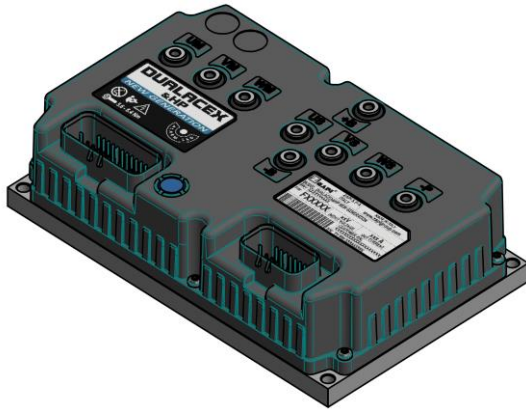




# DUALACEX & HP

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## DESCRIPTION

DUALACEX & HP inverter is suitable for controlling several type of motors (AC induction, BLDC, PMAC and SyncRel) in the range from 1 kW to 2.5 kW continuous power, adopted in small battery-powered vehicles. Additional DC controller is available for applications with DC series-excited pump motor up to 5 kW.

The high number of I/Os distributed using up to 35P + 23P poles ampseal connectors accommodates a wide range of vehicle controls and sensors. DUALACEX & HP can also easily interface with a wide range of external devices via CAN bus.

## APPLICATIONS

DUALACEX & HP is suitable for traction and hydraulic pump control on several types of battery-powered vehicles.

### Typical applications are:

Scissor lifts, small boom lifts, work assist vehicle, stock pickers.

Also, DUALACEX & HP may be suitable for other applications not listed here.

## FEATURES

- Nominal voltage from 24 V to 48 V.
- 16-bit microcontroller for main functions, 576+ kByte embedded flash memory.
- 16-bit microcontroller for safety functions, 576+ kByte embedded flash memory.
- Up to 18 digital inputs.
- Up to 8 analog inputs (range 0 V ÷ 10 V) with 10-bit resolution.
- 2 inputs for analog motor thermal sensor.
- Possible speed sensor interfaces:
  - 2 incremental encoder (default).
  - 4 incremental encoders.
  - 2 sin/cos sensor.
  - 2 set of three Hall sensors.
  - 2 Resolver (adding an external interface).
- 1 CAN bus interface up to 1 Mbit/s.
- 11-bit and 29-bit communication supported.
- Communication standard: CAN protocol.
- Three auxiliary supply outputs (+12V / +5V; max 200 mA for +12V in total, max 100 mA for +5V).
- Up to 2 PWM current-controlled low-side output with current feedback (up to 1.5 A continuous).
- Up to 10 PWM voltage-controlled low-side outputs.
- Up to 1 High side driver output.
- Up to 2 ON/OFF voltage-controlled low-side outputs.
- 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 connectors (23-pins or 35-pins Ampseal).
- Access to status and diagnostic information.



*Features and technical information included in this document are preliminary and modification could be introduced during developing*

## MODEL CHART

Nominal Voltage	Voltage Range	2 min RMS Current Ratings [Arms]	S2-60min RMS Current Ratings [Arms]	DC chopper maximum current [A]
24V	10 V ÷ 35 V	240	100	270
		150	75	
		120	60	
		80	40	
36/48V	10 V ÷ 65 V	150	75	240
		120	60	
		80	40	



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<sup>3</sup>/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

