Technical Data Sheet

IAC1300 RANGE
1300W / DC/AC INVERTER

FEATURES

- Sine Wave Output Voltage
- Suitable for Motors Control
- Adjustable Output Voltage
- High Input-Output Isolation 3000 Vrms
- Remote Control Via RS232
- Alarm by Isolated Relay Contacts
- Remote ON/OFF Opto-Coupled
- According to Standard EN50155
- Fire and Smoke: EN45545-2 Approved



APPLICATION



SAFETY & EMC

WARRANTY 5 YEARS

RoHS² compliant 10 from 10

Reach compliant

DESCRIPTION

The IAC1300 consists of three phase sine-wave DC-AC inverters with galvanic isolation between input and output.
The unit allows:

- Start-up motors by means of a soft start. In the start-up, the output voltage and frequency rise linearly from 0V to set voltage and from 5Hz to set frequency. The start-up ramp slope may be changed via RS-232 port
- Set the rotation speed of a motor according to the appropriate Voltage/Frequency ratio.
- Monitoring the status of the input and output.
- Set and monitor parameters via RS-232.

The IAC1300 has a maximum output current protection. This protects the semiconductors even when an output short-circuit occurs. It also features a disable function for input under-voltage.

MODELS

	24VDC 16.8…30V	72VDC 50.4…90V	110VDC 77…138V
250VAC	IAC1300-7442* 1300VA	IAC1300-7445* 1300VA	IAC1300-7447* 1300VA
400VAC	IAC1300-7452 1300VA	IAC1300-7455* 1300VA	IAC1300-7457 1300VA

Note*: references subject to special MOQs and lead times

copyright © RECOM Power System Srl GmbH, all rights reserved

IAC1300 RANGE
1300W / DC/AC INVERTER

BASIC CHARACTERISTICS

Parameter	Conditions	Min.	Typ.	Max.
Input				
Input Voltage Range		-30% Vin nom		+25% Vin nom
Maximum Input Ripple	Vrms, 100Hz		5% Vin nom	
Inrush Current			<25A	
Polarity Protection	By Diode			
Output				
Nominal Output Voltage (Vonom)	See table (ordering codes)			
Output Voltage Range	Models of 250V Output, Via RS-232	150V		250V
	Models 400V Output, Via RS-232	200V		400V
Output Frequency Range	Via RS-232	5Hz		60Hz
Output Wave Distortion THD	16 Samples Average		<3%	
Output HF Ripple			<2.5%	
Line Regulation	ΔVin -25…+25%		<2%	
	ΔVin -30…+30%		<10%	
	ΔVin -10…+25% for 12V Input Models		1%	
	ΔVin -20…+25% for 12V Input Models		10%	
Load Regulation			<4%	

ENVIRONMENTAL

Parameter	Conditions	Value
Operating Temperature Range	Full Load (EN50155 OT1)	-25°C to +55°C
	62.5% Load (EN50155 OT3)	-25°C to 70°C
	25% Load (EN50155 OT5)	-25°C to 85°C
Storage Temperature		-25°C to +85°C
Operating Temperature (62.5% Load)		-40°C to +70°C
Cooling	Controlled Internal Fan	
Overvoltage Protection		Category II
Relative Humidity	Without Condensation	5…95%
MTBF (MIL-HDBK-217-E; Gb, 25°C)		100.000h

SAFETY AND CERTIFICATION

Certification (Type)	Standard
Safety According	EN60950-1, EN62368-1
Dielectric Strength: Input/Output	3000Vrms/50Hz/1min
Dielectric Strength: Output/Ground	1500Vrms/50Hz/1min
Dielectric Strength: Input/Ground	500Vrms/50Hz/1min
Fire and Smoke	EN45545-2

EMC

	Conditions	Value
Immunity According		EN61000-6-2; EN50121-3-2
Emission According		EN61000-6-4; EN50121-3-2

