JUNMA SERVO SYSTEM

Save space, save wiring, save time

» Compact size

» MECHATROLINK-II

» Tuning-less concept

Advanced Industrial Automation

OMRON

A new concept in drive simplicity

The Junma ultra-compact servo series draws on our world-leading servo-drive technology to open up new dimensions in drive simplicity. The Junma is probably the first servo drive that is fully tuning-less and program-less. It features a built-in MECHATROLINK-II motion bus, allowing the servos to be easily daisy-chained and controlled through a single cable. The Junma can save you up to 30% of cabinet space and drastically reduces cabling and set-up time.

The Junma ML-II series also shares other performance characteristics that have made Omron-Yaskawa servos leading products worldwide. Like fast response, high speed, high torque, high accuracy and proven reliability.

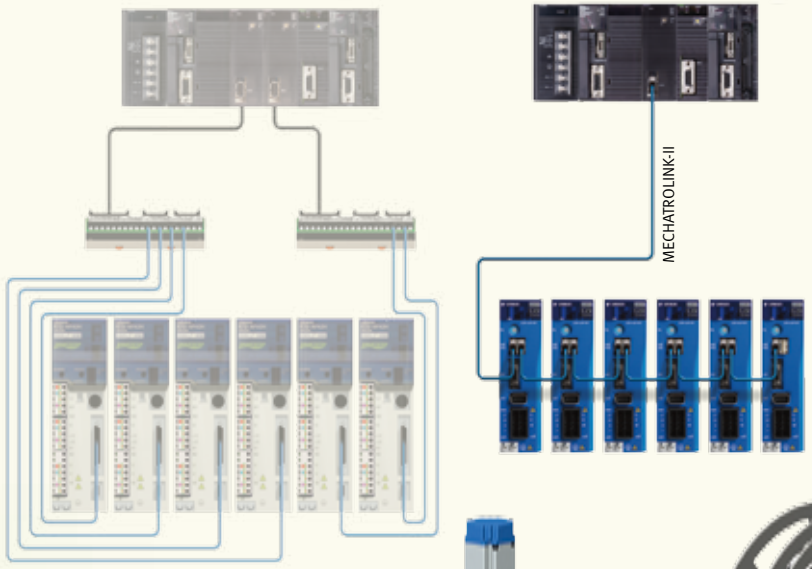
Key features at a glance:

- Pocket-size servo with smallest footprint 15x4.5 cm
- Tuning-less technology built-in for immediate start-up
- Built-in MECHATROLINK-II motion bus reduces cabling and allows remote servo configuration and diagnosis
- High starting torque: 300% for 3 secs.

RoHS Compliant

Save space, save wiring, save time

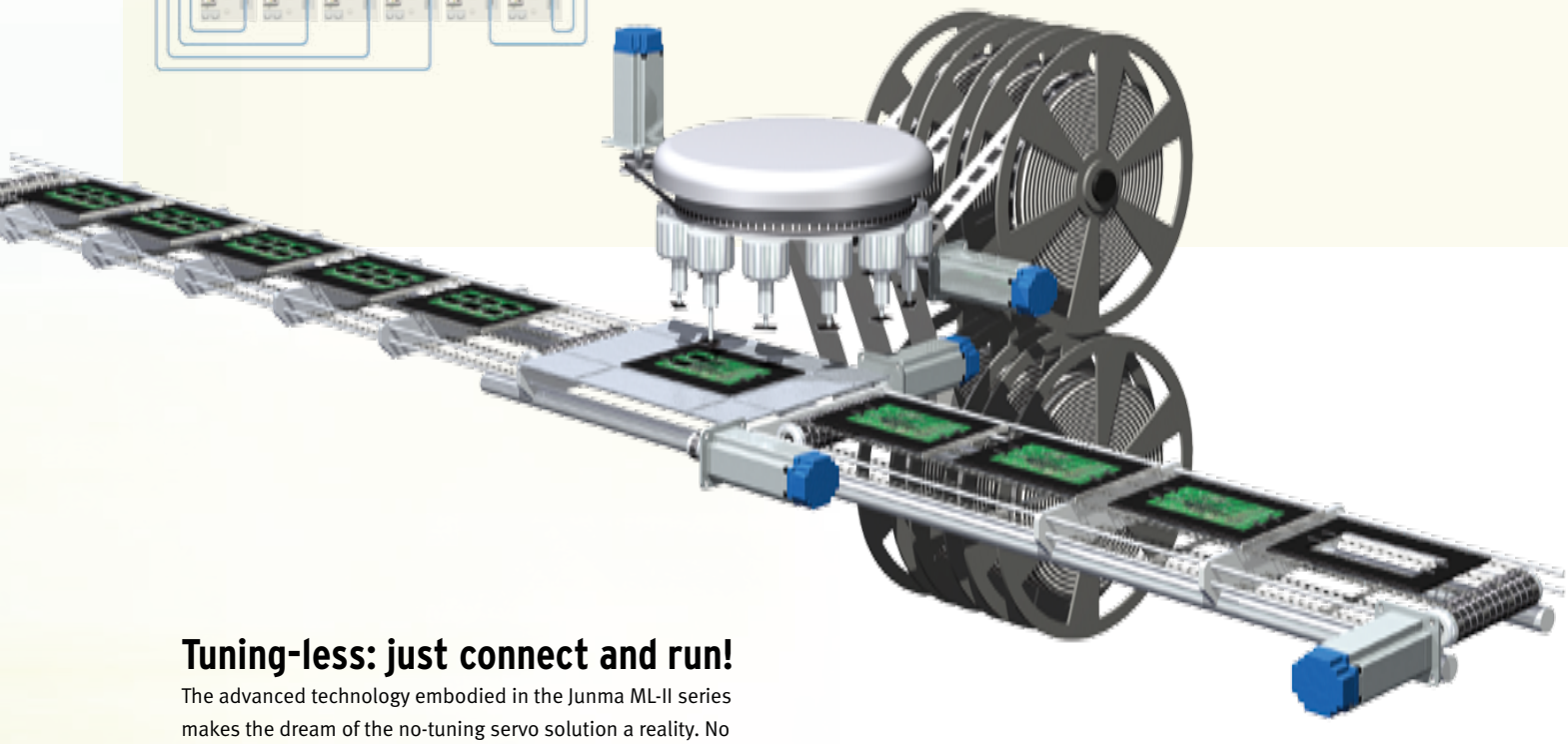
From multiple cables... **to only one cable**



