
Voltage sensing									
Source [1]	- V1	U23	U12 V1, V2	U12, U23, U31	U12, U23, U31	U12, U23, U31 V1, V2, V3	U12, U23, U31 V1, V2, V3	U12, U23, U31 V1, V2, V3	U12, U23, U31 V1, V2, V3
Source [2]	- V1	U23 -	U12 V1, V2	U12, U23, U31 -	U12, U23, U31 -	U12, U23, U31 V1, V2, V3	U12, U23, U31 V1, V2, V3	- V1	- V1, V2, V3
Source presence (source available)	✓	✓	✓	✓	✓	✓	✓	✓	✓
Source in ranges (U, V, F)	✓	✓	✓	✓	✓	✓	✓	✓	✓
Rotation phase order	-	-	-	✓	✓	✓	✓	S1 only	S1 only
Neutral position	-	-	✓	-	-	✓	✓	S1 only	S1 only
Voltage unbalanced is lower than threshold	-	-	-	✓	✓	✓	✓	S1 only	S1 only
Metering applicable to ATyS p									
Source [1]	- V1 f1	U23 - f1	U12 V1, V2 f1	U12, U23, U31 - f1	U12, U23, U31 - f1	U12, U23, U31 V1, V2, V3 f1	U12, U23, U31 V1, V2, V3 f1	U12, U23, U31 V1, V2, V3 f1	U12, U23, U31 V1 f1
Source [2]	- V1 f2	U23 - f2	U12 V1, V2 f2	U12, U23, U31 - f2	U12, U23, U31 - f2	U12, U23, U31 V1, V2, V3 f2	U12, U23, U31 V1, V2, V3 f2	- V1 f2	- 3xV1 f2
If CT connected (load side)	- - - P <sub>T</sub> , Q <sub>T</sub> , S <sub>T</sub> , PF <sub>T</sub>	- - - P <sub>T</sub> , Q <sub>T</sub> , S <sub>T</sub> , PF <sub>T</sub>	P1, Q1, S1, PF1 P2, Q2, S2, PF2 - P <sub>T</sub> , Q <sub>T</sub> , S <sub>T</sub> , PF <sub>T</sub> I1, I2	- - - P <sub>T</sub> , Q <sub>T</sub> , S <sub>T</sub> , PF <sub>T</sub> I1, I2, I3	P1, Q1, S1, PF1 P2, Q2, S2, PF2 P3, Q3, S3, PF3 P <sub>T</sub> , Q <sub>T</sub> , S <sub>T</sub> , PF <sub>T</sub> I1, I2, I3, I <sub>n</sub>	- - - P <sub>T</sub> , Q <sub>T</sub> , S <sub>T</sub> , PF <sub>T</sub> I1, I2, I3	P1, Q1, S1, PF1 P2, Q2, S2, PF2 P3, Q3, S3, PF3 P <sub>T</sub> , Q <sub>T</sub> , S <sub>T</sub> , PF <sub>T</sub> I1, I2, I3, I <sub>n</sub>	P1, Q1, S1, PF1* P2, Q2, S2, PF2 P3, Q3, S3, PF3 P <sub>T</sub> , Q <sub>T</sub> , S <sub>T</sub> , PF <sub>T</sub> I1, I2, I3, I <sub>n</sub>	P1, Q1, S1, PF1* P2, Q2, S2, PF2 P3, Q3, S3, PF3 P <sub>T</sub> , Q <sub>T</sub> , S <sub>T</sub> , PF <sub>T</sub> I1, I2, I3, I <sub>n</sub>

# 15. PREVENTIVE MAINTENANCE AND ROUTINE ANNUAL INSPECTION

It is recommended to verify once a year.

- Review event log (ATyS p)
- Check number of operations and other switch status figures (ATyS p)
- Visual inspection for damage
- Temperature measurement of terminals is within expected range
- Test transfer of load : operate the product in a full operating cycle (I – 0 – II – 0 – I: Auto and Manual) . Operation can be done off load.
- Observe voltage levels of both sources within expected range



Note: maintenance should be planned carefully and carried out by qualified and authorised 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.



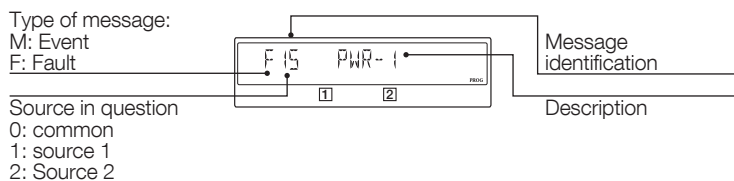
**WARNING ! The use Megohmmeter when the motor or electronic modules are connected is prohibited on this product as the connection terminals are intrinsically connected to the sensing circuit.**

# 16. TROUBLE SHOOTING GUIDE

<p>The ATyS p does not operate electrically</p>	<ul style="list-style-type: none"> <li>• Verify the power supply on terminals 101-102 and 201-202: 208 - 277 VAC <math>\pm</math>20 %</li> <li>• Verify that the front selector switch is in position (AUT)</li> <li>• Verify that contacts 313 and 317 are open.</li> <li>• Verify that the power LED (Green) is On whilst the fault LED (RED) is off.</li> <li>• Verify that the Ready light on the ATS controller is a steady Green light.</li> <li>• Verify presence of at least one green LED on the source supply available LED's.</li> <li>• Verify that the product is available with contacts 63A / 64A closed.</li> </ul>
<p>It is not possible to manually operate the switch</p>	<ul style="list-style-type: none"> <li>• Verify that the front selector switch position is on the Manual position.</li> <li>• Make sure that the product is not padlocked</li> <li>• Verify the rotation direction of the handle</li> <li>• Apply a sufficient progressive action in the direction as indicated on the handle</li> </ul>
<p>Electrical operation does not correspond to external order I,O,II</p>	<ul style="list-style-type: none"> <li>• Verify the selected control logic wiring (impulse or contactor)</li> <li>• Verify the connector connections.</li> </ul>
<p>Impossible to padlock</p>	<ul style="list-style-type: none"> <li>• Verify that the front selector switch is in manual position</li> <li>• Verify that the emergency handle for manual operation is not inserted into the ATyS manual slot.</li> <li>• Verify that the ATyS is in 0 position (Padlocking is only possible in 0 position for standard products)</li> </ul>
<p>The fault LED is ON (Motorisation module)</p>	<ul style="list-style-type: none"> <li>• The FAULT / MANUAL LED on the motorisation module is on when in manual mode (this is normal) and in AUT Mode when there is an internal fault in the ATyS p. To reset a fault condition switch the ATyS p from AUT to Manu and back to AUT. Should the fault LED remain on you will need to localize and clear the fault prior to reset.</li> <li>• The FAULT / Manual LED will also be on when contact 313 is closed with 317. (Force the ATyS to off position). This is a normal condition.</li> <li>• Should the Fault LED remain on abnormally, contact SOCOMEC.</li> </ul>
<p>The fault LED is on (ATS Controller)</p>	<ul style="list-style-type: none"> <li>• Switch the ATyS p from AUT to Manual and back to AUT. Should the fault condition remain contact SOCOMEC)</li> </ul> <p><b>Note:</b> In case the external fault / alarm condition is active through one of the ATyS configurable inputs, the fault LED on the ATS controller will be on. This is a normal condition and resettable by opening the associated contact input.</p>
<p>The SOURCE availability indicator does not illuminate when the source is available.</p>	<ul style="list-style-type: none"> <li>• Press the "LED test" button and ensure that the corresponding LED's illuminate.</li> <li>• Check in programming mode that the nominal voltage value (by default set to 400V), the nominal frequency value and the network configuration correspond to the network and modify if necessary.</li> <li>• Check the voltage and frequency thresholds and hysteresis for this source, in the Volt and Frequency menus and modify if necessary.</li> </ul>
<p>The product displays the message: F13 ROT-1 or F23 ROT-2</p>	<ul style="list-style-type: none"> <li>• Check for phase rotation consistency.</li> </ul>
<p>Product displays an event or error message</p>	<ul style="list-style-type: none"> <li>• Refer to chapter Events list and Error messages list in this manual.</li> </ul>

## 16.1. Events display

Typical example for decoding an events message on the LCD Screen.



MESSAGE	DEFINITION	ACTION	RESET
F00 OPFACTOR	Duty Cycle Fault Limited number of operations in a defined period.	Wait 1 min. for the error message to disappear.	Automatic
F03 NEUTRAL	Neutral Fault: The neutral on source 1 is not wired on the same side as the neutral on source 2 .	Check and rewire one of the two sources.	Change the selector switch from AUT to Manual and back to AUT
F11 ALR 3	Ext fault 3 without 0 return: This fault only appears if input AL3 is activated.	Resolve the external problem that caused activation of input FT1/FT2	Change the selector switch from AUT to Manual and back to AUT
F12 ALR 1	Ext fault 1 without 0 return: This fault only appears if input AL1 is activated.	Resolve the external problem. Once this is done, the error message will disappear.	Automatic
F13 ROT 1	Phase rotation fault on source 1 The phase rotation does not correspond to the ROT PH. Variable in the Setup menu.	Invert two phases on source 1 / source 2	Automatic
F16 POS 1	Position I not reached: Fault position following an electric or automatic order, position I is not reached.	Provisional action: Switch to manual mode and operate manually.	Change source status. Manual operation.
F21 ALR 4	Ext fault 4 without 0 return: This fault only appears if input AL4 is activated.	Resolve the external problem that caused activation of input FT2	Change the selector switch from AUT to Manual and back to AUT
F22 ALR 2	Ext fault 2 without 0 return: This fault only appears if input AL2 is activated.	Resolve the external problem. Once this is done, the error message will disappear.	Automatic
F23 ROT2	Phase rotation fault on source 2 The phase rotation does not correspond to the ROT PH. Variable in the Setup menu.	Invert two phases on source 1 / source 2	Automatic
F26 POS 2	Position 0 not reached: Fault position following an electric or automatic order, position 0 is not reached	Switch to manual mode and operate manually.	Change source status. Manual operation.
F06 POS 0	Position 0 not reached: Fault position following an electric or automatic order, position 0 is not reached.	Switch to manual mode and operate manually.	Change source status. Manual operation.
F08 MAIN FLT	Main fault	Contact your nearest dealer	
F09 MOT FLT	Motor fault	Contact your nearest dealer	
ATS VER 100	Product version	Informative	Automatic
F17 UNB 1	Source 1 unbalanced	Check the sensing voltages. Enter the values through the Voltage Levels Menu	Change the selector switch from AUT to Manual and back to AUT
F27 UNB 2	Source 2 unbalanced	Check the sensing voltages. Enter the values through the Voltage Levels Menu	Change the selector switch from AUT to Manual and back to AUT
F07 AUTOCONF	Auto - Configuration failed	Check the sensing voltages. Enter the values through the Voltage Levels Menu.	Change the selector switch from AUT to Manual and back to AUT
SAVED	User backup settings saved / settings saved	No Action	Automatic
LOADED	User backup settings loaded	No Action	Automatic

# 17. ACCESSORIES

## 17.1. Terminal shrouds

### Use

IP2X protection against direct contact with terminals or connecting parts.

