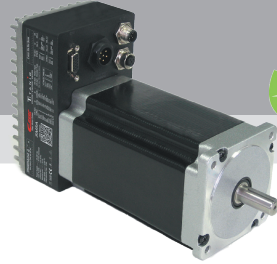


## Installation instructions

**i** Refer to installation use and maintenance manual for more information.  
Available user manual at link <http://www.everelettronica.it/manhw.html>



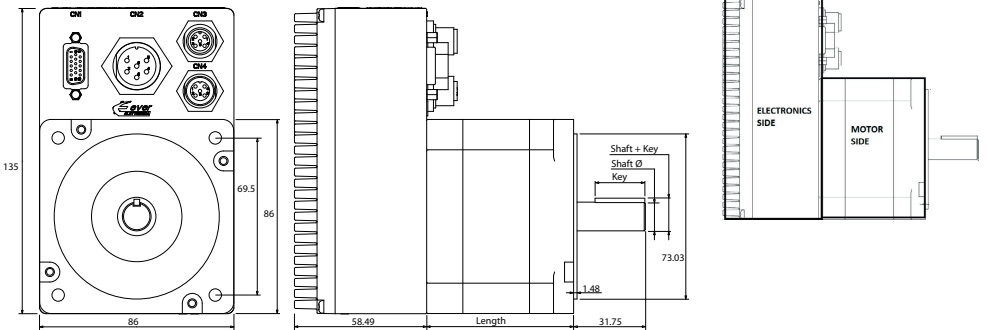
## Bipolar drive integrated with 2 phase step motor

- AC power Supply: 18 ÷ 100Vac
- DC Logic Supply: 24Vdc (mandatory and isolated)
- Phase current: up to 8.5 Arms (12 Apk)
- Chopper frequency: ultrasonic 40 kHz
- Stepless Control Technology (65536 position per turn)
- Protections: over-current, over-temperature, short circuit phase-phase motor and phase-ground
- Modbus or Canbus communication interfaces
- Digital inputs (opto-coupled)
- Digital outputs (opto-coupled and supplied from 24Vdc logic supply)
- Analog input (not isolated)
- Dimensions: Length (mm)x135x86mm
- Connectors not included(refer to picture)
- IP protection: IP65
- Working temperature 5°C + 40°C, storage temperature -25°C + 55°C
- Humidity: 5% + 85% not condensing

## Mechanical data

**i** Handle systems with care by taking them from the motor side and not from the electronics side.

Shaft axial load = 60 N max  
Shaft radial load = 220 N max (on front shaft end)



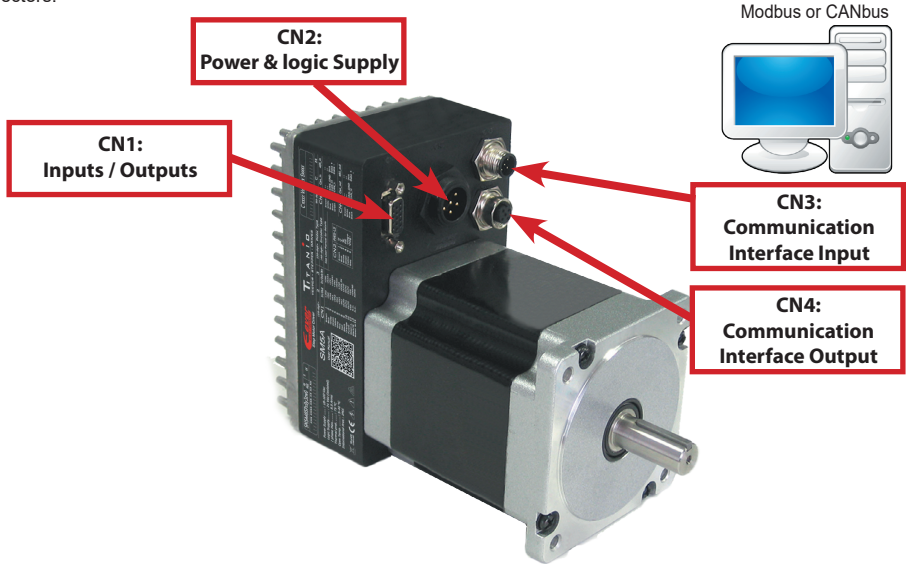
Composition code	SM5A	4	85P	x	0	y	3	z	w	0
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Model (z letter)	Length (mm)	Shaft Ø (mm)	Key on shaft (mm)	Holding Torque (Nm)	Rotor Inertia (g.cm <sup>2</sup> )
SM5A485P_A	67.5	9.53	3.0 x 3.0 x 22.0	4.0	1300
SM5A485P_B	78.5	12.7	3.175 x 3.175 x 22.23	5.0	1900
SM5A485P_C	96.5	12.7	3.175 x 3.175 x 22.23	7.0	2700
SM5A485P_D	118.5	12.7	3.175 x 3.175 x 22.23	8.5	3800
SM5A485P_E	159.5	15.87	4.763 x 4.763 x 22.23	12.5	5700