30% less cabinet space

Easy connection: single cable only!

With their built-in MECHATROLINK-II motion bus, just a single cable is needed to connect servos together. So you not only save on wiring and installation time, you also significantly reduce the chance of connection errors. Reliability is increased since the single-cable connection is much more rugged than a multiple-wiring solution.



Tuning-less: just connect and run!

The advanced technology embodied in the Junma ML-II series makes the dream of the no-tuning servo solution a reality. No gain parameters need to be set. Just connect up to the motor and you're ready to go.

The "Tuning-Less" algorithm consists of two major components:

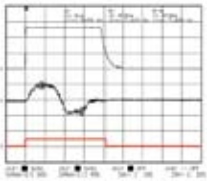
- adjusts internal speed loop calculation to always obtain the same response characteristics
- "Auto Notch" changes parameters in the notch filter in order to suppress mechanical resonance

Tuning-Less effect example

The test is done with a rotor inertia ratio of 0% (no load) and 1000% (load inertia 10 times rotor).
The graphs are showing position deviation and output torque test results, where the same dynamic response is achieved.

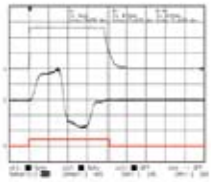
Rigid load inertia 0%

Positioning time: 410 ms



Rigid load inertia 1000%

Positioning time: 410 ms



Position deviation
Torque
Positioning cycle

The optimum positioning combination: Junma ML-II + NCF

Complete and compact positioning system

In a minimum of space you can have a complete and powerful PTP system when combining the CJ1W-NCF71 unit and the Junma servo. This configuration offers 16-axis positioning with linear and circular interpolation, as well as interrupt feeding. The NCF and the Junma offer the ideal solution for applications where space is tight.

Full transparency from a remote host

When the Junma is controlled by an NCF positioning unit, the servo drive is fully transparent to a remote PC. This is achieved over MECHATROLINK-II from Junma to PLC and over any serial or Ethernet link between PLC and PC. Hence complying fully with Omron Smart Platform.

CJ1 series PLC

CJ1W-NCF71

Junma MECHATROLINK-II

NCF features and benefits

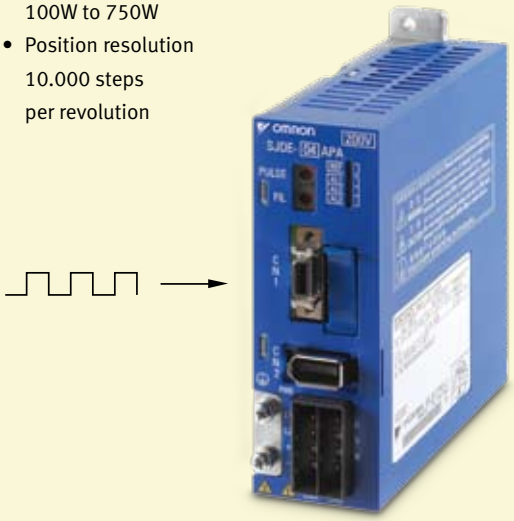
- 16-axes, point-to-point positioning controller over MECHATROLINK-II
- Easy, fast and reliable setup
- Optimised for positioning applications
- Simplified wiring to drives
- Integration into OMRON Smart Platform: Function Blocks, Smart Active Parts, CX-One
- Available for CS1 and CJ1 PLC series

PLC open

A global standard for industrial control programming, PLCopen provides a standardized programming interface to harmonise the way people design and operate industrial-control.

Drive version with Pulse train control available

- Save even more time and use 44% less space
- No need for servo parameter setting
- Ultra-compact
- Cost effective
- Position and speed controlled by pulse input
- Built-in tuning-less technology
- Output range from 100W to 750W
- Position resolution 10.000 steps per revolution



