

DAC60000 DUAL

48/60VDC Telecom Inverters with High Intelligence



*2 x 1500VA inverter modules in 19" 1.5U
System power 1.5kVA ...30kVA, modular solution
Redundant n+1 system, hot swap plug-in modules
Both On-line and Off-line applications*



*30kVA and 7.5kVA static switch and manual bypass
Total Systems solutions with AC- and DC-distribution*



POWERNET

**POWER
PARTNER**

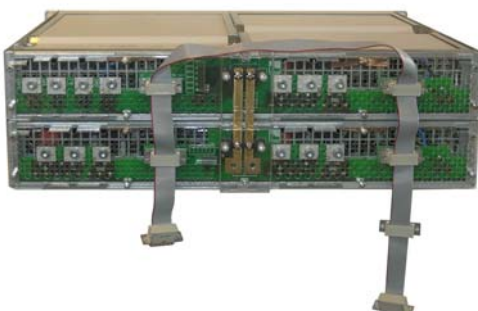
Sales & R&D: Mäkituvantie 3 H, FIN-01510 VANTAA, Tel. +358 9 8362 830, Fax +358 9 8362 8362
Production and Service: Teollisuuskatu 3, FIN-44150 ÄÄNEKOSKI, Tel. +358 14 3396 400, Fax +358 14 3396 410
E-mail: marketing@powernet.fi, service@powernet.fi, Internet: www.powernet.fi

INVERTER MODULES AND POWERFRAMES (sub-racks)						
Type	DC input Range	Nominal AC output	Nominal Power	Cooling	Dimensions Without handles	Weight
Parallel connectable plug-in modules						
DAC62434FR	40...72VDC	230VAC, 50Hz	1500VA/1200W	Forced, fan	220 x 64 x 409 mm	4,4kg
DAC62514FR	40...72VDC	115VAC, 60Hz	750VA/750W	Forced, fan	220 x 64 x 409 mm	4,4kg
Stand-alone plug-in modules						
DAC60434FR	40...72VDC	230VAC, 50Hz	1500VA/1200W	Forced, fan	220 x 64 x 409 mm	4,4kg
DAC60514FR	40...72VDC	115VAC, 60Hz	750VA/750W	Forced, fan	220 x 64 x 409 mm	4,4kg
19" 1.5U Powerframes						
MSR8170	Sub-rack for two inverter modules, 19" x 1.5U x 435mm, weight 4.3kg					
ADU68130	Sub-rack including AC-distribution 6xMCB and position for one inverter module, 19" x 1.5U x 435mm					
8169274	Coverplate set for empty module space in 19" 1.5U subrack					

7.5kVA STATIC SWITCH MODULES and POWERFRAMES (sub-racks)	
Type	Description
Plug-in static switch modules	
BPU69230FR	External static switch, 7500VA 230VAC, 220mm x 64mm x 409mm module, weight 3.3kg
BPU69310FR	External static switch, 3750VA 115VAC, 220mm x 64mm x 409mm module, weight 3.3kg
19" 1.5U Powerframes	
MSR8180	Sub-rack for inverter and static switch, 19" x 1.5U x 435mm, weight 4.3kg
MBP68300	Sub-rack including manual bypass and position for static switch (separate datasheet), weight 6.5kg
MBP68360	Sub-rack incl. manual bypass, AC-distr. and position for static switch, see separate datasheet for fuse types, weight 6.7kg

30kVA STATIC SWITCH MODULES and POWERFRAMES (sub-racks)	
Type	Description
Plug-in static switch modules	
BPU69430FR	External static switch, 30kVA 230VAC, 220 x 131 x 400 mm module, weight 8.4 kg
BPU69410FR	External static switch, 15kVA 115VAC, 220 x 131 x 400 mm module, weight 8.4 kg
19" 3U Powerframe	
MBP68400	Sub-rack including manual bypass and position for static switch, 19" x 3U x 435mm, weight 11.6kg

CABLES AND ACCESSORIES	
Type	Description
All systems	
8781832	RemoteMonitor software in CD and RS-232 cable between DAC60000 inverter and Computer
88818008	Bus bars to connect 2-4 power frames in parallel, includes 6mm ² and 10mm ² ring terminals
Inverter systems with 7.5kVA static switch or systems without static switch	
8781830	Communication system bus cable for 1-2 modules
8781831	Communication system bus cable for 1-6 modules
8781833	Communication system bus cable for 1-8 modules
Inverter systems with 30kVA static switch or systems without static switch	
8768432	Communication system bus cable for 1-10 modules (1-8 inverters and 30kVA bypass)
8768433	Communication system bus cable for 1-14 modules (1-12 inverters and 30kVA bypass)
8768434	Communication system bus cable for 1-18 modules (1-16 inverters and 30kVA bypass)
8768435	Communication system bus cable for 1-22 modules (1-20 inverters and 30kVA bypass)
8768436	10mm ² 1.5m wires between MSR8170 Inverter AC output and MBP68400 Inverter AC input terminals



