



Product Features

DH-Robotics servo drives feature advanced technology and broad applicability. With an integrated dual-axis EtherCAT design, they support various motor types and provide robust performance across a wide range of applications.

Multi-axis Synchronous Control & High-Precision Response

Supports EtherCAT bus control for nanosecond-level multi-axis synchronization. High-speed 3.5 kHz velocity loop enables stable, vibration-free motion. Compatible with a wide range of motors, including servo motors, linear motors, and voice coil motors. Supports various encoder protocols (Biss-C, SSI, Endat, etc.) with up to 24-bit feedback resolution.

Auto Tuning & Intelligent Identification

Smart algorithms streamline commissioning, reducing tuning time by 60%, Automatically identifies system parameters such as load, inertia, cogging force, and friction, Adaptive stiffness tuning enhances overall system robustness,Built-in motor parameter library simplifies installation and configuration.

High-Precision Force Control & Mechanical Error Compensation

Hardware-based current loop with high-precision current sampling; supports soft landing, Effectively compensates for mechanical errors such as guide rail misalignment, spring resistance, and cogging, High-precision force control algorithm enables effortless 0.01 N-level force control, Enables intelligent full-stroke control with 1g resolution.

Versatile Control Modes & System Expandability

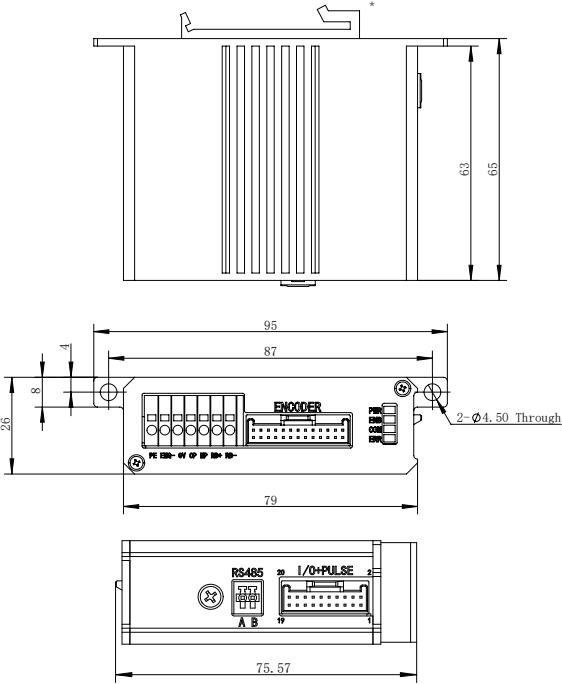
Supports position, velocity, torque, and hybrid control modes for diverse application needs, Vertically aligned modular multi-axis design with 3× overload capacity, Offers a wide range of industrial control protocols including EtherCAT, RS485, EtherNet/IP, and CC-Link, Designed to meet the demands of complex industrial automation integration.

Series	Number of Controllable Axes	Support Control Methods	Reference Page
SAC-S	1	I/O, Pulse(24V), ModbusRTU RS485	P29-30
SAC-N	1	I/O, Pulse(24V), ModbusRTU RS485	P31-32
SAC2-NP1	1	EtherCAT communication, compliant with CiA402 standard Position, Velocity, Torque, and Hybrid control modes	P33-36
SAC-N2	2	EtherCAT, IO	P37-38
SAC-NP2	2	EtherCAT, IO	P39-40
SAC-NP4	4	EtherCAT, IO	P41-42

SAC-S

Single Axis Controller

TECHNICAL SPECIFICATIONS



*Guide rail clips are industry standard size and can be removed when installed with screws

Technical Parameters

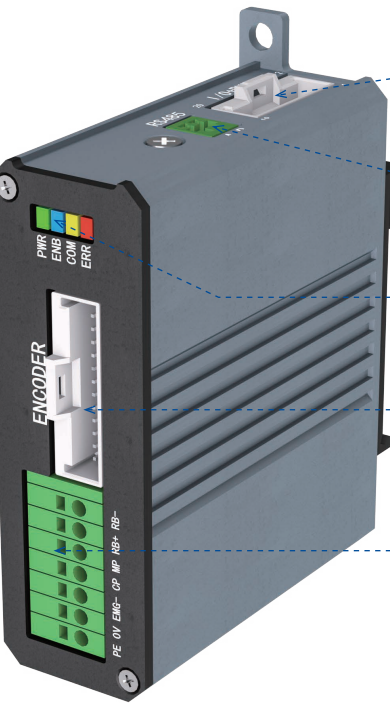
Number of controllable axes	1
Support control methods	I/O, Pulse(24V), ModbusRTU RS485
Number of points	16
I/o and pulse connection holder	20PIN Connector
Number of i/o	8 in 8 out
Debugging protocols	RS485(Modbus-RTU)
Pulse type	Opticalcoupler
Max. Pulse frequency	100 Kpps
Brake control	Support
Force-controlled Closed-loop control	Support

Operating Environment

Input voltage	24 V DC $\pm$ 10%
Output current	3 A(Rated)/9 A(Peak)
Recommended operating Environment	0 to 40°C, below 85% RH
Ip class	IP 20
Weigh	150 g

Selection Method

Series	Type	Communication interface	Voltage	Rated Current	Encoder
SAC	S	M1	K	03	A1
		M1 ModbusRTU (RS485)+IO(NN) M2 ModbusRTU (RS485)+IO(PP)	K 24V	03 3A	A1 Incremental ABZ+ Single-Turn Absolute SSI
	S Simple				



- I/O and Pulse(24V) Interface:**
20-Pin Terminal Block, including I/O interfaces and pulse (24V) input interfaces.
- RS485 Interface:**
Used for debugging, control, and monitoring.
- Indicators:**
Power indicator and status indicator.
- Actuator Interface:**
Connects to the actuator of the electric cylinder, including motor power line, encoder line, and brake line interfaces.
- Power Supply, Discharge, Emergency Stop, and PE Interface:**
Logic Power Supply Interface: Supplies power to internal logic circuits, brake, and some external interfaces.
Motor Power Supply Interface: Supplies power to the motor for motion.
PE (Protective Earth) Interface: Connects to the equipment's protective earth (ground) connection.

