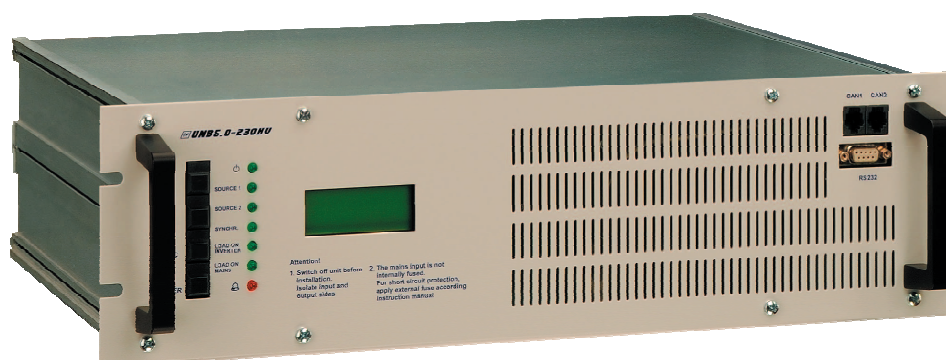


# STATIC TRANSFER SWITCH

## UNB

# USER MANUAL



## Notes to this manual

ATTENTION! Read this manual very carefully before installing and commissioning the specified module. This manual is a part of the delivered module. Familiarity with the contents of this manual is required for installing and operating the specified module. The rules for prevention of accidents for the specific country and the general safety rules in accordance with IEC 364 must be observed.

The function description in this manual corresponds to the date of publishing. Technical changes and changes in form and content can be made at any time by the manufacturer without notice. There are no obligations to update the manual continually.

The module is manufactured in accordance with applicable DIN and VDE standards such as VDE 0106 (part 100) and VDE 0100 (part 410). The CE marking on the module confirms compliance with EU standards 73/23 EWG (low voltage) and 89/339 EWG (electromagnetic compatibility) if the installation and operation instructions are followed.

### Supplier:

	ELTEK VALERE INDUSTRIAL GmbH Schillerstraße 16 D-32052 Herford
	+ 49 (0) 5221 1708-210
FAX	+ 49 (0) 5221 1708-222
Email	Info.industrial@eltekvalere.com
Internet	<a href="http://www.eltekvalere-industrial.com">http://www.eltekvalere-industrial.com</a>

© Copyright Eltek Valere Industrial 2008. All rights reserved.

## Current revision status of this user manual

Revision: 03

Date: 2008-06-05

Revision	Description of change	Writer	Date
01	First edition	RTH	2007-04-26
02	Layout change, minor text modifications, UNB30.0 inserted	RTH	2008-01-14
03	Minor text modifications, "Remote switch ON" added	RTH	2008-06-05

## Table of Contents

1. SAFETY INSTRUCTIONS AND WASTE DISPOSAL RULES .....	5
2. GENERAL INFORMATION.....	6
2.1 Example of use .....	6
2.2 Operating modes.....	7
2.2.1 Inverter priority configuration .....	7
2.2.2 Mains priority configuration .....	7
3. TYPE LIST AND MAIN DATA.....	8
3.1 Optional equipment for UNB assembly: .....	9
3.2 Front View and Operating Elements .....	9
3.2.1 Front view UNB5.0/12.5kVA.....	9
3.2.2 Front view UNB23.0/30.0/40.0kVA.....	10
3.3 Electrical Connectors .....	11
3.3.1 Input terminals .....	11
3.3.2 Output terminals.....	11
3.3.3 Connectors UNB 5.0 and UNB 12.5kVA .....	12
3.3.4 Connectors UNB 23.0kVA .....	13
3.3.5 Connectors UNB 30.0kVA & UNB 40.0kVA.....	14
3.3.6 Pinning of the CAN bus connectors .....	15
3.3.7 Connector (Sub-Min-D, 9-pole).....	15
3.5 Cooling/Air flow direction .....	16
3.6 CAN-Bus Communication Interface .....	17
4.1 Storage .....	18
4.2 Commissioning.....	18
4.3 Operation.....	18
4.3.1 LED indication .....	18
4.3.2 Adjustment keys.....	19
4.3.3 LCD panel / Indication of measuring values & alarm messages .....	20
4.4 Parameter adjustments .....	21
4.4.1 Table “Adjustable Parameters” (customer menu) .....	21
4.4.2 Diagram “Customer menu” .....	22
5. MAINTENANCE .....	24
6. TROUBLE SHOOTING .....	24
7. TECHNICAL SPECIFICATIONS.....	25
7.1 Dimensional Drawings UNB5.0/12.5 kVA: .....	27
7.2 Dimensional Drawings UNB23.0kVA, UNB30.0kVA & 40.0 kVA: .....	28
7.3 Photo UNB5.0/12.5kVA .....	29
7.4 Photo UNB23.0/30.0/40.0kVA .....	29

## 1. Safety Instructions and Waste Disposal Rules



### Warning!

---

Because several components of operating electrical modules are charged by dangerous voltage, the improper handling of electrical modules may be the cause of accidents involving electrocution, injury, or material damages.

- Operation and maintenance of electrical modules must be performed by qualified skilled personnel such as electricians in accordance with EN 50110-1 or IEC 60950.
- Install the module only in areas with limited access to unskilled personnel.
- Before starting work, the electrical module must be disconnected from mains. Make sure that the module is earthed.
- Do not touch connector pins as they can be charged with dangerous voltage up to 30 seconds after disconnection.
- Only spare parts approved by the manufacturer must be used.

---

All electric modules must be disposed of separate from domestic waste at collecting points that have been set up by the government or municipal authority.

“Separate collection is the precondition to ensure specific treatment and recycling of WEEE and is necessary to achieve the chosen level of protection of human health and the environment in the Community.”

The above statement from EU directive 2002/96/EC applies to all electric modules installed within EU countries.

In countries outside the EU, different rules may apply regarding waste disposal of electric modules.

For more information about waste disposal of your discarded equipment, contact your ELTEK VALERE INDUSTRIAL partner.

---

## 2. General Information

An electronic transfer switch is to be used if critical consumer loads have to be switched over nearly interruption free between two AC sources (usually inverters and substitute-mains) with a reaction time which is not able to be reached with a manual (mechanical) bypass switch. The electronic transfer switch guarantees the synchronization of frequency and phase of the inverter with mains and a switch over from the disturbed source to the alternative source within 0.5 to 4.0ms depending on the adjusted sensitivity (factory setting, only adjustable by skilled service personnel). Switching over again takes place interruption free at the zero point of the voltage. In case of synchronization error between mains and inverters switching over takes place with a delay time of maximum 12ms.

