DM5D2xxxx26xxxx

Installation instructions

Refer to installation use and maintenance manual for more information.

Integrated BLDC Servo Drive:

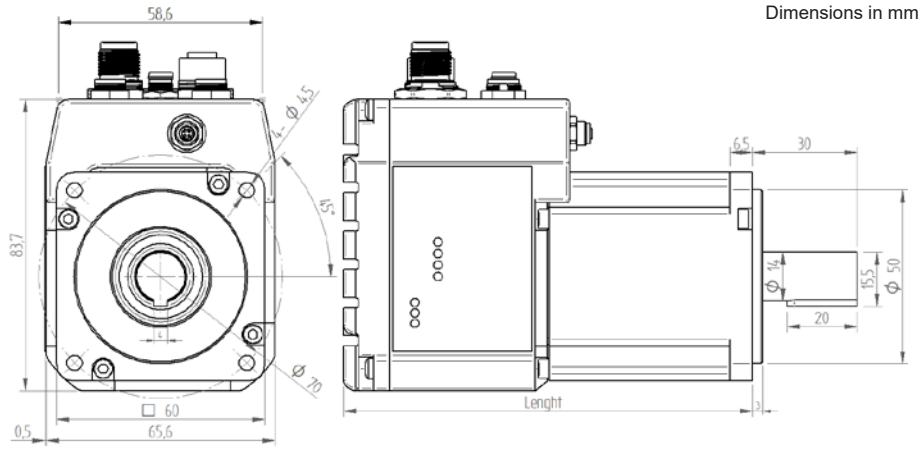
- *DC power Supply: 12-48 Vdc – 16A MAX*
- *DC Logic Supply: 12-24 Vdc (optional and not isolated) - 500mA MAX*
- *Protections: over-current, over-temperature, short circuit phase-phase motor and phase-ground*
- *Modbus RTU or Canbus or Industrial-Ethernet communication interfaces*
- *Service interface for programming and real time debugging*
- *Safe Torque Off (STO) inputs (opto-coupled)*
- *4 Digital inputs not isolated*
- *2 Digital outputs not isolated*
- *2 Analog input not isolated*
- *Protection degree: IP65*
- *Pollution degree 2*
- *Overvoltage Category II (not directly connected to supply mains)*
- *Working temperature: 5°C ÷ 40°C*
- *Storage temperature: -25°C ÷ 55°C*
- *Humidity: 5% ÷ 85% not condensing*

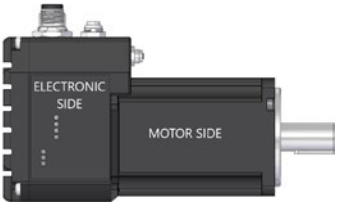
LITIO
INTEGRATED BLDC SERVO DRIVES

MULTIPROTOCOL

Mechanical data

Dimensions in mm





Shaft axial load	Shaft radial load
98 N max	245 N max (20mm from flange)

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

Ordering codes

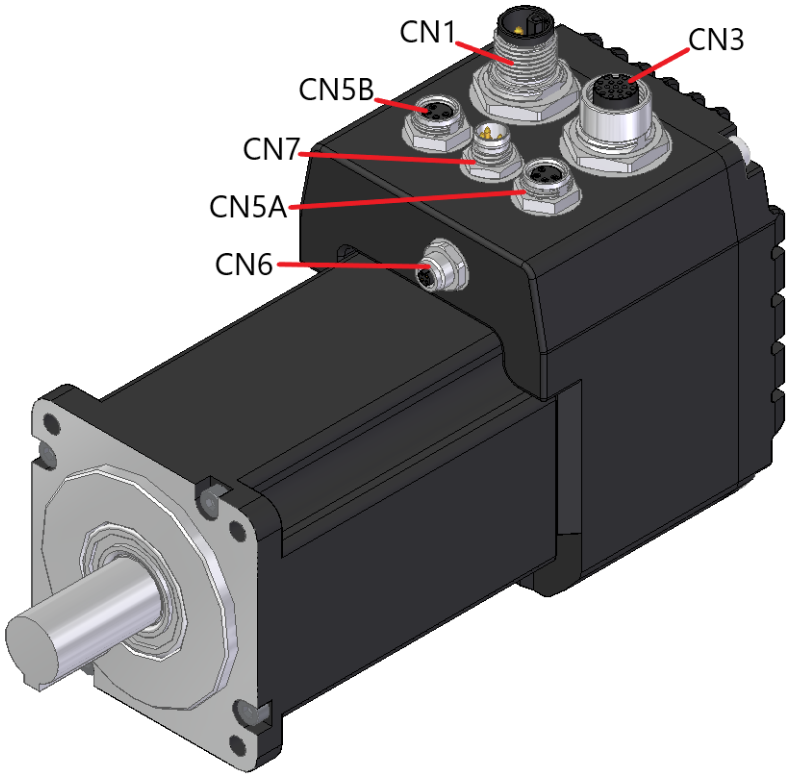
System code	Rated power	Length	Motor flange	Motor size		
				Rated torque	Peak torque	Rated spped
DM5D2200x262Dw0	200 W	118 mm	60 mm	0.52 Nm	1.56 Nm	3800 rpm
DM5D2400x262Ew0	400 W	139 mm		1.00 Nm	3.00 Nm	3800 rpm