SAC-N

Single Axis Controller

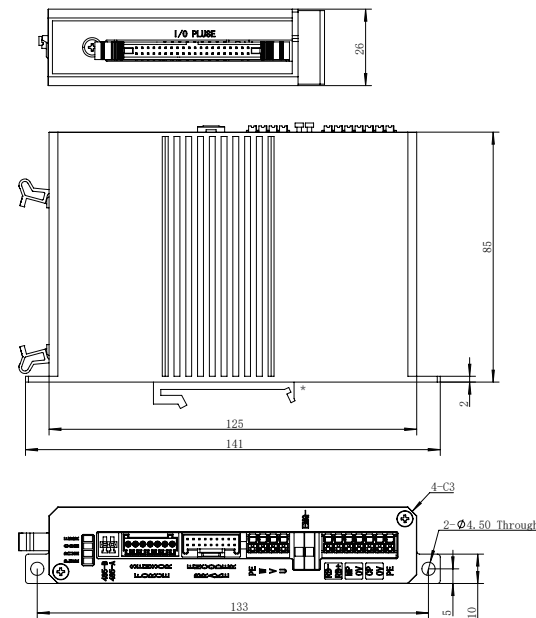
Single Axis Controller



Selection Method

Series	Type	Communication interface	Voltage	Rated Current	Encoder
SAC	N	M0	K	03 A1	
	N Standard NF Standard + Closed-loop force control ^(*)	M0 ModbusRTU (RS485) + Pulse+IO (NPN/PNP Compatible) M1 ModbusRTU (RS485) + IO (NN) M2 ModbusRTU (RS485) + IO (PP)	K 24V	03 3A 10 10A	A1 Incremental ABZ+ Single-Turn Absolute SS

TECHNICAL SPECIFICATIONS



*Guide rail clips are industry standard size and can be removed when installed with screws

Technical Parameters

Number of controllable axes	1
Support control methods	I/O, Pulse(24V), ModbusRTU RS485
Number of points	64
I/o and pulse connection holder	40PIN Connector
Number of i/o	16 in 16 out
Debugging protocols	RS485(Modbus-RTU)
Pulse type	Opticalcoupler
Max. Pulse frequency	100 Kpps
Brake control	Support
Force-controlled Closed-loop control	Support

Operating Environment

Input voltage	24 V DC $\pm$ 10%
Output current	3 A(Rated)/9 A(Peak) 10A(Rated)/25A(Peak)
Recommended operating Environment	0 to 40°C, below 85% RH
Ip class	IP 20
Weigh	300 g

Interface Diagram



I/O and Pulse (24V) Interface:

40-Pin Terminal Block, including I/O interfaces and pulse(24V) input interfaces.

Indicators:

Power indicator and status indicator.

RS485 Interface:

Used for debugging, control, and monitoring.

Sensor Interface:

Relay sensor interface.

Feedback and Brake Interface:

Connects to the encoder and brake of the actuator.

Motor Interface:

UVW and PE connections for the motor of the actuator.

Emergency Stop:

Emergency Stop Control Interface: Used for emergency stop control.

Power Supply, Discharge, and PE Interface:

Logic Power Supply Interface: Supplies power to internal logic circuits, brake, and some external interfaces.

Motor Power Supply Interface: Supplies power to the motor for motion.

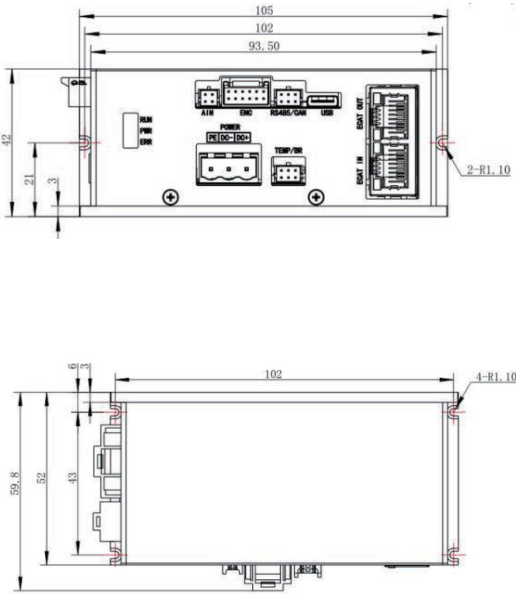
PE (Protective Earth) Interface: Connects to the equipment's protective earth (ground) connection.