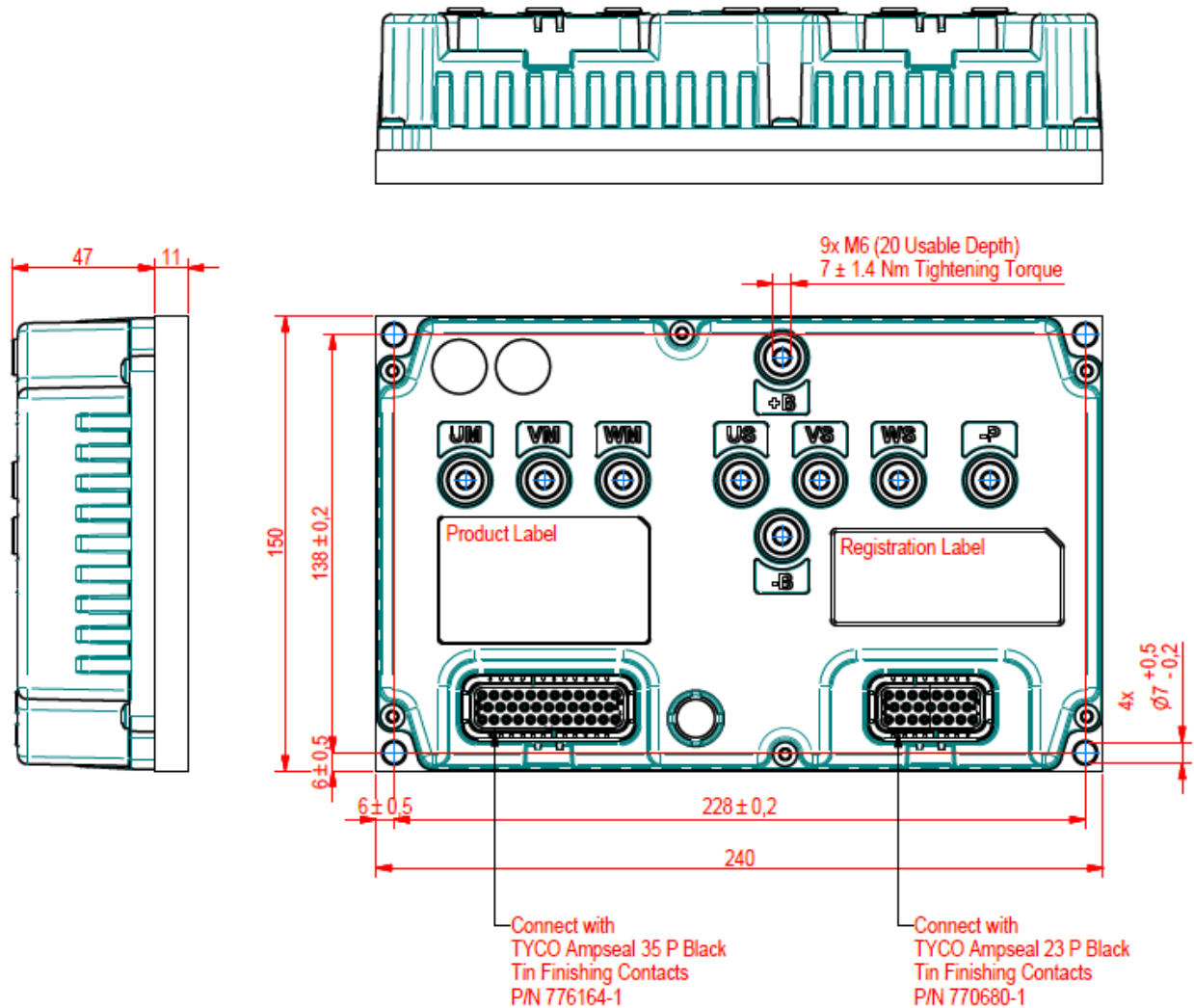
<b>UL certificate</b>	UL 583 compliant (AU3503).
<b>Functional safety</b>	Applicable requirements of EN 1175-1:2010, Compliant to upcoming revision of EN1175.
<b>EMC</b>	Applicable requirements of EN 12895.
<b>IP code</b>	IP65.

## TECHNICAL DATA

Version		23P	35P	35P + 23P
Digital inputs		3	6	18
Analog inputs		2	6	8
PWM voltage-controlled outputs		3	6	10
ON/OFF output		-	1	2
PWM current-controlled output		1	1	2
Auxiliary supply output (+12/+5V)		2 (max 200 mA for +12V, max 100 mA for +5V)		3 (max 200 mA for +12V, max 100 mA for +5V)
CAN bus interface		1		
Input for motor thermal sensor		2		
Encoder interface		2	2 (4 on demand)	
Sin-cos / 3-Hall / resolver interface		-	2 on demand	
High-side driver		No	Yes (4A max)	
Memory	Main $\mu$ C	576+ kB Flash, 48 kB SRAM, 64kB emulated EEPROM		
	Supervisor $\mu$ C	576+ kB Flash, 48 kB SRAM, 64kB emulated EEPROM		

PRELIMINARY

## DIMENSIONS



*Dimensions and layout are preliminary and purely indicative. Changes could be introduced during developing.*

## TYPICAL WIRING DIAGRAM 35P+23P – DUAL TRACTION&HP

