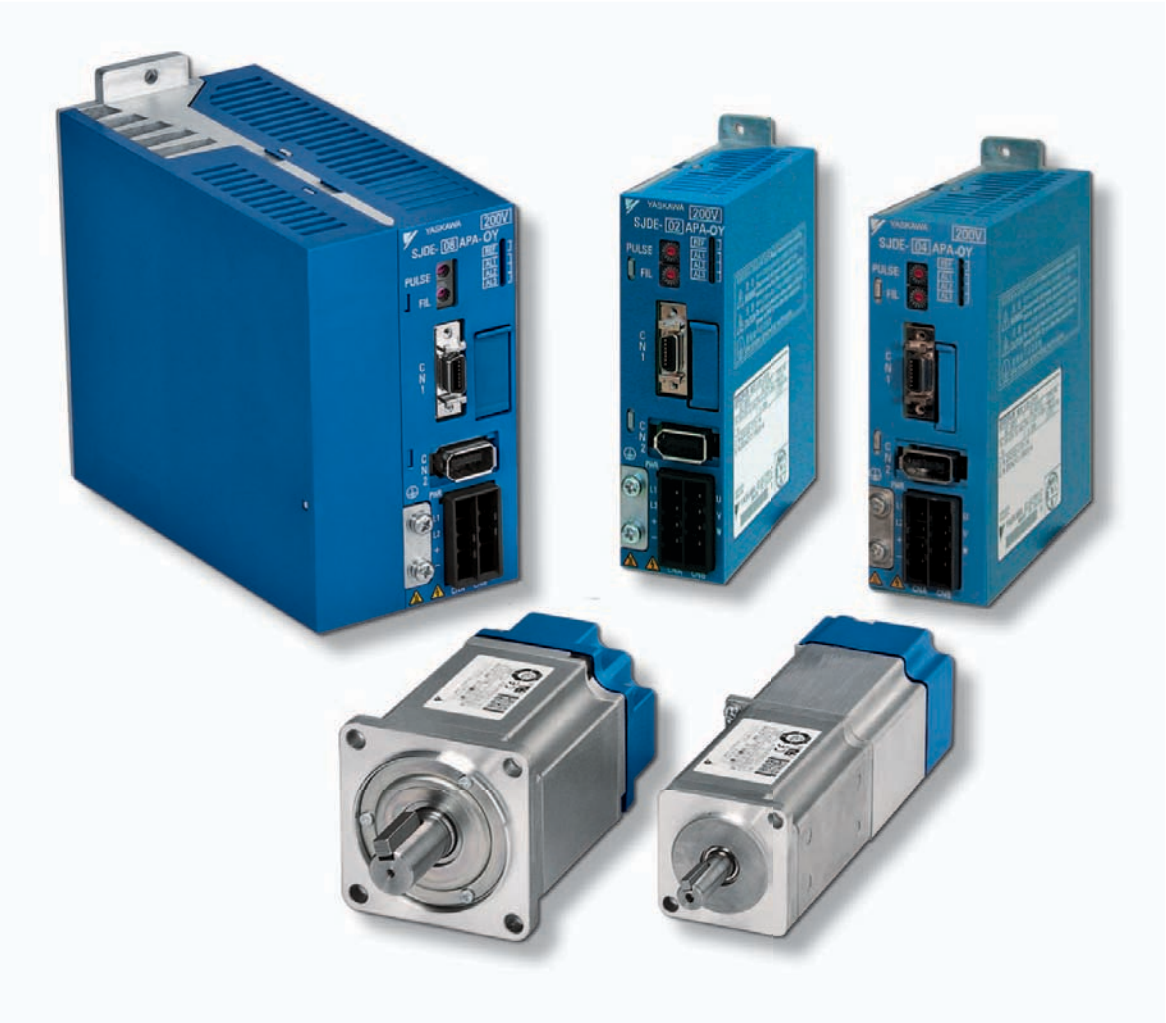
Junma Series Servo

YASKAWA™

SJME Servo Motor
SJDE SERVOPACK
Pulse Reference Control

New Servo Concept: Junma



Junma uses the world's premier servo technology to provide unmatched performance with a quick and efficient setup.

This totally new plug and play design concept requires no parameter settings or gain adjustments.

Adaptive tuning and vibration suppression functionality simplify machine commissioning while maintaining steady high-precision positioning and optimum efficiency.

Junma's ready-to-use features for high-speed, high-torque, and high-precision operation are ready to work for you.