SAC2-NP1-EC

Single Axis Drive



TECHNICAL SPECIFICATIONS

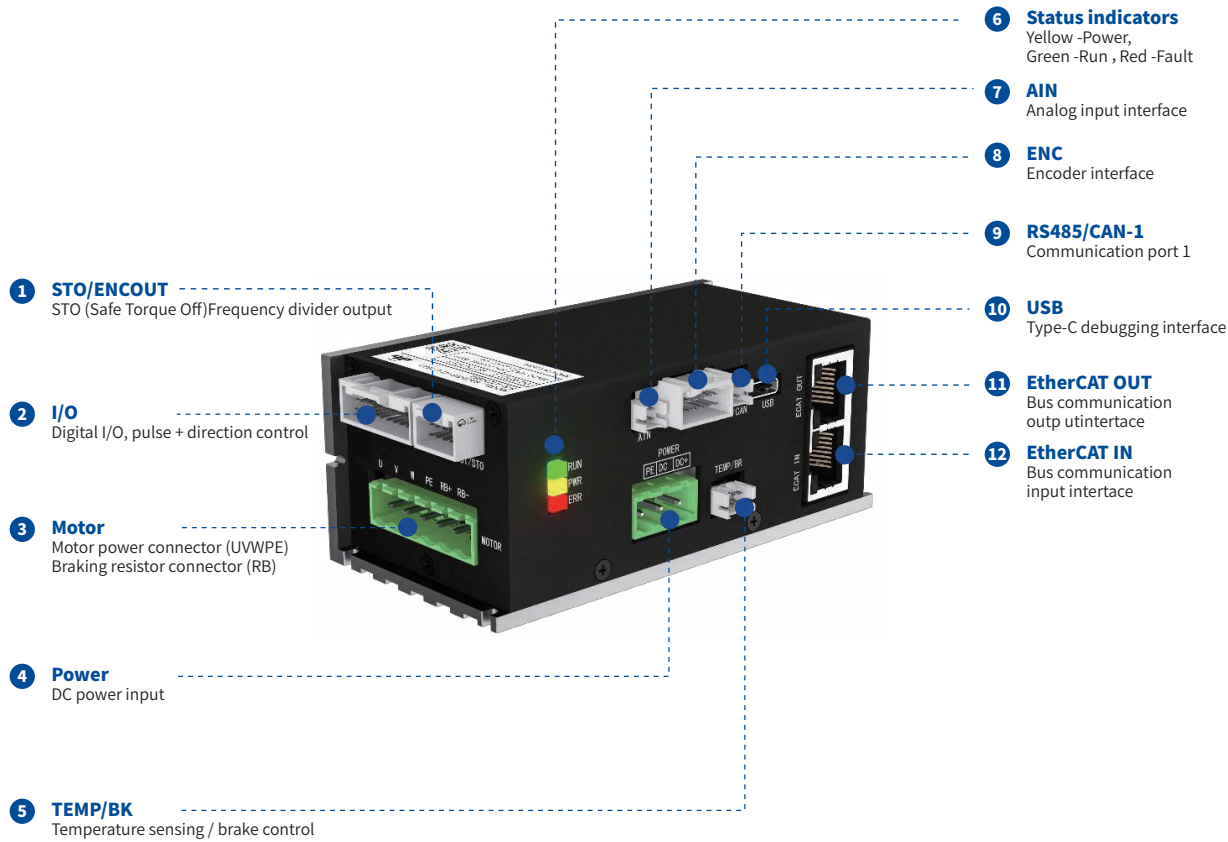
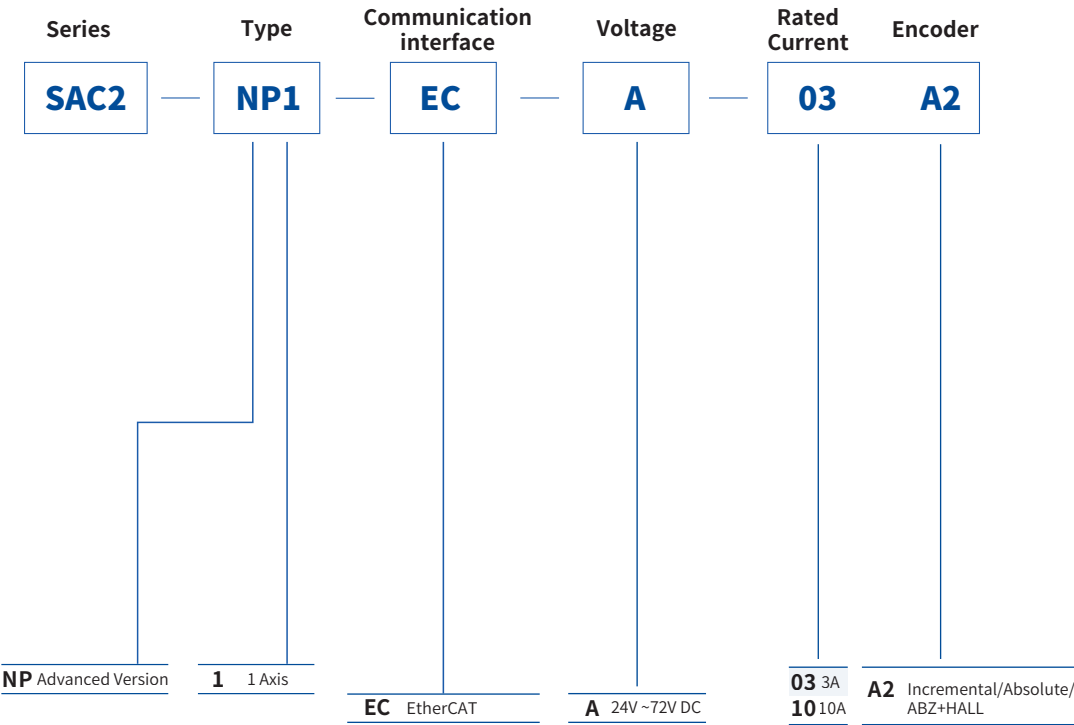


Technical Parameters

Controlled axis	1	
Supported control methods	EtherCAT communication, compliant with CIA402 standard	
Power supply voltage	24V ~ 72V DC (±20% tolerance protection)	
Supports voltage levels	24VDC/36VDC/48VDC/60VDC/72VDC	
Overload	3 times overload for more than 2.5 seconds	
Model	SAC2-NP1-EC-A-03A2	SAC2-NP1-EC-A-10A2
Output rated current	3 A	10 A
Output peak current	9 A	30 A
Supported Motor Types	BLDC, Linear motors, Voice coil motors, PMSM	
Digital I/O Channels	8×digital inputs, 4×digital outputs (NPN/PNP)	
Analog I/O Channels	2×analog inputs, 0–10V, 12-bit resolution	
Size	105 mm×52 mm×45 mm	
Encoder	Supports ABZ+HALL/BissC/SS1/Motegi/ABZ	
Mounting Method	Heat-sink plate mounting, vertical installation	

