



ELETRONICA PROFESSIONALE
PROFESSIONAL ELECTRONICS

ED/ID Series

500L/500/1000/2000

Sensorless & Programmable Inverter For Brushless Motors



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Introduction

ED/ID are new universal high efficiency inverters designed to drive all BLAC/PMSM motors. It will be very easy to match ED/ID series with all motors, via a preliminary tuning phase. User/Customer/Factory access to internal parameters is managed by authorization levels.

Main Specification

# SENSORLESS MOTOR CONTROL	Motors is driven without probes ensuring wide stability in all speed range, by using last modern control techniques
# LOW NOISE MOTOR CONTROL	A sinusoidal PWM is applied to the motor in order to have the best control and to reduce noise and dissipation
# PROGRAMMABLE MOTOR	Motor parameters are programmable to drive different motors. A preliminary tuning phase is required .
# PROGRAMMABLE CONTROL	Available controls – Speed, Power, current, flow, pressure Reference Source – Digital reference, Analog signal 0-10 V with programmable range, 4 DIPs to manual fine tune working range Control Response and Start up – Acceleration slopes and startup phase are programmable Limitation – Working mode is programmable up to a maximum Safety Operation Area (SOA). Standard connection – 8 poles connector is standard for all series
# SERIAL CONTROL	Inverters can be controlled with standard Modbus protocol over RS485 serial interface (adressable for network operation)
# SPECIAL FUNCTION CONTROL	Post ventilation – to perform a temporary ventilation in off condition to reduce overheating on motor Notch speed selection – to skip a frequency/speed range and avoid mechanical resonance if present Deflux for high speed – to reach higher speed without losing motor efficiency Flux at low speed – to have a strong control at low speed Master/slave option – to connect more inverter to work in the same mode and prevent parallel control oscillation Start up with progressive braking – to overcome back pressure condition
# HARDWARE BENEFITS	Precharge section – to reduce inrush current Active PFC – Active Power factor correction to have sinusoidal input current Efficiency – 91 % more PD3 Compliant – inverter designed to work in harsh environment (Pollution Degree 3)



Models

Model	Dimensions	V _{IN}	I _{IN}	W _{IN}	Environment		ET CODE
Model	mm	V	A	W	Protection	Installation	Code
ED500L	82 x 176 x 63	230	2,5	500			9926108X
ED500 (*)	112 x 176 x 83	230	2,5	500	IP 20	Air over inverter	9926116x
ED1000		230	5	1000			9926117x
ED2000	138 x 226 x 93	230	10	2000			9926118x
ID2000	150 x 226 x 112	230	10	2000	IP 55		9926119x

TAB 1: ED Models

(*)ED500 can be used without ventilation

Model coding

ED 1000 _ [03001]