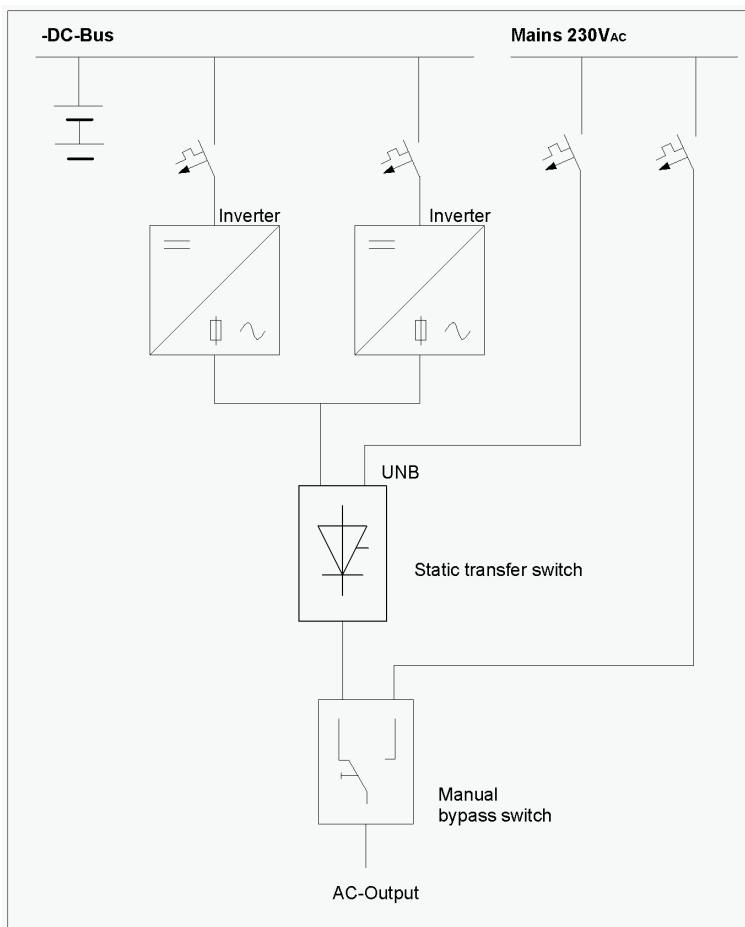
Static transfer switches of series UNB are available for delivery with power rating of 5.0KVA to 40.0KVA and are to be used for the operation with inverters of series UNV and PWS.

Typical applications are the use in UPS systems designed with input side rectifiers, battery circuit and output side inverters.

The UNB is a 19"-compatible rack according to DIN41494 with rear side connectors. The CAN bus connectors as well as any operating elements and indicators are user-friendly integrated in the front plate of the unit.

### 2.1 Example of use

Static transfer switch UNB connected between inverter output side and mains 230V<sub>AC</sub>:



## **2.2 Operating modes**

The static transfer switch UNB is designed for the operating modes “inverter priority” and “mains priority”. Source 1 always is the priority source, i.e. the consumer load is energized by this source if the operating system works under fully functional conditions.

### **2.2.1 Inverter priority configuration**

In the operating mode “inverter priority” the inverter works as source 1 and the substitute mains as source 2. This is the standard configuration (factory setting). Source 2 only is required to energize the consumer load if source 1 fails or is overloaded (i.e. distortions by short circuit behaviour or overload). The priority source is programmable in the service menu 2.

### **2.2.2 Mains priority configuration**

In the operating mode “mains priority” the AC mains works as source 1 and the inverter (in this case as “substitute mains”) as source 2.

### 3. Type List and Main Data

Type Designation	Material Code	Battery Voltage (V <sub>DC</sub> )	Rated Output Power (kVA @ 230V <sub>AC</sub> )
UNB5.0-24	600-050-411.00	24	5.0
UNB5.0-48	600-050-511.00	48	5.0
UNB5.0-60	600-050-611.00	60	5.0
UNB5.0-110	600-050-711.00	108	5.0
UNB5.0-220	600-050-811.00	216	5.0
UNB12.5-24	600-125-411.00	24	12.5
UNB12.5-48	600-125-511.00	48	12.5
UNB12.5-60	600-125-611.00	60	12.5
UNB12.5-110	600-125-711.00	108	12.5
UNB12.5-220	600-125-811.00	216	12.5
UNB23.0-24	600-230-411.00	24	23.0
UNB23.0-48	600-230-511.00	48	23.0
UNB23.0-60	600-230-611.00	60	23.0
UNB23.0-110	600-230-711.00	108	23.0
UNB23.0-220	600-230-811.00	216	23.0
UNB30.0-24	600-300-411.00	24	30.0
UNB30.0-48	600-300-511.00	48	30.0
UNB30.0-60	600-300-611.00	60	30.0
UNB30.0-110	600-300-711.00	108	30.0
UNB30.0-220	600-300-811.00	216	30.0
UNB40.0-24	600-400-411.00	24	40.0
UNB40.0-48	600-400-511.00	48	40.0
UNB40.0-60	600-400-611.00	60	40.0
UNB40.0-110	600-400-711.00	108	40.0
UNB40.0-220	600-400-811.00	216	40.0

See section 7) for detailed technical data.

