

Remotely Operated Transfer Switching Equipment

ATyS *d* H



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1. GENERAL SAFETY INSTRUCTIONS

This manual provides instructions on safety, connections and operation of the ATyS d H transfer switch.

- Whether the ATyS d H 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 d H.
- The ATyS d H meets the European Directives governing this type of product and includes CE and CCC marking on each product.
- No covers on the ATyS d H 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 d 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.
- Danger: Transportation Precaution. Do not enter the area under the ATS when it is lifted or suspended (such as when using a lifter or chain block as in case of lifting equipment failure the ATS may suddenly fall. This ATS is heavy therefore entering such an area may cause serious injury.

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

As a minimum the ATyS d H comply with the following international standards:
IEC 60947-6-1 and GB 14048-11.

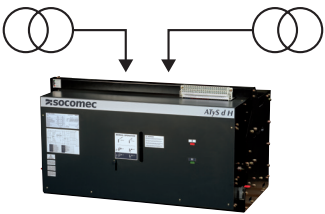
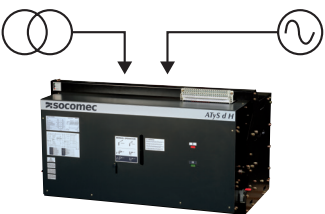
2. INTRODUCTION

ATyS d H “remotely operated transfer switching equipment” (RTSE) is designed for use in power systems 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 and GB 14048-11.

The ATyS d is a full load break Class PC RTSE, capable of “making and withstanding short circuit currents” assigned to IEC 60947-6-1 and GB 14048-11, with utilization categories of up to AC32B / AC33iB respectively.

ATyS d H 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.
- Integrated and robust switch disconnection.
- Window with clearly visible position indication I – 0 - II.
- An inherent 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.
- Emergency manual operation (off load).
- Integrated switch position auxiliary contacts.
- Self powered actuator through Source I and Source II power terminals.
- Compatibility with virtually any make of ATS, AMF, Genset controller.
(Typically a SOCOMEC ATyS C55/C65 ATS Controller and driven through volt free contacts).
- Power supply continuity for most applications.

	Mains / Mains	Mains / Genset	Genset / Genset
ATS Controller	 ATyS C55 or ATyS C65		
RTSE	 ↓ ATyS d H	 ↓ ATyS d H	 ↓ ATyS d H

3. THE ATYS FAMILY PRODUCT RANGE

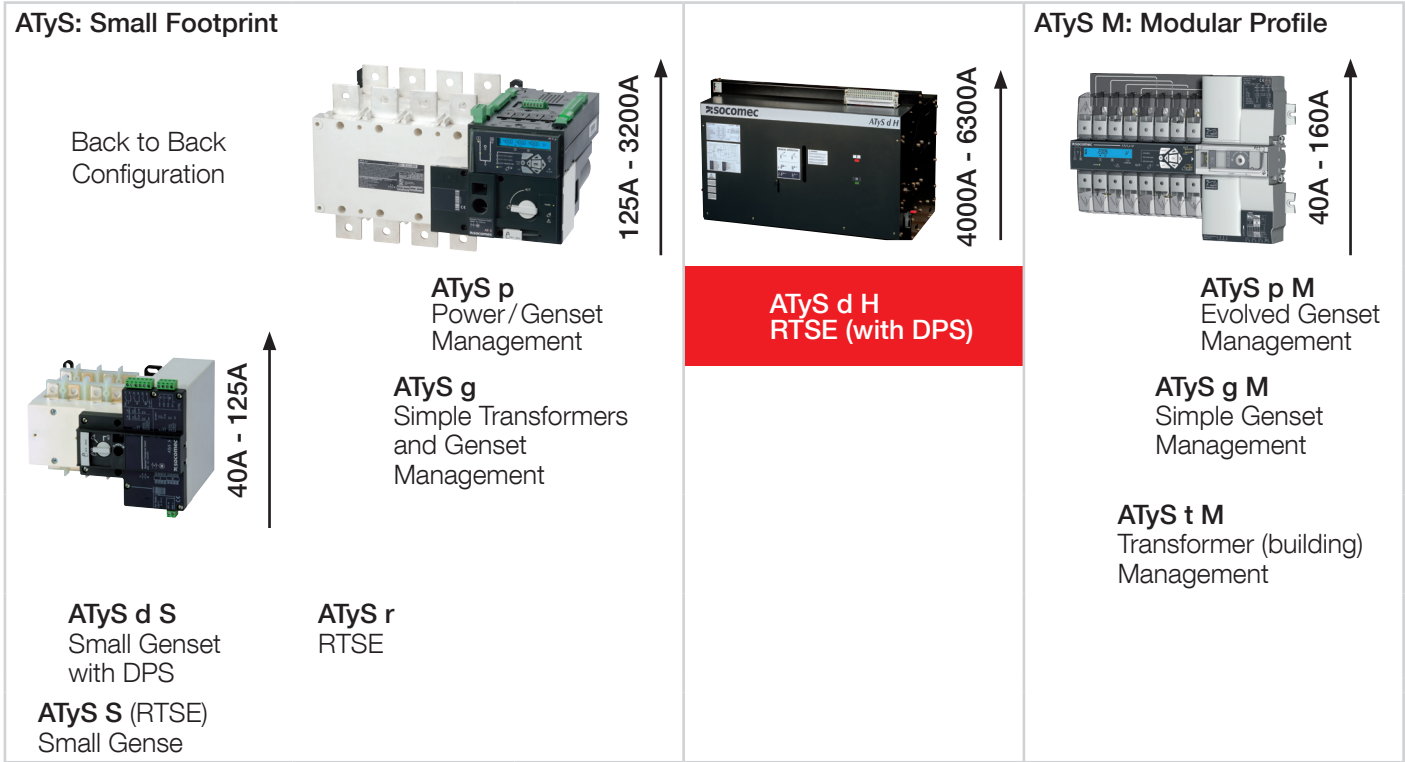
SOCOMEK has been manufacturing power control and safety products since 1922. The first generation of SOCOMEK “motorised changeover switches” were introduced in 1990 and today the ATyS brand has become trusted by major players in the power industry worldwide.

The ATyS Family includes a complete range of remotely operated transfer switch equipment (RTSE) as well as automatic fully integrated products and solutions (ATSE). Selecting the right ATyS will depend on the rating, the application as well as the nature of installation in which the ATyS will be installed.

This instruction manual includes details and instructions specific to the “ATyS d H” RTSE only. For all other ATyS family of products please refer to the specific instruction manual related to that product. (Available for download on www.socomec.com).

An overview of the ATyS range below up to 3200A is presented below:

Just the right ATyS for your application...



3.1. ATyS d H (High Ratings)

The ATyS d H is self-powered remotely operated transfer switching equipment (RTSE) with dual power supply for high current ratings. (Fixed, 3/4P rated from 4000 – 6300A).

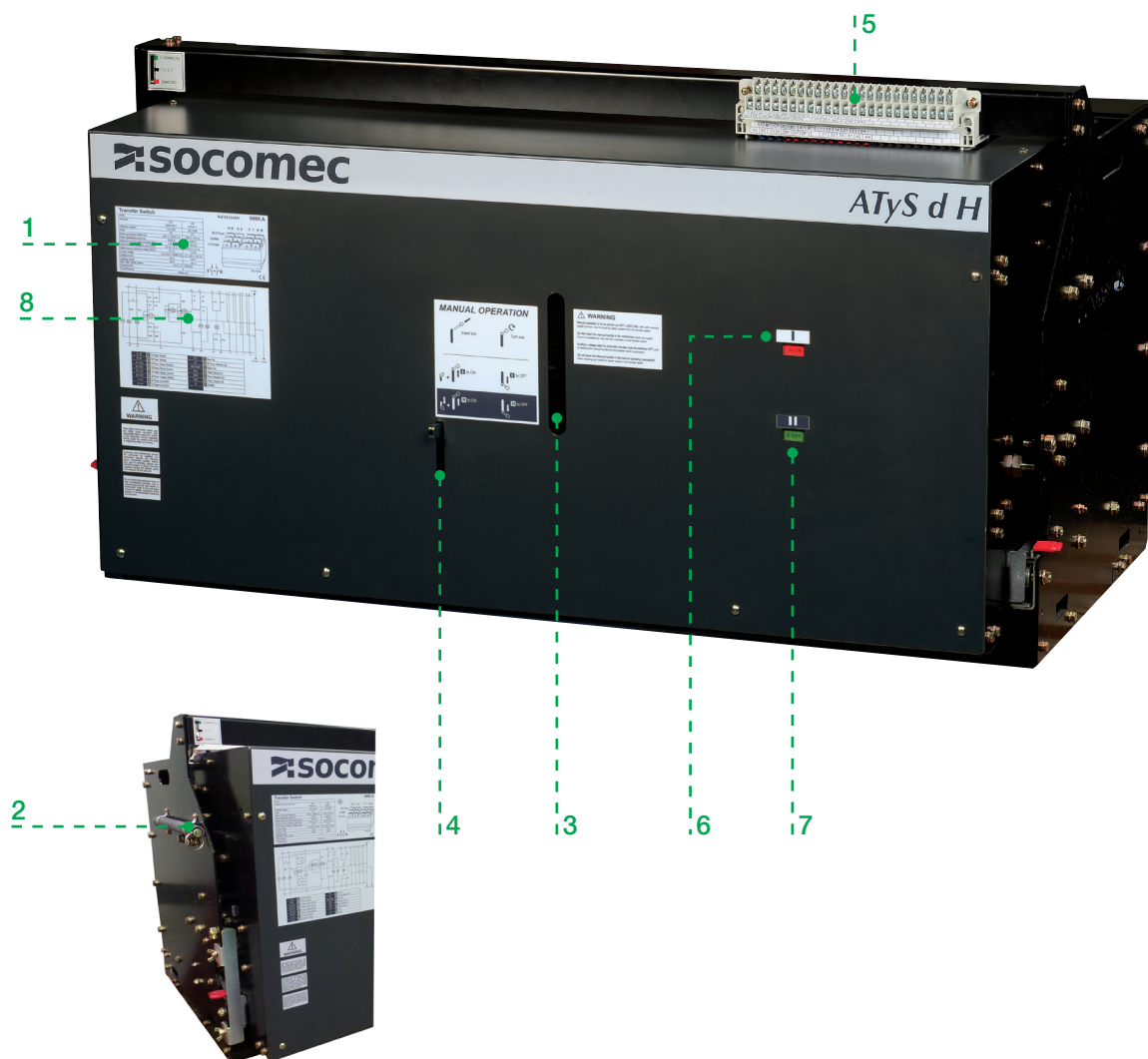
3.2. The ATyS Range Key Features

Selecting the right ATyS will depend on the application, the functionality required as well as the nature of the installation in which the ATyS will be installed. Below is an outline product selection chart listing the key features of each product to help to select the right ATyS for your needs.

	IEC 60947-6-1	ATyS <i>S</i>	ATyS <i>Sd</i>	ATyS <i>r</i>	ATyS <i>g</i>	ATyS <i>p</i>	ATyS <i>d H</i>
	UL 1008			ATyS 			
Changeover with control driven by dry contacts		•	•	•	•	•	•
Manual Emergency Operation with external handle		•	•	•	•	•	•
AC control voltage supply		•	•	•	•	•	•
Wide band DC control voltage supply		•					
Watchdog relay to ensure product availability				•	•	•	
Override controls and force switch to zero (off) position				•	•	•	
Integrated position auxiliary contacts		•	•	•	•	•	•
Source availability LED display					•	•	
Remote Display module RJ45 connection for D10					•		
Integrated Dual power supply			•		•	•	•
Network - Network Applications		•	•	•		•	•
Network - Genset Applications		•	•	•	•	•	•
Genset - Genset Applications		•	•	•			•
Pre-defined fixed I/O				• 5/1	• 11/3	• 5/2	
Programmable I/O						• 6/1	
Additional programmable I/O modules (Optional up to 4 modules)						• 8/8	
Remotely operated Transfer Switching Equipment (RTSE Class PC)		•	•	•			•
Automatic Transfer Switching Equipment (ATSE Class PC)					•	•	
Remote + Manual Control		•	•	•			•
Auto + Remote + Manual Control					•		
Auto + Remote + Local + Manual Control						•	
Auto-configuration of voltage and frequency levels					•	•	
Switch Position LED display					•	•	
Security Sealing Cover					•		
Configuration through potentiometers and dip switches					•		
Test on load functionality					•	•	
Test off load functionality					•	•	
Programmable configuration with keypad and LCD display						•	
Metering & Measurement: kW; kVar; kVA + kWh; kVarh; kVAh						•	
Communication RS485 + Ethernet + Ethernet gateway (Optional)					• RS485	•	
Webserver Access through optional Ethernet module (Optional)						•	
Easy Configuration software (Through Ethernet/Modbus)						•	
Remote Terminal Unit RJ45 connection for D20						•	
Data Logger for Event Recording with RTC (Through Ethernet/Modbus)						•	
Programmable Engine Exerciser functionality (Through Ethernet/Modbus)						•	
Multi level password access						•	
Load Shedding function						•	
Capacity Management functionality						•	
Peak shaving functionality						•	
4 - 20mA communication module (Optional)						•	
KWh Pulsed output module (Optional)						•	
Counters KWh, permutation...						•	
LCD display for programming, metering, timers and counters						•	
Possibility to add optional functionality						•	

4. GENERAL OVERVIEW

4.1. ATyS d H: RTSE Product introduction



1. Name plate and product characteristics
2. Emergency manual operating lever
3. Manual lever inlet
4. Selector switch handle for manually operating switch II (B power source)
5. Auxiliary wiring terminal block
6. Position indicator for switch I (A power : I On – OFF)
7. Position indicator for switch II (B power : II On – OFF)
8. Circuit diagram

4.2. ATyS d H: RTSE Sticker identification and details

4.2.1. Name plate and product characteristics

Transfer Switch

TYPE		
Standard	IEC 60947-6-1	GB 14048.11
Utilization category	AC-32B	AC-33iB
Class	PC	PC
Rated operational voltage (Ue)	660 V 50/60 Hz	660 V 50 Hz
Rated operational current (Ie)	4000 A	4000 A
Rated short-circuit making capacity (Icm)	143 kA	143 kA
Rated short-time withstand current (Icw)	65 kA / 0.1s	65 kA / 0.1s
Rated impulse withstand voltage (Uimp)	12 kV	12 kV
Control voltage	AC 230 V 50/60 Hz	AC 220 V 50 Hz
Closing current	65 A	65 A
Tripping current	65 A	65 A
Mfg. Date / Serial number		
Poles Number	4	
Fixed/Draw out	Fixed	

Ref.95334400

4000 A

RR SS TT NN

LOAD

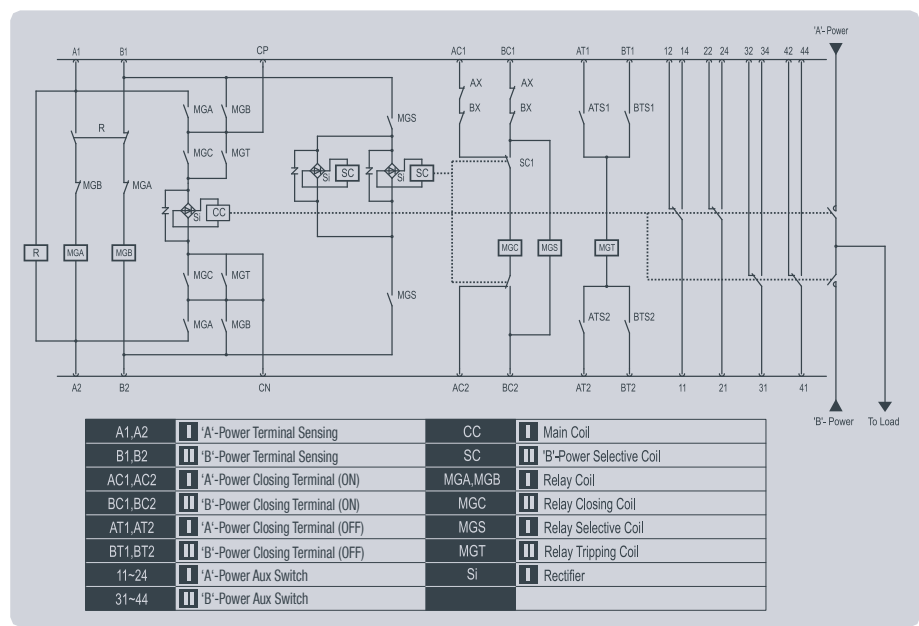
B Power

A Power

Top View

CE

4.2.2. Circuit diagram



4.2.3. Manual operation guide and warning stickers

WARNING

When lifting the transfer switch, use the lifting hooks provided with appropriate lifting equipment. (Refer to the instruction manual regarding the Kg Load). Be careful not to drop or impact the switch at all times.

