ZAPI® S.p.A.

Datasheet

ACE3

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DESCRIPTION

ACE3 inverter is suitable for controlling several types of motors (AC induction, BLDC and PMAC) in the range from 7.5 kW to 20 kW continuous power, adopted in battery-powered trucks for material handling.

It can be supplied in two I/O configurations:
- **Standard**: with one 23-poles connector.
- **Premium**: with two 23-poles connector, for enhanced I/O.

Also, two power-rating variants are available:
- **ACE3**: base power ratings.
- **ACE3 Power**: increased power ratings.

APPLICATIONS

ACE3 inverter is designed to handle all the electric functions usually present in material-handling machines.

Typical applications are:
Counterbalanced trucks with load up to 5 tons, HLOP (VNA), GSE, tow tractors and airport ground-support vehicles, aerial-access equipment (telescopic boom and scissor lift).
Also, ACE3 may be suitable for other applications not listed here.

FEATURES

- Nominal voltage from 24 V to 80 V.
- Microcontroller for main functions, 576+ kByte embedded flash memory.
- Microcontroller for safety functions, 320+ kByte embedded flash memory.
- Up to 5 active-high digital inputs.
- Up to 5 active-low digital inputs.
- Up to 4 analog inputs (range 0 V ÷ 10 V) with 10-bit resolution.
- Input for an analog motor thermal sensor.
- Compatible with several types of speed sensors:
  - Incremental encoder (default).
  - Sin/cos sensor.
  - Set of three Hall sensors.
  - Resolver (adding an external interface).
- CAN bus interface up to 500 kbit/s.
- 11-bit and 29-bit communication supported.
- Auxiliary supply output (+12V/+5V, max 100 mA for +12V, max 100 mA for +5V).
- Up to 7 PWM voltage-controlled low-side outputs.
- 1 PWM current-controlled low-side output with current feedback (up to 1.5 A continuous).
- Built-in freewheeling diodes.
- Dither injection with configurable amplitude and frequency.
- Protection from overload, short circuit, open load and ESD.
- Ambient temperature:
  - Operating: -40 °C ÷ +40 °C.
  - Storage: -40 °C ÷ +85 °C.
- Sealed connector (one or two 23-pins Ampseal).
- IP65 rated.
- Access to status and diagnostic information.

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MODEL CHART

Model	Nominal voltage	Voltage range	2-min current rating [Arms]	S2 60-min current rating [Arms]
ACE3	36/48V	10 V ÷ 65 V	600	300
	80V	30 V ÷ 115 V	450	225
ACE3 Power	24V	10 V ÷ 35 V	700	350
	36/48V	10 V ÷ 65 V	650	325
	80V	30 V ÷ 115 V	550	275

Current ratings are based on an initial heat sink temperature of 40 °C and a maximum heat sink temperature of 85 °C. No additional external heat sink is used for the 2-minute rating test.

Inverter can continuously deliver the rated RMS current only if it is adequately cooled. When it is equipped with its own finned heat sink, a proper dissipation is obtained by applying a 100 m^3/h airflow. In case the inverter is provided with the base plate, it is customer's duty to design an adequate cooling system that can dissipate the heat produced by the inverter, keeping its temperature below 85 °C.