### Advantages

Perforations allow remote thermographic inspection without the need to remove the shrouds.

Rating (A)	Frame size	No. of poles	Position	Reference
250 ... 400	B4	3 P	top / bottom / front (I) / rear (II)	2694 <b>3021</b> <sup>(1)(2)</sup>
630	B5	3 P	top / bottom / front (I) / rear (II)	2694 <b>3051</b> <sup>(1)(2)</sup>

- (1) To shroud front switch top and bottom 2 references required.  
 (2) To fully shroud front, rear, top and bottom 4 references required.

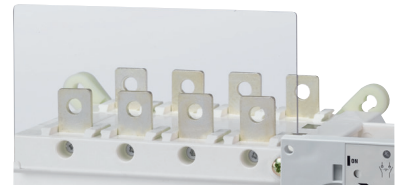


## 17.2. Terminal screens

### Use

Top and bottom protection against direct contact with terminals or connection parts. For upstream and downstream protection, order the reference once.

Rating (A)	Frame size	No. of poles	Position	Reference
250 ... 400	B4	3 P	top / bottom	1509 <b>3025</b>
630	B5	3 P	top / bottom	1509 <b>3063</b>
800 ... 1250	B6	3 P	top / bottom	1509 <b>3080</b>

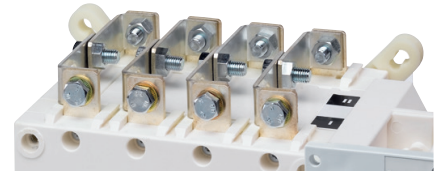


## 17.3. Bridging bars

### Use

For bridging power terminals on the top or bottom side of the switch. One piece required per pole.

Rating (A)	Frame size	No. of poles	Section (mm)	Reference
250	B4	3 P	25 x 2.5	4109 <b>3025</b>
400	B4	3 P	32 x 5	4109 <b>3039</b>
630	B5	3 P	50 x 5	4109 <b>3063</b>
800	B6	3 P	50 x 6	4109 <b>3080</b>



## 17.4. Autotransformer 400/230 VAC

### Use

For applications without neutral, this autotransformer provides the 230 VAC required to power these ATyS products.

Rating (A)	Reference
up to 800A	1599 <b>4064</b>

## 17.5. Voltage sensing and power supply kit

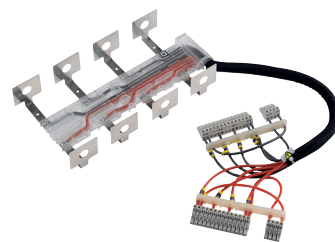
### Use

For power supply and voltage measurement (4 wire, three-phase). Routing of the conductors is controlled, which means that no specific protective device is necessary for these connections. The kit can be fitted on the top or bottom of the switch.

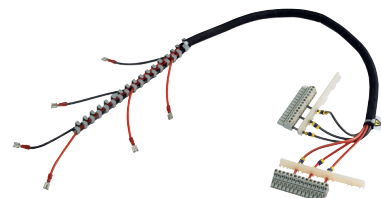
**Note: the 3-pole version does not integrate the power supply.**

For 3 pole		
Rating (A)	Frame size	Reference
250	B4	1559 3025
400	B4	1559 3040
630	B5	1559 3063
800	B6	1559 3080

From 125 to 400 A



From 800 to 1250 A

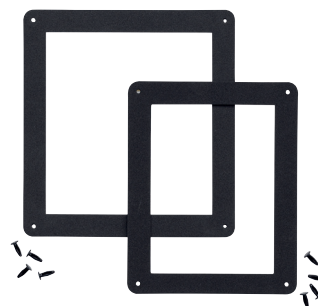


## 17.6. Door protective surround

### Use

When direct access to the ATyS front face (mode selection, manual operation, display...) is required, the door surround can be utilised to provide a clean and safe finish to the panel's cut-out.

Rating (A)	Frame size	Reference
250 ... 630	B4 -B5	1539 0012
800	B6	1539 0080



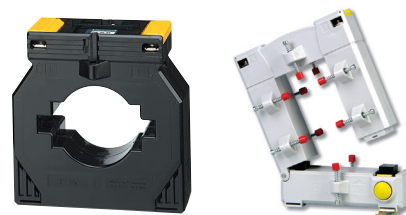
## 17.7. Current transformers

### Use - For ATyS p only

Used with ATyS p switches, current transformers enable information to be obtained on the load current.

### Reference

Please see our general catalogue or our website [www.socomec.com](http://www.socomec.com)



## 17.8. Plug-in optional modules

Description of accessories	Reference
RS485 MODBUS communication	4825 0092
2 inputs / 2 outputs	1599 2001
Analogue outputs	4825 0093
Pulse outputs	4825 0090

## 17.9. Remote interface

### Use

To remotely display source availability and position indication typically used on the front of a panel when the product is enclosed.  
Interfaces are powered from the ATyS transfer switch via the RJ45 connection cable.  
Maximum cable length: 3 m

### D20

In addition to the functions of the ATyS D10, the D20 displays measurements and enables control and configuration from the front of a panel.  
Protection degree: IP21.

### Door mounting

2 holes  $\varnothing 22.5$ . ATyS transfer switch connection via RJ45 cable, not isolated.  
Cable available as an accessory.

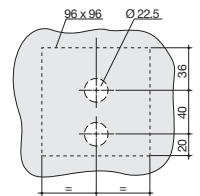
Description of accessories	Reference
D20	9599 2020



Interfaces are powered from the ATyS



Drillings



## 17.10. Connection cable for remote interface

### Use

To connect between a remote interface and an ATyS transfer switch.

### Characteristics

RJ45 8 wire straight-through, non isolated cable. Length 3m.



Type	Length	Reference
RJ45 cable	3 m	1599 2009

## 17.11. Auxiliary contacts (additional)

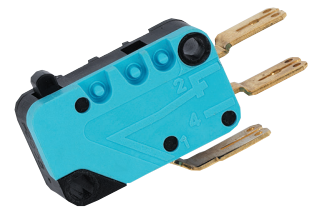
### Use

Pre breaking and signalling of positions I and II: each reference provides a single factory or customer fitted NO/NC contacts for both positions.  
Low level auxiliary contacts: please consult us.

Rating (A)	Nominal current (A)	Operating current I <sub>e</sub> (A)			
		A - 250 13 VAC	400 VAC AC-13	24 VDC DC-13	48 VDC DC-13
up to 800	16	12	8	14	6

Rating (A)	Reference
250 ... 630	1599 0502 <sup>(1)</sup>
800	1599 0532 <sup>(1)</sup>

(1) Up to 2 auxiliary contacts can be ordered.



# 18. FACTORY FITTED ACCESSORY

## 18.1. 3 position padlocking (I - O - II)

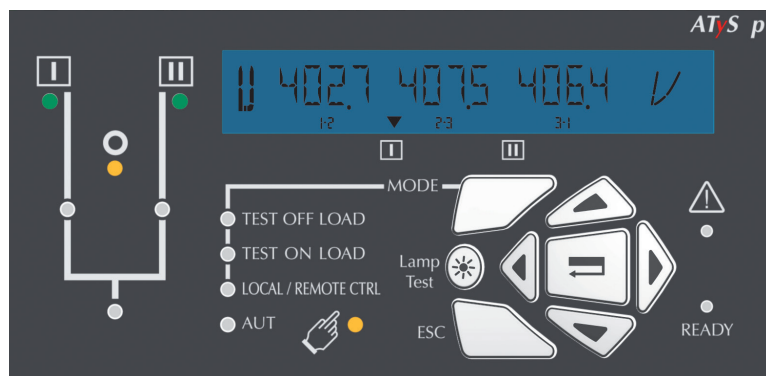
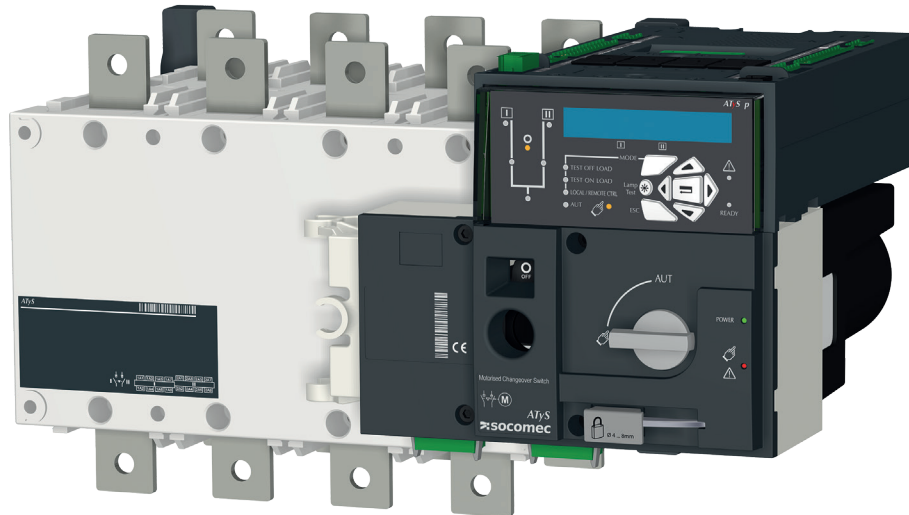
### Use

Enables the ATyS to be padlocked in the 3 positions 0, I and II (factory fitted).

Rating (A)	Reference
250 ... 630	9599 0003
800	9599 0004

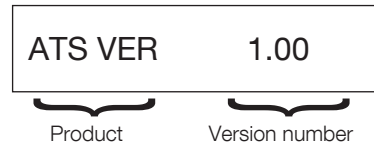


# ANNEX I. PROGRAMMING WITH THE ATYS P KEYPAD



## Annex I - 1. Getting started - Software Version

When the ATyS p is powered for the first time the software version will be displayed on the LCD screen.



This is also displayed after a product reset.  
(A 3 minute power off will allow for this type of reset).

