R88D-KN□□□-ECT, R88D-KN□□□-ML2, R88D-KT□

# Accurax G5 rotary drive

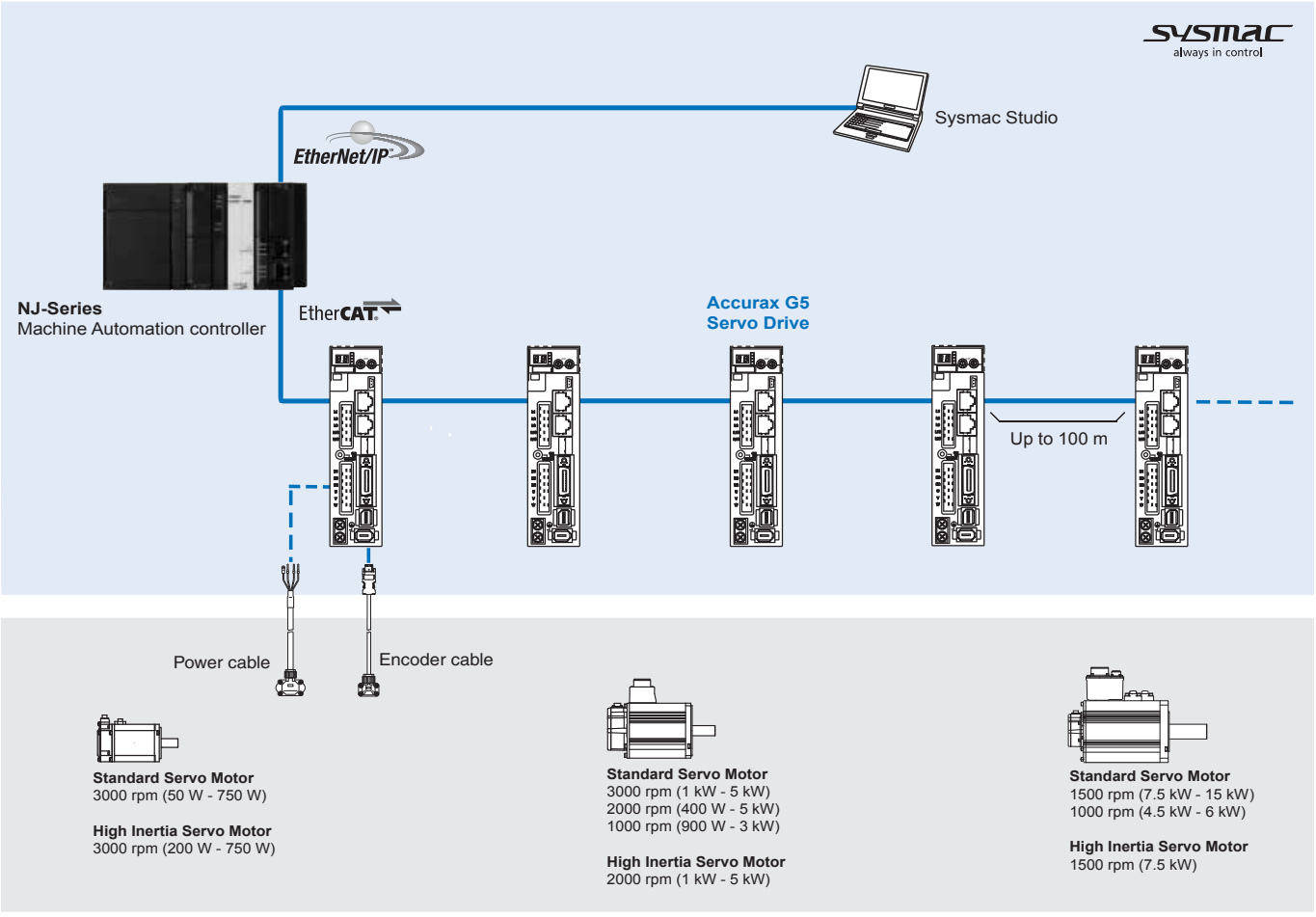
**Accurate motion control in a compact size servo drive family. EtherCAT and safety built-in.**

- EtherCAT, ML-II and Analog/pulse servo drive models
- Safety conforming ISO13849-1 PL-d
- High-response frequency of 2 kHz
- High resolution provided by 20 bits encoder
- Drive Programming: embedded indexer functionality in the Analogue/pulse models
- External encoder input for full closed loop
- Real time auto-tuning
- Advanced tuning algorithms (Anti-vibration function, torque feedforward, disturbance observer)

**Ratings**

- 230 VAC single-phase 100 W to 1.5 kW (8.59 Nm)
- 400 VAC three-phase 600 W to 15 kW (95.5 Nm)

## System configuration



## Servo motor supported

### Standard servo motors

| Accurax G5 rotary servo motor | | | | | | Accurax G5 servo drive models | | |
|---|---|---|---|---|---|---|---|---|
| | Voltage | Speed | Rated torque | Capacity | Model | EtherCAT | Analog/pulse | MECHATROLINK-II |
| | 230 V | 3000 min$^{-1}$ | 0.16 Nm | 50 W | R88M-K05030(H/T)-□ | R88D-KN01H-ECT | R88D-KT01H | R88D-KN01H-ML2 |
| | | | 0.32 Nm | 100 W | R88M-K10030(H/T)-□ | R88D-KN01H-ECT | R88D-KT01H | R88D-KN01H-ML2 |
| | | | 0.64 Nm | 200 W | R88M-K20030(H/T)-□ | R88D-KN02H-ECT | R88D-KT02H | R88D-KN02H-ML2 |
| | | | 1.3 Nm | 400 W | R88M-K40030(H/T)-□ | R88D-KN04H-ECT | R88D-KT04H | R88D-KN04H-ML2 |
| | | | 2.4 Nm | 750 W | R88M-K75030(H/T)-□ | R88D-KN08H-ECT | R88D-KT08H | R88D-KN08H-ML2 |
| | | | 3.18 Nm | 1000 W | R88M-K1K030(H/T)-□ | R88D-KN15H-ECT | R88D-KT15H | R88D-KN15H-ML2 |
| | | | 4.77 Nm | 1500 W | R88M-K1K530(H/T)-□ | R88D-KN15H-ECT | R88D-KT15H | R88D-KN15H-ML2 |
| | 400 V | | 2.39 Nm | 750 W | R88M-K75030(F/C)-□ | R88D-KN10F-ECT | R88D-KT10F | R88D-KN10F-ML2 |
| | | | 3.18 Nm | 1000 W | R88M-K1K030(F/C)-□ | R88D-KN15F-ECT | R88D-KT15F | R88D-KN15F-ML2 |
| | | | 4.77 Nm | 1500 W | R88M-K1K530(F/C)-□ | R88D-KN15F-ECT | R88D-KT15F | R88D-KN15F-ML2 |
| | | | 6.37 Nm | 2000 W | R88M-K2K030(F/C)-□ | R88D-KN20F-ECT | R88D-KT20F | R88D-KN20F-ML2 |
| | | | 9.55 Nm | 3000 W | R88M-K3K030(F/C)-□ | R88D-KN30F-ECT | R88D-KT30F | R88D-KN30F-ML2 |
| | | | 12.7 Nm | 4000 W | R88M-K4K030(F/C)-□ | R88D-KN50F-ECT | R88D-KT50F | R88D-KN50F-ML2 |
| | | | 15.9 Nm | 5000 W | R88M-K5K030(F/C)-□ | R88D-KN50F-ECT | R88D-KT50F | R88D-KN50F-ML2 |
| 230V (1 kW - 1.5 kW)<br>400V (400 W - 5 kW) | 230 V | 2000 min$^{-1}$ | 4.77 Nm | 1000 W | R88M-K1K020(H/T)-□ | R88D-KN10H-ECT | R88D-KT10H | R88D-KN10H-ML2 |
| | | | 7.16 Nm | 1500 W | R88M-K1K520(H/T)-□ | R88D-KN15H-ECT | R88D-KT15H | R88D-KN15H-ML2 |
| | 400 V | | 1.91 Nm | 400 W | R88M-K40020(F/C)-□ | R88D-KN06F-ECT | R88D-KT06F | R88D-KN06F-ML2 |
| | | | 2.86 Nm | 600 W | R88M-K60020(F/C)-□ | R88D-KN06F-ECT | R88D-KT06F | R88D-KN06F-ML2 |
| | | | 4.77 Nm | 1000 W | R88M-K1K020(F/C)-□ | R88D-KN10F-ECT | R88D-KT10F | R88D-KN10F-ML2 |
| | | | 7.16 Nm | 1500 W | R88M-K1K520(F/C)-□ | R88D-KN15F-ECT | R88D-KT15F | R88D-KN15F-ML2 |
| | | | 9.55 Nm | 2000 W | R88M-K2K020(F/C)-□ | R88D-KN20F-ECT | R88D-KT20F | R88D-KN20F-ML2 |
| | | | 14.3 Nm | 3000 W | R88M-K3K020(F/C)-□ | R88D-KN30F-ECT | R88D-KT30F | R88D-KN30F-ML2 |
| 7.5 kW - 15 kW | | | 19.1 Nm | 4000 W | R88M-K4K020(F/C)-□ | R88D-KN50F-ECT | R88D-KT50F | R88D-KN50F-ML2 |
| | | | 23.9 Nm | 5000 W | R88M-K5K020(F/C)-□ | R88D-KN50F-ECT | R88D-KT50F | R88D-KN50F-ML2 |
| | | 1500 min$^{-1}$ | 47.8 Nm | 7500 W | R88M-K7K515C-□ | R88D-KN75F-ECT | R88D-KT75F | – |
| | | | 70.0 Nm | 11000 W | R88M-K11K015C-□ | R88D-KN150F-ECT | R88D-KT150F | – |
| | | | 95.5 Nm | 15000 W | R88M-K15K015C-□ | R88D-KN150F-ECT | R88D-KT150F | – |
| | 230 V | 1000 min$^{-1}$ | 8.59 Nm | 900 W | R88M-K90010(H/T)-□ | R88D-KN15H-ECT | R88D-KT15H | R88D-KN15H-ML2 |
| | 400 V | | 8.59 Nm | 900 W | R88M-K90010(F/C)-□ | R88D-KN15F-ECT | R88D-KT15F | R88D-KN15F-ML2 |
| | | | 19.1 Nm | 2000 W | R88M-K2K010(F/C)-□ | R88D-KN30F-ECT | R88D-KT30F | R88D-KN30F-ML2 |
| | | | 28.7 Nm | 3000 W | R88M-K3K010(F/C)-□ | R88D-KN50F-ECT | R88D-KT50F | R88D-KN50F-ML2 |
| | | | 43.0 Nm | 4500 W | R88M-K4K510C-□ | R88D-KN50F-ECT | R88D-KT50F | R88D-KN50F-ML2 |
| | | | 57.3 Nm | 6000 W | R88M-K6K010C-□ | R88D-KN75F-ECT | R88D-KT75F | – |

### High inertia servo motors

| Accurax G5 rotary servo motor | | | | | | Accurax G5 servo drive models | | |
|---|---|---|---|---|---|---|---|---|
| | Voltage | Speed | Rated torque | Capacity | Model | EtherCAT | Analog/pulse | MECHATROLINK-II |
| | 230 V | 3000 min$^{-1}$ | 0.64 Nm | 200 W | R88M-KH20030(H/T)-□ | R88D-KN02H-ECT | R88D-KT02H | R88D-KN02H-ML2 |
| | | | 1.3 Nm | 400 W | R88M-KH40030(H/T)-□ | R88D-KN04H-ECT | R88D-KT04H | R88D-KN04H-ML2 |
| 200 W - 750 W | | | 2.4 Nm | 750 W | R88M-KH75030(H/T)-□ | R88D-KN08H-ECT | R88D-KT08H | R88D-KN08H-ML2 |
| | 400 V | 2000 min$^{-1}$ | 4.77 Nm | 1000 W | R88M-KH1K020(F/C)-□ | R88D-KN10F-ECT | R88D-KT10F | R88D-KN10F-ML2 |
| | | | 7.16 Nm | 1500 W | R88M-KH1K520(F/C)-□ | R88D-KN15F-ECT | R88D-KT15F | R88D-KN15F-ML2 |
| 1 kW - 5 kW | | | 9.55 Nm | 2000 W | R88M-KH2K020(F/C)-□ | R88D-KN20F-ECT | R88D-KT20F | R88D-KN20F-ML2 |
| | | | 14.3 Nm | 3000 W | R88M-KH3K020(F/C)-□ | R88D-KN30F-ECT | R88D-KT30F | R88D-KN30F-ML2 |
| | | | 19.1 Nm | 4000 W | R88M-KH4K020(F/C)-□ | R88D-KN50F-ECT | R88D-KT50F | R88D-KN50F-ML2 |
| | | | 23.9 Nm | 5000 W | R88M-KH5K020(F/C)-□ | R88D-KN50F-ECT | R88D-KT50F | R88D-KN50F-ML2 |
| 7.5 KW | | 1500 min$^{-1}$ | 47.8 Nm | 7500 W | R88M-KH7K515C-□ | R88D-KN75F-ECT | R88D-KT75F | – |

## Type designation

### Servo drive

R88D-KN01H-ECT

- Accurax G5 Series servo drive
- Drive Type
  - T: Analog/pulse type
  - N: Network type
- Model
  - Blank: Analog/pulse type
  - ECT: EtherCAT comms
  - ML2: MECHATROLINK-II comms
- Capacity and Voltage

| Voltage | Code | Output |
|---|---|---|
| 230 V | 01H | 100 W |
| | 02H | 200 W |
| | 04H | 400 W |
| | 08H | 750 W |
| | 10H | 1 kW |
| | 15H | 1.5 kW |
| 400 V | 06F | 600 W |
| | 10F | 1.0 kW |
| | 15F | 1.5 kW |
| | 20F | 2.0 kW |
| | 30F | 3.0 kW |
| | 50F | 5.0 kW |
| | 75F | 7.5 kW |
| | 150F | 15.0 kW |

## Servo drive specifications

### Single-phase, 230 V

| Servo drive type | | R88D-K□ | 01H□ | 02H□ | 04H□ | 08H□ | 10H□ | 15H□ |
|---|---|---|---|---|---|---|---|---|
| Applicable servo motor | | R88M-K□ | 05030(H/T)-□ | 20030(H/T)-□ | 40030(H/T)-□ | 75030(H/T)-□ | 1K020(H/T)-□ | 1K030(H/T)-□ |
| | | | 10030(H/T)-□ | – | – | – | – | 1K530(H/T)-□ |
| | | | – | – | – | – | – | 1K520(H/T)-□ |
| | | | – | – | – | – | – | 90010(H/T)-□ |
| Basic specifications | Max. applicable motor capacity W | | 100 | 200 | 400 | 750 | 1000 | 1500 |
| | Continuous output current Arms | | 1.2 | 1.6 | 2.6 | 4.1 | 5.9 | 9.4 |
| | Input power | Main circuit | Single-phase/3-phase, 200 to 240 VAC +10 to –15% (50/60 Hz) | | | | | |
| | Supply | Control circuit | Single-phase, 200 to 240 VAC +10 to –15% (50/60 Hz) | | | | | |
| | Control method | | IGBT-driven PWM method, sinusoidal drive | | | | | |
| | Feedback | | Serial encoder (incremental/absolute value) | | | | | |
| | Conditions: Usage/storage temperature | | 0 to +55°C/–20 to 65°C | | | | | |
| | Conditions: Usage/storage humidity | | 90% RH or less (non-condensing) | | | | | |
| | Conditions: Altitude | | 1000m or less above sea level | | | | | |
| | Conditions: Vibration/shock resistance (max.) | | 5.88 m/s$^2$ 10 to 60 Hz (Continuous operation at resonance point is not allowed) / 19.6 m/s$^2$ | | | | | |
| | Configuration | | Base mounted | | | | | |
| | Approx. weight | kg | 0.8 | | 1.1 | 1.6 | 1.8 | |