Programmed configuration

Additional specification

Nominal power size

Sensorless, programmable platform: ED = IP20, ID = IP55



Technical Specification

Supply	ED500L	ED500	ED1000	ID/ED2000
Type	Single phase - L/N	Single phase - L/N	Single phase - L/N	Single phase - L/Ni
V _{NOM}	230 Vac ±10% 50/60 Hz	230 Vac ±10% 50/60 Hz	230 Vac ±10% 50/60 Hz	230 Vac ±10% 50/60 Hz
W _{IN}	500 W (limit 550 W ±6%)	500 W (limit 550 W ±6%)	1000 W (limit 1100 W ±6%)	2000 W (limit 2100 W ±6%)
VA _{IN}	525 VA (limit 580 VA ±6%)	525 VA (limit 580 VA ±6%)	1050 VA (limit 1160 VA ±6%)	2100 VA (limit 2200 VA ±6%)
I _{IN}	2,5 Arms	2,5 Arms	5 Arms	10 Arms
Undervoltage	180 Vac	180 Vac	180 Vac	210 Vac
Leakage current	2,5 mA ±20% @ 230Vac, 50 Hz	2,5 mA ±20% @ 230Vac, 50 Hz	2,5 mA ±20% @ 230Vac, 50 Hz	2 mA ±20% @ 230Vac, 50 Hz
Inrush Current	3 Apk @ 230 Vac, T _{AMB} = 25°C, precharge function	3 Apk @ 230 Vac, T _{AMB} = 25°C, precharge function	3 Apk @ 230 Vac, T _{AMB} = 25°C, precharge function	3 Apk @ 230 Vac, T _{AMB} = 25°C, precharge function
Environment	ED500L	ED500	ED1000	ED2000
T _{AMB}	-20° to +50°C under ventilation	-20° to +50°C	-20° to +50°C under ventilation	20° to +50°C under ventilation
Air speed on heatsinks	3 m/s Derating on insufficient ventilation	Not mandatory	6 m/s Derating on insufficient ventilation	6 m/s Derating on insufficient ventilation
Altitude	<2000m			
Protection	ED500L	ED500	ED1000	ED2000
IEC Protection Class	Class I Signal part is a low voltage double insulation with respect to live parts Signal GND is connected to PE with 4,7nF 250V Y2 capacitor			
IP Grade	IP 20			IP20 / IP55
Dimensions	ED500L	ED500	ED1000	ED2000
W x L x H	82x176x83 mm	112 x 176 x 83 mm + 9.3 mm H faston		ED: 137,4x 226,4 x 93 mm + 9.3 mm H faston ID: 150x 226,4 x 112 mm
Motor Output	ED500L	ED500	ED1000	ED2000
Type	82 x 176 x 6 mm	Sinusoidal 3 Phase U/V/W (PWM)	Sinusoidal 3 Phase U/V/W (PWM)	Sinusoidal 3 Phase U/V/W (PWM)
W _{OUT}	460 W (limit 500 W ±6%)	460 W (limit 500 W ±6%)	910 W (limit 1000 W ±6%)	1800 W (limit 1900 W ±6%)
V _{OUT,MAX}	234 Vrms	234 Vrms	234 Vrms	234 Vrms
I _{OUT,MAX}	1,9 Arms	1,9 Arms	3,2 Arms	4 Arms
F _{OUT}	7 - 103 Hz (100 - 1550 rpm on 8 poles)			
S _{SPEED-RAMP}	7 Hz/s (100 rpm/s on 8 poles)			
Signal I/O	ED500L	ED500	ED1000	ED2000
AL1, AL2	Alarm, Tahco, Multifuncion AL1: NPN open collector (24 V max, 20 mA sink) AL2: 0,+5V source @ 10 µA typical (24 V max, 20 mA sink)			
V+	10 Volt regulated ±5% (max load 16 mA)			
IN	0-10 Vdc or 10V PWM, R _{IN} = 160kΩ, τ = 41ms V _{IN,START} = 0.5 V, V _{IN,STOP} = 0.25V, V _{IN,MAX,SPEED} = 9 V (±100 mV)			
VOL	Offline programming input voltage (5,5-15 Vdc)			
RS485 -/A, +/B	RS485 signals			
Control	ED500L	ED500	ED1000	ED2000
Default	Speed control in normal operation, speed reduction in limitation condition			
T _{ON}	4 s - Precharge time after power on			
T _{START}	6 s - Motor activation time after power on			
T _{STARTUP}	2 s - Startup phase after motor activation (brake + align)			

The icon indicates that the value/function is programmable.



Limitation / Protection & Alarm

Protection	Type	ED500L ED500	ED1000	ED2000	Notes
OverTemperature	Alarm *	105°C	105°C	105°C	Abs Max, lower values allowed (reset below Temp. Lim)
OverVoltage	Alarm	✓	✓	✓	440 Vdc Bus
UnderVoltage	Alarm	✓	✓	✓	330 Vdc Bus 180 Vac Supply 160 Vac Supply with motor active
OverCurrent	Alarm	3 A	4 A	7 A	Abs Max, lower values allowed
BlockedRotor	Alarm	80 rpm	80 rpm	80 rpm	Abs min, higher values are programmable
Temp. Limitation	Limitation **	90 °C	90 °C	90 °C	
Curr. Limitation	Limitation	2 A	3,5 A	5 A	
LowInputVoltage	Limitation	✓	✓	✓	Power derating from MaxPower to 300W below 200 Vac down to 160 Vac supply (linear)