OMRON

SJDE-□-OY, SJME-□-OY

Junma Servo system

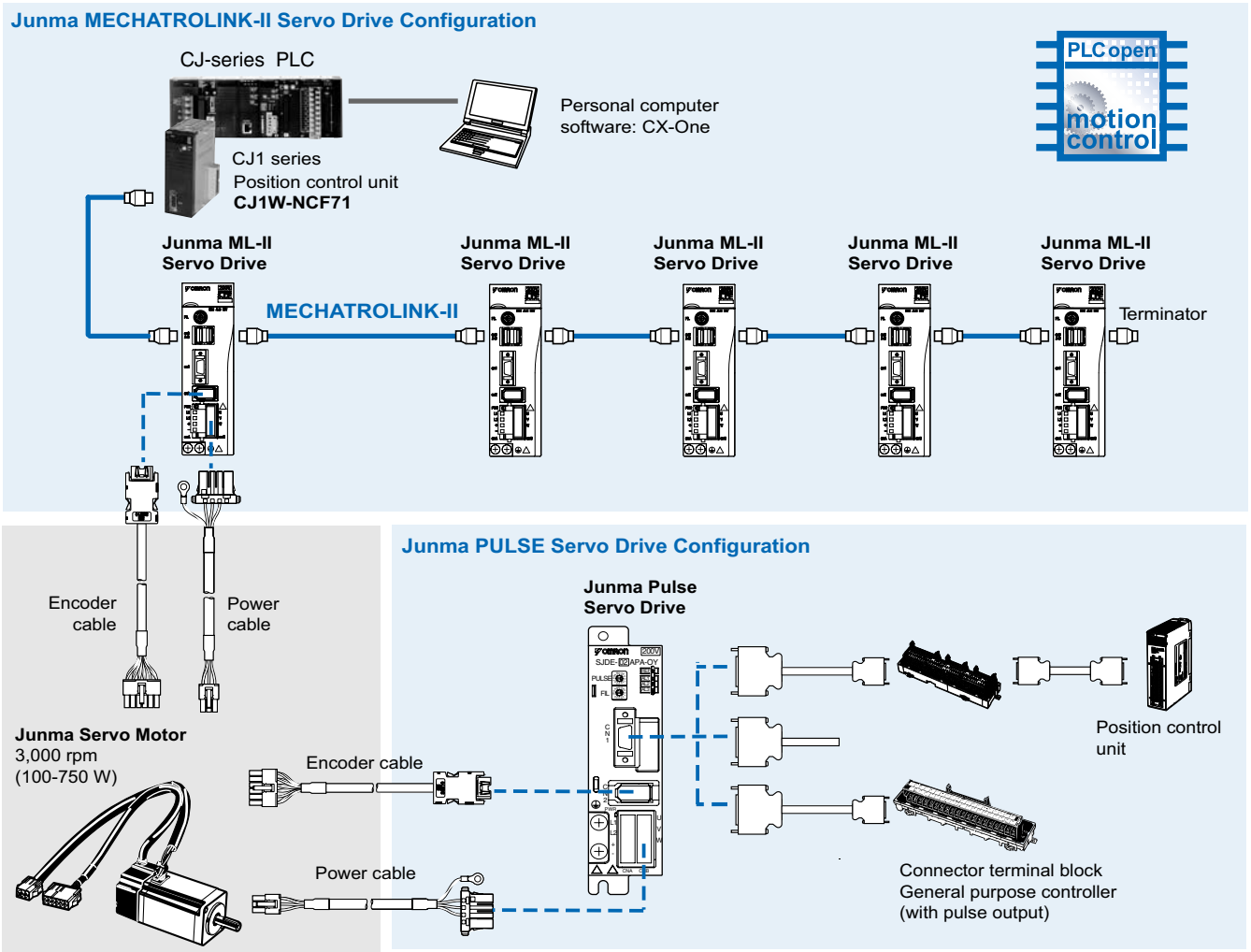
A new concept in drive simplicity
Save space, save wiring, save time

- Ultra compact drive size reduces panel space
- Tuning-less technology, no gain parameters need to be set
- Peak torque 300% of nominal for 3 seconds
- High response, high speed, high torque and high accuracy
- Drive version with MECHATROLINK-II port built-in
- MECHATROLINK-II simplifies wiring and reduces installation time
- MECHATROLINK-II provides access to the system from one point
- Pulse control Drive version available, fully "Parameter-less" just plug and run

Ratings

- 230 VAC Single-phase 100 W to 750 W (2.39 Nm)

System Configuration



Motor Type Designation

SJME - 02 A M B 4 1 - OY

- JUNMA servomotor
- Capacity

Code	Output (W)
01	100
02	200
04	400
08	750

- Voltage
  A: 200 VAC
- Feedback specifications
  M : Analogue output encoder
- Design procedure
  B : Standard
- Shaft end specifications
  4 : Straight, key
- Brake specifications
  1 : No brake
  C : 24VDC brake
- OMRON YASKAWA Motion Control BV

