



## DC/AC INVERTER

**In:220VDC**

**Out: 230VAC (2.25kVA)**

### KEY FEATURES

- 1/4 x 19", 2U
- Excellent overall efficiency and high regulation speed
  - "Hot plug-in" design with backplane connection
- High power density
- CAN-Bus interface
- Ability for parallel operation
- Temperature-controlled fan cooling
- Redundant synchronization bus
- Excellent sinusoidal output
- Input over/under voltage shutdown, overload and short circuit-proof

### PRODUCT DESCRIPTION

The inverter includes the newest switching technology with digital control. Due to this fact a dramatic reduction of volume and weight was achieved.

With a state-of-the-art control solution it provides an excellent functionality and several protection features.

The inverter is able to run in parallel operation mode to increase the reliability of the AC system without any additional options. Additional modules can be integrated in wired slots during normal system operation. For higher reliability the hard wired synchronization bus between paralleled inverters is working in a redundant mode.

Up to 4 inverters can be installed in a 19"-subrack with only 2U. The module is prepared to operate with the new static switches series to increase the system availability furthermore.

### APPLICATIONS

Inverter module for AC power supply facilities with or without battery in all areas of industry, power generation and power distribution.

## TEHNICAL DATA

|                                        |                                                                                                                        |
|----------------------------------------|------------------------------------------------------------------------------------------------------------------------|
| Nominal input voltage                  | 216VDC                                                                                                                 |
| Nominal input current                  | 9.2ADC @ 216VDC                                                                                                        |
| Input frequency range                  | DC                                                                                                                     |
| Input voltage range                    | 183.6-270VDC                                                                                                           |
| Inrush current                         | ≤nominal input current                                                                                                 |
| Overall efficiency                     | ≥90%                                                                                                                   |
| Internal input fusing                  | No; external fusing required (16A)                                                                                     |
| Nominal output voltage                 | 230VAC ±0.5%, adjustment range: 200-242VAC; parallel mode: 230VAC ±5%                                                  |
| Nominal output current                 | 9.8AAC @ cos phi=0.8; 7.8AAC @ cos phi=1 (resistive power)                                                             |
| Nominal output power                   | 1800W/2250VA @ cos phi=0.8                                                                                             |
| Overload capability                    | 130% for 5 sec, 110% for 1 min                                                                                         |
| Output frequency                       | 50Hz ±0.01Hz                                                                                                           |
| Synchronization range                  | 48-52Hz/58-62Hz (60Hz optional)                                                                                        |
| Static regulating deviation            | ±0.5%                                                                                                                  |
| Dynamic accuracy of the output voltage | <3% Vnom at load variations between 10%-90%-10% Inom; regulation time ≤0.3ms                                           |
| Short circuit protection               | Continuous short circuit proof; 3x Inom for 2.5 sec                                                                    |
| Parallel operation                     | Yes; current sharing ≤10% Inom; slope down output voltage line                                                         |
| THD/Crest factor                       | ≤2% at linear load/≤3                                                                                                  |
| Power factor range                     | 0.5 ind. - 1 - 0.5 cap.                                                                                                |
| External output fuse                   | 10A gL or MCB characteristic B                                                                                         |
| LED signalling                         | Operation (green), Vo OK (green), Alarm (red)                                                                          |
| Main processor                         | 16Bit Fujitsu                                                                                                          |
| Electronic protection                  | Input under voltage, input over voltage, over temperature, overload and short circuit protection                       |
| External synchronization               | Parallel operation; no fixed master; redundant synchronization bus; external synchronization by static transfer switch |
| Isolated signalling contacts           | "General fault"; relay contact NO; 60V/0.1A                                                                            |
| Communications interface               | CAN-Bus, proprietary protocol                                                                                          |
| Ambient temperature                    | Operation: -20°C to +55°C (power derating 2%/K above +40°C); storage: -40°C to +85°C                                   |
| Cooling                                | Fan cooling (temperature-regulated; monitored)                                                                         |
| Climatic conditions                    | according to IEC 721-3-3 class 3K3/3Z1/3B1/3C2/3S2/3M2                                                                 |
| Max. installation altitude             | ≤ 1500m                                                                                                                |
| Audible noise                          | <45dBA                                                                                                                 |
| Type of construction                   | 19"subrack 2U                                                                                                          |
| Dimensions (W/H/D)                     | 106.4/88.4/335mm                                                                                                       |
| Weight                                 | approx. 4.0kg                                                                                                          |
| Type of enclosure / Protection class   | IP20 (front panel) / 1                                                                                                 |
| Colour (front panel)                   | RAL 7035, black imprint                                                                                                |
| CE conformity                          | yes                                                                                                                    |
| Compliance to safety standards         | EN60950-1; VDE0100 T410; VDE0110; EN50178; EN60146                                                                     |
| Compliance to EMC standards            | EN55011/22 class "B"; EN61000-4 T2-5                                                                                   |
| Connections                            | DC input, AC output and signalization: DIN41612-M connector                                                            |



## DC/AC Inverter

**IN:100VDC**

**OUT: 230VAC (3.3kVA)**

### Description

The inverter family represents a high frequency DC to AC power conversion technology in 19" compatible racks. Suitable for any low to medium modular AC power system these inverters are ideal for applications in telecommunication, industry and railroad power supplies.

