## [KBX Series control parts]

### Master(Scanner) unit
KCA-25-M□0

KCA-25-M10

KCA-25-M40/M80

Page 174

| Motor capacity | I/O type | Extension interface unit |
|---|---|---|
| For 50 to 200 W<br>For 400 W<br>For 750 W | NPN I/O<br>PNP I/O | None<br>CC-Link unit<br>DeviceNet unit<br>Extension I/O unit |

### Slave(Adapter) unit
KCA-25-S□0

KCA-25-S10

KCA-25-S40/S80

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| Motor capacity | I/O type |
|---|---|
| For 50 to 200 W<br>For 400 W<br>For 750 W | NPN I/O<br>PNP I/O |

### Regenerative discharge unit
KCA-ABSU-□000

KCA-ABSU-2000/4000

KCA-ABSU-8000

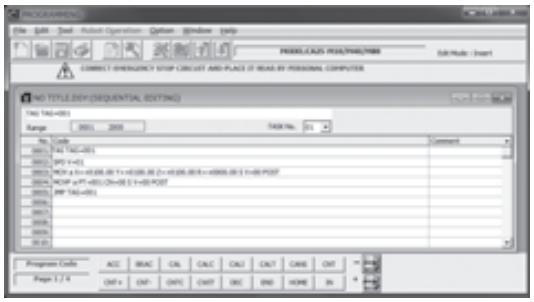
Page 194

| Motor capacity |
|---|
| For 50 to 200 W<br>For 400 W<br>For 750 W |

### Handy terminal
KCA-TPH-4C

Page 197

### PC software
KCA-SF-98D



Page 199

# MEMO

# Master(Scanner) unit

* Used as the master(scanner) unit for single axis to 4-axis types. A driver circuit board for a single axis is also incorporated.
  Easy teaching is possible by a program using the conventional robot language.
* For the supply power, multi power (100 to 115 VAC, 200 to 230 VAC) is used to cope with globalized production. (Note KCA-25-M40 and KCA-25-M80 are only used with a power supply of 200 to 230 VAC.)
* Select NPN or PNP for I/O signal.
* The multitask function (number of controlled axes: 4) is also available, which allows execution of up to four tasks in the sequential mode, so that two or more jobs can be executed at the same time.
* Handy terminal KCA-TPH-4C is used.

## How to order controllers

**KCA - 25 - M 10 - N X C**

- Ⓐ Motor capacity
- Ⓑ Select I/O type
- Ⓒ Extension I/F unit

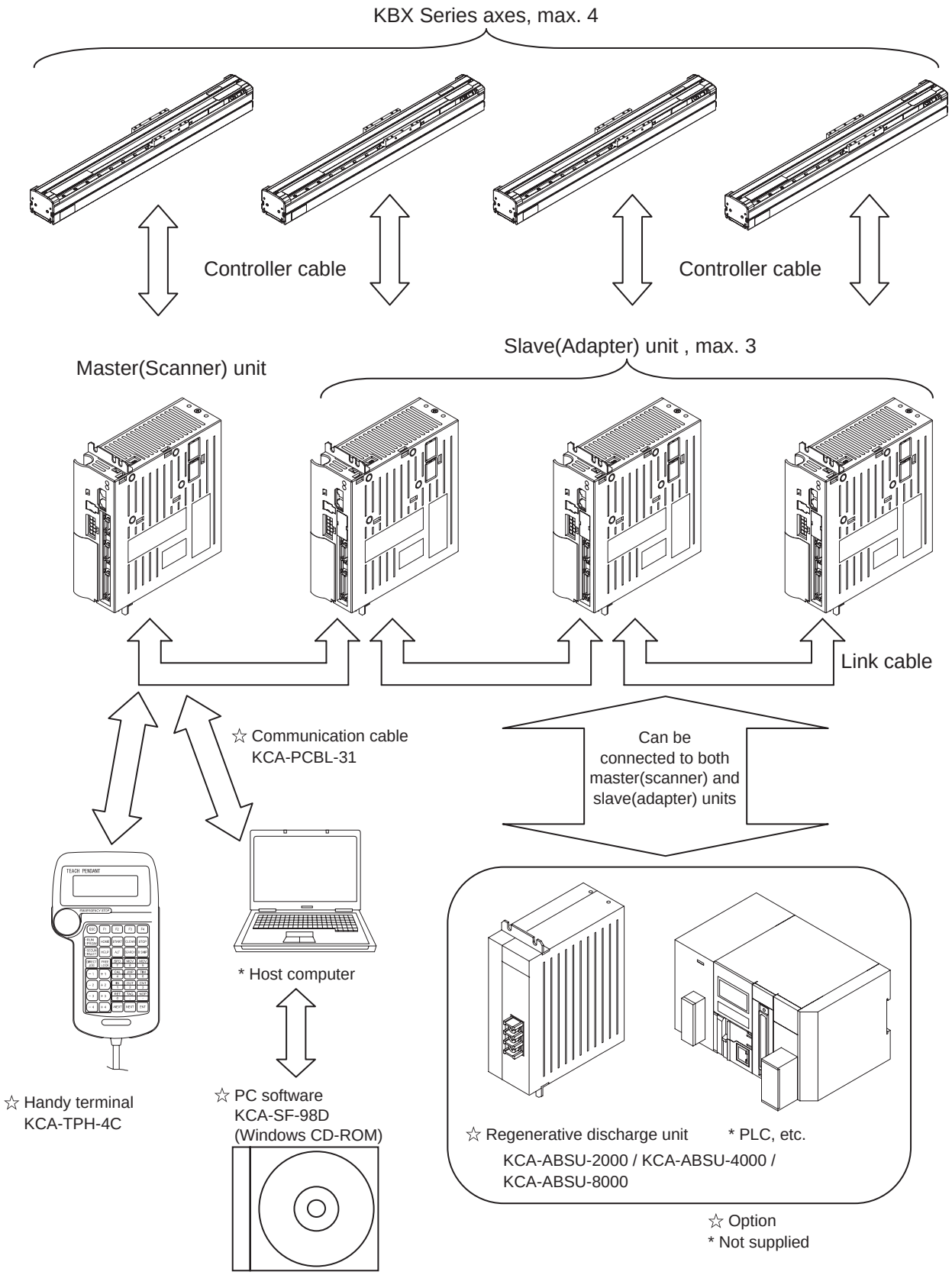
| Code | Content |
|---|---|
| **Ⓐ Motor capacity** | |
| **10** | 50 W to 200 W |
| **40** | 400 W |
| **80** | 750 W |
| **Ⓑ Select I/O type** | |
| **N** | NPN I/O |
| **P** | PNP I/O |
| **Ⓒ Extension I/F unit** | |
| **X** | None |
| **C** | CC-Link unit |
| **D** | DeviceNet unit |
| **B** | Extension I/O unit (common to NPN and PNP I/O) |

KCA-25-M10-*XC

KCA-25-M40-*XC
KCA-25-M80-*XC

With Extension I/O unit

## [System configuration]



## [Master(Scanner) unit specifications]

| | | | | | | |
|---|---|---|---|---|---|---|
| Applicable actuator | | KBX Series | | | | |
| Controller | | KCA-25-M10 | | | KCA-25-M40 *1 | KCA-25-M80 *2 |
| No. of control axes | | 1 axis, or 2 to 4 simultaneously controlled axes when connected to the slave(adapter) unit | | | | |
| Motor capacity *3 | | 50 W | 100 W | 200 W | 400 W | 750 W |
| Drive method | | AC servo motor | | | | |
| Control method | | PTP, CP, semi-closed loop control | | | | |
| Instruction method | | Remote teaching, direct teaching, or MDI | | | | |
| Speed setting | | 10 stages (changeable) | | | | |
| Acceleration setting | | 20 stages (changeable) | | | | |
| Operation mode | | Sequential, palletizing, external point designation | | | | |
| Operation method | | Step, continuous, single acting | | | | |
| CPU | | 32 bit RISC CPU | | | | |
| Origin sensor input | | Yes | | | | |
| Regenerative function | | Yes (KCA-ABSU-2000 mounting) | | | Yes (KCA-ABSU-4000 mounting) | Yes (KCA-ABSU-8000 mounting) |
| Dynamic brake function | | None | | | | |
| Self-diagnostic function | | CPU error, memory error, driver error, master power voltage error, program error, etc. by watchdog timers | | | | |
| Number of programs | | Sequential: 16, palletizing: 16 | | | | |
| Program | | Max. 2,500 steps + coordinate table 999 (task total) | | | | |
| Step No. | | | | | | |
| Memory | | FRAM | | | | |
| Number of counters | | 99 | | | | |
| Number of timers | | 9 | | | | |
| Abnormal display | | Abnormal display indicator ON (front panel), handy terminal | | | | |
| External I/O | System input | 24 V 7 mA 4-points | | | | |
| | General purpose input | 24 V 7 mA 4-points *4 | | | | |
| | System output | 24 V max. 100 mA 4-points | | | | |
| | General purpose output | 24 V max. 100 mA 4-points *4 | | | | |
| Communication function | | For handy terminal or for PC communication × 1 channel (RS-232C) | | | | |
| Power | | 100 to 115 VAC, 200 to 230 VAC, ±10% 50/60 Hz (Changeover of 100 V or 200 V circuit by Voltage Select terminal short-bar on front terminal block.) | | | 200 to 230 VAC, ±10% 50/60 Hz | |
| Power supply capacity (per axis) | | 140 VA | 210 VA | 600 VA | 1.2 kVA | 1.6 kVA |
| Ambient conditions | Operating ambient temperature range | 0 to 40°C | | | | |
| | Ambient humidity range | 30% to 90% RH (no condensation) | | | | |
| | Storage temperature range | −20 to 70°C | | | | |
| | Storage humidity range | 30% to 90% RH (no condensation) | | | | |
| | Environment | Indoors (no exposure to direct sunlight) at 1,000 m or less above sea level<br>No dirt, dust, or corrosive or flammable gases | | | | |
| | Vibration | Less than 9.8 $m/s^2$ | | | | |
| Dimensions | | 55 (W) × 160 (H) × 150 (D) (Mounting bracket not included) | | | 85 (W) × 160 (H) × 150 (D) (Mounting bracket not included) | |
| Weight | | 0.92 kg | | | 1.58 kg | |

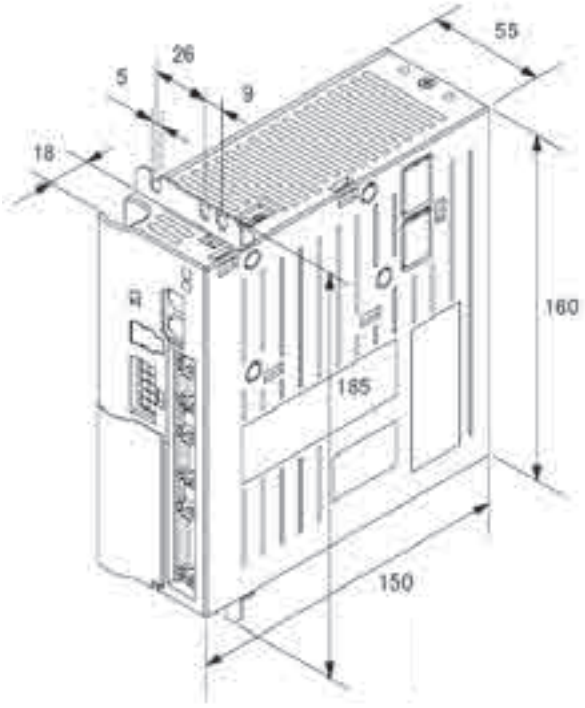
CAUTION

(*1) Always use KCA-25-M40 with regenerative discharge unit KCA-ABSU-4000.
(*2) Always use KCA-25-M80 with regenerative discharge unit KCA-ABSU-8000.
(*3) Applicable motor capacity is determined by the front panel controller.
Do not connect motors of differing capacities, as this could result in burning of the motor.
(*4) General purpose I/O can be used as the I/O signal of various systems depending on the mode settings.