## Annex I - 2. Keypad Operational Modes

### VISUALISATION :

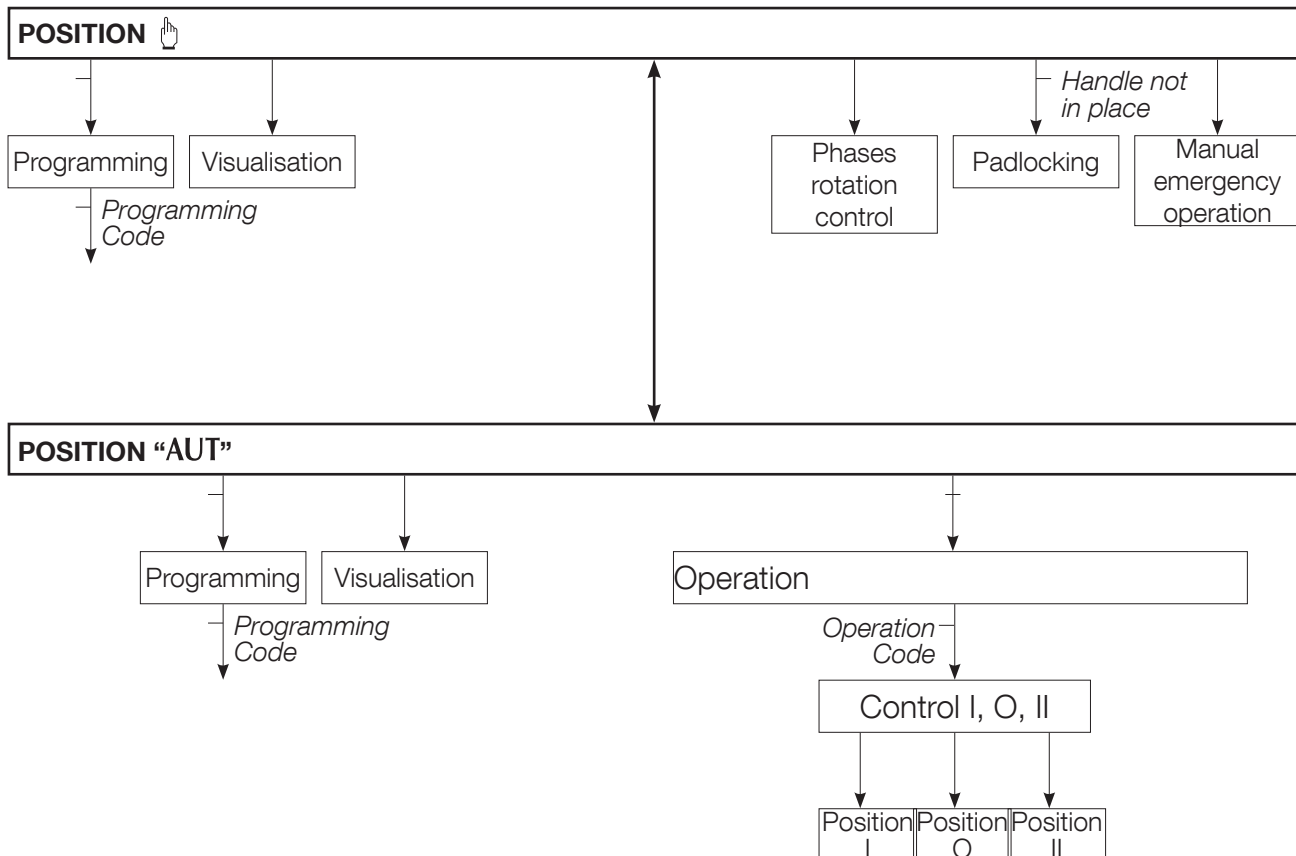
Measured values & parameter timers display.  
Always accessible without a password code.

### OPERATION:

Test sequences or electrical control of the position.  
Password access (code 4000).

### PROGRAMMING:

Parameters configuration.  
Password access (code 1000).



Note: one can quit the menu without saving by pressing the ESC key.

## Annex I - 3. Keypad programming - general information

Programming mode allows product parameter configuration through the keypad:

- It is always accessible when the product is in Manual position
- It is always accessible in AUT with the load on the priority source and priority source available.

The minimum configuration parameters that must be programmed before use are:

- type of network
- nominal voltage
- nominal frequency.

### Navigation in the programming menu



- To enter the programming menu press and hold the validation key until “SETUP” appears on the screen.



or

- For parameter access: Press the “up – down” or “left – right” keys to navigate.



### Programming



- Navigate to the parameter to be changed and press the validation key.

**Note:** The product will request a password.



+



- Input the password by using the “up – down” keys to change the value and the “left – right” keys to change the cursor position. (The default factory setting is 1000).

- Press the validation key to validate the password and enable programming.

+



- Change the parameter value by using the “up – down” keys to change the variable and the “left – right” keys to change the cursor position.

+



- Press the validation key to validate the change.

- If necessary, navigate to other parameters in the menu, change the value and validate each change.

- To save all changes, press and hold the validation key until “SAVED” is displayed.

+



- **Note:** After saving, “SAVED” will be displayed for 2s, the product will automatically exit programming mode and will then return to the main menu.

### Exiting programming mode without saving



- To quit programming mode without saving briefly press the “ESC” key. This will allow navigating back to the main menu.

**Note:** Whilst in programming mode, should the product remain idle for longer than 2 minutes it will automatically exit and return to the main menu without saving.





## Annex I - 4. Configuration navigation screen



1 SETUP		2 VOLT. LEVELS		3 FREQ. LEVELS		6 I-O		7 COMM		8 DATE/TIME	
NETWORK	4NBL	OV. U	█ 115%	OV. F	█ 105%	AL 1	--- NO	ADDRESS	005	YEAR	
NEUTRAL	AUTO	OV. U HYS	█ 110%	OV. F HYS	█ 103%	AL 2	--- NO	BDRATE	9600	MONTH	
NOM. VOLT	400 V	UND. U	█ 085%	UND. F	█ 095%	AL 3	--- NO	STOP BIT	1	DAY	
NOM. FREQ	50 Hz	UND. U HYS	█ 095%	UND. F HYS	█ 097%	AL 4	--- NO	PARITY	NONE	HOUR	
RETRANS	NO	UNB. U	█ 00%	OV. F	██ 105%	OUT 1	POP NO			MINUTE	
CT PRI	100	UNB. U HYS	█ 00%	OV. F HYS	██ 103%	OUT 2	S1A NO			SECOND	
CT SEC	5	OV. U	███ 115%	UND. F	██ 095%	OUT 3	S2A NO				
CODE P	1000 (1)	OV. U HYS	███ 110%	UND. F HYS	██ 097%						
		UND. U	███ 085%								
		UND. U HYS	███ 095%								
		UNB. U	██ 00%								
		UNB. U HYS	██ 00%								

(1) Only if a communication module is used

### Setup by Auto Configuration

(Volts, Hz, Neutral pos., Ph rotation)

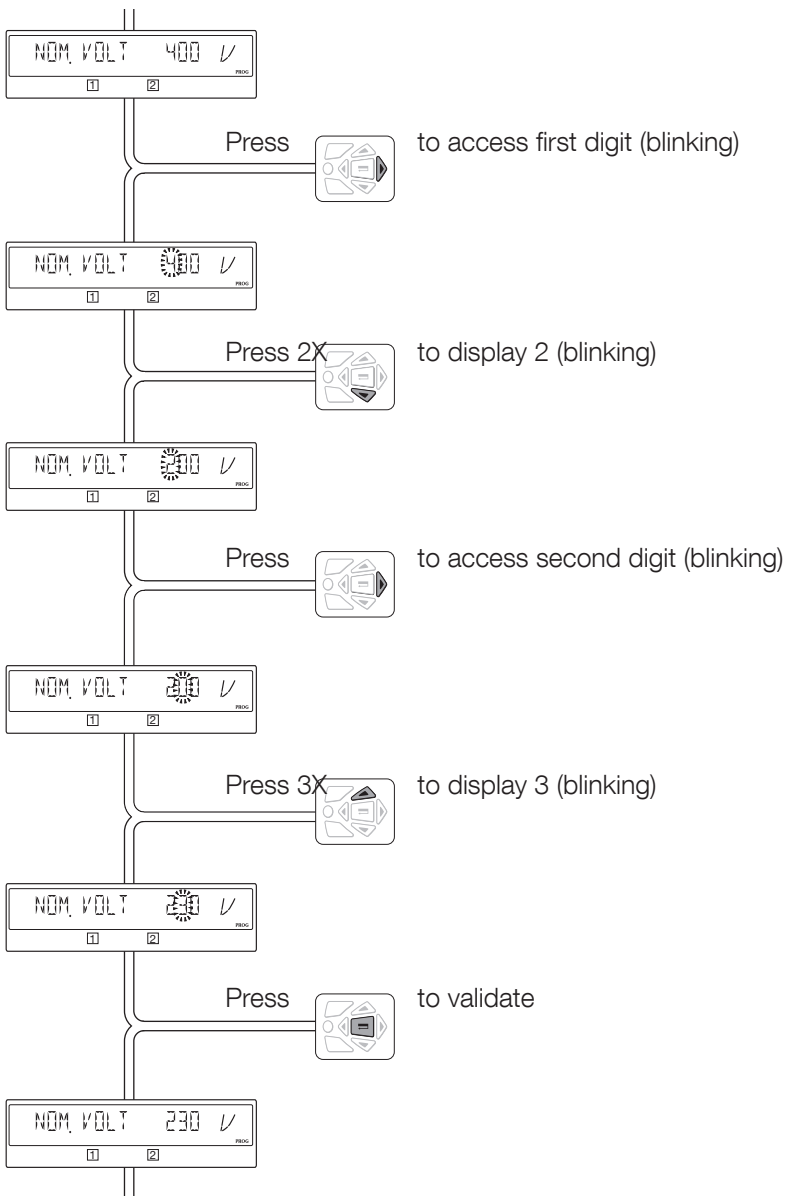
Press 5s	
Go To	<b>1</b> SETUP
Scroll to	AUTOCONF
Enter code	1000
Set to	YES
Press 60 ms	
LEDs flash	
Save : press 5s	

**Note:** Source  or source  must be available to set by Auto Configuration.


## Annex I - 5. Parameter modifications

> Example:


To modify network nominal voltage from 400 to 230 V.



