

## ProNet AC Servo Drive

### Features



- **Wide range, various models : 0.2kW ~ 22kW**
- **Current forward feedback control, acceleration forward-feed : high responsiveness**
- **Auto tuning function, online real time load Inertia Inspecting : simple setting**
- **Multiple feedback options : 17bits serials encoder, 2500P/R encoder, resolver**
- **Various communication protocols : CANopen, EtherCAT, POWERLINK, PROFIBUS, Modbus**
- **ProNet-E series : huge market competitiveness**
- **Universal servo : widely used in various industries covering CNC machine tool, router machine, wood making machine, packing machine, textile machine, printing machine, robot arm, medical machine, jewelry making machine, 3D cinema chair, car simulating machine, etc.**
- **Three phase 400V power supply models are available from 1kW to 22kW**
- **Low frequency vibration suppression function,with excellent performance at low speed movement**
- **New homing function available under position control mode**
- **Dynamic electronic gear ratio switching function**

## Typical application

- Electronic devices
- CNC machine (lathe,milling machine,grinder,machining center, etc.)
- Packaging machine(pillow type packaging machine,seal packaging machine,liquid filling machine, etc.)
- Textile machine(quilting machine,tricot machine,cross knitting machine, etc.)
- Printing machine (gravure printing machine,flat-bed printing machine,letterpress printer, etc.)
- Robot (manipulator,industrial robotics, etc.)

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## Model Comparison Table

Servo Motor				Servo Drive (ProNet)			Servo Drive (ProNet-E)	
Series		Power	Model	Three-phase 200V AC Single-phase 200V AC (0.2kW-1.5kW)	Three-phase 400V AC	Three-phase 200V AC Single-phase 200V AC (0.2kW-1.5kW)		
Medium Inertia	Small	EMJ 3000r/min	0.2kW	EMJ-02	ProNet-02		ProNetE-02	
			0.4kW	EMJ-04	ProNet-04		ProNetE-04	
			0.75kW	EMJ-08	ProNet-08		ProNetE-08	
			1.0kW	EMJ-10	ProNet-10		ProNetE-10	
	Medium	EMG 2000r/min	1.0kW	EMG-10	ProNet-10		ProNetE-10	
			1.5kW	EMG-15	ProNet-15		ProNetE-15	
			2.0kW	EMG-20	ProNet-20		ProNetE-20	
			3.0kW	EMG-30	ProNet-30		ProNetE-30	
			5.0kW	EMG-50	ProNet-50		ProNetE-50	
		EML 1000r/min	1.0kW	EML-10	ProNet-10		ProNetE-10	
			2.0kW	EML-20	ProNet-20		ProNetE-20	
			3.0kW	EML-30	ProNet-30		ProNetE-30	
	Large	EMB 1500r/min	4.0kW	EML-40	ProNet-50		ProNetE-50	
			7.5kW	EMB-75		ProNet-75		
			11kW	EMB-1A		ProNet-1A		
			15kW	EMB-1E		ProNet-1E		
		22kW	EMB-2B		ProNet-2B			

## Specification Description

# ProNet – 10

ProNet Servo Drive

Rated Power

# A

Power Voltage

# M

Control Style

# A

Encoder Interface

Extended Module

Sign	Spec.	Sign	Spec.	Sign	Spec.	Sign	Spec.	Sign	Spec.
02	0.2kW	A	200VAC	M	Speed Control, Torque Control, Position Control	A	17 Bits Serial Encoder		None
04	0.4kW	D	400VAC					-D	DP100
08	0.75kW							-E	EC100
10	1.0kW			E	Speed Control, Torque Control, Position Control (Support Extended Module)	B	Resolver	-P	PL100
15	1.5kW								
20	2.0kW								
30	3.0kW								
50	5.0kW								
75	7.5kW								
1A	11kW								
1E	15kW								
2B	22kW								

# ProNet-E – 10

ProNet-E Servo Drive

Rated Power

# A

Power Voltage

Sign	Spec.	Sign	Spec.
02	0.2kW	A	200VAC
04	0.4kW		
08	0.75kW		
10	1.0kW		
15	1.5kW		
20	2.0kW		
30	3.0kW		
50	5.0kW		

Notes:

- ① ProNet-E is only equipped with wire-saving incremental encoder (2500P/R).
- ② ProNet-E does not support extended module.



