

Upsilon™ STS

30/60/100/160/250/400/630 A 400 V

Technical Specifications

4/2017



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Table of Contents

Important Safety Instructions — SAVE THESE INSTRUCTIONS	5
Technical Data	7
Model List	7
Efficiency	7
Communication and Management	8
Compliance	8
Facility Planning	9
Input Specifications	9
Output Specifications	9
Recommended Cable Sizes (Phases and Neutral)	10
Upstream Protection Devices	10
Physical	11
Weights and Dimensions	11
Clearance	11
Environmental	11
Heat Dissipation	11
Settings	12
Default Settings	12
Drawings	13
One Line Diagram of Upsilon STS	13
Options	14
Configuration Options	14
Limited Factory Warranty	15

Important Safety Instructions — SAVE THESE INSTRUCTIONS

Read these instructions carefully and look at the equipment to become familiar with it before trying to install, operate, service or maintain it. The following safety messages may appear throughout this manual or on the equipment to warn of potential hazards or to call attention to information that clarifies or simplifies a procedure.



The addition of this symbol to a “Danger” or “Warning” safety message indicates that an electrical hazard exists which will result in personal injury if the instructions are not followed.



This is the safety alert symbol. It is used to alert you to potential personal injury hazards. Obey all safety messages with this symbol to avoid possible injury or death.

DANGER

DANGER indicates a hazardous situation which, if not avoided, **will result in death or serious injury**.

Failure to follow these instructions will result in death or serious injury.

WARNING

WARNING indicates a hazardous situation which, if not avoided, **could result in death or serious injury**.

Failure to follow these instructions can result in death, serious injury, or equipment damage.

CAUTION

CAUTION indicates a hazardous situation which, if not avoided, **could result in minor or moderate injury**.

Failure to follow these instructions can result in injury or equipment damage.

NOTICE

NOTICE is used to address practices not related to physical injury. The safety alert symbol shall not be used with this type of safety message.

Failure to follow these instructions can result in equipment damage.

Please Note

Electrical equipment should only be installed, operated, serviced, and maintained by qualified personnel. No responsibility is assumed by Schneider Electric for any consequences arising out of the use of this material.

A qualified person is one who has skills and knowledge related to the construction, installation, and operation of electrical equipment and has received safety training to recognize and avoid the hazards involved.

Technical Data

Model List

Upsilon STS 1400 mm Cabinet



- Upsilon STS 30 A
- Upsilon STS 60 A
- Upsilon STS 100 A
- Upsilon STS 160 A
- Upsilon STS 250 A

Upsilon STS 1900 mm Cabinet



- Upsilon STS 30 A
- Upsilon STS 60 A
- Upsilon STS 100 A
- Upsilon STS 160 A
- Upsilon STS 250 A
- Upsilon STS 400 A
- Upsilon STS 630 A

Efficiency

Upsilon STS (with 0.8 RL load)	30 A		60 A		100 A		160 A	
	Minimum	Nominel	Minimum	Nominel	Minimum	Nominel	Minimum	Nominel
Efficiency at 100% In	0.987	0.989	0.99	0.991	0.991	0.993	0.992	0.991
Efficiency at 75% In	0.985	0.987	0.989	0.991	0.991	0.992	0.991	0.992
Efficiency at 50% In	0.981	0.984	0.987	0.989	0.99	0.991	0.991	0.993
Efficiency at 25% In	0.969	0.973	0.981	0.984	0.986	0.988	0.988	0.991

Upsilon STS (with 0.8 RL load)	250 A		400 A		600 A		630 A	
	Minimum	Nominel	Minimum	Nominel	Minimum	Nominel	Minimum	Nominel
Efficiency at 100% In	0.992	0.993	0.992	0.993	0.992	0.993	0.991	0.992
Efficiency at 75% In	0.993	0.992	0.992	0.993	0.993	0.994	0.992	0.993
Efficiency at 50% In	0.994	0.992	0.992	0.993	0.992	0.993	0.993	0.994
Efficiency at 25% In	0.992	0.99	0.99	0.991	0.989	0.99	0.991	0.992

Communication and Management

Communication Cards

The Upsilon STS has four slots for communication cards. Two cards are supplied as standard equipment.

- Relay communication card for remote indications via isolated dry contacts
- JBus communication card, notably for connection to a PC for set-up

A relay card with two inputs and six outputs may be used to transmit the commands and information listed below.