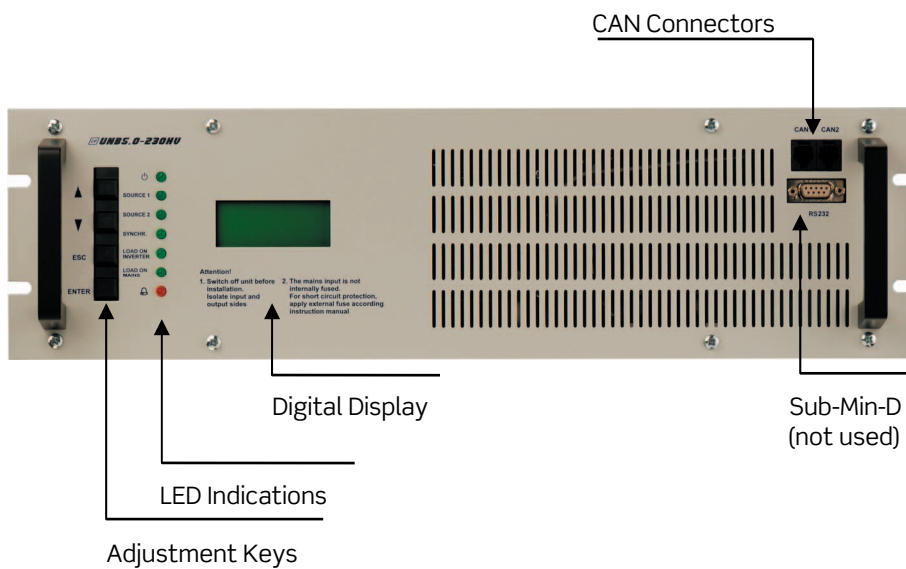


### 3.1 Optional equipment for UNB assembly:

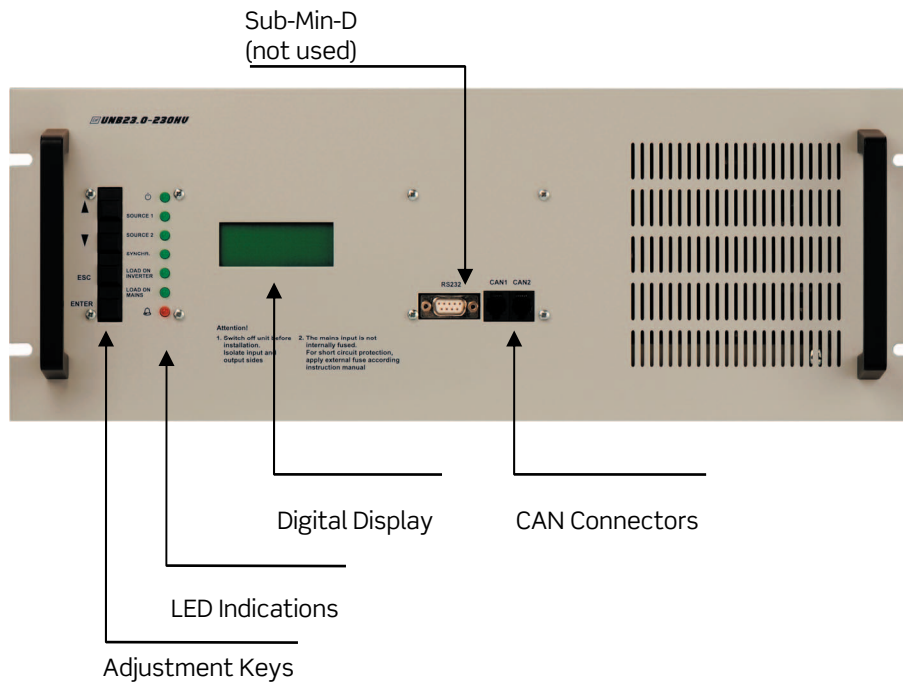
Article	Article code	Suitable for:
Mounting-kit	880-MEC-MKT.01	UNB5.0 & UNB12.5 type series
Mounting-kit	880-MEC-MKT.03	UNB23.0, UNB30.0 & UNB40.0 type series

### 3.2 Front View and Operating Elements

#### 3.2.1 Front view UNB5.0/12.5kVA



## 3.2.2 Front view UNB23.0/30.0/40.0kVA



All operating elements and indicators are located at the front of the modules:

- 4 adjustment keys: ▲ (up), ▼ (down), “ESC”, “ENTER”.
- 7 LED indications: “STANDBY”, “SOURCE 1”, “SOURCE 2”, “SYNCHR.”, “LOAD ON INVERTER”, “LOAD ON MAINS”, “ALARM”.
- Digital display


For detailed information concerning operating elements, LED indicators, digital display and connectors please see the following chapters.

## 3.3 Electrical Connectors

### 3.3.1 Input terminals

The UNB is equipped with two AC inputs, one for the inverter and the other for the substitute-mains. Both sources must have the same frequency and the same nominal voltage level. Because there are no protection fuses integrated in the unit, both sources must be protected externally.

If several inverters are connected in parallel, the parallel connection of the inverter outputs has to be arranged externally.

 **REMARK:** If inverters of series **PWS** are connected in parallel, a symmetry-choke per inverter additionally is to be installed into the L-phase.

The AC input connectors are located on the rear side of the unit. Because of the limited load capacity of the connector pins the UNB with an output power of 23.0kVA is equipped with two connectors, the 30.0 & 40.0kVA unit with three connectors with several contact pins connected in parallel accordingly. In that case the contact pins require an identical cable diameter and length. This applies also to the AC output connection terminal which is described in the following.

Additional the UNB is equipped with a DC input for the connection with the battery of the system. The internal electronic circuit of the UNB is supplied by mains and additionally by the battery (redundancy). The voltage level of the battery is monitored by the UNB; the result is used for switching off the inverters in case of over/under voltage.

The UNB measures and monitors the voltage level of both input sources (real effective values) and additional the frequencies. The thresholds of those measuring values are programmable (factory setting, only practicable by skilled service personnel).

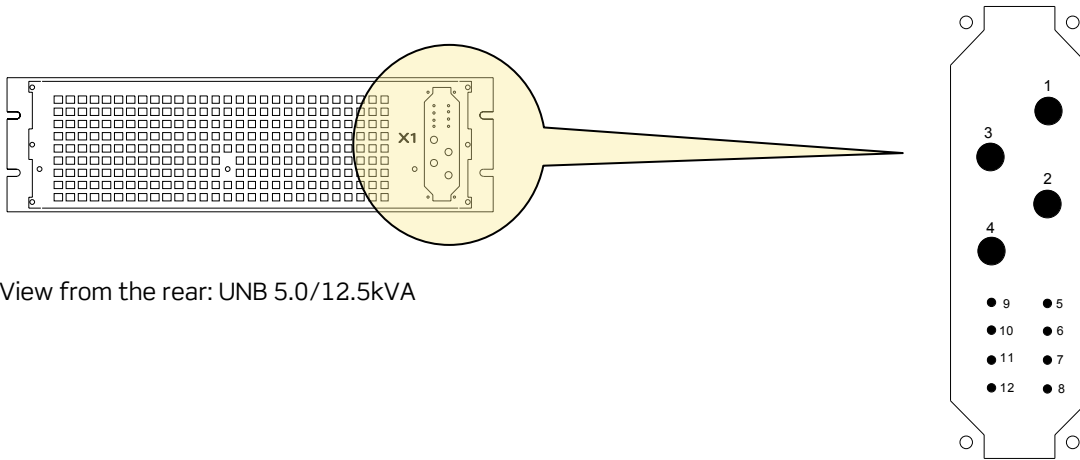
### 3.3.2 Output terminals

The unit is equipped with a plug-in AC output connection terminal. In case of short circuit, the short circuit power is transferred to the UNB input, which causes the fuse of source 1 or 2 to blow. The UNB may be overloaded only for short-time (see technical data). In particular this is to be observed for the correct dimensioning of the pre-fuse. The pre-fuse must be dimensioned according to the nominal output power of the UNB. If the pre-fuse is overdimensioned, the resultant delayed fuse tripping may destroy the internal thyristors of the UNB.

The operation of the UNB in combination with inverters of series **UNV**:

The UNB measures and monitors the current of the consumer load. In order to avoid a permanent overload of the inverters the UNB verifies the availability of the connected inverters and anew calculates the allowed total current of the consumer load. If one of the inverters in parallel operation fails, the overload threshold value automatically is reduced.

**3.3.3 Connectors UNB 5.0 and UNB 12.5kVA**



View from the rear: UNB 5.0/12.5kVA

Connector X1 (HAN-K4/8, socket outlet)

Pins (X1)	Function
1	Source 1 (inverter)/Phase L1
2	Source 2 (substitute mains)/Phase L1
3	Source 1 & 2/ neutral
4	UNB Output/Phase L1
5	DC-supply / L+ (24 / 48 / 108 / 216V DC)
6	DC-supply / L- (24 / 48 / 108 / 216V DC)
7	Synchronization / SYNC-SIG
8	Synchronization / SYNC-STAT
9	Remote switch ON (+24V)
10	Indication relay general fault / NO
11	Indication relay general fault / COM*
12	Synchronization / SYNC-GND

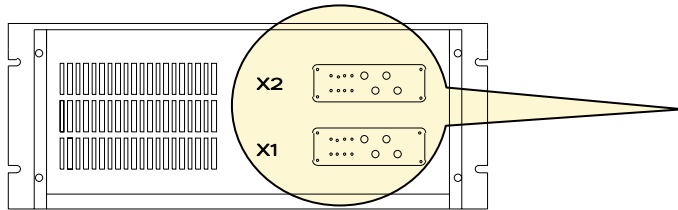
\*Function logic: OK = COM and NO closed  
 (Is equal to the programming "not inverted")

REMARK: If the UNB works in combination with a single inverter or inverters in parallel operation it is necessary to connect through the synchronization bus (contacts SYNC-GND→ SYNC-GND, SYNC-SIG→ SYNC-SIG and SYNC-STAT→ SYNC-STAT) between the inverter(s) and the UNB.