## Annex I - 6. Setup menu – keypad navigation

1 SETUP						
			Definition	Adjustment Range	M-G	M-M
NETWORK	4NBL		Network Type	1BL/2BL/2NBL/3BL/3NBL 4BL/4NBL/41NBL/42NBL	•	•
NEUTRAL	AUTO		Neutral Position: visible if the makes sense with the seleted network type. Neutral fixed on the LEFT - (N, L3, L2, L1) Neutral fixed on the RIGHT - (L1, L2, L3, N) Auto Detection of Neutral LEFT or RIGHT	LEFT RIGHT AUTO	•	•
NOM. VOLT	400 V		Nominal Network Voltage	1BL: 208-277V 2NBL: 416-554V Others: 360 – 479V	•	•
NOM. FREQ	50 Hz		Nominal Network Frequency	50Hz 60Hz	•	•
CT PRI	0000		Current Transformer primary rating	1 to 3200 A	•	•
CT SEC	5		Current Transformer secondary rating	1 A 5 A	•	•
CODE P	1000		Password Code to modify and save settings in Programming Mode. Default factory setting: 1000	0000 to 9999	•	•

## Annex I - 7. Voltage levels menu – keypad navigation

2 VOLT. LEVELS							
				Definition	** Adjustment Range	M-G	M-M
OV. U	I	115%		Overvoltage threshold: Source Supply 1	102 – 130%	•	•
OV. U HYS	I	110%		Over-voltage hysteresis: Supply 1	101 – 129%	•	•
UND. U	I	085%		Undervoltage threshold: Supply 1	60 – 98%	•	•
UND. U HYS	I	095%		Undervoltage hysteresis: Supply 1	61 – 99%	•	•
UNB. U	I	00%		Phase unbalance threshold: Supply 1 Refer to next paragraph for further details	0 – 30%	•	•
UNB. U HYS	I	00%		Hysteresis unbalance threshold: Supply 1 Refer to next paragraph for further details	0 – 29%	•	•
OV. U	II	115%		Overvoltage threshold: Source Supply 2	102 – 130%	•	•
OV. U HYS	II	110%		Over-voltage hysteresis: Supply 2	101 – 129%	•	•
UND. U	II	085%		Undervoltage threshold: Supply 2	60 – 98%	•	•
UND. U HYS	II	095%		Undervoltage hysteresis: Supply 2	61 – 99%	•	•
UNB. U	II	00%		Phase unbalance threshold: Supply 2 Refer to next paragraph for further details	0 – 30%	•	•
UNB. U HYS	II	00%		Hysteresis unbalance threshold: Supply 2 Refer to next paragraph for further details. Note 0% = function deactivated	0 – 29%	•	•

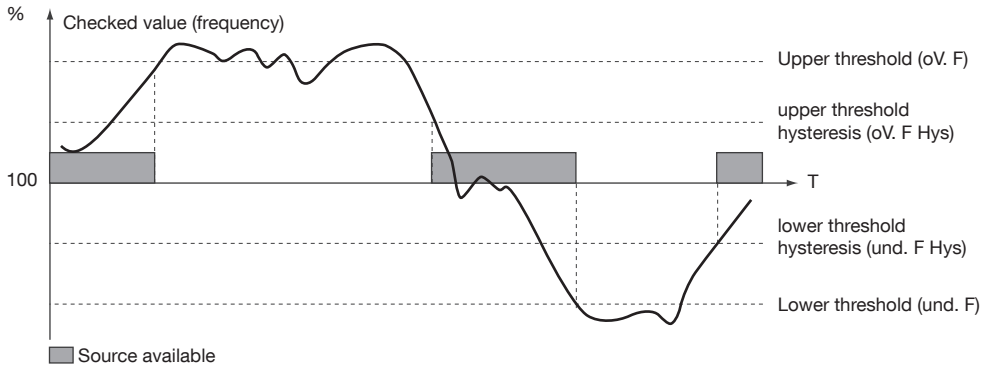
\*\* Adjustment range given:

- As a % of U nominal for Over and Undervoltage
- As a % of U avg in case of unbalances.

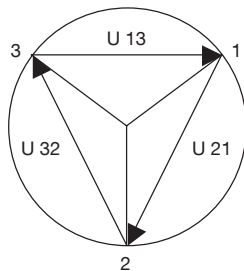
### Under-frequency or over-frequency

The thresholds and hysteresis are defined as percentages of nominal frequency.

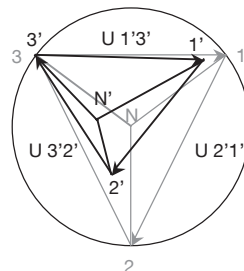
The hysteresis define return to normal levels following an under-frequency or over-frequency.



### Voltage unbalance measurement



Balanced network



Unbalanced network

## Annex I - 8. Frequency levels menu – keypad navigation

3 FREQ. LEVELS						
			Definition	** Adjustment Range	M-G	M-M
OV. F	I	105%	Over Frequency Threshold: Source 1	102 – 130%	•	•
OV. F HYS	I	103%	Over Frequency Hysteresis: Source 1	101 – 129%	•	•
UND. F	I	095%	Under Frequency Threshold: Source 1	60 – 98%	•	•
UND. F HYS	I	097%	Under Frequency Hysteresis: Source 1	61 – 99%	•	•
OV. F	II	105%	Over Frequency Threshold: Source 2	102 – 130%	•	•
OV. F HYS	II	103%	Over Frequency Hysteresis: Source 2	101 – 129%	•	•
UND. F	II	095%	Under Frequency Threshold: Source 2	60 – 98%	•	•
UND. F HYS	II	097%	Under Frequency Hysteresis: Source 2	61 – 99%	•	•

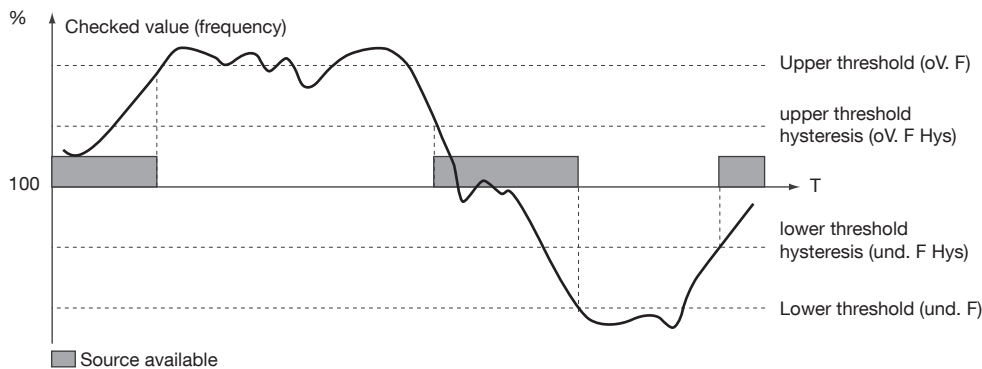
\*\* Adjustment range given:

- As a % of nominal frequency


### Under-frequency or over-frequency

The thresholds and hysteresis are defined as percentages of nominal frequency.


The hysteresis define return to normal levels following an under-frequency or over-frequency.




## Annex I - 9. I/O Menu – Keypad navigation


6 I-0			
			Definition
IN 1	AL1	NO	Input alarm 1
IN 2	AL2	NO	Input alarm 2
IN 3	AL3	NO	Input alarm 3
IN 4	AL4	NO	Input alarm 4
OUT 1	POP	NO	Programmable Output number 1
OUT 2	S1A	NO	Programmable Output number 2
OUT 3	S2A	NO	Programmable Output number 3

## Annex I - 10. Communication menu – keypad navigation

7 COMM			
		Definition	Adjustment Range
DHCP	NO	Dynamic Host Configuration Protocol	YES / NO
ADDRESS	005	ATyS p Device network address:	1 to 255
BDRATE	9600	Baud rate :	9600, 19200 38400
STOP BIT	1	Stop Bit Setting	1, 2
PARITY	NONE	Parity Type: NO -> No parity bit ODD -> Odd parity bit EVEN -> Even parity bit	NO, ODD, EVE

 Note: the COMM menu will only be visible and accessible when an optional communication module (Ethernet or MODBUS) is installed on the product.

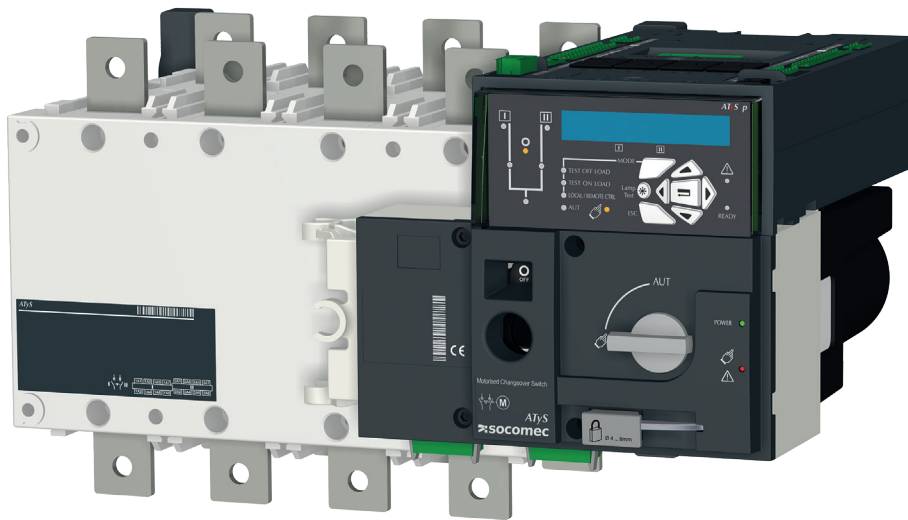
## Annex I - 11. Date and Time – keypad navigation

8 DATE/TIME			
		Definition	Adjustment Range
YEAR		Set the year:	00-99
MONTH		Set the month:	01-12
DAY		Set the day :	00-23
HOUR		Set the hour :	00-23
MINUTE		Set the minute :	00-59
SECOND		Set the seconds :	00-59



Note: for pulsed outputs and 4-20mA output refer to specific optional module instruction manual on [www.socomec.com](http://www.socomec.com).

