



INSTALLATION AND USERS MANUAL

Masterswitch 25kW 230V-125A

Automatic AC transfer switch



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ENGLISH:	PAGE 1
NEDERLANDS:	PAGINA 13
DEUTSCH:	SEITE 25
FRANÇAIS:	PAGINA 37

v 1.0. September 2007

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1 GENERAL INFORMATION

1.1 USE OF THIS MANUAL

This manual contains important safety and operating instructions for the safe and effective operation, maintenance and possible correction of minor malfunctions of the **Masterswitch 25kW, 230V-125A**, further mentioned as *Masterswitch*.

It is therefore obligatory that every person who works on or with the *Masterswitch* must be completely familiar with the contents of this manual, and that he/she carefully follows the instructions and important safety instructions contained herein.

The English version of this manual has 12 pages.

1.2 VALIDITY OF THIS MANUAL

All of the specifications, provisions and instructions contained in this manual apply solely to standard versions of the *Masterswitch* delivered by Mastervolt.

This manual is valid for the following models:

Part number	Model
55003500	Masterswitch 25kW, 230V-125A

For other models see other manuals available on our website: www.mastervolt.com

1.3 USE OF PICTOGRAMS

Safety instructions and warnings are marked in this manual by the following pictograms:



WARNING

A **WARNING** refers to possible injury to the user or significant material damage to the *Masterswitch* if the user does not (carefully) follow the procedures.



CAUTION!

Special data, restrictions and rules with regard to preventing damage.

1.4 IDENTIFICATION LABEL

The identification label is located at the right-hand side of the *Masterswitch*. Important technical information required for service, maintenance & secondary delivery of parts can be derived from the identification label.



CAUTION!

Never remove the identification label.

1.5 LIABILITY

Mastervolt can accept no liability for:

- consequential damage due to use of the *Masterswitch*;
- possible errors in the manuals and the results thereof.

2 IMPORTANT SAFETY INSTRUCTIONS

READ AND SAVE THESE INSTRUCTIONS



WARNING

This chapter describes important safety and operating instructions for use of a *Masterswitch* in residential, recreational vehicle (RV) and marine applications.

2.1 GENERAL

- 1 Before using the *Masterswitch*, read all instructions and cautionary markings on the *Masterswitch* and all appropriate sections of the manual.
- 2 To reduce the risk of electric shock – Do not expose *Masterswitch* to rain, snow, spray, moisture, excessive pollution and condensing circumstances.
- 3 Use of an attachment or spare part not recommended or sold by Mastervolt may result in a risk of fire, electric shock, or injury to persons.
- 4 The *Masterswitch* is designed to be permanently connected to an AC electrical system. Installation of, and work on the *Masterswitch*, may be carried out only by a qualified, authorized and trained technician or electrician, consistent with the locally applicable standards and regulations
- 5 Make sure that all wiring is properly installed and in good electrical condition; and that wire size is large enough for ac ampere rating of the *Masterswitch*. Check the wiring on a regular base, at least once a year. Do not use the *Masterswitch* when the wiring is undersized or damaged.
- 6 Do not operate *Masterswitch* if it has received a sharp blow, been dropped, or otherwise damaged in any way; take it to a qualified serviceman.
- 7 Except during installation (see chapter 4), the *Masterswitch* may not be opened or disassembled. There are no serviceable parts inside the cabinet. Take it to a qualified, authorized and trained serviceman when service or repair is required. Incorrect reassembly may result in a risk of electric shock or fire. Only qualified, electrician installers are authorized to open the *Masterswitch*.
- 8 To reduce risk of electric shock, disconnect the *Masterswitch* from AC electrical system before attempting any maintenance or cleaning.
- 9 The *Masterswitch* must be provided with an equipment-grounding conductor to the AC-input

ground terminal. Grounding and all other wiring must comply with local codes and ordinances.