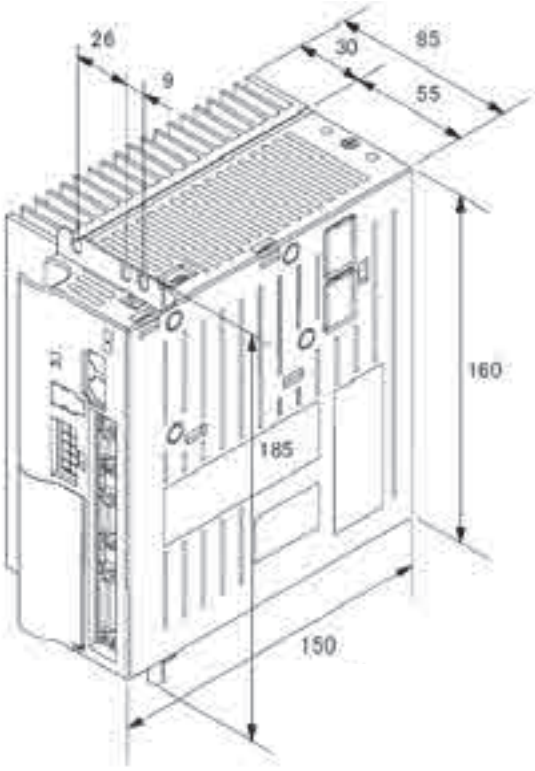
## Dimensions

No option unit

Controller type KCA-25-M10-*XC

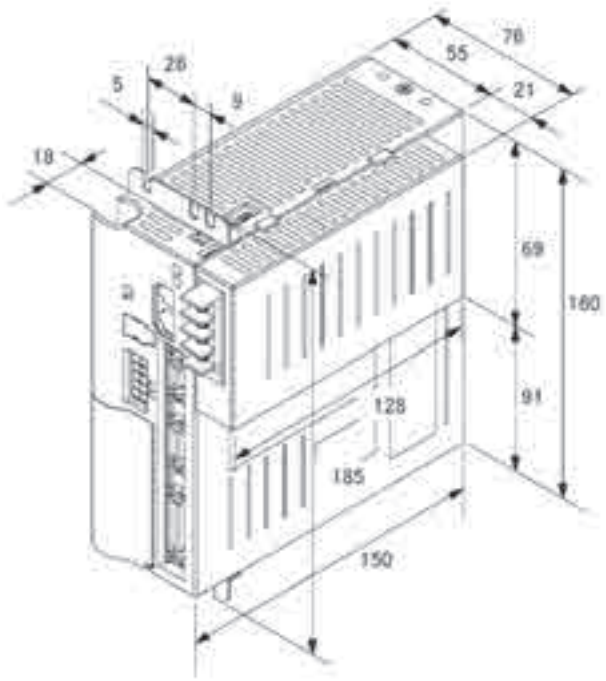



KCA-25-M40-*XC
KCA-25-M80-*XC

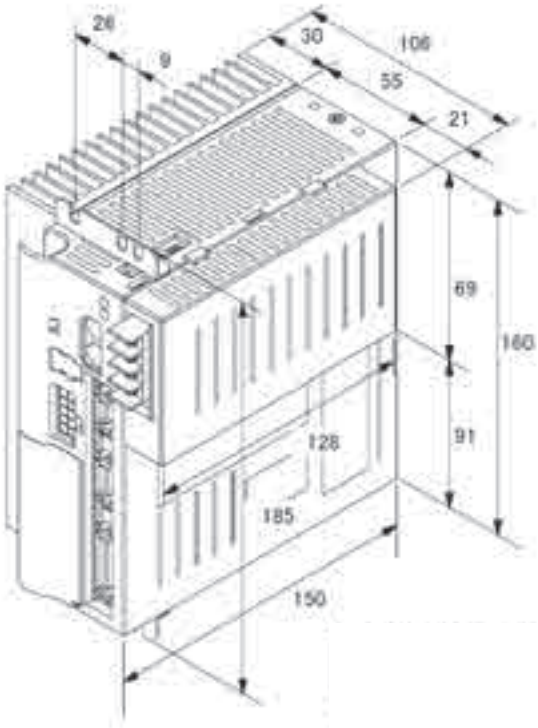



With option unit

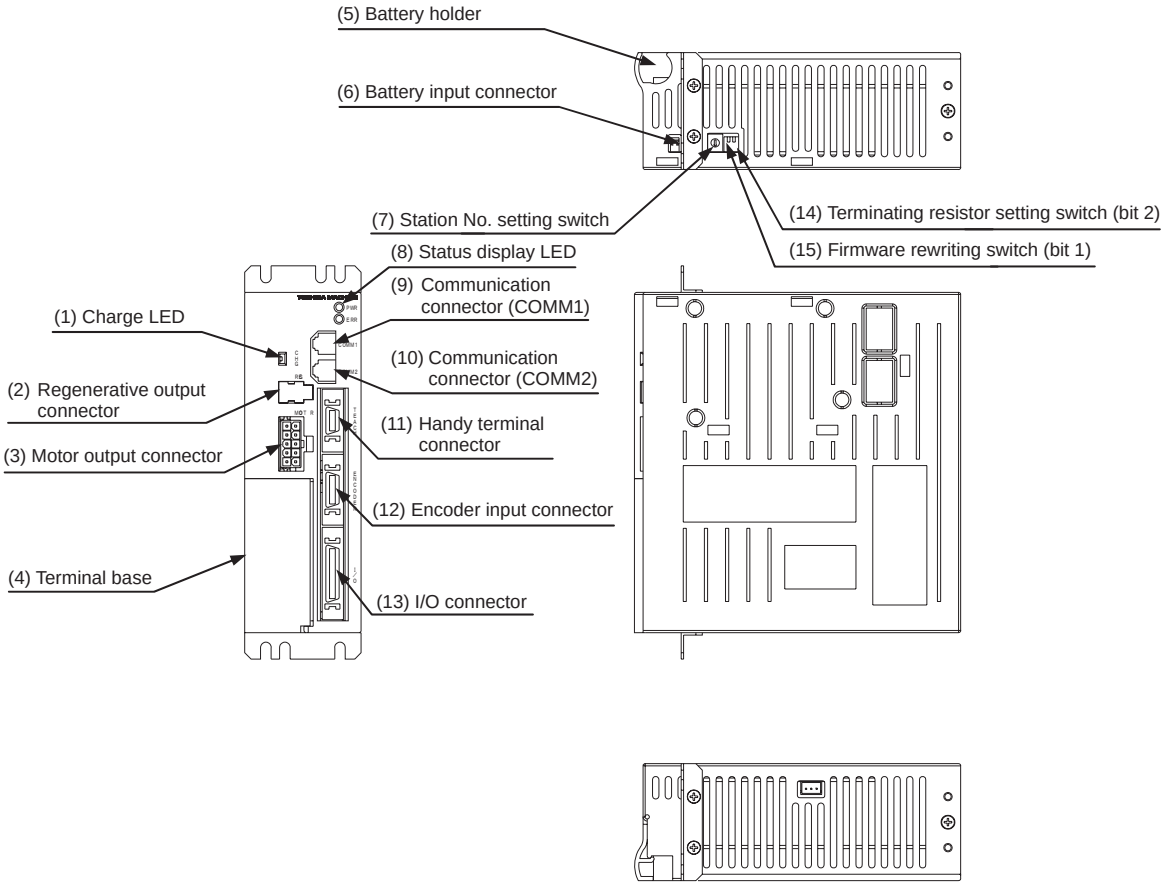
KCA-25-M10-**C




KCA-25-M40-**C
KCA-25-M80-**C



## [Section names/functions]




**CAUTION** The figure above is KCA-25-M10. There is no "(11) Handy terminal connector" with KCA-25-S10. It is a blank plate.

(1) Charge LED
The main circuit smooth capacitor displays the residual voltage status.

(2) Regenerative output connector
Used to connect a regeneration discharge unit (option).

(3) Motor output connector
Used to connect a motor cable.

(4) Terminal base
A power supply input terminal, power supply voltage changeover terminal, FG (frame ground) and LG (line ground) terminals are equipped.

(5) Battery holder
A backup lithium battery for the encoder is equipped.

(6) Battery input connector
Used to connect a battery harness.

(7) Station No. setting switch
Used to specify the station No. of each slave(adapter) unit when slave(adapter) units are connected to control multiple axes.
Specify "0" for the master(scanner) unit.

(8) Status display LED
Displays the controller status. When the power is turned on, it lights in green. In case of an error, it lights in red. In other conditions, it blinks.

(9) Communication connector (COMM1)
Used to connect link cables from the host controller.

(10) Communication connector (COMM2)
Used to connect link cables from subordinate controllers.

(11) Handy terminal connector (master(scanner) unit only)
Used to connect cables for handy terminal or PC communication. The slave(adapter) unit is a blank plate.

(12) Encoder input connector
Used to connect an encoder cable.

(13) I/O connector
Connect exterior control components (PLC, etc.).

(14) Terminating resistor setting switch (bit 2)
Used to set the terminating resistor for communication when a slave(adapter) unit is connected.

(15) Firmware rewriting switch (bit 1)
Used to rewrite the controller firmware. Normally should be turned OFF. When it is on, the controller will not start.

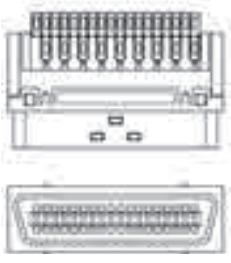
## [Master(Scanner) unit I/O pin No. and signal No.]

Controller KCA-25-M10, KCA-25-M40, KCA-25-M80

| Pin No. | I/O | Signal name | Content | |
|---|---|---|---|---|
| | | | NPN I/O specifications | PNP I/O specifications |
| 1 | - | +COM1 | +COM1 | −COM5 |
| 2 | OUT | OUT1 | General purpose output port 1—1 | ← |
| 3 | OUT | OUT2 | // 1—2 | ← |
| 4 | OUT | OUT3 | // 1—3 | ← |
| 5 | OUT | OUT4 | // 1—4 | ← |
| 6 | - | −COM1 | −COM1 (*1) | +COM5 (*1) |
| 7 | OUT | EMONO | Emergency stop output (NO) | ← |
| 8 | OUT | EMOCOM | Emergency stop output (COM) | ← |
| 9 | OUT | EMONC | Emergency stop output (NC) | ← |
| 10 | - | N.C | N.C | ← |
| 11 | OUT | OUT5 | Operation output | ← |
| 12 | OUT | OUT6 | Abnormal output | ← |
| 13 | OUT | OUT7 | Positioning completion output | ← |
| 14 | OUT | OUT8 | Origin return completion output | ← |
| 15 | - | N.C | N.C | ← |
| 16 | - | N.C | N.C | ← |
| 17 | - | −COM2 | −COM2 (*1) | +COM6 (*1) |
| 18 | - | N.C | N.C | ← |
| 19 | - | COM3 | COM3 (*2) | ← |
| 20 | IN | IN1 | General purpose input port 1—1 | ← |
| 21 | IN | IN2 | // 1—2 | ← |
| 22 | IN | IN3 | // 1—3 | ← |
| 23 | IN | IN4 | // 1—4 | ← |
| 24 | - | N.C | N.C | ← |
| 25 | IN | EMIN+ | Emergency stop input (+) | ← |
| 26 | IN | EMIN− | Emergency stop input (−) | ← |
| 27 | - | COM4 | COM4 (*2) | ← |
| 28 | IN | IN5 | Origin return input | ← |
| 29 | IN | IN6 | Start input | ← |
| 30 | IN | IN7 | Stop input | ← |
| 31 | IN | IN8 | Reset input | ← |
| 32 | - | N.C | N.C | ← |
| 33 | - | N.C | N.C | ← |
| 34 | - | N.C | N.C | ← |
| 35 | - | N.C | N.C | ← |
| 36 | - | N.C | N.C | ← |

**CAUTION**

(*1) The No. 6 pin and the No. 17 pin are connected internally.
(*2) The No. 19 pin and the No. 27 pin are not connected internally.