Input and Output Contacts

Two configurable input contacts

Below are the commands that may be assigned to either input contact:

- Overload reset
- Selection of Source 1 or Source 2 as the preferred source
- Selection of the mode for automatic return transfer
- Transfer disabled (transfer to the alternate source blocked)
- Emergency power off (enabling the opening command for the Q1 and Q2 switches)

Six configurable output contacts

Below is the status information available on either output contact:

- Load drawing power (presence or absence of power to the load)
- General alarm (fault on one of the sources or on the device)
- Device alarm (device fault)
- Source 1 "outside tolerances" or "within tolerances"
- Source 2 "outside tolerances" or "within tolerances"
- Phase displacement between the sources "outside tolerances" or "within tolerances"
- Source 1 active (SS 1 in ON-state)
- Source 2 active (SS 2 in ON-state)
- Source 1 or 2 selected as the preferred source
- Automatic return transfer enabled
- Overload

Compliance

Regulatory approvals	<ul style="list-style-type: none"> • Constructions and safety: IEC 60950 • Design: IEC 60439-1 and IEC 60439-3 for PDU • EMC: IEC /EN 61000-6-2 Electrostatic discharges: IEC / EN 61000-4-2, level 4 Radiated fields: IEC / EN 61000-4-3, level 3 Transient bursts: IEC / EN 61000-4-4, level 4 Overvoltages: IEC / EN 61000-4-5, level 4 • EMC emitted disturbances: EN 55011 and EN 55022 A, class A and IEC/EN 61000-6-4
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Facility Planning

Input Specifications

Inputs from sources 1 and 2

Voltage	380/400/415 V
Input voltage range	Un -35% to Un +20%
Connection type	3 or 4 wire + earth
Number of phases	3 phases interrupted (3-pole STS) 3 phases + neutral interrupted (4-pole STS)
Input frequency (Hz)	50/60 Hz +/-10%
Frequency range	Fn ± 10%
Maximum permissible THDU for maximum upstream voltage	15% continuous (without tripping of the protection devices)
Maximum upstream short-circuit current	35 kA
Number of phases	3 phases interrupted (3-pole STS) 3 phases + neutral interrupted (4-pole STS)

Output Specifications

	30 A	60 A	100 A	160 A	250 A	400 A	630 A
Voltage	380/400/415 V						
Maximum voltage	498 V (415 V + 20%)						
Minimum voltage	247 V (380 V – 35%)						
Overload capacity k x In	In x	1.05	continuous				
		1.10	15 minutes				
		1.2	10 minutes				
		1.35	5 minutes				
		1.50	2 minutes				
		6	20 seconds				
		20	20 milliseconds				
Output frequency (sync to mains)	50 or 60 Hz (45 Hz minimum, 66 Hz maximum)						
Load power factor	0.5 leading and 0.5 lagging						
Unbalanced load conditions	up to 100% continuous current unbalance						
Transfer time	≤5 ms typical						
Withstand for non-linear loads Fc (maximum crest factor)	Fc < 3.5 (A higher value will cause detection of an instantaneous overload, even if the rms current is less than the rated value.)						

Recommended Cable Sizes (Phases and Neutral)

NOTE: All wiring must comply with all national and/or local electrical code.

NOTE: The recommended cable sizes are based in an environment with an ambient temperature of 30 °C (86 °F).

Type		30 A	60 A	100 A	160 A	250 A	400 A	630 A
Recommended size ¹ in mm ²	Copper conductors	10	16	25	50	95	185	2x150
	Aluminum conductors	16	25	35	70	150	2x120	4x95
Maximum size in mm ²		50	50	50	120	120	240	240
Max number of cables per phase ²		2	2	2	2	2	4	4

Upstream Protection Devices

To ensure correct thermal protection of the STS units, protection devices (circuit breakers or fuses) must be installed upstream of the units, taking into account the requirements presented in the table below.

Upsilon STS	30 A	60 A	100 A	160 A	250 A	400 A	630 A
Max. I rms on phases (thermal)	30 A	60 A	100 A	160 A	250 A	400 A	630 A
Max. I rms on neutral (thermal)	30 A	60 A	100 A	160 A	250 A	400 A	630 A
Max. I on phases (magnetic)	300 A	600 A	1000 A	1600 A	2500 A	4000 A	6000 A
Max. I on neutral (magnetic)	300 A	600 A	1000 A	1600 A	2500 A	4000 A	6000 A
Recommended circuit breakers	C60L 32A	NS100H	NS100H	NS160H	NS250H	NS400H	NS630H
(=S=) For TNS ³ =>	4-pole	4-pole	4-pole	4-pole	4-pole	4-pole	4-pole
For TNC ⁴ =>	3-pole	3-pole	3-pole	3-pole	3-pole	3-pole	3-pole
Recommended circuit breakers	Curve C	STR22SE	STR22SE	STR22SE	STR22SE	STR23SE	STR23SE
(=S=) For TNS =>	4P 4T	4P 4T	4P 4T	4P 4T	4P 4T	4P 4T	4P 4T
For TNC =>	3P 3T	3P 3T	3P 3T	3P 3T	3P 3T	3P 3T	3P 3T
Io x Ir =>	≤ 1.05 In	≤ 1.05 In	≤ 1.05 In	≤ 1.05 In	≤ 1.05 In	≤ 1.05 In	≤ 1.05 In
Im =>	10 In	10 In	10 In	10 In	10 In	10 In	10 In