PROTECTIONS

Parameter	Type	Value
Against Overloads and Short-Circuits		Shutdown with Auto-Recovery (see working parameters)
Against Over-Temperature		Shutdown with Auto-Recovery

copyright © RECOM Power System Srl GmbH, all rights reserved

IAC1300 RANGE
1300W / DC/AC INVERTER

CONTROL

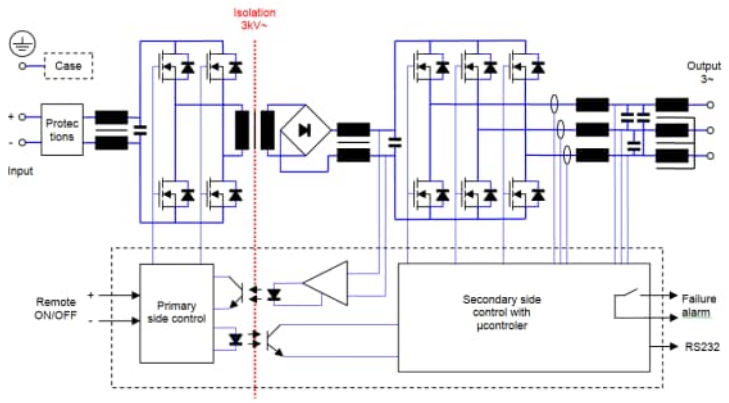
Type	Description
Remote ON/OFF Input	ON Applying a Voltage Within the Input Voltage Range OFF Open Circuit or <5V
Output Alarm	Open when Alarm. Maximum Rating: 0.16A at 160VDC

ORDERING CODES

Model	Input Voltage DC [V]	Input Voltage Range [V]	Output Voltage AC [V]	Output Current [A]	Active Output Power [W]	Appar. Output Power [VA]	Output Peak Curr. 10ms (Iopk) [A]	Efficiency [%] *	No Load Input Current [A]*	Size
IAC1300-7442*	24	16.8-30	250	3.10	1100	1300	6.6	89	<1.58	2
IAC1300-7445*	72	50.4-90	250	3.10	1100	1300	6.6	90	<0.52	1
IAC1300-7447*	110	77-138	250	3.10	1100	1300	6.6	90	<0.34	1
IAC1300-7452	24	16.8-30	400	1.88	1100	1300	3.4	89	<1.58	2
IAC1300-7455*	72	50.4-90	400	1.88	1100	1300	3.4	90	<0.52	1
IAC1300-7457	110	77-138	400	1.88	1100	1300	3.4	91	<0.34	1

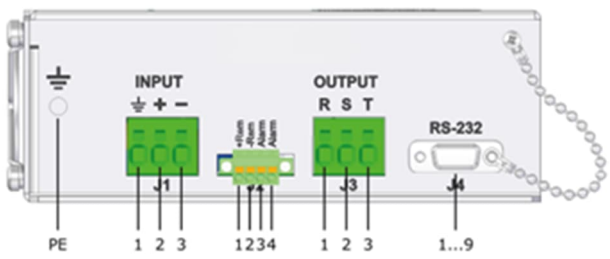
*References subject to special MOQs and lead times

BLOCK DIAGRAM



RS-232 Monitoring	RS-232 Settings
Output Voltage	On/Off
Internal Temperature	Output Voltage
Output Frequency	Output Frequency
Inverter State	Reset
Model Number	
Firmware Version	