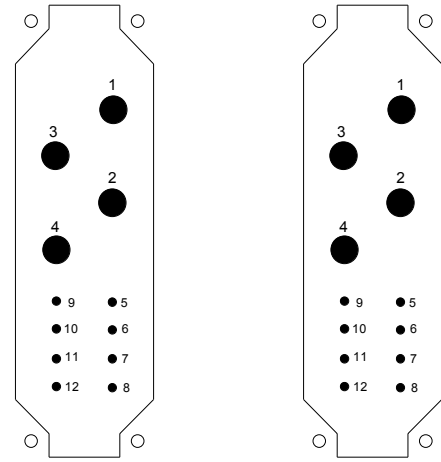
# Static Transfer Switch UNB

User Manual  
Page 13 (29)

## 3.3.4 Connectors UNB 23.0kVA



View from the rear: UNB 23.0kVA



Connector X1

Connector X2

(HAN-K4/8, socket outlet)

Pins (X1)	Function	Pins (X2)	Function
1	Source 1 (inverter)/Phase L1	1	Source 1 (inverter)/Phase L1
2	Source 2 (substitute mains)/Phase L1	2	Source 2 (substitute mains)/Phase L1
3	Source 1 & 2/ neutral	3	No connection
4	UNB Output/Phase L1	4	UNB Output/Phase L1
5	DC-supply / L+ (24 / 48 / 108 / 216V DC)	5	No connection
6	DC-supply / L- (24 / 48 / 108 / 216V DC)	6	No connection
7	Synchronization / SYNC-SIG	7	No connection
8	Synchronization / SYNC-STAT	8	No connection
9	Indication relay general fault / NC	9	Remote switch ON (+24V)
10	Indication relay general fault / NO	10	No connection
11	Indication relay general fault / COM*	11	No connection
12	Synchronization / SYNC-GND	12	No connection

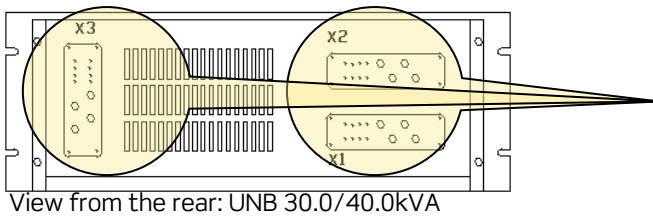
\*Function logic: fault = COM and NC closed  
OK = COM and NO closed  
(Is equal to the programming “not inverted”)

REMARK: If the UNB works in combination with a single inverter or inverters in parallel operation it is necessary to connect through the synchronization bus (contacts SYNC-GND→ SYNC-GND, SYNC-SIG→ SYNC-SIG and SYNC-STAT→ SYNC-STAT) between the inverter(s) and the UNB.

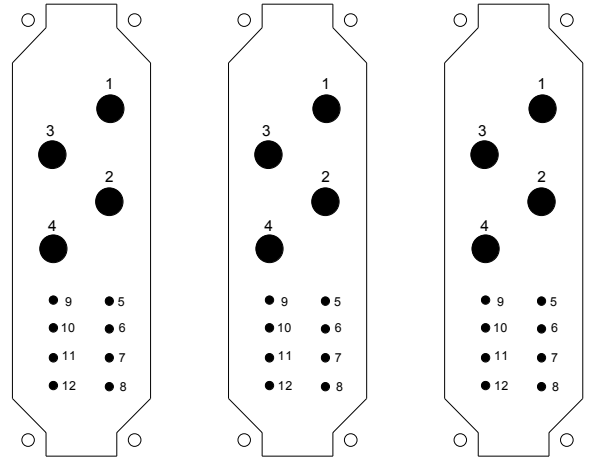
# Static Transfer Switch UNB

User Manual  
Page 14 (29)

### 3.3.5 Connectors UNB 30.0kVA & UNB 40.0kVA



View from the rear: UNB 30.0/40.0kVA



Connector X1    Connector X2    Connector X3  
(HAN-K4/8, socket outlet)

Pins (X1)	Function	Pins (X2)	Function
1	Source 1 (inverter) / Phase L1	1	Source 2 (substitute mains) / Phase L1
2	Source 1 (inverter) / Phase L1	2	Source 2 (substitute mains) / Phase L1
3	Source 1 (inverter) / Phase L1	3	Source 2 (substitute mains) / Phase L1
4	No connection	4	Source 1 & 2 / neutral
5	No connection	5	DC-supply / L+
6	Synchronization / SYNC-GND	6	DC-supply / L-
7	Synchronization / SYNC-SIG	7	No connection
8	Synchronization / SYNC-STAT	8	No connection
9	Remote switch ON (+24V)	9	No connection
10	No connection	10	Indication relay general fault / COM*
11	No connection	11	Indication relay general fault / NO
12	No connection	12	Indication relay general fault / NC

\*Function logic: fault = COM and NC closed  
OK = COM and NO closed  
(Is equal to the programming "not inverted")

REMARK: If the UNB works in combination with a single inverter or inverters in parallel operation it is necessary to connect through the synchronization bus (contacts SYNC-GND→ SYNC-GND, SYNC-SIG→ SYNC-SIG and SYNC-STAT→ SYNC-STAT) between the inverter(s) and the UNB.

Pins (X3)	Function
1	UNB Output/Phase L1
2	UNB Output/Phase L1
3	UNB Output/Phase L1
4	No connection
5	No connection
6	No connection
7	No connection
8	No connection
9	No connection
10	No connection
11	No connection
12	No connection

### 3.3.6 Pinning of the CAN bus connectors

The UNB is equipped with 2 CAN connectors (CAN1 and CAN2) at the front of the unit.



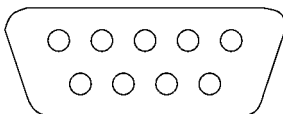
CAN bus connector  
(socket outlet RJ11, 6 pole)

Pinning table:

Pin	Signals CAN1	Signals CAN2	Designation
1	CAN_V+	←	DC-Supply +8...15V
2	CAN_V+	←	DC-Supply +8...15V
3	CAN_H	←	Signal (high)
4	CAN_L	←	Signal (low)
5	CAN_V-	←	DC-Supply Ground
6	CAN_V-	←	DC-Supply Ground