Junma Features

- **Attain optimum servo performance without time consuming setup:**
  - Connect and go! Matched motor and amplifier sets simplify setup
  - System parameters are set on system power-up
  - Machine load inertia is calculated automatically
  - Tuning gains are adjusted dynamically, even when the load changes
  - Mechanical vibrations are suppressed with the turn of a rotary switch

- **Input voltage: 120 or 240 VAC (single phase)**

- **Feedback resolution: 65,536 pulses/rev**

- **Control input: pulse and direction**

- **High torque output at speeds up to 4500 RPM**

- **Advanced control functionality:**
  - Adaptive tuning
  - Vibration suppression
  - Jogging
  - Homing to marker pulse
  - Electronic gearing
  - Torque limiting
  - Position complete output

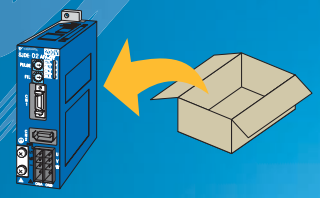
- **JunmaWin software diagnostic tools:**
  - Alarm history
  - Troubleshooting wizard
  - Extensive monitoring capability

- **Conforms to international standards:**

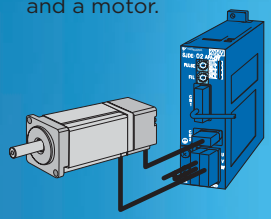
c UL us CE RoHS

FAST & EASY SETUP

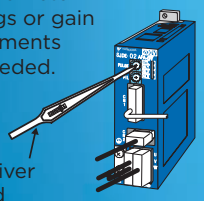
1 Unpacking
Remove the servo amplifier from the box.



2 Installation and Wiring
Connect the cables for the power supply, signal lines, and a motor.

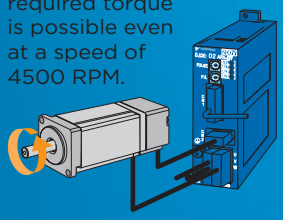


3 Reference Pulse Setting
Select the reference pulse switch for your controller. No parameter settings or gain adjustments are needed.



Screwdriver provided

4 Setup completion
The motor is ready to run with the reference from the controller. The required torque is possible even at a speed of 4500 RPM.



Ratings and Specifications

Junma Servo Motors

Voltage		100/200 VAC			
Servo motor Model SJME-□□A		**01**	**02**	**04**	**08**
Applicable Servo Amplifier	SJDE-□□A	01	02	04	08
Rated output *1	W	100	200	400	750
Rated torque *1, *2	Nm	0.318	0.637	1.27	2.39
Instantaneous peak torque*1	Nm	0.955	1.91	3.82	7.16
Rated current *1	A_{rms}	0.84	1.1	2.0	3.7
Instantaneous max. current *1	A_{rms}	2.5	3.3	6.0	11.1
Rated speed *1	RPM	3000 (for 200V models)*3			
Max. speed *1	RPM	4500 (for 200V models)*3			
Torque constant	Nm/A_{rms}	0.413	0.645	0.682	0.699
Rotor moment of inertia	$kg•m^2$	0.0634×10^{-4}	0.330×10^{-4}	0.603×10^{-4}	1.50×10^{-4}
Rated power rate *1	kW/s	16.0	12.3	26.7	38.1
Rated angular acceleration *1	rad/s^2	50200	19300	21100	15900
Time rating		Continuous			
Thermal class		B			
Vibration class		15μm 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)			
Impact resistance		Impact acceleration: 490 m/s^2 in three directions – vertical, side to side, and front to back. Impact occurrences: 2			
Vibration resistance		Vibration acceleration: 49 m/s^2 in three directions – vertical, side to side, and front to back.			

*1 These items and speed/torque characteristics quoted in combination with a SJDE servo amplifier are at an armature winding temperature of 100 °C. Other values are 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 Refer to the Speed/Torque Characteristics for rated speed and maximum speed for 100V models.

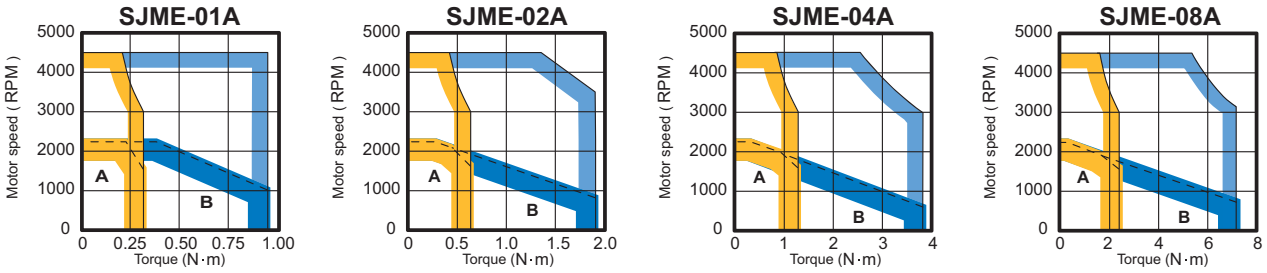
Holding Brake Specifications

Servo motor Model SJME-□□A		01	02	04	08
Rated voltage		24 VDC ±10%			
Holding brake moment of inertia*	$kg•m^2 \times 10^{-4}$	0.0075	0.064		0.171
Capacity	W	6	6.9		7.7
Minimum holding torque (Static friction torque)	Nm	0.318	1.27		2.39
Coil resistance	Ω (at 20 °C)	96	83		75
Rated current	A (at 20 °C)	0.25	0.29		0.32
Brake release time	ms	80 max.			
Rise time for holding torque	ms	100 max.			