- 10 Incorrect installation or reversing input and output wiring will lead to serious damage to the *Masterswitch*, wiring as well as accessories. Fuses can not prevent such damage and the warranty will be void.
- 11 In case of fire, you must use the fire extinguisher which is appropriate for electrical equipment.
- 12 If applied in a marine application in the United States, external connections to the *Masterswitch* shall comply with the United States Coast Guard Electrical Regulations (33CFR183, Sub part I)

2.2 WARNING REGARDING LIFE SUPPORT APPLICATIONS

The *Masterswitch* is not sold for applications in any medical equipment intended for use as a component of any life support system unless a specific written agreement pertaining to such intended use is executed between the manufacturer and Mastervolt. Such agreement will require the equipment manufacturer either to contract additional reliability testing of the *Masterswitch* and/or to commit to undertake such testing as a part of the manufacturing process. In addition the manufacturer must agree to indemnify and not hold Mastervolt responsible for any claims arising from the use of the *Masterswitch* in the life support equipment.

2.3 GUARANTEE SPECIFICATIONS

Mastervolt guarantees that this unit has been built according to the legally applicable standards and specifications. Should work take place, which is not in accordance with the guidelines, instructions and specifications contained in this users manual, then damage may occur and/or the unit may not fulfil its specifications. All of these matters may mean that the guarantee becomes invalid.

The guarantee is limited to the costs of repair and/or replacement of the product. Costs for installation labor or shipping of the defective parts are not covered by this guarantee.

3 HOW IT WORKS

3.1 SOURCE PRIORITY

The *Masterswitch* is the heart of the AC installation. It is designed to take over manual switching between two different AC power sources, indicated as *INPUT 1* and *INPUT 2*. The *Masterswitch* automatically transfers the available AC power source to the *OUTPUT*. Therefore the *Masterswitch* is equipped with a source priority. If more than one AC power source is available, the source with the highest priority is switched to the *OUTPUT*.

3.2 INPUT 1 (GENERATOR)

See figure 1. *INPUT 1* has the highest priority, which means that AC power is transferred from *INPUT 1* to the *OUTPUT* when AC power is available on *INPUT 1*. At the same time, *INPUT 2* is denied, even when AC power is available. The generator or the shore power should be connected to *INPUT 1*.

When power becomes available on *INPUT 1*, it is transferred to the *OUTPUT* after a delay of approximately 10 seconds. The 10 seconds delay time provides an 'easy start up' for the generator. In normal situations the

generator is stabilized after app. 3 sec. To make sure no voltage and frequency variations will occur the delay time is set to 10 sec. This increases the generator's lifetime

If *INPUT 1* is used to connect the shore, the delay time can be adjusted to 0 seconds. See chapter 4.7.

3.3 INPUT 2 (SHORE OR INVERTER)

INPUT 2 has the lowest priority. If there is no AC power available on *INPUT 1*, AC power from *INPUT 2* will be transferred to the *OUTPUT*.

In this case, the *Masterswitch* is in a neutral state and consumes no energy it self.



CAUTION!

During transfer between one of the power-sources, users are not supplied with power for a short time. Because of this, computers etc. connected to this group might loose data.