Inspection and maintenance should be performed by qualified and authorised persons and following good engineering practice. Before any type of servicing, special care should be taken to ensure that both supplies feeding the transfer switch are switched off and secured.

Do not install this product in areas of high temperature, humidity, dust or corrosive gas as this may result in a malfunction. Refer to the instruction manual for details. Installation of this product is recommended in dust free environment.

MANUAL OPERATION

Insert axe

Turn axe

to ON

to OFF

WARNING

Manual operation is to be carried out OFF LOAD Only, with both incoming supply sources I and II (A and B) safely isolated from the transfer switch.

Do Not insert the manual handle in the mechanism when any supply source is available (or may become available) on the transfer switch.

Auxiliary voltage used for automatic transfer must be switched OFF prior to inserting the manual handle into the transfer switch mechanism.

Do not leave the Manual handle in the manual operating mechanism when restoring any control or power supply to the transfer switch.

ATyS d H - 544077F - SOCOMEC

EN 9

4.3. ATyS d H: ATSE Environmental

The ATyS d H product meets the following environmental requirements:

4.3.1. IP Rating

- IP2X against direct contact for the ATyS d H (Front with all covers closed)
- IP 0 for the bare power section without terminal shields in place.

4.3.2. Operating Conditions

4.3.2.1. Temperature



- From -10 to +60 °C

4.3.2.2. Hygrometry



- <85% humidity without condensation at 40 °C
- <90% humidity with condensation at 20 °C

4.3.2.3. Altitude



- Up to 2000m in altitude without derating

4.3.3. Storage Conditions

4.3.3.1. Temperature



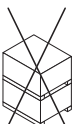
- From -20 to +60 °C

4.3.3.2. 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)

4.3.3.3. Storage position

- On a flat surface capable of handling >200kg and respecting the markings on the packaging.
Attn: This product is relatively heavy!
Do not stack.



4.3.4. Volume and shipping weights by reference ATyS d H

Rating	Type	N° of Poles	Reference Number IEC	Reference Number CCC	Net Weight (Kg)	Shipping Weight (Kg)	Product packed (Length x Width x Height (mm))
4000 A	Fixed	3	9533 3400	9533 3400-CN	200	270	920x1220x900
		4	9533 4400	9533 4400-CN	250	320	920x1220x900
5000 A	Fixed	3	9533 3500	9533 3500-CN	200	270	920x1220x900
		4	9533 4500	9533 4500-CN	250	320	920x1220x900
6300 A	Fixed	3	9533 3630	9533 3630-CN	200	270	920x1220x900
		4	9533 4630	9533 4630-CN	250	320	920x1220x900

4.3.5. CE marking

The ATyS d H complies with the European directive for:

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



4.3.6. EMC standard

The ATyS d H is designed and built in accordance with IEC 60947-1 and GB 14048-11 standards (products intended to be installed in an Industrial environment).

4.4. ATyS d H accessories

4.4.1. Customer Mounted Accessories

The ATyS d H is defined as remotely operated transfer switching equipment. When associated with an ATS controller the product is a fully compliant automatic transfer switch (ATSE) to safely transfer from a load supply from the normal to the alternative source as and when required.

SOCOMECC recommends to use the ATyS C55 or C65 ATS controller depending on the application. Refer to the ATyS C55/C65 instruction manual for wiring with these products.

For special applications please contact SOCOMECC.

CURRENT TRANSFORMERS

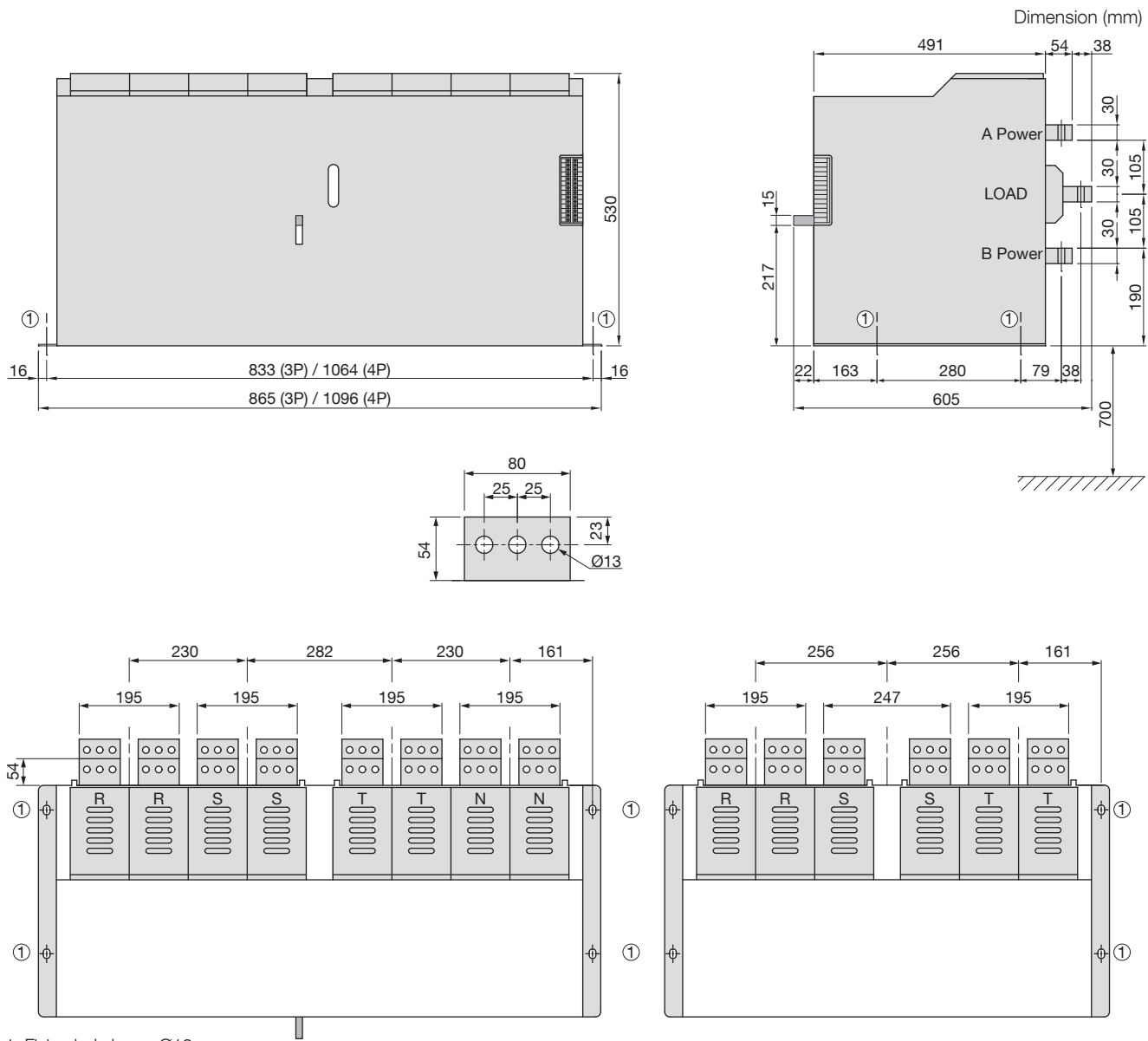
An extensive range of CT's are available from SOCOMECC. Please refer to the latest SOCOMECC general catalogue for details.

Others: Refer to the latest SOCOMECC product catalogue. (Downloadable from www.socomec.com)

5. INSTALLATION

5.1. ATyS d H Product dimensions and power terminals

5.1.1. Dimensions 4000 - 6300 A Fixed



1. Fixing hole base: Ø13 mm

 Note: when installing the ATyS dH in a panel it is recommended to allow a minimum height of 700 mm from the bottom of the product to the floor of the enclosure for ease of access.

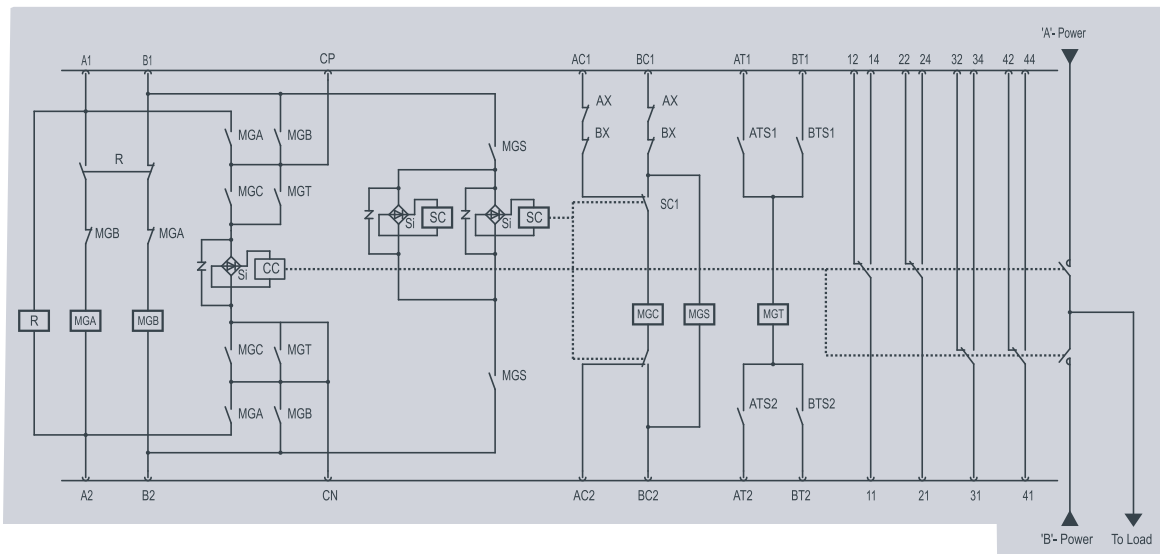
5.2. Mounting Orientation

4000 A 5000 A 6300 A	OK 	Others positions are not allowed
----------------------------	--	----------------------------------



CAUTION ! Always install the product on a flat and rigid surface paying attention to the net weight of the product being installed.

5.3. Control Wiring Connection Terminals 4000, 5000, 6300 A



A1,A2	I 'A'-Power Terminal Sensing	CC	I Main Coil
B1,B2	II 'B'-Power Terminal Sensing	SC	II 'B'-Power Selective Coil
AC1,AC2	I 'A'-Power Closing Terminal (ON)	MGA,MGB	I Relay Coil
BC1,BC2	II 'B'-Power Closing Terminal (ON)	MGC	II Relay Closing Coil
AT1,AT2	I 'A'-Power Closing Terminal (OFF)	MGS	I Relay Selective Coil
BT1,BT2	II 'B'-Power Closing Terminal (OFF)	MGT	II Relay Tripping Coil
11~24	I 'A'-Power Aux Switch	Si	I Rectifier
31~44	II 'B'-Power Aux Switch		

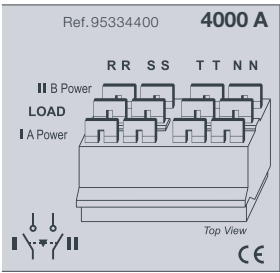


Note: CP-CN output terminals are the dual power supply (DPS) phase/neutral control power output terminals intended for use with position order signals. (Refer to chapter 5.6.7, page 21 for wiring with an ATyS C55/C65 ATS controller).



Note: on A1,A2,B1,B2 connections, a 6mm² cable and 65A peak protection devices must be used.

5.4. Power circuits and bar connections



Recommended tightening torque:
4000A: M12 / 45 Nm
5000A: M12 / 45 Nm
6300A: M12 / 45 Nm

Maximum tightening torque:
4000A: M12 / 45 Nm
5000A: M12 / 45 Nm
6300A: M12 / 45 Nm

 Note: terminals RR, SS, TT and NN are each to be connected in parallel and must be bridged as shown above. Bridging bars are not included with the product and must be supplied by others.

5.5. Busbar connection recommendations

Rating	Cross section per bar	Quantity of bars per phase	Type of screw	Recommended tightening torque (N.m)
4000 A	100mm x 10mm	4	M12	45Nm
5000 A	100mm x 10mm	5	M12	45Nm
6300 A	100mm x 10mm	6	M12	45Nm

5.6. Assembly of customer mounted accessories



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



Note: if you are using an external controller different from ATyS 55/65 please note that a delay timer in 0 position (OFF-OFF) must be established with a minimum time of 1,5 seconds and the order signal from ATS controller to the ATyS dH must be pulsed signals with pulse duration of at least 200ms. (Recommended pulse length : 300ms).

5.6.1. ATS Controller for use with the ATyS d H

ATyS C55/C65 are ATS controllers. They ensure the automatic control of remotely operated transfer switching equipment such as the ATyS r, ATyS S, ATyS d S, ATyS d M and ATyS d H as well as common contactors, circuit breakers or most other motorised transfer switches.



ATyS C55 General characteristics

- Self-powered from sensing.
- Wide voltage range (88-576VAC).
- 24 VDC aux power supply (for optional use).
- 2 latching relays.
- Smart commissioning wizard.
- IP65 degree of protection with gasket (accessory).
- 1000 Alarms and Events.
- 6 fully configurable I/O.
- Genset scheduler.
- Door or back plate mounting.
- Main/Main, Main/Genset and Genset/Genset applications.
- Easyconfig configuration software.
- RS485 Modbus communication.
- Ethernet, SNMP, BACnet using DIRIS M-70 gateways. Includes Webserver.
- A DIRIS Digiware D-70 gateway can be utilised as a remote display for multiple ATyS C55 controllers; the D-70 also provides Ethernet, SNMP & BACnet connectivity.



