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## ■ General Specifications (For 30- to 750-W Models)

| Item | Specifications |
|---|---|
| Operating ambient temperature | 0°C to 55°C |
| Operating ambient humidity | 35% to 85% RH (with no condensation) |
| Storage ambient temperature | −10°C to 75°C |
| Storage ambient humidity | 35% to 85% RH (with no condensation) |
| Storage and operating atmosphere | No corrosive gasses. |
| Vibration resistance | 10 to 55 Hz in X, Y, and Z directions with 0.10-mm double amplitude; acceleration: 0.5 G {4.9 m/s$^2$} max.; time coefficient: 8 min; 4 sweeps (See note 1.) |
| Impact resistance | Acceleration 2 G {19.6 m/s$^2$} max., in X, Y, and Z directions, three times |
| Insulation resistance | Between power line terminals and case: 5 MΩ min. (at 1,000 VDC) |
| Dielectric strength | Between power line terminals and case: 1,000 VAC for 1 min (20 mA max.) at 50/60 Hz |
| Protective structure | Built into panel. |

Note:
1. Vibration may be amplified due to sympathetic resonance of machinery, so use the Servomotor under conditions which will not exceed 0.5 G {4.9 m/s$^2$} over a long period of time.
2. The above items reflect individual evaluation testing. The results may differ under compounded conditions.
3. Absolutely do not conduct a withstand voltage test or other Megger tester tests on the Servo driver. If such tests are conducted, internal elements may be damaged.
4. Depending on the operating conditions, some Servo Driver parts will require maintenance. Refer to the relevant operation manual for details.

## ■ Performance Specifications (30- to 750-W Analog Input Models)

| Model | | 200 V | | | | | | 100 V | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | R88D -UA02HA | R88D -UA03HA | R88D -UA04HA | R88D -UA08HA | R88D -UA12HA | R88D -UA20HA | R88D -UA03LA | R88D -UA04LA | R88D -UA10LA | R88D -UA12LA | R88D -UA15LA |
| Continuous output current (0-P) | | 0.6 A | 0.85 A | 1.2 A | 2.8 A | 3.7 A | 6.2 A | 0.9 A | 1.3 A | 3.1 A | 3.8 A | 4.8 A |
| Momentary maximum output current (0-P) | | 1.8 A | 2.7 A | 4.0 A | 8.5 A | 11.3 A | 19.7 A | 2.8 A | 4.1 A | 10 A | 12 A | 15 A |
| Input power supply | | Single-phase 200/230 VAC (170 to 253 V) 50/60 Hz | | | | | | Single-phase 100/115 VAC (85 to 127 V) 50/60 Hz | | | | |
| Control method | | All-digital servo | | | | | | | | | | |
| Speed feedback | | Incremental encoder (magnetic), 2,048 pulses/revolution | | | | | | | | | | |
| Applicable load inertia INC (see note) | | Maximum of 30 times motor's rotor inertia | | | | Maximum of 20 times motor's rotor inertia | | Maximum of 30 times motor's rotor inertia | | | | Maximum of 20 times mo-tor's rotor inertia |
| Inverter method | | PWM method based on IGBT | | | | | | | | | | |
| PWM frequency | | 11 kHz | | | | | 7.8 kHz | 11 kHz | | | | 7.8 kHz |
| Applicable Servomotor INC (see note) | | R88M-U03030HA | R88M-U05030HA | R88M-U10030HA | R88M-U20030HA | R88M-U40030HA | R88M-U75030HA | R88M-U03030LA | R88M-U05030LA | R88M-U10030LA | R88M-U20030LA | R88M-U30030LA |
| Applicable Servomotor wattage | | 30 W | 50 W | 100 W | 200 W | 400 W | 750 W | 30 W | 50 W | 100 W | 200 W | 300 W |
| Weight | | Approx. 0.9 kg | | | | Approx. 1.2 kg | Approx. 1.5 kg | Approx. 0.9 kg | | | Approx. 1.2 kg | Approx. 1.5 kg |
| Capacity | Speed control range | 1:5000 | | | | | | | | | | |
| | Speed fluctuation rate (load character-istic) | 0.01% at 0 to 100% (at rated rotation speed) | | | | | | | | | | |
| | Speed fluctuation rate (voltage character-istic) | 0% at input voltage of 170 to 253 VAC | | | | | | 0% at input voltage of 85 to 127 VAC | | | | |
| | Speed fluctuation rate (tempera-ture character-istic) | ±0.2% max. at 0 to 50°C | | | | | | | | | | |
| | Frequency character-istics | 250 Hz (at the same load as the rotor inertia) | | | | | | | | | | |
| | Torque control reprodu-cibility | ±2.0% | | | | | | | | | | |
| | Accelera-tion time setting | 0 to 10 s (Acceleration and deceleration times are set separately) | | | | | | | | | | |

(This table continues on the next page.)

