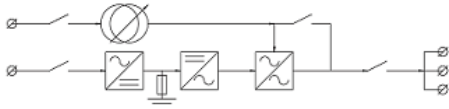


# Norwatt



## Customized Modular Inverters

Scalable and modular Inverter customizes according to the requirements of each client, providing a pure sine wave AC supply. The inverter is able to run in parallel operation mode to increase the reliability of the AC system without additional options.

In conjunction with a DC power system, it provides an excellent AC backup solution. It includes the newest switching technology with digital control.

It eliminates all single points of failure with full scalability.

It could be applied in all areas of industry, power generation and power distribution. The design is modular and scalable with hot-swappable inverter modules which ensures low mean time to repair, reduction in service costs and meets the changing needs for future expansion.

# Technical specifications

	24 / 230	48 / 230	60 / 230	110 ** / 230	220*** / 230
<b>GENERAL</b>					
EMC (immunity)	EN 61000-4-2 / EN 61000-4-3 / EN 61000-4-4 / EN 61000-4-5 / EN 61000-4-6 / EN 61000-4-8				
EMC (emission) (class)	EN 55022 (A)	EN 55022 (B)	EN 55022 (A)	EN 55022 (B)	
Safety	EN62040-1				
Cooling / Isolation	Forced / Doubled				
MTBF	240 000 hrs (MIL-217-F)				
Efficiency (Typical): Enhanced power conversion / on line	> 95.5% / > 89.5%	96% / 91%			96.5% / 92.5%
Dielectric strength DC/AC	4300 Vdc				
True Redundant Systems – compliant	3 disconnection levels on AC out and DC in power ports 4 disconnection levels on AC in port				
RoHS	Compliant				
Vibration	GR63 office vibration 0 to 100 Hz-0.1 g / transport vibration 5-100 Hz 0.5 g 100 to 500 Hz-1.5 g / Drop test				
Operating conditions	Designed for installation in an IP20 or IP21 environment. When installed in a dusty or humid environment, appropriate measures (air filtering, ...) must be taken.				
Altitude above sea without de-rating	< 1500 m / derating > 1500 m – 0.8 % per 100 m				
Ambient / storage temperature / relative humidity	-20 to 50 ° C / -40 to 70 ° C / 95 %, non-condensing				
Material (casing)	Coated steel-ALU ZINC				
<b>AC OUTPUT POWER</b>					
Nominal Output power (VA) / (W)	1500 / 1200	2500 / 2000			
Short time overload capacity	150 % (15 seconds) 110 % permanent within T <sup>n</sup> range				
Admissible load power factor	Full power rating from 0 inductive to 0 capacitive				
Internal temperature management and switch off	Yes				
<b>DC INPUT SPECIFICATIONS</b>					
Nominal voltage (DC)	24 V	48 V	60 V	110 V	220 V
Voltage range (DC)	19 – 35 V	40 - 60 V	48 - 72 V	90 - 160 V	170 - 300 V
Nominal current	56 A (at 24 Vdc and 1200 W output)	46 A (at 48 Vdc and 2000 W output)	35 A (at 60 Vdc and 2000 W output)	19 A (at 110 Vdc and 2000 W output)	9.8 A (at 220 Vdc and 2000 W output)
Maximum input current (for 15 second) / voltage ripple	84 A / < 100 mV rms	84 A / < 2 mV Psopho	52 A < 100 mV rms	29 A / < 200 mV rms	14.9 A / < 200 mV rms
Input voltage boundaries	User selectable with T2S interface				
<b>AC INPUT SPECIFICATIONS</b>					
<small>AC input available only with EPC modules, REG modules do not have any ACin</small>					
Nominal voltage (AC)	220/230/240 V 1P or 3P (Min 3 shelves for 3P)				
Voltage range (AC)	150-265 V				
Brownout	1200 VA / 960 W @ 150 Vac	150 to 185 V linear derating 150 VA/120 Watts per 10 Vac 2000 VA/1600 W @ 150 Vac			
Conformity range before transfer to DC	Adjustable				
Power factor	> 99%				
Frequency range (selectable) / synchronization range	50 – 60 Hz / range 47 – 53 Hz / 57 – 63 Hz				
<b>AC OUTPUT SPECIFICATIONS</b>					
Nominal voltage (AC*)	220/230/240 V				
Frequency / frequency accuracy	50 - 60 Hz / 0.03 %				
Total harmonic distortion (resistive load)	< 1.5 %				
Load impact recovery time	0.4 ms				
Turn on delay	20 s to 40 s depending on the number of module installed				
Nominal current. Protected against reverse current	6.6 A	10.9 A			
Crest factor at nominal power	2.8 : 1	3 : 1			
With short circuit management and protection					
Short circuit clear up capacity	10 x I <sub>n</sub> for 20 msec - Available while Mains is available at AC input port With magnitude control and management				
Short circuit current after clear up capacity	2.1 I <sub>n</sub> during 15 s and 1.5 I <sub>n</sub> after 15 s				
<b>IN TRANSFER PERFORMANCE</b>					
Max. voltage interruption / total transient voltage duration (max)	0 s / 0 s				
<b>SIGNALING &amp; SUPERVISION</b>					
Display	Synoptic LED				
Alarms output / supervision	Dry contacts on shelf / Standard USB port and MODBUS on T2S, optional : Candis Display / Candis TCP-IP				
Remote on / off	on rear terminal of the shelf via T2S				

Type	INV222-220/230-50
Article code	501-022-815.00
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/2350VA @ cos phi=0.8
Overload capability	130% for 10 sec
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; transient time <0.3ms
Short circuit protection	Continuous short circuit proof; 3x Inom for 3 sec
Parallel operation	Yes, ≤10 modules; current sharing ≤10% Inom; inclined output voltage characteristic
THD/Crest factor	≤2% at linear load/≤3
Power factor range	0.5 ind. - 1 - 0.5 cap.
External output fuse	10A gL or MCD characteristic D
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; 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: -20C to +55°C (power derating 2%/K above +40°C); storage: -40°C to +85°C
Cooling	Fan cooling (temperature-controlled; monitored)
Climatic conditions	According to IEC 721-3-3 class 3K3/3Z1/3B1/3C2/3S2/3M2
Max. installation altitude	≤1500m
Airborne noise	<45dBA
Type of construction	19"subrack 2U
Dimensions (W/H/D)	106.4/88.4/335mm
Weight	Approx. 3.5kg
Type of enclosure / Protection class	IP20 (front panel) / 1
Color	Front panel: RAL 7035, print: neutral, black RAL 9005
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