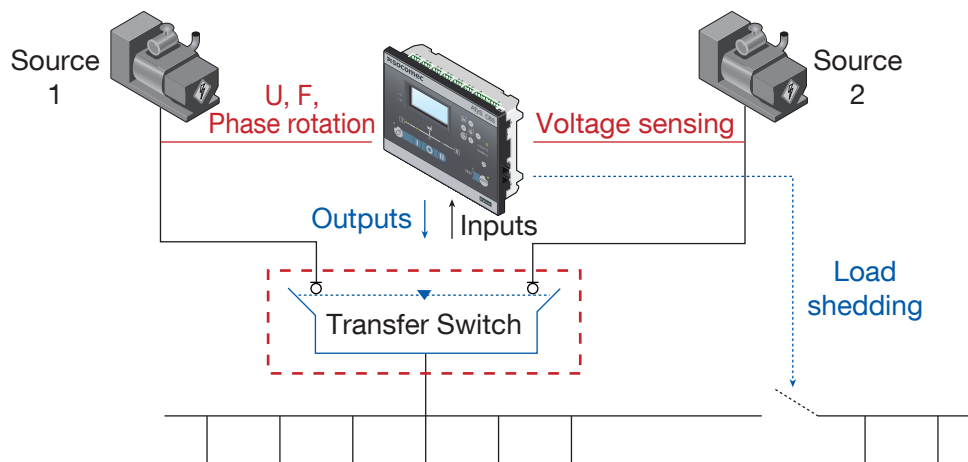
ATyS C65 General characteristics

- Self-powered from sensing.
- Wide voltage range (88 - 576 VAC).
- 24 VDC aux power supply (for optional use).
- 2 latching relays.
- **Digiware IO-10: I/O extension up to 30 inputs and 18 outputs.**
- **Power & Energy metering with /1 A or /5 A current transformers.**
- **Energy backup.**
- **IP65 degree of protection (panel gasket included).**
- **3000 Alarms and Events.**
- **Multiple fully configurable timers, thresholds and I/O.**
- Easyconfig configuration software.
- Shock resistant IK08+.
- **Digiware compatible (replaces U module).**
- Ethernet, SNMP, BACnet using DIRIS M-70 gateway. Includes Webserver.
- A DIRIS Digiware D-70 gateway can be used as a remote display for multiple ATyS C65 controllers; the D-70 also provides Ethernet, SNMP & BACnet connectivity.

5.6.2. Typical configurations

ATyS C55/C65 ATS controllers are designed for use in following applications:

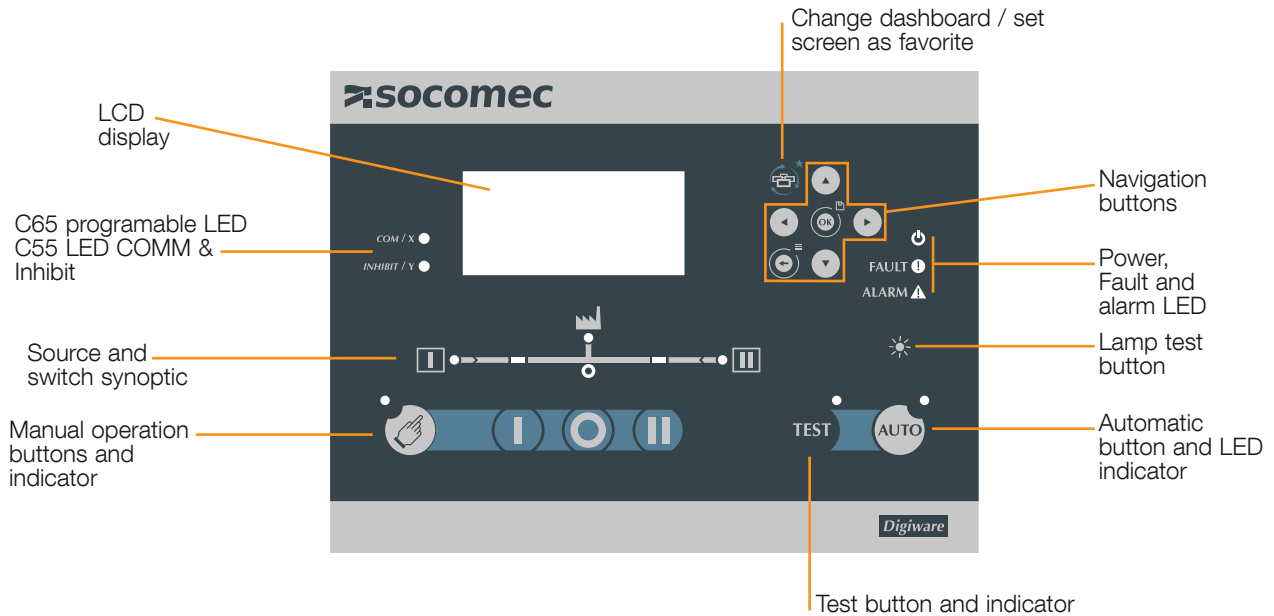
- Network/Network
- Network/Genset
- Genset/Genset



5.6.3. ATyS C55/C65 references

Part Number	Image	Description
1600 0055		ATyS C55 ATS Controller with mid-level functionalities
1600 0065		ATyS C65 ATS Controller with advanced functionalities

5.6.4. ATyS C55/C65 interface



BUTTON	OPERATION
Manual	Turns on CTRL mode. Allows the use of the I, 0, II buttons that will send position orders to the switch.
Automatic	Turns on AUTO mode. Controller will automatically perform transfers in case of priority source unavailability and priority source comeback.
I	Position I (source 1) manual order. Only in CTRL mode.
0	Position 0 (center-off) manual order. Only in CTRL mode.
II	Position II (source 2) manual order. Only in CTRL mode.
TEST	Performs a TEST (as defined inside Parameters/Display/Options menu)
Arrows	Navigation through different screens, menus, options and values.
Lamp Test/Fault clear	Press: lamp test and information about LED on screen Long press: Clear faults pop-up (only if faults active)
Back/Menu	Press: back/return to previous screen or clear pop-up Long press: Back to Main Menu page
Dashboard/Favourite	Press: Go to the favourite Dashboard / Change between dashboard type (1 to 8, in a loop) Long press: Sets the current dashboard screen as favourite (C65 only)
OK/Save & Quit	Press: Enter / OK / set a value / accept / confirm Long press: (only when configuring) Save and Quit (back to previous configuration screen)

Once the controller is connected to the switch with the cable harness, as soon as the controller is powered up, it will automatically start in MANUAL mode and, in order to facilitate the commissioning, a smart wizard will appear to drive the user through the main configuration parameters.



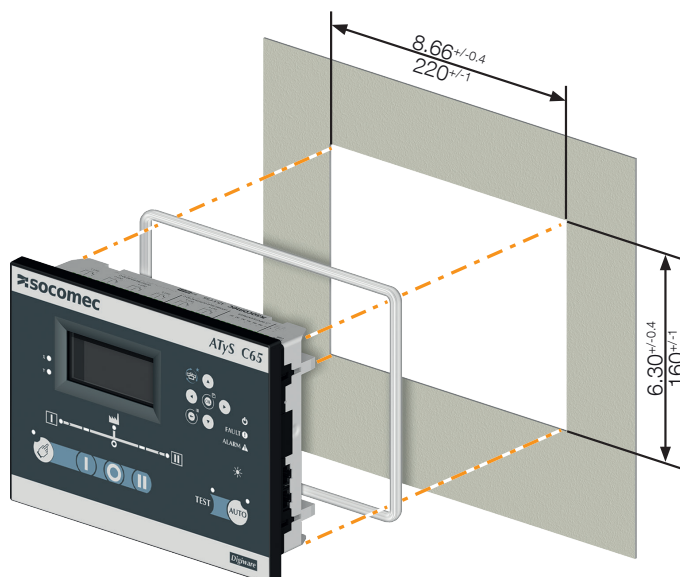
5.6.5. Mounting & connecting controller

Door mounting

The ATyS C55/C65 can be mounted on doors up to with a thickness 4mm (0.15in).

STEP 1: Cut out for the controller

Cut a rectangle hole of 220x160mm / 8.66 x 6.3in on the enclosure door as shown below.

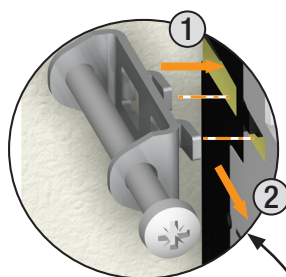


CAUTION ! For IP65 protection, the gasket must be placed and fitted around the inside edge of the controller as shown above.

STEP 2: Fixing the controller on the door:

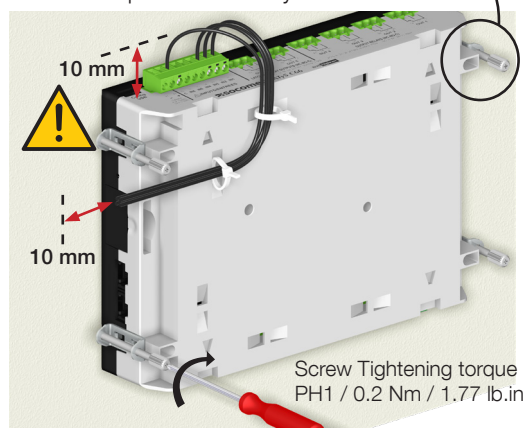
Remove all connectors then place the ATS controller inside the door cut-out and clip the door mounting screws into the side of the controller (2 screws on each side). It is important to respect the tightening torque indicated below and follow good engineering practise when installing the ATS controller.

The back of the controller includes fixing points for cable collars (see illustration below).



Insert the 4 door mounting screws in the designated slot and push back to lock in place.

Example of cable way.



Cable must be more than 10mm away from the RTC battery cover and USB.

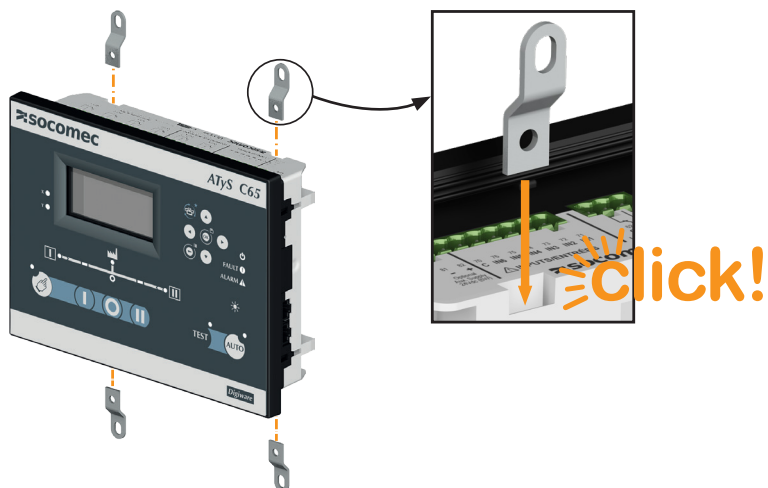
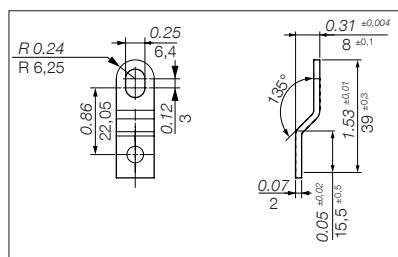


Do not drill holes above the controller after it has been mounted.

Backplate mounting

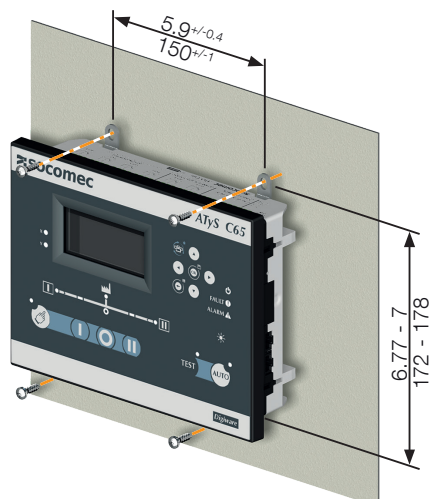
STEP 1: Placing the 4 mounting legs on the controller

Insert the mounting legs into the 4 slots (2 top side and 2 bottom side, (cf. below top side view).

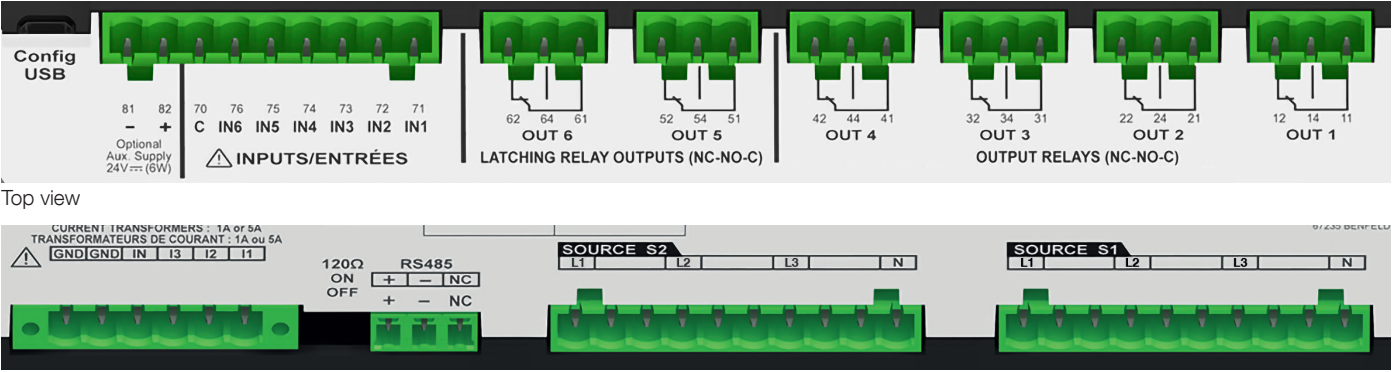


STEP 2: Fixing the controller on the backplate

Drill mounting holes in the backplate to match the fixing holes as shown and indicated below. Fix the controller through the mounting legs to the backplate with a maximum screw diameter of 6mm/0.22in.