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# Servo Driver Specifications

Specifications Table – continued from previous page

| | | |
|---|---|---|
| Input signal | Speed command voltage | ±2 to 10 VDC (motor rotation by +command) / rated rotation speed<br>Input impedance: Approx. 30 kΩ; circuit time constant: Approx. 47 μs |
| | Torque command voltage | ±1 to 10 VDC / rated torque<br>Input impedance: Approx. 30 kΩ; circuit time constant: Approx. 47 μs |
| | Sequence input | Run command, gain deceleration, forward/reverse current limit, forward/reverse drive prohibit, alarm reset, 24-VDC, 5-mA photocoupler input, external power supply: 24±1 VDC, 50 mA min. |
| Output signal | Position feedback output | A-, B-, Z-phase line driver output (EIA RS-422A)<br>A-phase and B-phase (dividing rate setting): 16 to N pulses/revolution, N=2,048 (incremental)<br>Z-phase: 1 pulse/revolution |
| | Speed monitor output | 0.5 V/1000 r/min |
| | Current monitor output | 0.5 V/100% |
| | Sequence output | Alarm output, alarm code output, motor rotation detection, brake interlock, speed conformity, open collector output, 30 VDC, 50 mA (except for alarm code output, which is 30 VDC, 20 mA) |
| Dynamic brake stopping | | Operates when the power supply turns off, a servo alarm is generated or an overrun occurs. |
| Protective functions | | Overcurrent, grounding, overload, overvoltage, overspeeding, A/D errors, transmission errors, encoder errors, overrun prevention |

Note: INC: Servomotor with Incremental Encoder attached.

## ■ Performance Specifications (30- to 750-W Pulse Train Input Models)

| Model | | 200 V | | | | | | 100 V | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | R88D -UP02HA | R88D -UP03HA | R88D -UP04HA | R88D -UP08HA | R88D -UP12HA | R88D -UP20HA | R88D -UP03LA | R88D -UP04LA | R88D -UP10LA | R88D -UP12LA | R88D -UP15LA |
| Continuous output current (0-P) | | 0.6 A | 0.85 A | 1.2 A | 2.8 A | 3.7 A | 6.2 A | 0.9 A | 1.3 A | 3.1 A | 3.8 A | 4.8 A |
| Momentary maximum output current (0-P) | | 1.8 A | 2.7 A | 4.0 A | 8.5 A | 11.3 A | 19.7 A | 2.8 A | 4.1 A | 10 A | 12 A | 15 A |
| Input power supply | | Single-phase 200/230 VAC (170 to 253 V) 50/60 Hz | | | | | | Single-phase 100/115 VAC (85 to 127 V) 50/60 Hz | | | | |
| Control method | | All-digital servo | | | | | | | | | | |
| Speed feedback | | Incremental encoder (magnetic), 2,048 pulses/revolution | | | | | | | | | | |
| Applicable load inertia | | Maximum of 30 times motor's rotor inertia | | | | Maximum of 20 times motor's rotor inertia | | Maximum of 30 times motor's rotor inertia | | | | Maximum of 20 times motor's rotor inertia |
| Inverter method | | PWM method based on IGBT | | | | | | | | | | |
| PWM frequency | | 11 kHz | | | | | 7.8 kHz | 11 kHz | | | | 7.8 kHz |
| Applicable Servomotor | | R88M-U03030HA | R88M-U05030HA | R88M-U10030HA | R88M-U20030HA | R88M-U40030HA | R88M-U75030HA | R88M-U03030LA | R88M-U05030LA | R88M-U10030LA | R88M-U20030LA | R88M-U30030LA |
| Applicable Servomotor wattage | | 30 W | 50 W | 100 W | 200 W | 400 W | 750 W | 30 W | 50 W | 100 W | 200 W | 300 W |
| Weight | | Approx. 0.9 kg | | | | Approx. 1.2 kg | Approx. 1.5 kg | Approx. 0.9 kg | | | Approx. 1.2 kg | Approx. 1.5 kg |
| Capacity | Maximum response pulse frequency | 200 kpps | | | | | | | | | | |
| | Position loop gain | 1 to 500 (1/s) | | | | | | | | | | |
| | Electrical gear function | Electrical gear ratio range: 0.01 ≦ (G1/G2) ≦ 100 (G1, G2 = 1 to 65, 535) | | | | | | | | | | |
| | Positioning completed width | 0 to 250 (command units) | | | | | | | | | | |
| | Feed forward compen-sation | 0 to 100% of the speed command (pulse frequency) | | | | | | | | | | |
| | Bias setting | 0 to 450 r/min | | | | | | | | | | |
| | Position accel/decel time constant setting | 0 to 64 ms (acceleration and deceleration are set the same) | | | | | | | | | | |

(This table continues on the next page.)