* To obtain the motor moment of inertia with a brake, add the holding brake moment of inertia to the rotor moment of inertia. The rated power rate and angular acceleration of the motor will change according to the motor moment of inertia.

Notes:
1 The holding brake is only used to hold the load and cannot be used to stop the servo motor.
2 Do not use the holding brake when the servo is on. Failure to observe this caution may result in an overload of the servo amplifier or a decrease of brake life.

Speed/Torque Characteristics



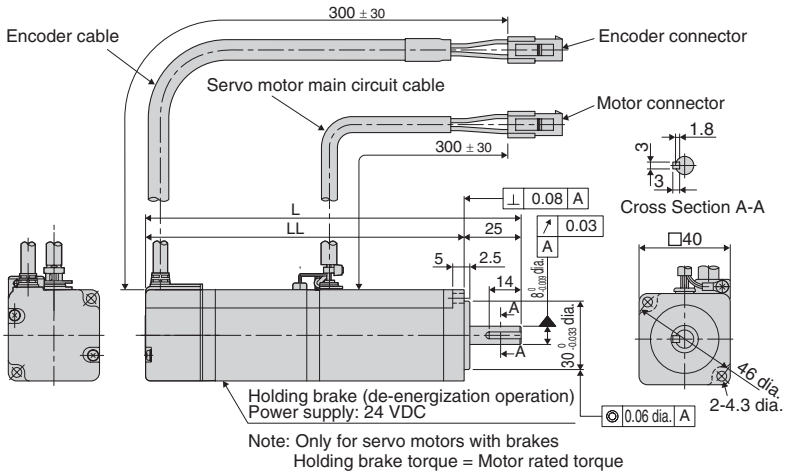
A: Continuous Duty Zone B: Intermittent Duty Zone

Note: Solid lines show the torque/speed characteristics of the servo motor at 200V and the broken lines show them at 100V.

Dimensions

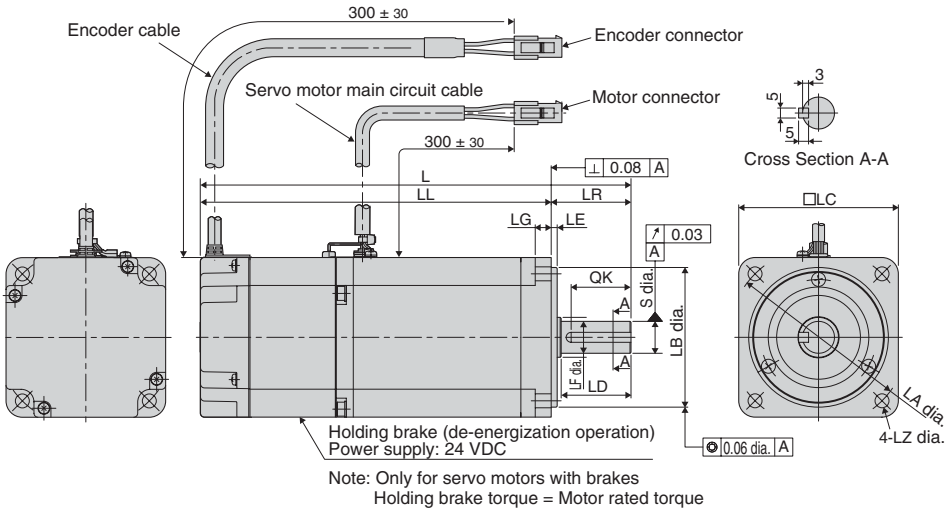
Units: mm

100 W



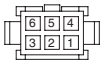
Type SJME-	L	LL	Approx. mass (kg)
01AMB41	119	94	0.5
01AMB4C	164	139	0.8

200 W to 750 W



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

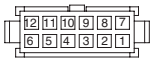
Motor Connector Specifications



Pin	No brake		With brake	
	Description	Color	Description	Color
1	Phase U	Red	Phase U	Red
2	Phase V	White	Phase V	White
3	Phase W	Blue	Phase W	Blue
4	FG	Green/ Yellow	FG	Green/ Yellow
5	–	–	Brake	Red
6	–	–	Brake	Black