Combining high frequency conversion with galvanic isolation between input and output, inverter is a flexible, efficient and reliable AC power source. The possibility of parallel connection offers highest flexibility for realizing systems with increased output power and/or (n+1)-redundancy.

The inverter is designed to operate together with the static switch and supervisory module. Remote control and communication is performed via CAN interface. Alternatively the units can be operated in stand-alone mode.

### Key Features

- >> 19", 3U
- >> Wide range DC input
- >> "Hot-Plug-In" systems
- >> High power density
- >> CAN-Bus interface
- >> Ability for parallel operation
- >> Digital displays to notify all relevant parameters
- >> Temperature-controlled fan cooling
- >> Input over/under voltage shutdown, overload and short circuit-proof

### Technical Data

|                          |                                                            |
|--------------------------|------------------------------------------------------------|
| Nominal input voltage    | 108VDC                                                     |
| Nominal input current    | 26.7ADC                                                    |
| Input frequency range    | DC                                                         |
| Input voltage range      | +20/-15%                                                   |
| Inrush current           | ≤ nominal current                                          |
| Overall efficiency       | ≥90%                                                       |
| Internal input fusing    | MCB 1 pole                                                 |
| Nominal output voltage   | 230VAC ±0.5%, sinusoidal                                   |
| Nominal output current   | 14.35A                                                     |
| Nominal output power     | 3300VA (cos phi= 0,8)                                      |
| Overload capability      | 130% for 30 seconds                                        |
| Output frequency         | 50 or 60Hz programmable                                    |
| Synchronization range    | 45– 65Hz                                                   |
| Accuracy                 | ±0.5% static                                               |
| Recovery time            | < 0.3 ms at load transients 10%- 90%- 10%                  |
| Short circuit protection | Continuous short circuit proof, 3 x Inom for app. 2.5 sec. |
| Parallel operation       | Max. 10 pieces, load sharing app. 5% Inom                  |
| THD/Crest factor         | ≤ 2% at linear load/≤ 3                                    |

|                                           |                                                                                                                                                                     |
|-------------------------------------------|---------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| Power factor range                        | 0.5 ind. - 1 - 0.5 cap..                                                                                                                                            |
| LED signalling                            | Standby, Vout, Vin>, Vin<, overload, overtemperature, general fault                                                                                                 |
| Electronic protection                     | Mechanically coupled input and output MCB, input undervoltage shut down, input overvoltage shut down, overtemperature shut down, overload / short circuit shut down |
| External synchronization                  | Parallel operation and three-phase systems without additional components or specified master                                                                        |
| Remote signals                            | Relay contact „General Fault“.                                                                                                                                      |
| Digital display                           | 2 x 3 digits, output voltage; output current; frequency, input voltage, input current, temperature, effective power, reactive power, cos phi                        |
| Microprocessor control                    | Programmable monitoring and protection for all system                                                                                                               |
| Communication                             | CAN-Bus interface for communication with static bypass switch                                                                                                       |
| Ambient temperature Operation:            | -20°C to +55°C, storage: -40°C to +85°C                                                                                                                             |
| Climatic conditions                       | IEC 721-3-3 class 3K3/3Z1/3B1/3C2/3S2/3M2                                                                                                                           |
| Max. installation altitude                | ≤1500m.                                                                                                                                                             |
| Audible noise                             | ≤45dB (A) at 1 m distance.                                                                                                                                          |
| Construction                              | 19“, 3U, rear side connectors                                                                                                                                       |
| Dimensions (W/H/D)                        | 483/133/360mm.                                                                                                                                                      |
| Weight                                    | approx. 27kg.                                                                                                                                                       |
| Minimum installation depth                | 440mm ex. 19“ frame.                                                                                                                                                |
| Cooling                                   | Speed-controlled fan with overtemperature monitoring                                                                                                                |
| Type of enclosure / Protection class      | IP20 (mech.); 1 acc. to EN 60950 (electr.)                                                                                                                          |
| Surfaces                                  | Front panel: powder coating RAL 7035, black imprint; constructive parts: anodized meta                                                                              |
| Compliance to safety standards            | EN 60950-1, VDE 0100 part 410, VDE 0110, EN 50178, EN 60146                                                                                                         |
| Compliance to EMC standards/CE conformity | EN 55011, EN 55022 class „B“, EN 61000– 4 part 2– 5 /yes                                                                                                            |

## DC/AC Inverter

IN: 220VDC

OUT: 230VAC (5.0kVA)

### Description

The inverter family (1kVA–5kVA) is equipped with a 50Hz isolation transformer following a primary side pulse-width modulation stage and is available as 19"-compatible rack or wall mounted cabinet.