Fieldbus type (letter x)	
C	Canbus
M	Modbus RTU
H	EtherCAT
E	Ethernet (Modbus TCP)
T	Profinet
R	Powerlink
I	Ethernet/IP

Feedback tye (letter w)	
9	Magnetic incremental 2500 ppr
B	Absolute multiturn BiSS-C

System connections

Connectors:

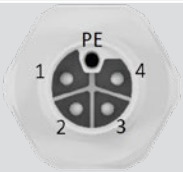


System connection

CN1: DC Power supply and Breaking resistor

M12 L-Code, 5 pins, male

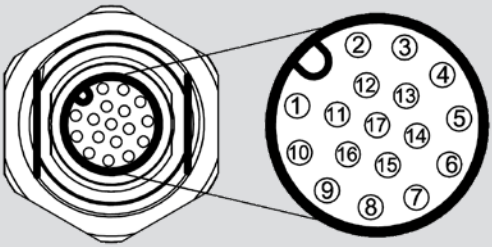
CN1.1	PGND	**Negative reference for power supply**
CN1.2	BRK_RES	**Breaking resistor output**
CN1.3	VIN	**Positive DC power supply (12-48 Vdc)**
CN1.4	n.c.	**Not connected**
CN1.5	PE	PE connection



CN3: DC logic supply, Inputs & Outputs

9 positions, male with pitch 3.5mm

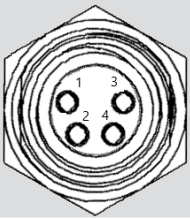
	GND	Negative reference for digital I/O
CN3.2	B0_IN0	Digital input 0
CN3.3	B0_IN1	Digital input 1
CN3.4	B0_IN2	Digital input 2
CN3.5	B0_IN3	Digital input 3
CN3.6	n.c.	Not connected
CN3.7	n.c.	Not connected
CN3.8	B0_OUT0	Digital output 0
CN3.9	B0_OUT1	Digital output 1
CN3.10	V_POT	5V supply output for potentiometer
CN3.11	AGND	Negative reference for analog inputs
CN3.12	+IN_AN0	Analog input 0 positive side
CN3.13	-IN_AN0	Analog input 0 negative side
CN3.14	+IN_AN1	Analog input 1 positive side
CN3.15	-IN_AN1	Analog input 1 negative side
CN3.16	VLOG	Positive DC logic supply (12-24 Vdc)
CN3.17	GND	Negative reference for logic supply



CN5A/B: Canbus or Modbus interface

M8 A-Code, 4 pins, female

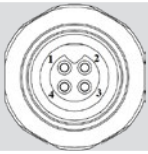
	Canbus	Modbus	EtherCAT or EtherNet or Profinet or PowerLink or Ethernet/IP
CN5A/B.1	CAN_H	Data +	TD+
CN5A/B.2	CAN_L	Data -	RD+
CN5A/B.3	GND		RD-
CN5A/B.4	Not connected		TD-



CN6: Service interface

M5 A-Code, 4 pins, female

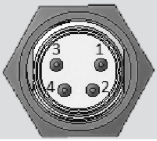
This connection is only possible with hardware and software provided by Ever. Kit code: SERV00-M5