Rear panel 4.5kVA system with static switch
MSR8170 powerframe for 2 x inverters,
MSR8180 for 1 x inverter and 7.5kVA static switch



Rear panel 9kVA system with static switch/manual bypass
3 x MSR8170 powerframe for 6 x inverters,
MBP68400 for 30kVA static switch and manual bypass

Ring terminals for connecting DC-, AC- and GND-cables are included with powerframe's and bus bar's delivery.

EXAMPLES OF ORDERING INVERTER SYSTEMS

6kVA system without static switch (4.5kVA n+1) 19" 3U

Type	Description	pcs per system
DAC62434FR	Inverter 48VDC/230VAC 1.5kVA/1.2kW	4
MSR8170	Powerframe 19" 1.5U, 2 x Inverter	2
8169274	Coverplate for empty module place	0
8781832	RS-232 Remote monitoring cable, Inverter – Computer	1
8781831	Communication cable for 3...6 modules	1
88818008	Bus bars to connect 2-4 powerframes in parallel	1

1.5kVA stand-alone system with static switch 19" 1.5U

Type	Description	pcs per system
DAC60434FR	Inverter 48VDC/230VAC 1.5kVA/1.2kW	1
BPU69230FR	Static Switch 7.5kVA	1
MSR8180	Powerframe 19" 1.5U Inverter + Static switch	1
8169274	Coverplate for empty module place	0
8781832	RS-232 Remote monitoring cable, Inverter – Computer	1
8781830	Communication cable for 1...2 modules	1

4.5kVA system with 7.5kVA static switch (3kVA n+1) 19" 3U

Type	Description	pcs per system
DAC62434FR	Inverter 48VDC/230VAC 1.5kVA/1.2kW	3
BPU69230FR	Static Switch 7.5kVA	1
MSR8180	Powerframe 19" 1.5U Inverter + Static switch	1
MSR8170	Powerframe 19" 1.5U, 2 x Inverter	1
8169274	Coverplate for empty module place	0
8781832	RS-232 Remote monitoring cable, Inverter – Computer	1
8781831	Communication cable for 3...6 modules	1
88818008	Bus bars to connect 2-4 powerframes in parallel	1

6kVA (4.5kVA n+1) system with 7.5kVA static switch and manual bypass and AC-Distr. 19" 4.5U

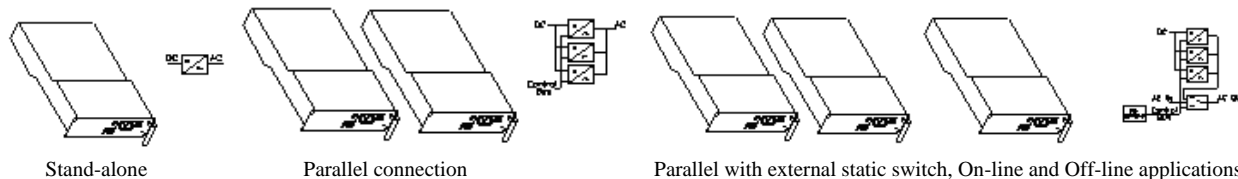
Type	Description	pcs per system
DAC62434FR	Inverter 48VDC/230VAC 1.5kVA/1.2kW	4
BPU69230FR	Static Switch 7.5kVA	1
MBP68360	Manual bypass/AC-distr 19" 1.5U + Powerframe for Static switch	1
MSR8170	Powerframe 19" 1.5U, 2 x Inverter	2
8169274	Coverplate for empty module place	0
8781832	RS-232 Remote monitoring cable, Inverter – Computer	1
8781831	Communication cable for 3...6 modules	1
88818008	Bus bars to connect 2-4 powerframes in parallel	1

