

PowerCOMBO™ series Multiconverter

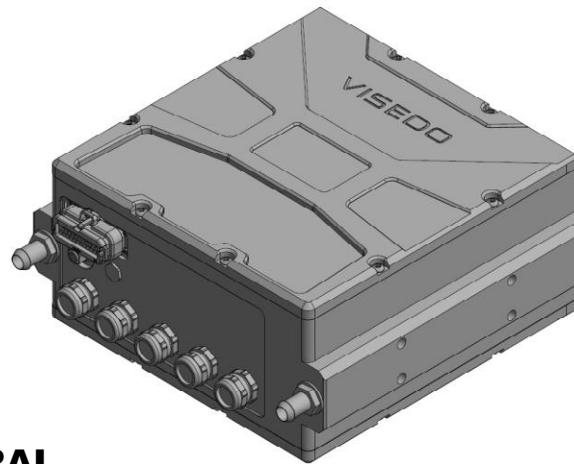
PRELIMINARY PRODUCT DATA

HARDWARE FEATURES:

- 50 kW inverter and 5 kW isolated DC/DC-converter
- High enclosure class IP67 – sealed from moisture and dust
- Using regular water or water glycol mixture for cooling
- Ambient temperature up to +105 °C and down to -40 °C
- Robust design withstanding high levels of mechanical vibrations and shocks
- Designed especially for highly cyclical loads
- Flexible control interface – CAN, RS485, encoder, analog, digital inputs/outputs of customers choice

SOFTWARE FEATURES:

- Various communication protocols e.g. CANopen, SAE J-1939
- Possibility to create customer specific applications with CoDeSys (IEC61131-3) software tool
- Inverter controls both induction and permanent magnet motors with or without sensor
- High performance vector control
- Speed and Torque reference motor control
- Generator control mode for DC-link voltage control
- Wide selection of protective functions



GENERAL

The PowerCOMBO™ is a heavy-duty multiconverter combined as Inverter and DC/DC converter. Designed especially for electric or hybrid drive trains for mobile work machines, buses or marine vessels.

Typical applications are:

- Controlling the speed and torque of auxiliary electrical motors
- Supplying 12 V, 24 V network.

SPECIFICATIONS

High voltage DC connection

DC link voltage range	200 - 800 V _{DC}
DC link nominal voltage	750 V _{DC}
Integrated Brake Chopper	

Low voltage DC connection

Nominal output voltage	12/24 V _{DC}
Nominal output current	200/200 A
Nominal power	5 kW (2,5 kW with 12 V _{DC})

AC connection (inverter)

AC output voltage	0-560 V _{EFF} (U _{DC} = 800 V _{DC})
Nominal current	60 A _{RMS}
Nominal power	50 kW
Output frequency	0...580 Hz Up to 1000 Hz as option
Switching frequency	1.5...8 kHz

Brake chopper connection

Nominal current	60 A
Nominal power	45 kW

Mechanical size prelim.

Dimensions WxHxL [mm]	345x164x355
Weight (prototypes)	24 kg

Ambient conditions

Storage temperature	-40°...+105 °C
Operating temperature	-40°...+105 °C (with nominal coolant temp.)
Altitude	max. 2000 m

Relative humidity 100%

Enclosure class IP 67 with option: IP6K9K

Cooling

Cooling type	Liquid cooling
Coolant type	Water or water glycol mixture (max. 50%)
Coolant temperature	-40°...+65 °C
Coolant flow	10 l/min
Pressure loss	30 mbar

PCO-S-D05V24-I50-x Multiconverter – Preliminary product Data R0416

Power Connections

Cable cross section

- **High voltage** ≤16 mm² (Cu)
- **Low voltage** ≤70 mm² (Cu)

Recommended cable type Radox Elastomer S, screened automotive cable www.hubersuhner.com

Control Connections

Connector type inverter (X1) 35-pin (male) Tyco electronics/AMPSEAL connector (part number: 1-776163-1)

Connector type cable Not included in delivery. Type: 35-pin (female) Tyco/AMPSEAL. Part numbers:
 - case: 776164-1
 - pins: 770854-3
 Please refer to Tyco application specification for detailed crimping and assembly instructions: www.tycoelectronics.com

Control signals general

Flexible control interface: CAN, RS485, encoder, analog, digital inputs /outputs etc. Interface A configuration see Table 2.