### Three-phase, 400 V

| Servo drive type | | R88D-K□ | 06F□ | 10F□ | 15F□ | 20F□ | 30F□ | 50F□ | 75F□ | 150F□ |
|---|---|---|---|---|---|---|---|---|---|---|
| Applicable servo motor | | R88M-K□ | 40020(F/C)-□ | 75030(F/C)-□ | 1K030(F/C)-□ | 2K030(F/C)-□ | 3K030(F/C)-□ | 4K030(F/C)-□ | 6K010C-□ | 11K015C-□ |
| | | | 60020(F/C)-□ | 1K020(F/C)-□ | 1K530(F/C)-□ | 2K020(F/C)-□ | 3K020(F/C)-□ | 5K030(F/C)-□ | 7K515C-□ | 15K015C-□ |
| | | | – | – | 1K520(F/C)-□ | – | 2K010(F/C)-□ | 4K020(F/C)-□ | – | – |
| | | | – | – | 90010(F/C)-□ | – | – | 5K020(F/C)-□ | – | – |
| | | | – | – | – | – | – | 4K510C-□ | – | – |
| | | | – | – | – | – | – | 3K010(F/C)-□ | – | – |
| Basic specifications | Max. applicable motor capacity | kW | 0.6 | 1.0 | 1.5 | 2.0 | 3.0 | 5.0 | 7.5 | 15.0 |
| | Continuous output current | Arms | 1.5 | 2.9 | 4.7 | 6.7 | 9.4 | 16.5 | 22.0 | 33.4 |
| | Input power | Main circuit | 3-phase, 380 to 480 VAC +10 to –15% (50/60Hz) | | | | | | | |
| | Supply | Control circuit | 24 VDC ±15% | | | | | | | |
| | Control method | | IGBT-driven PWM method, sinusoidal drive | | | | | | | |
| | Feedback | Serial encoder | Incremental or absolute encoder | | | | | | Absolute encoder | |
| | Conditions: Usage/storage temperature | | 0 to 55°C/–20 to 65°C | | | | | | | |
| | Conditions: Usage/storage humidity | | 90% RH or less (non-condensing) | | | | | | | |
| | Conditions: Altitude | | 1000 m or less above sea level | | | | | | | |
| | Conditions: Vibration/shock resistance | | 5.88 m/s$^2$ 10 to 60 Hz (Continuous operation at resonance point is not allowed)/19.6 m/s$^2$ | | | | | | | |
| | Configuration | | Base mounted | | | | | | | |
| | Approx. weight | kg | 1.9 | | | 2.7 | 4.7 | | 13.5 | 21.0 |

## General specifications (for EtherCAT servo drives)

| | | | |
|---|---|---|---|
| **Performance** | | Frequency characteristics | 2 kHz |
| EtherCAT interface | Command input | | EtherCAT commands (for sequence, motion, data setting/reference, monitor, adjustment, and other commands). |
| | Drive Profile[*1] | | CSP, CSV, CST, Homing and Position Profile modes (CiA402 Drive Profile)<br>Homing mode<br>Position profile mode<br>Dual touch probe function (Latch function)<br>Torque limit function |
| I/O signal | Sequence input signal | | Multi-function input × 8 by parameter setting (forward/reverse drive prohibition, emergency stop, external latch, origin proximity, forward/reverse torque limit, general purpose monitor input). |
| | Sequence output signal | | 1 × servo drive error output<br>2 × multi-function outputs by parameters setting (servo ready, brake release, torque limit detection, zero speed detection, warning output, position completion, error clear attributed, programmable output …) |
| Integrated functions | USB communications | Interface | Personal computer/ Connector mini-USB |
| | | Communications standard | Compliant with USB 2.0 standard |
| | | Function | Parameter setting, status monitoring and tuning |
| | EtherCAT communications | Communications protocol | IEC 61158 Type 12, IEC 61800-7 |
| | | Physical layer | 100BASE-TX (IEEE802.3) |
| | | Connectors | RJ45 × 2<br>ECAT IN: EtherCAT input × 1<br>ECAT OUT: EtherCAT output × 1 |
| | | Communications media | Category 5 or higher (cable with double, aluminium tape and braided shielding is recommended) |
| | | Communications distance | Distance between nodes: 100 m max. |
| | | LED indicators | RUN × 1<br>ERR × 1<br>L/A IN (Link/Activity IN) × 1<br>L/A OUT (Link/activity OUT) × 1 |
| | Autotuning | | Automatic motor parameter setting. One parameter rigidity setting. Inertia detection. |
| | Dynamic brake (DB) | | Built-in. Operates during main power OFF, servo alarm, servo OFF or overtravel. |
| | Regenerative processing | | Internal resistor included in models from 600 W to 5 kW. Regenerative resistor externally mounted (option). |
| | Overtravel (OT) prevention function | | DB stop, deceleration stop or coast to stop during P-OT, N-OT operation |
| | Encoder divider function | | Gear ratio |
| | Protective functions | | Overcurrent, overvoltage, undervoltage, overspeed, overload, encoder error, overheat... |
| | Analog monitor functions for supervision | | Analog monitor of motor speed, speed reference, torque reference, command following error, analog input...<br>The monitoring signals to output and their scaling can be specified with parameters.<br>Number of channels: 2 (Output voltage: ±10V DC) |
| | Panel operator | Display functions | 2 × digit 7-segment LED display shows the drive status, alarm codes, parameters... |
| | | Switches | 2 × rotary switches for setting the node address |
| | CHARGE lamp | | Lits when the main circuit power supply is turned ON. |
| | Safety terminal | Functions | Safety Torque OFF function to cut off the motor current and stop the motor. Output signal for failure monitoring function. |
| | | Conformed standards | EN ISO13849-1:2008 (PL- d, Performance Level d), IEC61800-5 -2:2007 (function STO, Safe Torque OFF), EN61508:2001 (Safety Integrity Level 2, SIL2), EN954-1:1996 (CAT3). |
| | External encoder feedback | | Serial signal and line-driver A-B-Z encoder for full-closed control |

[*1] The CSV, CST and Homing modes are supported in the servo drive with version 2.0 or higher.

## General specifications (for MECHATROLINK-II servo drives)

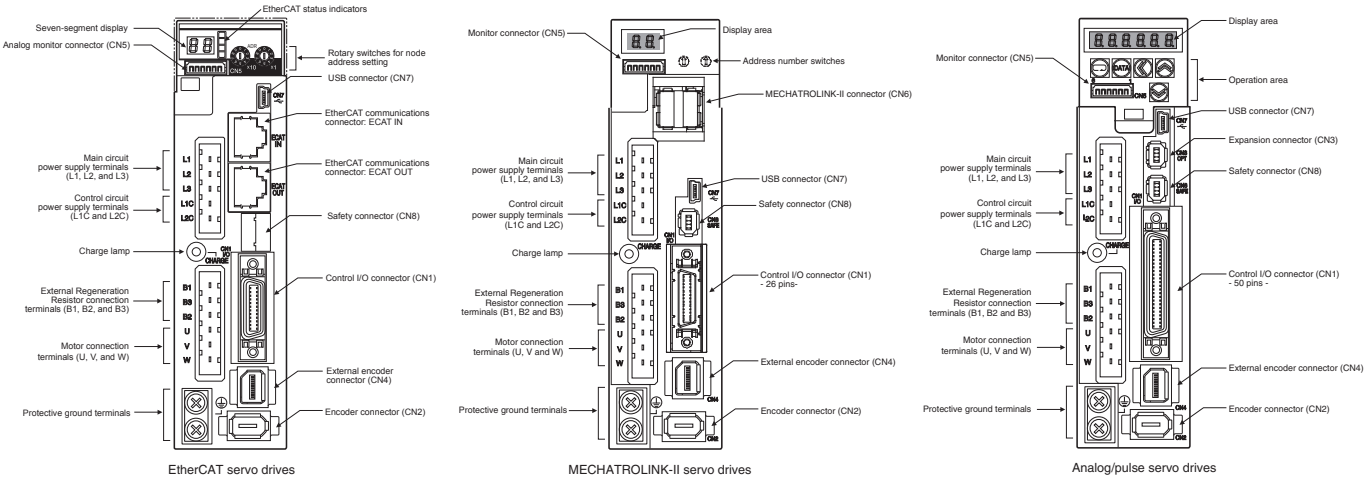
| | | | |
|---|---|---|---|
| **Control mode** | | | Position control, velocity control, torque control, full-closed control. |
| **Performance** | | Frequency characteristics | 2 kHz |
| | | Speed zero clamp | Preset velocity command can be clamped to zero by the speed zero clamp input. |
| | | soft start time setting | 0 to 10 s (acceleration, deceleration can be set separately). |
| **Command input** | | MECHATROLINK-II communication | MECHATROLINK-II commands (for sequence, motion, data setting/reference, monitor, adjustment and other commands) |
| **I/O signal** | Sequence input signal | | Multi-function input × 8 by parameter setting (forward/reverse drive prohibition, emergency stop, external latch, origin proximity, forward/reverse torque limit, general purpose monitor input). |
| | Sequence output signal | | It is possible to output three types of signal form incl.: brake release, servo ready, servo alarm, positioning complete, motor rotation speed detection, torque limit detection, zero speed detection, speed coincidence detection, warning, position command status, speed limit detection, alarm output, speed command status. |
| **Integrated functions** | USB communications | Interface | Personal computer/ Connector mini-USB |
| | | Communications standard | Compliant with USB 2.0 standard |
| | | Function | Parameter setting, status monitoring and tuning |
| | MECHATROLINK-II communications | Communications protocol | MECHATROLINK-II |
| | | Station address | 41H to 51 FH (max. number of slaves: 30) |
| | | Transmission speed | 10 Mbps |
| | | Transmission cycle | 1, 2 & 4 ms |
| | | Data length | 32 bytes |
| | Autotuning | | Automatic motor parameter setting. One parameter rigidity setting. Inertia detection. |
| | Dynamic brake (DB) | | Built-in. Operates during main power OFF, servo alarm, servo OFF or overtravel. |
| | Regenerative processing | | Internal resistor included in models from 600 W to 5 kW. Regenerative resistor externally mounted (option). |
| | Overtravel (OT) prevention function | | DB stop, deceleration stop or coast to stop during P-OT, N-OT operation |
| | Encoder divider function | | Optional division possible |
| | Protective functions | | Overcurrent, overvoltage, undervoltage, overspeed, overload, encoder error, overheat... |
| | Analog monitor functions for supervision | | Analog monitor of motor speed, speed reference, torque reference, command following error, analog input...<br>The monitoring signals to output and their scaling can be specified with parameters.<br>Number of channels: 2 (Output voltage: ±10V DC) |
| | Panel operator | Display functions | 2-digit 7-segment LED display shows the drive status, alarm codes, parameters... |
| | | | MECHATROLINK-II communications status LED indicator (COM) |
| | | Switches | 2 × rotary switches for setting the MECHATROLINK-II node address |
| | CHARGE lamp | | Lits when the main circuit power supply is turned ON. |
| | Safety terminal | Functions | Safety Torque OFF function to cut off the motor current and stop the motor. Output signal for failure monitoring function. |
| | | Conformed standards | EN ISO13849-1:2008 (PL- d, Performance Level d), IEC61800-5 -2:2007 (function STO, Safe Torque OFF), EN61508:2001 (Safety Integrity Level 2, SIL2), EN954-1:1996 (CAT3). |
| | External encoder feedback | | Serial signal and line-driver A-B-Z encoder for full-closed control |

## General specifications (for Analog/pulse servo drives)

| | | | | |
|---|---|---|---|---|
| **Control modes** | | | External control | (1) position control, (2) velocity control, (3) torque control, (4) position/velocity control, (5) position/torque control, (6) velocity/torque control and (7) full-closed control. |
| | | | Internal positioning | Drive Programming: indexer functionality enabled by parameter. |
| **Speed/torque control** | **Performance** | | Frequency characteristics | 2 kHz |
| | | | Speed zero clamp | Preset velocity command can be clamped to zero by the speed zero clamp input. |
| | | | Soft start time setting | 0 to 10 s (acceleration, deceleration can be set separately). S-curve acceleration/deceleration is also available. |
| | **Input signal** | Speed control | Speed reference voltage | 6 VDC at rated speed: set at delivery (the scale and polarity can be set by parameters) |
| | | | Torque limit | 3 VDC at rated torque (torque can be limited separately in positive/negative direction). |
| | | | Preset speed control | Preset speed is selectable from 8 internal settings by digital inputs. |
| | | Torque control | Torque reference voltage | 3 VDC at rated torque: set at delivery (the scale and polarity can be set by parameters). |
| | | | Speed limit | Speed limit can be set by parameter. |
| **Position control** | **Input signal** | Command pulse | Input pulse type | Sign + pulse train, 90° phase displacement 2-phase pulse (A-phase+ B-phase) or CCW/CW pulse train |
| | | | Input pulse frequency | 4 Mpps max. (200 Kpps max. at open collector). |
| | | | Command pulse scaling (Electronic Gear) | Applicable scaling ratio: 1/1000 to 1000<br>Any value of 1 to $2^{30}$ can be set for numerator (encoder resolution) and denominator (command pulse resolution per motor revolution). The combination has to be within the range shown above. |
| **Full-closed control** | **Input signal** | Command pulse | Input pulse type | Sign + pulse train, 90° phase displacement 2-phase pulse (A-phase+ B-phase) or CCW/CW pulse train |
| | | | Input pulse frequency | 4 Mpps max. (200 Kpps max. at open collector). |
| | | | Command pulse scaling (Electronic Gear) | Applicable scaling ratio: 1/1000 to 1000<br>Any value of 1 to $2^{30}$ can be set for numerator (encoder resolution) and denominator (command pulse resolution).<br>The combination has to be within the range shown above. |
| | External encoder scaling | | | Applicable scaling ratio: 1/20 to 160<br>Any value of 1 to $2^{30}$ can be set for numerator (encoder resolution) and denominator (external encoder resolution per motor revolution). The combination has to be within the range shown above. |
| **Drive Programming** | Functionality selection | | | Functionality enabled by parameter. |
| | Supported functionality | | | G5 Analogue/pulse servo drive with firmware 1.10 or higher. |
| | Software | | | CX-Drive version 2.30 or higher. |
| | Communication | | | The program can be downloaded via USB communication (CX-Drive) |
| | Command types | | | Move relative, Move absolute, Jog, Homing, Deceleration stop, Velocity update, Timer, Output signal control, Jump, Conditional branching, |
| | Number of commands | | | Up to 32 commands (0 to 31) |
| | Command execution | | | Strobe input to execute the selected command or to execute a complex sequence (combination of various commands). |
| | Command selection | | | Up to 5 digital inputs to select the individual commands or sequences |