5.6.6. ATyS C55/C65 controller wiring



Bottom view

TYPE	TERMINAL N°	DESCRIPTION	CHARACTERISTICS	RECOMENDED CROSS SECTION	TIGHTENING TORQUE
Sensing source 1	SOURCE 1 L1/L2/L3/N	Voltage sensing inputs source 1 & voltage supply (L1-L2)	Sensing voltage 50 - 575 V.a.c P-P - 50/60 Hz (+/- 10%) Supply voltage (L1-L2) 88 - 576 V.a.c - 50/60Hz (+/- 10%) Ui 600V	0.75-2.5mm² AWG 18-14	0.5-0.6 Nm 4.4-5.3 lb.in
Sensing source 2	SOURCE 2 L1/L2/L3/N	Voltage sensing inputs source 2 & voltage supply (L1-L2)			
Inputs	71	IN1: programmable input 1	Do not connect to any external power supply	0.5-2.5mm² AWG 20-14	
	72	IN2: programmable input 2			
	73	IN3: programmable input 3			
	74	IN4: programmable input 4			
	75	IN5: programmable input 5			
	76	IN6: programmable input 6			
	70	Common point for inputs			
Aux power supply	81/82	- : negative terminal for aux supply +: positive terminal of aux supply	12-24 Vd.c.		
Outputs	12/14/11	OUT1: programmable output 1	Dry contacts 8A / 277 VAC 50/60 Hz 5A / 24 VDC	1.5-2.5mm² AWG 16-14	
	22/24/21	OUT2: programmable output 2			
	32/34/31	OUT3: programmable output 3			
	42/44/41	OUT4: programmable output 4			
	52/54/51	OUT5: programmable output 5 (latching)			
	62/64/61	OUT6: programmable output 6 (latching)			
Current transformers	IN/I3/I2/I1	CT neutral / CT phase C / CT phase B / CT phase A	CT input 1A or 5A		
Serial connection	RS485	Connection RS485 -: negative terminal of RS485 bus +: positive terminal of RS485 bus NC : Ground	RS485 bus insulated	LiYCY shielded twisted pair 0.14 to 1.5 mm² 30-14 AWG	0.22 -0.25 Nm
Digiware*	DIGIBUS	Connection point for I/O 10 optional accessories & digiware connection (must use 24 VDC input)	RJ 45 digiware cable	-	-

* For more information check I/O module instruction sheet ref 545597

5.6.7. Interfacing the ATyS C55/C65 with the ATyS d H

The ATyS d H includes 4 inputs to control the supply source selector and switch positions:

Terminals	Name	Description
AC1, AC2	Input "Source I"	A power closing terminal
BC1, BC2	Input "Source II"	B power closing terminal
AT1, AT2	Input "Source I"	A power tripping terminal
BT1, BT2	Input "Source II"	B power tripping terminal

To transfer the source supply from source I to source II the following sequence must be followed:

To transfer the switch to source II (B) from source I (A) electrically (with push buttons or an ATS controller) ensure to follow the following sequence:

- Trip switch I to the OFF position – Momentarily close Input "Source I "A" power tripping terminal"
- Activate switch II to the ON position – Momentarily close input "Source II "B" power closing terminal"

To transfer to source I (A) from source II (B) orders must be given in the following sequence:

- Trip switch II to the OFF position – Momentarily close Input "Source II "B" power tripping terminal"
- Activate switch I to the ON position – Momentarily close input "Source I "A" power closing terminal"

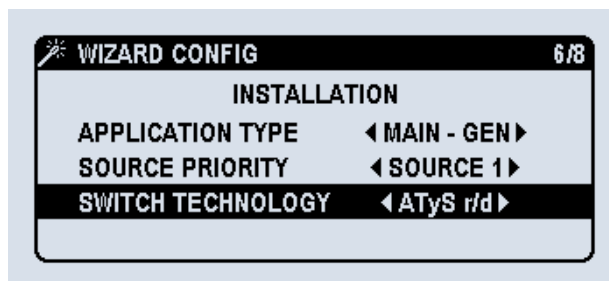


CAUTION !

- When tripping or transferring the switch positions, ensure to provide a dry contact signal for at least 0.5s.
- DO NOT activate switch I and switch II position inputs simultaneously as this will permanently damage the switching coil in the transfer switch.
- DO NOT open and close the switch repeatedly or without any interval between operations. Minimum interval between signals is 1.5s.

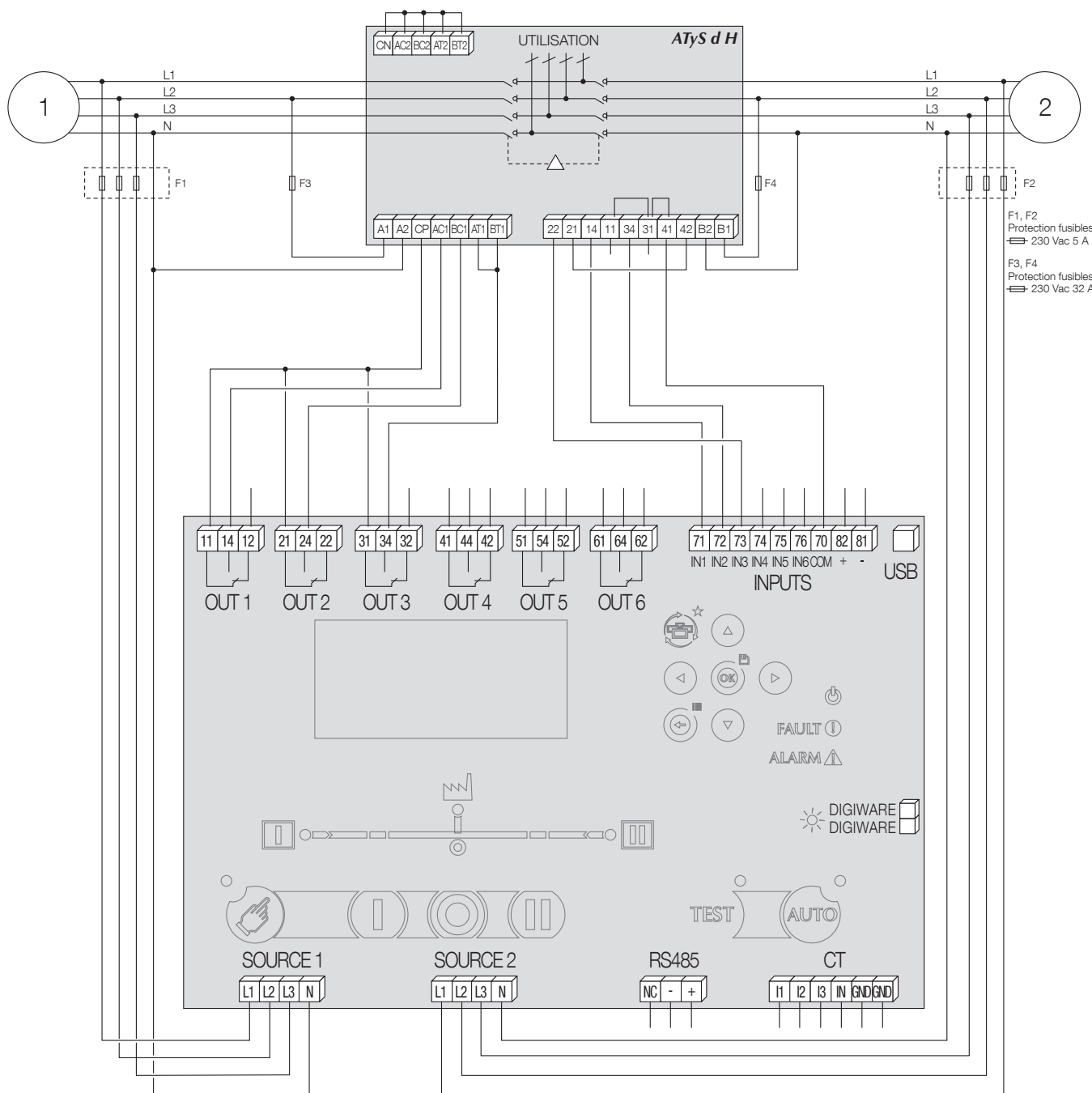
Mode Transfer Switch ATyS

Wiring diagram to be utilised when ATyS C55/C65 configured for "SWITCH TECHNOLOGY" as "ATyS r/d".



CAUTION !

- The ATyS C55/C65 must be configured to stop in the "0 position" (DEAD BAND TIMER) for a duration that is set higher than the one set on the transfer switch. (Minimum setting value 6s).
- DEAD BAND TIMER value of the ATyS C55/C65 controller must be higher than [1FT + 2AT] timers value :
 $1FT + 2AT + 6 \leq DBT$.
1FT – Source 1 failure timer
2AT – Source 2 availability timer
DBT – Dead Band Timer



Connections on the ATyS dH Terminals	Connections on the ATyS C55/C65 Terminals
A1-A2 : A Power Supply - Source I (230Vac Phase/ Neutral)	71 : Aux. Input – A Power Switch I is closed (ON)
B1-B2 : B Power Supply - Source II (230Vac Phase/ Neutral)	72 : Aux. Input – B Power Switch II is closed (ON)
CP – CN : Phase / Neutral internal dual power supply (DPS) output	73 : Aux. Input – A Power Switch I and B Power Switch II are in position 0 (OFF)
AC1 – AC2 : Position I order input terminals	70 : Common link for switch position aux. contacts
BC1 – BC2 : Position II order input terminals	11-21-31-41 : Common link for order Outputs
AT1 – AT2 : Position 0 order input terminals for switch I	14 : A Power Switch I closing (ON) order output
BT1 – BT2 : Position 0 order input terminals for switch II	24 : B Power Switch II closing (ON) order output
11-31-41 : Common link for switch positions aux. contacts outputs	34 : A Power Switch I and B Power Switch II position 0 (OFF) order output
22 : Aux contact output - A Power Switch I and B Power Switch II are in position 0 (OFF)	SOURCE 1 (L1-L2-L3-N) : 3 phase & N sensing power source A
14 : Aux contact output – A Power Switch I is closed (ON)	SOURCE 2 (L1-L2-L3-N) : 3 phase & N sensing power source B
34 : Aux contact output – B Power Switch II is closed (ON)	

Mode Breaker (preferred control method for ATyS dH)

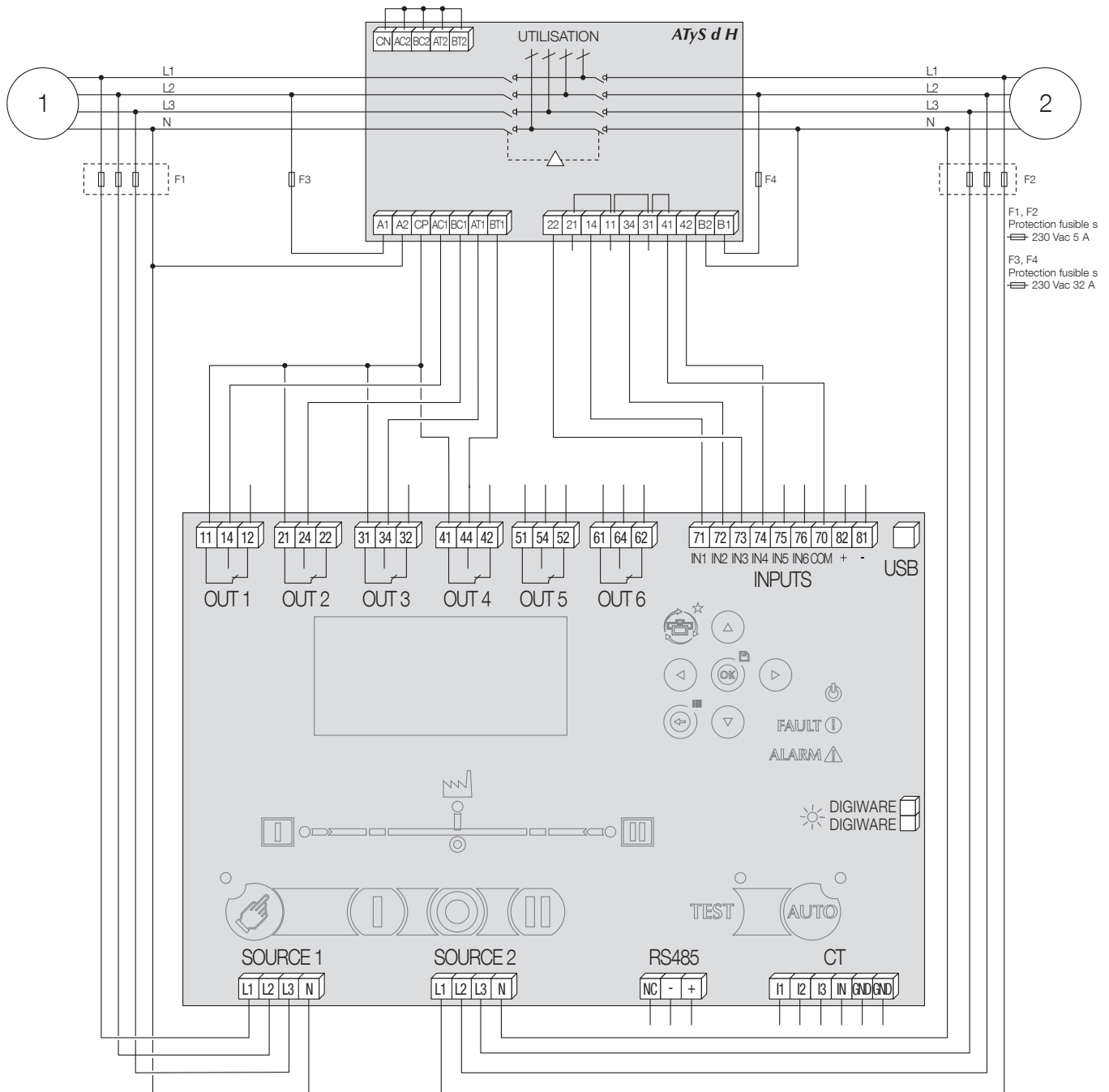
Wiring diagram to be utilised when ATyS C55/C65 configured for "SWITCH TECHNOLOGY" as "BREAKER"



CAUTION !

- The ATyS C55/C65 must be configured to stop in the "0 position" (DEAD BAND TIMER) for a duration that is set higher than that as set on the transfer switch. (Minimum setting value 6s).

- DEAD BAND TIMER value of the ATyS C55/C65 controller must be higher than $[1FT + 2AT]$ timers value :
 $1FT + 2AT + 6 \leq DBT$.
 1FT – Source 1 failure timer
 2AT – Source 2 availability timer
 DBT – Dead Band Timer



Connections on the ATyS dH Terminals	Connections on the ATyS C55/C65 Terminals
A1-A2 : A Power Supply - Source I (230Vac Phase/ Neutral)	71 : Aux. Input – A Power Switch I is closed (ON)
B1-B2 : B Power Supply - Source II (230Vac Phase/ Neutral)	72 : Aux. Input – B Power Switch II is closed (ON)
CP – CN : Phase / Neutral internal dual power supply (DPS) output	73 : Aux. Input – A Power Switch I in position 0 (OFF)
AC1 – AC2 : Position I order input terminals	74 : Aux. Input – B Power Switch II in position 0 (OFF)
BC1 – BC2 : Position II order input terminals	70 : Common link for switch position aux. contacts
AT1 – AT2 : Position 0 order input terminals for switch I	11-21-31-41 : Common link for order Outputs
BT1 – BT2 : Position 0 order input terminals for switch II	14 : A Power Switch I closing (ON) order output
11-21-31-41 : Common link for switch positions aux. contacts outputs	24 : B Power Switch II closing (ON) order output
22 : Aux contact output - A Power Switch I in position 0 (OFF)	34 : A Power Switch I position 0 (OFF) order output
14 : Aux contact output – A Power Switch I is closed (ON)	44 : B Power Switch II position 0 (OFF) order output
34 : Aux contact output – B Power Switch II is closed (ON)	SOURCE 1 (L1-L2-L3-N) : 3 phase & N sensing power source A
42 : Aux contact output - B Power Switch II in position 0 (OFF)	SOURCE 2 (L1-L2-L3-N) : 3 phase & N sensing power source B

6. ATYS D H CONTROLLER PROGRAMMING

The ATyS d H can be controlled by an ATyS C55/C65 ATS controllers. ATyS C55/C65 Menus & Programming.