These inverters are especially suited for applications in power plants, industrial, railroad and shipping AC power supplies up to 40kVA output power.

The combination of rugged mechanical construction, high overload ability and electrical isolation between input and output offers a very high flexibility in system configuration.

The inverters can be operated as single unit or in parallel connection (optionally) to provide power increase or further improved reliability by (n+1)- redundancy.

Operation with a static bypass switch is also possible.

### Applications

Inverter module for AC power supply facilities in all areas of industry, power generation and power distribution. Especially for heavy duty loads with high inrush currents.

### Key Features

- 19", 5U
  - Wall cabinet version available
  - "Hot plug-in" system (19")
  - Very high overload ability
  - Ability for parallel operation (optional)
  - Analogue measurement instruments (Vout, Iout)
  - Temperature-controlled fan cooling
  - Input over/under voltage shutdown, overload and short circuit-proof
-

## Technical Data

|                                      |                                                                                                                                                             |
|--------------------------------------|-------------------------------------------------------------------------------------------------------------------------------------------------------------|
| Nominal input voltage                | 216VDC                                                                                                                                                      |
| Nominal input current                | 20.0ADC                                                                                                                                                     |
| Input frequency range                | DC                                                                                                                                                          |
| Input voltage range                  | +20/-15%                                                                                                                                                    |
| Inrush current                       | ≤ nominal current                                                                                                                                           |
| Overall efficiency                   | ≥91%                                                                                                                                                        |
| Internal input fusing                | No; (external fusing required (25A))                                                                                                                        |
| Nominal output voltage               | 230VAC ±0.5%, sinusoidal                                                                                                                                    |
| Nominal output current               | 21,8A                                                                                                                                                       |
| Nominal output power                 | 5000VA (cos phi= 0,8)                                                                                                                                       |
| Overload capability                  | 160% for 1min, 130% for 10min, without shut down                                                                                                            |
| Output frequency                     | 50Hz±0,05%                                                                                                                                                  |
| Synchronization range                | 49,5–50,5Hz                                                                                                                                                 |
| Accuracy                             | ±0.5% static.                                                                                                                                               |
| Recovery time                        | <0.3 ms at load transients 10%- 90%- 10%                                                                                                                    |
| Short circuit protection             | Continuous short circuit proof, 2...2,5 x Inom for app. 2.5 sec.                                                                                            |
| Parallel operation                   | Max. 12 pieces, load sharing app. 5% Inom, with external parallel operation chokes                                                                          |
| THD                                  | ≤ 3% for linear load                                                                                                                                        |
| Crest factor                         | 2,5                                                                                                                                                         |
| Power factor range                   | 0 ind. - 1 - 0 cap.,                                                                                                                                        |
| External output fusing               | 25A                                                                                                                                                         |
| LED signaling                        | Standby, Vout, Vin>, Vin<, overload, overtemperature, general fault                                                                                         |
| Electronic protection                | input undervoltage shut down, input overvoltage shut down, overtemperatur shut down, output voltage OK, overload without shut down, short circuit shut down |
| External synchronization             | yes                                                                                                                                                         |
| Remote signals                       | Relay contact „General Fault“                                                                                                                               |
| Analog Measurement Instruments       | Iout, Vout                                                                                                                                                  |
| Ambient temperature                  | Operation: -20°C to +55°C; Storage: -40°C to +85°C                                                                                                          |
| Climatic conditions                  | IEC 721-3-3 class 3K3/3Z1/3B1/3C2/3S2/3M2                                                                                                                   |
| Max. installation altitude           | ≤1500m                                                                                                                                                      |
| Audible noise                        | ≤45dB (A) at 1 m distance                                                                                                                                   |
| Construction                         | 19“, 5U, rear side connectors                                                                                                                               |
| Dimensions (W/H/D)                   | 483/221/460mm                                                                                                                                               |
| Weight                               | approx. 52kg                                                                                                                                                |
| Cooling                              | Speed-controlled fan with overtemperature monitoring                                                                                                        |
| Type of enclosure / Protection class | IP20 (mech.); 1 acc. to EN 60950 (electr.)                                                                                                                  |
| Surfaces                             | Front panel: powder coating RAL 7035, black imprint; constructive parts: anodized metal                                                                     |
| CE conformity                        | yes                                                                                                                                                         |
| Compliance to safety standards 60146 | EN 60950-1, VDE 0100 part 410, VDE 0110, EN 50178, EN                                                                                                       |
| Compliance to EMC standards          | EN 55011, EN 55022 class „B“, EN 61000– 4 part 2– 5                                                                                                         |