



# ***ELECTROMOBILITY POWER DEVICES***



**DC/DC  
CONVERTERS**



**BATTERY  
CHARGER**



**INVERTERS**



**CHOPPERS**



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FOR LITHIUM CHEMISTRY

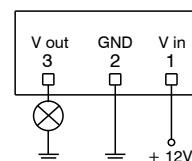
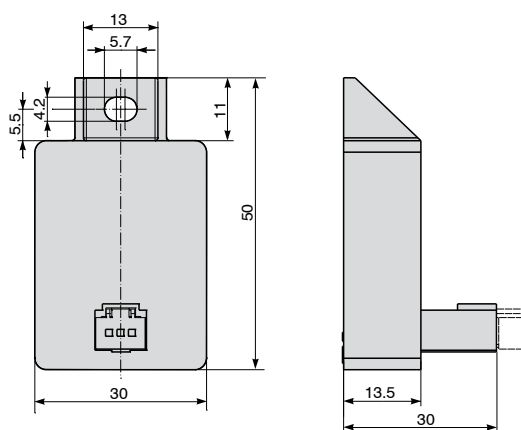
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# DC/DC Converter

LINEAR VOLTAGE REGULATOR

12V → 5V 100mA



## TECHNICAL SPECIFICATIONS

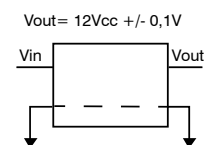
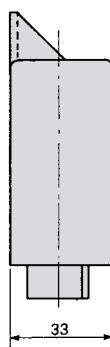
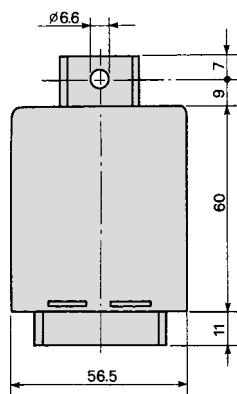
|                                  |                      |  |  |
|----------------------------------|----------------------|--|--|
| Input voltage                    | 12V                  |  |  |
| Output voltage                   | 5V                   |  |  |
| Maximum current output           | 100mA                |  |  |
| Short circuit protected output   | Yes                  |  |  |
| Reverse polarity protected input | Yes                  |  |  |
| Dimensions                       | 30mm x 51mm x 31,5mm |  |  |
| Operating temperature            | -20°C ÷ +65°C        |  |  |
| Storage temperature              | 20°C ÷ +85°C         |  |  |
| Sealing degree                   | IP66                 |  |  |
| Connector                        | JWPF 3 pins          |  |  |

| Purchase code  | Pkg  | 20 | 1030773      |  |  |  |  |
|----------------|------|----|--------------|--|--|--|--|
| Drawing code   | Q.ty |    | 34-0188-0000 |  |  |  |  |
| Input voltage  |      |    | 12V          |  |  |  |  |
| Output voltage |      |    | 5V           |  |  |  |  |
|                |      |    |              |  |  |  |  |
|                |      |    |              |  |  |  |  |

# DC/DC Converter

LINEAR VOLTAGE REGULATOR

36V → 12V 3A



## TECHNICAL SPECIFICATIONS

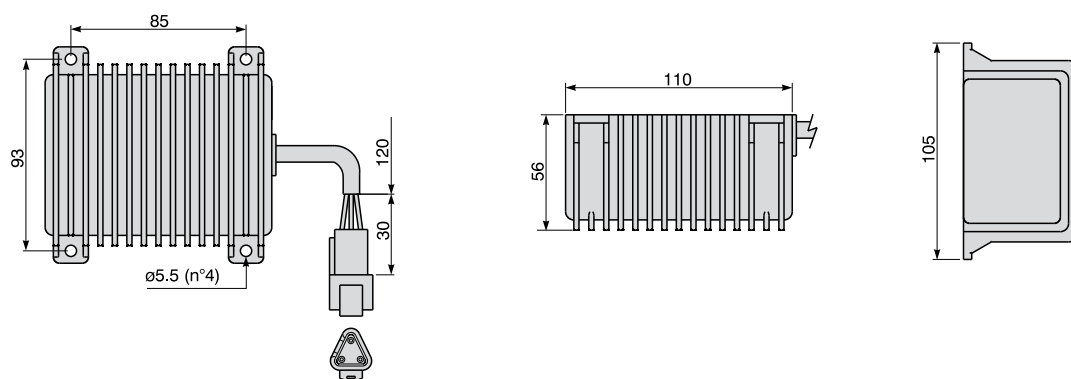
|                       |                        |  |  |
|-----------------------|------------------------|--|--|
| Input voltage         | 36V                    |  |  |
| Output voltage        | 12V                    |  |  |
| VIN minimum           | 28Vcc                  |  |  |
| VIN max               | 60Vcc                  |  |  |
| Performance           | 82% +/- 2%             |  |  |
| Dimensions            | 56,5mm x 86,5mm x 33mm |  |  |
| Operating temperature | -40°C ÷ +70°C          |  |  |
| Storage temperature   | -40°C ÷ +85°C          |  |  |
| Sealing degree        | IP44                   |  |  |

| Purchase code  | Pkg  | 20 | 1031514    |  |  |  |  |
|----------------|------|----|------------|--|--|--|--|
| Drawing code   | Q.ty |    | 39-012-000 |  |  |  |  |
| Input voltage  |      |    | 36V        |  |  |  |  |
| Output voltage |      |    | 12V        |  |  |  |  |
|                |      |    |            |  |  |  |  |
|                |      |    |            |  |  |  |  |

# DC/DC Converter

VOLTAGE CONVERTER

24V → 12V



## TECHNICAL SPECIFICATIONS

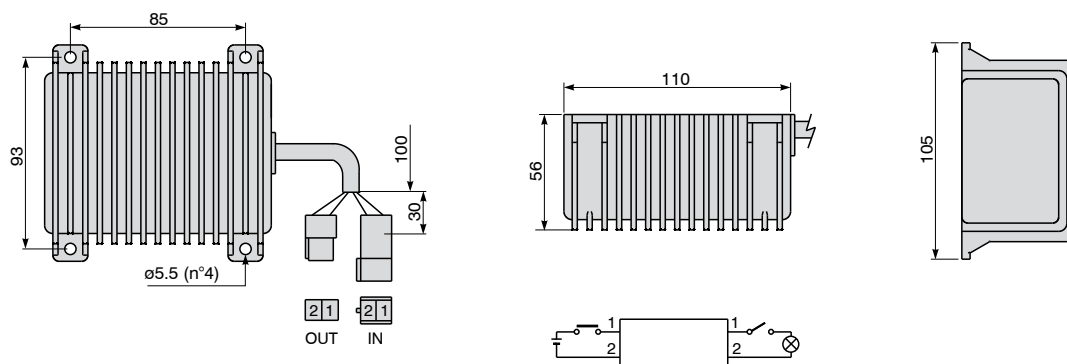
|                                       |            |                       |                      |
|---------------------------------------|------------|-----------------------|----------------------|
| Input voltage                         | 18 - 32V   | Maximum peak power    | 130W                 |
| Output voltage                        | 13,5V      | Nominal power rating  | 100W                 |
| Maximum current                       | 10A        | Frequency             | 62kHz                |
| Nominal current output (1 hr. rating) | 7,4A       | Shock and vibration   | SAE J1378            |
| Output voltage regulation             | + / - 0,5V | Dimensions            | 110mm x 56mm x 105mm |
| Output ripple voltage                 | 200mVpk-pk | Operating temperature | -30°C ÷ +60°C        |
| Short circuit protected output        | Yes        | Storage temperature   | -40°C ÷ +70°C        |
| Reverse polarity protected input      | Yes        | Sealing degree        | IP64                 |
| Overload protection                   | Yes        | Connector             | DEUTSCH 3 pins       |
| Thermal protection                    | Yes        |                       |                      |

| Purchase code  | Pkg  | 1031523    |  |  |  |  |  |
|----------------|------|------------|--|--|--|--|--|
| Drawing code   | Q.ty | 39-015-000 |  |  |  |  |  |
| Input voltage  |      | 18 - 32V   |  |  |  |  |  |
| Output voltage |      | 13,5V      |  |  |  |  |  |
|                |      |            |  |  |  |  |  |
|                |      |            |  |  |  |  |  |