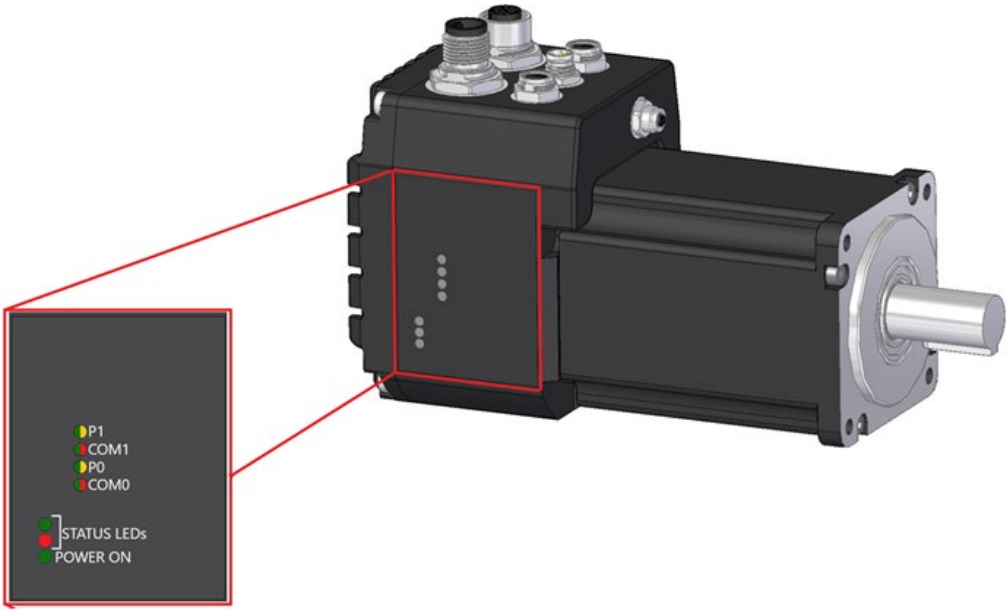
CN7: STO input

M8 A-Code, 4 pins, male

CN7.1	STO1-	**STO1 input negative side**
CN7.2	STO1+	**STO1 input positive side**
CN7.3	STO2-	**STO2 input negative side**
CN7.4	STO2+	**STO2 input positive side**



Working status LEDs



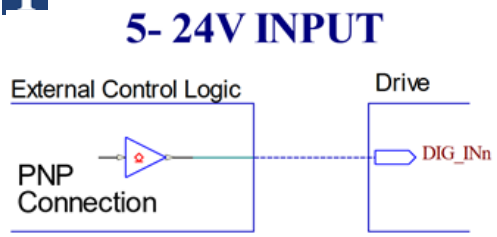
See software manual for details about Status Leds

The meaning of Industrial Ethernet LEDs is defined by the Industrial Ethernet protocol used.
Refer to Software manual for more details.

Industrial Ethernet LEDs					
Led name	**Powerlink**	**EtherCAT**	**ModbusTCP**	**Profinet**	**Ethernet/IP**
COM0	BS - Green	RUN - Green	SF - Red	SF - Red	MS - Green/Red
COM1	**BE - Red**	**ERR - Red**	**BF - Red**	**BF - Red**	**Ns - Green/Red**
P0 (on CN5A)	**L/A P0 - Green**	**L/A IN - Green**	**LINK - Green ACT - Yellow**	**LINK - Green RX/TX - Yellow**	**LINK - Green ACT - Yellow**
P1 (on CN5B)	**L/A P1 - Green**	**L/A OUT - Green**	**LINK - Green ACT - Yellow**	**LINK - Green RX/TX - Yellow**	**LINK - Green ACT - Yellow**

Digital inputs connection

5÷24V Single-ended PNP (TTL/CMOS compatible) digital inputs (not isolated)

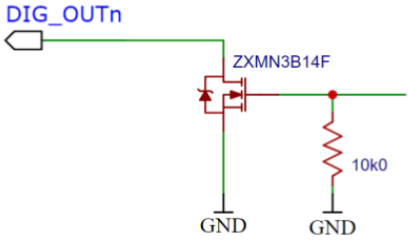


Characteristics	MIN.	MAX.	Unit
Supply voltage	5	24	Vdc
Inputs frequency	--	10	kHz
Threshold switching voltage	1.1	--	Vdc