1. Cable sizes have been calculated according to allowable temperature rises and take into account line voltage drops for a maximum length of 100 metres (AC circuit). For greater lengths, choose cable sizes that limit the voltage drop to 3% (AC circuit).
 2. NF C 15-100 authorizes a maximum of 4 cables per phase.
 3. For TNS with distributed neutral (valid for IT with distributed neutral as well).
 4. For TNC, valid for TNS as well if the neutral is not distributed.

Physical

Weights and Dimensions

STS cabinet		Weight kg (lbs)	Height mm (in)	Width mm (in)	Depth mm (in)
Upsilon STS 1400 mm cabinet	30–60–100 A	193 (418.8)	1430 (56.29)	610 (24)	550 (21.6)
	160–250 A	215 (474)			
Upsilon STS 1900 mm cabinet	30–60–100 A	215 (474)	1900 (74.8)	715 (28.1)	825 (32.5)
	160–250 A	225 (496.04)			
	400–630 A	327 (720.9)			

Clearance

Minimum rear clearance for 1400 mm cabinet	250 mm (9.8 in)
Minimum top clearance for 1900 mm cabinet	350 mm (13.7 in)

Environmental

Operating temperature	0 to 40 °C (32 to 104 °F)
Storage temperature	- 40 to 70 °C (-40 to 158 °F)
Relative humidity	0 to 75%, without condensation at ambient temperature
Operation elevation without derating	0 to 1000 meters (0–3280 feet) (derating above 1000 meters/3280 feet)
Derating coefficient depending on the elevation above 1000 meters (3280 feet)	<ul style="list-style-type: none"> • 0.85 at 1500 meters (4921.2 feet) • 0.79 at 2000 meters (6561.6 feet) • 0.75 at 2300 meters (7546 feet) • 0.69 at 3000 meters (9842.5 feet) • 0.59 at 4000 meters (13123.4 feet)
Storage elevation	≤ 10 000 meters (32808.4 feet)
Audible noise (measured according to standard ISO 3746 (NFS 31 027) on a normal floor and with linear loads)	30–250 A: 60 dB 400–630 A: 69 dB
Protection class	IP 20 and IP 21
Color	RAL 9023

Heat Dissipation

	30 A	60 A	100 A	160 A	250 A	400 A	630 A
Heat dissipation at rated power ⁵ in W (BTU/hr)	195	295	430	615	920	1420	2150
Heat dissipation) at 50% rated power ⁵ in W (BTU/hr)	150	195	260	350	495	735	1070

5. Calculated for a voltage of 400 V and a PF of 0.8.

Settings

Default Settings

Adjustable parameters and setting ranges

Parameter	Value or setting range	Default setting	Method and comments
Mode for transfer back to the preferred source	Manual or automatic	Automatic	Screen
Rated voltage of sources (Un)	380 or 400 or 415		PC and software
Overtoltage detection threshold ⁶	+5% to +20% of Un in 1% steps	+10%	Screen
Undervoltage detection threshold ⁶	-5% to -20% of Un in 1% steps	-10%	Screen
Rated frequency of sources (Fn)	50 or 60 Hz		PC and software
Frequency differential ⁶	±1% to ±10% of Fn in 1% steps	±5%	Screen
Phase-displacement tolerances ⁶	±1° to ±45° in 1° steps	±15°	Screen. Phase displacement between sources
Monitoring of transient undervoltages	-20% to -32% of Un in 1% steps	-25%	PC and software. Sliding average over ½ cycle
Hysteresis of voltage monitoring ⁷	1% to 6% in 1% steps	3%	PC and software
Time delay for cancelling of manual-transfer order	10 s to 30 mn in 1 s steps	1 mn	PC and software
Time delay for automatic return transfer from source 2 to source 1	1 s to 5 mn	3 s	PC and software. Time delay after return of Source 1 to within tolerances
Duration of break for "protected" transfer under out-of-phase conditions	0 to 3 seconds in 10 ms steps	0s	PC and software. Automatic transfer under poor phase conditions
Duration of break for "forced" transfer	0 to 3 seconds in 10 ms steps	0s	PC and software. "Forced" manual transfer