# DC/DC Converter

VOLTAGE CONVERTER

48 - 80V → 24V



## TECHNICAL SPECIFICATIONS

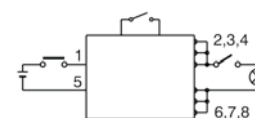
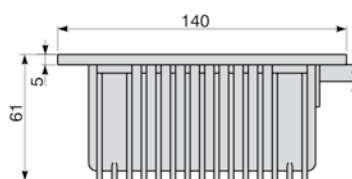
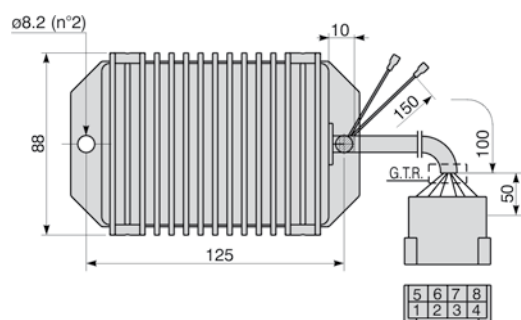
|                                       |            |                       |                         |
|---------------------------------------|------------|-----------------------|-------------------------|
| Input voltage                         | 48 - 80V   | Nominal power rating  | 200W                    |
| Output voltage                        | 24V        | Frequency             | 62kHz                   |
| Maximum current                       | 10A        | Shock and vibration   | SAE J1378               |
| Nominal current output (1 hr. rating) | 8,3A       | Dimensions            | 110mm x 56mm x 105mm    |
| Output voltage regulation             | + / - 1V   | Operating temperature | -30°C ÷ +55°C           |
| Output ripple voltage                 | 100mVpk-pk | Storage temperature   | -40°C ÷ +70°C           |
| Short circuit protected output        | Yes        | Sealing degree        | IP64                    |
| Reverse polarity protected input      | Yes        | Connectors            | BPF 2 pins + BPM 2 pins |
| Overload protection                   | Yes        |                       |                         |
| Maximum peak power                    | 250W       |                       |                         |

| Purchase code      | Pkg  | 1031517    | 1031497      |  |  |  |  |
|--------------------|------|------------|--------------|--|--|--|--|
| Drawing code       | Q.ty | 39-013-000 | 39-0018-0000 |  |  |  |  |
| Input voltage      |      | 48 - 80V   | 48 - 80V     |  |  |  |  |
| Output voltage     |      | 24V        | 24V          |  |  |  |  |
| Crowbar Protection |      | Yes        | No           |  |  |  |  |
|                    |      |            |              |  |  |  |  |

# DC/DC Converter

VOLTAGE CONVERTER

48 - 80V → 24V



## TECHNICAL SPECIFICATIONS

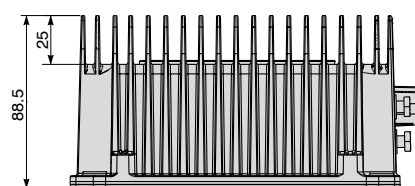
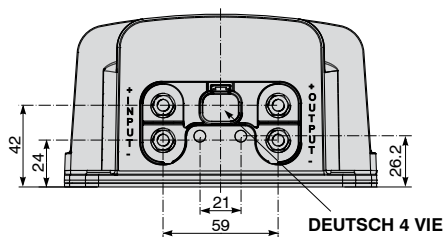
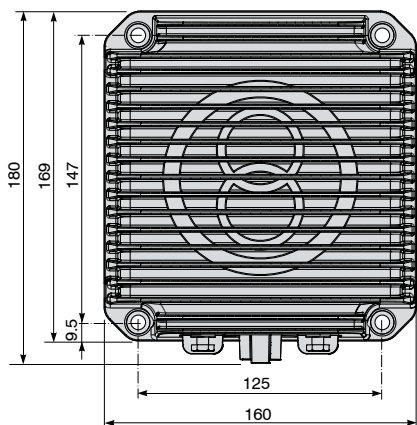
|                                       |            |                       |                             |
|---------------------------------------|------------|-----------------------|-----------------------------|
| Input voltage                         | 48 - 80V   | Nominal power rating  | 200W                        |
| Output voltage                        | 24V        | Frequency             | 62kHz                       |
| Maximum current                       | 10A        | Shock and vibration   | SAE J1378                   |
| Nominal current output (1 hr. rating) | 8,3A       | Dimensions            | 140mm x 61mm x 80mm         |
| Output voltage regulation             | + / - 1V   | Operating temperature | -30°C ÷ +55°C               |
| Output ripple voltage                 | 100mVpk-pk | Storage temperature   | -40°C ÷ +80°C               |
| Short circuit protected output        | Yes        | Sealing degree        | IP64                        |
| Reverse polarity protected input      | Yes        | Connectors            | 2 X Faston AMP + BPM 8 pins |
| Overload protection                   | Yes        |                       |                             |
| Maximum peak power                    | 250W       |                       |                             |

| Purchase code  | Pkg  | 1 | 1031519    |  |  |  |  |
|----------------|------|---|------------|--|--|--|--|
| Drawing code   | Q.ty |   | 39-014-000 |  |  |  |  |
| Input voltage  |      |   | 48 - 80V   |  |  |  |  |
| Output voltage |      |   | 24V        |  |  |  |  |
|                |      |   |            |  |  |  |  |
|                |      |   |            |  |  |  |  |

# DC/DC Converter

VOLTAGE CONVERTER

12V → 24V



## TECHNICAL SPECIFICATIONS

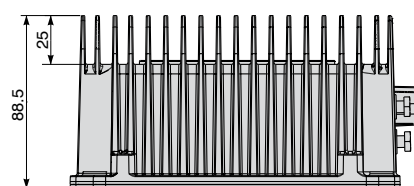
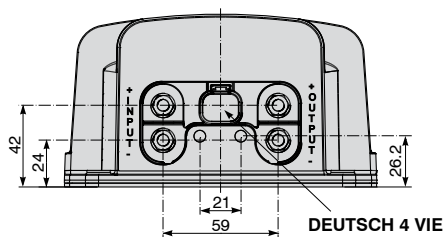
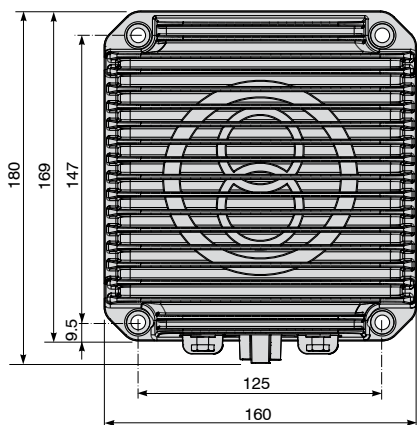
|                                     |              |                       |                        |
|-------------------------------------|--------------|-----------------------|------------------------|
| Input voltage                       | 9 - 18V      | Dimensions            | 160mm x 180mm x 88,5mm |
| Output voltage                      | 27,5 - 28,5V | Operating temperature | -30°C ÷ +45°C          |
| Input current @ POUT 700W Vin 13,5V | 56V          | Sealing degree        | IP66                   |
| Maximum peak power                  | 750W         | Connector             | DEUTSCH 4 pins         |
| Nominal power rating                | 700W         |                       |                        |
| Frequency                           | 60kHz        |                       |                        |
| Nominal input voltage               | 13,5V        |                       |                        |
| Nominal output voltage (lin bus)    | 22 - 32V     |                       |                        |
| Output voltage regulation           | + / - 0,5V   |                       |                        |
| Output ripple voltage               | 50mVpk-pk    |                       |                        |

| Purchase code  | Pkg  | 1 | 1031505      |  |  |  |  |
|----------------|------|---|--------------|--|--|--|--|
| Drawing code   | Q.ty |   | 39-0028-0000 |  |  |  |  |
| Input voltage  |      |   | 9 - 18V      |  |  |  |  |
| Output voltage |      |   | 27,5 - 28,5V |  |  |  |  |
|                |      |   |              |  |  |  |  |
|                |      |   |              |  |  |  |  |