Use the accessory connector.

● Cable side connector model No.
Plug 54306-3619 (MOLEX)
Shell kit 54331-0361 (MOLEX)

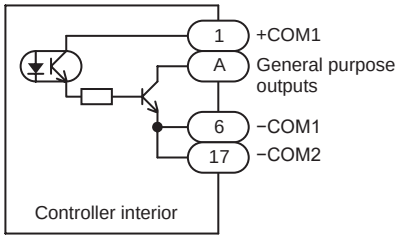
● Panel side connector model No.
Receptacle 52986-3621 (MOLEX)

Applicable wire size : AWG24 (0.22 mm$^2$)

## [Master(Scanner) unit I/O specifications]

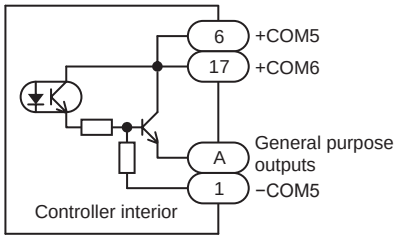
Controller KCA-25-M10, KCA-25-M40, KCA-25-M80

General purpose output circuit (NPN output)



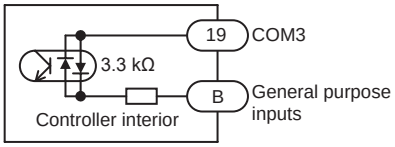

1) A: OUT1 - OUT4
2) Voltage: 24 VDC
3) Current: 100 mA (max.)
4) Photo coupler insulation
5) Open collector output

General purpose output circuit (PNP output)



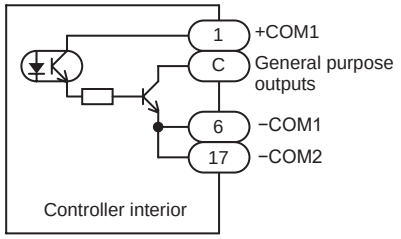

1) A: OUT1 - OUT4
2) Voltage: 24 VDC
3) Current: 100 mA (max.)
4) Photo coupler insulation
5) Emitter follower output

General purpose input circuit (common to NPN and PNP inputs)



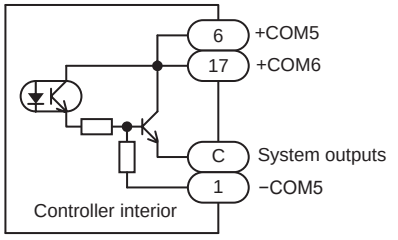

1) B: IN1 - IN4
2) Voltage: 24 VDC
3) Current: 7 mA
4) Photo coupler insulation

System output circuit (NPN output)



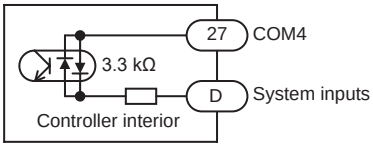

1) C: OUT5 - OUT8
2) Voltage: 24 VDC
3) Current: 100 mA (max.)
4) Photo coupler insulation
5) Open collector output

System output circuit (PNP output)




1) C: OUT5 - OUT8
2) Voltage: 24 VDC
3) Current: 100 mA (max.)
4) Photo coupler insulation
5) Emitter follower output

System input circuit (common to NPN and PNP inputs)




1) D: IN5 - IN8
2) Voltage: 24 VDC
3) Current: 7 mA
4) Photo coupler insulation

**CAUTION**

- The controller types differ for the two output circuit types, NPN output specifications and PNP output specifications.
- The input circuit is common between NPN input specifications and PNP input specifications.
- This device has no I/O power supply output (24 VDC). You must request it from a third party supplier.
- General purpose I/O can be used as the I/O signal of various functions depending on the mode settings.

# Slave(Adapter) unit

* Used as an auxiliary unit when controlling the master(scanner) unit.
* A driver unit for a one axis drive is built in to this unit.
* Select NPN or PNP for I/O signal.
* For the supply power, multi power (100 to 115 VAC, 200 to 230 VAC) is used to cope with globalized production.
  (Note: KCA-25-S40 and KCA-25-S80 are only used with a power supply of 200 to 230 VAC.)

## How to order slave(adapter) units

**KCA - 25 - S 10 - N X X**

Ⓐ Motor capacity

Ⓑ Select I/O type

| Code | Content |
|---|---|
| **Ⓐ Motor capacity** | |
| **10** | 50 W to 200 W |
| **40** | 400 W |
| **80** | 750 W |
| **Ⓑ Select I/O type** | |
| **N** | NPN I/O |
| **P** | PNP I/O |

KCA-25-S10-*XX

KCA-25-S40-*XX
KCA-25-S80-*XX

## [Slave(Adapter) unit specifications]

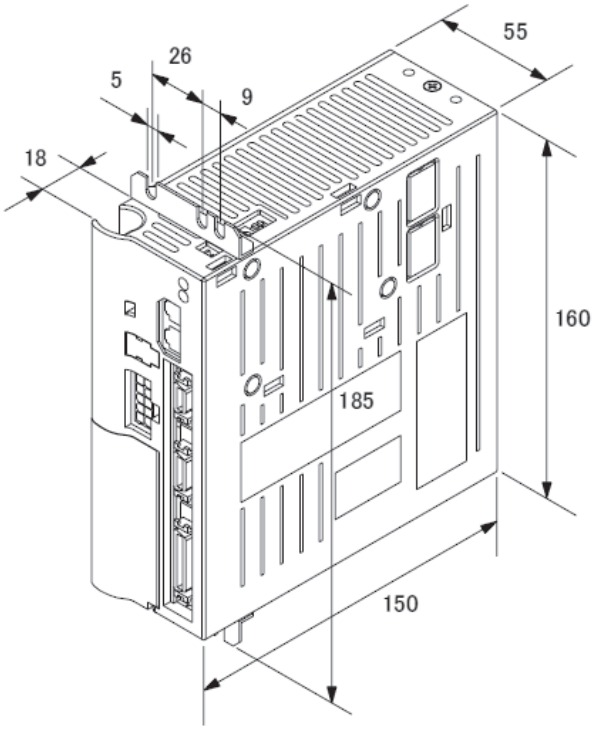
| | | | | | | |
|---|---|---|---|---|---|---|
| Applicable actuator | | KBX Series | | | | |
| Controller | | KCA-25-S10 | | | KCA-25-S40 *1 | KCA-25-S80 *2 |
| No. of control axes | | 1-axis (with connection to the master(scanner) unit) | | | | |
| Motor capacity *3 | | 50 W | 100 W | 200 W | 400 W | 750 W |
| Drive method | | AC servo motor | | | | |
| Origin sensor input | | Yes | | | | |
| Regenerative function | | Yes (KCA-ABSU-2000 mounting) | | | Yes (KCA-ABSU-4000 mounting) | Yes (KCA-ABSU-8000 mounting) |
| Dynamic brake function | | None | | | | |
| Self-diagnostic function | | Driver error, power supply voltage error, etc. | | | | |
| Abnormal display | | Abnormal display indicator ON (front panel), handy terminal (connect to master(scanner) unit) | | | | |
| External I/O | General purpose input | 24 V 7 mA 8-points | | | | |
| | General purpose output | 24 V 100 mA 8-points | | | | |
| Power | | 100 to 115 VAC, 200 to 230 VAC, ±10% 50/60 Hz (Changeover of 100 V or 200 V circuit by Voltage Select terminal short-bar on front terminal block.) | | | 200 to 230 VAC, ±10% 50/60 Hz | |
| Power supply capacity (per axis) | | 140 VA | 210 VA | 600 VA | 1.2 kVA | 1.6 kVA |
| Ambient conditions | Operating ambient temperature range | 0 to 40°C | | | | |
| | Ambient humidity range | 30% to 90% RH (no condensation) | | | | |
| | Storage temperature range | −20 to 70°C | | | | |
| | Storage humidity range | 30% to 90% RH (no condensation) | | | | |
| | Environment | Indoors (no exposure to direct sunlight) at 1,000 m or less above sea level<br>No dirt, dust, or corrosive or flammable gases | | | | |
| | Vibration | Less than 9.8 $m/s^2$ | | | | |
| Dimensions | | 55 (W) × 160 (H) × 150 (D) (Mounting bracket not included) | | | 85 (W) × 160 (H) × 150 (D) (Mounting bracket not included) | |
| Weight | | 0.92 kg | | | 1.58 kg | |

CAUTION

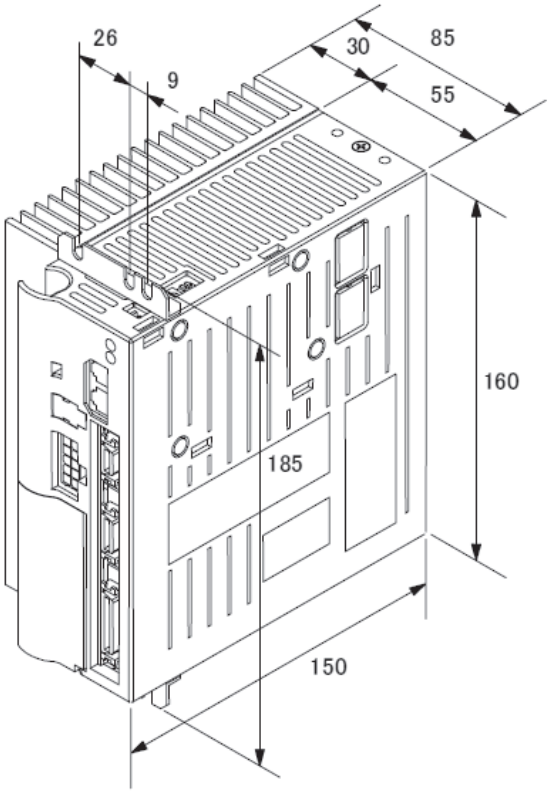
(*1) Always use KCA-25-S40 with regenerative discharge unit KCA-ABSU-4000.
(*2) Always use KCA-25-S80 with regenerative discharge unit KCA-ABSU-8000.
(*3) Applicable motor capacity is determined by the front panel controller.
Do not connect motors of differing capacities, as this could result in burning of the motor.

## Dimensions

Controller KCA-25-S10-*XX




KCA-25-S40-*XX
KCA-25-S80-*XX




## [Section names/functions]

Refer to the master(scanner) unit item on page 178 for the names and functions of each section.