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

Encoder Connector Specifications



Pin	Description	Color
1	PG 5V	Red
2	PG 0V (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

Plug: 5559-12P-210
Terminal: 5558T2 (reel) or 5558T2L (bagged)
(Manufactured by: Molex Japan Co., Ltd)

Ratings and Specifications

Junma SERVOPACKS

Servo Amplifier Model SJDE-□□OY			01APA	02APA	04APA	08APA
Max. applicable servo motor capacity W			100	200	400	750
Continuous output current A_{rms}			0.84	1.1	2.0	3.7
Instantaneous max. output current A_{rms}			2.5	3.3	6.0	11.1
Input power supply (for main circuit and control circuit)	Voltage		Single-phase 100 to 115 VAC, +10 to −15% ; Single-phase 200 to 230 VAC, +10 to −15%			
	Frequency		50/60 Hz ± 5%			
	Voltage frequency capacity at rated output kVA		0.40	0.75	1.2	2.2
Power loss at rated output W			14	16	24	35
Input control method			Capacitor-input type, single-phase full-wave rectification with resistance to prevent inrush current			
Output control method			PWM control, sine wave power driven system			
Feedback			Incremental encoder			
Allowable load inertia*1 kg•m²			0.6 x 10^{-4}	3 x 10^{-4}	5 x 10^{-4}	10 x 10^{-4}
I/O signals	Input signal for reference (designated pulse type and pulse resolution with PULSE switch)	Pulse type	Select one of the following settings: 1. CCW + CW pulse train 2. Sign + pulse train 3. CCW + CW pulse train (negative logic) 4. Sign + pulse train (negative logic)			
		Pulse resolution	Select one of the following settings: 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 at the rising edge of the pulse			
	Servo ON input signal		Turns the servo motor on or off			
	Alarm output signal		OFF if an alarm occurs			
	Brake output signal		External signal to control brakes. Turn ON to release the brake.			
	Position completed output signal		ON if the current position is equal to the reference position ±10 pulses			
	Origin output signal		ON if the motor is at the origin (width: 1/500 rev)			
Built-in functions	Dynamic brake (DB)		Operated at main power OFF, servo alarm, servo OFF (OFF after motor stops; ON if the motor power is off)			
	Regenerative processing		Optional (if the regenerative energy is too large, install a regenerative unit)			
	Protection*2		Speed errors, overload, encoder errors, voltage errors, overcurrents, disablement of the built-in cooling fan, system errors			
	Display		Five LED indicators (PWR, REF, AL1, AL2, AL3)			
	Reference filter		Select one of eight levels with FIL switch			
Cooling method			Forced cooling (built-in fan)			
Operating temperature			0 °C to +55 °C			
Operating humidity			90% RH or less (no condensation)			
Storage temperature			−20 °C to +70 °C			
Storage humidity			90% RH or less (no condensation)			
Installation site			Free of corrosive gases; Free of dust and iron powder; Clean and dry			
Altitude			1000 m or below			
Vibration resistance			4.9 m/s²			
Shock resistance			19.6 m/s²			
Operating conditions			Installation category (overvoltage category): II; Pollution degree: 2 Protection class: IP1X (EN50178)			

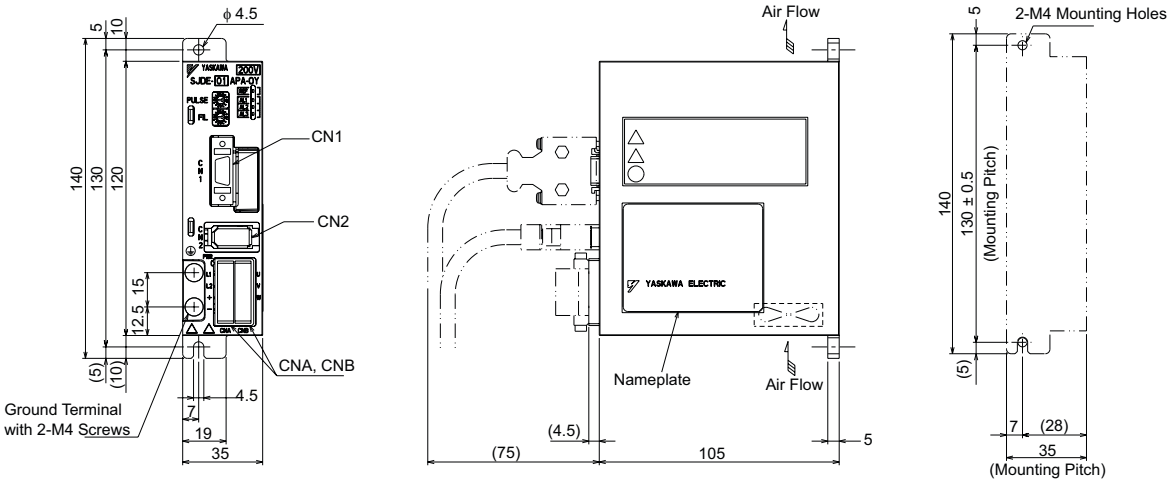
*1 Be sure to use the motor within the allowable load moment of inertia. The motor will become unstable if the load moment of inertia exceeds the allowable value.

