

# **Upsilon STS**

30A-60A-100A-160A  
250A-400A-600A

## **Installation and user manual**



THE UNINTERRUPTIBLE POWER PROVIDER

**M G E**  
UPS SYSTEMS







# Introduction

Thank you for selecting an MGE UPS SYSTEMS product to protect your electrical equipment.

The **Upsilon STS** range has been designed with the upmost care. We recommend that you take the time to read this manual to take full advantage of the many features of your new equipment.

MGE UPS SYSTEMS pays great attention to the environmental impact of its products. Measures that have made **Upsilon STS** a reference in environmental protection include:

- ▶ the eco-design approach used in product development,
- ▶ production on an industrial site certified ISO 14001,
- ▶ recycling of **Upsilon STS** at the end of its service life.

To discover the entire range of MGE UPS SYSTEMS products and the options available for the **Upsilon STS** range, we invite you to visit our web site at [www.mgeups.com](http://www.mgeups.com) or contact your MGE UPS SYSTEMS representative.

All products in the **Upsilon STS** range are protected by patents. They implement original technology not available to competitors of MGE UPS SYSTEMS.

To take into account evolving standards and technology, equipment may be modified without notice. Indications concerning technical characteristics and dimensions are not binding unless confirmed by MGE UPS SYSTEMS.

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# Foreword

## Using this document

Information may be found primarily by consulting:

- ▶ the contents,
- ▶ the index.

## Pictograms Document

	Important instructions that must be followed
	Information, advice, help
	Visual indication
	Action
	Audio indication
	LED off
	LED flashing
	LED on green
	LED on orange
	LED on red
	Earth cables
	Other cables

### Display

		Up / down selection			Go up or down one page
					Select date for event log consultation
		Confirm			Increase
		Details			Reduce
		Scrolling menu			Save
		Graphic display			Enter characters
		Graphic display			Phase-to-neutral measurements
		Graphic display			Phase-to-phase measurements
88.8 8.88		Digital display			Interrupt manual transfer without break
E S C		Return to previous display			Transfer
D E L		Delete			Alarm
		Access to measurements	0101 1010 0101		Status conditions
		Buzzer off			Settings
					Maintenance

**Note:** LEDs and switches are represented in their rest position. Transient conditions are indicated by dotted arrows.



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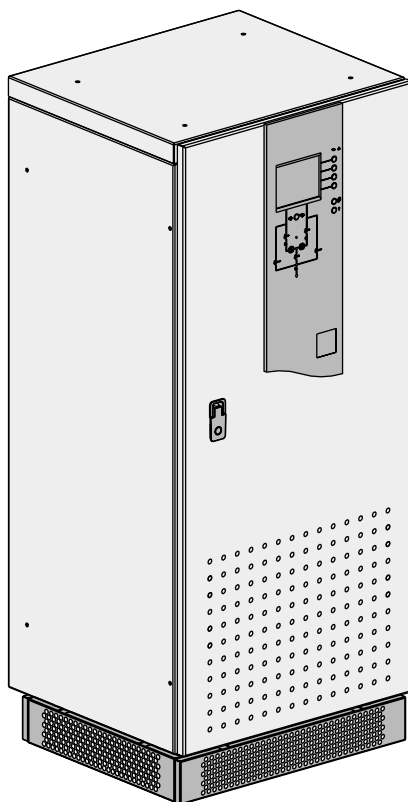
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# 1. Presentation

## 1.1 Upsilon STS 30 - 60 - 100 - 160 - 250 A (cabinet 1400 mm high)



### Dimensions in mm

Height	Width	Depth
1400	600	500

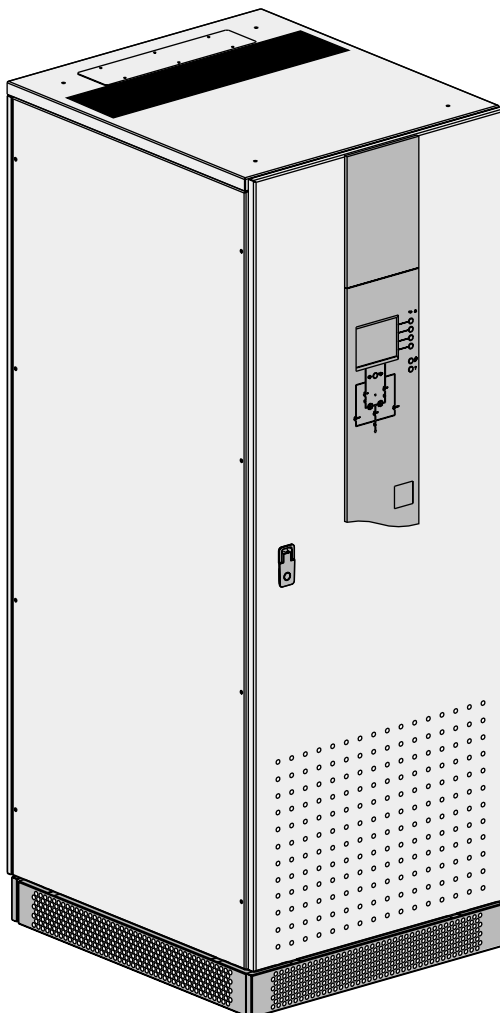
### Weight in kg

Upsilon STS	
30 - 60 - 100 A	157 kg
160 - 250 A	174 kg

### Footprint

0.45 m <sup>2</sup>
---------------------

## 1.2 Upsilon STS 30 - 60 - 100 - 160 - 250 - 400 - 600 A (cabinet 1900 mm high)



### Dimensions in mm

Height	Width	Depth
1900	715	800

### Weight in kg

Upsilon STS	
30 - 60 - 100 A	215 kg
160 - 250 A	225 kg
400 - 600 A	327 kg

### Footprint

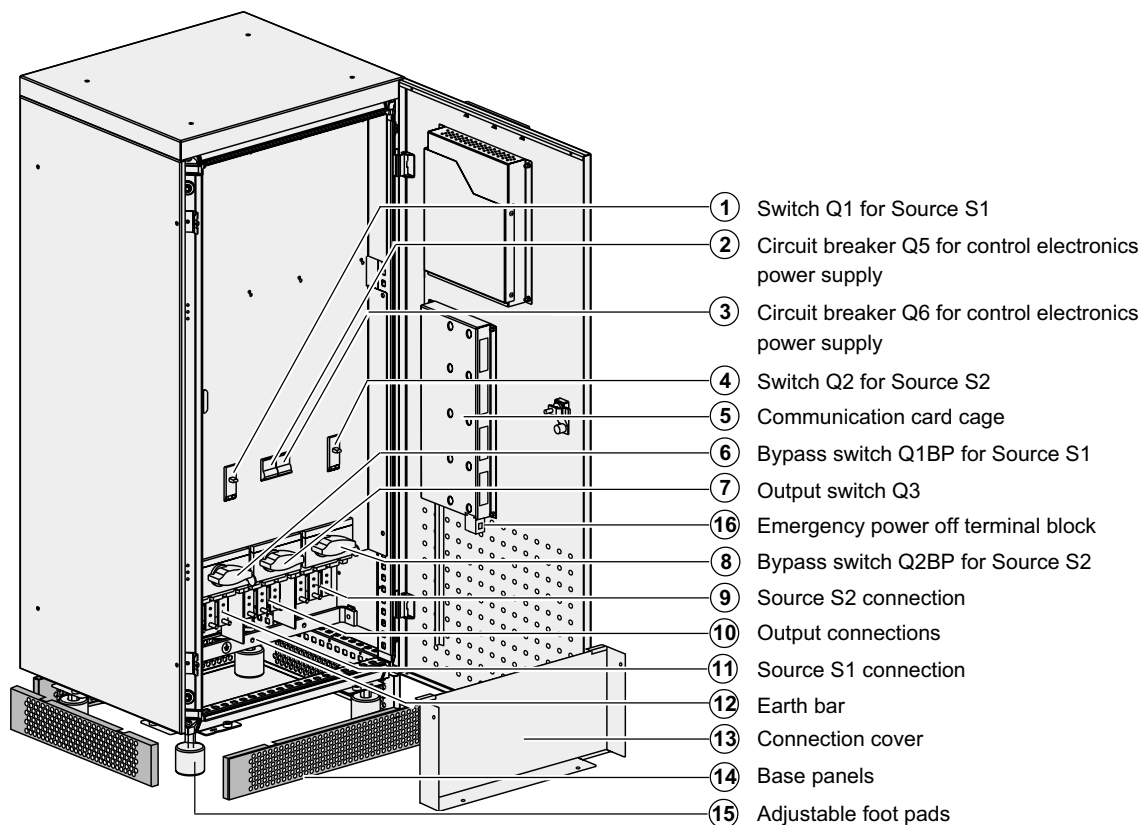
0.57 m <sup>2</sup>
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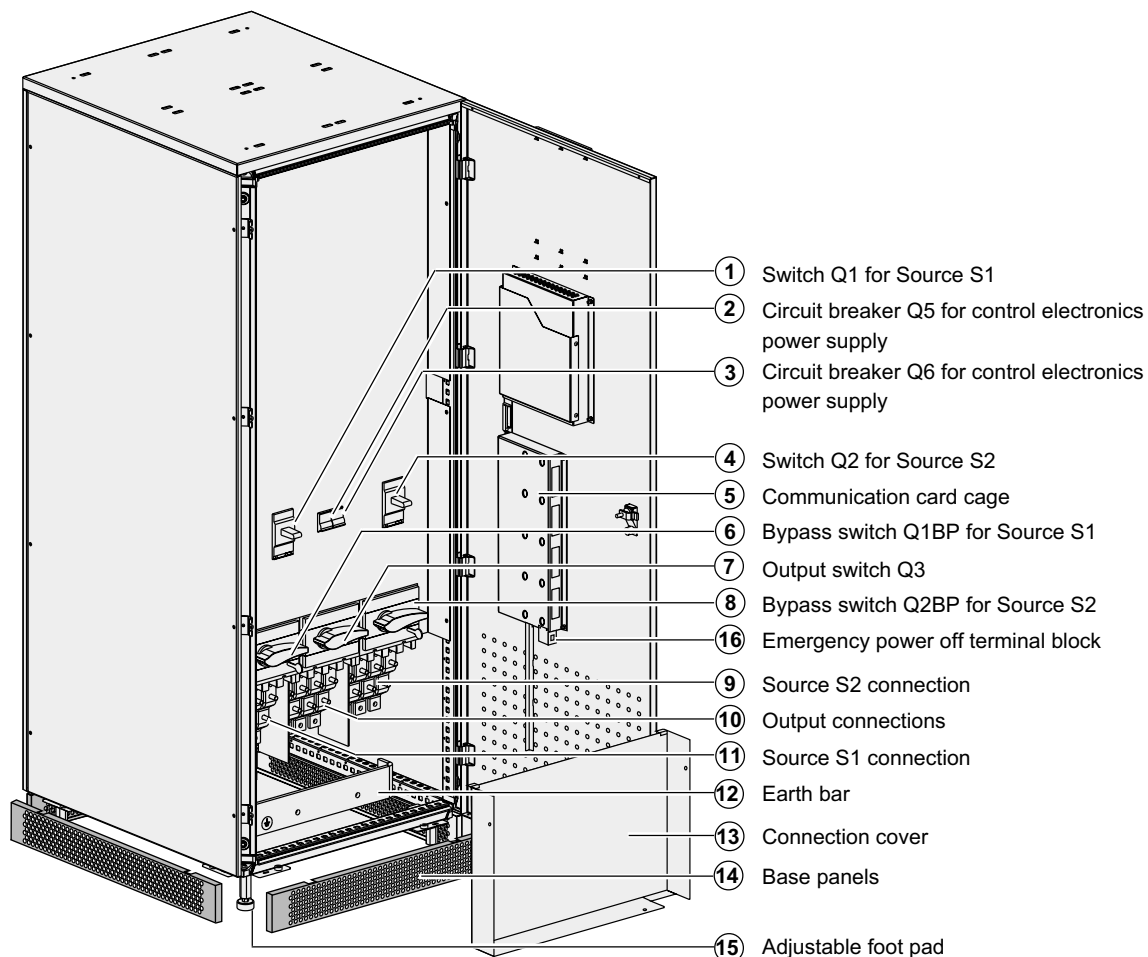
# 1. Presentation