# ANNEX II. MODBUS® COMMUNICATION ADDRESS AND DESIGNATION DETAILS



## Annex II - 1. Table compatible with old product versions

Dec. Address	Hex. Address	Words count	Description	Unit
768	300	2	Current : I1	A/1000
770	302	2	Current : I2	A/1000
772	304	2	Current : I3	A/1000
774	306	2	Neutral Current : In	A/1000
776	308	2	Source 1: U12	V
778	30A	2	Source 1: U23	V
780	30C	2	Source 1: U31	V
782	30E	2	Source 1: V1	V
784	310	2	Source 1: V2	V
786	312	2	Source 1: V3	V
788	314	2	Source 1: F	Hz/100
790	316	2	$\sum$ active Power $\pm$ : P	W/0,1
792	318	2	$\sum$ reactive Power $\pm$ : Q	var/100
794	31A	2	$\sum$ apparent Power: S	VA/100
796	31C	2	$\sum$ power factor: - : leading and +: lagging: PF	-/1000
798	31E	2	Active Power phase 1 $\pm$ : P1	W/0,1
800	320	2	Active Power phase 2 $\pm$ : P2	W/0,1
802	322	2	Active Power phase 3 $\pm$ : P3	W/0,1
804	324	2	Reactive Power phase 1 $\pm$ : Q1	var/100
806	326	2	Reactive Power phase 2 $\pm$ : Q2	var/100
808	328	2	Reactive Power phase 3 $\pm$ : Q3	var/100
810	32A	2	Apparent Power phase 1 : S1	VA/100
812	32C	2	Apparent Power phase 2 : S2	VA/100
814	32E	2	Apparent Power phase 3 : S3	VA/100
816	330	2	Power Factor phase 1: - : leading and +: lagging : PF1	-/1000
818	332	2	Power Factor phase 2: - : leading and +: lagging : PF2	-/1000
820	334	2	Power Factor phase 3: - : leading and +: lagging : PF3	-/1000
880	370	2	Source 2: U12	V
882	372	2	Source 2: U23	V
884	374	2	Source 2: U31	V
886	376	2	Source 2: V1	V
888	378	2	Source 2: V2	V
890	37A	2	Source 2: V3	V
892	37C	1	Source 2: F	Hz/100
1792	700	1	Source 1: U12	V/10
1793	701	1	Source 1: U23	V/10
1794	702	1	Source 1: U31	V/10
1795	703	1	Source 1: V1	V/10
1796	704	1	Source 1: V2	V/10
1797	705	1	Source 1: V3	V/10
1798	706	1	Source 1: F	Hz/100
1799	707	1	Source 2: U12	V/10
1800	708	1	Source 2: U23	V/10
1801	709	1	Source 2: U31	V/10

Dec. Address	Hex. Address	Words count	Description	Unit
1802	70A	1	Source 2: V1	V/10
1803	70B	1	Source 2: V2	V/10
1804	70C	1	Source 2: V3	V/10
1805	70D	1	Source 2: F	Hz/100
1813	715	1	$\sum$ active Power $\pm$ : P	A/1000
1814	716	1	$\sum$ reactive Power $\pm$ : Q	A/1000
1815	717	1	$\sum$ apparent Power: S	A/1000
1816	718	1	$\sum$ power factor: -: leading and +: lagging: PF	A/1000
1817	719	1	$\sum$ active Power $\pm$ : P	W/0,1
1818	71A	1	$\sum$ reactive Power $\pm$ : Q	var/0,1
1819	71B	1	$\sum$ apparent Power: S	VA/0,1
1820	71C	1	$\sum$ power factor: -: leading and +: lagging: PF	-/1000
1821	71D	1	Active Power phase 1 $\pm$ : P1	W/0,1
1822	71E	1	Active Power phase 2 $\pm$ : P2	W/0,1
1823	71F	1	Active Power phase 3 $\pm$ : P3	W/0,1
1824	720	1	Reactive Power phase 1 $\pm$ : Q1	var/0,1
1825	721	1	Reactive Power phase 2 $\pm$ : Q2	var/0,1
1826	722	1	Reactive Power phase 3 $\pm$ : Q3	var/0,1
1827	723	1	Apparent Power phase 1 : S1	VA/0,1
1828	724	1	Apparent Power phase 2 : S2	VA/0,1
1829	725	1	Apparent Power phase 3 : S3	VA/0,1
1830	726	1	Power Factor phase 1: -: leading and +: lagging : PF1	-/1000
1831	727	1	Power Factor phase 2: -: leading and +: lagging : PF2	-/1000
1832	728	1	Power Factor phase 3: -: leading and +: lagging : PF3	-/1000
257	101	1	Product Identification	-
258	102	1	Option slot 1 Type 0xFF: None 0x00: RS485 Communication option 0x01: Metering option 0x20: Input/Output option 0x30: Analog Outputs option 0x70: Ethernet Communication option	-
259	103	1	Option slot 2 Type 0xFF: None 0x00: RS485 Communication option 0x01: Metering option 0x20: Input/Output option 0x30: Analog Outputs option 0x70: Ethernet Communication option	-
260	104	1	Option slot 3 Type 0xFF: None 0x00: RS485 Communication option 0x01: Metering option 0x20: Input/Output option 0x30: Analog Outputs option 0x70: Ethernet Communication option	-
261	105	1	Option slot 4 Type 0xFF: None 0x00: RS485 Communication option 0x01: Metering option 0x20: Input/Output option 0x30: Analog Outputs option 0x70: Ethernet Communication option	-
262	106	1	Soft version	-
274	112	1	Fault state relay 0: No fault 1: Alarm 2: Fault	-

Dec. Address	Hex. Address	Words count	Description	Unit
278	116	1	Operating mode 0x0000: Auto Mode 0x0004: Manual Mode 0x0005: Locked Mode 0x0020: Remote control Mode 0x0040: Inhibit Mode	-
282	11A	1	Switch Position 255: Unknown 1: Position I 2: Position 0 3: Position II	-
285	11D	1	Total switches counter	-
512	200	1	Network type 0 : 4NBL 1 : 2NBL 2 : 2BL 3 : 3NBL 4 : 41NBL 5 : 1BL 6 : 42NBL	-
518	206	1	Unom	V
519	207	1	Fnom 0 : 50Hz 1 : 60Hz	-
522	20A	1	Source 1 : Overvoltage threshold	%
523	20B	1	Source 1 : Overvoltage hysteresis threshold	%
524	20C	1	Source 1 : Undervoltage threshold	%
525	20D	1	Source 1 : Undervoltage hysteresis threshold	%
526	20E	1	Source 2 : Overvoltage threshold	%
527	20F	1	Source 2 : Overvoltage hysteresis threshold	%
528	210	1	Source 2 : Undervoltage threshold	%
529	211	1	Source 2 : Undervoltage hysteresis threshold	%
530	212	1	Source 1 : Overfrequency threshold	%
531	213	1	Source 1 : Overfrequency hysteresis threshold	%
532	214	1	Source 1 : Underfrequency threshold	%
533	215	1	Source 1 : Underfrequency hysteresis threshold	%
534	216	1	Source 2 : Overfrequency threshold	%
535	217	1	Source 2 : Overfrequency hysteresis threshold	%
536	218	1	Source 2 : Underfrequency threshold	%
537	219	1	Source 2 : Underfrequency hysteresis threshold	%
545	221	1	Type of logic 0: Pulse 1: Contactor	-
548	224	1	In 1 - Ext display connector board input 1 function (n°413) 1 - AL1 - Alarm 1	-
549	225	1	In 1 - Input n°1 state 0: NO 1: NC	-
550	226	1	In 2 - Ext display connector board input 2 function (n°414) 1 - AL2 - Alarm 2	-
551	227	1	In 2 - Input n°2 state 0: NO 1: NC	-
552	228	1	Out1 function (only with 1IN1OUT module) 1: S1A - Source 1 available	-
553	229	1	Out2 function (only with 1IN1OUT module) 1: S2A - Source 2 available	-
554	22A	1	In 3 - Ext display connector board input 3 function (n°415) 1 - AL3 - Alarm 3	-
555	22B	1	In 3 - Input n°3 state 0: NO 1: NC	-
556	22C	1	In 4 - Ext display connector board input 3 function (n°416) 1 - AL4 - Alarm 4	-
557	22D	1	In 4 - Input n°4 state 0: NO 1: NC	-

## Annex II - 2. Metrology Affected by current and voltage transformers

### Function 3 Codes

Dec. Address	Hex. Address	Words count	Description	Unit
50514	C552	2	Phase to Phase Voltage: U12	V/100
50516	C554	2	Phase to Phase Voltage: U23	V/100
50518	C556	2	Phase to Phase Voltage: U31	V/100
50526	C55E	2	Frequency: F	Hz/100
50528	C560	2	Current: I1	mA
50530	C562	2	Current: I2	mA
50532	C564	2	Current: I3	mA
50534	C566	2	Neutral Current: In	mA
50536	C568	2	$\sum$ Active Power $\pm$ : P	kW/100 (Signed)
50538	C56A	2	$\sum$ Reactive Power $\pm$ : Q	kvar/100 (Signed)
50540	C56C	2	$\sum$ Apparent Power: S	kVA/100
50542	C56E	2	$\sum$ Power Factor: -: leading et +: lagging: PF	0,001 (Signed)
50544	C570	2	Active Power phase 1 $\pm$ : P1	kW/100 (Signed)
50546	C572	2	Active Power phase 2 $\pm$ : P2	kW/100 (Signed)
50548	C574	2	Active Power phase 3 $\pm$ : P3	kW/100 (Signed)
50550	C576	2	Reactive Power phase 1 $\pm$ : Q1	kvar/100 (Signed)
50552	C578	2	Reactive Power phase 2 $\pm$ : Q2	kvar/100 (Signed)
50554	C57A	2	Reactive Power phase 3 $\pm$ : Q3	kvar/100 (Signed)
50556	C57C	2	Apparent Power phase 1: S1	kVA/100
50558	C57E	2	Apparent Power phase 2: S2	kVA/100
50560	C580	2	Apparent Power phase 3: S3	kVA/100
50562	C582	2	Power Factor phase 1 -: leading and +: lagging : PF1	0,001 (Signed)
50564	C584	2	Power Factor phase 2 -: leading and +: lagging : PF2	0,001 (Signed)
50566	C586	2	Power Factor phase 3 -: leading and +: lagging : PF3	0,001 (Signed)

## Annex II - 3. Energy

### Function 3 Codes

Dec. Address	Hex. Address	Words count	Description	Unit
50770	C652	2	Total Positive Active Energy (no resetable): Ea+	kWh
50772	C654	2	Total Positive Reactive Energy (no resetable): Er +	kvarh
50774	C656	2	Total Apparent Energy (no resetable): Es	kVAh
50776	C658	2	Total Negative Active Energy (no resetable): Ea-	kWh
50778	C65A	2	Total Negative Reactive Energy (no resetable): Er -	kvarh
50780	C65C	2	Partial Positive Active Energy: Ea+	kWh
50782	C65E	2	Partial Positive Reactive Energy: Er +	kvarh
50784	C660	2	Partial Apparent Energy : Es	kVAh
50786	C662	2	Partial Negative Active Energy : Ea-	kWh
50788	C664	2	Partial Negative Reactive Energy : Er -	kvarh

