



ELETRONICA PROFESSIONALE
PROFESSIONAL ELECTRONICS

ED/ID Series

500L/500/1000/2000

Sensorless & Programmable Inverter For Brushless Motors



www.elettrotestspa.it
info@elettrotestspa.it



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 loosing 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

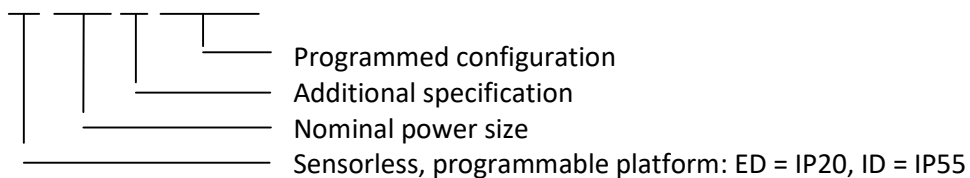
Model	Dimensions	V _{IN}	I _{IN}	W _{IN}	Enviroment		ET CODE
Model	mm	V	A	W	Protection	Installation	Code
ED500L	82 x 176 x 63	230	2,5	500	IP 20	Air over inverter	9926108X
ED500 (*)	112 x 176 x 83	230	2,5	500			9926116x
ED1000		230	5	1000			9926117x
ED2000		230	10	2000			9926118x
ID2000	150 x 226 x 112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

TAB 1: ED Models

(*)ED500 can be used without ventilation

Model coding

ED 1000 _ [03001]





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	ED500	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.



ELETRONICA PROFESSIONALE
PROFESSIONAL ELECTRONICS

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

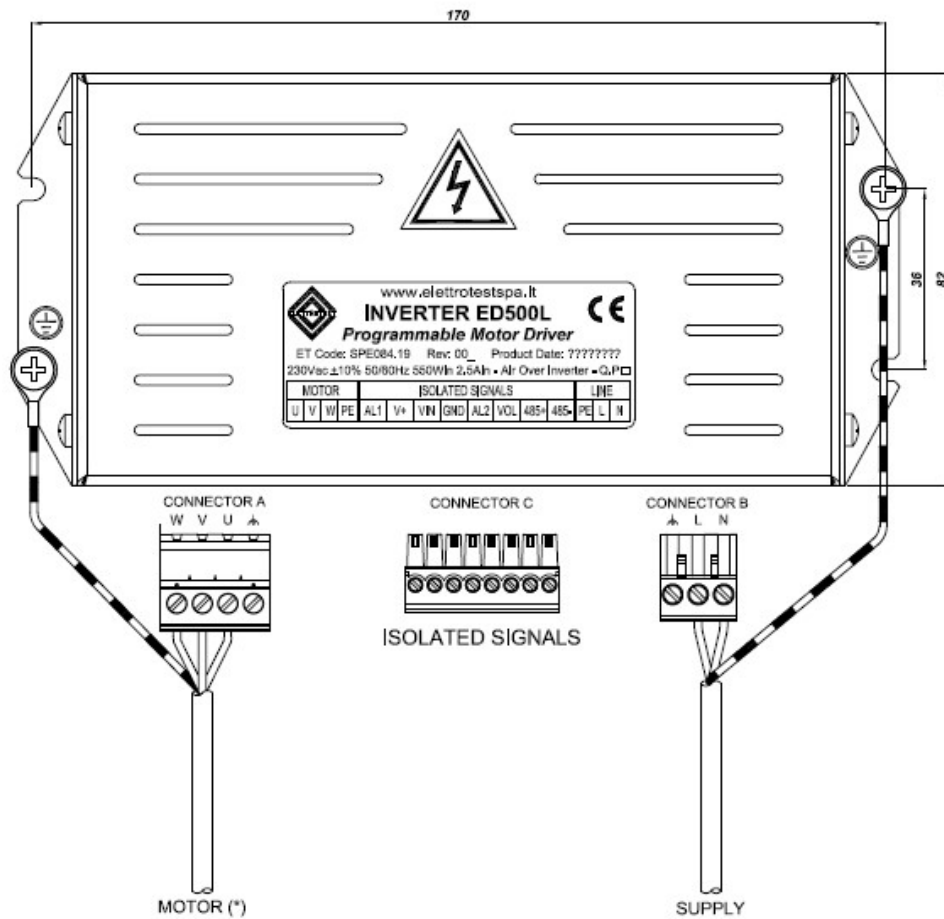
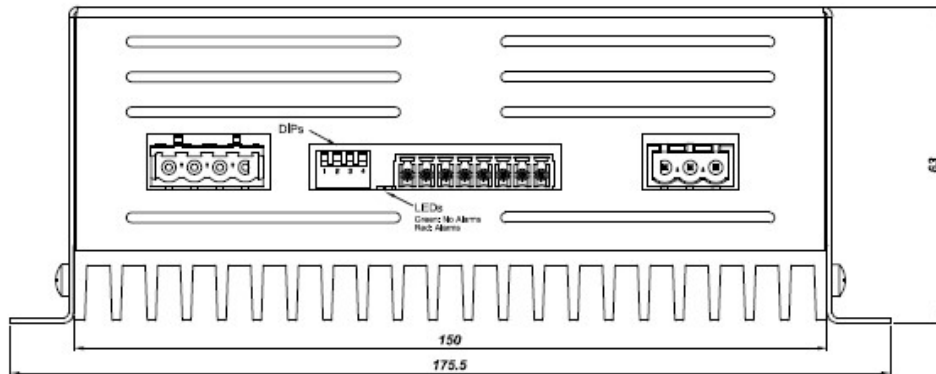
Compliance	ED500L / ED500/ ED1000 / ED2000/ ID 2000
Safety	EN 60335-1 Pollution Degree 3 compliant
EMC *	EN 61000-6-2 EN 61000-6-3 EN 61000-3-2