| | | | |
|---|---|---|---|
| I/O signal | Position signal output | | A-phase, B.phase, Z-phase line driver output and Z-phase open-collector output. |
| | Sequence input signal | External control | - Multi-function input × 10 by parameter setting: servo ON, control mode switching, forward/reverse drive prohibition, vibration filter switching, gain switching, electronic gear switching, error counter reset, pulse prohibition, alarm reset, internal speed selection, torque limit switching, zero speed, emergency stop, inertia ratio switching, velocity/torque command sign.<br><br>- Dedicated input × 1 (SEN: sensor ON, ABS data request). |
| | | Internal positioning (Drive programming mode) | - Multi-function input × 10 by parameter setting: servo ON, forward/reverse drive prohibition, damping filter switching, gain switching, alarm reset, torque limit switching, emergency stop, immediate stop, deceleration stop input, inertia ratio switching, latch input, origin proximity input, strobe and 5 × input command selection.<br><br>- Dedicated input × 1 (SEN: sensor ON, ABS data request). |
| | Sequence output signal | External control | - 3 × outputs signals configured by parameter settings: brake release, servo ready, servo alarm, positioning complete, motor rotation speed detection, torque limit detection, zero speed detection, speed coincidence detection, warning, position command status, speed limit detection, speed command status.<br><br>- 1 output fixed to Alarm output. |
| | | Internal positioning (Drive programming enabled) | 3 × outputs signals configured by parameter settings: ready, Brake, position completed, motor speed detection, torque limit status, zero speed detection, speed conformity, warning, position command status, position completed, drive programming command output and output during drive programming.<br><br>- 1 output fixed to Alarm output. |
| Integrated functions | USB Communications | Interface | Personal computer/ Connector mini-USB |
| | | Communications standard | Compliant with USB 2.0 standard |
| | | Function | Parameter setting, status monitoring and tuning |
| | Autotuning | | Automatic motor parameter setting. One parameter rigidity setting. Inertia detection. |
| | Dynamic brake (DB) | | Built-in. Operates during main power OFF, servo alarm, servo OFF or overtravel. |
| | Regenerative processing | | Internal resistor included in models from 600 W to 5 kW. Regenerative resistor externally mounted (option). |
| | Overtravel (OT) prevention function | | DB stop, deceleration stop or coast to stop during P-OT, N-OT operation |
| | Encoder divider function | | Optional division possible |
| | Electronic gearing (Numerator/Denominator) | | Up to 4 electronic gear numerators by combining with inputs. |
| | Internal speed setting function | | 8 speeds may be set internally |
| | Protective functions | | Overcurrent, overvoltage, undervoltage, overspeed, overload, encoder error, overheat... |
| | Analog monitor functions for supervision | | Analog monitor of motor speed, speed reference, torque reference, command following error, analog input...<br>The monitoring signals to output and their scaling can be specified by parameters.<br>Number of channels: 2 (Output voltage: ±10V DC) |
| | Panel operator | Display functions | 6-digit 7-segment LED display shows the drive status, alarm codes, parameters... |
| | | Panel operator keys | Used to set/monitor parameters and drive condition (5 key switches). |
| | CHARGE lamp | | Lits when the main circuit power supply is turned ON. |
| | Safety terminal | Functions | Safety torque OFF function to cut off the motor current and stop the motor. Output signal for failure monitoring function. |
| | | Conformed standards | EN ISO13849-1:2008 (PL- d, Performance Level d), IEC61800-5 -2:2007 (function STO, Safe Torque OFF), EN61508:2001 (Safety Integrity Level 2, SIL2), EN954-1:1996 (CAT3). |
| | External encoder feedback | | Serial signal and line-driver A-B-Z encoder for full-closed control |
| | Expansion connector | | Serial bus for option board |

## Servo drive part names




**Note:** The above pictures show 230 V servo drives models only. The 400 V servo drives have 24 VDC power input terminals for control circuit instead of L1C and L2C terminals.

## I/O specifications

### Terminals specifications (for all servo drives)

| Symbol | Name | Function |
|---|---|---|
| L1 | Main power supply input terminal | AC power input terminals for the main circuit<br><br>**Note:** for single-phase servo drives connect the power supply input to L1 and L3. |
| L2 | | |
| L3 | | |
| L1C | Control power supply input terminal | AC power input terminals for the control circuit<br>(for 200 V single/three-phase servo drives only). |
| L2C | | |
| 24 V | | DC power input terminals for the control circuit<br>(for 400 V three-phase servo drives only). |
| 0 V | | |
| B1 | External regeneration resistor connection terminals | Servo drives 200 V below 750 W: no internal resistor is connected. Leave B2 and B3 open.<br>Connect an external regenerative resistor between B1 and B2.<br><br>Servo drives from 600 W to 5 kW: short-circuit in B2 and B3 for internal regenerative resistor. If the internal regenerative resistor is insufficient, connect an external regenerative resistor between B1 and B2 and remove the wire between B2 and B3. |
| B2 | | |
| B3 | | |
| U | Servo motor connection terminals | Terminals for outputs to the servomotor. |
| V | | |
| W | | |

### I/O signals (CN1) - Input signals (for EtherCAT and MECHATROLINK-II servo drives)

| Pin No. | Signal name | Function | |
|---|---|---|---|
| 6 | I-COM | ± pole of external DC power. The power must use 12 V to 24 V (±5%) | |
| 5 | E-STOP | Emergency stop | The signal name shows the factory setting. The function can be changed by parameter setting. |
| 7 | P-OT | Forward run prohibited | |
| 8 | N-OT | Reverse run prohibited | |
| 9 | DEC | Origin proximity | |
| 10 | EXT3 | External latch input 3 | |
| 11 | EXT2 | External latch input 2 | |
| 12 | EXT1 | External latch input 1 | |
| 13 | SI-MON0 | General purpose monitor input 0 | |
| 14 | BTP-I | Connecting pin for the absolute encoder backup battery. Do not connect when a battery is connected to the encoder cable (CN2 connector). | |
| 15 | BTN-I | | |
| 17 | – | Terminals not used. Do not connect. | |
| 18 | – | | |
| 19 | – | | |
| 20 | – | | |
| 21 | – | | |
| 22 | – | | |
| 23 | – | | |
| 24 | – | | |
| – | PCL | Forward torque limit | The function of input signals allocated to pins 5 and 7 to 13 can be changed with these options by parameters settings. |
| | NCL | Reverse torque limit | |
| | SI-MON1 | General-purpose monitor input 1 | |
| | SI-MON2 | General-purpose monitor input 2 | |
| Shell | FG | Shield ground. Connected to frame ground if the shield wire of the I/O signal cable is connected to the connector shell. | |
| 16 | GND | Signal ground. It is insulated with power supply (I-COM) for the control signal in the servo drive. | |

### I/O signals (CN1) - Output signals (for EtherCAT and MECHATROLINK-II servo drives)

| Pin No. | Signal name | Function | |
|---|---|---|---|
| 1 | BRK-OFF+ | External brake release signal | |
| 2 | BRK-OFF | | |
| 25 | S-RDY+ | Servo ready: ON when there is no servo alarm and control/main circuit power supply is ON | |
| 26 | S-RDY– | | |
| 3 | ALM+ | Servo alarm: Turns OFF when an error is detected | |
| 4 | ALM– | | |
| – | INP1 | Position completed output 1 | The function of output signals allocated to pins 1, 2, 25 and 26 can be changed with these options by parameters settings |
| | TGON | Speed detection | |
| | T_LIM | Torque limit | |
| | ZSP | Zero speed | |
| | VCMP | Speed command status | |
| | INP2 | Position completed output 2 | |
| | WARN1 | Warning 1 | |
| | WARN2 | Warning 2 | |
| | PCMD | Position command status | |
| | V_LIM | Speed limit | |
| | ALM-ATB | Error clear attribute<br>(for ECT model only) | |
| | R-OUT1 | Programmable output 1<br>(for ECT model only) | |
| | R-OUT2 | Programmable output 2<br>(for ECT model only) | |

## I/O signals (CN1) - Input signals (for Analog/pulse servo drives)

| Pin No. | Control mode | Signal name | Function | |
|---|---|---|---|---|
| 1 | Position/ Full closed loop | +24 VCW | Reference pulse input for line driver and open collector according to parameter setting.<br><br>Input mode:<br>Sign + pulse string<br>Reverse/forward pulse (CCW/CW pulse)<br>Two-phase pulse (90° phase differential) | |
| 3 | | +CW | | |
| 4 | | –CW | | |
| 2 | | +24 VCW | | |
| 5 | | +CCW | | |
| 6 | | –CCW | | |
| 44 | | +CWLD | Reference pulse input for line driver only.<br><br>Input mode:<br>Reverse/forward pulse (CCW/CW pulse) | |
| 45 | | –CWLD | | |
| 46 | | +CCWLD | | |
| 47 | | –CCWLD | | |
| 14 | Speed | REF | Speed reference input: ±10 V/rated motor speed (input gain can be modified using a parameter). | |
| | Torque | TREF1 | Torque reference input: ±10 V/rated motor torque (input gain can be modified using a parameter). | |
| | | VLIM | Speed limit input: ±10 V/rated motor speed (input gain can be modified using a parameter). | |
| 15 | – | AGND1 | Analog signal ground | |
| 16 | Torque | TREF2 | Torque reference input: ±10 V/rated motor torque (input gain can be modified using a parameter). | |
| | Position/Speed Full closed loop | PCL | Forward torque limit input: ±10 V/rated motor torque (input gain can be modified using a parameter). | |
| 18 | | NCL | Reverse torque limit input: ±10 V/rated motor torque (input gain can be modified using a parameter). | |
| 17 | – | AGND1 | Analog signal ground | |
| 7 | Common | +24 VIN | Control power supply input for sequence signals: users must provide the +24 V power supply (12 to 24 V). | |
| 29 | | RUN | Servo ON: this turn ON the servo. | |
| 26 | Position/Full closed loop | DFSEL1 | Vibration filter switching 1 | Enables vibration filter according parameter setting. |
| 27 | Common | GSEL | Gain switching | Enables gain value according parameter setting. |
| 28 | Position/Full closed loop | GESEL1 | Electronic gear switching 1 | Switches the numerator fro electronic gear ratio. |
| | Speed | VSEL3 | Internal speed selection 3 | Input to select the desired speed setting during internally speed operation.<br>The speed selection is combining this input with VSEL1 and VSEL2 inputs. |
| 30 | Position/Full closed loop | ECRST | Error counter reset input. | Resets the position error counter. |
| | Speed | VSEL2 | Internal speed selection 2 | Input to select the desired speed setting during internally speed operation.<br>The speed selection is combining this input with VSEL1 and VSEL3 inputs. |
| 31 | Common | RESET | Alarm reset input. | Release the alarm status. The error counter is reset when the alarm is reset. |
| 32 | Position/Speed/ Torque | TVSEL | Control mode switching | Position ↔ speed<br>Position ↔ torque<br>Torque ↔ speed<br>} Enables control mode switching |
| 33 | Position | IPG | Pulse prohibition input. Digital input to inhibit the position reference pulse. | |
| | Speed | VSEL1 | Internal speed selection 1 | Input to select the desired speed setting during internally speed operation.<br>The speed selection is combining this input with VSEL2 and VSEL3 inputs. |
| 8 | Common | NOT | Reverse run prohibited | Overtravel prohibited: stops servomotor when movable part travels beyond the allowable range of motion. |
| 9 | | POT | Forward run prohibited | |
| 20 | Position/Speed/ Torque | SEN | Sensor ON input. Initial data request signal when using an absolute encoder. | |
| 13 | | SENGND | Sensor ON signal ground. | |
| 42 | Common | BAT (+) | Backup battery connection terminals when the absolute encoder power is interrupted. Do not connect when a absolute encoder battery cable for backup is used. | |
| 43 | | BATGND (–) | | |
| 50 | | FG | Frame ground | |
| – | – | TLSEL | Torque limit switch | The function of input signals allocated to pins 8, 9 and 26 to 33 can be changed with these options by parameters settings |
| | | DFSEL2 | Vibration filter switching 2 | |
| | | GESEL2 | Electronic gear switching 2 | |
| | | VZERO | Zero speed | |
| | | VSIGN | Speed command signal | |
| | | TSIGN | Torque command signal | |
| | | E-STOP | Emergency stop | |
| | | JSEL | Inertia ratio switching | |
| | Drive Programming | EXT1 | Latch input 1 | |
| | | HOME | Origin proximity input | |
| | | H-STOP | Immediate stop input | |
| | | S-STOP | Deceleration stop input | |
| | | STB | Strobe | |
| | | B-SEL1 | Command selection input 1 | |
| | | B-SEL2 | Command selection input 2 | |
| | | B-SEL4 | Command selection input 4 | |
| | | B-SEL8 | Command selection input 8 | |
| | | B-SEL16 | Command selection input 16 | |
| 12 | – | Terminals not used. Do not connect. | | |
| 40 | – | | | |
| 41 | – | | | |

## I/O signals (CN1) - Output signals (for Analog/pulse servo drives)

| Pin No. | Control mode | Signal name | Function | |
|---|---|---|---|---|
| 21 | Position/ Full closed loop | +A | Encoder phase A+ | Encoder signals (or external scale signals during full closing control) are output according Encoder Dividing Numerator parameter. This is the line-driver output (equivalent to R422). The maximum output frequency is 4 Mbps. Phase Z is output for encoder signals (or external scale signals during full closing control). This is the line-driver output (equivalent to R422). |
| 22 | | –A | Encoder phase A– | |
| 48 | | +B | Encoder phase B+ | |
| 49 | | –B | Encoder phase B– | |
| 23 | | +Z | Encoder phase Z+ | |
| 24 | | –Z | Encoder phase Z– | |
| 19 | | Z | Encoder phase-Z output | Phase Z is output for encoder signals (or external scale signals during full closing control). Open-collector output. |
| 25 | | ZCOM | Encoder phase-Z common | |
| 11 | Common | BKIR | Brake release signal output | Timing signal for operating the electromagnetic brake on a motor. |
| 10 | | BKIRCOM | | |
| 35 | | READY | Servo ready: ON if there is not servo alarm when the control/main circuit power supply is turned ON. | |
| 34 | | READYCOM | | |
| 37 | | /ALM | Servo alarm: turns OFF when an error is detected. | |
| 36 | | ALMCOM | | |
| 39 | Speed/torque | TGON | Motor rotation speed detection. This output turns ON when the motor rotation speed reaches the speed set in a parameter. | |
| 39 | Position/ Full closed loop | INP1 | Positioning complete output 1: turns ON when position error is equal to setting parameter. | |
| 38 | | INP1COM | | |
| – | – | INP2 | Position complete output 2 | The function of output signals allocated to pins 11, 10, 34 to 39 can be changed with these options by parameters settings. |
| | | P-CMD | Position command status | |
| | | ZSP | Zero speed | |
| | | WARN1 | Warning 1 | |
| | | WARN2 | Warning 2 | |
| | | ALM-ATB | Error clear attribute | |
| | | VCMP | Speed conformity output | |
| | | V-CMD | Speed command status | |
| | | V-LIMIT | Speed limit detection | |
| | | T-LIMIT | Torque limit detection | |
| | Drive Programming | B-CTRL1 | Drive Programming output 1 | |
| | | B-CTRL2 | Drive Programming output 2 | |
| | | B-CTRL3 | Drive Programming output 3 | |
| | | B-BUSY | Output during Drive Programming | |
| | | HOME-CMP | Origin search complete | |