## Annex II - 4. Metrology not affected by current and voltage transformers

### Function 3 Codes

Dec. Address	Hex. Address	Words count	Description	Unit
51281	C851	1	Phase to Phase Voltage: U12	V/100
51282	C852	1	Phase to Phase Voltage: U23	V/100
51283	C853	1	Phase to Phase Voltage: U31	V/100
51287	C857	1	Frequency: F	Hz/100
51288	C858	1	Current: I1	mA
51289	C859	1	Current: I2	mA
51290	C85A	1	Current: I3	mA
51291	C85B	1	Neutral Current: In	mA
51292	C85C	1	$\sum$ active Power $\pm$ : P	kW/100 (Signed)
51293	C85D	1	$\sum$ reactive Power $\pm$ : Q	kvar/100 (Signed)
51294	C85E	1	$\sum$ apparent power: S	kVA/100
51295	C85F	1	$\sum$ power factor: -: leading and +: lagging: PF	0,001 (Signed)
51296	C860	1	Active Power phase 1 $\pm$ : P1	kW/100 (Signed)
51297	C861	1	Active Power phase 2 $\pm$ : P2	kW/100 (Signed)
51298	C862	1	Active Power phase 3 $\pm$ : P3	kW/100 (Signed)
51299	C863	1	Reactive Power phase 1 $\pm$ : Q1	kvar/100 (Signed)
51300	C864	1	Reactive Power phase 2 $\pm$ : Q2	kvar/100 (Signed)
51301	C865	1	Reactive Power phase 3 $\pm$ : Q3	kvar/100 (Signed)
51302	C866	1	Apparent power phase 1: S1	kVA/100
51303	C867	1	Apparent power phase 2: S2	kVA/100
51304	C868	1	Apparent power phase 3: S3	kVA/100
51305	C869	1	Power Factor phase 1 -: leading and +: lagging : PF1	0,001 (Signed)
51306	C86A	1	Power Factor phase 2 -: leading and +: lagging : PF2	0,001 (Signed)
51307	C86B	1	Power Factor phase 3 -: leading and +: lagging : PF3	0,001 (Signed)
51311	C86F	1	Total Positive Active Energy (no resetable): Ea+	MWh
51312	C870	1	Total Positive Reactive Energy (no resetable): Er +	Mvarh
51313	C871	1	Total Negative Active Energy (no resetable): Ea-	MWh
51314	C872	1	Total Negative Reactive Energy (no resetable): Er -	Mvarh

## Annex II - 5. Input/Output state

### Function 3 Codes

Dec. Address	Hex. Address	Words count	Description	Unit
51968	CB00	1	Input count	
51969	CB01	1	Bit 0: Input 1 Open or Closed Bit x: Input x +1 Open or Closed	
51970	CB02	1	Output count	
51971	CB03	1	Bit 0: Output 1 Open or Closed Bit x: Output x +1 Open or Closed	

## Annex II - 6. Network setting

### Function 3, 6 and 16 Codes

Dec. Address	Hex. Address	Words count	Description	Unit
57345	E001	1	Current Transformer secondary: 1: 1 A 5: 5 A	
57346	E002	1	Current Transformer primary	A

## Annex II - 7. Hour/Date setting

Function 3 and 16 Codes

Dec. Address	Hex. Address	Words count	Description	Unit
57600	E100	1	Day	
57601	E101	1	Month	
57602	E102	1	Year	
57603	E103	1	Hour	
57604	E104	1	Minute	
57605	E105	1	Second	

## Annex II - 8. Action system

Function 6 Codes

Dec. Address	Hex. Address	Words count	Description	Unit
57856	E200	1	Action: 0xA1: Product Configuration storage 0xB2: Produit reset	

## Annex II - 9. Status

Function 3 Codes

Dec. Address	Hex. Address	Words count	Description	Unit
20480	5000	2	Date & Time Current	-
20482	5002	1	Operating Mode 0x0000: Manual Mode 0x0001: Locked Mode 0x0010: Auto Mode 0x0020: Remote control mode 0x0040: Inhibit Mode	
20483	5003	1	Switch Position 0: Unknown 1: Position 0 2: Position I 3: Position II	
20486	5006	1	Source1 State 0: Under Threshold BusBar 1: Present 2: Available	
20487	5007	1	Source2 State 0: Under Threshold BusBar 1: Present 2: Available	
20489	5009	1	Fault summary 0: None 1: Alarm 2: Fault	

Dec. Address	Hex. Address	Words count	Description	Unit
20490	500A	1	Alarm/Fault Code 0x0001: Operating factor (Alarm) 0x0002: Neutral position (Alarm) 0x0004: Alarm 3 (Alarm) 0x0008: Alarm 4 (Alarm) 0x0010: Alarm 1 (Alarm) 0x0020: Alarm 2 (Alarm) 0x0040: Source 1 rotation (Alarm) 0x0080: Source 2 rotation (Alarm) 0x0100: Source 1 unbalanced 1 (Alarm) 0x0200: Source 2 unbalanced 2 (Alarm) 0x0400: Position 0 (Fault) 0x0800: Position I (Fault) 0x1000: Position II (Fault) 0x2000: Main fault (Fault) 0x4000: Motor fault (Fault) 0x8000: Autoconfiguration failed (Alarm)	
20491	500B	1	Last Switch over cause 0: None 1: Manual 2: Remote controlled 3: Under voltage source 1 4: Under voltage source 2 5: Over voltage source 1 6: Over voltage source 2 7: Under Frequency source 1 8: Under Frequency source 2 9: Over Frequency source 1 10: Over Frequency source 2 11: Unbalance Source 1 12: Unbalance Source 2 13: Rotation Source 1 14: Rotation Source 2	
20492	500C	2	Firmware last flash date	-
20494	500E	2	Date of first commissioning	-
20496	5010	8	Product identification	-
20504	5018	1	Power supply status 0: No network present for DPS 1: Source 1 present for DPS 2: Source 2 present for DPS 3: Sources 1+2 present for DPS	
20505	5019	1	Source 1: Phase 1 presence 1: Present 0: Absent	
20506	501A	1	Source 1: Phase 2 presence 1: Present 0: Absent	
20507	501B	1	Source 1: Phase 3 presence 1: Present 0: Absent	
20508	501C	1	Source 2: Phase 1 presence 1: Present 0: Absent	
20509	501D	1	Source 2: Phase 2 presence 1: Present 0: Absent	
20510	501E	1	Source 2: Phase 3 presence 1: Present 0: Absent	
20511	501F	1	BET Mode 0: Not present 1: Auto 2: Manual 3: Remote control 4: Locked	
20512	5020	1	BET Available 0: Not available 1: Available	
20513	5021	1	Product is available 0: Not available 1: Available	

## Annex II - 10. Measurement table (no CT/VT affected)

### Function 3 Codes

Dec. Address	Hex. Address	Words count	Description	Unit
20736	5100	2	Date & Time current	sec.

#### Down Stream Voltage

20738	5102	1	U12	V/100
20739	5103	1	U23	V/100
20740	5104	1	U31	V/100
20744	5108	1	Fr	Hz/100

#### Up Stream Voltage

20745	5109	1	Source 1: U12	V/100
20746	510A	1	Source 1: U23	V/100
20747	510B	1	Source 1: U31	V/100
20751	510F	1	Source 1: F	Hz/100
20752	5110	1	Source 2: U12	V/100
20753	5111	1	Source 2: U23	V/100
20754	5112	1	Source 2: U31	V/100
20758	5116	1	Source 2: F	Hz/100

#### Down Stream Current

20759	5117	1	I1	mA
20760	5118	1	I2	mA
20761	5119	1	I3	mA
20762	511A	1	Ineutral	mA

#### Power

20763	511B	2	Active Power phase 1	W / 100
20765	511D	2	Active Power phase 2	W / 100
20767	511F	2	Active Power phase 3	W / 100
20769	5121	2	Reactive Power phase 1	var / 100
20771	5123	2	Reactive Power phase 2	var / 100
20773	5125	2	Reactive Power phase 3	var / 100
20775	5127	2	Apparent power phase 1	VA / 100
20777	5129	2	Apparent power phase 2	VA / 100
20779	512B	2	Apparent power phase 3	VA / 100
20781	512D	1	Power Factor phase 1 (-: leading and +: lagging)	% / 100
20782	512E	1	Power Factor phase 2 (-: leading and +: lagging)	% / 100
20783	512F	1	Power Factor phase 3 (-: leading and +: lagging)	% / 100
20784	5130	2	Total Active Power	W / 100
20786	5132	2	Total Reactive Power	var / 100
20788	5134	2	Total Apparent Power	VA / 100
20790	5136	1	Total Power Factor (-: leading and +: lagging)	% / 100

## Annex II - 11. Energies and time meters

### Function 3 Codes

Dec. Address	Hex. Address	Words count	Description	Unit
20992	5200	2	Date & Time current	sec.