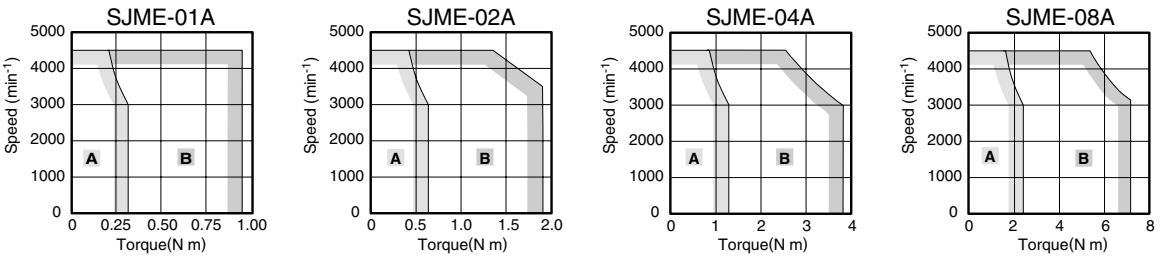
Servomotor Specifications

Voltage			**230 V**			
Servomotor Model SJME- □			**01A**□	**02A**□	**04A**□	**08A**□
Rated Output *1		W	100	200	400	750
Rated Torque *1, *2		N·m	0.318	0.637	1.27	2.39
Instantaneous Peak Torque *1		N·m	0.955	1.91	3.82	7.16
Rated Current *1		Arms	0.84	1.1	2.0	3.7
Instantaneous Max. Current *1		Arms	2.5	3.3	6.0	11.1
Rated Speed *1		min^{-1}	3000			
Max. Speed *1		min^{-1}	4500			
Torque Constant		N·m/Arms	0.413	0.645	0.682	0.699
Rotor Moment of Inertia (JM)		$kg·m^2x10^{-4}$	0.0634	0.330	0.603	1.50
Allowable load inertia *3		$kg·m^2x10^{-4}$	0.6	3.0	5.0	10.0
Rated Power Rate		kW/s	16.0	12.3	26.7	38.1
Rated Angular Acceleration		rad/s^2	50200	19300	21100	15900
Encoder		Standard	Analogue output encoder			
Allowable radial load			78	245	245	392
Allowable thrust load			54	74	74	147
Approx. mass		kg (without brake)	0.5	0.9	1.3	2.6
		kg (with brake)	0.8	1.5	1.9	3.5
Brake specifications	Rated voltage		24 VDC ±10%			
	Holding Brake Moment of Inertia	$kg·m^2x10^{-4}$	0.0075	0.064		0.171
	Power consumption (at 20°C)	W	6	6.9		7.7
	Current consumption (at 20°C)	A	0.25	0.29		0.32
	Static friction torque	N·m (minimum)	0.318	1.27		2.39
	Rise time for holding torque	ms (max)	100			
	Release time	ms (max)	80			
Basic Specifications	Time Rating		Continuous			
	Thermal Class		Class B			
	Vibration Class		15 µm or below			
	Withstand Voltage		1500 VAC for one minute			
	Insulation resistance		500 VDC, 10 MΩ min.			
	Enclosure		Totally-enclosed, self-cooled, IP55 (excluding shaft opening and connectors)			
	Vibration Resistance		Vibration acceleration 49 m/s^2			
	Usage / storage temperature		0 to +40° C / -20 to 60° C without freezing			
	Usage / storage humidity		20 to 80% RH (non-condensing)			
	Altitude		1000 m or less above sea level			
	Mounting		Flange-mounted			

Note: ***1.** These items and speed/torque characteristics quoted in combination with an SJDE servo drive are at an armature winding temperature of 100°C. Other values quoted at 20°C.
***2:** The rated torques listed here are the values for the continuous allowable torque at 40°C with an aluminium heatsink (250 mm x 250 mm x 6 mm) attached.
***3.** Value usig the appropriate SJDE drive without of external regeneration unit

Torque-Speed Charecteristics

(A : Continuous Duty Zone B : Intermittent Duty Zone)



Servomotor / Servo Drive Combination

Junma Servomotor						Junma servo drive	
	Voltage	Rated Torque	Capacity	Model without brake	Model with brake	MECHATROLINK-II	Pulse Control
SJME- (3000 min^{-1}) 	200 V	0.318 Nm	100 W	SJME-01AMB41-OY	SJME-01AMB4C-OY	SJDE-01ANA-OY	SJDE-01APA-OY
		0.637 Nm	200 W	SJME-02AMB41-OY	SJME-02AMB4C-OY	SJDE-02ANA-OY	SJDE-02APA-OY
		1.27 Nm	400 W	SJME-04AMB41-OY	SJME-04AMB4C-OY	SJDE-04ANA-OY	SJDE-04APA-OY
		2.39 Nm	750 W	SJME-08AMB41-OY	SJME-08AMB4C-OY	SJDE-08ANA-OY	SJDE-08APA-OY

Servo Drive Type Designation

SJDE - 02 A N A - OY

- SJDE: JUNMA servo drive
- 02: Applicable servomotor capacity

Code	Output (W)
01	100
02	200
04	400
08	750

- A: Power supply voltage — A: 200 VAC
- N: Control Interface specification — N: MECHATROLINK-II; P: Pulse train input
- A: Design revision — A: Standard
- OY: OMRON YASKAWA Motion Control BV

Servo Drive Specifications

Junma MECHATROLINK-II Servo Drive

Servo Drive Type		SJDE- □	01ANA-OY	02ANA-OY	04ANA-OY	08ANA-OY
Applicable servomotor		SJME-□	01A□	02A□	04A□	08A□
Basic specifications	Max. Applicable Motor capacity	W	100	200	400	750
	Continuous output current	Arms	0.84	1.1	2.0	3.7
	Max. output current	Arms	2.5	3.3	6.0	11.1
	Input power supply (Main circuit and control circuit)	Voltage	Single-phase, 200 to 230 VAC, + 10 to -15% (50/60 Hz)			
		Capacity KVA	0.40	0.75	1.2	2.2
	Control Method		PWM control, sine wave current drive system			
	Feedback		Analogue incremental encoder (13 bits incremental equivalent)			
	Allowable load inertia*1	kg· m^2	0.6×10^{-4}	3.0×10^{-4}	5.0×10^{-4}	10.0×10^{-4}
	Usage / storage temperature		0 to +55° C / -20 to 70° C			
	Usage / storage humidity		90%RH or less (non-condensing)			
	Altitude		1000m or less above sea level			
	Vibration/shock Resistance		4.9m/s^2 (0.5G) / 19.6m/s^2 (2G)			
	Configuration		Base mounted			
	Approx. mass	Kg	1.0			1.4
Built-in functions	Dynamic brake (DB)		Operated at main power OFF, servo alarm, servo OFF.(OFF after motor stops; ON when motor power is off.)			
	Regenerative processing		Optional (If the regenerated energy is too large, install a regenerative unit JUSP-RG08D)			
	Over-travel (OT) prevention function		P_OT, N_OT			
	Emergency stop		Emergency stop (E-STP)			
	LED display		4 LEDs (PWR, RDY, COM, ALM)			
	MECHATROLINK-II monitor		MECHATROLINK-II under communication : COM LED (Light ON)			
	Servo ON/OFF monitor		At Servo OFF : RDY LED (Light OFF), at Servo ON : RDY LED (Light Blinks)			
	Power supply status monitor		Control / main-circuit power-supply OFF state: PWR LED (Light OFF) Control / main-circuit power-supply ON state: PWR LED (Light ON)			
	Electronic gearing		0,01< A/B<100			
	Protection		Overcurrent, overvoltage, undervoltage, overload, main circuit sensor error, board temperature error, excessive position error overflow, overspeed, encoder signal error, overrun protection, system error, parameter error			
	MECHATROLINK Communication	Comm. protocol	MECHATROLINK-II			
		Transmission rate	10 Mbps			
		Transmission cycle	1ms, 1.5ms, 2ms, 3ms, 4ms			
		Data length	17 byte and 32 byte			
	Command input	MECHATROLINK communication	MECHATROLINK-II commands (For sequence, motion, data setting/reference, monitor, adjustment, and other commands)			
	Sequence Input signal	Fixed input	5 points (fixed layout: external latch signal, zero return reduced speed signal, forward drive inhibiting signal, reverse run inhibiting signal, emergency stop signal)			
	Sequence Output signal	Fixed output	2 points (fixed layout: servo alarm, brake interlock)			

