Direct drive actuator
# GS/S type driver

## Common specifications

| Descriptions | Model | |
|---|---|---|
| | GS type driver AX9000GS | S type driver AX9***S |
| Power voltage | 1. 200 VAC -10% to 230 VAC +10% three phase (standard) (Note 1) 2. 100 VAC -10% to 115 VAC +10% single phase (-J1: Option) | |
| Power frequency | 50/60Hz | |
| Structure | Driver and controller integrated type (open frame) | |
| Working ambient temperature range | 0 to 50°C | |
| Working ambient humidity range | 20 to 90%RH (with no dew condensation) | |
| Storage ambient temperature range | -20 to 80°C | |
| Storage ambient humidity range | 20 to 90%RH (with no dew condensation) | |
| Atmosphere | With no corrosive gas and powder dust | |
| Noise-resistance | 1000V (P-P), pulse amplitude 1μsec., start up 1nsec. | |
| Vibration resistance | 4.9m/s$^2$ | |
| Weight | Approx. 2kg | |

Note 1: Models with a max. torque of 50 N·m or less are used with single-phase 200 to 230 VAC.

## Power supply wattage / breaker capacity

### GS type driver

| Actuator model No. | Driver model No. | Power supply wattage (KVA) | | Breaker capacity |
|---|---|---|---|---|
| | | Max. value | Rated value | Rated current (A) |
| AX2006G | AX9000GS | 0.8 | 0.5 | 10 |
| AX2012G, AX4009G | | 1.0 | 0.5 | |
| AX2018G, AX4022G | | | | |
| AX4045G | | 1.5 | 0.5 | |
| AX4075G | | 2.0 | 0.8 | |

### S type driver

| Actuator model No. | Driver model No. | Power supply wattage (KVA) | | Breaker capacity |
|---|---|---|---|---|
| | | Max. value | Rated value | Rated current (A) |
| AX*006 | AX9006S | 0.8 | 0.5 | 10 |
| AX*009, AX*012 | AX9009S, AX9012S | 1.0 | 0.5 | |
| AX*021, AX*022 | AX9021S, AX9022S | | | |
| AX*045, AX*042 | AX9045S, AX9042S | 1.5 | 0.5 | |
| AX*070, AX*075 | AX9070S, AX9075S | 2.0 | 0.8 | |

## CN3 input signal

| Pin No. | Signal name | Logic | Judgment |
|---|---|---|---|
| 1 to 2 | External power input + 24V±10% | | |
| 3 to 4 | External power input GND | | |
| 5 | Program No. selection input (bit 0) | Positive | Level |
| 6 | Program No. selection input (bit 1) | Positive | Level |
| 7 | Program No. selection input (bit 2) | Positive | Level |
| 8 | Program No. selection input (bit 3) | Positive | Level |
| 9 | Program No. selection input (bit 4) /program No. setting input 2nd digit | Positive | Level Edge |
| 10 | Program No. setting input 1st digit | Positive | Edge |
| 11 | Reset input | Positive | Edge |
| 12 | Return to origin command input | Positive | Edge |
| 13 | Start input | Positive | Edge |
| 14 | Program stop input | Positive | Edge |
| 15 | Continuous rotation stop input | Positive | Edge |
| 16 | Answer input | Positive | Edge |
| 17 | Emergency stop input | Negative | Level |
| 18 | Brake release input | Positive | Level |

## CN3 pulse string input signal

| Pin No. | Signal name |
|---|---|
| 19 | PULSE/UP/A phase |
| 20 | -PULSE/-UP/-A phase |
| 21 | DIR/DOWN/B phase |
| 22 | -DIR/-DOWN/-B phase |