Interface Diagram

Selection Method



SAC2-NP1-G

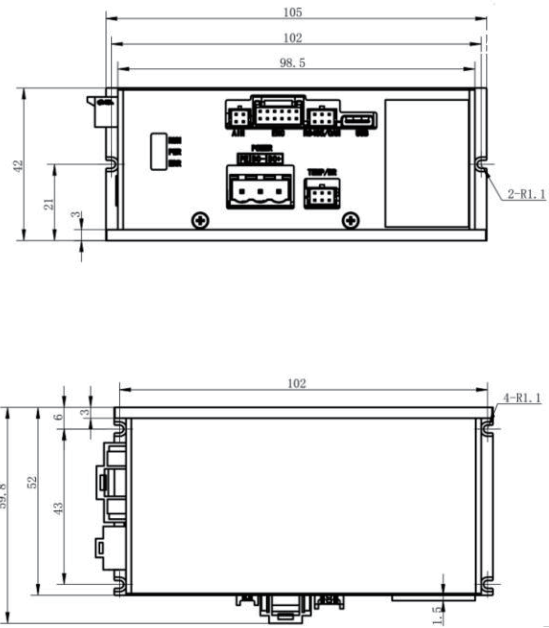
Single Axis Drive



技术参数

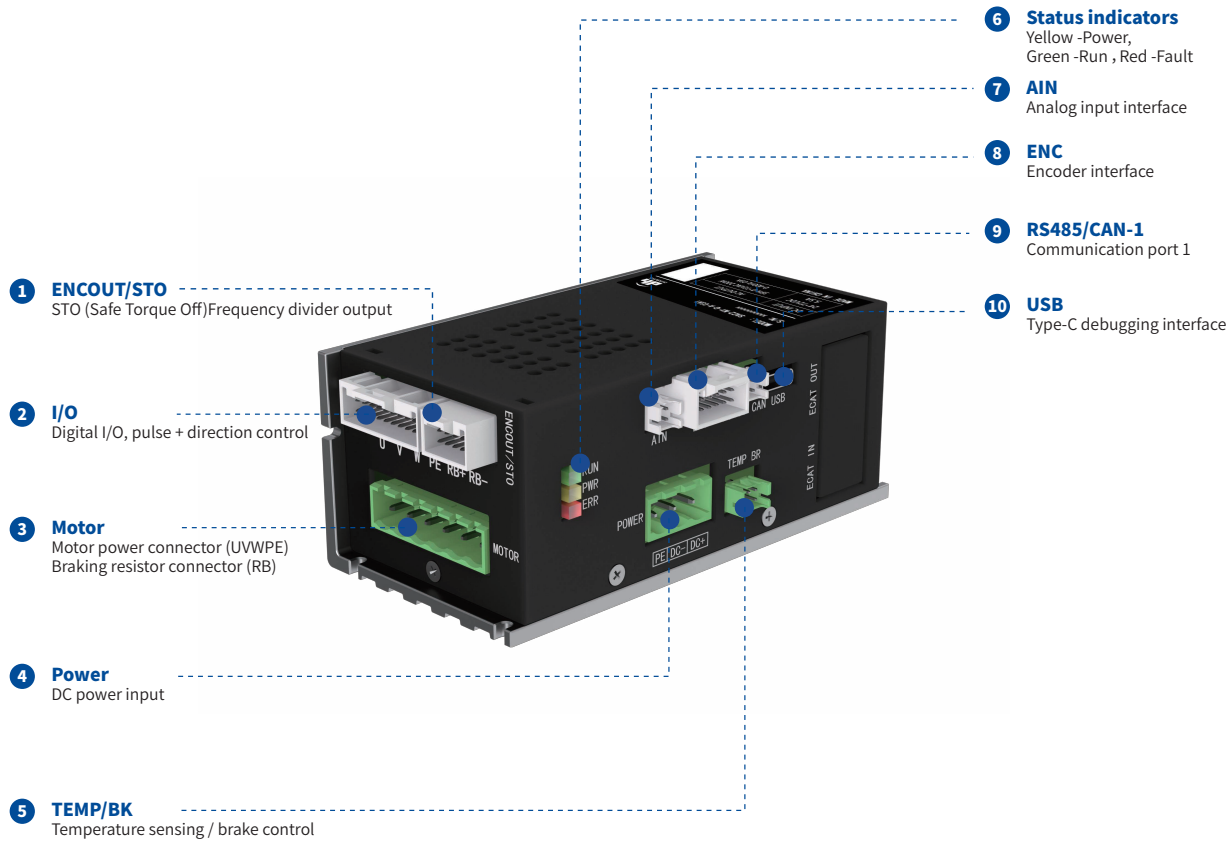
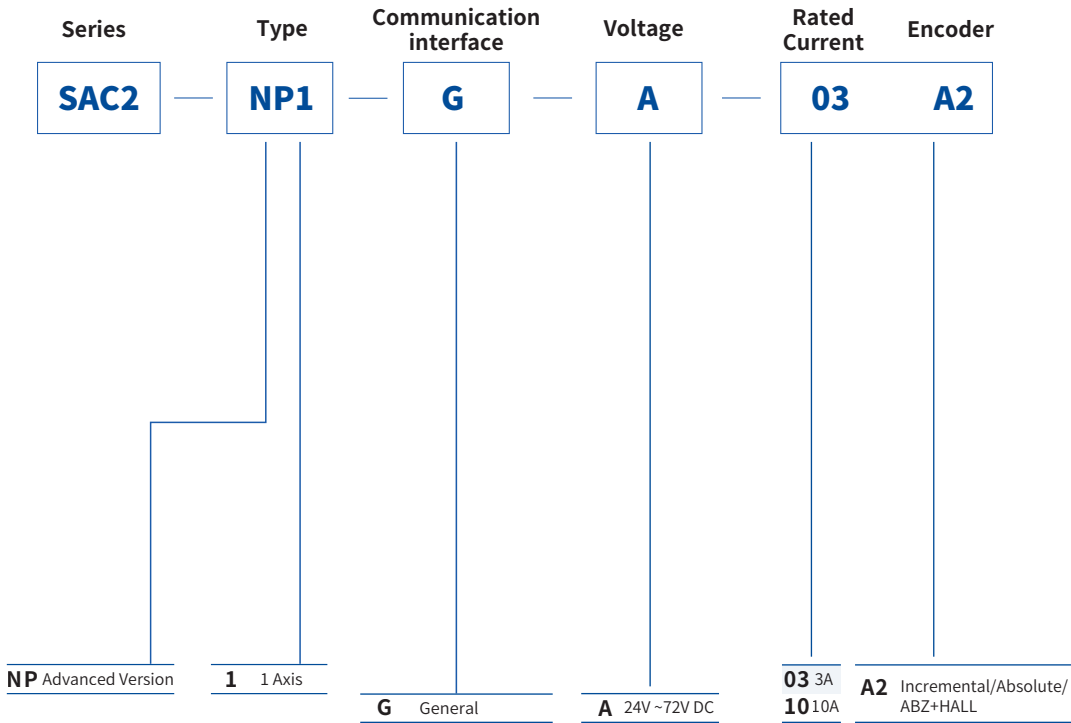
Technical Parameters