CONNECTIONS

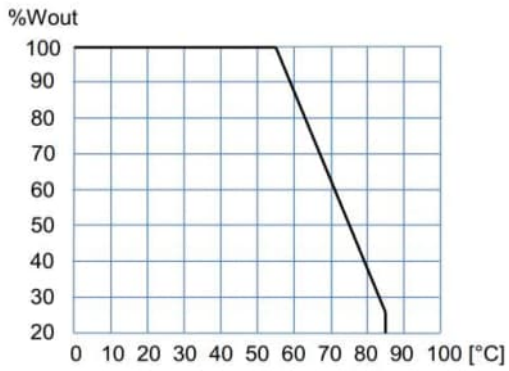


copyright © RECOM Power System Srl GmbH, all rights reserved

CONNECTIONS

Connection	Terminal	Notes
J0	Case PE	Threaded Shack M6 (Rec. Torque 3.8 Nm)
J1-1	Protective Earth	Cable 1.5…16mm²
J1-2	+Input	
J1-3	-Input	
J2-1	+Remote Off	Phoenix Contact MC1.5/4-GF-3.81 Mating Connector Included
J2-2	-Remote Off	
J2-3	Alarm	
J2-4	Alarm	
J3-1	R Output	Cable 0.75…4mm²
J3-2	S Output	
J3-3	T Output	
J4-2	RS232 Rx	SUB DB9
J4-3	RS232 Tx	
J4-5	RS232 GND	

POWER DERATING vs AMBIENT TEMP.

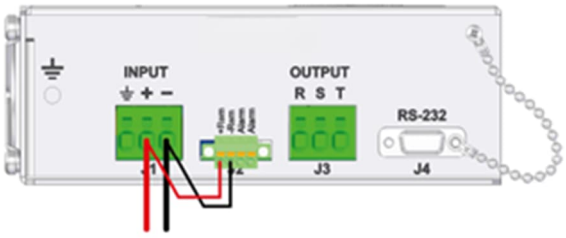


RECOMMENDED WIRING

	Input 12V	Input 24V	Input 36V	Input 48V	Input 72V	Input 110V	Output 120VAC	Output 230VAC
Max. Current [A]	23	14	10	7.4	5.0	3.2	2.2	1.2
Cable Section [mm²]	2.5	1.5	1.5	1	0.75	0.75	0.75	0.75

INSTALLATION

- The unit has 4 threaded holes for the fixation on a mounting surface.
- The unit has internal fans. For an appropriate cooling, the air input and output should be free of elements that cause and an air flow reduction (minimum recommended distance to other objects 50mm).
- Make connection as shown in the figure
- To start-up the unit without a remote ON/OFF signal, it is possible by configuring the units via RS232 port or by making the following connection



copyright © RECOM Power System Srl GmbH, all rights reserved

For safety reasons, the following requirements must be met:

- Provide the equipment with some kind of protective enclosure that complies with the electrical safety directives in effect within the country where the equipment is installed
- Include an input fuse with a rating immediately higher than the maximum input current
- Use cables of adequate cross-sections for the cables used for each power connection

	Input 24V	Input 72V	Input 110V	Output 250V	Output 400V
Current	70A	24.4A	16A	3.1A	1.88A
Cable Cross Section	16mm²	2.5mm²	1.5mm²	0.75mm²	0.75mm²

RS232 COMMUNICATION PORT

It is possible to control and monitor de unit via RS232 by means a terminal emulator like “Tera Term” or “Putty”. Also it is possible to control and monitor de unit directly using the protocol showed in table:
Protocol Configuration: ASCII Code, 9600Bauds, Parity None, 8Bits, 1Bit Stop

