



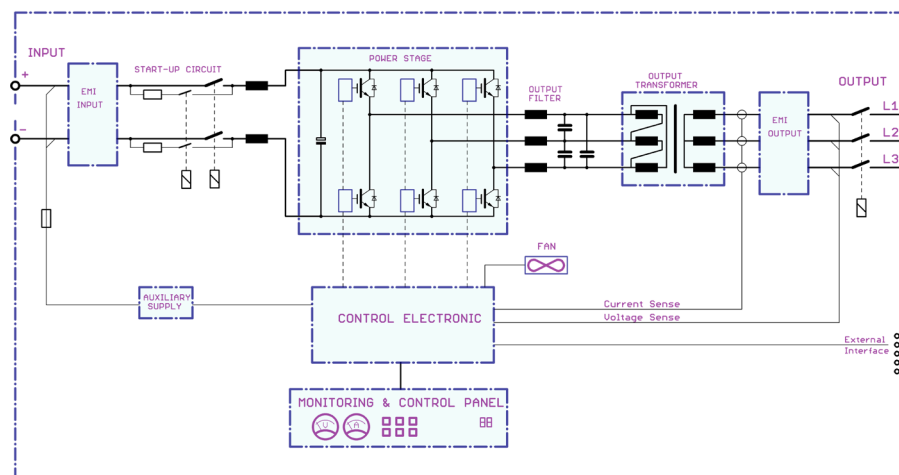
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## DC/AC Inverter Family for Naval Applications

The inverter family was especially designed for the 209 Submarine Class.

The static inverters convert a submarine battery voltage of 160 Vdc...320 Vdc into a high quality 120 V / 60 Hz, 120 V / 400 Hz and 230 V / 50 Hz voltage

Our products consist of static power conversion equipment of the latest available technology. All components fulfill the requirements of naval standards. The electronic is integrated in a stainless steel frame cabinet with steel walls according to the general requirements of naval ships. The topology of all three inverter types is equivalent.



Inverter block diagram

### For Submarine Type 209

#### Key Features of the Inverters

- High efficiency
- Low noise
- Built-in self test feature
- High reliability (MTBF)
- Modular design
- Low lifecycle cost
- Complete integrated logistic support (ILS)

#### Custom Options

- Different output power available as required by the onboard loads
- Input voltage range can be adapted to the submarine type and battery voltage
- Cabinet design can be modified according to the available space
- Output configuration either single phase or three phases
- Various output frequencies available



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## 209 Submarine DC/AC Inverter Family

| Model No.              | 3396  | 3397                       | 3398                           |
|------------------------|---|----------------------------|--------------------------------|
| <b>Input</b>           |   |                            |                                |
| Static range           | 160 Vdc - 330 Vdc, 245 V nominal  |                            |                                |
| Spikes                 | 1.1 kV for 0.4 ms   |                            |                                |
| Ripple voltage         | < 3%  |                            |                                |
| Inrush current         | less than nominal current   |                            |                                |
| <b>Output</b>          |   |                            |                                |
| General                | 120 V / 60 Hz<br>3 phases   | 120 V / 400 Hz<br>3 phases | 230 V / 50 Hz<br>single phases |
| Power                  | 27 kVA  | 15 kVA                     | 7 kVA                          |
| Power factor           | PF 0,95 cap. to 1 to 0.8 ind.   |                            |                                |
| Voltage adjustment     | ± 5.0% (by int. potentiometer)  |                            |                                |
| Distortion             | THD ≤ 3%, SHD ≤ 2%, at linear load  |                            |                                |
| Overload capacity      | 150% for 5 min  |                            |                                |
| Short circuite current | 200% of nominal current for 5 seconds   |                            |                                |
| Frequency              | 60 Hz / 0.1%  | 400 Hz / 0.1%              | 50 Hz / 0.1%                   |
| Start-up time          | < 5 seconds   |                            |                                |
| Control                | Start/stop, local/remote, lamp test   |                            |                                |
| Monitoring             | Standby, online, local/remote, time counter, voltage, current, power, frequency |                            |                                |
| Alarm                  | Master alarm, individual alarms & warnings                                      |                            |                                |
| <b>General</b>         |   |                            |                                |
| Efficiency             | ≥ 92%   |                            |                                |
| Shock                  | acc. to BV 043 (half sine)  |                            |                                |
| RFI / EMI              | acc. to MIL-STD 461 E, CE101,CE102 and RE102                                    |                            |                                |
| Operating temperature  | 0°C up to +45°C   |                            |                                |
| Protection             | IP 43   |                            |                                |
| MTBF                   | > 25,000 h  |                            |                                |
| Dimensions             | W: 981 H: 790<br>D: 580 mm  | W: 981 H: 492<br>D: 480 mm | W: 981 H: 490<br>D: 480 mm     |
| Weight                 | 377 kg  | 225 kg                     | 192 kg                         |
| Enclosure              | Stainless steel frame cabinet with steel walls and aluminium drawers            |                            |                                |
| Standards              | BV3100, DIN VDE 0160, MIL-STD 461E, MIL-STD1310, BV043                          |                            |                                |



Model: 3396, 27 kVA



Model: 3397, 2 x 15 kVA



Model: 3398, 7 kVA