## External encoder connector (CN4) - (for all servo drives)

| Pin No. | Signal name | Function |
|---|---|---|
| 1 | E5V | External scale power supply output. Use at 5.2 V ±5% and at or below 250 mA. |
| 2 | E0V | This is connected to the control circuit ground connected to connector CN1. |
| 3 | PS | External scale signal I/O (serial signal). |
| 4 | /PS | |
| 5 | EXA | External scale signal input (Phase A, B, and Z signals). Performs the input and output of phase A, B and Z signals. |
| 6 | /EXA | |
| 7 | EXB | |
| 8 | /EXB | |
| 9 | EXZ | |
| 10 | /EXZ | |
| Shell | FG | Shield ground |

## Monitor connector (CN5) - (for all servo drives)

| Pin No. | Signal name | Function |
|---|---|---|
| 1 | AM1 | Analog monitor output 1. Outputs the analog signal for the monitor. Use the parameters setting to select the output to monitor. Default setting: Motor rotation speed 1 V/(1000 r/min). |
| 2 | AM2 | Analog monitor output 2. Outputs the analog signal for the monitor. Use the parameters setting to select the output to monitor. Default setting: Motor rotation speed 1 V/(1000 r/min). |
| 3 | GND | Ground for analog monitors 1, 2. |
| 4 | – | Terminals not used. Do not connect. |
| 5 | – | |
| 6 | – | |

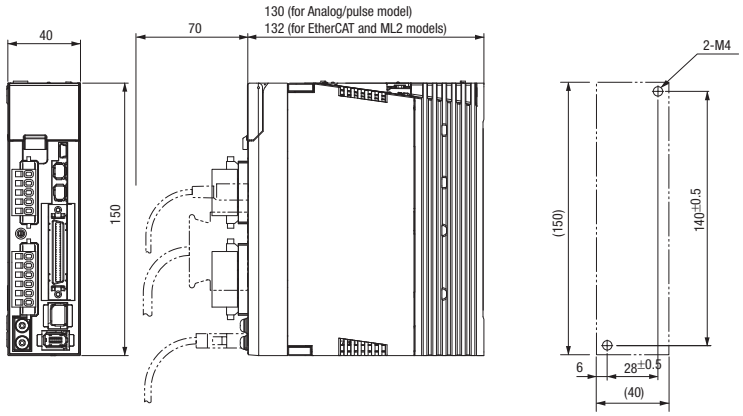
## Safety connector (CN8) - (for all servo drives)

| Pin No. | Signal name | Function |
|---|---|---|
| 1 | – | Not used. Do not connect |
| 2 | – | |
| 3 | SF1– | Safety input 1 & 2. This input turns OFF the power transistor drive signals in the servo drive to cut off the current output to the motor. |
| 4 | SF1+ | |
| 5 | SF2– | |
| 6 | SF2+ | |
| 7 | EDM– | A monitor signal is output to detect a safety function failure. |
| 8 | EDM+ | |
| Shell | FG | Frame ground. |

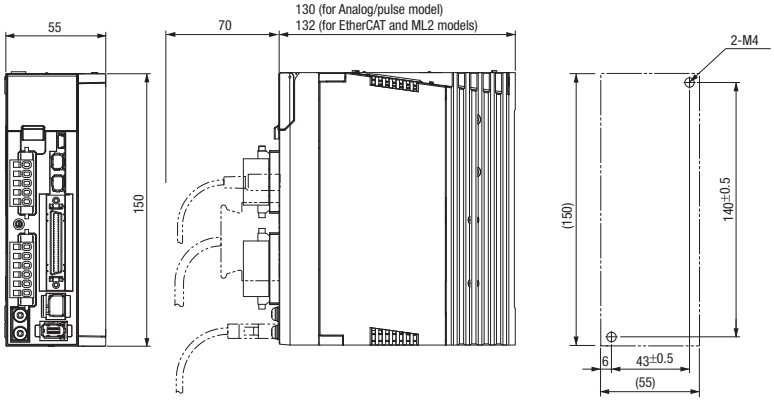
# Dimensions

## Servo drives

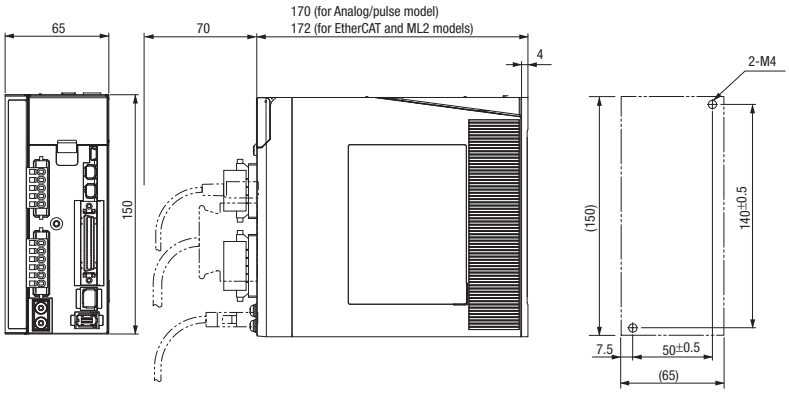
### R88D-KT01/02H, R88D-KN01/02H-□ (230 V, 100 to 200 W)



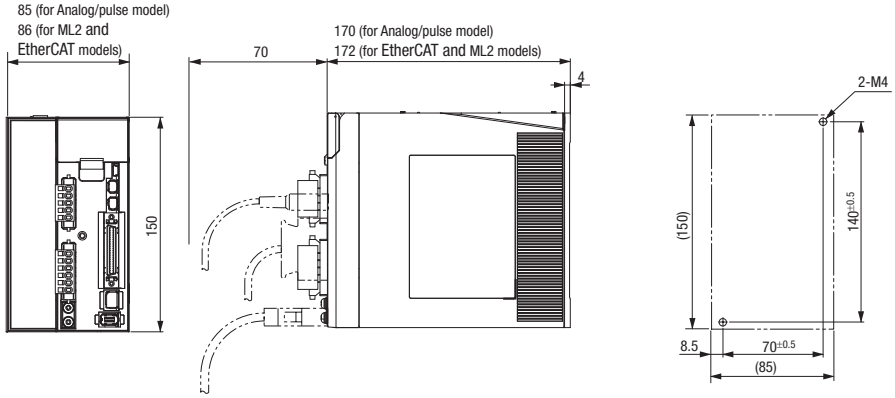

### R88D-KT04H, R88D-KN04H-□ (230 V, 400 W)



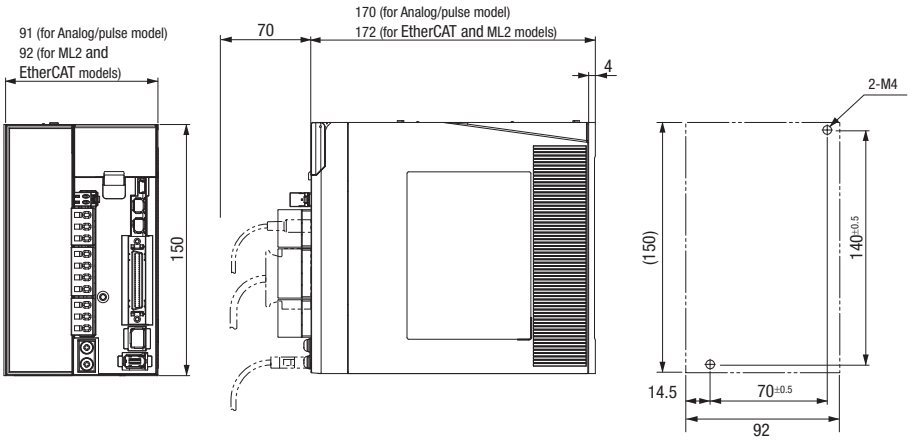

### R88D-KT08H, R88D-KN08H-□ (230 V, 750 W)



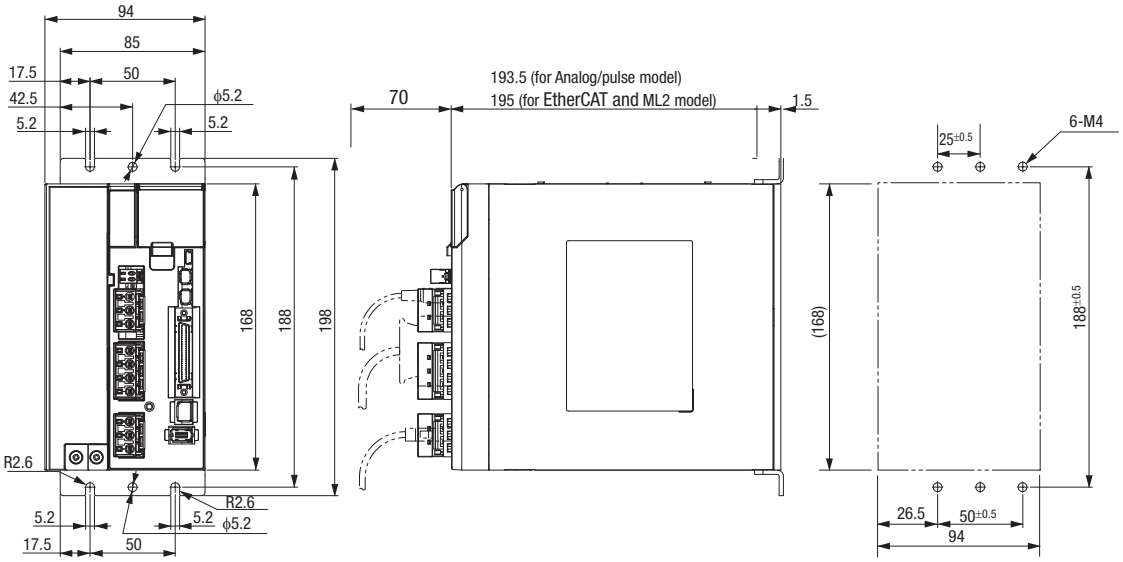

### R88D-KT10/15H, R88D-KN10/15H-□ (230 V, 1 to 1.5 kW)



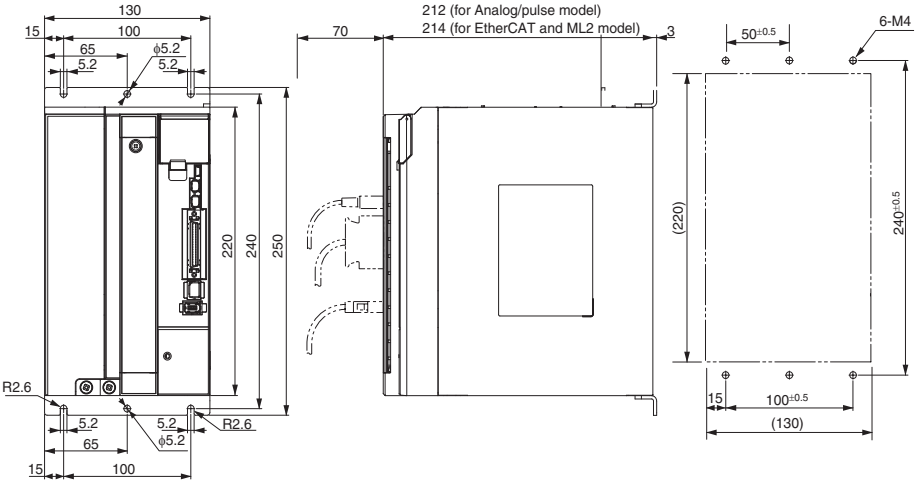
## R88D-KT06/10/15F, R88D-KN06/10/15F-□ (400 V, 600 W to 1.5 kW)