Model (w letter)	Encoder type
SM5A485P_N	Without feedback
SM5A485P_7	Incremental encoder 4096ppr
SM5A485P_M	Incremental encoder 4096ppr + Absolute single turn
SM5A485P_B	Absolute multiturn encoder Biss-C

# System connections

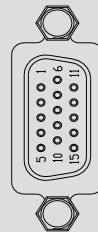
Connectors:



Composition code	SM5A	4	85P	x	0	y	3	z	w	0
------------------	------	---	-----	---	---	---	---	---	---	---

## CN1: Digital inputs and outputs

y = 2 : 4 digital inputs (differential) and 3 digital outputs			
CN1.1	+B0_IN0	DIG_IN	Digital input positive side B0_IN0
CN1.2	-B0_IN0	DIG_IN	Digital input negative side B0_IN0
CN1.3	+B0_IN1	DIG_IN	Digital input positive side B0_IN1
CN1.4	-B0_IN1	DIG_IN	Digital input negative side B0_IN1
CN1.5	+B0_IN2	DIG_IN	Digital input positive side B0_IN2
CN1.6	-B0_IN2	DIG_IN	Digital input negative side B0_IN2
CN1.7	+B0_IN3	DIG_IN	Digital input positive side B0_IN3
CN1.8	-B0_IN3	DIG_IN	Digital input negative side B0_IN3
CN1.9	B0_OUT0	DIG_OUT	PNP digital output OUT0
CN1.10	B0_OUT1	DIG_OUT	PNP digital output OUT1
CN1.11	B0_OUT2	DIG_OUT	PNP digital output OUT2
CN1.12	VSS	PWR_IN	Negative reference for digital outputs
CN1.13	n.c.	n.c.	Not connected
CN1.14	n.c.	n.c.	Not connected
CN1.15	n.c.	n.c.	Not connected
y = 3 : 4 digital inputs (single-ended), 3 digital outputs and 2 analog inputs			
CN1.1	+B0_IN0	DIG_IN	Digital input positive side B0_IN0
CN1.2	-IN_AN1	AN_IN	Negative side analog input IN_AN_1
CN1.3	+B0_IN1	DIG_IN	Digital input positive side B0_IN1
CN1.4	+IN_AN1	AN_IN	Positive side analog input IN_AN1
CN1.5	+B0_IN2	DIG_IN	Digital input positive side B0_IN2
CN1.6	-IN_AN0	AN_IN	Negative side analog input IN_AN_0
CN1.7	+B0_IN3	DIG_IN	Digital input positive side B0_IN3
CN1.8	B0_COM_IN	DIG_IN	Reference common inputs
CN1.9	B0_OUT0	DIG_OUT	PNP digital output OUT0
CN1.10	B0_OUT1	DIG_OUT	PNP digital output OUT1
CN1.11	B0_OUT2	DIG_OUT	PNP digital output OUT2
CN1.12	VSS	PWR_IN	Negative reference for digital outputs
CN1.13	+IN_AN0	AN_IN	Positive side analog input IN_AN_0
CN1.14	AGND	PWR_OUT	Output negative reference for potentiometers
CN1.15	VPOT	PWR_OUT	Output positive supply for potentiometers