### 3.3.7 Connector (Sub-Min-D, 9-pole)

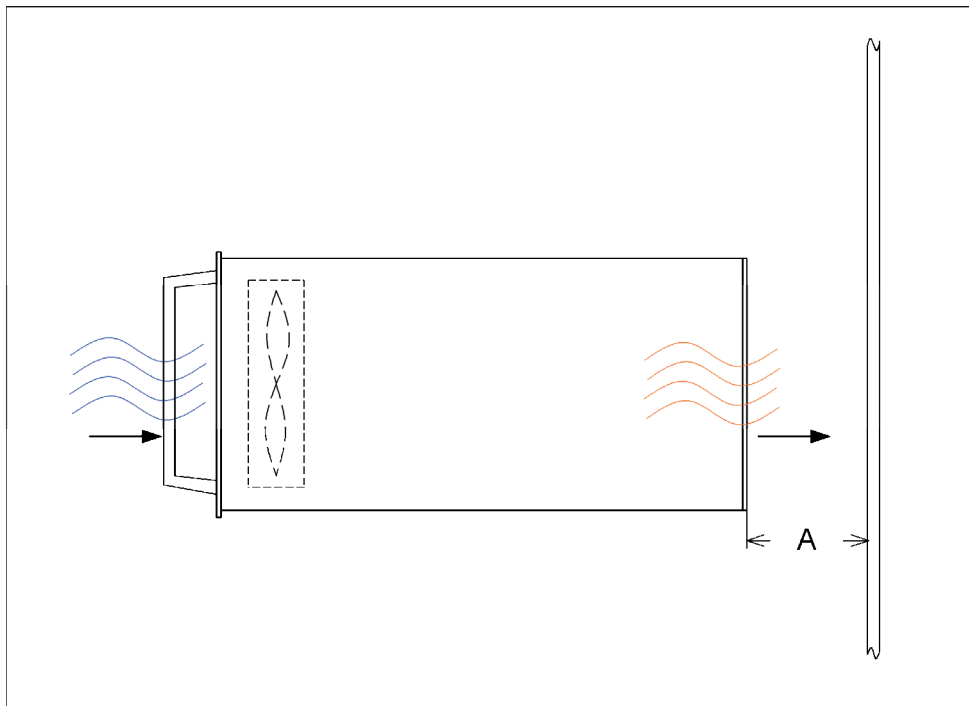
Additional a connector (Sub-Min-D, 9-pole) is located at the front of the UNB.



REMARK: This connector is not used.

### 3.5 Cooling/Air flow direction

The unit is cooled with an internal fan. The airflow is from the front to rear side. The fan is monitored and speed controlled by device temperature. For a sufficient airflow a minimum space (A) of 50 mm between the unit and the rear cabinet wall as well as an unobstructed influx of supply air from front side is necessary.





### 3.6 CAN-Bus Communication Interface

The UNB is equipped with a serial data interface according to CAN (= Controller Area Network) -specification. Two CAN-Bus connectors are integrated in the front plate of the unit.

The UNB communicates via CAN-Bus with the connected inverters and a possibly implemented supervision monitoring device (UPC3 or MU1000C).

Following information is available via the CAN-Bus:

- Status information of the UNB
- Availability of the connected inverters
- Availability of the substitute mains
- Output current of the UNB
- Device temperature
- Battery-voltage at the UNB
- Frequency of source 1 and source 2
- Input- and output values of the connected inverters as follows:
  - Input current
  - Input voltage
  - Output current
  - Output voltage
  - Output frequency
  - Device state (okay/not okay)

(The values are measured at regular intervals via the CAN-Bus and can be called in the display).

If the signal to one of the connected inverters is interrupted, the failure message “CAN failure” is indicated and the number of the particular inverter is shown. The numbering of the inverters automatically follows the CAN addresses in ascending order which have been adjusted at the inverters.

The output voltage of the connected inverters is controlled by the UNB via CAN-Bus according to the adjusted value “mains voltage” in the service menu 1 (factory setting, only practicable by skilled service personnel). When the CAN-Bus connection is inactive for more than 5 seconds the inverters automatically switch back to the internally stored default values.

The inverters are switched off by the UNB if  $U_{batt} > U_{max}$  (default value=  $2.5V \times \text{number of cells}$ ) or  $U_{batt} < U_{min}$  (default value=  $1.7V \times \text{number of cells}$ ) is detected by the UNB.

**ATTENTION:** The internally stored value (output voltage of the inverter  $U_o$ ) must be the same for all of the inverters which are connected in parallel and the same value must be adjusted at the UNB. Detailed information regarding the adjustment of “ $U_o$ ” can be found in the user manuals of the particular inverters.

The CAN bus is not relevant for the synchronization of the inverters. For safety reasons, the synchronization takes place via the hard-wired synchronization bus between inverters and UNB (please see section 3.3.3 ff “connectors”).

## 4. Handling

### 4.1 Storage

The UNB must be stored in a dry, dust free environment with a storage temperature according to specified data (see section 7).

### 4.2 Commissioning

**Note:** Before commissioning the module make sure that the voltage level of both input sources and the battery voltage correspond to the values according to the type plate of the UNB.








To mount the inverter in a 19" compatible cabinet, a mounting-kit according to section 3.1 is necessary. After unpacking the unit put it upon the rails and slide in the unit carefully over the rails until the module connector gets in touch with the backplane connector. Increase the pressure until the unit fits in completely. Please avoid too much pressure. If the unit does not fit in please start again with the complete slide-in process. Mount the unit with 4 screws (M4x12).

**Caution:** The unit is delivered without internal fuses. Therefore the unit has to be fused externally at the input source "mains" to protect the internal thyristors against damages in case of short circuit. The pre-fuse must be dimensioned according to the nominal output power of the UNB. In case of inverters in parallel operation, the output of each inverter has to be fused.

### 4.3 Operation

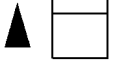



The operation and adjustment respectively of the unit takes place with keys located at the front side of the unit. All main functional parameters and measuring values are displayed on the front side LCD panel (text indicator) as well as with LED indications. They are described in the following.

#### 4.3.1 LED indication

LED	Indication	Colour	Operation mode
	STANDBY	green	The UNB is switched on and operational
	SOURCE 1	green	Voltage and frequency of source 1 (priority source) are within allowable range
	SOURCE 2	green	Voltage and frequency of source 2 (substitute source) are within allowable range
	SYNCHR.	green	Inverters are synchronised with mains by UNB
	LOAD ON INVERTER	green	Load fed by inverter
	LOAD ON MAINS	green	Load fed by mains
	ALARM	red	General Alarm (the assignment of the individual alarm messages is programmable)

