Enedo
RESHAPING ELECTRICITY

UTILITY | RAIL | INDUSTRIAL | TELECOM

CE

DAC60000
2U SERIES
Datasheet

48/60VDC Horizontal inverters

Stand alone applications
Parallel connected systems
Natural cooled 1000VA/700W modules
Fan cooled 1200VA/1200W modules
Both Online and Offline applications

- Real redundant, Fault tolerant system
- Small size, light weight, standard 19" rack
- High overload capability
- User programmable features
- Remote monitoring through RS-232 with standard PC

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STAND ALONE INVERTERS						
Type	DC input Range	Nominal AC output	Nominal Power	Cooling	Dimensions Without handles	Weight
DAC60134HF	40…72VDC	230VAC, 50Hz	1000VA/700W	Convection	19" x 2U x 280mm	7 kg
DAC60234HF	40…72VDC	230VAC, 50Hz	1200VA/1200W	Forced, fan	19" x 2U x 280mm	7 kg

PARALLEL CONNECTABLE INVERTERS						
Type	DC input Range	Nominal AC output	Nominal Power	Cooling	Dimensions Without handles	Weight
DAC62134HF	40…72VDC	230VAC, 50Hz	1000VA/700W	Convection	19" x 2U x 280mm	7 kg
DAC62234HF	40…72VDC	230VAC, 50Hz	1200VA/1200W	Forced, fan	19" x 2U x 280mm	7 kg

STATIC SWITCH + MANUAL BYPASS	
Type	Description
MSR7990 + BPU69130VF	External static switch, 6000VA 230VAC, 19" x 2U x 372mm
MBP68200	See separate datasheets for 2U manual bypass solutions

ACCESSORIES	
Type	Description
8760037	Remote monitoring software in CD and RS232 cable between DAC60000 inverter and Computer
8760038	Communication system bus cable for 1...6 modules
8760039	Power cable between 6kVA static switch and inverter

AC-DISTRIBUTION
See separate datasheets for AC-distribution solutions

The Inverter packing includes following:
1) Inverter
2) AC output connector (finger protected screw terminals)
3) DC input cable 3m 2.5mm^2-10mm^2
4) User manual
5) Grounding cable 3m 6-10mm^2

The Static Switch packing includes:
6) Static Switch
7) Mains Input cable 2m 4,5 mm^2
8) AC output cable 2m 4,5 mm^2
9) Grounding cable 2m 6mm^2

To be ordered separately
10) RemoteMonitor software and
    Remote monitoring cable PC-Inverter(s)
11) Communication system bus cable
12) Power cable static switch – inverters 1m 1,5 mm^2

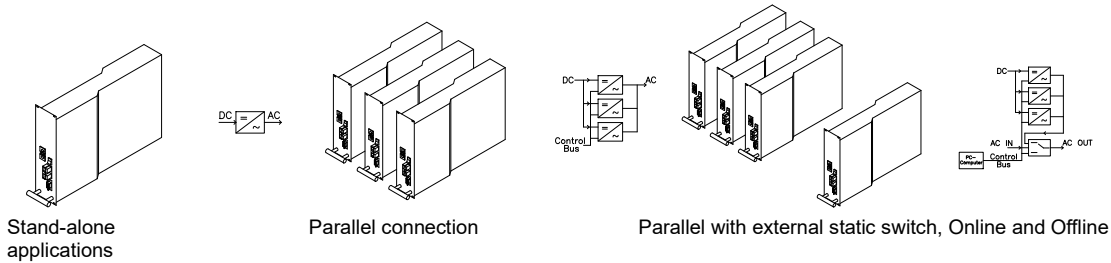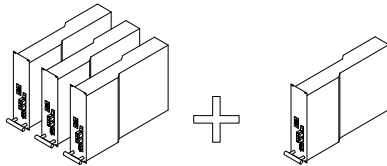www.enedopower.com
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SPECIFICATION INVERTERS	48VDC / 230VAC 1000VA	48VDC / 230VAC 1200VA
ELECTRICAL		
Input voltage	40-72 VDC User programmable (PC/RS-232) start-up and shut down voltage limits and delays	
Input current	22 Amax (continuous) 50 Amax (5 s)	35 Amax (continuous) 50 Amax (5 s)
Inrush current	< 20 A	< 20 A
Output voltage	Nominal 230 VAC sine wave, user programmable 200-240V, floating output	
Output frequency	Nominal 50 Hz, user programmable 40 - 70 Hz, crystal locked	
Nominal output power	1000VA / 700W	1200VA / 1200W
Output current	Nominal 4.4A Short circuit max 13 A / 5 sec	Nominal 5.2A Short circuit max 13 A / 5 sec
Efficiency	90 %	90 %
Load power factor range	Full power rating from 100% inductive to 100% capacitive	
Total harmonic distortion, resistive load	< 2 %	< 2 %
Crest factor	> 3	> 2.7
Static regulation, 0…100% load	+/-3%	+/-3%
Transient recovery	< 0.3 ms	< 0.3 ms
Psofometric noise, input	< 2 mV	< 2 mV
Isolation	Input-Chassis 1500 VAC (2000 VCD) Input-Output 3000 VAC (4000 VDC) Output-Chassis 1500 VAC (2000 VDC)	
Overload	240 % (1700 W) / 5 seconds Max time can be limited shorter, 110% /60 s is always available Number of restart attempts and delays are user programmable	140 % (1700 W) / 5 seconds
Protection	Output current limiting Overload and short circuit proof Input and output fuses Additional external fuse max C40A must be used in supply of each inverter module	
STANDARDS		
Safety	EN62368-1:2014	
EMC	Inverters: EN61000-6-4:2006, EN61000-6-2:2007 + A1:2011 Static Switch: As inverters except immunity: EN61000-4-3 radiated immunity according to EN61000-6-1, other immunity standards EN61000-6-2	
ALARMS, INDICATIONS AND CONTROLS		
LED-Indications	Input ON Output ON Output loading, 4 levels: >5%, >30%, >50%, >80% Overload / Fault	
Relay alarms	2 relay contacts: Fault in system summary alarm (module failure, DC input low etc) Primary supply failure (system with bypass) or Output ON indication (system without bypass) Relay contact rating: 60VDC/1A	
Remote monitoring through RS-232 (Remote monitoring software)	Status information: For example, input and output voltage, power, temperature, faults etc. Parameter adjustment: For example, input voltage limits, output voltage, overload, faults etc.	
MECHANICAL		
Dimensions	See first page	
Connectors in front panel	Input: 50A DC connector, Anderson SB50 6319 or UMA S50 50 A DC Output: Finger protected AC-connector, Wieland ST18/3S2	
Enclosure	Steel casing IP20	