* 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.



ELETRONICA PROFESSIONALE
PROFESSIONAL ELECTRONICS

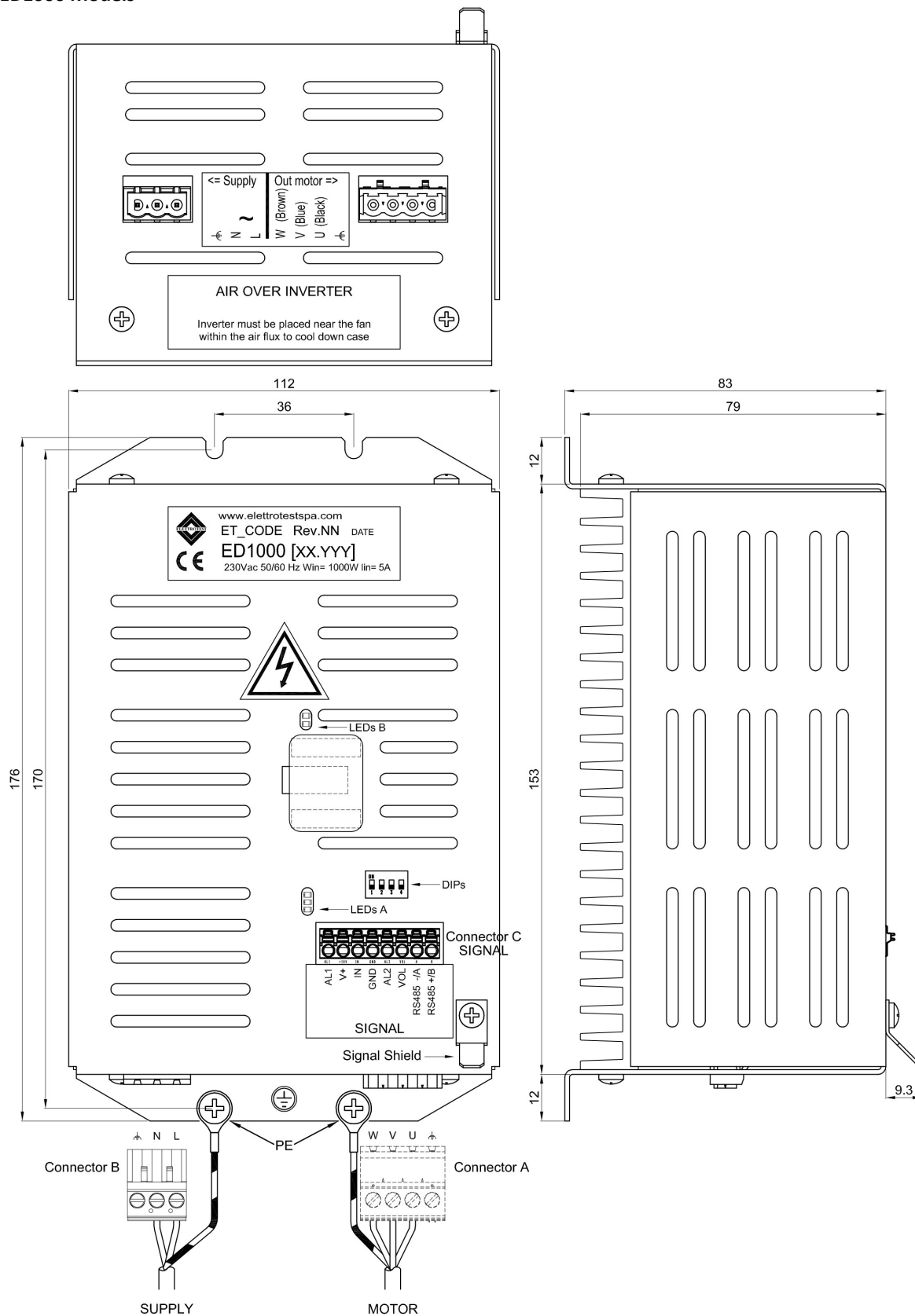
ED500L model





ELETRONICA PROFESSIONALE
PROFESSIONAL ELECTRONICS