6. Parameter defining a value or detection range for a "source outside tolerances".

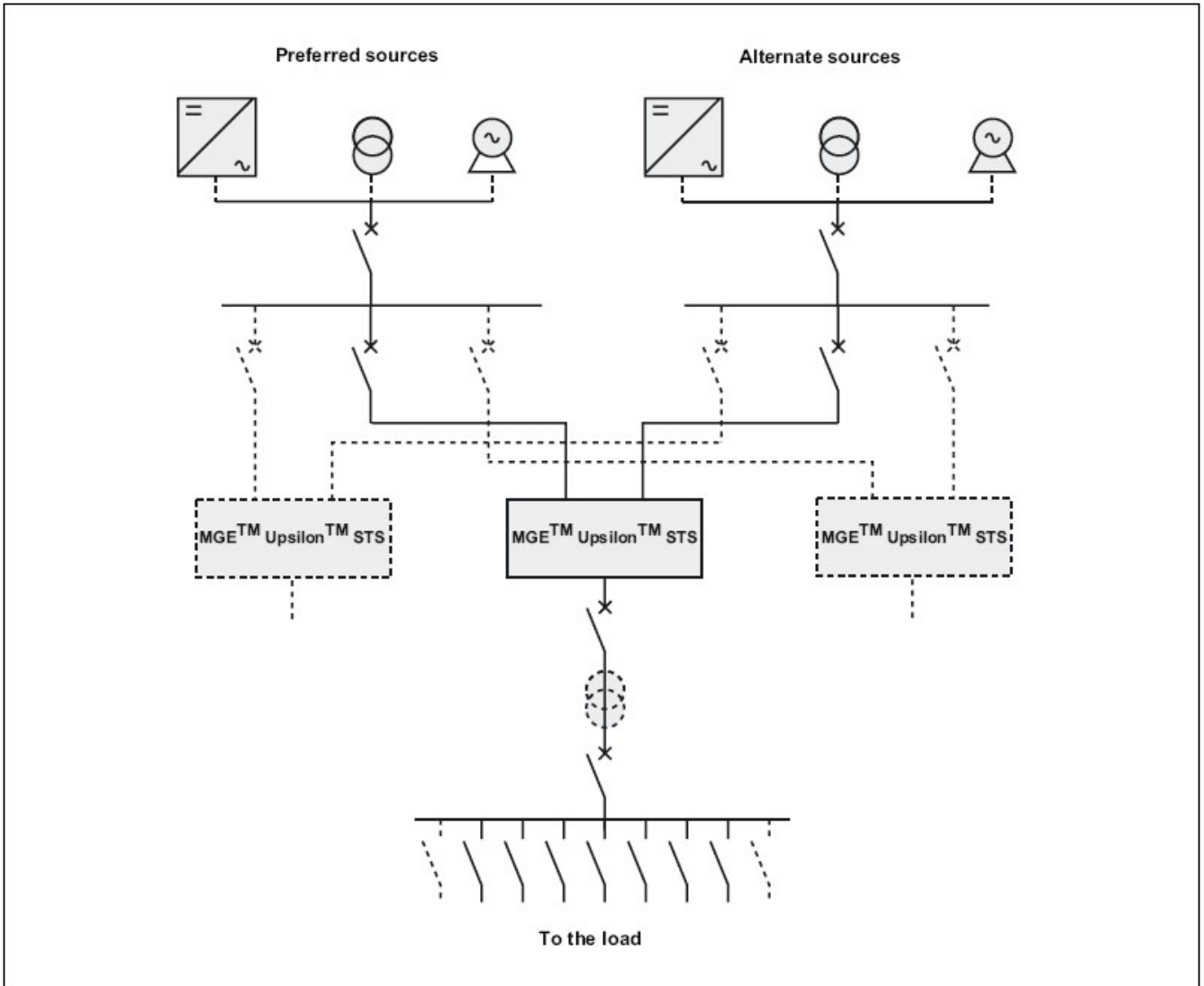
7. This parameter defines the difference between the voltage-monitoring thresholds for voltages going outside tolerances and voltages returning within tolerances.

Drawings

NOTE: A comprehensive set of drawings is available on the engineering website at engineer.apc.com.

NOTE: These drawings are for reference ONLY — subject to change without notice.

One Line Diagram of Upsilon STS



Options

Configuration Options

- Connection at the top of the unit
- ISX Central, SNMP, and TCP/IP compatible Network Management Card (NMC)
- Additional Jbus/ModBus/ or current loop
- PDU distribution unit (36 16 A circuit breakers incorporated in the H = 1900 cell, up to 100 A)
- Open frame version

Limited Factory Warranty

One-Year Factory Warranty

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990–4727A–001