Note: *1. Value without external regeneration unit

Junma Pulse Servo Drives

Servo Drive Type		SJDE- □	01APA-OY	02APA-OY	04APA-OY	08APA-OY
Applicable servomotor		SJME-□	01A□	02A□	04A□	08A□
Basic specifications	Max. Applicable Motor capacity	W	100	200	400	750
	Continuous output current	Arms	0.84	1.1	2.0	3.7
	Max. output current	Arms	2.5	3.3	6.0	11.1
	Input power supply (Main circuit and control circuit)	Voltage	Single-phase, 200 to 230 VAC, + 10 to -15% (50/60 Hz)			
		Capacity KVA	0.40	0.75	1.2	2.2
	Control Method		PWM control, sine wave current drive system			
	Feedback		Analogue incremental encoder (10000 steps per revolution)			
	Allowable load inertia*1	kg· m^2	0.6×10^{-4}	3.0×10^{-4}	5.0×10^{-4}	10.0×10^{-4}
	Usage / storage temperature		0 to +55° C / -20 to 70° C			
	Usage / storage humidity		90%RH or less (non-condensing)			
	Altitude		1000 m or less above sea level			
	Vibration/shock Resistance		$4.9m/s^2$ (0.5G) / $19.6m/s^2$ (2G)			
	Configuration		Base mounted			
	Cooling method		Forced cooling (built-in fan)			
	Approx. mass	Kg	0.5			1.0
Built-in functions	Dynamic brake (DB)		Operated at main power OFF, servo alarm, servo OFF.(OFF after motor stops; ON when motor power is off.)			
	Regenerative processing		Optional (If the regenerated energy is too large, install a regenerative unit JUSP-RG08D)			
	LED display		5 (PWE, REF, AL1, AL2, AL3)			
	Reference filter		Select one of eight levels with FIL switch			
	Protection		Speed errors, overload, encoder errors, voltage errors, overcurrents, disablement of the built-in cooling fan, system errors			
I/O Signals	Input signal for reference Designated pulse type and pulse resolution with PULSE switch.	Pulse type	Select one of the following signals: 1. CCW + CW 2. Sign + pulse train 3. CCW + CW (logic reversal) 4. Sign + pulse train (logic reversal)			
		Pulse resolution	Select one of the following signals: 1. 1000 pulses/rev (Open collector/line driver) 75 kpps max. 2. 2500 pulses/rev (Open collector/line driver) 187.5 kpps max. 3. 5000 pulses/rev (Line driver) 375 kpps max. 4. 10000 pulses/rev (Line driver) 750 kpps max.			
	Clear input signal		Clears the positioning error when turned ON			
	Servo ON input signal		Turns the servomotor ON or OFF			
	Alarm output signal		OFF if an alarm occurs. (Note: OFF for 2s when power is turned ON)			
	Brake output signal		External signal to control brakes. Turn ON to release the brake			
	Positioning completed output signal		ON if the current position is equal to the reference position ±10 pulses.External signal to control brakes.			
	Origin output signal		ON if the motor is at the origin. (Width: 1/500 rev) (Note:Use the pulse edge that changes the signal from OFF to ON)			

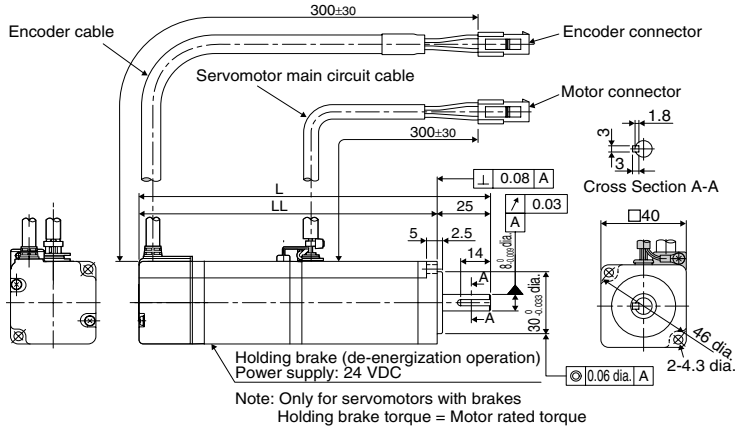
Note: *1. Value without external regeneration unit

Dimensions

Junma servomotors

SJME-01 (200V, 100W)