## [Slave(Adapter) unit I/O pin No. and signal No.]

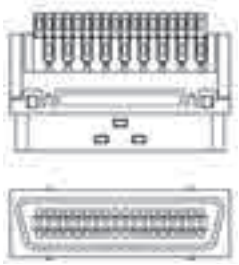
Controller KCA-25-S10, KCA-25-S40, KCA-25-S80

| Pin No. | I/O | Signal name | Content | |
|---|---|---|---|---|
| | | | NPN I/O specifications | PNP I/O specifications |
| 1 | - | +COM1 | +COM1 | −COM5 |
| 2 | OUT | OUT1 | General purpose output port 1—1 | ← |
| 3 | OUT | OUT2 | // 1—2 | ← |
| 4 | OUT | OUT3 | // 1—3 | ← |
| 5 | OUT | OUT4 | // 1—4 | ← |
| 6 | - | −COM1 | −COM1 (*1) | +COM5 (*1) |
| 7 | - | N.C | N.C | ← |
| 8 | - | N.C | N.C | ← |
| 9 | - | N.C | N.C | ← |
| 10 | - | N.C | N.C | ← |
| 11 | OUT | OUT5 | General purpose output port 1—5 | ← |
| 12 | OUT | OUT6 | // 1—6 | ← |
| 13 | OUT | OUT7 | // 1—7 | ← |
| 14 | OUT | OUT8 | // 1—8 | ← |
| 15 | - | N.C | N.C | ← |
| 16 | - | N.C | N.C | ← |
| 17 | - | −COM2 | −COM2 (*1) | +COM6 (*1) |
| 18 | - | N.C | N.C | ← |
| 19 | - | COM3 | COM3 (*2) | ← |
| 20 | IN | IN1 | General purpose input port 1—1 | ← |
| 21 | IN | IN2 | // 1—2 | ← |
| 22 | IN | IN3 | // 1—3 | ← |
| 23 | IN | IN4 | // 1—4 | ← |
| 24 | - | N.C | N.C | ← |
| 25 | - | N.C | N.C | ← |
| 26 | - | N.C | N.C | ← |
| 27 | - | COM4 | COM4 (*2) | ← |
| 28 | IN | IN5 | General purpose input port 1—5 | ← |
| 29 | IN | IN6 | // 1—6 | ← |
| 30 | IN | IN7 | // 1—7 | ← |
| 31 | IN | IN8 | // 1—8 | ← |
| 32 | - | N.C | N.C | ← |
| 33 | - | N.C | N.C | ← |
| 34 | - | N.C | N.C | ← |
| 35 | - | N.C | N.C | ← |
| 36 | - | N.C | N.C | ← |

N.C: No Connection

**CAUTION**

(*1) The No. 6 pin and the No. 17 pin are connected internally.
(*2) The No. 19 pin and the No. 27 pin are not connected internally.

Use the accessory connector.

● Cable side connector model No.
Plug 54306-3619 (MOLEX)
Shell kit 54331-0361 (MOLEX)

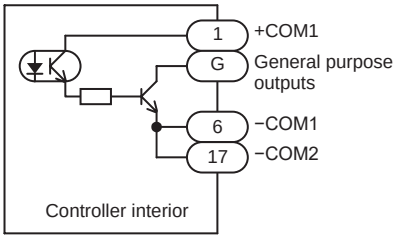
● Panel side connector model No.
Receptacle 52986-3621 (MOLEX)

Applicable wire size : AWG24 (0.22 mm$^2$)

## [Slave(Adapter) unit I/O specifications]

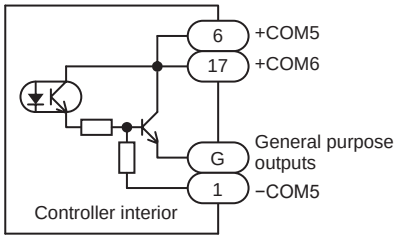
Controller KCA-25-S10, KCA-25-S40, KCA25-S80

General purpose output circuit (NPN output)



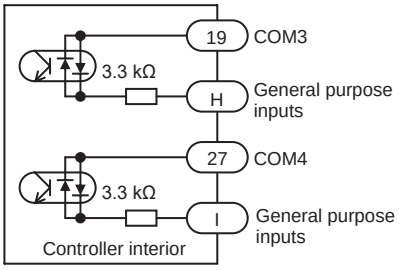

1) G:OUT1 - OUT8
2) Voltage: 24 VDC
3) Current: 100 mA (max.)
4) Photo coupler insulation
5) Open collector output

General purpose output circuit (PNP output)




1) G: OUT1 - OUT8
2) Voltage: 24 VDC
3) Current: 100 mA (max.)
4) Photo coupler insulation
5) Emitter follower output

General purpose input circuit (common to NPN and PNP inputs)




1) H: IN1 - IN4 I: IN5 - IN8
2) Voltage: 24 VDC
3) Current: 7 mA
4) Photo coupler insulation
5) The No. 19 pin and the No. 27 pin are not connected internally.

**CAUTION**

- The controller types differ for the two output circuit types, NPN output specifications and PNP output specifications.
- The input circuit is common between NPN input specifications and PNP input specifications.
- This device has no I/O power supply output (24 VDC). You must request it from a third party supplier.
- General purpose I/O can be used as the I/O signal of various functions depending on the mode settings.

# Extension I/O unit

The extension I/O unit increases the number of I/O points for the master(scanner) unit by 24 input points and 8 output points. Use when there are not enough I/O connectors on the controller body.
This unit has bidirectional polarity, and is used for input and output circuits.
(Note) Mounting cannot be performed by the customer.

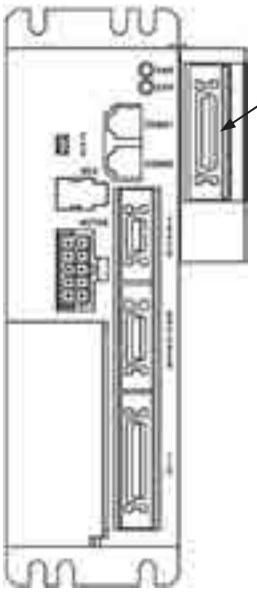
KCA-25-M10-*BC

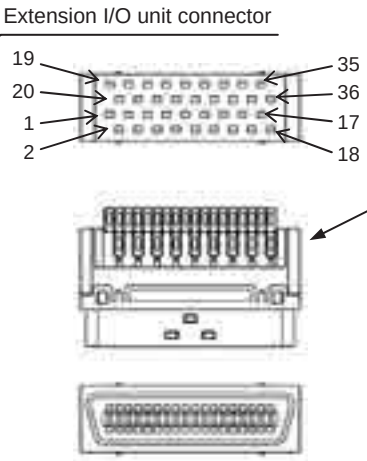
[Extension I/O unit pin No. and signal No.]

| Pin No. | I/O | Signal name | Content | |
|---|---|---|---|---|
| | | | NPN I/O specifications | PNP I/O specifications |
| 1 | IN | IN9 | General purpose input port 2—1 | ← |
| 2 | IN | IN10 | // 2—2 | ← |
| 3 | IN | IN11 | // 2—3 | ← |
| 4 | IN | IN12 | // 2—4 | ← |
| 5 | IN | IN13 | // 2—5 | ← |
| 6 | IN | IN14 | // 2—6 | ← |
| 7 | IN | IN15 | // 2—7 | ← |
| 8 | IN | IN16 | // 2—8 | ← |
| 9 | IN | IN17 | // 3—1 | ← |
| 10 | - | COM7 | COM7 (*1) | ← |
| 11 | IN | IN18 | General purpose input port 3—2 | ← |
| 12 | IN | IN19 | // 3—3 | ← |
| 13 | - | COM8 | COM8 (*2) | ← |
| 14 | IN | IN20 | General purpose input port 3—4 | ← |
| 15 | IN | IN21 | // 3—5 | ← |
| 16 | IN | IN22 | // 3—6 | ← |
| 17 | IN | IN23 | // 3—7 | ← |
| 18 | IN | IN24 | // 3—8 | ← |
| 19 | IN | IN25 | // 4—1 | ← |
| 20 | IN | IN26 | // 4—2 | ← |
| 21 | IN | IN27 | // 4—3 | ← |
| 22 | IN | IN28 | // 4—4 | ← |
| 23 | IN | IN29 | // 4—5 | ← |
| 24 | IN | IN30 | // 4—6 | ← |
| 25 | IN | IN31 | // 4—7 | ← |
| 26 | IN | IN32 | // 4—8 | ← |
| 27 | OUT | OUT9 | General purpose output port 2—1 | ← |
| 28 | OUT | OUT10 | // 2—2 | ← |
| 29 | - | COM9 | COM9 (*2) | ← |
| 30 | OUT | OUT11 | General purpose output port 2—3 | ← |
| 31 | OUT | OUT12 | // 2—4 | ← |
| 32 | OUT | OUT13 | // 2—5 | ← |
| 33 | OUT | OUT14 | // 2—6 | ← |
| 34 | OUT | OUT15 | // 2—7 | ← |
| 35 | OUT | OUT16 | // 2—8 | ← |
| 36 | - | N.C | N.C | ← |

N.C: No Connection

CAUTION
(*1) The No. 10 pin is not connected internally to the No. 13 pin and No. 29 pin.
(*2) The No. 13 pin and the No. 29 pin are connected internally.






Use the accessory connector.

● Cable side connector model No.

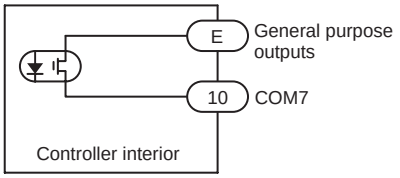
| | |
|---|---|
| Plug | 54306-3619 (MOLEX) |
| Shell kit | 54331-0361 (MOLEX) |

● Panel side connector model No.

| | |
|---|---|
| Receptacle | 52986-3621 (MOLEX) |

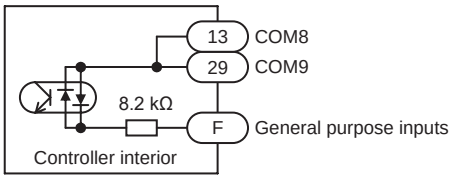
Applicable wire size : AWG24 (0.22 $mm^2$)

General purpose output circuit (common to NPN and PNP outputs)




1) E: OUT9 - OUT16
2) Voltage: 24 VDC
3) Current: 50 mA (max.)
4) Photo coupler insulation
5) Photo MOS relay output

General purpose input circuit (common to NPN and PNP inputs)




1) F: IN9 - IN32
2) Voltage: 24 VDC
3) Current: 3 mA
4) Photo coupler insulation

**CAUTION**

- The extension I/O unit output circuit is photo MOS relay output. This is common between NPN output specifications and PNP output specifications.
- The extension I/O unit input circuit is common between NPN input specifications and PNP input specifications.
- This device has no I/O power supply output (24 VDC). You must request it from a third party supplier.
- General purpose I/O can be used as the I/O signal of various systems depending on the mode settings.

# CC-Link unit

CC-Link (Control & Communication Link) is a field network interface that enables reduction of wiring and high speed data communication. Data communication of each I/O, coordinate table, status, and JOG operation can be performed through the CC-Link interface.
(Note) Mounting cannot be performed by the customer.