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ENVIRONMENTAL

Operating temperature	0…40 ºC full power, 40…60 ºC reduced power, derating -2%/ºC typically		
Cooling	Natural convection	Forced cooling, monitored redundant fans	Natural convection
Humidity	5…95%, non-condensing		
Altitude	Full power up to 2000m, derating -2% / 100m, max altitude 3000m		

CONFIGURATIONS

Stand-alone applications

Parallel connection

Parallel with external static switch, Online and Offline

EXPANDING SYSTEM

More power needed or unit replacement
No need to shut down system output
1) Connect cables: DC cable, AC cable, System bus
2) Turn new unit on
- Automatically enters system
- Automatically adapts system parameters (voltage, frequency etc.)
- Automatically turns output on if the system output is on

RS-232 AND SYSTEM BUS
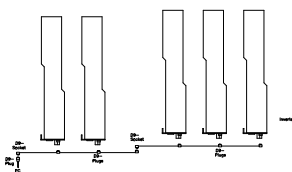
Single 9 pin female D-connector
- Standard 4 pins for RS-232 for communication and firmware updates with a PC
  2 pins for internal system communication
Single 9-pin flat cable
- male D-connectors for inverters
- one female connector for connecting PC or similar expansion cable

REMOTE MONITORING SOFTWARE

Continuous status information from all units:
- Output on/standby, voltage, current, power, loading per cent
- Input voltage and current
- Internal temperatures, led and button status, faults

Parameter adjustment (without turning system output off):
- Inverter start up and shut down input voltage limits, reaction delays
- Output voltage and frequency, restart attempts after overload shut down
- Bypass synchronising frequency range, accepted mains voltage range etc.

History file reading for last 30-40 events per module
Unit control to remote control or to read diagnostics

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SYSTEM AVAILABILITY

Real redundancy - No single failure may fail the system
No external controller
- No other master slave dependence but synchronising
- If synchronising master fails, next unit starts sending the synchronising data

Rugged system bus structure with galvanic isolation
Automatic bus address configuring
- No need for address setup by user
- No malfunctions because of wrong setup

Self tests and diagnostics
- Full automatic power stage test every time inverter is started
- Continuous monitoring of internal operations
- Error counters (RS-232) for troubleshooting
- Recognising of wrong connections (cable not connected, wrong AC bus polarity)

Recovery and monitoring procedures in hardware and software
- Stands disturbances in system bus
- Stands accidental system bus disconnecting for seconds
- Stands wrong connections of cables
- If one unit fails other units alarm
- Voting procedures for recognising and filtering wrong operation

Automatic fast shut down of failed unit
- Disconnecting from AC bus in 10 ms
- Automatic watch dog restart if processor hangs up
- Unit automatically turns output off if synchronising lost for too long time

Internal history file in each inverter, last 30-40 system and unit specific events

COMPLETE INVERTER SYSTEMS, AC-DISTRIBUTION AND MANUAL BYPASS

19" sub-rack systems

1-20 inverters up to 24kVA
Static Switch, manual bypass
AC- and DC-distribution
1-pole MCBs, 2-pole MCBs,
Schuko outlets, RCD

Please contact Enedo for customized inverter system configurations

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