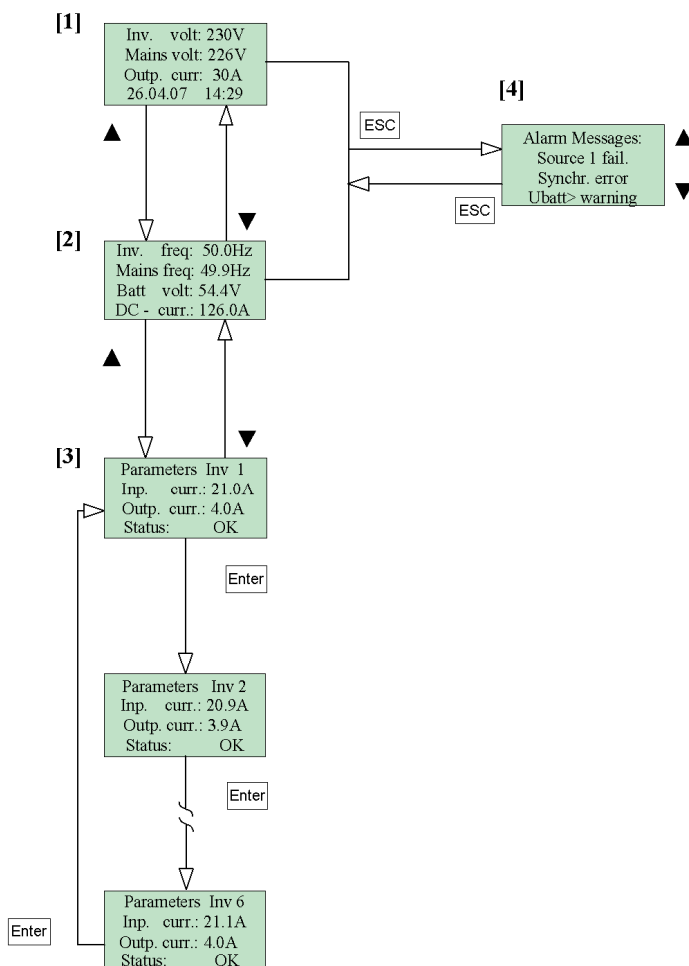
### 4.3.2 Adjustment keys

The adjustment takes place with the four front keys:

Front keys	Indication	Function
	<b>Up</b>	<ul style="list-style-type: none"><li>➤ during menu item selection: change to previous item (parameter)</li><li>➤ during adjustment mode: increase value</li></ul>
	<b>Down</b>	<ul style="list-style-type: none"><li>➤ during menu item selection: change to next item (parameter)</li><li>➤ during adjustment mode: decrease value</li></ul>
<b>ESC</b> 	<b>Escape</b>	<ul style="list-style-type: none"><li>➤ leave the menu without changing</li></ul>
<b>ENTER</b> 	<b>Enter</b>	<ul style="list-style-type: none"><li>➤ call menu</li><li>➤ leave menu with changing</li><li>➤ save parameter</li></ul>

### 4.3.3 LCD panel / Indication of measuring values & alarm messages

In the initial state the display shows the measuring values of the input sources (AC output voltage of inverter, mains voltage, output current, date and time, additional frequencies of inverter and mains and battery voltage as well as the total DC-current).



(The example above shows six registered inverters)

Display [1] shows the initial state (basic display). The plain text of the basic display becomes visible after a successful start-up procedure. According to the diagram above you can select the displays [1], [2] and [3] by pushing the keys ▲ or ▼:

- If no inverter is registered, display [3] is not available.
- If exactly one inverter is registered, display [3] is visible without inverter number.
- If more than one inverter is registered, it is possible to call the parameters (input current, output current and status) of all connected inverters in succession by pressing “ENTER”. The inverter number is shown in the first line of the display.

The display will automatically revert to display [1] if no key is pressed for a period of more than 30 seconds.

Display [4] “Alarm messages” indicates the current alarm status. It can be selected from display [1] or [2] by pressing “ESC”.

With pressing the keys ▲ or ▼ you can leaf through the list of alarm messages if more than three entries are present there. The display “Alarm messages” can be quit by pressing “ESC” again.

Basically (factory setting) all individual failures according to “list of the selectable individual collective failures” (please see section 4.4.1) are switched “active” and therefore they are visible on the display in case of failure. The alarm messages which shall **not** be visible on the display in case of failure are to be switched “inactive” in the customer menu (please see the diagram “Customer menu”).

## 4.4 Parameter adjustments

REMARK: The configuration of the system during commissioning takes place with the service menu 1 and 2 and the calibration menu. They are code protected to guard against illegal parameter changes. The special documents only are available for qualified and skilled service personnel.

In the following the adjustable parameters in the **customer menu** (available for each customer) are described.

### 4.4.1 Table “Adjustable Parameters” (customer menu)

In the customer menu the parameters can be adjusted according to the table:

Menu item	Functions	Range	Default value (factory setting)
INV-count	Key in the number of the connected inverters*	0- 15	0
Time/Date	Adjustment of the real time clock		
Configuration CF	Selection (switching active/inactive) of individual failures for the collective failure signalisation= General Alarm (LED and Relay)	All individual failures**	All active
Delay LED CF	LED time delay of the collective failure signal	1- 60 sec	30
Delay Relay CF	Time delay of the collective failure relay	1- 60 sec	30
LCD-contrast	Contrast adjustment of the display	0- 255	220
LCD backlight	Background illumination	On / off	On
Language	Selection of the language	English, German, Polish, Swedish, Italian	English
Softw. version?	Shows the current firmware version	Read only	

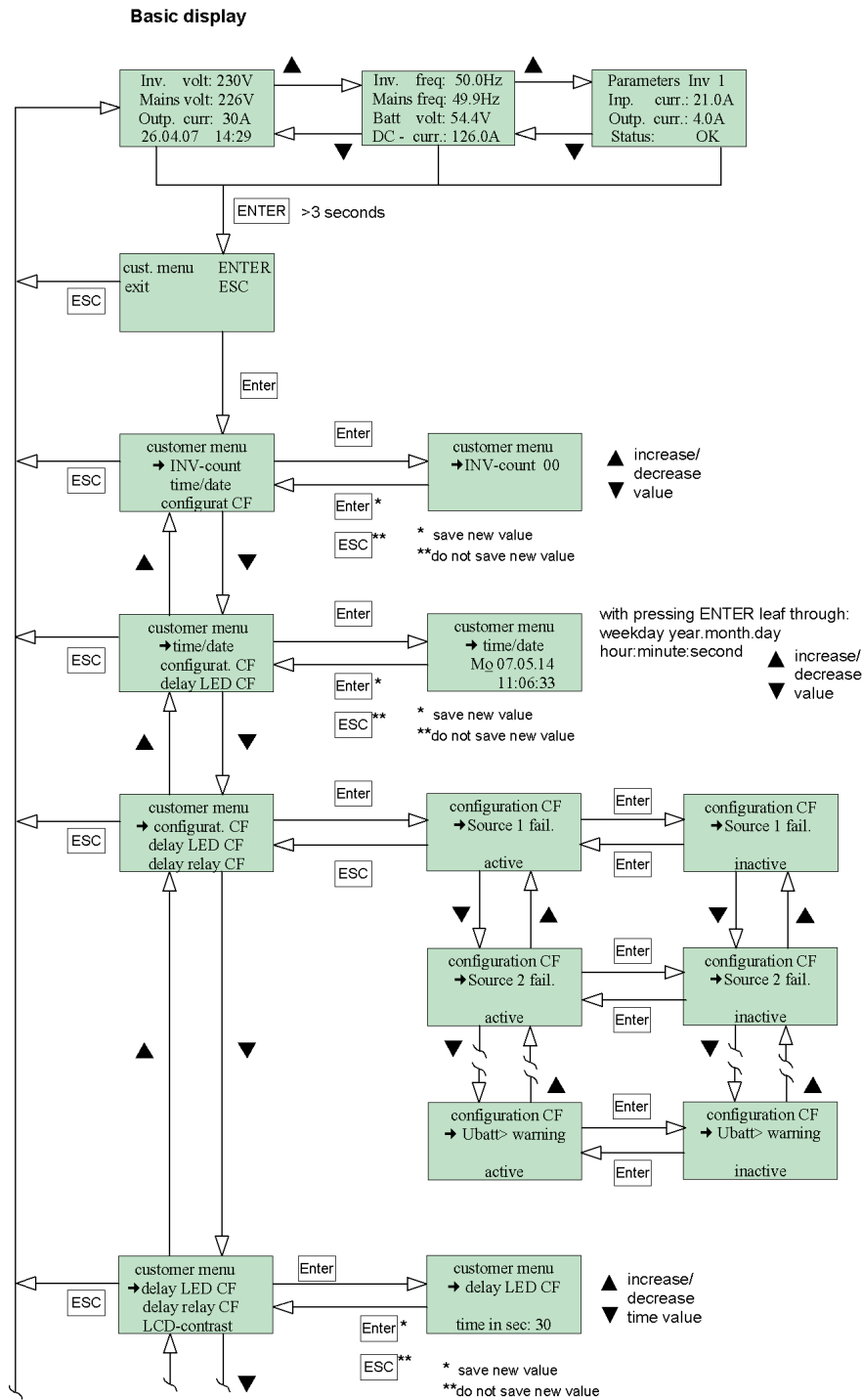
\* If the UNB works together with inverters of type PWS, the INV-count must be set to “0” because the PWS is not equipped with a CAN interface. Otherwise, the failure message “Inverter fail.” would be generated.

