

DUALACE2 & COMBIACE2 NEW GENERATION

Publication: **AFNZP0AA**
Edition: **Dec 20, 2019**



DESCRIPTION

DUALACE2 & COMBIACE2 NEW GENERATION inverters are suitable for controlling a pair of several type of motors (AC induction, SPM, IPM, SRM, SRPM), with nominal power ratings of 4 kW through 12 kW, adopted in battery-powered trucks for material handling.

It is available in two main configurations:

- **Standard:** 23-poles connector
- **Premium:** 35-poles connector, for enhanced I/O

The high number of I/O accommodates a wide range of vehicle controls and sensors.

DUALACE2 & COMBIACE2 NEW GENERATION can also easily interface with a wide range of external devices via CAN bus.

APPLICATIONS

Typical applications are:

Counterbalanced trucks with load up to 3 tons, HLOPs (VNAs), reach trucks, tow tractors, airport ground-support vehicles, aerial-access equipment (telescopic booms and scissor lifts). Furthermore, it may also be suitable for other markets such as E-mobility and agriculture.

FEATURES

- Nominal voltage 24 V, 36 V, 48 V, 72 V, 80 V.
- Two microcontrollers for main and safety functions, 576+ kByte embedded flash memory.
- Up to 8 active-high digital inputs.
- Up to 3 active-low digital inputs.
- Up to 4 analog inputs (range 0 V ÷ 10 V) with 10-bit resolution.
- Two inputs for analog motor thermal sensors.
- Several options available for speed or position sensor interfaces:
 - Incremental encoders (default).
 - Sin/cos sensors.
 - Set of three Hall sensors.
 - Resolver (adding an external interface).
- CAN bus interface that allows communication with a wide range of devices.
- Communication speed up to 500 kbit/s.
- 11-bit and 29-bit communication supported.
- Two auxiliary supply outputs (12 V or 5 V, up to 200 mA).
- One PWM current-controlled low-side output (up to 1.5 A continuous), with dither injection configurable in amplitude and frequency.
- Up to 3 PWM voltage-controlled low-side outputs.
- Built-in freewheeling diodes for all the low-side outputs.
- Protection against overload, short circuit, open load and ESD.
- Ambient temperature
 - Operating: -40 °C ÷ +40 °C.
 - Storage: -40 °C ÷ +85 °C.
- Sealed connector (23-pins or 35-pins Ampseal).
- Access to status and diagnostic information.

MODEL CHART

| Nominal voltage | Voltage range | 2-min RMS current ratings [A] | S2 60-min RMS current ratings [A] |
|-------------------|---------------|-------------------------------|-----------------------------------|
| 24V | 10 V ÷ 35 V | 550 + 550 | 275 + 275 |
| | | 500 + 500 | 250 + 250 |
| | | 450 + 450 | 225 + 225 |
| | | 400 + 400 | 200 + 200 |
| | | 350 + 350 | 175 + 175 |
| | | 250 + 250 | 125 + 125 |
| 36/48V | 10 V ÷ 72,5 V | 550 + 550 | 275 + 275 |
| | | 500 + 500 | 250 + 250 |
| | | 450 + 450 | 225 + 225 |
| | | 400 + 400 | 200 + 200 |
| | | 350 + 350 | 175 + 175 |
| 72/80V | 30 V ÷ 115 V | 400 + 400 | 200 + 200 |
| | | 350 + 350 | 175 + 175 |
| | | 300 + 300 | 150 + 150 |
| | | 250 + 250 | 125 + 125 |
| 96V (upcoming) | 30 V ÷ 130 V | 350 + 350 | 175 + 175 |
| | | 250 + 250 | 125 + 125 |



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 m³/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.