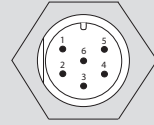


Connector Type: SubD 15 pins, Female, High Density, IP68  
 Manufacturer: LTW  
 Model: LTWHDB-15PFFS-SL8001

# System connections

## CN2: Power & Logic Supply

CN2.1	ACin	PWR_IN	AC input power supply 18 + 100 Vac
CN2.2	ACin	PWR_IN	AC input power supply 18 + 100 Vac
CN2.3	ACin	PWR_IN	AC input power supply 18 + 100 Vac
CN2.4	PE	EARTH	Environmental Protective Earthing (PE)
CN2.5	+Vlog	PWR_IN	Positive logic supply +24 Vdc (mandatory and isolated)
CN2.6	-Vlog	PWR_IN	Reference negative logic supply GND (mandatory and isolated)

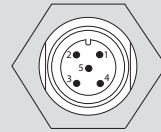


Connector Type: screw, 6 pins, male, IP67  
 Manufacturer: LTW  
 Model: LTWCB-06PMMS-SC7001

Composition code	SM5A	4	85P	x	0	y	3	z	w	0
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## CN3 Communication interface input

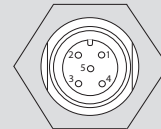
x = C: CANbus			
CN3.1	n.c.	---	Not connected
CN3.2	n.c.	---	Not connected
CN3.3	CAN_GND	PWR output	Signal ground
CN3.4	CAN_H	Digital I/O	Bus Line High
CN3.5	CAN_L	Digital I/O	Bus Line Low
x = M: Modbus RS485			
CN3.1	n.c.	---	Not connected
CN3.2	n.c.	---	Not connected
CN3.3	0V_A	PWR output	Signal ground
CN3.4	Data +	Digital I/O	Not inverting signal RS485
CN3.5	Data -	Digital I/O	Inverting signal RS485



Connector Type: M12, 5 pins, male, IP68  
 Manufacturer: LTW  
 Model: LTW1205-05PMMS-SF8001

## CN4 Communication interface output

x = C: CANbus			
CN4.1	n.c.	---	Not connected
CN4.2	n.c.	---	Not connected
CN4.3	CAN_GND	PWR output	Signal ground
CN4.4	CAN_H	Digital I/O	Bus Line High
CN4.5	CAN_L	Digital I/O	Bus Line Low
x = M: Modbus RS485			
CN4.1	n.c.	---	Not connected
CN4.2	n.c.	---	Not connected
CN4.3	0V_A	PWR output	Signal ground
CN4.4	Data +	Digital I/O	Not inverting signal RS485
CN4.5	Data -	Digital I/O	Inverting signal RS485



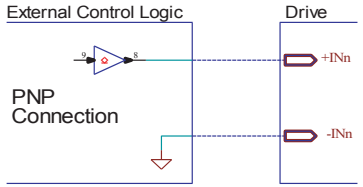
Connector Type: M12, 5 pins, female, IP68  
 Manufacturer: LTW  
 Model: LTW1205-05PFFS-SF8001

## Digital inputs connection

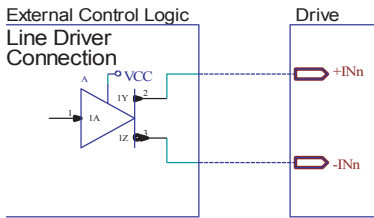
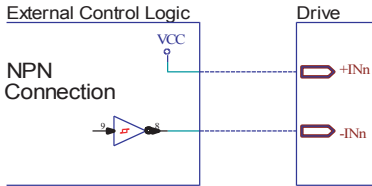
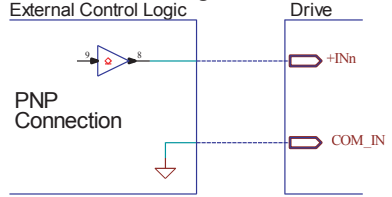