Energies meters				
20994	5202	2	Total Positive Active Energy (Ea+) source 1	kWh
20996	5204	2	Total Positive Reactive Energy (Er+) source 1	kVARh
20998	5206	2	Total Apparent Energy (Es) source 1	kVAh
21000	5208	2	Total Negative Active Energy (Ea-) source 1	kWh
21002	520A	2	Total Negative Reactive Energy (Er-) source 1	kVARh
21004	520C	2	User Partial Positive Active Energy (Ea+) source 1	kWh
21006	520E	2	User Partial Positive Reactive Energy (Er+) source 1	kVARh
21008	5210	2	User Partial Apparent Energy (Es) source 1	kVAh
21010	5212	2	User Partial Negative Active Energy (Ea-) source 1	kWh
21012	5214	2	User Partial Negative Reactive Energy (Er-) source 1	kVARh
21014	5216	2	Since Last Commutation Positive Active Energy (Ea+) source 1	kWh
21016	5218	2	Since Last Commutation Positive Reactive Energy (Er+) source 1	kVARh
21018	521A	2	Since Last Commutation Apparent Energy (Es) source 1	kVAh
21020	521C	2	Since Last Commutation Negative Active Energy (Ea-) source 1	kWh
21022	521E	2	Since Last Commutation Negative Reactive Energy (Er-) source 1	kVARh
21024	5220	2	Total Positive Active Energy (Ea+) source 2	kWh
21026	5222	2	Total Positive Reactive Energy (Er+) source 2	kVARh
21028	5224	2	Total Apparent Energy (Es) source 2	kVAh
21030	5226	2	Total Negative Active Energy (Ea-) source 2	kWh
21032	5228	2	Total Negative Reactive Energy (Er-) source 2	kVARh
21034	522A	2	User Partial Positive Active Energy (Ea+) source 2	kWh
21036	522C	2	User Partial Positive Reactive Energy (Er+) source 2	kVARh
21038	522E	2	User Partial Apparent Energy (Es) source 2	kVAh
21040	5230	2	User Partial Negative Active Energy (Ea-) source 2	kWh
21042	5232	2	User Partial Negative Reactive Energy (Er-) source 2	kVARh
21044	5234	2	Since Last Commutation Positive Active Energy (Ea+) source 2	kWh
21046	5236	2	Since Last Commutation Positive Reactive Energy (Er+) source 2	kVARh
21048	5238	2	Since Last Commutation Apparent Energy (Es) source 2	kVAh
21050	523A	2	Since Last Commutation Negative Active Energy (Ea-) source 2	kWh
21052	523C	2	Since Last Commutation Negative Reactive Energy (Er-) source 2	kVARh

Time meters				
21054	523E	2	Total time on source 1	sec.
21056	5240	2	User partial time on source 1	sec.
21058	5242	2	Since last commutation time on source 1	sec.
21060	5244	2	Total time on source 2	sec.
21062	5246	2	User partial time on source 2	sec.
21064	5248	2	Since last commutation time on source 2	sec.

## Annex II - 12. Option module state

### Function 3 Codes

Dec. Address	Hex. Address	Words count	Description	Unit
21504	5400	2	Date & Time Current	sec.
21506	5402	1	Option slot 1 Type 0xFF: None 0x00: Communication option 0x01: Metering option 0x20: Input/Output option 0x30: Analog Outputs option	
21507	5403	1	Option slot 2 Type 0xFF: None 0x00: Communication option 0x01: Metering option 0x20: Input/Output option 0x30: Analog Outputs option	
21508	5404	1	Option slot 3 Type 0xFF: None 0x00: Communication option 0x01: Metering option 0x20: Input/Output option 0x30: Analog Outputs option	
21509	5405	1	Option slot 4 Type 0xFF: None 0x00: Communication option 0x01: Metering option 0x20: Input/Output option 0x30: Analog Outputs option	

## Annex II - 13. Commands

### Function 6 Codes

Dec. Address	Hex. Address	Words count	Description	Unit
21760	5500	1	Set Command / Alarm 0x10: Clear Alarms/Faults 0x11: Set external Alarm 3 0x12: Set external Alarm 4 0x13: Set External Alarm 1 0x14: Set External Alarm 2	
21761	5501	1	Set Operating Mode 4: Inhibit 5: Remote Control	
21763	5503	1	Set Position 0: None 1: Position in Zero 2: Position in 1 3: Position in 2	

## Annex II - 14. User commands

### Function 6 Codes

Dec. Address	Hex. Address	Words count	Description	Unit
21840	5550	1	Auto configuration request <i>1: make autoconfig</i>	
21841	5551	1	Settings backup <i>1: save current settings as user defaults</i> <i>2: restore user defaults settings</i> <i>3: restore factory settings</i>	
21842	5552	1	Source 1 partial counters erase <i>0x01: Ea+</i> <i>0x02: Er+</i> <i>0x04: Es</i> <i>0x08: Ea-</i> <i>0x10: Er-</i> <i>0x20: Hour counter</i>	
21843	5553	1	Source 2 partial counters erase <i>0x01: Ea+</i> <i>0x02: Er+</i> <i>0x04: Es</i> <i>0x08: Ea-</i> <i>0x10: Er-</i> <i>0x20: Hour counter</i>	
21844	5554	1	Product user counters erase <i>0x01: Genset start counter erase</i> <i>0x02: Genset runtime counter erase</i> <i>0x04: Secondary source presence counter erase</i> <i>0x08: Secondary source active duration counter erase</i> <i>0x10: Source 1 load supplied duration counter erase</i> <i>0x20: Source 2 load supplied duration counter erase</i>	

## Annex II - 15. Setup threshold for upstream Voltages

Function 3, 6 and 16 Codes

Dec. Address	Hex. Address	Words count	Description	Unit
22272	5700	1	Source 1: Overvoltage threshold	%
22273	5701	1	Source 1: Overvoltage hysteresis threshold	%
22274	5702	1	Source 1: Undervoltage threshold	%
22275	5703	1	Source 1: Undervoltage hysteresis threshold	%
22276	5704	1	Source 2: Overvoltage threshold	%
22277	5705	1	Source 2: Overvoltage hysteresis threshold	%
22278	5706	1	Source 2: Undervoltage threshold	%
22279	5707	1	Source 2: Undervoltage hysteresis threshold	%
22280	5708	1	Source 1: Unbalanced voltage threshold	%
22281	5709	1	Source 1: Unbalanced voltage hysteresis threshold	%
22282	570A	1	Source 2: Unbalanced voltage threshold	%
22283	570B	1	Source 2: Unbalanced voltage hysteresis threshold	%
22284	570C	1	Source 1: Overfrequency threshold	%
22285	570D	1	Source 1: Overfrequency hysteresis threshold	%
22286	570E	1	Source 1: Underfrequency threshold	%
22287	570F	1	Source 1: Underfrequency hysteresis threshold	%
22288	5710	1	Source 2: Overfrequency threshold	%
22289	5711	1	Source 2: Overfrequency hysteresis threshold	%
22290	5712	1	Source 2: Underfrequency threshold	%
22291	5713	1	Source 2: Underfrequency hysteresis threshold	%

## Annex II - 16. Setup network

Function 3, 6 and 16 Codes

Dec. Address	Hex. Address	Words count	Description	Unit
22784	5900	1	Network Type 0: 1BL 1: 2NBL 2: 2BL 3: 3NBL 4: 3BL 5: 4NBL 6: 4BL 7: 41NBL 8: 42NBL	
22785	5901	1	Neutral 0: LEFT 1: RIGHT 2: AUTO	
22786	5902	1	Phase rotation 0: Verify Compatible ("Auto") 1: Verify ABC 2: Verify ACB	
22787	5903	1	Unom	V
22788	5904	1	Fnom 0: 50Hz 1: 60Hz	
22799	590F	1	BackLight 0: ON 1: OFF 2: INT	
22800	5910	1	Current transformer (Pri)	-
22801	5911	1	Current transformer (Sec) 1: TCsec = 1A 5: TCsec = 5A	

## Annex II - 17. Setup Input/Output

Dec. Address	Hex. Address	Words count	Description	Unit
23044	5A04	1	In 1 - Ext display connector board input 1 function 10: AL1 - Alarm 1	
23045	5A05	1	In 2 - Ext display connector board input 2 function 11: AL2 - Alarm 2	
23046	5A06	1	In 3 - Ext display connector board input 3 function 12: AL3 - Alarm 3	
23047	5A07	1	In 4 - Ext display connector board input 4 function 13: AL4 - Alarm 4	
23048	5A08	1	In 1 - Input n°1 state 0: NO 1: NC	
23049	5A09	1	In 2 - Input n°2 state 0: NO 1: NC	
23050	5A0A	1	In 3 - Input n°3 state 0: NO 1: NC	
23051	5A0B	1	In 4 - Input n°4 state 0: NO 1: NC	
23070	5A1E	1	Out 1 function (only with 1IN1OUT module) 1: S1A - Source 1 available	
23071	5A1F	1	Out 2 function (only with 2IN2OUT module) 2: S2A - Source 2 available	
23078	5A26	1	Out 1 state (only with 1IN1OUT module #1) 0: NO 1: NC	
23079	5A27	1	Out 2 state (only with 2IN2OUT module #1) 0: NO 1: NC	

## Annex II - 18. Communication settings

Function 3, 6 and 16 Codes

Dec. Address	Hex. Address	Words count	Description	Unit
23296	5B00	1	MODBUS Address	-
23297	5B01	1	UART Baud Rate 2: 9600 bps 3: 19200 bps 4: 38400 bps	
23298	5B02	1	UART Parity 0: none 1: even 2: odd	
23299	5B03	1	UART Stop bit number 1: 1 stop bit 2: 2 stop bits	
23307	5B0B	8	Product identification	-

## Annex II - 19. Product counters

### Function 3 Codes

Dec. Address	Hex. Address	Words count	Description	Unit
23552	5C00	1	Total Cycles counter	nb of cycles
23553	5C01	1	Total Position 0 switches counter	nb of operations
23554	5C02	1	Total Position I switches counter	nb of operations
23555	5C03	1	Total Position II switches counter	nb of operations
23556	5C04	1	Total switches counter	nb of operations
23557	5C05	1	Cycles in auto mode (including control mode) counter	nb of cycles
23558	5C06	1	Position 0 switches in auto mode (including control mode) counter	nb of operations
23559	5C07	1	Position I switches in auto mode (including control mode) counter	nb of operations
23560	5C08	1	Position II switches in auto mode (including control mode) counter	nb of operations
23561	5C09	1	Total switches in auto mode (including control mode) counter	nb of operations
23562	5C0A	1	Cycles in manual mode counter	nb of cycles
23563	5C0B	1	Position 0 switches in manual mode counter	nb of operations
23564	5C0C	1	Position I switches in manual mode counter	nb of operations
23565	5C0D	1	Position II switches in manual mode counter	nb of operations
23566	5C0E	1	Total switches in manual mode counter	nb of operations
23567	5C0F	1	Cycles in control mode counter	nb of cycles
23568	5C10	1	Position 0 switches in control mode counter	nb of operations
23569	5C11	1	Position I switches in control mode counter	nb of operations
23570	5C12	1	Position II switches in control mode counter	nb of operations
23571	5C13	1	Total switches in control mode counter	nb of operations
23572	5C14	2	Product power on time	s
23574	5C16	1	Start order activation counter	nb of operations
23575	5C17	2	Start order active duration	s
23577	5C19	2	Secondary source presence duration	s
23579	5C1B	2	Secondary source active (i.e. present and switch position at secondary source) duration	s
23581	5C1D	2	Source 1 load supplied duration	s
23583	5C1F	2	Source 2 load supplied duration	s