## 1.3 Access to control and connections

**Upsilon STS 30 - 60 - 100 - 160 - 250 A** (cabinet 1400 mm high)

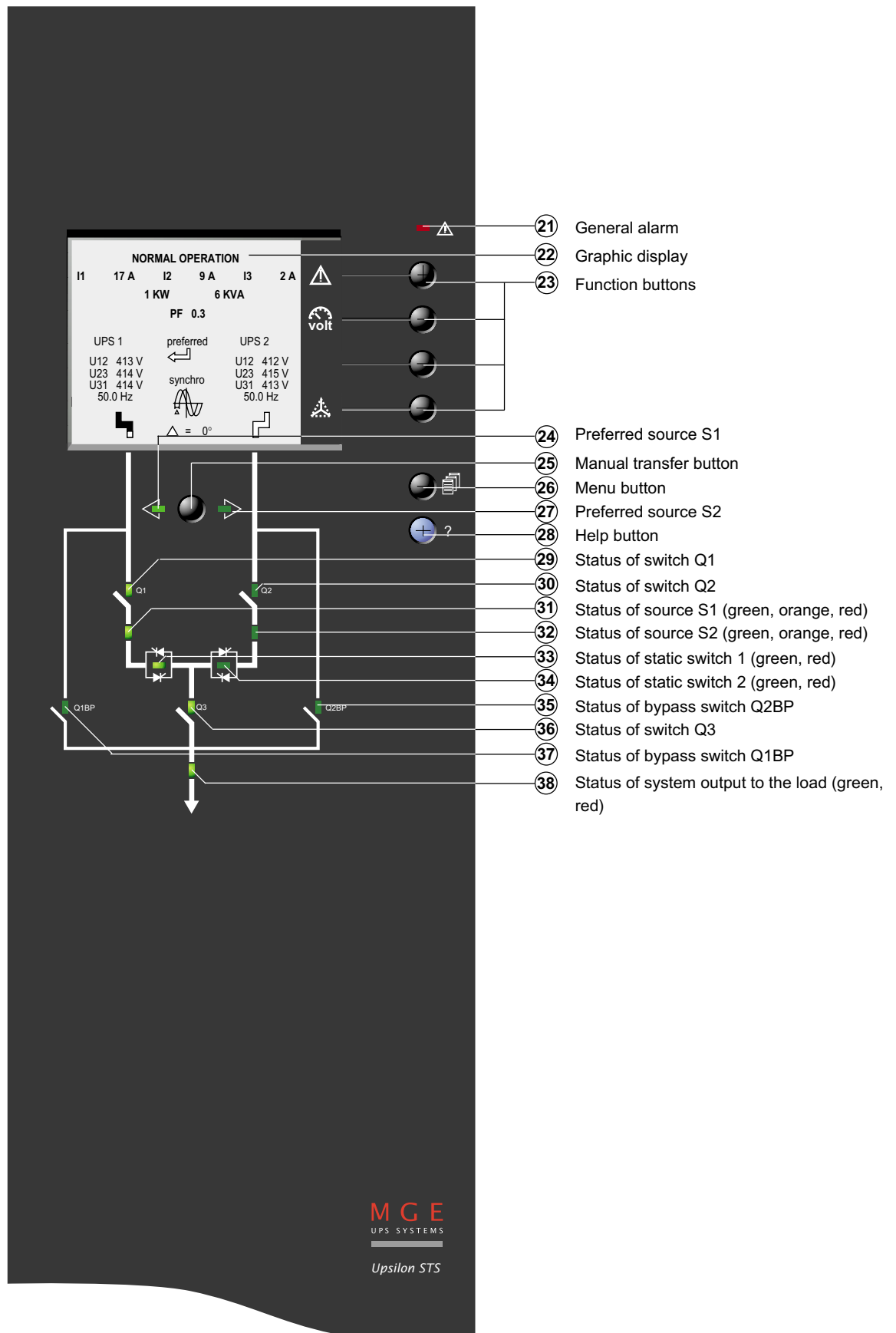


**Upsilon STS 30 - 60 - 100 - 160 - 250 - 400 - 600 A** (cabinet 1900 mm high)





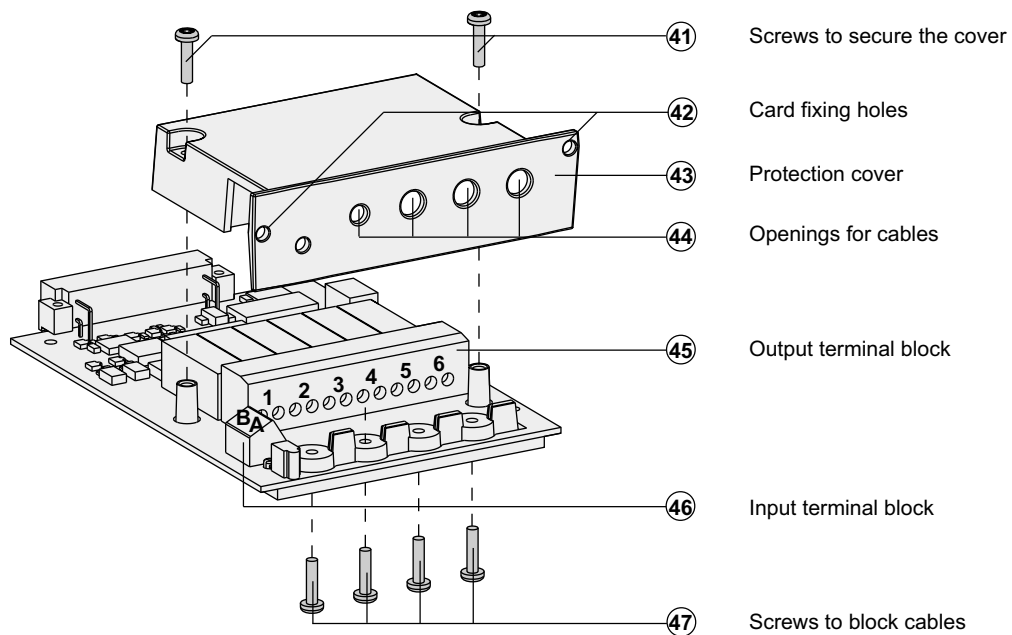
## 1.4 Man / machine interface



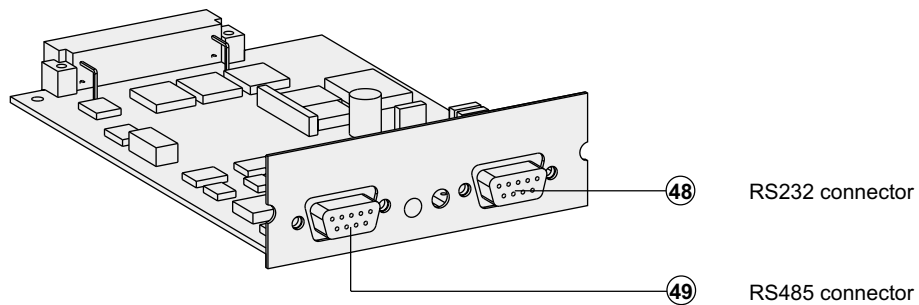


# 1. Presentation

## 1.5 Relay communication card



## 1.6 JBus communication card

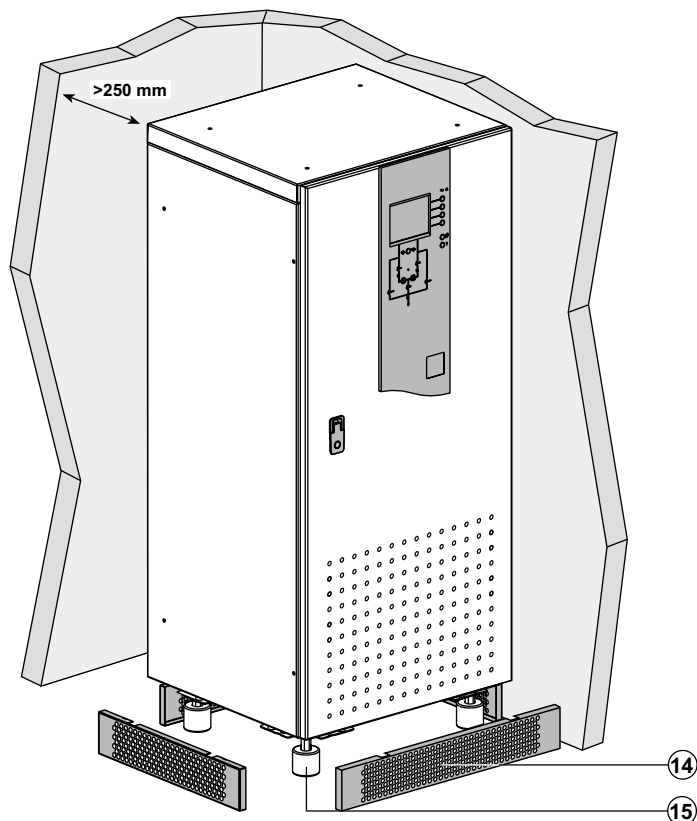




## 2. Installation

### 2.1 Positioning

**Upsilon STS 30 - 60 - 100 - 160 - 250 A** (cabinet 1400 mm high)

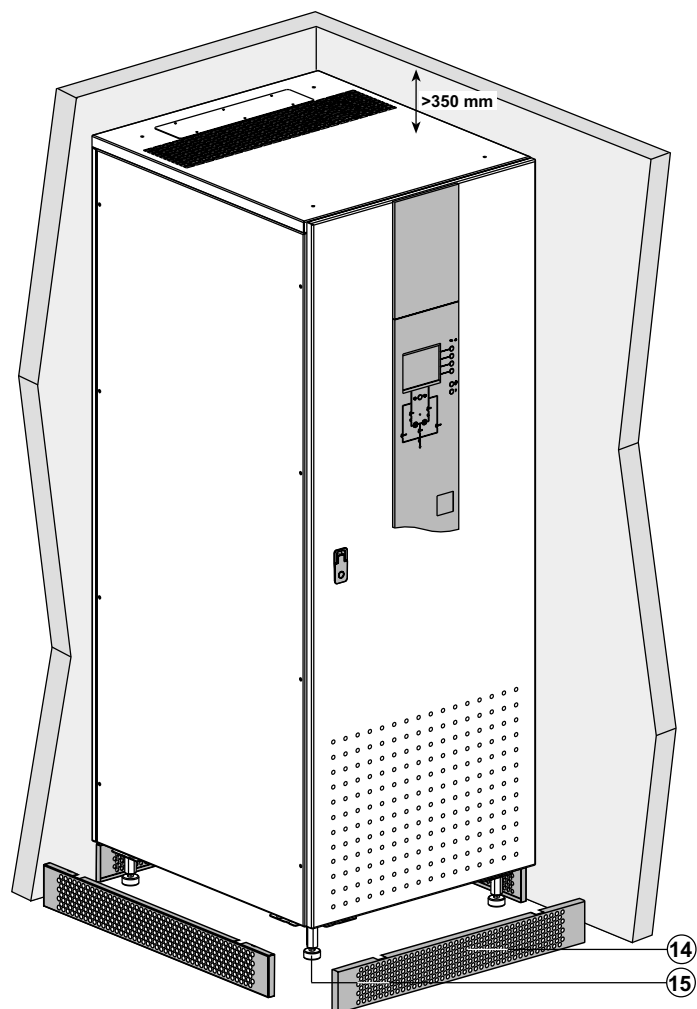


- 1 - Unclip the base panels (14).
- 2 - Set the cabinet to a level position using the adjustable foot pads (15).
- 3 - Put the base panels (14) back in place.



**Important: correct ventilation requires at least 250 mm of free space behind the cabinet.**

**Upsilon STS 30 - 60 - 100 - 160 - 250 - 400 - 600 A** (cabinet 1900 mm high)



- 1 - Unclip the base panels (14).
- 2 - Set the cabinet to a level position using the adjustable foot pads (15).
- 3 - Put the base panels (14) back in place.



**Important: correct ventilation requires at least 350 mm of free space above the cabinet.**



# 2. Installation

## 2.2 Power connections

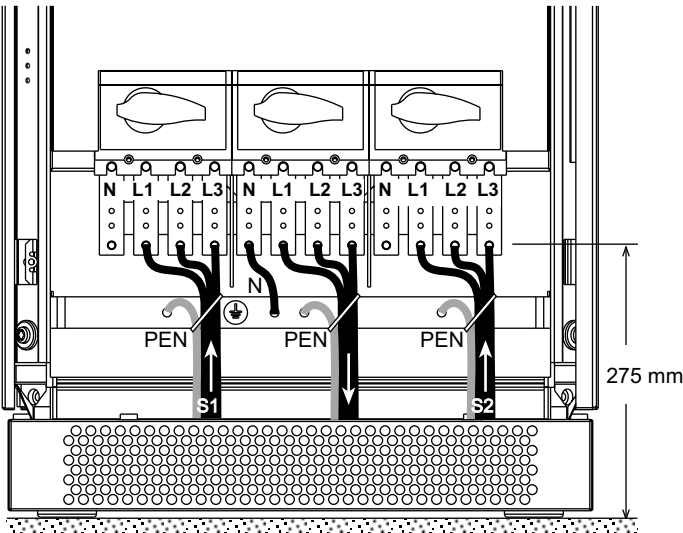