24 Vdc Differential PNP, NPN, Line Driver type or Single-Ended PNP type.  $F_{max} = 200 \text{ kHz}$ .

### VERSION -----> $y = 2$ 24V Differential



### VERSION -----> $y = 3$ 24V Single Ended



## Digital outputs connection

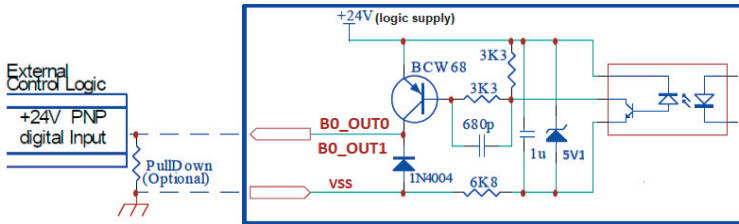


*Digital outputs are supplied from the 24 Vdc of logic supply.*

### B0\_OUT0 and B0\_OUT1



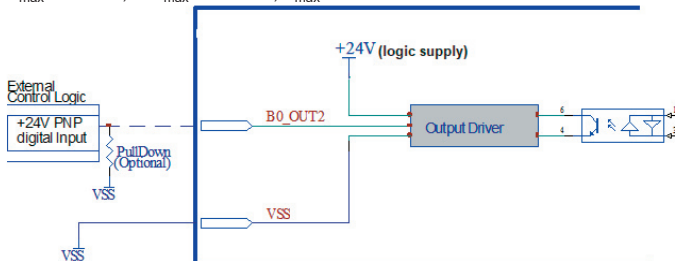
PNP with  $V_{out_{max}} = 24 \text{ Vdc}$ ,  $I_{out_{max}} = 100 \text{ mA}$ ,  $F_{max} = 250 \text{ kHz}$



### B0\_OUT2



PNP with  $V_{out_{max}} = 24 \text{ Vdc}$ ,  $I_{out_{max}} = 500 \text{ mA}$ ,  $F_{max} = 1 \text{ kHz}$

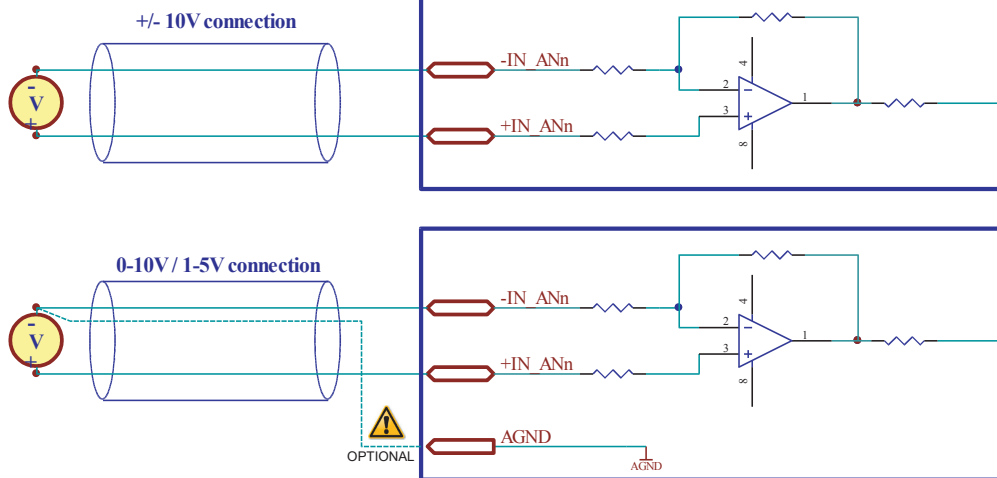


## Analog inputs connection (only for version y=3)



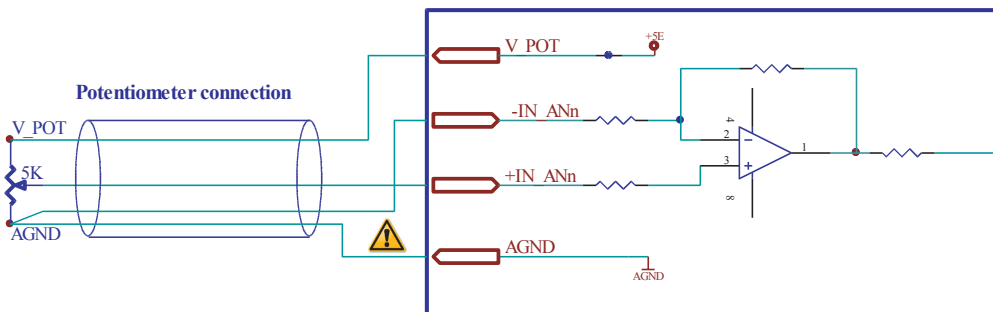
The resolution of the analog input depends from the type of the connection which could be defined by software: differential or potentiometer.