*2 The ground protection circuit is designed for ground fault inside the motor windings while the motor is running. Therefore, it may not protect the system under the following cases:
- A low-resistance ground fault occurs in the main circuit cable or in the connector of the cable for the servo motor.
- The power supply is turned on during a ground fault.

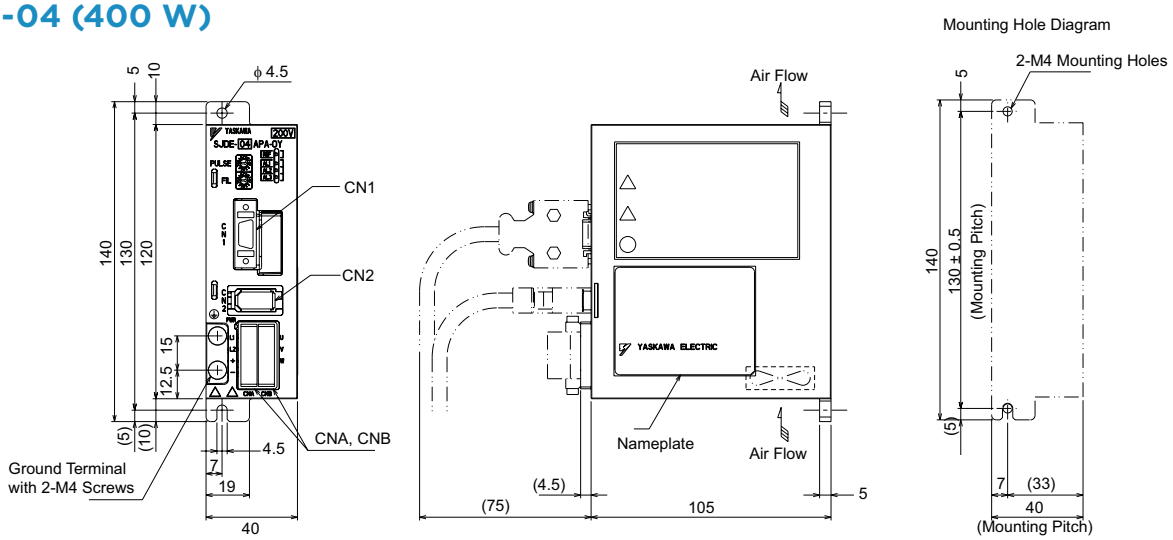
Dimensions

Units: mm

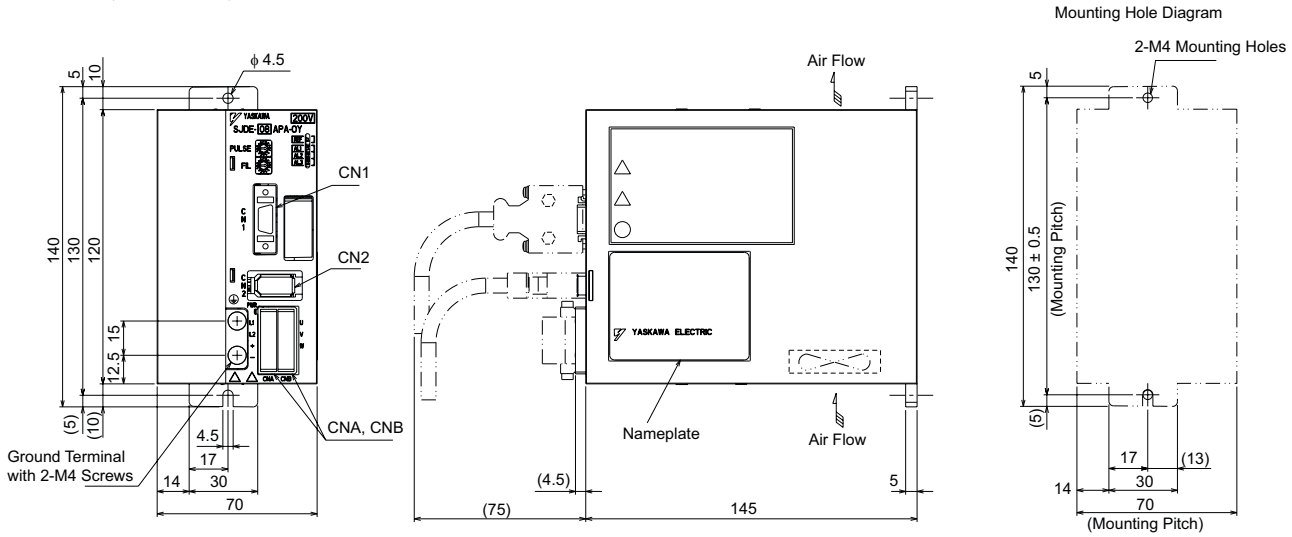
SJDE-01, 02 (100 W, 200 W)