# DC/DC Converter

VOLTAGE CONVERTER

48V → 12V    24V → 12V



## TECHNICAL SPECIFICATIONS

|                                   |            |                                     |                                                  |
|-----------------------------------|------------|-------------------------------------|--------------------------------------------------|
| Maximum current output            | 14,5A      | Frequency                           | 64kHz                                            |
| Nominal current output            | 12,5A      | Shock and vibration                 | SAE J1378                                        |
| Output voltage regulation         | + / - 1V   | Dimensions                          | 160mm x 180mm x 88,5mm                           |
| Output ripple voltage             | 100mVpk-pk | Operating temperature               | -30°C ÷ +45°C                                    |
| Short circuit protected output    | Yes        | Storage temperature                 | -40°C ÷ +70°C                                    |
| Reverse polarity protected input  | Yes        | Sealing degree                      | IP65                                             |
| Overload protection               | Yes        | Electromagnetic compatibility (EMC) | 61000-6-3 for emission<br>61000-6-2 for immunity |
| Maximum peak power                | 350W       | Connector                           | DEUTSCH 4 pins                                   |
| Input/output isolation (1000vrms) | Yes        |                                     |                                                  |
| Nominal power rating              | 300W       |                                     |                                                  |

| Purchase code<br>Drawing code | Pkg<br>Q.ty | 1 | 1031501<br>39-0022-0000 | 1031503<br>39-0026-0000 | 1031504<br>39-0027-0000 |  |  |  |
|-------------------------------|-------------|---|-------------------------|-------------------------|-------------------------|--|--|--|
| Input voltage                 |             |   | 48V                     | 24V                     | 24V                     |  |  |  |
| Output voltage                |             |   | 12V                     | 12V                     | 12V                     |  |  |  |
| Load sharing (max 5 units)    |             |   |                         |                         | X                       |  |  |  |
|                               |             |   |                         |                         |                         |  |  |  |

# Isolated DC/DC Converter

## VOLTAGE CONVERTER

29V → 60V    62V → 142V    62V → 150V



Scarica il manuale d'uso  
in Italiano



Download the user manual  
in English

### TECHNICAL SPECIFICATIONS

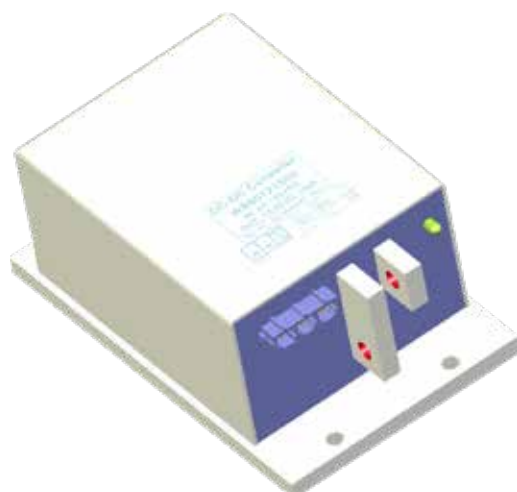
|                                              |                                                                  |                                    |                      |
|----------------------------------------------|------------------------------------------------------------------|------------------------------------|----------------------|
| Load variation 10-90% static                 | typ.0,5% (max.1,0%)                                              | Inrush current <sup>2</sup>        | <5A                  |
| Load variation 10-90% dynamic                | typ.1,0% (max.2,0%)                                              | Operating temperature              | -40°C ÷ +105°C       |
| Input voltage variation ±10%                 | typ.0,2% (max.0,5%)                                              | Storage temperature                | -40°C ÷ +105°C       |
| Recovery time to ±1%                         | typ.0,25ms (max.0,5ms)                                           | Operating temperature at full load | -40°C ÷ +70°C        |
| Efficiency at full load                      | typ.86%@13,8V output<br>typ.87%@26V output<br>typ.87%@28V output | Temperature coefficient            | 0,05%/K              |
| Ripple and noise                             | 1,5% U-out NOM                                                   | Humidity                           | 100% RH              |
| Switching spikes                             | typ.100mVpp                                                      | Encapsulated                       | IP65                 |
| Switching frequency                          | typ.110kHz                                                       | Isolated Switching                 | Regulator            |
| Conducted interference at input              | ≤1%pp.max                                                        | Output power max                   | 300W/450W/900W/1500W |
| Idle current input at 72VDC                  | approx.15mA                                                      | Switch input                       | On / Off Key         |
| Break down voltage input/output              | 1000VDC/1 min                                                    | Vibration                          | Resistant            |
| Isolated resistance                          | 100MΩ                                                            | Wide input range                   |                      |
| Output short circuit protected by switch off | approx.120% I-nom                                                | Short circuit                      | Protected            |
|                                              |                                                                  | Over temperature                   | Protected            |
|                                              |                                                                  | Connector                          | MOLEX Mini-Fit Sr    |



| Purchase code<br>Drawing code | Pkg<br>Q.ty | 1 | 1096198<br>AV-39-0004 | 1096200<br>AV-39-0005 | 1098419<br>AV-39-0007 |  |  |
|-------------------------------|-------------|---|-----------------------|-----------------------|-----------------------|--|--|
| Input voltage                 |             |   | 29 - 60V              | 29 - 60V              | 62 - 142V             |  |  |
| Output voltage                |             |   | 26.0V<br>I max 11.5A  | 13.8V<br>I max 33A    | 13.8V<br>I max 33A    |  |  |
| Power                         |             |   | 300W                  | 450W                  | 450W                  |  |  |
| Connector MOLEX               |             |   | 5 ways                | 5 ways                | 5 ways                |  |  |
| Dimensions                    |             |   | 115x72x49mm           | 120x72x57.5mm         | 120x72x57.5mm         |  |  |



| Purchase code<br>Drawing code | Pkg<br>Q.ty | 1 | 1096201<br>AV-39-0006 | 1098421<br>AV-39-0008 | 1104288<br>AV-39-0014 | 1108495<br>AV-39-0018 | 1110130<br>AV-39-0019 |
|-------------------------------|-------------|---|-----------------------|-----------------------|-----------------------|-----------------------|-----------------------|
| Input voltage                 |             |   | 29 - 60V              | 62 - 142V             | 62 - 142V             | 62 - 150V             | 62 - 142V             |
| Output voltage                |             |   | 13.8V<br>I max 60A    | 13.8V<br>I max 60A    | 26.0V<br>I max 32A    | 26.0V                 | 28.0V                 |
| Power                         |             |   | 900W                  | 900W                  | 900W                  | 1500W                 | 900W                  |
| Connector MOLEX               |             |   | 3 ways + 4 ways       | 3 ways + 4 ways       | 3 ways + 4 ways       | 3 ways + 4 ways       | 3 ways + 4 ways       |
| Dimensions                    |             |   | 147x90x58.5mm         | 147x90x58.5mm         | 147x90x58.5mm         | 47x90x58.5mm          | 147x90x58.5mm         |



| Purchase code<br>Drawing code | Pkg<br>Q.ty | 1 | 1108493<br>AV-39-0016 | 1108494<br>AV-39-0017 |  |  |  |
|-------------------------------|-------------|---|-----------------------|-----------------------|--|--|--|
| Input voltage                 |             |   | 29 - 60V              | 62 - 150V             |  |  |  |
| Output voltage                |             |   | 13.8V                 | 13.8V                 |  |  |  |
| Power                         |             |   | 1500W                 | 1500W                 |  |  |  |
| Connector MOLEX               |             |   | 3 ways                | 3 ways                |  |  |  |
| Dimensions                    |             |   | 175x110x74.5mm        | 175x110x74.5mm        |  |  |  |

# Battery Charger for lithium chemistry

**Progettato per macchinari mobili non stradali e macchinari industriali. Carica ad alta potenza per pacchi batteria da 48V a 96V.**

## Design robusto

Involucro in alluminio pressofuso con grado di protezione IP66 / IP67. Connettori sigillati per la protezione da sporco, sostanze chimiche e fluidi.

## Interfaccia elettrica globale

Multifase e multitemensione. Compatibile con tensioni di rete monofase e trifase da 85 a 400Vac

## Potenza modulabile

3 diversi livelli di potenza di assorbimento, gestibili tramite segnali di ingresso digitali.