## Ratings

Servo Drive Model	ProNet -	02A	04A	08A	10A	10D	15A	15D	20A	30A	50A	75D	1AD	1ED	2BD
	ProNet-E														
Applicable Servo Motors Model	EMJ-	02	04A	08A	10A	-	-	-	-	-	-	-	-	-	-
	EMG-	-	-	-	10A	10D	15A	15D	20A	30A	50A	-	-	-	-
	EML-	-	-	-	10A	10D	-	-	20A	30A	40A	-	-	-	-
	EMB-	-	-	-	-	-	-	-	-	-	-	75D	1AD	1ED	2BD
Continuous Output Current		1.4	2.8	4.0	6.0	3.0	9.0	4.8	12.0	18.0	28.0	18.0	28.0	38.0	55.0
Max. Output Current		4.2	8.4	12.0	18.0	9.0	28.0	14.4	42.0	56.0	84.0	56.0	70.0	84.0	138.0
Input Power Supply Capacity		0.5	0.9	1.3	1.8	1.8	2.5	2.5	3.5	4.5	7.5	12.0	18.0	22.0	32.0

## Specification

Items		Specifications	
Input Power Supply	Main Circuit	200V	Three-phase 200 to 230VAC 50/60Hz (0.2kW-5.0kW)
		400V	Three-phase 380 to 440VAC 50/60Hz (1.0kW-1.5kW, 7.5kW-22kW)
	Control Circuit	200V	Single-phase 200 to 230VAC 50/60Hz (0.2kW-5.0kW)
		400V	Single-phase 380 to 440VAC 50/60Hz (1.0kW-1.5kW, 7.5kW-22kW)
Control Method		SVPWM Control	
Feedback		Serial Encoder: 131072P/R Resolver Wire-saving Incremental Encoder (2500P/R)	
Operating Conditions	Ambient / Storage Temperature		Ambient Temperature: 0 to +55°C, Storage Temperature: -20 to +85°C
	Ambient / Storage Humidity		90% RH or less (no condensation)
	Elevation		1000m or less
	Vibration / Impact Resistance		Vibration Resistance: 4.9m/s <sup>2</sup> , Impact Resistance: 19.6m/s <sup>2</sup>
Configuration		Base-mounted	
Performance	Speed Control Range		1:5000
	Speed Regulation	Load Regulation	0 to 100% load: ±0.01% max. (at rated speed)
		Voltage Regulation	Rated voltage, ±10%: 0% (at rated speed)
		Temperature Regulation	25±25°C: ±0.1% max. (at rated speed)
Torque Control	Analog Input	Reference Voltage	±10VDC at rated torque (variable setting range: ±0 to 10VDC) Max. input voltage: ±12V
		Input Impedance	About 10MΩ min.
		Circuit Time Constant	10μs

Items		Specifications	
Speed Control	Analog Input	Reference Voltage	±10VDC at rated torque (variable setting range: ±0 to 10VDC) Max. input voltage: ±12V
		Input Impedance	About 10MΩ min.
		Circuit Time Constant	10μs
	Set Speed Reference	Speed Selection	Speed 1 to 7 selection
Function	Soft Start Setting	0 to 10s (can be set individually for acceleration and deceleration)	
Position Control	Reference Pulse	Type	Sign+ pulse train, CCW+CW pulse train, or 90° phase difference 2-phase pulse (phase A + phase B)
		Form	Non-insulated line driver (+5V level), open collector
		Frequency	x1 multiplier: 4Mpps x2 multiplier: 2Mpps x4 multiplier: 1Mpps Open collector: 200kpps Frequencies drop when the duties have errors
	Set Position Reference	Position Setting	Can set 16 position reference
I/O Signals	Encoder Output Pulses		Phase A, phase B, phase C: line driver output The number of dividing pulse: Any setting ratio is available
	Sequence Input	Number of Channels	8 channels
		Function	Signal allocations and positive/negative logics can be modified: Servo ON (IS-ON), P control (P-CON), alarm reset (I-ALM-RST), clear error pulse (I-CLR), forward run prohibited (P-OT), reverse run prohibited (N-OT), forward torque limit (P-CL), reverse torque limit (N-CL)
	Sequence Output	Number of Channels	4 channels
Function		Servo alarm (ALM) Signal allocations and positive/negative logics can be modified: Positioning completion (I-COIN), speed agree detector (I-W-CMP), motor rotation detection (I-TGON), servo ready (IS-RDY), torque limit detection (I-CLT), brake interlock (I-BK), encoder C pulse (I-PC), over travel signal (I-OT)	
Built-in Functions	Dynamic Brake (DB) Functions		Operates during main power OFF, servo alarm, servo OFF or overtravel
	Regenerative Processing Functions		750W to 5.0kW: built-in regenerative resistor; 7.5kW to 22kW: External regenerative resistor (optional)
	Protective Functions		Overcurrent, overvoltage, low voltage, overload, regeneration error, overspeed, etc.
	Utility Functions		Alarm trace back, JOG operation, inertia detections, etc.
	Display Functions		CHARGE (red), POWER (green), 7-segment 5-digit LED (Built-in digital operator function)
	Communications		RS-485 communication port; use Modbus protocol. CAN communication port; use CANopen protocol.