## Annex II - 20. Input state

### Function 3 Codes

Dec. Address	Hex. Address	Words count	Description	Unit
23818	5D0A	1	In 1 - External Display Board Input1 logical state 0: Not active 1: Active	
23819	5D0B	1	In 2 - External Display Board Input2 logical state 0: Not active 1: Active	
23820	5D0C	1	In 3 - External Display Board Input3 logical state 0: Not active 1: Active	
23821	5D0D	1	In 4 - External Display Board Input4 logical state 0: Not active 1: Active	

## Annex II - 21. Setup pulse and 0/4-20mA option modules

Function 3, 6 and 16 Codes

Dec. Address	Hex. Address	Words count	Description	Unit
23888	5D50	1	OUT 1 pulse output allocation 0: kWh+ 1: kvarh + 2: kVAh 3: kWh - 4: kvarh - 5: Command	
23889	5D51	1	OUT 1 pulse output value 0: 0,1 kWh/kvarh 1: 1 kWh/kvarh 2: 10 kWh/kvarh 3: 100 kWh/kvarh 4: 1000 kWh/kvarh 5: 10000 kWh/kvarh	
23890	5D52	1	OUT 1 pulse output duration 0: 100ms 1: 200ms 2: 300ms 3: 400ms 4: 500ms 5: 600ms 6: 700ms 7: 800ms 8*: 900ms	
23891	5D53	1	OUT 2 pulse output allocation 0: kWh+ 1: kvarh + 2: kVAh 3: kWh - 4: kvarh - 5: Command	
23892	5D54	1	OUT 2 pulse output value 0: 0,1 kWh/kvarh 1: 1 kWh/kvarh 2: 10 kWh/kvarh 3: 100 kWh/kvarh 4: 1000 kWh/kvarh 5: 10000 kWh/kvarh	
23893	5D55	1	OUT 2 pulse output duration 0: 100ms 1: 200ms 2: 300ms 3: 400ms 4: 500ms 5: 600ms 6: 700ms 7: 800ms 8: 900ms	
23894	5D56	1	Type of analog output OUT 1 0: 0/20 mA 1: 4/20 mA 2: 30 V	

Dec. Address	Hex. Address	Words count	Description	Unit
23895	5D57	1	Output allocation analog OUT1 0: U12 (V) 1: U23 (V) 2: U31 (V) 3: V1 (V) 4: V2 (V) 5: V3 (V) 6: I1 (A) 7: I2 (A) 8: I3 (A) 9: In (A) 10: F (Hz) 11: $\sum P$ (W) 12: $\sum Q$ (var) 13: $\sum S$ (VA) 14: $\sum PFL$ (%) 15: $\sum PFC$ (%)	
23896	5D58	1	Value at 0 or 4 mA from analog output OUT 1 (-20000 to +20000)	-
23897	5D59	1	Unit at 0 or 4 mA from analog output OUT1 0: / 1: k 2: M	
23898	5D5A	1	Value at 20 mA from analog output OUT 1 (-20000 to +20000)	-
23899	5D5B	1	Unit at 20 mA from analog output OUT1 0: / 1: k 2: M	
23900	5D5C	1	Type of analog output OUT 2 0: 0/20 mA 1: 4/20 mA 2: 30 V	
23901	5D5D	1	Output allocation analog OUT2 0: U12 (V) 1: U23 (V) 2: U31 (V) 3: V1 (V) 4: V2 (V) 5: V3 (V) 6: I1 (A) 7: I2 (A) 8: I3 (A) 9: In (A) 10: F (Hz) 11: $\sum P$ (W) 12: $\sum Q$ (var) 13: $\sum S$ (VA) 14: $\sum PFL$ (%) 15: $\sum PFC$ (%)	
23902	5D5E	1	Value at 0 or 4 mA from analog output OUT 2 (-20000 to +20000)	-
23903	5D5F	1	Unit at 0 or 4 mA from analog output OUT2 0: / 1: k 2: M	
23904	5D60	1	Value at 20 mA from analog output OUT 2 (-20000 to +20000)	-
23905	5D61	1	Unit at 20 mA from analog output OUT2 0: / 1: k 2: M	

Detailed events

Function 6 and 16 Codes

- Command Zone R1

Dec. Address	Hex. Address	Words count	Description	Unit
24320	5F00	1	Action <i>0x0001: Reset read pointer</i> <i>0xFFFE: Get next data</i>	
24321	5F01	1	Filtering action - If not written, no filtering is done <i>To use filtering, entire table should be written in one time with function 16</i> <i>0x00XX: only get events in the form XXyy</i> <i>0xFFFF: no filter</i>	

Function 3 Codes

- Data Zone R2

Dec. Address	Hex. Address	Words count	Description	Unit
24336	5F10	1	record count <i>If record count == 0xFFFF, it means that filtering process is not done now, so the reader has to re-read the table to get the values.</i>	
24337	5F11	1	record size <i>If record size == 0xFFFF, it means that filtering process is not done now, so the reader has to re-read the table to get the values.</i>	nb words
		120	8 * Event data record	

Function 3 Codes

• Data record description

Dec. Address	Hex. Address	Words count	Description	Unit
0	0	1	<p>Event ID</p> <p>0x8000: Power On</p> <p>0x8001: Power Off</p> <p>0x8100: Configuration changed</p> <p>0x8101: Configuration save failed</p> <p>0x8102: Configuration load failed</p> <p>0x8105: Configuration date saved</p> <p>0x8106: Configuration date save failed</p> <p>0x8107: Configuration date read failed</p> <p>0x8110: Configuration calibration read failed</p> <p>0x8300: User reset</p> <p>0x8301: Watchdog reset</p> <p>0x8302: Date resynchronized</p> <p>0xFF00: Software version changed</p> <p>0x0001: Source 1 Lost</p> <p>0x0002: Source 1 comes back</p> <p>0x0003: Source 1 not started (1ST / 2ST)</p> <p>0x0004: Source 1 Undervoltage</p> <p>0x0005: Source 1 Overvoltage</p> <p>0x0006: Source 1 Unbalanced</p> <p>0x0007: Source 1 Underfrequency</p> <p>0x0008: Source 1 Overfrequency</p> <p>0x0009: Source 1 Rotation fault</p> <p>0x000A: Source 1 Neutral fault</p> <p>0x000B: External fault with zero return source 1</p> <p>0x000C: External fault without zero return source 1</p> <p>0x000D: Source 1 Overload</p> <p>0x0101: Source 2 Lost</p> <p>0x0102: Source 2 comes back</p> <p>0x0103: Source 2 not started (2ST)</p> <p>0x0104: Source 2 Undervoltage</p> <p>0x0105: Source 2 Overvoltage</p> <p>0x0106: Source 2 Unbalanced</p> <p>0x0107: Source 2 Underfrequency</p> <p>0x0108: Source 2 Overfrequency</p> <p>0x0109: Source 2 Rotation fault</p> <p>0x010A: Source 2 Neutral fault</p> <p>0x010B: External fault with zero return source II</p> <p>0x010C: External fault without zero return source II</p> <p>0x0304: Manual switch to position 0</p>	
0	0	1	<p>0x0305: Manual switch to position I</p> <p>0x0306: Manual switch to position II</p> <p>0x0307: Remote controlled switch to position 0</p> <p>0x0308: Remote controlled switch to position I</p> <p>0x0309: Remote controlled switch to position II</p> <p>0x030A: Operating Factor Fault</p> <p>0x030B: Position 0 not reached</p> <p>0x030C: Position I not reached</p> <p>0x030D: Position II not reached</p> <p>0x030E: Unexpected switch to pos 0 when in auto mode</p> <p>0x030F: Unexpected switch to pos I when in auto mode</p> <p>0x0310: Unexpected switch to pos II when in auto mode</p> <p>0x0311: Unexpected switch to pos 0 when in locked mode</p> <p>0x0312: Unexpected switch to pos I when in locked mode</p> <p>0x0313: Unexpected switch to pos II when in locked mode</p> <p>0x0401: Input/Output configuration changed</p> <p>0x0402: Application/Timers configuration changed</p> <p>0x0403: Sources (thresholds) configuration changed</p> <p>0x0404: Communication configuration changed</p> <p>0x0405: HMI configuration changed</p> <p>0x0406: Network configuration changed</p> <p>0x0407: Option modules configuration changed</p> <p>0x0408: Date/Time configuration changed</p> <p>0x0409: Default configuration loaded</p> <p>0x040A: User backup configuration loaded</p> <p>0x040B: User backup configuration saved</p> <p>0x040C: Product autoconfiguration requested</p> <p>0x040D: Product autoconfiguration done</p> <p>0x040E: Product autoconfiguration failed</p> <p>0x0608: Product becomes available</p> <p>0x0609: Product becomes unavailable</p> <p>0x060A: Product becomes inhibited</p> <p>0x060B: Product no more inhibited</p> <p>0x0701: Source 1 EA+ counter reset</p> <p>0x0702: Source 1 EA- counter reset</p> <p>0x0703: Source 1 EQ+ counter reset</p> <p>0x0704: Source 1 EQ- counter reset</p> <p>0x0705: Source 1 ES counter reset</p> <p>0x0706: Source 1 Time meter reset</p>	

Dec. Address	Hex. Address	Words count	Description	Unit
0	0	1	0x0707: Source 2 EA+ counter reset 0x0708: Source 2 EA- counter reset 0x0709: Source 2 EQ+ counter reset 0x070A: Source 2 EQ- counter reset 0x070B: Source 2 ES counter reset 0x070C: Source 2 Time meter reset 0x070D: Start order count reset 0x070E: Start order active duration reset 0x070F: Secondary source duration reset 0x0710: Secondary source active duration reset 0x0711: Source 1 load supplied duration reset 0x0712: Source 2 load supplied duration reset 0x1001: Read indus area failure 0x1002: Write indus area failure 0x1003: Read serial number failure 0x1004: Write serial number failure 0x1101: Customization load error 0x1102: BET in default 0x1103: BET not present 0x1104: Load context failure 0x1106: RTC fault 0x1107: Internal display board detection error 0x1108: External display board detection error 0x1109: 2IN/2OUT option module #1 no more detected 0x110A: 2IN/2OUT option module #2 no more detected 0x110B: 2IN/2OUT option module #3 no more detected 0x110C: 2IN/2OUT option module #4 no more detected 0x110D: External display detection error 0x110E: I2C Fault	
1	1	1	Type 0: State 1: Edge 2: System	
2	2	1	Severity 0: none 1: information 2: warning 3: default	
3	3	1	Satus 0: non active 1: active 2: finished 3: new & checked 4: finished & checked	
4	4	4	Start Date	ms since 1 jan 2000
8	8	2	Duration	ms
10	A	1	Cause	-
11	B	2	Value 1	-
13	D	2	Value 2	-



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