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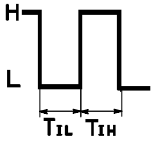
Specifications Table – continued from previous page

| | | |
|---|---|---|
| Input signal | Position command pulse input (See note.) | TTL line driver input photo isolation input power supply 6 mA to 3 V. Feed pulse/forward, reverse signal, forward pulse/reverse pulse, 90° disparity (A-, B-phase) signal. |
| | Deviation counter reset | TTL line driver input photo isolation input power supply 6 mA to 3 V. |
| | Sequence input | Run command, gain deceleration, forward/reverse current limit, forward/reverse drive prohibit, alarm reset, 24-VDC, 5-mA photocoupler input, external power supply: 24±1 VDC, 50 mA min. |
| Output signal | Position feedback output | A-, B-, Z-phase line driver output (EIA RS-422A)<br>A-phase and B-phase (dividing rate setting): 16 to 2,048 pulses/revolution<br>Z-phase: 1 pulse/revolution |
| | Speed monitor output | 0.5 V/1000 r/min |
| | Current monitor output | 0.5 V/100% |
| | Sequence output | Alarm output, alarm code output, motor rotation detection, brake interlock, positioning complete, open collector output, 30 VDC, 50 mA (except for alarm code output, which is 30 VDC, 20 mA) |
| Dynamic brake stopping | | Operates when the power supply turns off, a servo alarm is generated or an overrun occurs. |
| Protective functions | | Overcurrent, grounding, overload, overvoltage, overspeeding, overrun prevention, transmission errors, encoder errors, deviation counter overrun |

Note: Ensure that the input pulse width meets the following conditions.




$T_{IL}$, $T_{IH} \geq 2.5$ µs

## ■ U-Series Servomotors and Servo Drivers Are UL and cUL Approved

| Standard | Model | Applicable Standard | File No. |
|---|---|---|---|
| UL | AC Servo Driver | UL508C | E179149 |
| | AC Servomotor | UL1004 | E179189 |
| cUL | AC Servo Driver | cUL C22.2 No. 14 | E179149 |
| | AC Servomotor | cUL C22.2 No. 100 | E179189 |

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# Options Specifications

## ■ Regeneration Unit Specifications (For 30- to 750-W Models)

### General Specifications

| Item | Specifications |
|---|---|
| Operating ambient temperature | 0°C to 55°C |
| Storage ambient temperature | −10°C to 75°C |
| Operating ambient humidity | 35% to 85% RH (with no condensation) |
| Storage ambient humidity | 35% to 85% RH (with no condensation) |
| Storage and operating atmosphere | No corrosive gasses. |
| Vibration resistance | 0.5 G {4.9 m/s$^2$} max. |
| Impact resistance | Acceleration 2 G {19.6 m/s$^2$} max. |

### Performance Specifications

| Model | R88A-RG08U |
|---|---|
| Regeneration operating voltage | 380 $V_{DC}$ |
| Regeneration processing current | 8 $A_{DC}$ |
| Average regeneration power | 12 W (internal resistance: 50 Ω, 60 W) |
| Error detection function | Regeneration resistance disconnection, regeneration transistor damage, overvoltage |
| Alarm output | 1b contact (open contact at time of protective function operation)<br>(200 VAC drive possible.) |
| Weight | Approx. 1 kg |

### Indicator LED Specifications

| Item | Specifications |
|---|---|
| POWER | Lit while power flows through PN terminal. |
| REGEN | Lit during regeneration operation. |
| ALARM-REGEN | Lit for regeneration resistance disconnection or regeneration transistor damage. |
| ALARM-OV | Lit when overvoltage occurs. |

Note:
1. When the error detection function operates, an alarm is output from the Unit.
2. Create a sequence so that the power supply (R−T) to the Servo Driver is cut off when an alarm is generated.
3. When the error detection function operates and the Servo Driver's power supply is cut off, the Regeneration Unit won't be restored to its normal status until 2 to 3 seconds have elapsed, even if the power supply is turned on again. (Normal status is restored after the electrolytic capacitor in the Servo Driver has been discharged and the voltage between signals P and N drops.)

## ■ Parameter Unit Specifications

### General Specifications

| Item | Specifications |
|---|---|
| Operating ambient temperature | 0°C to 55°C |
| Storage ambient temperature | −10°C to 75°C |
| Operating ambient humidity | 35% to 85% RH (with no condensation) |
| Storage ambient humidity | 35% to 85% RH (with no condensation) |
| Storage and operating atmosphere | No corrosive gasses. |
| Vibration resistance | 0.5 G {4.9 m/s$^2$} max. |
| Impact resistance | Acceleration 2 G {19.6 m/s$^2$} max. |

### Performance Specifications

| Item | | | | R88A-PR02U | R88A-PR03U |
|---|---|---|---|---|---|
| Type | | | | Handy type | Mounted type |
| Accessory cable | | | | 1 m | (Connected by connectors.) |
| Connectors | | | | 7910-7500SC (10 pins) | D sub-connector (9 pins) |
| Display | | | | 7-segment LED, 5 digits | |
| Weight | | | | Approx. 0.18 kg | Approx. 0.02 kg |
| Communications specifications | Standard | | | RS-232C | RS-422A |
| | Communications method | | | Asynchronous (ASYNC) | |
| | Baud rate | | | 2,400 bps | |
| | Start bits | | | 1 bit | |
| | Data | | | 8 bits | |
| | Parity | | | None | |
| | Stop bits | | | 1 bit | |
| Errors detected by Parameter Unit | | Display | CPF00 | Cannot transmit even after 5 seconds have elapses since power supply was turned on. | |
| | | | CPF01 | A BCC error or faulty reception data has occurred for five consecutive times, or a time overrun (1 s) has occurred for three consecutive times. | |

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