KCA-25-M10-*CC

## [Interface specifications]

| Descriptions | Specifications |
|---|---|
| Transmission specifications | CC-Link Ver1.10 |
| Communication speed | 10 M/5 M/2.5 M/625 k/156 kbps (change settings from parameters) |
| Station | Remote device station |
| Number of occupied stations | 4 fixed stations (RX/RY each 128 points, RWw/RWr each 16 points) |
| Station No. setting | 1 to 64 (set by parameters) |
| Number of I/O points | System input 4 points/system output 4 points |
| | General purpose input 64 points/general purpose output 64 points |
| | JOG input 8 points/JOG output 8 points |
| | Handshake input 1 point/handshake output 2 points |
| | Data selection input 4 points/data selection confirmation output 4 points |
| Data communication function | Coordinate table transmission and reception, current position monitor, error code request, status request et. |

*) I/O are in the direction viewed from the robot controller side

[I/O signal list]

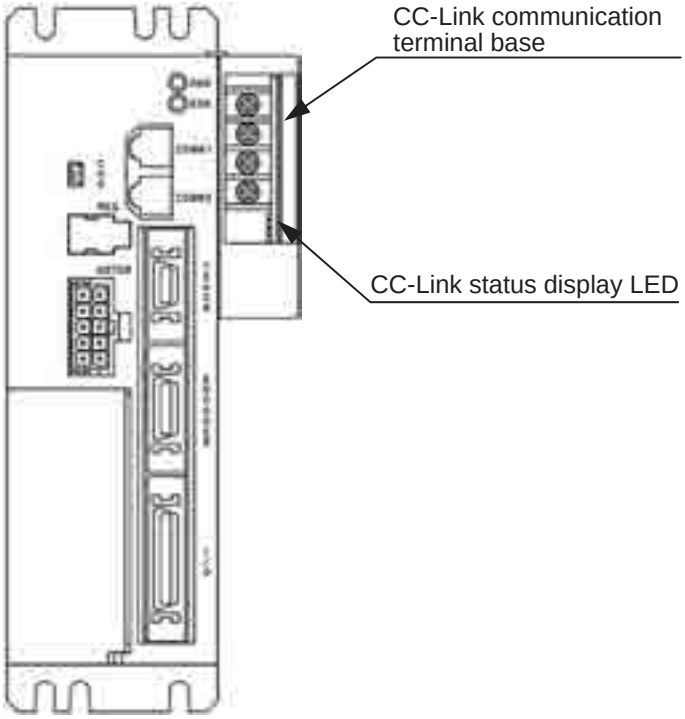
| Signal direction CC-Link master(scanner) ← KCA-25-M10-*CC | |
|---|---|
| Device No. (input) | Signal name |
| RXn0 | Operation output |
| RXn1 | Abnormal output |
| RXn2 | Positioning completion output |
| RXn3 | Origin return completion output |
| RXn4 to RXn7 | Use prohibited |
| RXn8 to RXnF | General purpose output ports 1-1 to 8 |
| RX(n+1)0 to RX(n+1)7 | General purpose output ports 2-1 to 8 |
| RX(n+1)8 to RX(n+1)F | General purpose output ports 3-1 to 8 |
| RX(n+2)0 to RX(n+2)7 | General purpose output ports 4-1 to 8 |
| RX(n+2)8 to RX(n+2)F | General purpose output ports 5-1 to 8 |
| RX(n+3)0 to RX(n+3)7 | General purpose output ports 6-1 to 8 |
| RX(n+3)8 to RX(n+3)F | General purpose output ports 7-1 to 8 |
| RX(n+4)0 to RX(n+4)7 | General purpose output ports 8-1 to 8 |
| RX(n+4)8 to RX(n+4)F | JOG output |
| RX(n+5)0 to RX(n+5)7 | Reserve (*2) |
| RX(n+5)8 to RX(n+5)F | |
| RX(n+6)0 to RX(n+6)7 | |
| RX(n+6)8 | Command complete (*3) |
| RX(n+6)9 | Command error (*3) |
| RX(n+6)A to RX(n+6)B | Use prohibited |
| RX(n+6)C to RX(n+6)F | Data selection confirmation output |
| RX(n+7)0 to RX(n+7)7 | Use prohibited |
| RX(n+7)8 to RX(n+7)F | Use prohibited |

| Signal direction CC-Link master(scanner) → KCA-25-M10-*CC (*1) | |
|---|---|
| Device No. (output) | Signal name |
| RYn0 | Origin return input |
| RYn1 | Start input |
| RYn2 | Stop input |
| RYn3 | Reset input |
| RYn4 to RYn7 | Use prohibited |
| RYn8 to RYnF | General purpose input ports 1-1 to 8 |
| RY(n+1)0 to RY(n+1)7 | General purpose input ports 2-1 to 8 |
| RY(n+1)8 to RY(n+1)F | General purpose input ports 3-1 to 8 |
| RY(n+2)0 to RY(n+2)7 | General purpose input ports 4-1 to 8 |
| RY(n+2)8 to RY(n+2)F | General purpose input ports 5-1 to 8 |
| RY(n+3)0 to RY(n+3)7 | General purpose input ports 6-1 to 8 |
| RY(n+3)8 to RY(n+3)F | General purpose input ports 7-1 to 8 |
| RY(n+4)0 to RY(n+4)7 | General purpose input ports 8-1 to 8 |
| RY(n+4)8 to RY(n+4)F | JOG input |
| RY(n+5)0 to RY(n+5)7 | Reserve (*2) |
| RY(n+5)8 to RY(n+5)F | |
| RY(n+6)0 to RY(n+6)7 | |
| RY(n+6)8 | Command request (*3) |
| RY(n+6)9 | Use prohibited |
| RY(n+6)A to RY(n+6)B | Use prohibited |
| RY(n+6)C to RY(n+6)F | Data selection input |
| RY(n+7)0 to RY(n+7)7 | Use prohibited |
| RY(n+7)8 to RY(n+7)F | Use prohibited |

CAUTION

n: Addresses assigned to KCA-25-M10-*CC by station No. setting.
(*1) When there is interference with the CC-Link communication, set the stop input to 1 and other input to 0. However, stop input will also be cleared to 0 during T/P operation.
(*2) A reservation area for extending future functions.
(*3) Data communication handshake signal

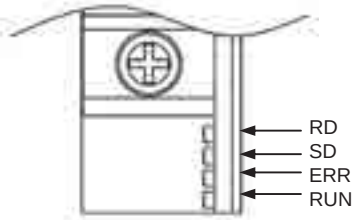
## [CC-Link description]




## [CC-Link status display LED]

| Name | Color | ON/OFF | Content |
|---|---|---|---|
| RD | Green | ON | Receiving data |
| | | OFF | Not receiving data |
| SD | Green | ON | Transmitting data |
| | | OFF | Not transmitting data |
| ERR | Red | ON | CRC error, abnormal speed, abnormal station No. setting |
| | | OFF | Operating normally |
| RUN | Green | ON | Operating normally |
| | | OFF | Timeout or network stopped |

CC-Link status display LED section

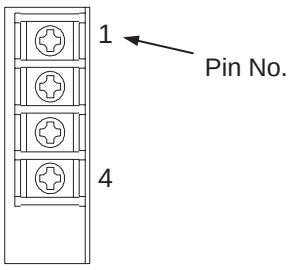



## [CC-Link communication terminal base]

Used to connect the CC-Link dedicated cable for data link.

| Pin No. | Signal name | Wire color |
|---|---|---|
| 1 | Communication line (DA) | Blue |
| 2 | Communication line (DB) | White |
| 3 | Digital GND (DG) | Yellow |
| 4 | Shield (SLD) | Shield |

CC-Link communication terminal base section



# DeviceNet unit

DeviceNet is a field network interface that enables reduction of wiring, lowered costs and high speed data communication.
Data communication of each I/O and JOG operation can be performed through the DeviceNet interface.
(Note) Mounting cannot be performed by the customer.

KCA-25-M10-*DC

## [Interface specifications]

| Descriptions | Specifications | | |
|---|---|---|---|
| Communication protocol | DeviceNet compliant | | |
| Support connection | I/O connection (polling) | | |
| Communication speed | 125 k/250 k/500 kbps (set by parameters) | | |
| Station No. setting | 0 to 63 (set by parameters) | | |
| Cable length | Communication speed | Thick cable | Thin cable |
| | 125 k | 500 m | 100 m |
| | 250 k | 250 m | |
| | 500 k | 100 m | |
| Number of occupied points | Transmission: 128 points Reception: 128 points | | |
| Number of I/O points (*1) | System input 4 points/system output 4 points | | |
| | General purpose input 64 points/general purpose output 64 points | | |
| | JOG input 8 points/JOG output 8 points | | |
| Vendor ID | 733 (TOSHIBA-MACHINE CO., LTD.) | | |
| Device | 0 (Generic Device) | | |
| Product code | 11 (KCA-25-M10-*DC) | | |

(*1) I/O are in the direction viewed from the robot controller side

[I/O signal list]

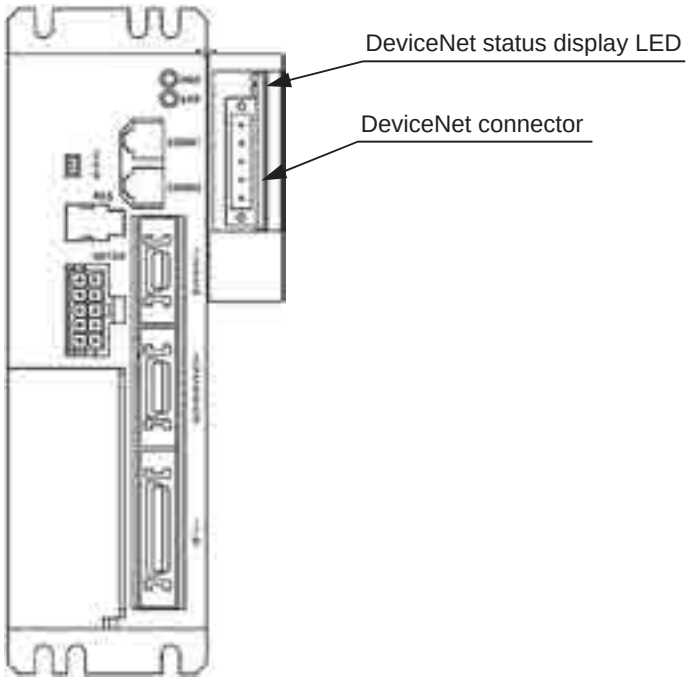
| Signal direction DeviceNet master(scanner) ← KCA-25-M10-*DC | |
|---|---|
| Input device No. (Offset *2) | Signal name |
| +0 | Operation output |
| +1 | Abnormal output |
| +2 | Positioning completion output |
| +3 | Origin return completion output |
| +4 to +7 | Use prohibited |
| +8 to +15 | General purpose output ports 1-1 to 8 |
| +16 to +23 | General purpose output ports 2-1 to 8 |
| +24 to +31 | General purpose output ports 3-1 to 8 |
| +32 to +39 | General purpose output ports 4-1 to 8 |
| +40 to +47 | General purpose output ports 5-1 to 8 |
| +48 to +55 | General purpose output ports 6-1 to 8 |
| +56 to +63 | General purpose output ports 7-1 to 8 |
| +64 to +71 | General purpose output ports 8-1 to 8 |
| +72 to +79 | JOG output |
| +80 to +127 | Reserve (*3) |

| Signal direction DeviceNet master(scanner) → KCA-25-M10-*DC (*1) | |
|---|---|
| Output device No. (Offset *2) | Signal name |
| +0 | Origin return input |
| +1 | Start input |
| +2 | Stop input |
| +3 | Reset input |
| +4 to +7 | Use prohibited |
| +8 to +15 | General purpose input ports 1-1 to 8 |
| +16 to +23 | General purpose input ports 2-1 to 8 |
| +24 to +31 | General purpose input ports 3-1 to 8 |
| +32 to +39 | General purpose input ports 4-1 to 8 |
| +40 to +47 | General purpose input ports 5-1 to 8 |
| +48 to +55 | General purpose input ports 6-1 to 8 |
| +56 to +63 | General purpose input ports 7-1 to 8 |
| +64 to +71 | General purpose input ports 8-1 to 8 |
| +72 to +79 | JOG input |
| +80 to +127 | Reserve (*3) |

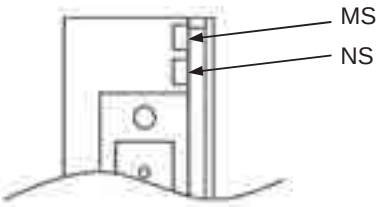
CAUTION

(*1) When there is interference with the DeviceNet communication, set the stop input to 1 and other input to 0. However, stop input will also be cleared to 0 during T/P operation.
(*2) The amount of offset from the lead device. (Unit: bits)
(*3) A reservation area for extending future functions (fix at 0).