SJDE-04 (400 W)

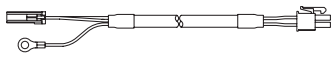
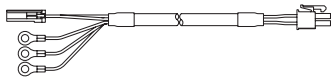


SJDE-08 (750 W)

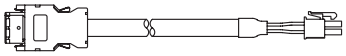


Cable/Connector Selection

Power Cables

Specifications			Model	Appearance
Servo Motor Main Circuit Cables with Connectors at Both Ends	Without holding brake	3 m	JZSP-CHM000-03	
		5 m	JZSP-CHM000-05	
		10 m	JZSP-CHM000-10	
		15 m	JZSP-CHM000-15	
		20 m	JZSP-CHM000-20	
	With holding brake	3 m	JZSP-CHM030-03	
		5 m	JZSP-CHM030-05	
		10 m	JZSP-CHM030-10	
		15 m	JZSP-CHM030-15	
		20 m	JZSP-CHM030-20	

Encoder Cables

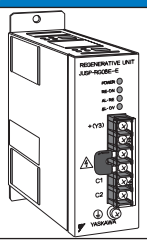
Specifications		Model	Appearance
Encoder Cables with Connectors at Both Ends (shielded)	3 m	JZSP-CHP800-03	
	5 m	JZSP-CHP800-05	
	10 m	JZSP-CHP800-10	
	15 m	JZSP-CHP800-15	
	20 m	JZSP-CHP800-20	

Connectors for Power and Encoder

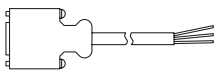
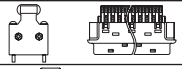
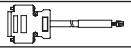
Specifications	Type		Model	Appearance
Connector Kits for Servo Motor Main Circuit Cable*1	Servo motor side	Crimp Type	JZSP-CHM9-1 *2	
	Servo amplifier side (CNB)	Spring Type	JZSP-CHM9-2 *3	
Power Supply and Regenerative Unit Connector Kits	Servo amplifier side (CNA)	Spring Type	JZSP-CHG9-1 *3	
Encoder Cable Connector Kits*1	Servo motor side	Crimp Type	JZSP-CHP9-1 *2	
	Servo amplifier side (CN2)	Soldered Type	JZSP-CHP9-3	

*1 Sold separately. If making cable assemblies, these connectors are necessary.
*2 Crimping tool required.
*3 With tool (lever for wiring).