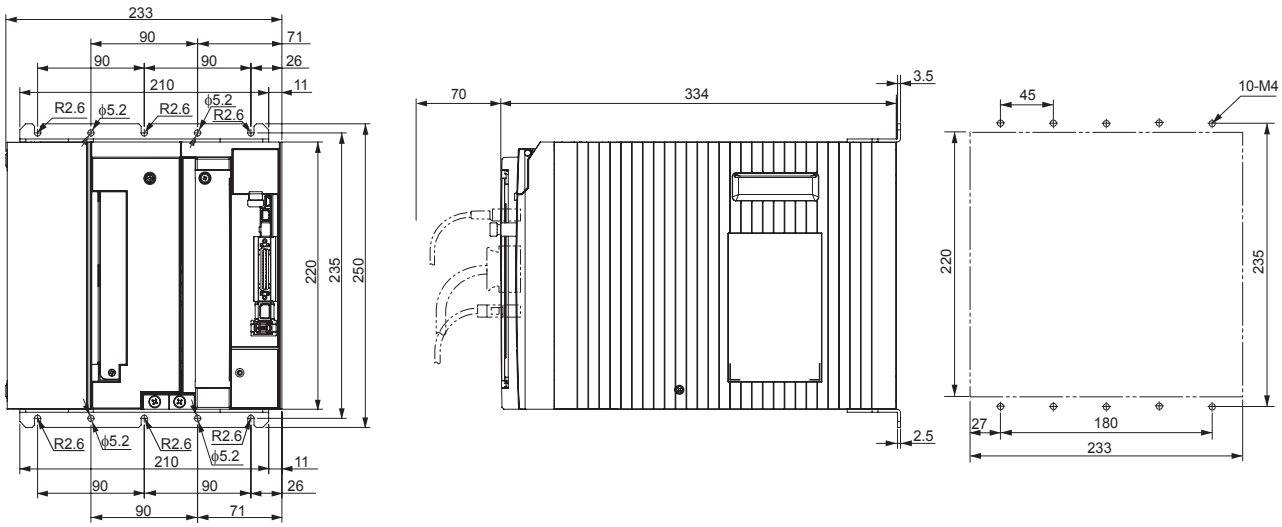

## R88D-KT20F, R88D-KN20F-□ (400 V, 2 kW)



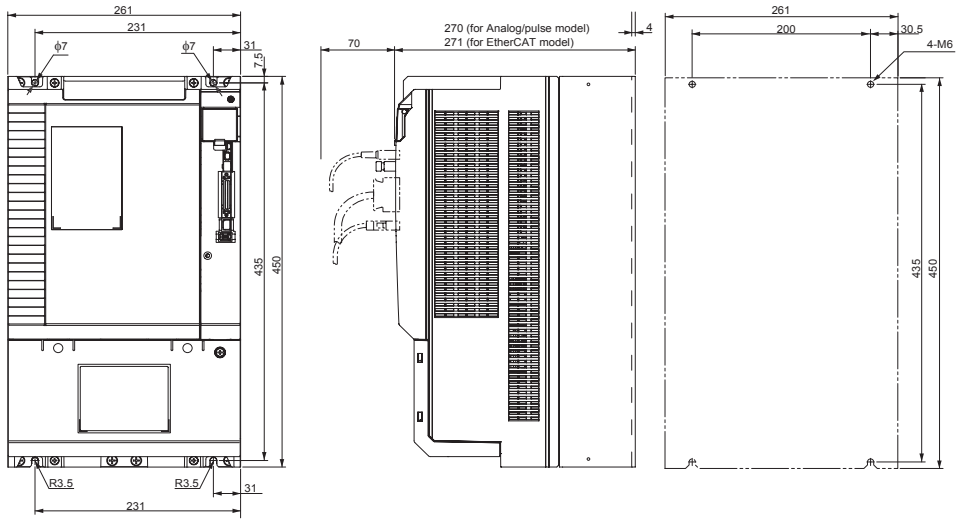

## R88D-KT30/50F, R88D-KN30/50F-□ (400 V, 3 to 5 kW)



## R88D-KT75F, R88D-KN75H-ECT (400 V, 7.5 kW)

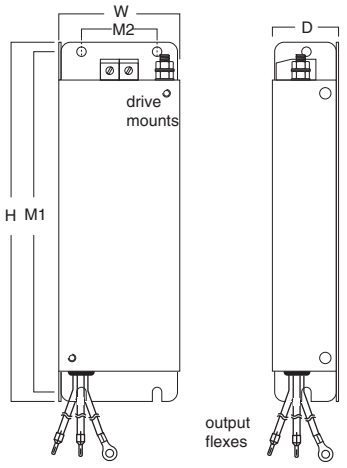



## R88D-KT150F, R88D-KN150H-ECT (400 V, 15 kW)



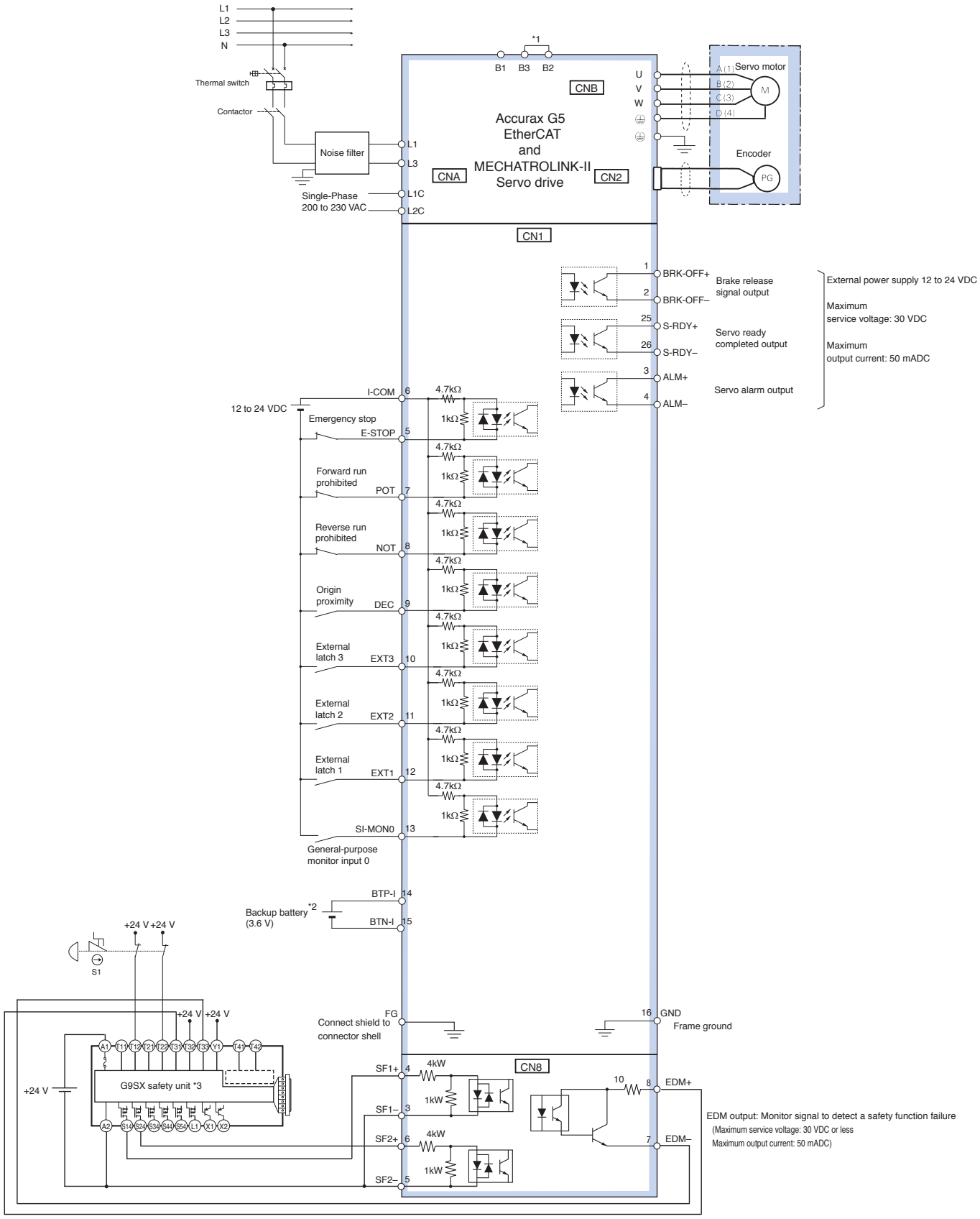

## Filters

| Filter model | External dimensions | | | Mount dimensions | |
|---|---|---|---|---|---|
| | H | W | D | M1 | M2 |
| R88A-FIK102-RE | 190 | 42 | 44 | 180 | 20 |
| R88A-FIK104-RE | 190 | 57 | 30 | 180 | 30 |
| R88A-FIK107-RE | 190 | 64 | 35 | 180 | 40 |
| R88A-FIK114-RE | 190 | 86 | 35 | 180 | 60 |
| R88A-FIK304-RE | 196 | 92 | 40 | 186 | 70 |
| R88A-FIK306-RE | 238 | 94 | 40 | 228 | 70 |
| R88A-FIK312-RE | 291 | 130 | 40 | 278 | 100 |
| R88A-FIK330-RE | 310 | 233 | 50 | 293 | 180 |
| R88A-FIK350-RE | 506 | 261 | 52 | 491 | 200 |



## Installation

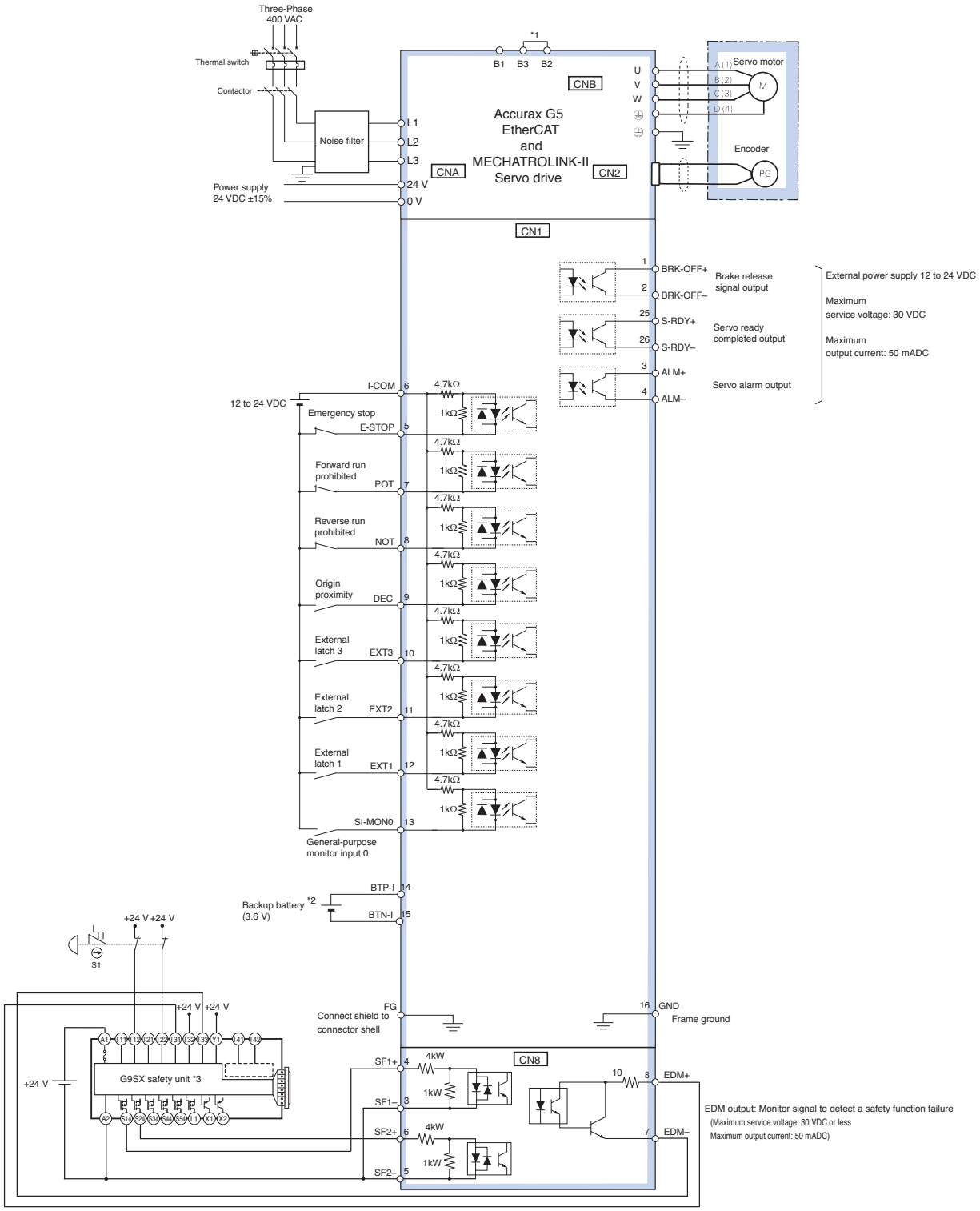
### Single-phase, 230 VAC (for EtherCAT and MECHATROLINK-II servo drives)




*1 For servo drives from 750 W, B2 and B3 are short-circuited. If the internal regenerative resistor is insufficient, remove the wire between B2 and B3 and connect an external regenerative resistor between B1 and B2.
*2 For use only with an absolute encoder. If a backup battery is connected to CN1 I/O connector, an encoder cable with a battery is not required.
*3 Wiring diagram example using the G9SX safety unit. If a safety unit is not used, keep the factory safety bypass connector installed in the CN8.

**Note:** The input function of pins 5 and 7 to 13, and output function of pins 1, 2, 25 and 26, can be changed via parameter settings.

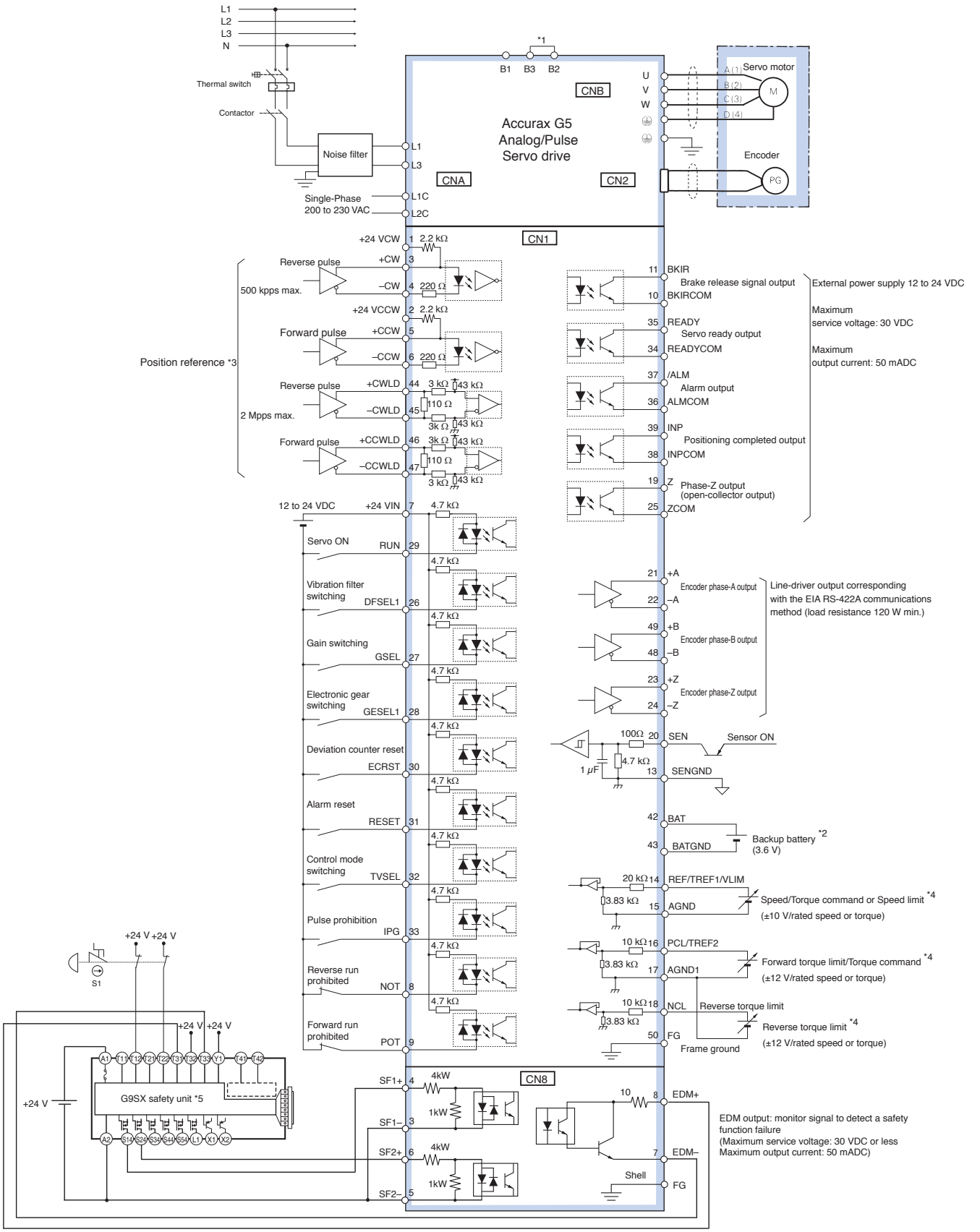
## Three-phase, 400 VAC (for EtherCAT and MECHATROLINK-II servo drives)




*1 Normally B2 and B3 are short-circuited. If the internal regenerative resistor is insufficient, remove the wire between B2 and B3 and connect an external regenerative resistor between B1 and B2.
*2 For use only with an absolute encoder. If a backup battery is connected to CN1 I/O connector, an encoder cable with a battery is not required.
*3 Wiring diagram example using the G9SX safety unit. If a safety unit is not used, keep the factory safety bypass connector installed in the CN8.