See section 6.1 for information on sizing protection devices and cables (Appendix, Technical data).

Two cables maximum may be used per phase.

### Upsilon STS 30 to 250 A

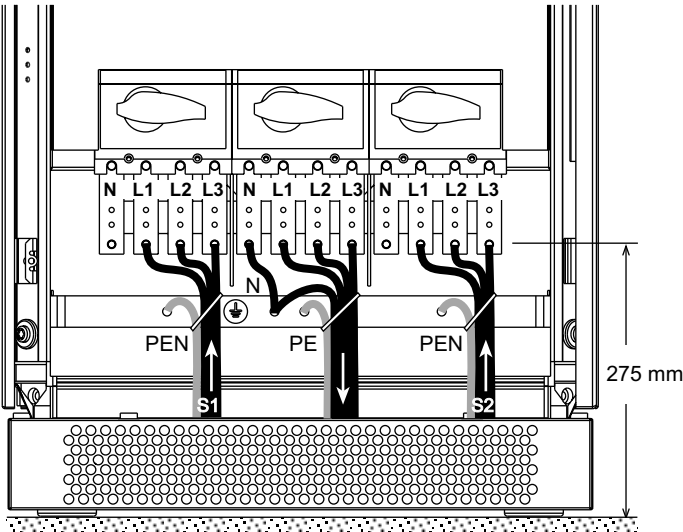
**Input: 3 phases + PEN**  
**Output: 3 phases + PEN**



See section 1.3 for information on accessing the connections.  
Connections are made using lugs connected to threaded studs (diameter 8 mm).  
The cables are tied to the earth bar.

### Upsilon STS 30 to 250 A

**Input: 3 phases + PEN**  
**Output: 3 phases + PE + Neutral**



See section 1.3 for information on accessing the connections.  
Connections are made using lugs connected to threaded studs (diameter 8 mm).  
The cables are tied to the earth bar.

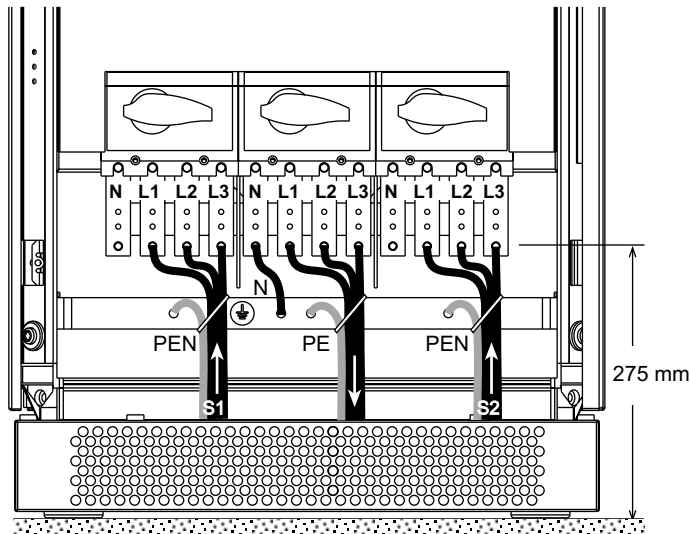


## 2. Installation

**Upsilon STS 30 to 250 A**

**Input: 3 phases + PEN**

**Output: 3 phases + PE**



See section 1.3 for information on accessing the connections.

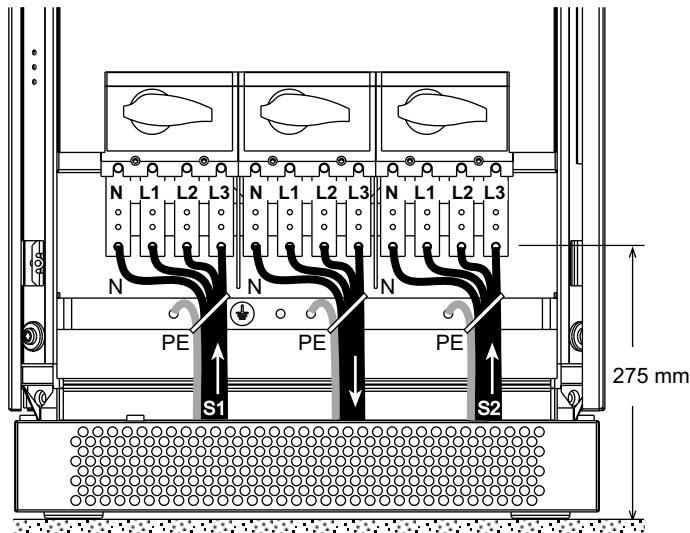
Connections are made using lugs connected to threaded studs (diameter 8 mm).

The cables are tied to the earth bar.

**Upsilon STS 30 to 250 A**

**Input: 3 phases + PE + Neutral**

**Output: 3 phases + PE + Neutral**



See section 1.3 for information on accessing the connections.

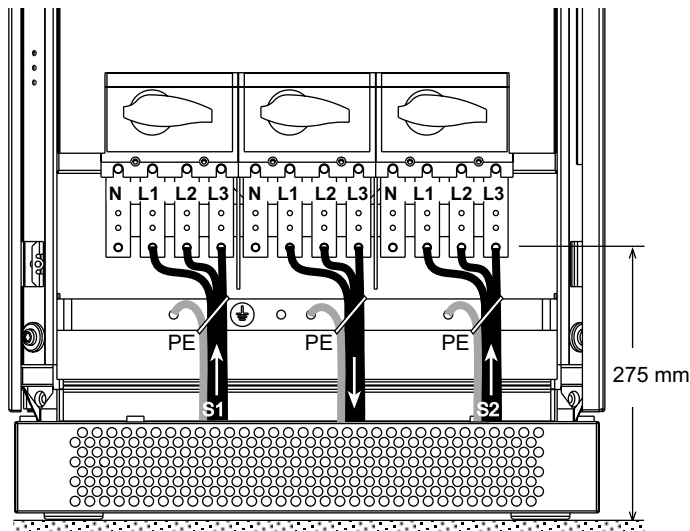
Connections are made using lugs connected to threaded studs (diameter 8 mm).