For complete details concerning the programming refer to the C55/65 instruction manual downloadable from www.socomec.com



- Short press on this button to go back one level.
- Long press to access the menus.

MAIN MENU CONTROL LOG STATISTICS GENSET SCHEDULER PARAMETERS SPECIFIC FUNCTION MAINTENANCE ABOUT	SPECIFIC FUNCTIONS MANUAL RETRANSFER INPHASE TRANSFER * RETURN TO 0 LOAD CTRL * FORCED LOAD SHEDDING * SMART LOAD SHEDDING * POWER UP IN AUTO DBT TIMER IN CTRL * HVAC COMPRESSOR TRIPPING ACTION LOAD ADDING CYCLER COMMIT TO TRANSFER *	PARAMETERS NETWORK LOAD DISPLAY TIMERS I/O COMMUNICATION ALARMS PASSWORDS WIZARD	TIMERS OPERATION GENSET SOURCE 1 GENSET SOURCE 2 TESTS ON LOAD TESTS OFF LOAD
CONTROL MODE / POSITION TEST MANUAL RETRANSFER			I/O INPUTS OUTPUTS EXTERNAL I/O DETECTION * EXTERNAL I/O CONFIG *
STATISTICS CYCLES OPERATIONS OPERATING HOURS SOURCE 1 SOURCE 2 GENSET 1 GENSET 2 BREAKER BYPASS		NETWORK AUTODETECT SETUP APPLICATION OP RANGE S1 OP RANGE S2	COMMUNICATION MODBUS ADDRESS RS485 MODBUS DIGIBUS COMM DIGIWARE MODE
LOG EVENT LOG EVENT BY DATE * ALARM LOG FAULT LOG		LOAD LOAD STATUS LOAD TYPE INOM LOAD NAME CT PRIMARY CT SECONDARY NEUTRAL CT PRIMARY NEUTRAL CT SECONDARY LINE I1 WAY LINE I2 WAY LINE I3 WAY LINE I4 WAY	ALARMS MEASURE ALARMS MAINTEN. ALARMS COMBI ALARMS * LOGICAL ALARMS SYSTEM ALARMS
SCHEDULER GENERAL PARAMETERS CUSTOM 1 CUSTOM 2 * CUSTOM 3 * CUSTOM 4 *		DISPLAY SCREEN DATE AND TIME LED CONFIG * OPTIONS CHANGE PRODUCT NAME SCREENSAVER TEXT	PASSWORDS CHANGE OPERATOR PWD CHANGE CONFIG PWD CHANGE MAINTENANCE PWD BACK

7. ATYS D H OPERATING MODES

The ATyS d H includes three operating modes as follows:

- Remote mode that accepts orders from external push buttons. (On-Load)
- Automatic mode when associated with an ATS Controller. (On-Load)
- Manual / Emergency operation. (OFF Load)

7.1. Manual operation procedure

This procedure is intended for use “Off-Load” during a maintenance or emergency transfer operation.



CAUTION

- Ensure to put the ATS controller /transfer switch into Manual Mode before attempting to carry out manual operation.
- Manual operation “MUST” be done under no load condition.



WARNING

Manual operation is to be carried out OFF LOAD Only, with both incoming supply sources I and II (A and B) safely isolated from the transfer switch.

Do Not insert the manual handle in the mechanism when any supply source is available (or may become available) on the transfer switch.

Auxiliary voltage used for automatic transfer must be switched OFF prior to inserting the manual handle into the transfer switch mechanism.

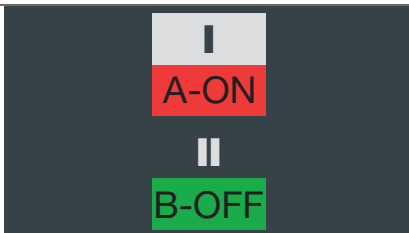
Do not leave the Manual handle in the manual operating mechanism when restoring any control or power supply to the transfer switch.

7.2. Manual transfer procedure

7.2.1. Transfer from source I to source II (A to B Power)

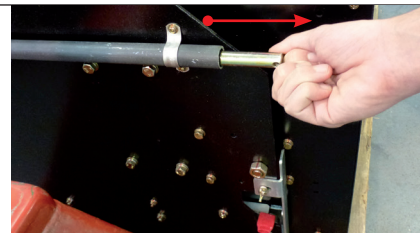
1

Check that the position indicator B shows B-OFF. Trip (Switch off) the switch if the indicator A is shown as ON. (Refer to the next step to Trip)



2

Remove the handle from its storage location.



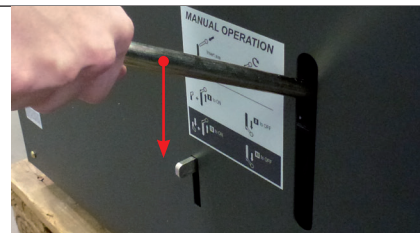
3

Insert the manual lever into the dedicated hole through the front cover as shown



4

Push the lever down to the full.



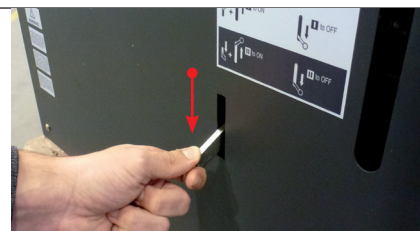
5

Check that indicator A is in the OFF position.



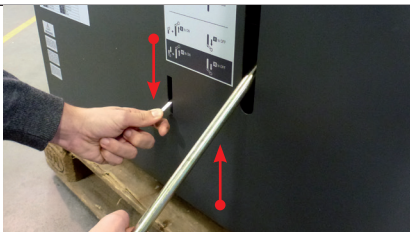
6

ATTENTION: Follow this instruction carefully.
Press and hold “B power selection lever” as shown with the left hand.



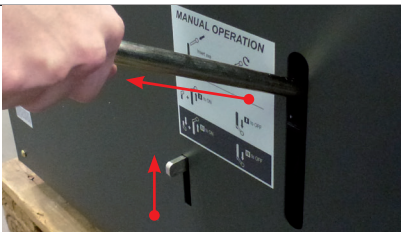
7

Insert the manual lever into the location and pull the lever up to the full. The switch shall be switched to B power.



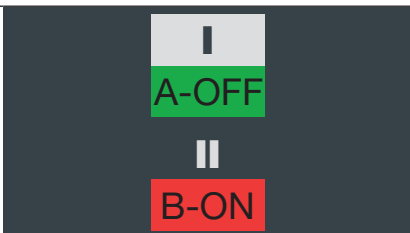
8

Release the “B” power selection lever and withdraw the manual lever.



9

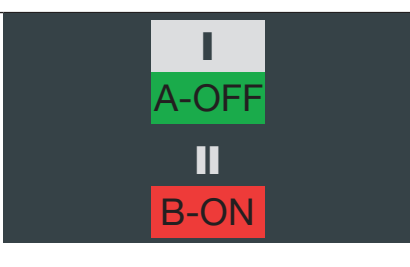
Check that the position indicator B is -ON.



7.2.2. Transfer from “B” to “A” Power

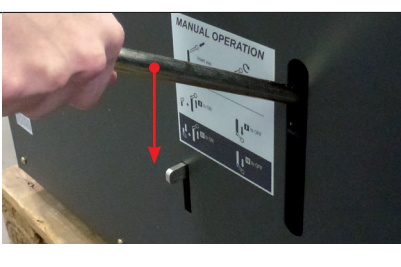
1

Check that the position indicator A shows A-OFF. Trip (Switch off) the switch if the indicator B is shown as ON. (Refer to the next step to Trip)



2

Insert the manual lever into the dedicated hole through the front cover as shown, and push the lever down to the full.



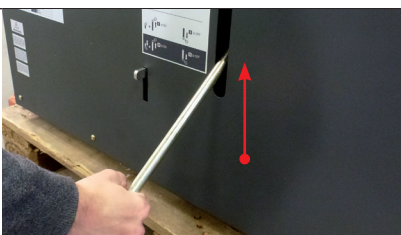
3

Check that indicators A and B are in the OFF position.



4

To switch to A Power. Insert the manual lever into the lever hole, and pull the lever up to the full.



5

Check that the position indicator A is -ON. In case the indicator does not show A-ON, repeat the above mentioned step



8. ATYS D H CHARACTERISTICS

After all checks have been verified and all programming and commissioning procedures are ready and ok, put the ATyS d H into AUTO operation. To be carried out by qualified and trained personnel.

4000 to 6300 A

Thermal current I _{th} at 40°C	4000 A	5000 A	6300 A
Rated operating voltage U _e (V)	660		
Rated insulation voltage U _i (V)	1000		
Rated impulse withstand voltage U _{imp} (kV)	12		
Number of poles	3 and 4 poles (with fully rated neutral)		
Rated short-circuit withstand at 660 VAC			
Rated short-time withstand current 0.1 s I _{cw} (kA rms)	65		
Rated short-circuit making capacity I _{cm} (kA peak)	143		
Utilisation category at 660 Vac - AC32B - IEC 60947-6-1	4000 A	5000 A	6300 A
Utilisation category at 660 Vac - AC 33iB (6xIn cos φ 0.5) - GB 14048-11	4000 A	5000 A	6300 A
Connection			
Rear connection with busbar	•	•	•
Switching time			
I to 0 (ms)	≤ 150		
0 to I and 0 to II (ms)	≤ 90		
II to 0 (ms)	≤ 200		
I-0-II / II-0-I (s)	≤ 1.2		
Operating frequency	<10 operations per hour		
Power supply			
VAC power supply (Self powered directly off SI and SII power terminals)	230		
Main coil operating current (peak during transfers)	65 A ⁽¹⁾		
Mechanical characteristics			
Durability (number of operating cycles)	3000		
Weight (kg) - Fixed model 3 poles / 4 poles	200 / 250	200 / 250	200 / 250

(1) Instantaneous value. For a complete operation, power should be available during 0.5 s.

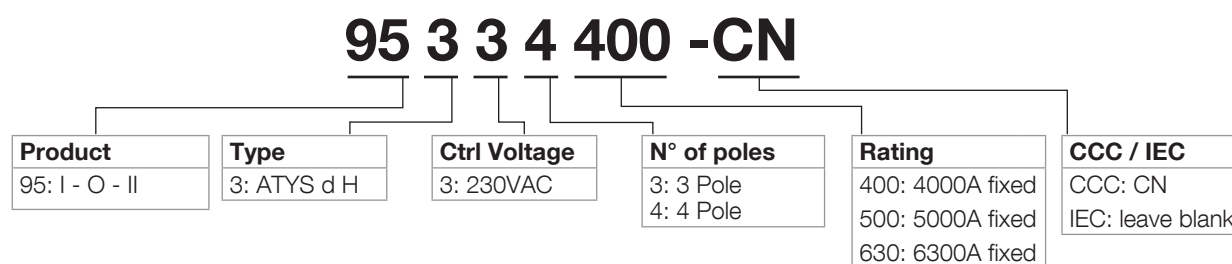
Note: Maximum cable length for position orders 5m

9. ATYS D H FAMILY: ORDERING INFORMATION

The following is an ordering guide for ATyS d H remotely operated transfer switching equipment. This guide is intended so as to explain the logic behind SOCOMEC ATyS reference numbers.

When ordering please consult the latest SOCOMEC catalogue.

Typical ATyS d H reference numbers:



CAUTION ! To order a complete automatic transfer switch order the transfer switch based on the ordering information above and the ATyS C55/C65 ATS controller separately depending on the requirement. (Refer to the spares and accessories section for reference details).

10. SPARES AND ACCESSORIES

10.1. ATyS C55/C65 ATS Controllers

ATyS C55 & C65 are complete ATSE controllers that can be used to pilot a remotely operated transfer switch of any technology: motorised switches (e.g. ATyS r, ATyS S or ATyS d M), circuit breakers or contactors. They ensure the automatic or remotely controlled transfer from one source to another, with configurable timers and thresholds, for any combination of sources: 2 transformers, 1 transformer and 1 genset or 2 gensets.

ATyS C65 is an advanced ATSE controller offering all the functions of the ATyS C55 with the addition of current, power & energy monitoring, increased I/O capacity and functions, load shedding, lift control function, energy backup, increased number of events and alarms (measurement and combination alarms) and DIRIS Digiware module compatibility.

Part Number	Image	Description
1600 0055		ATyS C55
1600 0065		ATyS C65

Refer to the ATyS C55/C65 instruction manual for details.
Available for download from www.socomec.com

10.2. Maintenance spares

Description	
Contacteur MC40	Contact SOCOMEC
Contacteur MC22	
8 pole relay HR7	
Bridge rectifier DD11	
Silicon rectifier 6A	
Main solenoid coil SPG	
Selective solenoid coil DS3	
Limit switch DZ10	
Limit switch 215G	
Limit switch V163	
Shock absorber MAK	
Arc chamber AC	

11. PREVENTIVE MAINTENANCE

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

It is recommended to clean from dust and any residue that may be present every six months. It is also recommended to verify the tightening torque of all connections and to operate the product in a full operating cycle (I – 0 – II – 0 – I : Auto and Manual) at least once every year. The main contacts should be checked visually and carefully inspected for distortion or discolour of the contacts area.