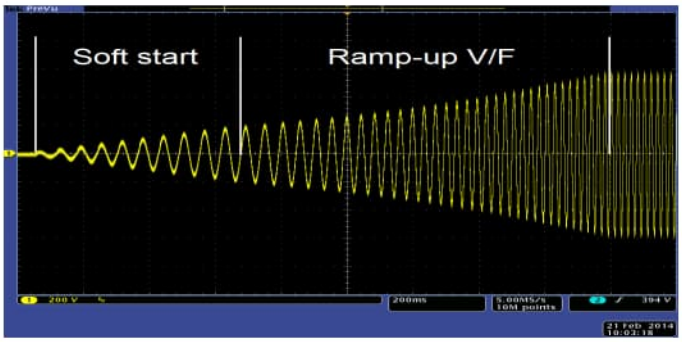
TABLE

Header		Function	Parameter		Returns	Description
P	R	L	U		PTU■■■.■	Output voltage in Volts RMS
			T		PTT■■■.■	Internal Temperature in °C
			F		PTF■■■.■	Output Frequency in Hz
			S		PTS■■■.■	Inverter Status 999.9 -> Enabled 000.0 -> Disabled 111.1 -> Inverter Blocked by Overload or Short-Circuit
			M		PTM■■■.■	Model Number
			R		PTR■■■.■	Firmware Version
			Other Character		PTE	Command Not Supported
		G	3	■■■.■	OK / ERR	Changes the Inverter Status 999.9 -> Enable 000.0 -> Disable
			4	■■■.■	OK / ERR	Set the Output Voltage in Volts RMS 150.0 ≤ ■■■.■ ≤ 250.0 (models of 250V output) 200.0 ≤ ■■■.■ ≤ 4000.0 (models of 400V output)
			6	■■■.■	OK / ERR	Changes the Output Frequency in Hz (output must be stopped) 0.05.0 ≤ ■■■.■ ≤ 075.0 Factory Preconfigured -> 50Hz
			8	■■■.■	OK / ERR	111.1 -> Reset the Inverter
			B	■■■.■	OK / ERR	Changes the Logic of the “Remote OFF Input” 222.2 -> Inverter On Applying 15…143VDC on “Remote OFF Input” 111.1 -> > Inverter Off Applying 15…143VDC on “Remote OFF Input”
			O	■■■.■	OK / ERR	Set the Initial Frequency in the Start-Up (Fi) (output must be stopped) 005.0 ≤ ■■■.■ ≤ 075.0 Factory Preconfigured
			P	■■■.■	OK / ERR	Set the Ramp-Up in Increment of “N” Cycles per Hz in mode V/F, Frequency Changes or Start-Up (Note-1) 001.0 ≤ ■■■.■ ≤ 100.0

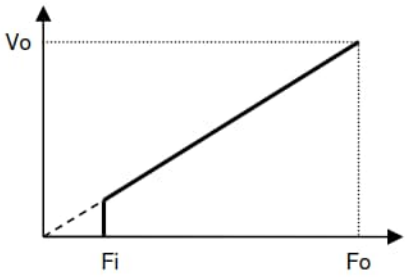
Note: OK (Data Accepted) / ERR (Data not Valid for the Current Parameter)

copyright © RECOM Power System Srl GmbH, all rights reserved

Note 1:



Example for N=1: Start-Up Time = N x 1.7s for Chargers from 16Hz to 50Hz



Mode V/F Curve

DEFAULT WORKING PARAMETERS			
Thermal Protection	7442…7457		
Internal Shutdown Temperature	87°C		
Internal Restart Temperature	82°C		
Internal Temperature of Fan Start-Up	45°C		
Input Voltage Parameters	74X2	74X5	74X7
Low Input Voltage Timed Shutdown (t) (Input Alarm)	16.8 VDC	50.4VDC	77.0VDC
Low Input Voltage Instantaneous Shutdown	14.4VDC	43.2VDC	66.0VDC
Time to Shutdown (t)	500ms		
Output Voltage Parameters	744X	745X	
Output Frequency	60Hz	50Hz	
Output Voltage	208VAC	400VAC	
Output Under-Voltage Shutdown	<85% of Setting 1000ms		
Warning Voltage (Output Alarm)	<90% of Setting 200ms		
Initial Start-Up Frequency	5Hz		
Soft Start Duration	10 Cycle		
Ramo-Up V/F	1Hz/Cycle		
Output Current Parameters	744X	745X	
Maximum Continuous Output Current	3.10A	1.88A	
Time Between Restart Attempts	4000ms		
Number of Attempts of Conservative Overload	3		
Working Failures and Reset	7442…7457		
Lock for Continuous Overload or Internal Failure	Unlimited Time		
Reset Time by Input Disconnection	>2min		