## [DeviceNet description]




DeviceNet status display LED section




## [DeviceNet status display LED]

| Name | Color | ON/OFF | | Causes/countermeasures |
|---|---|---|---|---|
| MS | Green | ● ON | Normal | Normal operation |
| | | ★ Blinking | Status not set | KCA-25-M10 set value error. Confirm settings and restart. May also be on standby. Confirm that the master(scanner) unit is operating normally. |
| | Red | ● ON | Catastrophic failure | Indicates a serious error.<br>(DPRAM, internal ROM, internal RAM, EEPROM, CAN error, WDT error, etc.)<br>Restart. In the event of another occurrence, replace the unit. |
| | | ★ Blinking | Minor failure | User settings are abnormal and user side timeout interruption has occurred.<br>Reconfirm settings and restart. |
| | - | ○ OFF | No power supply | Power is not being supplied, the unit is initializing, etc.<br>Confirm power supply. |
| NS | Green | ● ON | Normal | The unit is online and at least one connection has been established. |
| | | ★ Blinking | Awaiting connection | Master(Scanner) unit is not operating normally.<br>(This includes configuration errors in the I/O area of the master(scanner) unit.)<br>Confirm that the master(scanner) unit is operating normally. |
| | Red | ● ON | Catastrophic communication error | Indicates a communication error. (Node address overlap, busoff detection, communication speed inconsistency, etc.)<br>Confirm connection status, noise conditions, node address setting, communication speed setting, etc. and restart. |
| | | ★ Blinking | Minor communication error | Communication with the master(scanner) unit has timed out.<br>Confirm master(scanner) unit status, connection status, noise conditions, node address setting, communication speed setting, etc. and restart. |
| | - | ○ OFF | No power supply | Indicates WDT error, baud rate check, node address overlap, lack of power supply, etc. Confirm power supply. |

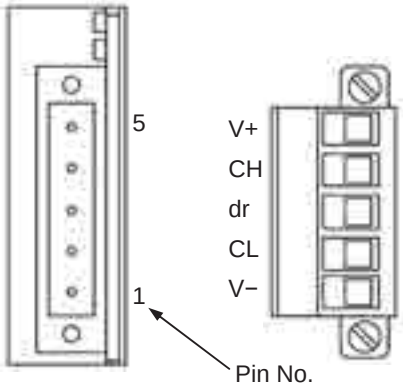
* ★ Blinking is when the indicator lights ON and OFF in 0.5 second intervals.

## [DeviceNet connector]

Used to connect the DeviceNet dedicated cable for data link.

Comes equipped with the controller.

| Pin No. | Signal name | Display | Wire color |
|---|---|---|---|
| 5 | V+ | V+ | Red |
| 4 | CANH | CH | White |
| 3 | Shield | dr | Shield |
| 2 | CANL | CL | Blue |
| 1 | V− | V− | Black |



# Regenerative discharge unit

## [Applications]

The regenerative discharge unit uses resistance to absorb the excess energy generated when the shaft body motor decelerates.
Used when the load inertia exceeds the allowable value, or when a heavy load is lowered over a long stroke on the Z-axis (generating excessive power).
(The unit prevents overvoltage generated in the controller.)

## [KCA-25 regenerative discharge unit]

### How to order

**KCA - ABSU - 2 - 000**

Ⓐ Motor capacity

| Code | Content |
|---|---|
| Ⓐ **Motor capacity** | |
| **2** | 50 to 200 W (applicable controller: KCA-25-M10, KCA-25-S10) |
| **4** | 400 W (applicable controller: KCA-25-M40, KCA-25-S40) |
| **8** | 750 W (applicable controller: KCA-25-M80, KCA-25-S80) |

### [Specifications]

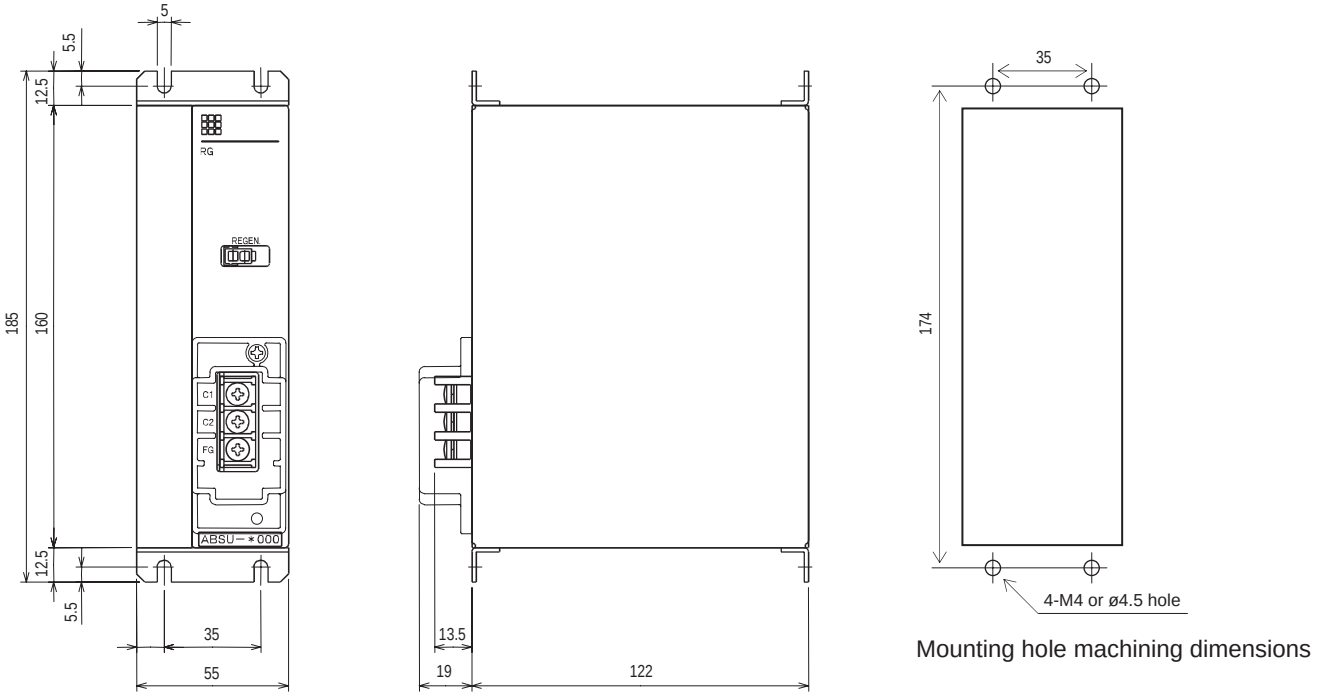
| Descriptions | | Content | | |
|---|---|---|---|---|
| Type | | KCA-ABSU-2000 | KCA-ABSU-4000 | KCA-ABSU-8000 |
| Regenerative working voltage | | 420 VDC | 390 VDC | 421 VDC |
| Applicable controller | | KCA-25-M10, KCA-25-S10 | KCA-25-M40, KCA-25-S40 | KCA-25-M80, KCA-25-S80 |
| Cooling method | | Natural air cooling | Forced air cooling (using a cooling fan) | |
| Cooling fan specifications | | - | 24 VDC - 0.19 A<br>Brushless DC motor | 24 VDC - 0.1 A<br>Brushless DC motor |
| Protection function | | Temperature relay operates at a discharge resistance temperature of 150°C.<br>Output contact: 1b<br>Contact capacity: 125 VAC/4 A, 250 VAC/4 A | | Temperature relay operation at a discharge resistance temperature of 150°C.<br>Output contact: 1b<br>Contact capacity: 125 VAC/6 A, 250 VAC/3 A |
| Ambient conditions | Installation location | Indoors | | |
| | Operating ambient temperature range | 0 to 40°C | | |
| | Ambient humidity range | 30% to 90% RH (no condensation) | | |
| | Storage temperature range | −20 to 70°C | | |
| | Storage humidity range | 30% to 90% RH (no condensation) | | |
| | Environment | Indoors (no exposure to direct sunlight)<br>1,000 m or less above sea level<br>No dirt, dust, or corrosive or flammable gases | | |
| | Vibration | 9.8 m/s$^2$ or less | | |
| Dimensions | | 55 (W) × 160 (H) × 122 (D)<br>(Mounting bracket not included) | 80 (W) × 189 (H) × 122 (D)<br>Including cooling fan<br>(Mounting bracket not included) | 95 (W) × 200 (H) × 169 (D)<br>Including cooling fan |
| Weight | | 0.78 kg | 0.94 kg | 2.9 kg |

CAUTION

- When used in combination with a controller other than the applicable controller, the regenerative discharge unit may fail or not operate.