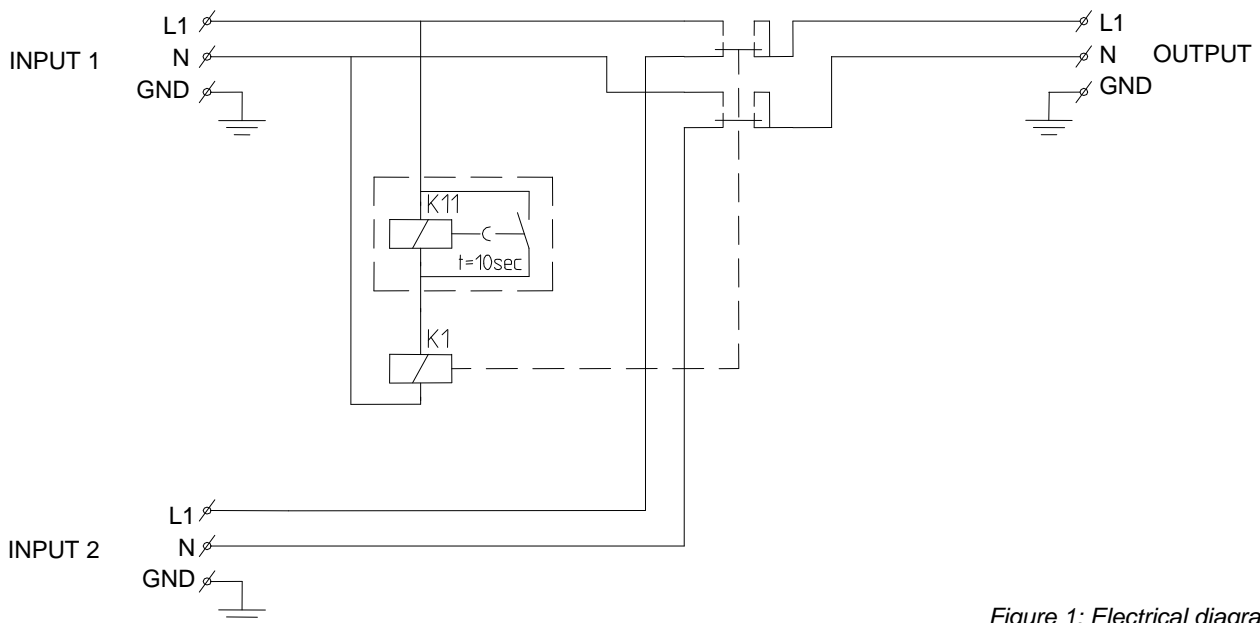


Figure 1: Electrical diagram

4 INSTALLATION



WARNING

Be sure that all AC power sources are switched off or disconnected during installation.

4.1 GENERAL

During installation and commissioning of the *Masterswitch* the Important Safety Instructions are applicable at all times. See chapter 2 of this manual.

After unpacking, check the *Masterswitch* for possible damage. Do not use the *Masterswitch* if the cabinet is damaged.

Check from the type number plate whether the AC voltage of the power sources is equal to the input voltage of the *Masterswitch*.

Do not change the internal wiring of the *Masterswitch*.

4.2 AC WIRING

For a safe installation the correct wire cross section must be applied. The indicated values stated in the table below are considered as guiding values. In critical situation the locally applicable rules and recommendations should be followed.

AC-Current	Minimum cross section:	
	in mm ²	AWG
0-32 Amp	4 mm ²	AWG 10
32-48 Amp	6 mm ²	AWG 8
48-80 Amp	10 mm ²	AWG 6
80-125 Amp	16 mm ²	AWG 4



WARNING

Don't use a cross section that is smaller than indicated!

Under-sized cables and/or loose connections can cause dangerous overheating of the cables and/or terminals. Therefore use the proper size and tighten all connections well, in order to limit transition resistance as far as possible. See chapter 5 for recommended torques.

Recommended wire colours (refer to locally applicable rules and recommendations):

- Single phase 230V AC installations:

Wire color	Meaning	Indication:
Brown or Black	Phase	L1
Blue	Neutral	N
Green/Yellow	Earth	PE

4.3 EXTERNAL FUSES




WARNING

External fuses and earth leakage switches (RCD's) must be integrated in the wiring of all inputs and the output of the *Masterswitch*.

The wiring to the AC-inputs and output must be protected by fuses which are suitable for the applied wire cross section (see 4.2). Rating of these fuses should never be higher than the maximum allowed input and output current of the *Masterswitch*; see table below.

Model Masterswitch	Maximum allowed input and output current
Masterswitch 25kW, 230V-125A	125 Amps

4.4 GROUND CONNECTIONS

For safety reasons it is very important that all ground connections of the power sources and power consumers are connected to the central ground connection of the ship or vehicle. Improper ground connections might lead to life treating situations. A reliable ground connection is made by connecting the ground connections of the sources and the consumers to the ground terminal  of the *Masterswitch*. This ground terminal must be connected to the central ground connection of the ship / vehicle, which is connected to the hull of the ship / chassis of the vehicle. When a ship lies in sea water (salt) while using shore power, corrosion can occur. This corrosion is caused by potential differences between shore ground and ships ground. Using an isolation transformer will solve this problem. Mastervolt can provide a suitable transformer.