* Alarm: motor halted and restarted after a pause of 10 seconds

** Limitation: speed reduction in order to keep inverter or motor in programmed safe operating area

Compliance

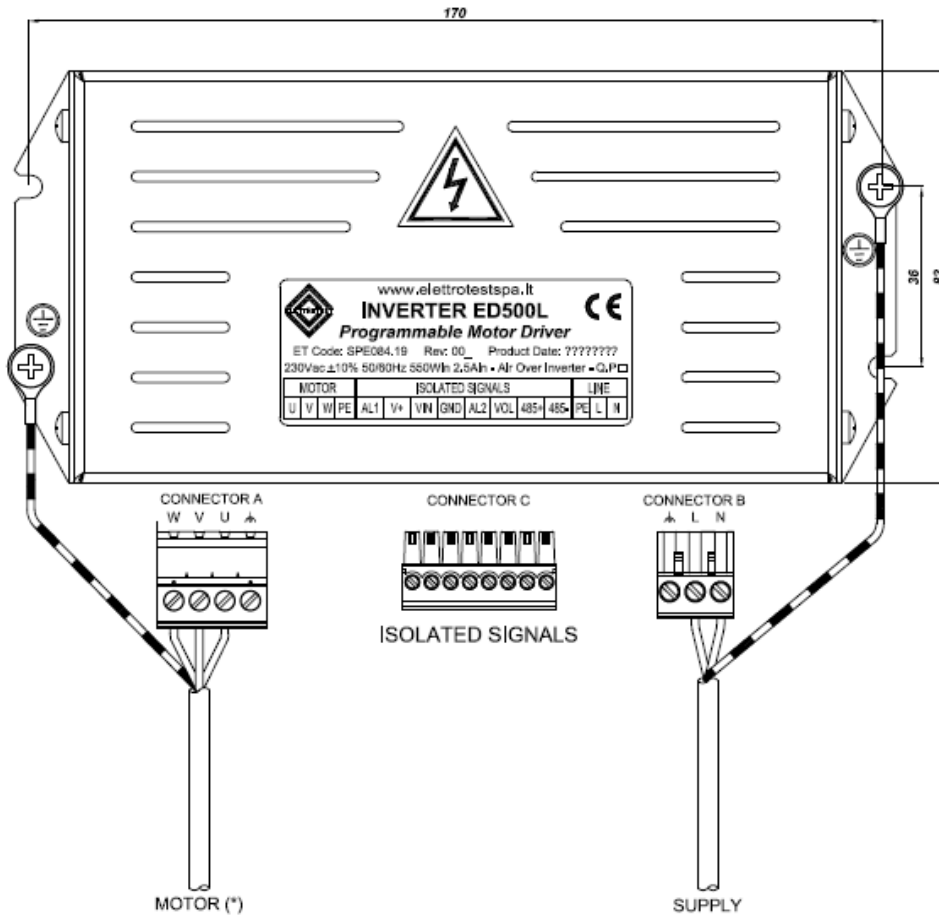
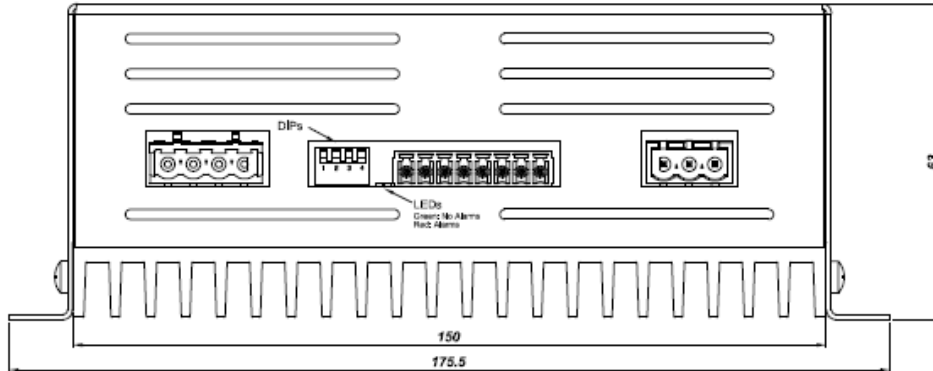
Compliance	ED500L / ED500/ ED1000 / ED2000/ ID 2000
Safety	EN 60335-1 Pollution Degree 3 compliant
EMC *	EN 61000-6-2 EN 61000-6-3 EN 61000-3-2

* These products are intended to be used inside other applications. Compliance is referred to conditions expressed in section 6. Additional filters may be required in case of other installation layouts.



