

DC/AC Inverter Family for Naval Applications



The inverter family was designed and manufactured by Wärtsilä 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 consists of static power

conversion equipment of the latest available technology. All components fulfill the requirements of naval standards. The electronic are housed 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.



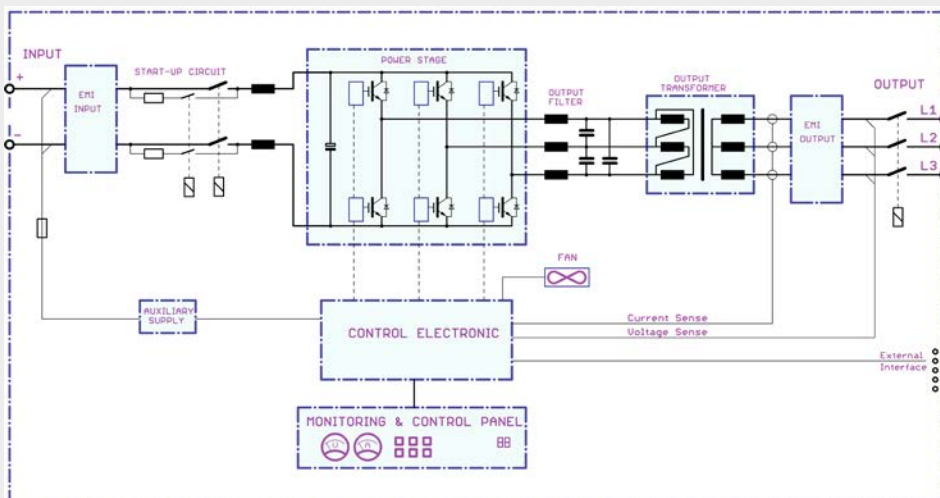
Model: 3396, 27 kVA



Model: 3397, 2 x 15 kVA



Model: 3398, 7 kVA



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
Input			
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		
Output			
General	120 V / 60 Hz 3 phase	120 V / 400 Hz 3 phase	230 V / 50 Hz single phase
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 circuited 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		
General			
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 D: 580 mm	W: 981 H: 492 D: 480 mm	W: 981 H: 490 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		

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