The cables are tied to the earth bar.

**Upsilon STS 30 to 250 A**

**Input: 3 phases + PE**

**Output: 3 phases + PE**



See section 1.3 for information on accessing the connections.

Connections are made using lugs connected to threaded studs (diameter 8 mm).

The cables are tied to the earth bar.



# 2. Installation

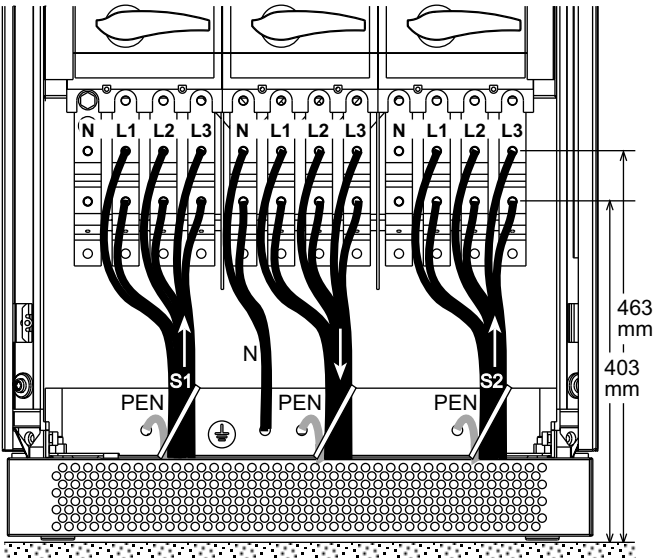


See section 6.1 for information on sizing protection devices and cables (Appendix, Technical data).

A maximum of four cables may be used per phase.

## Upsilon STS 400 to 600 A

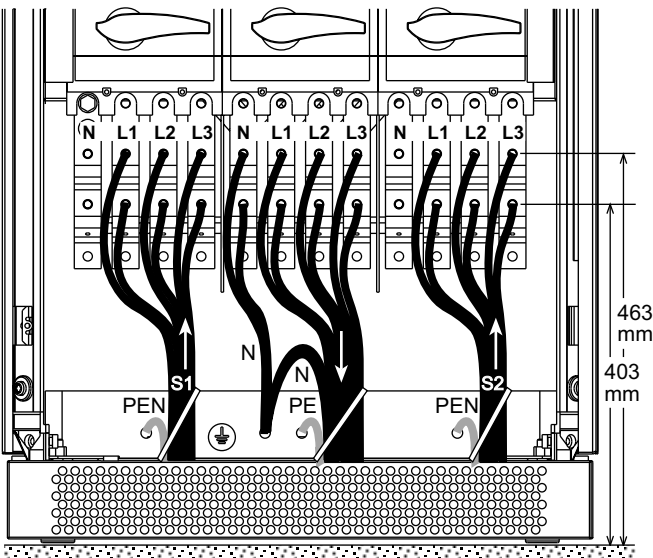
**Input: 3 phases + PEN**  
**Output: 3 phases + PEN**



See section 1.3 for information on accessing the connections.  
Connections are made using lugs connected to two threaded studs per phase (diameter 10 mm).  
The cables are tied to the earth bar.

## Upsilon STS 400 to 600 A

**Input: 3 phases + PEN**  
**Output: 3 phases + PE + Neutral**



See section 1.3 for information on accessing the connections.  
Connections are made using lugs connected to two threaded studs per phase (diameter 10 mm).  
The cables are tied to the earth bar.

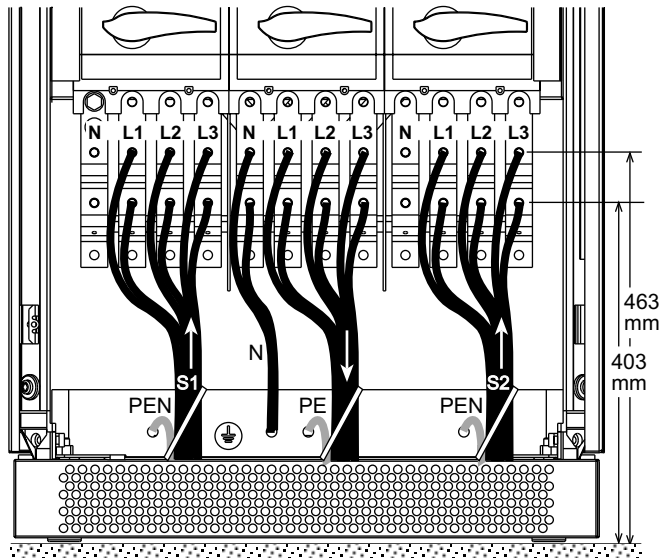


## 2. Installation

**Upsilon STS 400 to 600 A**

**Input: 3 phases + PEN**

**Output: 3 phases + PE**

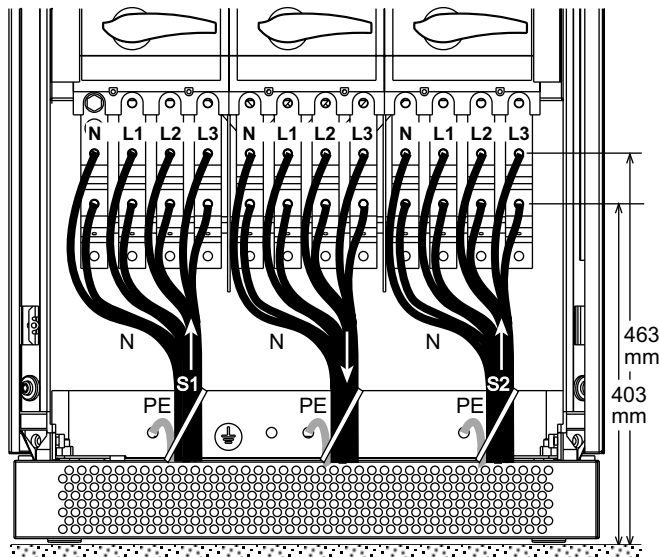


See section 1.3 for information on accessing the connections.  
Connections are made using lugs connected to two threaded studs per phase (diameter 10 mm).  
The cables are tied to the earth bar.

**Upsilon STS 400 to 600 A**

**Input: 3 phases + PE + Neutral**

**Output: 3 phases + PE + Neutral**

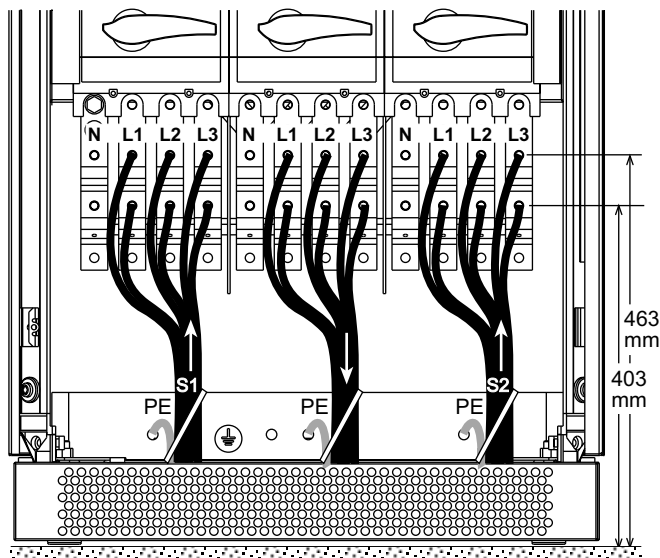


See section 1.3 for information on accessing the connections.  
Connections are made using lugs connected to two threaded studs per phase (diameter 10 mm).  
The cables are tied to the earth bar.

**Upsilon STS 400 to 600 A**

**Input: 3 phases + PE**

**Output: 3 phases + PE**

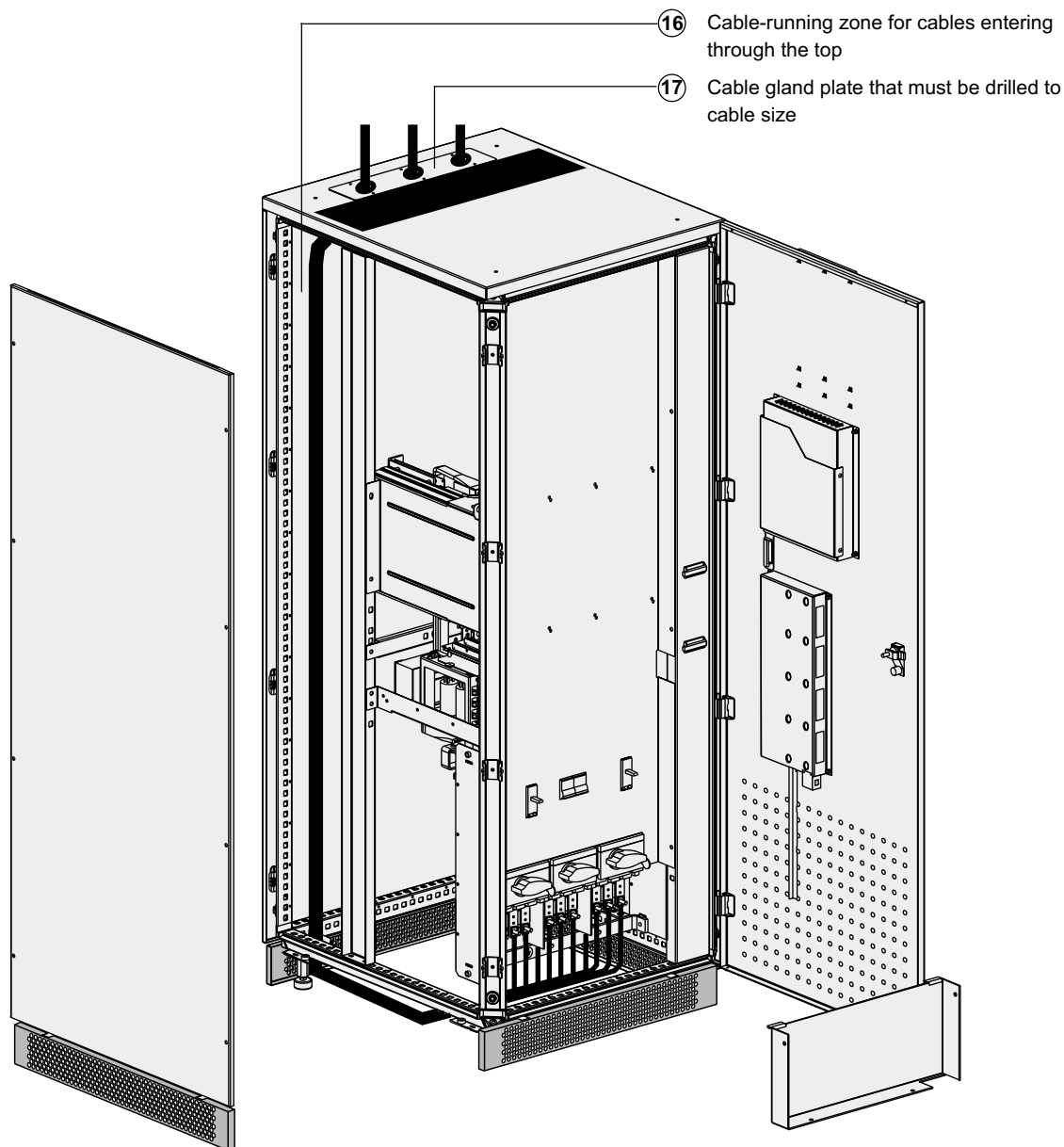


See section 1.3 for information on accessing the connections.  
Connections are made using lugs connected to two threaded studs per phase (diameter 10 mm).  
The cables are tied to the earth bar.