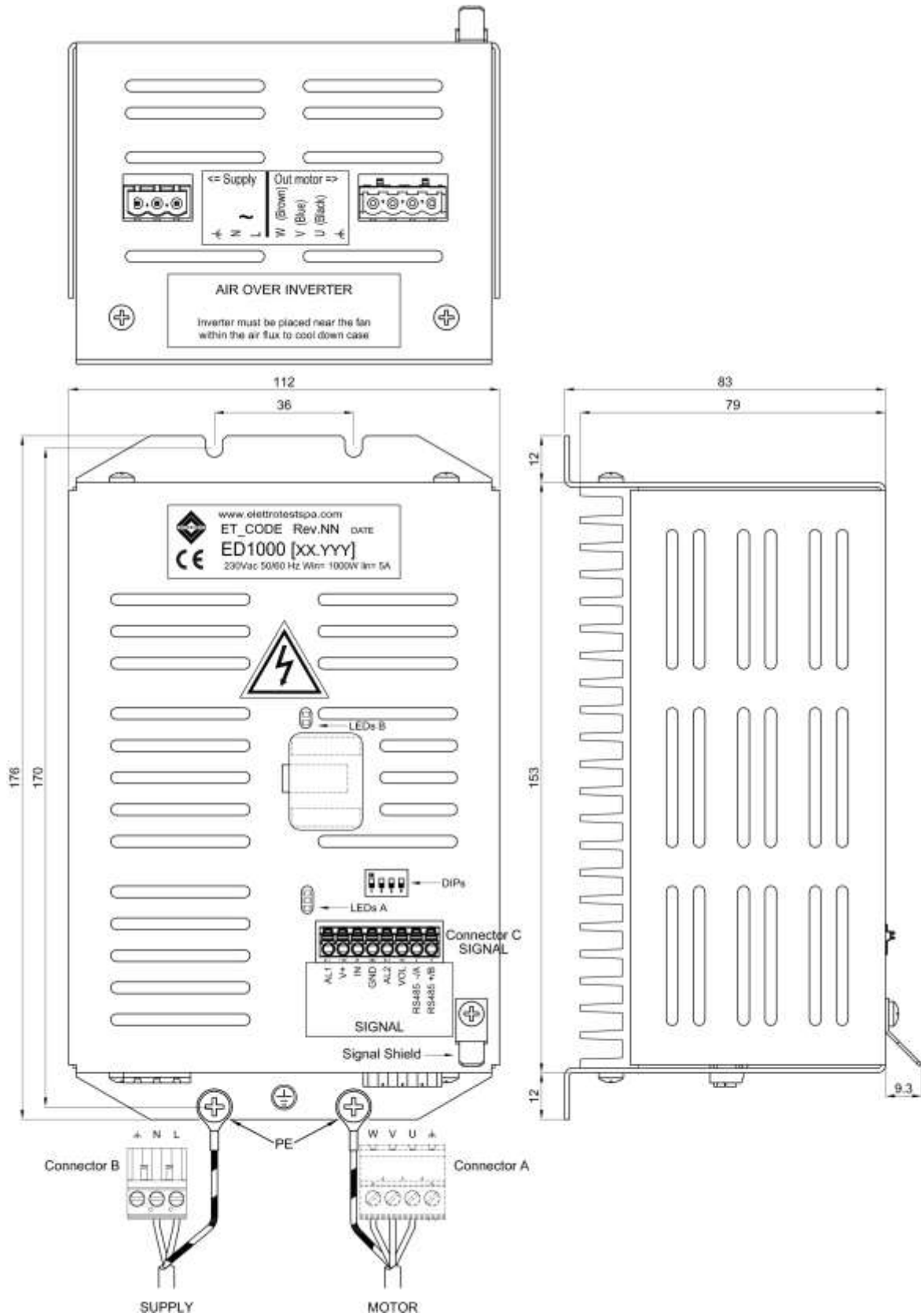
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ED500L model