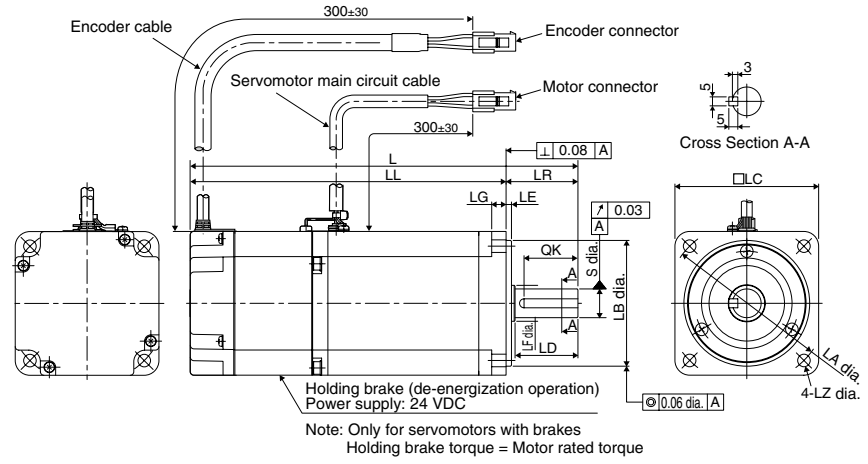
Model	L	LL	Approx. Mass (kg)
SJME-01AMB41-OY	119	94	0.5
SJME-01AMB4C-OY	164	139	0.8



Units: mm

SJME-02, 04, 08 (200V, 200 to 750W)

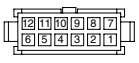
Model	L	LL	LR	LG	LE	S	LB	LC	LD	LF	LA	LZ	QK	Approx. Mass (kg)
SJME-02AMB41-OY	125.5	95.5	30	6	3	$14^{0}_{-0.011}$	$50^{0}_{-0.039}$	60	-	-	70	5.5	20	0.9
SJME-02AMB4C-OY	165.5	135.5												1.5
SJME-04AMB41-OY	148.5	118.5							-	-				1.3
SJME-04AMB4C-OY	188.5	158.5												1.9
SJME-08AMB41-OY	173	133	40	8	3	$16^{0}_{-0.011}$	$70^{0}_{-0.046}$	80	35	20	90	7	30	2.6
SJME-08AMB4C-OY	216	176												3.5



Units: mm

Servomotor connectors

Encoder Connector Specifications



Plug:
5559-12P-210
Terminal:
5558T2(chained) or
5558T2L(detached)
(Manufacture: Molex Japan Co., Ltd)

1	PG5V	Red
2	PG0V(GND)	Black
3	Phase A+	Blue
4	Phase A-	Blue/White
5	Phase B+	Yellow
6	Phase B-	Yellow/White
7	Phase /Z	Purple
8	Phase U	Gray
9	Phase V	Green
10	Phase W	Orange
11	-	-
12	FG	Shield

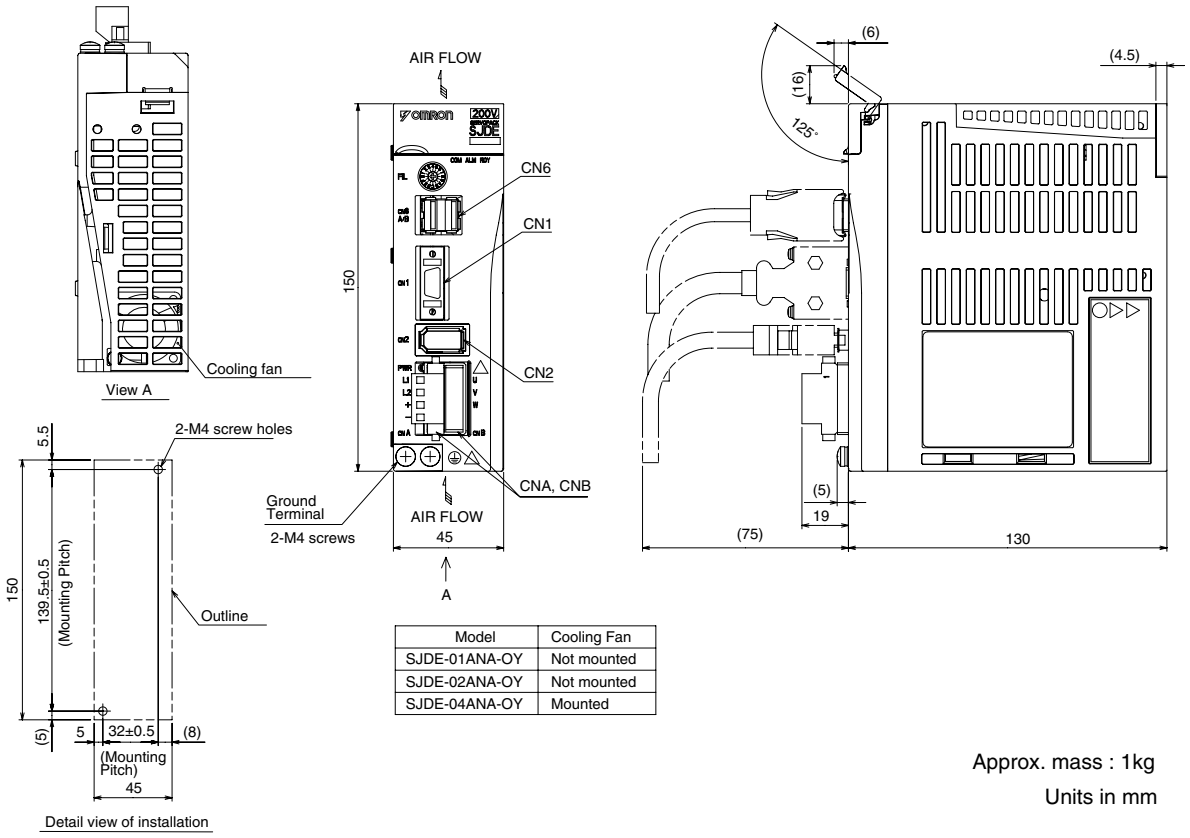
Motor Connector Specifications

Plug:
5559-06P-210
Terminal (No.1 to 3, 5, 6):
5558T(chained) or 5558TL(detached)
Grounding Pin (No.4):
30490-2002(chained) or
30490-2012 (detached)
(Manufacture: Molex Japan Co., Ltd)