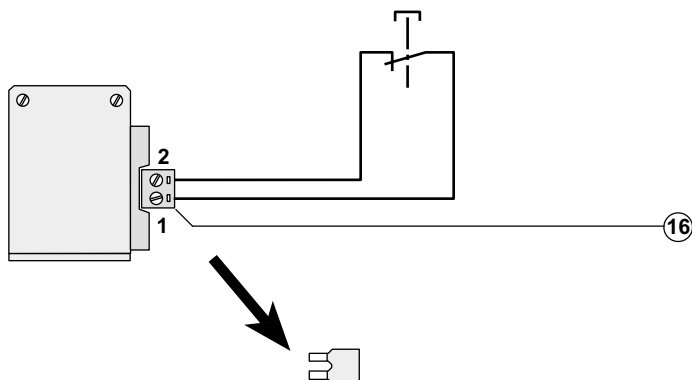


## 2. Installation

### Cable running for cables entering through the top of the Upsilon STS 30 to 250 A cabinet



### 2.3 Connection of the emergency power off terminal block

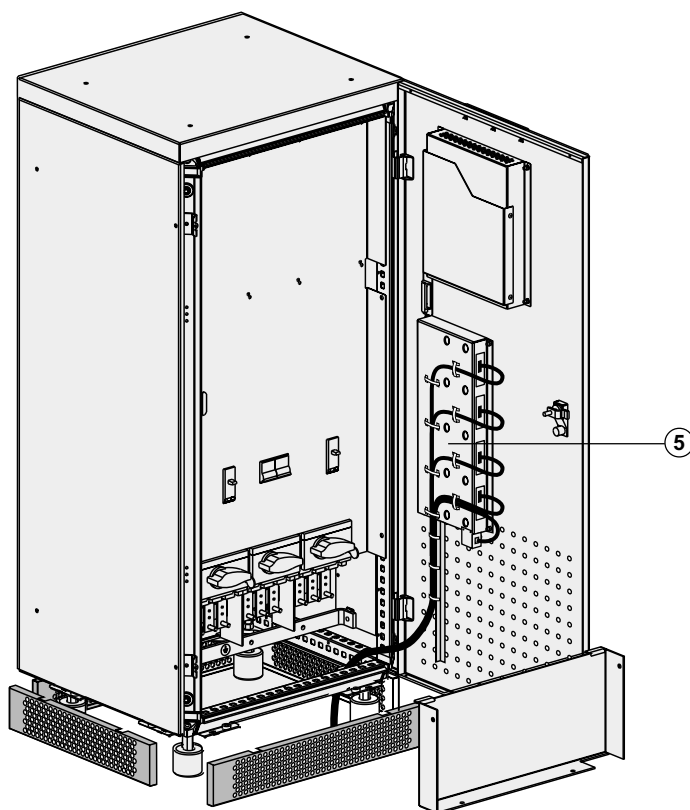


- 1 - Remove the jumper from terminal block (16).
- 2 - Connect the emergency power off NC contact to terminals 1 and 2.
- 3 - Tie the cable down as illustrated in section 2.4.



## 2. Installation

### 2.4 Connection of the communication cards



Tie the cables to the cable way on the door.

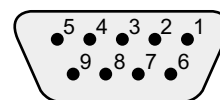
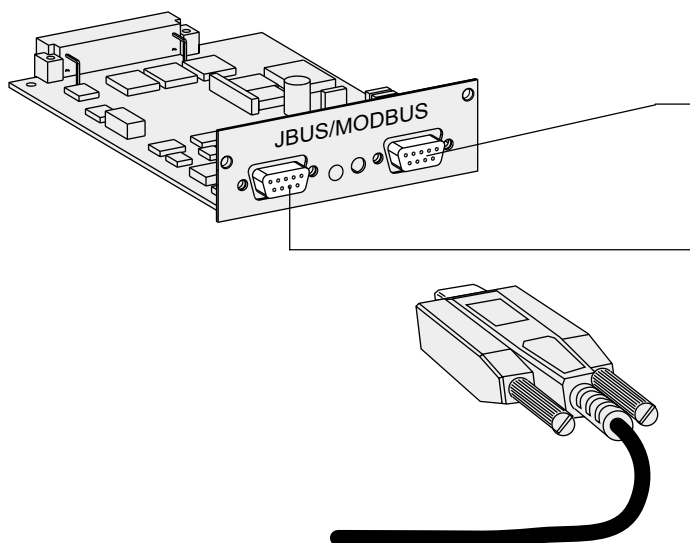


Do not run the control wires with the power cables.



Two slots are available in the card cage ⑤ for additional cards.

### 2.5 Connection of the JBUS communication card



#### RS232:

Pin 2: Rxd (or Txd)  
Pin 3: Txd (or Rxd)  
Pin 5: Earth

#### RS485:

Pin 4: R-  
Pin 5: T-  
Pin 8: R+  
Pin 9: T+



For information on using the communication card, see the JBUS communication card manual.



**Only one communication port (the RS232 OR the RS485) may be used at a time.**

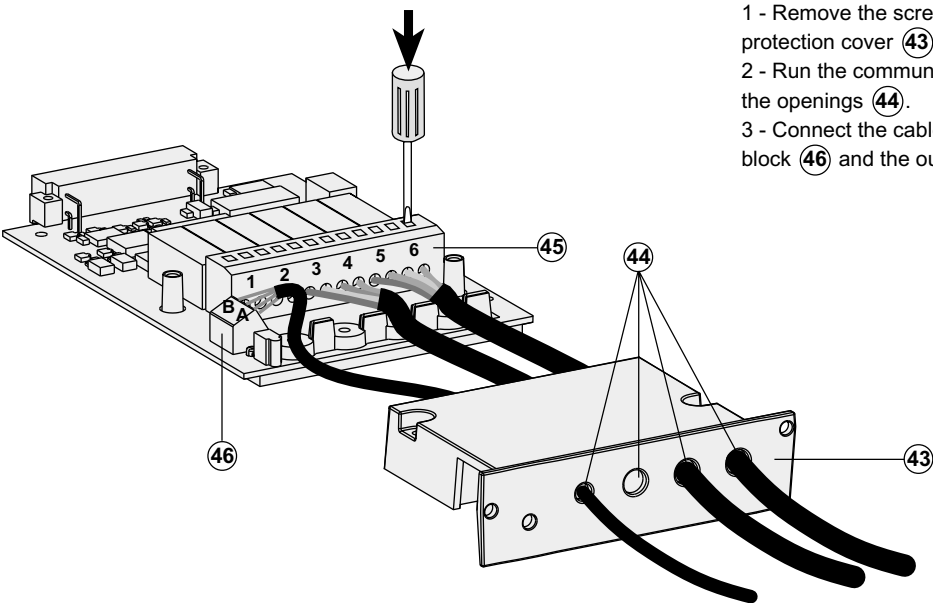


# 2. Installation

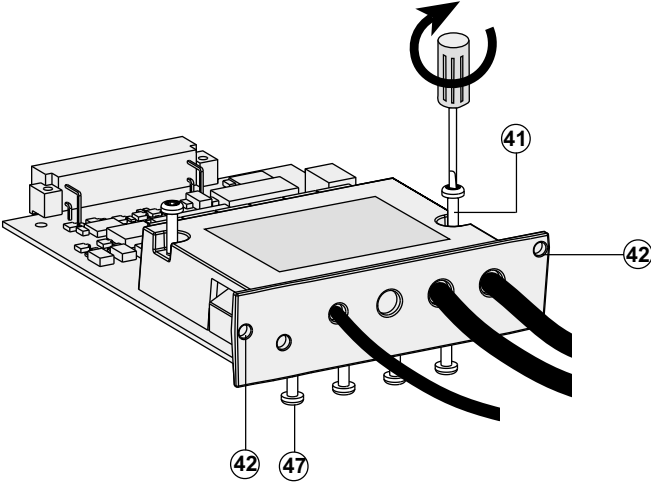
## 2.6 Connection of the relay communication card



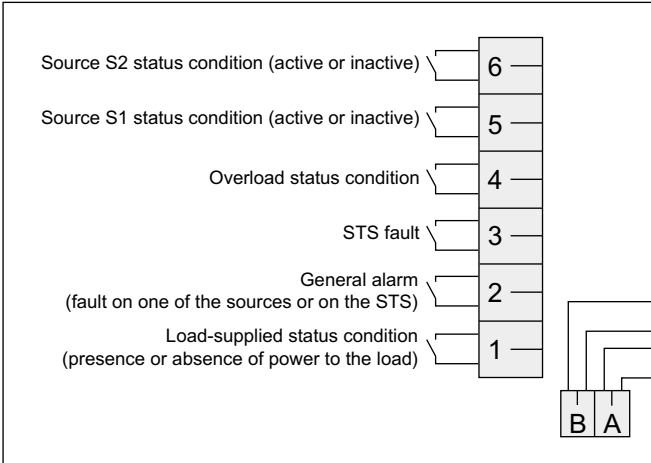
Before proceeding, disconnect all power sources connected to the card.  
Do not mix very low safety voltage (VLSV) and non-VLSV circuits on the card outputs.