## Potenza scalabile

È possibile collegare in parallelo 2 o 3 caricabatterie per opzioni di ricarica molto rapide

**Designed for non-road mobile machinery and industrial machinery. High power charge for 48V to 96V battery pack.**

## Rugged design

IP66 / IP67 rated, aluminium die-cast enclosure. Sealed connectors protects against dirt, chemical and fluids.

## Global electrical interface

Multi-voltage and multi-phase compatible. From 85 to 400Vac single or two phase mains voltage.

## Modulable power

3 different levels of absorption power, manageable via digital input signals.

## Scalable power

2 or 3 charger can be parallel connected for very high fast charging options.

## DC out connector



**p/n COBO: 3046514 (XE0809631)**  
Connettore a 2 vie, modello tipo E-LINK  
Parte spina correlata, EHV211 L S19 17 A  
o HVSL600062A125 (Amphenol)  
Segnale di interblocco  
Dimensione filo: 25 mm<sup>2</sup>  
Diametro esterno del filo richiesto: 13,2 mm ± 0,5  
Terminali e guarnizioni inclusi

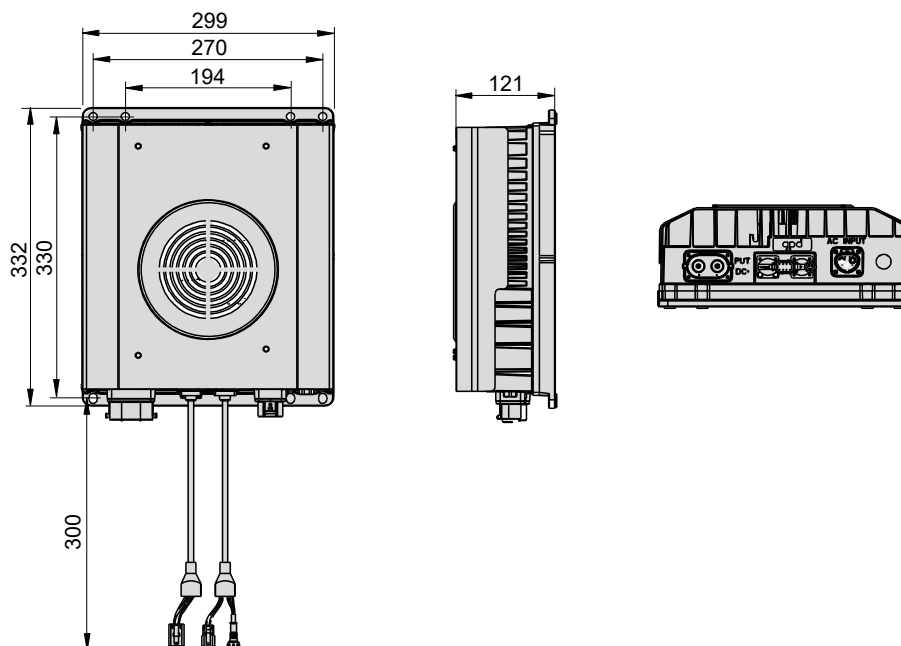
**COBO p/n: 3046514 (XE0809631)**  
2 ways connector, model type E-LINK  
Related plug part, EHV211 L S19 17 A  
Or HVSL600062A125 (Amphenol)  
Interlock signal  
Wire size: 25mm<sup>2</sup>  
Outer diameter of wire required: 13,2mm ± 0.5  
Terminals and seals are included

## AC input connector



**p/n COBO: 3046513 (XE0809630)**  
Connettore a 3 vie, modello tipo E-LINK  
Parte spina correlata, ELV311 L S18 14 X  
o PL183X-40-6 (Amphenol)  
Segnale di interblocco  
Dimensione filo: 6 mm<sup>2</sup>  
Diametro esterno del filo: 7,5 mm ± 0,3  
Terminali e guarnizioni inclusi

**COBO p/n: 3046513 (XE0809630)**  
3 ways connector, model type E-LINK  
Related plug part, ELV311 L S18 14 X  
Or PL183X-40-6 (Amphenol)  
Interlock Signal  
Wire size: 6mm<sup>2</sup>  
Outer diameter of wire required: 7.5mm ± 0.3  
Terminals and seals are included



Scarica il manuale d'uso  
in Italiano



Download the user manual  
in English

## TECHNICAL SPECIFICATIONS

|                                       |                               |                   |                                            |
|---------------------------------------|-------------------------------|-------------------|--------------------------------------------|
| AC input Voltage                      | 85 – 400Vac                   | Coolin            | Forced fan                                 |
| AC Nominal                            | 100 – 230 – 380               | Dimensions        | 350mm x 299mm x 121mm                      |
| Phase                                 | Single and Two phase          | DC Connector      | Amphenol HVSL 6000                         |
| Nominal AC input frequency            | 50 – 60 Hz                    | AC Connector      | Amphenol series Powerlok 4.0 or compatible |
| Isolated CAN bus                      | CAN open compatible protocols | Signals connector | Amphenol ATM                               |
| Indicator (charging status and fault) | Round remote segment display  |                   |                                            |
| Sealing degree                        | IP66 / IP67                   |                   |                                            |
| Weight                                | < 12kg                        |                   |                                            |

| Purchase code<br>Drawing code | Pkg<br>Q.ty <sup>1</sup> | 1111506<br>AV-50-0002 | 1111507<br>AV-50-0001 |  |  |  |  |
|-------------------------------|--------------------------|-----------------------|-----------------------|--|--|--|--|
| DC output                     |                          | 48V                   | 96V                   |  |  |  |  |
| Output voltage range          |                          | 30 ÷ 67V              | 56 ÷ 120V             |  |  |  |  |
| Nominal power                 |                          | 5500 W                | 6600 W                |  |  |  |  |
| Max current                   |                          | 100A                  | 80A                   |  |  |  |  |
| Short circuit protection      | Yes                      | Yes                   |                       |  |  |  |  |
| Inverse polarity protection   | Yes                      | Yes                   |                       |  |  |  |  |
| Over temperature protection   | Yes                      | Yes                   |                       |  |  |  |  |

# Traction Controllers General Features

VALID FOR ALL INVERTER **TC** MODELS



Drive Asynchronous Motors  
and Permanent Magnet  
Synchronous Motors



From 1KW size motor  
to 30KW size motor



CAN open compatible  
protocol



Work as a standalone drive  
with wired commands, or like  
a slave drive with CAN bus  
commands



Very high efficiently  
Autotuning function to  
mach the controller with  
general market motors



Field Oriented Control  
architecture, very good  
accuracy on the  
control speed

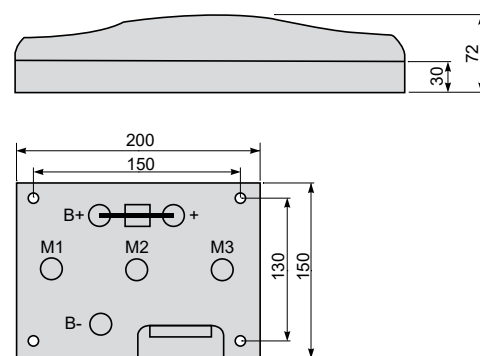
- Progettato per azionare motori asincroni e motori sincroni a magneti permanenti (tecnologia di superficie o interna)
- Gamma di tensione della batteria da 24V a 96V
- Batteria tradizionale al piombo o al litio
- Motori da 1 kW a 30 kW
- Protocollo CAN open
- Progettato per funzionare come azionamento autonomo con comandi cablati o come azionamento slave con comandi CAN bus
- **Funzione di autotuning ad altissima efficienza per adattare il controller ai motori standard del mercato**
- **Architettura di controllo orientata al campo, elevata precisione nella regolazione della velocità**
- Modalità di controllo della velocità, modalità di controllo della coppia
- Funzioni di frenatura rigenerativa
- Limitatore di corrente dinamico per preservare la batteria
- Controllo di mantenimento in salita, profili di accelerazione e decelerazione in linea o in curva
- Controller differenziale elettronico per motori di trazione doppi
- Il controller può essere utilizzato per gestire un motore di trazione o un motore di pompaggio
- La versione CAN isolata è obbligatoria per macchine con batteria da 48V ÷ 96V
- È necessario un calibratore CAN open per la configurazione del controller. Codice articolo del calibratore: 1104121