Checks	Interval			
	Normal environment		Severe environment	
Instantaneous	Once	6 months	Once	6 months
Periodic	Once	1 year	Once	6 months
Temporary	Not necessary			

11.1. Instantaneous checks

Checks Type	Details
Visual check	Discoloration of terminals due to overheating Discoloration of insulation Corrosion on any part of the product Dust in or on the product Abnormal odour from or around the product Damage such as breakage and/or distortion

11.2. Periodic checks

Item		Requirement check for...	Trouble shooting and action
Insulation materials	Contacts enclosure insulation	Damage or cracks	Stop operation safely and consider to replace the damaged parts
		Humidity and/or dust	If a lot of humidity and/or dust is present plan a safe intervention to clean the product
		Loose bolts	Tighten the bolts at the specified torque
		Arc damage on insulation barriers	If heavy spoiling is found check the contacts for any damage and consider to safely replace the damaged parts
	Arcing chamber	Serious damage to the Arcing chambers	Discoloration is considered to be a normal condition but consider to replace any parts that are broken
		Serious damage to the Arcing barriers	Consider to replace any parts that are broken or damaged.
Conductive parts	Contacts	Damage to auxiliary contacts	Light discolour - Clean with sand paper. If serious discolour consider to replace the contacts
		Surface contact	Ensure that the contact is good to avoid overheating
		Damage to contacts	Consider to replace the contacts
		Discolouring of the contacts	Clean or replace contacts depending on the damage
		Loose bolts on the contacts	Tighten to the specified torque
Operation	Mechanical Operation	Moving parts dry or scratched	Lubricate moving parts
		Damage or rust on moving parts	Evaluate the damage and replace the parts when safe
		Damage or rust on the springs	Replace the damage parts
		Loose bolts and nuts	Tighten to the specified torque
		Loose or damaged E ring, shock absorbers and/or stoppers	Fix or replace in the right position

12. MAINTENANCE AND TROUBLE SHOOTING

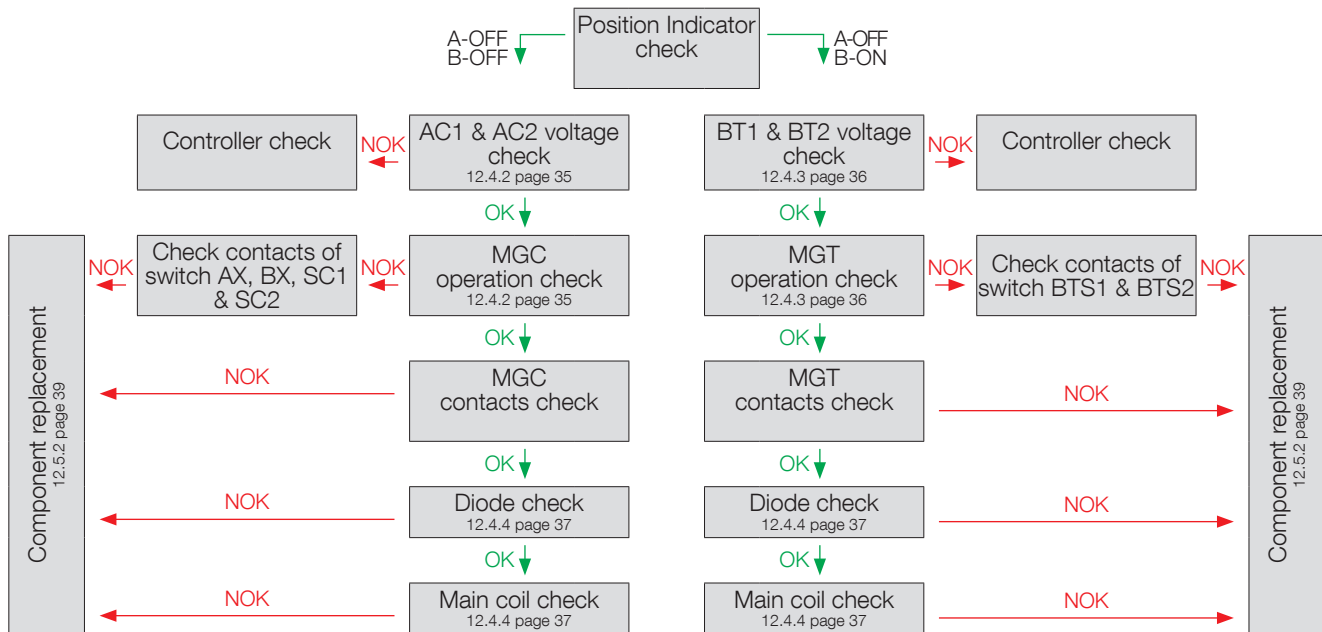


DANGER ! Maintenance and trouble-shooting must only be carried out by qualified and authorised personnel that are equipped with the right tools and protective wear whilst following safe procedures and practices. Failure to do so may result in electric shock, burns, physical disability and/or death. Furthermore note that any maintenance such as verification of the contacts: replacement on the main coil will required the use of adequate lifting equipment.

12.1. The ATyS d H fails to switch to A-ON (Position I)

- Check that the voltage on terminals A1 and A2 is available and within the limits of 220-240 VAC
- Check that the circuit breaker for A power is ON
- Check that the power output between terminals CP and CN is within 220-240 VAC
- Refer to section «12.4.1. Circuit and components check (Dual Power Supply output circuit – DPS)», page 34

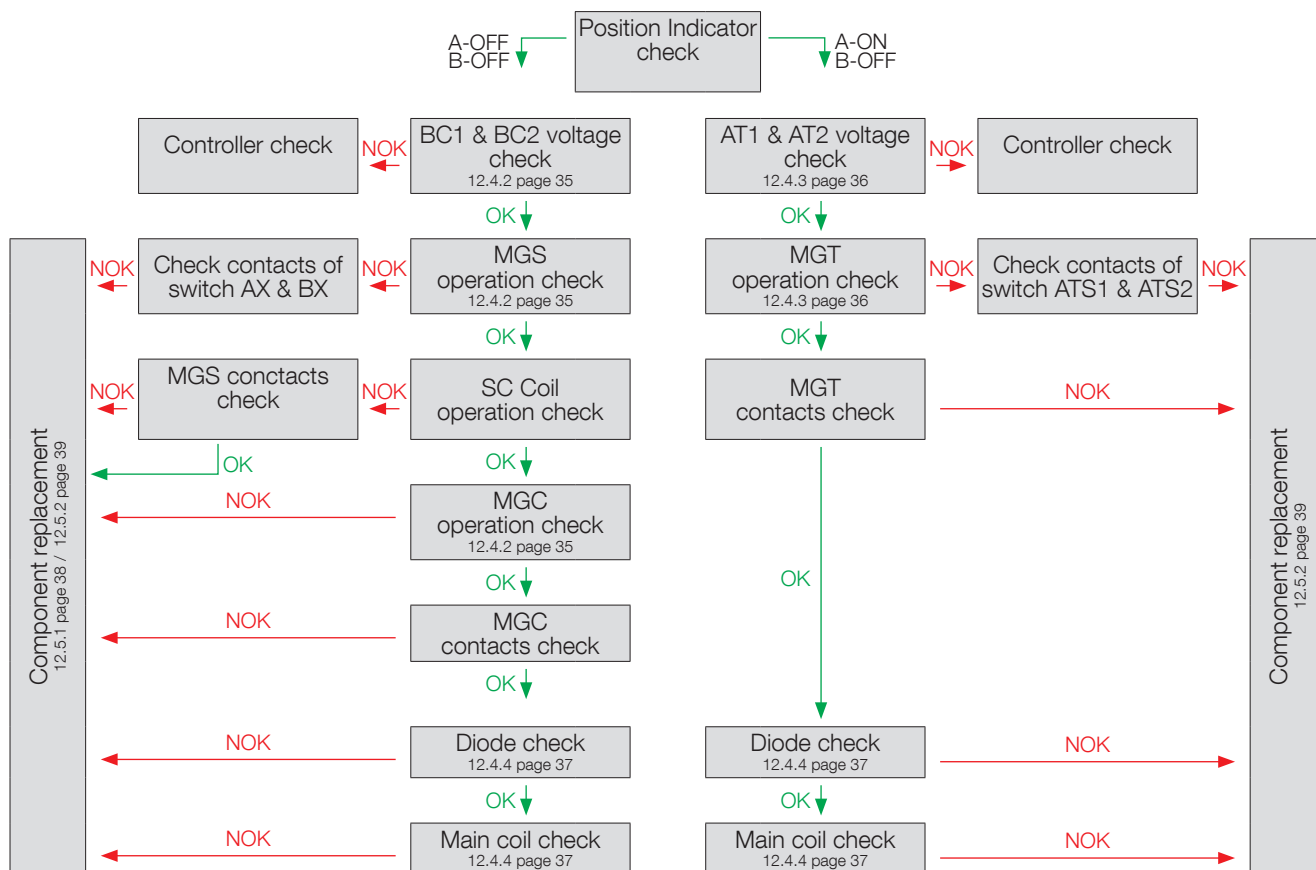
After carefully checking the above go through the following fault-finding procedures:



12.2. The ATyS d H fails to switch to A-OFF or B-OFF (Position I or position II to OFF)

- Check that the voltage on terminals B1 and B2 is available and within the limits of 220-240 VAC
- Check that the circuit breaker for B power is ON
- Check that the power output between terminals CP and CN is within 220-240 VAC
- Refer to section «12.4.1. Circuit and components check (Dual Power Supply output circuit – DPS)», page 34

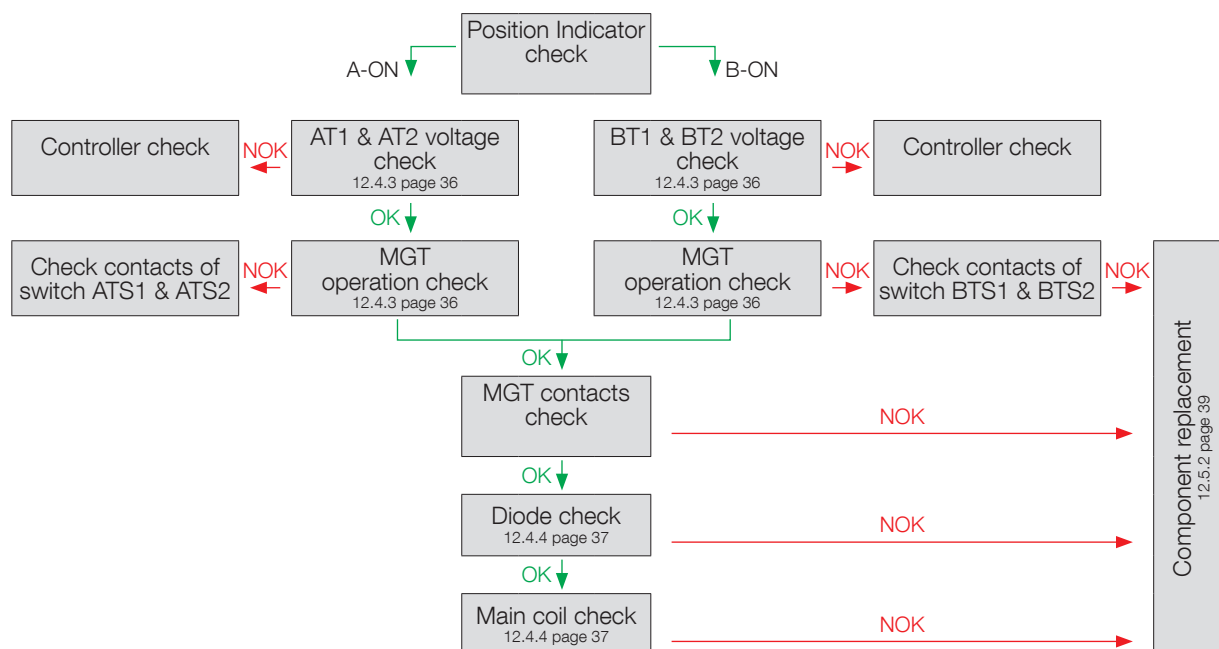
After carefully checking the above go through the following fault-finding procedures:



12.3. The ATyS d H fails to switch to B-ON (Position II)

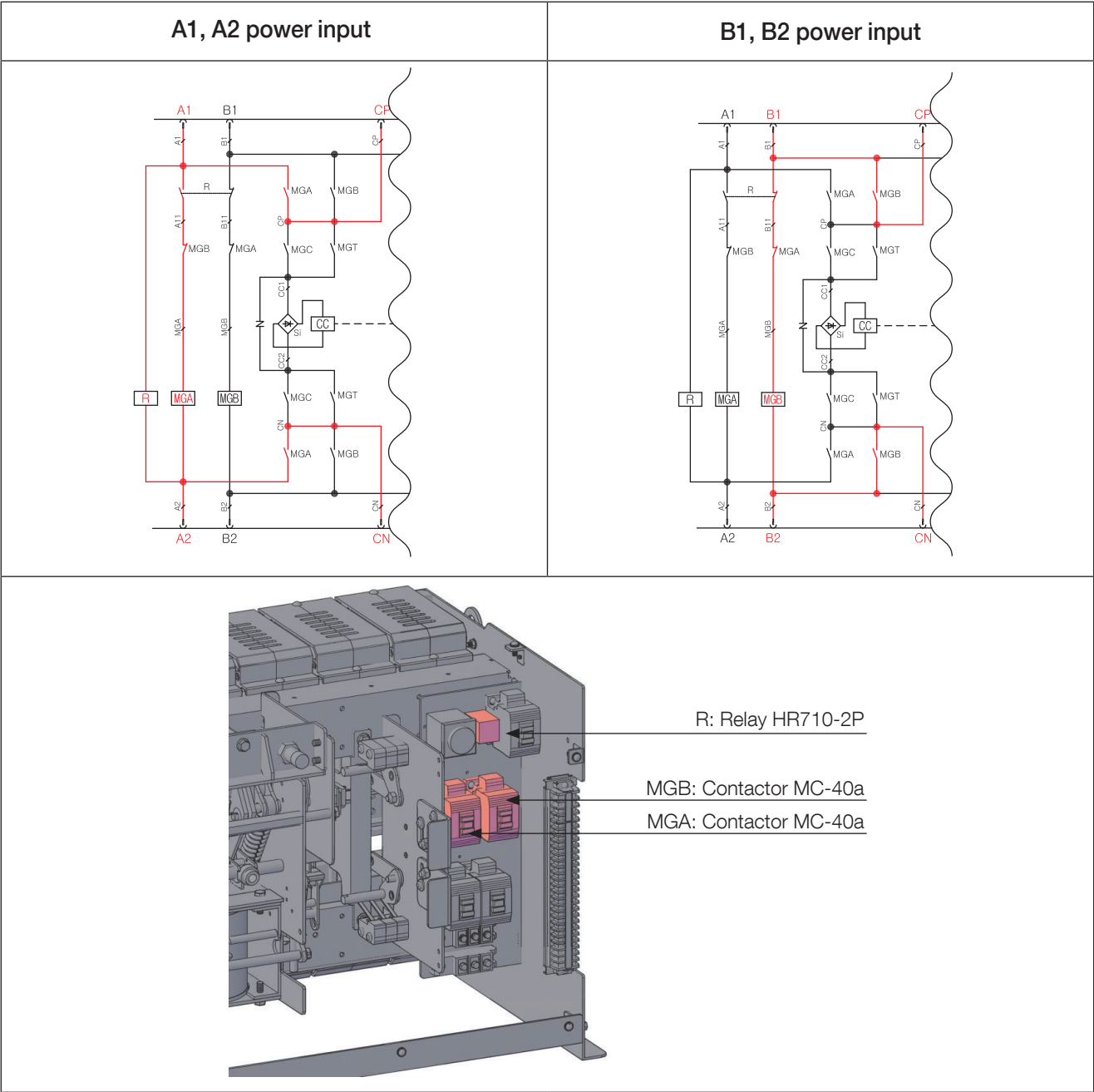
- Check that the voltage on terminals “A1 and A2” or “B1 and B2” is available and within the limits of 220-240 VAC
- Check that the circuit breaker for A power and/or B power is ON
- Check that the power output between terminals CP and CN is within 220-240 VAC
- Refer to section «12.4.1. Circuit and components check (Dual Power Supply output circuit – DPS)», page 34

After carefully checking the above go through the following fault-finding procedures:



12.4. Loop checks

12.4.1. Circuit and components check (Dual Power Supply output circuit – DPS)



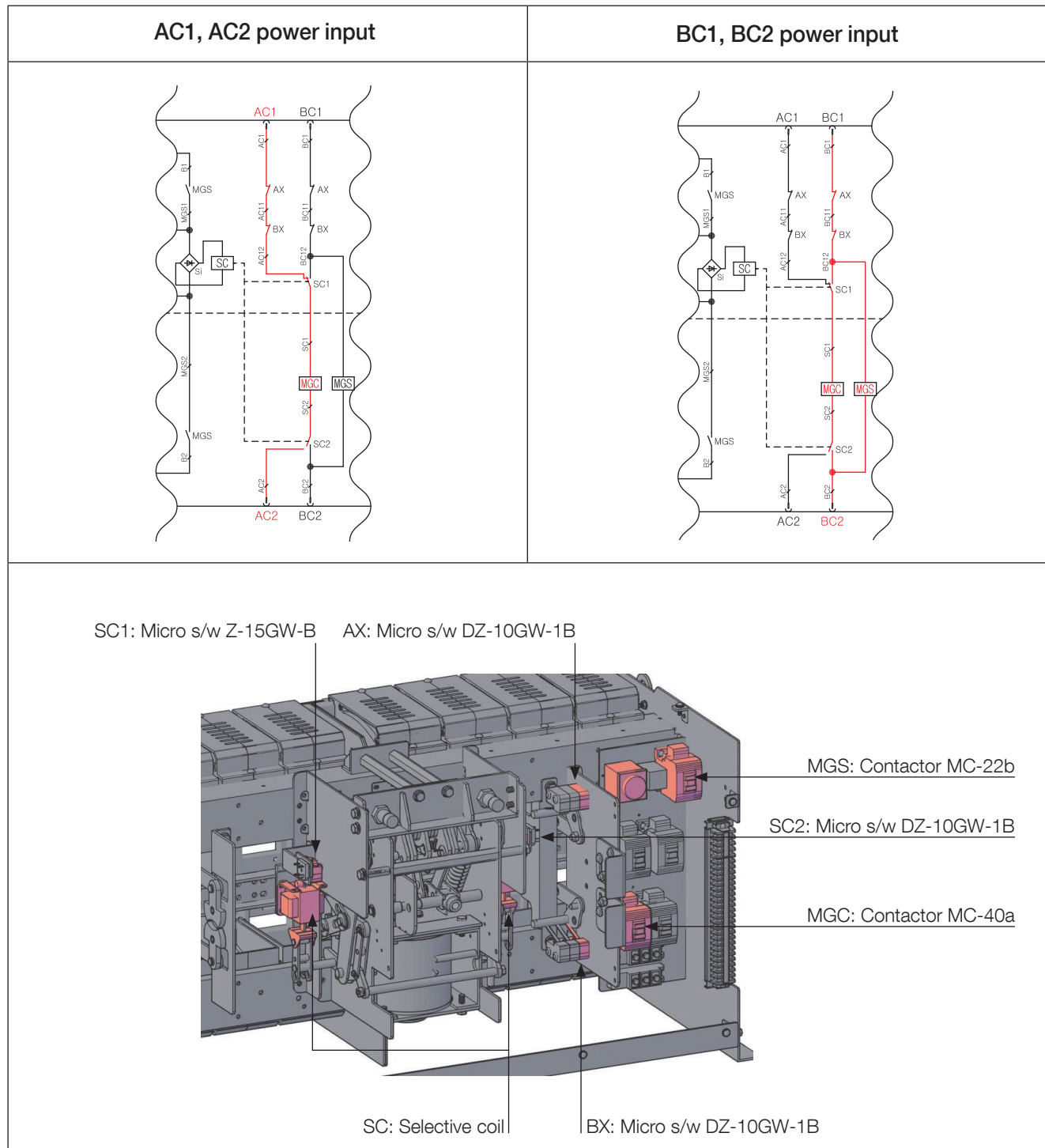
Note:

A – Power fed through A1 – A2 input terminals takes priority over B – Power supplied through B1 – B2 terminals. The output terminals CP – CN are supplied by A – Power when both A and B – Power supplies are both available.

- Should there be no output phase / neutral voltage between CP – CN terminals with A1 – A2 active, check relay R and contactor MGA for contact continuity and correct operation.
- Should there be no output phase / neutral voltage between CP – CN terminals with B1 – B2 active, check relay R and contactor MGB for contact continuity and correct operation.

12.4.2. Change MGC circuit check (Contactor closing coil)

Ensure that any automatic controls in auxiliary equipment is put to manual mode before carrying out an MGC circuit check.



- Give the A-ON order by powering AC1 and AC2 terminals with an impulse command.
- Should MGC not operate check the contacts of AX, BX, SC1, SC2.

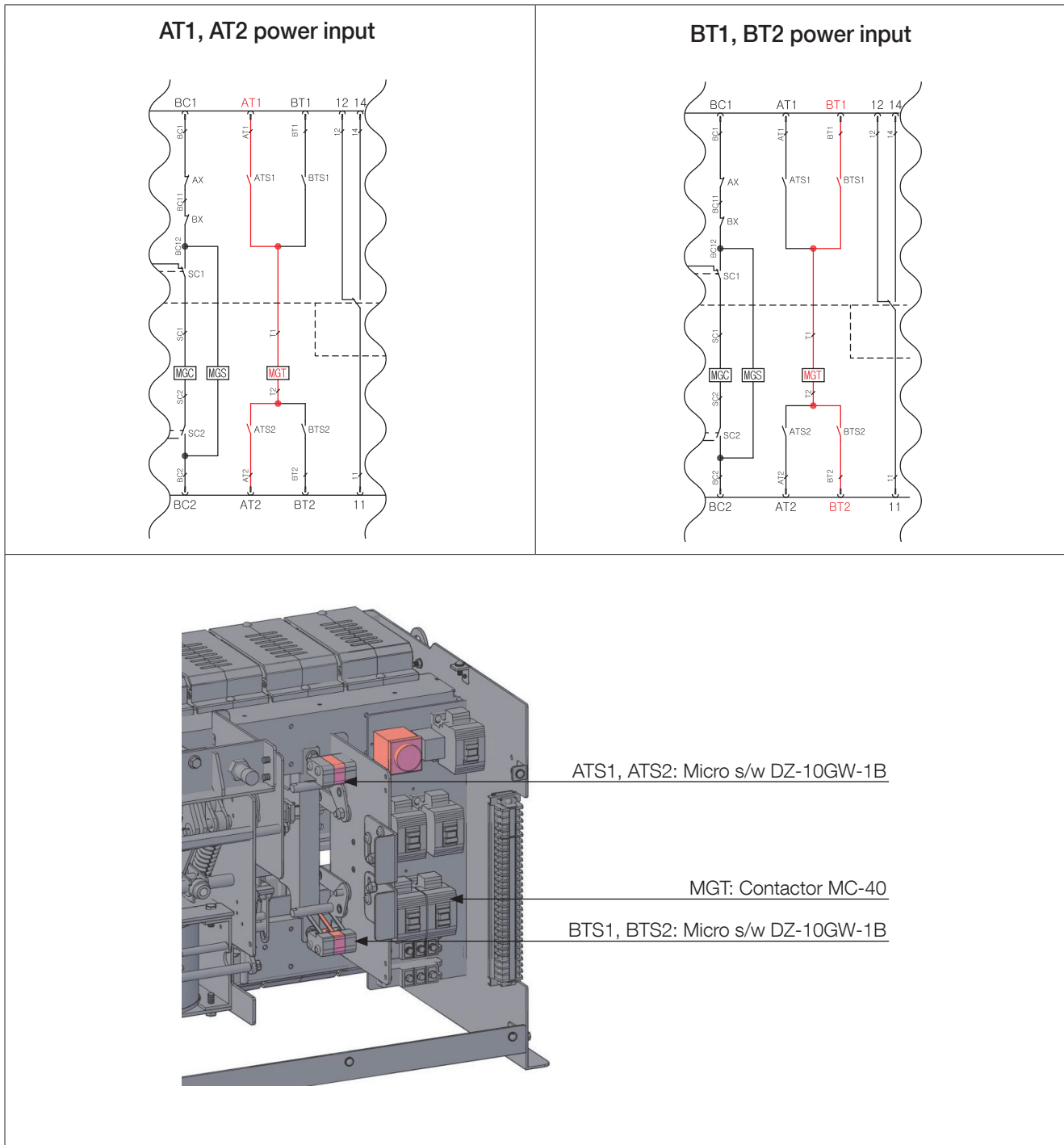
Action required: Replace any component found defective.

- Similarly give the B-ON order by powering BC1 and BC2 terminals with an impulse command.
- If MGS is not operating properly then check that contacts SC1 and SC2 operate solenoid SC.

Action required: Replace any component found defective.

12.4.3. MGT circuit check (Relay tripping coil)

Ensure that any automatic controls in auxiliary equipment is put to manual mode before carrying out an MGT circuit check.



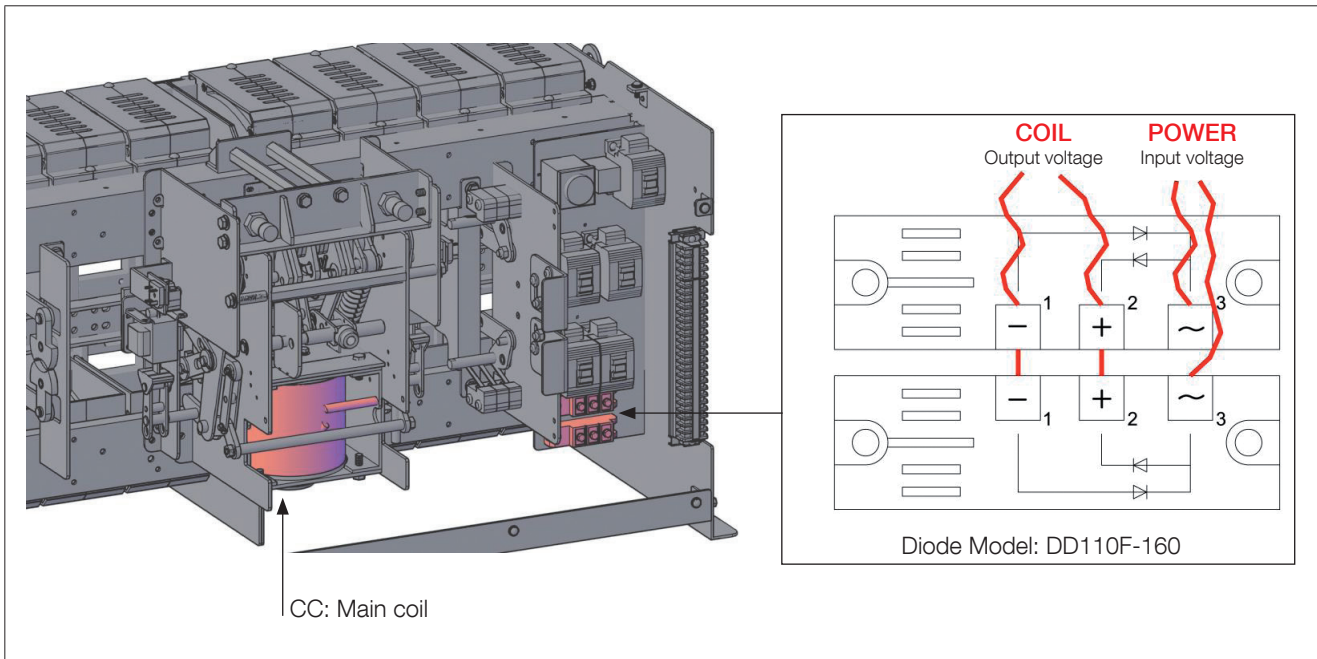
- Give the A-OFF order by powering AT1 and AT2 terminals with an impulse command.
- Should MGT not operate check the micro switch contacts of ATS1, ATS2.

Action required: Replace any component found defective.

- Similarly give the B-ON order by powering BT1 and BT2 terminals with an impulse command.
- If MGS is not operating properly then check that contacts BTS1, BTS2.
- If MGS does not operate then check that micro-switch SC1 and SC2 operate selective coil SC.

Action required: Replace any component found defective.

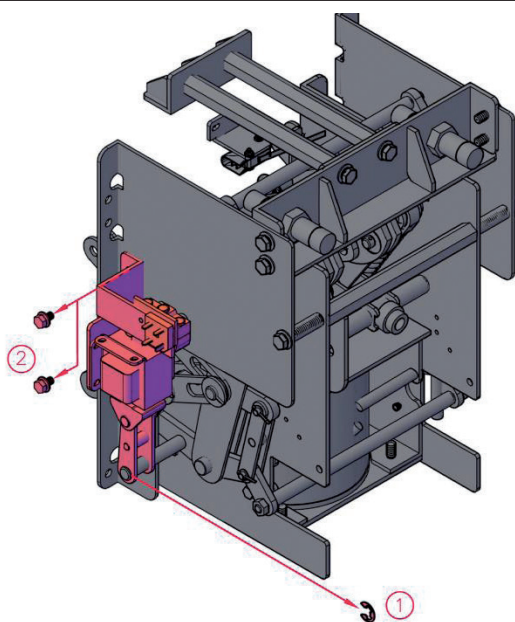
12.4.4. Diode rectifier & Main coil check



- Check the input AC voltage of the rectifier
- Replace the diode if there is input voltage with no output on the component. (Refer to the diagram above for contacts and polarity).
- If the diode is found to be OK check the voltage and resistance value of the main coil. The diode must be put out of circuit to check measure resistance of the main coil.
- The resistance should be 2.2 Ω

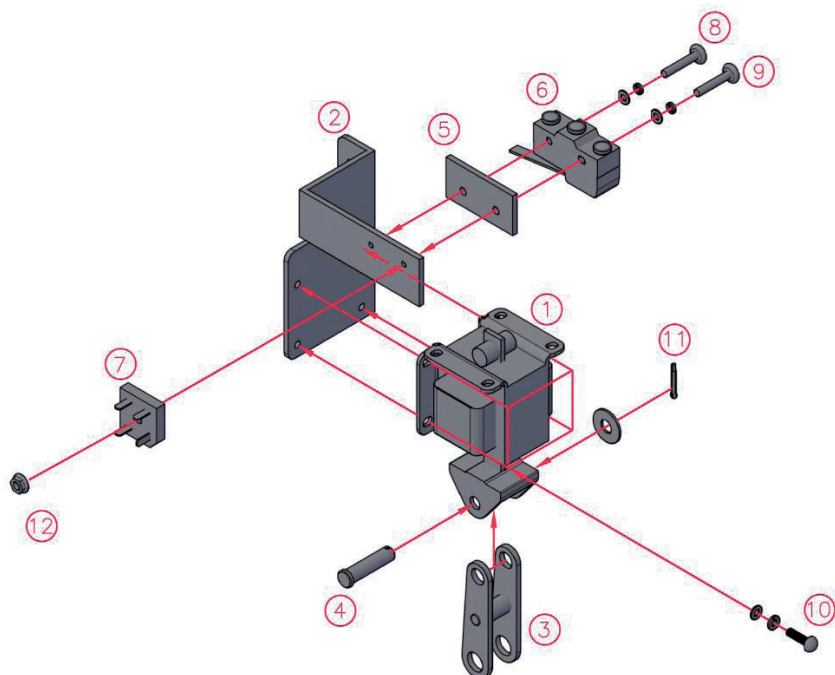
12.5. Construction of the main components