REGULATIONS

| | |
|--------------------------|--|
| UL certificate | UL 583 compliant (AU3503). |
| Functional safety | Applicable requirements of EN 1175-1:2010 Compliant to upcoming revision of EN 1175 Applicable requirements of EN 280:2015 Functional safety according to EN ISO 13849:2015 |
| EMC | Applicable requirements of EN 12895:2015. |
| IP code | IP65. |

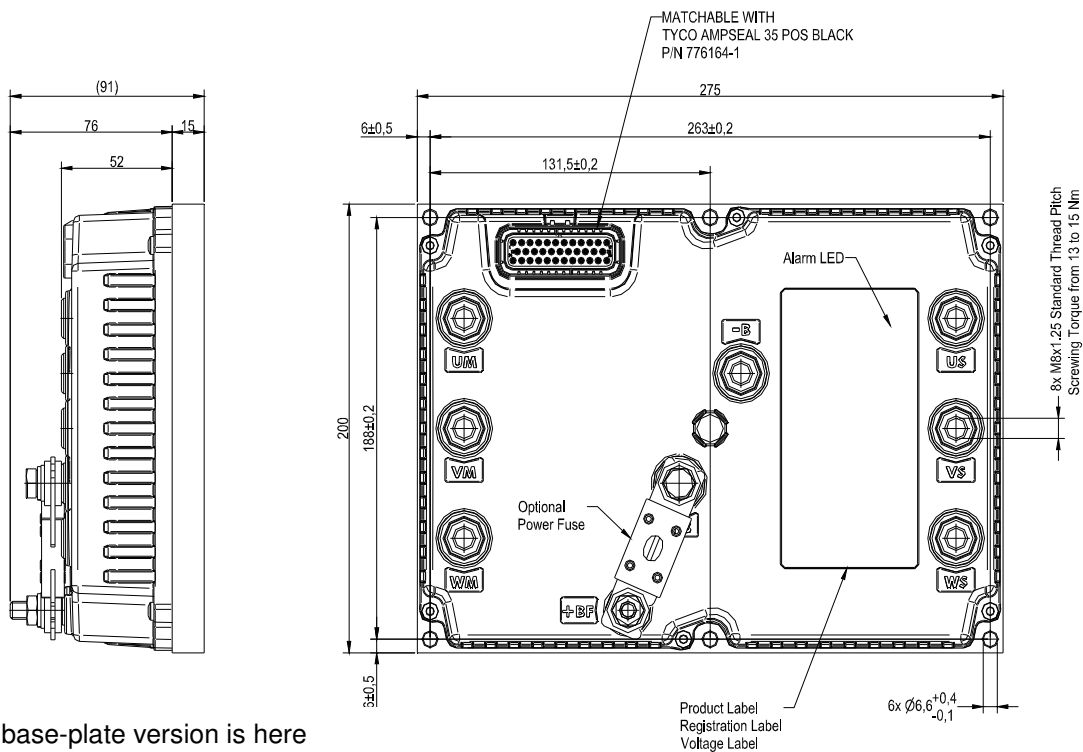
TECHNICAL DATA

| Version | | STANDARD | PREMIUM |
|---|-------------|---|-----------------|
| Connector | | 23-pins Ampseal | 35-pins Ampseal |
| Digital inputs | Active high | 2 | 3 |
| | Active low | 1 | 5 |
| Analog inputs | | 2 | 6 |
| PWM voltage-controlled outputs | | 3 | |
| PWM current-controlled output | | 1 | |
| High side output | | - | 1 |
| Auxiliary supply output (12 V / 5 V) | | 2 (max 200 mA) | |
| CAN bus interface | | 1 | |
| Input for motor thermal sensors | | 2 | |
| Encoder interfaces | | 2 | |
| Sin-cos / 3-Hall interface | | - | 2 (on demand) |
| Memory (for each microcontroller) | | 576+ kB Flash, 48 kB SRAM, 64kB emulated EEPROM | |