- *Designed to drive Asynchronous Motors and Permanent Magnet Synchronous Motors (Surface or Internal technology)*
- *Battery range from 24V from 96V*
- *Traditional Lead acid battery or Lithium battery*
- *From 1KW size motor to 30KW size motor*
- *CAN open compatible protocol*
- *Designed to work as a standalone drive with wired commands, or like a slave drive with CAN bus commands*
- ***Very high efficiently Autotuning function to mach the controller with general market motors***
- ***Field Oriented Control architecture, very good accuracy on the control speed***
- *Speed control mode, Torque control mode*
- *Regenerative braking functions*
- *Dynamic current limiter to preserve the battery*
- *Hill hold control, line or curve acceleration and deceleration profiles*
- *Electronic differential controller for double traction motors*
- *The controller can be used to manage a traction motor or a pump motor*
- *CAN isolated version is mandatory for machines with 48V ÷ 96V battery*
- *A CAN open calibrator is required for setting up the controllers p/n of calibrator: 1104121*

# TC - S

## Traction Controller

### INVERTER



#### TECHNICAL SPECIFICATIONS

|                          |                        |                |                                 |
|--------------------------|------------------------|----------------|---------------------------------|
| Digital input            | 7                      | Sealing degree | IP65                            |
| Analog input             | 3                      | Can interface  | Can open compatible             |
| Power output (contactor) | 3                      | Can option     | Can isolated (Option suggested) |
| Digital outputs          | 1                      | Dimensions     | 160mm x 200mm x 75mm            |
| Encoder type             | Sin/cos or incremental | Connector      | AMPSEAL 35 pins                 |
| Motor thermal input      | 1                      |                |                                 |
| Switching frequency      | 8kHz                   |                |                                 |
| Motor frequency (max)    | 600Hz                  |                |                                 |
| Regulation               | EN12895 - EN1175       |                |                                 |
| Operating temperature    | -30°C ÷ +40°C          |                |                                 |

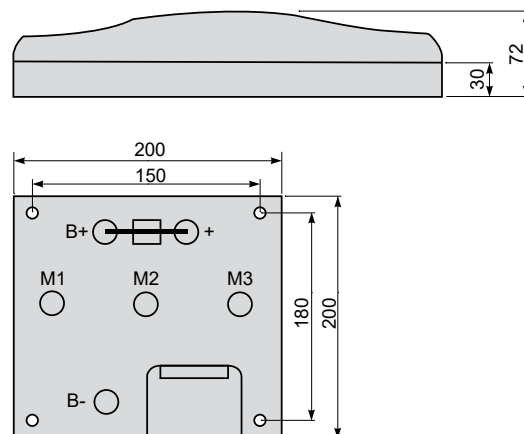
The ordering P/N shown on the brochure are referred to the standard version, CAN open compatible (non isolated CAN hardware)

| Purchase code<br>Drawing code | Pkg<br>Q.ty | 1103332<br>40-0053-0000 | 1103324<br>40-0052-0000 | 1104665<br>40-0055-0000 | 1104671<br>40-0061-0000 |  |  |
|-------------------------------|-------------|-------------------------|-------------------------|-------------------------|-------------------------|--|--|
| Battery voltage               |             | 24 ÷ 48V                | 24 ÷ 48V                | 60 ÷ 96V                | 60 ÷ 96V                |  |  |
| CAN isolated                  |             | yes                     | Yes                     | yes                     | Yes                     |  |  |
| Nominal current               |             | 130Arms                 | 130Arms                 | 75Arms                  | 75Arms                  |  |  |
| Peak current (2min)           |             | 250Arms                 | 250Arms                 | 140Arms                 | 140Arms                 |  |  |
| For 3 pahse Motor type        |             | AC motor                | AC motor                | AC motor                | IPM motor               |  |  |
| Software applications         |             | Traction                | Pump                    | Traction                | Traction                |  |  |

# TC - M

## Traction Controller

### INVERTER



#### TECHNICAL SPECIFICATIONS

|                          |                        |                |                                 |
|--------------------------|------------------------|----------------|---------------------------------|
| Digital input            | 7                      | Sealing degree | IP65                            |
| Analog input             | 3                      | Can interface  | Can open compatible             |
| Power output (contactor) | 3                      | Can option     | Can isolated (Option suggested) |
| Digital outputs          | 1                      | Dimensions     | 200mm x 200mm x 75mm            |
| Encoder type             | Sin/cos or incremental | Connector      | AMPSEAL 35 pins                 |
| Motor thermal input      | 1                      |                |                                 |
| Switching frequency      | 8kHz                   |                |                                 |
| Motor frequency (max)    | 600Hz                  |                |                                 |
| Regulation               | EN12895 - EN1175       |                |                                 |
| Operating temperature    | -30°C ÷ +40°C          |                |                                 |

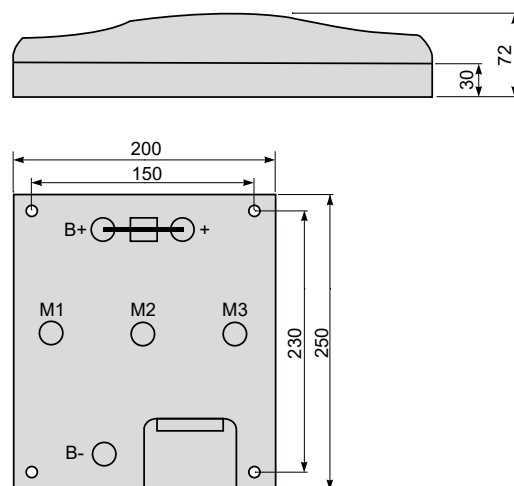
The ordering P/N shown on the brochure are referred to the standard version, CAN open compatible (non isolated CAN hardware)

| Purchase code<br>Drawing code | Pkg<br>Q.ty | 1103333<br>40-0054-0000 | 1103323<br>40-0051-0000 | 1104674<br>40-0064-0000 | 1104666<br>40-0056-0000 | 1104672<br>40-0062-0000 | 1104675<br>40-0065-0000 |
|-------------------------------|-------------|-------------------------|-------------------------|-------------------------|-------------------------|-------------------------|-------------------------|
| Battery voltage               |             | 24 ÷ 48V                | 24 ÷ 48V                | 24 ÷ 48V                | 60 ÷ 96V                | 60 ÷ 96V                | 60 ÷ 96V                |
| CAN isolated                  |             | yes                     | yes                     | yes                     | yes                     | yes                     | yes                     |
| Nominal current               |             | 250Arms                 | 250Arms                 | 250Arms                 | 140Arms                 | 140Arms                 | 140Arms                 |
| Peak current (2min)           |             | 450Arms                 | 450Arms                 | 450Arms                 | 270Arms                 | 270Arms                 | 270Arms                 |
| For 3 pahse Motor type        |             | AC motor                | IPM motor               | IPM motor               | AC motor                | IPM motor               | IPM motor               |
| Software applications         |             | Traction                | Traction                | Pump                    | Traction                | Traction                | Pump                    |

# TC - M+

## Traction Controller

### INVERTER



#### TECHNICAL SPECIFICATIONS

|                          |                        |                |                                 |
|--------------------------|------------------------|----------------|---------------------------------|
| Digital input            | 7                      | Sealing degree | IP65                            |
| Analog input             | 3                      | Can interface  | Can open compatible             |
| Power output (contactor) | 3                      | Can option     | Can isolated (Option suggested) |
| Digital outputs          | 1                      | Dimensions     | 250mm x 200mm x 75mm            |
| Encoder type             | Sin/cos or incremental | Connector      | AMPSEAL 35 pins                 |
| Motor thermal input      | 1                      |                |                                 |
| Switching frequency      | 8kHz                   |                |                                 |
| Motor frequency (max)    | 600Hz                  |                |                                 |
| Regulation               | EN12895 - EN1175       |                |                                 |
| Operating temperature    | -30°C ÷ +40°C          |                |                                 |