Controlled axis	1	
Supported control methods	Pulse Control, Modbus-RTU, CANopen	
Power supply voltage	24V ~ 72V DC (±20% tolerance protection)	
Supports voltage levels	24VDC/36VDC/48VDC/60VDC/72VDC	
Overload	3 times overload for more than 2.5 seconds	
Model	SAC2-NP1-G-A-03A2	SAC2-NP1-G-A-10A2
Output rated current	3 A	10 A
Output peak current	9 A	30 A
Supported Motor Types	BLDC, Linear motors, Voice coil motors, PMSM	
Digital I/O Channels	8× digital inputs, 4× digital outputs (NPN/PNP)	
Analog I/O Channels	2× analog inputs, 0~10V, 12-bit resolution	
Size	102 mm×52 mm×45 mm	
Encoder	Supports ABZ+HALL/BissC/SS1/Motegi/ABZ	
Mounting Method	Heat-sink plate mounting, vertical installation	



Interface Diagram

Selection Method

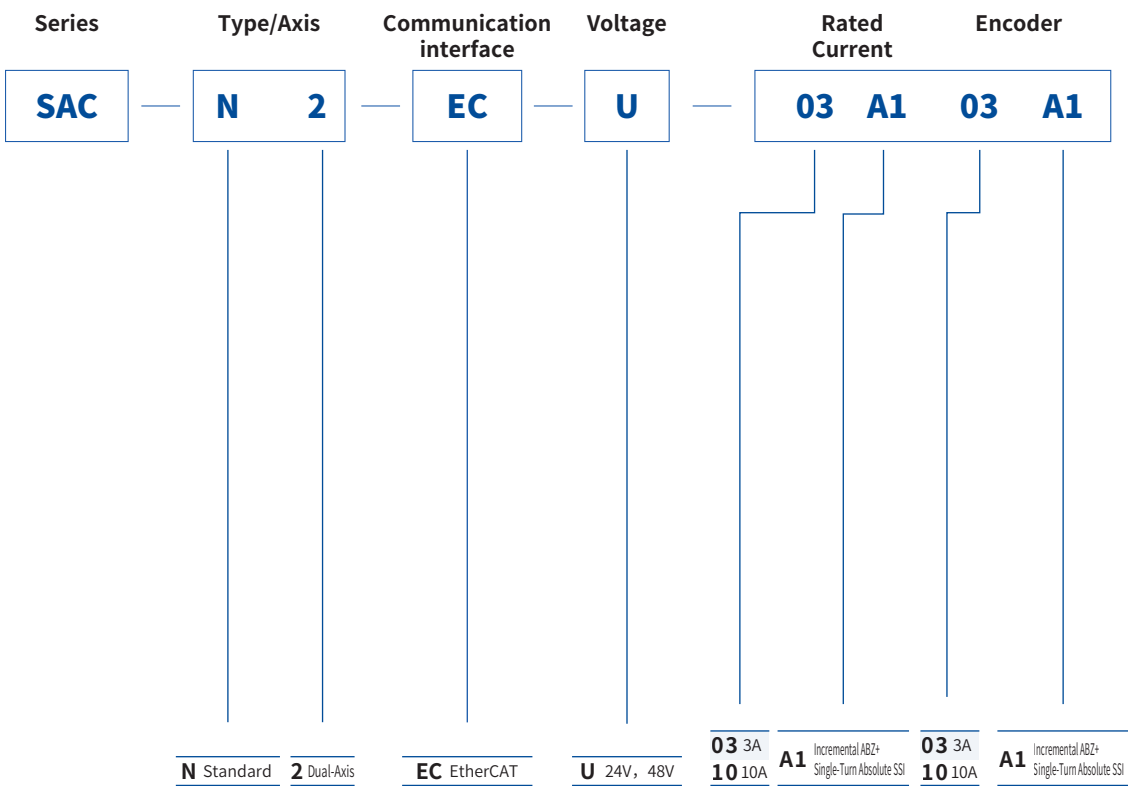


SAC-N2

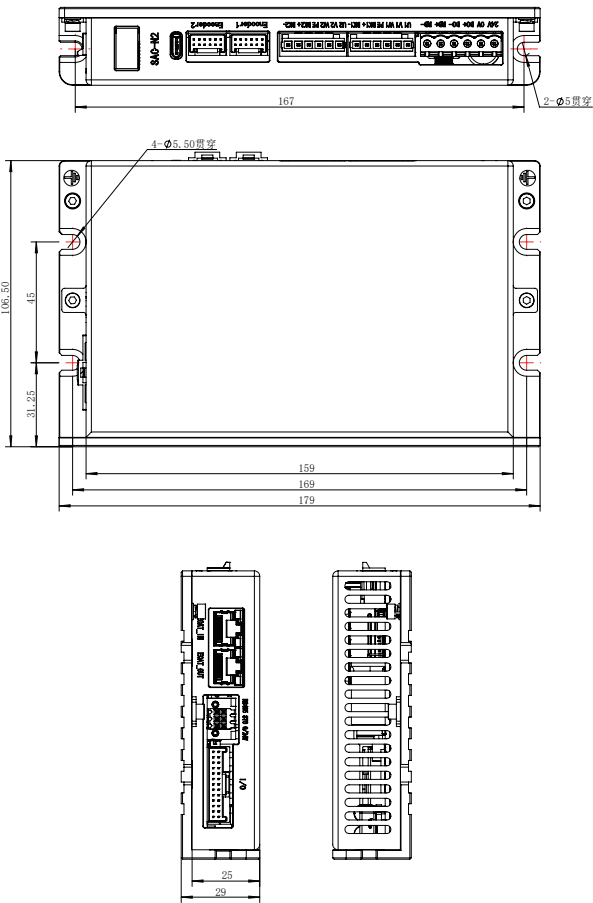
Dual-axis Controller



Selection Method



TECHNICAL SPECIFICATIONS



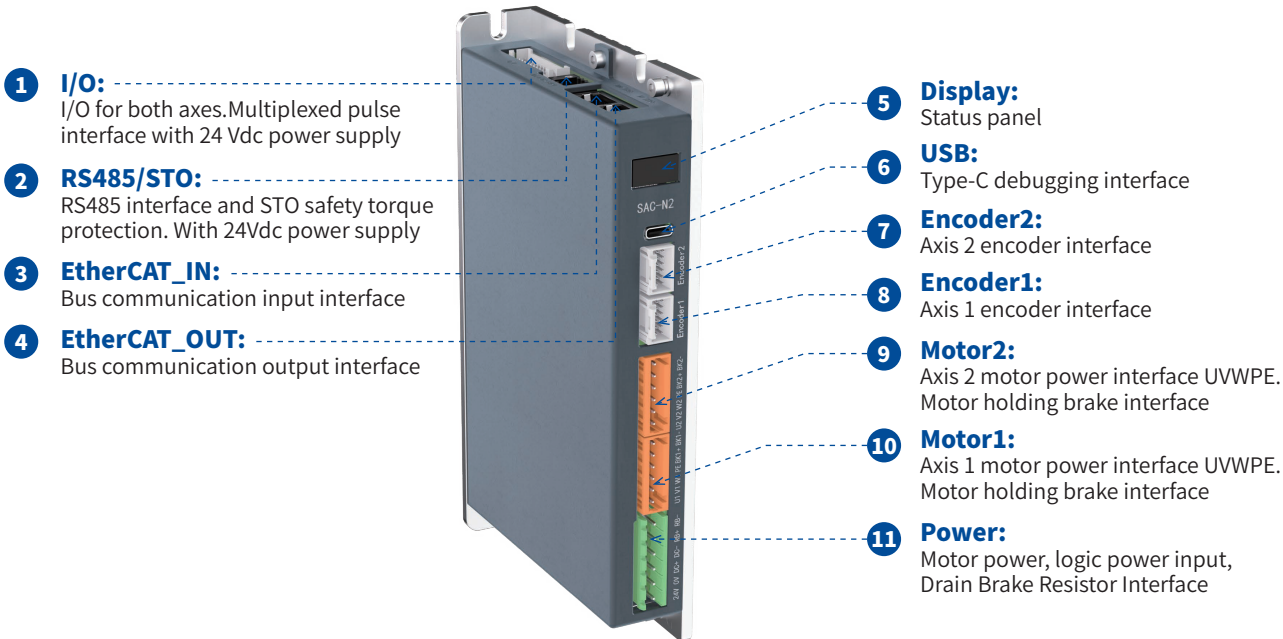
Technical Parameters

Controlled axis	2	
Supported control methods	EtherCAT, IO	
EtherCAT control modes	Position Mode, Velocity Mode, Torque Mode, and Hybrid Mode	
Power supply voltage	24 V	
Motor voltage	24 V / 48 V	
Model	SAC-N2-EC-U-03A1-03A1	SAC-N2-EC-U-10A1-10A1
Output rated current	3 A	10 A
Output peak current	9 A	18 A
Power supply voltage	24 V, 72 W 48 V, 144 W	24 V, 240 W 48 V, 480 W
Encoder	Supports BissC\SSI\Endat\Motegi\ABZ	
Limit Switch, home position, probe	Supported	
Size	179 mm×107.65 mm×29 mm	

Operating Environment

Overload	3 times overload for more than 2.5 seconds
Minimum etherCAT period	200 us
Filters	4 or more
Closed-loop control	Supported
Gantry control	Synchronized in nanoseconds
High-precision encoder and sampling	Supports 23-bit resolution
Auto-tuning gain	Supported
Protection	Overcurrent, Overvoltage, Overheating protection; STO (Safe Torque Off) function
Speed loop response	3.5 KHz
Weight	< 0.6 KG
Protection Level	IP20
Operating Temperature	0~55 °C