12.5.1. Selective coil assembly



Parts name

- ① E Washer Ø 10mm
- ② Screw M6x12

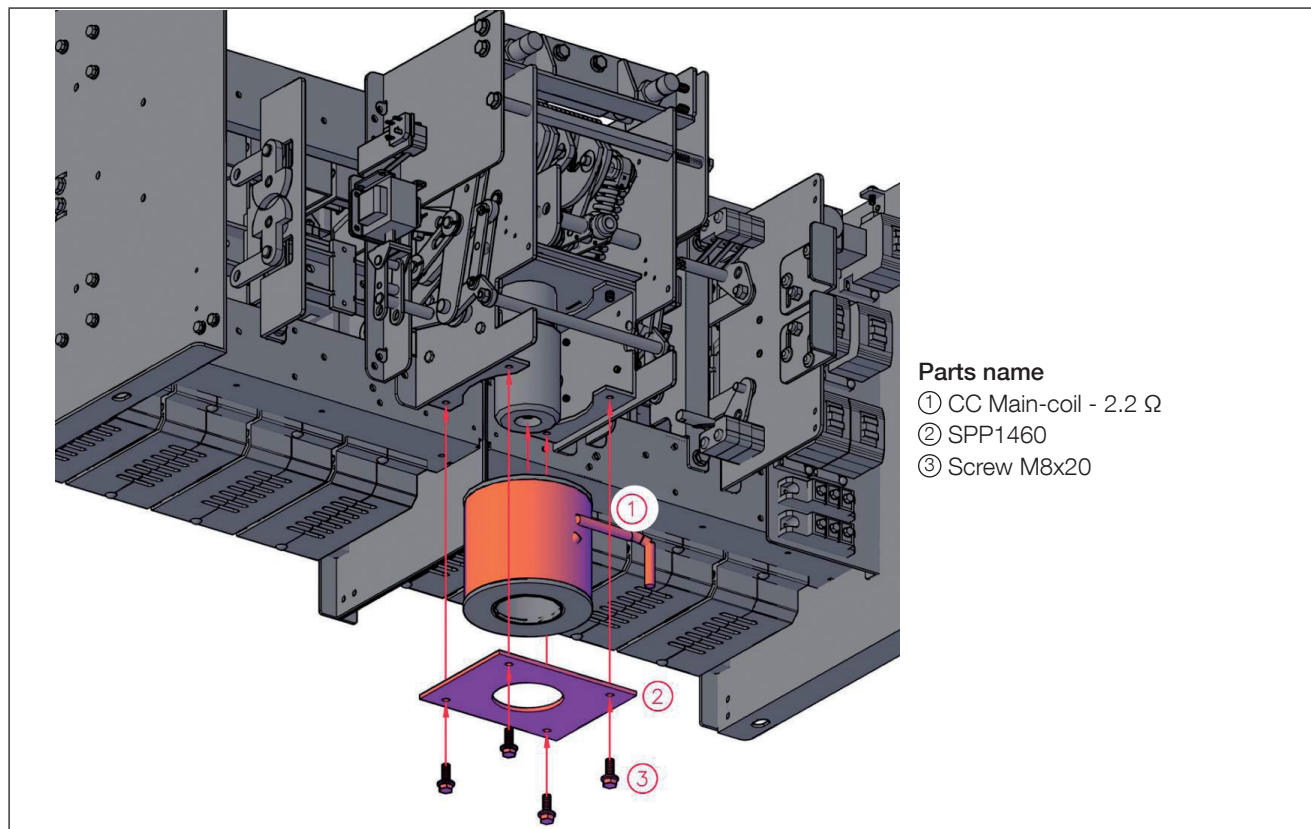


Parts name

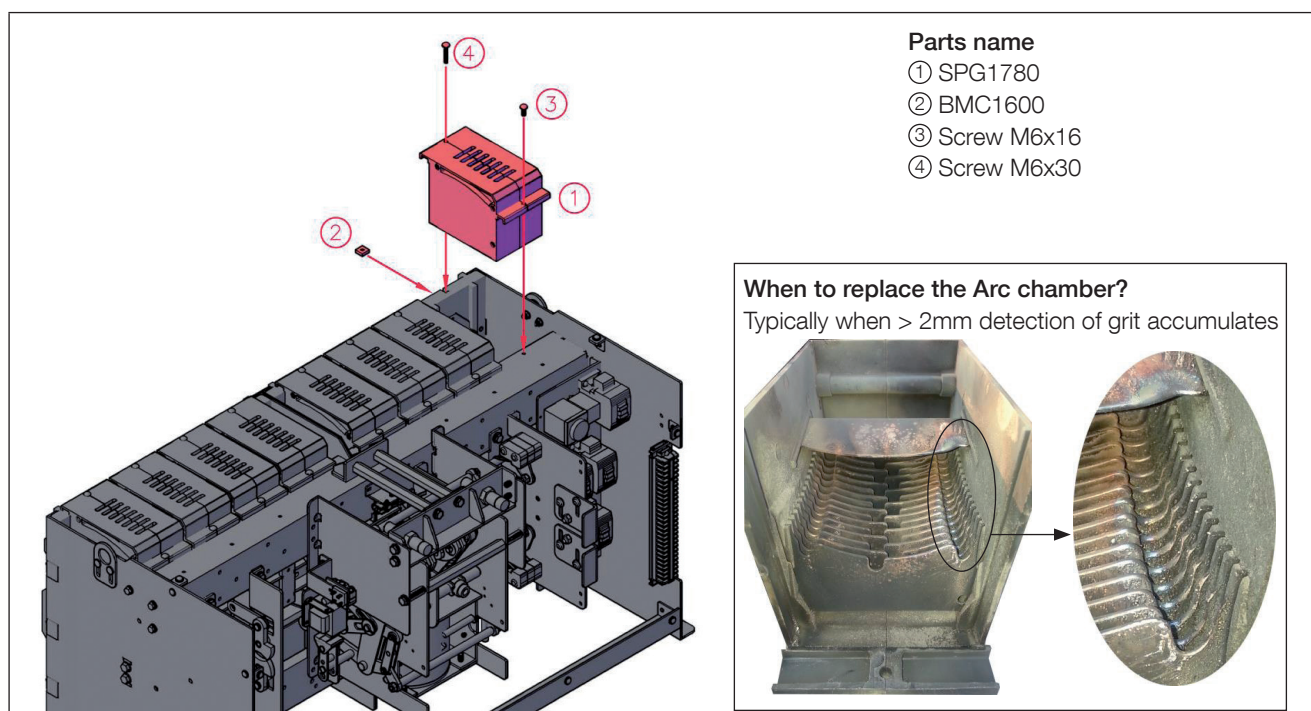
- ① Selective coil DS-302MD
- ② SNP1190
- ③ SNG1010
- ④ SNC1150
- ⑤ STP1220
- ⑥ SC1, SC2 Micro s/w Z-15GW-B
- ⑦ Silicon Rectifier 6A100
- ⑧ Screw M4x25
- ⑨ Screw M4x40
- ⑩ Screw M5x10
- ⑪ Split pin Ø 2x30
- ⑫ Nut M5

 Note: the selective coil assemblies SC are placed on either side of the main electro-mechanical switching assembly shown above.

12.5.2. Main coil

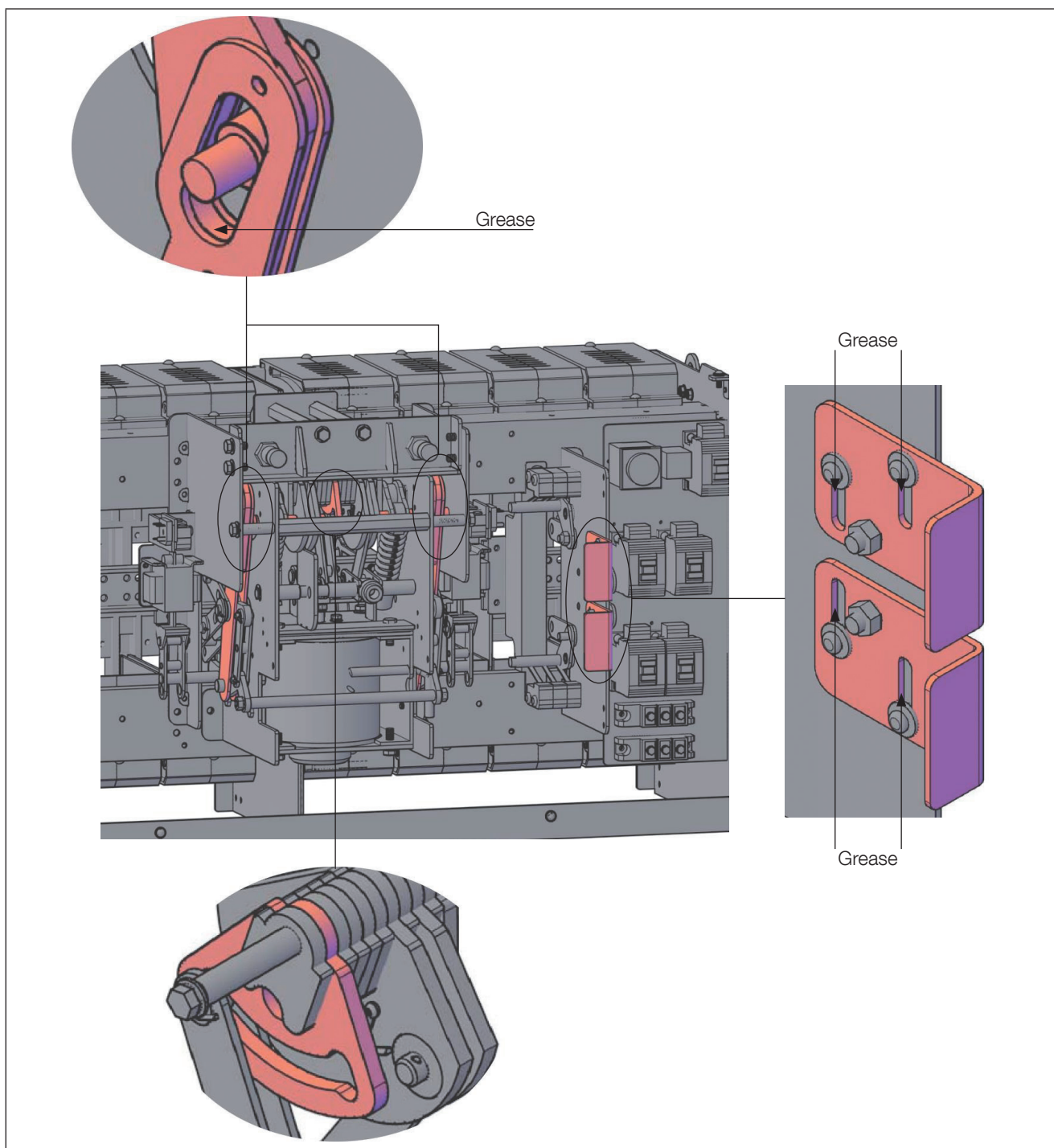


12.5.3. Arc chamber

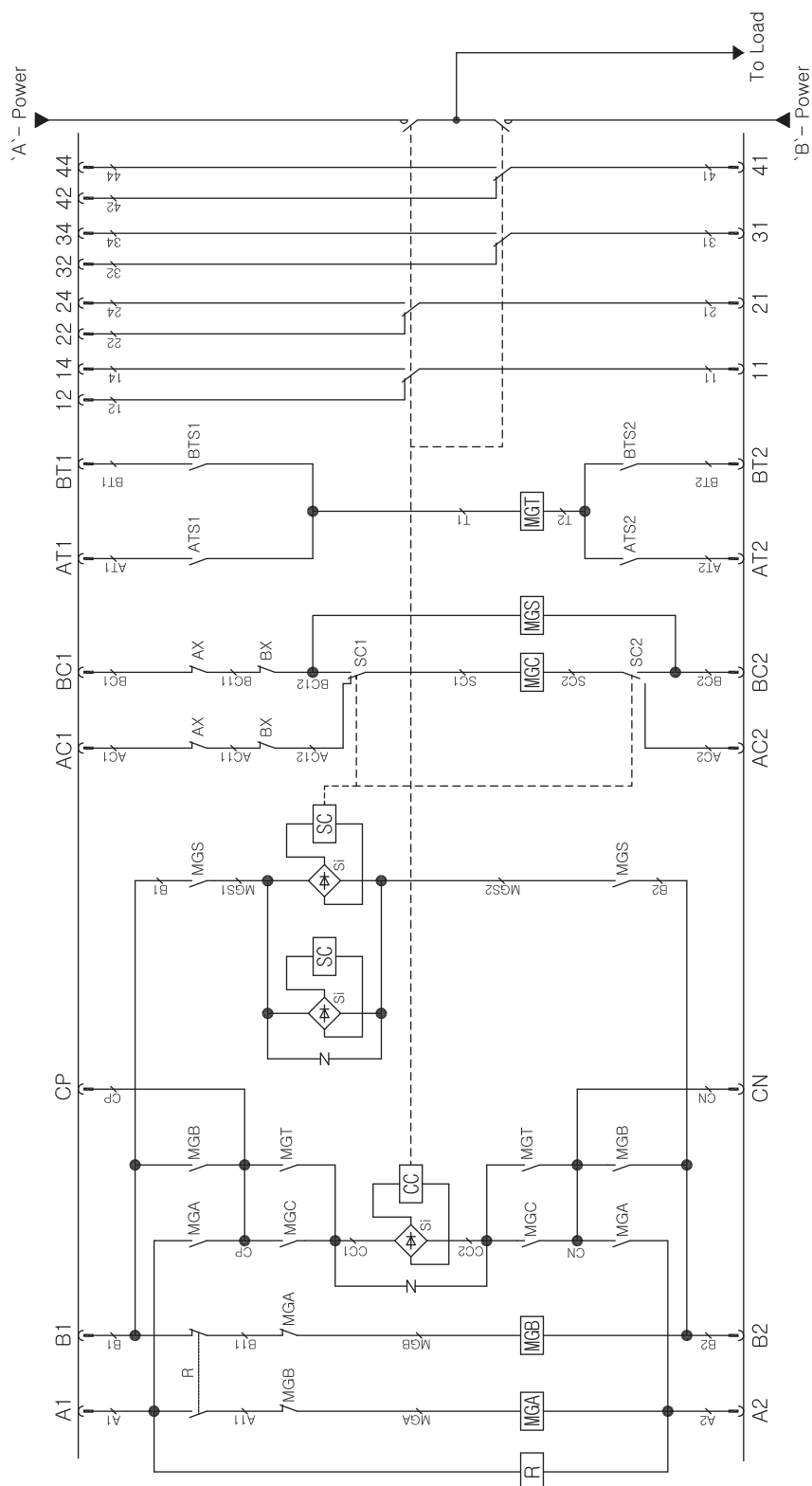


12.6. Lubrication

Grease shall be injected onto specific points in the mechanical cradle evenly and “MUST” only be applied to parts and in the marked positions as shown below.



13. CIRCUIT DIAGRAM



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