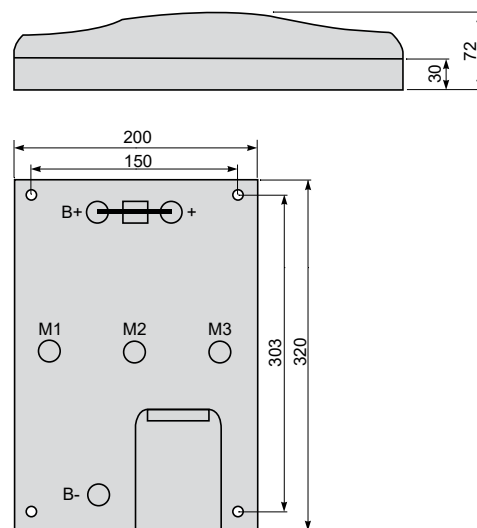
The ordering P/N shown on the brochure are referred to the standard version, CAN open compatible (non isolated CAN hardware)

| Purchase code<br>Drawing code | Pkg<br>Q.ty <sup>1</sup> | 1093437<br>40-0045-0000 | 1104667<br>40-0057-0000 | 1104669<br>40-0059-0000 | 1106341<br>40-0066-0000 |  |  |
|-------------------------------|--------------------------|-------------------------|-------------------------|-------------------------|-------------------------|--|--|
| Battery voltage               |                          | 24 ÷ 48V                | 60 ÷ 96V                | 60 ÷ 96V                | 60 ÷ 96V                |  |  |
| CAN isolated                  |                          | -                       | yes                     | yes                     | yes                     |  |  |
| Nominal current               |                          | 330Arms                 | 230Arms                 | 230Arms                 | 230Arms                 |  |  |
| Peak current (2min)           |                          | 600Ams                  | 450Arms                 | 450Ams                  | 450Arms                 |  |  |
| For 3 pahse Motor type        |                          | PMS motor               | AC motor                | AC motor                | IPM motor               |  |  |
| Software applications         |                          | Traction                | Traction                | Pump                    | Pump                    |  |  |

# TC - L

## Traction Controller

### INVERTER



#### TECHNICAL SPECIFICATIONS

|                          |                        |                |                                 |
|--------------------------|------------------------|----------------|---------------------------------|
| Digital input            | 7                      | Sealing degree | IP65                            |
| Analog input             | 3                      | Can interface  | Can open compatible             |
| Power output (contactor) | 3                      | Can option     | Can isolated (Option suggested) |
| Digital outputs          | 1                      | Dimensions     | 320mm x 200mm x 75mm            |
| Encoder type             | Sin/cos or incremental | Connector      | AMPSEAL 35 pins                 |
| Motor thermal input      | 1                      |                |                                 |
| Switching frequency      | 8kHz                   |                |                                 |
| Motor frequency (max)    | 600Hz                  |                |                                 |
| Regulation               | EN12895 - EN1175       |                |                                 |
| Operating temperature    | -30°C ÷ +40°C          |                |                                 |

The ordering P/N shown on the brochure are referred to the standard version, CAN open compatible (non isolated CAN hardware)

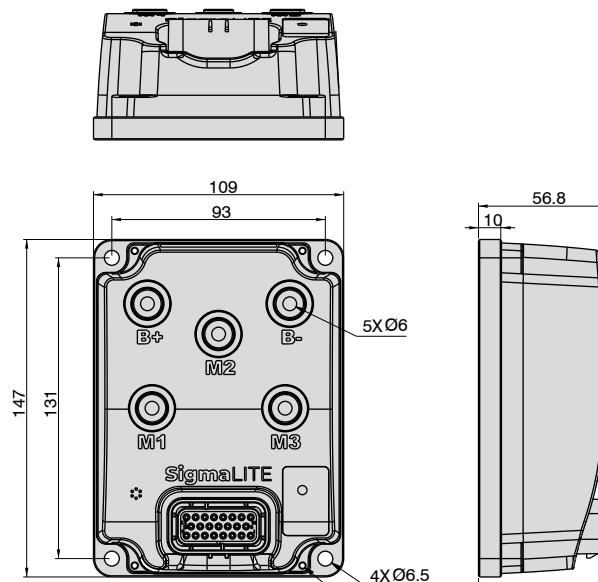
| Purchase code<br>Drawing code | Pkg<br>Q.ty | 1108509<br>40-0068-0000 | 1104668<br>40-0058-0000 | 1104670<br>40-0060-0000 | 1104673<br>40-0063-0000 |  |  |
|-------------------------------|-------------|-------------------------|-------------------------|-------------------------|-------------------------|--|--|
| Battery voltage               |             | 24 ÷ 48V                | 60 ÷ 96V                | 60 ÷ 96V                | 60 ÷ 96V                |  |  |
| CAN isolated                  |             | yes                     | yes                     | yes                     | yes                     |  |  |
| Nominal current               |             | 400Arms                 | 300Arms                 | 300Arms                 | 300Arms                 |  |  |
| Peak current (2min)           |             | 800Arms                 | 600Arms                 | 600Arms                 | 600Arms                 |  |  |
| For 3 pahse Motor type        |             | IPM motor               | AC motor                | AC motor                | IPM motor               |  |  |
| Software applications         |             | Traction                | Traction                | Pump                    | Traction                |  |  |

# TC – SigmaLite Traction Controller

INVERTER



Download the user manual  
in English



## TECHNICAL SPECIFICATIONS

|                          |                               |                       |                      |
|--------------------------|-------------------------------|-----------------------|----------------------|
| Digital input            | 7                             | Sealing degree        | IP67                 |
| Analog input             | 3                             | Can interface         | Open, J1939, custom  |
| Power output (contactor) | 3                             | Can isolated          | Yes                  |
| Digital outputs          | 1                             | Dimensions            | 147mm x 109mm x 57mm |
| Encoder type             | Sin/cos & two channel encoder | Connector             | AMPSEAL 23 WAYS      |
| Motor thermal input      | 1xPT100 or KTY83              | Operating temperature | -30 °C to +85 °C     |
| Switching frequency      | Up to 8kHz                    |                       |                      |
| Motor frequency (max)    | Up to 700Hz                   |                       |                      |
| Regulation               | EN12895, EN1175               |                       |                      |
| PL                       | EN13849-1                     |                       |                      |

The ordering P/N shown on  
the brochure are referred to  
the standard version, CAN open  
compatible (non isolated CAN hardware)

| Purchase code<br>Drawing code | Pkg<br>Q.ty <sup>1</sup> | 1109479<br>AV-40-0040 | 1109654<br>AV-40-0041 | 1112421<br>AV-40-0042 | 1112422<br>AV-40-0043 |  |  |
|-------------------------------|--------------------------|-----------------------|-----------------------|-----------------------|-----------------------|--|--|
| Battery voltage               |                          | 24 ÷ 48V              | 24 ÷ 48V              | 12 ÷ 24V              | 12 ÷ 24V              |  |  |
| CAN isolated                  |                          | yes                   | yes                   | Yes                   | Yes                   |  |  |
| Nominal current               |                          | 130 Arms              | 130 Arms              | 125 Arms              | 125 Arms              |  |  |
| Peak current (2min)           |                          | 250 Arms              | 250 Arms              | 250 Arms              | 250 Arms              |  |  |
| For 3 pahse Motor type        |                          | IPM                   | AC induction          | AC induction          | AC induction          |  |  |
| Software applications         |                          | Traction              | Traction              | Traction              | Pump                  |  |  |

**TC**

**S / M / M+ / L / SigmaLite** TRACTION CONTROLLERS

*INVERTER*

*APPLICATIONS EXAMPLES*

ELECTRIC - PUMP DRIVE

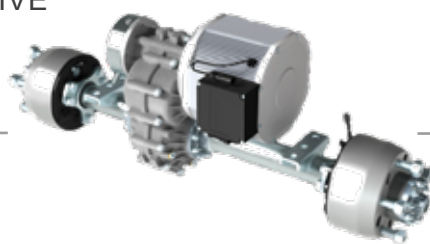


Electric pump



Articulated boom lift

TRACTION DRIVE



Electric power unit



Road sweeper

# CANopen Calibrator for INVERTERS



|               |      |            |
|---------------|------|------------|
| Purchase code | Pkg  | 1104121    |
| Drawing code  | Q.ty | AV-40-0036 |

## Generale

Il calibratore CAN Open è progettato per la configurazione della gamma di controllori motore. È inoltre dotato di un dongle integrato per la configurazione del controllore tramite PC e DMC Configurator.