Regenerative Unit

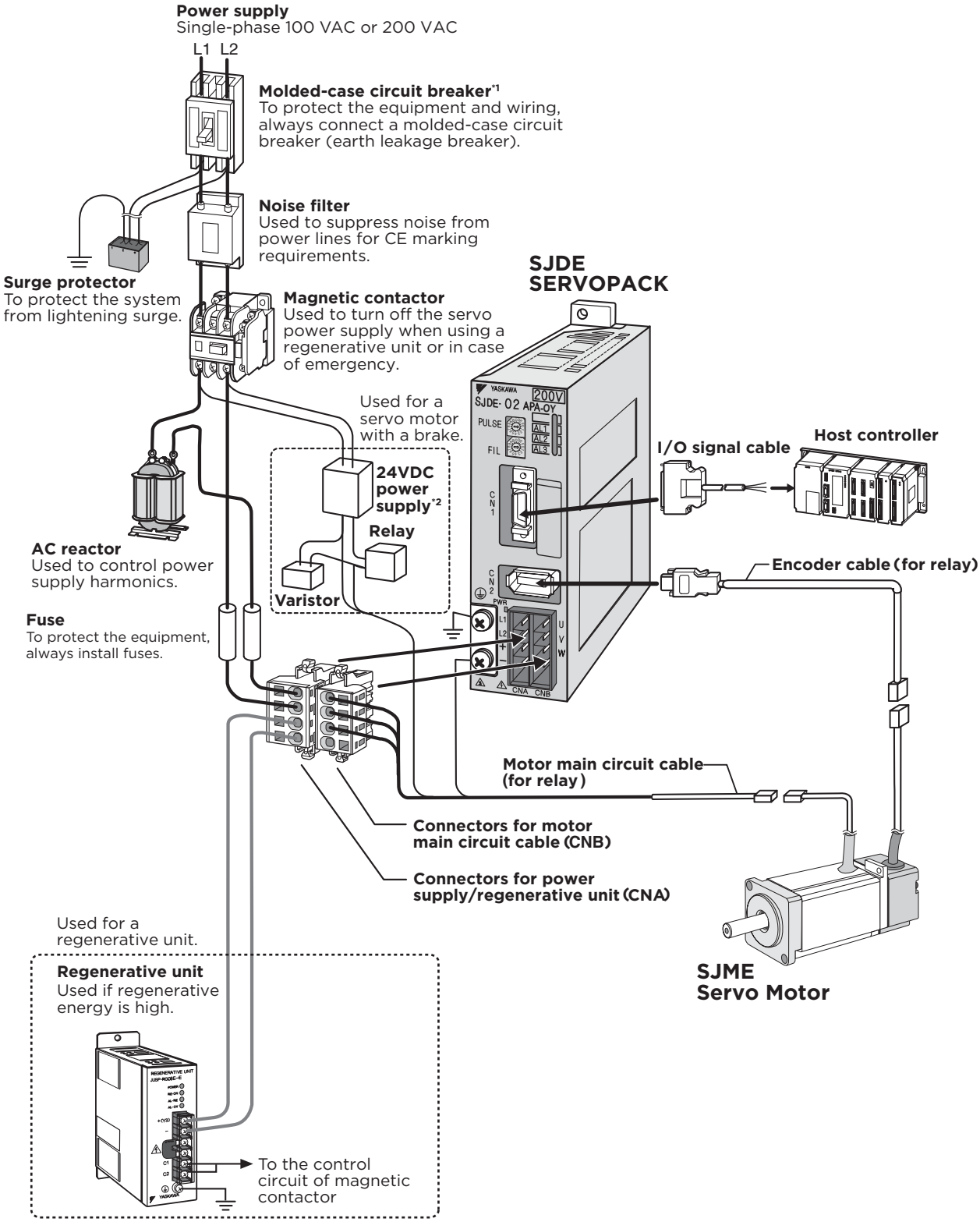
Description	Specifications	Model	Appearance
Regenerative Unit for Servo Amplifier (CNA)	Resistance: 50 Ω	JUSP-RG08E-E	
	Allowable Regenerative Energy: 12 W		
	Regenerative Voltage: 380 VDC		
	Regenerative Current: 8 ADC		
	Error Detection: Disconnection of regenerative resistance, failure of regenerative transistor, or overvoltage		
	Alarm Output: NC contact (opens when an error is detected). Contact specifications: 250 VAC, 1.5 A (inductive load)		

Signal and Communication Cables

Name	Type		Length	Model	Appearance
I/O Signal Cables			1 m	JZSP-CHI003-01	
			2 m	JZSP-CHI003-02	
			3 m	JZSP-CHI003-03	
I/O Signal Connector Kits*1	For Servo amplifier CN1	Soldered Type	–	JZSP-CHI9-1	
Cable for Personal Computer			2 m	JZSP-CPS00-02	
PC Communication Board (Required for Setup with JunmaWin Software)				JUSP-JC001-1	

*1: Sold separately. If making cable assemblies, these connectors are necessary.

