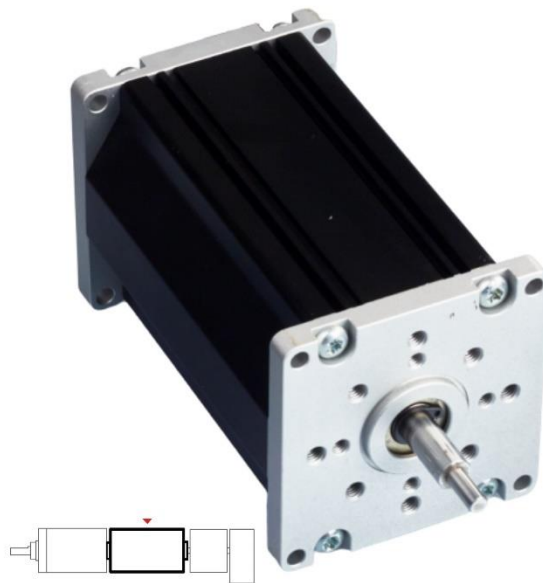


Assun Motor

Product Manual



For DC Servo Motor

of

AM-PC65140DN Series

(CAN Bus Communication)

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Assun Motor Inc.

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1. About the Manual

1.1 Validity of This Document

The product manual document here is used for AM-PC65140DN Series product by Assun Motor which is DC brushless motor with integrated position servo controller and CAN Open communication. The manual has made detailed description to the safety and functional usage of this motor product series. It helps the professional user to install and connect the motor, and also guide the user in relevant control function usage.

All data in this manual are based on the actual manufacturing and standard testing condition of AM-PC65140DN Series product. Standard testing condition is when the motor installed horizontally and environment temperature is 25°C.

For relevant parameter summaries of the product series, please refer to Appendix 1 “Product Series Parameters”; For specified standard model or customized model, please refer to Appendix 2 “Detailed Product Drawing and Parameter”.

1.2 Using This Document

Please read this document carefully before install and set-up the product. Please pay extra attention to the second chapter “Product Safety”, and strictly follow the warnings and instructions.

Please retain this document throughout the entire working life of the product, and keep the document accessible to the operating and, if necessary, maintenance personnel at all times.

Pass a copy of this document on to any subsequent owner or user of the product.

1.3 Definition of Terms

Term	Meaning
CAN	Control Area Network
CiA	CAN in Automation
PWM	Pulse Width Modulation
CW/CCW	Clockwise/Counter Clockwise
Feedback Pulse	Pulses give out per revolution
VIL/VIH	Voltage Input Low / Voltage Input High
Pin	Control Function Connect Pin
Cable	Power Connection Cable
GND	Ground / Negative Pole
Vcc	Direct Current Voltage
RPM	Revolution per Minute

1.4 Definition of Symbols



Caution! Hazard to persons. Disregard may lead to injury.



Warning! Improper operation will cause product damage.



Caution! Hazardous due to hot surface. Disregard may lead to burns.

2. Product Safety

2.1 Intended Product Usage

The Assun Motor AM-PC65140DN Series integrated DC servo motor product, which we are describing here in this manual, are used for rotating power output under rated DC supply and CAN Bus position control. It is suitable for many automation systems that require precise position control. Position controller is integrated and encoder also attached, thus forming a close-loop position servo control system that controlled by upper computer with CAN Bus communication.

The product must be properly installed when in use, and shall be operated in an environment with good heat dissipation conditions. In normal installation condition, when the operational parameters have not exceeded the maximum continuous values, winding temperature must be maintained below 85°C. The product can be used alone or coupled to a gearbox to achieve ideal output torque and RPM.

The product is not suitable for operation in environments with high humid or excessive dust. During the operation, please follow the parameter limits in the appendices to adjust the power supply and running state, so as to achieve the optimum operational output and longest product lifetime.

For usage of product in special environment, please contact our local sales or service staff for consultancy and get the relevant advice or customized service.

This product is NOT SUITABLE for applications where the failure of the product could result in the death of an individual or group of individuals.

2.2 Product Usage Safety



The product is a high-speed rotating device. Please make sure the product is properly mounted before commencement of operation to prevent potential hazards to people or equipment. Please refer to Chapter 4.1 of this manual for further installation guidance.



Motor surface temperature could be high after long term operation. Please exercise caution when touching or handling the product.



Power supply must be filtered DC. The input voltage shall be within the rated value for normal operation. Voltage cannot be lower than 10V for lower voltage operation. Voltage cannot exceed the rated value for long term operation and shall be always under 28V.