- 1 - Remove the screws (41) and the protection cover (43).
- 2 - Run the communication cables through the openings (44).
- 3 - Connect the cables to the input terminal block (46) and the output terminal block (45).



- 4 - Put the cover back in place and secure it with the screws (41).
- 5 - Secure the cables using the screws (47).
- 6 - Note the position of the power sources on the labels.
- 7 - Insert the card in its slot.
- 8 - Secure the card using the two screws (42).



**Characteristics of the output contacts:**  
Permissible voltage: 250 V AC, 30 V DC  
Permissible current: 2 A  
Cable: 4 x 0.93 mm<sup>2</sup>, Ø 6.6 mm ± 0.3 mm.

**Characteristics of the input contacts:**  
Switched voltage: 5 V DC  
Current drawn: 10 mA  
Cable: 4 x 0.34 mm<sup>2</sup>, Ø 5 mm ± 0.5 mm.

Command to disable transfer (transfer to alternate source inhibited)  
Memorised faults reset command



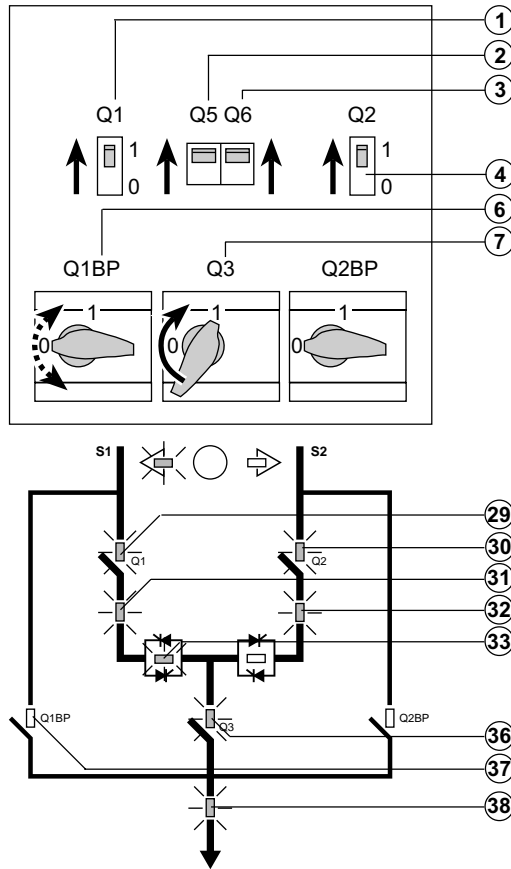
## 3. Operation



Make sure that the voltages and frequencies of the two sources S1 and S2 are identical.

Make sure that the voltages of the two sources S1 and S2 are the same as the rated voltage (400 V) of Upsilon STS, otherwise see section 3.5 (Customization).

### 3.1 Start-up



1 - Check that the two sources are energised (voltage present).

2 - Set circuit breakers Q5 (2) and Q6 (3) to the ON position (position 1).

3 - Turn switch Q1BP (6) to the ON position (position 1). LEDs (37) and (38) go on.

The load is supplied by Source 1 via the bypass.

4 - Set switches Q1 (1) and Q3 (7) to the ON position (position 1). LEDs (29), (31), and (36) go on.

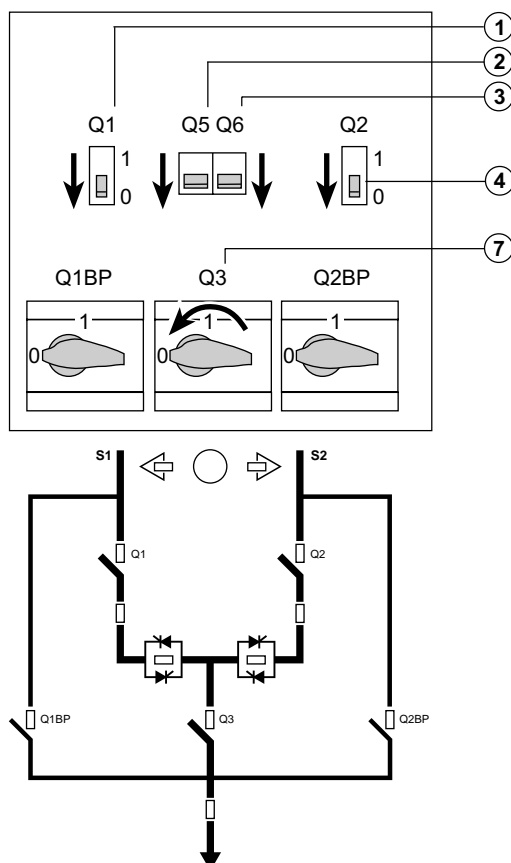
5 - Turn switch Q1BP (6) back to the OFF position (position 0). LED (37) goes off.

6 - Set switch Q2 (4) to the ON position (position 1). LEDs (30) and (32) go on.

**The load is supplied by Source 1.**

**?** If LED (33) is red or off, if LEDs (31) and/or (32) are orange or red: see section "Maintenance".

### 3.2 Shutdown



1 - Set switches Q1 (1), Q2 (4) and Q3 (7) to the OFF position (position 0).

2 - Set circuit breakers Q5 (2) and Q6 (3) to the OFF position (position 0). All LEDs should go off.

**The load is not supplied with power.**

**!** Dangerous voltage levels are still present inside the Upsilon STS cabinet, in the connection zone.

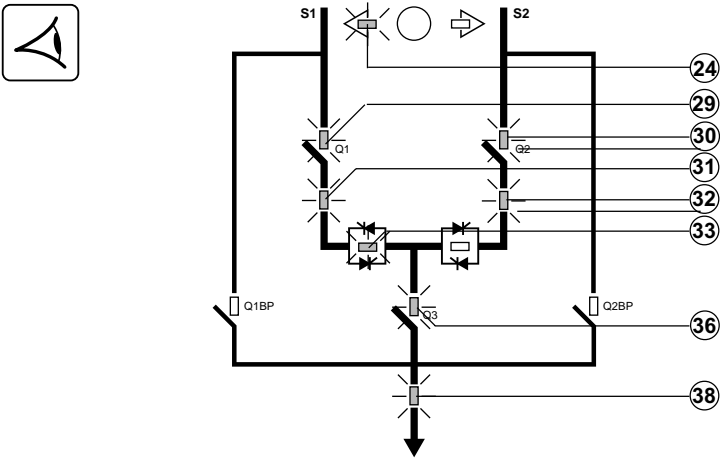




# 3. Operation

## 3.3 Normal mode. Operation on preferred source S1

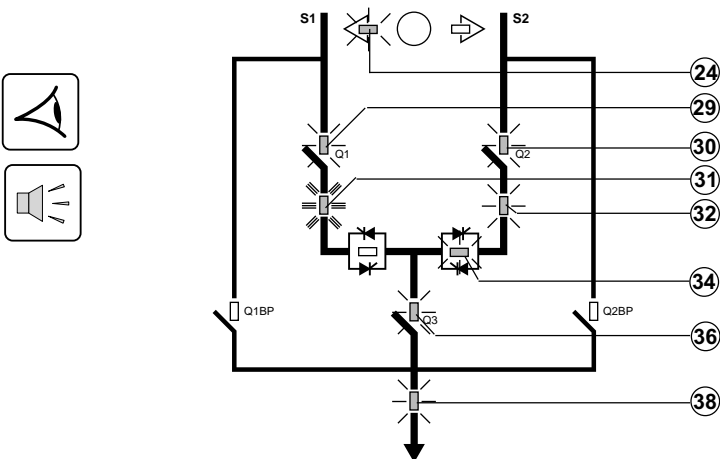
### Operation on the preferred source



During normal operation on the preferred source S1, LEDs 24, 29, 30, 31, 32, 33, 36 and 38 are on in green.

? If LED 38 is orange, there is an overload.  
If LED 38 is red, the load is no more supplied.

### Automatic transfer to the alternate source



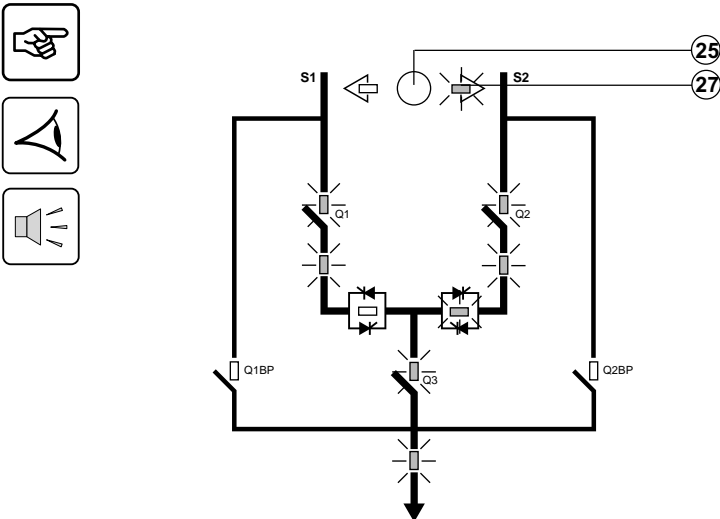
The load is automatically transferred to the source offering the highest level of power quality.

**For example**, if the preferred source S1 goes outside tolerances, LED 31 goes orange or red. The buzzer beeps.  
**Upsilon STS** automatically transfers the load to the alternate source S2. LEDs 24, 29, 30, 32, 34, 36 and 38 are on.

? **Upsilon STS** transfers the load back to the preferred source S1 as soon as it returns to within tolerances.

? To stop the buzzer, press the function button marked

### Manual transfer to the alternate source



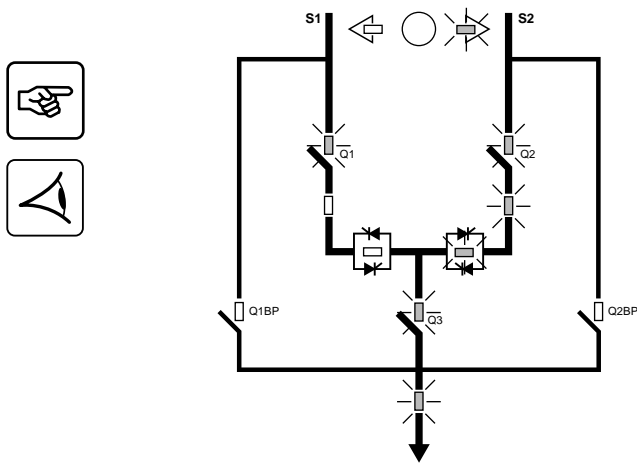
1 - Press the manual transfer button 25:  
2 - Confirm the order by pressing the grey function button 23 marked on the screen.  
LEDs 24 and 27 flash.  
After the transfer, the green LED 27 goes on.