	No brake		With brake	
1	Phase U	Red	Phase U	Red
2	Phase V	White	Phase V	White
3	Phase W	Blue	Phase W	Blue
4	F G	Green/Yellow	F G	Green/Yellow
5	-	-	Brake	Red
6	-	-	Brake	Black

Junma MECHATROLINK-II servo drives

SJDE-01, 02, 04ANA-OY (200V, 100 to 400W)

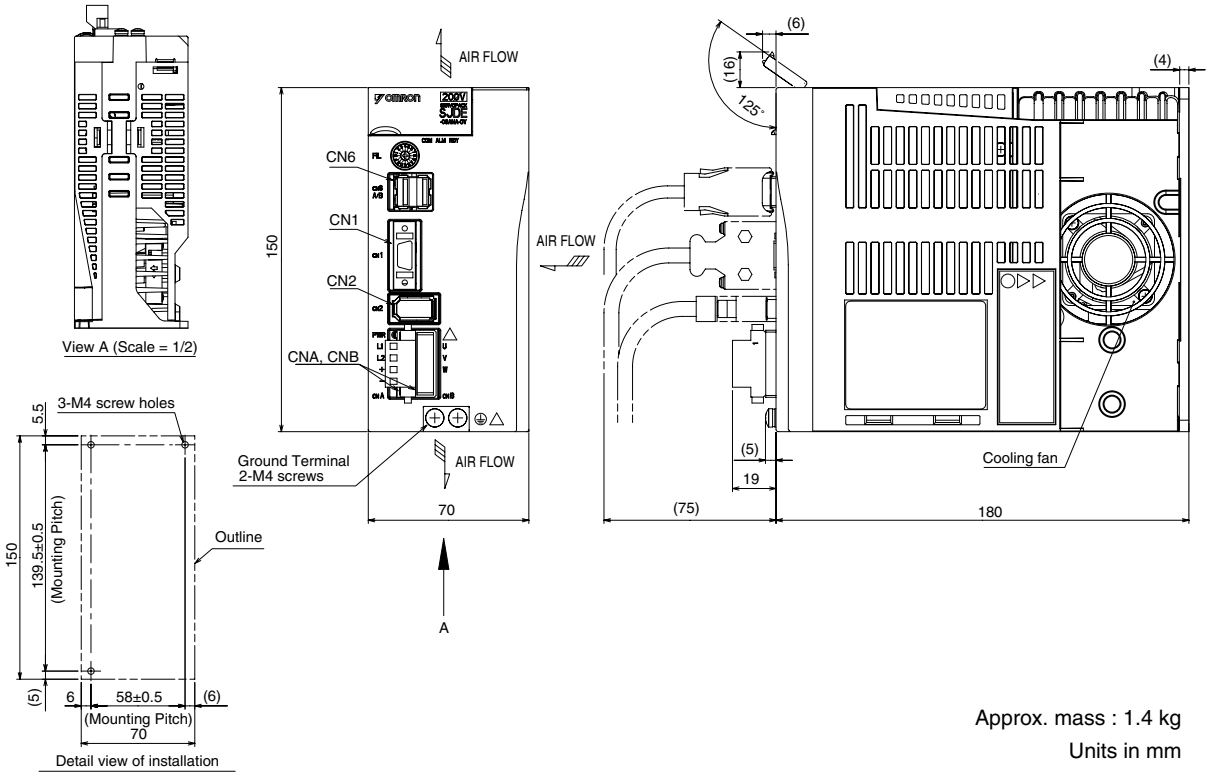


Model	Cooling Fan
SJDE-01ANA-OY	Not mounted
SJDE-02ANA-OY	Not mounted
SJDE-04ANA-OY	Mounted

Approx. mass : 1kg

Units in mm

SJDE-08ANA-OY (200V, 750W)