## Performance specifications

| Descriptions | |
|---|---|
| Number of control axis | 1 axis, 540672 pulses/rotation (name: A axis) |
| Angle input increment | ° (degree), pulse, index number |
| Min. angle input increment | 0.001°, pulse |
| Speed input increment | Sec., rpm |
| Speed setting range | 0.01 to 100 sec./0.01 to 100rpm (S type) 0.01 to 100 sec./0.01 to 300rpm (Note) (GS type) (Note) The max. rotation speed differs depending on the actuator connected. |
| Equal index number | 1 to 255 |
| Max. command value | 7-digit input ±9999999 |
| Timer | 0.01 to 99.99 sec. |
| Programming language | NC language |
| Programming method | Data can be set with an interactive terminal or personal computer, etc., using the RS-232-C port. |
| Operation mode | Automatic, MDI, jog, single block, servo OFF, pulse string input mode |
| Coordinates | Absolute, incremental |
| Acceleration curve | <5 types> Modified sine (MS), modified constant velocity (MC/MC2), modified trapezoidal (MT), tropecloid (TR) |
| Status display | Power supply display with LED |
| Operating indication | Display with 7 segment LED |
| Communication interface | RS-232C conformed |
| I/O signal | <Input> Return to origin command, reset, start, stop, continuous rotation stop, emergency stop, answer, program No. selection, brake release, program No. setting, pulse string input <Output> Alarm 1/2, positioning complete, in-position, start input waiting M code 8 point, during indexing 1 (Z phase output)/ during indexing 2, timing, M code strobing, index position strobing |
| Program capacity | 6000 characters (256 programs) |
| Electronic thermal | Over heat protection of actuator |
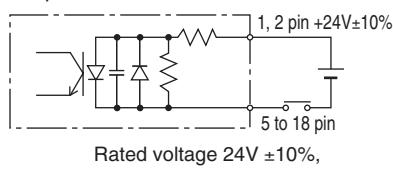
## CN3 output signal

| Pin No. | Signal name | Logic |
|---|---|---|
| 33 | M code output (bit 0) | Positive |
| 34 | M code output (bit 1) | Positive |
| 35 | M code output (bit 2) | Positive |
| 36 | M code output (bit 3) | Positive |
| 37 | M code output (bit 4) | Positive |
| 38 | M code output (bit 5) | Positive |
| 39 | M code output (bit 6) | Positive |
| 40 | M code output (bit 7) | Positive |
| 41 | In-position output | Positive |
| 42 | Positioning complete output | Positive |
| 43 | Start input waiting output | Positive |
| 44 | Alarm output 1 | Negative |
| 45 | Alarm output 2 | Negative |
| 46 | Output during indexing 1/Z phase output (pulse string input mode) | Positive |
| 47 | Output during indexing 2 | Positive |
| 48 | Output of time (Note 2) | Positive |
| 49 | Index position strobing output | Positive |
| 50 | M code strobing output | Positive |
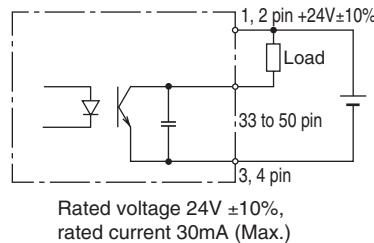
Note 2: Timing output cannot be used if the continuous rotation direction is CCW.

## CKD

## CN3 I/O circuit specifications

● Input circuit

1, 2 pin +24V±10%

5 to 18 pin

Rated voltage 24V ±10%,
rated current 5mA

● Output circuit

1, 2 pin +24V±10%

Load

33 to 50 pin

3, 4 pin
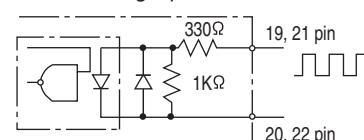
Rated voltage 24V ±10%,
rated current 30mA (Max.)
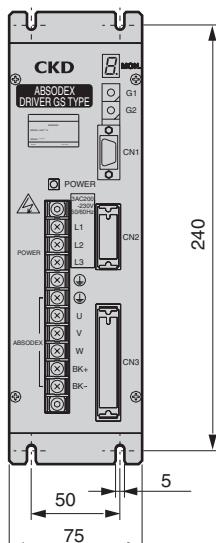
● Pulse string input circuit

330Ω    19, 21 pin

1KΩ

20, 22 pin
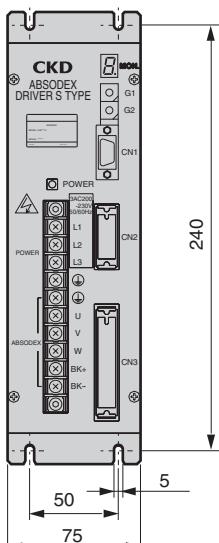
Rated voltage 5V±10%
Max. input frequency
Line driver 400Kpps
Open collector 250Kpps

## Dimensions

● GS/S type driver (with controller)