## Configurazione del protocollo CAN

Il calibratore CAN Open è completamente compatibile con tutti i protocolli CAN utilizzati dai controllori motore (ovvero protocollo CAN DMC, protocollo CAN Open compatibile e protocollo CAN Open completo). Per impostazione predefinita, il calibratore CAN Open è configurato in modalità "Autoscan", che riconosce automaticamente il protocollo CAN attivo della rete.

## Configurazione del nodo CAN

Quando si collega il calibratore CAN Open a un controllore, questo "scansiona" il bus CAN alla ricerca di tutti i controllori motore disponibili, per consentire la calibrazione di tutti i controllori motore sullo stesso bus. Tutti i controllori sono impostati di fabbrica sul Nodo 1. Pertanto, prima di utilizzare il calibratore CAN Open, a ciascun controllore motore DEVE essere assegnato un numero di nodo univoco. Per fare ciò, il calibratore deve essere collegato a un solo controllore motore alla volta per assegnargli un numero di nodo univoco.

## Impostazione della velocità di trasmissione CAN

Quando si collega il calibratore CAN Open a una rete CAN, la comunicazione avverrà a una velocità di trasmissione selezionabile (125, 250 kbit/s). Per impostazione predefinita, il calibratore è impostato per utilizzare una velocità di trasmissione di 250 kbit/s. Nel caso in cui la velocità di trasmissione del calibratore CAN Open e dei controllori motore non siano identiche, la comunicazione non avverrà.

## General

*The CAN Open Calibrator is designed for Setting up the motor controller range. It also has a build-in dongle for setting up the controller via PC and DMC Configurator.*

## CAN protocol setup

*The CAN Open Calibrator is fully compatible with all CAN protocols used by motor controllers (i.e. DMC CAN protocol, CAN Open compatible protocol and Full CAN Open protocol). By default, the CAN Open Calibrator is setup in "Autoscan" mode, which automatically recognises the active CAN protocol of the network*

## CAN node setup

*When connecting the CAN Open Calibrator to a controller it will "scan" the CAN bus for all available motor controllers, to enable calibration of all motor controllers on the same bus. All controllers are by factory default set to Node 1. Therefore before using the CAN Open Calibrator, all motor Controllers MUST be given a unique Node number. To do this, the Calibrator must be plugged into one single motor Controller at a time to give it an unique node number.*

## CAN baud rate setup

*When connecting the CAN Open Calibrator into a CAN network, it will communicate at a selectable baud rate (125, 250 kbit/s). By default the Calibrator is set to use 250 kbit/s baud rate. In case the baud rate of CAN Open Calibrator and motor Controllers are not consistent, they will not communicate*

# Traction Module General Features

## CHOPPERS



No matter the vehicle size and working height, same traction module for the same range of vehicle



Powerful and compact traction module



Main functions are adjustable through internal parameters



Diagnosis function for electrical motor and harness



Designed & manufactured by COBO

### Funzioni principali

- Regolazione della velocità e della coppia dei motori di trazione.
- Gestione del motore della pompa idraulica.
- Controllo simultaneo di più motori.
- Parametrizzazione software delle funzioni operative.
- Diagnostica di motori e cablaggi.
- Architettura compatta per integrazione su macchine elettriche

### Vantaggi tecnici

- Riduzione del numero di centraline a bordo macchina.
- Uniformità della piattaforma elettronica su veicoli di dimensioni diverse.
- Maggiore efficienza energetica grazie al controllo PWM dei motori.
- Progettazione e produzione completamente COBO.

### Main functions

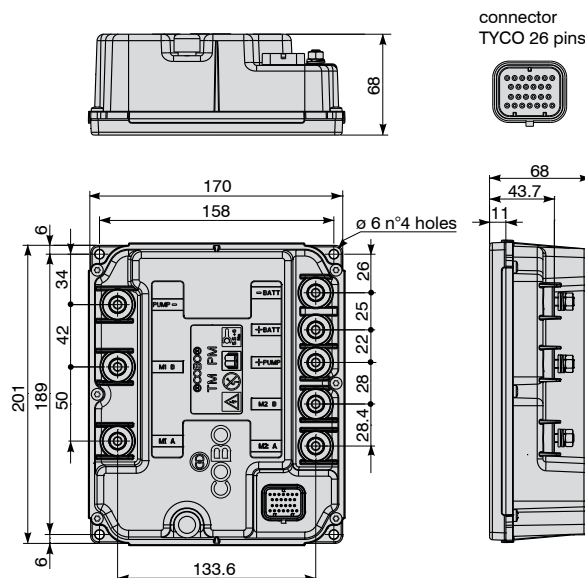
- *Traction motor speed and torque regulation.*
- *Hydraulic pump motor management.*
- *Simultaneous control of multiple motors.*
- *Software parameterization of operating functions.*
- *Motor and wiring diagnostics.*
- *Compact architecture for integration into electric machines.*

### Technical advantages

- *Reduction in the number of on-board control units.*
- *Uniformity of the electronic platform across vehicles of different sizes.*
- *Greater energy efficiency thanks to PWM motor control.*
- *100% COBO design and manufacturing.*

# TM plus 1 GP Traction Module

CHOPPER



**Traction motors: DC brushed**  
**Pump motors: DC brushed**

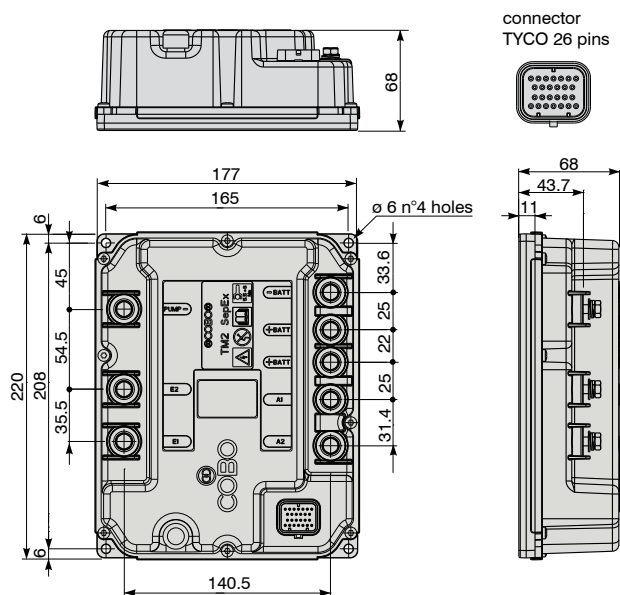
## TECHNICAL SPECIFICATIONS

|                       |                      |             |            |
|-----------------------|----------------------|-------------|------------|
| Power supply          | 24V                  | Pump motors | DC brushed |
| Regulation            | EN12895 / EN1175     |             |            |
| Operating temperature | -40°C ÷ +40°C        |             |            |
| Sealing degree        | IP65                 |             |            |
| Dimensions            | 170mm x 201mm x 68mm |             |            |
| Connector             | AMPSEAL 26 pins      |             |            |
| Traction motors       | DC brushed           |             |            |

| Purchase code<br>Drawing code        | Pkg<br>Q.ty | 1 | 1091431<br>40-0032-0000 |  |  |  |  |
|--------------------------------------|-------------|---|-------------------------|--|--|--|--|
| Power output                         | 5           |   |                         |  |  |  |  |
| Digital output                       | 3           |   |                         |  |  |  |  |
| Battery voltage                      | 14,5 - 32V  |   |                         |  |  |  |  |
| Pump nominal current (1h) [Arms]     | 90          |   |                         |  |  |  |  |
| Traction nominal current (1h) [Arms] | 70 + 70     |   |                         |  |  |  |  |
| Pump max current (2 min) [Arms]      | 200         |   |                         |  |  |  |  |
| Traction max current (2 min) [Arms]  | 150 + 150   |   |                         |  |  |  |  |