Interface Diagram



SAC-NP2

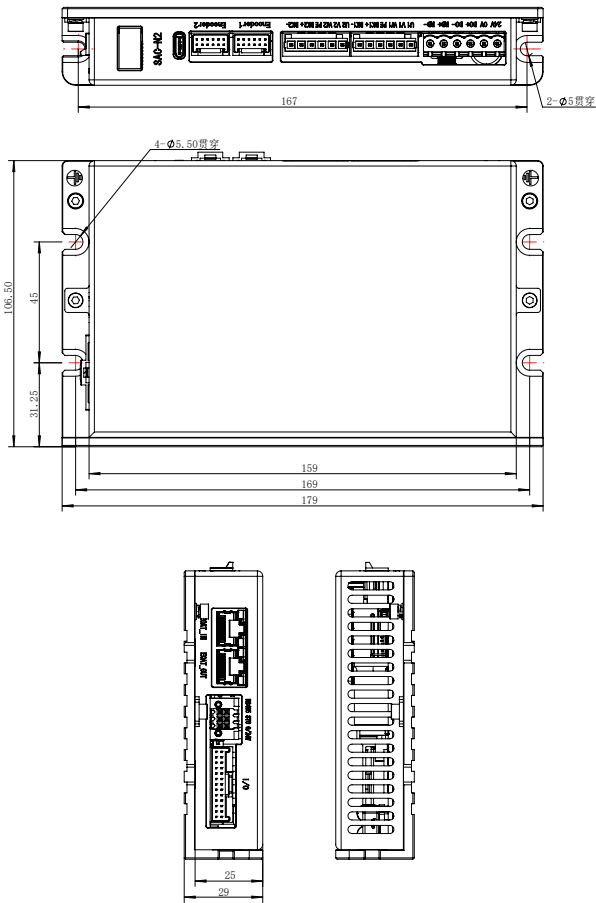
Dual-axis Drive



Selection Method

Series	Type/Axis	Communication interface	Voltage	Rated Current		Encoder	
SAC	NP 2	EC	U	03	A2	03	A2
NP Advanced Version 2 Dual-Axis		EC EtherCAT	U 24V, 48V	03 3A 10 10A	A1 Incremental ABZ+ Single-Turn Absolute SSI	03 3A 10 10A	A2 Incremental ABZ+ Single-Turn Absolute SSI

TECHNICAL SPECIFICATIONS



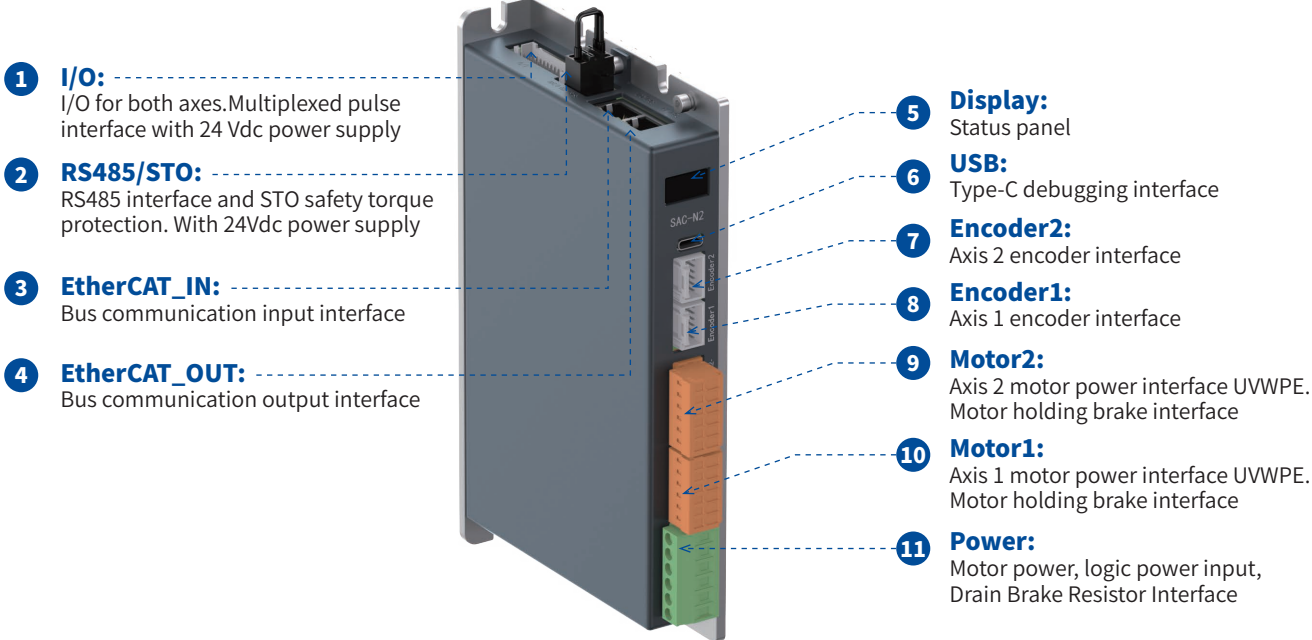
Technical Parameters

Controlled axis	2	
Supported control methods	EtherCAT, IO	
EtherCAT control modes	Position Mode, Velocity Mode, Torque Mode, and Hybrid Mode	
Power supply voltage	24 V	
Motor voltage	24 V / 48 V	
Model	SAC-N2-EC-U-03A1-03A1	SAC-N2-EC-U-10A1-10A1
Output rated current	3 A	10 A
Output peak current	9 A	18 A
Power supply voltage	24 V, 72 W 48 V, 144 W	24 V, 240 W 48 V, 480 W
Encoder	Supports BissC\SSI\Endat\Motegi\ABZ	
Limit Switch, home position, probe	Supported	
Size	179 mm×107.65 mm×29 mm	

Operating Environment

Overload	3 times overload for more than 2.5 seconds
Minimum etherCAT period	200 us
Filters	4 or more
Closed-loop control	Supported
Gantry control	Synchronized in nanoseconds
High-precision encoder and sampling	Supports 23-bit resolution
Auto-tuning gain	Supported
Protection	Overcurrent, Overvoltage, Overheating protection; STO (Safe Torque Off) function
Speed loop response	3.5 KHz
Weight	< 0.6 KG
Protection Level	IP20
Operating Temperature	0~55 °C