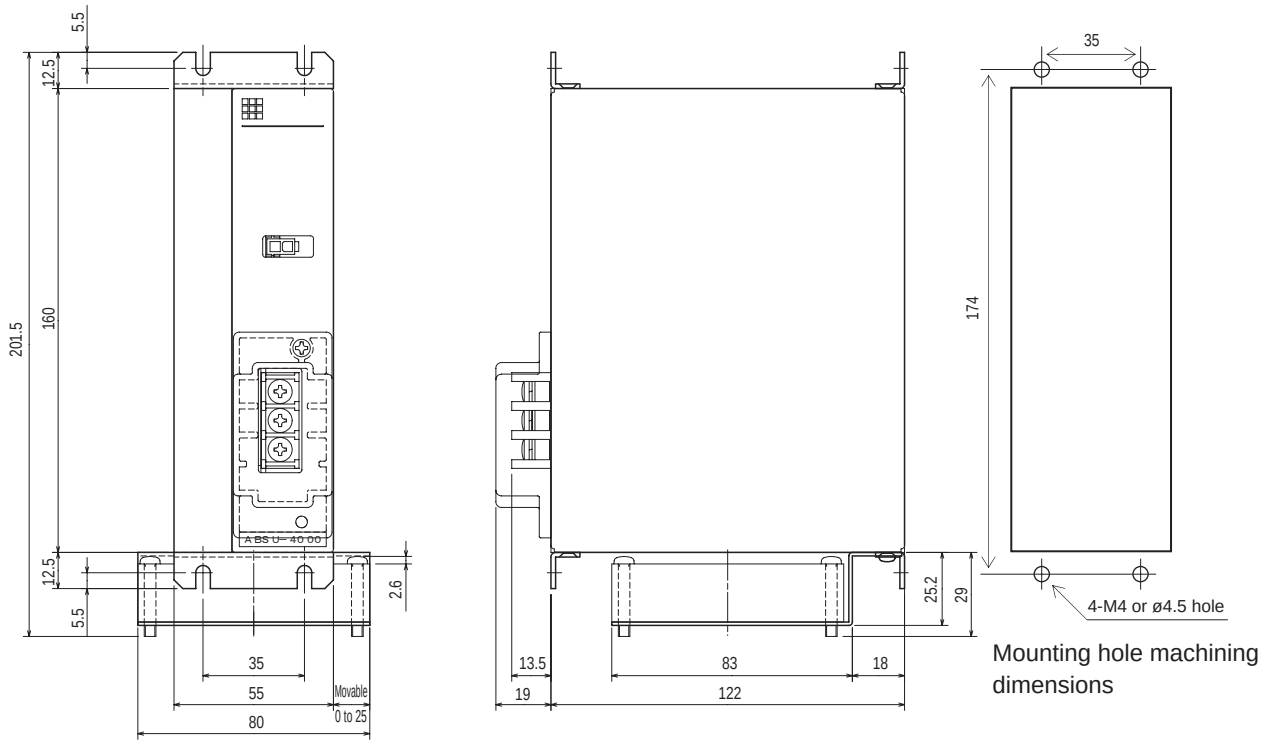
## Dimensions

KCA-ABSU-2000




Mounting hole machining dimensions

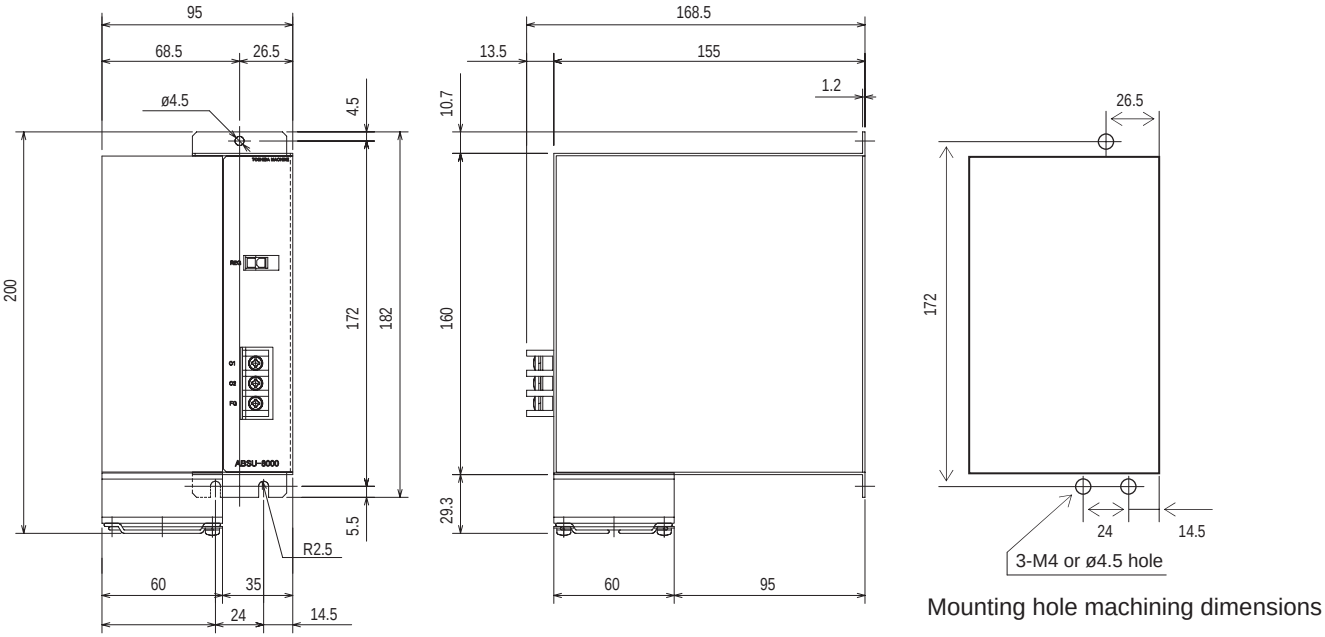
KCA-ABSU-4000




Mounting hole machining dimensions

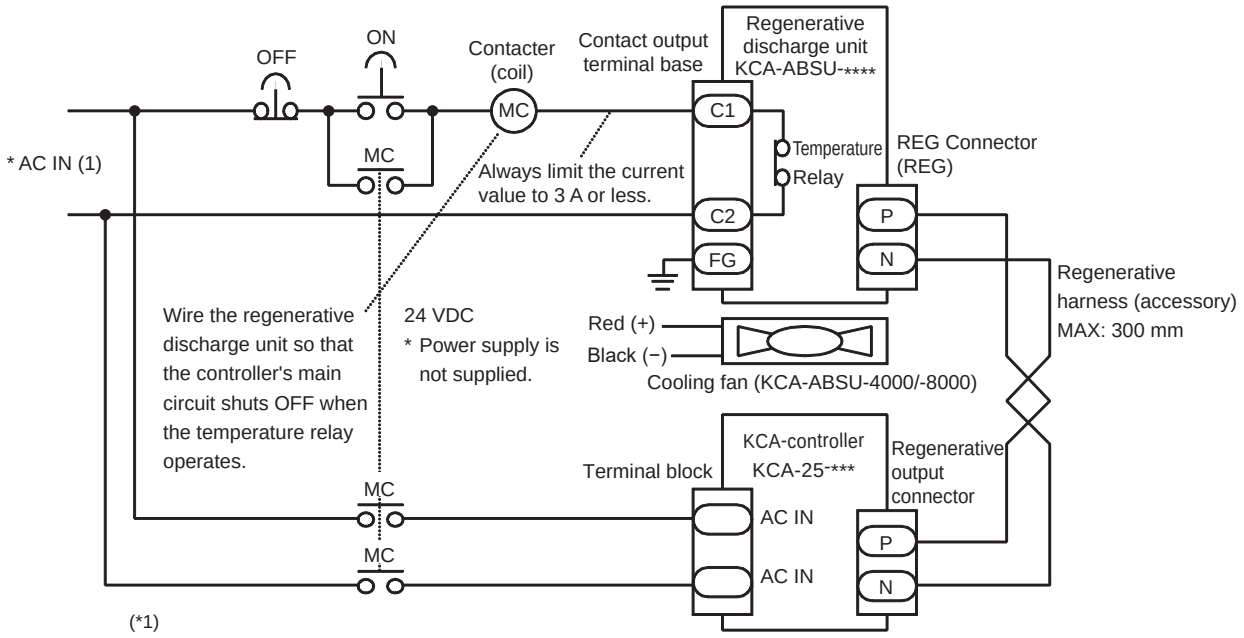
## Dimensions

KCA-ABSU-8000




Mounting hole machining dimensions

## [Connection example]




(*1)
100 to 115 VAC (KCA-ABSU-2000)
or
200 to 230 VAC (KCA-ABSU-2000, KCA-ABSU-4000, KCA-ABSU-8000)

**CAUTION** Directly connecting the AC input to the C1 and C2 terminals of the regenerative discharge unit causes excessive current flow and may burn out the temperature relay.
Always limit the current value to 3 A or less using the contacter coil.

# Handy terminal

## [Applications]

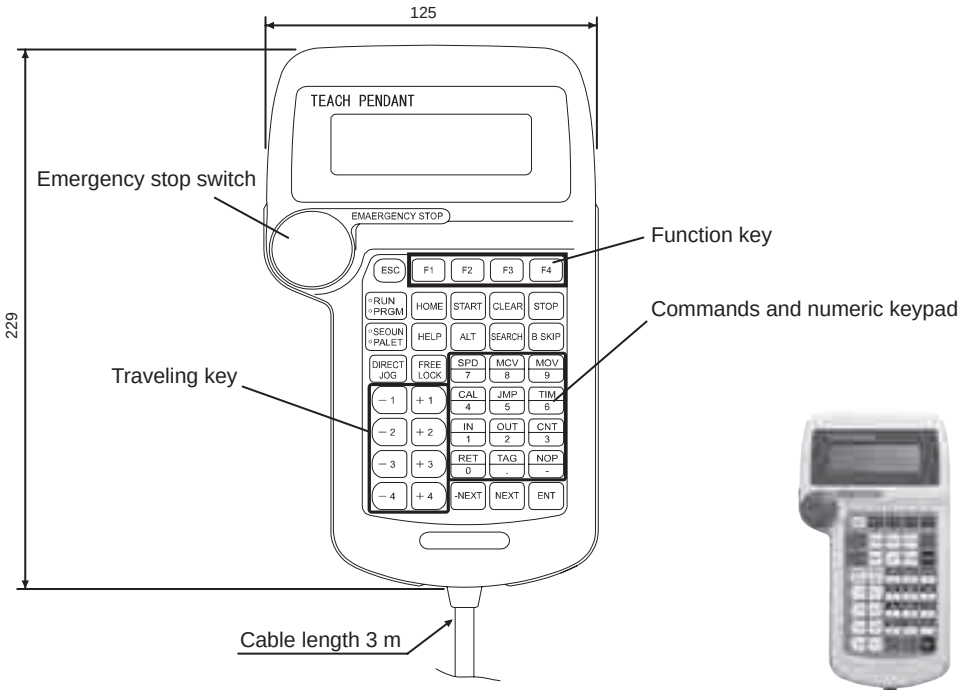
When the handy terminal is connected with a controller, it can serve as a program and parameter input device, and can give commands for executing motions including origin establishment, start, stop, jog motion and emergency stop.
The handy terminal also displays and releases an error or fault when it has been generated.

## How to order

**KCA - TPH - 4C**

## [Compatible controller]

KCA-25-M10, KCA-25-M40, KCA-25-M80, KCA-01-M05
Conventional model: KCA-10 Series, KCA-20 Series






Type: KCA-TPH-4C

*) Compatible with KCA-25 version 2.26 and up.

# Link cable

## [Applications]

Used for communication between the master(scanner) unit serving as the main controller and the slave(adapter) unit which operates under commands given from the main controller.
This cable is not required when a single axis is controlled and only the master(scanner) unit is used.
This link cable connects the master(scanner) unit with each slave(adapter) unit in series.
Cable length differs when the master(scanner) and slave(adapter) units are mounted closely and when they are installed separately from each other.


## How to order

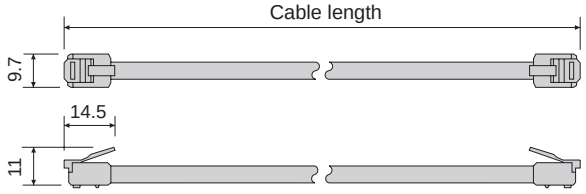
**KCA - 10 - LC - A 01**

Ⓐ Cable length

| Code | Content |
|---|---|
| Ⓐ **Cable length** | |
| **01** | 150 mm |
| **03** | 300 mm |
| **10** | 1000 mm |

* A link cable must not be bundled together with other signal cables or run in the same wire duct where other cables run.
* A link cable is equipped with plugs on both ends. It cannot be cut or reworked.

## Dimensions




| Cable length (mm) |
|---|
| 150 |
| 300 |
| 1000 |

# I/O cable

## [Applications]

Used to connect a controller (master(scanner), slave(adapter)) or an I/O port of an extension I/O unit to transmit signals with an external operation panel or control device.
A plug is attached to one side of the cable, which can be connected directly to the controller.
The I/O cable should be connected to an external device according to the color marking put on the core wire and the sign table.
Before connecting the external device, the core wire should be treated with a crimp-terminal.

## How to order

**KCA - 10 - IC - A 30**

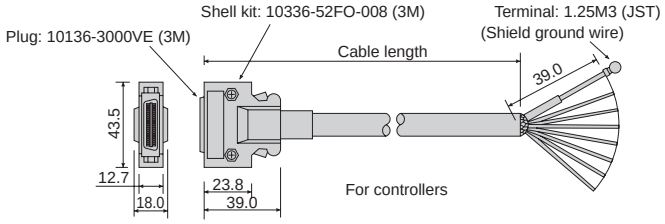
Ⓐ Cable length

| Code | Content |
|---|---|
| Ⓐ **Cable length** | |
| **30** | 3000 mm |
| **50** | 5000 mm |

## [Connected unit]

KCA-25-M10, KCA-25-M40,
KCA-25-M80, KCA-25-S10,
KCA-25-S40, KCA-25-S80
Extension I/O unit

## Dimensions




| Type | Number of core wires | Core wire size | Covering diameter |
|---|---|---|---|
| KCA-10-IC-A□□ | 36 | 0.13 sq | 10.5 mm |

* The I/O cable is shielded to improve noise resistance.
Ground the shield wire as necessary.
* The I/O cable is not resistant to repeated bending.