CAN protocols

CANopen
 SAE J-1939 CAN
 (Other protocols can be implemented as needed)

User application

IEC61131-3 environment

CODESYS V3
www.3s-software.com

Protections

Overcurrent protection HV	135 A _{peak} /phase
Overcurrent protection LV	250 A _{peak}
Overvoltage protection	920 V DC
Converter overtemperature	yes
Earth-fault	yes

PRODUCT TYPE DESIGNATION

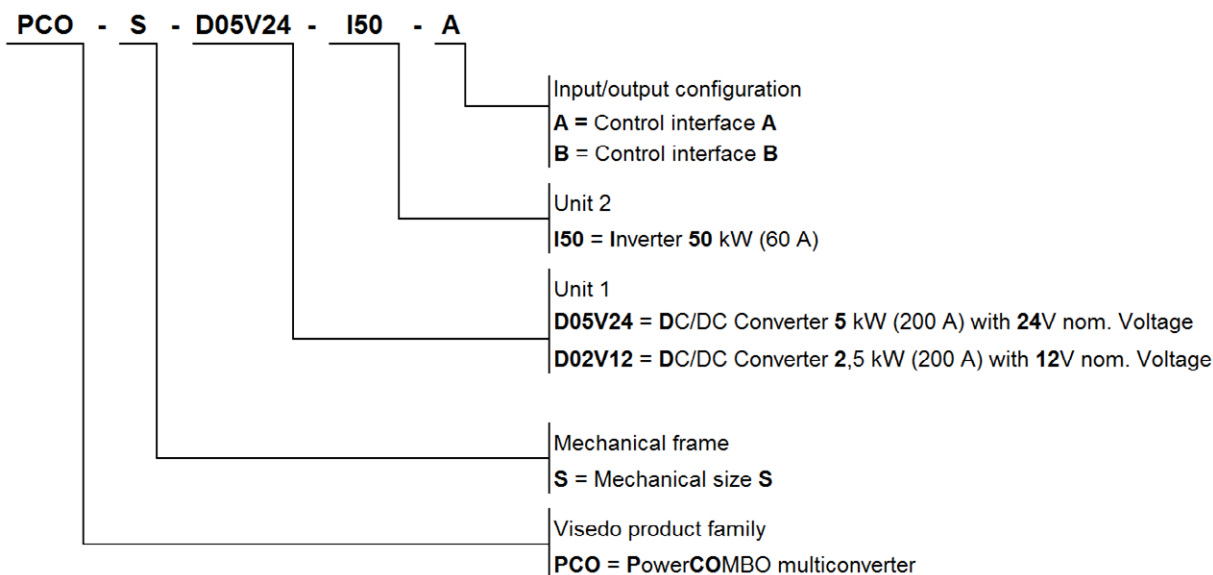


Table 1. PowerBOOST™ DC/DC-converter typecodes

PCO-S-D05V24-I50-x Multiconverter – Preliminary product Data R0416

DIMENSIONS

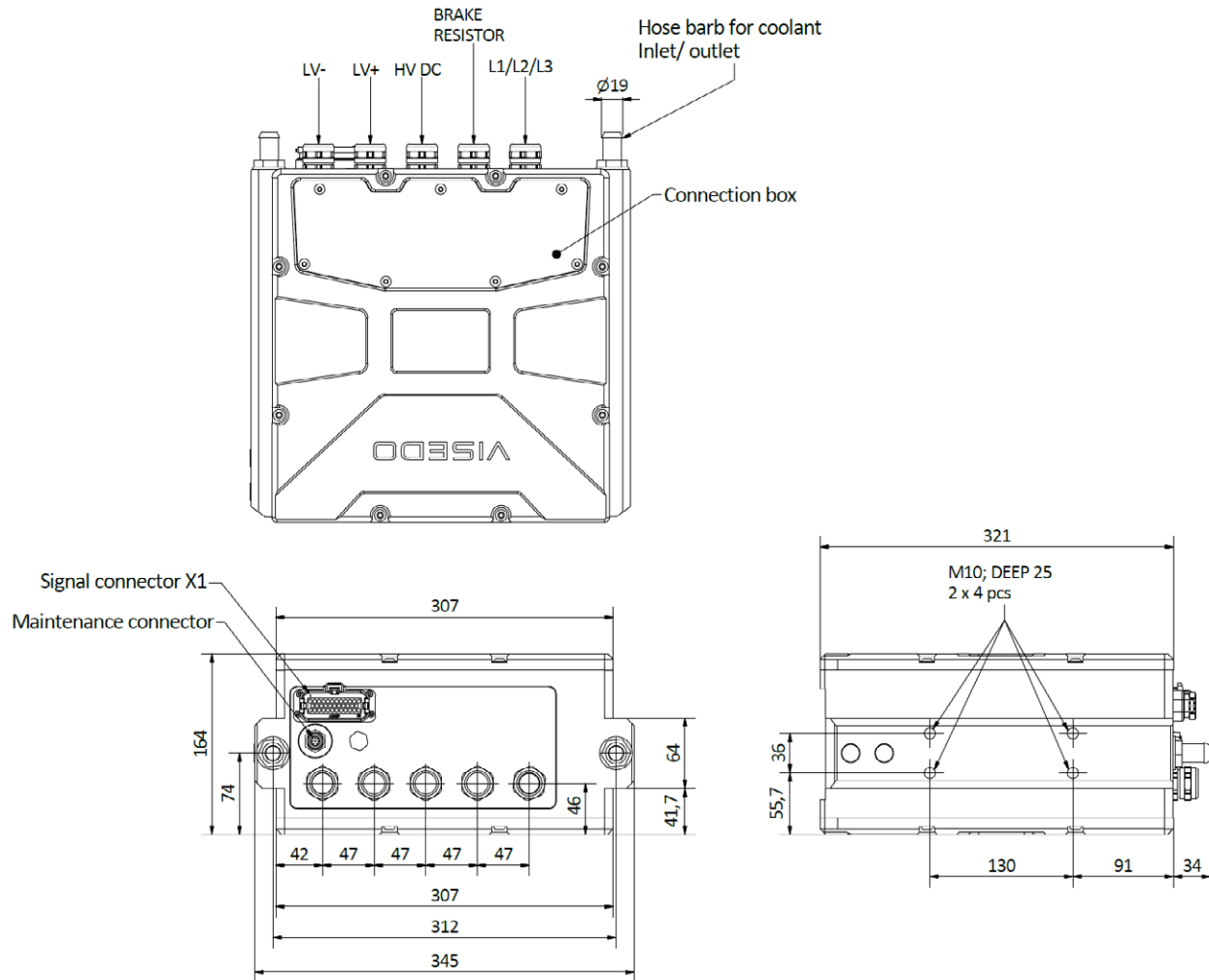


Figure 1. Dimensions and connections

CONTROL CONNECTIONS

PIN	Signal	Description	Additional information
1 13	V _{IN P} V _{IN N}	Supply voltage + 12/ 24 V DC Supply voltage – 0 V	Operating range: 7-33V; Current consumption 1.1A with 12V(0.6A with 24V); Leakage current 70µA with 12V (350µA with 24V), Reverse polarity protected
2	POWER ON	Digital input: Turn Power ON	High Active: 0 = Shutdown, 1= Turn on; Turn ON @ >7.40V, Shutdown @ <5.80V
24 3	STOP 1 STOP 2	Stop Inverter 1 Stop inverter 2	Low Active: 0 = STOP, 1 = RUN; RUN @ >4.65V; STOP @ <1.2V. Pulling one /STOP-signal down stops inverter modulation
5 28	CANA_L CANA_H	CAN A Low CAN A High	Terminated CAN-BUS