Configurable Parameters Underlined

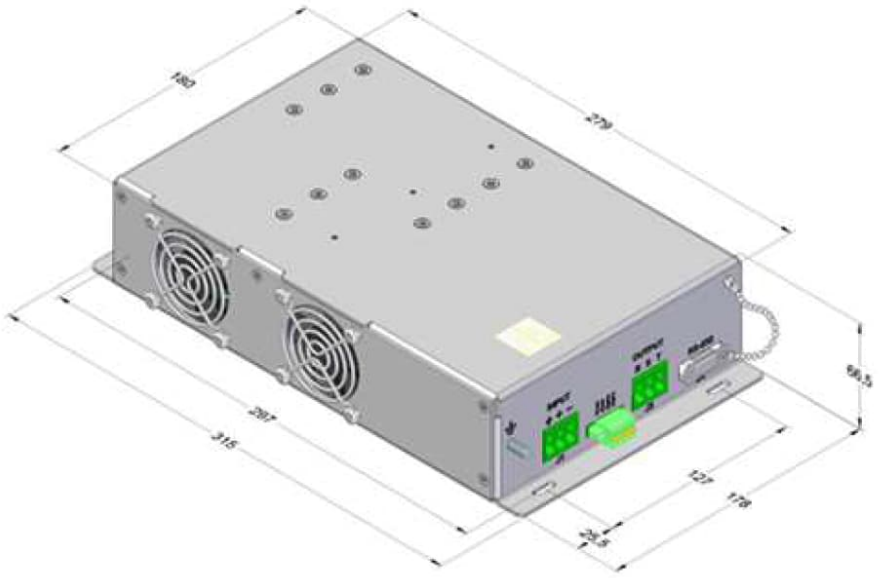
copyright © RECOM Power System Srl GmbH, all rights reserved

IAC1300 RANGE
1300W / DC/AC INVERTER

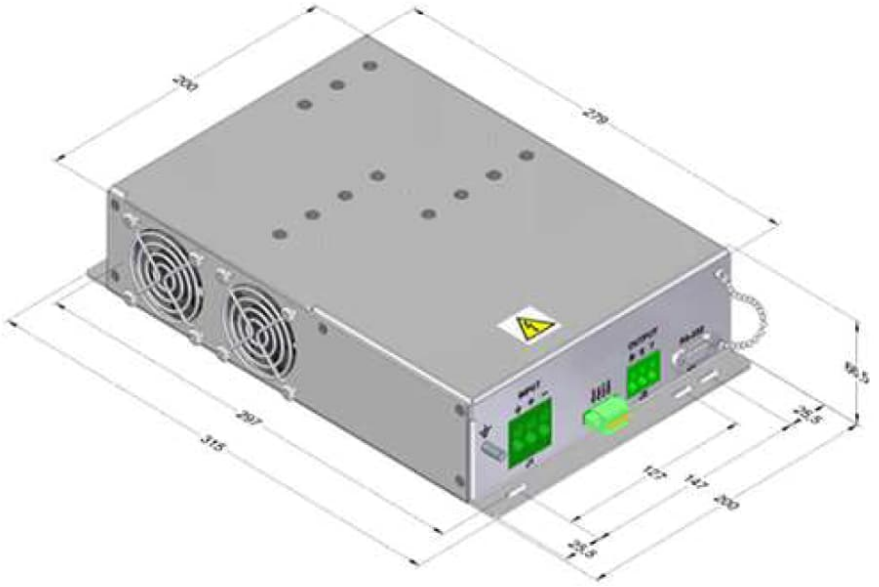
DIMENSION & PHYSICAL CHARACTERISTICS

Parameter	Type	Value
Weight		<3200g

SIZE-1



SIZE-2



copyright © RECOM Power System Srl GmbH, all rights reserved

ANNEX

Applicable values for the different sections of the norm EN50155: 2017

4.3.1	Working Altitude	Up to 2000m
4.3.2	Ambient Temperature	Class OT1 (-25 to 55°C): load < 100% Class OT3 (-25 to 70°C): load <50% Class OT5 (-25 to 85°C): load <25%
4.3.3	Switch-On Extended Operating Temp.	ST1
4.3.4	Rapid Temperature Variation	H1
4.3.5	Shocks And Vibrations	According EN61373:2010 Category 1 class B