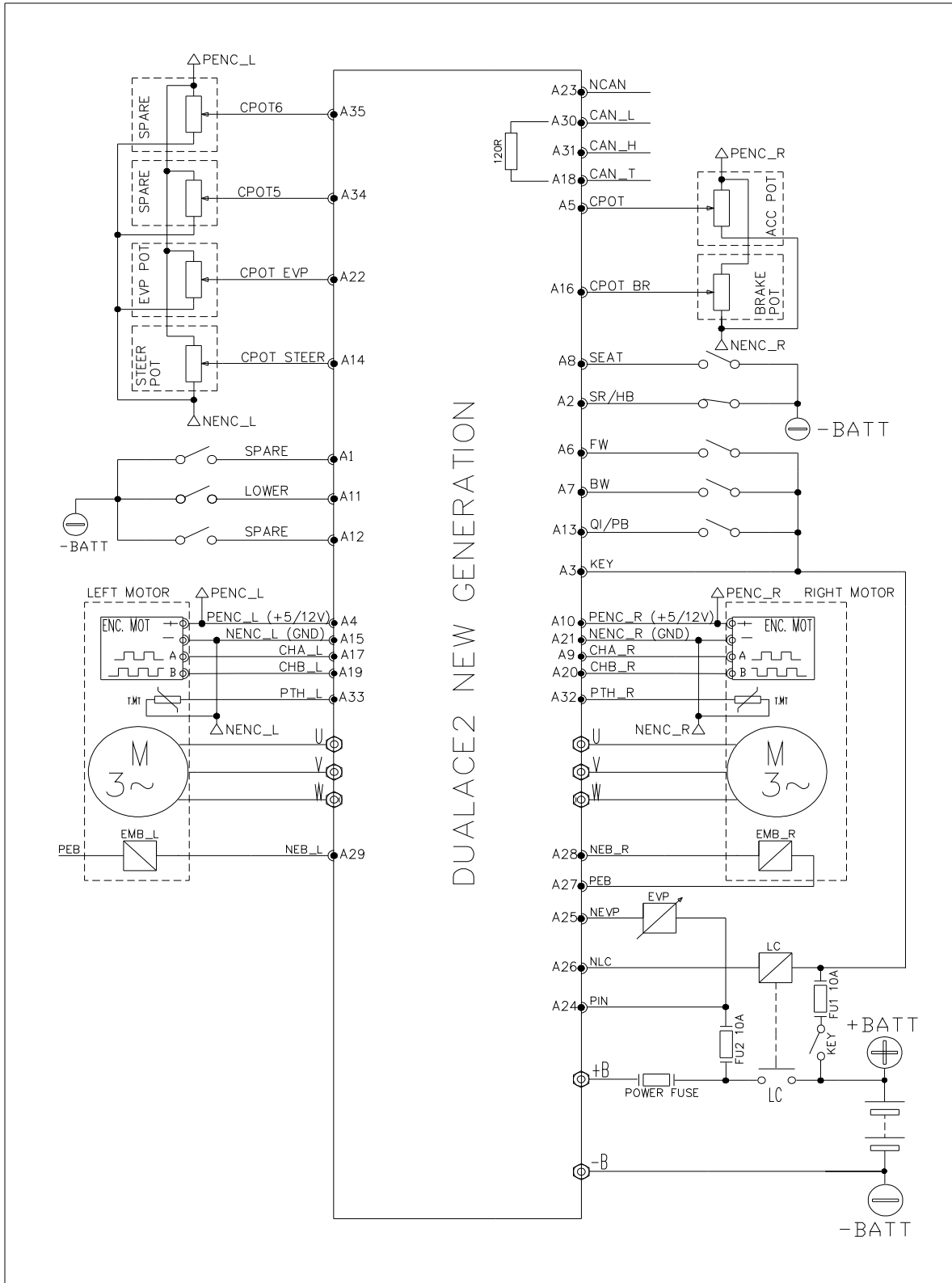
Speed/position sensor interfaces different from incremental encoder reduce the number of digital/analog inputs available.

DIMENSIONS



The base-plate version is here depicted. Longitudinal and transversal heat sink versions are available too.

TYPICAL WIRING DIAGRAM – DUAL TRACTION



DUALACE2 NEW GENERATION

DUALACE2 NEW GENERATION 35P PREMIUM WITH ENCODER FUNCTIONAL DRAW.