Power supply connection must be strictly according to the designated positive and negative polarity. If the power supply is reversed, it will seriously damage the internal driver and lead to malfunction of the motor. Red cable from motor shall connect to the positive of power supply, blue cable from motor shall connect to the negative of power supply. For detailed power connection guidance, refer to Chapter 4.1.



Please install the motor in an environment with good heat sinking and/or ventilation. Inadequate heat dissipation will lead to the motor winding temperature exceeding the limit of 85°C and will cause thermal damage to the internal electronic parts and winding, resulting in motor malfunction and/or failure.



Please use the motor according to the parameter limits in the appendix, otherwise it may cause the motor to be exceed current limits or overheat, which could lead to irreversible damage to the motor.



The motor is not suitable for operating in high humid and dusty environments. High humidity or excessive dust concentration could lower the motor performance and shorten the motor lifetime.



The product is a precision Brushless DC motor with sensitive internal electronic components. Please do not personally disassemble the product.

2.3 Product Disposal/Recycling

This series of motor products is manufactured with multiple types of metals, alloy materials, chemical adhesives and lubricants. Please dispose it properly as recyclable material. For a detailed product material listing please refer to Chapter 3.1.

3. Product Series Information

3.1 Product Series Structure Introduction

AM-PC65140DN Series products is a series of precision DC servo motors with integrated electronics and inner rotating rotor. Flange length is 65 mm, case length is 141.5 mm, rated power around 95 W, with a net weight of approximately 1.5 Kg. For detailed series information and parameters please refer to Appendix 1.

The series product is inner rotor brushless dc motor, relying on the internal driver electronics to energize the stator winding in sequence to make the magnetic poles rotate and thus attract the permanent magnetic rotors to rotate in synchronization. The product's basic structure is depicted in illustration 1.

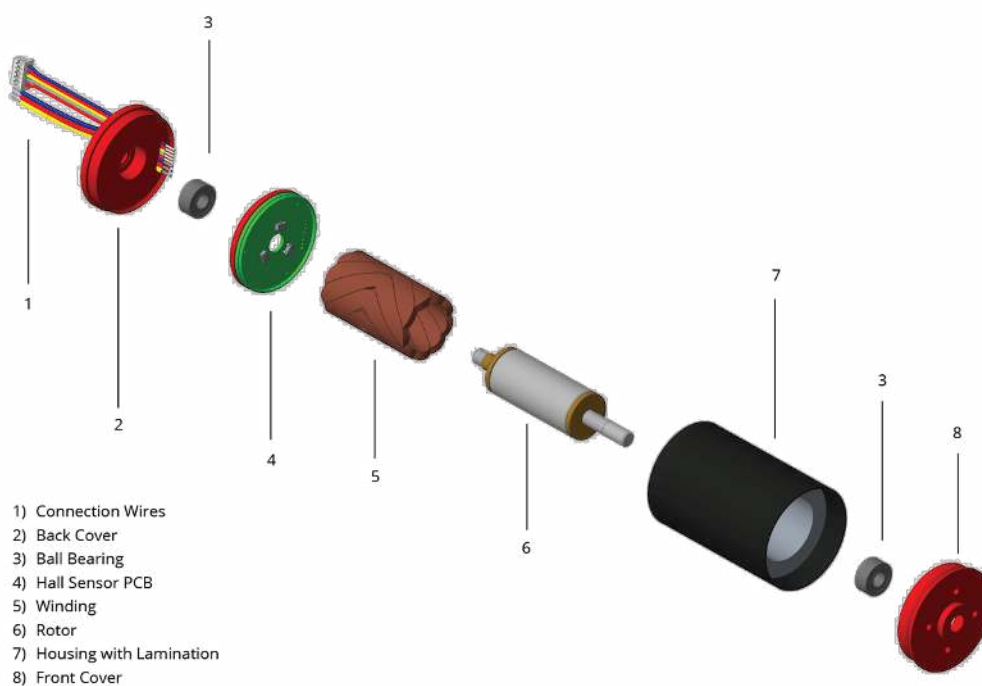


Illustration 1. Exploded Product View

This series of product are manufactured using materials using multi-types of metal, alloy material and chemical products. Specific material usage as shown in Table 1.

Table 1. Product Material Matrix

Components	End Cover	Winding	Bearing	Rotor Magnet	Rotor Shaft	Housing	Cable Core
Material	Stainless Steel	Copper	Stainless Steel	Sintered NdFeB	Stainless Steel	Aluminum Alloy	Copper
Components	Cable Insulation	PCB Board	PCB Circuit	Glue	Grease	Cushion	Other Materials
Material	Plastic (Teflon)	Glass Fiber & Copper	Copper	Epoxy Resin	Fluorine Grease	Stainless Steel	Precious Metals; Silicon.