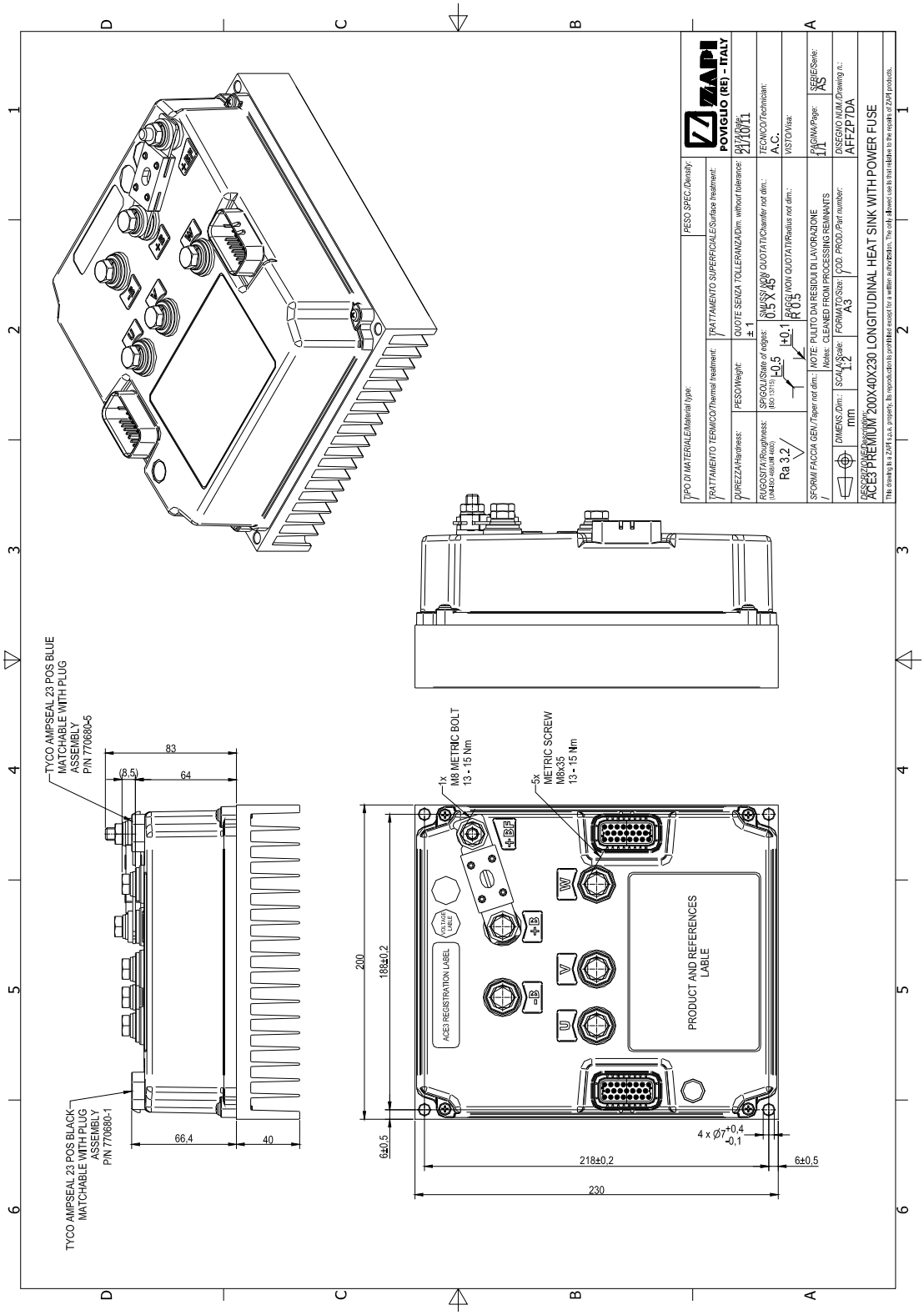
TECHNICAL DATA

Version		STANDARD	PREMIUM
Ampseal connectors		1 x 23-pins Ampseal	2 x 23-pins Ampseal
Digital inputs	Active high	3	5
	Active low	2	5
Analog inputs		2	4
Input for Hall sensors		-	3
Input for sin/cos sensor		-	2
PWM voltage-controlled outputs		2	7
PWM current-controlled output		1	
Auxiliary supply output (+12/+5V)		2 (max 100 mA for +12V, max 100 mA for +5V)	
Encoder interface		1	
Input for motor thermal sensor		1	
CAN bus interface		1	
Memory	Main µC	576+ kB Flash, 48 kB SRAM, 64kB emulated EEPROM	
	Supervisor µC	320+ kB Flash, 32 kB SRAM, 64 kB emulated EEPROM	