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

Digital outputs connection

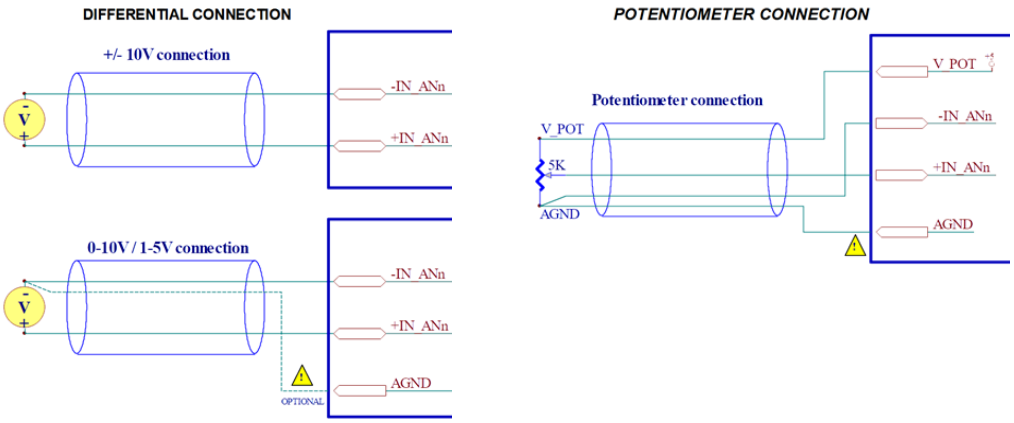
Open-Drain digital outputs, IOUTmax=100mA, Fmax=100KHz (not isolated)



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

Analog inputs connection

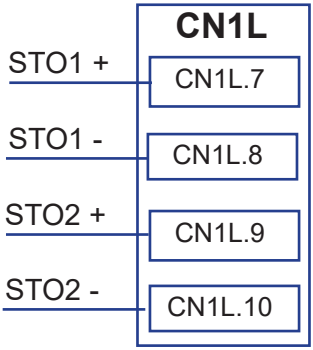
The resolution of the analog inputs depends on the type of the connection which could be defined by software: differential or potentiometer.



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

Safe Torque Off inputs (STO)

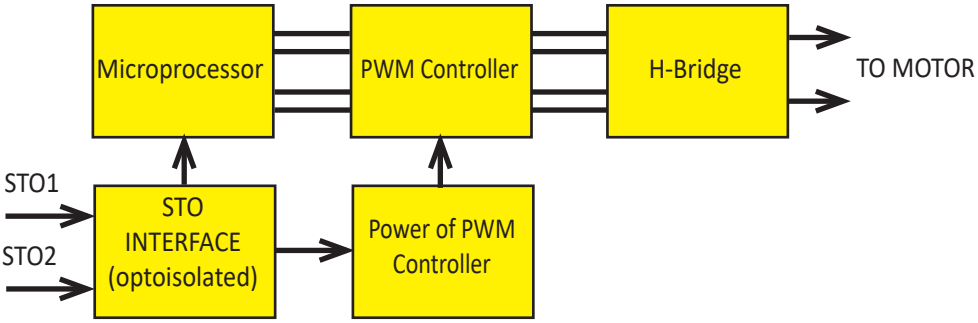
2 terminals, 24V compatible (optoisolated)



STO
Safe Torque Off
SIL3
PLe

STO1	STO2	Drive Status	Motor Status
+24Vdc	+24Vdc	Enable	SW controlled
+24Vdc	Not connected	Disable	Stop for inertia
Not connected	+24Vdc	Disable	Stop for inertia
Not connected	Not connected	Disable	Stop for inertia

Principle of operation:



The drive has a safety feature that is designed to provide the Safe Torque Off (STO) function. Two input signals are provided which, when not connected, prevent the upper and lower devices in the PWM outputs from being operated by the digital control core. This provides a positive OFF capability that cannot be overridden by the control firmware, or associated hardware components.

When both STO signals are activated (current is flowing in the input diodes of the optocouplers), the control core will be able to control the on/off state of the PWM outputs.