System Configuration Diagram

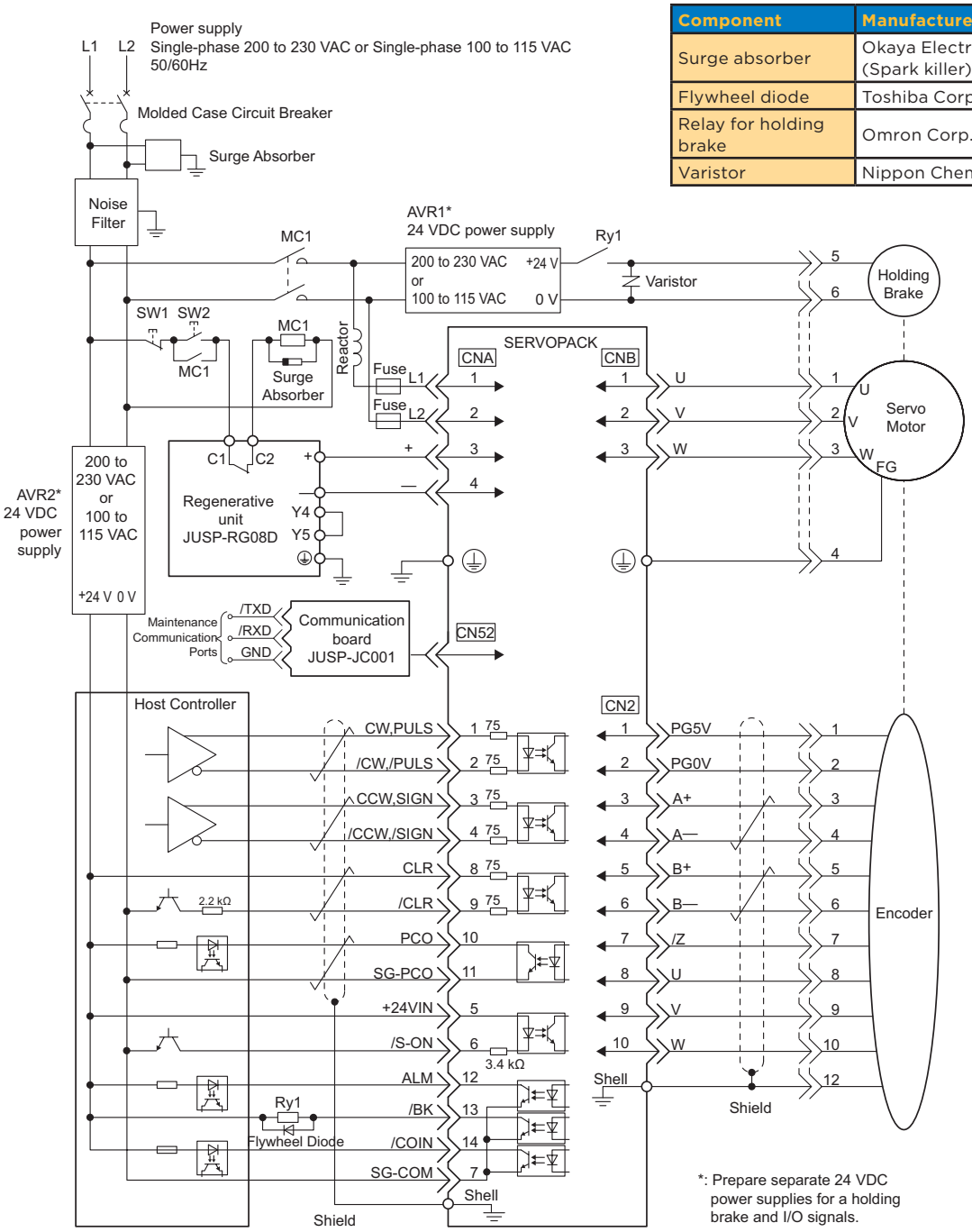


*1: Install a ground fault interrupter to protect against both overloads and short circuits, or install a ground fault interrupter for ground fault protection and a molded case circuit breaker.

*2: Prepare a 24VDC power supply for holding brake and I/O signals.

Connection Diagram

SJDE SERVOPACK



Manufacturers of Components

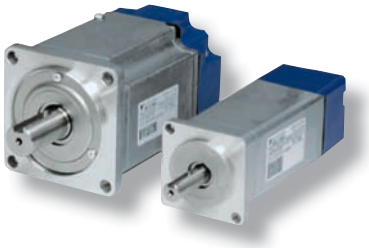
Component	Manufacturer	Model
Surge absorber	Okaya Electric Industries Co., Ltd. (Spark killer)	CRE-50500
Flywheel diode	Toshiba Corp.	1NH42
Relay for holding brake	Omron Corp.	MY series
Varistor	Nippon Chemi-Con Corp.	TNR7V121K

Notes: 1 AVR1 : 24 VDC power supply for holding brake
SW1 : Power off switch
MC1 : Magnetic contactor
AVR2 : 24 VDC power supply for I/O signals
SW2 : Power on switch
Ry1 : Relay for holding brake

2 The ground fault protection circuit is designed for ground fault inside the motor windings while the motor is running. Therefore, it may not protect the system under the following cases.
- A low-resistance ground fault occurs in the main circuit cable or in the connector of the cable for the servo motor.
- The power supply is turned on during a ground fault.

To make your system even safer, install a ground fault interrupter for overloads and short circuits, or install a molded-case circuit breaker combined with a ground fault interrupter for ground faults.

Model Number Designations



Junma Servo Motor
3,000 rpm - 4,500 rpm
(100 – 750 W)

Servo Motor Model Designation

SJME - 02 A M B 4 1

Junma Series Servo Motor

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

Voltage	
Specification	Code
100/200 VAC	A

Brake Specifications	
Specification	Code
No Brake	1
24 VDC Brake	C

Shaft end Specifications	
Specification	Code
Straight with key	4

Design procedure	
Specification	Code
Standard	B

Feedback specification	
Specification	Code
Analog output encoder	M

Junma
Servo Amplifier

Servo Amplifier Model Designation

SJDE - 02 A P A - OY

Junma Series
Servo Amplifier

Design Revision Order
A, B...

Applicable Servo Motor Capacity	
Output (W)	Code
100	01
200	02
400	04
750	08

Interface Specification	
Specification	Code
Pulse Reference Control	P

Power Supply Voltage	
Specification	Code
100/200 VAC	A

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Drives & Motion Division

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