# PC software

## [Applications]

PC software KCA-SF-98D has been developed to support programming by using a PC as the host computer. It is possible to transfer program data, etc. of the controller to the PC and vice versa, edit and save it, to monitor the I/O status and coordinate values and to execute a program, JOG, origin return, etc. This software is optimized for debugging and maintenance.

## How to order

KCA - SF - 98 D

## [Compatible controller]

KCA-25-M10, KCA-25-M40, KCA-25-M80, KCA-01-M05
Conventional model: KCA-10 Series, KCA-20 Series

## Specifications

| | | |
|---|---|---|
| Package content | | CD-ROM × 1, (communication cable KCA-PCBL-31 sold separately) |
| Required system configuration | PC body | Serial communication port (D-Sub 9-pin), IBM PC/AT compatible computer equipped with CD-ROM drive<br>Available memory size: 12 MB or over, Available hard disk size: 10 MB or over |
| | Supported OS | Microsoft Windows 7 |
| | Display | SVGA or over (resolution 800 × 600 pixels or over) |
| | Printer | Printer which can be connected with your PC and allows printing from Windows |
| | Communication cable | Used to connect the PC and the controller. Use PCBL-31. |
| Compatible controllers | | KCA-25-M10, KCA-25-M40, KCA-25-M80(*1), KCA-01-M05, Conventional model: KCA-10 Series, KCA-20 Series |

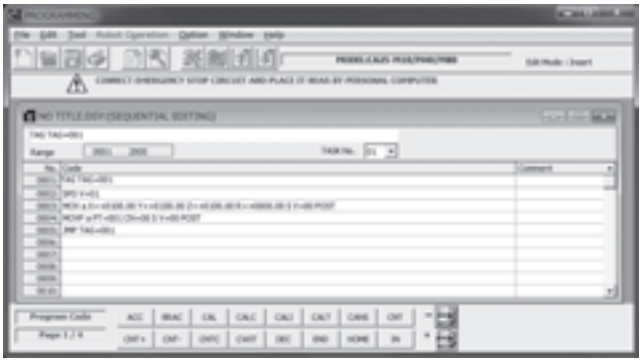
* Microsoft Windows and Windows logotype are the registered trademarks or trademarks of Microsoft Corporation in the United States.

*1) Compatible with KCA-25 version 3.1.0 and up.

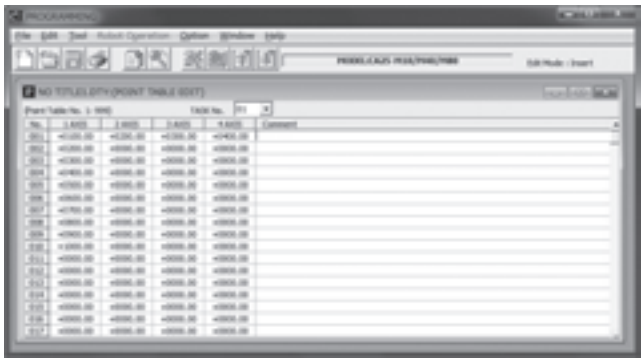
## [Features]

- This software can be used with PCs operating Microsoft Windows 7.
- Programs can be edited easily by using the multi-window screen editor.
- Programs and table data can be sent to and received from the controller. Additionally, such data can be saved as a file.
- Axis motions can be controlled by teaching or program execution.
- At printing of a program (i.e., output to the printer), a title and comment (or annotation) can be included. Thus, this software is very convenient for debugging and confirmation of data.
- Files saved with a conventional model (KCA-10 Series, KCA-20 Series) can be converted to KCA-25 Series files.

● Editing screen of sequential program



● Editing screen of coordinate table
Data in CSV format as created using Excel, etc. can also be input.



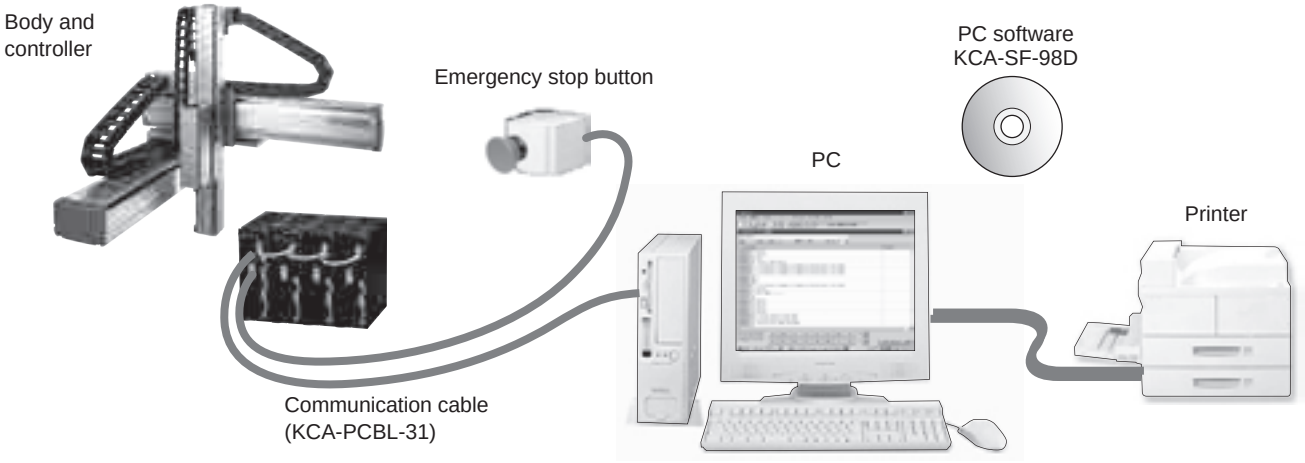
## ● Operation screen

Operations such as program execution and JOG, which are the same as in the handy terminal, are possible.

## ● Monitor screen

Current position coordinates and I/O port status can be monitored.

## [Connection configuration]




# Communication cable (RS-232C)

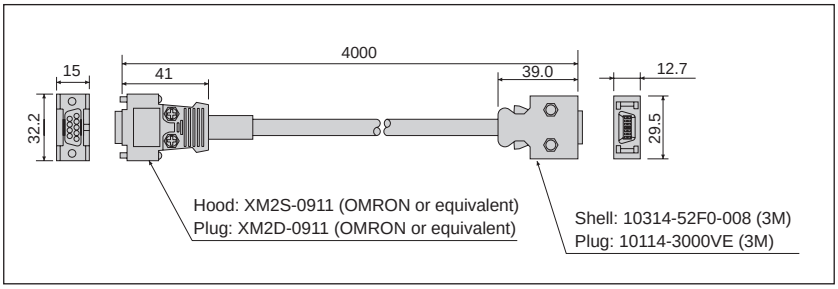
## [Applications]

Communication cable to connect the controller and the PC.
It is used when using the PC software.

## How to order

**KCA - PCBL - 31**

## Dimensions



# Backup lithium battery for the encoder

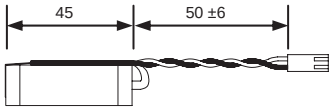
## [Applications]

Mounted on the controller as a backup battery for an absolute encoder.
One battery each is attached to the master(scanner) unit (KCA-25-M10, KCA-25-M40, KCA-25-M80) and slave(adapter) unit (KCA-25-S10, KCA-25-S40, KCA-25-S80).
Use this battery for replacement or spare purpose.

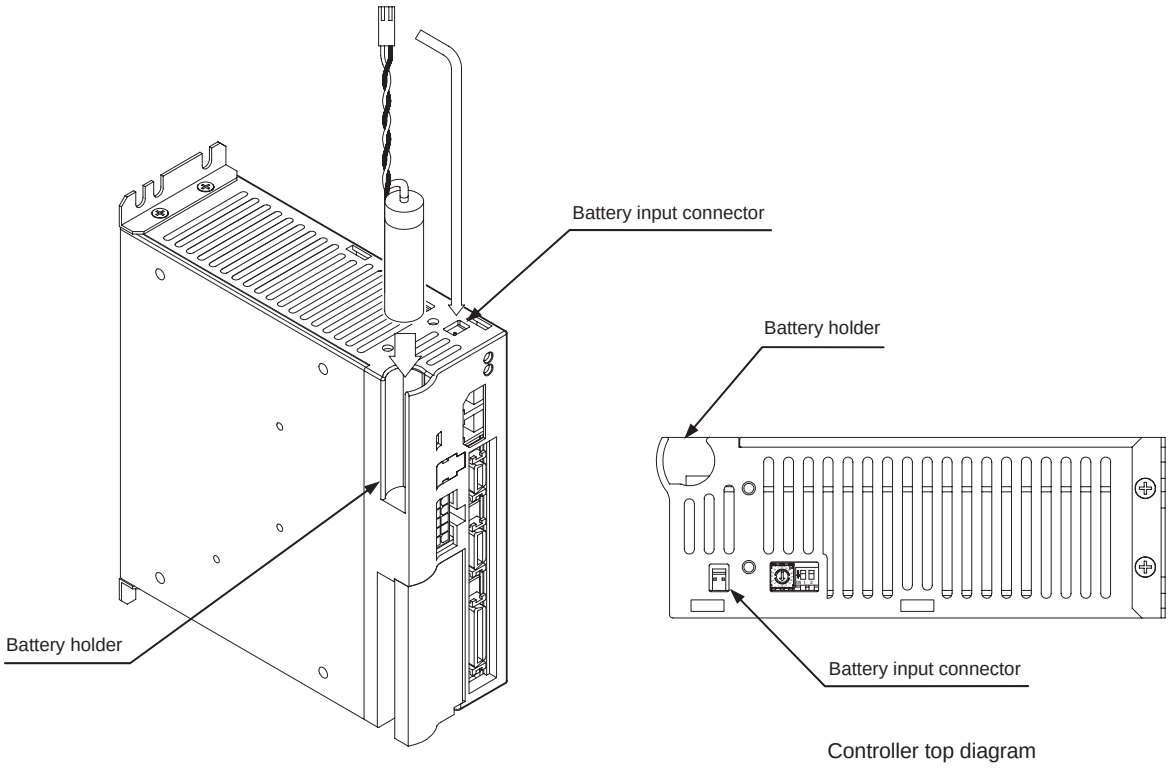
## How to order

**KCA - 25 - EB - 05**

## [Specifications]

| Descriptions | | | Content | Remarks |
|---|---|---|---|---|
| Part name | | | Lithium battery | Thionyl chloride lithium battery |
| Type | | | KCA-25-EB-05 | Battery body: ER6C (made by Hitachi Maxell) |
| Specifications | Nominal voltage, capacity | | 3.6 V 1800 mAh |   |
| | External | Battery body | ø14.5 × 45 mm (excluding projections) | |
| | | Harness length | 50 ±6 mm (excluding connectors) | |
| | Weight | | Approx. 14.5 g | |
| Backup duration (*1) | | | Approx. 3 years (*2) | 25°C, backup battery 65 µA |

CAUTION
(*1) Total time when the controller power is turned OFF.
(*2) Duration of battery varies with the ambient temperature, etc. The value only provides a rough guide.




Controller top diagram