3.2 Product Model Information

To make it convenient for the customer to choose a specific part number or model and understand the part number methodology, please refer below in Illustration 2 the explanation for model number composition principle.

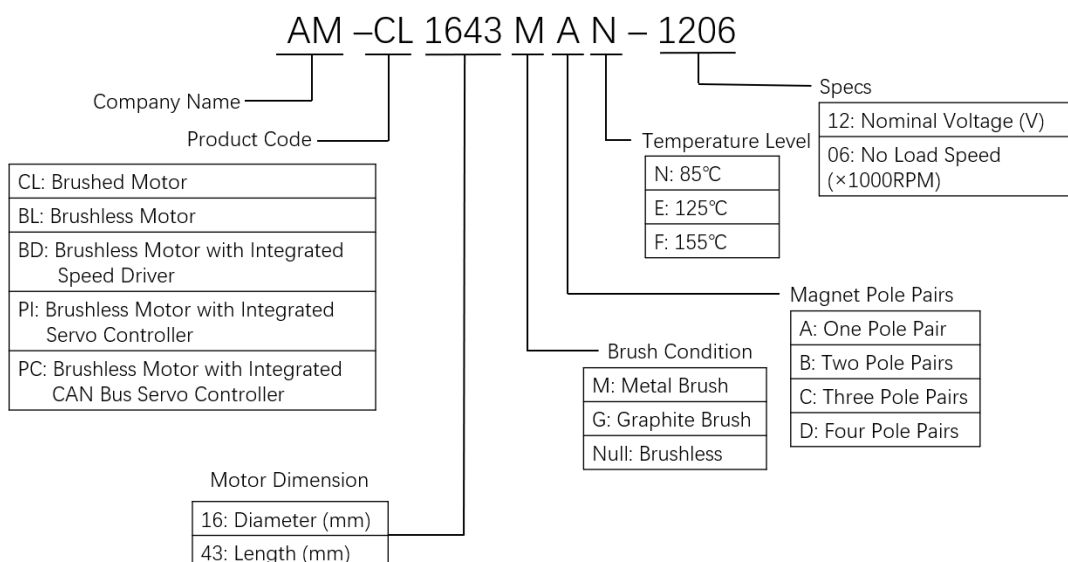


Illustration 2. Part Number Nomenclature

Customers can choose suitable products based on their types and characteristics shown in the part number methodology. If products with special characteristics are required, please contact our regional sales person for customized service.

4. Product Function and Usage

Motor rotating direction (CW/CCW) is defined as when looking at the front cover of motor.

4.1 Motor Specs

Basic parameters	
Rated power	95W
Rated voltage	24V DC
Rated current (effective value)	5.4A
Maximum current (effective value)	12.0A
Brake Resistance Voltage Threshold	Default 32V (modifiable)
Overload time	20S
MTBF	≥ 10000 hours
Power control mode	SVPWM control
Cooling method	Natural cooling
Digital IO input	Have Home switch(di0), (Reserved: positive limit switch(di0) and negative limit switch(di0))
Feedback method	Optical encoder ABZ
Rated Speed of Motor	3000RPM
Maximum Speed of Motor	3500RPM
Encoder Line Number	1000 Line

Basic application parameters	
Communication method	CANOPEN CIA DS301 + 402
CANOPEN Control mode	The default baud rate is 500kbps. the default node ID of the drive is 0x08.

	<p>Node ID scope is 1-127.</p> <p>CNOPEN PROFILE POSITION MODE(1), HOMING MODE(6), PROFILE VELOCITY MODE(3), PROFILE TORQUE MODE(4), CYCLIC SYNC POSITION MODE(8).</p>
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Protective function	
Undervoltage protection	18 VDC
Overvoltage protection	60 VDC
IGBT protection	IGBT drive undervoltage or IGBT overcurrent
Overload protection	The driver outputs the maximum working current for a certain period of time and reports overload protection.
Overcurrent protection	Drive output exceeds the maximum current value set by the software
Fault lock	A voltage fault, a current fault, a rotor fault, etc. are detected, the fault will be automatically locked, and motor needs to restart.

4.2. Application of Protocol

Motor fully complies with the CIA301 protocol, and partially complies with the CANOPEN DS402 protocol. Before the official application is implemented, you can check the AssunMotor-MAN-CAN301-V1.1 and AssunMotor-MAN-CAN402-V1.1. (Ask for the copy from our sales.)

You may also refer to the official CAN manual.

5. Maintenance

The product series is maintenance free, please do not disassemble in person. There are no repairable components inside the motor. Regarding any quality issue or maintenance needs, please contact our regional service person for relevant technical support.

Ignoring this warning will void the warranty.

Appendix

Appendix 1. Series Product Parameters

Appendix 2. Specified Product Drawing and Parameters

Contact

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