16 4	CANB_L CANB_H	CAN B Low CAN B High	Unterminated CAN-BUS
29 18 30 31	RES_COSN RES_COSP RES_SINN RES_SINP		Resolver
7	+5V	5 V output	+5V/300mA output
9 10	HV_LOOP_IN HV_LOOP_OUT	High voltage diagnostic loop	Direct connection on PCB between pins 9 and 10 for High Voltage in Loop detection.
11 12	RES_EXCN RES_EXCP		Resolver
6 14 25	Reserved Reserved Reserved		Not connected
15	GND	Signal ground	
17	GND	Signal ground	
19	GND	Signal ground	
21	GND	Signal ground	
23	GND	Signal ground	
26 27 8 34	User IO1 User IO2 User IO3 User IO4	Digital I/O or Analog input	User IO-pins configurable and controllable through CODESYS: - Digital Input: LOW < 1.69V, HIGH > 2.5V - 5V-Digital or 24V-OpenCollector Output: HIGH > 4.5V@RI10k, LOW < 0.5V@10mA - Analog input: 0..5V
20 22 32 33	pt100_1 pt100_2 pt100_3 pt100_4	PT100/ PT1000 input PT100/ PT1000 input PT100/ PT1000 input PT100/ PT1000 input	PT100/PT1000 sensors must be connected against signal ground. Measurement range: -45...200 °C
35	GND	enclosure ground	

Table 2. Control connector X1 signals in Visedo control interface A

APC Hi-Rel specialises in the design-in, specification and distribution of electronic components for high reliability, high temperature and high voltage applications.