# Communication

## EtherCAT



EtherCAT Module

- High communication speed
- Precise multiple axis synchronous control
- Revolution of traditional field bus control

Items	Specifications
Communication standard	IEC 61158 Type 12, IEC 61800-7 CI A402 Drive Profile
Physical layer	100BASE-TX (IEEE802.3)
Bus connection	CN4 (RJ45): EtherCAT Signal IN CN5 (RJ45): EtherCAT Signal OUT
Cable	Class-5 twisted pair cable
Communication distance	Node space: within 100 meters
SyncManager	SM0: output mailbox, SM1: input mailbox SM2: output process data, SM3: input process data
FMMU	FMMU0: mapping to process data (RxPDO) Receiving area FMMU1: mapping to process data (TxPDO) Transmitting area FMMU2: mapping to mailbox status
EtherCAT Commands (Data Link Layer)	AP RD, FP RD, BRD, LRD, AP WR, FP WR, BWR, LWR, ARMW, FRMW Note: AP RW, FP RW, BRW, LRW Commands are not supported
PDO data	Dynamic PDO mapping
Mail box (CoE)	Emergency event, SDO request, response, SDO information Note: do not support TxPDO/RxPDO and remote TxPDO/RxPDO
Differential clock (DC)	Free-run, DC mode (set active in configuration) Supported DC period: 250us - 8ms
Size	256 bytes (read - only)
LED Indicator	EtherCAT System indicator (SYS) x1 EtherCAT Run indicator (RUN) x1 EtherCAT Error indicator (ERR) x1
CI A402 Drive Profile	Homing mode, Profile position mode, Interpolated position mode, Profile velocity mode, Cyclic synchronous position mode

Standard CAN bus interfaces are available in ProNet series servo drives, which makes it easy to get integrated into a distributed control system.

Items	Specifications
Communication standard	CIA-D6301 CIA402 Drive Profile
Physical layer	ISO 11898-2 CIA 303-1
Bus connection	CN3 (RJ45): Signal IN CN4 (RJ45): Signal OUT
Cable	Twisted pair cable
Baud rate	50Kbps, 100Kbps, 125Kbps, 250Kbps, 500Kbps, 1Mbps
COB	SDO, P DO, SYNC, EMCY, NMT, Heartbeat
Control mode	Homing mode, speed control mode, position control mode, position interpolation mode
PDO data	Dynamic PDO mapping, 2 sending PDO, 2 receiving PDO

## POWERLINK

POWERLINK technology applied in ProNet series drives leads to improved performances and expanded application fields. POWERLINK is open source technology and has no platform limit. It is CANopen over Ethernet, which has inherited all former applications based on CANopen. Customer programs are protected and performance level is increased. POWERLINK drive provides fast and realtime response ability of 250µs, which definitely gives better support for applications like high speed synchronization, high speed positioning control and electronic gear, etc.

Items	Specifications	
POWERLINK	Communication standard	IEC 61784-2, IEC 61800-7 CIA402 Drive Profile
	Physical layer	100BASE-TX (IEEE802.3)
	Bus connection	CN5 (RJ45): POWERLINK Signal IN/OUT CN6 (RJ45): POWERLINK Signal IN/OUT
	Cable	Class-5 twisted pair cables
	PDO data	Dynamic PDO mapping
	LED indicator	POWERLINK System indicator (SYS) ×1 POWERLINK Run indicator (RUN) ×1 POWERLINK Error indicator (ERR) ×1
Communication Mode	Homing mode Profile position mode Profile velocity mode Interpolation position mode	

# PROFIBUS



Profibus Module

Code Switch  
Address Setting

Alarm Light  
Communication Light

Profibus  
Connection  
End



There are many applications based on profibus communication in industrial automation market. DP100 module is a PROFIBUS DP module, which can connect the other PROFIBUS products with ESTUN ProNet -servo drive, and the project cost of providing profibus connection is low.

Items	Specifications
Communication standard	PROFIBUS-DP, PROFIDRIVE
Physical layer	RS-485 transmission
Bus connection	CN5 (DB9)
Cable	RS-485 cable with D type
Baud rate	Automatic identification of bus transmission baud rate Communication distance: 9.6Kbps~12Mbps Transmission distance: 100m~1200m
Data exchange	Cyclic data exchange and Acyclic data exchange
LED indicator	ALM, COMM
Address setting	ADDH, ADDL

# Modbus

## Modbus

- ProNet series servo drives provide the Modbus communication function with RS-485 interface
- Which can be used to easily set parameters or to perform monitoring operations and so on

Items	Specifications
Communication standard	Modbus
Physical layer	RS-485 transmission
Bus connection	CN3 (RJ45): Signal IN CN4 (RJ45): Signal OUT
Cable	Twisted pair cable
Baud rate	4800bps, 9600bps, 19200bps
Communication Mode	ASCII, RTU