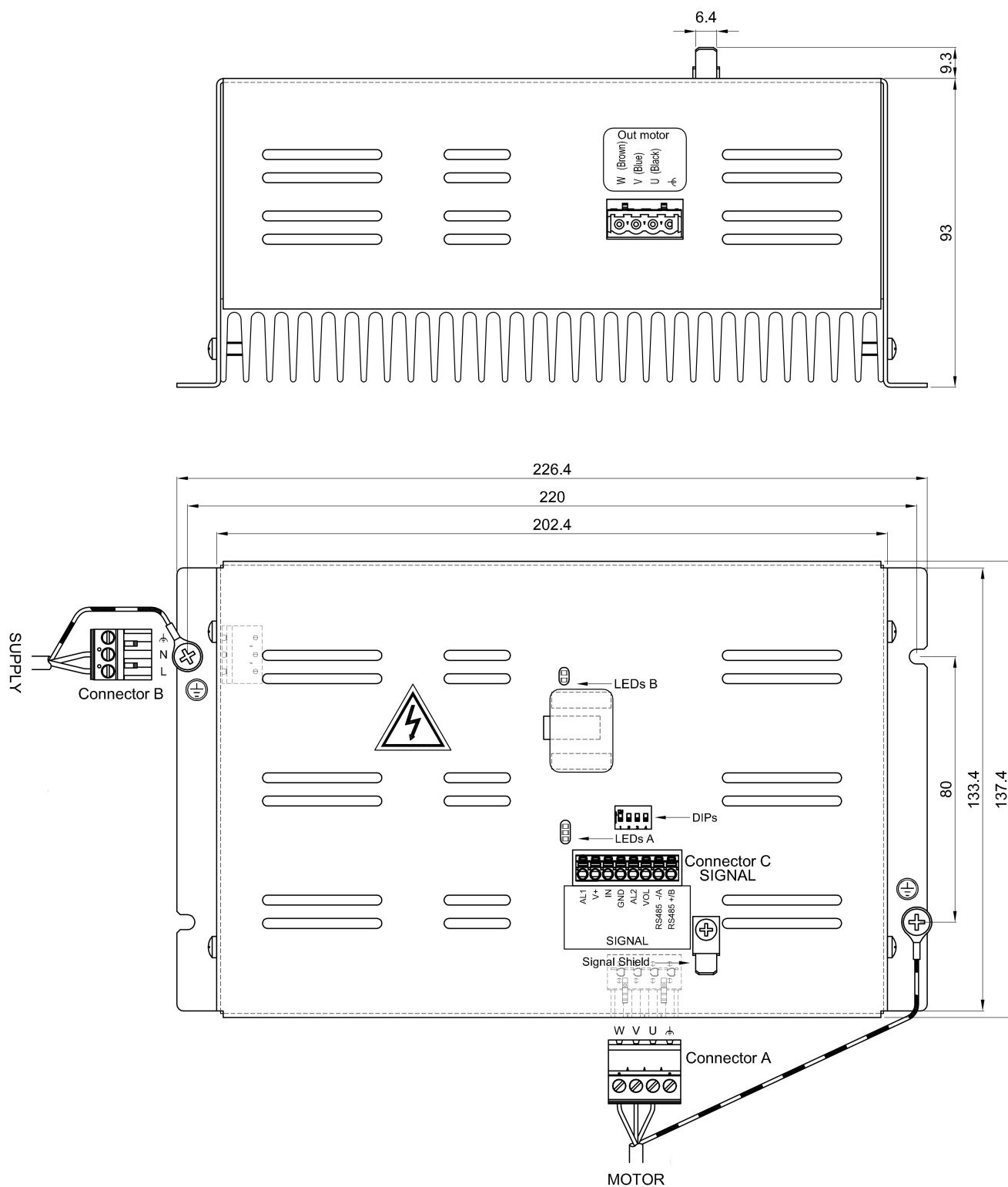
ED500/ED1000 Models





ELETRONICA PROFESSIONALE
PROFESSIONAL ELECTRONICS

ED2000 Model





ELETRONICA PROFESSIONALE
PROFESSIONAL ELECTRONICS

ID2000 Model