**The load is supplied by alternate Source 2.**

? Transfer is authorised only if the two sources are within tolerances (voltage, frequency) and their phase displacement is within the set limits. If these two conditions are not met, the transfer order is stored in memory and executed when the voltages cross zero.  
If transfer does not take place within thirty minutes, the order is cancelled.



### Manual transfer to an out-of-phase alternate source



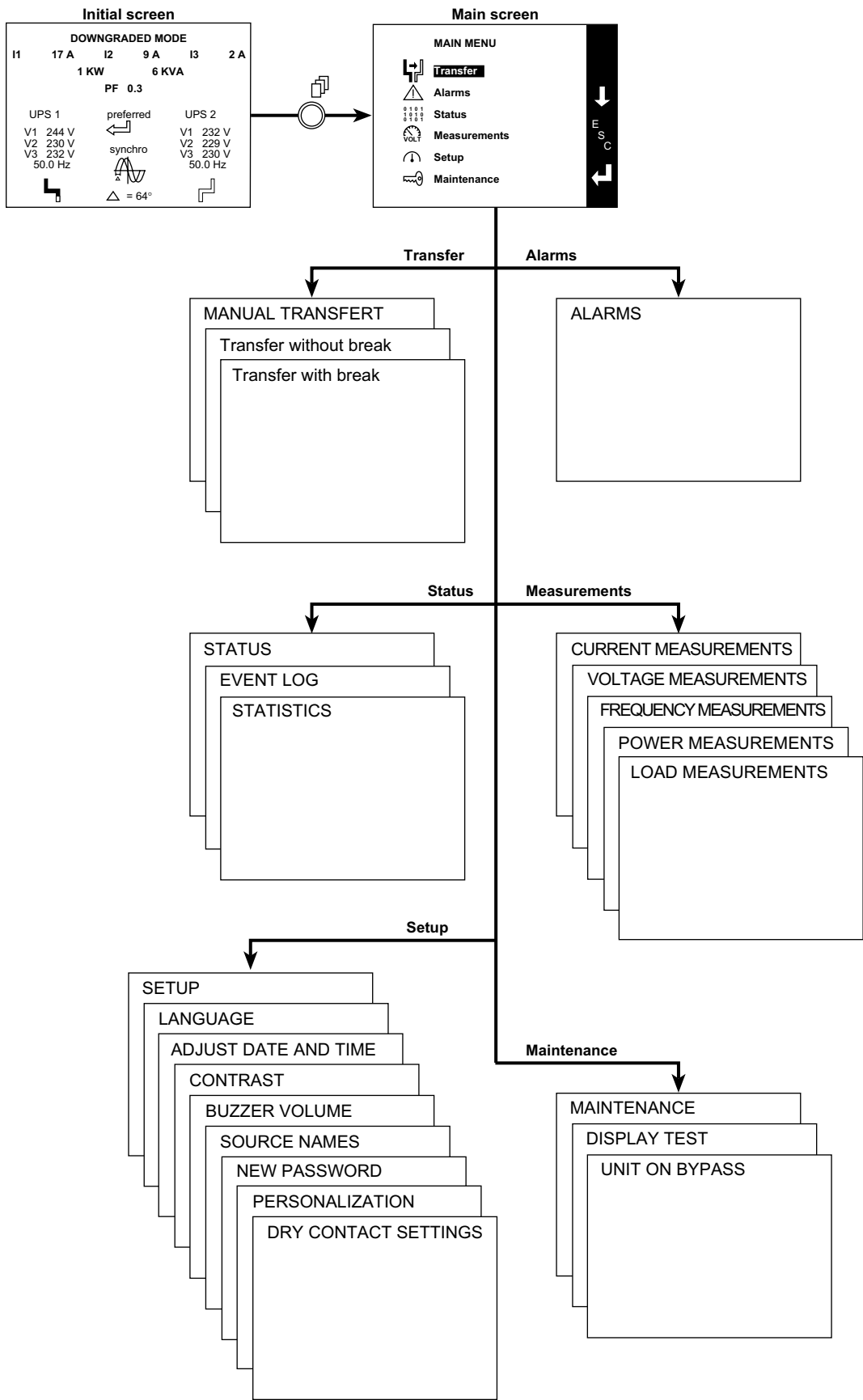
When the two sources are not in phase, it is possible to force manual transfer using the commands on the screen, after entering a password.

- 1 - Enter the password (see section 3.5, Customization).
- 2 - Follow the instructions provided on the screen.



# 3. Operation

## 3.4 Display screens



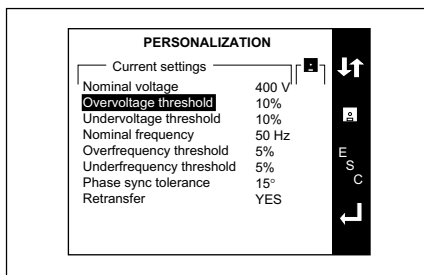


## 3.5 Upsilon STS customization

- 1 - Press the menu button (26).
- 2 - Select "Setup", then "Customization" using the function buttons (23) marked ↓ or ↑.
- 3 - Confirm the order by pressing the function button (23) marked ↵.
- 4 - Enter the password.

The password     is set in the factory.

Select "Setup", then "Password" to personalise the password.





The monitoring parameters must be identical for the two sources. These parameters depend on the tolerances of the connected loads.







	Factory setting	Customization
Return to preferred source after transfer	Automatic	Manual / Automatic
Nominal source voltage	400 V	380 / 400 / 415 V
Overvoltage threshold	Un +10%	Un +5% to Un +20% in 1% steps
Undervoltage threshold	Un -10%	Un -5% to Un -20% in 1% steps
Nominal source frequency	50 Hz	50 / 60 Hz
Frequency tolerances	±5%	+1% to +10% -1% to -10% in 0.5% steps
Phase error tolerance between the two sources	±15°	±1° to ±45° in 1° steps



## 3. Operation

### 3.6 Customization of the relay communication card

	Inputs	Factory setting	Signals available on each contact
1.A		- Memorised faults reset command.	- Memorised faults reset command.
1.B		- Command to disable transfer.	- Selection command for source S1. - Selection command for source S2. - Selection command for the authorised automatic retransfer mode. - Selection command for the inhibited automatic retransfer mode. - Command to authorise transfer. - Command to disable transfer. - EPO command (enables the opening command for switches Q1 and Q2).

	Outputs	Factory setting	Signals available on each contact
1.1		- Load-supplied status condition (presence or absence of power to the load).	- Load-supplied status condition (presence or absence of power to the load).
1.2		- General alarm (fault on one of the sources or on the <b>Upsilon STS</b> ).	- General alarm (fault on one of the sources or on the <b>Upsilon STS</b> ). - <b>Upsilon STS</b> fault.
1.3		- <b>Upsilon STS</b> fault.	- Source S1 status condition (within or outside tolerances). - Source S2 status condition (within or outside tolerances).
1.4		- Overload status condition.	- Phase-error condition between the two sources (within or outside tolerances).
1.5		- Source S1 status condition (active or inactive).	- Source S1 status condition (active or inactive). - Source S2 status condition (active or inactive). - Preferred-source status condition (S1 inactive and S2 active).
1.6		- Source S2 status condition (active or inactive).	- Automatic-transfer status condition (authorised or not). - Overload status condition.

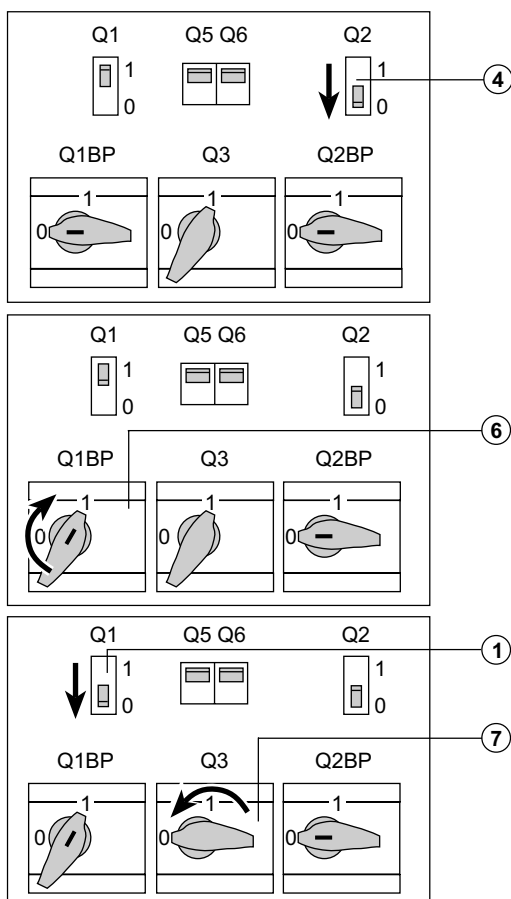


## 4.1 Identification of anomalies

General-alarm LED (21)	S1 (31) or S2 (32) LED	Static-switch LED (33) or (34)	Buzzer	System output LED (38)	Meaning
	-	-	Beeps	-	Internal STS fault.
-		-	Beeps	-	Source outside tolerances, load still supplied.
-		-	Beeps	-	Source outside tolerances, no voltage. The load cannot be supplied by this source.
-	-		Beeps	-	Static-switch fault.
-	-	-	-		Overload.
-	-	-	-		Load not supplied.

The meaning of all these anomalies are detailed on the display:  
Select the alarm: the corresponding informations are displayed.

## 4.2 Transfer to the manual bypass



### Transfer to the manual bypass for source S1:

- 1 - Manually transfer the load to source S1.
- 2 - Set switch Q2 (4) to the OFF position (position 0).
- 3 - Set switch Q1BP (6) to the ON position (position 1).

### The load is supplied by source S1 via the bypass.

- 4 - Set switches Q1 (1) and Q3 (7) to the OFF position (position 0).

**?** The operation for source S2 is identical, using switches Q2 and Q2BP.

**?** Interlocking of the bypass lines is ensured by use of a single key that must be inserted on the bypass switch to be operated.



## 5. Environment

### **This product has been designed to respect the environment**

It does not contain CFCs or HCFCs.

It is manufactured on a production site certified ISO 14001.