**Note:** The input function of pins 5 and 7 to 13, and output function of pins 1, 2, 25 and 26, can be changed via parameter settings.

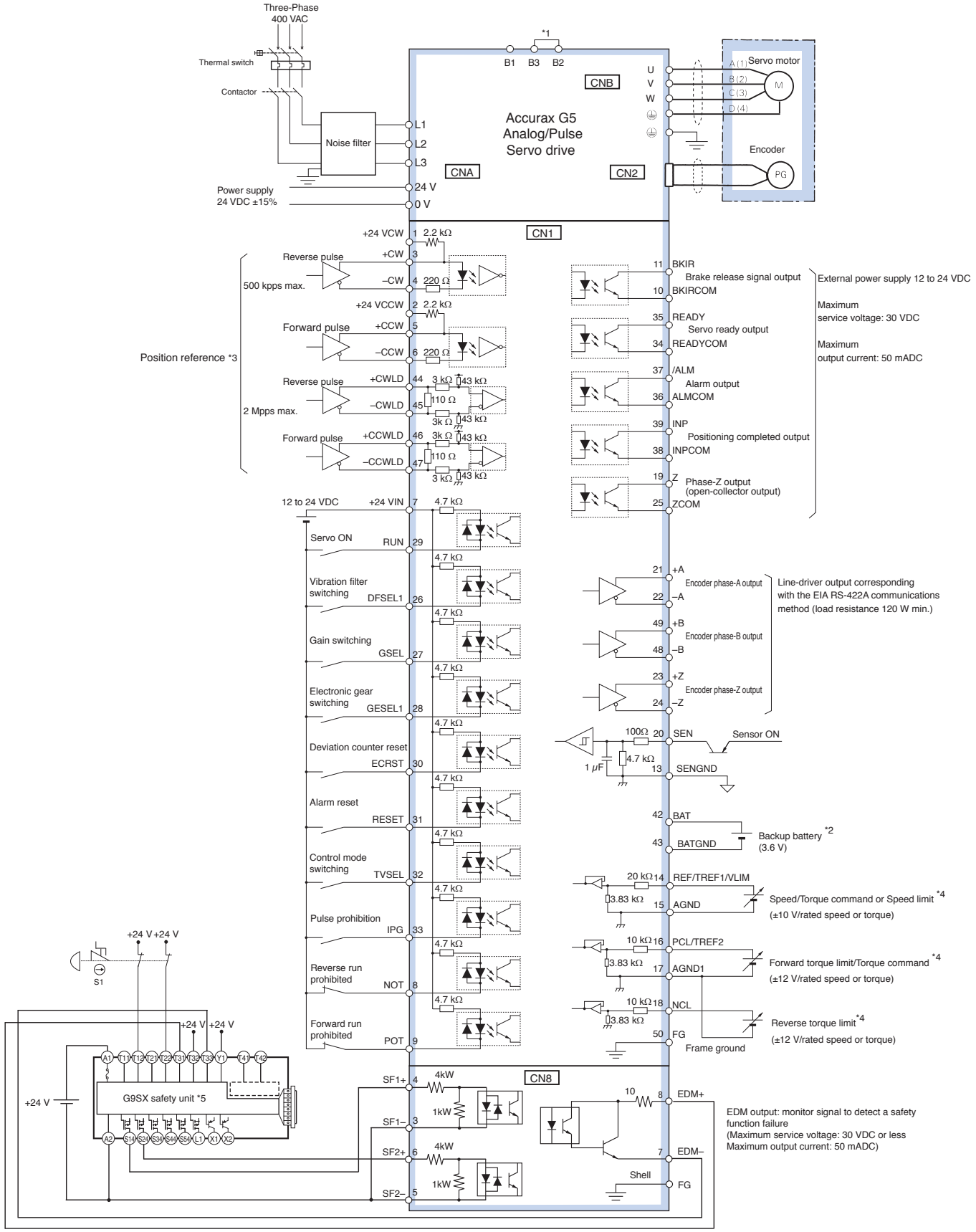
## Single-phase, 230 VAC (for Analog/pulse servo drives)




*1 For servo drives from 750 W, B2 and B3 are short-circuited. If the internal regenerative resistor is insufficient, remove the wire between B2 and B3 and connect an external regenerative resistor between B1 and B2.
*2 For use only with an absolute encoder. If a backup battery is connected to CN1 I/O connector, an encoder cable with a battery is not required.
*3 Only available in Position control mode.
*4 The input function depends on control mode used (Position, speed or torque control).
*5 Wiring diagram example using the G9SX safety unit. If a safety unit is not used, keep the factory safety bypass connector installed in the CN8.

**Note:** The input function of pins 8,9 and 26 to 33, and output function of pins 10, 11, 34, 35, 38 and 39, can be changed via parameter settings.

## Three-phase, 400 VAC (for Analog/pulse servo drives)

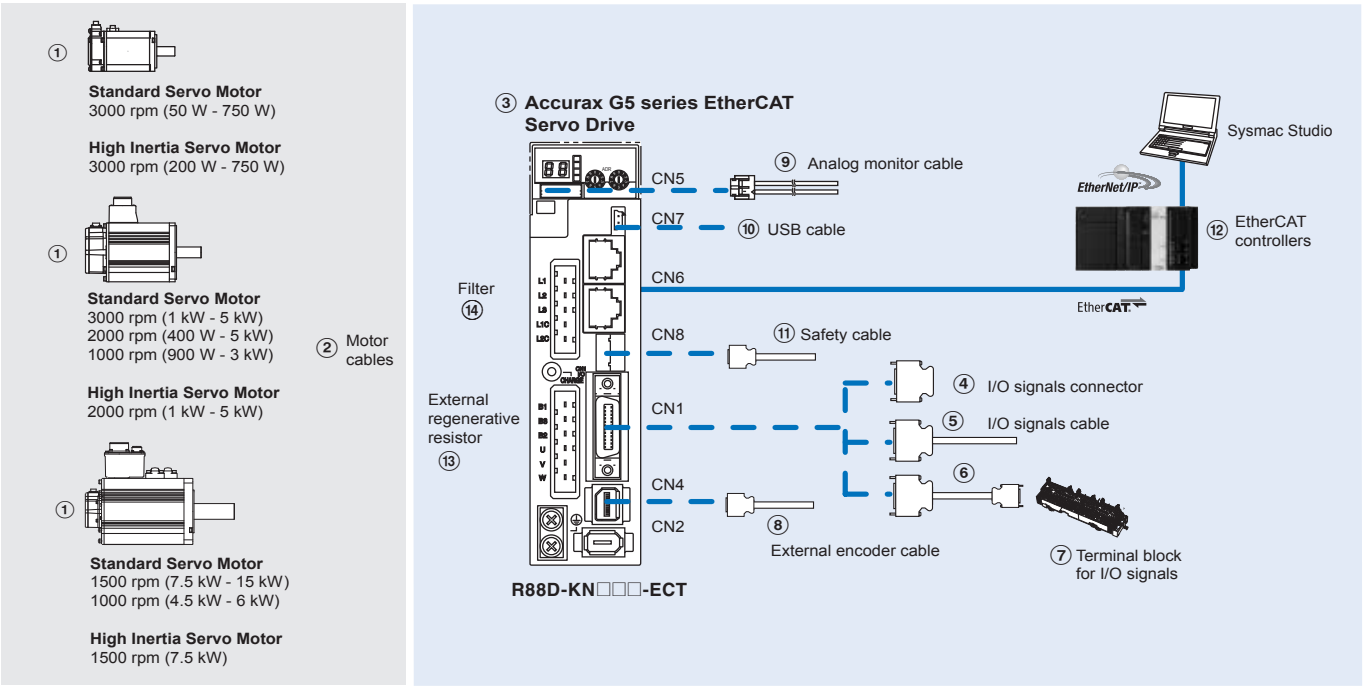



*1 Normally B2 and B3 are short-circuited. If the internal regenerative resistor is insufficient, remove the wire between B2 and B3 and connect an external regenerative resistor between B1 and B2.
*2 For use only with an absolute encoder. If a backup battery is connected to CN1 I/O connector, an encoder cable with a battery is not required.
*3 Only available in Position control mode.
*4 The input function depends on control mode used (Position, speed or torque control).
*5 Wiring diagram example using the G9SX safety unit. If a safety unit is not used, keep the factory safety bypass connector installed in the CN8.

**Note:** The input function of pins 8,9 and 26 to 33, and output function of pins 10, 11, 34, 35, 38 and 39, can be changed via parameter settings.

## Ordering information

### Accurax G5 series EtherCAT reference configuration




**Note:** The symbols ①②③④⑤... show the recommended sequence to select the components in Accurax G5 servo system

### Servo motors, power & encoder cables

**Note:** ①② Refer to the Accurax G5 servo motor chapter for servomotor, motor cables or connectors selection

### Servo drives

| Symbol | Specifications | | Servo drive models | ① Compatible G5 series rotary servo motors | |
|---|---|---|---|---|---|
| | | | | Standard models | High Inertia models |
| ③ | 1 phase 230 VAC | 100 W | R88D-KN01H-ECT | R88M-K05030(H/T)-□ | – |
| | | | | R88M-K10030(H/T)-□ | – |
| | | 200 W | R88D-KN02H-ECT | R88M-K20030(H/T)-□ | R88M-KH20030(H/T)-□ |
| | | 400 W | R88D-KN04H-ECT | R88M-K40030(H/T)-□ | R88M-KH40030(H/T)-□ |
| | | 750 W | R88D-KN08H-ECT | R88M-K75030(H/T)-□ | R88M-KH75030(H/T)-□ |
| | | 1.0 kW | R88D-KN10H-ECT | R88M-K1K020(H/T)-□ | – |
| | | 1.5 kW | R88D-KN15H-ECT | R88M-K1K030(H/T)-□ | – |
| | | | | R88M-K1K530(H/T)-□ | – |
| | | | | R88M-K1K520(H/T)-□ | – |
| | | | | R88M-K90010(H/T)-□ | – |
| | 3 phase 400 VAC | 600 W | R88D-KN06F-ECT | R88M-K40020(F/C)-□ | – |
| | | | | R88M-K60020(F/C)-□ | – |
| | | 1.0 kW | R88D-KN10F-ECT | R88M-K75030(F/C)-□ | – |
| | | | | R88M-K1K020(F/C)-□ | R88M-KH1K020(F/C)-□ |
| | | 1.5 kW | R88D-KN15F-ECT | R88M-K1K030(F/C)-□ | – |
| | | | | R88M-K1K530(F/C)-□ | – |
| | | | | R88M-K1K520(F/C)-□ | R88M-KH1K520(F/C)-□ |
| | | | | R88M-K90010(F/C)-□ | – |
| | | 2.0 kW | R88D-KN20F-ECT | R88M-K2K030(F/C)-□ | – |
| | | | | R88M-K2K020(F/C)-□ | R88M-KH2K020(F/C)-□ |
| | | 3.0 kW | R88D-KN30F-ECT | R88M-K3K030(F/C)-□ | – |
| | | | | R88M-K3K020(F/C)-□ | R88M-KH3K020(F/C)-□ |
| | | | | R88M-K2K010(F/C)-□ | – |
| | | 5.0 kW | R88D-KN50F-ECT | R88M-K4K030(F/C)-□ | – |
| | | | | R88M-K5K030(F/C)-□ | – |
| | | | | R88M-K4K020(F/C)-□ | R88M-KH4K020(F/C)-□ |
| | | | | R88M-K5K020(F/C)-□ | R88M-KH5K020(F/C)-□ |
| | | | | R88M-K4K510C-□ | – |
| | | | | R88M-K3K010(F/C)-□ | – |
| | | 7.5 kW | R88D-KN75F-ECT | R88M-K6K010C-□ | – |
| | | | | R88M-K7K515C-□ | R88M-KH7K515C-□ |
| | | 15 kW | R88D-KN150F-ECT | R88M-K11K015C-□ | – |
| | | | | R88M-K15K015C-□ | – |

### Signals cables for I/O general purpose (CN1)

| Symbol | Description | Connect to | | Model |
|---|---|---|---|---|
| ④ | I/O connector kit (26 pins) | For I/O general purpose | – | R88A-CNW01C |
| ⑤ | I/O signals cable | For I/O general purpose | 1 m | R88A-CPKB001S-E |
| | | | 2 m | R88A-CPKB002S-E |
| ⑥ | Terminal block cable | For I/O general purpose | 1 m | XW2Z-100J-B34 |
| | | | 2 m | XW2Z-200J-B34 |
| ⑦ | Terminal block (M3 screw and for pin terminals) | | – | XW2B-20G4 |
| | Terminal block (M3.5 screw and for fork/round terminals) | | – | XW2B-20G5 |
| | Terminal block (M3 screw and for fork/round terminals) | | – | XW2D-20G6 |

### External encoder cable (CN4)

| Symbol | Name | | Model |
|---|---|---|---|
| ⑧ | External encoder cable | 5 m | R88A-CRKM005SR-E |
| | | 10 m | R88A-CRKM010SR-E |
| | | 20 m | R88A-CRKM020SR-E |

### Analog monitor (CN5)

| Symbol | Name | | Model |
|---|---|---|---|
| ⑨ | Analog monitor cable | 1 m | R88A-CMK001S |

### USB personal computer cable (CN7)

| Symbol | Name | | Model |
|---|---|---|---|
| ⑩ | USB mini-connector cable | 2 m | AX-CUSBM002-E |

### Cable for safety (CN8)

| Symbol | Name | | Model |
|---|---|---|---|
| ⑪ | Safety cable | 3 m | R88A-CSK003S-E |

### EtherCAT controllers

| Symbol | Name | | Model |
|---|---|---|---|
| ⑫ | NJ-series | CPU unit | NJ501-1500 (64 axes) |
| | | | NJ501-1400 (32 axes) |
| | | | NJ501-1300 (16 axes) |
| | | | NJ301-1200 (8 axes) |
| | | | NJ301-1100 (4 axes) |
| | | Power supply unit | NJ-PA3001 (220 VDC) |
| | | | NJ-PD3001 (24 VDC) |
| | Trajexia stand-alone | Motion control unit | TJ2-MC64 (64 axes) |
| | | EtherCAT master unit | TJ2-ECT64 (64 axes) |
| | | | TJ2-ECT16 (16 axes) |
| | | | TJ2-ECT04 (4 axes) |
| | Position controller unit for CJ1 PLC series | | CJ1W-NCF8□ (16 axes) |
| | | | CJ1W-NC88□ (8 axes) |
| | | | CJ1W-NC48□ (4 axes) |
| | | | CJ1W-NC281(2 axes) |

### External regenerative resistor

| Symbol | Regenerative resistor unit model | Specifications |
|---|---|---|
| ⑬ | R88A-RR08050S | 50 Ω, 80 W |
| | R88A-RR080100S | 100 Ω, 80 W |
| | R88A-RR22047S | 47 Ω, 220 W |
| | R88A-RR50020S | 20 Ω, 500 W |

### Filters

| Symbol | Applicable servodrive | Filter model | Manufacturer | Rated current | Leakage current | Rated voltage |
|---|---|---|---|---|---|---|
| ⑭ | R88D-KN01H-ECT, R88D-KN02H-ECT | R88A-FIK102-RE | Rasmi Electronics Ltd | 2.4 A | 3.5 mA | 250 VAC single-phase |
| | R88D-KN04H-ECT | R88A-FIK104-RE | | 4.1 A | 3.5 mA | |
| | R88D-KN08H-ECT | R88A-FIK107-RE | | 6.6 A | 3.5 mA | |
| | R88D-KN10H-ECT, R88D-KN15H-ECT | R88A-FIK114-RE | | 14.2 A | 3.5 mA | |
| | R88D-KN06F-ECT, R88D-KN10F-ECT, R88D-KN15F-ECT | R88A-FIK304-RE | | 4 A | 0.3 mA / 32 mA[*1] | 400 VAC three-phase |
| | R88D-KN20F-ECT | R88A-FIK306-RE | | 6 A | 0.3 mA / 32 mA[*1] | |
| | R88D-KN30F-ECT, R88D-KN50F-ECT | R88A-FIK312-RE | | 12.1 A | 0.3 mA / 32 mA[*1] | |
| | R88D-KN75F-ECT | R88A-FIK330-RE | | 22 A | 0.3 mA / 40 mA[*1] | |
| | R88D-KN150F-ECT | R88A-FIK350-RE | | 44 A | 2 mA / 130 mA[*1] | |

[*1] Momentary peak leakage current for the filter at switch-on/off.