\*\*List of the selectable individual collective failures (CF):

- Source 1 fail.
- Source 2 fail.
- Synchr. Error
- Inverter fail.
- UNB overtemp.
- UNB overload
- INV overload
- DC voltage low
- DC voltage high
- Ubatt< warning
- Ubatt> warning

### 4.4.2 Diagram “Customer menu”

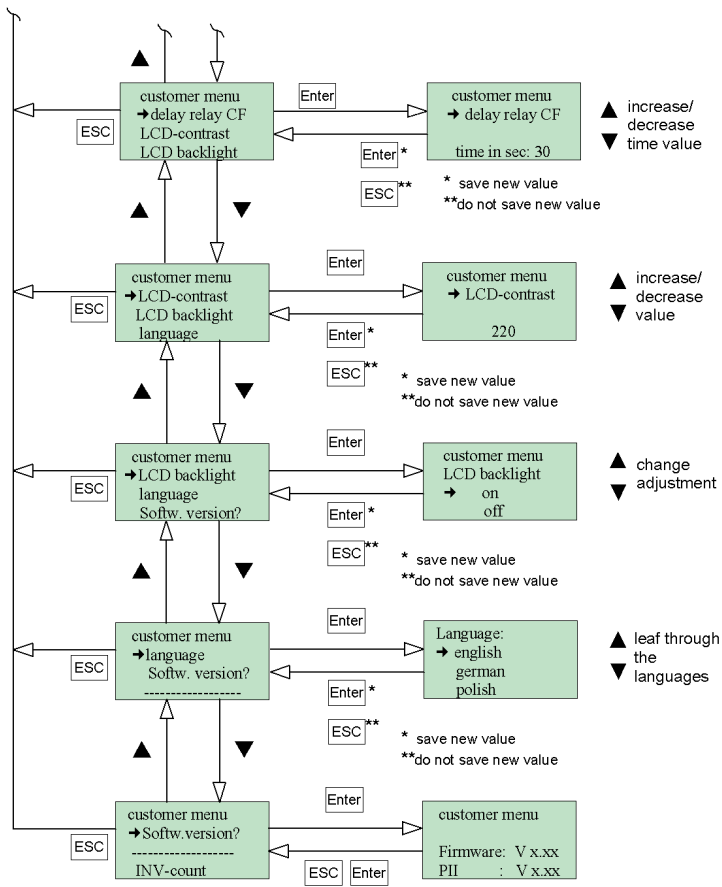
The customer menu can be entered from the basic display by pressing ENTER for around 3 seconds and then press ENTER again.



A list of all selectable individual collective failures (CF) is shown on the previous page.

Continuation: Next page

Continuation of the previous page:



The final display provides information about the currently used firmware version.

## 5. Maintenance

In general, the static transfer switch UNB is maintenance-free.  
A yearly inspection with following checks is simply recommended:

- Correct fan operation
- Mechanical inspection
- Removal of dust and dirt, especially on radiating surfaces
- Check for internal dust or humidity

**Attention!** Dust combined with dew or water may influence or destroy the internal electronic circuits.  
Dust inside the unit can be blown out with dry compressed air.  
The intervals between those checks depend on ambient conditions of the installed module.

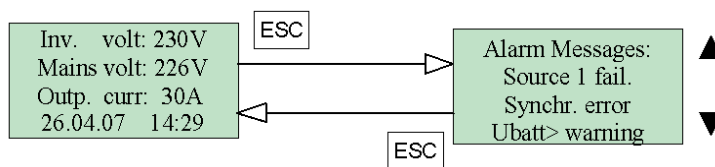
## 6. Trouble shooting

If a failure occurs in the system, the LED “Alarm” is illuminated according to the adjustments in the customer menu, item “Configuration of Collective Failures” (see diagram “customer menu”).

The failures are shown in clear text modus in the display “Alarm messages”.

The display “Alarm messages” can be entered from the basic display by pressing ESC (please also see section 4.3.3).

Basic display



Alarm messages	Possible reason	Corrective action
Source 1 fail.	Mains voltage or frequency not ok	Check mains voltage/inverter output voltage
Source 2 fail.	Inverter voltage or frequency not ok	Check inverter output voltage/mains voltage
Synchr. Error	Inverter voltage is not synchronous to mains	No mains voltage available or frequency of mains voltage is not stable (out of frequency tolerance range)
Inverter fail.	Inverter failure	CAN communication with one ore more Inverters failed Inverter failure detected via CAN
UNB overtemp	UNB over temperature	Check the air flow Check admissible ambient temperature
UNB overload	UNB output current to high	Reduce load current
INV overload	Actual output current exceeds the combined INV power	Reduce load current or increase INV power by additional inverter
DC-voltage low	Battery voltage low	Check DC voltage system
DC-voltage high	Battery voltage high	Check DC voltage system
Ubatt < warning	Battery voltage < warning level	Check DC voltage system
Ubatt > warning	Battery voltage > warning level	Check DC voltage system