REGULATIONS

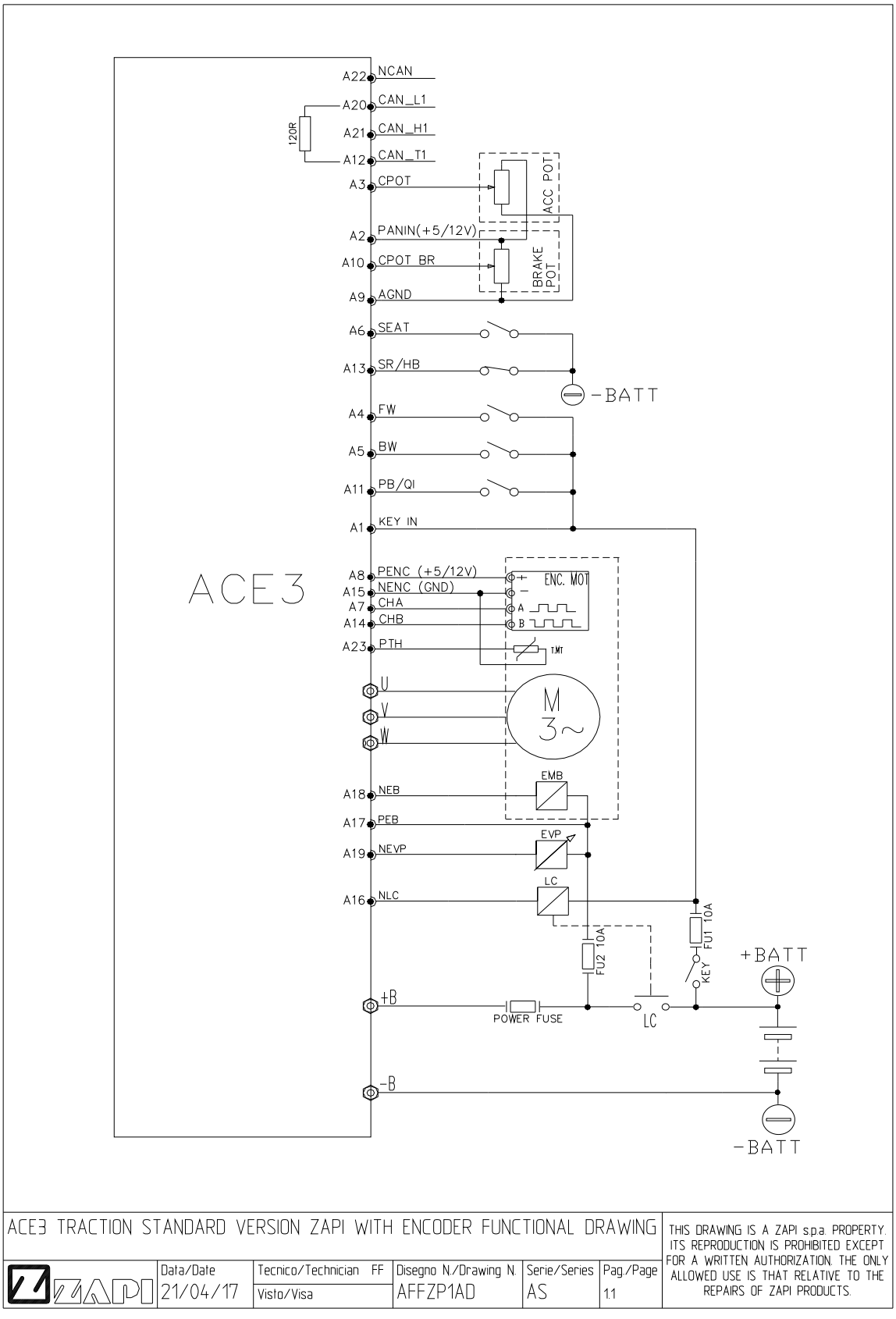
UL certificate	UL 583 compliant (AU3503).
Functional safety	Applicable requirements of EN 1175-1:2010, Compliant to upcoming revision of EN1175.
EMC	Applicable requirements of EN 12895.
IP code	IP65.

DIMENSIONS



Other versions (with only one Ampseal connector, without power fuse, with base-plate, with other types of heat sink) exist.