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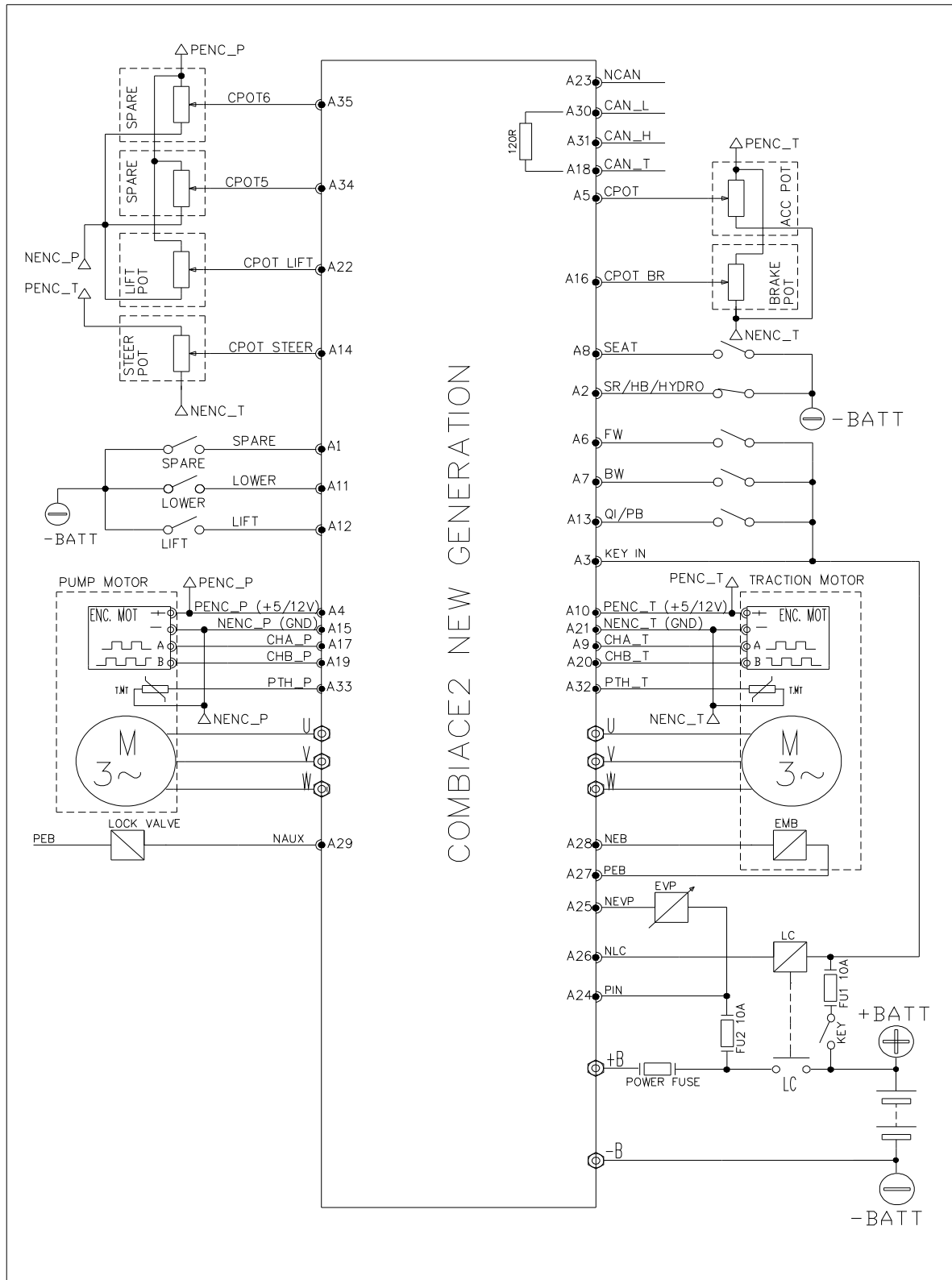
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TYPICAL WIRING DIAGRAM – COMBI TRACTION + PUMP



COMBIACE2 NEW GENERATION 35P WITH ENCODER FUNCTIONAL DRAWING

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