- Auto Tuning
- Auto Phasing
- Filter
- Response Bode plot
- Time response plot

Wizard Step by step setup interface
AC Servo Driver

- **Gain switch**
  - Fast control loop up to 5k Hz
  - Can test 3 groups of gain set
  - Feedforward signal path
  - Easy to fine tune
  - Input response with profile position

- **Auto tuning**
  - Highly efficient tuning algorithm
  - Short tuning time
  - Can tune for stable or fast system response

- **Auto phasing**
  - Hall sensor or force commutation
  - Step by step phasing progress prompt

- **Auto tune(position)**
  - Auto tuning
  - Visualized control loop
  - User-friendly interface
  - Highly efficient tuning algorithm
  - Short tuning time
  - Can tune for stable or fast system response

- **Gain switch Test**
  - Distance: 0.6m
  - Acceleration: 3g
  - Velocity: 3m/s
  - Deceleration: 3g

- **Auto tune(velocity)**
  - Fast control loop up to 10k Hz
  - Can test 3 groups of gain set
  - Easy to fine tune
  - Feedforward signal path
  - Response Bode plot
  - Bandwidth label
  - Input response test with step/sine/triangle
  - 3 filters on force output

Performance without Gain-switch

Yellow: velocity profile
Red: Position Error [± 35 count]
**Gain switch Test**
- Distance: 0.6m
- Velocity: 3m/s
- Acceleration: 3g

**Scope**
- Scope provides a real-time monitor of driver information.
- User could inspect motion detail without an oscilloscope.

**Homing**
- Setup interface provides 35 kinds of homing methods.
- Also, the vivid animations explain how a homing method is performed.

---

**Scripting**
- Script could program motor motion with a user-friendly interface.

---

**Ordering Information**

<table>
<thead>
<tr>
<th>TC1-</th>
<th>B</th>
<th>9</th>
<th>P</th>
<th>/230-</th>
<th>H</th>
<th>R</th>
<th>E</th>
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</tbody>
</table>

- CANopen (Note1)
- EtherCAT
- CAN open
- EtherCAT

- No Resistor (Note1)
  - No resistor
  - Brake Resistor
- Brake Resistor

- No heatsink (Note2)
  - No heatsink
  - Heatsink with fan
- Heatsink with fan

- AC supply: 230VAC

Continuous current (Amps):
- 8, 20 (A-type only)
- 3, 9 (B-type only)

**Servo Driver**
- A-type
- B-type
TC1-B

Product Overview

Overview:
- **Controller port:**
  - 3x Digital inputs
  - 2x Digital outputs

- **Feedback port:**
  - 6x Digital inputs
  - 1x Digital output

- **General port:**
  - 3x Digital inputs
  - 2x Digital outputs

- **Encoder:**
  - 2x Encoder inputs

- **USB Serial port:**
  - 3x Digital inputs

- **AC power input:**
  - 2x Digital inputs

- **AC power output:**
  - External regen. resistor

- **Pulse trigger output:**
  - 1x Digital output

- **Analog input:**
  - 2x 

- **Digital input:**
  - 6x

- **Digital output:**
  - 1x

- **USB Serial port:**
  - 3x

- **RS232 port:**
  - 2x

- **General port:**
  - 1x

- **Feedback port:**
  - 1x

- **Controller port:**
  - 2x

- **AC Servo Driver**

Dimension:

**Model:**
- TC1-B
- TC1-B-E

**Input Power:**
- Voltage and Phase: 10-30 VDC
- Frequency (Hz): 50 to 60

**Power Rating (W):**
- 1125

**Power Range (VDC):**
- 24 VDC

**Peak power output (VA):**
- 1.3

**Peak current output (A):**
- 4.4

**Contin. current output (A):**
- 6

**Regenerative resistor:**
- Resistance (Ohm): 3

**Continuous dissipation (Watt):**
- 10 (option)

**Pulse braking energy:**
- 5000 (option)

**Fieldbus:**
- CANopen
- EtherCAT
- RS232

**Motor type:**
- PMSM

**Current control:**
- Type: A/B Incremental (S422 signaling)

**Velocity control:**
- Type: A/B Incremental (S422 signaling)

**Position control:**
- Type: A/B Incremental (S422 signaling)

**Encoder:**
- Type: A/B Incremental (S422 signaling)

**Gain switch function:**
- Yes

**Control panel:**
- x1 (8 bit digital character LCD)

**Software protection:**
- Dynamic brake, motor over-current, over-under position, over-velocity, virtual physical position limit switch, missing hall signal, external fault trigger

**Hardware protection:**
- Drive over-temperature (analog), 5V output short circuit, motor over-temperature (analog)

**Dimensions (LxWxH):**
- 200 x 134 x 53

**Weight (Kg):**
- 1.2

**Note 1:** Only applicable for the TC1-B series.

**Note 2:** Only applicable for the TC1-B series. Current sensor with a wider input range is used at the cost of additional signal noise and reduced resolution. This arrangement is suitable for applications where the motor mostly operates in short, high-current bursts.

**Note 3:** Additional heatsink required to ensure continuous operation at rated output.

**EtherCAT is a registered trademark and patented technology, licensed by Beckhoff Automation GmbH, Germany.**
TC SERIES
AC Servo Driver

**Product Overview**

- Auto Phasing
- Auto Tuning
- Auto Gain Switch
- Current Filter
- Oscilloscope
- S-curve Profile
- Anti-Cogging
- Scripting

**Dimension**

![TC1 Diagram]

**System status LEDs**
- 5 Digit 7-Segment display
- 4x front panel key
- Communication interface

**Model**

<table>
<thead>
<tr>
<th>TC1-8/230</th>
<th>TC1-20/230</th>
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<tbody>
<tr>
<td>Voltage and Phase</td>
<td>380-230 VAC</td>
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<tr>
<td>Frequency (Hz)</td>
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<tr>
<td>Power Rating (W)</td>
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<tr>
<td>Current (A)</td>
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<td>Peak power output (kW)</td>
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<tr>
<td>Peak current output (A)</td>
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<tr>
<td>Cont. current output (A)</td>
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<td>Regenerative resistor</td>
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<td>Pulse energy capacity (Joule)</td>
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<td>Regenerative resistor switch cont. current (A)</td>
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<td>Fieldbus (DS402 V3.0)</td>
<td>CANopen</td>
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<tr>
<td>Operation modes</td>
<td>PP, PV, PV, HM, CST, CSV, CSP</td>
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<tr>
<td>Serial bus</td>
<td>RS422</td>
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<tr>
<td>Motor type</td>
<td>Linearity Linear PM/S</td>
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<td>Encoder Input</td>
<td>A/B/Z (RS422), Sk(Cos(Cos))</td>
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<td>Motor Encoder Input</td>
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<td>Feedback position error mapping</td>
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<td>Current control</td>
<td>Loop Frequency</td>
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<tr>
<td>PWM modulation</td>
<td>20 KHz</td>
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<td>Command input</td>
<td>Serial, Fieldbus, ±10V Analog, internal software</td>
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<tr>
<td>Velocity control</td>
<td>Loop Frequency</td>
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<tr>
<td>Command input</td>
<td>10 KHz</td>
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<tr>
<td>Output filter</td>
<td>Serial, Fieldbus, ±10V Analog, internal software</td>
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<tr>
<td>Weight (Kg)</td>
<td>1.6</td>
</tr>
<tr>
<td>Operating temperature</td>
<td>10~40°C</td>
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</tbody>
</table>