4.3.6 EMC Electromagnetic Compatibility

EN50121-3-2:2016

Test	Norm	Port	Frequency	Limits
Radiated Emissions	IEC55016	Case	30MHz…230MHz	40dB(µV/m) Qpk at 10m
			230MHz…1GHz	47dB(µV/m) Qpk at 10m
			1…3GHz	Do not apply
			3…6GHz	Internal freq. < 108MHz
Conducted Emissions	IEC55016	Input	150kHz…500kHz	99dB(µV) Qpk
			500kHz…30MHz	93dB(µV) Qpk

Test	Norm	Port	Severity	Conditions	P
Electrostatic Discharge	IEC61000-4-2	Case	±8kV	Air (isolated parts)	B
			±8kV	Contact (conductive parts)	
Radiated High Frequency	IEC61000-4-3	X/Y/Z Axis	20V/m	0.08…1.0GHz M. 80% 1kHz	A
			10V/m	1.4…2.1GHz M. 80% 1kHz	
			5V/m	2.1…2.5GHz M. 80% 1kHz	
			3V/m	5.1…6Ghz M. 80% 1kHz	
Fast Transients	IEC61000-4-4	Input	±2kV	Tr/Th: 5/50 ns	A
		Output	±2kV		
		Signal	±2kV		
		PE	±1kV		
Surge	IEC61000-4-5	Input L to L	±1kV	Tr/Th: 1.2/50µs	B
		Input L to PE	±2kV		
Conducted RF	IEC61000-4-6	Input	10V	0.15...80MHz M. 80% 1kHz	A
		Output	10V		
		Signal	10V		
		PE	10V		
Magnetic field	IEC61000-4-8	X/Y/Z Axis	300A/m	0Hz, 16.7Hz, 50/60Hz	A

P= Performance criteria, L= Line, PE= Protective Earth

4.3.7	Relative Humidity	Up to 95%	
5.1.1.2	DC Power Supply Range	From 0.70 to 1.25 Un continuous	
5.1.1.3	Temporary DC Power Supply Fluctuation	From 0.60 to 1.40 Un 0.1s From 1.25 to 1.40 Un 1s without damage	
5.1.1.4	Interruptions Of Voltage Supply	Class S1 (without interruptions)	
5.1.1.6	Input Ripple Factor	10% peak to peak with a DC Ripple Factor of 5 %	
5.1.3	Supply Change-Over	0,6 Un duration 100 ms (without interruptions). Performance criterion A	
7.2.7	Input Reverse Polarity Protection	By External fuse	
10.7	Protective Coating For PCB Assemblies	Class PC2	
13.3	Tests List	1 Visual Inspection 2 Performance test 3 Power supply test 4 Insulation test 5 Low temperature storage test 6 Low temperature start-up test 7 Dry heat test 8 Cyclic damp heat test 9 Salt mist test 10 Enclosure protection test (IP code) 11 EMC test 12 Shocks and vibrations test 13 Equipment stress screening test 14 Rapid Temperature variation test	Routine Routine Routine Routine - Type Type Type - - Type Type Routine: 24h at 40°C and load 100% -

copyright © RECOM Power System Srl GmbH, all rights reserved

The product information and specifications may be subject to changes even without prior written notice. The product has been designed for various applications; its suitability lies in the responsibility of each customer. The products are not authorized for use in safety-critical applications without RECOM's explicit written consent. A safety-critical application is an application where a failure may reasonably be expected to endanger or cause loss of life, inflict bodily harm or damage property. The applicant shall indemnify and hold harmless RECOM, its affiliated companies and its representatives against any damage claims in connection with the unauthorized use of RECOM products in such safety-critical applications.

copyright © RECOM Power System Srl GmbH, all rights reserved