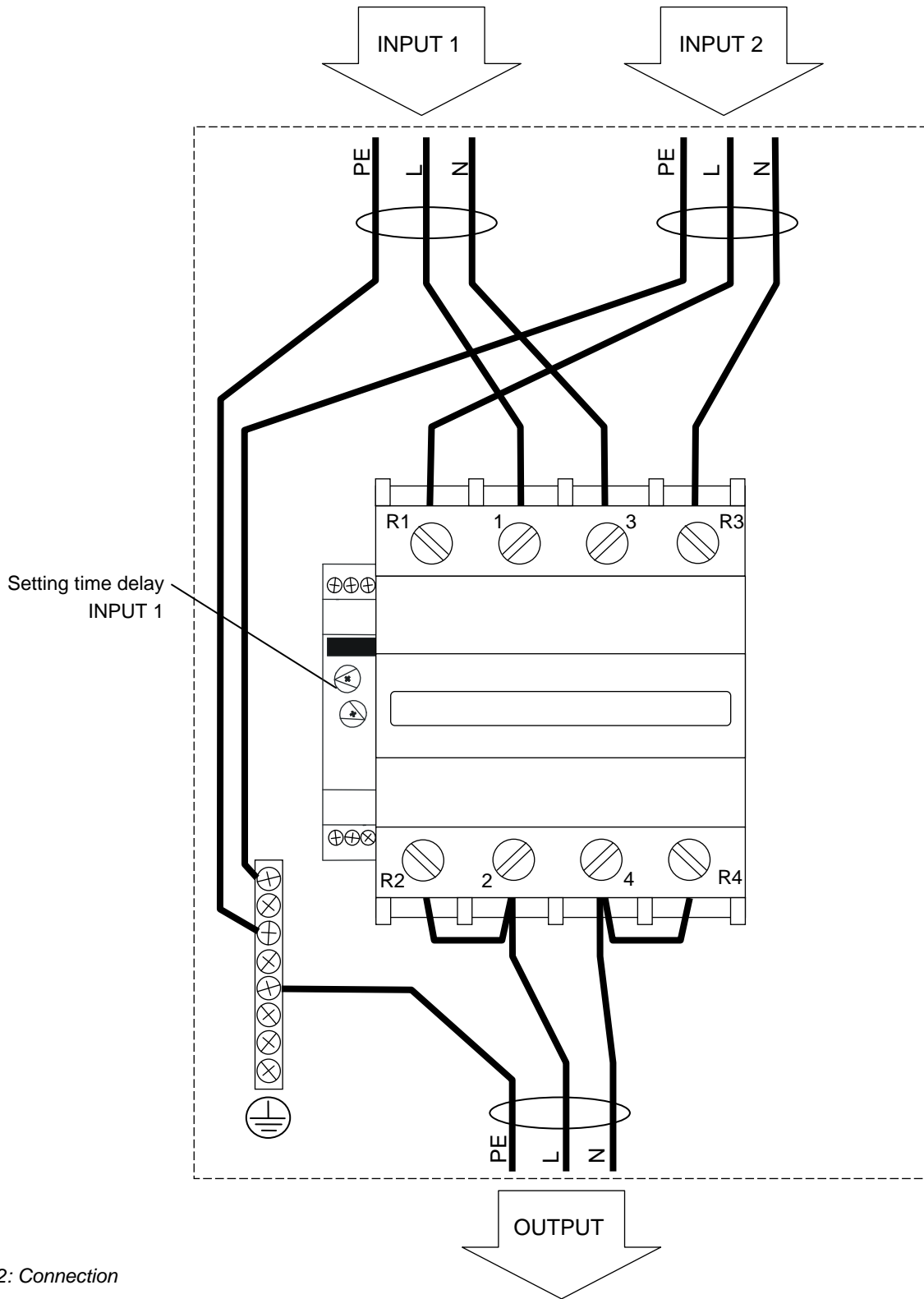




Figure 2: Connection

4.5 INPUTS


See figure 2 to connect the AC power sources.

Wire	INPUT 1	INPUT 2
L (phase)	1	R1
N (neutral)	3	R3
PE (ground)		

Connections to the AC sources

4.6 OUTPUTS

Connect the load to the terminals as indicated in figure 2.