### Connectors

| Specifications | Model |
|---|---|
| External encoder connector (for CN4) | R88A-CNK41L |
| Safety I/O signal connector (for CN8) | R88A-CNK81S |

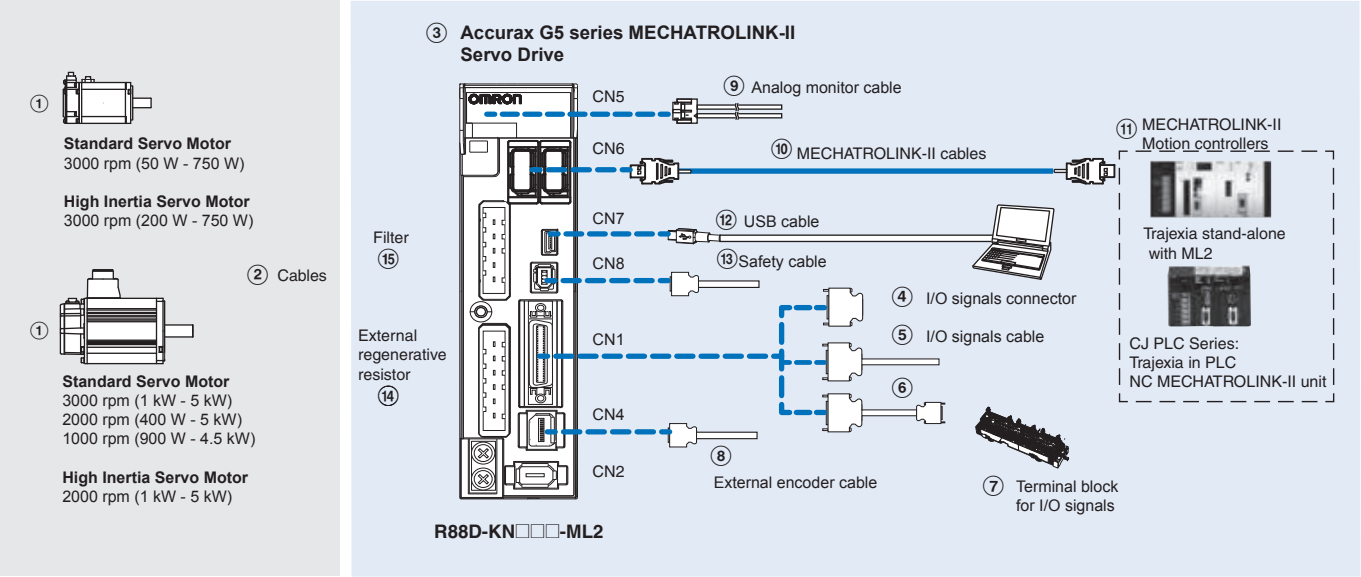
### Computer software

| Specifications | Model |
|---|---|
| Sysmac Studio version 1.0 or higher | SYSMAC-SE2□□□ |
| CX-Drive version 2.10 or higher | CX-DRIVE 2.10 |
| CX-One software package including CX-Drive 2.10 or higher | CX-ONE |

**Note:** If CX-One is installed on the same computer as Sysmac Studio, it must be CX-One v4.2 or higher

## Ordering information

### Accurax G5 series MECHATROLINK-II reference configuration




**Note:** The symbols ①②③④⑤... show the recommended sequence to select the components in Accurax G5 servo system

### Servo motors, power & encoder cables

**Note:** ①② Refer to the Accurax G5 servo motor chapter for servomotor, motor cables or connectors selection

### Servo drives

| Symbol | Specifications | | Servo drive models | ① Compatible G5 series rotary servo motors | |
|---|---|---|---|---|---|
| | | | | Standard models | High inertia models |
| ③ | 1 phase 230 VAC | 100 W | R88D-KN01H-ML2 | R88M-K05030(H/T)-□ | – |
| | | | | R88M-K10030(H/T)-□ | – |
| | | 200 W | R88D-KN02H-ML2 | R88M-K20030(H/T)-□ | R88M-KH20030(H/T)-□ |
| | | 400 W | R88D-KN04H-ML2 | R88M-K40030(H/T)-□ | R88M-KH40030(H/T)-□ |
| | | 750 W | R88D-KN08H-ML2 | R88M-K75030(H/T)-□ | R88M-KH75030(H/T)-□ |
| | | 1.0 kW | R88D-KN10H-ML2 | R88M-K1K020(H/T)-□ | – |
| | | 1.5 kW | R88D-KN15H-ML2 | R88M-K1K030(H/T)-□ | – |
| | | | | R88M-K1K530(H/T)-□ | – |
| | | | | R88M-K1K520(H/T)-□ | – |
| | | | | R88M-K90010(H/T)-□ | – |
| | 3 phase 400 VAC | 600 W | R88D-KN06F-ML2 | R88M-K40020(F/C)-□ | – |
| | | | | R88M-K60020(F/C)-□ | – |
| | | 1.0 kW | R88D-KN10F-ML2 | R88M-K75030(F/C)-□ | – |
| | | | | R88M-K1K020(F/C)-□ | R88M-KH1K020(F/C)-□ |
| | | 1.5 kW | R88D-KN15F-ML2 | R88M-K1K030(F/C)-□ | – |
| | | | | R88M-K1K530(F/C)-□ | – |
| | | | | R88M-K1K520(F/C)-□ | R88M-KH1K520(F/C)-□ |
| | | | | R88M-K90010(F/C)-□ | – |
| | | 2.0 kW | R88D-KN20F-ML2 | R88M-K2K030(F/C)-□ | – |
| | | | | R88M-K2K020(F/C)-□ | R88M-KH2K020(F/C)-□ |
| | | 3.0 kW | R88D-KN30F-ML2 | R88M-K3K030(F/C)-□ | – |
| | | | | R88M-K3K020(F/C)-□ | R88M-KH3K020(F/C)-□ |
| | | | | R88M-K2K010(F/C)-□ | – |
| | | 5.0 kW | R88D-KN50F-ML2 | R88M-K4K030(F/C)-□ | – |
| | | | | R88M-K5K030(F/C)-□ | – |
| | | | | R88M-K4K020(F/C)-□ | R88M-KH4K020(F/C)-□ |
| | | | | R88M-K5K020(F/C)-□ | R88M-KH5K020(F/C)-□ |
| | | | | R88M-K4K510C-□ | – |
| | | | | R88M-K3K010(F/C)-□ | – |

### Control cables (CN1)

| Symbol | Description | Connect to | | Model |
|---|---|---|---|---|
| ④ | I/O connector kit (26 pins) | For I/O general purpose | – | R88A-CNW01C |
| ⑤ | I/O signals cable | | 1 m | R88A-CPKB001S-E |
| | | | 2 m | R88A-CPKB002S-E |
| ⑥ | Terminal block cable | For I/O general purpose | 1 m | XW2Z-100J-B34 |
| | | | 2 m | XW2Z-200J-B34 |
| ⑦ | Terminal block (M3 screw and for pin terminals) | | – | XW2B-20G4 |
| | Terminal block (M3.5 screw and for fork/round terminals) | | – | XW2B-20G5 |
| | Terminal block (M3 screw and for fork/round terminals) | | – | XW2D-20G6 |

### External encoder cable (CN4)

| Symbol | Name | Length | Model |
|---|---|---|---|
| ⑧ | External encoder cable | 5 m | R88A-CRKM005SR-E |
| | | 10 m | R88A-CRKM010SR-E |
| | | 20 m | R88A-CRKM020SR-E |

### Analog monitor (CN5)

| Symbol | Name | Length | Model |
|---|---|---|---|
| ⑨ | Analog monitor cable | 1 m | R88A-CMK001S |

### MECHATROLINK-II cables (CN6)

| Symbol | Specifications | Length | Model |
|---|---|---|---|
| ⑩ | MECHATROLINK-II Terminator resistor | – | JEPMC-W6022-E |
| | MECHATROLINK-II cables | 0.5 m | JEPMC-W6003-A5-E |
| | | 1 m | JEPMC-W6003-01-E |
| | | 3 m | JEPMC-W6003-03-E |
| | | 5 m | JEPMC-W6003-05-E |
| | | 10 m | JEPMC-W6003-10-E |
| | | 20 m | JEPMC-W6003-20-E |
| | | 30 m | JEPMC-W6003-30-E |

### USB personal computer cable (CN7)

| Symbol | Name | Length | Model |
|---|---|---|---|
| ⑫ | USB mini-connector cable | 2m | AX-CUSBM002-E |

### Cable for Safety Functions (CN8)

| Symbol | Description | Model |
|---|---|---|
| ⑬ | Safety connector with 3 m cable (with loose wires at one end) | R88A-CSK003S-E |

### External regenerative resistor

| Symbol | Regenerative resistor unit model | Specifications |
|---|---|---|
| ⑭ | R88A-RR08050S | 50 Ω, 80 W |
| | R88A-RR080100S | 100 Ω, 80 W |
| | R88A-RR22047S | 47 Ω, 220 W |
| | R88A-RR50020S | 20 Ω, 500 W |

### MECHATROLINK-II Motion controllers

| Symbol | Name | | Model |
|---|---|---|---|
| ⑪ | Trajexia stand-alone | Motion control unit | TJ2-MC64 (64 axes) |
| | | | TJ1-MC16 (16 axes) |
| | | | TJ1-MC04 (4 axes) |
| | | ML2 master unit | TJ1-ML16 (16 axes) |
| | | | TJ1-ML04 (4 axes) |
| | Trajexia-PLC motion controller | | CJ1W-MCH72 (30 axes) |
| | | | CJ1W-MC472 (4 axes) |
| | Position Controller Unit for CJ1 PLC | | CJ1W-NCF71 (16 axes) |
| | | | CJ1W-NC471 (4 axes) |
| | | | CJ1W-NC271 (2 axes) |
| | Position Controller Unit for CS1 PLC | | CS1W-NCF71 (16 axes) |
| | | | CS1W-NC471 (4 axes) |
| | | | CS1W-NC271 (2 axes) |

### Filters

| Symbol | Applicable servodrive | Filter model | Manufacturer | Rated current | Leakage current | Rated voltage |
|---|---|---|---|---|---|---|
| ⑮ | R88D-KN01H-ML2, R88D-KN02H-ML2 | R88A-FIK102-RE | Rasmi Electronics Ltd | 2.4 A | 3.5 mA | 250 VAC single-phase |
| | R88D-KN04H-ML2 | R88A-FIK104-RE | | 4.1 A | 3.5 mA | |
| | R88D-KN08H-ML2 | R88A-FIK107-RE | | 6.6 A | 3.5 mA | |
| | R88D-KN10H-ML2, R88D-KN15H-ML2 | R88A-FIK114-RE | | 14.2 A | 3.5 mA | |
| | R88D-KN06F-ML2, R88D-KN10F-ML2, R88D-KN15F-ML2 | R88A-FIK304-RE | | 4 A | 0.3 mA/32 mA*1 | 400 VAC three-phase |
| | R88D-KN20F-ML2 | R88A-FIK306-RE | | 6 A | 0.3 mA/32 mA*1 | |
| | R88D-KN30F-ML2, R88D-KN50F-ML2 | R88A-FIK312-RE | | 12.1 A | 0.3 mA/32 mA*1 | |

*1 Momentary peak leakage current for the filter at switch-on/off.