15kVA (13.5kVA n+1) system with 30kVA static switch and manual bypass 19" 10.5U

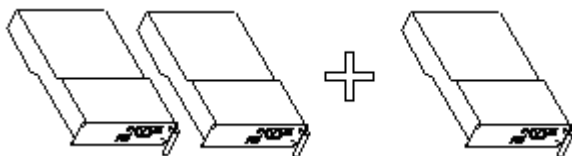
Type	Description	pcs per system
DAC62434FR	Inverter 48VDC/230VAC 1.5kVA/1.2kW	10
BPU69430FR	Static Switch 30kVA	1
MBP68400	Manual bypass 19" 3U + Powerframe for Static switch	1
MSR8170	Powerframe 19" 1.5U, 2 x Inverter	5
8169274	Coverplate for empty module place	0
8781832	RS-232 Remote monitoring cable, Inverter – Computer	1
8768433	Communication cable for 1-12 inverters and 30kVA bypass	1
88818008	Bus bars to connect 2-4 powerframes in parallel	2
8768436	Inverter AC input 10mm ² 1.5m wires, MSR8170 - MBP68400	2

SPECIFICATION INVERTERS	48VDC / 230VAC 1500VA	48VDC / 115VAC 750VA
ELECTRICAL		
Input voltage	40-72 VDC User programmable (PC/RS-232) start-up and shut down voltage limits and delays	40-72 VDC
Input current	35 Amax (continuous), 50 Amax (5 s)	22 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	1500VA / 1200W	750VA / 750W
Output current	Nominal 6.5A Short circuit 13 A max	Nominal 6.5A Short circuit 13 A max
Efficiency	90 %	86 %
Load power factor range	Full power rating from 0 inductive to 0 capacitive	
Total harmonic distortion, resistive load	< 2 %	< 2 %
Crest factor	> 2.5	> 2.5
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	140 % (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	165 % (1000 W) / 5 seconds
Protection	Output current limiting Overload and short circuit proof Input and output fuses	
STANDARDS		
Safety	EN 60950-1	
EMC	Inverters: EN 55022B, EN61000-6-3, EN61000-6-2, ETS 300 132-2, BTNR 2511 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)	
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, over load, faults etc.	
MECHANICAL		
Dimensions	See first page	
Connectors in modules rear panel	plug-in connectors DIN41612 F48, DIN41612 H15	
Connectors in sub-racks rear panel	MSR8170 sub-rack: (see separate datasheets for other racks) - DC input and GND M5 screw for cable clamp, 2 per powerframe - AC output M4 screw for cable clamp, 1 per powerframe 88818008 bus bars M6 screws for cable clamp Connectors are shielded from hazardous contact	
Enclosure	Steel casing IP20	
ENVIRONMENTAL		
Operating temperature	0...45 C full power, 45...60 C reduced power, derating -2%/C typically	
Cooling	Forced cooling front to rear, 2 fans inside the module. Fans are redundant, one fan is enough for cooling in normal conditions.	
Humidity	5...95%, non condensing	
Altitude	Full power up to 2000m, derating -2% / 100m, max altitude 3000m	

CONFIGURATIONS



EXPANDING SYSTEM

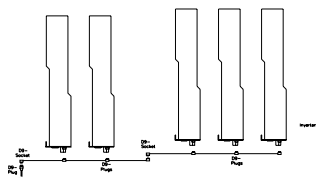


More power needed or unit replacement

No need to shut down the system if there is free module positions available in power frame

- 1) Plug new inverter module into the powerframe
- 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



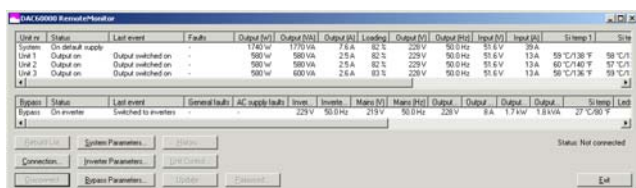
Single 15 pin female D-connector

- Standard 4 pins for RS-232 for communication with a PC
- 2 pins for internal system communication

Single 15-pin flat cable

- male D-connectors for inverters
- one female connector for connecting PC adapter 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

Software updates to update or add features for DAC60000 inverters

RELIABILITY

Real redundancy - No single point of failure may fail the system

No external controller

- No other master slave dependence than 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

SYSTEM SOLUTIONS AND AC-DISTRIBUTION



Dual System 19" n x 1.5U

1-20 inverters up to 30kVA
Static Switch
Manual bypass
AC- and DC-distribution



19" 1U IEC320 distribution

AC-distribution, load monitoring and parallel connection units

Please contact Powernet for customized inverter system configurations

©We reserve the right to change the specification without notice

Created: TRä 03.06.2009

File: DAC60000 Dual_48-60V_UK_030609.doc