If not using the STO feature, both signals must be connected to a 24Vdc supply in order to enabled the drive.

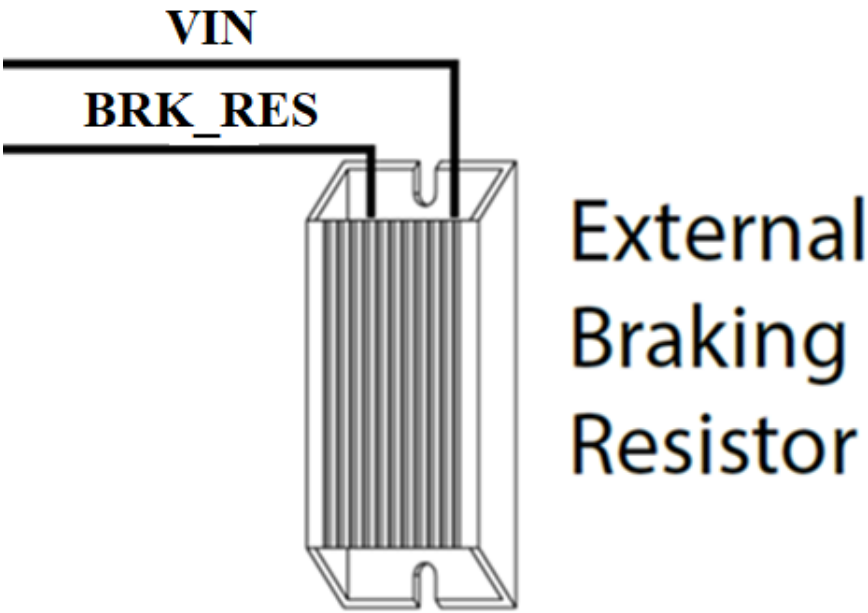
If a drive in operation mode is disabled by STO signal, it immediately finish to produce torque but the motor continues to run by inertia until it can stop.

Internal circuit drives a breaking resistor when the mechanical energy of the motor is converted back into electrical energy that must be dissipated before it charges the internal capacitors to an overvoltage condition.

Cut-In Voltage +DC_BUS > 60 Vdc (settable by SW): output is on, external breaking resistor is dissipating energy.

Drop-Out Voltage +DC_BUS < 58 Vdc (settable by SW): output is off, regen resistor not dissipating energy
Tolerance ±2 Vdc for either Cut-In or Drop-Out voltage
DC Bus Capacitance: 135uF

Input Voltage	Energy absorpion capacity of the DC bus
12 Vdc	0.233 joules
24 Vdc	0.204 joules
48 Vdc	0.087 joules



External braking resistor must be placed more than 50 mm from the drive on not- flammable and heat-resistant surfaces. The metal case of the braking resistor can reach high temperatures. Take all necessary measures to avoid possible contacts in the final installation.

Mating connectors

Connector	Description
CN1	M12 L-Code 5pin Female
CN3	M12 A-Code 17pin Male
CN5A / B	M8 A-Code 4pin Male (for Canbus and Modbus versions) M8 A-Code 4pin Male with shielded twisted pair cable compliant to 100 Mbit/s for Industrial Ethernet communication (for Industrial-Ethernet versions)
CN7	M8 A-Code 4pin Female

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.

Drive's fault analysis

When any of the following situations occur, the drive is placed in a fault condition.

DEFECT	CAUSE	ACTION
Intervention of the thermal protection.	Can be caused by a heavy working cycle or a high current in the motor.	Improve the drive cooling by natural or fan air flow. Consider to use a motor with a higher torque vs current rating.
Intervention of the over/under voltage protection.	Supply voltage out of range	Check the value fo the supply voltage

When any of the following situations occur, the drive doesn't work and isn't placed in an error condition.

DEFECT	CAUSE	ACTION
Noisy motor movement with vibrations.	Can be caused by a lack of power supply to a phase of the motor or a poor regulation of the winding currents.	Check the cables and connections of the motor and/or change the motor speed to avoid a resonance region.
The external fuse on the power supply of the drive is burned.	Can be caused by a wrong connection of the power supply.	Connect the power supply correctly and replace the fuse.

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