### Connectors

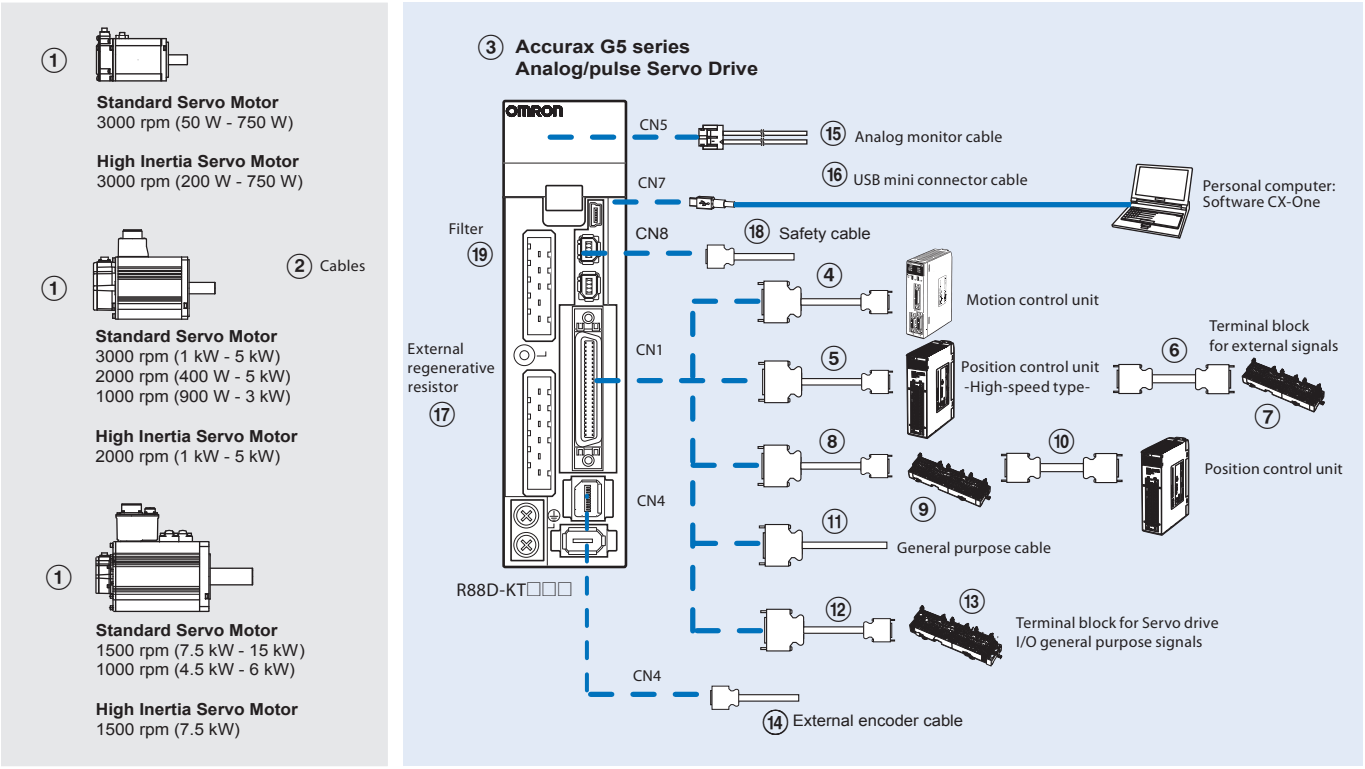
| Specifications | Model |
|---|---|
| External encoder connector (for CN4) | R88A-CNK41L |
| Safety I/O signal connector (for CN8) | R88A-CNK81S |

### Computer software

| Specifications | Model |
|---|---|
| CX-Drive version 1.91 or higher | CX-DRIVE 1.91 |
| CX-One software package including CX-Drive 1.91 or higher | CX-ONE |

# Ordering information

## Accurax G5 series Analog/pulse reference configuration




**Note:** The symbols ①②③④⑤... show the recommended sequence to select the components in Accurax G5 servo system

### Servo motors, power & encoder cables

**Note:** ①② Refer to the Accurax G5 servo motor chapter for servomotor, motor cables or connectors selection

### Servo drives

| Symbol | Specifications | | Servo drive models*1 | ① Compatible Accurax G5 series rotary servo motors | |
|---|---|---|---|---|---|
| | | | | Standard models | High inertia models |
| ③ | 1 phase 230 VAC | 100 W | R88D-KT01H | R88M-K05030(H/T)-□ | – |
| | | | | R88M-K10030(H/T)-□ | – |
| | | 200 W | R88D-KT02H | R88M-K20030(H/T)-□ | R88M-KH20030(H/T)-□ |
| | | 400 W | R88D-KT04H | R88M-K40030(H/T)-□ | R88M-KH40030(H/T)-□ |
| | | 750 W | R88D-KT08H | R88M-K75030(H/T)-□ | R88M-KH75030(H/T)-□ |
| | | 1.0 kW | R88D-KT10H | R88M-K1K020(H/T)-□ | – |
| | | 1.5 kW | R88D-KT15H | R88M-K1K030(H/T)-□ | – |
| | | | | R88M-K1K530(H/T)-□ | – |
| | | | | R88M-K1K520(H/T)-□ | – |
| | | | | R88M-K90010(H/T)-□ | – |
| | 3 phase 400 VAC | 600 W | R88D-KT06F | R88M-K40020(F/C)-□ | – |
| | | | | R88M-K60020(F/C)-□ | – |
| | | 1.0 kW | R88D-KT10F | R88M-K75030(F/C)-□ | – |
| | | | | R88M-K1K020(F/C)-□ | R88M-KH1K020(F/C)-□ |
| | | 1.5 kW | R88D-KT15F | R88M-K1K030(F/C)-□ | – |
| | | | | R88M-K1K530(F/C)-□ | – |
| | | | | R88M-K1K520(F/C)-□ | R88M-KH1K520(F/C)-□ |
| | | | | R88M-K90010(F/C)-□ | – |
| | | 2.0 kW | R88D-KT20F | R88M-K2K030(F/C)-□ | – |
| | | | | R88M-K2K020(F/C)-□ | R88M-KH2K020(F/C)-□ |
| | | 3.0 kW | R88D-KT30F | R88M-K3K030(F/C)-□ | – |
| | | | | R88M-K3K020(F/C)-□ | R88M-KH3K020(F/C)-□ |
| | | | | R88M-K2K010(F/C)-□ | – |
| | | 5.0 kW | R88D-KT50F | R88M-K4K030(F/C)-□ | – |
| | | | | R88M-K5K030(F/C)-□ | – |
| | | | | R88M-K4K020(F/C)-□ | R88M-KH4K020(F/C)-□ |
| | | | | R88M-K5K020(F/C)-□ | R88M-KH5K020(F/C)-□ |
| | | | | R88M-K4K510C-□ | – |
| | | | | R88M-K3K010(F/C)-□ | – |
| | | 7.5 kW | R88D-KT75F | R88M-K6K010C-□ | – |
| | | | | R88M-K7K515C-□ | R88M-KH7K515C-□ |
| | | 15 kW | R88D-KT150F | R88M-K11K015C-□ | – |
| | | | | R88M-K15K015C-□ | – |

*1 Drive Programming – embedded indexer functionality – is available in the Accurax G5 Analogue/pulse models with firmware 1.10 or higher.

**Control cables (CN1)**

| Symbol | Description | Connect to | | Model |
|---|---|---|---|---|
| ④ | Control cable (1 axis) | Motion control units CS1W-MC221 CS1W-MC421 | 1 m | R88A-CPG001M1 |
| | | | 2 m | R88A-CPG002M1 |
| | | | 3 m | R88A-CPG003M1 |
| | | | 5 m | R88A-CPG005M1 |
| | Control cable (2 axes) | Motion control units CS1W-MC221 CS1W-MC421 | 1 m | R88A-CPG001M2 |
| | | | 2 m | R88A-CPG002M2 |
| | | | 3 m | R88A-CPG003M2 |
| | | | 5 m | R88A-CPG005M2 |
| ⑤ | Control cable (line-driver output for 1 axis) | Position control units (high-speed type) CJ1W-NC234 CJ1W-NC434 | 1 m | XW2Z-100J-G9 |
| | | | 5 m | XW2Z-500J-G9 |
| | | | 10 m | XW2Z-10MJ-G9 |
| | Control cable (open-collector output for 1 axis) | Position control units (high-speed type) CJ1W-NC214 CJ1W-NC414 | 1 m | XW2Z-100J-G13 |
| | | | 3 m | XW2Z-300J-G13 |
| | Control cable (line-driver output for 2 axes) | Position control units (high-speed type) CJ1W-NC234 CJ1W-NC434 | 1 m | XW2Z-100J-G1 |
| | | | 5 m | XW2Z-500J-G1 |
| | | | 10 m | XW2Z-10MJ-G1 |
| | Control cable (open-collector output for 2 axes) | Position control units (high-speed type) CJ1W-NC214 CJ1W-NC414 | 1 m | XW2Z-100J-G5 |
| | | | 3 m | XW2Z-300J-G5 |
| ⑥ | Terminal block cable for external signals (for input common, forward/reverse run prohibited inputs, emergency stop input, origin proximity input and interrupt input) | Position control units (high-speed type) CJ1W-NC234 CJ1W-NC434 CJ1W-NC214 CJ1W-NC414 | 0.5 m | XW2Z-C50X |
| | | | 1 m | XW2Z-100X |
| | | | 2 m | XW2Z-200X |
| | | | 3 m | XW2Z-300X |
| | | | 5 m | XW2Z-500X |
| | | | 10 m | XW2Z-010X |
| ⑦ | Terminal block for external signals (M3 screw, pin terminals) | | – | XW2B-20G4 |
| | Terminal block for ext. signals (M3.5 screw, fork/round terminals) | | – | XW2B-20G5 |
| | Terminal block for ext. signals (M3 screw, fork/round terminals) | | – | XW2D-20G6 |
| ⑧ | Cable from servo relay unit to servo drive | CS1W-NC1□3, CJ1W-NC1□3, C200HW-NC113, CS1W-NC2□3/4□3, CJ1W-NC2□3/4□3, C200HW-NC213/413, CQM1H-PLB21 or CQM1-CPU43 | 1 m | XW2Z-100J-B25 |
| | | | 2 m | XW2Z-200J-B25 |
| | | CJ1M-CPU21/22/23 | 1 m | XW2Z-100J-B31 |
| | | | 2 m | XW2Z-200J-B31 |
| ⑨ | Servo relay unit | Position control units CS1W-NC1□3, CJ1W-NC1□3 or C200HW-NC113 | – | XW2B-20J6-1B (1 axis) |
| | | Position control units CS1W-NC2□3/4□3, CJ1W-NC2□3/4□3 or C200HW-NC213/413 | – | XW2B-40J6-2B (2 axes) |
| | | CQM1H-PLB21 or CQM1-CPU43 | – | XW2B-20J6-3B (1 axis) |
| | | CJ1M-CPU21/22/23 | – | XW2B-20J6-8A (1 axis) XW2B-40J6-9A (2 axes) |
| ⑩ | Position control unit connecting cable | CQM1H-PLB21 | 0.5 m | XW2Z-050J-A3 |
| | | | 1 m | XW2Z-100J-A3 |
| | | CS1W-NC113 or C200HW-NC113 | 0.5 m | XW2Z-050J-A6 |
| | | | 1 m | XW2Z-100J-A6 |
| | | CS1W-NC213/413 or C200HW-NC213/413 | 0.5 m | XW2Z-050J-A7 |
| | | | 1 m | XW2Z-100J-A7 |
| | | CS1W-NC133 | 0.5 m | XW2Z-050J-A10 |
| | | | 1 m | XW2Z-100J-A10 |
| | | CS1W-NC233/433 | 0.5 m | XW2Z-050J-A11 |
| | | | 1 m | XW2Z-100J-A11 |
| | | CJ1W-NC113 | 0.5 m | XW2Z-050J-A14 |
| | | | 1 m | XW2Z-100J-A14 |
| | | CJ1W-NC213/413 | 0.5 m | XW2Z-050J-A15 |
| | | | 1 m | XW2Z-100J-A15 |
| | | CJ1W-NC133 | 0.5 m | XW2Z-050J-A18 |
| | | | 1 m | XW2Z-100J-A18 |
| | | CJ1W-NC233/433 | 0.5 m | XW2Z-050J-A19 |
| | | | 1 m | XW2Z-100J-A19 |
| | | CJ1M-CPU21/22/23 | 0.5 m | XW2Z-050J-A33 |
| | | | 1 m | XW2Z-100J-A33 |
| ⑪ | General purpose cable | For general purpose controllers | 1 m | R88A-CPG001S |
| | | | 2 m | R88A-CPG002S |
| ⑫ | Terminal block cable | For general purpose controllers | 1 m | XW2Z-100J-B24 |
| | | | 2 m | XW2Z-200J-B24 |
| ⑬ | Terminal block (M3 screw and for pin terminals) | | – | XW2B-50G4 |
| | Terminal block (M3.5 screw and for fork/round terminals) | | – | XW2B-50G5 |
| | Terminal block (M3 screw and for fork/round terminals) | | – | XW2D-50G6 |

### External encoder cable (CN4)

| Symbol | Name | | Model |
|---|---|---|---|
| ⑭ | External encoder cable | 5 m | R88A-CRKM005SR-E |
| | | 10 m | R88A-CRKM010SR-E |
| | | 20 m | R88A-CRKM020SR-E |

### Analog monitor (CN5)

| Symbol | Name | | Model |
|---|---|---|---|
| ⑮ | Analog monitor cable | 1 m | R88A-CMK001S |

### USB personal computer cable (CN7)

| Symbol | Name | | Model |
|---|---|---|---|
| ⑯ | USB mini-connector cable | 2 m | AX-CUSBM002-E |

### External regenerative resistor

| Symbol | Regenerative resistor unit model | Specifications |
|---|---|---|
| ⑰ | R88A-RR08050S | 50 Ω, 80 W |
| | R88A-RR080100S | 100 Ω, 80 W |
| | R88A-RR22047S | 47 Ω, 220 W |
| | R88A-RR50020S | 20 Ω, 500 W |

### Cable for Safety Functions (CN8)

| Symbol | Description | Model |
|---|---|---|
| ⑱ | Safety connector with 3 m cable (with loose wires at one end) | R88A-CSK003S-E |

### Filters

| Symbol | Applicable servodrive | Filter model | Manufacturer | Rated current | Leakage current | Rated voltage |
|---|---|---|---|---|---|---|
| ⑲ | R88D-KT01H, R88D-KT02H | R88A-FIK102-RE | Rasmi Electronics Ltd | 2.4 A | 3.5 mA | 250 VAC single-phase |
| | R88D-KT04H | R88A-FIK104-RE | | 4.1 A | 3.5 mA | |
| | R88D-KT08H | R88A-FIK107-RE | | 6.6 A | 3.5 mA | |
| | R88D-KT10H, R88D-KT15H | R88A-FIK114-RE | | 14.2 A | 3.5 mA | |
| | R88D-KT06F, R88D-KT10F, R88D-KT15F | R88A-FIK304-RE | | 4 A | 0.3 mA / 32 mA*1 | 400 VAC three-phase |
| | R88D-KT20F | R88A-FIK306-RE | | 6 A | 0.3 mA / 32 mA*1 | |
| | R88D-KT30F, R88D-KT50F | R88A-FIK312-RE | | 12.1 A | 0.3 mA / 32 mA*1 | |
| | R88D-KT75F | R88A-FIK330-RE | | 22 A | 0.3 mA / 40 mA*1 | |
| | R88D-KT150F | R88A-FIK350-RE | | 44 A | 2 mA / 130 mA*1 | |

*1 Momentary peak leakage current for the filter at switch-on/off.

### Connectors

| Specifications | Model |
|---|---|
| I/O connector kit -50 pins-(for CN1) | R88A-CNU11C |
| External encoder connector (for CN4) | R88A-CNK41L |
| Safety I/O signal connector (for CN8) | R88A-CNK81S |

### Computer software

| Specifications | Model |
|---|---|
| CX-Drive version 2.10 or higher | CX-DRIVE 2.10 |
| CX-One software packaging including CX-Drive 2.10 or higher | CX-ONE |

ALL DIMENSIONS SHOWN ARE IN MILLIMETERS.
To convert millimeters into inches, multiply by 0.03937. To convert grams into ounces, multiply by 0.03527.

Cat. No. I101E-EN-04A In the interest of product improvement, specifications are subject to change without notice.