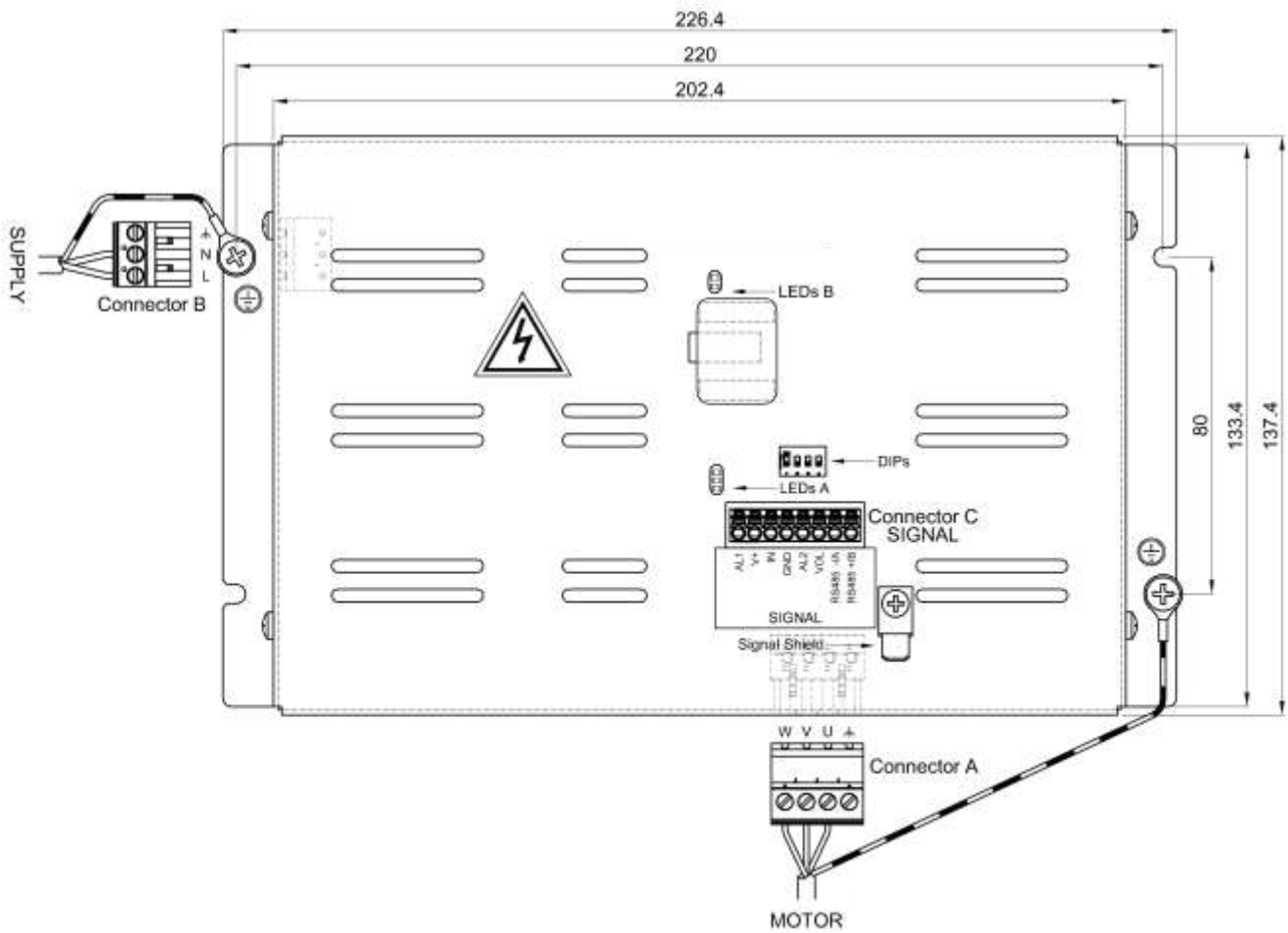
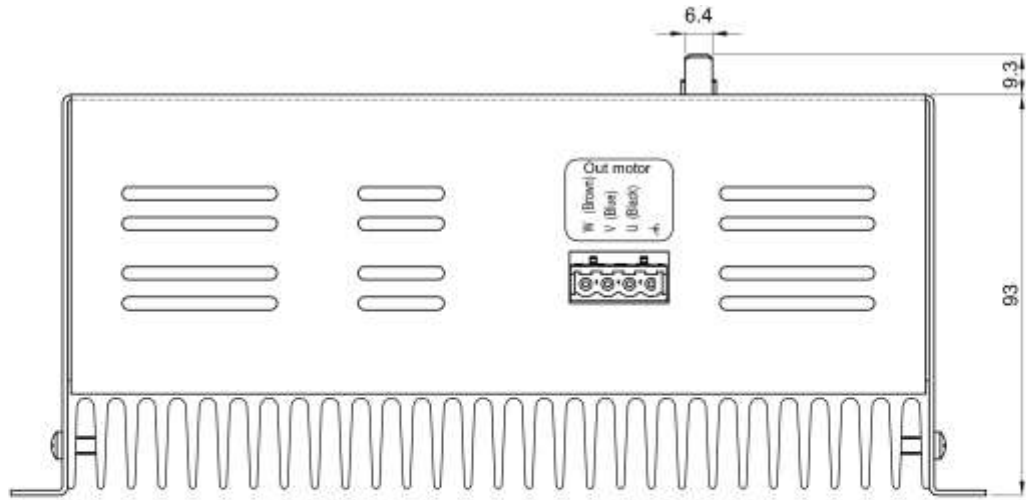


ED500/ED1000 Models





ED2000 Model





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ID2000 Model