2.3

17.5

2.3

240

220

240

50    5

50    5

75

75

17.5

(100)    160.5
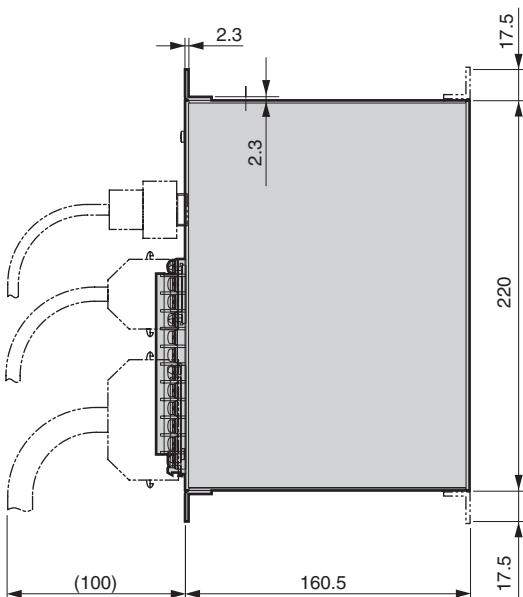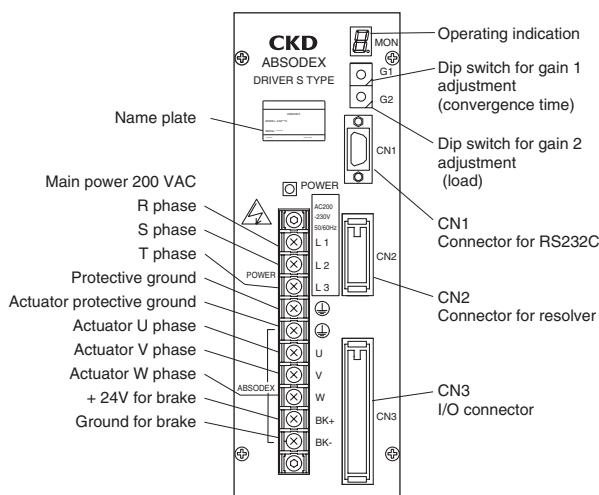
GS type driver          S type driver          GS and S type driver common
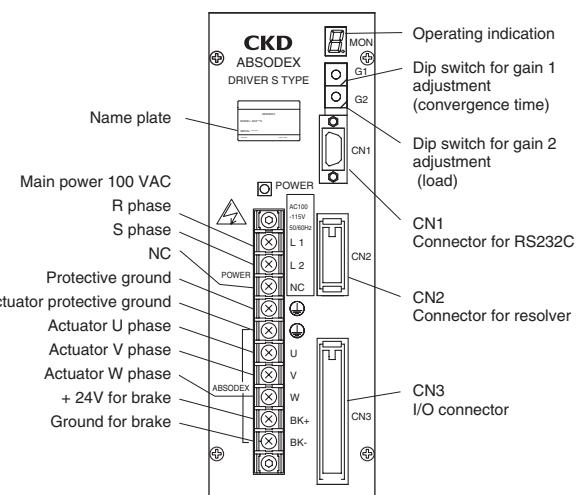
## Panel explanation    Note) The front panel designs of GS and S type driver are different.

● GS/S type driver (with controller)

CKD
ABSODEX
DRIVER S TYPE

Operating indication

Dip switch for gain 1
adjustment
(convergence time)

Name plate

Dip switch for gain 2
adjustment
 (load)

Main power 200 VAC
R phase
S phase
T phase
Protective ground
Actuator protective ground
Actuator U phase
Actuator V phase
Actuator W phase
+ 24V for brake
Ground for brake

CN1
Connector for RS232C

CN2
Connector for resolver

CN3
I/O connector

For 200 VAC (50/60Hz)
( Usable with actuators whose max. )
  torque is 75 N·m.

CKD
ABSODEX
DRIVER S TYPE

Operating indication

Dip switch for gain 1
adjustment
(convergence time)

Name plate

Dip switch for gain 2
adjustment
 (load)

Main power 100 VAC
R phase
S phase
NC
Protective ground
Actuator protective ground
Actuator U phase
Actuator V phase
Actuator W phase
+ 24V for brake
Ground for brake

CN1
Connector for RS232C

CN2
Connector for resolver

CN3
I/O connector

For 100 VAC (50/60Hz)
( Usable with actuators whose max. )
  torque is 50 N·m.

Driver type

S type driver

CKD    60