TYPICAL WIRING DIAGRAM – ACE3 STANDARD



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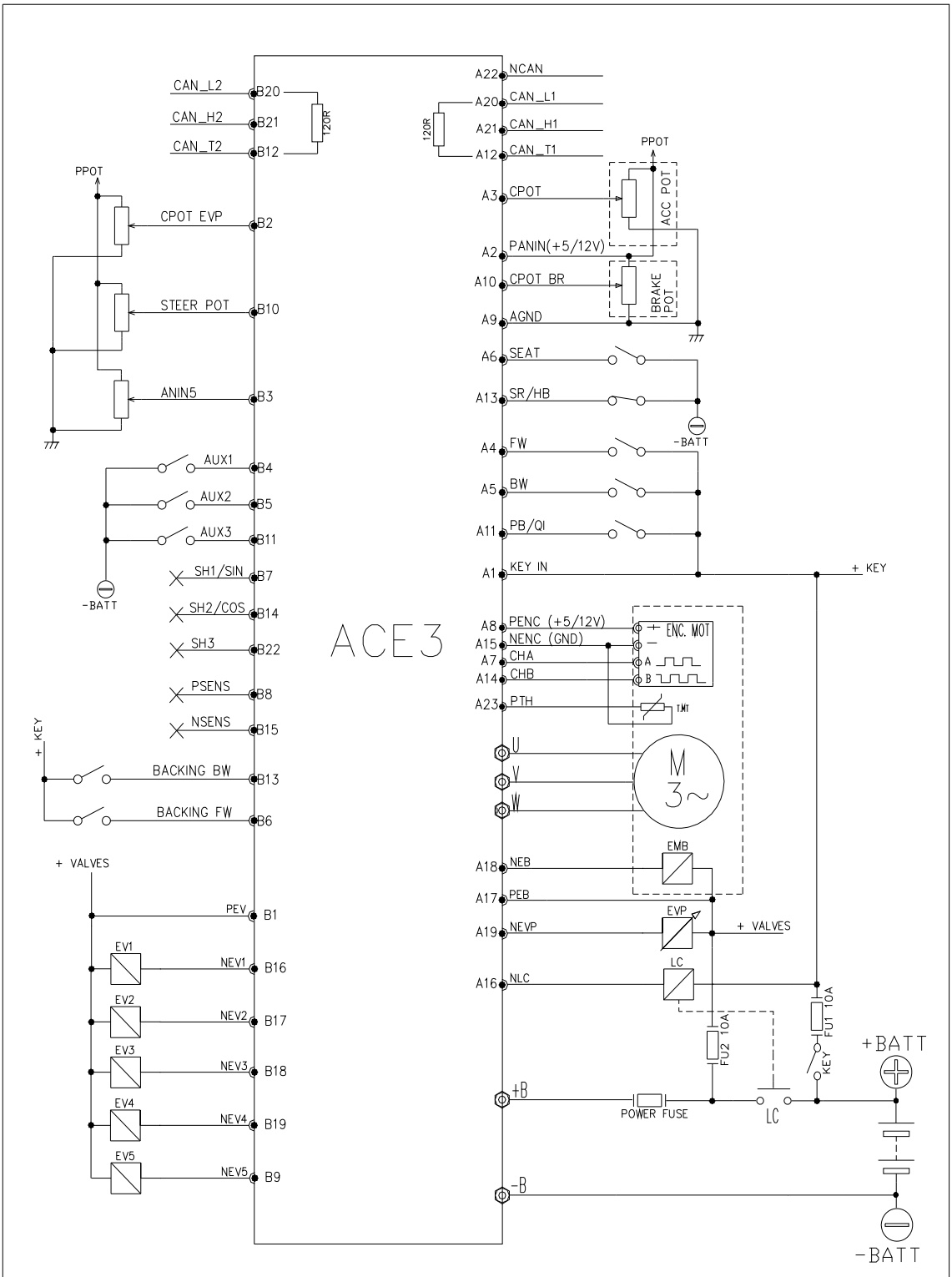
TYPICAL WIRING DIAGRAM – ACE3 PREMIUM



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