# TM 2 GP Traction Module

CHOPPER



Traction motors: SepEx  
Pump motors: DC brushed

## TECHNICAL SPECIFICATIONS

|                       |                      |             |            |
|-----------------------|----------------------|-------------|------------|
| Power supply          | 24V                  | Pump motors | DC brushed |
| Regulation            | EN12895 / EN1175     |             |            |
| Operating temperature | -40°C ÷ +40°C        |             |            |
| Sealing degree        | IP65                 |             |            |
| Dimensions            | 177mm x 220mm x 68mm |             |            |
| Connector             | AMPSEAL 26 pins      |             |            |
| Traction motors       | SepEx                |             |            |

| Purchase code                        | Pkg  | 1          | 1108489      |  |  |  |  |
|--------------------------------------|------|------------|--------------|--|--|--|--|
| Drawing code                         | Q.ty |            | 40-0067-0000 |  |  |  |  |
| Power output                         |      | 5          |              |  |  |  |  |
| Digital output                       |      | 3          |              |  |  |  |  |
| Battery voltage                      |      | 14,5 - 32V |              |  |  |  |  |
| Pump nominal current (1h) [Arms]     |      | 125        |              |  |  |  |  |
| Traction nominal current (1h) [Arms] |      | 70 + 70    |              |  |  |  |  |
| Pump max current (2 min) [Arms]      |      | 275        |              |  |  |  |  |
| Traction max current (2 min) [Arms]  |      | 180 + 180  |              |  |  |  |  |
| Maximum excitation current [Arms]    |      | 40         |              |  |  |  |  |

**TM**

**plus 1 GP / 2 GP TRACTION MODULE**

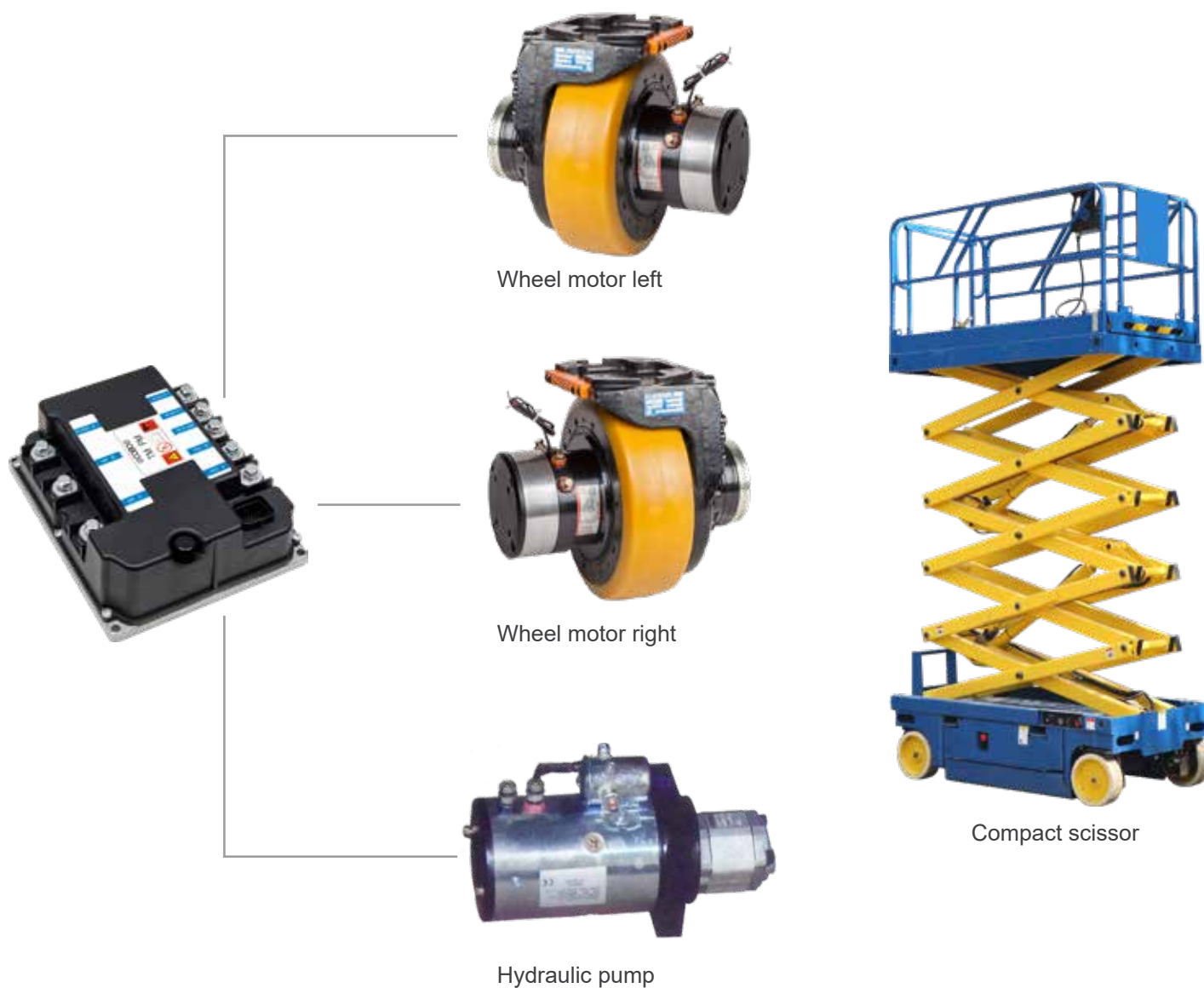
*CHOPPERS*

## *APPLICATIONS EXAMPLES*

**Designed to manage 2 traction motors 24V + hydraulic pump motor 24V**

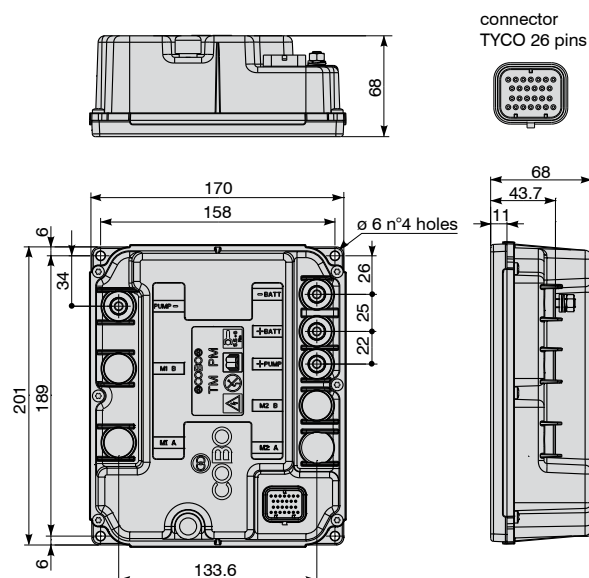
**Typical application field: indoor AWP or compact scissors**

**Slave configuration, all of commands via CAN**



# TM 3 GP Idraulic Pump Motor

CHOPPER



## Pump motors: DC brushed or series

### TECHNICAL SPECIFICATIONS

|                       |                      |  |  |
|-----------------------|----------------------|--|--|
| Power supply          | 24V                  |  |  |
| Regulation            | EN12895 / EN1175     |  |  |
| Operating temperature | -40°C ÷ +40°C        |  |  |
| Sealing degree        | IP65                 |  |  |
| Dimensions            | 170mm x 201mm x 68mm |  |  |
| Connector             | AMPSEAL 26 pins      |  |  |
| Pump motors           | DC brushed or series |  |  |

| Purchase code                    | Pkg        | 1 | 1091432      |  |  |  |  |
|----------------------------------|------------|---|--------------|--|--|--|--|
| Drawing code                     | Q.ty       |   | 40-0033-0000 |  |  |  |  |
| Power output                     | 2          |   |              |  |  |  |  |
| Digital output                   | 3          |   |              |  |  |  |  |
| Battery voltage                  | 14,5 - 32V |   |              |  |  |  |  |
| Pump nominal current (1h) [Arms] | 125        |   |              |  |  |  |  |
| Pump max current (2 min) [Arms]  | 275        |   |              |  |  |  |  |
|                                  |            |   |              |  |  |  |  |
|                                  |            |   |              |  |  |  |  |

**TM**

## **3 GP IDRAULIC PUMP MOTOR**

*CHOPPERS*

### *APPLICATIONS EXAMPLES*

Hydraulic pump motor 24V (DC permanent magnet or series)

Typical application field: indoor AWP or compact scissors

Slave configuration, all of commands via CAN



Hydraulic pump



Compact scissor



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