Interface Diagram



SAC-NP4

Four-axis Drive

TECHNICAL SPECIFICATIONS

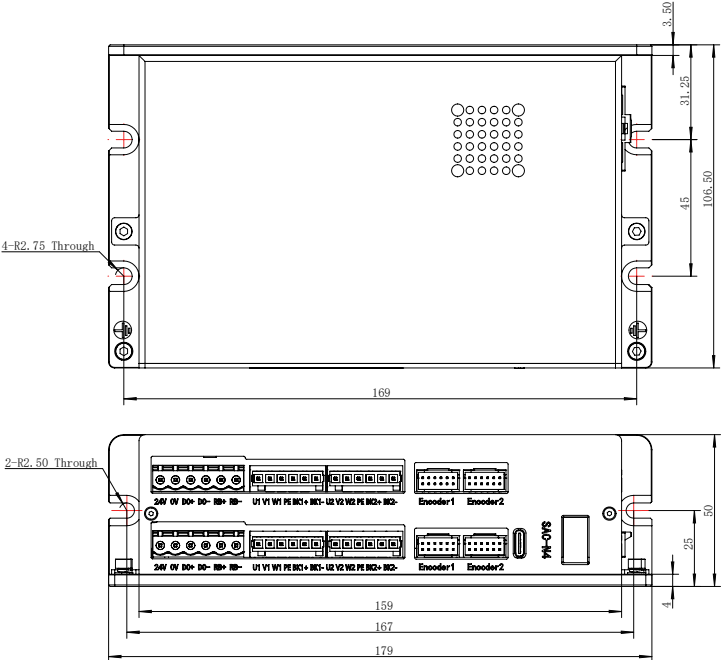
Technical Parameters

Controlled axis	4
Supported control methods	EtherCAT, IO
EtherCAT control modes	Position Mode, Velocity Mode, Torque Mode, and Hybrid Mode
Power supply voltage	24 V
Motor voltage	24 V / 48 V
Model	SAC-NP4-EC-U-03A3-03A3-03A3-03A3 SAC-NP4-EC-U-10A3-10A3-10A3-10A3 SAC-NP4-EC-U-03A4-03A4-03A4-03A4 SAC-NP4-EC-U-10A4-10A4-10A4-10A4

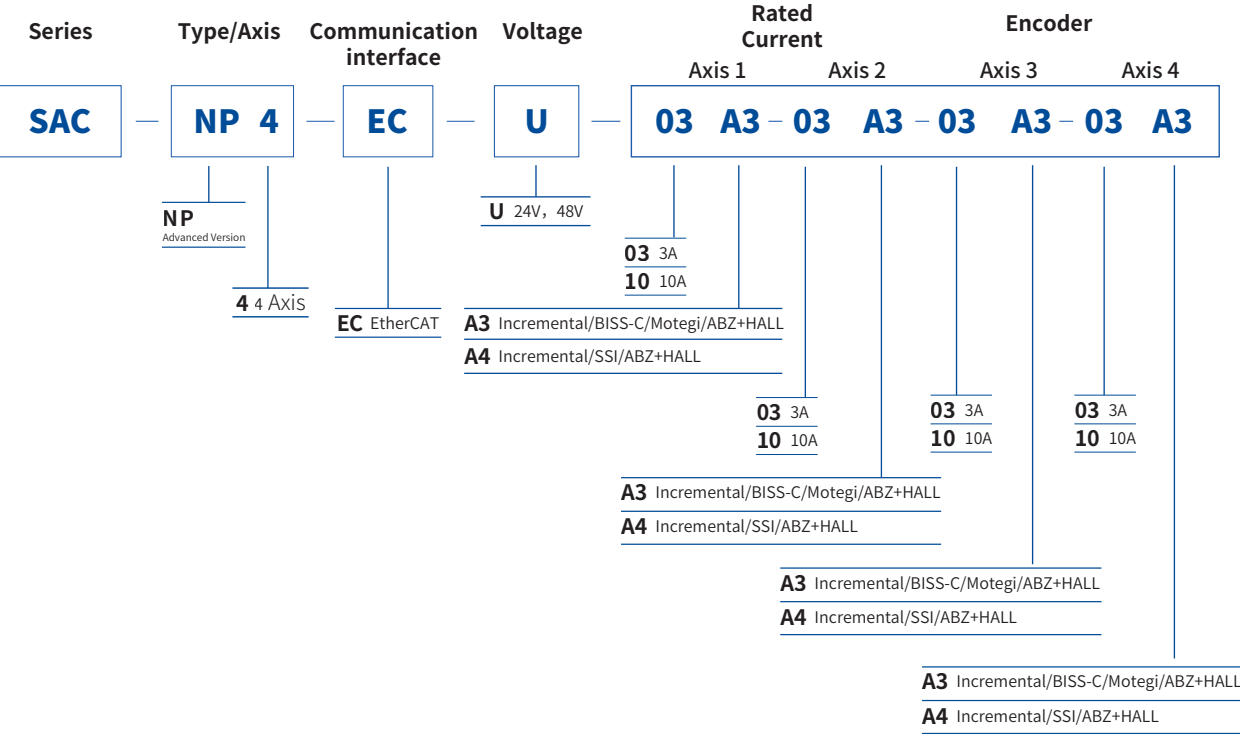
Encoder	A3 Incremental / BiSS-C/Motegi/ABZ+HALL A4 Incremental/SSI/ABZ+HALL
Output rated current	3 A 10 A
Output peak current	9 A 30 A
Power supply voltage	24 V, 72 W 24 V, 240 W 48 V, 144 W 48 V, 480 W
Limit Switch, home position, probe	Supported
Size	179 mm × 119.3 mm × 50 mm

Operating Environment

Overload	3 times overload for more than 2.5 seconds
Minimum etherCAT period	200 us
Filters	4 or more
Closed-loop control	Supported
Gantry control	Synchronized in nanoseconds
High-precision encoder and sampling	Supports 23-bit resolution
Auto-tuning gain	Supported
Protection	Overcurrent, Overvoltage, Overheating protection; STO (Safe Torque Off) function
Speed loop response	3.5 KHz
Weight	< 0.6 KG
Protection Level	IP20
Operating Temperature	0~55 °C



Selection Method



Interface Diagram