### Differential connection



The connection from an external reference and AGND should be preceded by a thorough risk analysis on the machine/circuit in which the drive will be installed.

### Potentiometer connection



AGND is internally in common with power ground, this is potentially dangerous. Take all necessary measures to avoid possible contacts in the final installation.

## Mating cable kit

Connection	Connector kit information		Kit order code
CN1	Pin: Pinout: Conductors: Cable: Waterproof rate:	15 position 1 - Brown, 2 - Blue, 3 - White, 4 - Green, 5 - Yellow, 6 - Grey, 7 - Pink, 8 - Red, 9 - Black, 10 - Orange, 11 - Purple, 12 - Light Green, 13 - Black/White, 14 - Brown/White, 15 - Red/White. UL2464 26AWG Black PVC Jacket (UV resistant) ext. Ø 6.5mm IP67	CA/LTWHDB15AF01
CN2	Pin: Pinout: Conductors: Cable: Waterproof rate:	6 position 1 - Brown, 2 - Blue, 3 - White, 4 - Green, 5 - Yellow, 6 - Grey. UL2464 20AWG Black PVC Jacket (UV resistant) ext. Ø 6.5mm IP67	CA/LTWCB06BF01
CN3	Pin: Pinout: Conductors: Cable: Waterproof rate:	5 position 1 - Brown, 2 - White, 3 - Blue, 4 - Black, 5 - Green or Gray. UL2517 22AWG Black PVC Jacket (UV resistant) ext. Ø 5.1mm IP68	CA/LTW1205BF01
CN4	Pin: Pinout: Conductors: Cable: Waterproof rate:	5 position 1 - Brown, 2 - White, 3 - Blue, 4 - Black, 5 - Green or Gray. UL2517 22AWG Black PVC Jacket (UV resistant) ext. Ø 5.1mm IP68	CA/LTW1205BM01

## Section of the cables

Function	Cable	
	Minimum	Maximum
Power supply	0.5 mm <sup>2</sup> (AWG20)	1.5 mm <sup>2</sup> (AWG15)
Communication interface	0.25 mm <sup>2</sup> (AWG23) CANbus CIA-CANopen	
Digital inputs	0.14 mm <sup>2</sup> (AWG25)	0.5 mm <sup>2</sup> (AWG20)
Digital outputs	0.14 mm <sup>2</sup> (AWG25)	0.5 mm <sup>2</sup> (AWG20)

## Verify the installation

- Check all connection: power supply and inputs/outputs.
- Make sure all settings right for the application.
- Make sure the power supply is suitable for the drive.
- If possible, remove the load from the motor shaft to avoid that wrong movements cause damage.
- Enable the current to the motor and verify the applied torque.
- Enable a movement of some steps and verify if the rotation direction is the desired one.
- Disconnect the power supply, connect the load on the motor and check the full functionality.

## Analysis of malfunctions



**When one of the following situations occur, the drive doesn't function correctly and it is reported an error.**

DEFECT	CAUSE	ACTION
The external fuse to the drive burns.	May be due to a wrong connection of the power supply.	Adjust the connection and recover the fuse. Use a fuse suitable for the application.
Over temperature protection.	May be due to a duty cycle.	Increase the air flux and if it is possible chose a motor with higher torque at same current value.
Over current protection.	May be due to a short circuit on the motor power stage.	Shut down the power supply and check if the motor is damaged.
Noisy motor movement with vibrations.	May be caused due to a state of resonance.	Increase the resolution of the step angle and/or change the motor velocity to avoid resonance area.
The motor produce torque but doesn't rotate.	May be caused due to a wrong connection of the I/O's.	Check the connection of the I/O's.

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