Wire	OUTPUT
L (phase)	2 + R2
N (neutral)	R4 + 4
PE (ground)	

Connections to the AC output

4.7 SETTINGS

Under normal circumstances adjustment of the *Masterswitch* is not recommended: after installation the *Masterswitch* is immediately ready for use. However specific circumstances may require adjustment of the switch-on time delay of *INPUT 1*. For instance when a generator needs to supply high starting currents during a longer period. This may occur when a small generator is used to power air-conditioning.



CAUTION!

Wrong adjustment of the switch-on time delay may lead to damage to the generator and/or the connected load. For this reason adjustments may only be carried out by trained technical engineers!

See figure 2. Use a small flat blade screw driver to adjust the switch-on time delay.

4.8 COMMISSIONING AFTER INSTALLATION

Follow the steps described below to switch on the *Masterswitch*.

- 1 Tighten all cable glands to ensure the pull relief
- 2 Check all wiring and connections.
- 3 Close the cabinet.
- 4 Switch on the AC power sources.

4.9 DECOMMISSIONING

If it is necessary to put the *Masterswitch* out of operation, follow the instructions in order of succession as described below:

- 1 Switch off all loads
- 2 Switch off the AC power sources. These power sources should be secured against unexpected and unintended switching on.
- 3 Open the casing of the *Masterswitch*
- 4 Check with a suitable voltage meter whether the inputs of the *Masterswitch* are voltage free.
- 5 Disconnect all the wiring

Now the *Masterswitch* can be demounted in a safe way.

4.10 TRANSPORTATION

Always use the original packing for transportation. Contact your local MasterVolt Service Centre for further details if you want to return the apparatus for repair.

4.11 RE-INSTALLATION

To reinstall the *Masterswitch*, follow the instructions as described in chapter 4