## 7. Technical Specifications

<b>Type designation</b>	Please see section 1 “ <b>Type List/Main Data</b> ”
<b>Material code</b>	Please see section 1 “ <b>Type List/Main Data</b> ”
<b>AC input:</b>	
Nominal input voltage source 1 + 2	220/230/240V <sub>AC</sub> , adjustable
Input voltage tolerance	±20%
Input frequency range	48- 52Hz/ 58-62Hz, adjustable
Synchronization range	±2Hz (in combination with inverters of series PWS the range must be adjusted to ±0.5Hz).
Efficiency	≥ 99%
<b>DC Voltage input:</b>	
Nominal battery voltage	Please see section 1 “ <b>Type List/Main Data</b> ”
<b>AC Output:</b>	
Nominal output voltage	220/230/240V <sub>AC</sub> , adjustable, switch over threshold ±5 to ±20%, adjustable
Nominal output power	Please see section 1 “ <b>Type List/Main Data</b> ”
Overload capability	1000% for 10ms
Output frequency	acc. to the input frequency
Switch transfer time	≤3ms
Fusing	External with rated current, character gL
<b>Standard Features:</b>	
Monitoring functions	voltage/frequency of sources 1 and 2; synchronization mains/ inverter; over temperature; CAN communication lost; battery voltage
LED indications	Operation (green), source 1 OK (green), source 2 OK (green), load on mains (green), load on inverter (green), synchronization (green), collective alarm (red)
Alphanumeric display	LCD (4 x 16 characters), background lighted
Control keys	▲ , ▼ , ESC, ENTER
Fault signalization	Text message on LCD; in addition 1 programmable isolated collective failure (alarm) relay, max. contact load: <0.25A <sub>DC</sub> @ V <sub>max</sub> < 150V <sub>DC</sub> ; <0.5A <sub>DC</sub> @ V <sub>max</sub> <100V <sub>DC</sub>
Communication interface	CAN-Bus for communication with inverters of type UNV
Remote switch ON	available

**Environmental:**

Ambient temperature	operation: -20°C to +55°C; storage: -40°C to + 85°C
Climatic conditions	acc. to IEC 721-3-3 class 3K3/3Z1/3B1/3C2/3S2/3M2
Dust	<1mg/m <sup>3</sup>
Max. installation altitude	≤1500m
Audible noise	≤45dBA at 1m distance

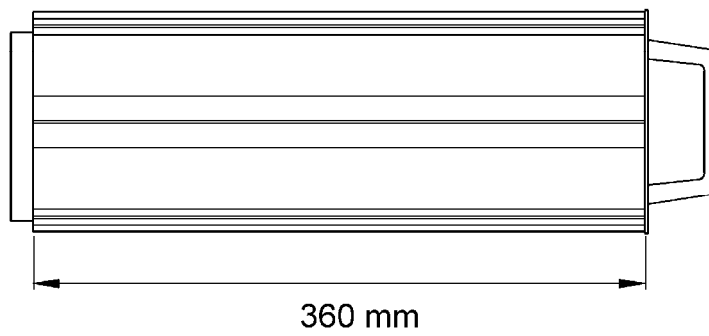
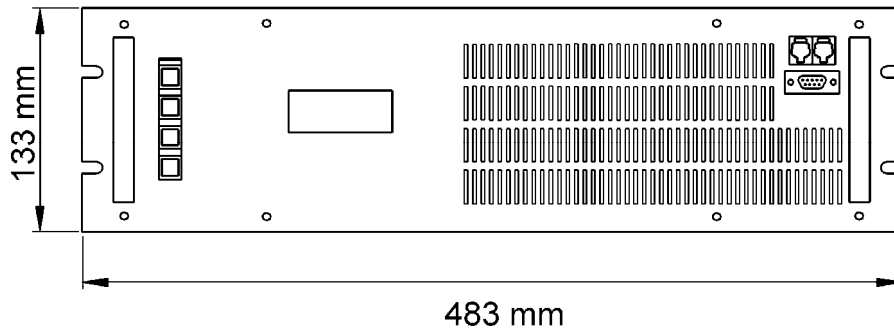
**Mechanical:**

Type of construction	19"- compatible rack acc. to DIN 41494
Cooling	forced cooling with internal fan (temperature regulated; monitored)
Surfaces	powder coating RAL 7035 (front panel only), black imprint; constructive parts: anodized metal
Dimensions (W/H/D)	UNB 5kVA + 12.5kVA: 483/133/360mm (3HU) UNB 23kVA + 30kVA + 40kVA: 483/177/460mm (4HU)
Weight	UNB 5kVA + 12.5kVA: approx. 12.6kg UNB 23kVA: approx. 13.2kg UNB 30kVA: approx. 15.8kg UNB 40kVA: approx. 16.9kg
Electrical connectors	Front side: 2 x CAN-Bus (RJ11); 1 x Sub-Min-D9 connector (not used) Rear side: AC inputs/output, DC input and signalization; UNB 5kVA + 12.5kVA: 1 x HAN-K4/8; UNB 23kVA: 2 x HAN-K4/8; UNB 30kVA + 40kVA: 3 x HAN-K4/8

**Applicable standards:**

Type of enclosure/protection class	IP20 (front panel) /1 acc. to EN 60950 (electr.)
CE conformity	yes
Compliance to EMC standards	EN55011/55022 class "B"; EN61000-4 part 2-5)
Compliance to safety standards	acc. to EN60950-1; VDO0100 T410; VDO0110; EN60146

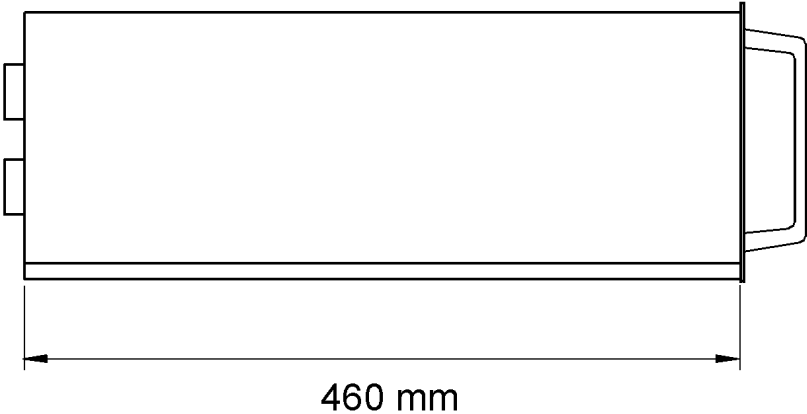
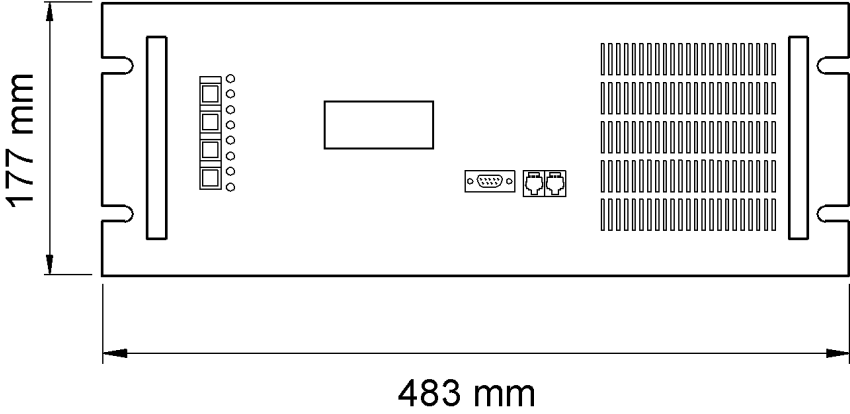
**7.1 Dimensional Drawings UNB5.0/12.5 kVA:**



Static Transfer Switch  
**UNB**

User Manual  
Page 28 (29)

**7.2 Dimensional Drawings UNB23.0kVA, UNB30.0kVA & 40.0 kVA:**



### 7.3 Photo UNB5.0/12.5kVA

Please see first cover page

### 7.4 Photo UNB23.0/30.0/40.0kVA