### **UPS recycling at the end of service life**

MGE UPS SYSTEMS undertakes to recycle, by certified companies and in compliance with all applicable regulations, all products recovered at the end of their service life (contact your MGE UPS SYSTEMS branch office).

### **Packing**

Packing materials must be recycled in compliance with all applicable regulations.



## 6. Appendix

### 6.1 Technical data

#### Output currents and voltage

<b>Rated output current:</b>	<b>30 A</b>	<b>60 A</b>	<b>100 A</b>	<b>160 A</b>	<b>250 A</b>	<b>400 A</b>	<b>600 A</b>
<b>Input and output voltage:</b> ► Rated operating voltage: ► Maximum voltage: ► Minimum voltage: ► Rated frequency:	380 V / 400 V / 415 V 498 V (415 V +20%) 247 V (380 V -35%) 50 or 60 Hz (45 Hz minimum, 66 Hz maximum)						

#### Thermal characteristics

<b>Heat losses <sup>(1)</sup>:</b> ► at rated power: ► at 50% rated power:	195 W 150 W	295 W 195 W	430 W 260 W	615 W 350 W	920 W 495 W	1420 W 735 W	2150 W 1070 W
<b>Required ventilation:</b>	350 m³/h	350 m³/h	350 m³/h	1600 m³/h	1600 m³/h	2300 m³/h	2300 m³/h

(1) These characteristics are calculated for a voltage of 400 V and a power factor of 0.8.

#### Noise level

<b>Noise in dB (ISO 3746):</b>	55	55	55	59	59	59	59
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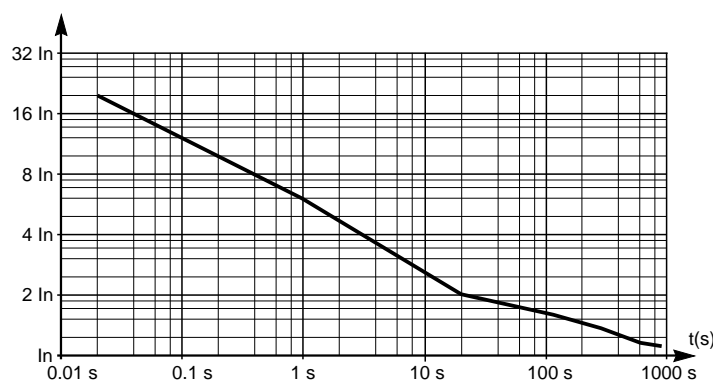
#### Cable sizes

<b>Cross-sectional area in mm² :</b>	50	50	50	120	120	240	240
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#### Recommended protection devices upstream of Upsilon STS

<b>Type of circuit breaker:</b> ► TNS system: ► TNC system:	C60L 32A	NS100H 4P 4D  NS100H 3P	NS160H 4P 4D NS160H 3P	NS250H 4P 4D NS250H 3P	NS400H 4P 4D NS400H 3P	NS630H 4P 4D NS630H 3P
<b>Trip unit:</b>	curve C	STR22SE	STR22SE	STR22SE	STR23SE	STR23SE
<b>Thermal setting:</b>	1.05 In	≤1.05 In	≤1.05 In	≤1.05 In	≤1.05 In	≤1.05 In
<b>Magnetic setting:</b>	10xIn	≤10xIn	≤10xIn	≤10xIn	≤10xIn	≤10xIn

#### Permissible-overload curve



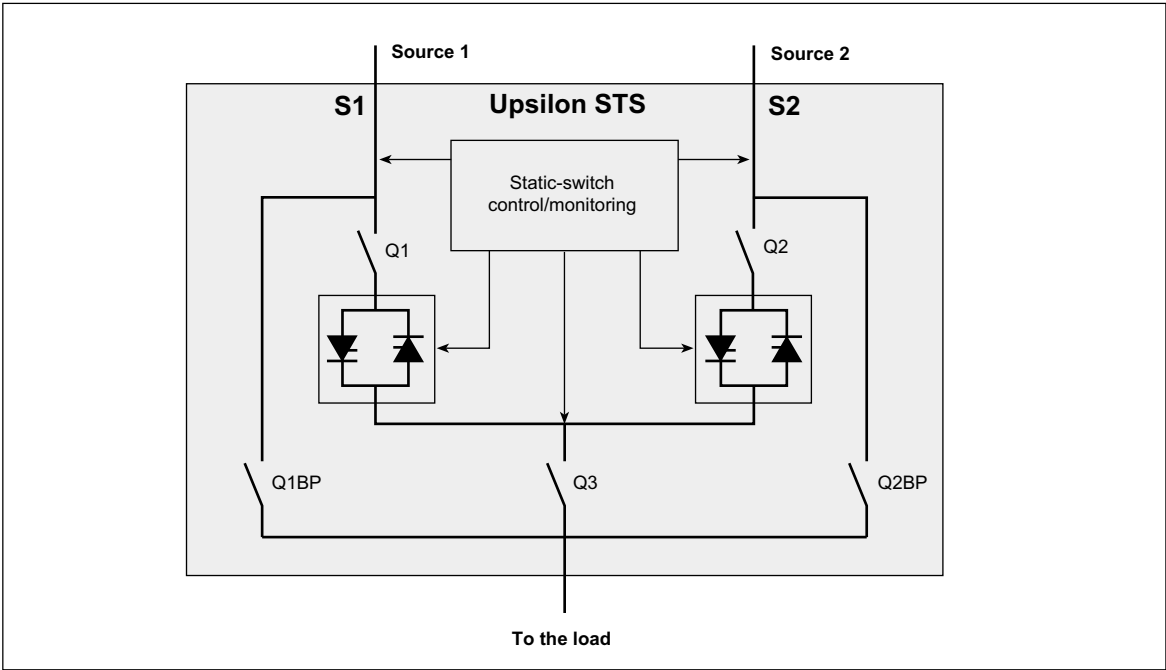
- During an overload, transfer between sources is disabled.
- Overloads higher than 1.5 In are stored in memory. The alarm must be reset to return to normal operation.



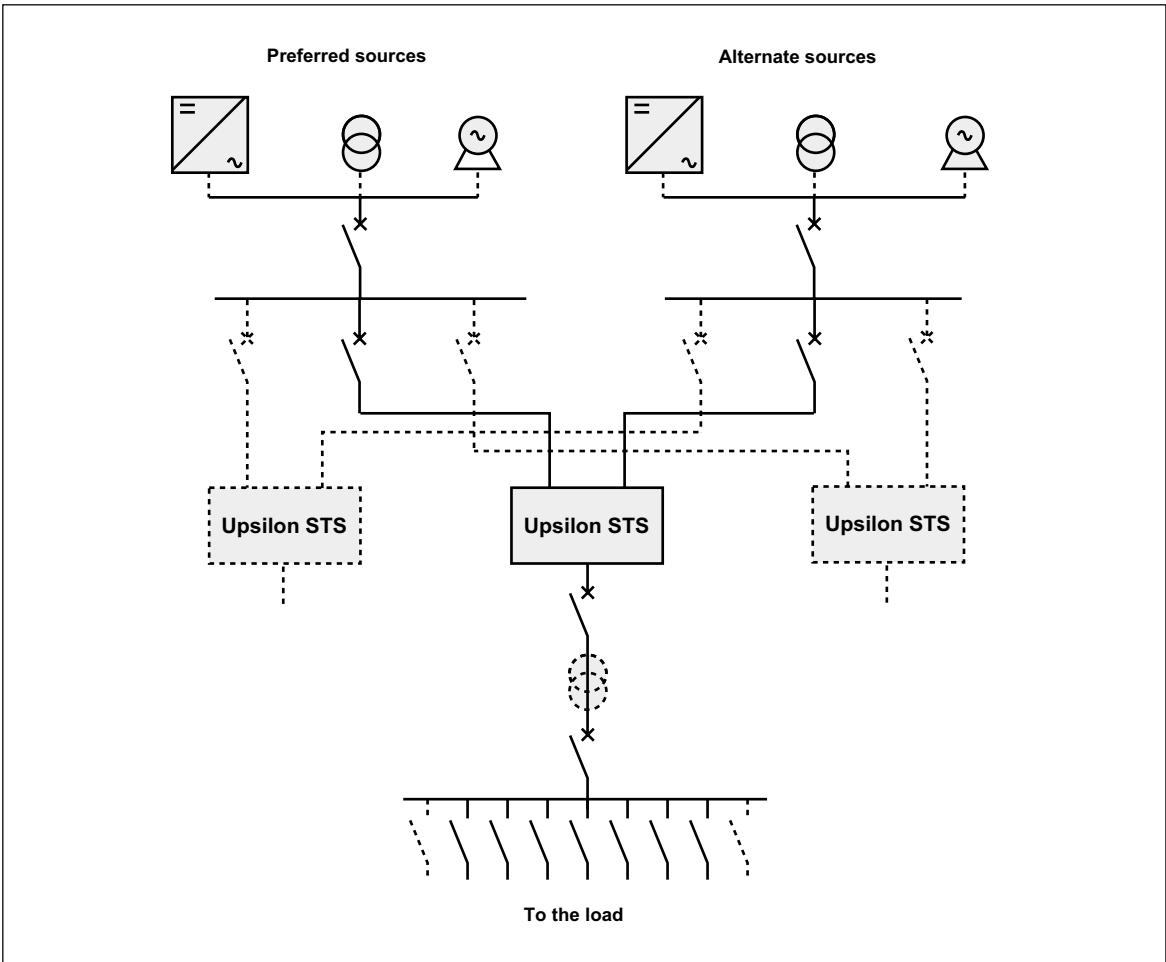
# 6. Appendix

## 6.2 Simplified diagrams

### Upsilon STS simplified diagram



### Simplified diagram of an installation





### 6.3 Glossary

<b>Alternate source</b>	Backup source that steps in if the preferred source fails.
<b>JBUS communication card</b>	Internal card implementing the JBus protocol on a serial link to supply the user with system information.
<b>Load</b>	Device(s) or system(s) connected the <b>Upsilon STS</b> output.
<b>Manual bypass</b>	Q1BP, Q3 and Q2BP switches, accessible to the user, that may be used to directly supply the load from Source S1 or S2. The bypass enables servicing on the equipment without interrupting the supply of power to the load.
<b>Normal mode</b>	Operating mode during which the load is supplied by the preferred source.
<b>Preferred source</b>	Source selected as the normal source of power.
<b>Relay communication card</b>	Internal card implementing contacts to supply the user with system information.
<b>Static switch</b>	Electronic switch ensuring instantaneous switching.



# 6. Appendix

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