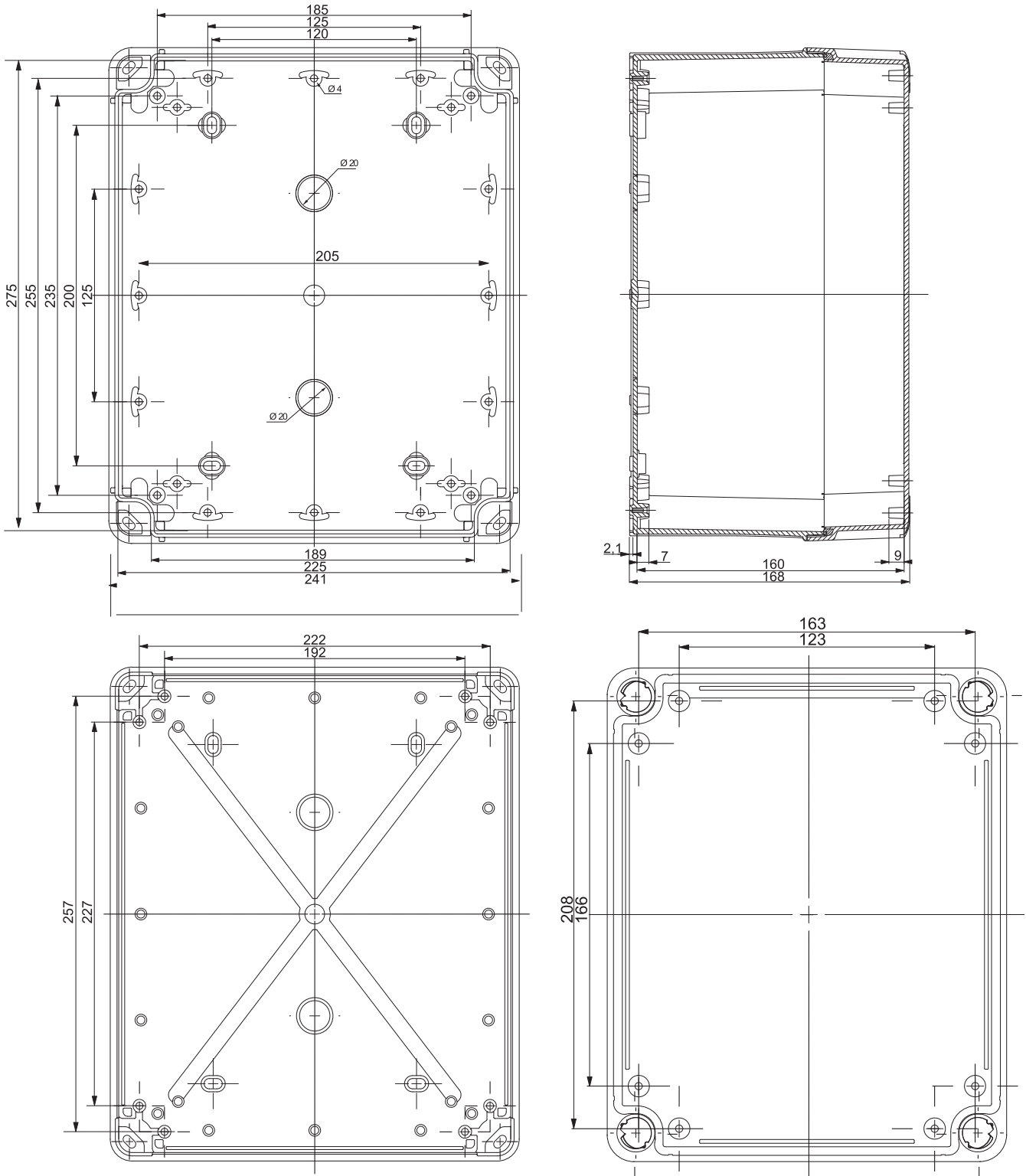
5 ADDITIONAL INFORMATION

5.1 SPECIFICATIONS

GENERAL	
Masterswitch 25kW, 230V-125A	
Part number:	55003500
Product description:	Automatic two source selector switch with one output. Required in and output breakers and/or RCD's are not included.
Manufacturer:	Mastervolt, Amsterdam, the Netherlands
ELECTRICAL	
Earth leakage breaker (RCD):	Not included
Circuit breakers:	Not included
Nominal voltage:	230V, 50/60Hz
Nominal current <i>INPUT 1</i> :	125 Amps
Nominal current <i>INPUT 2</i> :	125 Amps
Nominal current <i>OUTPUT</i> :	125 Amps
Switching current (I _{eff} , IEC947):	1100 Amps
AC Power consumption:	
AC available on <i>INPUT 1</i> :	26 VA ± 10%
Only AC available on <i>INPUT 2</i> :	0 VA
Transfer time by making	20...35 msec
Transfer time by braking	8...12 msec
Delay time <i>INPUT 1</i> :	Approximately 10 sec. (adjustable, see chapter 4.7)
Recommended torque screw connections:	9 Nm (80 In-Lbs)
Cross section single wire:	4...50 mm ² (AWG 10-1/0)
ENVIRONMENTAL	
Specified operation temperature	-5...+60 °C (23...140°F) (will meet specified tolerances)
Allowed operating temperature:	-40...+70 °C (-40...158°F) (may not meet all specified tolerances)
None operating temperature:	-60...+80 °C (-76...176°F) (storage temperature)
Relative humidity:	95% max., non-condensing
Protection degree:	IP66 – NEMA 4,4X
Dimensions without cable glands:	(H x W x D)= 291x241x168mm (11.5 x 9.5 x 6.6 inch) (see also section 5.2)
Weight:	3.8kg (8.4Lbs)
Colour:	Gray RAL7035
Cable glands:	3 x PG29, maximum diameter: 17-27mm (0.67-1.06 inch)

All specifications are subject to change without prior notice

5.2 OUTLINE DRAWINGS



All dimensions are in millimetres
 Figure 3: dimensions of the Masterswitch

5.3 EC DECLARATION OF CONFIRMITY



Manufacturer Mastervolt
Address Snijdersbergweg 93, 1105 AN Amsterdam
 The Netherlands

Herewith declares that:

Product: 55003500 Masterswitch 25kW, 230V-125A

Is in conformity with the provision of the EC, EMC directive 89/336/EEC and amendments 92/31/EEC, 93/68/EEC

The following harmonized standards have been applied:

Generic emission standard EN 50081-1:1992,

Generic immunity standard EN 50082-1:1997,

And the safety directive 73/23/EEC and amendment 93/68/EEC, with the following standard:

Low voltage standard EN 60950:2000,

Amsterdam,



P.F. Kenninck,
General Manager MASTERVOLT



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