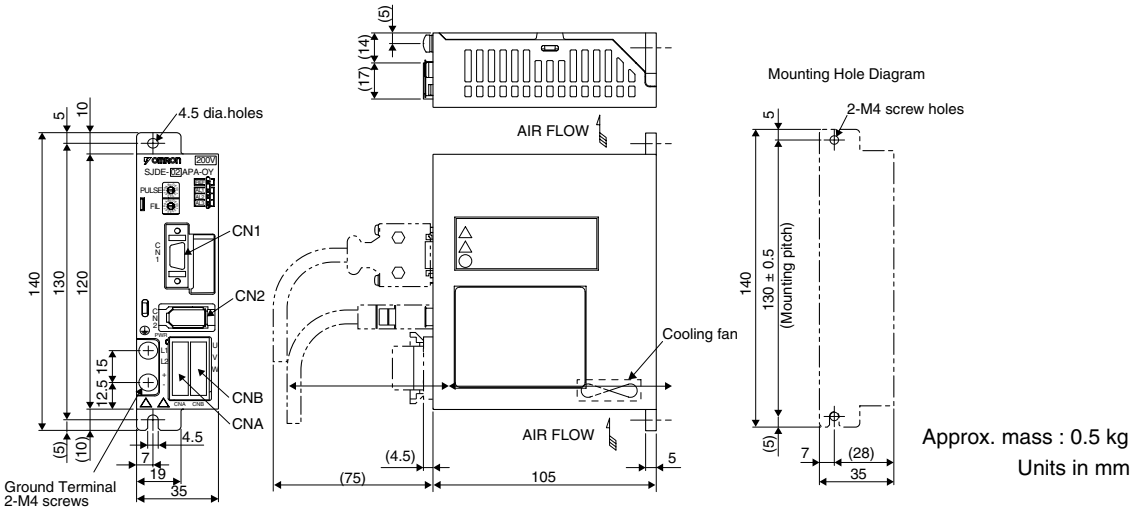


Approx. mass : 1.4 kg

Units in mm

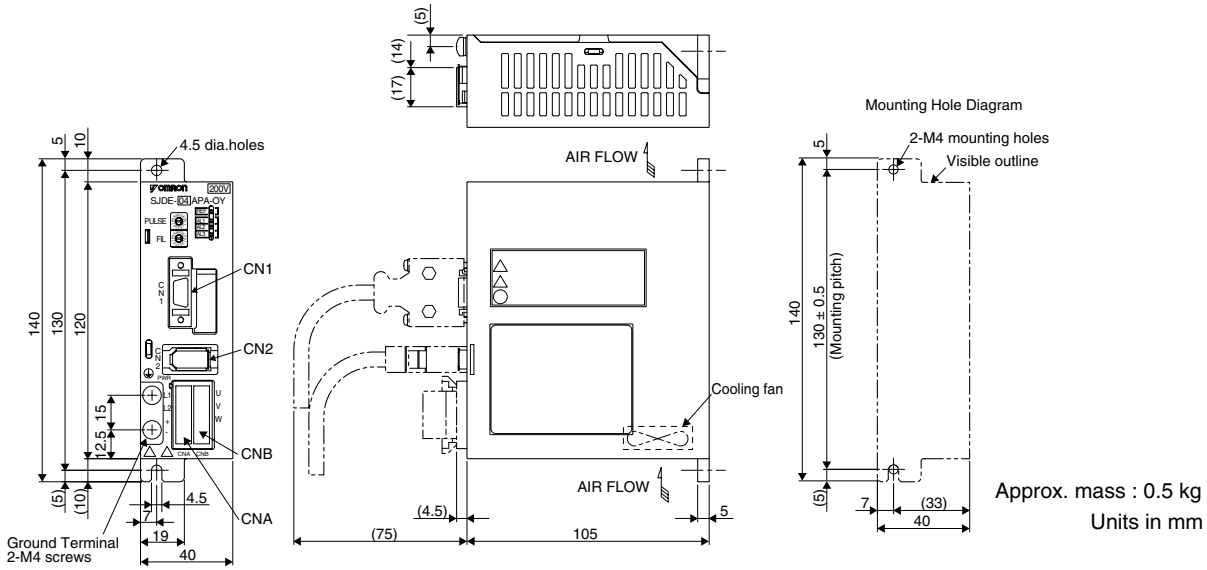
Junma pulse control servo drives

SJDE-01, 02APA-OY (200V, 100 to 200W)



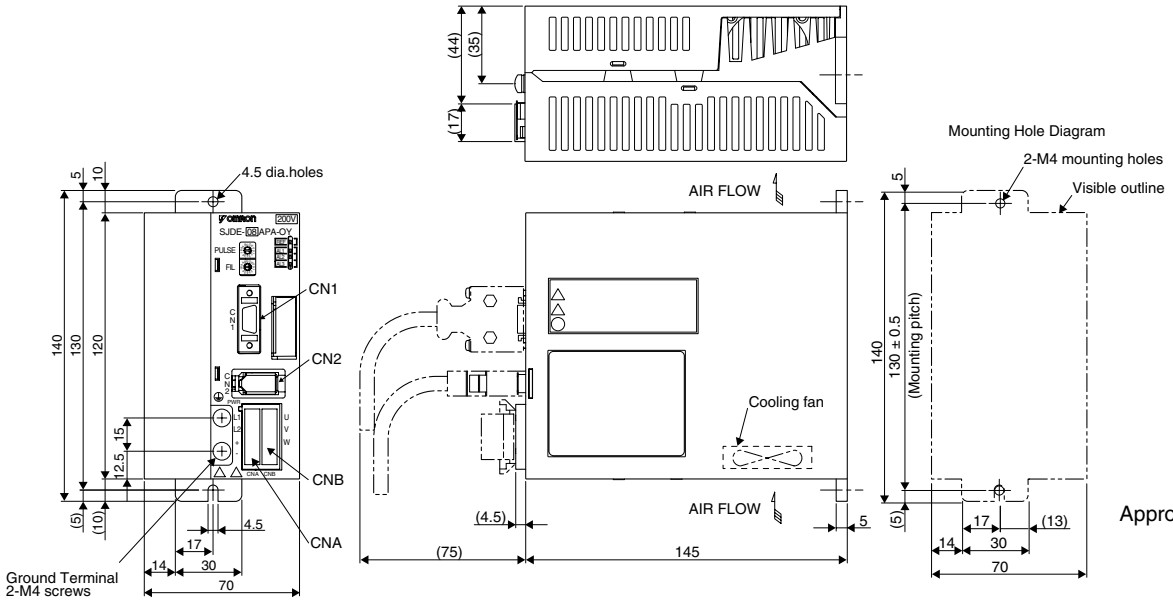
Approx. mass : 0.5 kg
Units in mm

SJDE-04APA-OY (200V, 400W)



Approx. mass : 0.5 kg
Units in mm

SJDE-08APA-OY (200V, 800W)



Approx. mass : 1 kg
Units in mm